

NO.	SH	DATE	REMARKS	NO.	SH	DATE	REMARKS
01	1	6- 9-41	Pending issue of S-999	40	-	1-31-30	35 Sheets New issue pending
06B	1	5-23-51	"	"	"	54	1 6- 7-33 Pending issue of S-999
08C	1	7-26-43	"	"	"	S-81	1 5-17-66
011A	1	9-30-42	"	"	"	S-200	1 12- 1-66
013A	1	11- 6-46	"	"	"	S-200	2 12- 1-66
014	1	1- 9-35	"	"	"	S-200	3 12- 1-66
021	1	12-12-41	"	"	"	S-200	4 12- 1-66
026	1	2-18-38	"	"	"	S-200	5 12- 1-66
028A	1	7-15-42	"	"	"	S-200	6 12- 1-66
032D	1	2- 9-53	"	"	"	S-200	7 12- 1-66
036	1	5-18-36	"	"	"	S-200	8 12- 1-66
038	1	5-15-36	"	"	"	S-200	9 12- 1-66
040C	1	10- 6-52	"	"	"	S-200	10 12- 1-66
042C	1	8-20-52	"	"	"	S-200	11 12- 1-66
044B	1	9-30-42	"	"	"	S-200	12 12- 1-66
046A	1	4- 5-51	"	"	"	S-200	13 12- 1-66
056	1	4- 2-35	"	"	"	S-200	14 12- 1-66
058B	1	4-28-49	"	"	"	S-200	15 12- 1-66
24	1	7-23-31	"	"	"	S-200	16 12- 1-66
26C	1	7-24-50				S-200	17 12- 1-66
26C	2	7-24-50				S-200	18 12- 1-66
26C	3	7-24-50				S-200	19 12- 1-66
						S-200	20 12- 1-66
						S-200	21 12- 1-66
30C	1	10-14-52				S-201	1 9-15-59
30C	2	10-14-52				S-201	2 9-15-59
						S-201	3 9-15-59
S-35	1	7- 1-54				S-205	1 8-19-64
S-35	2	7- 1-54				S-205	2 8-19-64
S-35	3	7- 1-54				S-205	3 8-19-64
36C	1	4- 1-54				S-205	4 8-19-64
37A	1	2-13-51				S-205	5 8-19-64
						215	1 8-15-39
						S-256	1 6- 1-61
						260	1 7-22-39

CHECK LIST - SYSTEM STANDARD SIGNAL PLAN BOOK AS OF 12-1-66
 NEW YORK CENTRAL SYSTEM, OFFICE OF DIR. OF COMM. & SIG., NEW YORK, N.Y.

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NO.	SH	DATE	REMARKS	NO.	SH	DATE	REMARKS
260	2	7-22-39		S-436	3	3-28-58	
265	1	1-15-40		440	1	1-15-40	
265	2	8-15-39		S-441	1	6-11-58	
270	1	3-28-58		S-441	2	5-6-57	
270	2	3-28-58		S-441	3	4-20-64	
270	3	4-1-63		S-441	4	5-6-57	
271	-	1949	AAR - 21 Sheets	S-441	5	4-20-64	
325D	1	2-15-51		S-441	6	5-6-57	
350	1	6-1-61		S-441	7	5-6-57	
350	2	4-20-64		S-441	8	4-20-64	
364	1	12-23-52		S-441	9	6-16-58	
S-370	1	9-8-59		S-441	10	4-20-64	
S-375	1	6-16-61	Limited Distribution	S-441	11	5-21-57	
S-380	1	3-28-58		S-441	12	6-16-58	
S-380	2	3-28-58		S-441	13	6-16-58	
S-390	-	-	146 Sheets New issue pending	S-441	14	12-15-58	
S-393	2-34	3-1-62		S-441	15	12-15-58	
S-393	35	8-19-63		S-442	1	11-1-61	
S-393	36-66	3-1-62		S-442	2	11-1-61	
S-393	67	3-4-64	62 Sheets	S-442	3	11-1-61	
S-394	1	11-17-58		S-500	1	4-10-63	
410	1	8-15-39		S-500	2	4-10-63	
415	1	7-22-39		S-500	3	4-10-63	
S-419	1	4-20-64		S-500	4	4-10-63	
S-419	2	4-20-64		S-500	5	4-10-63	
S-419	3	4-20-64		S-500	6	4-10-63	
420	1	8-15-39					
421	1	8-15-39		S-750	1	8-19-64	
S-423	1	12-1-66		S-760	1	4-20-64	
S-423	2	12-1-66		S-1156	1	1-16-58	
S-425	1	10-15-58					
S-426	1	6-1-61					
S-434	1	10-15-58					
S-434	2	10-15-58					
S-436	1	3-28-58					
S-436	2	3-28-58					

NO.	SH	DATE	REMARKS	NO.	SH	DATE	REMARKS
S-1157	1	1-14-63		2020B	1	5-27-49	
S-1158	1	5-2-66					
S-1158	2	5-2-66					
S-1160	1	12-7-59		2024A	1	6-13-50	
S-1165	1	3-21-63		S-2245	1	1-23-59	
S-1170	1	3-21-63					
S-1170	2	1-14-63		S-2300	1	10-19-59	
S-1173	1	3-29-63		S-2301	1	12-1-67	
S-1175	1	10-31-57		S-2301	2	12-1-67	
1660B	1	M-1956	A.A.R.	S-2301	3	12-1-66	
1661B	1	M-1944	"	S-2312	1	12-1-66	
1662E	1	M-1954	"	S-2312	2	12-1-66	
1663C	1	M-1954	"	S-2318	1	9-1-57	
1664C	1	M-1949	"	S-2325	1	4-10-63	
1665B	1	M-1944	"	S-2325	2	3-17-60	
1666B	1	M-1944	"	S-2325	3	4-10-63	
1667C	1	M-1954	"	S-2326	1	9-29-59	
1668B	1	M-1944	"	S-2330	1	8-19-63	
1669B	1	M-1944	"	S-2330	2	8-19-63	
1673F	1	M-1954	"	S-2330	3	8-19-63	
1674G	1	M-1954	"	S-2330	4	8-19-63	
1674G	2	M-1954	"	S-2330	5	8-19-63	
1674G	3	M-1954	"				
1675C	1	M-1954	"				
1675C	2	M-1954	"				
1676B	1	M-1943	"	S-2440	1	4-2-57	
1677C	1	M-1954	"	S-2635	1	8-1-57	
1677C	2	M-1954	"				
1678B	1	M-1943	"	S-2655	1	6-1-54	
1679B	1	M-1943	"	S-2656	1	9-29-59	
1680D	1	M-1954	"				
1680D	2	M-1954	"	S-2685	1	1-24-56	
1681B	1	M-1943	"				
S-2000	1	10-15-58		S-2685	2	1-24-56	

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SHEET NO. 3

NO.	SH	DATE	REMARKS	NO.	SH	DATE	REMARKS
S-2700	1	11-24-58		S-3140	1	8-19-64	
S-2700	2	11-24-58		S-3140	2	8-19-64	
S-2720	1	12-23-57		S-3150	1	10-19-62	
S-2920	1	2-1-55		S-3150	2	10-19-62	
S-3000	1	1-14-63		S-3150	3	10-19-62	
S-3000	2	12-1-67		S-3160	1	1-14-63	
S-3000	3	1-14-63		S-3160	2	1-14-63	
S-3000	4	12-1-67		S-3160	3	1-14-63	
S-3001	1	1-14-63		S-3170	1	8-19-64	
S-3001	1	1-14-63		S-3170	2	8-19-64	
S-3001	2	9-8-59		S-3180	1	8-19-64	
S-3001	3	8-19-64		S-3180	2	8-19-64	
S-3001	4	8-19-64		S-3190	1	8-19-63	
S-3002	1	4-20-64		S-3190	2	8-19-63	
S-3002	2	12-23-57		S-3190	3	8-19-63	
S-3002	3	4-10-62		S-3200	1	8-19-64	
S-3003	1	4-20-64		S-3210	1	8-19-64	
S-3003	2	12-1-67		S-3210	2	8-19-64	
S-3003	3	4-20-64		S-3210	2	8-19-64	
S-3003	4	4-20-64		S-3210	2	8-19-64	
S-3003	5	12-1-67		S-3250	2	8-19-64	
S-3004	1	4-20-64		S-3250	3	8-19-64	
S-3004	2	8-19-64		S-3251	1	4-10-62	
S-3004	3	4-20-64		S-3252	1	4-10-62	
S-3005	1	8-19-64		S-3253	1	4-10-62	
S-3006	1	12-1-67		S-3900	1	8-19-64	
S-3007	1	10-19-62		S-3900	2	8-19-64	
S-3010	1	4-20-64		S-4315	1	8-19-63	
S-3011	1	9-8-59		S-4550	1	4-10-59	
S-3012	1	9-8-59		S-4550	2	4-10-59	
S-3014	1	9-8-59		S-4550	3	4-10-59	
S-3014	2	4-20-64		S-4551	1	4-10-59	
S-3017	1	5-26-60		S-4560	1	2-17-59	
S-3017	2	10-19-62		S-4560	2	2-17-59	
S-3025	1	12-23-57		S-4560	3	6-1-61	
S-3087	1	10-19-62		S-4565	1	9-29-59	
S-3100	1	8-19-63		S-4565	2	2-17-59	
S-3100	2	8-19-63		S-4570	1	7-9-62	
S-3101	1	10-19-62		S-4570	2	10-24-60	
S-3101	2	10-19-62		S-4570	3	10-24-60	
S-3101	3	10-19-62		S-4570	4	7-9-62	
S-3110	1	8-19-64		S-4572	1	7-9-62	
S-3110	2	10-19-62		S-4575	1	10-19-62	
S-3120	1	8-19-64		S-4575	2	10-19-62	
S-3120	2	8-19-64		S-4575	3	10-19-62	
S-3130	1	8-19-64		S-4830	1	6-1-61	
				S-4841	1	12-2-57	
				S-4841	2	8-19-64	
				S-4841	3	10-24-60	

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NO.	SH	DATE	REMARKS	NO.	SH	DATE	REMARKS
S-4841	4	10-24-60		S-9801	1	1-23-61	
S-4841	5	7-9-62		S-9801	2	1-23-61	
S-4844	1	12-1-66		S-9801	3	1-23-61	
S-4930	1	3-21-63		S-9801	4	11-8-63	
S-4930	2	3-21-63		S-9801	5	11-8-63	
S-4935	1	2-1-55		S-9801	6	12-1-67	
				S-9801	7	12-1-67	
				S-9802	1	1-23-61	
S-4935	2	2-1-55		S-9802	2	1-23-61	
S-4937	1	10-15-58		S-9802	3	1-23-61	
S-4939	1	2-1-55		S-9802	4	11-8-63	
S-4940	1	2-1-55		S-9802	5	11-8-63	
S-4942	1	7-1-54		S-9802	6	12-1-67	
S-6315	1	6-28-60		S-9802	7	12-1-67	
S-6315	2	6-28-60		S-9802	8	12-1-67	
				S-9803	1	2-1-55	
S-6580	1	2-1-55		S-9890	1	4-20-64	
S-7700	1	1-14-63					
S-7700	2	1-14-63					
S-7701	1	5-29-63					
S-7702	1	1-14-63					
S-8510	1	6-1-61					
S-8510	2	6-1-61					
S-8515	1	6-1-61					
S-8520	1	6-16-58					
S-8550	1	6-1-61					
S-8550	2	6-1-61					
S-8575	1	6-1-61					
S-9038	1	12-18-57					
S-9045	1	11-8-63					
S-9048	1	2-17-59					
S-9275	1	7-1-60					
S-9275	2	7-1-60					
S-9275	3	11-8-63					
S-9275	4	12-1-66					
S-9275	5	8-19-64					
S-9800	1	7-1-54					

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SHEET NO. 5

PLAN	NO.	PLAN	NO.	PLAN	NO.
ARMS, GATE-HIGHWAY CROSSING SIGNAL	S-2330	CIRCUITS, ARRESTER APPLICATION	S-9038	INDUCTOR, DUMMY - A.T.S.	S-4942
ASPECTS, AUTOMATIC INTERLOCKING-REQUIREMENTS	401	AUTOMATIC FLASHING LIGHT SIGNALS & GATES	S-9275	FASTENINGS - A.T.S.	S-4935
		AUTOMATIC INTERLOCKING	S-9048	LAYOUT - A.T.S.	S-4930
BACKGROUND, TYPE FA SIGNAL	S-4572			INSPECTORS INSTRUCTIONS	215
BATTERIES, EDISON PRIMARY-COPPER OXIDE TYPE, INSTRUCTIONS	26C	FOUR ASPECT COLOR LIGHT AUTOMATIC SIGNALS	S-9045	INTERLOCKING, ELECTRIC-INSTRUCTIONS	205-B
LEAD TYPE STORAGE -INSTRUCTIONS	S-35			MECHANICAL-ELECTRO-MECHANICAL-INSTRUCTIONS	210-B
LEAD TYPE STORAGE-TWO RATE CHARGE-INSTRUCTIONS	S-380	OVERLAY TRACK-INSTRUCTION	S-270		
NICKLE-IRON STORAGE -INSTRUCTIONS	30C				
		SWITCH-110 V. SWITCH MACHINE, CROSSOVER	S-9802	JOINTS, INSULATED-LOCATION	S-2301
BLOCKS & MARKERS, LEVER	2020B	110V. SWITCH MACHINE, SINGLE SWITCH	S-9801		
" " "	2024A			LAMP, ELECTRIC SIGNAL-SPECIFICATIONS	S-750
		SWITCH REPEATER	S-9800		
		SWITCH REPEATER-HAND OPERATED SWITCH	S-9803	LEVER, THROW-OVER - PLUNGER LOCKS	S-3025
BLOCKS, WIRE TERMINAL	2651	TRACK-ADJUSTMENTS, CODED ENERGY D.C	S-442	LIGHT UNIT, ELECTRIC-HIGHWAY CROSSING SIGNALS-INSTRUCTIONS	S-760
		TRACK-ADJUSTMENTS, STEADY ENERGY D.C.	S-441	LINE, POLE-SIGNAL WIRES ON COMMUNICATION DEPT. POLES	364A
BOLTS, RETARDER-SPECIFICATION	1142	TRACK-INSTRUCTIONS	440	STRUCTURE	S-7700
THROW ROD CONNECTION	S-3007			WIRE JOINTS	S-7702
				WIRE TIES	S-7701
BONDS, INSTALLATION OF RAIL SIGNAL -INSTRUCTIONS	36C				
PLUG TYPE RAIL-TRACK CIRCUIT CONNECTORS	S-1156				
RAIL HEAD SIGNAL-DRILLING & APPLICATION	S-1157	CONDUIT ASSEMBLIES	S-1173	LINK - FOR SWITCH CONNECTED BLOCK DERAIL	S-3087
		CONNECTIONS, TRACK LEAD	S-1160	LOCKS, ELECTRIC-INSTRUCTIONS	265
BONDING- FROGS, SWITCH POINTS & FOULING CIRCUITS	S-1158	CONNECTORS, TERMINAL & TEST LINKS	6860-A	LOCKING, ELECTRIC-TEST INSTRUCTIONS	S-426
OIL SIDINGS - DETAILS & INSTRUCTIONS	S-2318	CONTROLLER, SWITCH CIRCUIT-INSTRUCTIONS	415	MECHANICAL-INSTRUCTIONS	260
				LUG, POINT DETECTOR	S-3006
BOOTLEG - ASSEMBLY	S-1165	COVER, CABLE ENTRANCE- INDUCTOR	S-4937	MARKER, GRADE SIGNAL	S-4315
				MASTS, HIGHWAY CROSSING SIGNAL	S-2656
BOX, EMERGENCY TOOL	S-1175	CRANKS- SWITCH LAYOUTS	S-3017	MOUNTING, SIGNAL-BRACKET POST	S-4560
				BRIDGE, 7 FT. TRUSS	S-4575
BOXES, TERMINAL	S-1170	DERAILS, BLOCK TYPE	S-3012	GROUND MAST	S-4550
BRUSHES, MOTOR	S-6580	SIDINGS & YARD TRACKS-REQUISITES	S-81	HOT BOX, D.E. DET, TAKE SIDING	S-4570
		DIAGRAM, ROAD	S-2300	NUMBER PLATES, SIGNAL	S-2245
CAP-JUNCTION BOX BASE	S-2326	DISTANCE, BRAKING	S-2685	NUMERALS & LETTERS-FOR MARKING SWITCHES & SIGNALS	S-2280
		ESTIMATES, PREPARATION OF -INSTRUCTIONS (LIMITED DISTRIBUTION)	S-370	NUTS-FOR TYPE B RETARDER BOLTS, SPECIFICATIONS	1141
CASES, STEEL -DETAILS	S-8520			NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT INDEX SYSTEM STANDARD SIGNAL PLANS, INSTRUCTIONS & SPECIFICATIONS	
HALF CASE	S-8515	FORMS (TO BE ISSUED)	S-999		
HIGH DOUBLE	S-8575				
ONE DOOR-HIGH & LOW	S-8510	GAGE, INDUCTOR-RECEIVER	S-4940		
SINGLE-HIGH & LOW	S-8550	SWITCH ADJUSTMENT	S-2000		
		GATE ARMS, HIGHWAY CROSSING	S-2330		
		GROUNDS, LIGHTNING ARRESTER-INSTRUCTION	S-256		
		GUIDE, POINT DETECTOR ROD	S-3252		
		HOOD, SNOW SHIELD- FOR C.L. SIGNALS	S-4830		

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SHEET 1 Cont'd. on Sh. 2

PLAN	NO.	PLAN	NO.	PLAN	NO.
		SIGNAL, C. L. TYPE - INSTRUCTIONS	410	SWITCHES & SIGNALS, SAFELY SECURING OF - INSTRUCTIONS	420
OIL, ILLUMINATING - SPECIFICATION	830	HIGHWAY CROSSING - FLASHING LIGHT TYPE	S-2312		
OILS & GREASES - ORDERING REFERENCES	325D	- FLASHING LIGHTS & GATES - INSTR.	37A	SWITCHES, SPRING - INSTRUCTIONS	421
		- GATE TYPE	S-2325		
PAINTING - INSTRUCTIONS & ORDERING REFERENCES	S-350	SPRING, BOOSTER - SPRING SWITCH	S-3253		
		STEP, POLE - FLASHING LIGHT SIGNALS	S-2655	SYMBOLS, TERMS & - ELECTRONIC (ADOPTED A A R PLAN)	271
PIPE, SOIL	S-2440	STOP DISTANCE - FREIGHT & PASSENGER TRAINS	S-2685	GRAPHICAL (ADOPTED A A R PLAN)	1660-1681
		STOP, SWITCH POINT - SPRING SWITCH	S-3251		
PLATES, BASE - SWITCH LAYOUTS	S-3004	STRAPS, TIE	S-3014		
SIGNAL NUMBER	S-2245	SUPPORT, CABLE - GROUND MAST SIGNALS	S-4551	TAGGING - IDENTIFICATION OF WIRES	S-2700
PLATFORM - BRACKET POST	S-4565	SWITCH LAYOUT - AUXILIARY THROW	S-3010	TARGETS, SWITCH & DERAIL	S-2720
		CROSSOVER, MAIN TO MAIN, A. B. S. TERRITORY	S-3120		
		MAIN TO MAIN OR SIGNED SIDING	S-3110		
		MAIN TO NON-SIGNED SIDING	S-3130	TESTS & INSPECTIONS, SCHEDULE OF FIELD	S-423
				TESTS, INSULATION RESISTANCE	S-425
		HAND THROW, MODEL 10 LOCK	S-3101		
RECEPTACLES, LAMP - FOR INDICATORS & TRACK CHARTS	6500	MOVABLE POINT FROG	S-3190		
RECTIFIERS, COPPER OXIDE - SPECIFICATIONS	27			TIES, INDUCTOR	S-4939
SELENIUM - REQUIREMENT TABLE	879A			SWITCH	S-3011
		SINGLE SWITCH - 5A, 5C OR 5G SWITCH MACHINE	S-3000		
REFERENCE, APPARATUS	S-500	MODEL 6 SWITCH MACHINE	S-3210	TOOL BOARD & EQUIPMENT	2765-B
		MODEL 9 SWITCH MACHINE	S-3100		
RELAYS, A. C. - AND INDICATORS, INSTRUCTIONS	40	MODEL 13 SWITCH MACHINE	S-3200		
D. C. - CODE CONTROL SYSTEM, INSTRUCTIONS	S-394	MECHANICAL - FACING POINT LOCK	S-3900	TRAIN STOP, AUTOMATIC - INSTRUCTIONS	S-436
D. C. - TRACTIVE ARMATURE, PLUG-IN TYPE, SPECIFICATIONS	S-393				
D. C. - TRACTIVE ARMATURE TYPE, SPECIFICATIONS	390C			UNIT VALUES, SIGNAL - SUPPLEMENT TO AAR M.P. 203 (LIMITED DIST.)	S-375
RELEASE, TIME - INSTRUCTION	S-434	SLIP, DOUBLE	S-3180		
REPORT, SIGNAL INTERRUPTION - INSTRUCTION	S-201	SINGLE	S-3170	WRENCHES, SWITCH ADJUSTMENT	S-2920
RESISTORS, WIRE WOUND	881B				
		SPRING SWITCH, HAND THROW	S-3250		
RODS, FRONT	S-3001			NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT INDEX SYSTEM STANDARD SIGNAL PLANS, INSTRUCTIONS & SPECIFICATIONS	
GROUND - SECTIONAL	S-6315	TURNOUT - BLOCK DERAIL, INTERLOCKED SWITCH	S-3140		
LOCK	S-3003	BLOCK DERAIL, NON-INTERLOCKED SWITCH	S-3150		
POINT DETECTOR	S-3005	SPLIT POINT DERAIL, NON-INTERLOCKED SW.	S-3160		
SWITCH LAYOUTS	S-3002				
RULES, I. C. C. - STANDARDS & INSTRUCTIONS	2008				
SHUNT, TRACK	S-2635				
SIGNS - HIGHWAY CROSSING	S-4844				
- VARIOUS	S-4841				

FIGURE 1,- Block Derail

PARALLEL TRACKS

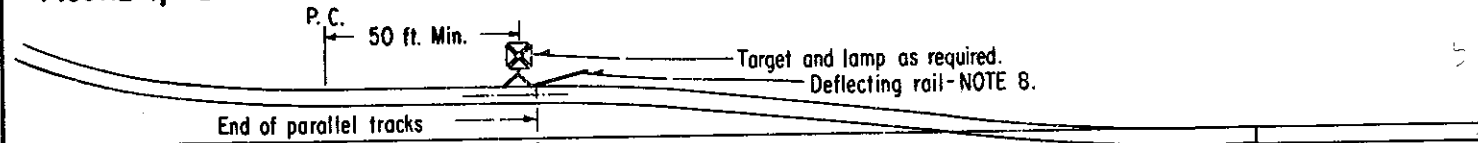


FIGURE 2,- Block Derail

DIVERGING TRACKS

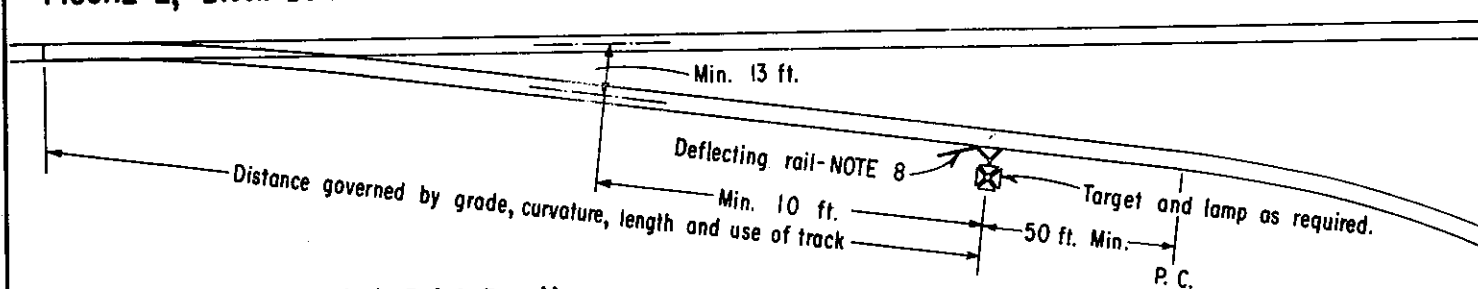


FIGURE 3,- Single Switch-Point Derail

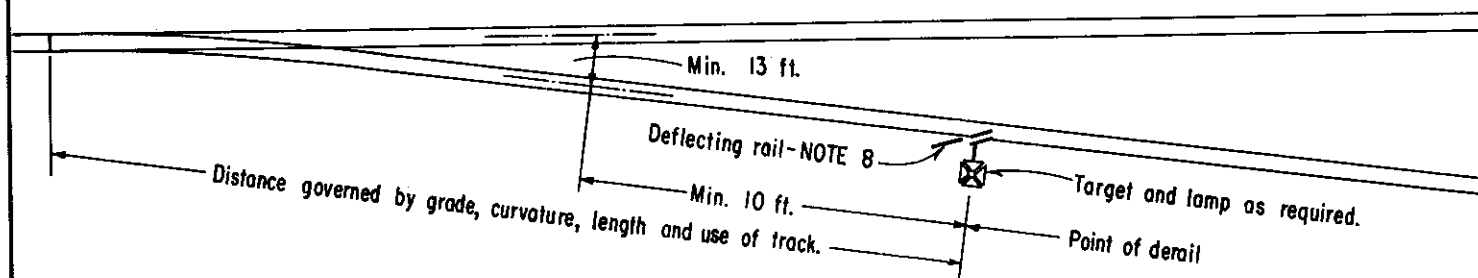
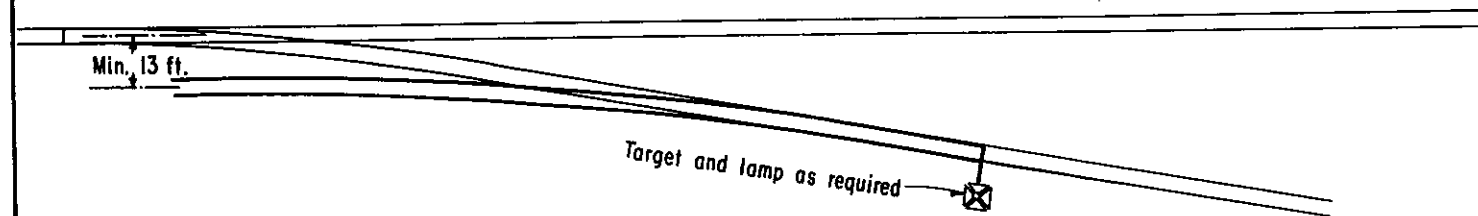


FIGURE 4,- Double Switch-Point Derail



REQUISITES

- 1 - DERAIL shall be installed:
 - a. Where the grade of a track upon which cars are stored is descending toward the track to be protected.
 - b. Where operating conditions require.
 - c. Where required by public bodies.
- 2 - DERAIL shall be located to insure, as far as practicable, derailed equipment will not foul track to be protected.
- 3 - DERAILS, where practicable, shall be operated by pipe connection from switch. In automatic block signal territory, separately operated derails must be provided with switch circuit controller. In non-automatic block territory, separately operated derails must be forced into the derailing position before the switch can be lined for a movement on the track to be protected.
- 4 - BLOCK DERAIL shall not be used where, because of grade or other conditions, "SLOW SPEED" may be exceeded.
- 5 - BLOCK DERAIL may be located on outside of curve.
- 6 - SINGLE SWITCH-POINT DERAIL shall be used for derailing to the inside of curve.
- 7 - DOUBLE SWITCH-POINT DERAIL with frog shall be used where a single switch-point derail will not, on account of curvature, grade, track length or other local conditions, provide proper protection.
- 8 - DEFLECTING RAIL, where required, shall be installed in accordance with N. Y. C. System Roadway Standards.

**NEW YORK CENTRAL SYSTEM
SIGNAL STANDARD
DERAILS
SIDINGS AND YARD TRACKS
REQUISITES**

W. H. Haskins
VICE PRESIDENT - OPERATION

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FIGURE 1,- Block Derail

PARALLEL TRACKS

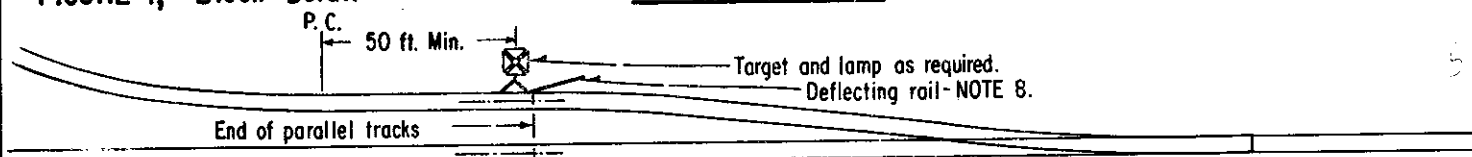


FIGURE 2,- Block Derail

DIVERGING TRACKS

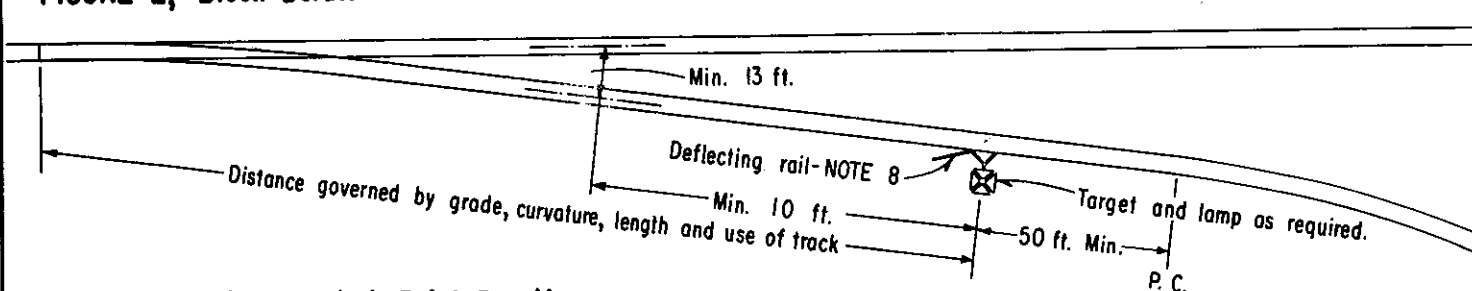


FIGURE 3,- Single Switch-Point Derail

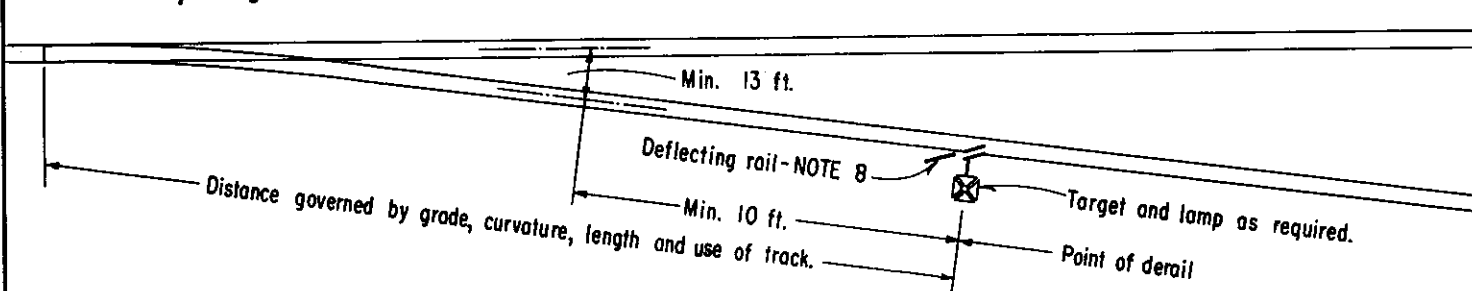
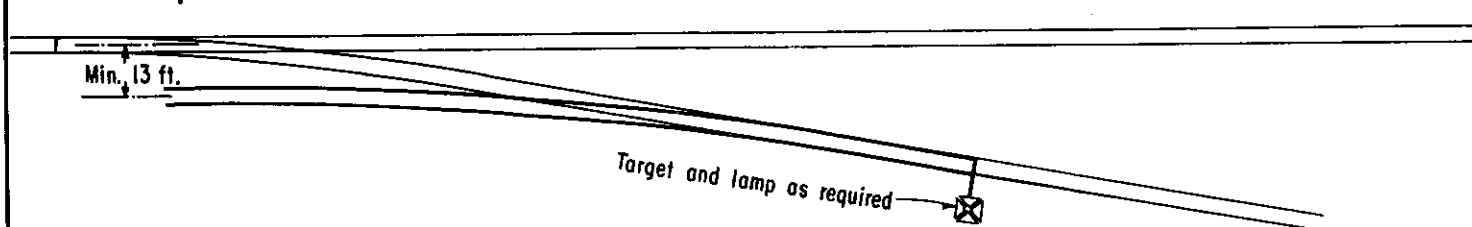


FIGURE 4,- Double Switch-Point Derail



REQUISITES

- 1 - DERAIL shall be installed:
 - a. Where the grade of a track upon which cars are stored is descending toward the track to be protected.
 - b. Where operating conditions require.
 - c. Where required by public bodies.
- 2 - DERAIL shall be located to insure, as far as practicable, derailed equipment will not foul track to be protected.
- 3 - DERAILS, where practicable, shall be operated by pipe connection from switch. In automatic block signal territory, separately operated derails must be provided with switch circuit controller. In non-automatic block territory, separately operated derails must be forced into the derailing position before the switch can be lined for a movement on the track to be protected.
- 4 - BLOCK DERAIL shall not be used where, because of grade or other conditions, "SLOW SPEED" may be exceeded.
- 5 - BLOCK DERAIL may be located on outside of curve.
- 6 - SINGLE SWITCH-POINT DERAIL shall be used for derailing to the inside of curve.
- 7 - DOUBLE SWITCH-POINT DERAIL with frog shall be used where a single switch-point derail will not, on account of curvature, grade, track length or other local conditions, provide proper protection.
- 8 - DEFLECTING RAIL, where required, shall be installed in accordance with N. Y. C. System Roadway Standards.

**NEW YORK CENTRAL SYSTEM
SIGNAL STANDARD
DERAILS
SIDINGS AND YARD TRACKS
REQUISITES**

W. L. Hasler
VICE PRESIDENT - OPERATION

S-81

LIGHTNING ARRESTER GROUNDS - INSTRUCTIONS

GENERAL

1. Ground rods shall be provided for lightning arresters in accordance with Plan S-9038.
2. Ground rods and connecting parts shall be in accordance with Plan S-6315.
3. Where desired resistance is not obtained with 1 ground rod, a system of multiple ground rods (main and 1 or more supplementary rods) should be driven. In such cases the rod at the arrester location must be retained because it tends to reduce the inductive effect of a long wire extending to the more reliable ground.
4. Where desired resistance is not obtained with a system of multiple ground rods, the soil should be treated.

LOCATION AND ARRANGEMENT

5. Ground rod shall be located as close as practicable to lightning arresters but preferably not closer than 3 ft. from post, pole or foundation except as specified below.
6. Top of ground rod shall be 3 to 6 in. below surface of the earth except that ground rod to which the steel relay case, steel relay racks, etc. are connected shall be driven so that the ground rod connection is 3 to 6 in. above surface of the earth to facilitate inspection.
7. One ground rod shall consist of not more than 3 sections unless authorized by the Signal Engineer.
8. Where the desired resistance is not obtained with 1 ground rod of 3 sections, 1 or more supplementary ground rods, as necessary, shall be driven. Rods shall be located not less than 6 ft. apart.
9. Where arrester location is on top of fill and desired resistance of ground is not obtained with one 3 section ground rod at arrester location, supplementary ground rod or rods may be driven down the slope or at the foot of slope where good soil exists.

10. Where space is not available 3 ft. from post, pole or foundation to drive a rod vertically, the rod may be at an angle so that the lower end is more than 3 ft. from post, pole or foundation. If supplementary ground rod is required it should be not less than 120 deg. around the obstruction from main rod and driven at same angle.
11. Not more than 3 rods (main and supplementary) shall be used at 1 arrester location unless authorized by The Signal Engineer.
12. Joint use of 1 ground rod for high voltage (more than 175 volts) arresters and low voltage (175 volts or less) arresters must be approved by the Signal Engineer.
13. Separate ground rods for high voltage and low voltage arresters must be not less than 12 ft. apart.

DRIVING

14. Ground rods shall be driven with coupling, S-6315-15, and driving stud, S-6315-16, connected so that the driving stud bears solidly on top of the rod.
15. While being driven, the ground rod must be properly guided in order to prevent bending and to keep vibration to a minimum.
16. When connecting sections of rod the connection must be made in the coupling so that the upper section will bear solidly on top of the lower section.

GROUND LEAD AND CONNECTIONS

17. Ground lead between low voltage arrester ground post or bus and ground rod shall be bare soft-drawn copper wire No. 6 A. W. G.
18. Ground lead between high voltage arrester and ground rod shall be bare soft-drawn copper wire No. 6 A. W. G. except as specified on Plan S-9038.
19. Connections to ground rod shall be made in accordance with Plan S-6315.
20. Ground lead and interconnecting wires must be as short as practicable and shall not exceed 60 ft. in length unless authorized by the Signal Engineer.

21. Ground lead and interconnecting wires shall be buried not less than 3 in. in earth, run as directly as practicable, avoiding acute angles and must have sufficient slack to avoid breakage by frost.
22. A 3/8 in. or more air space or equivalent insulation shall be provided between ground lead and low voltage circuits.

TREATMENT OF SOIL

23. Soil should be treated by digging a circular trench 15 in. wide, 18 in. deep and 48 in. outside diameter around each rod; distribute 50 to 75 lb. of rock salt, depending on soil resistivity, in the trench; flood trench with water 2 or 3 times and then replace the soil in the trench.

TESTS

24. The preferred maximum resistance of ground when installed is 15 ohms measured at the arrester, thereafter the ground shall be maintained with resistance preferably of not more than 25 ohms.
25. Where discharge path to rail is not provided in accordance with Plan S-9038, periodical ground resistance tests shall be made preferably during the summer months.
26. Where ground resistance within the allowable limits, cannot be maintained with methods specified herein the condition must be reported to the Signal Supervisor.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT LIGHTNING ARRESTER GROUNDS INSTRUCTIONS

Approved 
Chief Signal Engineer

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GENERAL

1. These instructions must be followed unless instructed otherwise by Chief Signal Engineer. Signal Department forces shall be responsible for painting maintenance of all signal facilities unless specifically instructed otherwise. Painting must be done at sufficiently frequent intervals to provide adequate protection and maintain good appearance. All materials used under this schedule shall conform to the applicable specification as designated and failure of material to prove satisfactory shall be reported. Painting, except as specified herein, shall be in accord with requirements shown on plans for such apparatus and equipment.
2. Color numbers referred to in this specification are in accordance with Federal Specification TT-C-595.

APPLICATION

3. Paint may be applied by brushing, dipping or spraying and may be air dried or baked. Paint shall be uniformly applied, thoroughly worked into all joints or open spaces and each coat dry before application of the succeeding coat. Surfaces that will be inaccessible after assembly shall be properly coated before being assembled. In general, manufacturer's instructions for application practices shall be followed.
4. Cleaning
 - a. Surfaces shall be thoroughly cleaned. All loose or detachable mill scale, paint, rust, grease, dirt or other foreign substances shall be removed and surfaces thoroughly dry before painting.
5. Mixing and Thinning:
 - a. Mixing:
 1. Paint shall be thoroughly mixed before and during application, or an inferior paint coating will result. To provide thorough mixing the following procedure should be carried out:
 - a. Pour off a portion of the liquid into another clean container.
 - b. Stir the paint left in original container until it is a uniform smooth mixture, then add all the liquid previously poured off, stirring constantly as it is being added.

- c. Pour the contents from one container to the other until a smooth uniform mixture is obtained.
 - b. Thinning:
 1. For the thinning of primers, paints and enamels, for application by brushing, spraying or dipping, manufacturer's direction shall be followed and the specified thinners used.
 6. Paint shall not be applied under poor weather conditions nor when the temperature falls below 40° Fahrenheit.

PAINTING REQUIREMENTS - FIELD

7. Rust spots appearing on a painted surface shall be cleaned of loose rust by scraping or wire brushing and surface protected against further damage by spot painting. Pressurized one-half pint containers for spot painting may be ordered as follows:
Self Spray Flat Black - Rust-oleum 412, Item 64.
Self Spray Aluminum - Rust-oleum 470, Item 65.
8. Sheet metal housings, including instrument and battery cases, terminal boxes, bungalows, and other sheet metal structures for outdoor installations shall be painted as follows:
 - a. Exterior surfaces - Aluminum Paint, Item 53.
 - b. Interior surfaces except composition linings - Gray Enamel, Item 33.
9. Sheet metal cabinets, tower cases, chaseways, and cases for indoor installations shall be painted as follows:
 - a. Exterior and interior surfaces - Green, Quick Drying Enamel, Item 42, Color No. 1445.
10. Mechanical and power interlocking machine frame shall be painted with Non-Reflecting Black Enamel, Item 46.
11. Levers of mechanical and power interlocking machines (except machine-finished surfaces and latch handles) shall be given one coat of Quick-Drying enamel, Item 42, using colors as follows except that operative levers in mechanical machines not connected to a pipe line shall have the lower half painted with Aluminum paint, Item, 53:

- a. Signal (Int.): Vermillion Red, Color No. 1105.
 - b. Signal (Approach): Chrome Yellow, Color No. 1310.
 - c. Switch: Black, Color No. 1775.
 - d. Lock (F.P.L.): Robinegg Blue, Color No. 1520.
 - e. Traffic: Green, Color No. 1445.
 - f. Master Lock: Brown, Color No. 1005.
 - g. Spare: White, Color No. 1755.
 - h. Railroad Crossing Gates: Diagonal stripes of Black, Color No. 1775 and White, Color No. 1755. Stripes two inches wide on mechanical lever and one inch wide on power lever, pointing downward at an angle of 45°, away from the Operator. Stripes adjacent to handle shall be black.
 12. Searchlight and color-light type signal cases, except finished surfaces, shall be painted as follows:
 - a. Interior surfaces of cases and hoods - Primer, Item 31, followed by non-reflecting Black Enamel, Item 46.
 - b. Backgrounds - Primer, Item 31, on both sides followed by non-reflecting Black Enamel, Item 46, on the front side. Aluminum Paint, Item 53, on the opposite side.
 - c. Exterior surfaces of cases - Aluminum Paint, Item 53, except front, side of dwarf, signals, which shall be painted with one coat of non-reflecting Black Enamel, Item 46.
 13. Exposed iron work, threaded parts, rivets and areas where galvanizing has been cut or removed on interlocking pipe - Primer, Item 31, followed by Black Enamel, Item 32.
 14. Steel pipe for signal masts and cable posts shall be painted as follows:
 - a. Interior surface - Primer, Item 31.
 - b. Exterior surface - Aluminum Paint, Item 53.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT PAINTING INSTRUCTIONS AND ORDERING REFERENCES

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ISSUED 6-1-61
SHEET 1-1 Cont'd on Sh. 2

15. Wood housings for outdoor installations shall be painted as follows:
 - a. Exterior surfaces -- Aluminum Paint, Item 53.
 - b. Interior surfaces, except composition linings -- Gray Enamel, Item 33.
16. Woodwork, installed in Signal Stations (except interlocking machine cabinets, relay and battery racks) shall be painted the same as inside of building.
17. Switch machines, switch circuit controller, cable terminal and junction boxes shall be painted with Green Lacquer, Item 52 as follows:
 - a. Inside surface of switch machine case.
 - b. Interior parts of switch machines where paint is required.
 - c. Inside surface of switch circuit controller case.
 - d. Inside surface of cable terminal and junction boxes.
18. Metal covers of trunking and battery boxes shall be painted with Aluminum Paint, Item 53.
19. Block Type derails, outside surfaces of switch machines, switch circuit controllers, cable terminal and junction boxes, hot box detectors and inductors shall be given one coat of black enamel, Item 32.
20. Unwound inductor cores and exposed laminations of wound cores shall be painted with asphaltic car cement, Item 36.
21. Battery trays, inside of battery boxes, and battery racks exposed to battery acid shall be painted with Acid Resisting Paint, Item 34.
22. Signal blades, switch and derail target banners shall be painted with Quick-Drying enamel, Item 42, of required color.
23. Frames of motors and generators shall be painted with Green Lacquer, Item, 52, armature and coils shall be painted with Clear Lacquer, Item 51.
24. Concrete relay housings shall be painted as follows:
 - a. Interiors -- Gray Enamel, Item 33, prior to placement and wiring of apparatus.
 - b. Exteriors shall not be painted unless required to prevent surface deterioration. Where painting is required, Gray Enamel, Item 33, shall be applied.
25. Concrete floors shall be given one finishing coat of Gray Enamel, Item 33.

PAINTING REQUIREMENTS -- SHOP

26. Paints and painting required in connection with construction and repairs of apparatus and equipment in the shop shall be governed by requirements for the apparatus and equipment involved except as provided under Prescribed Paint Coatings -- Field.

PAINTING REQUIREMENTS -- MANUFACTURERS

27. Apparatus and equipment furnished by manufacturer shall be painted in accordance with his standard practice except as follows:
 - a. Pinnacles, pipe line connections and switch rods shall be furnished with priming coat only.

REMOVABLE PROTECTIVE COVERING

28. Before shipment, storage, or exposure to dampness, machine-finished parts such as Lock Rods, Detector bars, threads, etc. shall be covered with Grade A, No-Ox-Id, Item 62.

ITEM	ORDERING REFERENCE
31 PRIMER:	Zinc Chromate N.Y.C.S. Spec. 1225
32 ENAMEL:	Black, N.Y.C.S., Spec. 1211A
33 ENAMEL:	Burry's Floor, Porch & Deck Enamel, Light Gray
34 PAINT:	Edison Esbalite Compound
35	
36	Asphaltic car cement, Spec. 1233
37	
38	
39	
40	
41 ENAMEL:	Traffic Enamel Yellow
42 ENAMEL:	High Grade, Quick-drying, Hard Finish, Specify color number. Approved list of Manufacturers: Dolphin-DuPont-Rapolin Valentine-C.A. Wiley's Chas. R. Long, Jr., Co. O'Brien Varnish Co. Patterson-Sargent's E.E.
44 THINNER:	Thinning Oil, N.Y.C.S. Spec. 1205A
45	

ITEM	ORDERING REFERENCES
46	ENAMEL: Non-Reflecting Black No. 6651 McDougall-Butler Co.
47	REDUCER: Mineral Spirits, N.Y.C.S. Spec. 12 N.Y.C.S. Spec. 1208C
48	
49	
50	
51	LACQUER: Clear, Glyptal No. 1202 General Electric Company
52	LACQUER: Green, Glyptal No. 1211 General Electric Company
53	PAINT: Aluminum N.Y.C.S. Spec. 1227
54	THINNER: Glyptal No. 1500, General Electric Company (Thinner for G.E. Co., Glyptal)
55	
56	
57	VARNISH: Electrical Baking N.Y.C.S. Spec. V-9, V-12
58	
59	
60	
61	
62 Grease	Grade A, Special No-Ox-Id 5 Gal. Containers Dearborn Chemical Co.
63	
64 Paint, Self Spray, Flat Black	Rust-Oleum 412 1/2 Pint Containers
65 Paint, Self Spray, Aluminum	Rust-Oleum 470 1/2 Pint Containers

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT PAINTING INSTRUCTIONS AND ORDERING REFERENCES

Approved

L. J. Battinelli
Chief Signal Engineer

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ITEM NO.	TEST AND/OR INSPECTION	RULES & INSTRUCTIONS		TEST AND/OR INSPECTION INTERVAL	TEST AND/OR INSPECTION TO BE MADE BY		RECORDED ON FORM NO.	DISPOSITION OF FORM	REMARKS
		I.C.C. NO.	N. Y. C. NO.		MAINTAINER (M)	INSPECTOR (I)			
1	Ground Test	136.2	S-205	As Required	M		SC-29	Retained by Maintainer	
2	Rail Bonds			1 Year	M		Log Book	Retained by Maintainer	Every 3 months in non-signalized territory
3	Semaphore Arm Clearance	136.22	AAR Part 54	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	*
4	Track Circuit (Series Overlay)		S-270	1 Year	M		Log Book	Retained by Maintainer	
5	Batteries, Primary		26	As Required	M		Log Book	Retained by Maintainer	
6	Batteries, Storage - Ni-Fe		30	1 Month	M		SC-27	Retained at Location	
7	Batteries, Storage - Lead		S-35	1 Month	M		SC-27	Retained at Location	
8	Arrester Inspection			See Remarks	M		Log Book	Retained by Maintainer	With routine apparatus inspection.
9	Arrester Ground	136.78	S-256	2 Years		I	SC-54	Dist. Engr. C&S Sig. Supvr.	
10	Signal Mechanisms	136.102	410, Mfrs. & Special	See Remarks	M		SC-6	Signal Supervisor	Semaphore Signals to be inspected each month. Colorlight Signals to be inspected each 6 months.
11	Signal Mechanisms	136.102	410, Mfrs. & Special	2 Years		I	SC-12, SC-38	Dist. Engr. C&S Sig. Supvr.	
12	Switch Circuit Controllers	136.103	415	3 Months	M		SC-6	Signal Supervisor	
13	Shunt Fouling Circuits	136.104	440	3 Months	M		SC-6	Signal Supervisor	
14	Insulated Joints	136.59	440	6 Months	M		Log Book	Retained by Maintainer	
15	Electric Locks		265	6 Months	M		Log Book	Retained by Maintainer	
16	Electric Locks	136.105	265	1 Year		I	SC-12, SC-38	Dist. Engr. C&S Sig. Supvr.	Except forced drop type.
17	Relays, AC	136.106	40, Mfrs.	See Remarks		I	SC-19, SC-12	Dist. Engr. C&S Sig. Supvr.	Vane Type relays to be tested every 2 years. All other types each year.
18	Relays, DC	136.106	390, S-393, Mfrs.	2 Years		I	SC-12	Dist. Engr. C&S Sig. Supvr.	Every 4 years in non-signalized territory.
19	Relays, DC Non Vital	136.106	S-394	2 Years		I	SC-12, Tape Rec.	Dist. Engr. C&S Sig. Supvr.	
20	Insulation Tests	136.108	S-425	As Required		I	SC-47	Dist. Engr. C&S Sig. Supvr.	
21	Mechanical Locking		260	3 Months	M		Log Book	Retained by Maintainer	
22	Mechanical Locking	136.376	260	4 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
23	Approach Locking	136.377	S-426	1 Year		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
24	Time Locking	136.378	S-426	1 Year		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
25	Route Locking	136.379	S-426	3 Months	M		SC-6	Signal Supervisor	
26	Route Locking		S-426	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	*
27									
28	Indication Locking	136.380	S-205, S-426	1 Year (See Remarks)		I	SC-38	Dist. Engr. C&S Sig. Supvr.	2 Years - Light Signals.

* Maintainer will make required tests under supervision of Inspector.

NEW YORK CENTRAL SYSTEM SIGNAL STANDARD SCHEDULE OF FIELD TESTS AND INSPECTIONS

S-423

ITEM NO.	TEST AND/OR INSPECTION	RULES & INSTRUCTIONS		TEST AND/OR INSPECTION INTERVAL	TEST AND/OR INSPECTION TO BE MADE BY		RECORDED ON FORM NO.	DISPOSITION OF FORM	REMARKS
		I.C.C. No.	N.Y.C. No.		MAINTAINER (M)	INSPECTOR (I)			
29	Traffic Locking	136.381	S-426	1 Year		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
30	Switch Obstruction Test	136.382	S-419	1 Month	M		SC-6	Signal Supervisor	
31	Switch Obstruction Test		S-419	1 Year		I	SC-38	Dist. Engr. C&S Sig. Supvr.	*
32	E.P. Lock Valve Test	136.383		3 Months	M		SC-6	Signal Supervisor	
33									
34	Cross Protection Test	136.384	S-205	3 Months	M		SC-6	Signal Supervisor	
35	Cross Protection Test		S-205	2 Years		I	SC-28	Dist. Engr. C&S Sig. Supvr.	
36	Time Release or Time Relays	136.385	S-205	3 Months	M		SC-6	Signal Supervisor	
37									
38	Restoring Feature Power Switches	136.386		3 Months	M		SC-6	Signal Supervisor	See Note 4
39									
40	Presence Detector		Mfgrs.	1 Month	M		Log Book	Retained by Maintainer	
41	Bridge Locking	136.387	S-205	1 Year		I	SC-38	Dist. Engr. C&S Sig. Supvr.	*
42	ATS Inductor	136.576	S-436	1 Month	M		SC-6, S-436	Signal Supervisor	Test of Gage, Alignment.
43	ATS Inductor	136.576	S-436	1 Year		I	SC-24	Dist. Engr. C&S Sig. Supvr.	Test in Spring
44	ATS Inductor	136.576	S-436	6 Months	M		SC-6, S-436	Signal Supervisor	Test of Impedance
45	Indication Magnets	136.8	S-205	See Remarks		I	SC-28	Dist. Engr. C&S Sig. Supvr.	Test Period - At least every 2 years at interlockings having complete slow speed network with WP circuits. At least once each year at others.
46	Switch Machine-Overload Relays		S-419	3 Months	M		Log Book	Retained by Maintainer	
47	Switch Machine-Overload Relays	136.8	S-419	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
48	Switch Machine-Brakes		S-419	3 Months	M		Log Book	Retained by Maintainer	Omit where Dynamic Snub is used.
49	Switch Machine-Brakes	136.8	S-419	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	Omit where Dynamic Snub is used.
50	Switch Machine Clutches		S-419	3 Months	M		Log Book	Retained by Maintainer	
51	Switch Machine Clutches		S-419	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
52	Spring Switch		421	3 Months	M		Log Book	Retained by Maintainer	
53	Sycro-Scan Equipment				M Maint. Fore.		Special Form	Retained at Headquarters	
54	Highway Crossing Signals & Gates			1 Month	M		AAR 7054	Signal Supervisor	Operating Test: Additional tests following electrical storms
55	Highway Crossing Signals & Gates			2 Years		I	SC-12	Dist. Engr. C&S Sig. Supvr.	General Conditions, Torque - Operating Characteristics
56	General Inspection		215	2 Years		I	SC-38	Dist. Engr. C&S Sig. Supvr.	
57	Switch Machine - Overrun		S-419	3 Months	M		Log Book	Retained by Maintainer	Omit where Dynamic Snub is used.

* Maintainer will make required tests under supervision of Inspector.

- NOTES: 1. Signal Supervisor and Inspector will examine and sign Log Book at least annually.
2. Test or inspect at more frequent intervals if required by local conditions.
3. NYC requirements to be followed where more restrictive than I.C.C. R. S. & I.
4. Test to be made where switch movement is equipped with an arrangement by means of which, when the switch is electrically locked, power is applied to restore the movement to the full normal or reverse position before the driving bar creeps sufficiently to unlock the switch.

NEW YORK CENTRAL SYSTEM SIGNAL STANDARD SCHEDULE OF FIELD TESTS AND INSPECTIONS

Approved R.C. K...
Director Communications & Signals

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ELECTRIC LOCKING - TEST INSTRUCTIONS

Periodic Tests shall be made as follows:

APPROACH LOCKING - S-423, Item 23

1. Clear home signal by reversing the lever.
2. Open approach relay.
3. Restore signal lever to normal position or against the lock where lever is so equipped.
4. Check that all switches, movable point frogs and derails in the route are locked. After specified time interval has expired, check that locking is released.
5. Close approach relay.

TIME LOCKING - S-423, Item 24

1. Clear home signal by reversing the lever.
2. Restore signal lever to normal position or against the lock where lever is so equipped.
3. Check that all switches, movable point frogs and derails in the route are locked. After specified time interval has expired, check that locking is released.

ROUTE LOCKING - S-423, Item 25

1. Line route.
2. Clear home signal by reversing the lever.
3. Open first track circuit in the route.
4. Restore signal lever to full normal position.
5. After approach or time locking has released, check that all switches, movable point frogs and derails in the route are locked.
6. Close track circuit.
7. Each route must be tested. Where two or more signals governing movements in one direction have a common track circuit in advance of such signals, all routes must be checked for one of these signals and only one route need be checked for each of the remaining signals in that group. Also where the last switches in a route are detector locked on a common track circuit, only one exit route need be lined over such track circuit and tested.

TRAFFIC LOCKING - *S-423, Item 29

1. Position the traffic levers so as to establish a traffic direction.

2. Clear signal governing movement into that track section.
3. Check that the direction of traffic cannot be changed.
4. Open first track circuit in the route.
5. Restore signal lever to full normal position.
6. After approach or time locking has released, check that direction of traffic cannot be changed.
7. Close track circuit.
8. Repeat the test with traffic established in the opposite direction.

*This test applies only to the periodic testing of traffic locking between attended interlockings wherein the direction of traffic is established through manipulation of traffic levers or other devices which are equipped with electric locks.

INDICATION LOCKING - S-423, Item 28

POWER OPERATED HOME SIGNAL - BATTERY INDICATION

1. Clear home signal by reversing the lever.
2. Open RGP circuit.
3. Restore signal lever to full normal position or against the lock where lever is so equipped.
4. Check that all switches, movable point frogs and derails in the route are locked or that signal lever equipped with electric lock cannot be restored to full normal position.
5. Close RGP circuit.
6. Check that the RGP circuit is open when any aspect other than stop is displayed on the home signal.

POWER OPERATED HOME SIGNAL - DYNAMIC INDICATION

1. Remove fuse in operating circuit.
2. Reverse signal lever.
3. Check that signal lever cannot be placed in full normal position.
4. Replace fuse, clear signal by reversing the lever.
5. Restore signal lever to full normal position.

SEMAPHORE APPROACH SIGNAL

1. Clear home signal by reversing the lever.
2. Restore lever to full normal position or against the lock where lever is so equipped and hold top or "A" arm of approach signal at approximately 60°.

3. Check that all switches, movable point frogs and derails in the route in advance of the home signal are locked or that home signal lever equipped with electric lock cannot be restored to the full normal position.

4. Release "A" arm.

Where approach signal has more than one operating arm—

1. Clear home signal by reversing the lever.
2. Restore lever to full normal position or against the lock where lever is so equipped and hold bottom or "B" arm of approach signal at approximately 15°.
3. Check that all switches, movable point frogs and derails in the route in advance of the home signal are locked or that home signal lever equipped with electric lock cannot be restored to the full normal position.
4. Release "B" arm.

POWER OPERATED SWITCHES

1. Place a one inch or larger obstruction in the open switch point and operate machine against the obstruction under power.
2. Where interlocking machines are equipped with dynamic indication locking, check that movement of the lever cannot be completed. Where battery indication circuits are used, check that the switch repeater relay remains in the deenergized position.
3. Operate machine to original position, remove obstruction and repeat test with obstruction placed in opposite point opening.

Nothing in the above procedures must be construed as a compromise with safety. As always, measures to insure safety of train movements and safety of employees must be taken and must be considered of first importance.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT ELECTRIC LOCKING TEST INSTRUCTIONS

Approved

R. J. Battinelli
Chief Signal Engineer

S-426

The purpose of this instruction is to establish uniform procedures in the adjustment of coded D.C. detection track circuits employing a standard code responsive track relay fed from two cells of lead storage battery for use on circuits of 6000 to 15,000 feet. This instruction does not cover the adjustment of track circuits with inverse codes.

Battery End

The limiting resistance is to be adjusted to obtain the short circuit current specified for length of circuit and the desired minimum ballast setting. The short circuit current should be read with a low resistance ammeter, 15 ampere scale, when the batteries are not being charged and when temporary connections have been made to supply steady energy to the track. Ammeter leads should be as short as practicable. A low resistance shunt, No. 6 AWG wire or larger, should be connected across the rails by means of clamps to complete the circuit.

Relay End

The coils of the relay should be connected in series and the relay series resistor adjusted so that the total circulating resistance, including leads, is equal to 1.2 ohms. This adjustment is fixed for all lengths of circuit and all minimum ballast settings. The circulating resistance may be read directly with an ohmmeter provided the feed energy is removed from the track relay by placing a low resistance shunt (No. 6 AWG copper or larger) across the rails by means of clamps. Or the circulating resistance

may be measured by dividing the voltage at the rails by the relay current when steady D.C. energy is applied to the track.

Use of Adjustment Curves

The adjustment curves show the values of short circuit current at the feed end for circuits of 6000 to 15,000 feet at minimum ballast resistances of 3, 4, and 5 ohms per thousand feet.

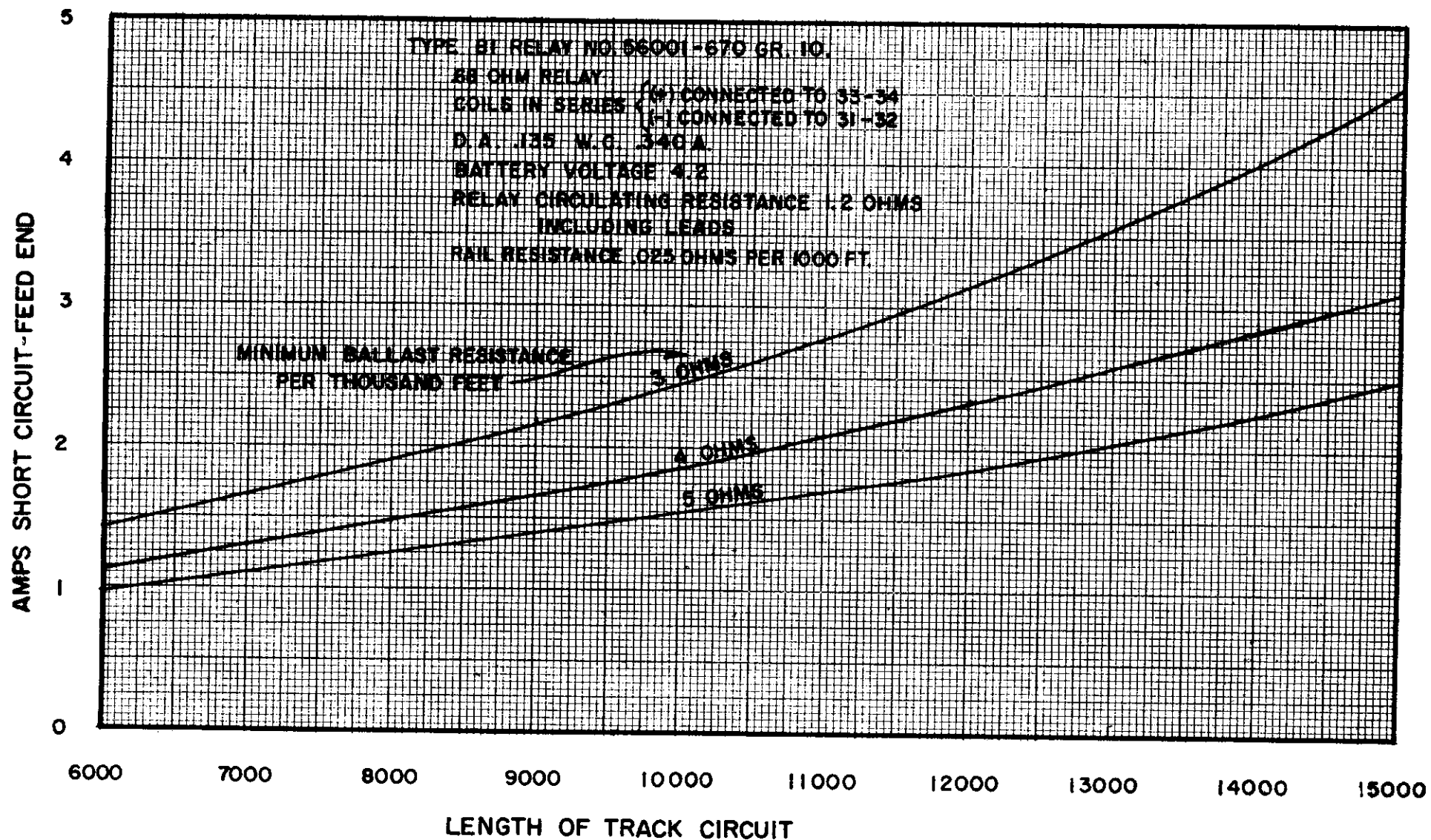
The 5 ohm per thousand feet minimum ballast setting is the preferred setting in order to keep the short circuit current as low as practicable. When ballast conditions and ties are below average, it may be necessary to increase the short circuit current to the 4 ohm or 3 ohm setting. However, the short circuit current should never exceed 5 amperes.

It is not necessary to measure existing rail and ballast resistances to use the adjustment curves. If an abnormal condition is suspected, the actual rail and ballast resistances may be determined by following the procedure outlined in Instruction S441.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT TRACK CIRCUIT ADJUSTMENT INSTRUCTIONS

Approved *L. J. Lattinelli*
Chief Signal Engineer

S-442

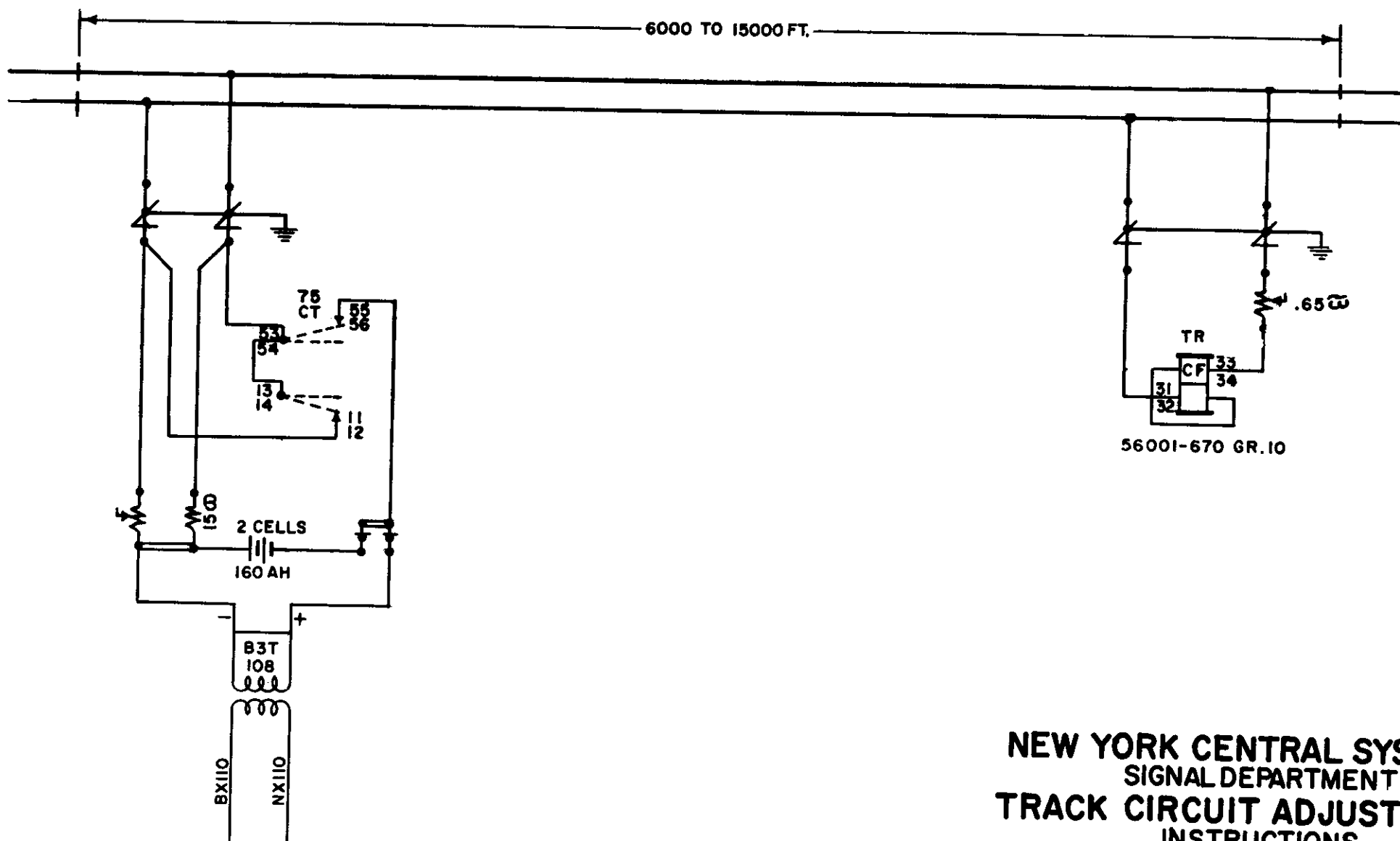


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ISSUED 11-1-61

SHEET 2 Cont'd on SH 3



**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TRACK CIRCUIT ADJUSTMENT
INSTRUCTIONS**

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ISSUED 11-1-61...
SHEET...3...Cont'd on Sh.....

REF	DESCRIPTION	TYPE	G.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	G.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS
1	ARRESTER - CLEARVIEW RACO 485-33	L.V.	56937-8	LINE	33					65	CUTOUT, FUSE	L-M FSIAI		TYPE PSD USE 3A FUSE REF 135
2	ARRESTER GE 9LA10A204	550V	58745	DOUBLE	34					66				
3	ARRESTER - THYRITE GE 9LA15B22	650V			35					67				
4	ARRESTER - BALKITE FANSTEEL	L-5	56937-13	SIGNAL LIGHTING	36					68				
5	ARRESTER GE 9LA15A7	650V		SINGLE	37					69				
6	ARRESTER L-M AS1A2	650V		DOUBLE	38					70				
7	ARRESTER L-M AS3A2	650V		CODE LINE	39					71				
8	ARRESTER - HEAVY DUTY RACO 615-4	L.V.			40					72				
9					41					73				
10					42					74				
11					43					75				
12					44					76				
13					45					77				
14					46					78				
15					47					79				
16					48					80	EQUALIZER - CLEARVIEW RACO 700-2	L.V.		FOR TRACK CONNECTIONS WITH OVERLAY CIRCUITS
17					49					81				
18					50					82				
19					51					83				
20					52					84				
21	BUTTON, PUSH		31030-10 58855		53					85				
22	" & SHIELD	550V	29493-16 47474-14		54					86				
23					55	MOTOR CONTACTOR - REVERSING	125 V. D.C.	ALLEN-BRADLEY BULLETIN 205	SWITCH CONTROL	87				
24					56					88				
25					57					89				
26	CAPACITOR UNIT - 1000MF-18		47630-3GR.1	USED WITH FRONT REPEATER RELAYS.	58									
27	CAPACITOR - GE 23F - 402 - 10MFD				59									
28					60									
29					61	CONVENIENCE OUTLET	110V	46529-1						
30					62									
31					63									
32					64									

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
APPARATUS REFERENCE LIST**

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REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS
90					122	FUSETRON	250V 32A			154				
91					123	"	250V 625A			155	REACTOR, PORCELAIN BLOCK	L.V.	58235-GR.2	CHOKES TO SUPPRESS RADIO INTERFERENCE AT HWY. XINGS.
92					124	"	250V 10A.			156	" , FIXED TRACK		42100-4GR.1	TO CONTROL FRONT CONTACT TIME OF C.T.P.R.
93					125					157	" , 30A., 0.5w		42100-2GR.1	USED IN FEED A.C. TRACK CIRCUITS
94					126					158				
95					127	FUSETRON	600V 1A.			159				
96					128	"	600V 2A.			160				
97					129	"	600V 4A.			161				
98					130					162				
99					131	FUSE BLOCK - PORCELAIN	250V 0-30A			163				
100					132	" " - RACO 841	600V			164				
101	FILLER PLATE	B1	42812	FOR B1 RELAY SPACE	133	FUSE CUTOUT BASE	600V 31-60A		BRYANT-CAT.NO.1930 OR EQUAL	165				
102					134	NON-FUSIBLE LINK			USED IN RACO 497 SWITCH	166				
103					135	FUSE LINK L-M FLIA3	3A		FOR L-M TYPE PSD CUTOUT	167				
104					136					168				
105					137					169				
106					138	IMPEDANCE, BALANCING		42960-1GR.1	SINGLE RAIL-RELAY-A.C. TRACK CIRCUITS	170	RECTIFIER-D.C. OUTPUT 3V. 2.2AMPS. A.C. INPUT 5V.	B3X 104	57163GR.1	CHARGE 1 LEAD CELL
107					139					171				
108					140	INSULATING NUT	110V.			172	RECTIFIER- D.C. OUTPUT 3V. 2.2 AMPS. A.C. INPUT 110V.60~	ST	59897-4GR.1	CHARGE 1 LEAD CELL
109					141					173	RECTIFIER- D.C. OUTPUT 3V. 2.2 AMPS. A.C. INPUT 110V.25~	B3T 104	57162GR.2	" " "
110	FUSE	250V 10A.		NON-RENEWABLE ✓	142	LIGHT, BOX		57956- BASE 57957- BODY		174	RECTIFIER- D.C. OUTPUT 7V. 2.2 AMPS. A.C. INPUT 110V.60~	B3T 108	57162-2GR.1	FOR CHARGING 2-3 LEAD CELLS
111	"	250V 10A.		RENEWABLE	143	JACK, PHONE		56215-1GR.1		175	RECTIFIER- D.C. OUTPUT 13.5V. 1.7AMPS. A.C. INPUT 110V.	ST	59897-4 GR.3	" " 4-6 " "
112	"	250V 15A.		RENEWABLE	144					176	RECTIFIER- D.C. OUTPUT 13.5V. 1.7AMPS. A.C. INPUT 110V. 25~	BT 232	54935-102GR.2	" " 4-6 " "
113	"	250V 20A.		NON-RENEWABLE	145	KIT, PLUG BOARD	B1	A62-506 59686-5GR.1	COMPLETE WITH INSULATOR AND MOUNTING SCREWS	177	RECTIFIER- D.C. OUTPUT 13.5V. 2.7AMPS. A.C. INPUT 110V.	ST	59897-4 GR.4	" " 4-6 " "
114	"	250V 30A.		" "	146	" " "	B2	A62-508 59686-7GR.1	COMPLETE WITH INSULATOR AND MOUNTING SCREWS	178	RECTIFIER-D.C. OUTPUT 2.2V. 1.5AMPS. A.C. INPUT 110V.	BT 432	54935-3GR.9	" " 7-10 " "
115	"	250V 60A.			147									
116	"	600V 10A.			148									
117	"	600V 30A.			149	MOUNTING, RELAY	B1	A62-500	USE WITH REF 145					
118	" TYPE B FERRULE 600V.- 30AMP.	BCF		NON-RENEWABLE FOR RACO 506-1	150	" " "	B2	A62-502	" " " " OR 146					
119					151	" " "	B4	A62-504	" " " " " "					
120					152									
121					153									

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
APPARATUS REFERENCE LIST**

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REF.	DESCRIPTION	TYPE	G.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF.	DESCRIPTION	TYPE	G.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF.	DESCRIPTION	TYPE	G.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS
179	RECTIFIER-D.C. OUTPUT 20-27V 90 AMP. A.C. INPUT 110V.	BT 232	54935-102GR.3	FOR CHARGING 10-12 LEAD CELLS	211					243	RESISTOR 2.0 ω RACO 602-6	ADJ.		TRACK CIRCUITS AND SIGNAL LIGHTING
180					212					244	RESISTOR 4.95 ω RACO 603-2	ADJ.		TRACK CIRCUITS
181					213	RESISTOR 510 ω ALLEN-BRADLEY 2 WATT	HB	57831-18GR.3	MOUNTS ON REAR OF PLUGBOARD	245	RESISTOR 7.95 ω RACO 603-4	ADJ.		" "
182					214					246	RESISTOR 21.8 ω RACO 603-9	ADJ.		" "
183					215					247	RESISTOR 111.5 ω RACO 603-16	ADJ.		TWO RATE CHARGE
184					216					248	RESISTOR 0.635 ω RACO 602-1	ADJ.		
185	RECTIFIER-D.C. OUTPUT 22V. 18 AMPS. A.C. INPUT 110V.	BP 848	54725-5GR.21	FOR CHARGING 5-10 LEAD CELLS	217					249	RESISTOR 0.5 ω RACO 258-80-1	TAP		A.C. TRACK CIRCUITS
186	RECTIFIER-D.C. OUTPUT 30V. 6 AMPS. -A.C. INPUT 110V.	BP 448	54725-4GR.13	" " 11-14 " "	218					250	RESISTOR 0.9 ω RACO 805	TAP		TRACK CIRCUITS
187					219					251	RESISTOR 1.5 ω RACO 810-2	TAP		TRACK CIRCUITS
188	RECTIFIER-D.C. OUTPUT 20V. 10.5 AMPS. A.C. INPUT 110V.	BP 648	54725-5GR.15	FOR CHARGING 5-10 LEAD CELLS	220	RESISTOR 15 ω RACO 245-3	FIXED			252	RESISTOR 2.5 ω RACO 258-50-A2	TAP		A.C. TRACK CIRCUITS
189	RECTIFIER-D.C. OUTPUT 22V. 4.5 AMPS. A.C. INPUT 110V.	BP 248	54725-7GR.1	" " 5-10 " "	221	RESISTOR 1 ω RACO 245-3	FIXED			253	RESISTOR 21 ω RACO 810-8	TAP		TRACK CIRCUITS
190	RECTIFIER-D.C. OUTPUT 30V. 3.0 AMPS. A.C. INPUT 110V.	BP 248	54725-7GR.11	" " 10-14 " "	222	RESISTOR 2 ω RACO 245-3	FIXED			254				
191	RECTIFIER-D.C. OUTPUT 50V. 3.0 AMPS. A.C. INPUT 110V.	BP 448	54725-4GR.11	" " 14-20 " "	223	RESISTOR 5 ω RACO 245-3	FIXED			255				
192					224	RESISTOR 10 ω RACO 245-3	FIXED			256				
193	RECTIFIER-D.C. OUTPUT 155V. 0.20 AMPS. A.C. INPUT 110V.	BPC 280	54725-8GR.1	FOR CHARGING 20-70 LEAD CELLS	225	RESISTOR 25 ω RACO 245-3	FIXED			257				
194	RECTIFIER-D.C. OUTPUT 145V. 0.75 AMPS. A.C. INPUT 110V.	BP 248	54725-7GR.5	" " 55-65 " "	226	RESISTOR 50 ω RACO 245-3	FIXED			258				
195	RECTIFIER-D.C. OUTPUT 145V. 1.5 AMPS. A.C. INPUT 110V.	BP 448	54725-4GR.5	" " 55-65 " "	227	RESISTOR 100 ω RACO 245-3	FIXED			259				
196					228	RESISTOR 200 ω RACO 245-3	FIXED			260				
197	RECTIFIER-D.C. OUTPUT 12V. 0.05 AMPS.	BI 57170 GR.1		RECTIFIER FOR USE WITH RELAY REF. 329 & 273	229	RESISTOR 300 ω RACO 245-21	FIXED			261				
198	RECTIFIER-D.C. OUTPUT 13.5V. 0.05 AMPS.	BI 59605-3GR.2		RECTIFIER ONLY 59605-4 Gr.1 USED TO MAKE RELAY S.R.	230	RESISTOR 500 ω RACO 245-21	FIXED			262				
199	RECTIFIER-D.C. OUTPUT 13.5V. 0.15 AMPS.	B $\frac{1}{4}$ 54728-60GR.1		RECTIFIER ONLY 54728-5 Gr.4 USED WITH P.T. RELAY REF. 284 & 285	231	RESISTOR 3000 ω RACO 245-21	FIXED			263				
200	RECTIFIER AND RESISTOR 51 ω		19375-1GR.1	USED WITH REF. 323	232					264				
201	RECTIFIER 1/2 WAVE	B $\frac{1}{4}$ 54728-62GR.1		USED WITH LIGHTOUT RELAY REF. 325 & 326 (HOT)	233					265				
202	RECTIFIER-D.C. OUTPUT 12V. 0.20 AMPS. A.C. INPUT 16V.	B $\frac{1}{2}$ 54941-104GR.1		USED WITH BI LIGHT OUT RELAY REF. 325 (COLD)	234					266				
203	RECTIFIER-D.C. OUTPUT 12V. 0.20 AMPS. A.C. INPUT 55V.25~	BQ $\frac{1}{2}$ 54944-104GR.17		LOW MAG. I (020a)	235					267				
204	RECTIFIER-D.C. OUTPUT 8V. .05 AMPS. A.C. INPUT 55V.25~	BQ $\frac{1}{2}$ 54944-104GR.26		HIGH MAG. I (270a)	236									
205	RECTIFIER-D.C. OUTPUT 12.5V. 200 AMPS. A.C. INPUT 110V.	BQ $\frac{1}{2}$ 54944-104GR.16		USED WITH SNOW MELTER INDICATION RELAY	237									
206	RECTIFIER-D.C. OUTPUT 1.5V. 0.30 AMPS. A.C. INPUT 20V.	BQ $\frac{1}{2}$ 54944-104GR.10		USED FOR AC TRACK CIRCUIT WITH RELAY REF. 268	238									
207					239									
208					240									
209					241									
210					242	RESISTOR 1.0 ω RACO 602-3	ADJ.		TRACK CIRCUITS					

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
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REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REGISTRY	REMARKS
268	RELAY 2FB-3F-3B 4~	BIN	56001-838 GR.2	1-2-17-32	FOR AC TRACK CIR. WITH RECT. REF. 206	300						332					
269	RELAY 2FB-3F-3B 28.5~	BIN	56001-838 GR.1	1-2-17-32	USE REF. 268	301	RELAY 2FB 3 SEC. AT 9 VOLTS 460~	BIN SR	A62-353 56001-830 GR.1	1-2-16-28	XPR - APBR - XBPR	333					
270	" 4F-2B 1.8~	BIN	A62-270 56001-734 GR.2	1-2-5-21	TRACK	302	RELAY 2F-IB 18-25 SEC. AT 5 VOLTS 105~	BIN PSR	56001-713 GR.2	1-2-3-25	COMPOUND	334					
271	" 6FB 4~	BIN	A62-261 56001-714 GR.1	1-2-3-26	"	303	RELAY 6FB OB SEC. AT 10 VOLTS 165~	BIN PSR	56001-754 GR.1	1-2-7-32	COMPOUND - .050" FRONT CONT. OPENING	335					
272	" 4FB 6~	BIN	A62-293 56001-785 GR.9	1-3-6-11	FOR SERIES OVERLAY CIRCUIT	304						336					
273	" 6FB 84~	BIN	A62-295 56001-785 GR.3	1-2-12-32	USED WITH RECT. REF. 197 & RELAY REF. 295 & 329	305						337	RELAY-4NR MAG. STICK 34~	BI	A62-246 58645-172 GR.4	1-2-12-13	BUILT IN 150~ RES. OPERATES FROM CODE
274	" 6FB 100~	BIN	56001-762 GR.5	1-2-9-14		306	RELAY 2FB-5F-IB .045~ 450~	BIN	56001-785 GR.99	1-3-5-12	COMPOUND FOR MODEL 6 SWITCH MACHINE	338	RELAY-4NR MAG. STICK 7~	BI	A62-245 58645-172 GR.6	1-3-5-20	OPERATES UNIT. FROM STEPPER UNIT.
275	" 4F-2B 100~	BIN	A62-317 56001-789 GR.3	1-2-11-30	FOR LONG SHUNT OVERLAY CIRCUIT	307	RELAY 2B(EHD) .068~ 1225~	BIN	56001-785 GR.1	1-2-5-23	HIGH VOLT OVERLOAD	339					
276	" 6FB 200~	BIN	56001-762 GR.6	1-2-9-14		308						340	RELAY IB 300~	BIF	56001-903 GR.1	1-3-4-24	50-60 FL./MIN. OBSOLETE USE 341
277						309						341	RELAY IB 490~	BIF	A62-200 56001-915 GR.1	1-3-4-24	58-60 FL./MIN. REPLACES REF. 340
278	RELAY 2FB-2B HD CONTACTS 210~	BIN	A62-205 56001-880 GR.1	1-2-24-28	LAMP CONTROL	310						342					
279	RELAY 6FB 500~	BIN	56001-701 GR.2	1-2-3-4	OBSOLETE USE REF. 281	311						343					
280	RELAY 4FB S-S HD CONTACTS 500~	BIN	56001-753 GR.2	1-2-7-27	OBSOLETE	312						344					
281	RELAY 6FB 500~	BIN	A62-262 56001-762 GR.2	1-2-9-14	REPLACES REF. 279	313						345	RELAY 1F-IB 25-45 SEC. 18.6 OHM HEATER RES.	BITA	A62-465 57100-702 GR.21	1-3-7-32	ADJUST TO 9-11 SEC. FRONT CONTACT CLOSING
282						314						346					
283						315						347					
284	RELAY 2FB HD CONTACTS 50~ 50~	BIN	A62-401 56001-721 GR.1	1-2-3-33	POR USE RECT. REF. 199	316						348					
285	RELAY 6FB HD CONTACTS 100~ 100~	BIN	A62-406 56001-745 GR.1	1-2-6-15	" " " " "	317	RELAY 6FB 1.4 SEC. AT 11 VOLTS 230~	BIN SPU	A62-345 56001-736 GR.1	1-2-5-24		349					
286						318	RELAY 4FB 2.2 SEC. AT 10 VOLTS 300~	BIN SPU	56001-729 GR.1	1-2-4-24		350					
287						319						351					
288	RELAY IB 705~	BIN	A62-475 56001-749 GR.1	1-2-7-19	2 RATE CHARGE 4-7 CELLS LEAD	320						352					
289	RELAY IB 1580~	BIN	A62-476 56001-749 GR.2	1-2-7-20	2 RATE CHARGE 10-14 CELLS LEAD	321	RELAY 4FB-2F-IB 135~ M.D. BACK CONTACTS 135~	BIN QPU	56001-885 GR.1	1-2-22-26	OPERATES FROM STEPPER UNIT	353					
290	" IB 14105~	BIN	A62-477 56001-749 GR.3	1-2-7-21	2 RATE CHARGE 50-60 CELLS LEAD	322	RELAY 8F-IB 135~ 135~	BIN QPU	56001-717 GR.6	1-2-3-29	OPERATES FROM STEPPER UNIT	354					
291						323	RELAY 4FB-2F-IB 65~ 135~	BIN QPU	A62-335 56001-909 GR.1	1-2-22-26	OPERATES FROM STEPPER UNIT	355					
292						324						356					
293						325	RELAY 4FB 450~ 60~	BILO	A62-221 56001-873 GR.1	1-2-22-25	LIGHT OUT RELAY USED WITH RECT. REF. 201						
294						326											
295	RELAY 2F-4B 0.1 SEC. AT 2 VOLTS 80~	BIN SR	A62-380 56001-759 GR.1	1-2-9-10	AER USED WITH RELAY REF. 273 & 329	327	RELAY 4FB 450~ 25~	BILO	A62-215 56001-785 GR.59	1-2-24-26	USED WITH RECT. REF. 201						
296						328	RELAY 6FB BIASED NEUTRAL 48~	BIBN	56001-801 GR.9	1-2-4-13	USED IN SERIES WITH SC MECHANISM						
297	RELAY 6FB SINGLE COIL 17 SEC. AT 8.4 VOLTS 300~	BIN SR	56001-744 GR.1	1-2-6-14		329	RELAY 6FB BIASED NEUTRAL 63~	BIBN	A62-140 56001-922 GR.5	1-2-4-13	USED WITH RECT. REF. 197						
298	RELAY 6FB 1 SEC. AT 10 VOLTS 340~	BIN SR	A62-359 56001-780 GR.1	1-2-4-23	SAME AS 56001-728 GR.26	330											
299						331											

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
APPARATUS REFERENCE LIST

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT APPARATUS REFERENCE LIST

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REF	DESCRIPTION	TYPE	GRS DRAWING NO. OR ORDER- ING REFERENCE	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	GRS DRAWING NO. OR ORDER- ING REFERENCE	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	GRS DRAWING NO. OR ORDER- ING REFERENCE	REGISTRY	REMARKS
357	RELAY 12 FB 4 ω	B2N	56002-702GR1	1-2-4-25	OBSOLETE	389						421	RELAY 2FB 0.07 ω SILV-PLAT. CONTACTS	BI-CF	56001-663 GR.12	1-2-25-26	TR-AR-AER
358	RELAY 8FB-2F END CONTACTS 330 ω	B2N	56002-710GR1	1-2-10-12	SWITCH CONTROL LSR	390	RELAY 2F-2B 75 CODE 150 ω	B2	A62-170 57490-95 GR.1	1-2-5-14		422					
359	RELAY 12 FB 330 ω	B2N	56002-713 GR.3	1-2-22-32	CONTACT OPENING SECOND RANGE .090	391	RELAY 2F-2B 120 CODE 150	B2	A62-171 57490-95 GR.1	1-2-5-15		423	RELAY 2FB 10 ω SILV-SILV. CONTACTS	BI-CF	56001-679GR2	1-2-11-14	TPPR
360	" 12FB 500 ω	B2N	A62-330 56002-703GR1	1-2-4-33		392						424	RELAY IF TUNG- 100 ω IFB SILV-PLAT. CONTACTS	BI-CF	58640-179GR21	1-2-25-28	CTPR 47.5 INTERNAL TPBR RES. BETWEEN TPAR CONT. 21-28
361						393						425					
362						394						426					
363						395						427					
364						396						428					
365						397						429					
366	RELAY 12 FB 0.5 SEC. AT 10.8V. 500 ω	B2N	56002-708GR1	1-2-7-28	USED WITH RECT. REF. 198 FOR SR	398						430					
367						399						431	RELAY MOUNTING	BI	58570-4 GR.3		
368	RELAY 12 FB BIASED NEUTRAL 350 ω	B2BN	A62-150 56002-720GR1	1-3-5-22		400	RELAY (N)1FB-3F 17 ω (RX)FB-3F 250 ω	VTB	59301-200 GR.1	1-2-3-18	2 ARMATURE	432	" "	BI	58570-4 GR.6		
369						401						433	" "	BI	58570-9 GR.6		CONTACTS IN SPACE 1-2-3
370						402						434	" "	B2	58570-10GR.7		CONTACTS IN SPACE 1-2-3-4-5-6
371	RELAY 4FB 4NR 200 ω	B2P	A62-390 56003-701GR3	1-2-3-12		403						435	RELAY SUPPORT		P5-183 58287 GR.1		1 REQUIRED FOR FIRST ROW OF 8 RELAYS IN H.S. OR H.D. CASES
372						404						436	RELAY SUPPORT		P5-185 18481		1 REQUIRED FOR EACH ADD'L ROW OF 8 RELAYS IN H.S. OR H.D. CASES
373						405						437	RELAY SUPPORT		P5-184		1 REQUIRED FOR FIRST ROW OF 8 RELAYS IN HALF SIZE CASES
374						406						438	RELAY SUPPORT		P5-186		1 REQUIRED FOR EACH ADD'L ROW OF 8 RELAYS IN HALF SIZE CASES
375						407						439					
376	RELAY 4FB 4NR 120 ω	B2P SR	56003-709GR2	1-2-6-33		408						440					
377						409						441					
378						410	RELAY 2F LOCAL 55V. 25 $\sim$	B2 VANE	56005-100 GR.6	25-26-27-29	A.C. TRACK	442					
379						411						443					
380	RELAY 4FB FLASHER 12V.	B2FL	57261-802 GR.4	1-2-6-7	MOTOR OPERATED OBSOLETE	412						444					
381	RELAY 4FB FLASHER 10V.	B2FL	57261-802 GR.3	1-2-5-33	MOTOR OPERATED OBSOLETE	413						445					
382	RELAY 4FB FLASHER 12V.	B2FL	A62-192 56008-53 GR.2	1-3-5-10	TRACTIVE ARMATURE 40-45 F.P. MIN.	414											
383	RELAY 4FB FLASHER 10V.	B2FL	A62-191 56008-53 GR.1	1-3-5-9	"	415											
384						416											
385	RELAY IF 1CK 12V. 400 ω 4-64SEC. MOTOR TIME	B2MT	A62-442 57263-853 GR.3	1-2-4-27	TIME NOT SEALED, TIME AND CHECKS CONTACTS INDEPENDENT	417											
386	RELAY IF 1CK 12V. 400 ω 1-8 MIN. MOTOR TIME	B2MT	A62-443 57263-853 GR.2	1-2-4-26	TIME NOT SEALED, TIME AND CHECKS CONTACTS INDEPENDENT	418											
387	RELAY 2F 2CK 12V. 400 ω 1-8 MIN. MOTOR TIME	B2MT	A62-453 57263-856GR2	1-3-6-8	TIME NOT SEALED, TIME AND CHECK CONTACTS INDEPENDENT	419											
388	RELAY 2F 2CK 12V. 400 ω 4-64SEC. MOTOR TIME	B2MT	A62-452 57263-856GR3	1-3-6-9	TIME NOT SEALED, TIME AND CHECK CONTACTS INDEPENDENT	420											

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
APPARATUS REFERENCE LIST**

S-500

Printed in U.S.A.

ISSUED 4-10-63
SHEET..5..Cont'd on Sh...6....

REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO. OR ORDERING REFERENCE	REMARKS
446					478					510	TRANSFORMER 13AU-217	U1		APPROACH DECODING TRANS.
447					479					511	" 13AU-107	U1		USE REF. 503
448					480					512	" 13AU-168	U1		" " 503
449					481					513	" 13AU-105 25~	U1		USE REF. 503 SPECIFY 25~
450					482					514	" 13AU-113 25~	U1		USE REF. 491 SPECIFY 25~
451					483					515	" 13AU-157 25~	U1		FOR 55 VOLT LOCAL A.C. TRACK RELAYS
452					484					516	" 13AU-205	U1		CODED TRACK CIRCUITS
453					485	TERMINAL BOARD WITH 35 A.A.R. TERMINALS	B2	59681-2GR.1	COMP WITH MOUNTING SCREWS	517	" 13AU-212	U1		USE REF. 491
454					486					518	" 13AU-225 25~	U1		PRI. 55V. SEC. 22V. - 4.55 AMP
455					487	TEST LINK - SAFETY RACO 620-1 1"				519	" 13AU-140	U1		DECODING
456					488					520				
457					489					521				
458					490	TRANSFORMER 110V. 13D185	K2		USE REF. 491	522				
459					491	" 115V - 230V. 13D-255	K2	A95-230	3 SECONDARYS 27.75V - 3.6A EACH	523				
460	SWITCH, DISCONNECT 250V. RACO 324	2 WAY		NON-RENEWABLE FUSES	492	" 220V. 13D110	K2		USE REF. 503	524				
461	SWITCH, DISCONNECT 600V. RACO 506-1	2 WAY			493	" 440V - 110V. 13D36	K2		" " 504	525	TRANSCEIVER		A92-627 27359-4 GR.2	FOR OVERLAY CIRCUIT
462	SWITCH, DISCONNECT RACO 497	7 WAY		HAMP FUSETRON FOR FUSING CAPACITOR & 2-2 AMP. FUSE - TRON & 4 NON-FUSIBLE LINKS	494	" 550V - 110V. 13D203	K2		" " 504	526	TUNER		A92-630 27619-GR.1	FOR OVERLAY CIRCUIT
463					495	" 550V. 13D176	K2		" " 502	527				
464					496	" 13D191	K2		AC SUPPLY FOR CODED TRACK AND SIGNAL LIGHTING	528				
465	SWITCH 125V. TRUMBULL 710	D.P.D.T.			497	" 13D50	K2		USE REF. 491	529				
466	SWITCH-SNAP 6A-125V. 3A-250V.	125V. 250V.			498	" 13D51 25~	K2		" " 491 SPECIFY 25~	530				
467					499	" 13D117 25~	K2		A.C. TRACK CIRCUITS	531				
468					500	" 13D93 25~	K2		SIGNAL LIGHTING-14 AMP. SEC. 55V. DIMMING TRANS.	532				
469					501	" 13D99 25~	K2		SECONDARY 57.5V - 435 AMP. 12V. - 25 AMP.	533				
470	TAG, RACO 585-1	CLEAR		WITH STRING LOOP	502	" 460V - 575V. 13D-256	K2	A95-240	3 SECONDARYS 27.75V - 3.6A EACH	534				
471	" , " 585-16	"		MULTI-UNIT	503	" 110V - 220V. 13D-257	K2	A95-220	4 SECONDARYS-SIGNAL LIGHTING & L.V. RECTIFIER					
472	" , " 585-19	"		SINGLE UNIT	504	" 460V - 575V. 13D-258	K2	A95-241	110V. SECONDARY 1.0 KVA					
473					505	" 13B-167 25~	K $\frac{1}{2}$		SECONDARY .154 AMP. .308 AMP.					
474					506	" 13AS-165	SI		PRI. 110V. SEC. 10V.					
475	TERMINAL-RACO 390	12 WAY			507									
476					508									
477	TERMINAL-BAKELITE BASE		46048-22GR.2	USED FOR TERMINATING WIRE LARGER THAN NO.6 AWG.	509									

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT APPARATUS REFERENCE LIST

Approved *R. J. Bottinelli*
Chief Signal Engineer

S-500

AAR M.P. 91 ITEM NO.	VOLTS	AMPS WATTS OR CP	1541 BULB	1542 BASE	1543 FILAMENT	USE	SERVICE VOLTAGE	CHANGE-OUT PERIOD	REMARKS
37	2.5	.150A	S8	SC	C-2R	SEM	2.4-2.5	12 Mos. & 10 Mos.	For use with National Carbon CG212 (12 Mos.) or Edison 2SJ1 Batteries (10 Mos.).
84	2.9	.150A	S8 I.F.	SC	C-2R	SL	2.4-2.5	12 Mos. & 10 Mos.	For use with National Carbon CG212 (12 Mos.) or Edison 2SJ1 Batteries (10 Mos.).
CMB-682	5	.060±.006A			C-2R	CTI		Burnout	CTC Machine
503	6	3CP	G6	S.CAN	C-2R	IND		Burnout	Replacement only
516	6	15CP	S8	SC	C-2R	IND		Burnout	Used in series with 6V., 21 CP. lamp in T.O. Sig.
517	6	21CP	S8	SC	C-2R	T.O.		Burnout	Used in series with 6V., 15 CP. IND lamp.
GE51	7.5	1CP	G 3-1/2	B MIN	C-2R	Ionization Lamp		Burnout	Used with cold cathode tubes.
94	10	18W	A15	3PS	CC6	CLT	9.5	3 Mos.- 1 Yr.	GRS Doublet lens-unit type-change cont. lighted 3 Mos., App. lighted 1 year.
95	10	18W	A15	2PS	CC6	CLT	9.5	3 Mos.- 1 Yr.	Union Doublet lens-unit type-change cont. lighted 3 Mos., App. lighted 1 year.
88	10	18W	S11	SC	CC6	SLT, SEM, XNG, CGA, SL, SIGNS, MC	8.3*	6 Mos.- 2 Yr.	Change cont. lighted sigs. -6 mos., App. lighted signals at 2 yrs., all other at burnout. *9.5V Illinois and Canada for flashing light signals.
20	10	40W	A15	3PS	C2V	CLT	9.5	Burnout	Gibson and Blue Island Hump Signals.
505	12	4CP	G6	SC	C2R	LL, IND, ESL	10.3	Burnout	For Model 10 Sw. Locks, Burn at 9.5V and change out at 1 year.
507	12	4CP	G6	DC	C2R	LL, IND	10.3	Burnout	Replacement only.
506	12	4CP	G6	S.CAN	C2R	IND	10.3	Burnout	Replacement only.
529	12	.09-.11A	T2	SL.1	C21	CTI, IND	9.5	Burnout	Panel machines.
28	14	.2A	G6	S.Min.	C2V	CTI, IND		Burnout	
542	24	.032-.038A	T2	SL.1	C2F	CTI		Burnout	Type F, K, CTC machines.
558	35	.035-.045A	T2	SL.1	C5	CTI	28	Burnout	Syncrostep machines.
	60	20W	Clear	S.Med.	Carbon	2A Signals	55	Burnout	GCT - 2 lamps connected in multiple.
	64	6W	S6	SC	C7A		55	Burnout	Chart lights - GCT.
	75	2CP	S8	S.Min.	Carbon	IND, LL	55	Burnout	Lock lever lights.
521	120	10W	SL4	S.Med.	C9	IND	110	Burnout	Interlocking switchboards.
49	120	10W	SL1	SC	C7A	IND, SEM	110	Burnout	Power off indicators and sem. sigs.
	125	60W	A19-Clear	S.Med.	C9	P.T., Traffic Sigs.	110		

SEM - Semaphore
IND - Indicator
T.O. - Train Order
CLT - Colorlight

CGA - Crossing Gate Arm
SL - Switch Lamp
LL - Lever Light
SLT - Searchlight

XNG - Crossing
ESL - Electric Switch Lock
CTI - Chart Track Indicator
MC - Maintainer's Call

P.T. - Pole Target

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT ELECTRIC LAMPS SPECIFICATIONS

Approved *R. J. Battinelli*
Chief Signal Engineer

S-750

ELECTRONIC TERMS AND SYMBOLS USED IN SIGNALING*

1949

Official Approval

Feb. 1950.

General

Electronics.

Electronics is that branch of science and technology which relates to the conduction of electricity through gases or in vacuo.

Electron.

An electron is the natural, elementary quantity of negative electricity. The quantity of electricity on an electron is 1.592×10^{-19} coulomb, or 4.774×10^{-10} electrostatic unit. The mass of an electron at rest is 9.00×10^{-28} gram.

Ion.

An ion is an electrified portion of matter of subatomic, atomic or molecular dimensions.

Electrode.

An electrode is a conductor belonging to the class of metallic conductors, but not necessarily a metal, through which a current enters or leaves an electrolytic cell, arc, furnace, vacuum tube, gaseous discharge tube, or any conductor of the non-metallic class. Specifically, in an electrolytic cell, an electrode is a conductor of the metallic-conductor class, at which there is a change from conduction by electrons to conduction by ions or colloidal particles.

Electron emission.

Electron emission is the liberation of electrons from an electrode into the surrounding space. Quantitatively, it is the rate at which electrons are emitted from an electrode.

Thermionic emission. (Edison Effect) (Richardson Effect)

Thermionic emission is electron or ion emission due directly to the temperature of the emitter. Electrons are emitted from hot bodies, the rate of emission increasing rapidly with temperature.

Secondary emission.

Secondary emission is electron emission due directly to the impact of electrons or ions.

Ionization.

Ionization is the process of producing ions.

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Ionization current.

Ionization current is the electric current resulting from the movement of electric charges in an ionized medium, under the influence of an applied electric field.

Gas current.

Gas current is a current flowing to an electrode and composed of positive ions which have been produced as a result of gas ionization by an electron current flowing between other electrodes.

Vacuum Tubes

Vacuum tube.

A vacuum tube is a device consisting of an evacuated enclosure containing a number of electrodes between two or more of which conduction of electricity through the vacuum or contained gas may take place.

High-vacuum tube. (Electron tube)

A high-vacuum tube is a vacuum tube evacuated to such a degree that its electrical characteristics are essentially unaffected by gaseous ionization.

Thermionic tube.

A thermionic tube is a vacuum tube in which one of the electrodes is heated for the purpose of causing electron or ion emission from that electrode.

Gas tube.

A gas tube is a vacuum tube in which the pressure of the contained gas or vapor is such as to affect substantially the electrical characteristics of the tube.

Mercury-vapor tube.

A mercury-vapor tube is a gas tube in which the active contained gas is mercury vapor.

Phototube. (Photoelectric tube)

A phototube is a vacuum tube in which one of the electrodes is irradiated for the purpose of causing electron emission from that electrode.

Cathode-ray oscillograph tube.

A cathode-ray oscillograph tube is a vacuum tube in which the deflection of an electron beam, effected by means of applied electric and/or magnetic fields, indicates the instantaneous values of the actuating voltages and/or currents.

Diode.

A diode is a two-electrode vacuum tube containing an anode and a cathode.

Triode.

A triode is a three-electrode vacuum tube containing an anode, a cathode and a control electrode.

Tetrode.

A tetrode is a four-electrode vacuum tube containing an anode, a cathode, a control electrode and one additional electrode ordinarily in the nature of a grid.

Pentode.

A pentode is a five-electrode vacuum tube containing an anode, a cathode, a control electrode and two additional electrodes ordinarily in the nature of grids.

Hexode.

A hexode is a six-electrode vacuum tube containing an anode, a cathode, a control electrode and three additional electrodes ordinarily in the nature of grids.

Heptode.

A heptode is a seven-electrode vacuum tube containing an anode, a cathode, a control electrode and four additional electrodes ordinarily in the nature of grids.

Octode.

An octode is an eight-electrode vacuum tube containing an anode, a cathode, a control electrode and five additional electrodes ordinarily in the nature of grids.

Multiple-unit tube.

A multiple-unit tube is a vacuum tube containing within one envelope two or more groups of electrodes associated with independent electron streams.

Note.—A multiple-unit tube may be so indicated, as, for example: duodiode, duotriode, diode-pentode, duodiode-triode, duodiode-pentode and triode-pentode.

Vacuum Tube Electrodes

Anode (of a vacuum tube). (Plate)

An anode of a vacuum tube is an electrode to which a principal electron stream flows.

Plate.

Plate is a common name for the principal anode in a vacuum tube.

Cathode (of a vacuum tube).

A cathode of a vacuum tube is an electrode which is the primary source of an electron stream.

Indirectly heated cathode. (Equipotential cathode) (Unipotential cathode)

An indirectly heated cathode is a cathode of a thermionic tube to which heat is supplied by an independent heater element.

Heater.

A heater is an electric heating element for supplying heat to an indirectly heated cathode.

Filament.

A filament is a cathode of a thermionic tube, usually in the form of a wire or ribbon, to which heat may be supplied by passing current through it.

Control electrode.

A control electrode is an electrode on which a voltage is impressed to vary the current flowing between two or more other electrodes.

Grid.

A grid is an electrode having one or more openings for the passage of electrons or ions.

Control grid.

A control grid is a grid, ordinarily placed between the cathode and an anode for use as a control electrode.

Screen grid.

A screen grid is a grid placed between a control grid and an anode, and usually maintained at a fixed positive potential, for the purpose of reducing the electrostatic influence of the anode in the space between the screen grid and the cathode.

Space-charge grid.

A space-charge grid is a grid which is placed adjacent to the cathode and positively biased so as to reduce the limiting effect of space charge on the current through the tube.

Suppressor grid.

A suppressor grid is a grid which is interposed between two electrodes (usually the screen grid and plate), both positive with respect to the cathode, in order to prevent the passing of secondary electrons from one to the other.

Electrode Voltage, Current and Power

Electrode voltage.

Electrode voltage is the voltage between an electrode and a specified point of the cathode.

Anode voltage.

See Electrode voltage.

Peak (or crest) forward anode voltage.

Peak (or crest) forward anode voltage is the maximum instantaneous anode voltage in the direction in which the tube is designed to pass current.

Peak (or crest) inverse anode voltage.

Peak (or crest) inverse anode voltage is the maximum instantaneous anode voltage in the direction opposite to that in which the tube is designed to pass current.

Heater voltage.

Heater voltage is the voltage between the terminals of a heater.

Filament voltage.

Filament voltage is the voltage between the terminals of a filament.

Grid voltage.

See Electrode voltage.

Direct grid bias.

Direct grid bias is the direct component of grid voltage.

Note.—This is commonly called grid bias.

Electrode current.

Electrode current is the current passing to or from an electrode through the vacuous space.

Anode current.

See Electrode current.

Cathode current.

Cathode current is the total current passing to or from the cathode through the vacuous space.

Heater current.

Heater current is the current flowing through a heater.

Filament current.

Filament current is the current supplied to a filament to heat it.

Grid current

See Electrode current.

Grid emission.

Grid emission is electron or ion emission from a grid.

Leakage current.

Leakage current is a conductive current which flows between two or more electrodes by any path other than across the vacuous space.

Electrode characteristic.

An electrode characteristic is a relation, usually shown by a graph, between an electrode voltage and current, other electrode voltages being maintained constant.

Transfer characteristic.

A transfer characteristic is a relation, usually shown by a graph, between the voltage of one electrode and the current to another electrode, all other voltages being maintained constant.

Emission characteristic.

An emission characteristic is a relation, usually shown by a graph, between the emission and a factor controlling the emission (as temperature, voltage or current of the filament or heater).

Electrode dissipation.

Electrode dissipation is the power dissipated in the form of heat by an electrode as a result of electron and/or ion bombardment.

Grid driving power.

Grid driving power is the average product of the instantaneous value of the grid current and the alternating component of the grid voltage over a complete cycle.

Note.—This comprises the power supplied to the biasing device and the grid dissipation.

Electrode Impedances and Admittances

Mu factor.

Mu factor is the ratio of the change in one electrode voltage to the change in another electrode voltage, under the conditions that a specified current remains unchanged and that all other electrode voltages are maintained constant. It is a measure of the relative effect of the voltages on two electrodes upon the current in the circuit of any specified electrode.

Note.—As most precisely used, the term refers to infinitesimal changes.

Amplification factor.

Amplification factor is the ratio of the change in plate voltage to a change in control electrode voltage, under the conditions that the plate current remains unchanged and that all other electrode voltages are maintained constant. It is a measure of the effectiveness of the control-electrode voltage relative to that of the plate voltage upon the plate current. The sense is usually taken as positive when the voltages are changed in opposite directions.

Note.—As most precisely used, the term refers to infinitesimal changes. Amplification factor is a special case of mu factor.

Electrode admittance.

Electrode admittance is the quotient of the alternating component of the

electrode current by the alternating component of the electrode voltage, all other electrode voltages being maintained constant.

Note.—As most precisely used, the term refers to infinitesimal amplitudes.

Transadmittance.

Transadmittance from one electrode to another is the quotient of the alternating component of the current of the second electrode by the alternating component of the voltage of the first electrode, all other electrode voltages being maintained constant.

Note.—As most precisely used, the term refers to infinitesimal amplitudes.

Electrode impedance.

Electrode impedance is the reciprocal of the electrode admittance.

Electrode conductance.

Electrode conductance is the quotient of the in-phase component of the electrode alternating current by the electrode alternating voltage, all other electrode voltages being maintained constant.

Note.—This is a variational and not a total conductance. As most precisely used, the term refers to infinitesimal amplitudes.

Plate conductance.

See Electrode conductance.

Grid conductance.

See Electrode conductance.

Transconductance.

Transconductance from one electrode to another is the quotient of the in-phase component of the alternating current of the second electrode by the alternating voltage of the first electrode, all other electrode voltages being maintained constant.

Note.—As most precisely used, the term refers to infinitesimal amplitudes.

See Control grid—Plate transconductance.

Control grid—Plate transconductance. (Transconductance) (Mutual conductance)

Control grid—plate transconductance is the name for the plate current to control grid voltage transconductance.

Note.—This is ordinarily the most important transconductance and is commonly understood when the term transconductance or mutual conductance is used.

Mutual conductance.

See Control grid—Plate transconductance.

Electrode resistance.

Electrode resistance is the reciprocal of the electrode conductance.

Note.—This is the effective parallel resistance and is not the real component of the electrode impedance.

Plate resistance.

See Electrode resistance.

Interelectrode capacitance.

Interelectrode capacitance is the direct capacitance between two electrodes.

Electrode capacitance.

Electrode capacitance is the capacitance of one electrode to all other electrodes connected together.

Input capacitance.

The input capacitance of a vacuum tube is the sum of the direct capacitances between the control grid and the cathode and such other electrodes as are operated at the alternating potential of the cathode.

Note.—This is not the effective capacitance, which is a function of the impedances of the associated circuits.

Output capacitance.

The output capacitance of a vacuum tube is the sum of the direct capacitances between the output electrode (usually the plate) and the cathode and such other electrodes as are operated at the alternating potential of the cathode.

Note.—This is not the effective capacitance, which is a function of the impedances of the associated circuits.

Amplifiers

Amplifier.

An amplifier is a device for increasing the power associated with a phenomenon without appreciably altering its quality, through control by the amplifier input of a larger amount of power supplied by a local source to the amplifier output.

Class A amplifier.

A class A amplifier is an amplifier in which the grid bias and alternating grid voltages are such that plate current in a specific tube flows at all times.

Note.—To denote that grid current does not flow during any part of the input cycle, the suffix 1 may be added to the letter or letters of the class identification. The suffix 2 may be used to denote that grid current flows during some part of the cycle.

Class AB amplifier.

A class AB amplifier is an amplifier in which the grid bias and alternating grid voltages are such that plate current in a specific tube flows for appreciably more than half but less than the entire electrical cycle.

Note.—See note under Class A amplifier.

Class B amplifier.

A class B amplifier is an amplifier in which the grid bias is approximately equal to the cut-off value so that the plate current is approximately zero when no exciting grid voltage is applied, and so that plate current in a specific tube flows for approximately one-half of each cycle when an alternating grid voltage is applied.

Note.—See note under Class A amplifier.

Class C amplifier.

A class C amplifier is an amplifier in which the grid bias is appreciably greater than the cut-off value so that the plate current in each tube is zero when no alternating grid voltage is applied, and so that plate current flows in a specific tube for appreciably less than one-half of each cycle when an alternating grid voltage is applied.

Note.—See note under Class A amplifier.

Gas Tubes

Tube voltage drop.

Tube voltage drop in a gas tube is the anode voltage during the conducting period.

Critical grid voltage.

Critical grid voltage in a gas tube is the instantaneous value of grid voltage when the anode current starts to flow.

Critical grid current.

Critical grid current in a gas tube is the instantaneous value of grid current when the anode current starts to flow.

Control characteristic.

The control characteristic of a gas tube is a relation, usually shown by a graph, between critical grid voltage and anode voltage.

Cathode heating time.

Cathode heating time is the time required for the cathode to attain operating temperature with normal voltage applied to the heating element.

Tube heating time.

Tube heating time in a mercury-vapor tube is the time required for the coolest portion of the tube to attain operating temperature.

Phototubes

Static sensitivity (of a phototube).

Static sensitivity of a phototube is the quotient of the direct anode current by the incident radiant flux of constant value.

Dynamic sensitivity (of a phototube).

Dynamic sensitivity of a phototube is the quotient of the alternating component of anode current by the alternating component of incident radiant flux.

Note.—This is a variational and not a total sensitivity. As most precisely used, the term refers to infinitesimal amplitudes.

Luminous sensitivity (of a phototube).

Luminous sensitivity of a phototube is the quotient of the anode current by the incident luminous flux.

2870 Tungsten sensitivity (of a phototube).

2870 tungsten sensitivity of a phototube is the quotient of the anode current by the total incident luminous flux in lumens from a tungsten filament lamp at a color temperature of 2870 degrees Kelvin.

Gas amplification factor (of a phototube).

Gas amplification factor of a phototube is the factor of increase in the sensitivity of a gas phototube due solely to the ionization of the contained gas.

Note.—For a gas phototube having a structure such as to permit saturation to occur at a voltage less than that causing appreciable ionization, the gas amplification factor at a specified operating voltage is the ratio of the sensitivity measured at that voltage to the sensitivity measured at the saturation voltage.

Current-wavelength characteristic (of a phototube).

Current-wavelength characteristic of a phototube is a relation, usually shown by a graph, between the direct anode current per unit energy of the incident radiant flux and the wavelength of the flux.

Cathode-Ray Oscillograph Tubes

Gas focusing.

Gas focusing is a method of focusing an electron stream in which focus is produced through the action of ionized gas.

Electrostatic focusing.

Electrostatic focusing is a method of focusing an electron stream in which focus is produced through the action of an electric field.

Magnetic focusing.

Magnetic focusing is a method of focusing an electron stream in which focus is produced through the action of a magnetic field.

Deflection sensitivity (of a cathode-ray oscillograph tube).

The deflection sensitivity of a cathode-ray oscillograph tube is the quotient of the displacement of the electron beam at the place of impact by the change in the deflecting field.

Note.—It is usually expressed in millimeters per volt applied between the deflection electrodes, or in millimeters per gauss of the deflecting magnetic field.

Deflection factor (of a cathode-ray oscillograph tube).

The deflection factor of a cathode-ray oscillograph tube is the reciprocal of the deflection sensitivity.

Not Otherwise Classified

Rectifier.

A rectifier is a device which converts alternating current into unidirectional current by virtue of a characteristic permitting appreciable flow of current in only one direction.

Mercury-arc rectifier.

A mercury-arc rectifier is a rectifier which makes use of the rectifying properties of an electron-emitting cathode and non-electron-emitting anodes enclosed in a chamber containing mercury vapor.

Metal tank mercury-arc rectifier.

A metal tank mercury-arc rectifier is a mercury-arc rectifier with the anodes and mercury cathode enclosed in a metal container or chamber.

Controlled mercury-arc rectifier.

A controlled mercury-arc rectifier is a mercury-arc rectifier in which one or more electrodes are employed to control the starting of the discharge.

Discharge tube.

A discharge tube is an evacuated enclosure containing a gas at low pressure which permits the passage of electricity through the gas upon application of sufficient voltage.

Note.—The tube is usually provided with metal electrodes, but one form permits an electrodeless discharge with induced voltage.

Geissler tube.

A Geissler tube is a special form of discharge tube for showing the luminous effects of discharges through rarefied gases.

Note.—The density of gas is roughly one-thousandth of that of the atmosphere.

Cathode glow.

The cathode glow is the luminous glow which covers the surface of the cathode in a discharge tube, between the cathode and the cathode dark space.

Cathode dark space. (Crookes dark space)

The cathode dark space is the relatively non-luminous region in a discharge tube between the cathode glow and the negative glow.

Negative glow.

The negative glow is the luminous glow in a discharge tube between the cathode dark space and the Faraday dark space.

Faraday dark space.

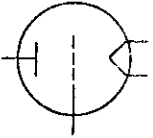
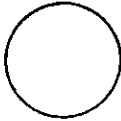
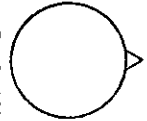
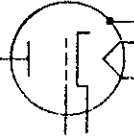
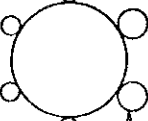
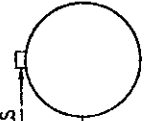
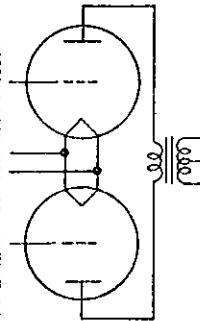
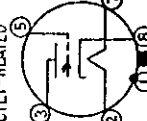
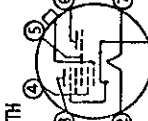
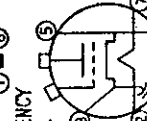
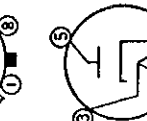
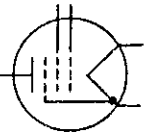
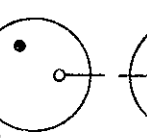
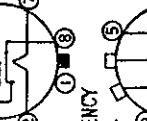
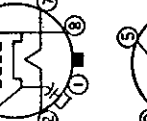
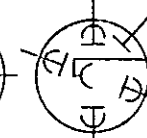
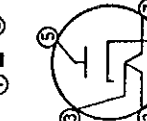
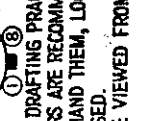
The Faraday dark space is the relatively non-luminous region in a discharge tube between the negative glow and the positive column.

Positive column.

The positive column is the luminous glow, often striated, in a discharge tube between the Faraday dark space and the anode.

Symbols

See Plates 1-9, inclusive.

TYPICAL APPLICATION OF SYMBOLS	TUBE BASING CONVENTIONS
TRIODE WITH FILAMENTARY CATHODE 	BASING ORIENTATION SYMBOLS A - FOR TUBES WITH KEYED BASES  KEY CONVENTION B - FOR TUBES WITH BAYONETS, BOSSES, AND OTHER REFERENCE POINTS 
TRIODE WITH INDIRECTLY-HEATED CATHODE AND ENVELOPE CONNECTION 	TUBE TERMINALS A - BASE TERMINALS  SMALL PIN LARGE PIN B - ENVELOPE TERMINALS  RIGID TERMINAL FLEXIBLE LEAD
TYPICAL WIRING FIGURE THIS FIGURE ILLUSTRATES HOW TUBE SYMBOLS MAY BE PLACED IN ANY CONVENIENT POSITION IN A CIRCUIT 	GENERAL APPLICATION A - TRIODE WITH INDIRECTLY-HEATED CATHODE AND ENVELOPE CONNECTED TO BASE TERMINAL  B - TRIODE-HEPTODE WITH RIGID ENVELOPE CONNECTION  C - ULTRA-HIGH-FREQUENCY TRIODE (DISC-SEAL TUBE TYPE)  D - RECTIFIER WITH HEATER TAP 
PENTODE (SUPPRESSOR OR BEAM-CONFINING ELECTRODES) 	NOTE: IN LINE WITH STANDARD DRAFTING PRACTICE, STRAIGHT-LINE CROSSOVERS ARE RECOMMENDED. IF CONDITIONS DEMAND THEM, LOOP CROSSOVERS MAY BE USED. ALL BASE DIAGRAMS ARE VIEWED FROM THE BOTTOM.
DIODE (COLD CATHODE AND GAS CONTENT) 	VELOCITY-MODULATION (VELOCITY-VARIATION) TUBES A - SINGLE-CAVITY TYPE WITH REFLECTING ELECTRODE  B - DOUBLE-CAVITY TYPE WITH COLLECTING ELECTRODE 
PHOTOTUBES A - VACUUM TYPE 	CATHODE-RAY TUBES A - WITH ELECTROSTATIC DEFLECTION  B - MULTIPLIER TYPE 

Flate 2.

SYMBOL COMPONENTS			
CONTACT	CORE	VARIABLE	
A - ADJUSTABLE OR SLIDING CONTACT OR REGULAR CONTACT FOR RELAYS, KEYS, JACKS, ETC. 	A - AIR (NO SYMBOL, INDICATE AIR CORE WHEN REQUIRED) B - MAGNETIC (GENERAL) C - RELAY OR MAGNET D - ADAPTATIONS 	A - GENERAL 	
B - MOVING CONTACT OR ARMATURE FOR RELAYS, NON-LOCKING KEYS, JACKS, ETC. 		B - ADAPTATIONS 	
C - MOVING CONTACT FOR LOCKING KEYS, JACKS, ETC. 	AIR-CORE INDUCTOR 	VARIABLE OR ADJUSTABLE RESISTOR 	
(CIRCLE INDICATES PIVOT POINT AND IS ALWAYS SHOWN ON MOVING CONTACTS) 	AIR-CORE TRANSFORMER 	VARIABLE OR ADJUSTABLE CAPACITOR 	
C - MOVING CONTACT FOR LOCKING KEYS, JACKS, ETC. 	MAGNETIC-CORE INDUCTOR 		
D - VIBRATOR REED 	MAGNETIC-CORE TRANSFORMER 		
USE ONLY ONE DASH 	SINGLE-WINDING RELAY 		
SPLIT REED 	DOUBLE-WINDING RELAY 		
E - SLEEVE 	HEATER ELEMENT 		
F - INSULATOR FOR MECHANICAL COUPLING BETWEEN MOVING CONTACTS ON JACKS, RELAYS, KEYS, ETC. 	NOTE: TO BE USED WHERE HEAT-PRODUCING ELEMENTS ARE REQUIRED AS IN THERMOSTATS, CONSTANT TEMPERATURE CHAMBERS, ETC.		
G - ADAPTATIONS OF CONTACTS AND MECHANICAL COUPLING 	SHIELDING A - GENERAL B - ADAPTATIONS 		
MAKE 	SHIELDED WIRES 		
BREAK 	SHIELDED WIRES WITH SHIELD GROUNDED 		
TRANSFER 	SHIELDED WIRES WITH SHIELD GROUNDED 		
RELAY COMBINATION MAKE BREAK MAKE 	RELAY WITH CERTAIN WINDINGS INTERNALLY CONNECTED AND BROUGHT OUT TO A COMMON TERMINAL 		
RELAY COMBINATION MAKE-BREAK MAKE 	RELAY WITH CERTAIN WINDINGS INTERNALLY CONNECTED AND BROUGHT OUT TO COMMON TERMINALS 		
RELAY COMBINATION WITH MECHANICAL COUPLING 	RELAY WITH CERTAIN WINDINGS INTERNALLY CONNECTED AND BROUGHT OUT TO COMMON TERMINALS 		
NOTE: WHERE SIMPLE CONTACTS ONLY ARE INVOLVED, THE FOLLOWING SYMBOLS ARE ACCEPTABLE: NORMALLY OPEN			
NORMALLY CLOSED			

Plate 3.

BASIC SYMBOLS AND ADAPTATIONS

AMPLIFIER

A - FOR USE IN SINGLE LINE DIAGRAMS

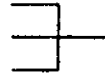


B - WHERE MORE LEADS ARE SHOWN

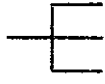


ANTENNA

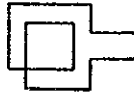
A - AERIAL



B - COUNTERPOISE



C - LOOP



BATTERY

A - GENERAL
(THE LONG LINE IS ALWAYS POSITIVE BUT IN CASES OF UNCERTAINTY, POLARITY MAY BE INDICATED)



B - COUNTER EMF



C - ADAPTATIONS

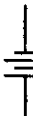


WITH POLARITY INDICATED

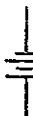
ONE CELL



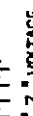
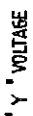
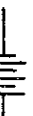
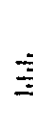
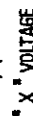
MULTI-CELLS



* SEVERAL VOLTAGES ON ONE CIRCUIT



* (WHERE IT IS DESIRED TO INDICATE DIFFERENT VOLTAGES IN SAME CIRCUIT, INDICATE BY CHANGES IN NUMBER OF CELL SECTIONS AS ILLUSTRATED)



CAPACITOR

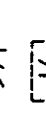
A - FIXED



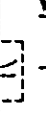
B - ADAPTATIONS



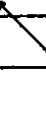
VARIABLE OR ADJUSTABLE



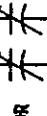
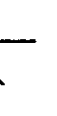
SHIELDED



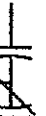
VARIABLE DIFFERENTIAL



WITH MECHANICAL LINKAGE OF UNITS



SPLIT-STATOR



NOTE:

WHERE IT IS NECESSARY TO IDENTIFY THE CAPACITOR ELECTRODES, THE CURVED ELEMENT SHALL REPRESENT THE OUTSIDE ELECTRODE IN FIXED PAPER-DIELECTRIC AND CERAMIC-DIELECTRIC CAPACITORS, THE NEGATIVE ELECTRODE IN ELECTROLYTIC CAPACITORS AND THE MOVING ELEMENT IN VARIABLE AND ADJUSTABLE CAPACITORS. WHEN IT IS DESIRED TO ESPECIALLY DISTINGUISH TRIMMER CAPACITORS, THE LETTER "T" SHOULD APPEAR ADJACENT TO THE SYMBOL.

CRYSTAL

A - DETECTOR



B - PIEZO-ELECTRIC



DIAL

A - TYPICAL



(USE SPRINGS AND CONTACTS AS REQUIRED)

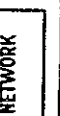
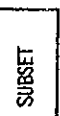
GENERAL

A

* IN ALL CASES INDICATE TYPE OF APPARATUS; SYMBOL TO BE USED WHERE INTERNAL DETAILS NEED NOT BE SHOWN.



B - ADAPTATIONS

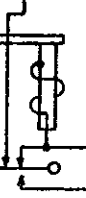


RESISTOR, FIXED



* THIS SYMBOL MUST ALWAYS BE USED WITH AN IDENTIFYING LEGEND WITHIN OR ADJACENT TO THE RECTANGLE.

GENERATOR (HAND) TYPICAL

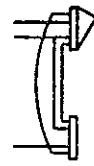


(USE SPRINGS AND CONTACTS AS REQUIRED)

GROUND



HAND SET



A - THREE-CONDUCTOR

B - ADAPTATIONS



FOUR-CONDUCTOR

FOUR-CONDUCTOR WITH TRANSMITTER CUT-OUT KEY

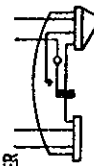
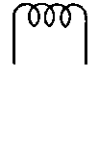


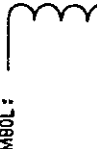
Plate 4.

BASIC SYMBOLS AND ADAPTATIONS (CONTINUED)

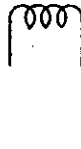
INDUCTOR (ALSO SEE RELAY)
A - FIXED



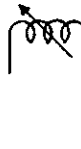
WHEREVER THE ABOVE SYMBOL HAS BEEN USED IN THIS STANDARD, IT IS ALSO ACCEPTABLE TO USE THE FOLLOWING SYMBOL:



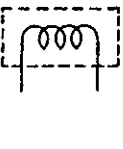
B - ADAPTATIONS
AIR CORE



VARIABLE OR ADJUSTABLE



SHIELDED



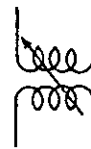
MAGNETIC CORE



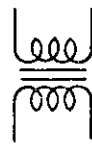
TRANSFORMER



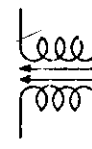
TRANSFORMER (VARIABLE OR ADJUSTABLE)



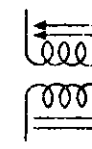
TRANSFORMER (MAGNETIC CORE)



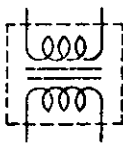
TRANSFORMER (VARIABLE CORE)



TRANSFORMER (VARIABLE CORE IN ONE WINDING ONLY)

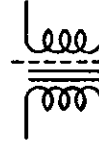


TRANSFORMER (MAGNETIC CORE AND SHIELDING)

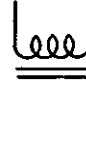


B. (CONTINUED) TRANSFORMER

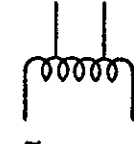
(MAGNETIC CORE AND SHIELDING ON ONE WINDING ONLY)



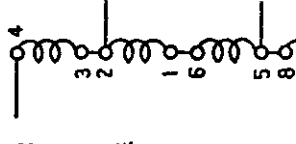
TRANSFORMER (MAGNETIC CORE MULTI-WINDING)



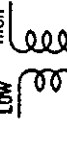
AUTO TRANSFORMER



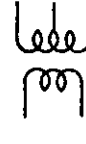
AUTO TRANSFORMER (TERMINALS AND DESIGNATIONS ARE SHOWN ONLY WHEN TERMINALS REQUIRE IDENTIFICATION)



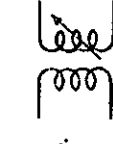
TRANSFORMER (UNEQUAL RATIO)



TRANSFORMER (WITH TAPPED WINDING)

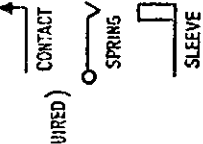


TRANSFORMER (VARIABLE COUPLING. POSITION OF ARROW INDICATES MOVING COIL)



JACK

A - COMPONENTS (ASSEMBLY AS REQUIRED)



B - ADAPTATIONS

TWO-CONDUCTOR



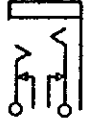
THREE-CONDUCTOR



THREE-CONDUCTOR (WITH AUXILIARY CONTACTS)



SERIES-THREE-CONDUCTOR

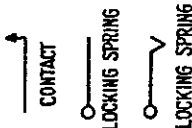


GANG

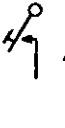


KEY

A - COMPONENTS (ASSEMBLY AS REQUIRED)



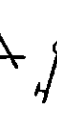
B - TELEGRAPH KEY
a - SIMPLE



b - CLOSED-CIRCUIT



c - OPEN-CIRCUIT OR POLE-CHANGING



C - ADAPTATIONS

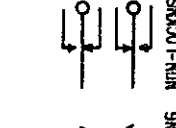
NON-LOCKING



LOCKING



TYPICAL LEVER-TYPE COMBINED LOCKING AND NON-LOCKING KEY, WITH AUXILIARY CONTACTS



BASIC SYMBOLS AND ADAPTATIONS (CONTINUED)

LAMP

A - SWITCHBOARD

B - ILLUMINATING

C - BALLAST OR RESISTANCE

LOUDSPEAKER, HORN OR HOWLER

A - GENERAL

B - ADAPTATIONS

MAGNETIC ARMATURE

PERMANENT MAGNET, WITH MOVING COIL

ELECTROMAGNETIC, WITH MOVING COIL

ELECTROMAGNETIC, WITH MOVING COIL AND HUM-NEUTRALIZING WINDING

MESSAGE REGISTER

METER

A - GENERAL SYMBOL

* ABBREVIATIONS TO IDENTIFY THE SPECIFIC TYPE OF METER. FOR EXAMPLE:

- A - AMMETER
- AH - AMPERE HOUR
- F - FREQUENCY
- G - GALVANOMETER
- MA - MILLIAMMETER
- PF - POWER FACTOR
- TT - TOTAL TIME
- V - VOLTMETER
- VA - VOLT-AMMETER
- W - WATTMETER
- WH - WATT HOUR
- μA - MICROAMMETER

MICROPHONE (ALSO SEE TRANSMITTER)

A - GENERAL

B - ADAPTATIONS

SINGLE-BUTTON

DOUBLE-BUTTON

CONDENSER

MOVING-COIL

VELOCITY

CRYSTAL

NETWORK

A - GENERAL

B - ADAPTATIONS

* SPECIFIC ARRANGEMENT

* APPARATUS REPRESENTED BY THE RECTANGLES WILL BE DESIGNATED INSIDE OF EACH.

SPECIFIC ARRANGEMENT

PLUG

TYPICAL SWITCHBOARD

A - PLUG - TWO-CONDUCTOR

TYPICAL SWITCHBOARD

B - PLUG - THREE-CONDUCTOR

C - GANG

D - NON-POLARIZED (NUMBER OF TERMINALS AS REQUIRED)

E - POLARIZED (NUMBER OF TERMINALS AS REQUIRED)

F - THREE-CONDUCTOR, POLARIZED

RADIAL PRONG INDICATES POLARIZATION

PROTECTION

A - ARRESTOR OR PROTECTOR

a - GENERAL

b - CARBON BLOCK

c - HORN GAP

B - CIRCUIT BREAKER

C - FUSE

a - GENERAL

b - FUSE MOUNTED ON BUS BAR

c - FUSE MOUNTED ON PROTECTOR MOUNTING

D - HEAT COIL

a - HEAT COIL AND MOUNTING

Plate 6.

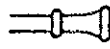
BASIC SYMBOLS AND ADAPTATIONS (CONTINUED)

RECEIVER

A - GENERAL



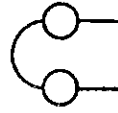
B - HAND



C - SINGLE HEAD SET

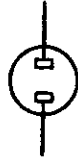


D - DOUBLE HEAD SET



RECEPTACLE (ALSO SEE PLUG)

A - NON-POLARIZED
(NUMBER OF
TERMINALS
AS REQUIRED)



B - POLARIZED
(NUMBER OF
TERMINALS
AS REQUIRED)



C - THREE-CONDUCTOR,
POLARIZED

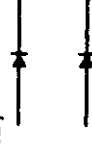


RADIAL CONTACT
INDICATES POLARIZATION

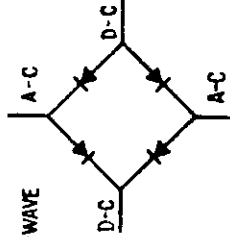
RECTIFIER

A - GENERAL

(THE ARROW POINTS IN THE DIRECTION
OF LOW RESISTANCE)



B - ADAPTATIONS
HALF-WAVE



FULL-WAVE

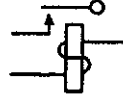
REGULATOR

A - CENTRIFUGAL GOVERNOR
(CONTACTS NORMALLY
OPEN OR NORMALLY
CLOSED AS REQUIRED
— SHOWN HERE AS
NORMALLY CLOSED)

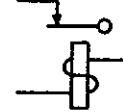


RELAY

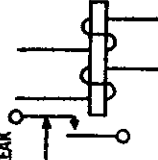
A - WITH MAKE CONTACT



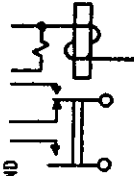
B - WITH BREAK CONTACT



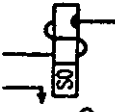
C - DOUBLE WINDING WITH
MAKE-BEFORE-BREAK
CONTACTS



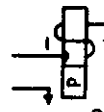
D - NON-INDUCTIVE WINDING
AND TRANSFER AND
MAKE CONTACTS



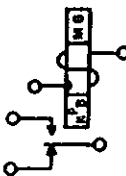
E - WINDING WITH SPECIFIC
OPERATING FEATURE
(SEE NOTE)



F - WINDING WITH SPECIFIC
OPERATING FEATURE
(SEE NOTE)



G - WINDING WITH SPECIFIC OPERATING
FEATURE
(SEE NOTE)



NOTE:

THE PROPER POLING FOR A POLARIZED RELAY SHALL BE SHOWN BY THE USE OF + AND — DESIGNATIONS APPLIED TO THE WINDING LEADS. THE INTERPRETATION OF THIS SHALL BE THAT CURRENT IN THE DIRECTION INDICATED SHALL MOVE OR TEND TO MOVE THE ARMATURE TOWARD THE CONTACT SHOWN NEAREST THE CORE ON THE SCHEMATIC. IF THE RELAY IS EQUIPPED WITH NUMBERED TERMINALS, THE PROPER TERMINAL NUMBERS SHALL ALSO BE SHOWN.

AC—INDICATES ALTERNATING CURRENT OR RINGING RELAY

D—INDICATES DIFFERENTIAL

DB—INDICATES DOUBLE BIASED (BIASED IN BOTH DIRECTIONS)

DP—INDICATES DASHPOT

EP—INDICATES ELECTRICALLY POLARIZED

*FO—INDICATES FAST OPERATE

*FR—INDICATES FAST RELEASE

MG—INDICATES MARGINAL

NB—INDICATES NO BIAS

NR—INDICATES NON-REACTIVE

P—INDICATES MAGNETICALLY POLARIZED, USING BIASING SPRING, OR HAVING MAGNET BIAS

SO—INDICATES SLOW OPERATE

SR—INDICATES SLOW RELEASE

SW—INDICATES SANDWICH WOUND TO IMPROVE BALANCE TO LONGITUDINAL CURRENTS

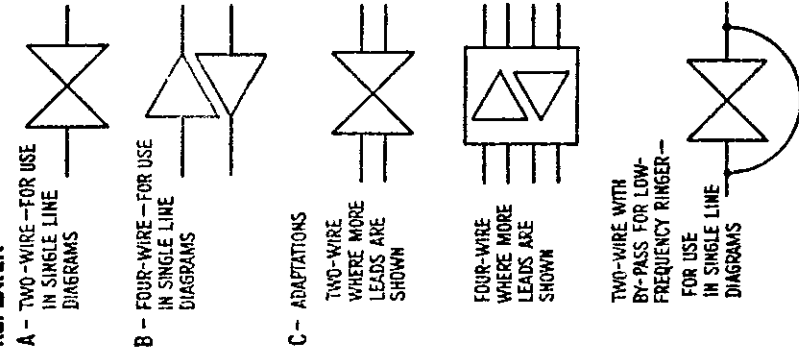
ANY COMBINATION OF THE ABOVE MAY BE USED WHERE A RELAY POSSESSES MORE THAN ONE SPECIAL FEATURE.

* USED WHERE UNUSUALLY FAST OPERATION OR FAST RELEASING IS ESSENTIAL TO THE CIRCUIT OPERATION.

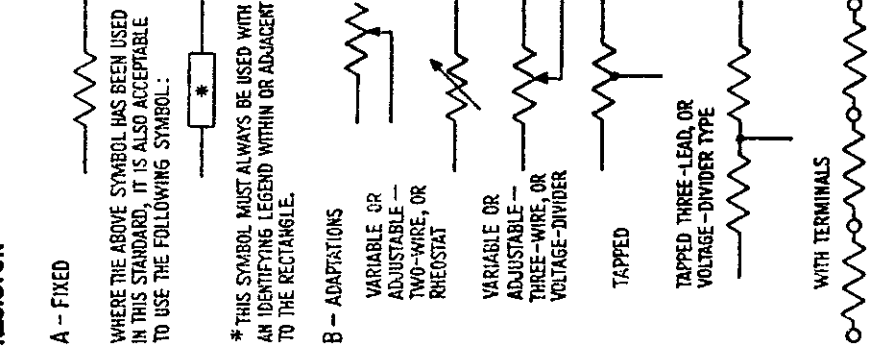
Plate 7.

BASIC SYMBOLS AND ADAPTATIONS (CONTINUED)

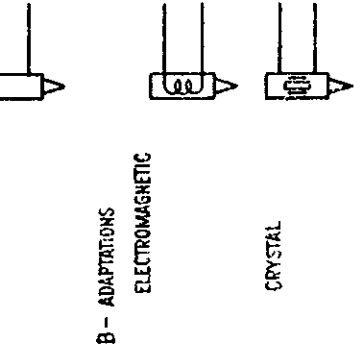
REPEATER



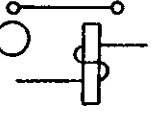
RESISTOR



REPRODUCER



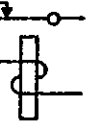
C - A-C BELL



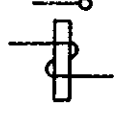
C - BUZZER



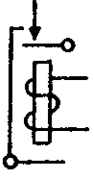
B - D-C BUZZER



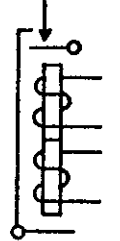
C - A-C BUZZER



D - DROPS



B - ELECTRICALLY RESTORED



E - RINGER



F - SOLENOID



SOUNDER - TELEGRAPH



B - ADAPTATION WITH CONTACT



SUBSET



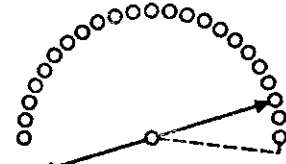
Plate 8.

BASIC SYMBOLS AND ADAPTATIONS (CONTINUED)

SWITCH

A - SELECTOR TYPE

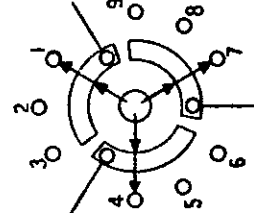
a - 22-POINT
SELECTOR



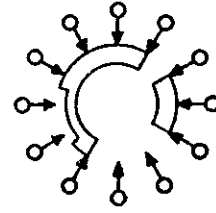
b - 10-POINT
SELECTOR



c - WAFER



TYPICAL
VIEWED
FROM END
OPPOSITE
CONTROL
KNOB



SWITCH HOOK

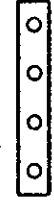


TERMINAL

A - TERMINAL OR
BINDING POST



B - TYPICAL TERMINAL STRIP
OR CONNECTING BLOCK



(NUMBER OF
TERMINALS AS
REQUIRED)

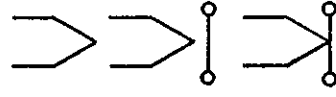
THERMOCOUPLE

A - GENERAL

B - THERMOELEMENT

a - INDIRECTLY HEATED

b - DIRECTLY HEATED

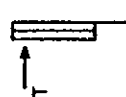


THERMO-CUTOUT

A - INTEGRAL-HEATER UNIT



B - EXTERNALLY-HEATED UNIT



C - SELF-HEATED UNIT



D - EXTERNAL-HEATER UNIT



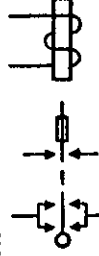
TRANSMITTER (ALSO SEE MICROPHONE)

A - GENERAL



VIBRATOR

TYPICAL



VOLTAGE, SOURCE OF ALTERNATING



WIRE

A - CROSSING,
NOT CONNECTED



B - CONNECTIONS (PREFERRED) NO
USE OF CROSSES WITH CONNECTIONS



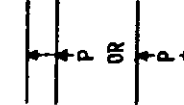
C - CONNECTIONS



D - STRAP



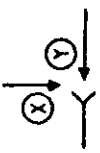
E - PAIR



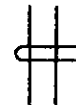
F - SPICE



G - CONDITIONAL



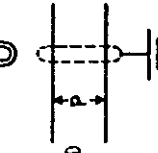
H - SWITCHBOARD CABLE



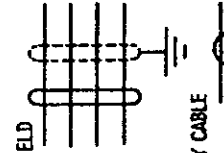
I - DUPLEX OR QUADDED CABLE



J - ADAPTATIONS



K - RADIO-FREQUENCY CABLE COAXIAL



TWIN COAXIAL



TWIN-CONDUCTOR

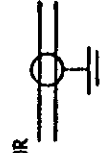
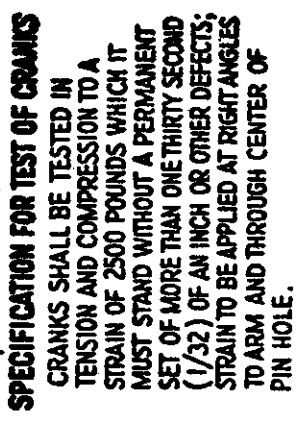
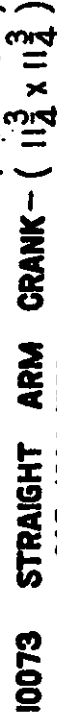


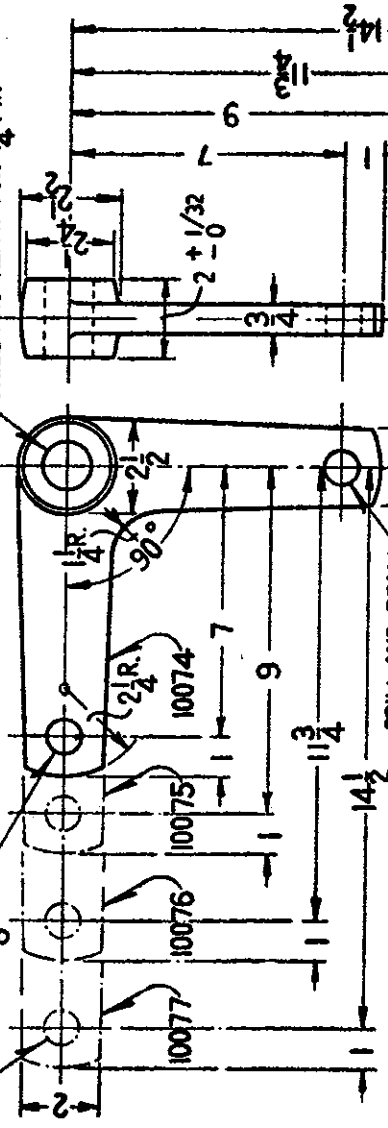
Plate 9.



0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES



DRILL AND REAM FOR 7 PIN
SAE-1020 STEEL
DRILL AND REAM FOR 1 1/4 PIN



Association of American Railroads
Signal Section

Official Approval

Sept. 1934, Mar. 1944, May 1947, Apr. 1949, Feb. 1950, Mar. 1951, Feb. 1955.

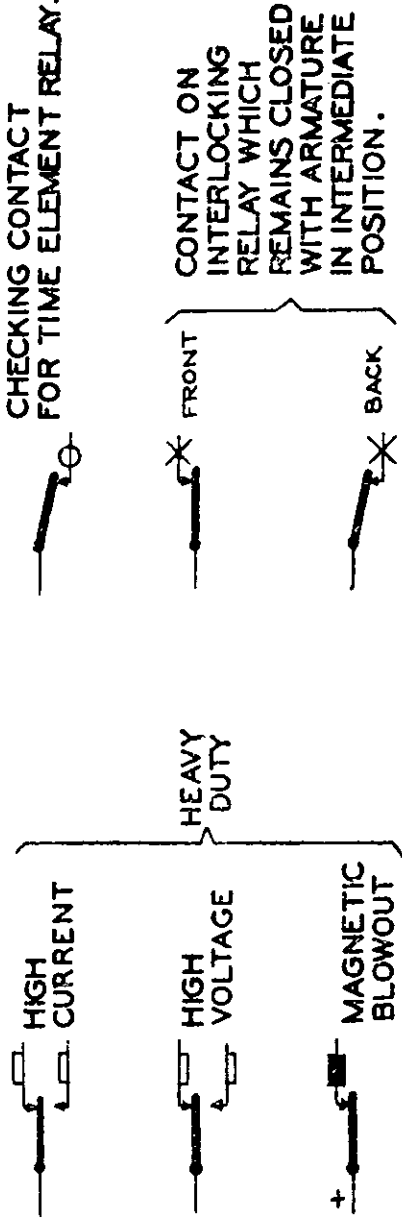
TYPE OF CONTACT	
ENERGIZED	DE-ENERGIZED
NORMAL REVERSE	

Association of American Railroads
Signal Section

Official Approval

Sept. 1934, Mar. 1944, May 1947, Apr. 1949, Feb. 1950, Mar. 1951, Feb. 1955.

RELAY CONTACTS WITH SPECIAL CHARACTERISTICS

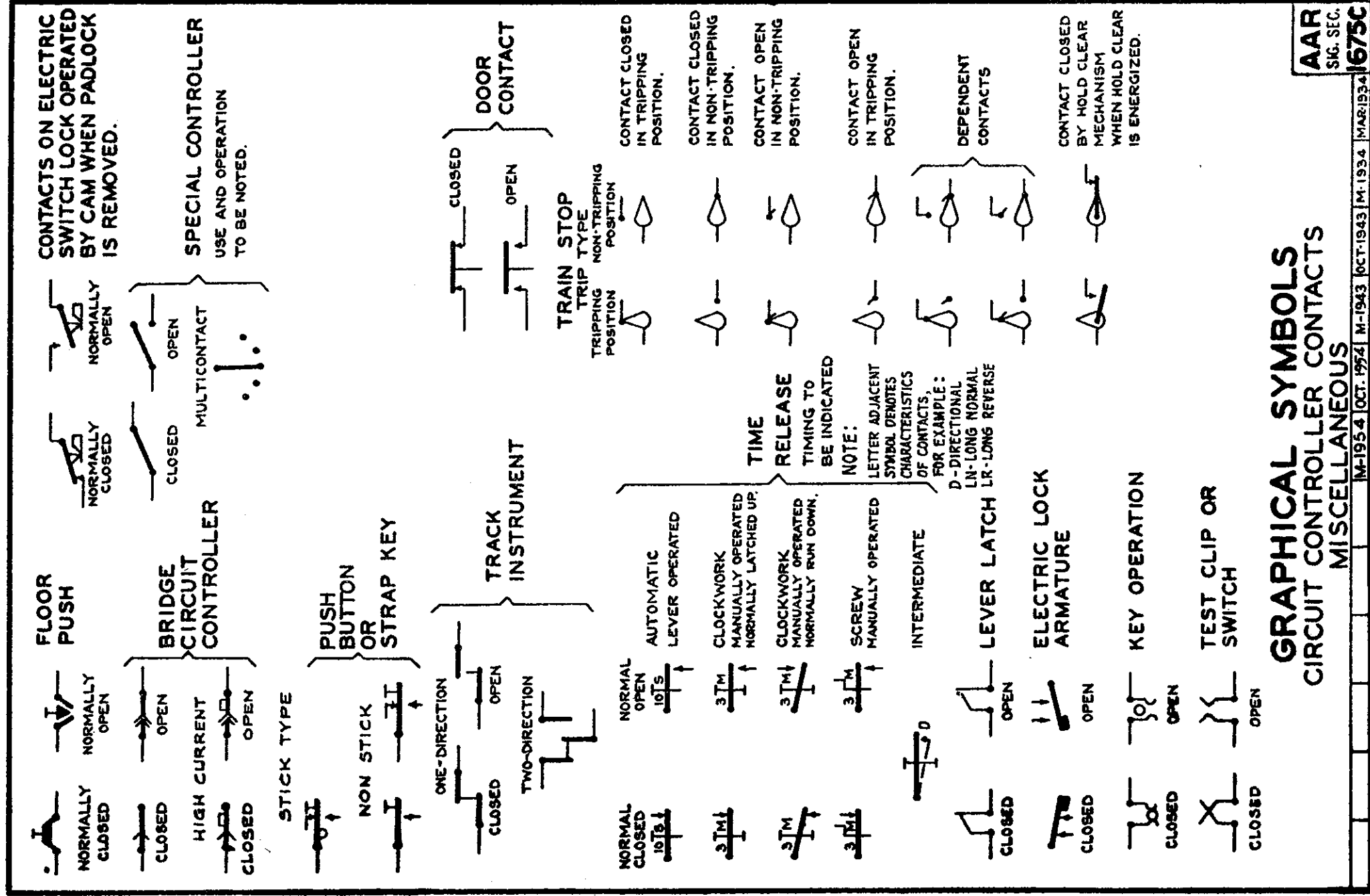


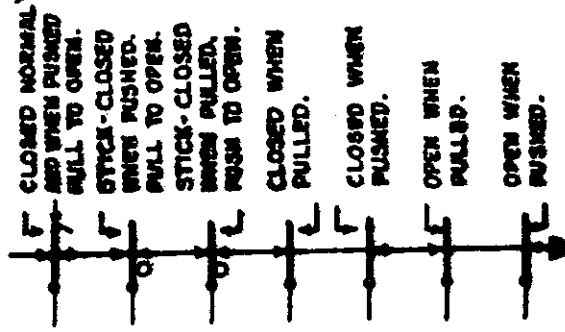
NOTE: CONTACT CHARACTERISTICS MAY BE COMBINED
TO FORM ADDITIONAL SYMBOLS AS REQUIRED.

GRAPHICAL SYMBOLS
RELAY CONTACTS

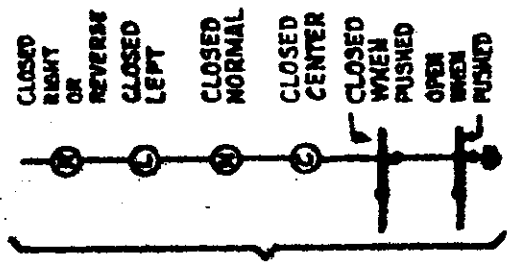
AAR		SG. SEC.	
M-1950	SEPT-1950	M-1949	SEPT-1949
M-1948	SEPT-1948	M-1946	OCT-1946
M-1943	OCT-1943	M-1934	MAR-1934
674-G			

(Sheet 3 of 3 sheets)





PUSH-
PULL
BUTTON



PUSH-
TURN
BUTTON

NOTE:

CONTACT CHARACTERISTICS MAY
BE COMBINED TO FORM OTHER
SYMBOLS.

TURN SEQUENCE MAY BE
INDICATED BY USE OF LETTERS
PLACED ADJACENT SYMBOL,
SUCH AS:

- P-P - PUSH PULL
- P-T - PUSH THEN TURN
- T-P - TURN THEN PUSH
- PP-T - PUSH OR PULL THEN TURN
- T-PP - TURN THEN PUSH OR PULL

HEAVY DUTY CONTACT DESIGNATION
AS SHOWN FOR RELAY CONTACTS
MAY BE USED ON CIRCUIT CONTROL-
LER CONTACTS TO INDICATE
SPECIAL CHARACTERISTICS.

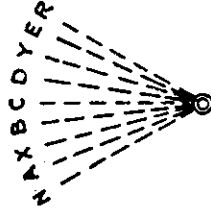
GRAPHICAL SYMBOLS CIRCUIT CONTROLLER CONTACTS MISCELLANEOUS

AAR
SIG. SEC.
1675C

M-1954 OCT. 1954 M-1943 OCT. 1943 M-1934 MAR. 1934

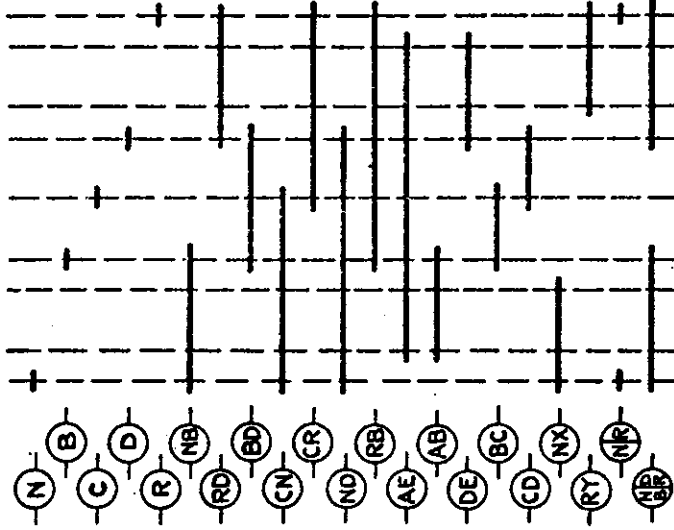
LEVERS WITH END POSITION AS NORMAL

N-NORMAL POSITION
A-LEVER SLIGHTLY MOVED FROM N TOWARD B
X-LEVER SLIGHTLY MOVED FROM B TOWARD N
B-NORMAL INDICATION POSITION
C-CENTRAL POSITION
D-REVERSE INDICATION POSITION
Y-LEVER SLIGHTLY MOVED FROM D TOWARD R
E-LEVER SLIGHTLY MOVED FROM R TOWARD D
R-REVERSE POSITION



POSITIONS INDICATED

SYMBOLS N A X B C D Y E R

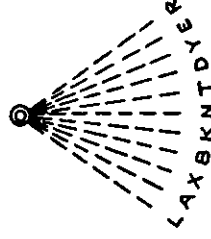


INDEPENDENT TYPE CONTACT —○—
HEAVY DUTY TYPE CONTACT —●—

HORIZONTAL LINES INDICATE THAT PORTION OF THE CYCLE OF LEVER MOVEMENT DURING WHICH THE CIRCUIT IS CLOSED.
VERTICAL LINE BETWEEN LETTERS IN SYMBOL INDICATES THAT THE CIRCUIT IS CLOSED AT AND OPEN BETWEEN POINTS INDICATED.

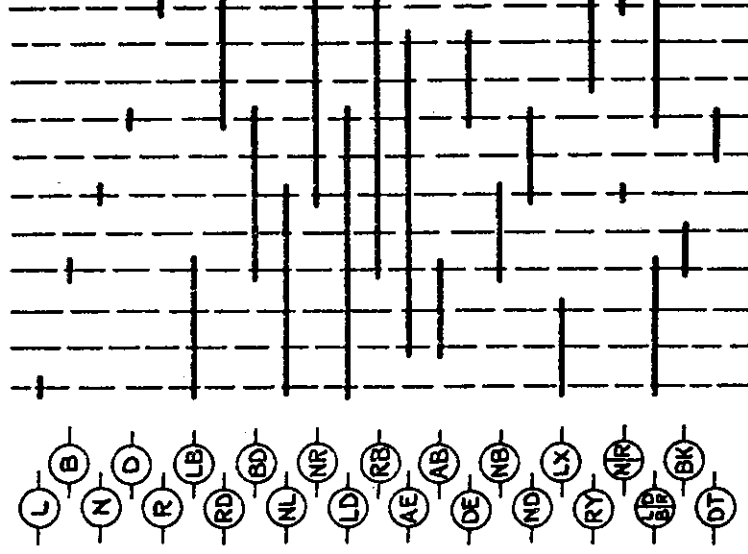
LEVERS WITH MIDDLE POSITION AS NORMAL

L-REVERSE POSITION TO LEFT
A-LEVER SLIGHTLY MOVED FROM L TOWARD B
X-LEVER SLIGHTLY MOVED FROM B TOWARD L
B-INDICATION POSITION TO LEFT
K-LEVER SLIGHTLY MOVED FROM N TOWARD B
N-NORMAL POSITION
T-LEVER SLIGHTLY MOVED FROM N TOWARD D
D-INDICATION POSITION TO RIGHT
Y-LEVER SLIGHTLY MOVED FROM D TOWARD R
E-LEVER SLIGHTLY MOVED FROM R TOWARD D
R-REVERSE POSITION TO RIGHT



POSITIONS INDICATED

SYMBOLS L A X B K N T D Y E R



DEPENDENT TYPE CONTACTS —○—
—●—

GRAPHICAL SYMBOLS

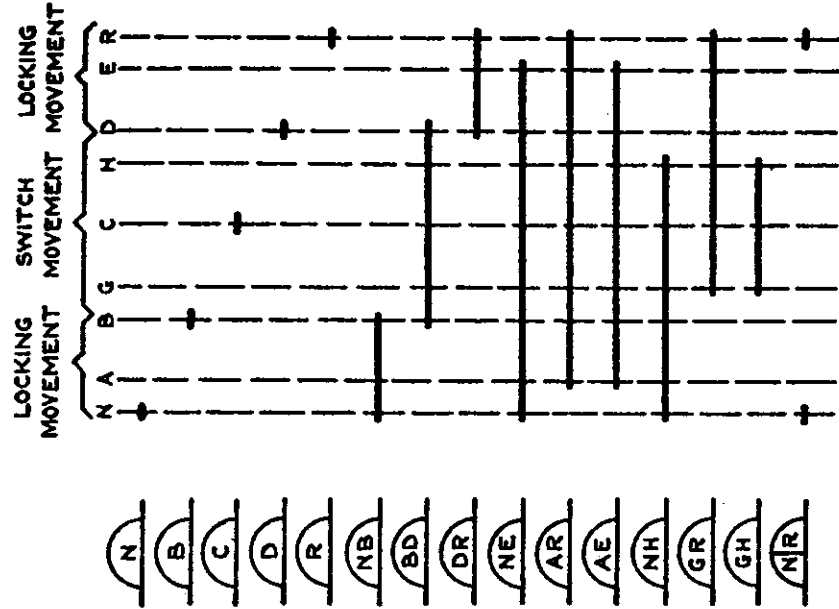
CIRCUIT CONTROLLER CONTACTS
CONTACTS ACTUATED MECHANICALLY BY INTERLOCKING MACHINE LEVER OR LATCH

AAR
SIG. SEC.
676B

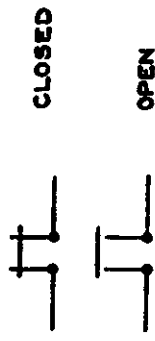
M-1943 OCT-1943 M-1934 MAR-1934

SWITCH MACHINE

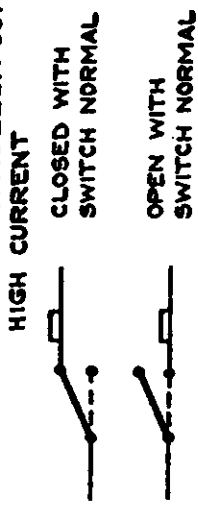
- N• SWITCH IN NORMAL POSITION AND LOCKED.
- A• LOCKING SLIGHTLY MOVED FROM NORMAL.
- B• SWITCH IN NORMAL POSITION AND UNLOCKED.
- G• SWITCH SLIGHTLY MOVED FROM NORMAL.
- C• SWITCH IN CENTRAL POSITION.
- H• SWITCH SLIGHTLY MOVED FROM REVERSE.
- D• SWITCH IN REVERSE POSITION AND UNLOCKED.
- E• LOCKING SLIGHTLY MOVED FROM REVERSE.
- R• SWITCH IN REVERSE POSITION AND LOCKED.



F.P.L.CIRCUIT CONTROLLER CONTACT



SWITCH CIRCUIT CONTROLLER CONTACT



HORIZONTAL LINES INDICATE THAT PORTION OF THE MOVEMENT DURING WHICH THE CIRCUIT IS CLOSED.

VERTICAL LINE BETWEEN LETTERS IN SYMBOL INDICATES THAT THE CIRCUIT IS CLOSED AT AND OPEN BETWEEN POINTS INDICATED.

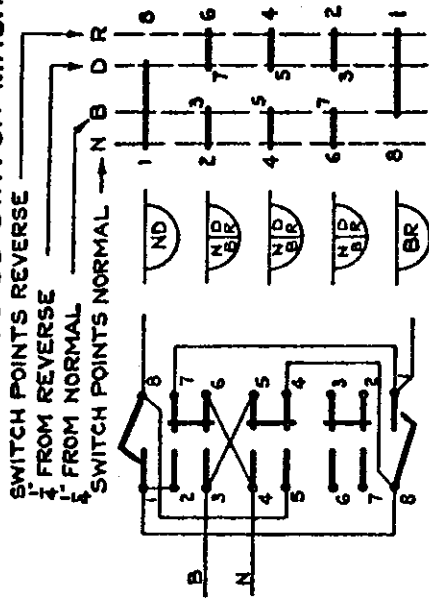
GRAPHICAL SYMBOLS

CONTACTS ACTUATED BY SWITCH POINTS, DERAILS OR LOCKING CONNECTIONS

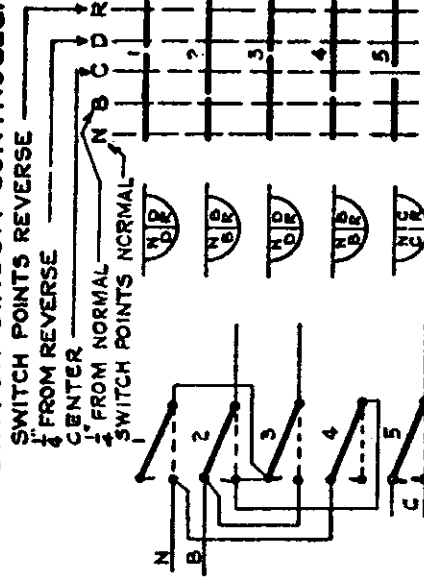
AAR
SIG. SEC.
1677C

M-1954 OCT. 1954 M-1943 OCT. 1943 M-1934 MAR-1934

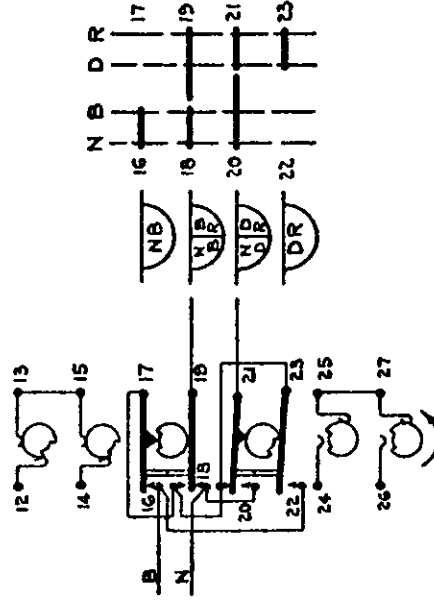
MODEL 5A-5B-5C-5D SWITCH MACHINE



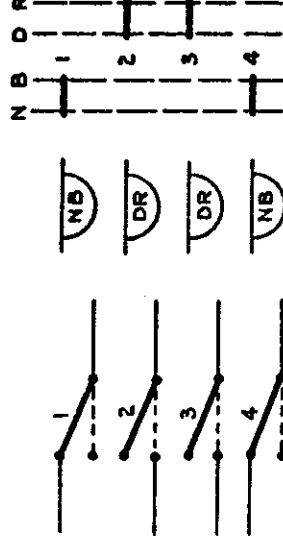
SWITCH CIRCUIT CONTROLLER



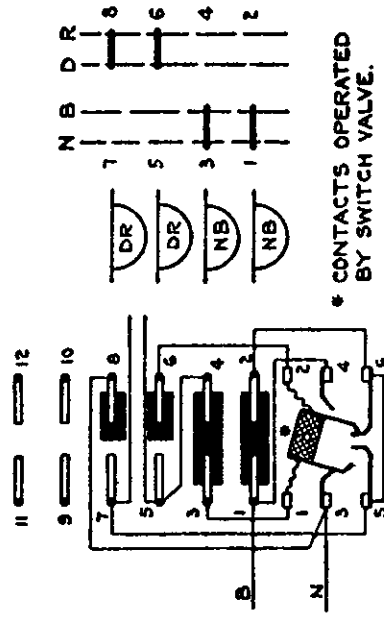
TYPE M-3-M-23 SWITCH MACHINE



SPRING SWITCH



ELECTRO-PNEUMATIC SWITCH MACHINE



NOTE:

HORIZONTAL LINES INDICATE THAT PORTION OF THE MOVEMENT DURING WHICH THE CIRCUIT IS CLOSED.

VERTICAL LINE BETWEEN LETTERS IN A SYMBOL INDICATES THAT THE CIRCUIT IS CLOSED AT AND OPEN BETWEEN POINTS INDICATED.

SWITCH MACHINE CIRCUIT CONTROLLER CONTACTS INDICATED BY FIGURES, SHOW MFR. REFERENCE.

POWER-OPERATED SWITCH MACHINE

INDEPENDENT TYPE CONTACT

CLOSED IN POWER POSITION
CLOSED IN HAND POSITION
DUAL SELECTOR LEVER CONTACT

DEPENDENT TYPE CONTACT

GRAPHICAL SYMBOLS

CONTACTS ACTUATED BY SWITCH POINTS, DERAILS OR LOCKING CONNECTIONS

AAR

SIG. SEC.

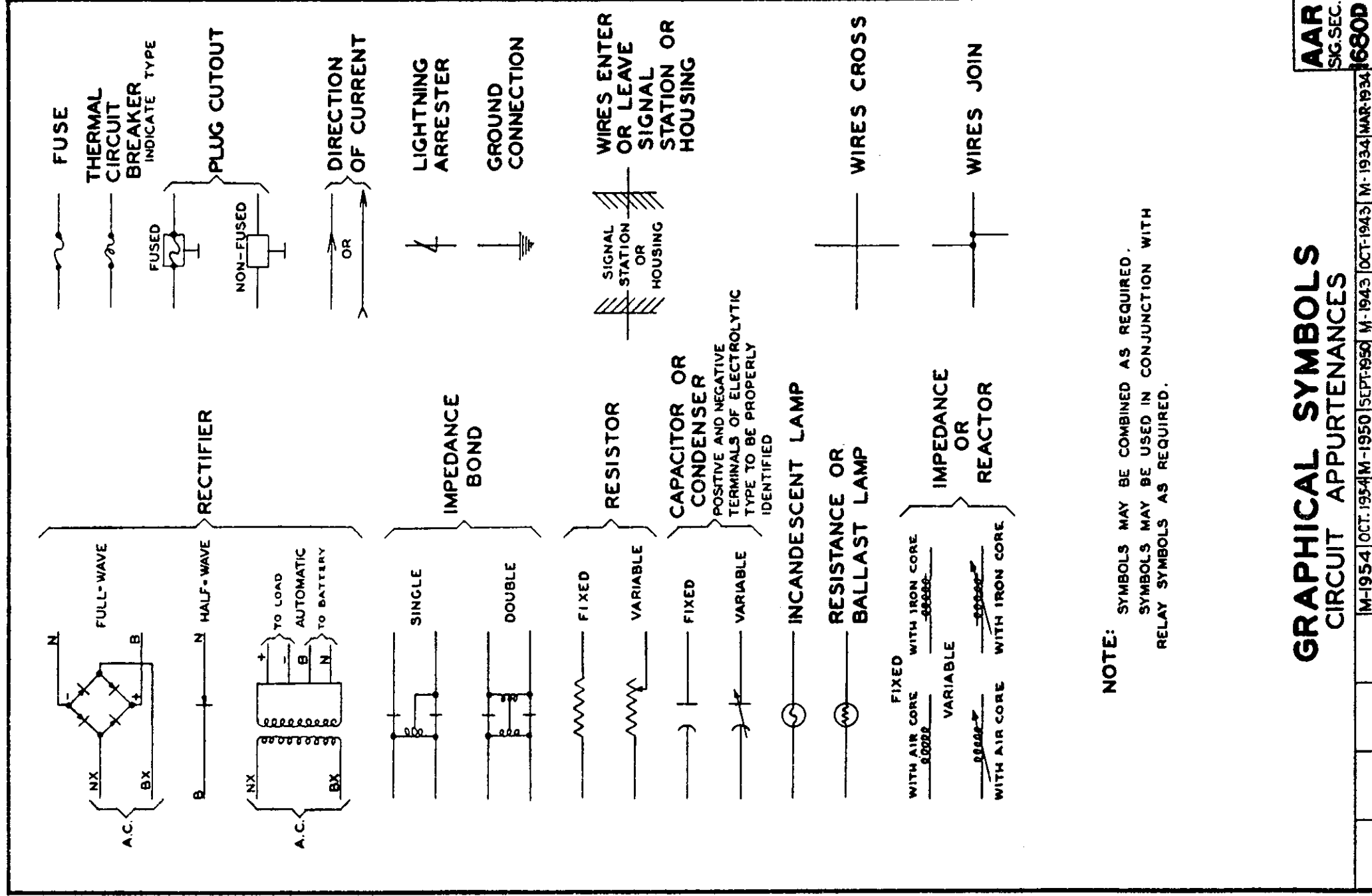
1677C

M-1954 OCT. 1954 M-1943 OCT. 1943 M-1934 MAR. 1934

Association of American Railroads
Signal Section

Official Approval

Sept. 1934, Mar. 1944, Mar. 1951, Feb. 1955.



GRAPHICAL SYMBOLS
CIRCUIT APPURTENANCES

AAR
SG. SEC.
1680D

M-1954 OCT. 1954 M-1950 SEPT. 1950 M-1943 OCT. 1943 M-1934 MAR. 1934

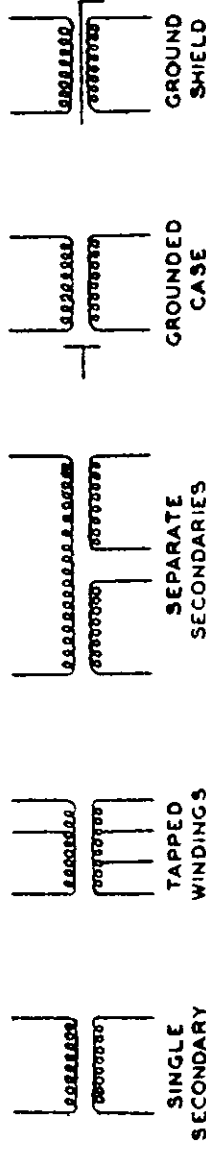
(Sheet 1 of 2 sheets)

Association of American Railroads Signal Section

Official Approval

Sept. 1934, Mar. 1944, Mar. 1951, Feb. 1955.

TRANSFORMER



BATTERY



NOTE:
SPECIFY NUMBER, TYPE AND
CAPACITY OF CELLS.
SL - STORAGE - LEAD
SA - STORAGE - ALKALINE
D - DRY
P - PRIMARY

EXAMPLE - $\frac{5}{80AH}$

INTERNALLY WIRED UNITS

* * NOTE:
THIS SYMBOL TO BE USED FOR INTERNALLY WIRED UNITS
WITH AN IDENTIFYING LEGEND WITHIN OR ADJACENT THERETO,
FOR EXAMPLE:
SU - ARC SUPPRESSOR UNIT
CT - CARRIER TRANSMITTER
CR - CARRIER RECEIVER
TRU - TRACK RESONANT UNIT
180DU - 180 DECODING UNIT.
NUMBER INDICATES CODE
PER MINUTE TO WHICH
UNIT IS TUNED.

AUTOMATIC TRAIN STOP INDUCTOR



GRAPHICAL SYMBOLS CIRCUIT APPURTENANCES

AAR
SIG. SEC.

M-1954 | OCT. 1954 | M-1950 | SEPT. 1950 | M-1943 | OCT. 1943 | M-1934 | MAR. 1934 | 68QD

(Sheet 2 of 2 sheets)

Plan No.

Title

MISCELLANEOUS PLANS

- 1141 Nuts for G.R.S. Type B Car Detector Bolts
1142 Bolts for G.R.S. Type B Car Detectors
1143 Plug Type Rail Bonds and Track Circuit Connectors
2001 Switch Lamp - 48 Oz. Oil Pount
2002 Lamp Parts - For Oil Lighted Switch and Signal Lamps
2003 Lamp Parts - For Oil Lighted Switch and Signal Lamps
2020 Lever Blocks and Markers
2021 Lever Blocks and Markers
2280 Numerals and Letters - For Marking Switches and Signals
2700 Tags For Marking Wires
2765 Tool Board and Equipment

SWITCH LAYOUTS

- 3000 Switch Layout - G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3001 Front Rods - For Single Switch - 127 - 112 - 105 Lb. Rail
3002 Throw Rods and Connecting Bolts - G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3003 Lock Rods - G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3004 Saddle Plate - For G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3005 Point - Detector Rods - For G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3006 Switch Circuit Controller - For G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3008 Special Switch Ties - For G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3019 Special Switch Ties - For G.R.S. Model 54 Switch Machine - 127 - 112 - 105 Lb. Rail
3900 Switch Layout Mechanical - 127 - 112 - 105 Lb. Rail
3901 Throw Rods
3902 Lock Rods
3903 Saddle Plate

Plan No.

- 3905 Switch Circuit Controller Rods - For Hand Thrown and For Mechanical Interlocked Switches and Derails - 127 - 112 - 105 Lb. Rail
3906 Connecting Rods
3907 Cranks
3909 Tie Straps

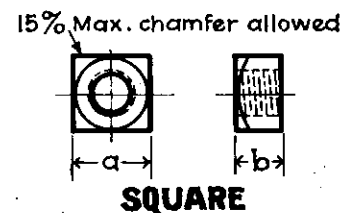
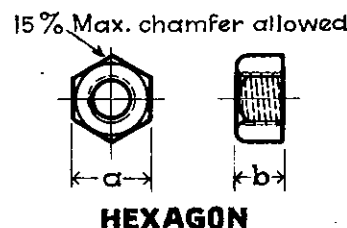
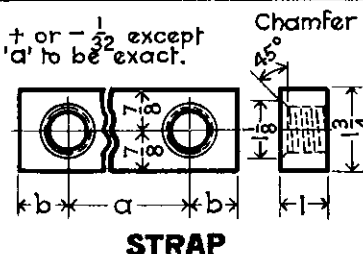
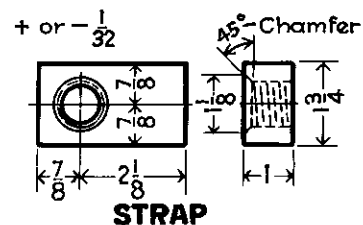
SIGNAL LAYOUTS AND DETAILS

- 4733 Concrete Posts
4820A Permanent "STOP" Sign
4830A Temporary "STOP" Sign
4890 Track Fan Lights - Location
4930A Inductor Layout - Automatic Train Stop
4935A Inductor Fastenings - Assemblies - Automatic Train Stop
4936A Inductor Fastenings - Details - Automatic Train Stop
4937A Inductor Cable Entrance Covers and Cable Clamp - Auto. Train Stop
4939A Inductor Ties - Automatic Train Stop
4940 Inductor - Receiver Gauge - Automatic Train Stop
4941 Inductor - Receiver - Relative Location - Auto. Train Stop
4942 Dummy Inductor - For Test Tracks - Automatic Train Stop
4943 Signs - For Marking Automatic Train Stop Territory

ELECTRICAL MATERIAL

- 4944 Lamp - For Indicators and Track Chart
4945 Lamp - For Indicator Crossing Signals
4946 Lamp - For Indicator Crossing Signals
4947 Lamp - For Indicator Crossing Signals
4948 Lamp - For Indicator Crossing Signals
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4998 Lamp - For Indicator Crossing Signals
4999 Lamp - For Indicator Crossing Signals

Plan rev'd 11-11-40
and renumbered
1141 Issue:1 (11-11-40)
was old 801, Issue 2
of 8-21 1936



ORDER NUMBER

REF.
ON
GRS
PLAN
52600

DIMENSIONS

DIAM.
OF
BOLT

THD.
PER
INCH

a

b

FOR ASSEMBLING

1141-1

73

1

8

Rail clip bolts-wood tie

1141-10

72

1

8

2 9/16

3 1/32

Chair and rail clip bolts-steel tie - Outside of far rail from mechanism

1141-11

70

1

8

3 1/16

3 1/32

Chair and rail clip bolts-steel tie - Outside of near rail and gauge side of far rail from mechanism

1141-12

71

1

8

3 3/16

2 9/32

Chair and rail clip bolts-steel tie - Gauge side of near rail to mechanism

1141-13

59

1

8

4 1/4

7/8

Steel tie through bolts

1141-20

49

2

8

3 1/8

2

Stud pins in bearing for lever in crank and angle bars; and operating bar in lever

1141-21

50

2

8

3 1/8

1 1/8

1141-22

54

1

8

1 1/2

7/8

1141-23

63

3

4

1 1/4

3/4

1141-24

114

2

13

7/8

1 1/2

For 'U' bolt fastening leaf springs to shoe beams

1141-25

114

3

16

1 1/16

2 3/4

1141-26

Z

3

3 1/2

4 5/8

1 3/4

1141-27

X

2 1/2

4

3 7/8

1 1/2

1141-28

1 1/4

7

2

1 1/4

1141-40

69

1

8

1 1/2

7/8

1141-41

64

1 1/4

7

2

1 1/4

1141-42

3/4

10

1 1/4

3/4

SPECIFICATION

Nuts shall be of material capable of developing the full strength of the nickel steel bolts shown on Plan No. 1142 up to the yield point without stripping the threads of the bolt or nut.

One strip test shall be made from each lot.

If the results of the strip test do not conform to the requirements, two additional tests shall be made from such lot. Failure of these to meet the requirements rejects such lot.

All nuts cadmium plated: .0004"-.0005".

Threads: NC-2.

Square and hexagon nuts shall be hot forged, cold trimmed, normalized, chamfered and faced.

Not to scale
All dimensions given in inches



**SIGNAL AND TRAIN
CONTROL COMMITTEE**

N.Y.C.R.R.
M.G.R.R.
C.C.&ST.L.R.
B.&A.R.R.
P.&L.E.R.R.
RUTL.R.R.

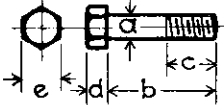
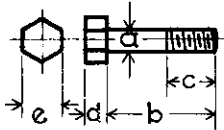
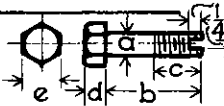
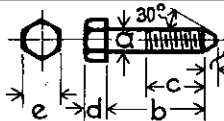
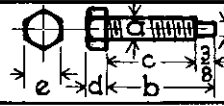
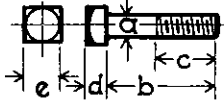
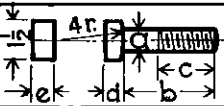
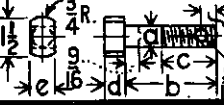
1141
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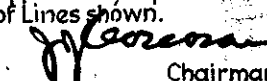
**NUTS
FOR G.R.S. TYPE-B
CAR RETARDER BOLTS**

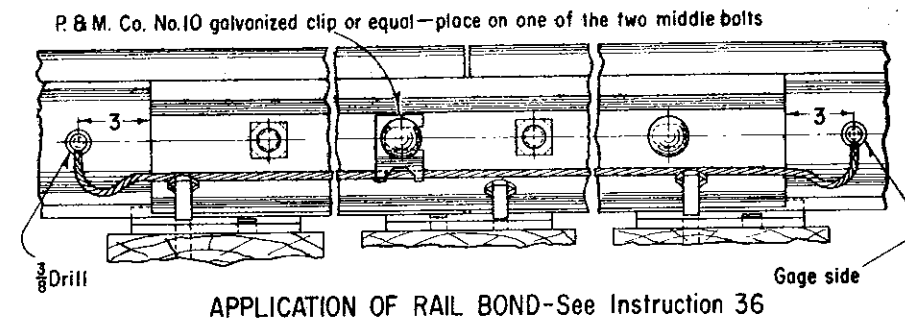
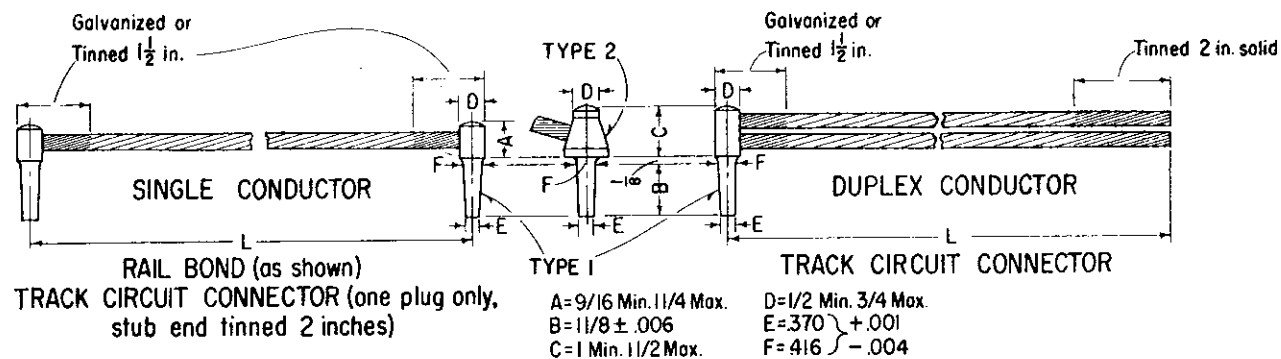
Approved by Representative
of Lines shown.

M. J. Rosen
Chairman

Plan revd. 11-13-40
and renumbered
1142 Issue: 1 (11-13-40)
was old 802 Issue:
1 of 9-8-1933.

	ORDER NUMBERS		DIAM. OF BOLT (a)	THDS. PER INCH	DIMENSIONS				FOR ASSEMBLING	SPECIFICATIONS
	NICKEL STEEL	O.H. STEEL			b	c	d	e		
	1142-1		1	8	3	1	2 1/32	1 1/2	Chair to steel tie	FOR O. H. STEEL BOLTS Cadmium plate: .0004"-.0005", Threads: NC-2. FOR NICKEL STEEL BOLTS Bolts shall be made from nickel steel heat treated material meeting the requirements of the A.S.T.M. standard specification A96-27 for alloy steel bolting material meeting the following requirements: Tensile strength, Lbs. per sq. in.-----125 000 Yield point, Lbs. per sq. in.-----105 000 Elongation in 2 ins., per cent-----16 Reduction of area, per cent-----50 Brinell hardness number-----260-320 Identification mark: on top of head, a circle, thus:  Cadmium plate: .0004"-.0005", Threads: NC-2.
	1142-2		"	"	3 1/2	1 1/2	"	"	Fixed lever bracket to tie bar	
		1142-203	"	"	4 1/4	2 1/2	"	"	Lower bearing bracket to angle bar	
		1142-204	"	"	5	1 1/2	"	"	Crank bar and spacer to steel tie *	
	1142-4		"	"	"	"	"	"	Floating lever bracket to cross bar	
		1142-206	"	"	2 3/4	1 1/4	"	"	Angle bar to steel tie *	
		1142-207	"	"	5	1 1/8	"	"	Crank bar and spacer to steel tie *	
		1142-208	"	"	4	2 3/8	"	"	Floating lever bracket to cross bar	
	1142-8		"	"	"	"	"	"	Upper half rocker type fixed lever bracket to tie bar	
		1142-210	1 1/2 MAX.	6	5 1/8	1 3/4	1	2 1/4	Link to operating bar	
		1142-211	5/8	11	3/4	5/8	27/64	15/16	Shims to angle bar	
	1142-12		3/4	10	2	1 1/2	1/2	1 1/8	Upper and lower halves of rocker type fixed lever brackets to tie bar	
	1142-20		1	8	2 1/4	1 1/8	5/8	1 1/2	Fixed lever bracket to tie bar	FOR CHROME NICKEL STEEL BOLTS Bolts shall be heat treated to provide the following requirements: Tensile strength, Lbs. per sq. in.-----220 000 Yield point, Lbs. per sq. in.-----200 000 Elongation in 2 ins., per cent-----12 Reduction of area, per cent-----38 Brinell hardness number-----350-420 Identification mark: on top of head, 2 circles, thus:  Cadmium plate: .0004"-.0005", Threads: NC-2.
	1142-21		"	"	3 3/4	1 3/8	"	"	Rail clip to steel tie. - Chair to steel tie	
		1142-222	1 MAX.	"	6 1/4	1 1/2	2 1/32	"	Upper bearing bracket and spacer to steel tie *	
		1142-223	"	"	3 1/2	"	"	"	Upper bearing bracket to crank bar	
		1142-224	"	"	3	"	"	"	Lower mechanism case casting to mechanism case channel	
		1142-225	1 ± .0002	"	2 3/4	"	"	"	Mechanism to angle bar	
	1142-26		1	"	5	"	1/2	"	Floating lever brackets to cross bars	
	1142-30		3/4	10	2	1 1/4	1/2	1 1/8	Shoe to shoe beam - Selkirk only.	NOTES: * Where through bolts are not used. ** Chrome nickel steel. Not to scale All dimensions given in inches
		1142-240	1	8	13 1/8	1 3/4	2 1/32	1 1/2	Top crank bar, spacer, angle bar, steel tie	
		1142-241	"	"	17 1/2	"	"	"	Upper bear. bkt, top crank bar, spacer, ang. bar, steel tie, 4" wood tie	
		1142-242	1 MAX.	"	14 3/8	"	"	"	Upper bear. bkt, top crank bar, spacer, angle bar, steel tie	
	**1142-51		3/4	10	3 1/4	2 7/8	1/2	1 1/8	Fixed lever pin to fixed lever bracket	
		1142-261	1	8	10 1/2	2 1/2	2 1/32	1 1/2	Mechanism to wood ties	
		1142-262	"	"	5 1/2	2 1/4	"	"	Lower bearing bracket to angle bar	
		1142-263	1 1/4	7	18	3	2 1/32	1 7/8	Top crank bar, angle bar to wood tie	
	1142-70		3/4	10	2 1/2	1 1/2	1/2	3/4	Shoe to shoe beam	
	1142-75		3/4	10	6 1/2	2 1/2	1/2	3/4	T-Head shoe bolt (Square shank)	

 SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R. M.C.R.R. C.G.C. & ST.L.R.Y. B. & A.R.R. P. & L.E.R.R. RUTL.R.R.	1142 11-23-1941
	BOLTS FOR G.R.S. TYPE - B CAR RETARDERS	
Approved by Representatives of Lines shown.  Chairman		



C-1 Min. 1/2 Max. P-410 1-1004

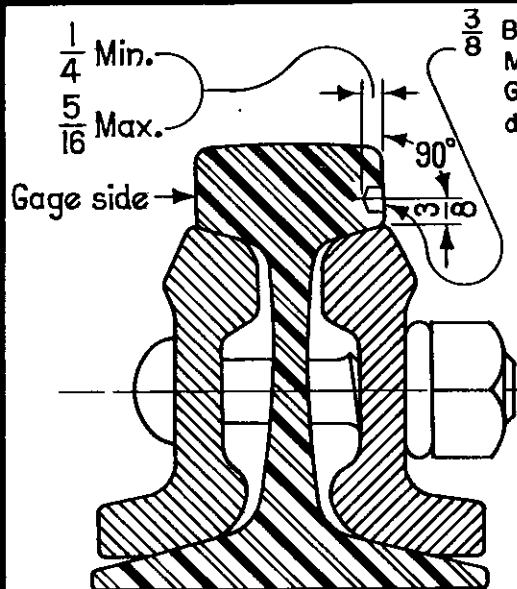
PLUG TYPE RAIL BONDS AND CONNECTORS									
ORDER NO.	CONDUCTOR					PLUG TYPE	LENGTH		USE
	AAR TYPE	WIRES IN EACH STRAND	DIAMETER		LENGTH OF STRAND LAY		BOND	CONNECTOR	
			WIRE	STRAND					
1156-3	BI631	3 copper, 16 galvanized steel	.0661	.330	2.54	2	36		26 in. joint bar & fouling circuit connection
1156-5	"	" " " " " "	"	"	"	"	48		36 in. & 38 in. joint bar & fouling circuit connection
1156-6	"	" " " " " "	"	"	"	1	72		Oil unloading siding
1156-7	"	" " " " " "	"	"	"	"	102		Fouling circuit connection
1156-8	"	" " " " " "	"	"	"	"	144		" " "
1156-9	"	" " " " " "	"	"	"	"	180		Frogs, etc.
1156-47	BI632	7-40% copper covered steel	.081	.243	2.75	"		60	Rail connection (Duplex Conductor)
1156-52	DI631	" " " " " "	"	"	"	"		36	Oil unloading siding
1156-53	"	" " " " " "	"	"	"	"		60	" " "
1156-61	"	" " " " " "	"	"	"	"		lg'th as reqd.	" " "

- NOTES:
1. All bonds to be butt welded and annealed.
 2. Plugs, bonds, and connectors shall be in accordance with A.A.R. Specification 151, Manual Part 112.
 3. See Instruction 36 for general bonding instructions.

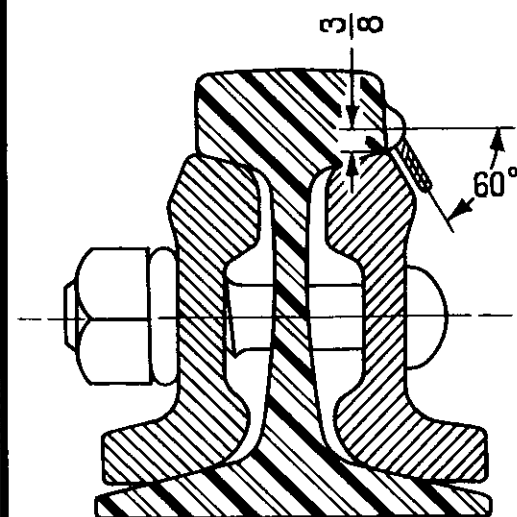
All dimensions given inches

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
PLUG TYPE RAIL BONDS
AND TRACK CIRCUIT CONNECTORS

Approved: *H. H. H.*



SECTION A-A



SECTION B-B

Bonding drill - AAR
Manual Part 259.
Gage shall be used to check
diameter and depth.

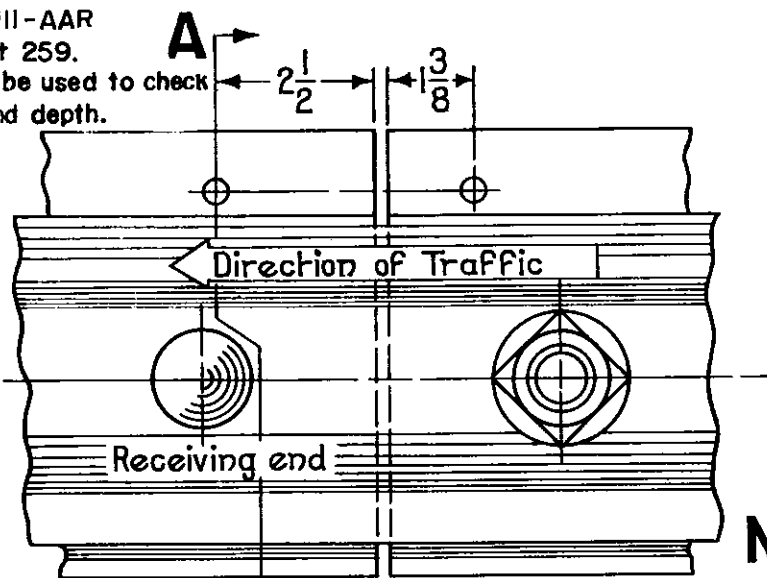


FIG. 1

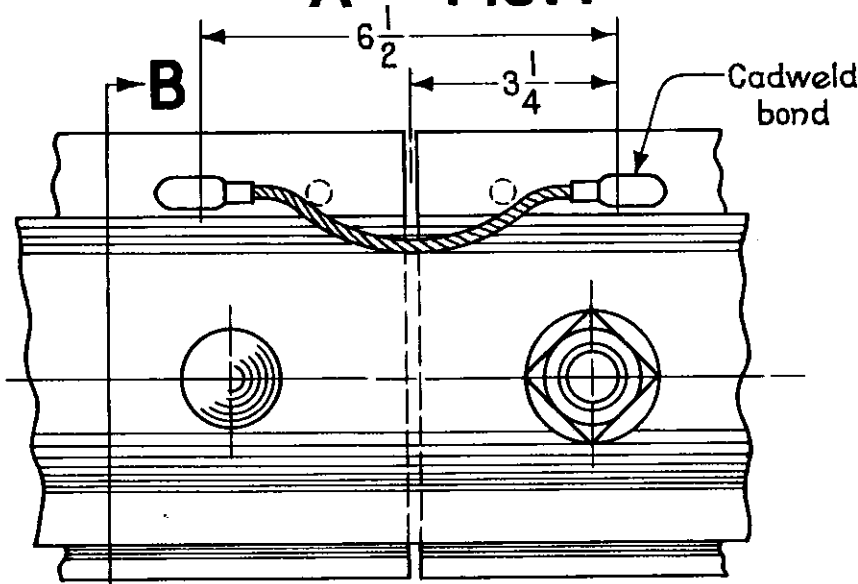


FIG. 3

NOTES:

1. Fig. 1 1st. Application
" 2 2nd. "
" 3 3rd. "
2. See Instruction 36 for General Bonding Instructions.
3. Limitations shown apply to all weights of rail.
4. Drilling and dimensions based on Engineering Committee Plan EC G-25.

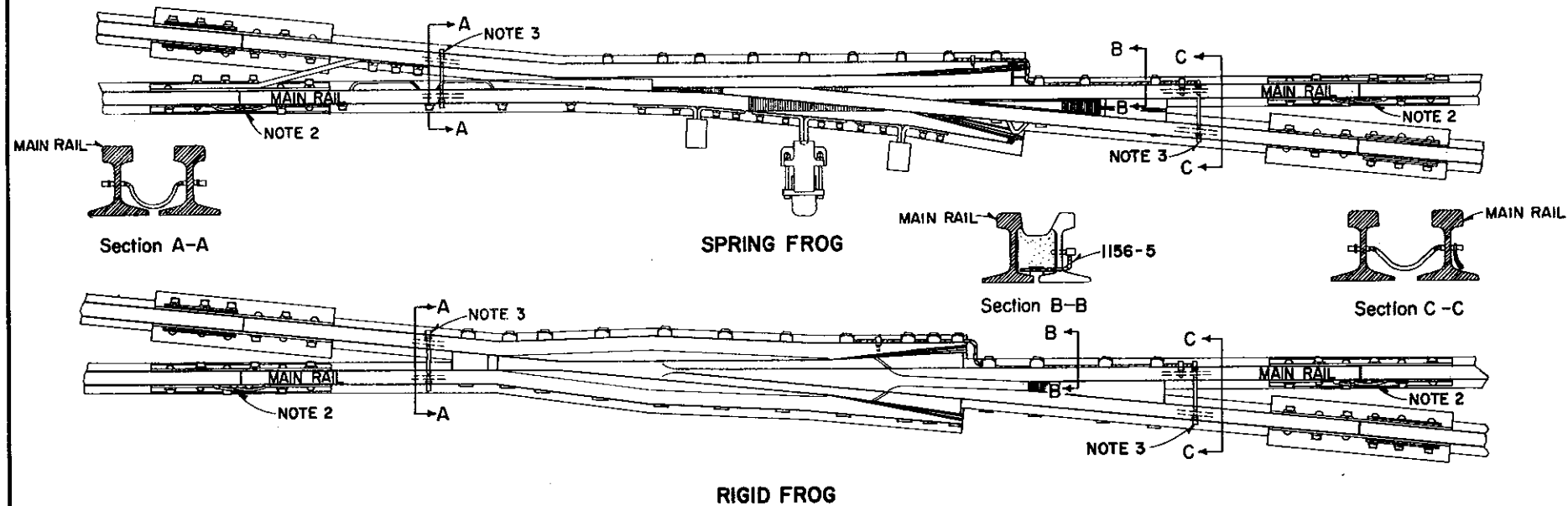
0 1 2 3 6 inches.

All dimensions given in inches

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
RAIL HEAD SIGNAL BONDS
DRILLING AND APPLICATION**

Approved *[Signature]*
Chief Signal Engineer

S-1157



NOTES:

1. All bonding in accordance with Instruction 36.
2. Each non-insulated joint in shunt fouling circuit shall be double bonded with rail head bonds, Plan 1157.
3. Raco Bond Strand No. 624-2 with Raco Stranpins No. 624-6.
4. Fig. 2 to be installed where track relay or track feed is located on end of fouling section, otherwise install Fig. 3.

NEW YORK CENTRAL SYSTEM
SIGNAL STANDARD
BONDING
FROGS, SWITCH POINTS AND
FOULING CIRCUITS

S-1158

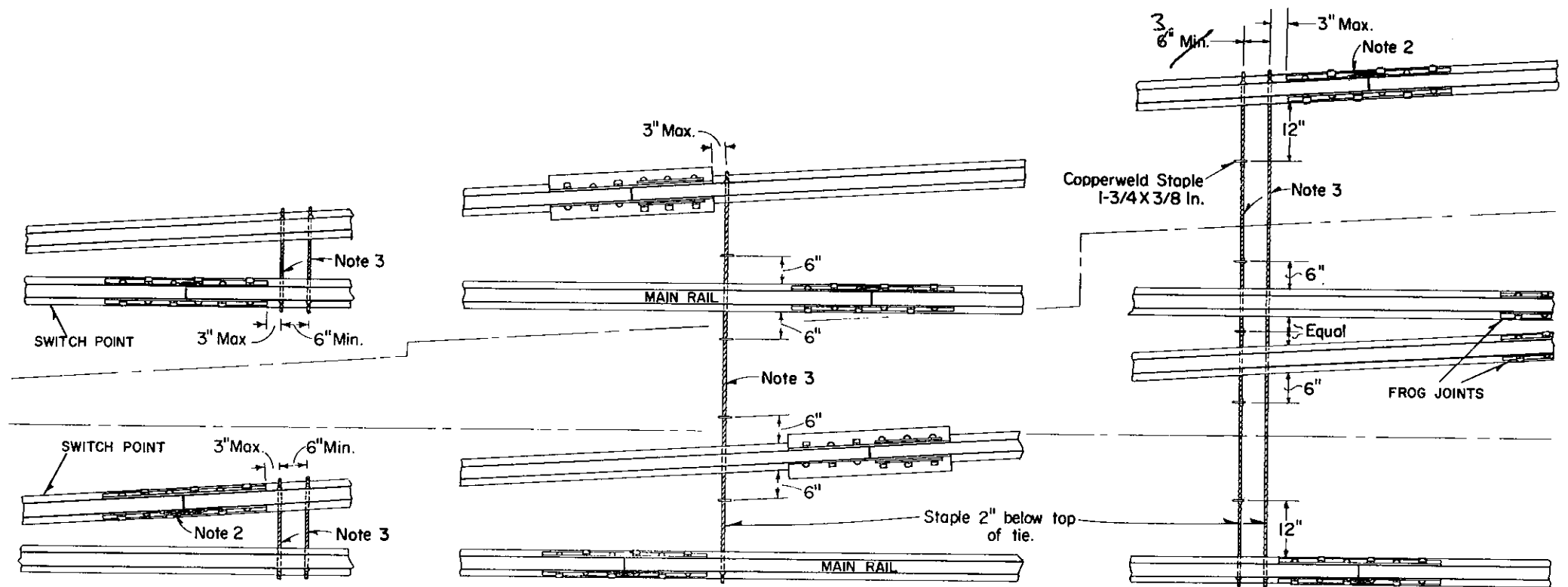


FIG. 1

FIG. 2
(NOTE 4)

FIG. 3
(NOTE 4)

NOTES. 1- All bonding in accordance with Instruction 36.

2- Each non-insulated joint in fouling circuit shall be double bonded with rail head bonds, Plan 1157.

3- Bonds, other than rail joint bonds (Note 2) shall be Raco Bondstrand No. 624, 3/16 in. diameter. To install these bonds, the following material is required.

Cadweld - Sleeve, S-696-C (1-1/2 in.).

- Hammer Die, S-428.

- Welder, M2705 (T17G).

4- Fig. 2 to be installed where track relay or track feed is located on end of fouling section, otherwise install Fig. 3.

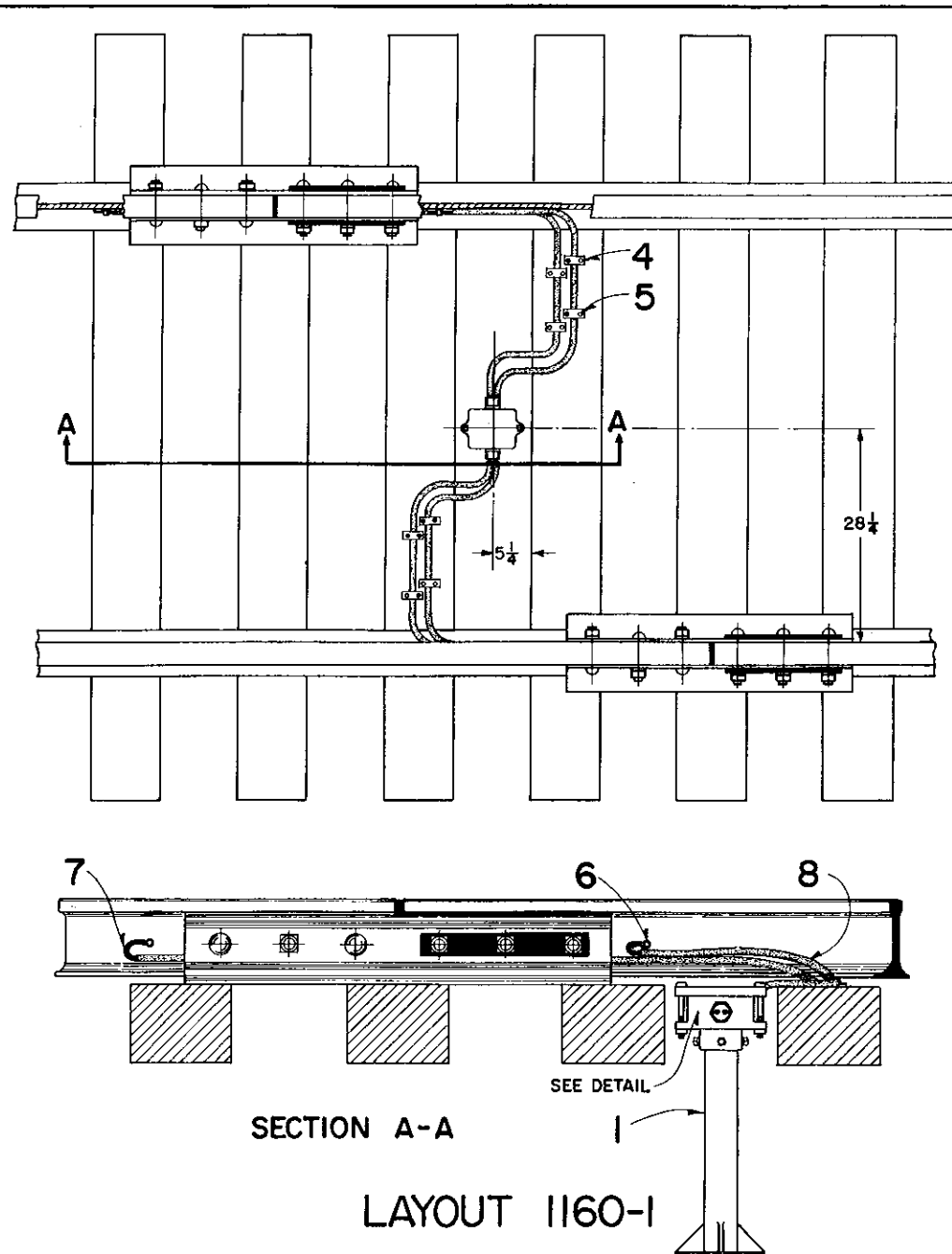
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
BONDING
FROGS, SWITCH POINTS AND
FOULING CIRCUITS

Approved: *L. J. Battistella*
Chief Signal Engineer

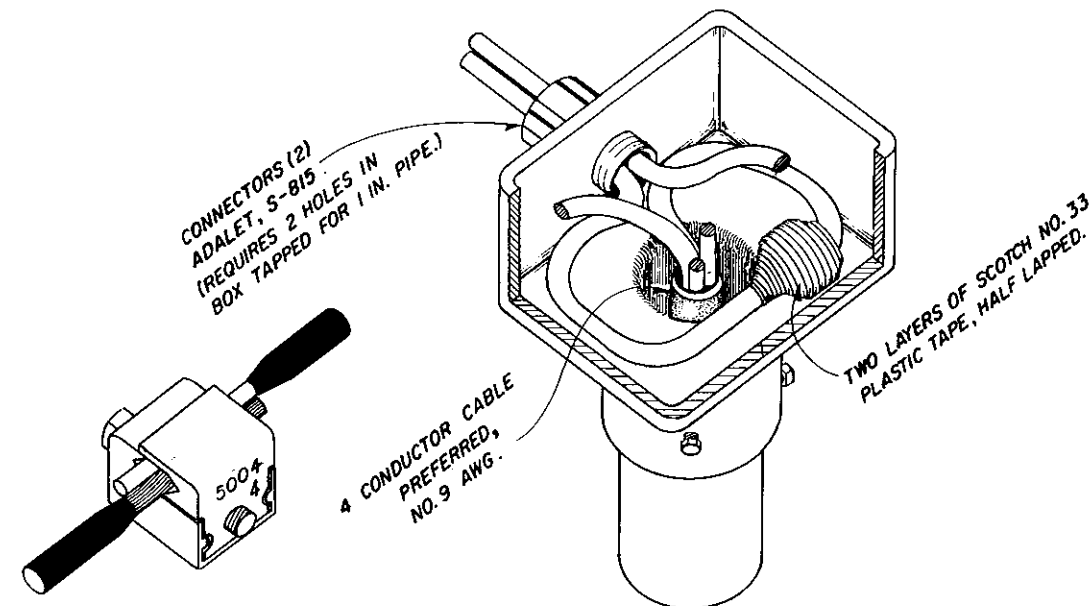
S-1158

Printed in U.S.A.

ISSUED 5-13-63
SHEET 2 Cont'd on Sh.....



NO.	ITEM	REF.	LAYOUT 1160-1 ITEMS	SPECIFY AS REQUIRED	REMARKS
1	Box, Junction-Complete With Connectors, (2)	Raco	463-85	1	
2					
3	Connector	Fargo	5004-4	4	
4	Guard, Fibre	Raco	378-12	8	
5	Nails, Roofing- Barbed Copperweld 1- 1/2 In.			16	
6	Strap-Pin	Raco	624-5	4	
7	Bond Strand, Insulated	Raco	624-2		30 Ft. (Est.) State length req.
8	Sleeving, Protective	Raco	625		30 Ft. (Est.) " " "



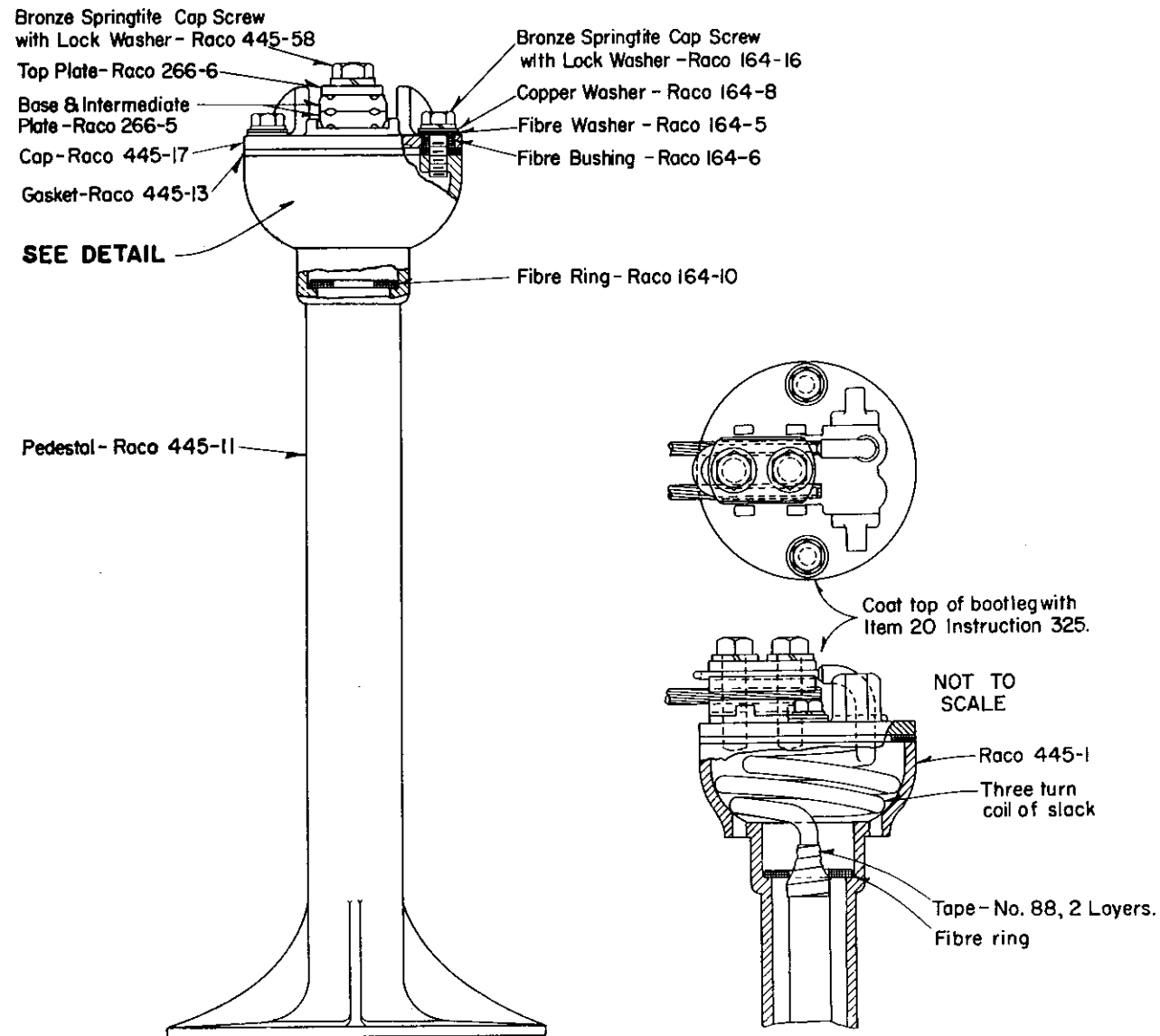
DETAIL- FIG. 1
WIRE SPLICE WITH FARGO
TYPE CONNECTOR

DETAIL-FIG. 2
TYPICAL CONNECTION
IN JUNCTION BOX

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT TRACK LEAD CONNECTIONS

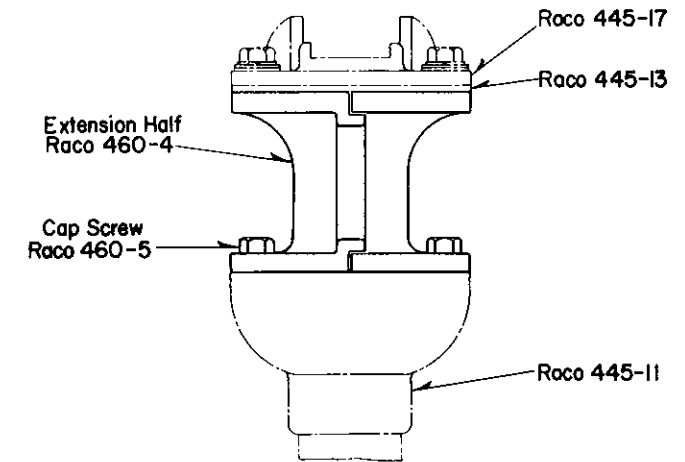
Approved *R. J. Battinelli*
Chief Signal Engineer

S-1160

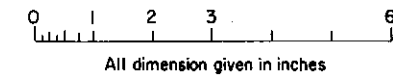


RACO 445-1, BOOTLEG COMPLETE

DETAIL



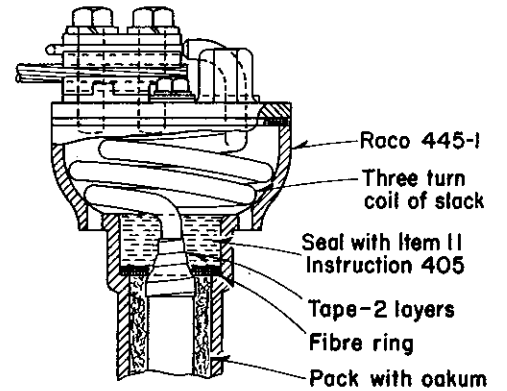
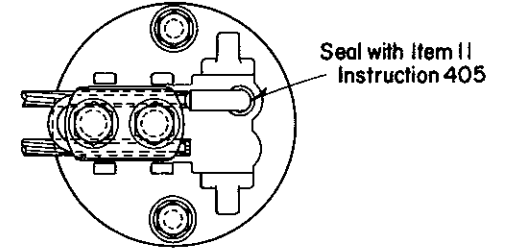
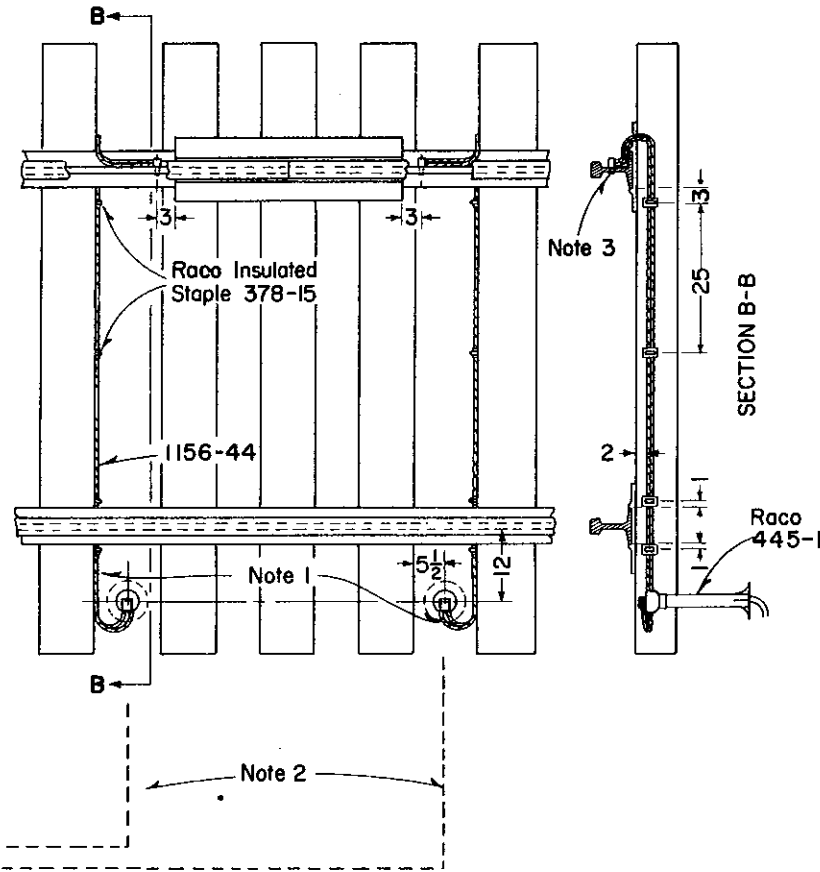
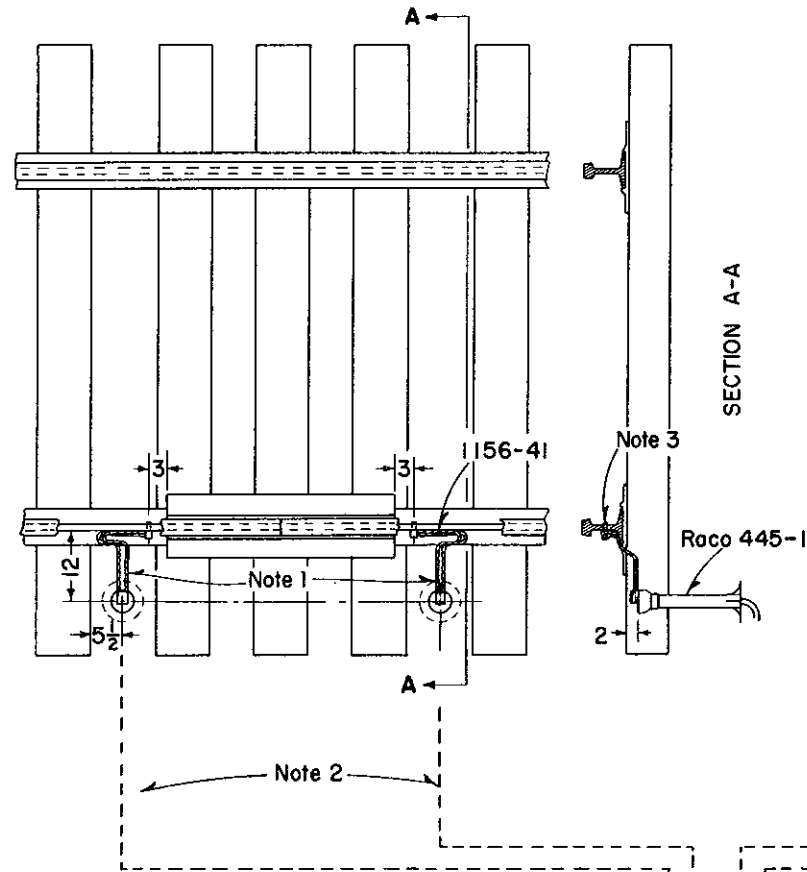
RACO 460-9 3IN. BOOTLEG EXTENSION COMPLETE



NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT BOOTLEG ASSEMBLY

Approved *R. S. Larrinell*
Chief Signal Engineer

S-1165



NOTES:

1. Keep conductors free of ballast
2. Single conductor No. 9 AWG Solid in accordance with Instruction 485 paragraph 1 unless otherwise specified.
3. All bonding in accordance with Instruction 36.

Relay Housing

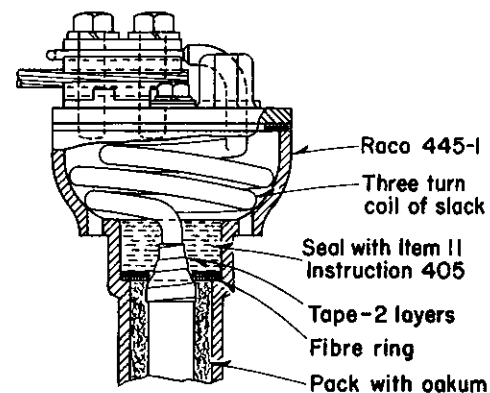
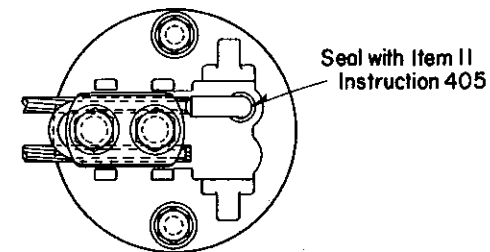
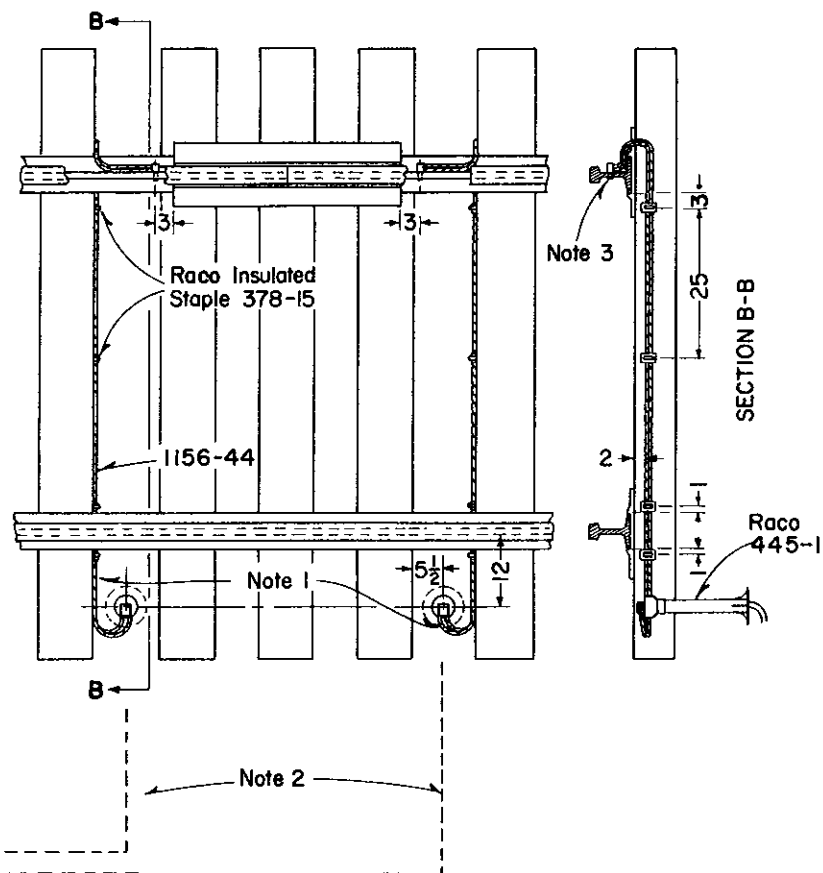
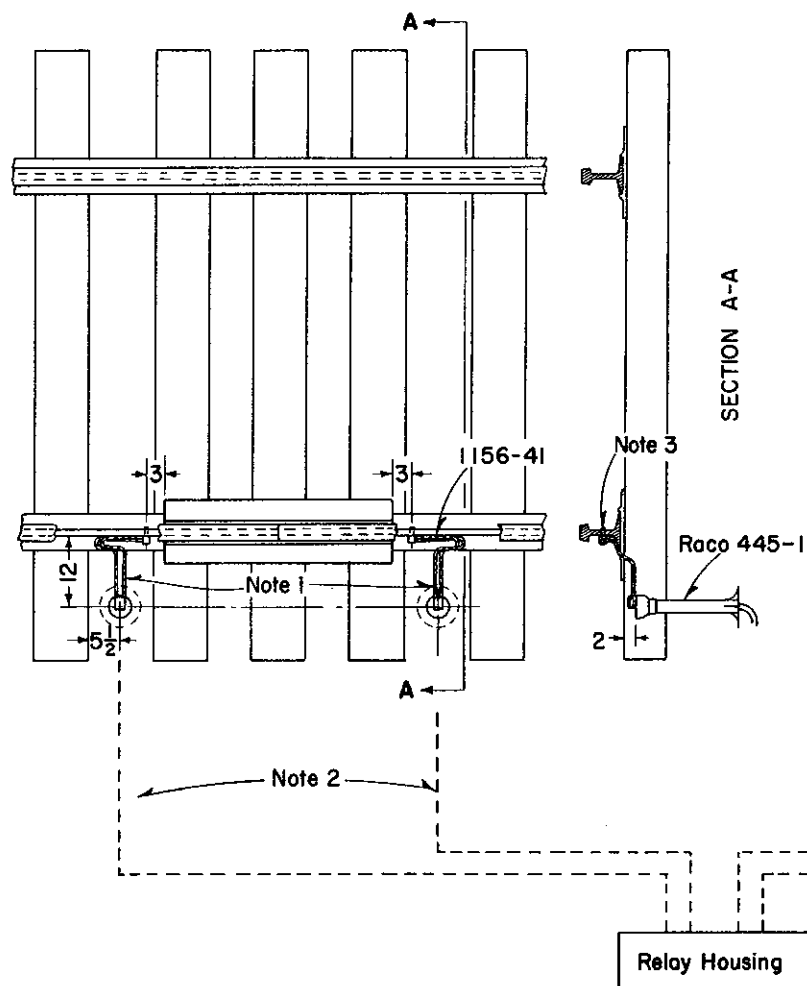
**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
BOOTLEG
APPLICATION**

Approved *H. Scott*
Chief Signal Engineer

S-1165

ISSUED 4-2-57

SHEET 2 Cont'd on Sh.



NOTES:

1. Keep conductors free of ballast
2. Single conductor No. 9 AWG Solid in accordance with Instruction 485 paragraph 1 unless otherwise specified.
3. All bonding in accordance with Instruction 36.

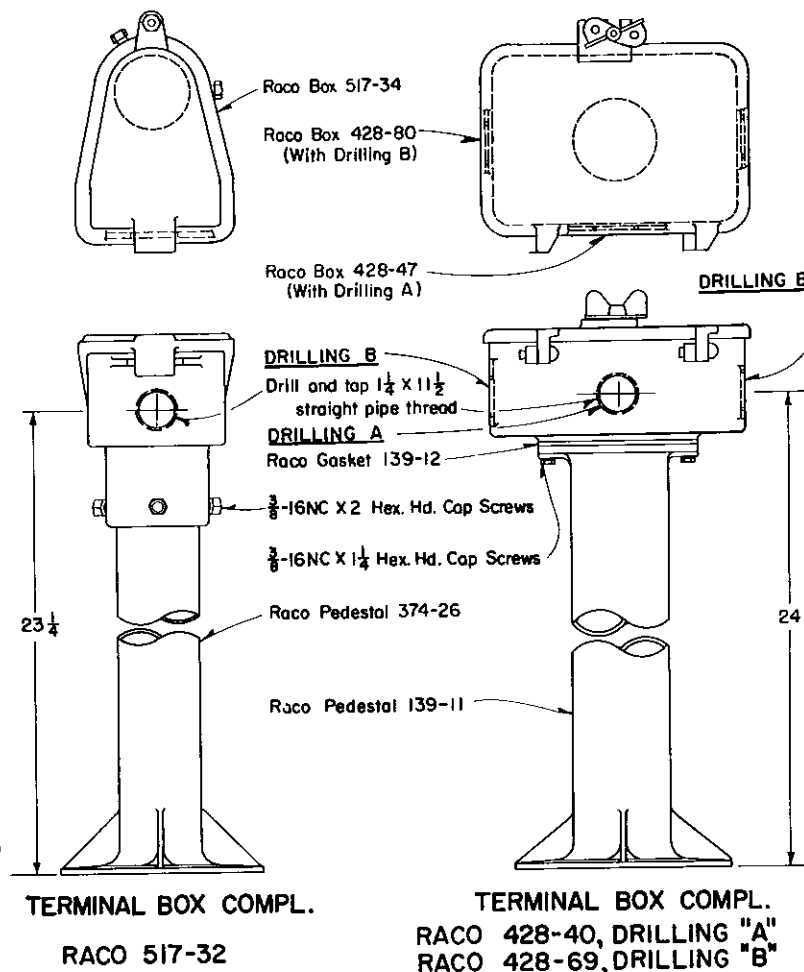
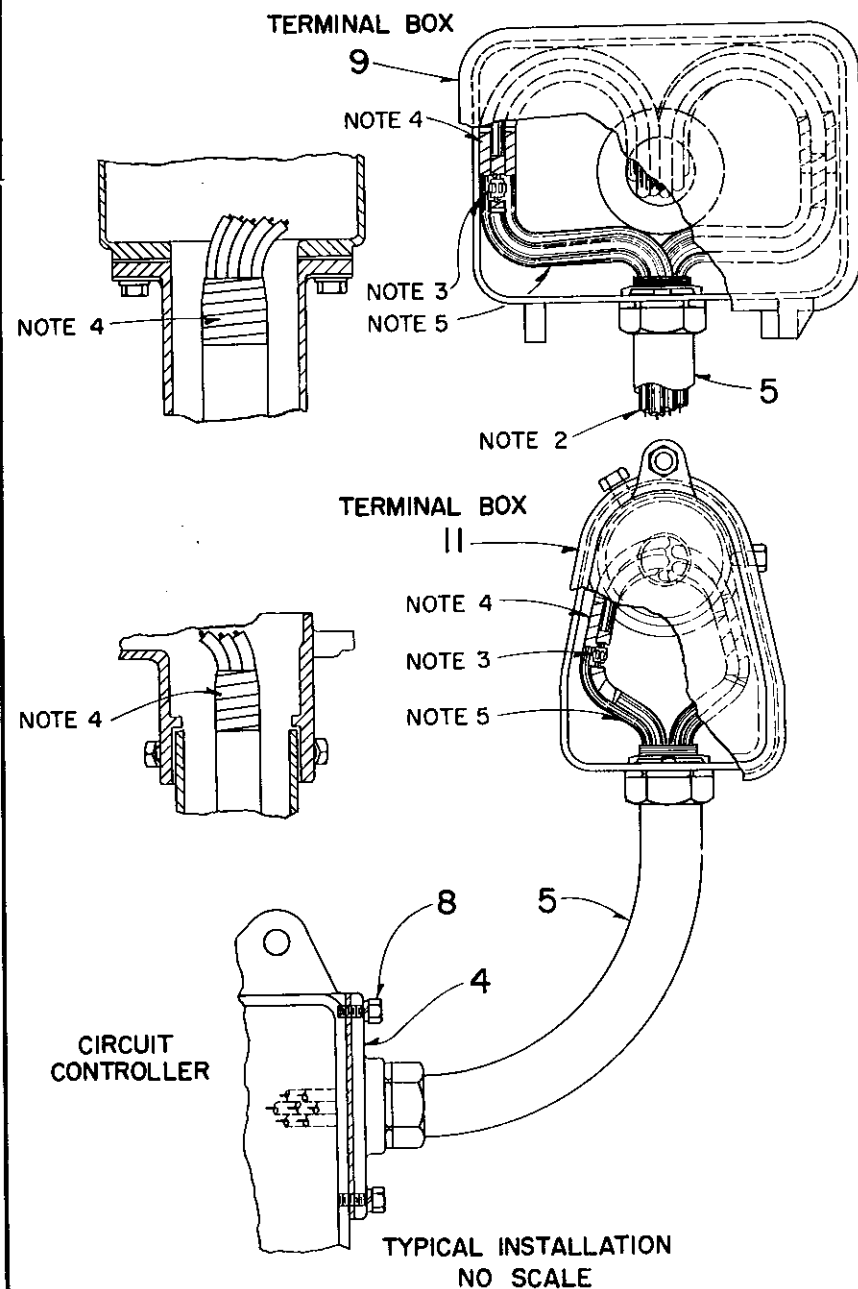
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
**BOOTLEG
APPLICATION**

Approved *H. Scott*
Chief Signal Engineer

S-1165

ISSUED 4-2-57

SHEET 2 Cont'd on Sh.



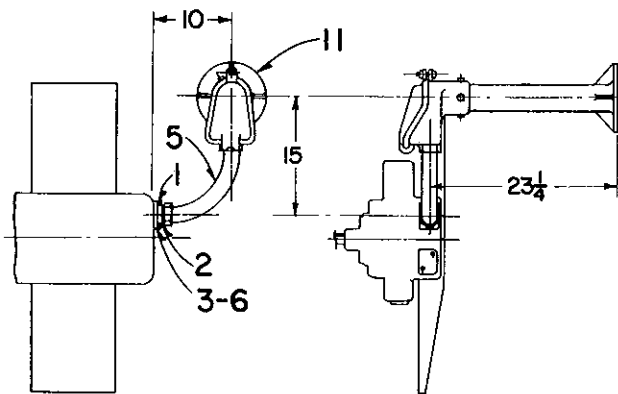
0 6 9 12 18
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT TERMINAL BOXES

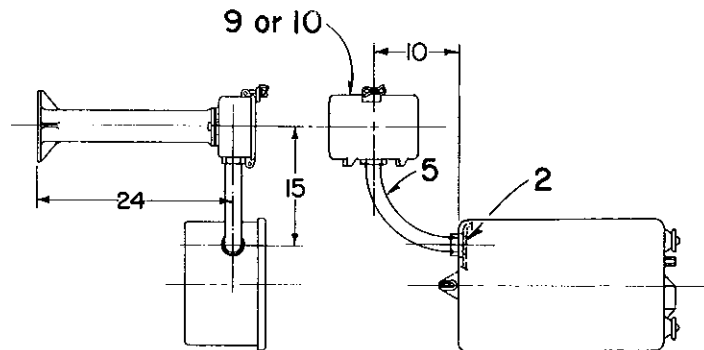
S-1170

ISSUED 3-21-63

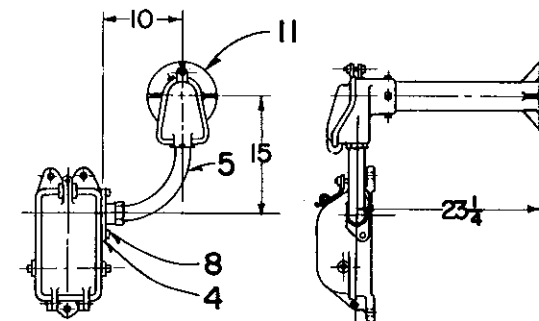
SHEET 1 Cont'd on Sh 2



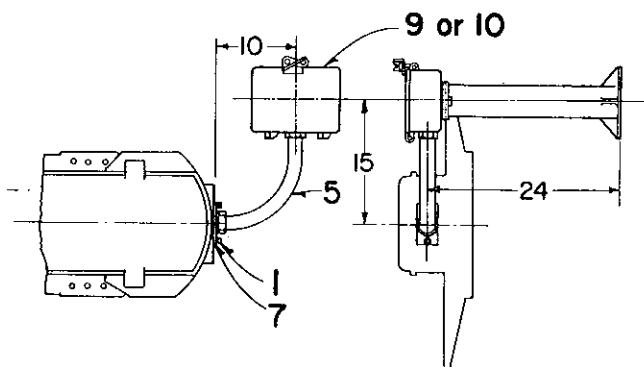
G.R.S. MODEL 9 SWITCH MACHINES



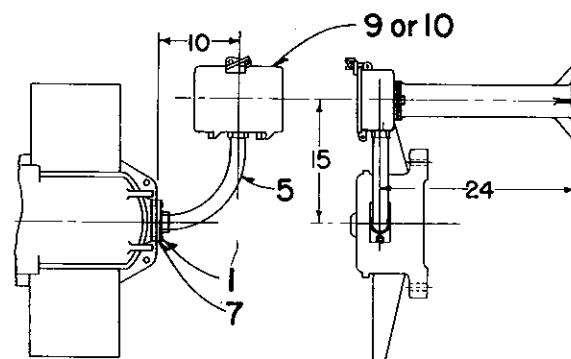
G.R.S. MODEL 13 SWITCH MACHINES



G.R.S. SWITCH CIRCUIT CONTROLLER



G.R.S. MODEL 6 SWITCH MACHINES



G.R.S. MODEL 5 SWITCH MACHINES

NOTES:

1.- Model 9 Switch Machine to provide 1-1/2 inch tapped hole. Items 3 & 6 are required only when removal of Roco Entrance Seal is necessary.

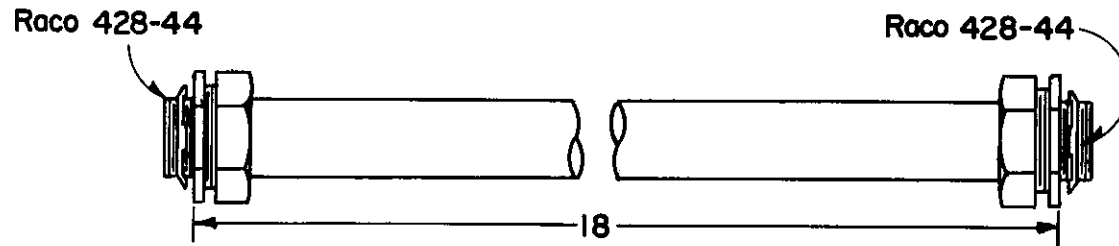
0 6 12 24 36
All dimensions given in inches

NO.	SPECIFY MATERIAL ITEMS 5, 9, 10 & 11 AS REQUIRED. OTHER ITEMS AS PROVIDED ON SWITCH LAYOUTS.	REFERENCE	MODEL 9 MACH.	MODEL 13 MACH.	SWITCH CIR. CONT.	MODEL 6 MACH.	MODEL 5 MACH.	REMARKS
1	Bolts, 5/16-18 X 1 in. Hex. Hd. & Nut & Spring Lock Washers		2			2	2	
2	Bushing, Reducing 1-1/2 X 1-1/4	GRS 41892-13						
3	Cap, Tapped 1-1/2 Pipe Thread	GRS 35491-25						See Note 1
4	Cap, Tapped 1-1/4 Pipe Thread	GRS 35491-24						
5	Conduit Assembly	1173-1						
6	Gasket	GRS 13014-287						See Note 1
7	Plate	GRS 52106-12						
8	Screw 3/8-16 X 1 Hex. Hd. & Lock Washer				2			
9	Terminal Box	RACO 428-40						
10	Terminal Box	RACO 428-42						
11	Terminal Box	RACO 517-32						
12								

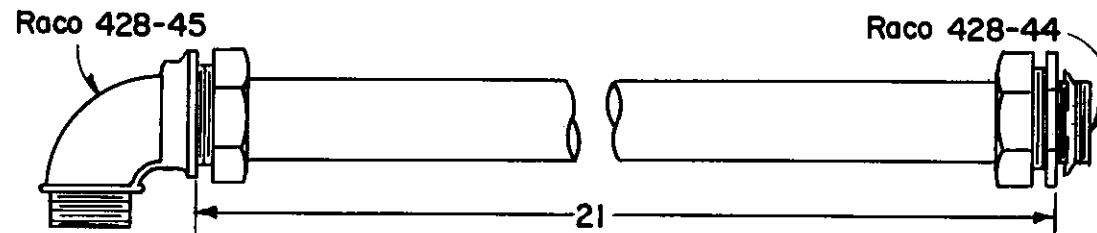
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TERMINAL BOXES

Approved: *R. J. D'Amico*
Chief Signal Engineer

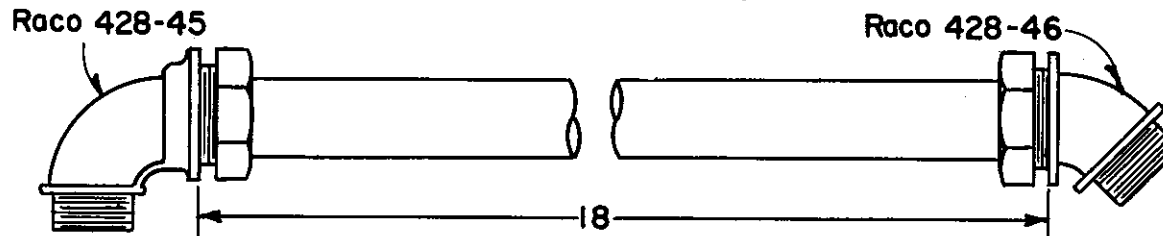
S-1170



1173-1, CONDUIT ASSEMBLY, COMPLETE
Raco 428-39 or equal.



1173-2, CONDUIT ASSEMBLY, COMPLETE
Raco 428-52 or equal.



1173-3, CONDUIT ASSEMBLY, COMPLETE
Raco 428-53 or equal.

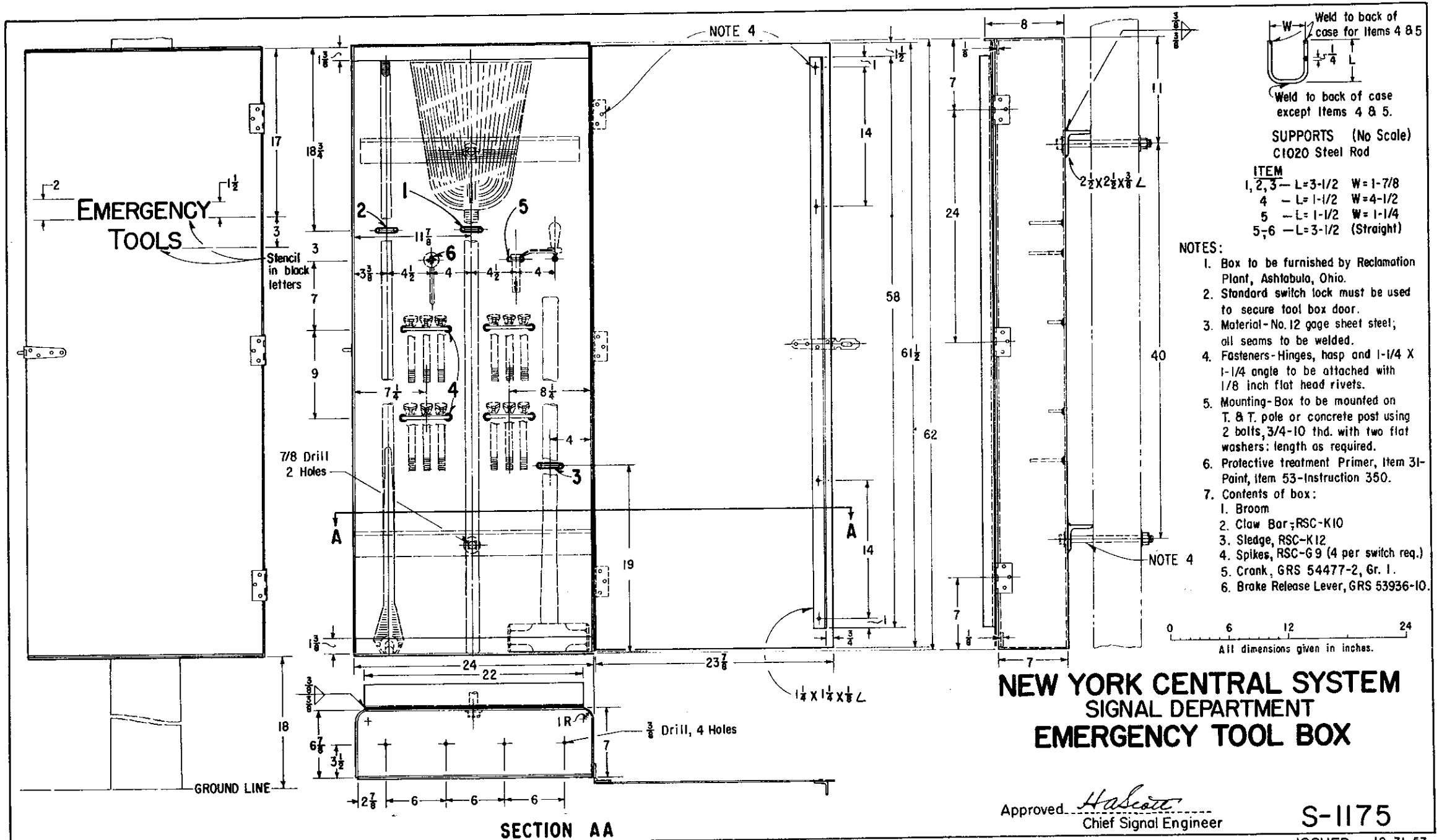
NOTES:

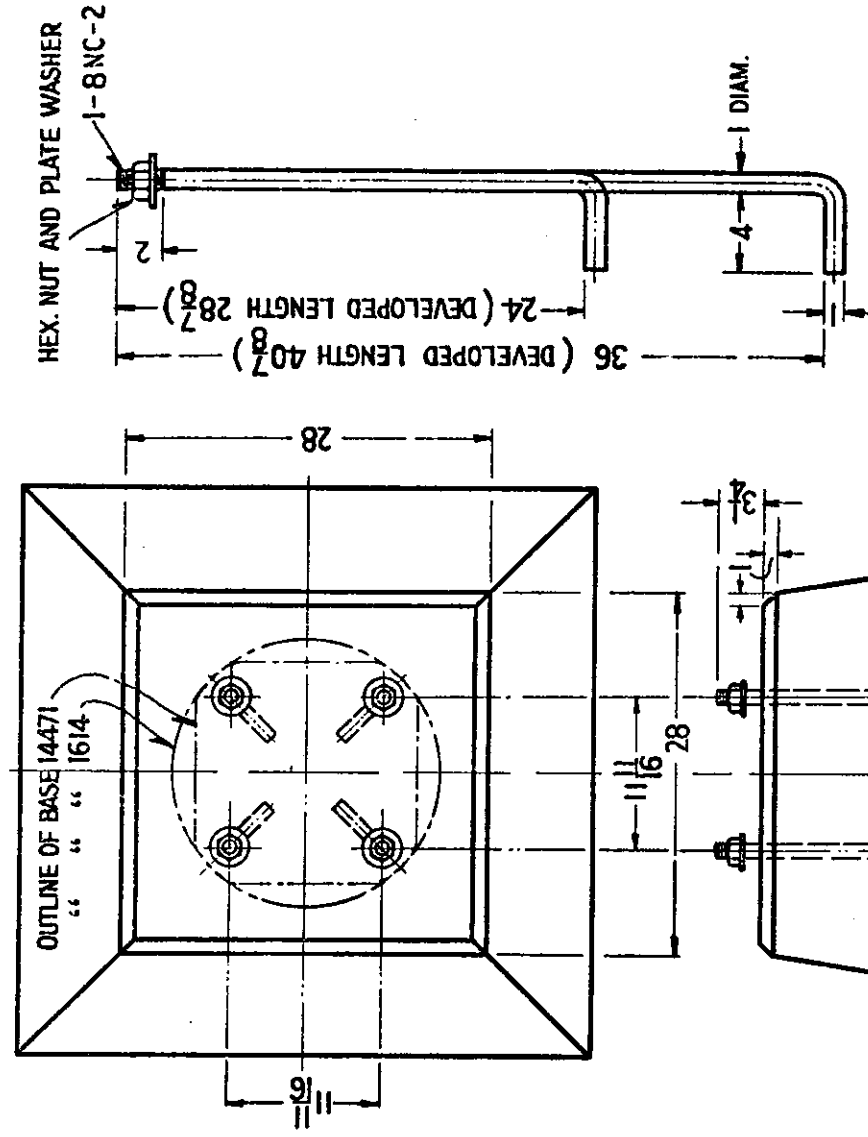
- 1 - Conduit to be liquid tight, 1-1/4 inch diameter.
- 2 - 1173-1 to be mounted as indicated on Plan 1170.
- 3 - 1173-2 to be mounted on automatic gates. Gate mechanism to be equipped with GRS Cover Plate 52106-12. Base to have AAR Cap 14723, drilled and tapped 1-1/4 X 11-1/2 straight pipe thread.
- 4 - 1173-3 to be mounted as indicated on Plan 3100.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT CONDUIT ASSEMBLIES

Approved *L. S. Bottinelli*
Chief Signal Engineer

S-1173





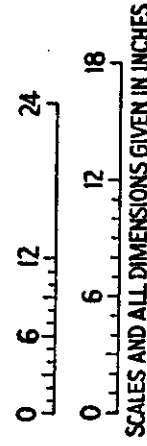
11079 36 IN. ANCHOR BOLT
FOR USE WITH BASE 16143.

110710 24 IN. ANCHOR BOLT
FOR USE WITH BASE 14471, 16141 OR 16142
MATERIAL: SAE-1020 STEEL
GALVANIZED OR CADMIUM PLATED
AFTER THREADS HAVE BEEN CUT.

NOTE:
CABLE ENTRANCE SHALL BE PROVIDED AS
REQUIRED.
BOTTOM OF FOUNDATION SHALL NOT BE LESS
THAN FOUR (4) FEET BELOW GROUND LINE

11078 ASSEMBLY WITH 11079
110711 " " 110710

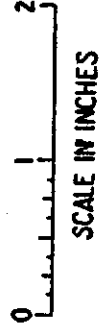
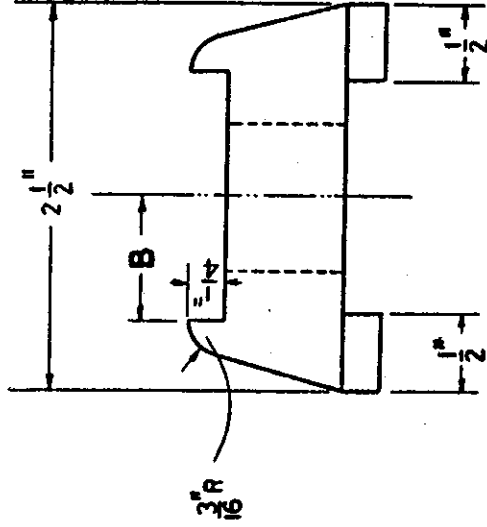
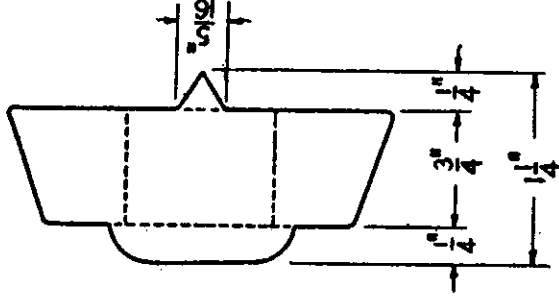
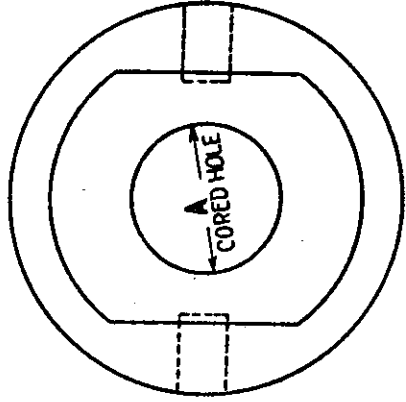
NOTE: FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE
IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING
ASSOCIATION SPECIFICATION.
COARSE AGGREGATE SHALL CONSIST OF $\frac{3}{4}$ INCH MAXIMUM SIZE
STONE OR GRAVEL.
NOT LESS THAN 6 SACKS OF CEMENT SHALL BE USED PER
CUBIC YARD OF CONCRETE.
WATER CEMENT RATIO TO PRODUCE A COMPRESSIVE STRENGTH
OF 2500 POUNDS PER SQUARE INCH AFTER 28 DAYS
SHALL BE USED.



FOUNDATION FOR GROUND MAST SIGNALS

AAR
SIG. SEC.
1107D

M-1943 [OCT. 1943] M-1939 [MAR. 1939] M-1935 [MAR. 1935] M-1924 [MAR. 1923] NOV. 1922 [MAY 1916] [M-3-1913] [OCT. 1909]



PART NO.	AMER. STD. REGULAR SQUARE HEAD BOLT	A	B
14581	3/4" DIAM.	7/8"	11/16"
14582	7/8" DIAM.	1"	3/4"

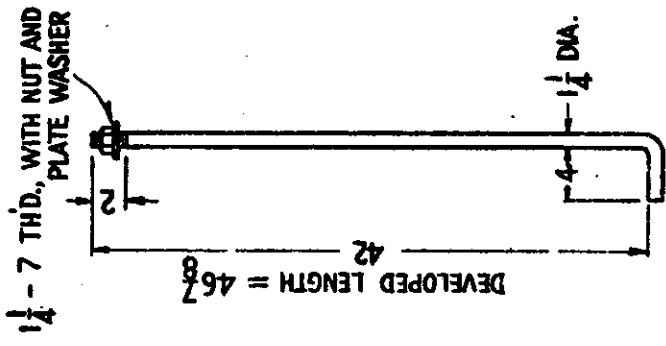
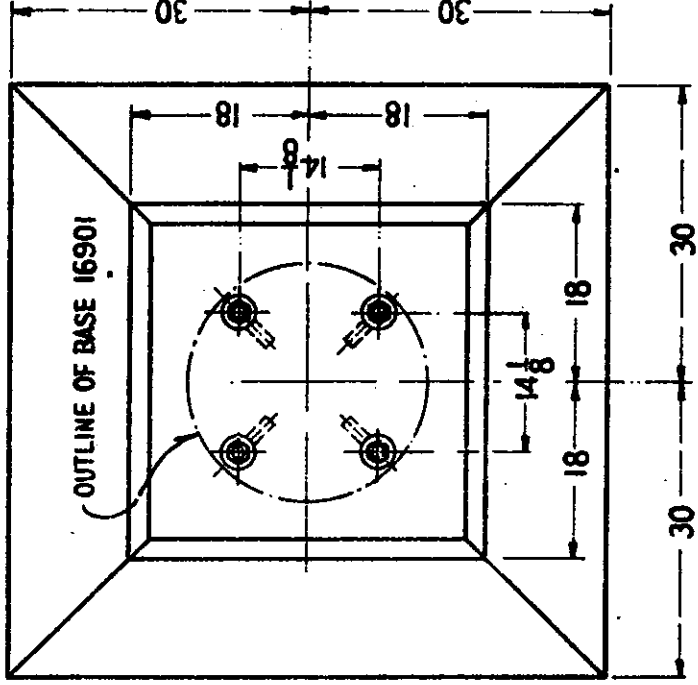
CAST-IRON WASHER

FOR THREE-FOURTHS INCH AND SEVEN-EIGHTHS INCH BOLTS

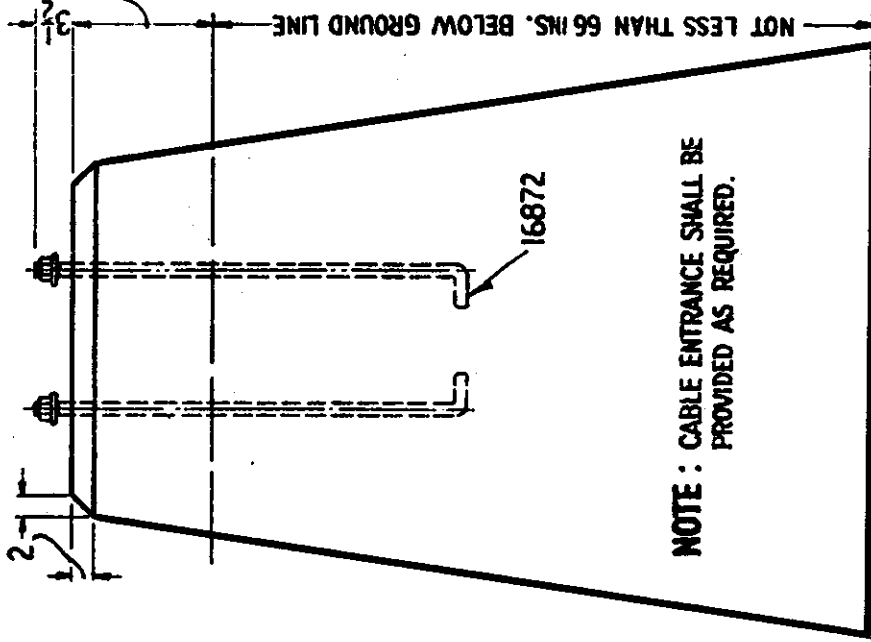
AAR
SIG. SEC.
1458C

M-1935 | MAR 1935 | M-1930 | SEP 1979 | M-1921 | MAR 1921

Material shall be in accordance with Specification for Gray Iron Castings.



16872 ANCHOR BOLT
SAE-1020 STEEL GALVANIZED
OR CADMIUM PLATED AFTER
THREADS HAVE BEEN CUT.

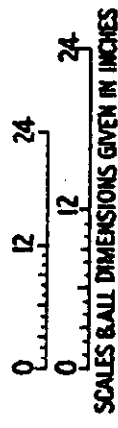


NOT MORE THAN 24 INS.
WHERE MORE THAN 12 INS.
VERTICAL REINFORCEMENT
SHALL BE USED.

CONCRETE :

FOUNDATION SHALL BE MADE OF PORTLAND
CEMENT CONCRETE IN ACCORDANCE WITH
AMERICAN RAILWAY ENGINEERING ASSOCIATION
SPECIFICATION.
COARSE AGGREGATE SHALL CONSIST OF 3/4 INCH
MAXIMUM SIZE STONE OR GRAVEL.
NOT LESS THAN 6 SACKS OF CEMENT SHALL
BE USED PER CUBIC YARD OF CONCRETE.
WATER CONTENT PER 94 LB. SACK OF CEMENT
SHALL NOT EXCEED 7 GALLONS.
COMPRESSIVE STRENGTH AFTER 28 DAYS SHALL
NOT BE LESS THAN 3000 LBS. PER SQUARE INCH.

16871 ASSEMBLY



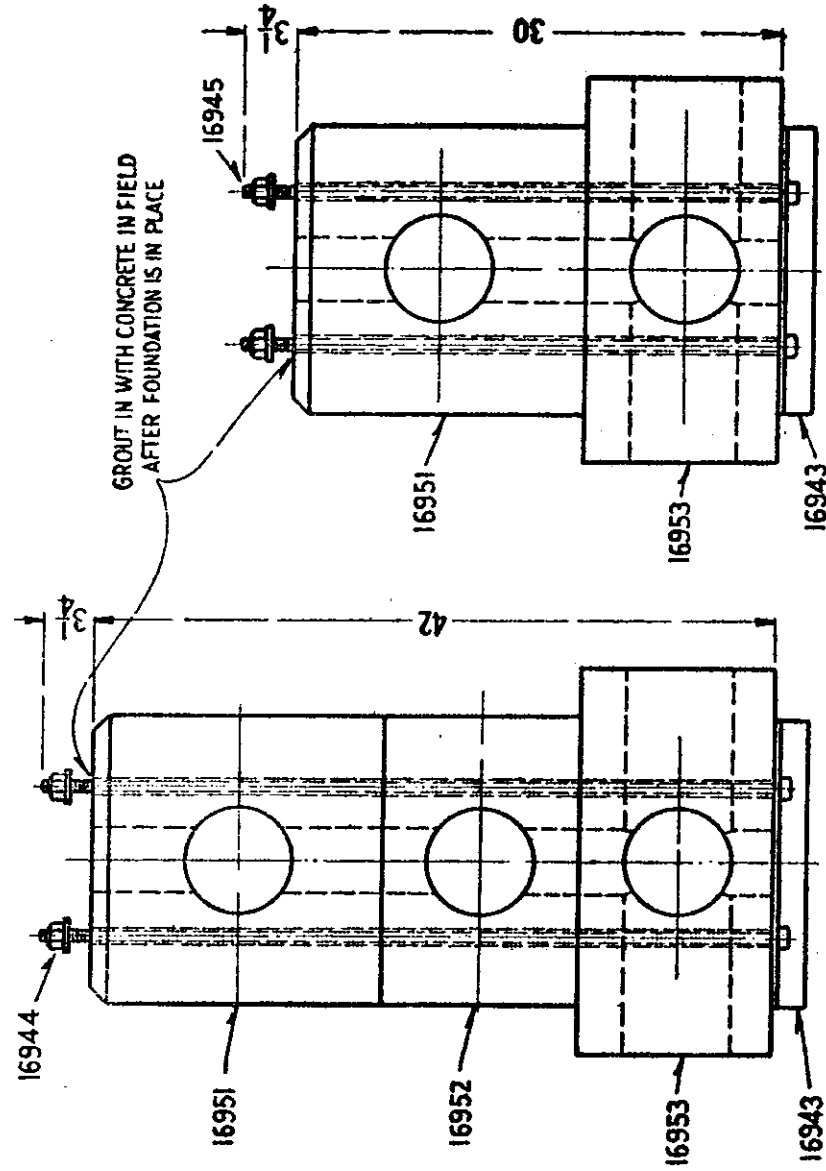
HIGHWAY CROSSING SIGNAL FOUNDATION

CANTILEVER MAST

AAR
SIG. SEC.

1687B

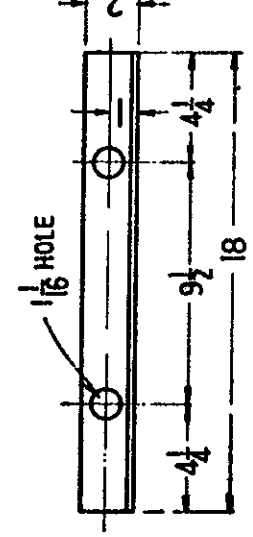
M-1945 OCT. 1945 M-1942 OCT. 1942



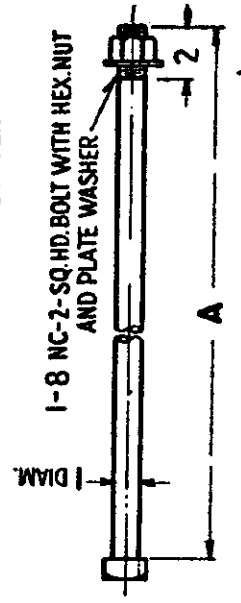
16941 3 UNIT FOUNDATION COMPL.

16942 2 UNIT FOUNDATION COMPL.

NOTE: BOLTS AND ANGLE IRON SHALL BE PAINTED WITH ASPHALT PAINT BEFORE ASSEMBLY.

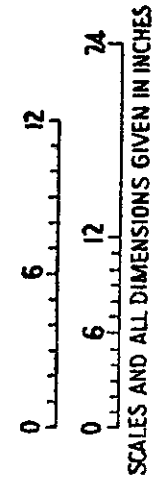


16943 ANCHOR IRON
 $1\frac{1}{2} \times 2 \times \frac{1}{4}$ ANGLE 2.77 LB. PER FT.



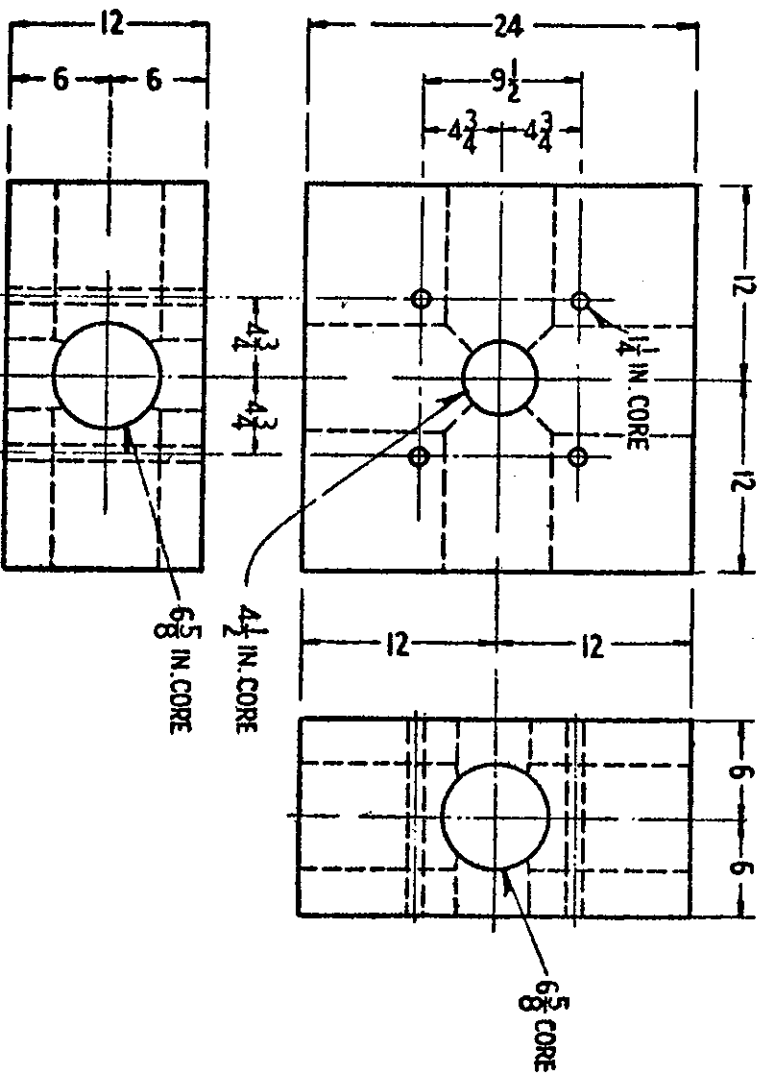
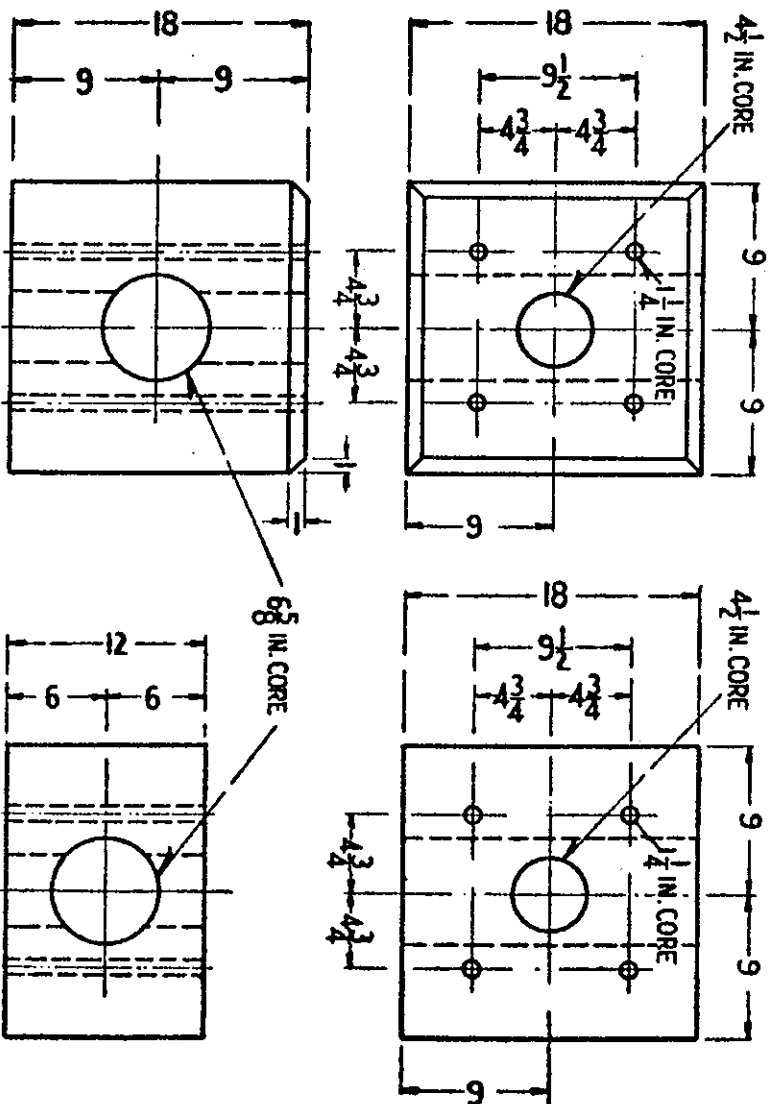
16944 ANCHOR BOLT - A = 45 1/2
16945 " " - A = 33 1/2
 O.H. STEEL GALVANIZED OR CADMIUM
 PLATED AFTER THREADS HAVE BEEN CUT

NOTE: FOUNDATIONS SHALL BE MADE OF PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING ASSOCIATION SPECIFICATION. COARSE AGGREGATE SHALL CONSIST OF 3/4 INCH MAXIMUM SIZE STONE OR GRAVEL. NOT LESS THAN 6 SACKS OF CEMENT SHALL BE USED PER CUBIC YARD OF CONCRETE. WATER CEMENT RATIO TO PRODUCE A COMPRESSIVE STRENGTH OF 2500 POUNDS PER SQUARE INCH AFTER 28 DAYS SHALL BE USED.



PRECAST FOUNDATION FOR 4 INCH MAST

DETAILS AND ASSEMBLIES



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

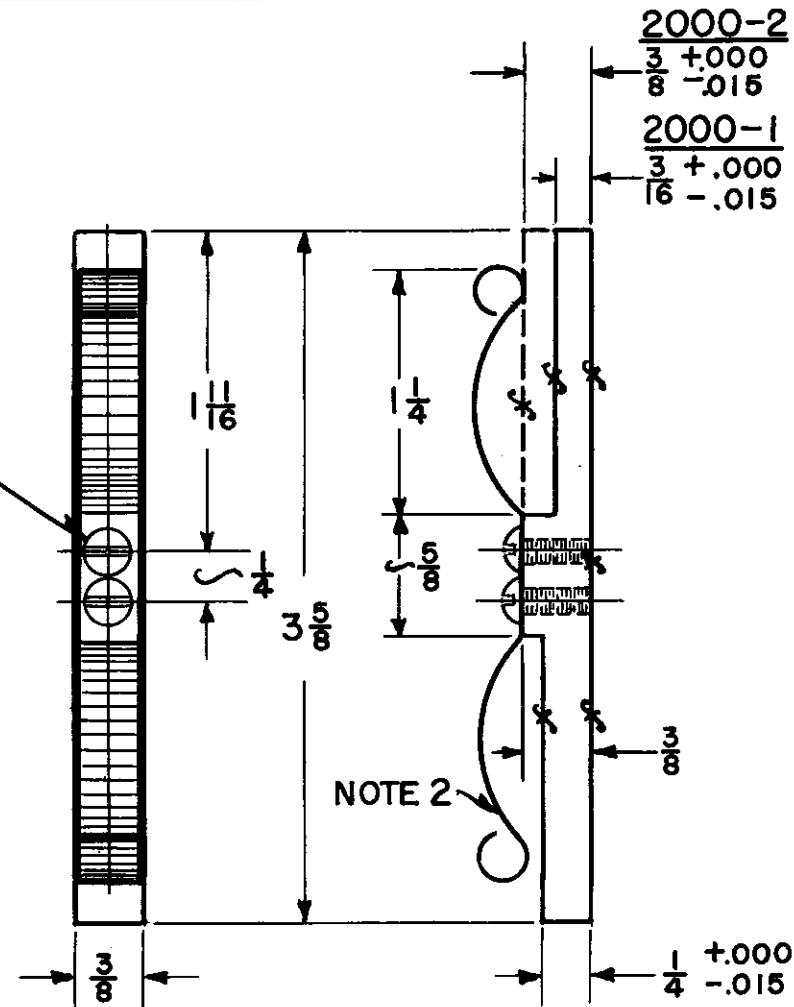
PRECAST FOUNDATION FOR 4 INCH MAST

DETAILS

M-1939 MAR 1939

AAR
SIG. SEC.
16954

Drill & tap for Rd. Hd.
machine screws 6-32X3/8.
2 Required.



NOTES:

1. Gage 2000-2 is to be used for testing classification yard switches only.
2. Heller Spring No. 0.
3. - C-1020 steel bar, Case hardened after milling and drilling and before assembly.

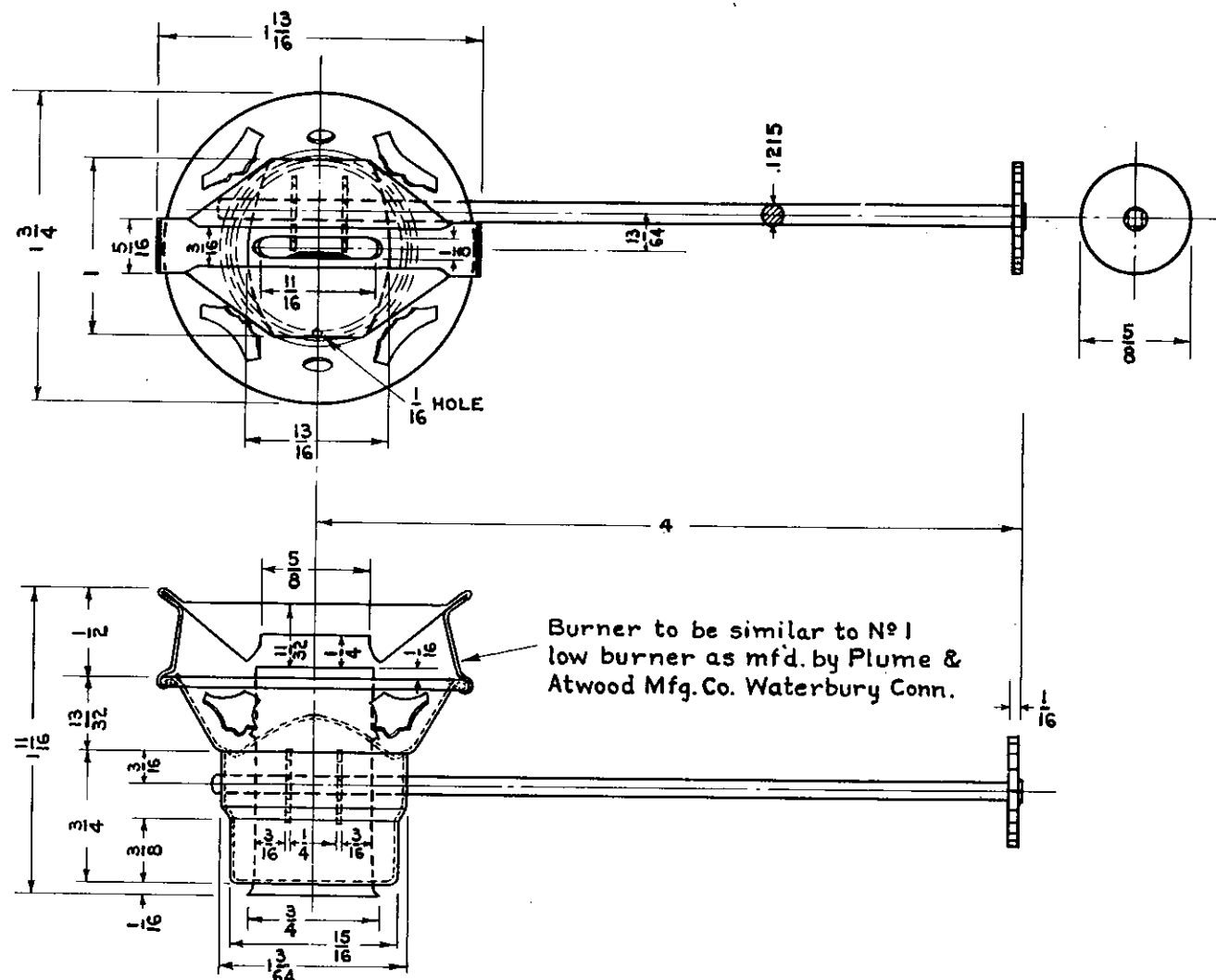
2000-1 SWITCH ADJUSTMENT GAGE
2000-2 SWITCH ADJUSTMENT GAGE

(SEE NOTE 1)

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
GAGE
SWITCH ADJUSTMENT

Approved *H. A. Scott*
Chief Signal Engineer

S-2000



Burner to be similar to No 1
low burner as mfd. by Plume &
Atwood Mfg. Co. Waterbury Conn.

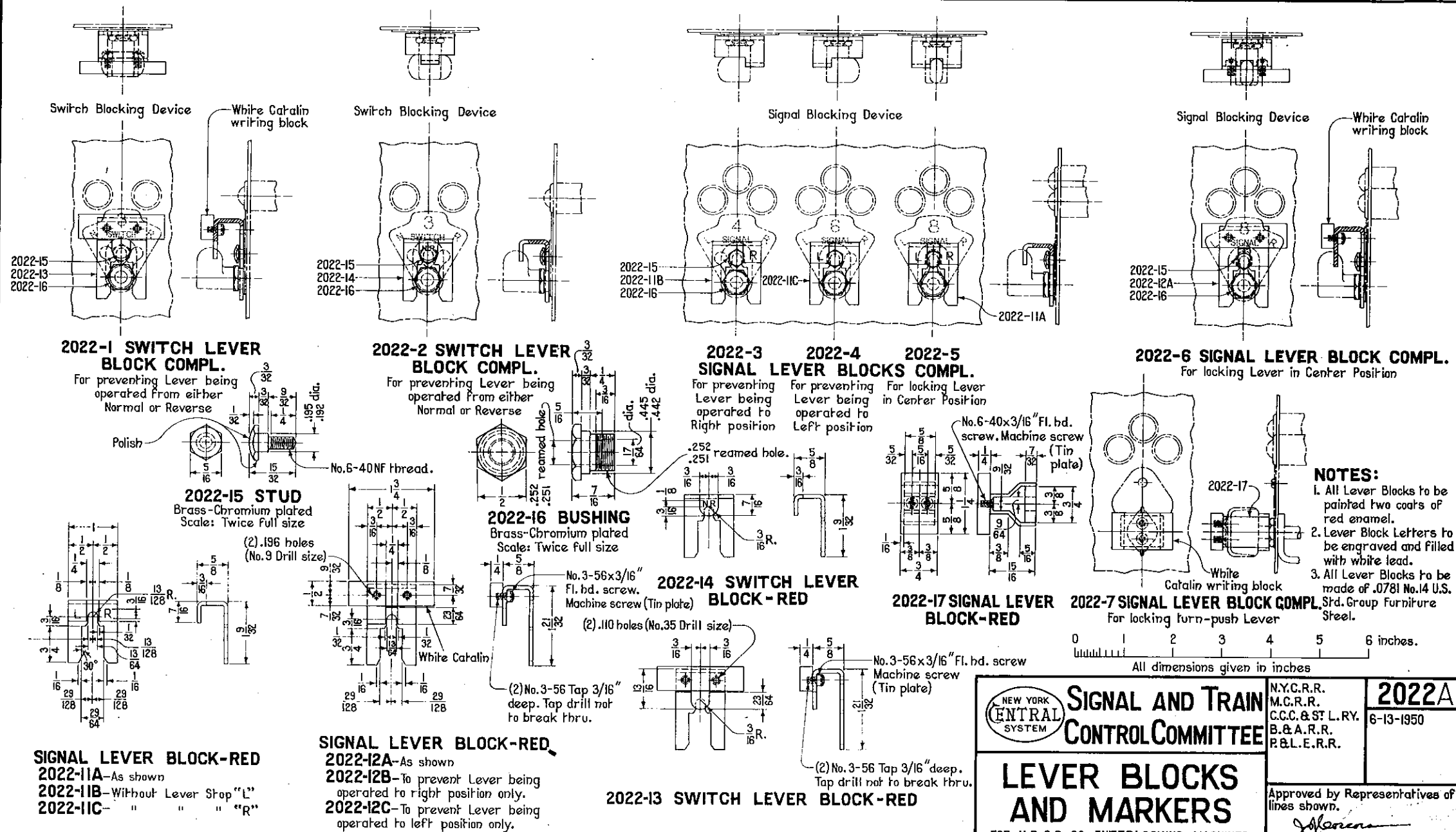
2004-1 BURNER COMPL.

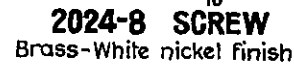
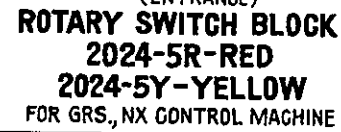
- NOTES :
1. Material and workmanship shall be first class in every respect.
 2. Manufacturer's name shall be die stamped or stenciled on burner.
 3. Wrapping and Packing :
Each burner shall be packed to permit convenient handling and to prevent loss or damage during shipment.
 4. Warranty :
Contractor shall warrant the material covered by this specification to be free from defects in material and workmanship under ordinary use and service, his obligation under this warranty being limited to manufacturing, at point of production, any part or parts to replace those which shall be found defective within one year after shipment to the purchaser. This warranty shall not apply to any apparatus which shall have been repaired or altered in any way by anyone other than the manufacturer thereof, so as to affect, in the contractor's judgment, its proper functioning or reliability, or which has been subject to misuse, negligence or accident.

0 1 2
Scale and all dimensions given in inches

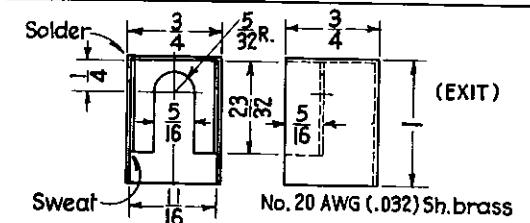
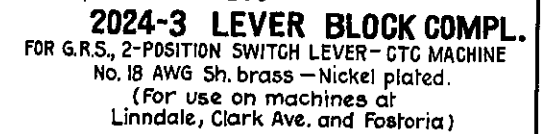
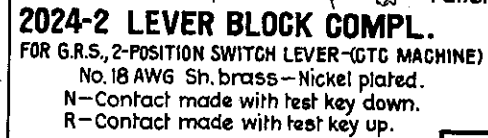
	SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R. M.C.R.R. C.C.C. & ST.L.R.Y. B. & A.R.R. P. & L.E.R.R.	2004A 1-15-47
		Approved by Representatives of lines shown. Chairman	
BURNER FOR TRAIN MARKER LAMP USING 5/8 INCH WICK			

Printed in U.S.A.

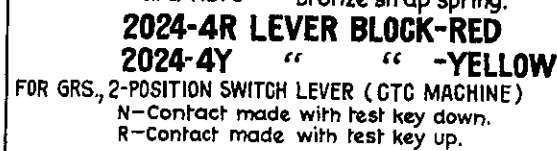
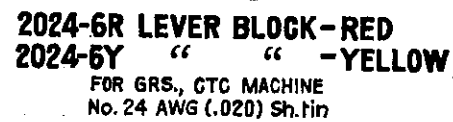




No. 18 AWG Sh. brass — Nickel plated.
C — Test key normally on center.
N — Contact made with test key down.
R — Contact made with test key up.



2024-7R PUSH-BUTTON BLOCK-RED
2024-7Y " " -YELLOW
 FOR GRS., NX CONTROL MACHINE



(Printed in U.S.A.)



NEW YORK
CENTRAL
SYSTEM

**SIGNAL AND TRAIN
CONTROL COMMITTEE**

LEVER BLOCKS AND MARKERS

FOR G.R.S.CO. INTERLOCKING MACHINES

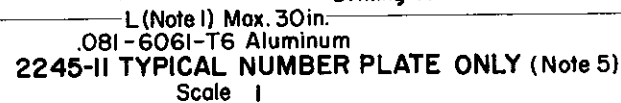
N.Y.C.R.R.
M.C.R.R.
C.C.G.&ST.LRY.
B.&A.R.R.
P.&L.E.R.R.

Approved by Representatives
of Lines shown.

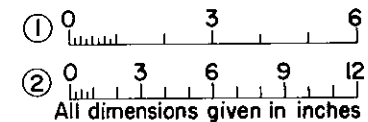
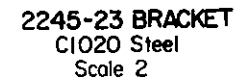
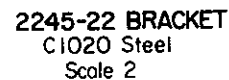
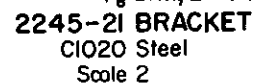
2024A

6-13-1950

Chairman



TYPICAL NUMBER PLATE COMPL. (Note 5)			
ORDER NO.	BRACKET	DRILLING	FOR MOUNTING ON
2245-1	2245-21	A	BRACKET POST
2245-2	2245-22	B	MAST
2245-3	2245-23	A	SIGNAL BRIDGE



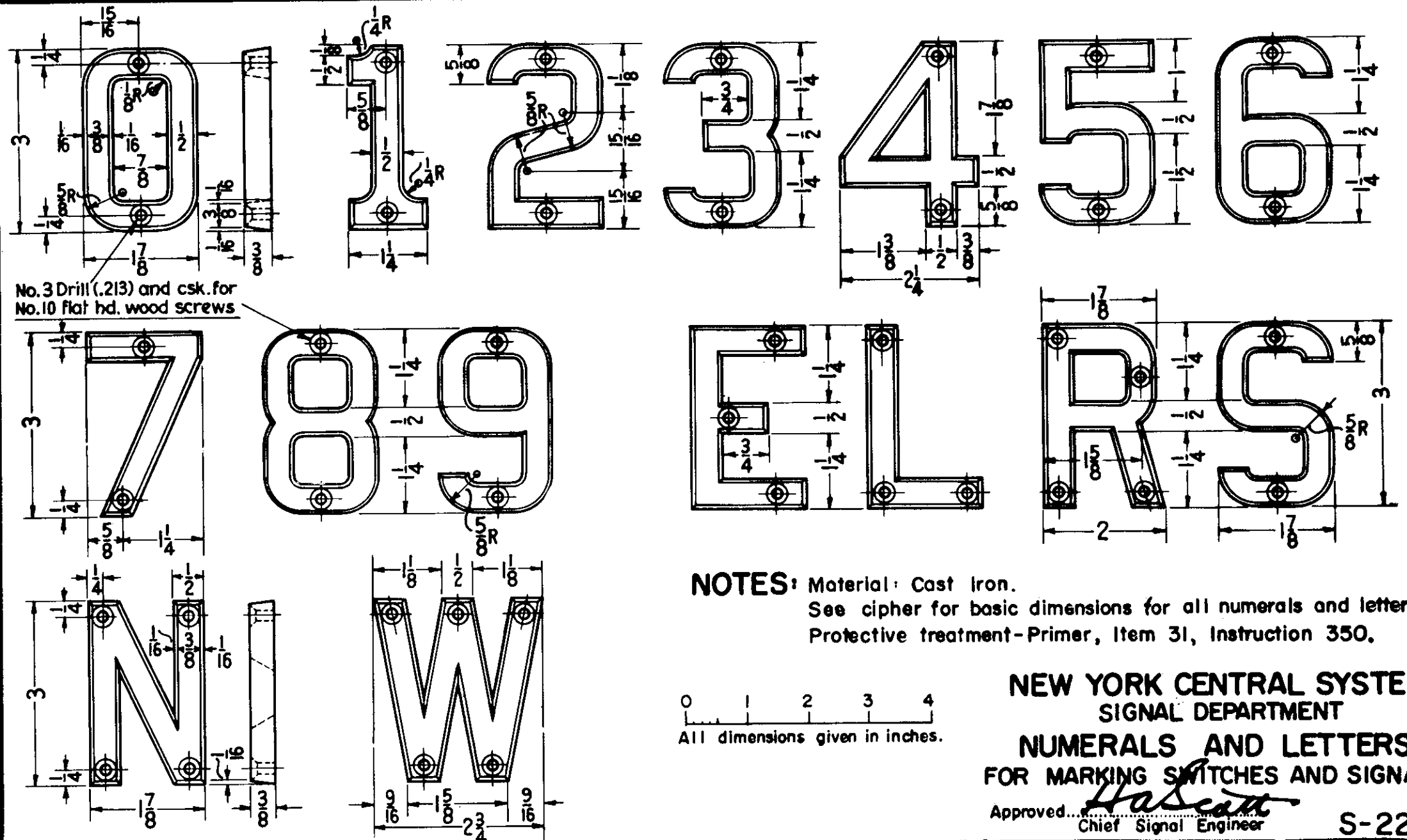
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNAL NUMBER PLATES

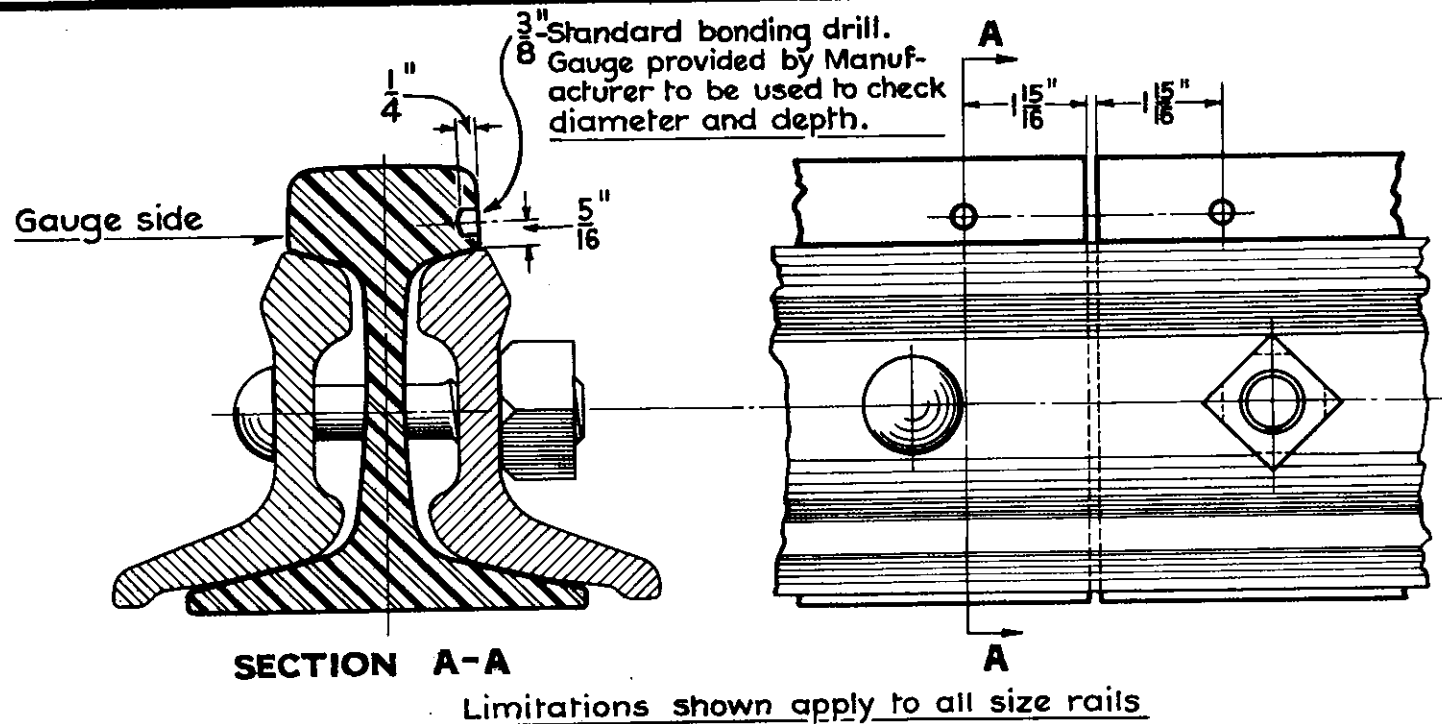
Approved: L. J. Bottinelli
Chief Signal Engineer

S-2245

ISSUED 1-23-59

SHEET__1__Cont'd on Sh_____





INSTRUCTIONS

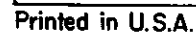
1. Drill holes dry and remove all chips from the holes.
2. Install bonds the same day holes are drilled.
3. To install bonds, use ordinary 2½ lb. hammer, and strike the pin, or punch where the application of the bond requires the use of a punch, squarely.
4. Three good blows will normally install the terminal. Additional blows should be given if the impact does not sound solid. Excessive pounding should be avoided.
5. Care should be used to see that the bonds, or bond sleeves are parallel to the splice bar.
6. To remove bonds, use an extracting tool as specified in the manufacturer's instructions. Place the forked end of the tool under the terminal and give it two or three blows with the hammer until the tool is wedged under the terminal head. Then pry out the terminal by striking the shank of the extracting tool with the hammer.

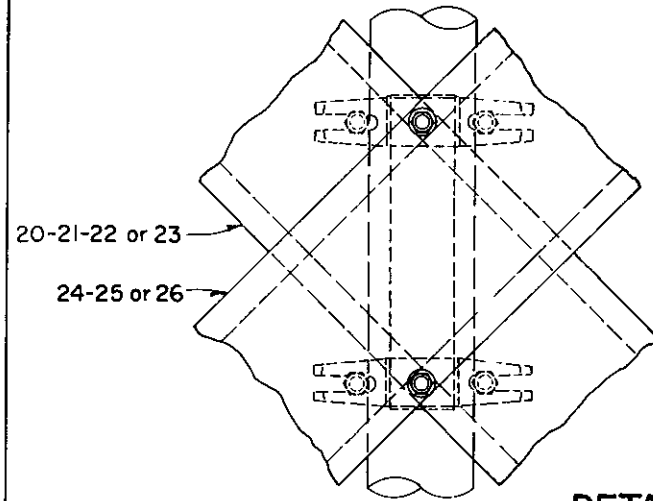
Scale: 4 in. = 1 ft.

NOTE: Drilling and dimensions based on Engineering Committee plan EC G-25.

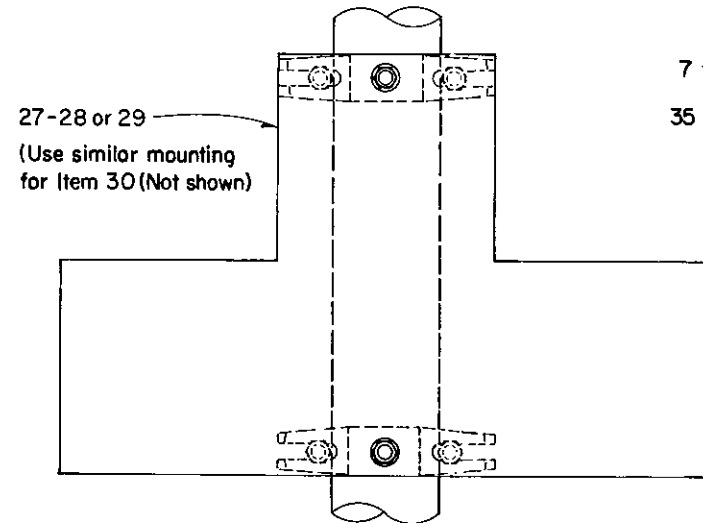
 SIGNAL AND TRAIN CONTROL COMMITTEE	2304	
	N.Y.C.R.R. M.G.R.R. C.G.G. & STL.R.R. B. & A.R.R. P. & L.E.R.R. RUTL.R.R.	ISSUE DATE 1 3-29-1937
DRILLING FOR RAIL-HEAD-PLUG SIGNAL BOND		Approved by Representatives of Lines shown.  Chairman

S-G3A

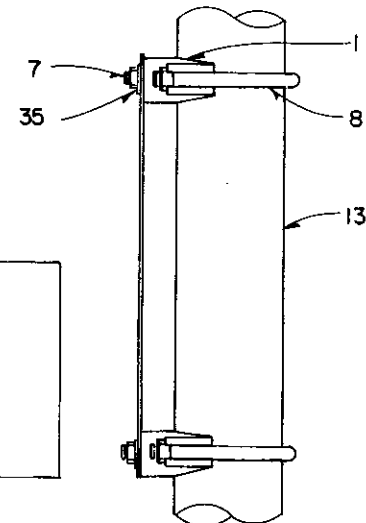
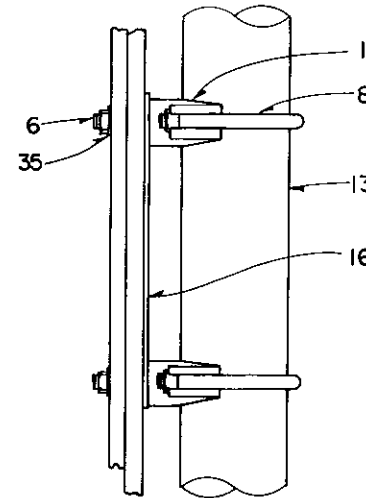




DETAIL
SIGN MOUNTING
(NO SCALE)



DETAIL
SIGN MOUNTING
(NO SCALE)



NO.	ITEM (See Note 1)	REFERENCE	REQUIRED			REMARKS
			STANDARD		CANADA	
1	Adapter	AAR 16477	As Req.		As Req.	
2	Arm, Cross-4 Way Complete	AAR 16565	1		1	
3						
4	Base	AAR 14492	1		1	
5	Bell	WRS Co. Type 222	1-If Req.		1-If Req.	
6	Bolts 5/8-11 X3 Sq. Hd., Hex. Nut.	* Coml.	2		2	Items 20 to 26
7	Bolts 5/8-11 X1-3/4 Sq. Hd., Hex. Nut.	*	As Req.		As Req.	Items 27-28-29
8	Bolts, U	AAR 16554	As Req.		As Req.	Item 1
9						
10	Foundation 3'-6"	Permacrete S1	1		1	
11						
12						
13	Mast 4 Inch	2656-1	1		1	
14						
15	Pinnacle	AAR 12452	1		1	
16	Plate, Backer	4844-13	1		1	Items 20 to 26
17						
18						
19	Signal Units	760	4		4	
20						
21	Sign "Railroad"	4844-3	1			
22	Sign "Railway"	4844-5				
23	Sign "Railway Crossing"	4844-9			1	Quebec only.
24						
25	Sign "Crossing"	4844-1	1			
26	Sign "Traverse du Chemin de Fer"	4844-7			1	Quebec only.
27	Sign, Number of Tracks. Specify Numeral	4844-10	1-If Req.		-	
28	Sign, Number of Tracks. " "	4844-11				
29	Sign, Number of Tracks. " "	4844-14			1-If Req.	Quebec only.
30	Sign, "Stop on Red Signal"	4844-12	1		-	NOT Req'd in Illinois
31						
32	Step	2655-1	1		1	
33						
34	Washer 1-1/16 I.D. 2-1/2 O.D.	U. S. Std.	8		8	
35	Washer 21/32 I.D. 1-5/16 O.D.	* SAE Std.	As Req.		As Req.	Items 6 & 7

* Bolts, nuts and threads to be in accordance with AAR Spec., Manual Part 17.

Washers to be in accordance with AAR Spec., Manual Part 35.

Bolts, Items 6 and 7, and Washers, Item 35, to be cadmium plated.

NEW YORK CENTRAL SYSTEM SIGNAL STANDARD HIGHWAY CROSSING SIGNAL FLASHING LIGHT TYPE

Approved *A. P. Kenneth*
Director Communications & Signals

S-2312

Printed in U.S.A.

ISSUED 12-1-66
SHEET 2 Cont'd on Sh-----



96" (8'-0")

$\frac{5}{8}$ -11 (Rolled)

6315-14

6315-17

$\frac{5}{8}$ -11 (Rolled)

Technical drawing of a bolt head and nut. The bolt head is shown on the left with dimensions: overall width 5/16, height 5/32, base diameter 3/32, and thread diameter 11/32. The nut is shown on the right with dimensions: outer diameter 3/4, height 7/16, and thread diameter 13/16. Both components are labeled 'Milled'.

Figure 1 is a cross-sectional diagram of a track structure. It shows a top layer (1) with a central rail (3) supported by a base (7). Below the rail is a layer (5A) and a bottom layer (4). A vertical line (2) is shown on the right side. A label 'Ground clamp to be above top of ballast' points to a component (6) on the right side of the rail.

The diagram shows a siding on the left and a main track on the right. The siding has a signal labeled 'Siding' and a track number '1'. The main track has several signals and track numbers: '1', '8', '2', '3', '3', '2', '2', '3', and '1J'. A signal labeled '5A' is also present. A vertical line labeled 'A' is shown between the siding and the main track.

4. Ground rod with clamp 6315-17.
5. Ground connection to pipe (7 annealed 40 per cent copper-covered strand, specify length—1156-61).
- 5A. Ground connection to rail (7 annealed 40 per cent copper-covered strand 36 ins. long—1156-52).
6. Bonding of unloading pipes (7 annealed 40 per cent copper-covered strand—1156-61).



NEW YORK
CENTRAL
SYSTEM

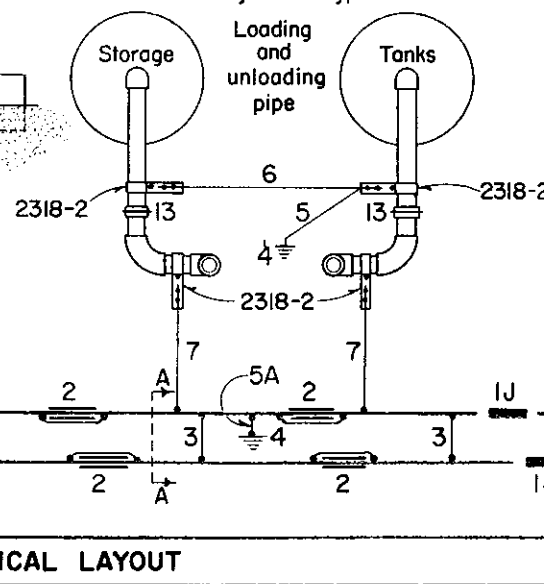
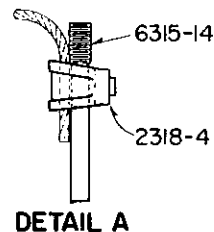
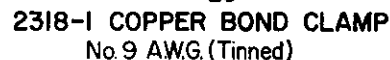
N.Y.C.R.R.
M.C.R.R.
C.C.C.&STL.RY.
B.&A.R.R.
P.&L.E.R.R.

9-18-1934
12-20-1935
6-15-1945

DETAILS AND INSTRUCTIONS
STEAM PROPULSION TERRITORY

Approved by Representatives
of Lines shown.

J. Horvath
Chairman



Approved *R. K. Hanson*
Asst. Vice President-Engineering

D.H. Simpson
Chief Engineer

BONDING IN ACCORDANCE WITH N.Y.C.SYSTEM ENGINEERING
COMMITTEE BOOK OF RULES GOVERNING TRANSFER OF
INFLAMMABLE LIQUIDS,EFFECTIVE APRIL 10,1943.

- I-J. Insulated rail joints: Bonded section to be of length to hold cars connected to tanks for loading or unloading only. Insulated joints "IJ" not required if station is located at end of spur track.
2. Bonded rail joints: Railroads standard plug bond, I156-25 -one bond per joint.
3. Cross-bond: Railroads standard cross-bond, I156-26
7. Each pipe to be bonded to rails with I156-53. If longer strand is required splice on I156-61 length as required, with connector 2318-6.
8. Derail, if installed, locate back of insulated joint as shown. If pipe connected with switch point, insulate operating pipe at a point opposite insulated joint I.
13. Insulated joints in the permanent piping system.

THE FOLLOWING BONDING AND GROUNDING SHALL BE PROVIDED ONLY WHEN SPECIFIED BY THE N.Y.C. SYSTEM MECHANICAL AND ELECTRICAL ENGINEER.

4. Ground rod with clamp.
5. Ground connection to pipe, 1156-61 length as required.
- 5A. Ground connection to rail, 1156-52
6. Bonding of unloading pipes, 1156-61 length as required.

Scales various: All dimensions given in inches

NEW YORK CENTRAL SYSTEM

SIGNAL DEPARTMENT

BONDING OIL SIDINGS

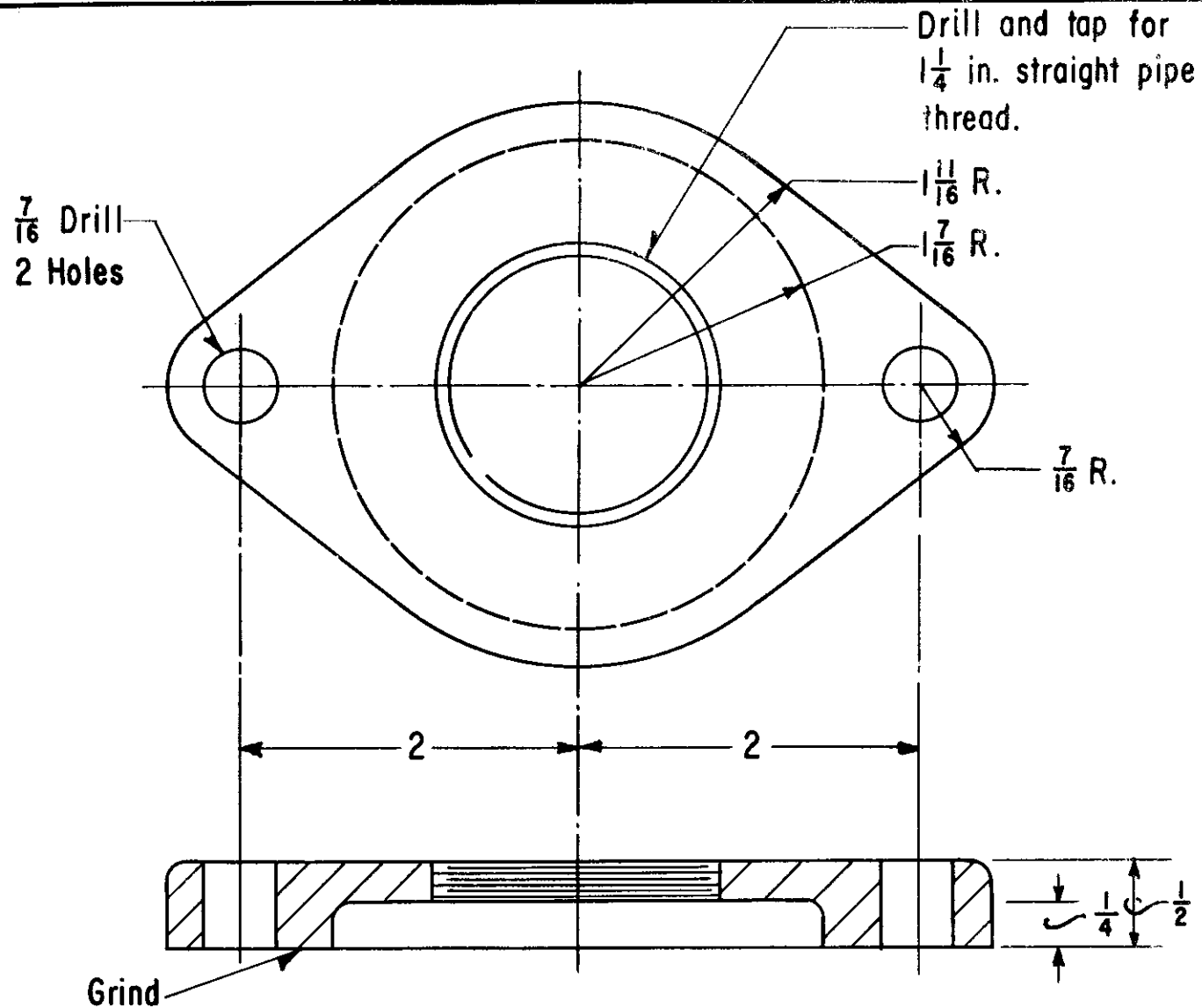
DETAILS AND INSTRUCTIONS

Hasco
Chief Signal Engineer

S-2318

ISSUED 9-1-57

SHEET...L...Cont'd on Sh.....



2326-1, CAP
Cast Iron

NOTES:

1. - Cap is modification of AAR 14723 required on Junction Box Base AAR 14713 to provide connection for Conduit Assembly 1173-2.
2. - Protective treatment-Primer, Item 31, Instruction 350.

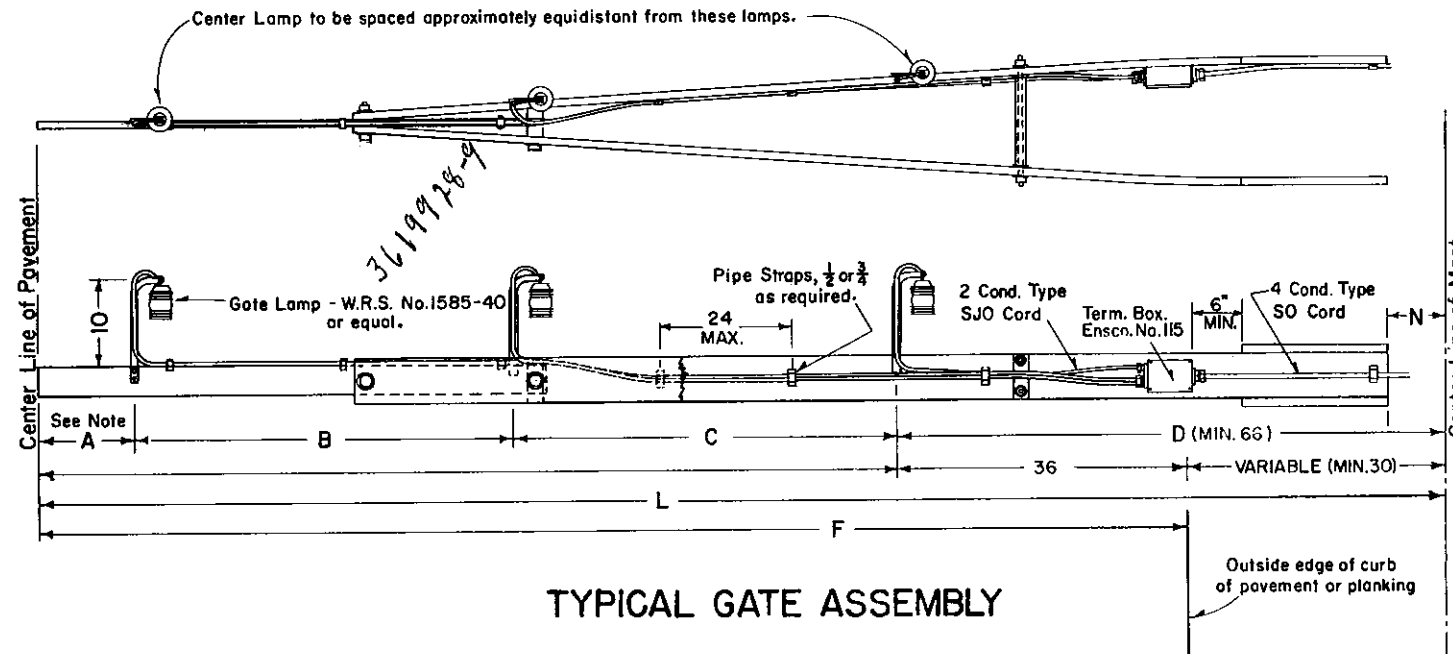
0 1 2 3
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
CAP
JUNCTION BOX BASE
HIGHWAY CROSSING SIGNAL-GATE TYPE
Approved *R. J. Bottinelli*
Chief Signal Engineer **S-2326**

GATE ARMS G.R.S. TYPE A, W.R.S. 3563 - 41 GL					
ORDER NO.	Dimension L	Dim.N	Tongue	Side Plate	Reinf. Plate
ROADWAY					
2330-1A	16'-0" To 22'-1"	17	2330-140	2330-164	
2330-2A	22'-1" To 27'-5"	17	2330-140	2330-168	
2330-3A	27'-5" To 30'-1"	17	2330-140	2330-166 & 150	2330-151
2330-4A	30'-1" To 32'-9"	17	2330-140	2330-166 & 154	2330-155
2330-5A	32'-9" To 35'-5"	17	2330-140	2330-166 & 158	2330-159
2330-6A	35'-5" To 38'-1"	17	2330-140	2330-166 & 162	2330-163
SIDEWALK					
2330-AB	6'-3" To 12'-3"	15	2330-141	2330-144	

GATE ARMS G.R.S. TYPE B, W.R.S. 3566 & TRANSPORT PROD. MOD. S					
ORDER NO.	Dimension L	Dim.N	Tongue	Side Plate	Reinf. Plate
ROADWAY					
2330-1B	15'-0" To 21'-1"	5	2330-140	2330-164	
2330-2B	21'-1" To 26'-5"	5	2330-140	2330-168	
2330-3B	26'-5" To 29'-1"	5	2330-140	2330-166 & 150	2330-151
2330-4B	29'-1" To 31'-9"	5	2330-140	2330-166 & 154	2330-155
2330-5B	31'-1" To 34'-5"	5	2330-140	2330-166 & 158	2330-159
2330-6B	34'-5" To 37'-1"	5	2330-140	2330-166 & 162	2330-163
SIDEWALK					
2330-AB	6'-0" To 12'-0"	12	2330-141	2330-144	
* 2330-C	6'-9" To 5'-9"	5	2330-140	2330-160	
* 2330-1C	15'-0" To 21'-1"	5	2330-140	2330-164	

* Use with W.R.S. gate support 3565-205.



TYPICAL GATE ASSEMBLY

ORDERING REFERENCES

When ordering Gate Arms from Manufacturer Specify:
Roadway, Dimensions A, B, C, D, & L
Sidewalk, Dimensions L (& A if lamp is required.)

When ordering Gate Arms from Storehouse Specify:
Roadway, Dimensions L & F
Sidewalk, Dimensions L (& A if lamp is required.)

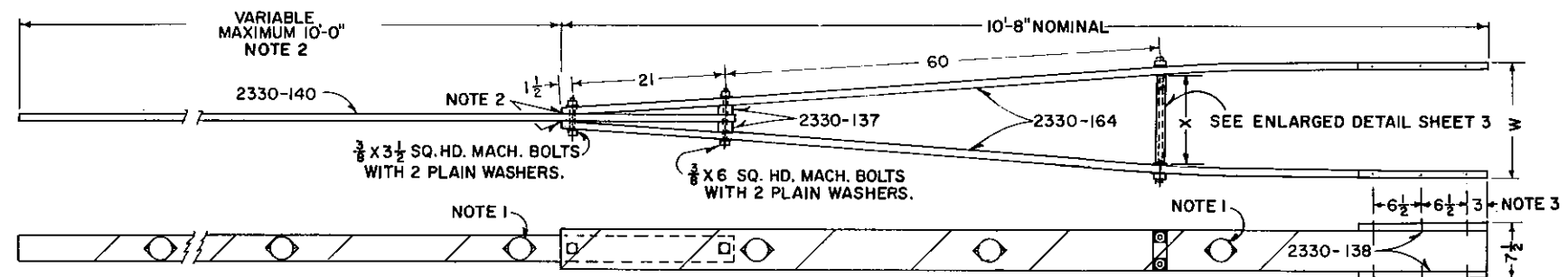
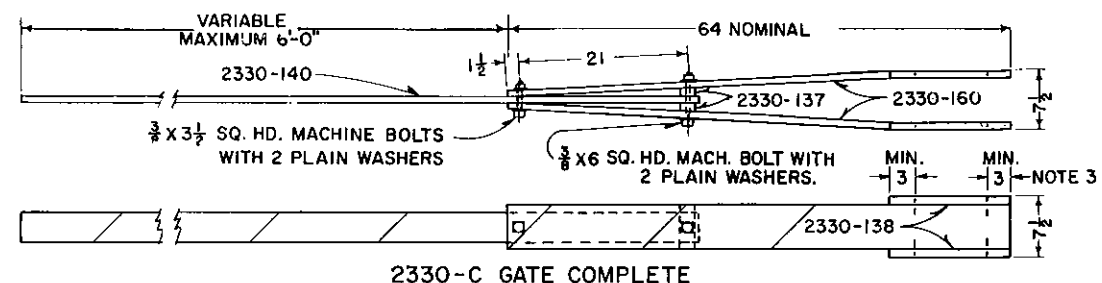
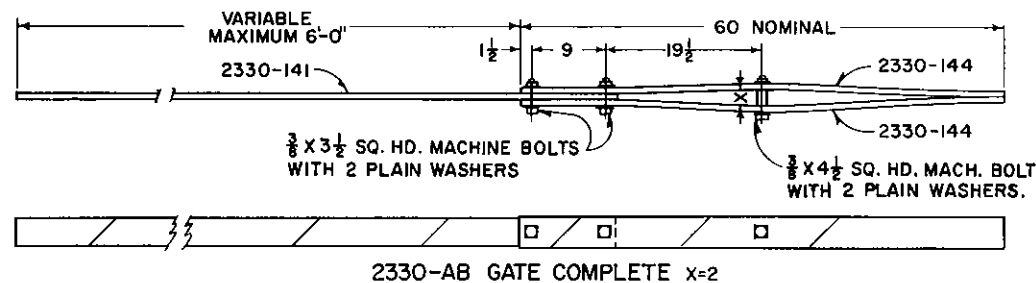
NOTE: Roadway Arms used in U.S.A. Dim. A=12, in Canada Dim. A=18.

Sidewalk Arms Dim. A shall be as required.

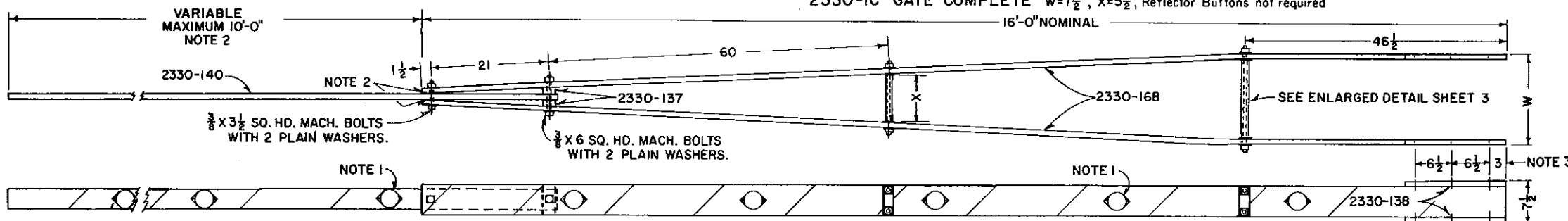
All dimensions given in inches unless otherwise indicated

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
HIGHWAY CROSSING SIGNAL
GATE ARMS

S-2330



2330-1A GATE COMPLETE W=11 3/4, X=9 3/4
 2330-1B GATE COMPLETE W=16, X=12 3/4
 2330-1C GATE COMPLETE W=7 1/2, X=5 1/2, Reflector Buttons not required

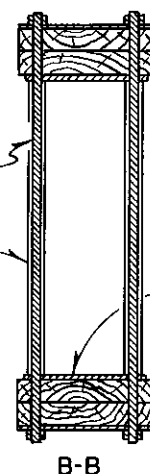
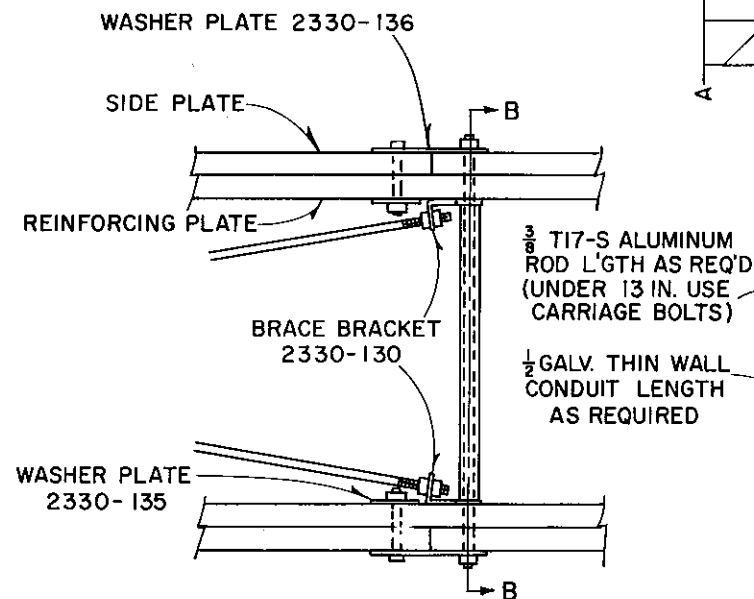
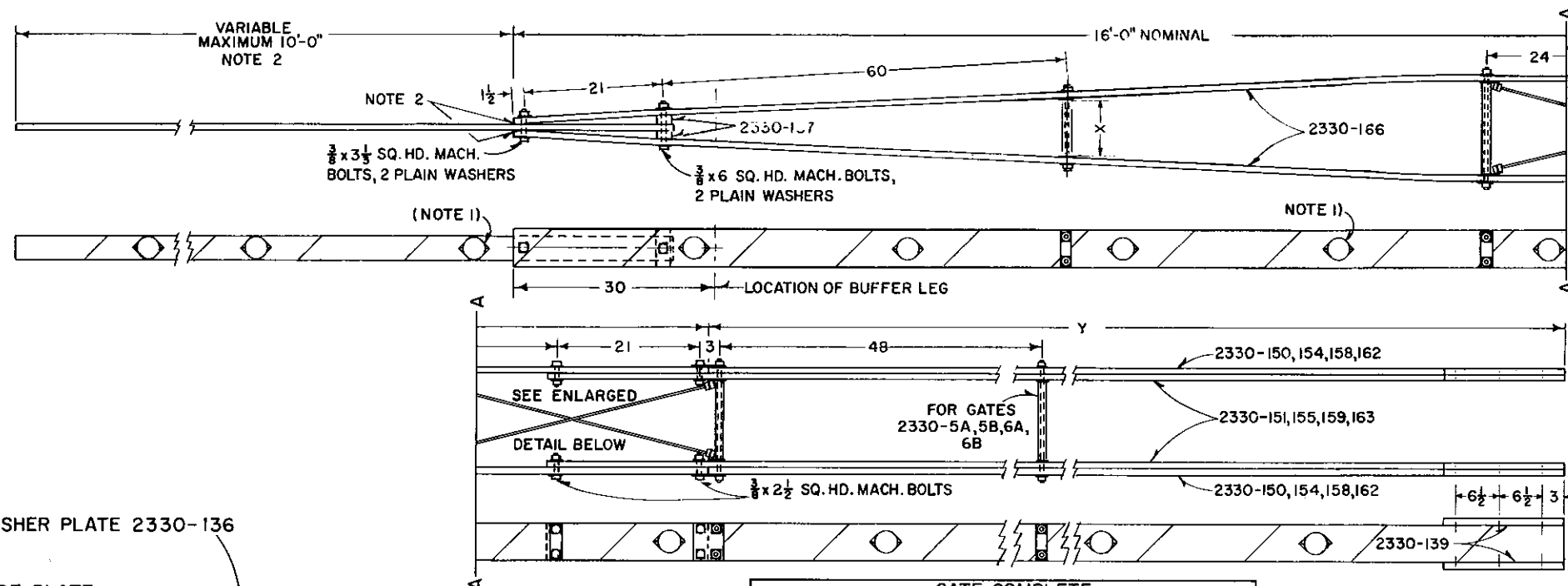


- NOTES:
- 2330-2A GATE COMPLETE W=11 3/4, X=7
 2330-2B GATE COMPLETE W=16, X=8
1. Reflectors-WRS Co. Clear Stratolite, No. 38B, 3 in. diam. Mount on black stripes only on side of gate facing approaching traffic using two No. 6, 1/2 in. theft proof, wood screws.
 2. Tongues longer than 8 ft. (6 ft. exposed) to be reinforced with 2330-133 of required length. When reinforcement is installed, insert plain aluminum washers, 7/16 X 1-1/2 X 1/8, to serve as shims between side plate and tongue. (2 required.)
 3. Use 6d. finishing nails. Drive head 1/8 in. minimum below surface of wood.

0 12 24 36 48
 All dimension given in inches unless indicated otherwise.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT HIGHWAY CROSSING SIGNAL GATE ARMS

S-2330



BRACE BRACKET 2330-130
OR
WASHER PLATE 2330-135

GATE COMPLETE					
	DIM. Y	DIM. W	DIM. X	SIDE PL.	REINF. PL.
2330-3A	32	11 3/4	7	2330-150	2330-151
2330-3B	32	16	8	2330-150	2330-151
2330-4A	64	11 3/4	7	2330-154	2330-155
2330-4B	64	16	8	2330-154	2330-155
*2330-5A	8'-0"	11 3/4	7	2330-158	2330-159
*2330-5B	8'-0"	16	8	2330-158	2330-159
*2330-6A	10'-8"	11 3/4	7	2330-162	2330-163
*2330-6B	10'-8"	16	8	2330-162	2330-163

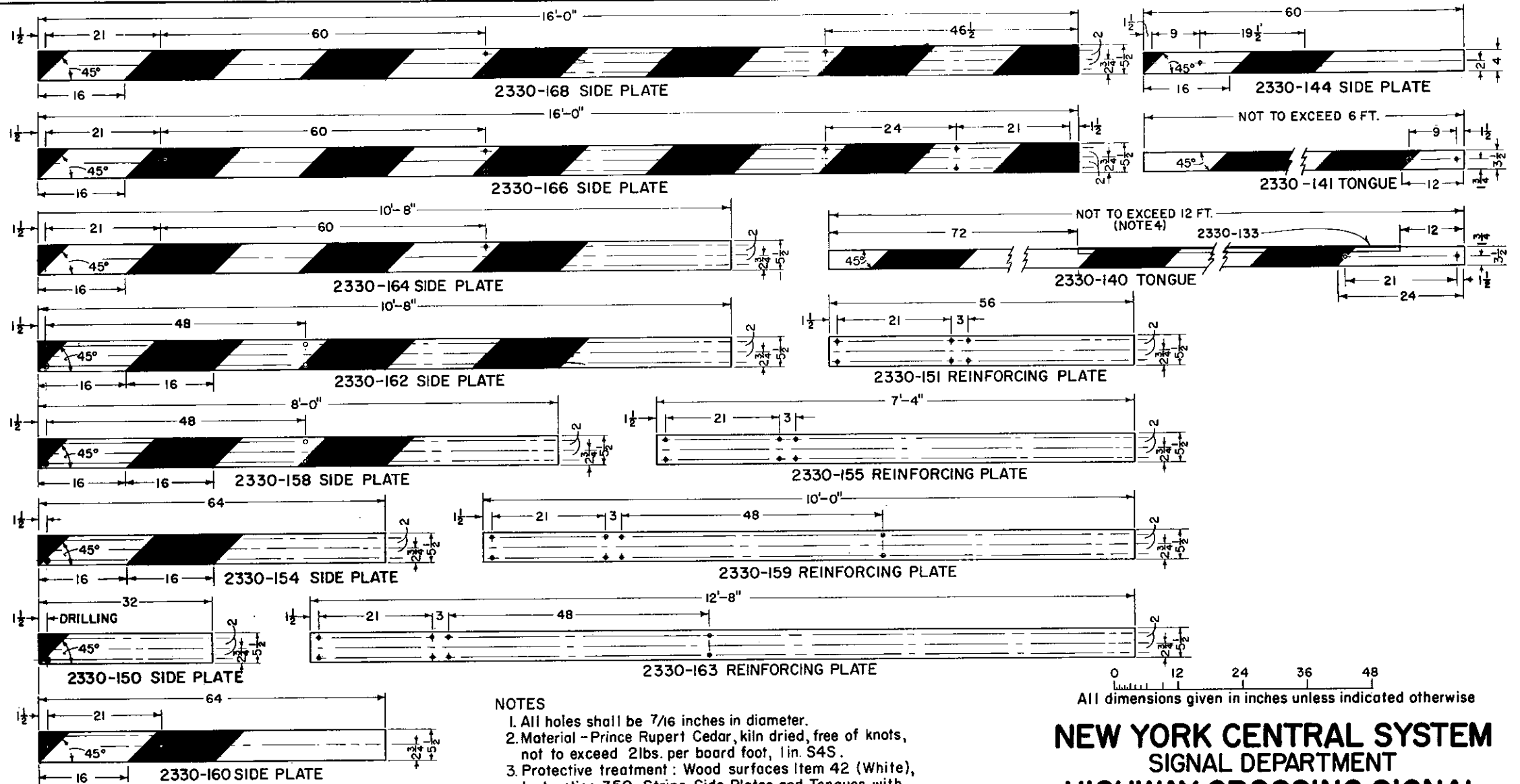
* GATES LONGER THAN 30 FT. TO BE EQUIPPED WITH WRS. CO. BUFFER LEG 3562-316A.

NOTES:

1. Reflectors-WRS Co. Clear Stratolite, No. 38B, 3 in. diam. Mount on black stripes only on side of gate facing approaching highway traffic using two No. 6, 1/2 in. theft-proof, wood screws.
2. Tongues longer than 8 ft. (6 ft. exposed) to be reinforced with 2330-133 of required length. When reinforcement is installed, insert plain aluminum washer, 7/16 X 1-1/2 X 1/8, to serve as shims between side plate and tongue. (2 Req.)
3. Drive nail heads 1/8 inch below surface of wood.

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
HIGHWAY CROSSING SIGNAL
GATE ARMS**

S-2330



NOTES

1. All holes shall be 7/16 inches in diameter.
2. Material - Prince Rupert Cedar, kiln dried, free of knots, not to exceed 2lbs. per board foot, 1in. S4S.
3. Protective treatment: Wood surfaces Item 42 (White), Instruction 350. Stripe Side Plates and Tongues with Item 42 (Black), Instruction 350. Stripe both sides of Tongue and one side of Side Plates as indicated. Gates to be assembled so that stripes appear on both outer faces.
4. Tongues over 8 feet long to be reinforced with 2330-133 of required length.

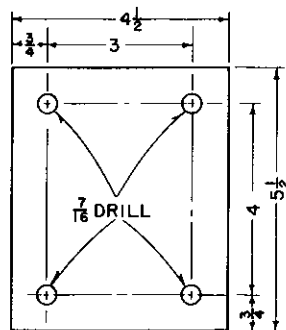
0 12 24 36 48
All dimensions given in inches unless indicated otherwise

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
HIGHWAY CROSSING SIGNAL
GATE ARMS

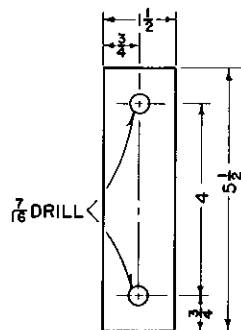
S-2330

ISSUED...8-19-63...

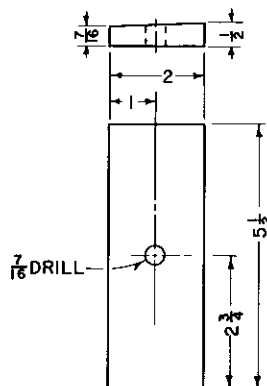
SHEET...4...Cont'd on Sh...5...



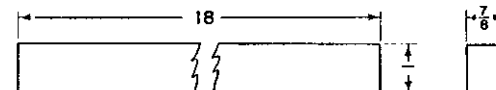
2330-136
WASHER PLATE
.125 24S-T4 ALUMINUM



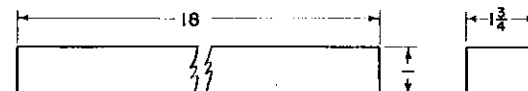
2330-135
WASHER PLATE
.125 24S-T4 ALUMINUM



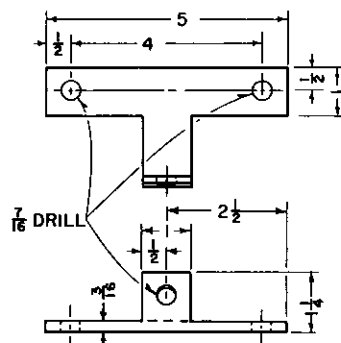
2330-137
FILLER BLOCK
WHITE PINE



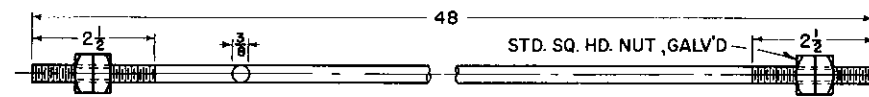
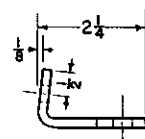
2330-138 FILLER BLOCK
WHITE PINE



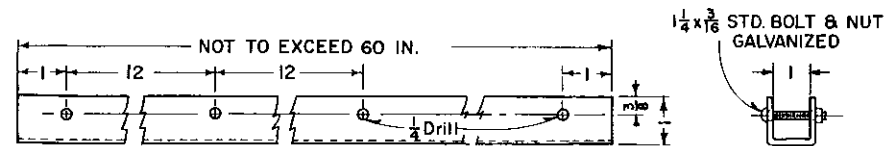
2330-139 FILLER BLOCK
WHITE PINE



2330-130 BRACE BRACKET
C1020 STEEL



2330-127 BRACE ROD
T17-S ALUMINUM



2330-133 REINFORCING CHANNEL COMPL. WITH BOLTS AND NUTS
.125 14S-T6 ALUMINUM

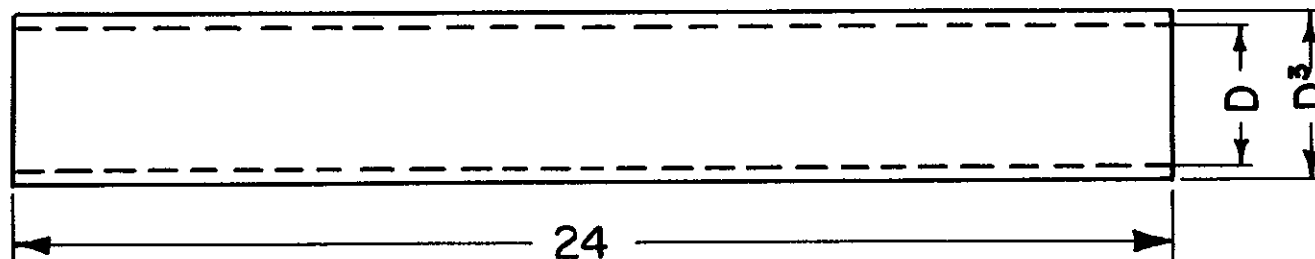
NOTES:
Protective Treatment:
a. Metal surfaces (excepting aluminum)-
Primer, Item 31, Paint, Item 53 Instruction
350.
b. Wood surfaces- Item 42 (White),
Instruction 350.

0 3 6
All dimensions given in inches

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT HIGHWAY CROSSING SIGNAL GATE ARMS

Approved *R. S. Battimella*
Chief Signal Engineer

S-2330



Transite Korduct EL-I-IB cut in 24 inch lengths

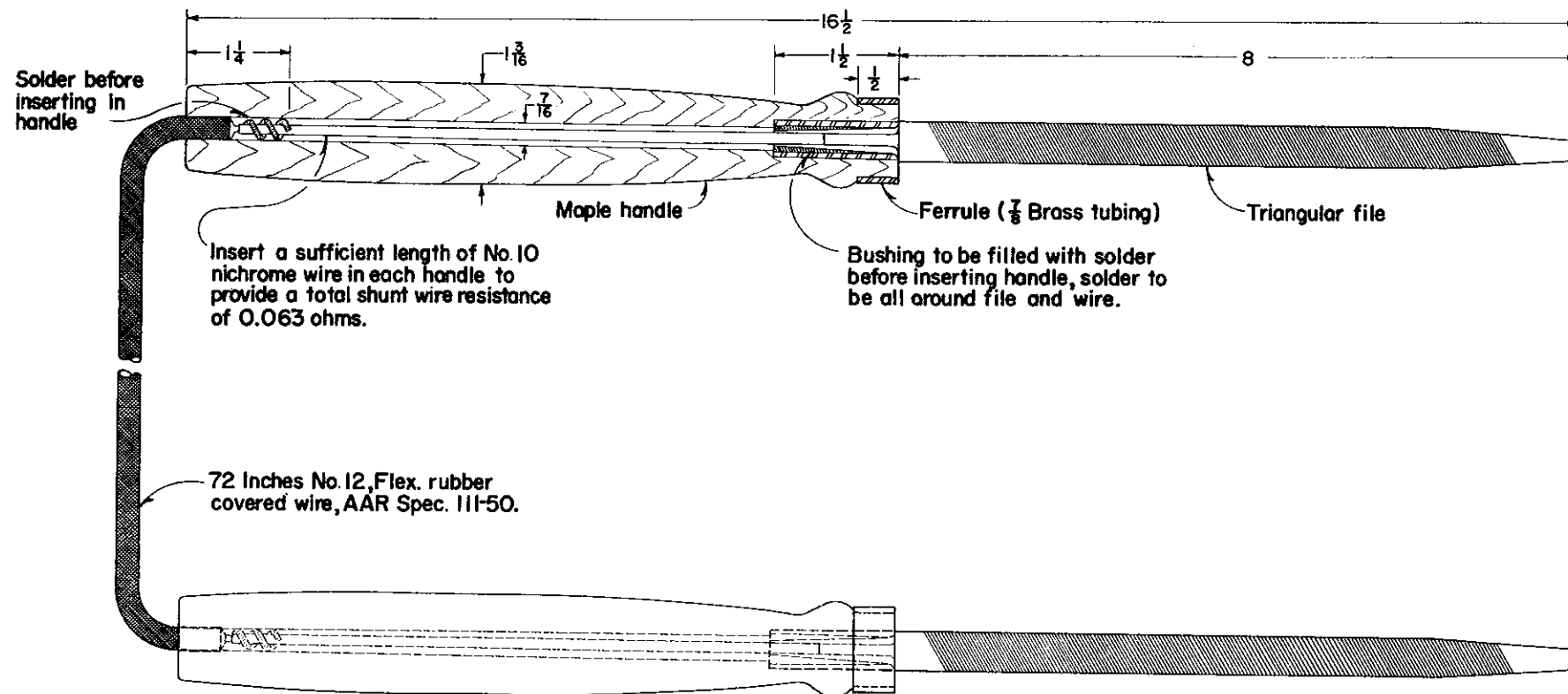
SOIL PIPE		
ORDER NO.	D	D^3
2440-2	2	2.50
2440-3	3	3.54
2440-4	4	4.54
2440-6	6	6.60

All dimensions given in inches

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SOIL PIPE

Approved *H. A. Scott*
 Chief Signal Engineer

S-2440



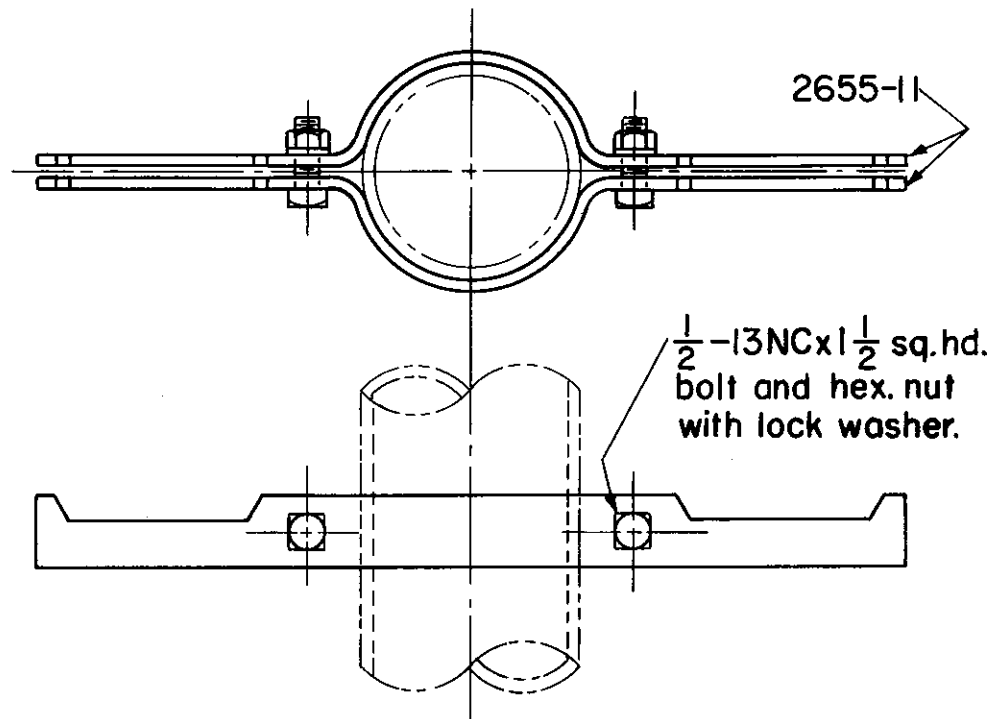
2635-1, TRACK SHUNT, COMPLETE

0 1 2 3
All dimensions given in inches.

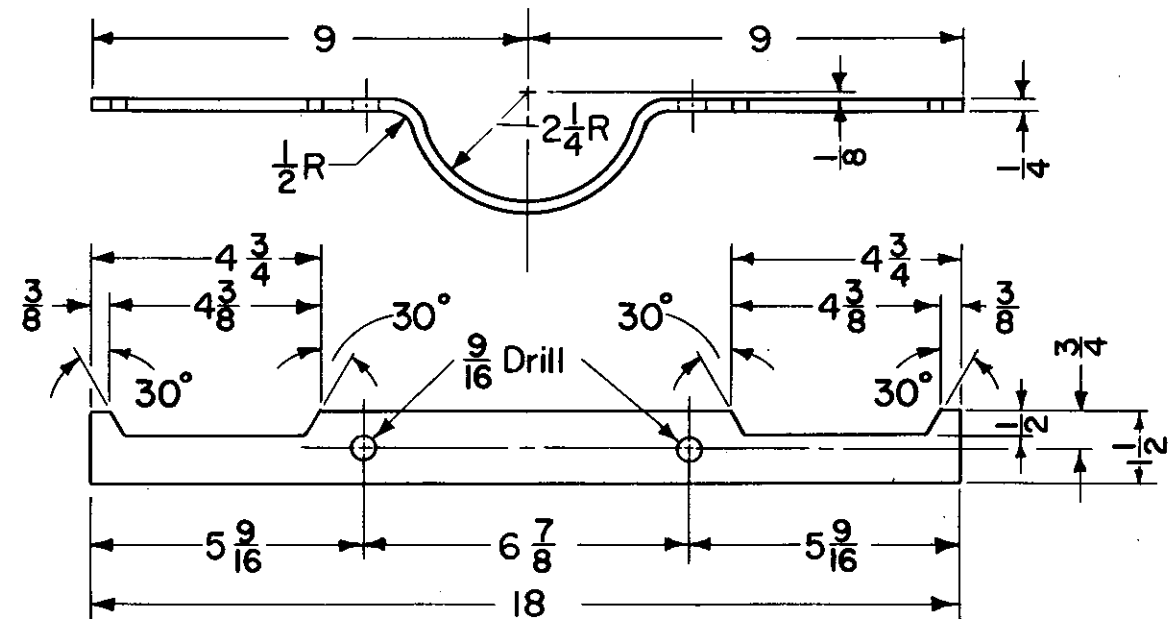
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TRACK SHUNT

Approved *H. A. Scott*
Chief Signal Engineer

S-2635



2655-I DOUBLE STEP COMPL.



2655-II DOUBLE STEP

NOTES:

1. Material - C1020 steel.
2. Protective treatment -
Primer, Item 31, Instruction 350.

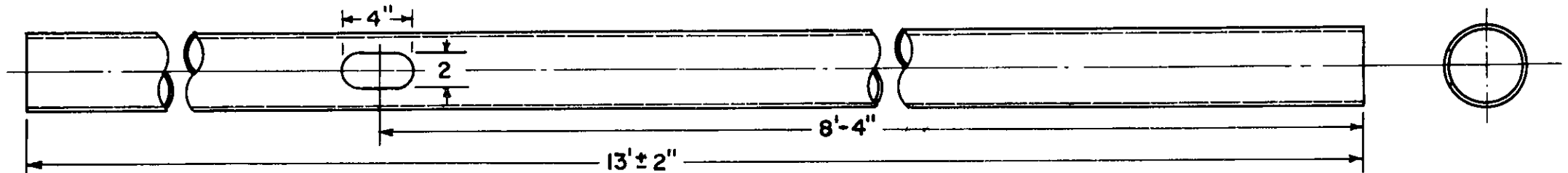


All dimensions given in inches

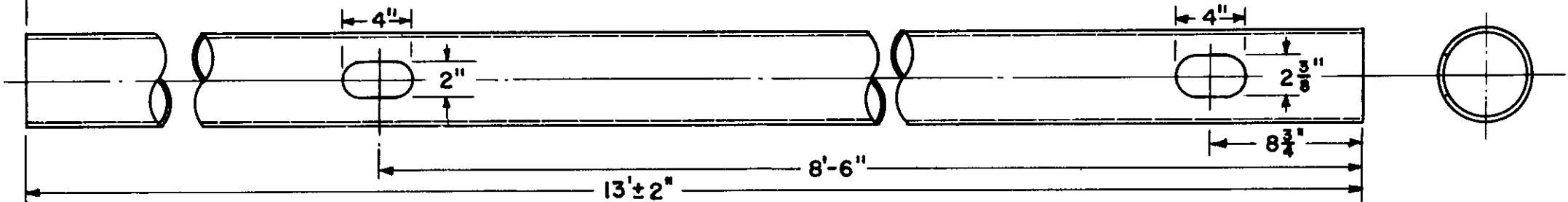
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
POLE STEP
FOR FLASHING LIGHT SIGNALS

Approved *[Signature]*
 Chief Signal Engineer.

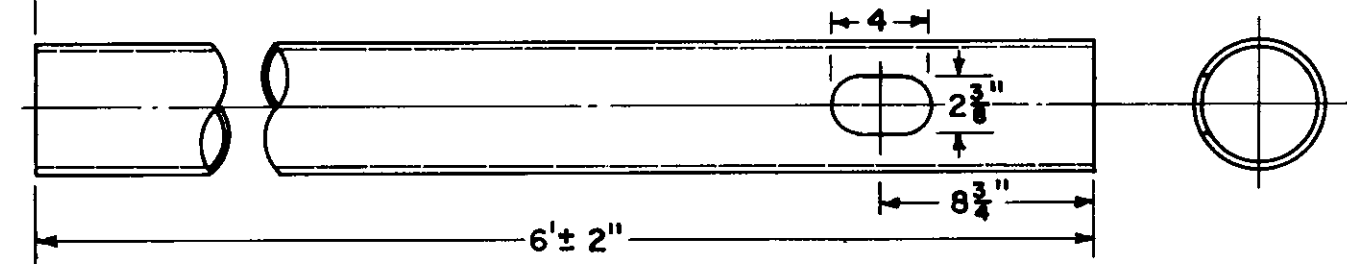
S-2655



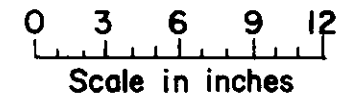
2656-1 MAST, Standard Steel Pipe, 4 Inch.



2656-2 MAST, Standard Steel Pipe, 5 Inch.



2656-3 MAST, Standard Steel Pipe, 5 Inch.



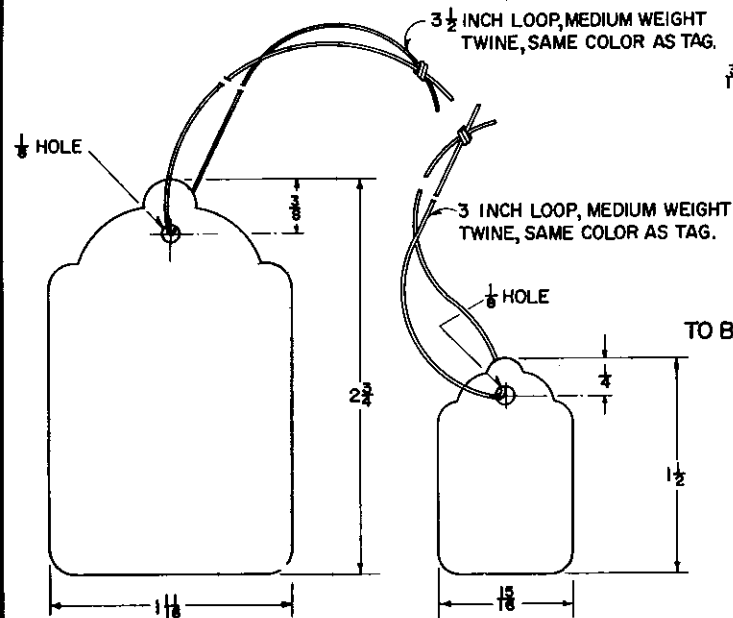
NOTE:

Protective treatment-Primer, Item 31, Instruction 350.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
MASTS
HIGHWAY CROSSING SIGNAL

Approved: *L. J. Lottinell*
Chief Signal Engineer

S-2656

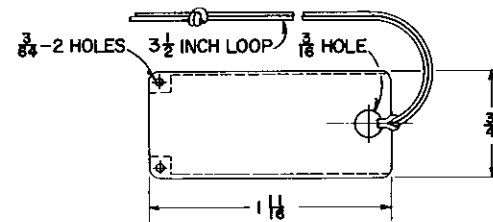


2700-1 - RED
2700-2 - YELLOW
2700-3 - GREEN
2700-4 - WHITE

SUITABLE GRADE OF CARDBOARD
.014 TO .020 INCH THICKNESS.

2700-10 - RED
2700-11 - YELLOW
2700-12 - GREEN
2700-13 - WHITE

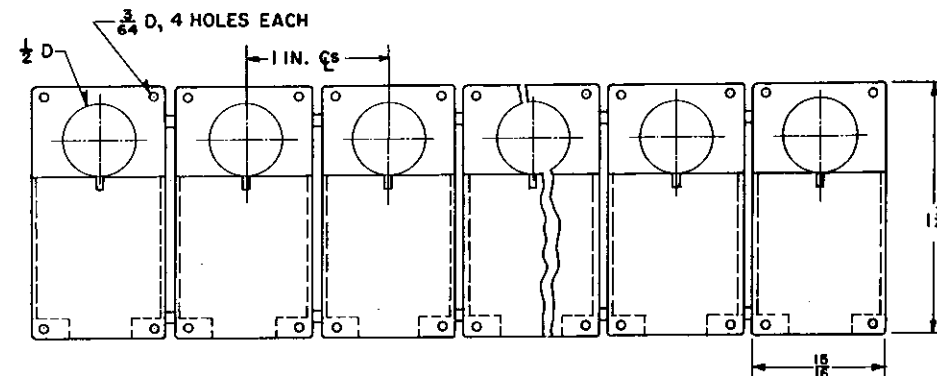
2700-8
ALUMINUM, NO. 20 AWG.
TO BE MARKED WITH STENCILS



CLEARTAGS, RACO 585-1

IN 1000 TAG LOTS COMPLETE WITH
LOOPS AND CLEARTAG SHEETS 585-11.

2700-9
NO. 13 ROOFING NAILS
REGULAR HEAD
TINNED BARBED WIRE



CLEARTAGS, MULTIUNIT, RACO 585-16

IN 1000 TAG LOTS (100-10 TAG STRIPS) COMPLETE
WITH CLEARTAG SHEETS 585-15 & ESCUTCHEON PINS.

11	12	13	14	15	16	21	22	23	24	25	26	31	32	33	34	35	36	3A	3B	3C	3D	1E	1E	1E	3E	3E	3E	3E	3E
11	12	13	14	15	16	21	22	23	24	25	26	31	32	33	34	35	36	3A	3B	3C	3D	1E	1E	1E	3E	3E	3E	3E	3E
11	12	13	14	15	16	21	22	23	24	25	26	31	32	33	34	35	36	3A	3B	3C	3D	1E	1E	1E	3E	3E	3E	3E	3E
11	12	13	14	15	16	21	22	23	24	25	26	31	32	33	34	35	36	3A	3B	3C	3D	1E	1E	1E	3E	3E	3E	3E	3E
11	12	13	14	15	16	21	22	23	24	25	26	31	32	33	34	35	36	3A	3B	3C	3D	1E	1E	1E	3E	3E	3E	3E	3E

2700-20, WRAP-AROUND TAGS, B-1 RELAYS - GRS 59539-405 OR EQUAL, (AS SHOWN).
2700-21, WRAP-AROUND TAGS, B-2 RELAYS - GRS 59539-405 AND 59539-406 OR EQUAL.

0 1 2 3
All dimensions given in inches.

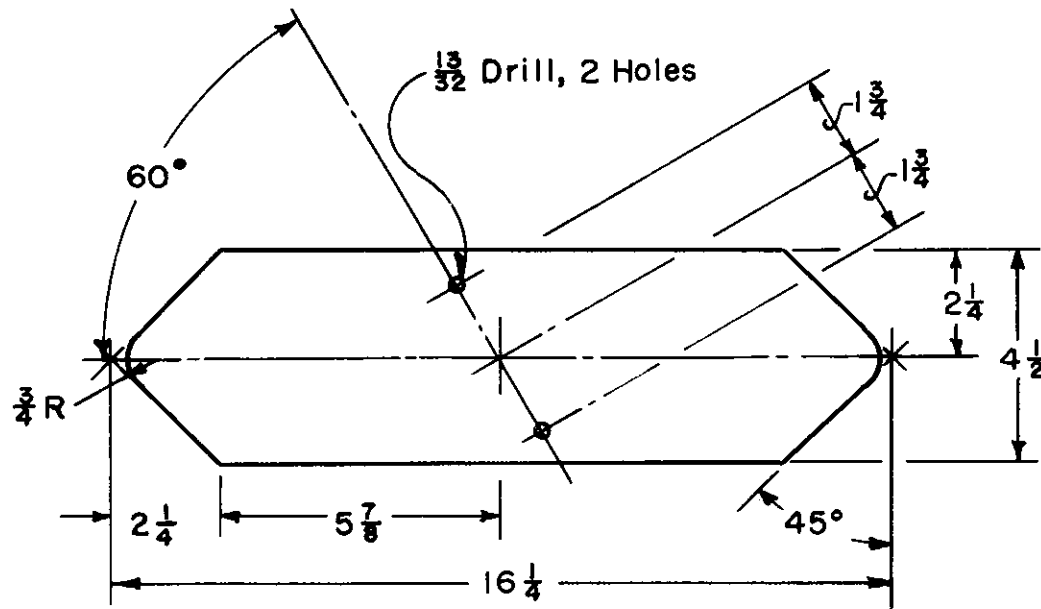
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TAGGING
IDENTIFICATION OF WIRES

Approved *L. J. Battaglia*
Chief Signal Engineer

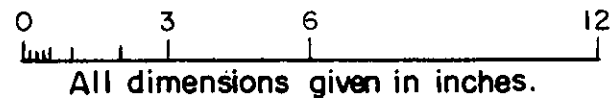
S-2700

ISSUED 11-24-58

SHEET 2 Cont'd. on Sh.



2720-14 DIAGONAL TARGET BANNER



NOTES:

- 1.- Target plates to be made of No. 13 U.S.S.G. (.092) sheet steel.
- 2.- Protective treatment, Enamel, Item 42, Instruction 350.
2720-14 to be No. 1310, Yellow.
2720-15 to be No. 1105, Red.

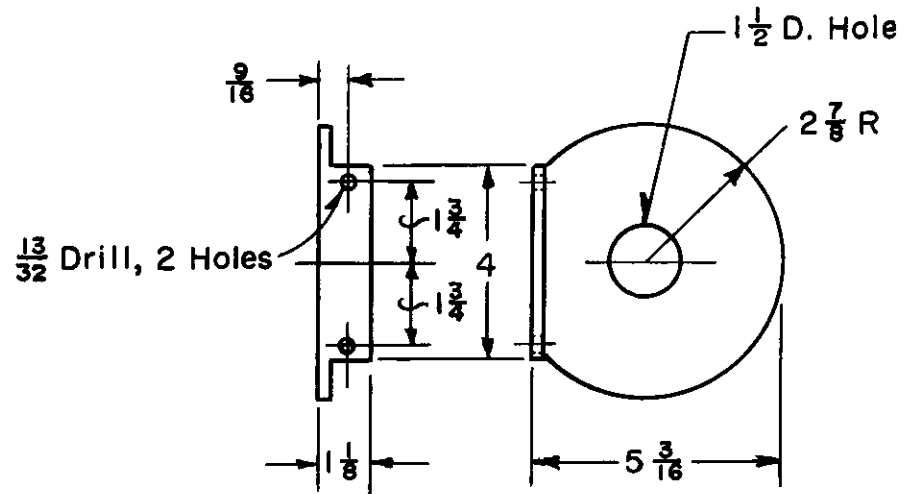
Approved: *W. Converse*
Asst. Vice President - Engineering

K. E. Dunn
Engineer Maintenance of Way

H. A. Scott
Chief Signal Engineer

S-2720

Printed in U. S. A.

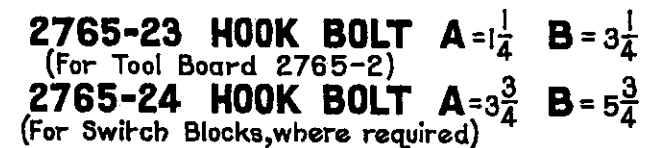
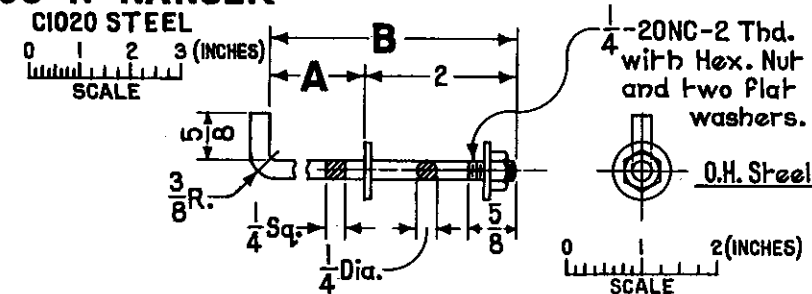
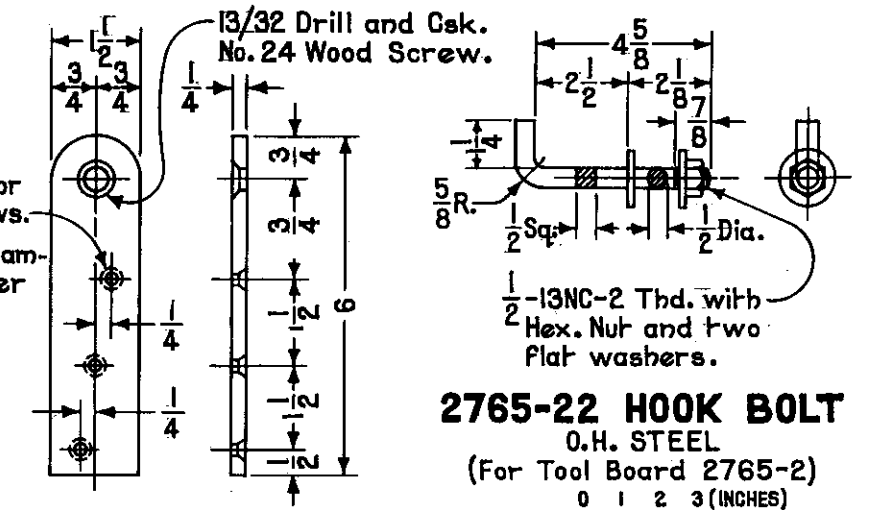
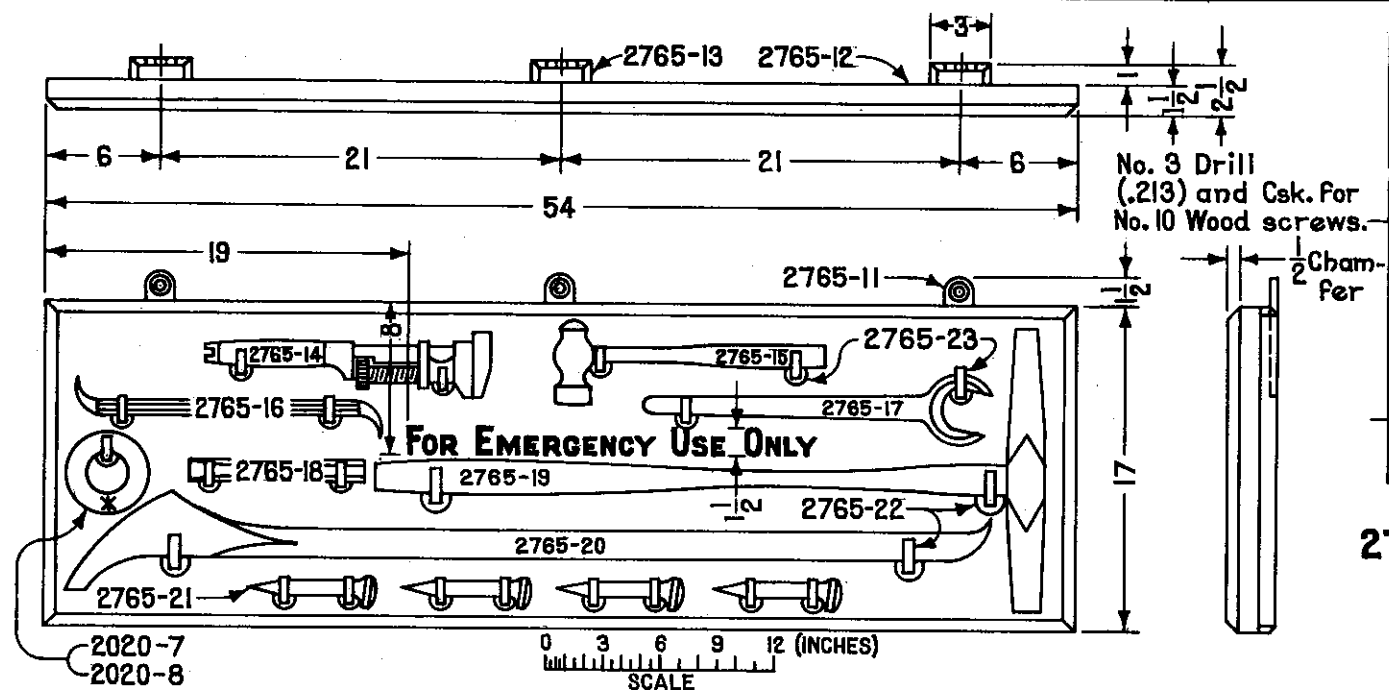


2720-15 TARGET DISC.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TARGETS
SWITCH & DERAIL

ISSUED 12-23-57
SHEET 1 Cont'd on Sh...

(Printed in U.S.A.)



2765-1 TOOL BOARD COMPL. Without Tools or mounting books

REF NO.	MATERIAL
2765-11	3-Hangers
2765-12	1-Oak board-1½ x 17 x 54 inches
2765-13	3-Wood cleats-1 x 3 x 17 inches
	24-No. 10 x 1¾ - Flat hd. wood screws
	3-No. 24 x 1½ - " " " "
	1
	Finish: Board to be made from well seasoned oak and given one coat filler and two coats varnish. Letter in black as shown.

PAINTING SPECIFICATIONS:

All tools shall be painted Red.

***All lever blocks and markers shall be painted Red or Yellow as specified, see**

2765-2 TOOL BOARD COMPL. With Tools and mounting hooks

REF. NO.	EQUIPMENT
2765-14	1-Monkey wrench (15 in.)
2765-15	1-Machine hammer (1 1/2 lb.)
2765-16	1-Tommy bar (16 in.)
2765-17	1-Switch adjustment wrench (18 in.)
2765-18	1-Cold chisel (9 in.)
2765-19	1-Spike maul (15 in.)
2765-20	1-Claw bar (4 Ft.)
2765-21	4-Standard track spikes
2020-7	5-Lever blocks and markers (Red)
2020-8	5- " " " " (Yellow)
2765-22	4-Hooks for mounting maul & Claw bar
2765-23	19- " " " all other tools

drawings 2020 and 2021 for types applicable
to other than S.&F. and Style "A" Interlocking Machines.

NOTE: Protective treatment shall be in accordance with Instruction 350.

Printed in U.S.A.

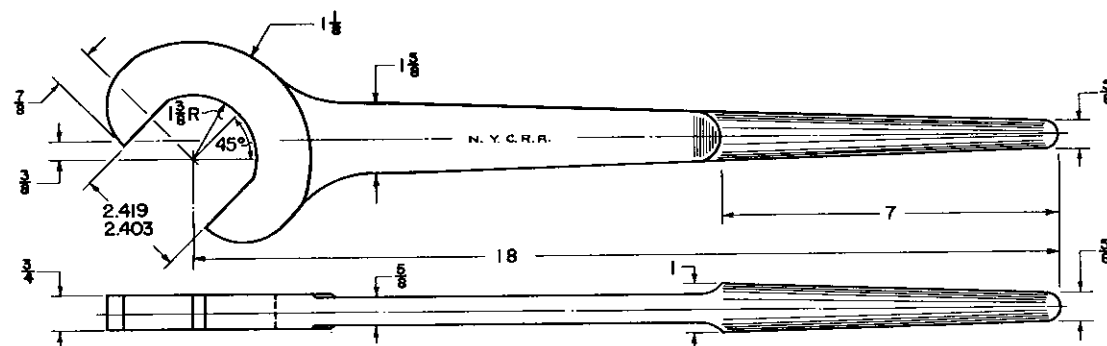
**NEW YORK
CENTRAL
SYSTEM**

**SIGNAL AND TRAIN
CONTROL COMMITTEE**

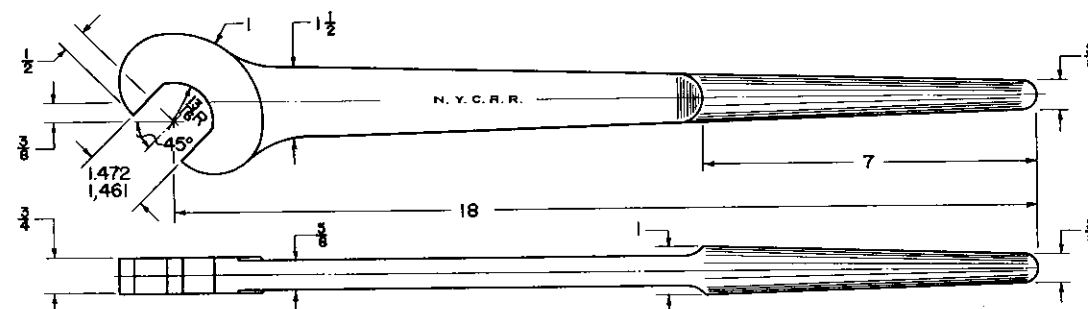
TOOL BOARD AND EQUIPMENT

NY.C.R.R.	2765B
M.C.R.R.	
C.C.C.&ST.L.RY	1-25-1940
B.&A.R.R.	9-20-1948
P.B.L.E.R.R.	

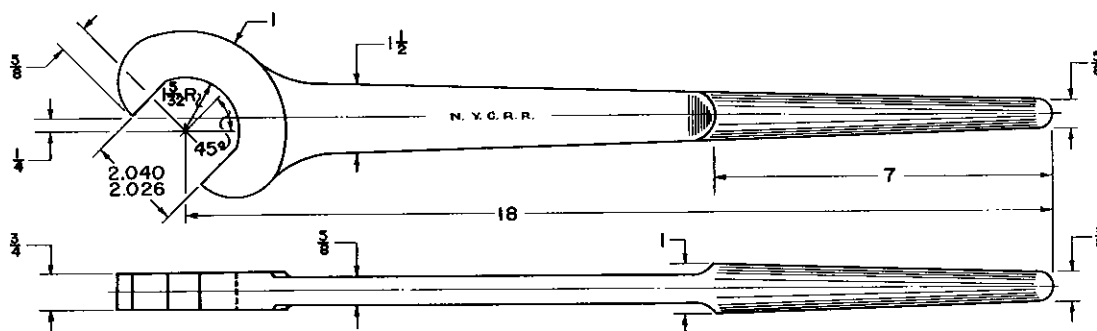
Approved by Representatives
of lines shown.
George
Chairman.



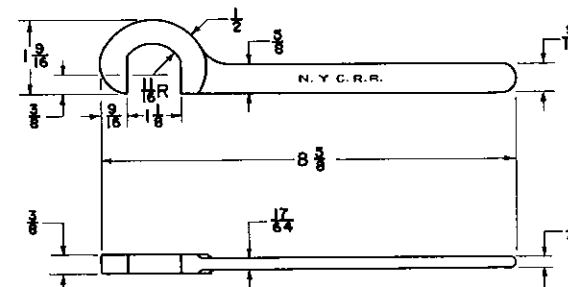
2920-1 WRENCH, SLIP SWITCH ADJUSTMENT (Weight 5 3/4 Lbs.)
For 1 1/2 Std. Hex. Nuts



2920-4 WRENCH, LOCK ROD ADJUSTMENT (Weight 4 1/2 Lbs.)
Raco 249-3 or equivalent for 3/4 special adjustment nuts.



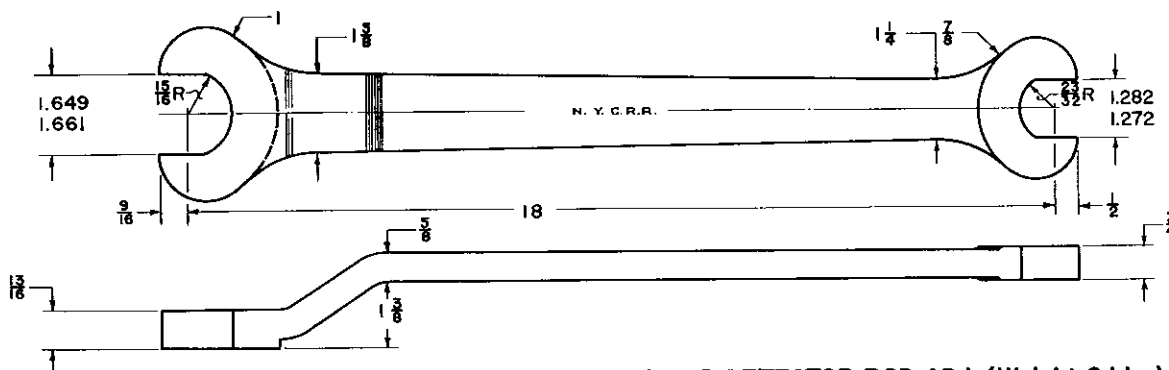
2920-2 WRENCH, SWITCH ADJUSTMENT (Weight 4 1/2 Lbs.)
Raco 249-4 or equivalent for 1 1/4 Std. Hex. Nuts



2920-5 WRENCH, DETECTOR ROD ADJ. (Weight 6 1/2 oz.)
GRS 36593-18 or equal for 5/8 Std. Hex. Nuts

NOTES:

1. Wrench 2920-5 to be chrome vanadium steel; all others to be chrome molybdenum steel.
2. Each tool to be initialed "N.Y.C.R.R." with 1/8 inch letters as shown.



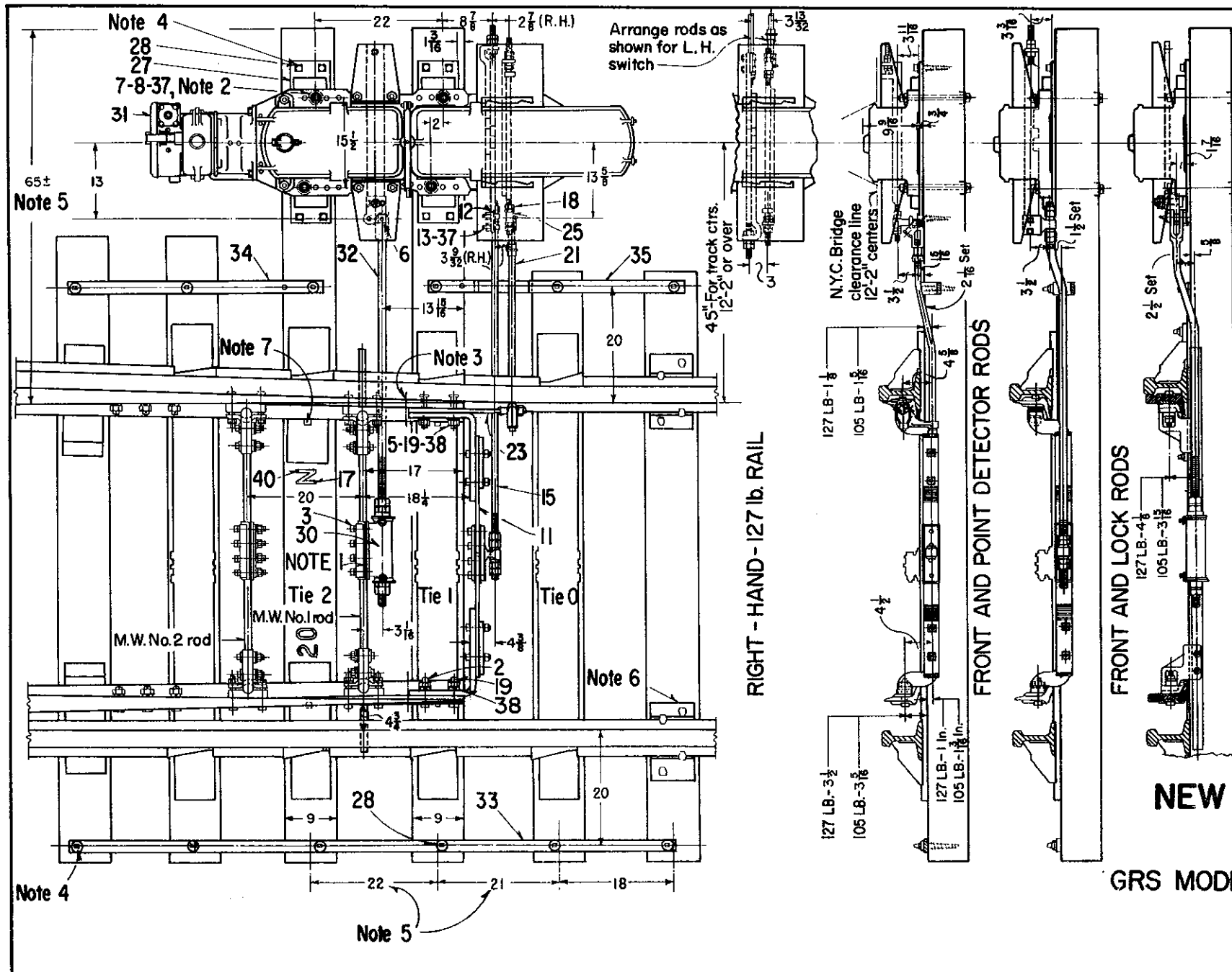
2920-3 WRENCH, SW. CIRCUIT CONT, LOCK & DETECTOR ROD ADJ. (Weight 6 Lbs.)
Raco 249-1 or equivalent for 3/4 & 1 inch Std. Hex. Nuts.

0 1 2 3 4 5 6
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
WRENCHES
SWITCH ADJUSTMENT

Approved *H. A. S. H.*
Chief Signal Engineer

S-2920



NOTES:

- 1 Remove one splice plate from No.1 switch rod and install switch adjustment bracket, Item 30.
- 2 Item 7 to be ASA regular double end stud bolt with square nuts and spring washers.
- 3 To provide clearance for front rod or point lug, switch bolt located 9-1/2 inches from switch point may be removed.
- 4 Holes for Drive Spikes, Item 28, to be one-half inch in diameter and five inches deep.
- 5 M. of W. to provide ties of length required, spaced as indicated. Creosote after framing.
- 6 M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 7 M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch. Four holes required.
- 8 Protective treatment-Item 32, Instruction 350.

0 12 24 36
All dimensions given in inches

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
 GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
 127-105 LB. RAIL

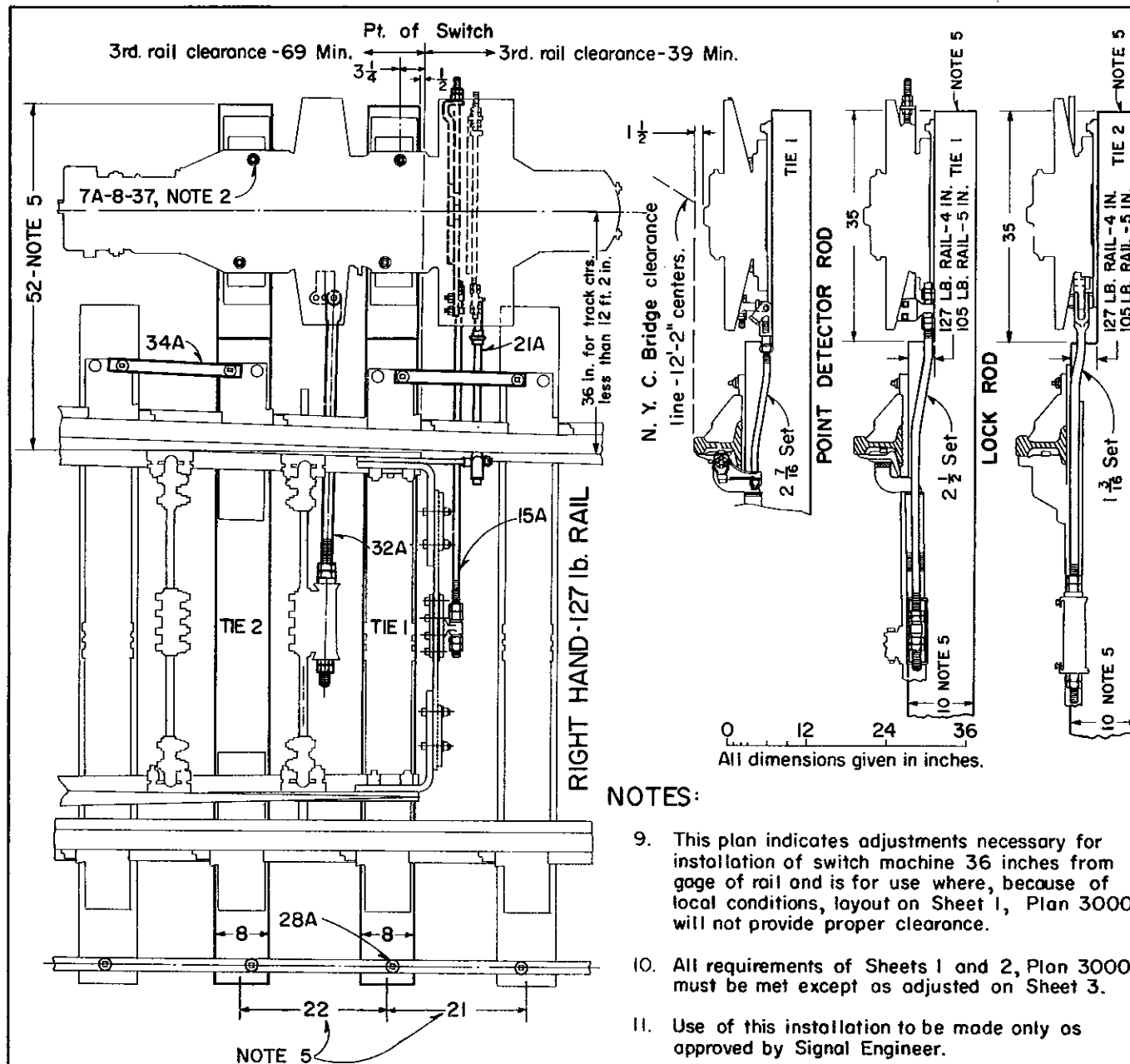
S-3000

NO	ITEM	REF.	REQ	USE	NO	ITEM	REF.	REQ	USE	NO	ITEM	REF.	REQ	USE
1	Bolt, 3/4 X 3-3/4, Special Hd., Hex. Nut.	RSC-G35C	2	Fr. Rod - 105 Lb.	25	Pt-Detector Ball Stud Lug, Compl.	3006-9	1	Conn. at Sw. Mach.	49				
2	" 1 X 4-1/4 " " " "	RSC-G35C		Fr. Rod - 127 Lb.	26					50				
3	" 3/4 X 3	3001-18	4	Item 30-No. 1 Rod.	27	Saddle plate, Compl.	3004-1	2	Switch Machine	51				
4	Bolt, 3/4 X 4-1/2, Special Hd., Hex. Nut.	RSC-G35C	2	Fr. Rod - 105 Lb.	28	Spike, Drive-6 long *	21-C-361	20		52				
5	" 1 X 5, " " " "	RSC-G35C		Fr. Rod - 127 Lb.	29					53				
6	" Compl.	3007-1	1	Throw Rod	30	Switch Adjustment Bracket G. R. S.	46948-12 Gr.1	1	Note 1	54				
7	Bolt, Stud, 3/4-10 X 1/2, Compl. with nuts.	Note 2	4	Switch Machine	31	Switch Machine		1	As required	55				
8	Bolt Grip Raco	589-1	4	Item 7	32	Throw Rod, Compl.	3002-11	1		56				
9	Bushing - For 3/4 Bolt GRS	6714-309	(2)	With Item 1 only.	33	Tie Strap - long	3014-1	1		57				
10	" " " " GRS	8104-2	(2)	With Item 4 only.	34	" " -short	3014-3	1		58				
11	Front Rod, Compl.	3001-50	1		35	" " -short; set	3014-5	1		59				
12	Lug, Lock Rod	3003-18	1		36					60				
13	Lug Bolt, Hex. Nut 3/4-10 X 2-1/2 GRS	0423	2	Lock Rod Lug.	37	Washer, Steel Spr. 3/4 In. ASA Med.	Compl.	As	Items 1, 4, 7, 13	61				
14					38	" " " 1 In. " "	"	Req.	Item 2 & 5	62				
15	Lock Rod	3003-21	1	127, 105 Lb. Rail	39					63				
16					40	Wood Screws, 2 In. No. 10 Flat Head	Compl.	8	Item 17	64				
17	Numerals - Letter "N" (Specify number)	2280		Sw. No. & Position.	41					65				
18	Nut-ASA-UNC-28 Heavy hex. jam 3/4-10	Compl.	4	Item 25	42					66				
19	Pins, Cotter 1/4 X 1-3/4	"	4	Items 2 & 5	43					67				
20	" " 1/4 X 1-1/4	"		Items 1 & 4	44					68				
21	Pt-Detector Rod, Compl.	3005-1	1		45					69				
22					46					70				
23	Point Lug, Compl.	3006-21	1	127-105 Lb. Rail	47					71				
24					48					72				

* Pittsburg Screw & Bolt Corp. or equal.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
127-105 LB. RAIL

S-3000



REQUIRED ADJUSTMENT OF MATERIAL LIST-SHEET 2					
USE NO.	OMIT NO.	ITEM	REF.	REQ.	USE
7A	7	Bolt, Stud 3/4-10 X 11, Compl. with nuts	Note 2-Sh. 1		Sw. Machine - 127 Lb. rail
7B	7	" " 3/4-10 X 10, " " "	"	4	" " 105 Lb. rail
15A	15	Lock Rod	3003-22		127 Lb. rail
15B	15	" "	3003-23		105 Lb. rail
21A	21	Point Detector Rod, Compl.	3005-2	1	
28A	28	Spike, Drive 6 long, 5 thd.	* 21-C-361	14	
32A	32	Throw Rod, Compl.	3002-8		127 Lb. rail
32B	32	" " "	3002-9		105 Lb. rail
34A	34	Tie Straps, Short		2	Make in field as required
-	35	Tie Straps, Short, Set		0	Use Item 34A

* Pittsburg Screw & Bolt Corp. or equal.

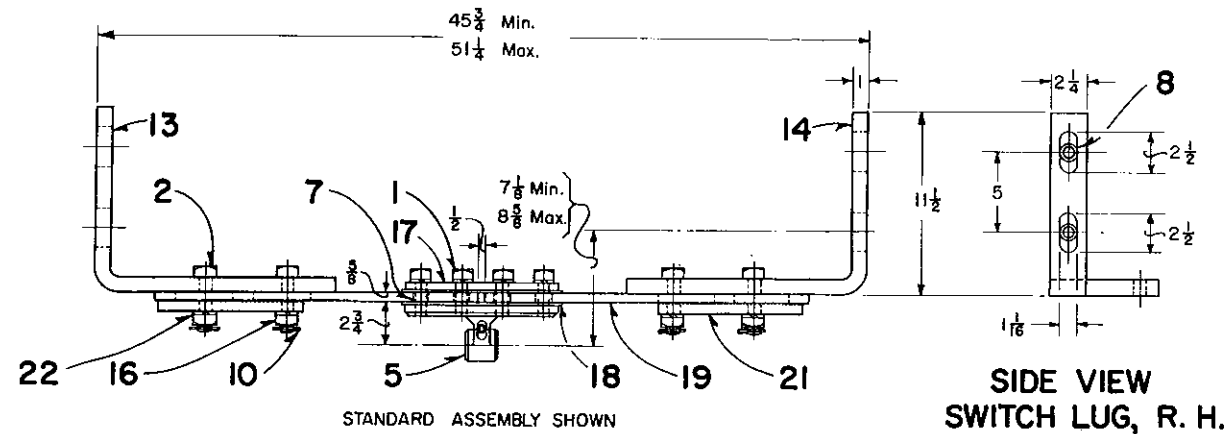
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
127-105 LB. RAIL

Approved *R. J. Bottinelli*
 Chief Signal Engineer

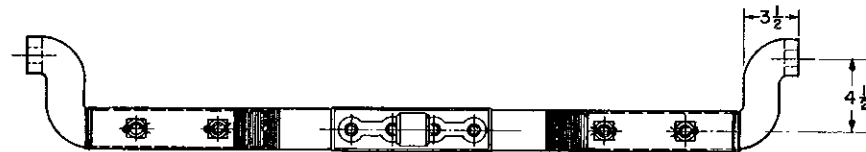
S-3000

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ISSUED...3-15-60
 SHEET...3...Cont'd on Sh.....

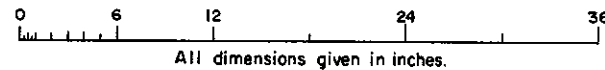


STANDARD ASSEMBLY SHOWN
Assembly To Be Made As Indicated On Switch Layout Plans.

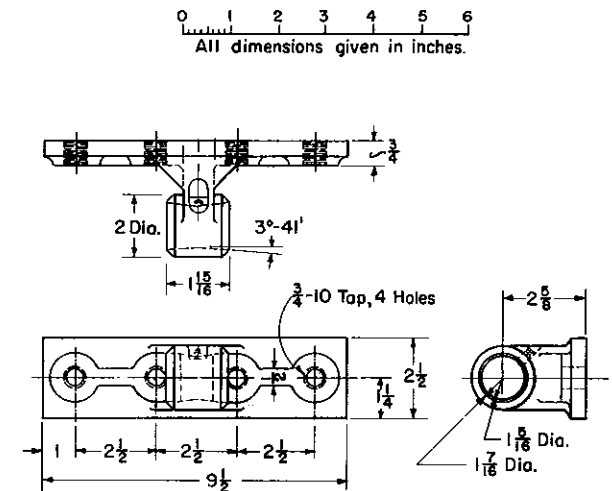
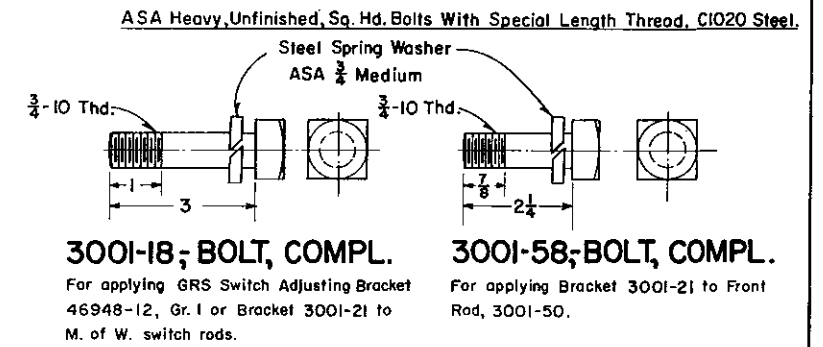


3001-50, FRONT ROD, ADJUSTABLE

APPLIES TO 127 LB. RAIL. FOR 105 LB. RAIL SPECIFY BUSHINGS, ITEMS 8 & 9.



NO.	ITEM	3001-50	3001-51	3001-53	REMARKS
1	Bolt, 3/4-10 X 2-1/4, Sq. Hd.	4	4	4	
2	Bolt, 3/4-10 X 3-1/2, Sq. Hd.	4	2	2	
3					
4					
5	Bracket, Compl.	1	1	1	
6					
7	Bushing, Insulation	4	4	4	
8	Bushing - For 3/4 Bolt, Front Rod only	2	2	2	105 Lb. Rail
9	Bushing - For 3/4 Bolt, Front Rod & Point Lug	2			105 Lb. Rail
10	Cotter Pin 3/16 X 1-1/4	4	2	2	
11					
12					
13	Lug, Switch L. H.	1	1		
14	Lug, Switch R. H.	1		1	
15					
16	Nut, 3/4-10 Thd., Sq. Hd.	4	2	2	
17	Plate, Connecting	1	1	1	
18	Plate, Insulation	2	2	2	
19	Plate, Center	2	1	1	
20	Rod, Front - Straight		1	1	
21	Washer, Plate	2	1	1	
22	Washer, Lock - 3/4	4	2	2	



NOTES:

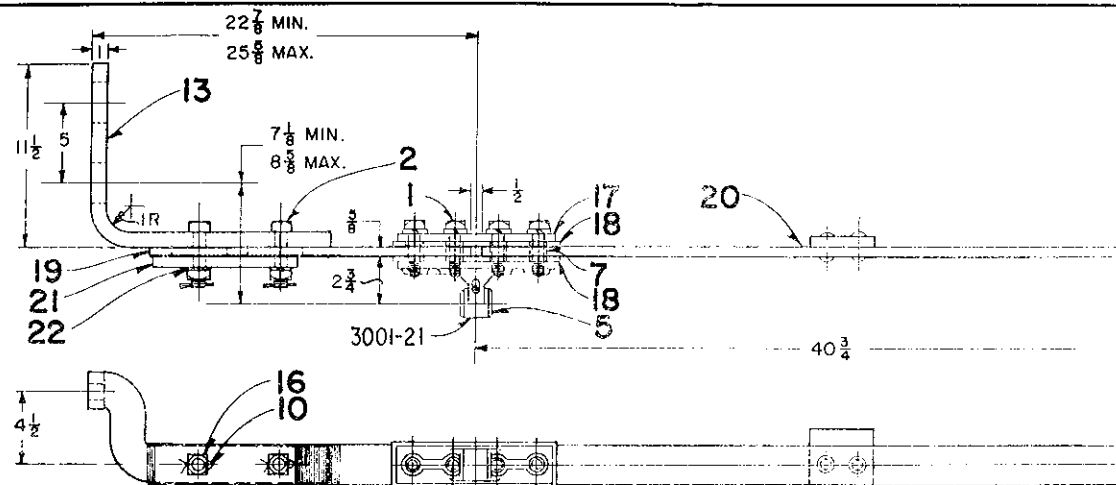
- 1 - Bolts, Nuts and Threads to be as specified on N.Y.C.S. Plan G35 unless otherwise indicated.
- 2 - Washers to be in accordance with current AREA specifications.
- 3 - Protective treatment - Primer, Item 31, Instr. 350. or manufacturer's equivalent.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
FRONT RODS
ADJUSTABLE

S-3001

ISSUED 9-8-59

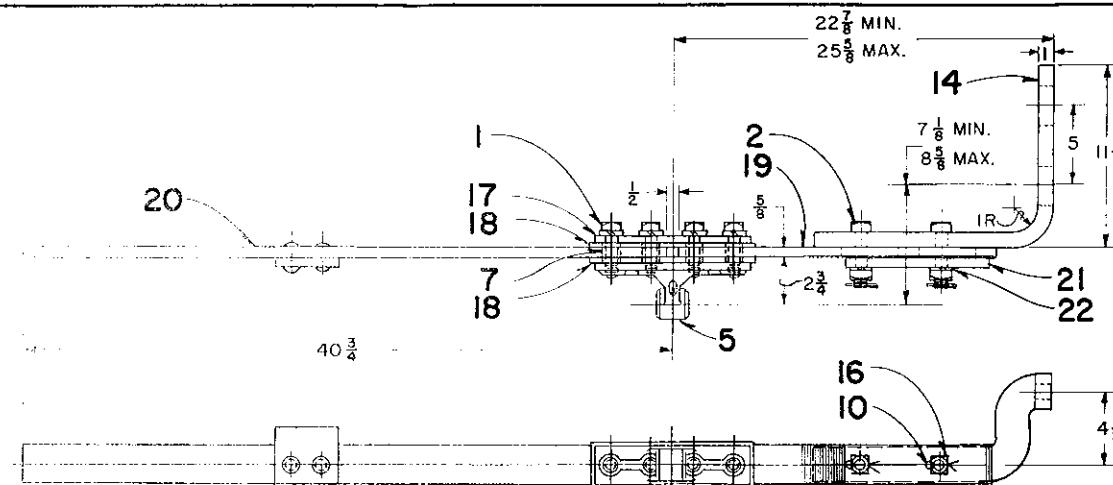
SHEET 1 Cont'd on Sh. 2



SCALE A

3001-51,-FRONT ROD,ADJUSTABLE-L.H. DERAIL

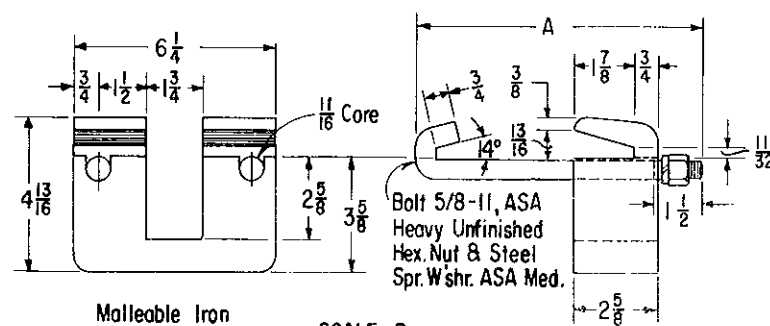
APPLIES TO 127 LB. RAIL. FOR 105 LB. RAIL SPECIFY BUSHINGS, ITEM 8.



SCALE A

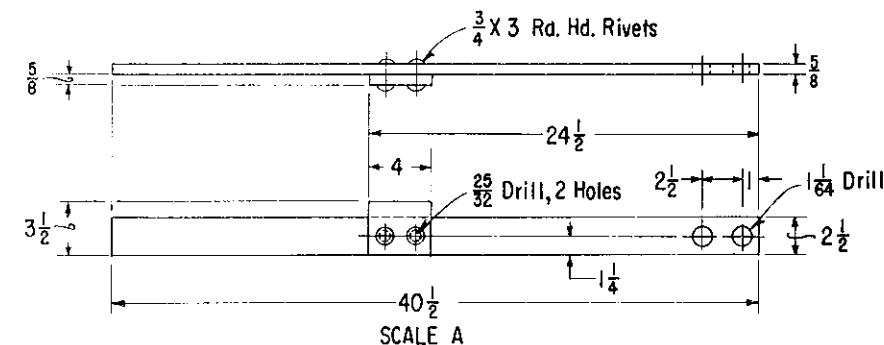
3001-53; FRONT ROD, ADJUSTABLE-R. H. DERAIL

APPLIES TO 127 LB. RAIL. FOR 105 LB. RAIL SPECIFY BUSHINGS, ITEM 8.



3001-35, GUIDE COMPL., 127 lb. rail A = 9

3001-36, GUIDE COMPL., 105 lb. rail A = 8



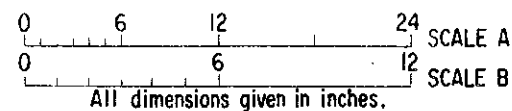
3001-59, FRONT ROD,-STRAIGHT END

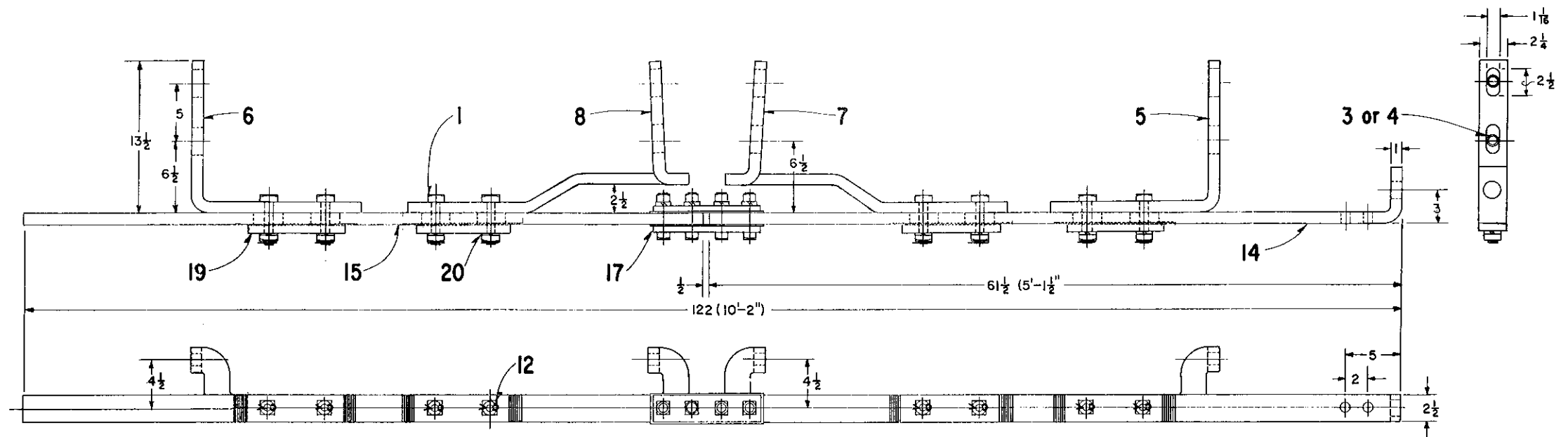
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
FRONT RODS
FOR SWITCH POINT DERAILS

S-3001

ISSUED...9-8-59...

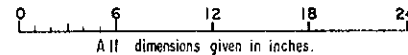
SHEET 2 Cont'd on Sh. 3





3001-60, FRONT ROD, COMPLETE

APPLIES TO 127 LB. RAIL. FOR 105 LB. RAIL SPECIFY BUSHING, ITEMS 3 OR 4. SEE NOTE 1.



NO	ITEM	3001-60	REMARKS
1	Bolt - 3/4-10 X 3-3/4 With Square Nuts	8	
2			
3	Bushing, For 3/4 in. Bolt - Specify if required	GRS 6714-309	* Note 1
4	Bushing, " " " " " " " "	GRS 8104-2	* Note 1
5	Lug, R. H.	1	
6	Lug, L. H.	1	
7	Lug, R. H.	1	
8	Lug, L. H.	1	
9			
10			
11			
12	Pin, Cotter 3/16 X 1-1/4	8	
13			
14	Rod, Connecting, Bent	1	
15	Rod, " "	1	
16			
17	Sw. Rod Insulation, Complete	AAR 10556	1
18			
19	Washer Plate, Serrated	4	
20	Washer, 3/4" Lock	8	

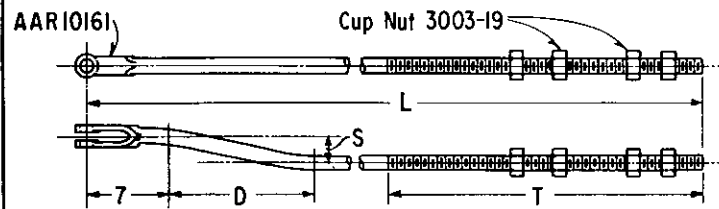
NOTES:

- For use with 105 lb. rail two bushings are required for each lug. Item 4 is required where a point detector lug is attached. Otherwise Item 3 is required.
- Bolts, nuts and threads to meet specifications of N. Y. C. S. Pton G-35 unless otherwise indicated.
- Material - C1020 steel.
- Protective treatment - Primer, Item 31, Instr. 350 or manufacturer's equivalent.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
FRONT RODS
DOUBLE SLIP SWITCH

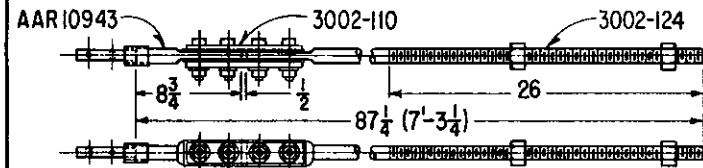
Approved R. S. Battinelli
 Chief Signal Engineer

S-3001

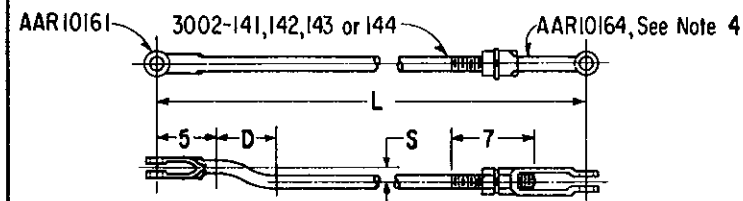


THROW RODS COMPLETE

NO.	L	S	D	T	HEX. NUTS	CUP NUTS
3002-8	59	1-3/16	6	26	2	0
3002-9	59	2-3/16	6	26	2	0
3002-10	68	3-1/4	10	12	2	0
3002-11	68	2-1/2	12	26	2	2
3002-12	68	2-1/2	12	26	2	0
3002-13	81	1-5/8	12	26	2	2
3002-14	54	2-13/16	6	22	2	0
3002-15	75	1-3/16	6	26	2	0
3002-16	75	2-3/16	6	26	2	0
3002-17	117	0	-	26	2	0
3002-18	110	3-3/4	12	26	2	0

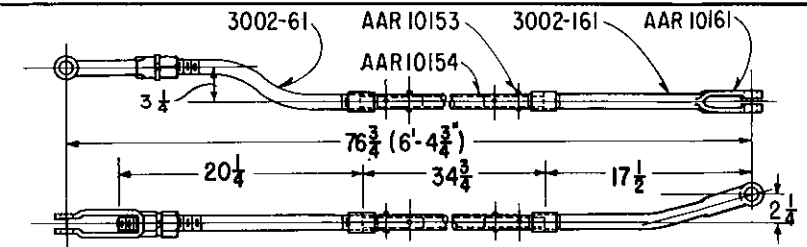


3002-21, THROW ROD COMPL.



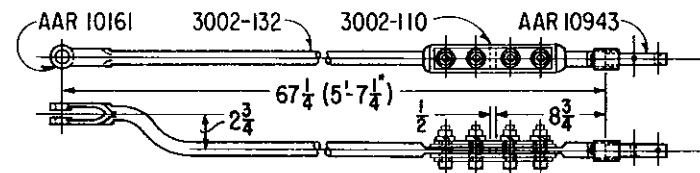
CONNECTING RODS, COMPL.

NO.	L	S	D	With Rod.
3002-31	33-3/4	0	-	3002-141
3002-32	35-1/4	0	-	3002-142
3002-33	25-1/2	0	-	3002-143
3002-34	30-1/2	1-1/8	5	3002-144

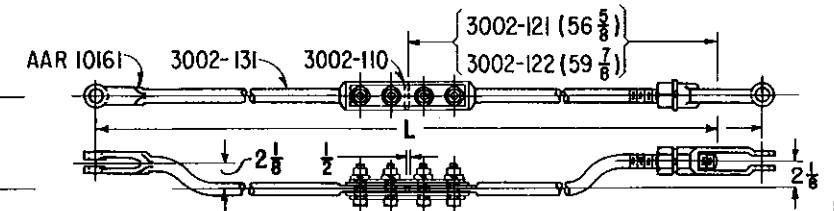


CONNECTING ROD

3002-71, COMPL., With screw jaw AAR 10164
3002-72, ROD ONLY, Less screw jaw.



3002-51, CROSS CONNECTING ROD COMPL.

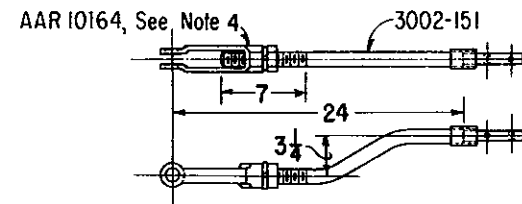


CROSS CONNECTING RODS

3002-81, COMPL., With screw jaw. With 3002-122 L=116
3002-82, ROD ONLY, Less screw jaw. With 3002-122 L=111-3/4
3002-83, COMPL., With screw jaw. With 3002-121 L=112-3/4
3002-84, ROD ONLY, Less screw jaw. With 3002-121 L=108-1/2

NOTES:

- 1-Rods to be of C1020 steel, 1-1/4 inches in diameter. Factory welds permitted but rods shall not be welded or reformed after manufacture. Portions which have been subjected to forging or welding operations to be normalized.
- 2- Nuts shall be of C1020 steel, ASA heavy hex. jam nuts unless otherwise indicated.
- 3- Threads shall be 1 1/4-7, external threads shall be ASA-UNC-2A with rounded root throughout. Internal threads shall be ASA-UNC-2B.
- 4- Screw Jaws are AAR 10164 and will be furnished complete with hex. nuts and ASA medium lock washers.
- 5- Protective treatment-Primer, Item 31, Instruction 350.



3002-61, TANG END ROD COMPL.

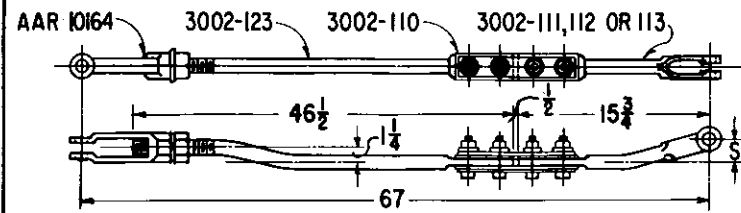


NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT RODS FOR SWITCH LAYOUTS

S-3002

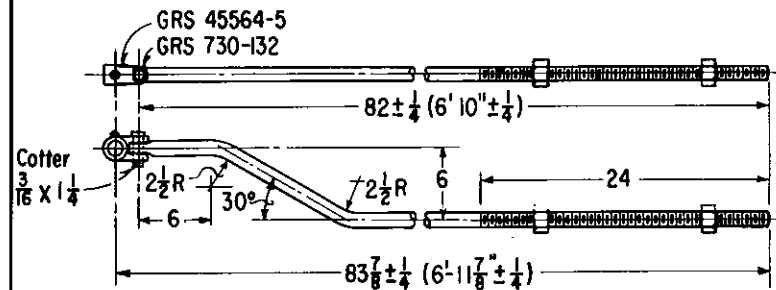
ISSUED 5-26-60

SHEET... Cont'd. on Sh. 2...



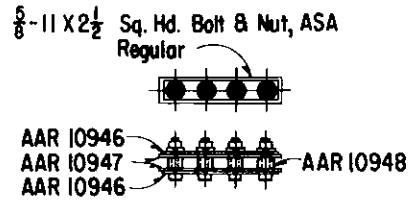
DERAIL CONNECTING RODS

- 3002-91, COMPL., With screw jaw. With 3002-111, S=1-7/8
 3002-92, ROD ONLY, Less screw jaw. With 3002-111, S=1-7/8.
 3002-93, COMPL., With screw jaw. With 3002-112, S=1
 3002-94, ROD ONLY, Less screw jaw. With 3002-112, S=1
 3002-95, COMPL., With screw jaw. With 3002-113, S=0
 3002-96, ROD ONLY, Less screw jaw. With 3002-113, S=0

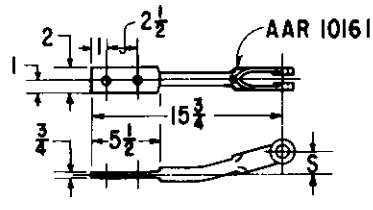


- 3002-101, THROW ROD COMPL., With Jaw and Pin
 3002-102, THROW ROD ONLY, Less Jaw and Pin

See Notes on Sheet 1.

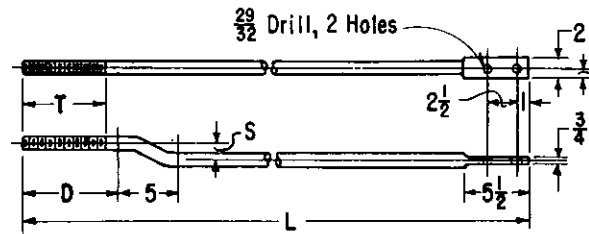


3002-110, SPLICE COMPL. INSULATED



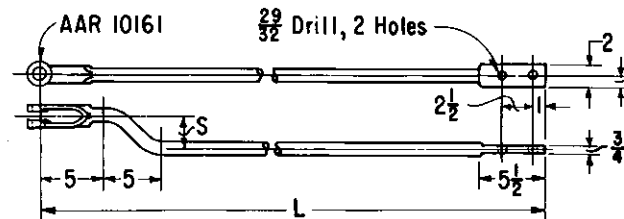
SOLID JAW, SPLICE END

- 3002-111, S=1-7/8
 3002-112, S=1
 3002-113, S=0



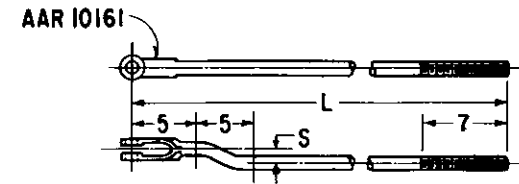
SPLICE END RODS, THREADED

- 3002-121, L=56-5/8 S=2-1/8 T=7 D=8
 3002-122, L=59-7/8 S=2-1/8 T=7 D=8
 3002-123, L=46-1/2 S=1-1/4 T=7 D=8
 3002-124, L=78 S=0 T=26 D=0



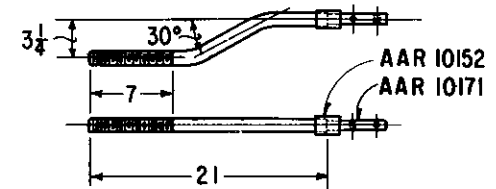
SOLID JAW ROD, SPLICE END

- 3002-131, L=51-3/8 S=2-1/8
 3002-132, L=58 S=2-3/4

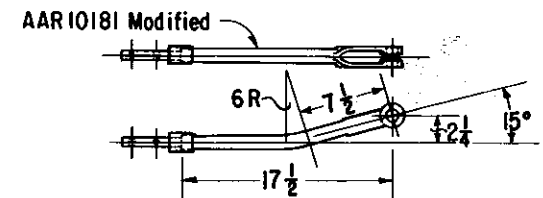


SOLID JAW RODS, THREADED

- 3002-141, L=29-1/2 S=0
 3002-142, L=31 S=0
 3002-143, L=21-1/4 S=0
 3002-144, L=26-1/4 S=1-1/8



3002-151, TANG END ROD, THREADED



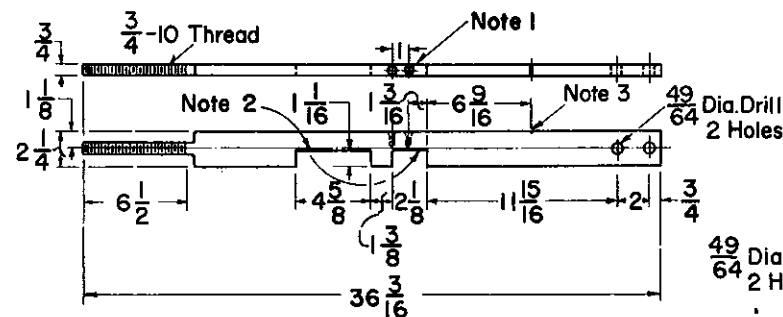
3002-161, SOLID JAW ROD, TANG END

0 12 24 36
 All dimensions given in inches.

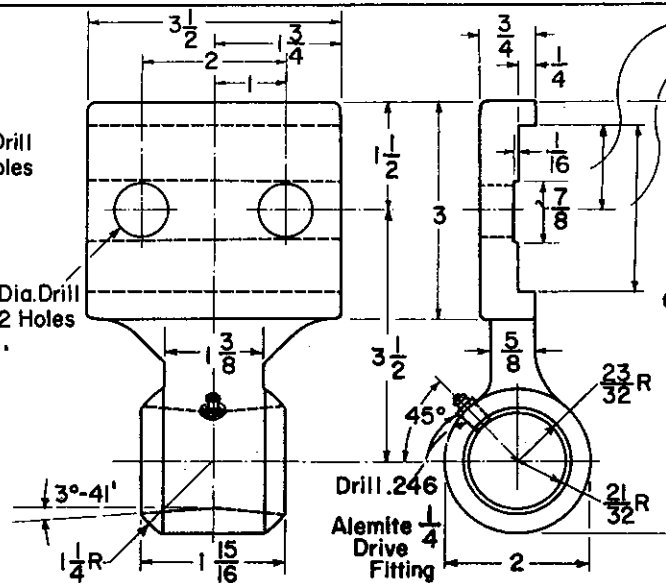
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
RODS
FOR SWITCH LAYOUTS

Approved *H. Scott*
 Chief Signal Engineer

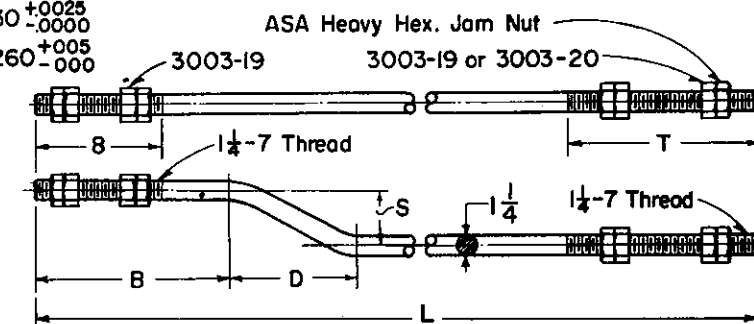
S-3002



3003-15 LOCK PLATE
C1020 Steel forged



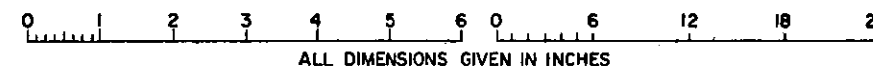
3003-18 LUG
Steel ASTM-A27-46T, Grade 65-30



ROD ONLY (C1020 STEEL)						ROD ONLY-WITH NUTS				
NO.	L	S	B	D	T	NO.	ROD	JAM NUT	3003-19	3003-20
3003-11	67	1-1/2	12	8	12	3003-21	3003-11	4	4	—
3003-12	58	2-1/2	12	8	12	3003-22	3003-12	4	4	—
3003-13	58	3-1/2	12	8	12	3003-23	3003-13	4	4	—
3003-111	24-3/4	1	9-3/8	6	8	3003-121	3003-111	4	2	2
3003-112	24-3/4	1-3/16	9-3/8	6	8	3003-122	3003-112	4	2	2
3003-113	67	2-7/8	12	8	12	3003-123	3003-113	4	4	0
3003-114	74	3-1/2	12	8	12	3003-124	3003-114	4	4	0
3003-115	74	4-1/4	12	8	12	3003-125	3003-115	4	4	0
3003-116	67	3/4	12	8	12	3003-126	3003-116	4	4	—

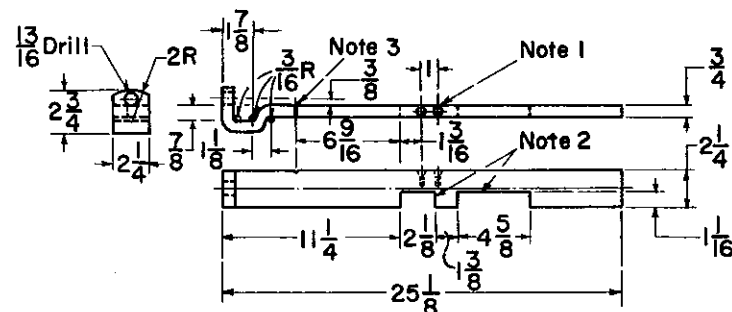
NOTES:

- 1.- TAP 5/16-18 X 5/8 THREAD. COUNTERSINK 82° TO 3/8 DIAMETER. CENTERLINE OF HOLES MUST BE PARALLEL WITH SIDE OF PLATE.
- 2.- LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS, FREE FROM BURRS AND HAVE STRAIGHT EDGES.
- 3.- LOCATING NOTCHES 1/32 DEEP, 1/32 WIDE.
- 4.- ALL NUTS TO BE C1020 STEEL, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED CHAMFERED AND FACED.
- 5.- PROTECTIVE TREATMENT, INSTRUCTION 360: MACHINED AND THREADED PARTS ITEM 61; OTHER PARTS, PRIMER, ITEM 31.
- 6.- EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT. INTERNAL THREADS SHALL BE ASA-UNC-2B.

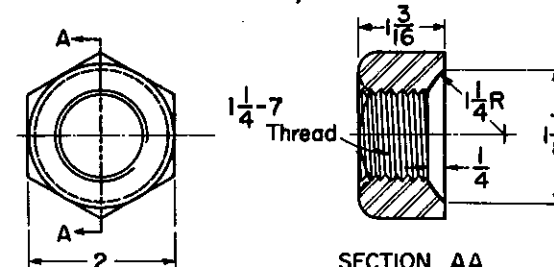


NEW YORK CENTRAL SYSTEM
SIGNAL STANDARD
LOCK RODS
GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
DETAILS

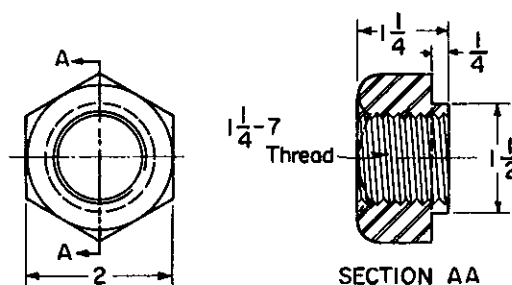
S-3003



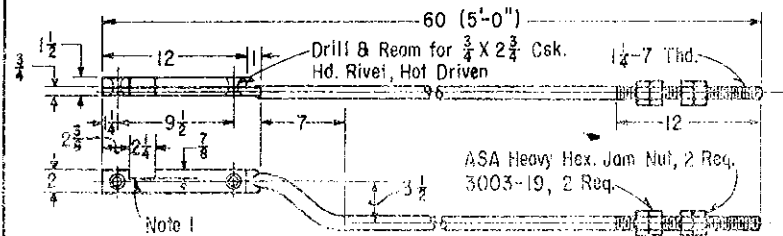
3003-17 LOCK PLATE
C1020 Steel forged



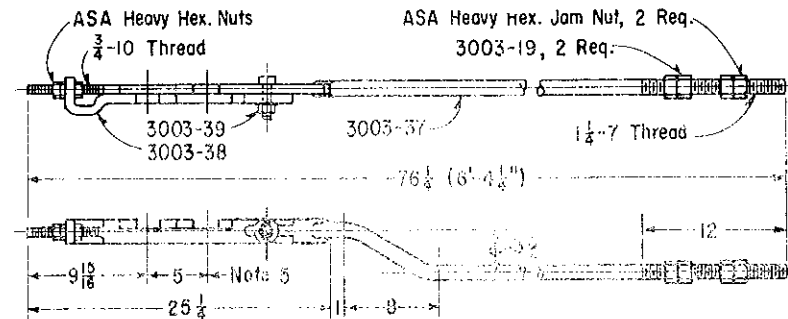
3003-19 CUP NUT
C1020 STEEL



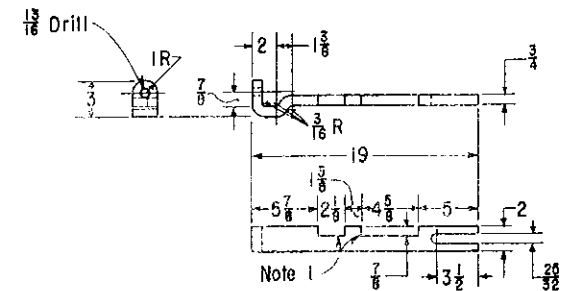
3003-20 SLEEVE NUT
C1020 STEEL



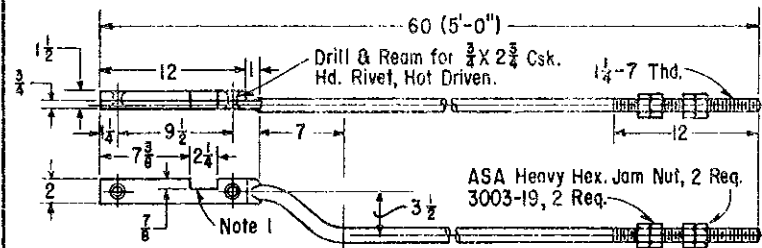
3003-31, LOCK ROD COMPLETE
USE AT OPEN SWITCH POINT



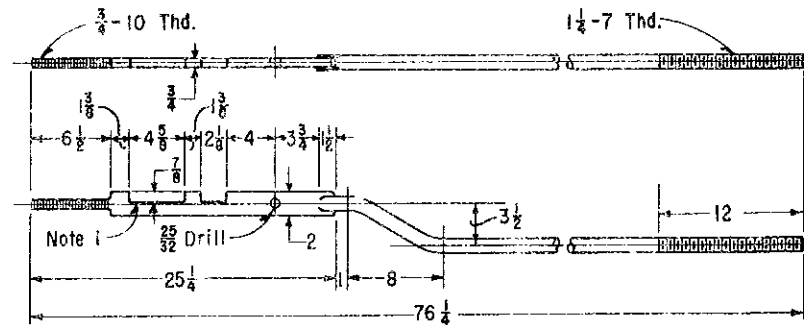
3003-35, LOCK ROD COMPLETE



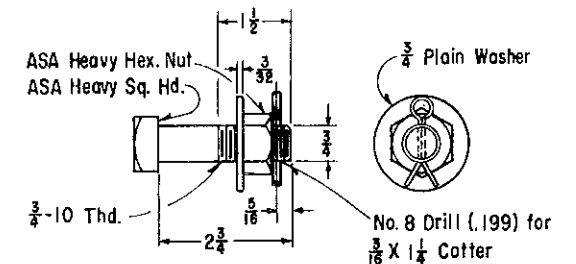
3003-38, LOCK PLATE



3003-33, LOCK ROD COMPLETE
USE AT CLOSED SWITCH POINT



3003-37, LOCK ROD ONLY



3003-39, BOLT COMPLETE

NOTES:

- 1 - Locking notches must be accurate to dimensions, free from burrs and have straight edges.
- 2 - All nuts to be of C-1020 steel, shall be hot forged, cold trimmed, normalized, chamfered and faced.
- 3 - All rods to be of C-1020 steel, 1-1/4 inches in diameter. Factory weld permitted; portions which have been subjected to forging or welding operations to be normalized. Rods must not be welded or reformed after manufacture.
- 4 - External threads shall be ASA-UNC-2A with rounded root throughout. Internal threads shall be ASA-UNC-2B.

- 5 - Assembly shown for 5 inch throw and may be adjusted from 3-1/2 to 6 inch throw.
- 6 - Protective treatment-Primer, Item 31, Instruction 350.

0 6 12 24 36

0 1 2 3 4 5 6

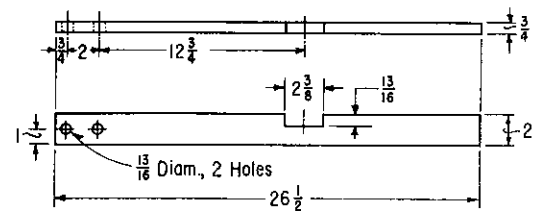
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
LOCK RODS
MECHANICAL SWITCH LAYOUTS

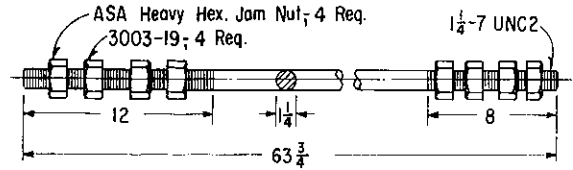
S-3003

ISSUED 9-8-59

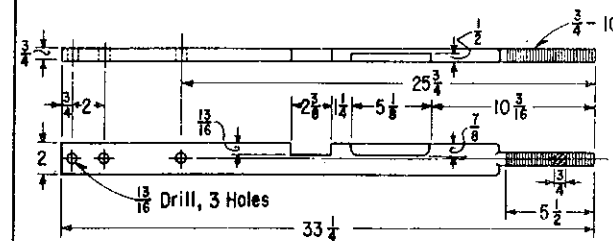
SHEET 3 Cont'd. on Sh. 4



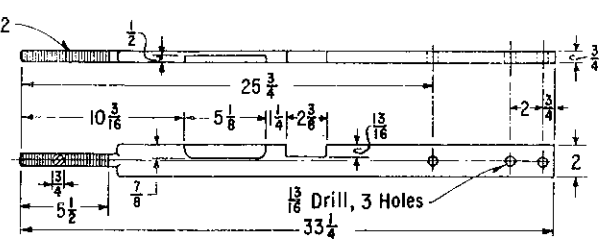
3003-54,-THROUGH PLATE



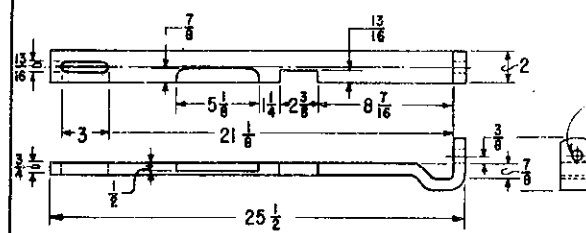
3003-58,- ROD, ONLY
3003-59,- ROD, COMPL. WITH NUTS



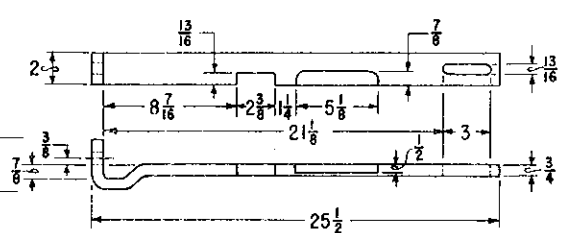
3003-55,-THROUGH PLATE



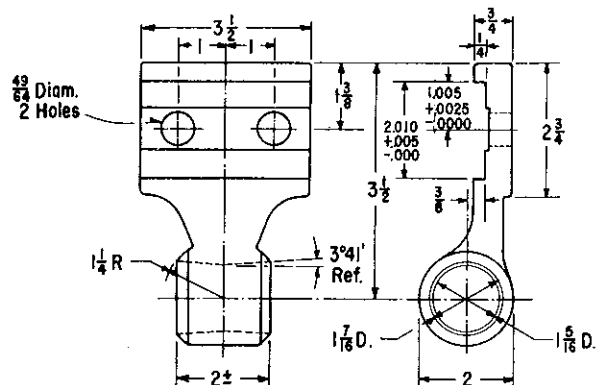
3003-60,-THROUGH PLATE



3003-56,-LOCK PLATE



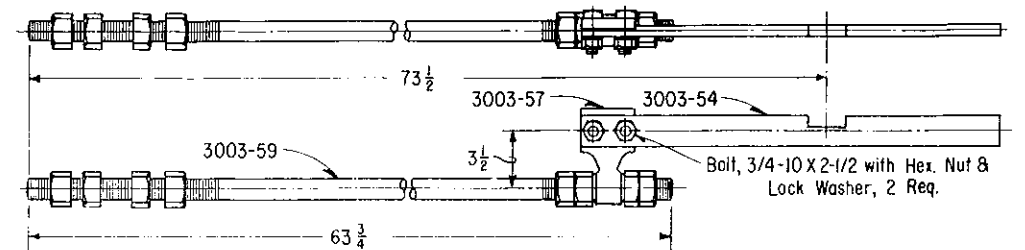
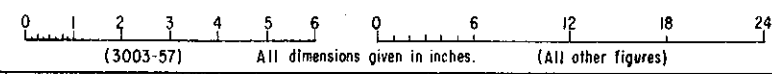
3003-61,- LOCK PLATE



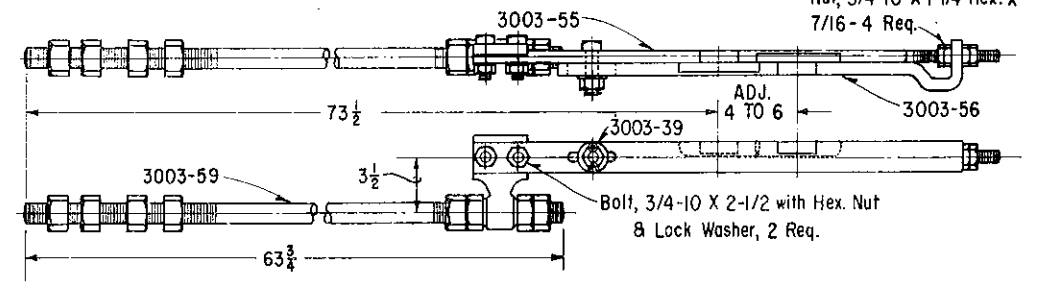
3003-57,- LUG
MATERIAL- CAST STEEL ALLOY

NOTES:

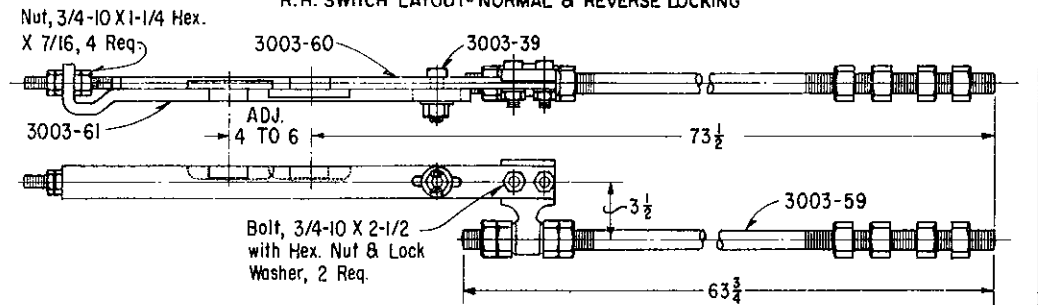
- 1.- Material - C. D. Steel AISI-1335 unless otherwise noted.
- 2.- Rods must not be welded or reformed after manufacture.
- 3.- Rods will have one coat of primer when supplied by manufacturer.
Rods reissued by Signal Dept. shop to have one coat of primer,
Item 31, Instruction 350.



3003-51,-LOCK ROD, COMPLETE
R. H. OR L. H. LAYOUT-NORMAL LOCKING ONLY



3003-52,-LOCK ROD, COMPLETE
R. H. SWITCH LAYOUT-NORMAL & REVERSE LOCKING



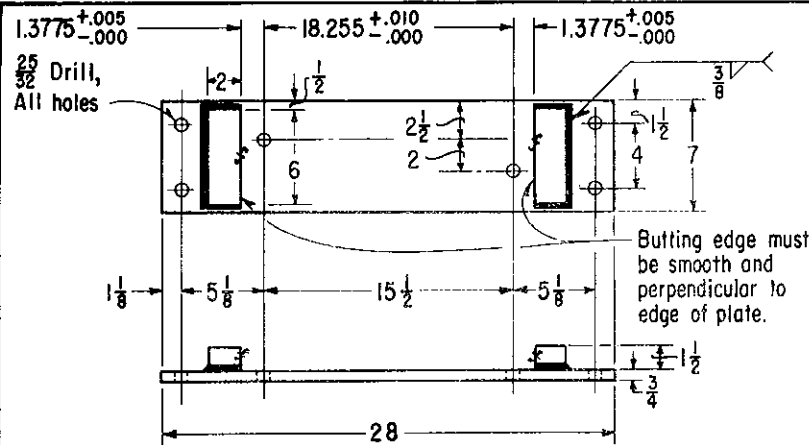
3003-53,-LOCK ROD, COMPLETE
L. H. SWITCH LAYOUT-NORMAL & REVERSE LOCKING

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
LOCK RODS

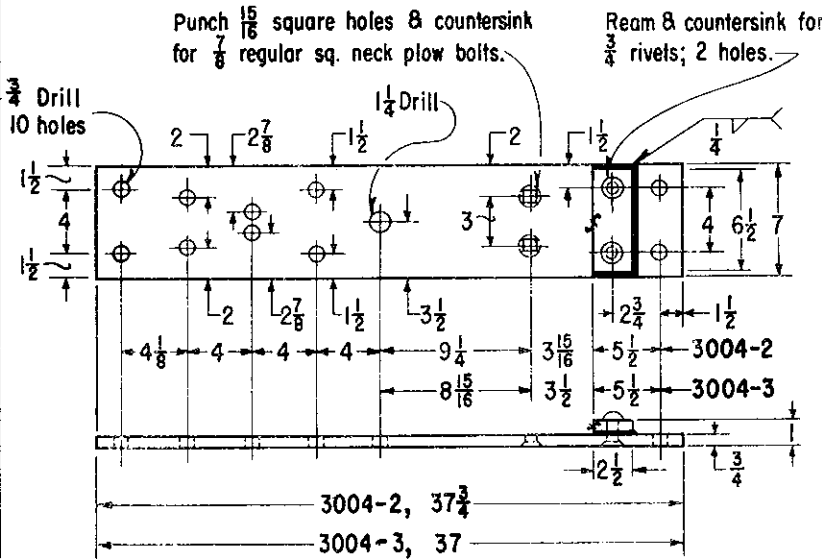
GRS MODEL 9 SWITCH MACH.

Approved *D. J. Battinelli*
Chief Signal Engineer

S-3003

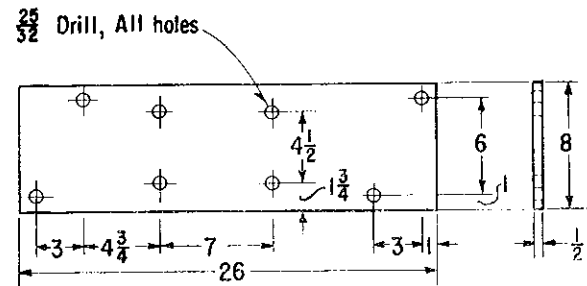


3004-1, SADDLE PLATE COMPL. G.R.S. Model 5 Sw. Moch.

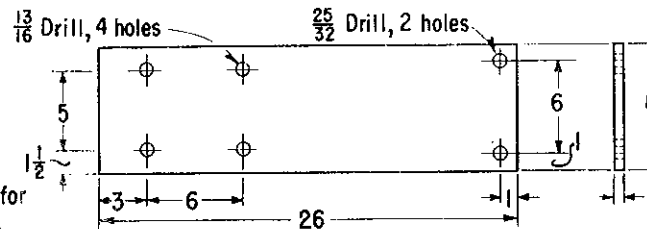


3004-2, TIE PLATE COMPL. HBP Derail, 127 lb. rail.

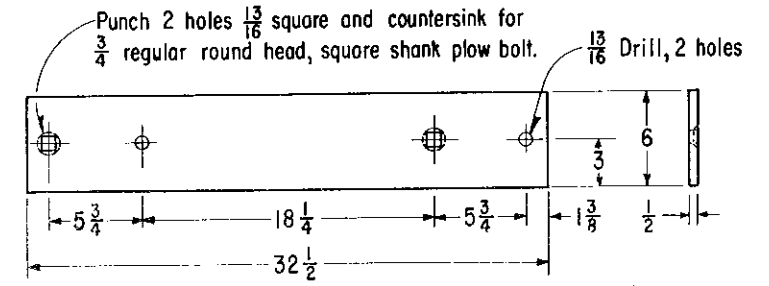
3004-3, TIE PLATE COMPL. HBP Derail, 105 lb. rail.



3004-4, BASE PLATE, Plunger Lock.



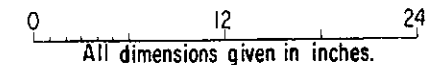
3004-5, BASE PLATE, Crank Stand.



3004-8, BASE PLATE, Model 10 Tandem Lock.

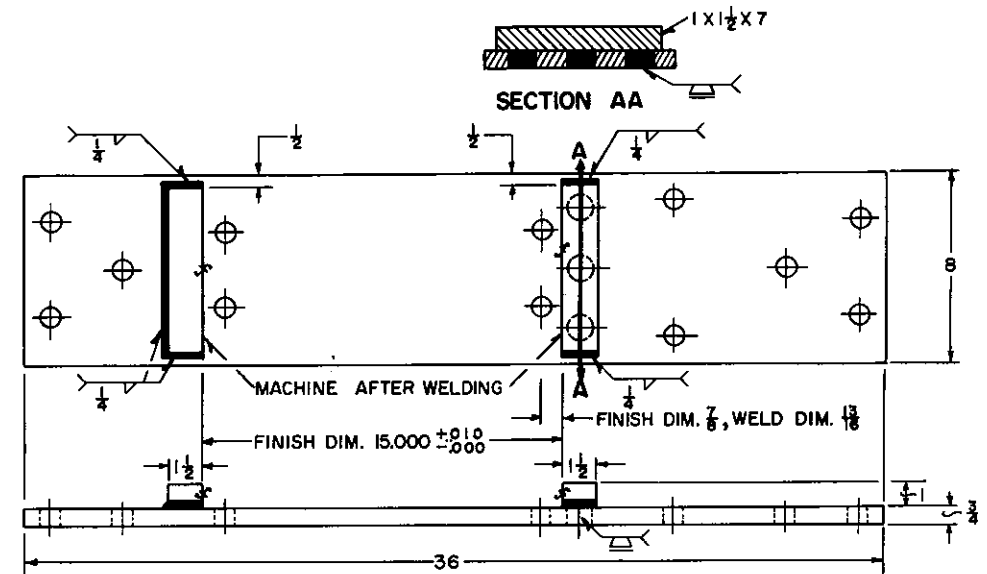
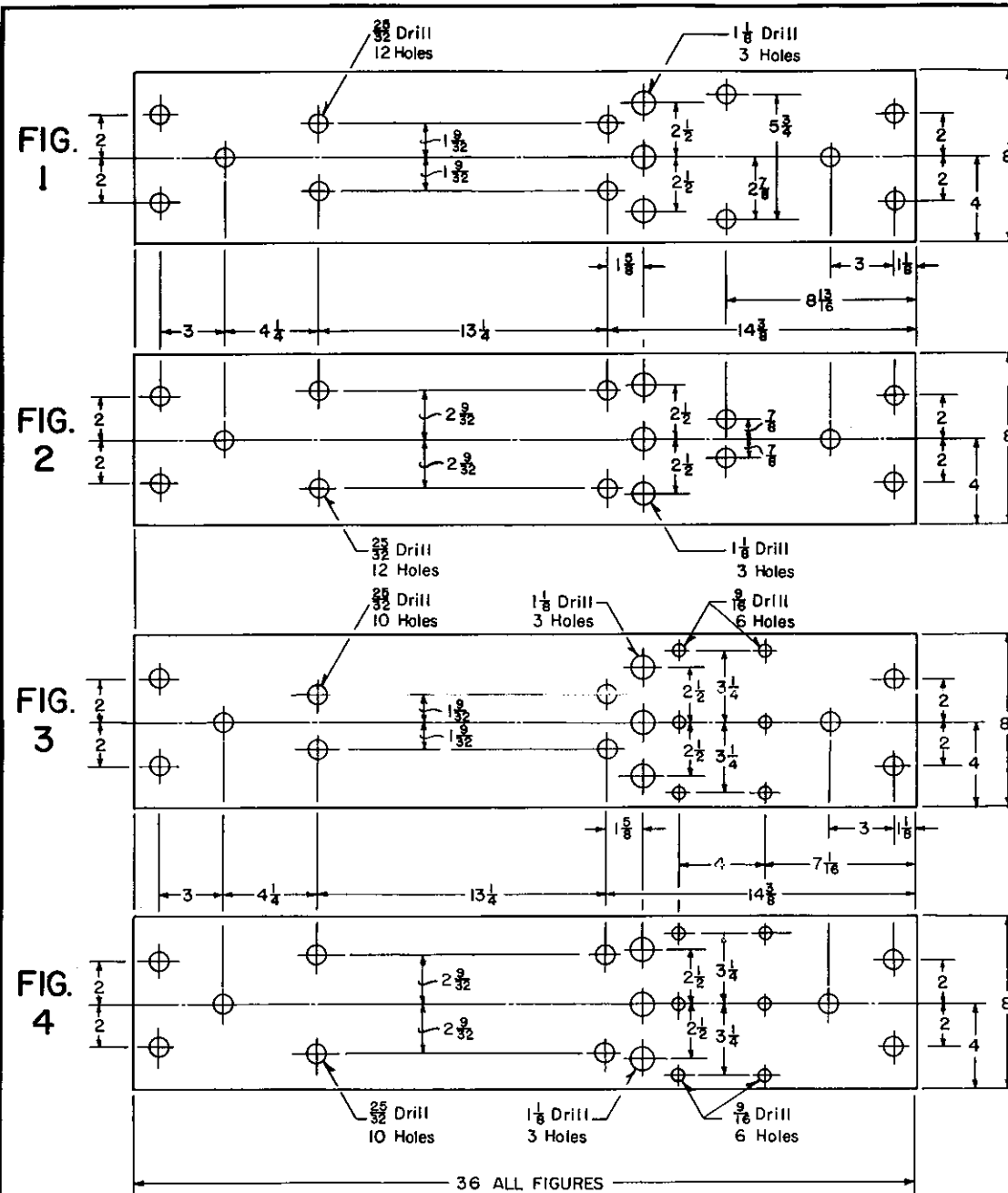
NOTES:

- 1 - Rail Braces used with 3004-2 and 3004-3 are to be adjustable and removable and will be furnished by M. of W. Dept.
- 2 - Material - C1020 steel.
- 3 - Protective treatment - Primer, Item 31, Instruction 350.



NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT BASE PLATES FOR SWITCH LAYOUTS

S-3004



3004-11, SADDLE PLATE, COMPL. With drilling Fig. 1 for Tie 2 with lock (Shown).
 3004-12, SADDLE PLATE, COMPL. " " Fig. 2 " Tie 1 " tandem lock.
 3004-13, SADDLE PLATE, COMPL. " " Fig. 3 " Tie 2 " latch stand.
 3004-14, SADDLE PLATE, COMPL. " " Fig. 4 " Tie 1 " latch stand.

NOTES: 1. Material- C1020 steel.
 2. Protective treatment-Primer, Item 31, Instruction 350.

0 6 12 24
 All dimensions given in inches.

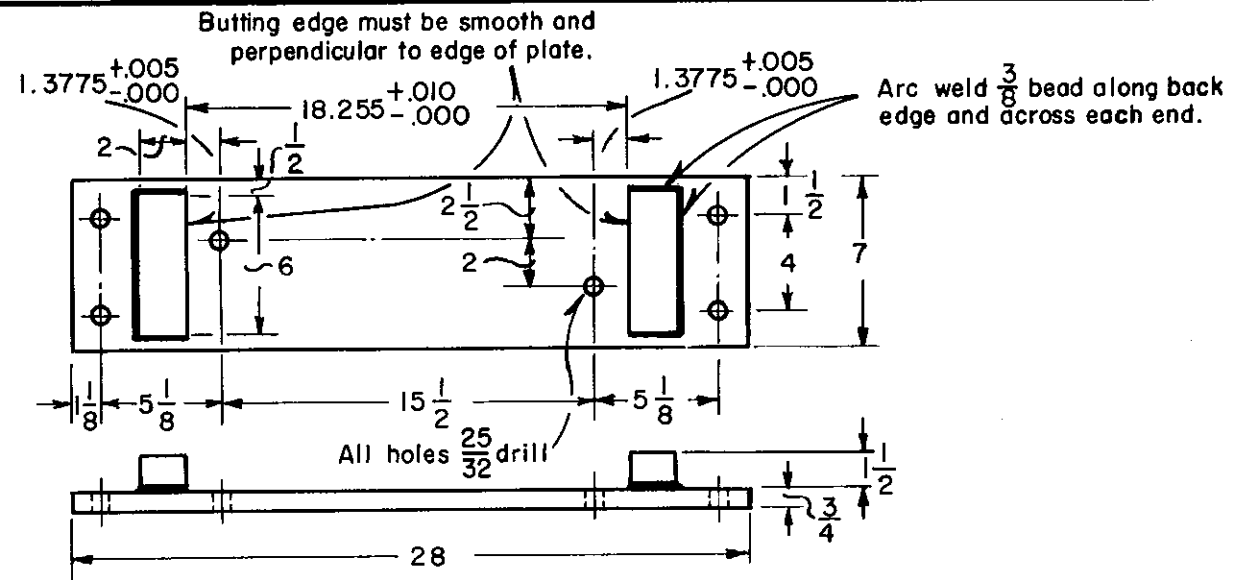
NEW YORK CENTRAL SYSTEM
 SIGNAL DEPARTMENT.
 BASE PLATES
 FOR GRS MODEL 9 SWITCH MACHINE

Approved *H. A. Scott*
 Chief Signal Engineer

S-3004

Printed in U.S.A.

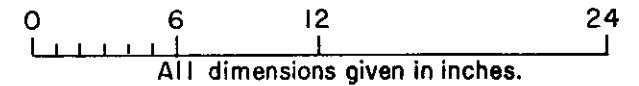
ISSUED J2-23-57
 SHEET 2 Cont'd on Sh.



3004-1, SADDLE PLATE COMPLETE
C-1020 Steel - For Layout 3000

Note:

Protective treatment - Primer, Item 31, Instruction 350.

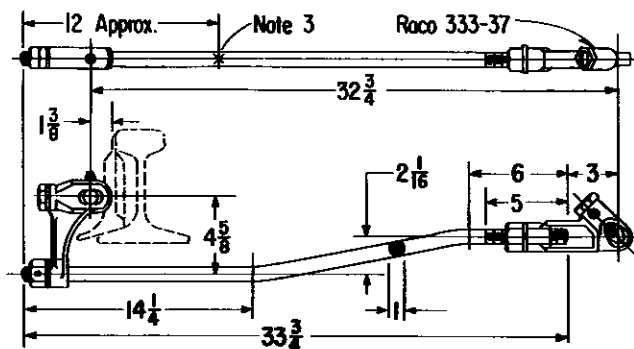


NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SADDLE PLATE
FOR GRS 5A OR 5C SWITCH MACHINE

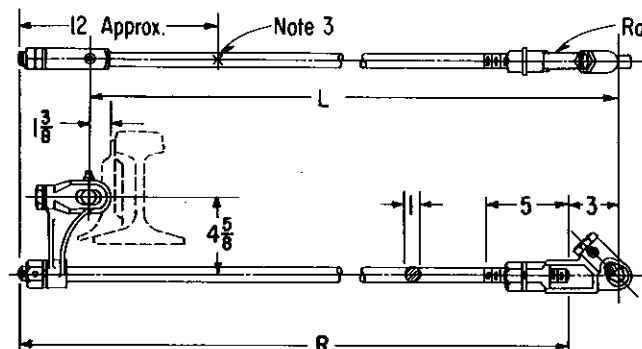
Approved - *[Signature]*
Chief Signal Engineer

S-3004

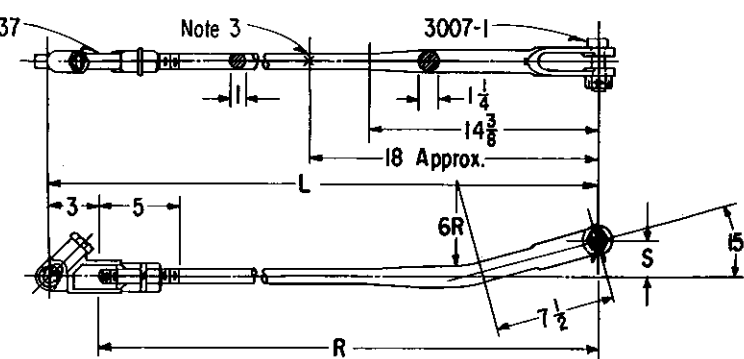
ISSUED 6-1-54



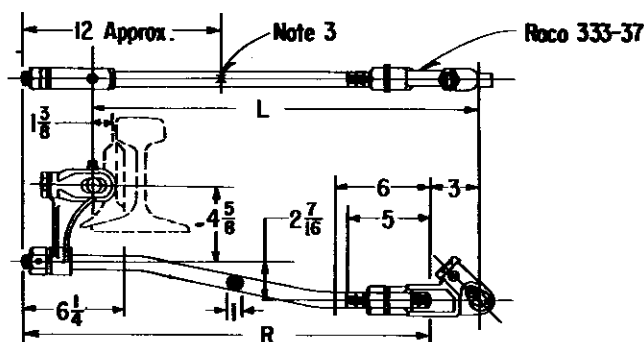
3005-1, ROD COMPLETE
3005-11, ROD & POINT SOCKET ASSEMBLY



3005-3, ROD COMPLETE L=33-7/8
3005-13, ROD & POINT SOCKET ASSEMBLY R=34-7/8
3005-4, ROD COMPLETE L=46-3/8
3005-14, ROD & POINT SOCKET ASSEMBLY R=47-3/8

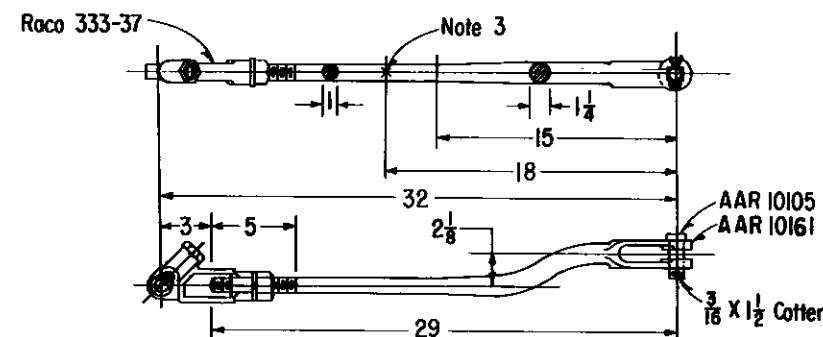


3005-6, ROD COMPLETE L=62-1/8
3005-16, ROD ONLY R=59-1/8 S=2-1/4
3005-7, ROD COMPLETE L=84
3005-17, ROD ONLY R=81 S=0



3005-2, ROD COMPLETE L=23-3/4
3005-12, ROD & POINT SOCKET ASSEMBLY R=24-3/4
3005-9, ROD COMPLETE L=39-1/4
3005-19, ROD & POINT SOCKET ASSEMBLY R=40-1/4

- NOTES: 1- Rods to be of 1335 steel. Factory welds permitted but rods shall not be welded or reformed after manufacture. Portions which have been subjected to forging or welding operations to be normalized.
2- Threads shall be 1-8, external threads shall be ASA-UNC-2A with rounded root throughout. Internal threads shall be ASA-UNC-2B.
3- Manufacturer's identification to be stamped on each rod at "X."
4- For lengths not shown specify rod number and length required.
5- Protective treatment-Primer, Item 31, Instruction 350.



3005-8, ROD COMPLETE
3005-18, ROD ONLY

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT POINT DETECTOR RODS

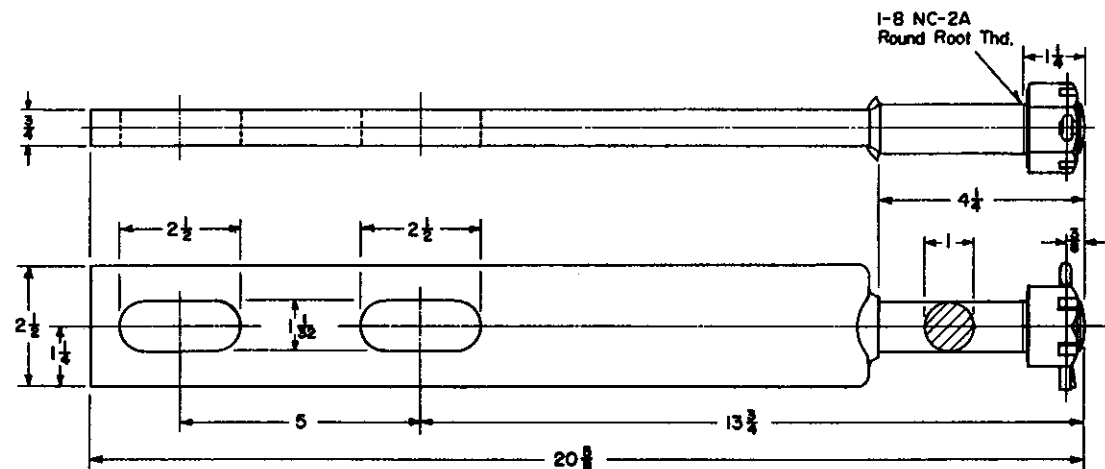
Approved *R. J. Battwell*
Chief Signal Engineer

S-3005

Printed in U.S.A.

0 6 12 18 24
All dimensions given in inches.

ISSUED 5-26-60
SHEET 1 Cont'd. on Sh.

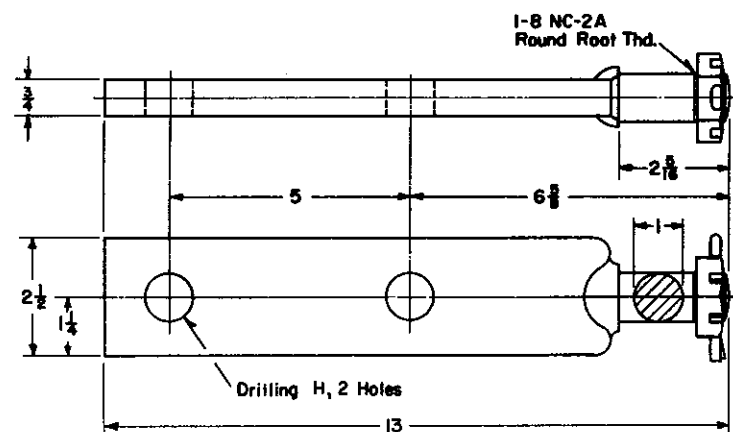


MATERIAL C-1020 STEEL

3006-21, POINT LUG, Compl. with Nut & Cotter

3006-31, POINT LUG, Only

BUSHINGS REQUIRED FOR 3/4 IN. BOLTS (105 LB. RAIL) SEE PLAN 3001, ITEMS 8 OR 9.



MATERIAL C1020 STEEL

3006-23, POINT LUG, Compl. with Nut & Cotter.

H=1-1/16

3006-33, POINT LUG, Only

H=1-1/16

3006-24, POINT LUG, Compl. with Nut & Cotter.

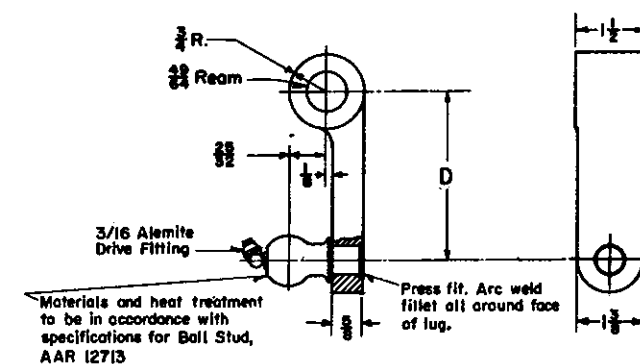
H=13/16

3006-34, POINT LUG, Only

H=13/16

NOTE:

1.-Protective treatment-Primer, Item 31, Instruction 350 or manufacturer's equivalent.



MATERIAL-CAST STEEL

3006-9, BALL-STUD LUG, Compl.

D=3-1/2

3006-10, BALL-STUD LUG, Compl.

D=2-1/2

0 1 2 3 4 5 6
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL STANDARD LUGS FOR POINT DETECTOR RODS

Approved *R. C. Kammatt*
Director Communications & Signals

S-3006

333-5 CAP.

333-4 SPRING

333-3 PLUNGER

333-32 PLUNGER

ALEMITE FITTING #1633

333-5 CAP.

333-4 SPRING

333-33A BEARING
2 REQUIRED.

1 1/2" RD. HD. 4

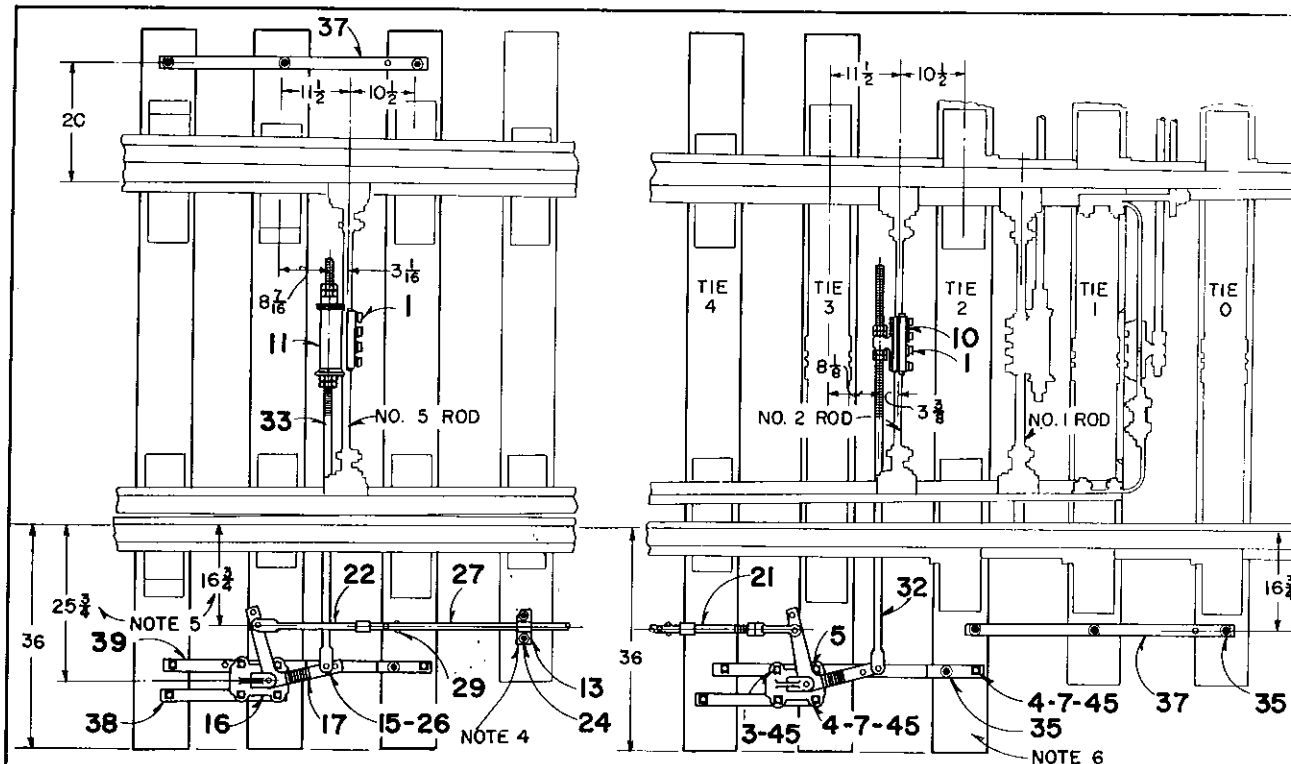
333-13 1" LOCK WASHER

333-11 1" HEX NUT 9/16 THK.

333-36 RACO POINT SOCKET

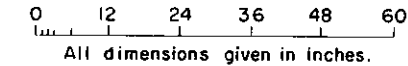
PARTS 333-3 PLUNGER
333-4 SPRING
333-5 CAP
ARE ALSO USED FOR
333-7 RACO CONTROLLER SOCKET.
333-15 RACO POINT SOCKET.

RAILROAD ACCESSORIES CORPORATION.	
PARTS FOR RACO [#] 333 SOCKETS.	
NEW YORK, N. Y.	333
JUNE 1, 1943	SHEET 14



NOTE :

- 1 - This plan to be used as directed by Signal Engineer and in conjunction with Plans 3000 or 3900.
- 2 - To install switch adjustment bracket, Item 11, on Type MJ rods, retain splice plate and attach bracket using four bolts, 3001-19. On other vertical M. of W. Dept. rods, remove one splice plate and attach bracket using four bolts, 3001-18.
- 3 - Drilling for drive lags, Item 24, to be 3/8 in. diameter, 2 in. deep.
- 4 - Pipe carrier spacing and distance between first carrier and center line of crank must not exceed 60 inches.
- 5 Where adjacent to third rail, locate pipe line and crank stands 3 inches nearer to gage.
- 6 - For Tie No. 2, add 18 inches to length required on Plan 3000 or 3900



NO.	ITEM	REF.	REQ.	USE	NO.	ITEM	REF.	REQ.	USE
1	Bolt, 3/4 X 3-1/2	3001-19	8	On Type MJ Mot W Rods	24	Lag, Drive, Wshr. Hd. 1/2 X 3; 2-1/2 Thd.	* 21-C-360	As req.	Pipe carrier
2	Bolt, 3/4 X 3	3001-18	4	On Other Vertical Rods	25	Pin, Jaw	AAR10105	4	Cranks
3	Bolt, 3/4 X 2-1/2 Sq. Hd. & Nut.	ASA Regular	8	Crank Stands	26	Pipe, 1 Inch, With plugs & couplings	AAR10155	As req.	
4	Bolt, Stud, 3/4-10X11 Sq. Nuts-Spr. Wshr.	ASA Regular	2	" "	27	Rivets	AAR10153	As req.	Pipe line
5	Bolt, Lag, 3/4 X 7, Cut Thd.	ASA	8	" "	28				
6					29				
7	Bolt Grips	Raco 589-1	8	Stud Bolts	30				
8					31				
9					32	Rod, Throw, Complete	3002-11	1	At No. 2 rod.
10	Bracket	3001-21	1	No. 2 rod	33	Rod, Throw, Complete	3002-12	1	At No. 5 rod.
11	Bracket, Sw. Adjustment	GRS 46948-12	1	No. 5 rod	34				
12					35	Spikes, Drive, 6 in. Long.	* 21-C-361	8	Tie Straps
13	Carrier, Pipe-One way	AAR10746	As req.	See Note 4	36				
14					37	Tie Straps, Short.	3014-3	2	
15	Cotter, 3/16 X 1-1/2		4	Jaw Pins	38	Tie Straps, Short	3014-4	2	Crank Stands
16	Crank Stand-With center pin	AAR10082	2		39	Tie Straps, Short, Set	3014-6	2	Crank Stands
17	Crank	3017-4	2	R. H. Turnout	40				
18	Crank	3017-2	2	L. H. Turnout	41				
19					42				
20					43				
21	Jaw, Screw-Tang End	AAR10199	1		44				
22	Jaw, Solid-Tang End	AAR10181	1		45	Washers, Steel Spr. 3/4 in. Am. Std.	Coml.	12	Items 3 & 4
23									

* Screw & Bolt Corp. of America

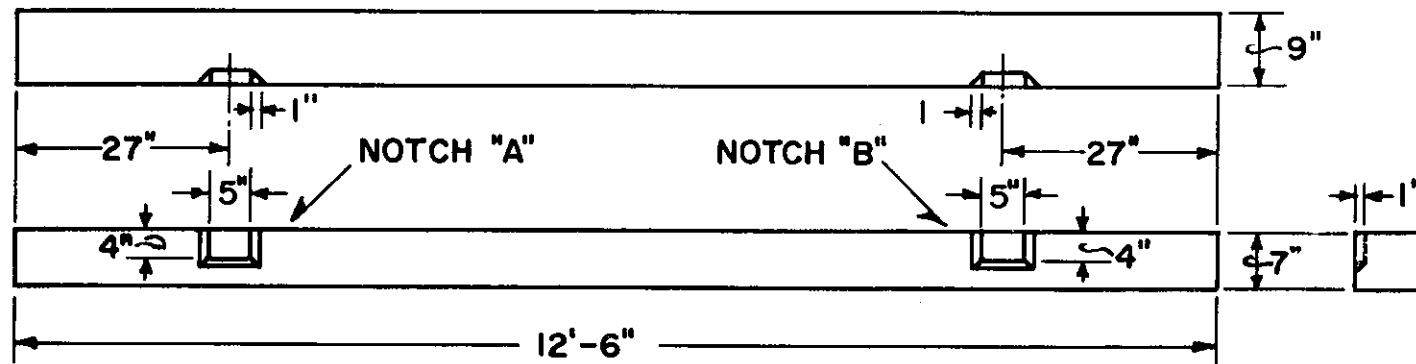
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT AUXILIARY THROW

Approved *R. J. Battinelli*
Chief Signal Engineer

S-3010

Printed in U. S. A.

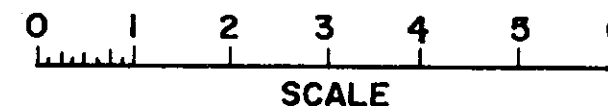
ISSUED 8-19-63
SHEET 1 Cont'd on Sh....



3011-11,-TIE NO. 1, R. H. WITH NOTCH "A"
3011-12,-TIE NO. 1, L. H. WITH NOTCH "B"
 FOR SWITCH LAYOUT 3100

NOTE:

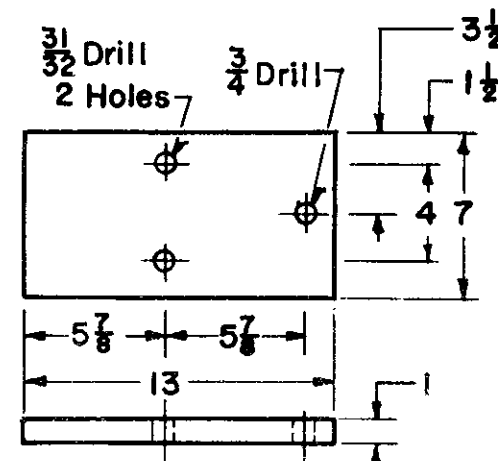
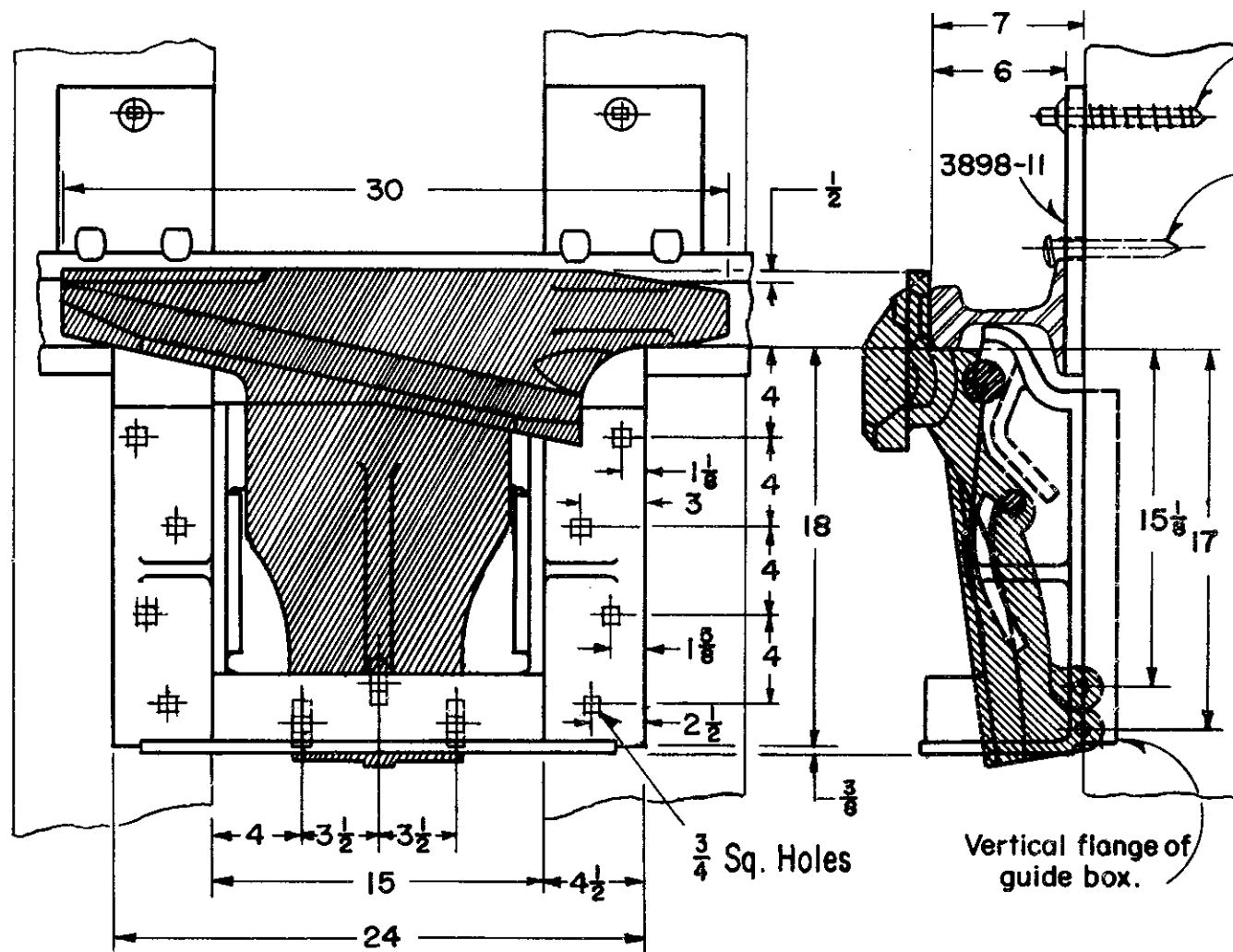
All ties to be creosoted after notching or framing.



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TIES
FOR SWITCH LAYOUTS

Approved *R. J. Battinelli*
 Chief Signal Engineer

S-3011



3898-II, RAIL SHIM
C1020 Steel

NOTES

- 1 - Facing direction to be protected, a right hand derail goes on the right hand rail and derails to the right. Conversely with the left.
- 2 - Guide box must be square with rail and vertical flange must be firm against side of ties.
- 3 - Protective treatment-Primer, Item 31, Instruction 350.

0 6 12 24

All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
DERAIL
BLOCK TYPE

Approved *R. J. Battinelli*
Chief Signal Engineer

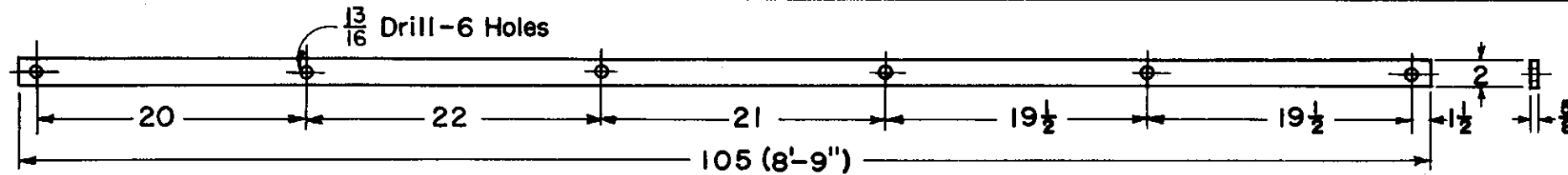
S-3012

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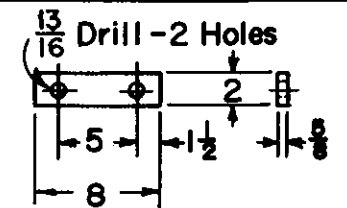
ISSUED 9-8-59

SHEET 1 Cont'd on Sh.

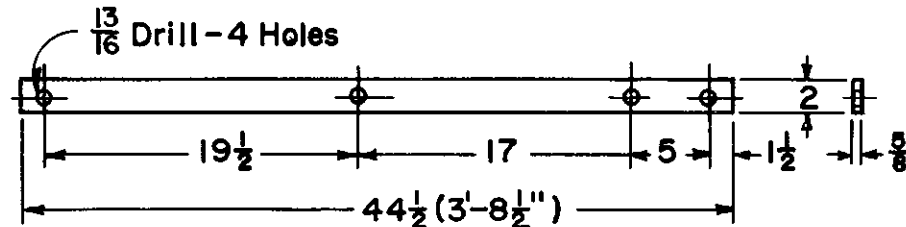
3012-1, DERAIL, HAYES-HBP 7, Specify R.H. or L.H., See Note 1.
Use for 127 Lb. rail
If necessary, use with Shim, 3898-II, for 105 lb. rail.
3012-2, DERAIL, HAYES-HBP 6, Specify R.H. or L.H., See Note 1.
Use for 105 Lb. rail



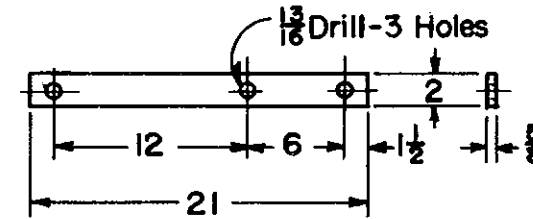
3014-1, TIE STRAP



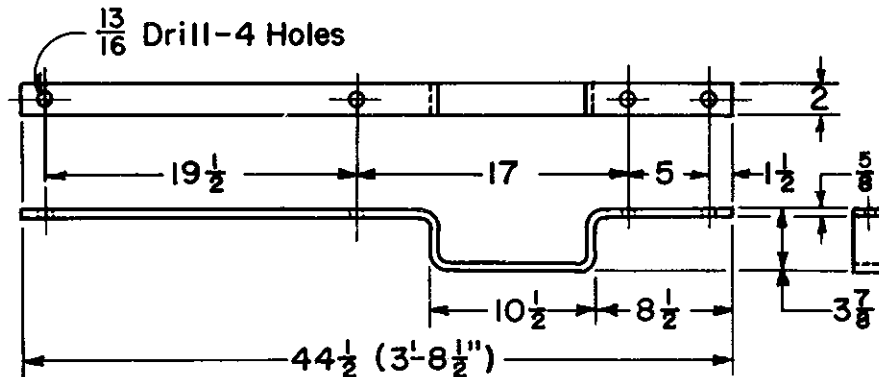
3014-2, STRAP WASHER



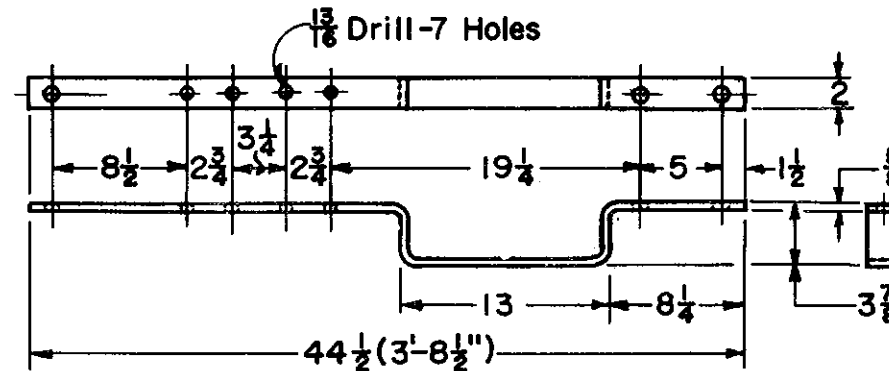
3014-3, TIE STRAP



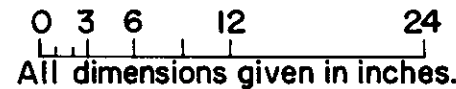
3014-4, TIE STRAP



3014-5, TIE STRAP



3014-6, TIE STRAP



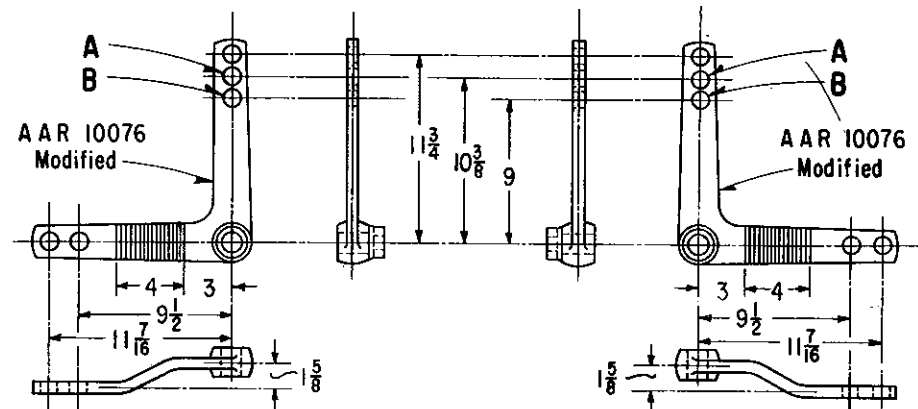
NOTES:

- 1.- Material to be C-1020 steel.
- 2.- Protective treatment-Primer, Item 31, Instruction 350.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TIE STRAPS

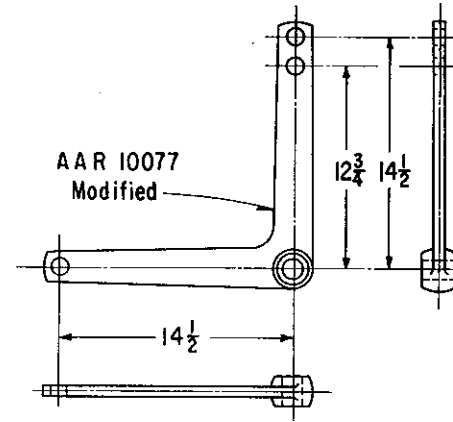
Approved *R. S. Battinelli*
Chief Signal Engineer

S-3014

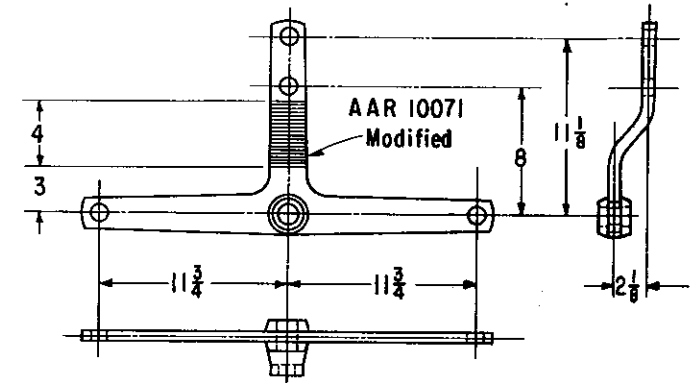


3017-1, CRANK, Without holes "A" & "B".
3017-2, CRANK, With holes "A" & "B"

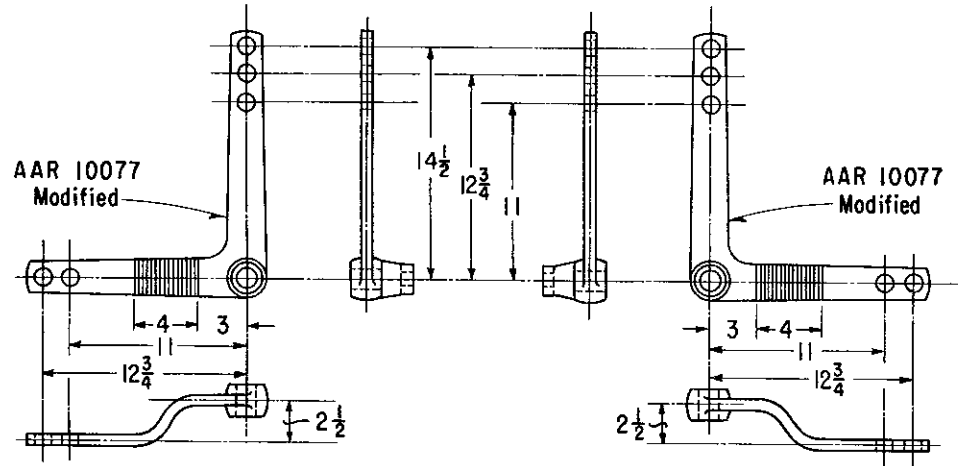
3017-3, CRANK, Without holes "A" & "B".
3017-4, CRANK, With holes "A" & "B".



3017-5, CRANK

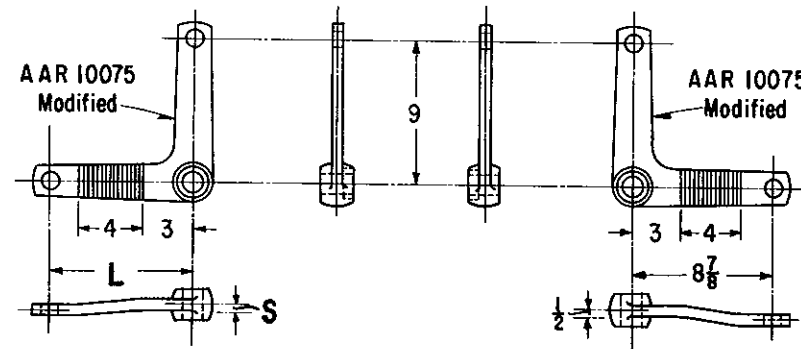


3017-6, CRANK, THREE ARM



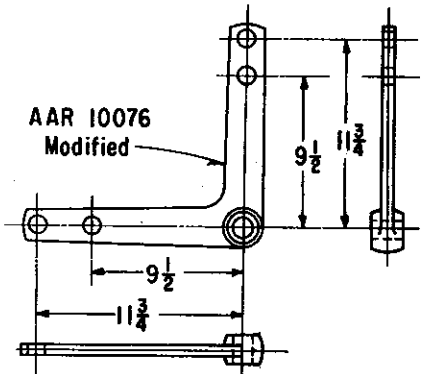
3017-7, CRANK

3017-8, CRANK



3017-9, CRANK - L=8-7/8, S=1/2
3017-19, CRANK - L=8-3/8, S=1

3017-10, CRANK



3017-11, CRANK

NOTES:

- 1 - All holes for jaw connections to be drilled and reamed for 7/8 pin.
- 2 - Protective treatment- Primer, Item 31, Instruction 350.

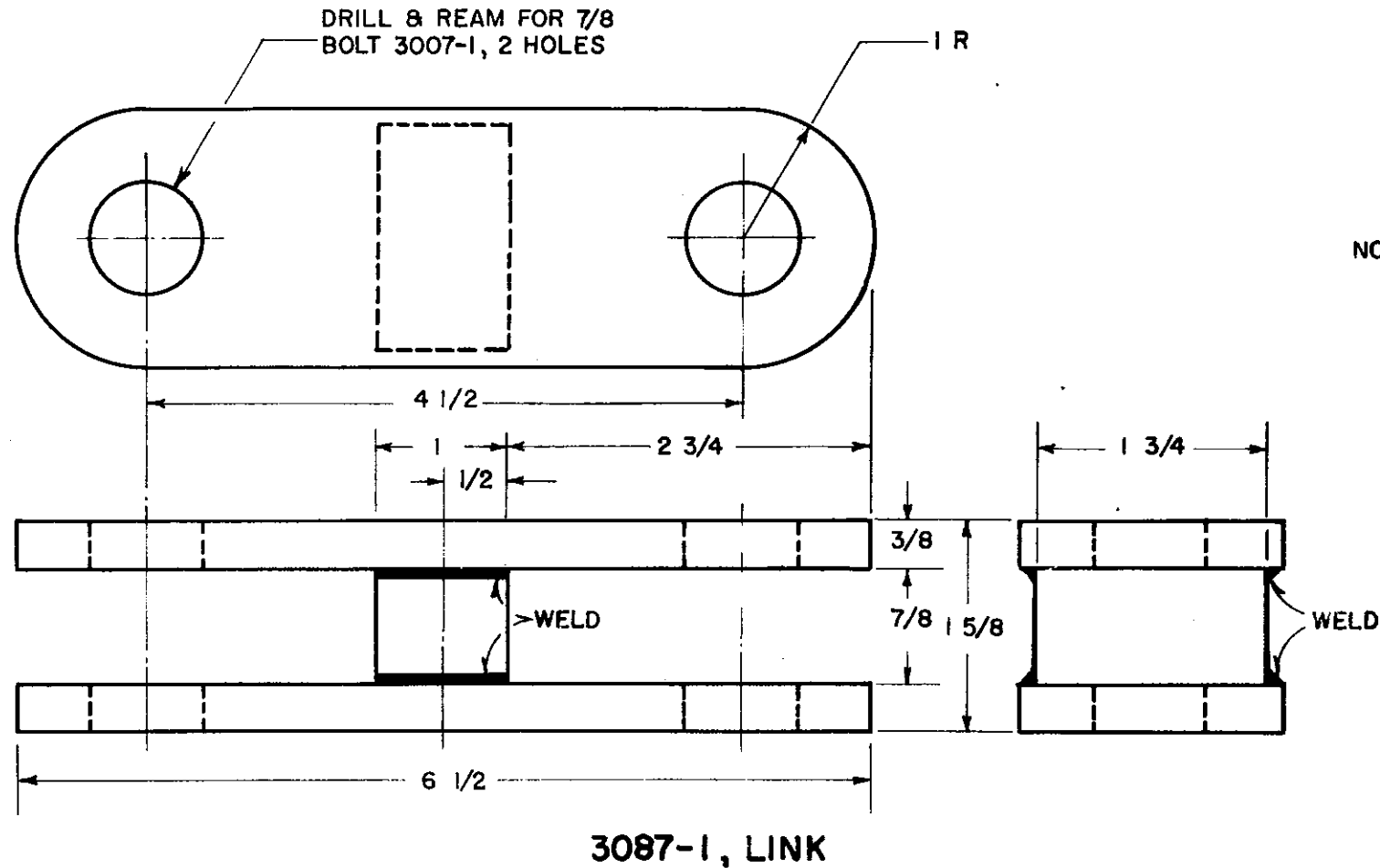
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT CRANKS FOR SWITCH LAYOUTS

Approved *L. J. Lawrence*
Chief Signal Engineer

S-3017

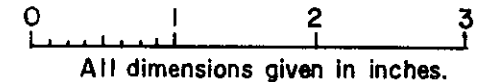
Printed in U. S. A.

ISSUED 5-26-60
SHEET 1... Cont'd on Sh...



NOTES:

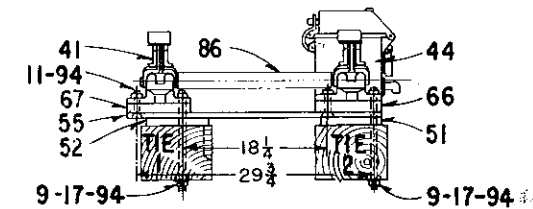
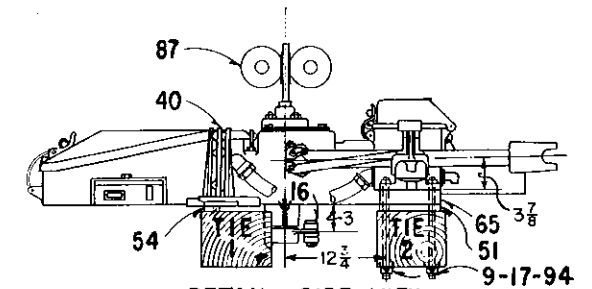
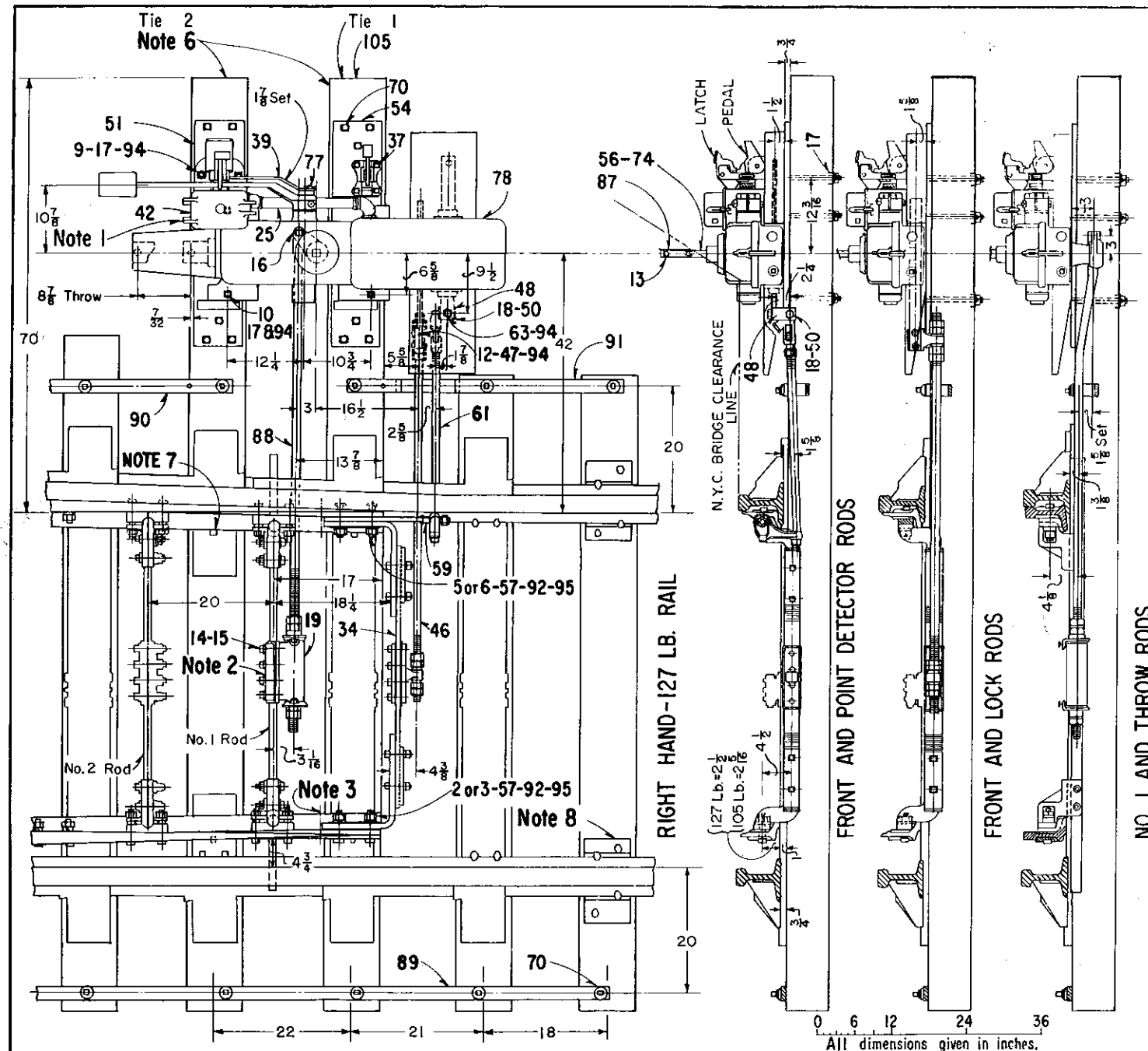
1. MATERIAL C1020 STEEL.
2. PROTECTIVE TREATMENT—
PRIMER, ITEM 31, INSTRUCTION 350.



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
LINK
FOR SWITCH CONNECTED BLOCK DERAIL
INTERLOCKED SWITCH

Approved *[Signature]*
 Chief Signal Engineer

S-3087



NOTES:

- 1 - Electric lock to be installed when specified by circuit plans.
- 2 - To install switch adjustment bracket, Item 19 on Type MJ rods, retain splice plate and attach bracket using four bolts, 3001-19. On other vertical rods, remove one splice plate and attach bracket using four bolts, 3001-18.
- 3 - To provide clearance for front rod or point lug, switch bolt 9-1/2 inches from switch point may be removed.
- 4 - Holes for drive spikes to be drilled in ties as follows: 1/2 X 5 inches for 21-C-361, 3/8 X 3 inches for 21-C-360.
- 5 - Switch target lamps, when required, to be installed as directed by Signal Engineers.
- 6 - M. of W. Dept. to provide Tie No. 1, Item 105 or 106 and Tie No. 2, minimum length as indicated.
- 7 - M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch.
- 8 - M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 9 - Protective treatment, Paint, Item 32, Instruction 350.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT MODEL 9 SWITCH MACHINE WITH MODEL 10 LOCK

S-3100

ISSUED 8-19-63

SHEET 1 Cont'd. on Sh. 2

Printed in U. S. A.

NUMBER	ITEM	REF.	REQUIRED FOR LAYOUT			USE	NUMBER	ITEM	REF.	REQUIRED FOR LAYOUT			USE	NUMBER	ITEM	REF.	REQUIRED FOR LAYOUT			USE	
			A	B	C					A	B	C					A	B	C		
1	Bolt, 3/4 X 4 Spt. Hd., Hex. Nut.	RSC-G35C				105 Lb. Rail	49							SUPPLEMENTARY-FURNISHED BY M. OF W. DEPARTMENT							
2	" 1 X 5-1/2 " " " "	RSC-G35C	2	2	2	127 Lb. 39 Ft. Points	50	Nut	G.R.S. 646-9	1	1	1	Ball Pin	101							
3	" 1 X 4-3/4 " " " "	RSC-G35C				127 Lb. Other Points	51	Plate, Saddle	3004-11	1		1	Tie 2	102							
4	" 3/4 X 4-3/4 " " " "	RSC-G35C				105 Lb. Rail	52	" "	3004-12			1	Tie 1	103							
5	" 1 X 6-1/4 " " " "	RSC-G35C	2	2	2	127 Lb. 39 Ft. Points	53	" "	3004-13		1		Tie 2	104							
6	" 1 X 5-1/2 " " " "	RSC-G35C				127 Lb. Other Points	54	" "	3004-14	1	1		Tie 1	105	Tie No. 1	7 X 9 X 12'-6"	3011-11	1	1	1	R. H. Layout
7							55	Plate, Base	3004-8			1	Lock & Latch St.	106	Tie No. 1	7 X 9 X 12'-6"	3011-12				L. H. Layout
8							56	Pin, Roll 3/8 X 2-1/2 * G.R.S.	17188-11	1	1	1	With target staff	107							
9	Bolt, Stud 3/4-10X13 with sq. nuts	ASA Reg.	2		2	Lock	57	Pin, Cotter 1/4 X 1-3/4	Coml.	4	4	4	Items 2,3,5,6	108							
10	" " 3/4-10X12 " " "	ASA Reg.	4	4	4	Switch Mach.	58	Pin, Cotter 1/4 X 1-1/4	Coml.				Items 1,4	109							
11	Bolt, Plow, Csk. Hd., Sq. Neck 3/4 X 3-1/4	Coml.			2	Base Plate	59	Point Lug, Compl.	3006-21	1	1	1		110							
12	Bolt, 3/4-10 X 2-1/2	GRS 0423	2	2	2	Lock Rod Lug	60														
13	Bolt, 3/8-16 NC-2X2, Hex. Hd. & Nut	ASA Reg.	2	2	2	Switch Target	61	Point Detector Rod, Compl.	3005-3	1	1	1									
14	Bolt, Compl.	3001-19	4	4	4	On Type MJ Rods	62														
15	Bolt, Compl.	3001-18				On Other Vert. Rods	63	Screw, Cap 3/4-10X1-1/2 G.R.S.	6013-7	1	1	1	Detector Bar Lug								
16	Bolt, Compl.	3007-1	1	1	1	Throw Rods	64														
17	Bolt Grip	Raco 589-1	6	4	6	Stud Bolts	65	Sub-base	G.R.S. 59559-1	1			Lock								
18	Bolt Stud, Eccentric	G. R. S. 38948-5	1	1	1	Detector Lug	66	" "	G.R.S. 59559-3			1	"								
19	Bracket, Sw. Adjustment	G. R. S. 46948-2 Gr.1	1	1	1	Throw Rod	67	" "	G.R.S. 59559-4			1	Latch Stand								
20	Bushing, For 3/4 Bolt	G. R. S. 8104-2	(2)	(2)	(2)	With Item 4 Only	68														
21	Bushing, For 3/4 Bolt	G. R. S. 6714-309	(2)	(2)	(2)	With Item 1 Only	69														
22							70	Spikes, Drive, 6 in.	* 21-C-361	24	24	24	Items 51-54 & 89-91								
23							71														
24							72														
25	Conduit Assembly	1173-3	1		1	Lock-Sw. Mach. Conn	73														
26							74	Staff, Target	# G.R.S. 57375-41	1	1	1									
27							75														
28							76														
29							77	Stud, Hex. Nut & Cotter	# G.R.S. K0205-4-Fig.1	1		1	Latch Rod								
30							78	Switch Machine, Model 9	G.R.S. 49600-501 Gr.3	1			R. H. Closed Point								
31							79	" " " " " "	G.R.S. 49600-501 Gr.4				L. H. Closed Point								
32							80														
33							81	Switch Machine, Model 9	G.R.S. 49600-521 Gr.3			1	R. H. Closed Point								
34	Front Rod, Compl.	3001-50	1	1	1		82	" " " " " "	G.R.S. 49600-521 Gr.4				L. H. Closed Point								
35							83														
36							84	Switch Machine, Model 9	G.R.S. 49600-602 Gr.12				R. H. Closed Point								
37	Lag, Wshr. Hd., 1/2 X 4, 2-1/2 Thd.	* 21-C-360	4	8		Latch Stand	85	" " " " " "	G.R.S. 49600-602 Gr.13				L. H. Closed Point								
38							86	Tube	G.R.S. 29474-40			1	Latch Conn.								
39	Latch Rod, 15 in. long	G. R. S. 46987-65	1		1	Lock	87	Target Disc.	2720-15	2	2	2	At Switch Mach.								
40	Latch Stand, Compl.	# G. R. S. 52589-4 Gr.1	1	2		Throw Lever	88	Throw Rod	3002-13	1	1	1									
41	" " " " " "	# G. R. S. 52589-7 Gr.1			1	" "	89	Tie Straps, Long	3014-1	1	1	1									
42	Lock, Model 10	G. R. S. 58800-4 Gr.16	1			R. H. or L. H. Layout	90	" " " " " "	3014-3	1	1	1									
43	" " " " " "	G. R. S. 17901 Gr.18			1	R. H. Layout	91	" " " " " " , Set	3014-5	1	1	1									
44	" " " " " "	G. R. S. 17901 Gr.5				L. H. " "	92	Washer, Plate	AAR 1255-11	2	2	2	127 Lb. Rail								
45							93	Washer, Plate	AAR 1255-12				105 Lb. Rail								
46	Lock Rod	3003-59	1	1	1		94	Washer, Steel Spr., 3/4 Med. A. Std.	Coml.	As	As	As									
47	Lug, Lock Rod	3003-57	1	1	1		95	" " " " " " in. " " "	"	Req.	Req.	Req.									
48	Lug, Detector Bar	G. R. S. 30908-92	1	1	1																

NOTES:

LAYOUT A-Independent switch machine with electric lock. Lock rod for normal locking only.

LAYOUT B-Dependent switch machine without electric lock. Lock rod for normal locking only.

LAYOUT C-Independent switch machine with normal and reverse electric lock. Lock rod for normal and reverse locking.

Model 9 switch machine circuit controllers to be supplied with two closed and two open contacts.

Model 10 lock to be supplied with emergency release and latch-out feature.

Contacts as follows: Two backs, electrically operated.

One front and two backs, mechanically operated.

12 Volts D. C. operating voltage.

Items indicated are included when ordering a switch machine (Items 78 thru 85) and are not to be specified except as replacement parts.

* Screw & Bolt Corp. of America.

Exceptions to the above requirements must be authorized by Signal Engineer.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
MODEL 9 SWITCH MACHINE
WITH MODEL 10 LOCK

Approved R. J. Battinelli
Chief Signal Engineer

S-3100

NOTES:

LAYOUT A-Independent switch machine with electric lock. Lock rod for normal locking only.

LAYOUT B-Dependent switch machine without electric lock. Lock rod for normal locking only.

LAYOUT C-Independent switch machine with normal and reverse electric lock. Lock rod for normal and reverse locking.

Model 9 switch machine circuit controllers to be supplied with two closed and two open contacts.

Model 10 lock to be supplied with emergency release and latch-out feature.

Contacts as follows: Two backs, electrically operated.

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Items indicated are included when ordering a switch machine (Items 78 thru 85) and are not to be specified except as replacement parts.

* Screw & Bolt Corp. of America.

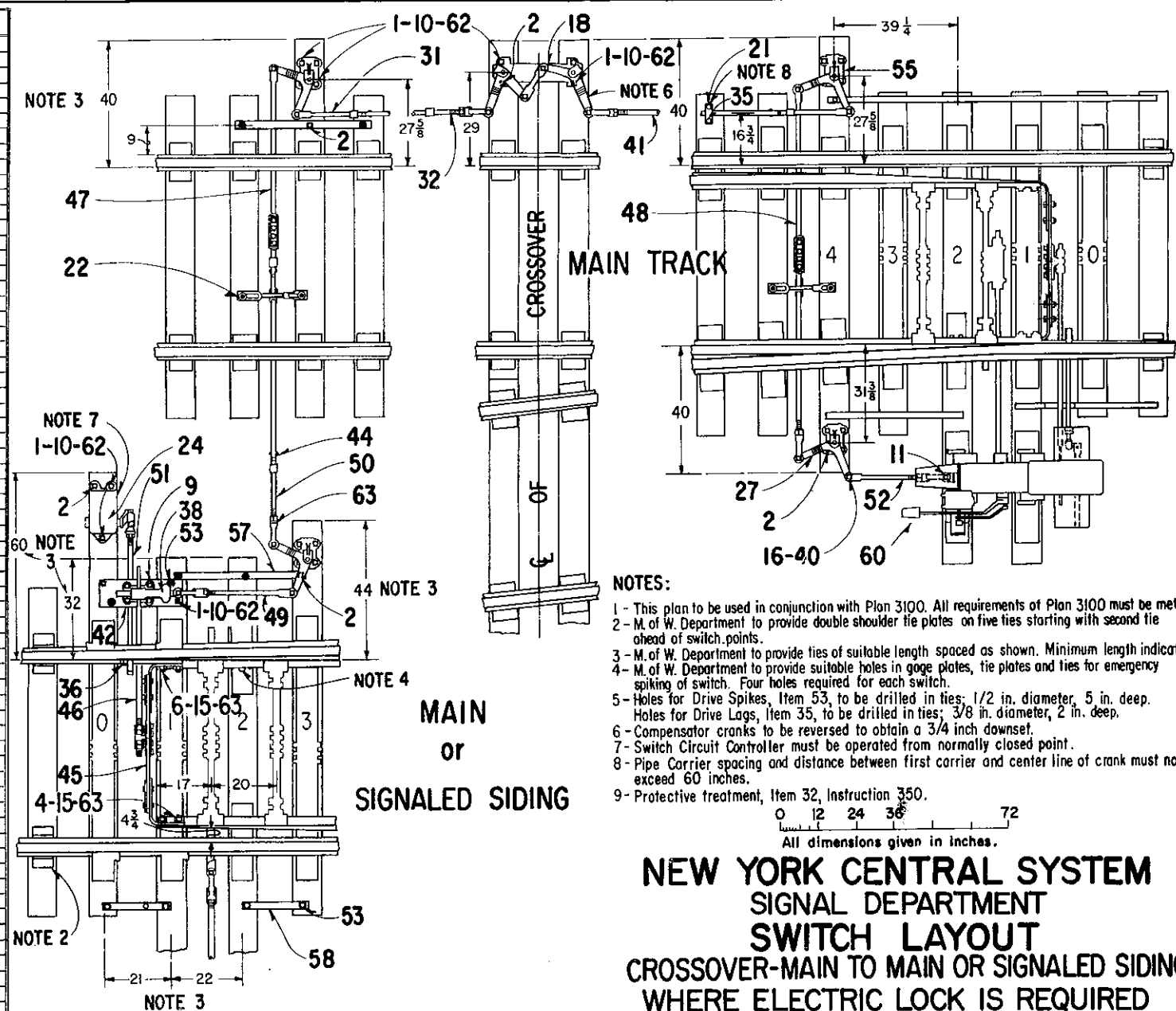
Exceptions to the above requirements must be authorized by Signal Engineer.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT MODEL 9 SWITCH MACHINE WITH MODEL 10 LOCK

Approved R. J. Battinelli
Chief Signal Engineer

S-3100

NO.	ITEM	REFERENCE	REQ.	USE
1	Bolt, Stud 3/4-10 X 11	ASA Regular	14	Items 18, 24, 42 & 55
2	Bolt, Lag 3/4 X 7	" "	14	Items 18, 24, 55 & 57
3	Bolt, Compl. 3/4 X 3-3/4, Spl. Hd., Hex. Nut.	RSC-G35 C		
4	" " 1 X 4-1/4 " " " "	"	2	105 lb. Rail
5	" " 3/4 X 4-1/2 " " " "	"		127 lb. Rail
6	" " 1 X 5 " " " "	"	2	105 lb. Rail
7				127 lb. Rail
8				
9	Bolt 3/4-10 X 2-1/2 Sq. Hd. 8 Nut	ASA Regular	4	Item 42
10	Bolt Grip	Raco 589-1	14	Stud Bolts
11	Bolt, Compl.	3007-1	1	At Switch Machine
12	Bushing-For 3/4 in. Bolt	GRS 6714-309	(2)	With Item 3 only
13	" " " "	GRS 8104-2	(2)	" " 5 "
14	Cotter 1/4 X 1-3/4	Com'l	4	Items 3, 8, 5
15	" 1/4 X 1-1/4	"		Items 4 & 6
16	" 3/16 X 1-1/2	"	11	Jaw Pins
17				
18	Compensator Assembly	AAR 10144	1	Pipe Line
19				
20				
21	Carrier, Pipe - One way	AAR 10746	As Req.	Pipe Line
22	" " - Transverse	Raco 411-1	2	Cross connections
23				
24	Circuit Controller	GRS Model 8	1	
25				
26	Crank	3017-3		
27	"	3017-1	4	L. H. Crossover
28				R. H. Crossover
29				
30	Jaw, Solid - With tang and	AAR 10181	2	Pipe Line
31	Jaw, Screw " " "	AAR 10199	2	" "
32				
33	Lag, Washer Hd. - 1/2 X 3, Thd. 2-1/2	* 21-C-360	As Req.	Pipe Carriers
34	Lag, Point	3006-21	1	Sw. Point on Siding
35				
36	Plunger Lock, Compl.	AAR 14253	1	
37				
38	Pins, Jaw	AAR 10105	11	
39	Pipe, 1 in. With plugs and couplings	AAR 10155	As Req.	
40				
41	Plate Base	3004-4	1	Plunger Lock
42				
43	Rivets 1/4 X 1-11/16	AAR 10153	As Req.	Pipe Conn.
44	Rod, End - Compl.	3001-50	1	
45	Rod, Lock - Compl.	3003-33	1	Plunger Lock
46	Rod, Connecting - Compl.	3002-51	1	Cross Connections
47	" " " "	3002-81	1	" "
48	" " " "	3002-32	1	Pl. Lock Connection
49	Rod, Yarn End	3002-61	1	Cross Connection
50	Rod, Point Detector, Compl.	3005-4	1	
51	Rod, Connecting, Compl.	3002-34	1	At Sw. Mach.
52	Splice, Drive 6 in.	* 21-C-361	10	Tie Straps & Item 42
53				
54	Stand, Crank - With Center Pin	AAR 10082	4	Pipe Line
55				
56	Straps, Tie - Short	3014-3	2	
57	" " "	3014-4	2	
58				
59	Switch Layout	Specify Requirements	3100	Layout A
60				
61	Washer, Steel Spring 3/4 in.	ASA Med.	Com'l.	As Req. Items 1, 3, 5, 9
62	" " " 1 in.	"	"	Items 4, 6
63	" " " 1-1/4 in.	"	2	Screw Jaws



- 1 - This plan to be used in conjunction with Plan 3100. All requirements of Plan 3100 must be met.
- 2 - M. of W. Department to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 3 - M. of W. Department to provide ties of suitable length spaced as shown. Minimum length indicated.
- 4 - M. of W. Department to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch. Four holes required for each switch.
- 5 - Holes for Drive Spikes, Item 53, to be drilled in ties; 1/2 in. diameter, 5 in. deep.
Holes for Drive Lags, Item 35, to be drilled in ties; 3/8 in. diameter, 2 in. deep.
- 6 - Compensator cranks to be reversed to obtain a 3/4 inch downset.
- 7 - Switch Circuit Controller must be operated from normally closed point.
- 8 - Pipe Carrier spacing and distance between first carrier and center line of crank must not exceed 60 inches.
- 9 - Protective treatment, Item 32, Instruction 350.

0 12 24 36
All dimensions given in inches.

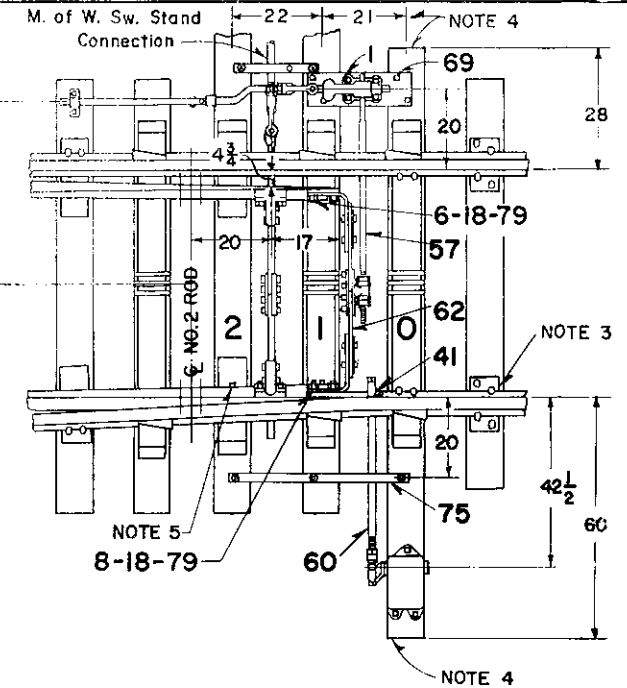
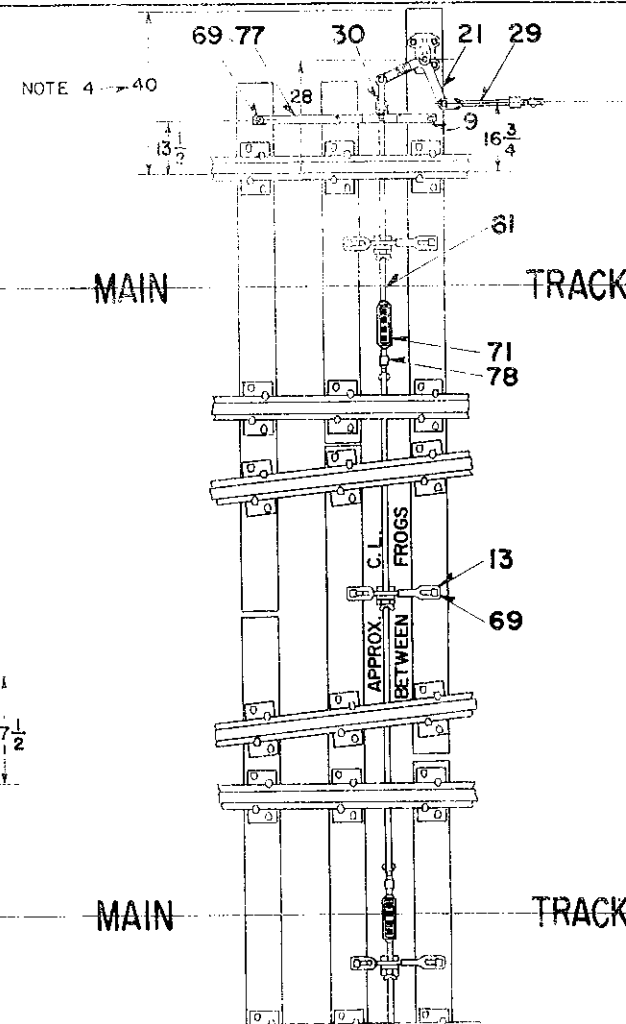
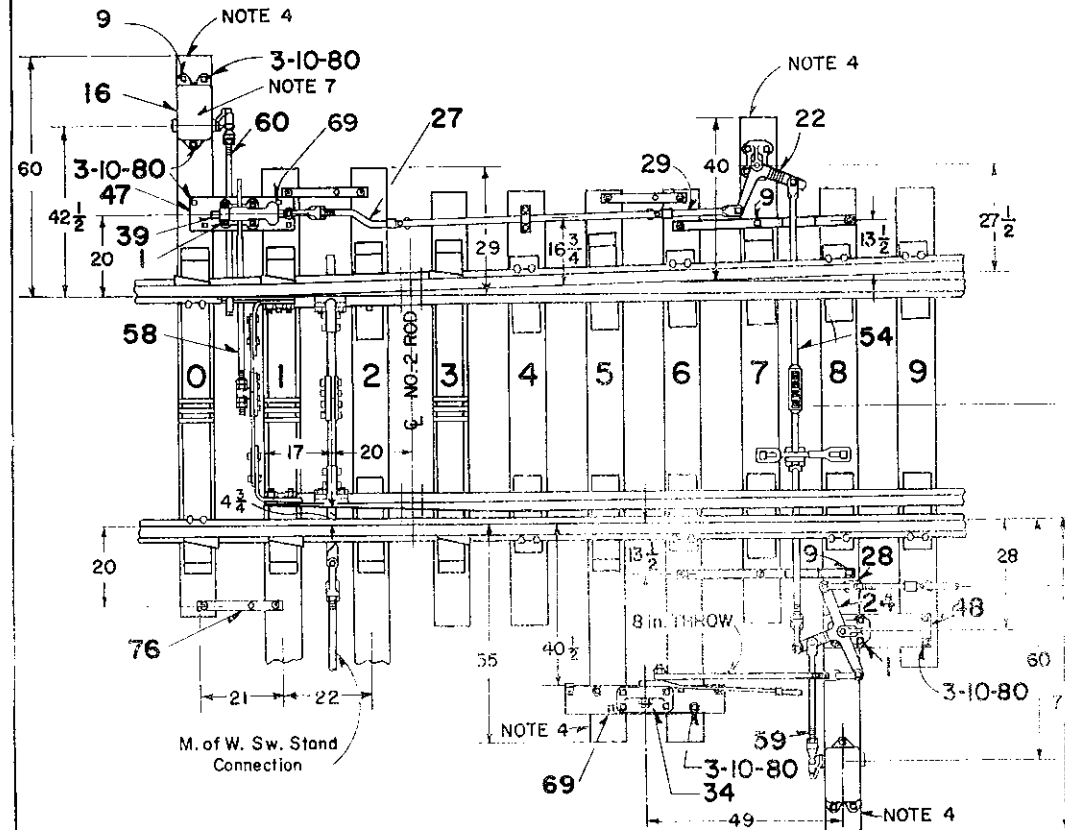
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
CROSSOVER-MAIN TO MAIN OR SIGNALLED SIDING
WHERE ELECTRIC LOCK IS REQUIRED

S-3110

ISSUED 9-8-59
SHEET 1 Cont'd. on Sh.

NOTES:

- 1- This plan, as shown, applies to No. 8 or No. 10 switch layouts.
- 2- Pipe carrier spacing and distance between first carrier and center line of crank stand must not exceed 60 inches.
- 3- M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 4- M. of W. Dept. to provide ties of length required, spaced as shown. Minimum length shown.
- 5- M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch. Four holes required for each switch.
- 6- Holes for Drive Spikes, Item 69, to be drilled in ties; 1/2 in. diameter, 5 inches deep.
- 7- Holes for Drive Lags, Item 33, to be drilled in ties; 3/8 in. diameter, 2 inches deep.
- 8- Switch Circuit Controller must be operated from normally closed point.
- 9- Protective treatment-Item 32, Instruction 350.



LEFT HAND LAYOUT, 127 Lb. Rail

0 12 24 36 72
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
CROSSOVER-MAIN TO MAIN
AUTOMATIC BLOCK SIGNAL TERRITORY
S- 3120

NO.	ITEM	REF.	REQ.	USE	NO.	ITEM	REF.	REQ.	USE
1	Bolt, 3/4 X 2-1/2, Sq. Hd. & Nut	ASA Regular	10	Items 47-48	41	Lug, Switch Point	3006-21	2	
2					42				
3	Bolts, Stud 3/4-10 X 11 with Sq. Nuts	ASA Regular	20	Items 16-34-47	43				
4				48-73	44	Pins, Jaw A A R	10105	12	
5	Bolt, Compl. 3/4 X 3-3/4, Spl. Hd. Hex Nut	RSC-G35C		105 lb. rail-Front Rod	45				
6	" " 1 X 4-1/4 " " " "	RSC-G35C	4	127 lb. " " " "	46	Pipe, 1 inch-With plugs, couplings. A A R	10155	As req.	
7	" " 3/4 X 4-1/2 " " " "	RSC-G35C		105 lb. " " " "	47	Plate, Base	3004-4	2	Item 39
8	" " 1 X 5 " " " "	RSC-G35C	4	127 lb. " " " "	48	" "	3004-5	1	Item 73
9	Bolt, Log 3/4 X 7		12	Items 16-73-77	49				
10	Bolt Grip Raco	589-1	20	Item 3	50				
11	Bushing- For 3/4 in. bolt	GRS	6714-309	(4) With Item 5 only	51				
12	" " " " "	GRS	8104-2	(4) With Item 7 only	52	Rivets 1/4 X 1-11/16 A A R	10153	As req.	Item 46
13	Carrier, Pipe - Transverse	Raco	411-1	4 Cross connections	53				
14	" " - One Way	A A R	10746	As req. See Note 1.	54	Rod, Cross-connecting, Compl, Insulated	3002-81	1	
15					55	" " " " " "	3002-51	1	
16	Circuit Controller, Compl.	G. R. S.	Model 8	3	56				
17	Cotter 1/4 X 1-3/4	Coml.		8	57	Rod, Lock, Compl.	3003-31	1	Open switch point.
18	" 1/4 X 1-1/4	"			58	" " "	3003-33	1	Closed switch point.
19	" 3/16 X 1-1/2	"	12	Jaw Pins	59	" , Sw. C. C. Compl.	3005-8	1	
20	Crank	3017-1	1	R. H. Layout	60	" " " "	3005-4	2	Switch points
21	"	3017-3		L. H. "	61	" , Threaded Half	3002-121	1	Cross connections
22	"	3017-2		L. H. "	62	" , Front, Compl.	3001-50	2	
23	"	3017-4	2	R. H. "	63				
24	" , Three Arm	3017-6	1	R. or L. H. Layout	64				
25					65				
26					66				
27	Jaw, Screw-Tang End, Offset	3002-61	2	Pipe Line	67				
28	" " " " "	A A R	10199	1	68				
29	" , Solid	A A R	10181	3	69	Spikes, Drive, 6 in. long, 5 in. thd. *	21-C-361	31	
30	" , Screw	A A R	10164	1	70				
31					71	Splice, Insulated, Compl.	3002-110	1	Cross connection
32					72				
33	Log, Drive-Wshr. Hd., 1/2 X 3; 2-1/2 Thd. *	21-C-360	As req.	Pipe Carrier	73	Stand, Crank, With center pin. A A R	10082	4	
34	Lever, Throw Over	3025-1	1		74				
35					75	Strap, Tie-Short	3014-3	1	
36					76	" " " "	3014-4	4	
37					77	" " " " , Set	3014-5	4	
38					78	Tang-End A A R	10943	1	Cross connection
39	Lock, Plunger-Compl.	A A R	14253	2	79	Washers, Steel Spr. 1 in. ASA Med.	Coml.	As	Items 6 & 8
40					80	" " " 3/4 in. ASA Med.	Coml.	Req.	Items 1, 3, 5 & 7

* Pittsburg Screw & Bolt Corp. or equal.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
CROSSOVER-MAIN TO MAIN
AUTOMATIC BLOCK SIGNAL TERRITORY

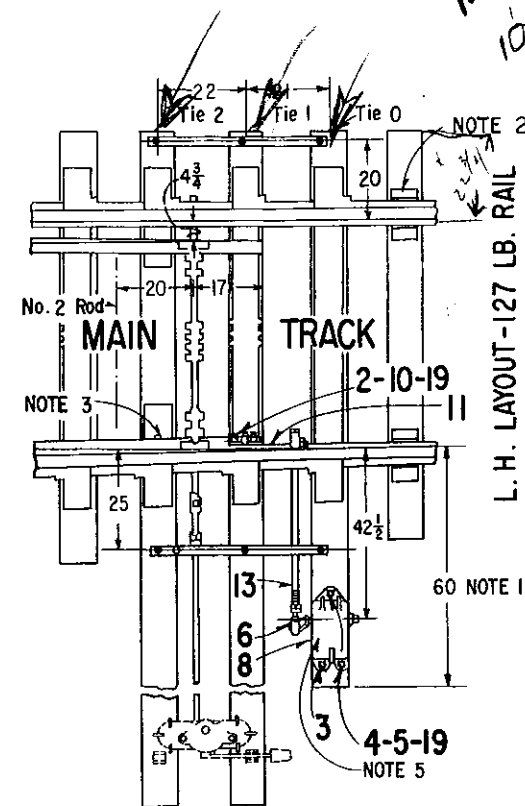
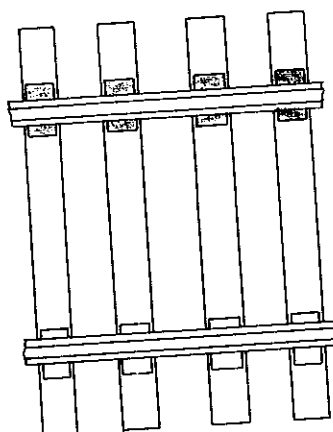
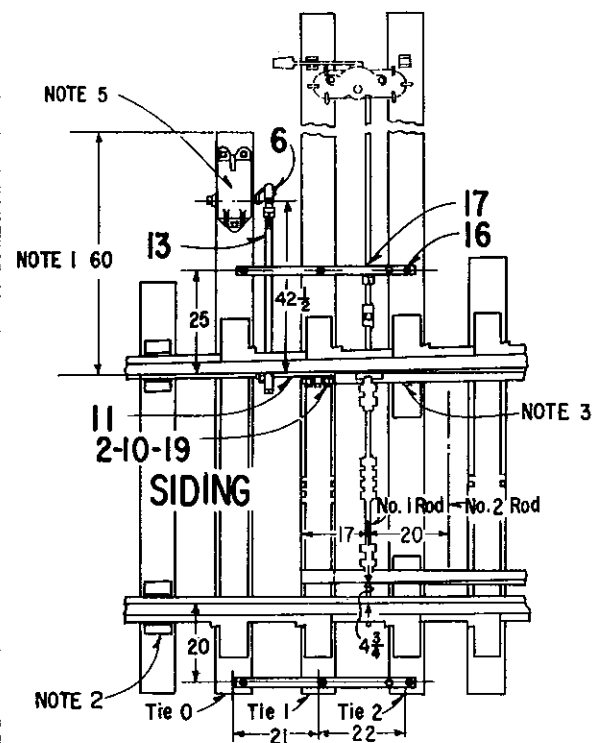
Approved *L. J. Battimelli*
 Chief Signal Engineer

S-3120

ISSUED 9-8-59
 SHEET 2 Cont'd on Sh.

NO.	ITEM	REFERENCE	REQ	USE
1	Bolt, Compl. 3/4 X 3 Spcl Hd. Hex. Nut	RSC-635 C	4	105 Lb. Rail
2	" " X 3-1/4 Spcl Hd. Hex. Nut	RSC-635 C	4	27 Lb. Rail
3	Bolt, Lag 3/4 X 7 ASA Cut Thd.	Coml.	2	Sw. C. C.
4	Bolt Grip Raco	589-1	4	Stud Bolts
5	Bolt Stud 3/4-10 X 11 With So. Nuts	ASA Regular	4	Sw. C. C.
6	Bolt Stud, Compl.	AAR [271]	2	Sw. C. C.
7	Bushing 3/4 Long Modified	GRS 6714-309	(4)	105 Lb. Rail
8	Circuit Controller, Compl.	GRS Model B	2	5-3/8 Arm, 1 in. Offset
9	Collar 1/4 X 1-1/4	Coml.	4	Item 1
10	" 1/4 X 1-3/4	"	4	Item 2
11	Lug, Point, Compl.	3006-21	2	
12	Rad. Circuit Controller	3005-4	2	
13				
14				
15				
16	Spoke Drive 6-1/2 in.	* 21-C-361	12	Tie Straps
17	Straps, Tie	3014-3	4	
18				
19	Washers, Steel Spr. 3/4 in.	ASA Medium	Coml.	Items 1 & 5
20	" " " " " "	"	As Req.	Item 2

* Pittsburg Screw & Bolt Corp. or equal.



NOTES:

- 1.- M. of W. Department to provide ties of suitable length, spaced as shown. Minimum length indicated.
- 2.- M. of W. Department to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 3.- M. of W. Department to provide suitable holes in gage plates, tie plates and ties to provide for emergency spiking of switch. Four holes required for each switch.
- 4.- Holes for Drive Spikes, Item 16, to be drilled in ties, 1/2 in. diam., 5 in. deep.
- 5.- Switch circuit controller must be operated from normally closed point.
- 6.- Protective treatment-Item 32, Instruction 350.

0 12 24 36 72
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT CROSSOVER-MAIN TO NON-SIGNALLED SIDING WHERE ELECTRIC LOCK IS NOT REQUIRED

Approved *R. J. Battimelli*
Chief Signal Engineer

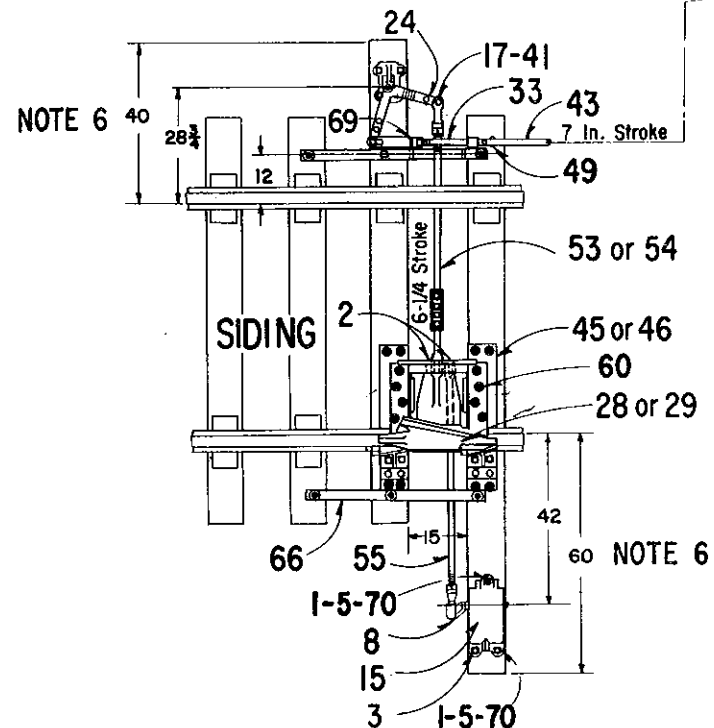
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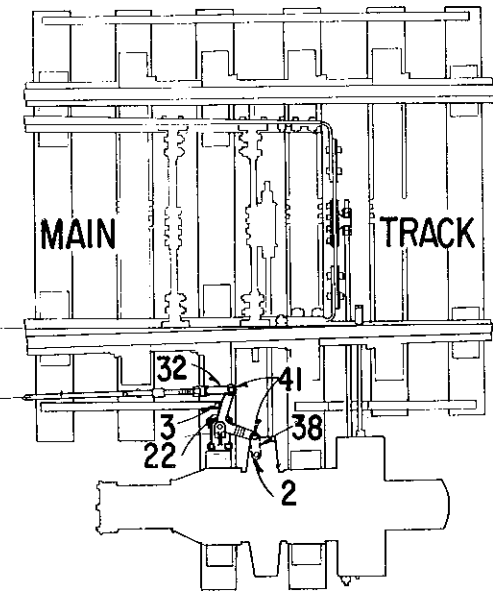
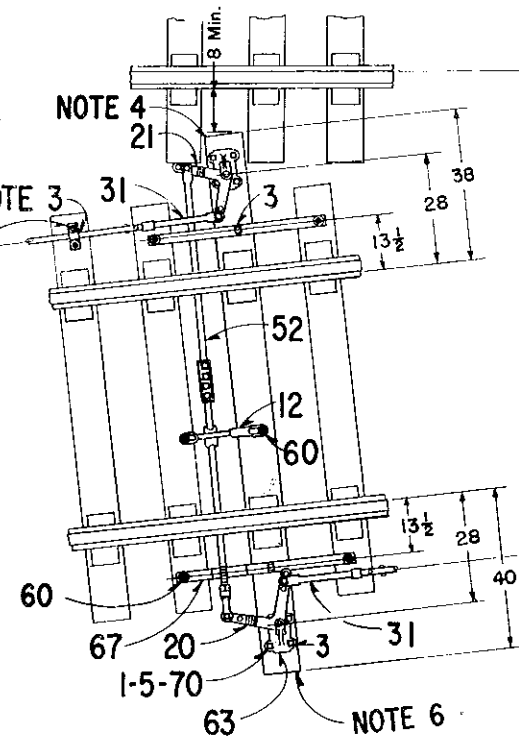
ISSUED 9-8-59
SHEET 1 Cont'd. on Sh...

NOTES:

- 1.- This plan to be used in conjunction with Plan 3000.
- 2.- Installation of derail to meet requirements of Plan 81.
- 3.- Pipe carrier spacing and distance between first carrier and center line of crank must not exceed 60 inches.
- 4.- Cross connection tie shall be located to provide clearance between crank and main track ties, and to provide proper pipe line compensation. End of cross connection tie must not be less than 8 inches from base of main rail.
- 5.- Holes for Drive Logs, Item 36, to be drilled in ties; 3/8 inch diameter, 2 inches deep.
- 6.- M. of W. Dept. to provide ties of length required, spaced as shown. Minimum length indicated.
- 7.- Protective treatment- Item 32, Instruction 350.



11-See NOTE 3
36-See NOTE 5



0 12 24 36 72
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH BLOCK TYPE DERAIL
INTERLOCKED SWITCH

S-3140

NO	ITEM	REF.	REQ.	USE	NO	ITEM	REF.	REQ.	USE	NO	ITEM	REF.	REQ.	USE
1	Bolt, Stud 3/4-10X 11 with sq. nuts	ASA Regular	10	Crank St., Sw. C. C.	31	Jaw, Solid-Tong End	A A R 10181	2	Pipe Line	61				
2	Bolt, Compl.	3007-1	3	At Sw. Mach. & Der.	32	" Screw " "	A A R 10189	1	" " "	62				
3	Bolt, Lag 3/4 X 7 Cut thd.	ASA	13	Crank St., Tie Strap	33	" Gain Stroke	G R S 39503	1	" " "	63	stand, Crank, with center pin.	AAR 10082	4	
4					34					64				
5	Bolt Grip	Roco 589-1	10	Stud Bolts	35					65				
6					36	Log, Drive, Wsh. thd. 5/8 X 3 1/2 11/16	21-C-361	27	Pipe Couplings	66	Straps, Short	3014-3	2	
7					37					67	" " , Short, Set	3014-5	2	
8	Bolt, Sico, Compl.	A A R 10711	1	Circuit Controller	38	Link	3007-1	1	Chain of Sw. Mach.	68				
9					39					69	Washers, Steel Spr. 1-1/4 ASA Med.	Coml.	1	Gain Stroke Jaw
10					40					70	" " 3/4 " "	"	10	Stud Bolts
11	Logster, Pipe- One way	A A R 10790	2	Logster, Pipe- One way	41	Pipe, der.	A A R 10790	2	Logster, Pipe- One way					
12	" " " " " "	A A R 10790	2	Logster, Pipe- One way	42	" " " " " "	A A R 10790	2	Logster, Pipe- One way					
13					43	" " " " " "	A A R 10790	2	Logster, Pipe- One way					
14					44	" " " " " "	A A R 10790	2	Logster, Pipe- One way					
15	Circuit Controller, complete	3007-1	1	50 Am. H. C. R. 1	45	Plate, 1/4 X 1-11/16	3007-1	1	50 Am. H. C. R. 1					
16					46	" " " " " "	3007-1	1	50 Am. H. C. R. 1					
17	Bolt 3/16 X 1-1/2	Coml.	7	Jaw Pins	47									
18					48									
19					49	Rivets, 1/4 X 1-11/16	A A R 10153	As req.	Pipe Couplings					
20	Crank	3017-2	1	R. H. or L. H. Turnout	50									
21	"	3017-4	1	" " "	51									
22	"	3017-10	1	L. H. Turnout	52	Rod, Cross Connection, Compl.	3002-03	1	Center of turnout					
23	"	3017-9	1	R. H. Turnout	53	" Derail Connection, Compl.	3002-91	1	HBP 7 Derail					
24	"	3017-7	1	L. H. Turnout	54	" " " " "	3002-93	1	HBP 6 Derail					
25	"	3017-6	1	R. H. Turnout	55	" Circuit Controller "	3005-6	1						
26					56									
27					57									
28	Derail, HBP 7- Specify R. H. or L. H.	3012-1	1	127 Lb. Rail	58									
29	" HBP 6 - " " "	3012-2	1	105 Lb. Rail	59									
30					60	Spike, Drive 6 in. - 5 in. thread X	21-C-361	27						

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH BLOCK TYPE DERAIL
INTERLOCKED SWITCH**

Approved R. J. Battinelli
Chief Signal Engineer

S-3140

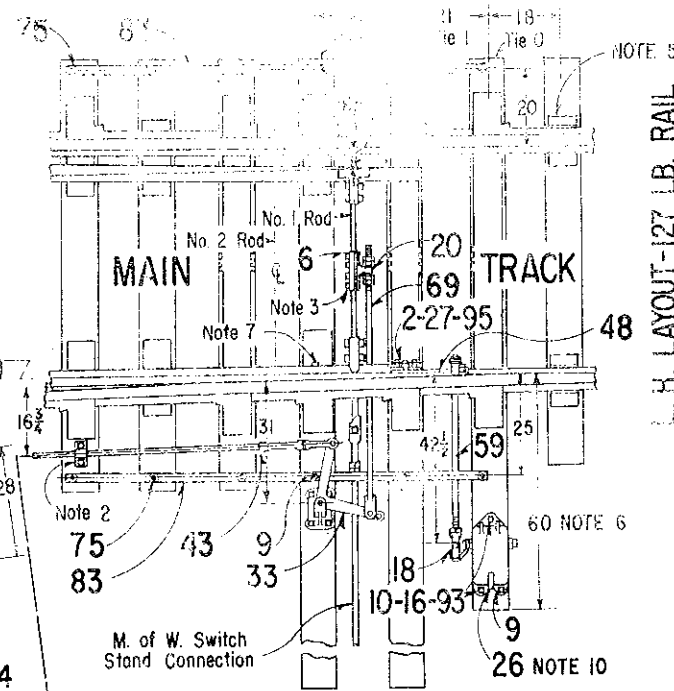
ISSUED 9-8-59

NOTES:

- 1- Installation of derail to meet requirements of Plan 81.
- 2- Pipe carrier spacing and distance between first carrier and center line of crank stand must not exceed 60 inches.
- 3- When used with M. of W. switch stand remove one splice plate from No. 1 switch rod and install bracket, Item 20.
- 4- Where necessary to secure additional clearance for No. 1 rod, tie No. 1 may be shifted a maximum of one half inch.
- 5- M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points and, on derail side of track, on tie each side of derail.
- 6- M. of W. Dept. to provide ties of length required, spaced as shown. Minimum length indicated.
- 7- M. of W. Dept. to provide suitable holes in gage plate, tie plates for emergency spiking of switch. Four holes required.
- 8- Cross connection tie shall be located to provide clearance between crank and main track ties and to provide proper pipe line compensation. End of cross-connection tie shall not be less than 8 inches from base of main rail.
- 9- Holes for Drive Spikes, Item 76, to be drilled in ties; 1/2 in. diam., 5 in. deep.
- 10- Holes for Drive Lags, Item 46, to be drilled in ties; 3/8 in. diam., 2 in. deep.
- 11- Switch Circuit Controller must be operated from normally closed point.
- 12- Where derail is not required omit pipe connections. Use main track connections only.
- 13- Protective treatment, Item 32, Instruction 350.

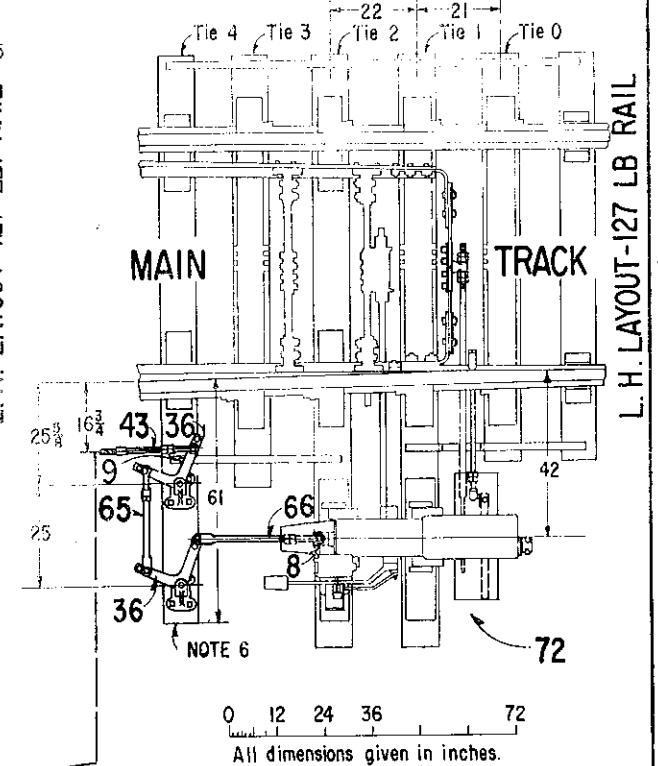
M. OF W. SWITCH STAND LAYOUT

USE WHERE ELECTRIC LOCK IS NOT REQUIRED



MODEL 9 SWITCH MACHINE LAYOUT

USE IN CONJUNCTION WITH PLAN 3100
WHERE ELECTRIC LOCK IS REQUIRED



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH BLOCK TYPE DERAIL
NON-INTERLOCKED SWITCH

S-3150

ISSUED 9-8-59

SHEET 1 Cont'd on Sh. 2

NO	ITEM	REF.	REQUIRED M. of W. MOD. 9 SWITCH STAND MACH.	USE	NO	ITEM	REF.	REQUIRED M. of W. MOD. 9 SWITCH STAND MACH.	USE	NO	ITEM	REF.	REQUIRED M. of W. MOD. 9 SWITCH STAND MACH.	USE
1	Bolt, Compl. 3/4 X 3 Spl. Hd. Hex. Nut	RSC-635C	2	Pt. Lug - 105 lb. Rail	42	Jaw, Solid-Tang End A. A. R.	10181	2	2	83	Strap, Tie, -Long	3014-1	2	
2	" " 1 X 3-1/4 " " " " " "	RSC-635C		" " 127 lb. Rail	43	Jaw, Screw- " " " "	10199	1	1	84	" " " -Short, Straight	3014-3	2	2
3					44	Jaw, Gain Stroke, Compl. G. R. S.	39598	1	1	85	" " " " " , Set	3014-5	2	2
4					45					86				
5					46	Lag, Drive, 1/2 X 3 Wshr. Hd. 2-1/2 Thd. *	21-C-360	As req.	As req.	87				
6	Bolt, Compl.	3001-18	4	Sw. Adj. Bracket	47					88	Target, Disc	2720-15	2	2
7					48	Lug, Point	3006-21	1		89	" " , Diagonal Banner	2720-14	1	1
8	Bolt, Compl.	3007-1	2	2	49					90				
9	Bolt, Lag 3/4 X 7 ASA cut thread	Coml.	12	14	50	Pins, Jaw A. A. R.	10105	8	11	91				
10	Bolt, Stud 3/4-10 X 11 with sq. nuts.	ASA Reg.	10	10	51					92				
11					52	Pipe, 1 in. -With plugs & couplings. A.A.R.	10155	As req.	As req.	93	Washer, Steel Spr. 3/4 in. ASA Med.	Coml.	As req.	As req.
12	Bolt, 3/8-16 NC-2X2, Hex. Hd. & Nut	ASA Reg.	2	2	53					94	" " " " 1-1/4 in. " "	"	1	1
13					54	Rivets, 1/4 X 1-11/16 A. A. R.	10153	As req.	As req.	95	" " " " 1 in. " "	"	As req.	As req.
14					55					96				
15					56					97				
16	Bolt Grip	Raco	589-1	10	57					98				
17					58					99				
18	Bolt Stud, Compl.	A. A. R.	12711	1	59	Rod, Circuit Controller	3005-4	1		100				
19					60									
20	Bracket	3001-21	1		61	Rod, Connecting -Cross Conn., Compl.	3002-83	1	1					
21	Bushing, 3/4 Long (Modified)	G R S	6714-309	(2)	62	" " -Derail, Compl.	3002-93	1	1					
22					63	" " " " " "	3002-95							
23	Carrier, Pipe-One Way	A. A. R.	10746	As req.	64	" " " -Der. Target, Compl.	3002-71	1	1					
24	Carrier, Pipe - Transverse	Raco	411-1	1	65	" " " , Compl.	3002-33		1					
25					66	" " " " "	3002-34		1					
26	Circuit Controller, Compl.	G. R. S	Model 8	1	67									
27	Cotter 1/4 X 1-3/4	Coml.		2	68									
28	" 1/4 X 1-1/4	"			69	Rod, Throw, Compl.	3002-10	1						
29	" 3/16 X 1-1/2	"	8	10	70									
30					71									
31	Crank	3017-2	1	1	72	Switch Layout, Mod. 9 Switch Mach.	3100		1					
32	"	3017-4	1	1	73									
33	"	3017-5	1		74									
34	"	3017-7	1	1	75	Spike, Drive, 6-1/2 in. *	21-C-361	33	22					
35	"	3017-8			76									
36	"	3017-11		2	77									
37					78									
38					79	Stand, Crank, With center pin A. A. R.	10082	4	5					
39					80	" , Target A. A. R.	13997	1	1					
40	Derail, HBP 7- Specify R.H. or L. H.	3012-1	1	1	81									
41	" HBP 6- " " " " " "	3012-2			82									

* Pittsburg Screw & Bolt Corp. or equal.

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH BLOCK TYPE DERAIL
NON-INTERLOCKED SWITCH**

Approved R. J. Battinelli
Chief Signal Engineer

S-3150

Printed in U.S.A.

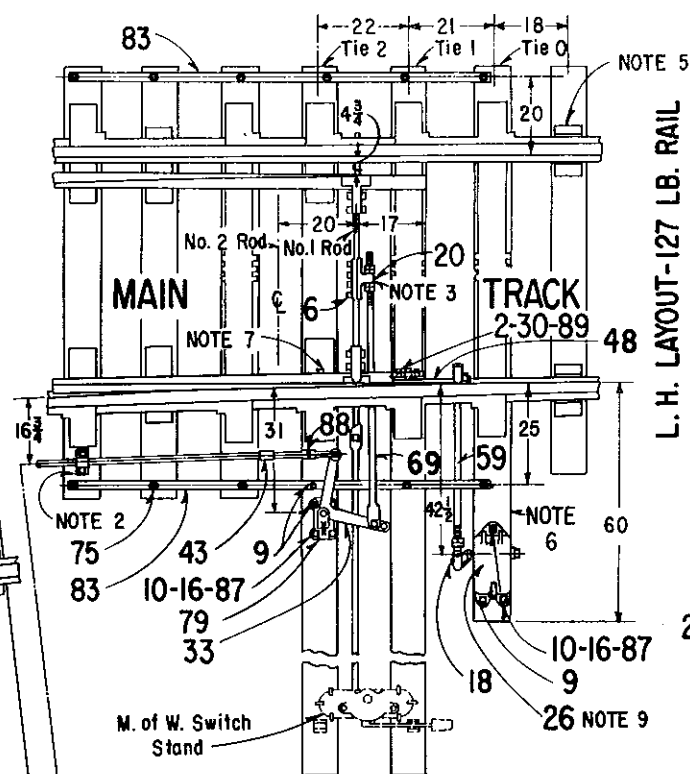
ISSUED 9-8-59
SHEET 2 Cont'd on Sh.....

NOTES:

- 1- Installation of derail to meet requirements of Plan 81.
- 2- Pipe carrier spacing and distance between first carrier and center line of crank stand must not exceed 60 inches.
- 3- When used with M. of W. switch stand remove one splice plate from No. 1 switch rod and install bracket, item 20.
- 4- Where necessary to secure additional clearance for No. 1 rod, tie No. 1 may be shifted a maximum of one half inch.
- 5- M. of W. Dept. to provide double shoulder tie plates on five ties, starting with second tie ahead of switch points at each end of turnout.
- 6- M. of W. Dept. to provide ties of length required, spaced as shown. Minimum length indicated.
- 7- M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties to provide for emergency spiking of switch and derail. Six holes required.
- 8- Holes for Drive Spikes, Item 75, to be drilled in ties; 1/2 in. diam., 5 in. deep.
- 9- Holes for Drive Lags, Item 46, to be drilled in ties; 3/8 in. diam., 2 in. deep.
- 9- Switch Circuit Controller must be operated from normally closed point.
- 10- Where derail is not required, omit pipe connections. Use main track connections only.
- 11- Protective treatment-Item 32, Instruction 350.

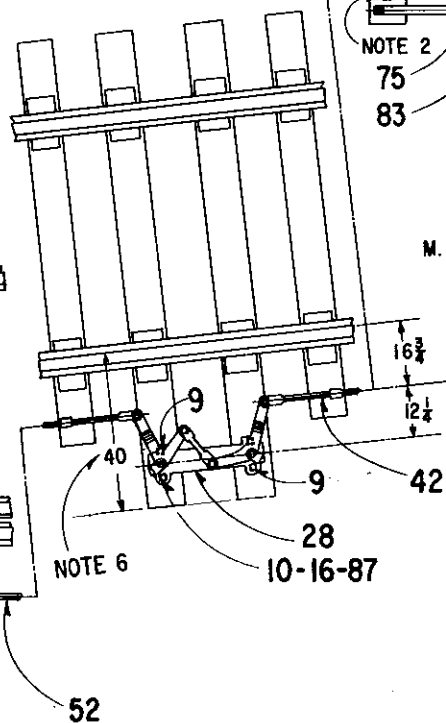
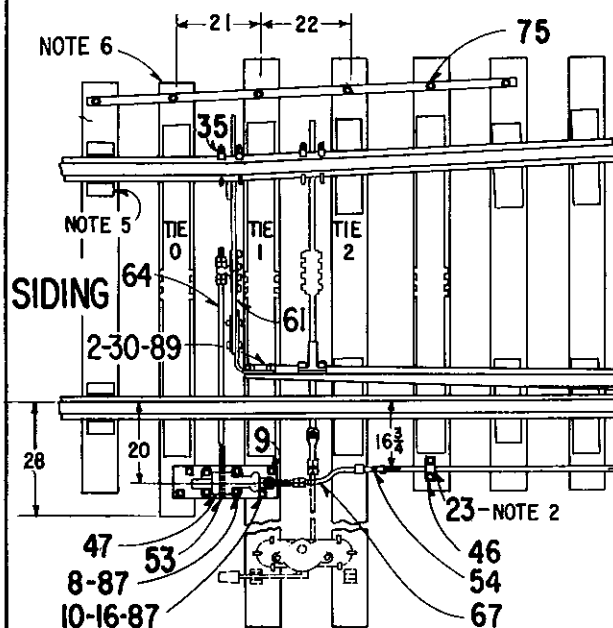
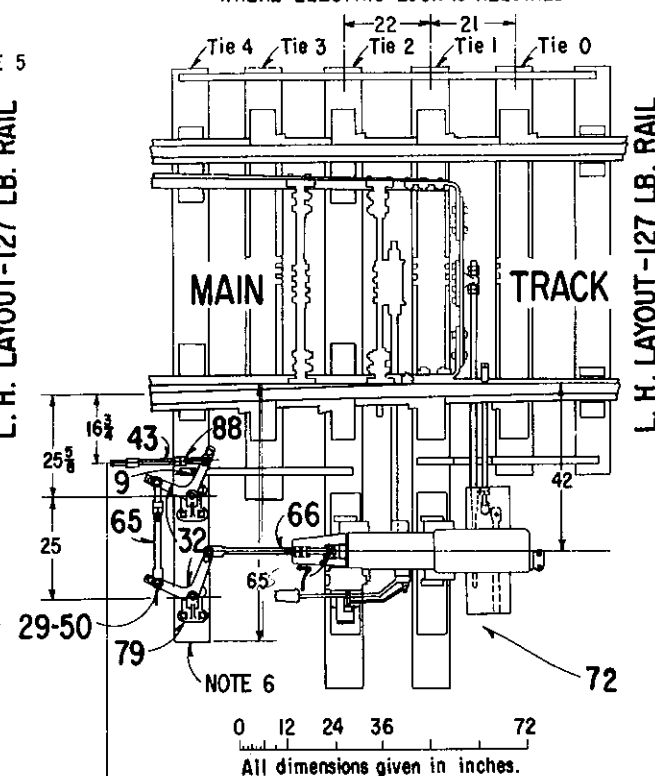
M. OF W. SWITCH STAND LAYOUT

USE WHERE ELECTRIC LOCK IS NOT REQUIRED



MODEL 9 SWITCH MACHINE LAYOUT

USE IN CONJUNCTION WITH PLAN 3100
WHERE ELECTRIC LOCK IS REQUIRED



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH SPLIT POINT DERAIL
NON-INTERLOCKED SWITCH

S-3160

NO	ITEM	REF.	REQUIRED M. or W. MOD. 9 SWITCH SWITCH STAND MACH.	USE	NO	ITEM	REF.	REQUIRED M. or W. MOD. 9 SWITCH SWITCH STAND MACH.	USE	NO	ITEM	REF.	REQUIRED M. or W. MOD. 9 SWITCH SWITCH STAND MACH.	USE
1	Bolt, Compl. 3/4 X 3-3/4, Spl. Hd. Hex. Nut	RSC-G35C	4	105 lb. Rail	42	Jaw, Solid-Tong End A. A. R.	10181	2	Pipe Line	83	Strap, Tie, Long	3014-1	3	
2	" " 1 X 4-1/4 " " " "	RSC-G35C		127 lb. Rail	43	Jaw, Screw- " " A. A. R.	10199	1	" "	84				
3					44					85				
4					45					86				
5					46	Log, Drive, Wshr. Hd. 1/2 X 3-2 1/2 Thd. *	21-C-360	As req.	Pipe Carriers	87	Washer, Steel Spr. 3/4 in. ASA Med.	Coml.	As req.	Items 1-8-10
6	Bolt, Compl.	3001-18	4	Sw. Adj. Bracket	47	Lock, Plunger-Compl. A. A. R.	14253	1		88	" " " 1-1/4 in. " "	"	1	Screw Jaw
7	Bolt, Compl.	3007-1	1	Sw. Mach. conn.	48	Lug, Point	3006-21	1	127-105 lb. Rail	89	" " " 1 in. " "	"	As req.	Item 2
8	Bolt, 3/4 X 2-1/2, Sq. Hd. & Nut	ASA Reg.	4	Plunger Lock	49					90				
9	Bolt, Log 3/4 X 7 ASA cut thread	Coml.	8		50	Pins, Jaw A. A. R.	10105	7		91				
10	Bolt, Stud 3/4-10 X 11, with sq. nuts.	ASA Reg.	8	Items 26, 28, 53	51					92				
11					52	Pipe, 1 in. With plugs & couplings. A. A. R.	10155	As req.		93				
12					53	Plate, Base-Plunger Lock	3004-4	1		94				
13					54	Rivets, 1/4 X 1-11/16 A. A. R.	10153	As req.	Pipe connections	95				
14					55					96				
15					56					97				
16	Bolt Grip	Raco	589-1	8	Stud Bolts	57				98				
17					58					99				
18	Ball Stud, Compl.	A. A. R.	12711	1	Sw. C. C.	59	Rod, Circuit Controller	3005-4	1	100				
19					60	Rod, Derail Front, Compl.	3001-51	1	L. H.					
20	Bracket	3001-21	1	Throw Rod	61	" " " "	3001-53	1	R. H.					
21	Bushing, 3/4 Long (Modified)	G. R. S.	6714-309	(2)	105 Lb. Rail only.	62								
22	Bushing	G. R. S.	6714-309	(2)	105 Lb. Rail only.	63								
23	Carrier, Pipe-One Way	A. A. R.	10746	As req.	See Note 2.	64	Rod, Lock	3003-31	1					
24					65	Rod, Connecting, Compl.	3002-33	1	Tandem cranks					
25					66	" " "	3002-34	1	Sw. Mach. conn.					
26	Circuit Controller, Compl.	G. R. S.	Model 8	1	5-3/8 Arm, 1 in. offset	67	Rod, Tong End	3002-61	1					
27					68									
28	Compensator Assembly	A. A. R.	10144	1		69	Rod, Throw, Compl.	3002-10	1	At Switch Points				
29	Cotter 3/16 X 1-1/2	Coml.	7	Jaw Pins	70									
30	" 1/4 X 1-3/4	"		Item 2	71									
31	" 1/4 X 1-1/4	"	4	Item 1	72	Switch Layout, Mod. 9 Switch Mach.	3100	1	Specify Requirements					
32	Crank	3017-11	2	Tandem Cranks	73									
33	"	3017-5	1		74									
34					75	Spike, Drive, 6-1/2 in. *	21-C-361	18	Tie Straps					
35	Guide, Front Rod	3001-35	1	Derail-127 lb. Rail	76									
36	" " "	3001-36	1	" 105 lb. Rail	77									
37					78									
38					79	Stand, Crank, With center pin A. A. R.	10082	1						
39					80									
40					81									
41					82									

* Pittsburg Screw & Bolt Corp. or equal.

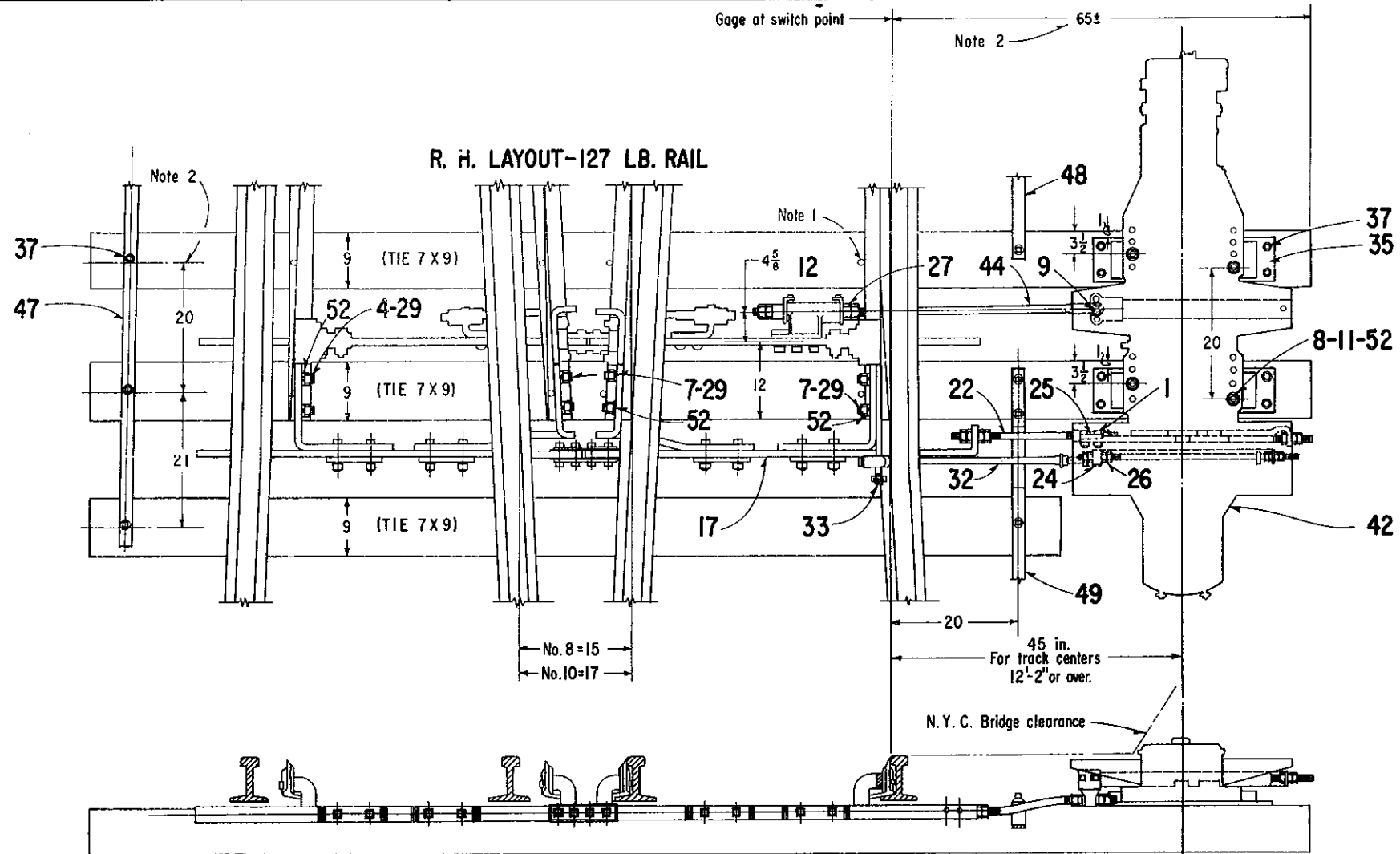
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
TURNOUT WITH SPLIT POINT DERAIL
NON-INTERLOCKED SWITCH

Approved R. S. Battinelli
Chief Signal Engineer

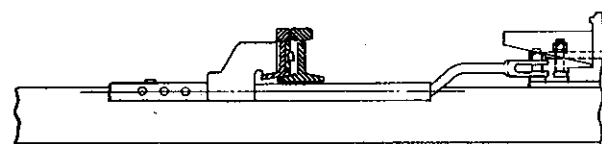
S-3160

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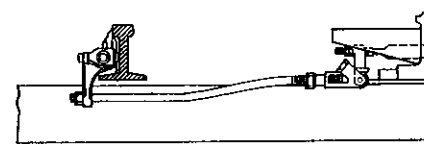
ISSUED 9-9-59
SHEET 2 Cont'd on Sh.



FRONT AND LOCK RODS



THROW ROD



POINT DETECTOR ROD

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
DOUBLE-SLIP SWITCH LAYOUT
G. R. S. MODEL 5A & 5C SWITCH MACHINES
127-105 LB. RAIL

S-3180

NO.	ITEM	REF.	REQ.	USE	NO.	ITEM	REF.	REQ.	USE
1	Bolt, Hex. Nut $\frac{3}{4}$ -10 X $1\frac{1}{2}$	Coml.	2	Lock Rod Lug	31				
2					32	Point Detector Rod	3005-1	1	
3	Bolt $\frac{3}{4}$ X $3\frac{3}{4}$, Special Hd., Hex. Nut	RSC-G35C	2	105 Lb. Straight Pt.	33	Point Lug Compl.	3006-21	1	127-105 Lb. Rail
4	" 1 X $4\frac{1}{4}$, " " " "	RSC-G35C		127 Lb. " "	34				
5					35	Saddle Plate, Compl.	3004-1	2	At Switch Mach.
6	Bolt $\frac{3}{4}$ X $4\frac{1}{2}$, Special Hd., Hex. Nut	RSC-G35C	6	105 Lb. Curved Pt.	36				
7	" 1 X 5 " " " "	RSC-G35C		127 Lb. " "	37	Spike, Drive-6 in. long.	* 21-C-361	20	
8	" -Stud $\frac{3}{4}$ -10 X 12, Sq. Nuts	ASA, Reg.	4	Switch Mach.	38				
9	"	3007-1	1	Throw Rod	39				
10					40				
11	Bolt Grip	Raco	589-1	4	Item 8.	41			
12	Bracket, Switch Adjustment	GRS	46948-13Gr.2	1	Throw Rod	42	Switch Machine	1	Specify requirements
13	Bushing - For $\frac{3}{4}$ bolts	GRS	6714-309	(2)	Item 3 only.	43			
14	" " " "	GRS	8104-2	(6)	Item 6 only.	44	Throw Rod, Complete	3002-14	1
15					45				
16					46				
17	Front Rod, Complete	3001-60	1		47	Tie Strap - Long	3014-1	1	
18					48	" " -Short	3014-3	1	
19					49	" " -Short, Set	3014-5	1	
20					50				
21					51				
22	Lock Rod	3003-121	1	127 Lb. Rail	52	Washer, Steel Spring $\frac{3}{4}$ SAE Med.	Coml.	As Req.	Items 3, 6 & 8
23	" "	3003-122		105 Lb. Rail	53	Washer, Steel Spring 1 in. SAE Med.	"	8	Items 4 & 7
24	Lug, Pt. Detector, Ball Stud	3006-9	1	Conn. of Sw. Mach.	54				
25	Lug, Lock Rod	3003-18	1		55				
26	Nut, $\frac{3}{4}$ -10 Heavy Hex. Jam, ASA-UNC-2B	Coml.	4	Item 24 of Sw. Mach.	56				
27	Nut, Sleeve, $1\frac{1}{4}$ -7	GRS	44921-2Gr.1	2	Item 12	57			
28					58				
29	Pins, Cotter $\frac{1}{4}$ X $1\frac{3}{4}$	Coml.	8	Items 4 & 7	59				
30	" " $\frac{1}{4}$ X $1\frac{1}{4}$	Coml.		Items 3 & 6	60				

* Pittsburg Screw & Bolt Corp. or equal.

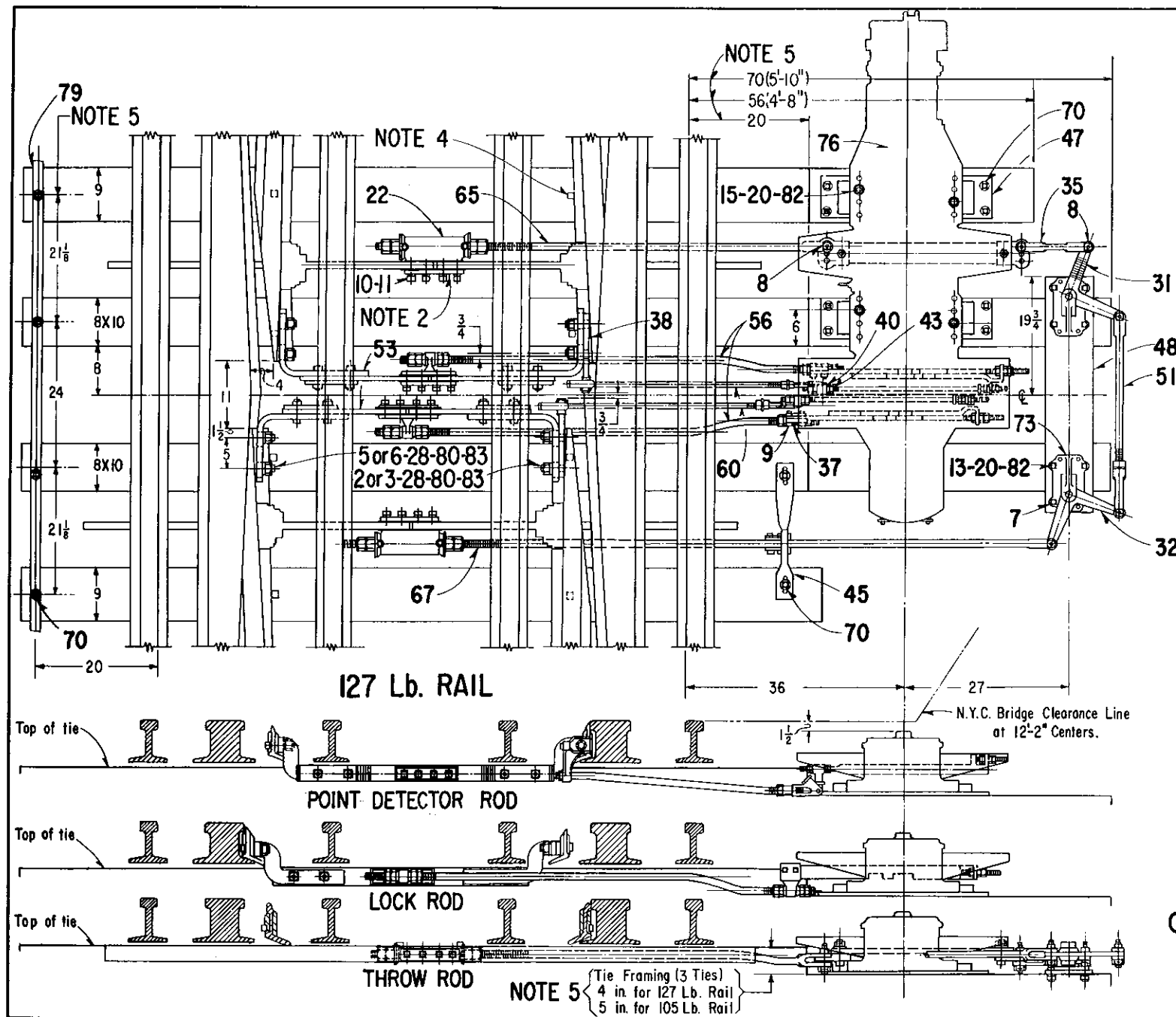
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
DOUBLE-SLIP SWITCH LAYOUT
G. R. S. MODEL 5A & 5C SWITCH MACHINES
127-105 LB. RAIL

Approved R. S. Battinelli
 Chief Signal Engineer

S-3180

ISSUED 9-8-59
 SHEET 2 Cont'd. on Sh ---





NOTES:

- 1 - This plan to be used where a slip rail is located between switch machine and knuckle rail. Where slip rail is not present use Layout A.
- 2 - To install switch adjustment brackets, Item 22, on Type MJ rods retain splice plate and attach bracket using four bolts, 3001-19. On other vertical rods, remove one splice plate and attach bracket using four bolts, 3001-18.
- 3 - Holes for Drive Spikes to be one-half inch diameter and five inches deep.
- 4 - M. of W. Dept. to provide holes in gage plates, tie plates and ties to provide for emergency spiking of switch. Eight holes required.
- 5 - M. of W. Dept. to provide ties of suitable length spaced as indicated. Ties to be creosoted after framing.
- 6 - Protective treatment, Item 32, Instruction 350.

0 12 24 36
All dimensions given in inches.

LAYOUT B

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
MOVABLE POINT FROG LAYOUT
GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
127-105 LB. RAIL

S-3190

Printed in U. S. A.

ISSUED 8-19-63
SHEET 2 Cont'd. on Sh. 3

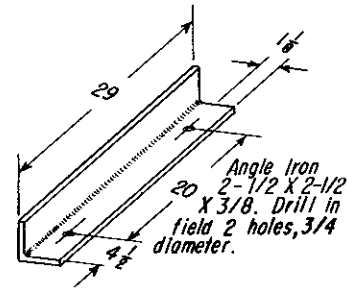
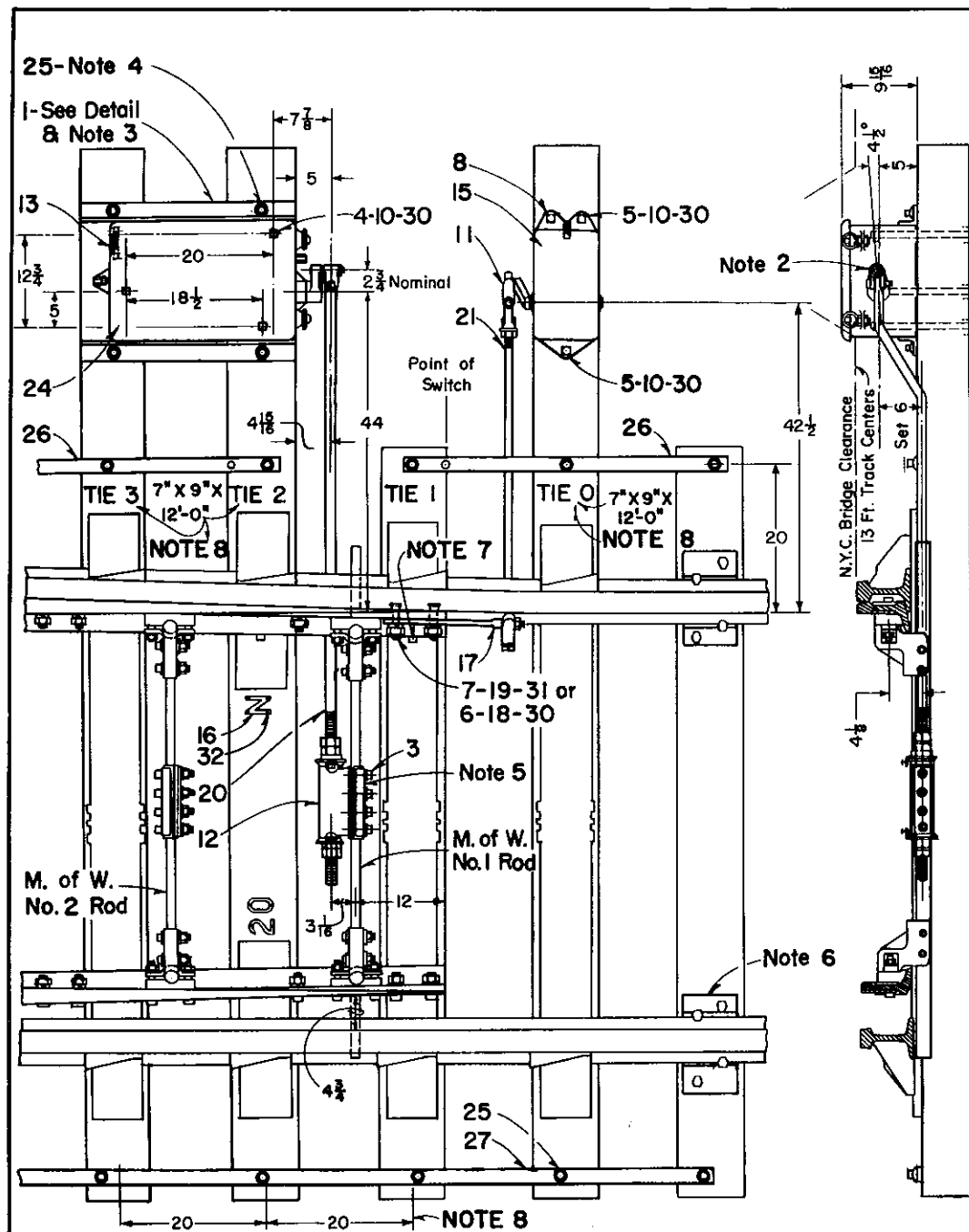
NO.	ITEM	REF.	LAYOUT A B	USE	NO.	ITEM	REF.	LAYOUT A B	USE	NO.	ITEM	REF.	LAYOUT A B	USE
1	Bolt, $\frac{3}{4}$ X 4, Special Head, Hex. Nut. RSC	G35C		105 Lb. Rail	31	Crank	3017-19	1 1		61				
2	Bolt, 1 X $5\frac{1}{2}$ " " " " "	"	4 4	127 Lb., 39 Ft. Points	32	Crank	AAR 10075	1 1		62				
3	Bolt, 1 X $4\frac{3}{4}$ " " " " "	"		127 Lb., Other Points	33					63	Rod, Throw	3002-11	1	
4	Bolt, $\frac{3}{4}$ X $4\frac{3}{4}$ " " " " "	"		105 Lb. Rail	34					64	Rod, Throw	3002-18	1	
5	Bolt, 1 X $6\frac{1}{4}$ " " " " "	"	4 4	127 Lb., 39 Ft. Points	35	Link	AAR 10173	1 1		65	Rod, Throw	3002-15	-	127 Lb. Rail
6	Bolt, 1 X $5\frac{1}{2}$ " " " " "	"		127 Lb. Other Points	36					66	Rod, Throw	3002-16		105 Lb. Rail
7	Bolt, $\frac{3}{4}$ X $2\frac{1}{2}$, Sq. Hd. & Nut	Coml.	4 4	Crank Stands	37	Lug, Lock Rod	3003-18	2 2		67	Rod, Throw	3002-17		127 & 105 Lb. Rail
8	Bolt, Compl.	3007-1	6 6	Throw Rod Conn.	38	Lug, Point-Compl.	3006-23	2 2	127 Lb. Rail	68				
9	Bolt, Lug, $\frac{3}{4}$ -10 X $2\frac{1}{2}$ Hex. Nut. GRS	0423	4 4	Lock Rod Lug	39	Lug, Point-Compl.	3006-24		105 Lb. Rail	69				
10	Bolt, Compl.	3001-19		On Type MJ Rods	40	Lug, Pt. Detector Ball Stud, Compl.	3006-9	2 2	Conn. at Sw. Mach.	70	Spike, Drive, 6 In. Long *	21-C-361	16 16	Items 45, 47, 79
11	Bolt, Compl.	3001-18	8 8	On Other Vert. Rods	41					71				
12	Bolt, Stud, $\frac{3}{4}$ -10 X 9 Compl. w/ Sq. Nuts	Coml.	- 4	Crank Std.-105 Lb. Rail	42					72				
13	Bolt, Stud, $\frac{3}{4}$ -10 X 10 " " "	"		" " -127 Lb. Rail	43	Nut, Heavy Hex. Jam. $\frac{3}{4}$ -10, UNC-2B	ASA Req.	8 8	Pt. Det. Ball Stud Lug.	73	Stand, Crank, With Center Pin	AAR 10082	2 2	
14	Bolt, Stud, $\frac{3}{4}$ -10 X 11 " " "	"	- 4	Sw. Mach.-105 Lb. Rail	44					74				
15	Bolt, Stud, $\frac{3}{4}$ -10 X 12 " " "	"		" " -127 Lb. Rail	45	Pipe Carrier, Transverse	Raco 411-1	1 1		75				
16	Bolt, Stud, $\frac{3}{4}$ -10 X 14 " " "	"	4 -	Crank Stands	46					76	Switch Machine	GRS	As Req. As Req.	Throw bar to have two couplings, 51153-1.
17	Bolt, Stud, $\frac{3}{4}$ -10 X 15 " " "	"	4 -	Sw. Machines	47	Plate, Saddle, Compl.	3004-1	2 2	Sw. Mach.	77				
18					48	Plate, Base	3004-6	1 1	Crank Stand	78				
19					49					79	Tie Straps, Long	3014-1	1 1	
20	Bolt Grip	Raco 589-1	8 8	Stud Bolts	50					80	Washer, Plate	AAR 125511	4 4	127 Lb. Rail
21					51	Rod, Connecting	3002-31	1 1		81	Washer, Plate	AAR 125512		105 Lb. Rail
22	Bracket, Switch Adjustment	GRS 46948-12Gr.1	2 2	Specify Item 10	52					82	Washer, Steel Spring, $\frac{3}{4}$ In. Med. A.S.	Coml.	As Req. As Req.	
23	Bushing, For $\frac{3}{4}$ Bolt	GRS 6714-309	(4) (4)	With Item 1 only	53	Rod, Front, Compl.	3001-50	2 2		83	Washer, " " 1 In. " "	"	" "	
24	Bushing, " " "	GRS 8104-2	(4) (4)	" " 3 "	54									
25					55	Rod, Lock	3003-123	2						
26					56	Rod, Lock	3003-124		127 Lb. Rail					
27	Cotter Pins $\frac{1}{4}$ X $1\frac{1}{4}$	Coml.	8 8	$\frac{3}{4}$ In. Switch Bolts	57	Rod, Lock	3003-125		105 Lb. Rail					
28	Cotter Pins $\frac{1}{4}$ X $1\frac{3}{4}$	"		1 In. " "	58									
29					59	Rod, Point Detector, Compl.	3005-1	2						
30					60	Rod, " " "	3005-9		2					

* Screw & Bolt Corp. of America.

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
MOVABLE POINT FROG LAYOUT
GRS MODEL 5A, 5C OR 5G SWITCH MACHINE
127-105 LB. RAIL**

Approved *R. S. Bottinelli*
Chief Signal Engineer

S-3190



DETAIL

NOTES:

- 1 - This layout to be installed only as authorized by Signal Engineer.
- 2 - When crank is attached to shaft of switch machine, the keyway must be used which positions the end of crank above the center line of the shaft when switch points are closed on machine side of track.
- 3 - Place angle iron in position after switch machine is installed. Scribe holes in ties and center punch for drilling 1/8 inch nearer to switch machine to obtain force fit against side of machine.
- 4 - Holes for Drive Spikes, Item 25 to be drilled in tie 1/2 inch diam., 5 inches deep.
- 5 - Remove one splice plate from No. 1 rod and install switch adjustment bracket.
- 6 - M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 7 - M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch.
- 8 - M. of W. Dept. to provide ties of length required, spaced as shown. Min. length indicated.
- 9 - Protective treatment-Item 32, Instruction 350.

RIGHT HAND - 127 LB. RAIL

NO	ITEM	REF.	REQ.	USE
1	Angle, 2-1/2 X 2-1/2 X 3/8 X 29		2	See Detail
2				
3	Bolt 3/4 X 3	3001-18	4	If req. (M. of W. to supply)
4	Bolt, Stud 3/4-10 X 15 Sq. Nuts, Spr. Wsh.	ASA Regular	3	Switch Machine
5	" " 3/4-10 X 11 " " " "	" " " "	2	Sw. Circuit Controller
6	Bolt, 3/4 X 3, Spcl. Hd., Hex. Nut.	RSC-G35C	2	Pt. Lug-105 Lb. Rail
7	" 1 X 3-1/4 " " " " " "	" " " "	2	" " 127 Lb. "
8	Bolt, Lag 3/4 X 7 ASA Cut Thd.	Com'l.	1	Sw. Circuit Controller
9				
10	Bolt Grip	Roco 589-1	5	Stud Bolts
11	Bolt Stud, Compl.	AAR 127-11	1	Sw. Circuit Controller
12	Bracket, Switch Adjustment	GRS 46948-1261	1	
13	Bushing, Reducing 1-1/2 to 1-1/4	GRS 41892-13	1	Sw. Machine Conn.
14	" " 3/4 Long Modified	GRS 6714-309	(2)	Pt. Lug on 105 lb. Rail
15	Circuit Controller, Compl.	GRS Model 8	1	5-3/8 Arm 1 in. offset
16	Letter "N" & Numerals As Required	2280	2	Switch No. & Position
17	Point Lug, Complete	3006-21	1	
18	Pin, Cotter 1/4 X 1-1/4	Com'l.	2	Item 6
19	Pin, Cotter 1/4 X 1-3/4	"	1	Item 7
20	Rod, Throw	3002-101	1	
21	Rod, Switch Circuit Controller	3005-4	1	
22				
23				
24	Sw. Machine	GRS Model 13	1	
25	Spikes, Drive 6-1/2 inch	* 21-C-361	14	
26	Straps, Tie	3014-3	2	
27	" "	3014-1	1	
28				
29				
30	Washer, Steel Spr. 3/4 in. ASA Medium	Com'l	As	Items 4, 5, 6
31	" " " 1 in. " " " "	Com'l	Req.	Item 7
32	Wood Screws-2 in. No. 10 Flat Hd.	Com'l	8	Item 16
33				
34				
35				

* Pittsburg Screw & Bolt Co. or equal.

0 6 12 24 36 48
All dimensions given in inches.

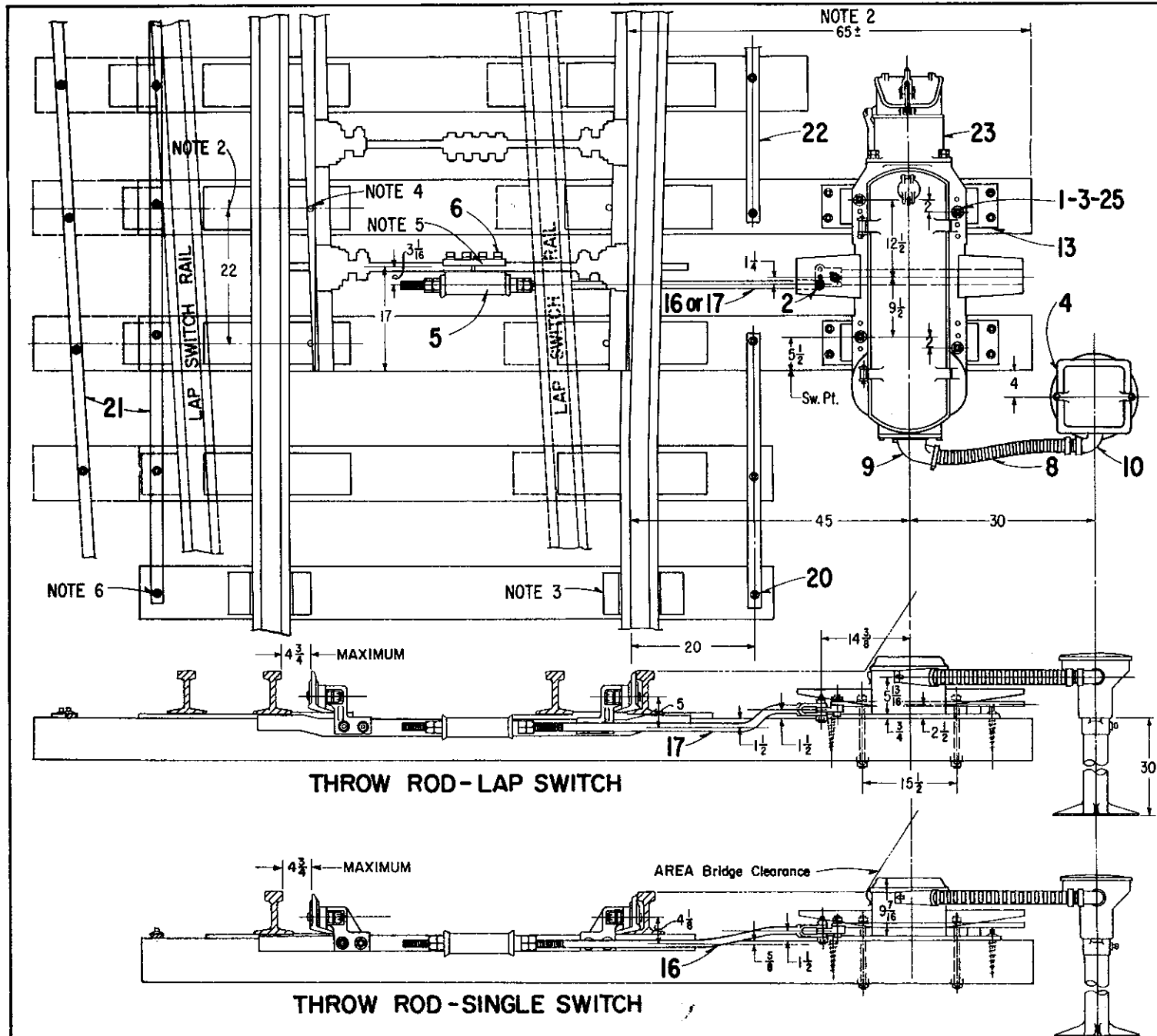
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
MODEL 13 SWITCH MACHINE

Approved L. J. Battinelli
Chief Signal Engineer

S-3200

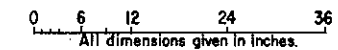
ISSUED 9-8-59

SHEET... Cont'd. on Sh...



NO.	ITEM	REFERENCE	REQ.	USE
1	Bolt, Stud 3/4-10 X 12 Compl. with Square Nuts	Coml.	4	Switch Machine
2	Bolt	3007-1	1	Throw Rod
3	Bolt Grip	Roco 589-1	4	Stud Bolt
4	Box, Terminal	GRS 52918-9	1	
5	Bracket, Switch Adjustment	GRS 46948-12 Gr. 1	1	
6	Bolts	3001-18	4	
7				
8	Conduit 2 in. Flex.	GRS Pl. J-3517 Fig. 5	1	
9	Coupling	GRS 45688-6 Gr. 1	1	Switch Machine
10	Coupling	GRS 45688-104 Gr. 1	1	Terminal Box
11				
12				
13	Plate, Saddle Complete	3004-1	2	Switch Machine
14				
15				
16	Rod, Throw	3002-11	1	Single Switch
17	Rod, Throw	3002-7	1	Lap Switch
18				
19				
20	Spike, Drive 6 in. long	*	20	Saddle Pl. & Tie Strap
21	Strap, Tie	3014-1	1	
22	Strap, Tie	3014-3	2	
23	Switch Machine	GRS 52500-4 Gr. 2	1	Specify Requirements
24				
25	Washers, Steel Spring 3/4 in. ASA Medium	Coml.	4	Stud Bolts

* Pittsburg Screw & Bolt Corp. or equal.



NOTES:

- 1- This layout is for use as authorized by Signal Engineer on classification track switches. On receiving or departure yard switches, or where signal is required, use Layout B.
- 2- M. of W. Dept. to provide ties of length required, spaced as indicated.
- 3- M. of W. Dept. to provide double shoulder tie plates, where practicable, on five ties, starting with second tie ahead of switch points.
- 4- M. of W. Dept. to provide suitable holes in switch plates and ties for emergency spiking of switch. Four holes required.
- 5- Remove one splice plate from No. 1 switch rod and install switch adjustment bracket.
- 6- Holes for drive spikes to be 1/2 inch diameter and 5 inches deep.
- 7- Protective treatment-Item 32, Instruction 350.

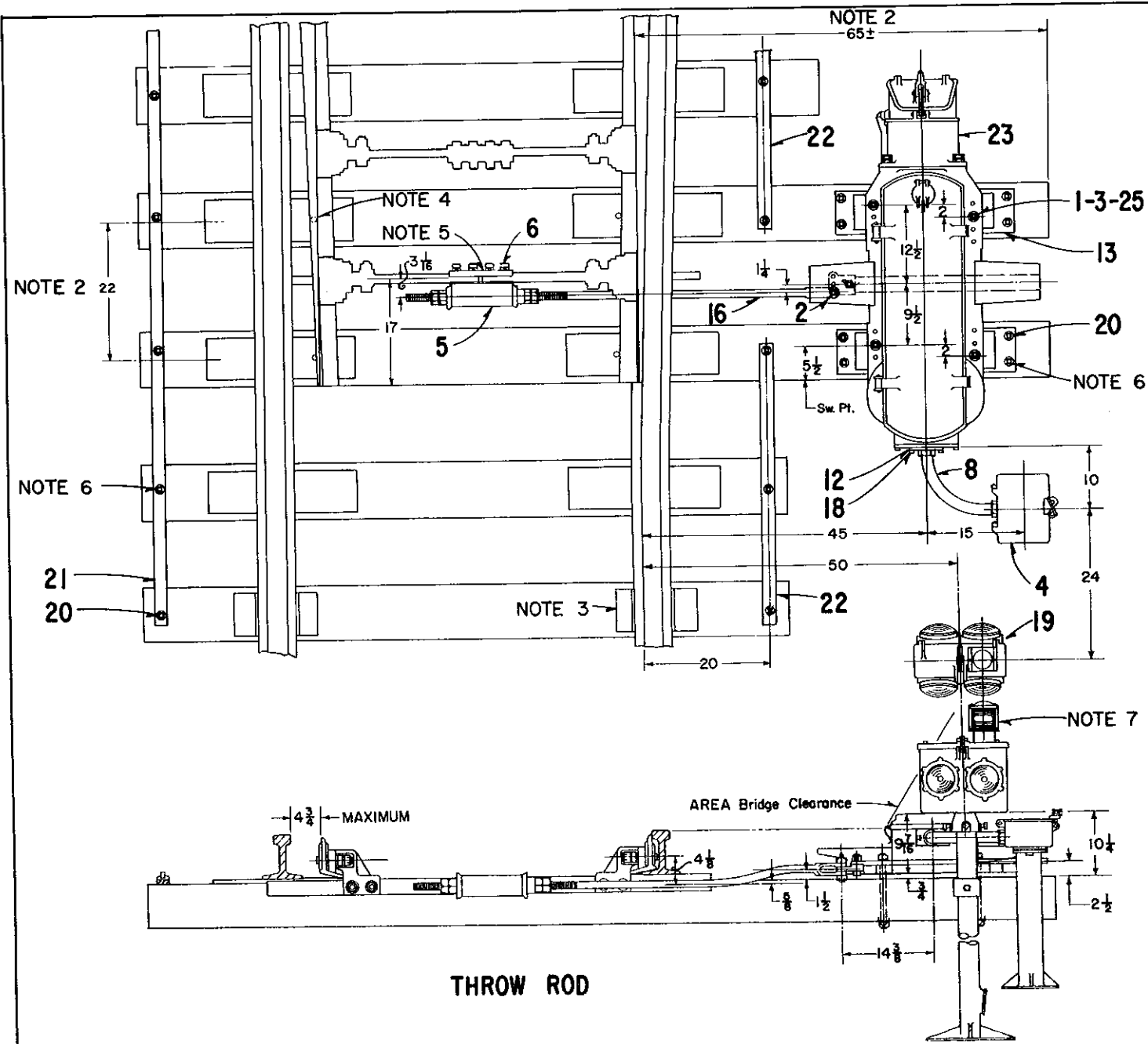
LAYOUT A

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT GRS MODEL 6 SWITCH MACHINE

S-3210

ISSUED 3-15-60

SHEET 1 Cont'd on Sh. 2



NO.	ITEM	REFERENCE	REQ.	USE
1	Bolt, Stud 3/4-10X12 Compl. with Square Nuts	Com'l.	4	Switch Machine
2	Bolt	3007-1	1	Throw Rod
3	Bolt Grip	Raco 589-1	4	Stud Bolts
4	Box, Terminal	Raco 428-40	1	
5	Bracket, Switch Adjustment	GRS 46948-12 Gr. 1	1	
6	Bolt	3001-18	4	
7				
8	Conduit	1173-1	1	
9				
10				
11				
12	Plate,	GRS 52106-12	1	Switch Machine
13	Plate, Saddle Complete	3004-1	2	Switch Machine
14				
15				
16	Rod, Throw	3002-11	1	
17				
18	Screw, 3/8-16 X 1 Hex. Hd. & Lock Washer	Com'l.	2	
19	Signal, Type P See Note 7	GRS As Req.	1	
20	Splice, Drive 6 in. long	* 21-C-361	20	Saddle PL & Tie Strap
21	Strap, Tie	3014-1	1	
22	Strap, Tie	3014-3	2	
23	Switch Machine	GRS 52500-4 Gr. 2	1	Specify Requirements
24				
25	Washers, Steel Spring 3/4 in. ASA Medium	Com'l.	4	Stud Bolts

* Pittsburgh Screw & Bolt Corp. or equal.

0 6 12 24 36
All dimensions given in inches.

NOTES:

- 1- This layout is for use as authorized by Signal Engineer on receiving or departure yard switches with Type P signal. On classification yard switches use Layout A.
- 2- M. of W. Dept. to provide ties of length required, spaced as indicated.
- 3- M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 4- M. of W. Dept. to provide suitable holes in switch plates and ties to provide for emergency splicing of switch. Four holes required.
- 5- Remove one splice plate from No. 1 switch rod and install switch adjustment bracket.
- 6- Holes for drive spikes to be 1/2 inch diameter and 5 inches deep.
- 7- Signal to be equipped with Transport Products Corp. special lamp 31223X with red Fresnel lens.
- 8- Protective treatment-Item 32, Instruction 350.

LAYOUT B

NEW YORK CENTRAL SYSTEM

SIGNAL DEPARTMENT

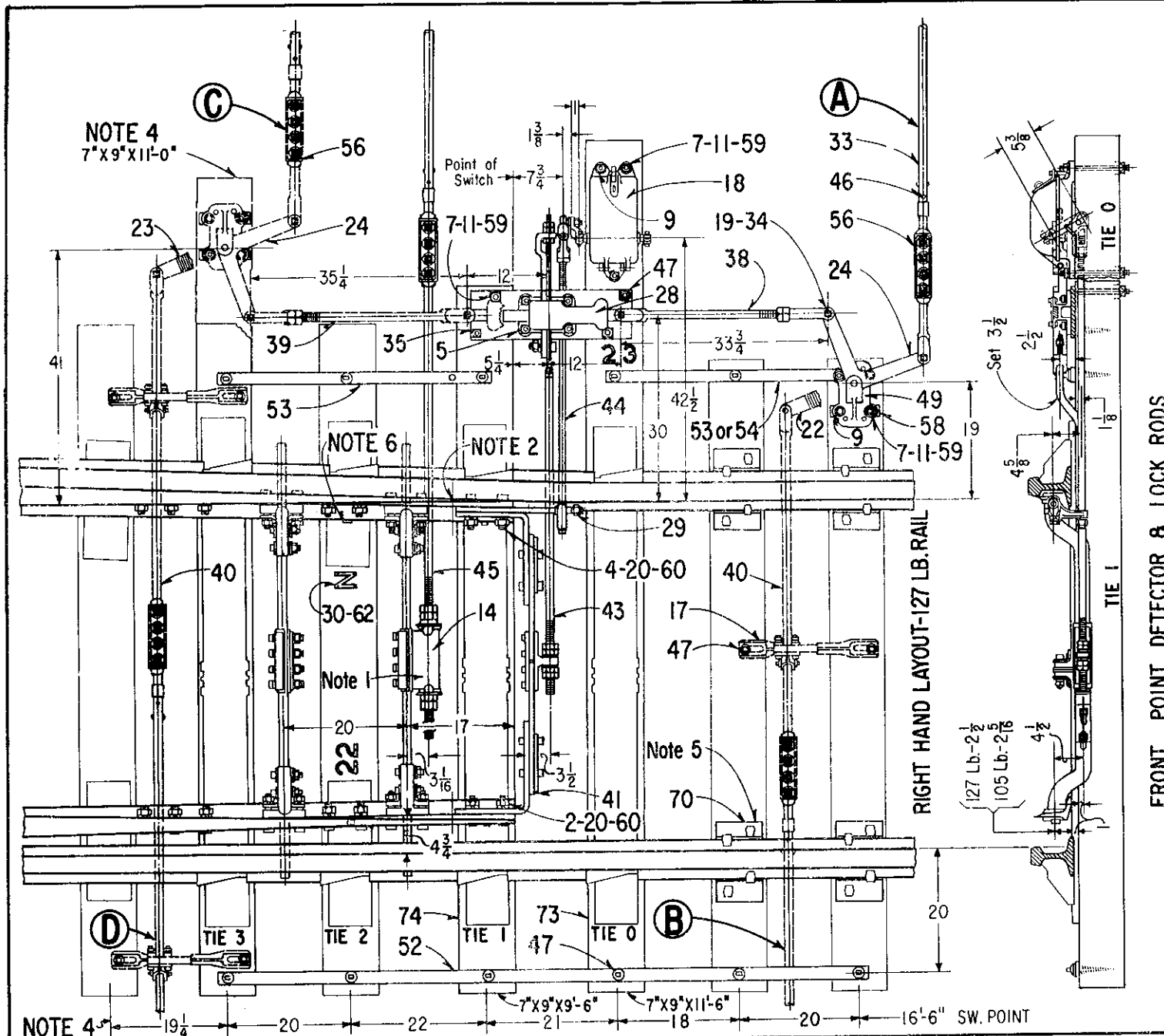
SWITCH LAYOUT

GRS MODEL 6 SWITCH MACHINE

Approved *L. J. Bottinelli*
Chief Signal Engineer

S-3210

ISSUED 3-15-60



NOTES:

- 1- Remove one splice plate from No. 1 switch rod and install switch adjustment bracket, Item 14.
- 2- To provide clearance for front rod or point lug, switch bolt located 9-1/2 inches from switch point may be removed.
- 3- Holes for Drive Spikes, Item 47, to be one half inch in diameter and five inches deep.
- 4- M. of W. Dept. to provide ties of length required, spaced as indicated.
- 5- M. of W. Dept. to provide double shoulder tie plates on five ties starting with second tie ahead of switch points.
- 6- M. of W. Dept. to provide suitable holes in gage plates, tie plates and ties for emergency spiking of switch, (4 required).
- 7- Protective treatment, Item 32, Instruction 350.

0 12 24 36
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SWITCH LAYOUT MECHANICAL- FACING POINT LOCK

S-3900

NO.	ITEM	REF.	REQUIRED FOR LAYOUT				USE	NO.	ITEM	REF.	REQUIRED FOR LAYOUT				USE
			A	B	C	D					A	B	C	D	
1	Bolt 3/4 X 3-3/4, Spcl. Hd. Hex. Nut	RSC-G35C	2	2	2	2	Fr. Rod 105 Lb.	43	Rod, Lock, Complete	3003-35	1	1	1	1	
2	" 1 X 4-1/4 " " " "	RSC-G35C					" " 127 Lb.	44	Rod, Point Detector, Compl.	3005-4	1	1	1	1	
3	" 3/4 X 4-1/2 " " " "	RSC-G35C	2	2	2	2	" " 105 Lb.	45	Rod, Throw, Compl.	3002-21	1	1	1	1	
4	" 1 X 5 " " " "	RSC-G35C					" " 127 Lb.	46	Rivets 1/4 X 1-11/16, Rd. Hd.	10153	As Req.	As Req.	As Req.	As Req.	Pipe Line
5	" 3/4 X 2-1/2, With Sq. Hd. & Nut	ASA Regular	4	4	4	4	Plunger Lock	47	Spike, Drive, 6" Long	21-C-361	13	15	13	17	Items 17, 35, 52, 53, 54
6								48							Tie Straps
7	Bolt, Stud, 3/4-10 X 11, With Sq. Hd. & Nuts	ASA Regular	6	6	6	6	Cr. Std.-C.C.-Pl. Lock	49	Stand, Crank, With Center Pin	10082	1	1	1	1	
8								50							
9	Bolt, Lag, 3/4 X 7, Cut Thread	ASA	3	3	3	3	Cr. Stand, C. C.	51		3014-1	1	1	1	1	
10								52	Strap, Tie	3014-3	2	1	2	2	
11	Bolt Grip	Raco	589-1	6	6	6	Stud Bolts	53	" "	3014-5		1			
12								54	" "						
13								55							
14	Bracket, Sw. Adjustment	G R S	46948-12Gr1	1	1	1	1	56	Tang End-Solid Jaw	AAR	109411	1		1	
15	Bushing, For 3/4 Bolt	G R S	8104-2	(2)	(2)	(2)	(2)	57							
16	Bushing, For 3/4 Bolt	G R S	6714-309	(2)	(2)	(2)	(2)	58	Washer, Strap	3014-2	1	1	2	2	Crank Stand
17	Carrier, Transverse Pipe	Raco	411-1		1		2	59	Washer, Steel Spring 3/4 ASA Medium	Coml.	As Req.	As Req.	As Req.	As Req.	Items 1, 3, 5 & 7
18	Circuit Controller, 5-3/8 Arm, Offset 1 in.	G R S	Model 8	1	1	1	1	60	" " " " " "						Items 2 & 4
19	Cotter 3/16 X 1-1/2	Coml.		3	3	4	4	61							
20	" 1/4 X 1-3/4	"		4	4	4	4	62	Wood Screws, 2 in., No. 10 Flat Hd.	Coml.	8	8	8	8	Numerals-Letters.
21	" 1/4 X 1-1/4	"						63							
22	Crank	3017-1			1		1	64							
23	"	3017-3						65							
24	"	AAR	10076	1		1		66							
25								67							
26								68							
27								69							
28	Lock, Plunger, Compl.	AAR	14253	1	1	1	1	70							
29	Lug, Point		3006-21	1	1	1	1	71							
30	Numerals-Letter "N"		2280	As Req.	As Req.	As Req.	As Req.	72	Sw. & Lock No.						
31								73							
32								74							
33	Pipe, 1 Inch, With Plugs & Couplings	AAR	10154	As Req.	As Req.	As Req.	As Req.	75							
34	Pin, Jaw	AAR	10105	3	3	3	3								
35	Plate, Base		3004-4	1	1	1	1								
36															
37															
38	Rod, Connecting		3002-31	1	1										
39	" "		3002-32			1	1								
40	Rod, Cross Connecting, Compl.		3002-51		1		1								
41	Rod, Front, Compl.		3001-50	1	1	1	1								
42															

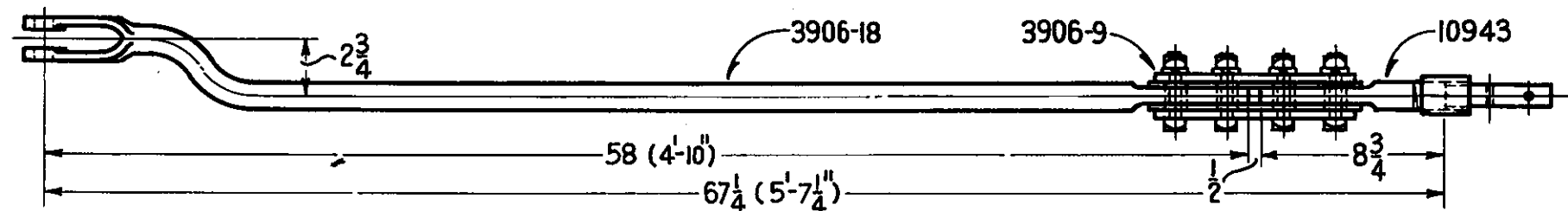
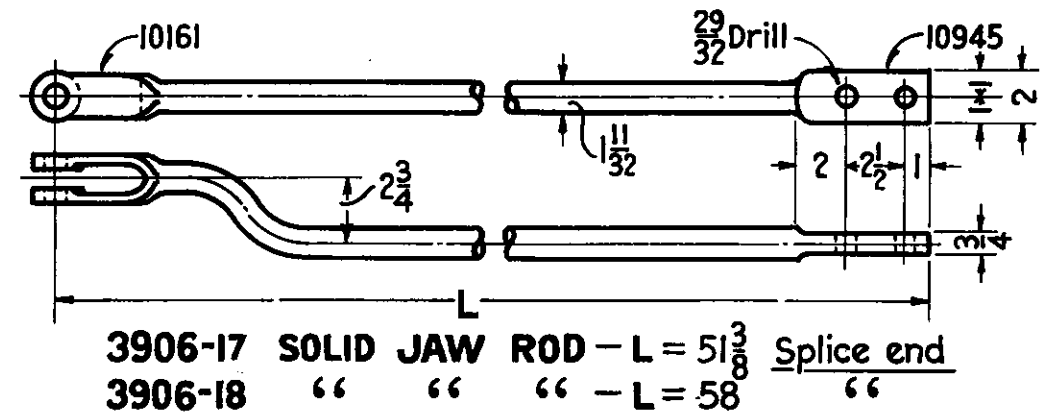
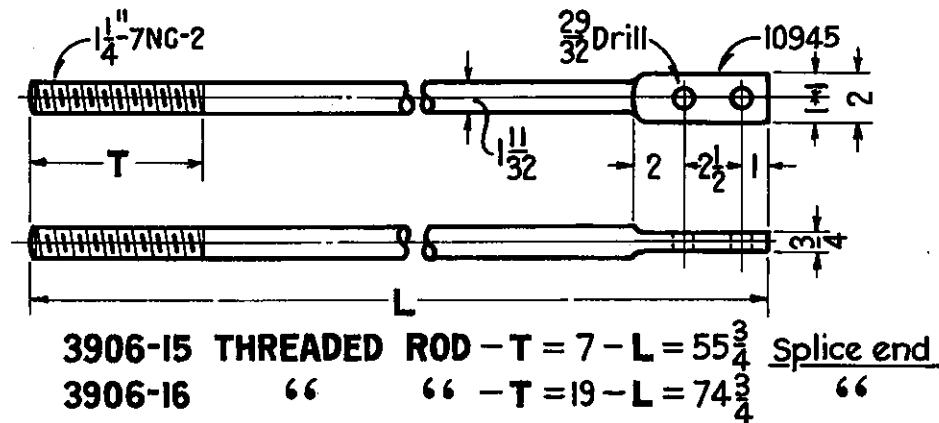
* Pittsburg Screw & Bolt Corp. or equal.

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SWITCH LAYOUT
MECHANICAL-FACING POINT LOCK**

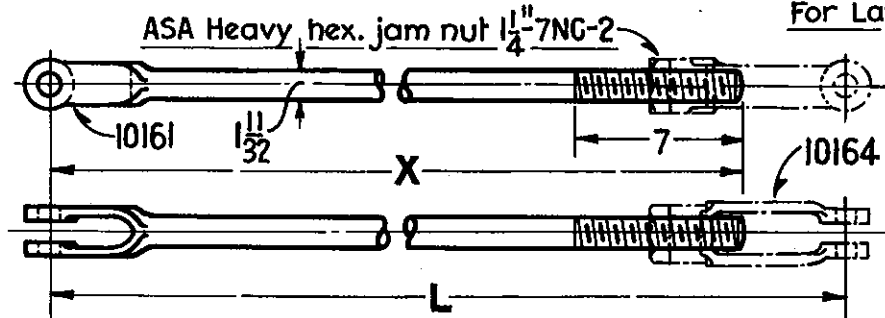
Approved R. S. Battinell
Chief Signal Engineer

S-3900

ISSUED 9-8-59
SHEET 2 Cont'd. on Sh...



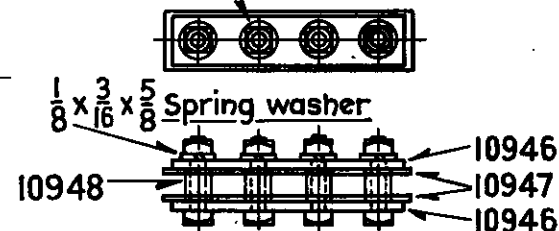
3906-5 CROSS CONNECTING ROD COMPL. Insulated
 For Layout 3900



PLUNGER LOCK CONNECTING RODS

ROD COMPL. with screw jaw and nut				ROD ONLY	
ORD. NO.	L	For connections	Layout	ORD. NO.	X
3906-1	33 ³ / ₄	A and B	3900	3906-11	29 ¹ / ₂
3906-2	35 ¹ / ₄	C and D	3900	3906-12	31

ASA Regular ⁵/₈" 11NC-2 x 2 ¹/₂ Sq. hd. bolt and nut



3906-9 ASSEMBLY INSULATING SPLICE PARTS COMPL.

NOTES:

All rods to be of SAE-1020 steel forged without weld.
 Protective treatment shall be in accordance with Instruction 350.

Scale: ¹/₂ in. = 1 ft.
 All dimensions given in inches



SIGNAL AND TRAIN CONTROL COMMITTEE

CONNECTING RODS

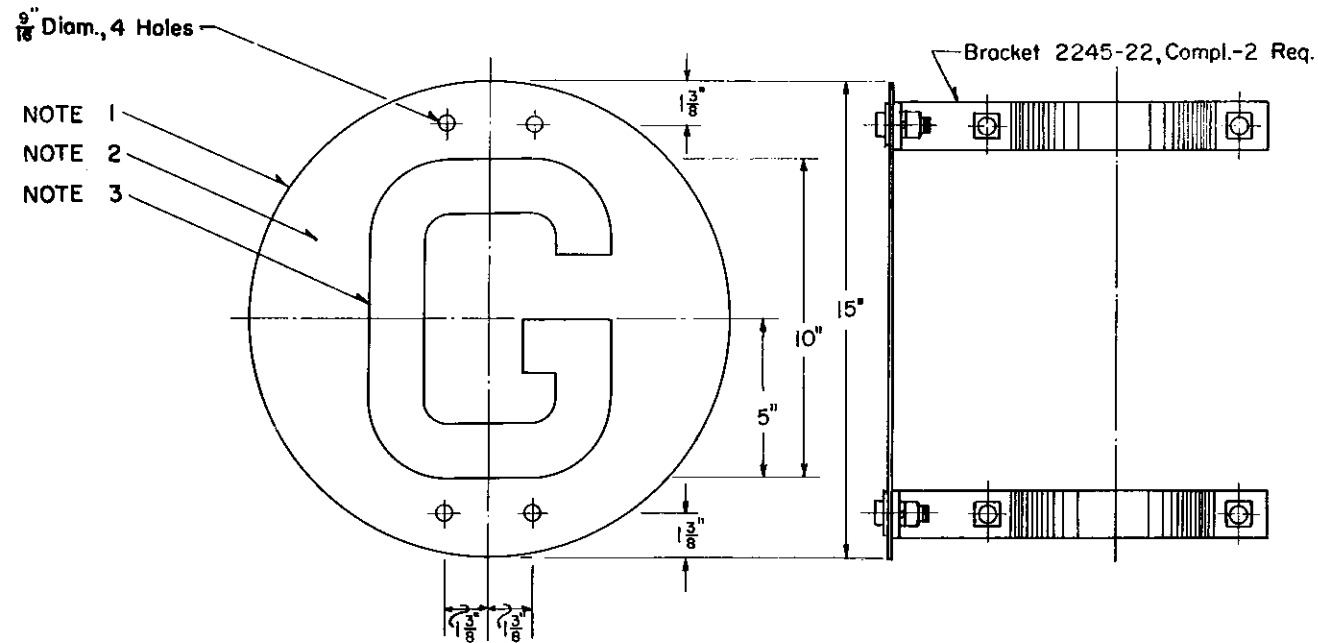
N.Y.C.R.R.
 M.C.R.R.
 C.G.&ST.L.R.
 B.&A.R.R.
 P.&L.E.R.R.
 RUTL.R.R.

3906

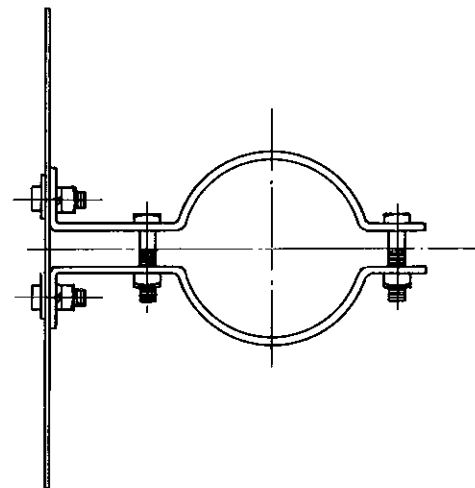
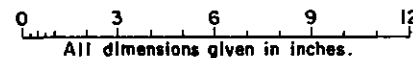
12-6-1938

Approved by Representatives of Lines shown.

Chairman



4315-1, GRADE SIGNAL MARKER,-DISC ONLY



4315-2, GRADE SIGNAL MARKER,-COMPL.
FOR FIVE INCH MAST

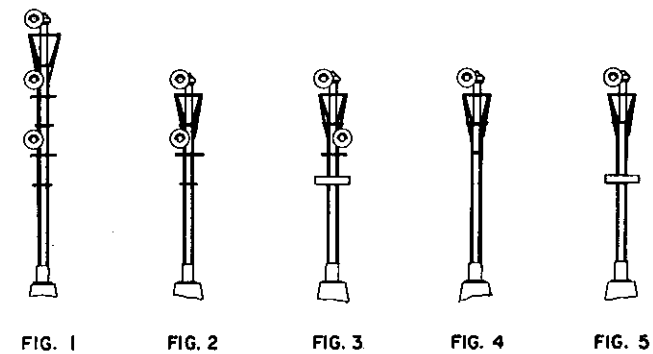
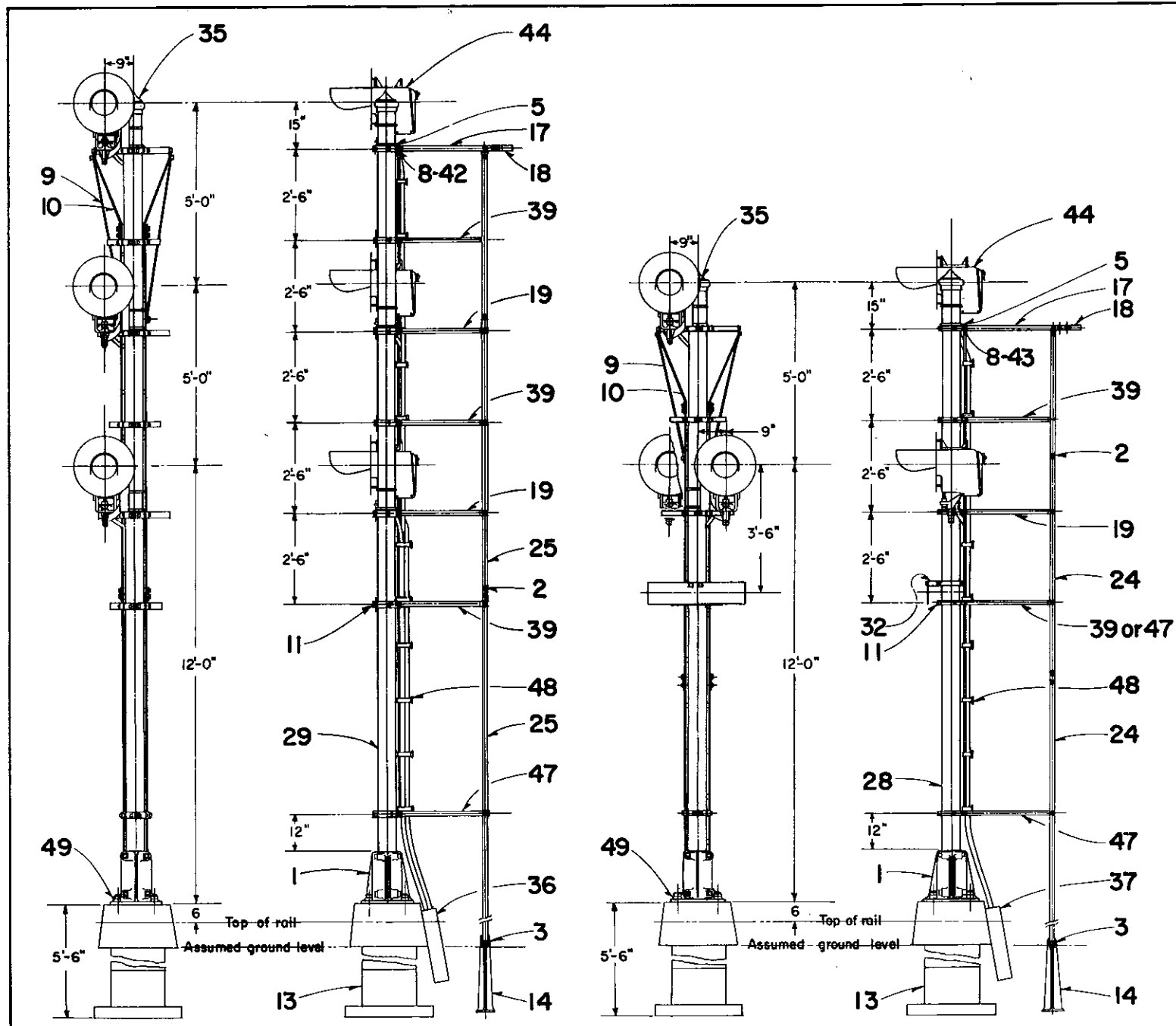
NOTES:

- 1.- Disc, 4315-1, to be .081-6061-T6 Aluminum.
- 2.- Background to be Minn. Mining and Mfg. Co. No. 2271, Wide Angle Yellow Flat-Top Scotchlite.
- 3.- Letter "G" to be Minn. Mining and Mfg. Co. No. 605 Black Scotchlite.
Configuration of letter "G" to conform to N. Y. C. EC J-2B or equal.
- 4.- Bolts and nuts to be galvanized or cadmium plated.
- 5.- Protective treatment, Instruction 350.
Bolt heads and washers appearing on face of disc, Primer, Item 31; Yellow Enamel, Item 42. Paint before assembly. Clamps to be painted with Aluminum Paint, Item 53.
- 6.- Grade Signal Marker to be mounted on Signal Mast directly below Signal Number Plate.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
GRADE SIGNAL MARKER
REFLECTING

Approved *R. J. Battinelli*
Chief Signal Engineer

S-4315



TYPICAL ASSEMBLIES

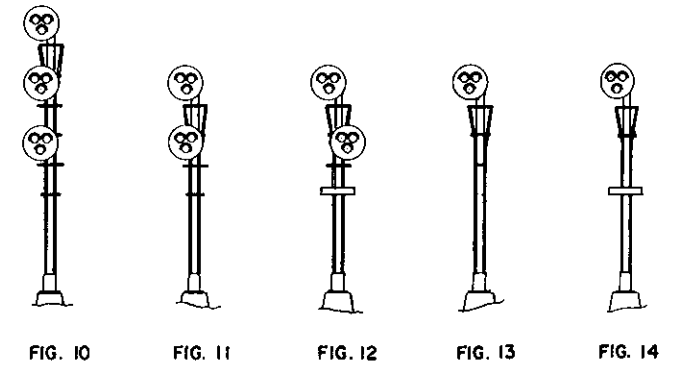
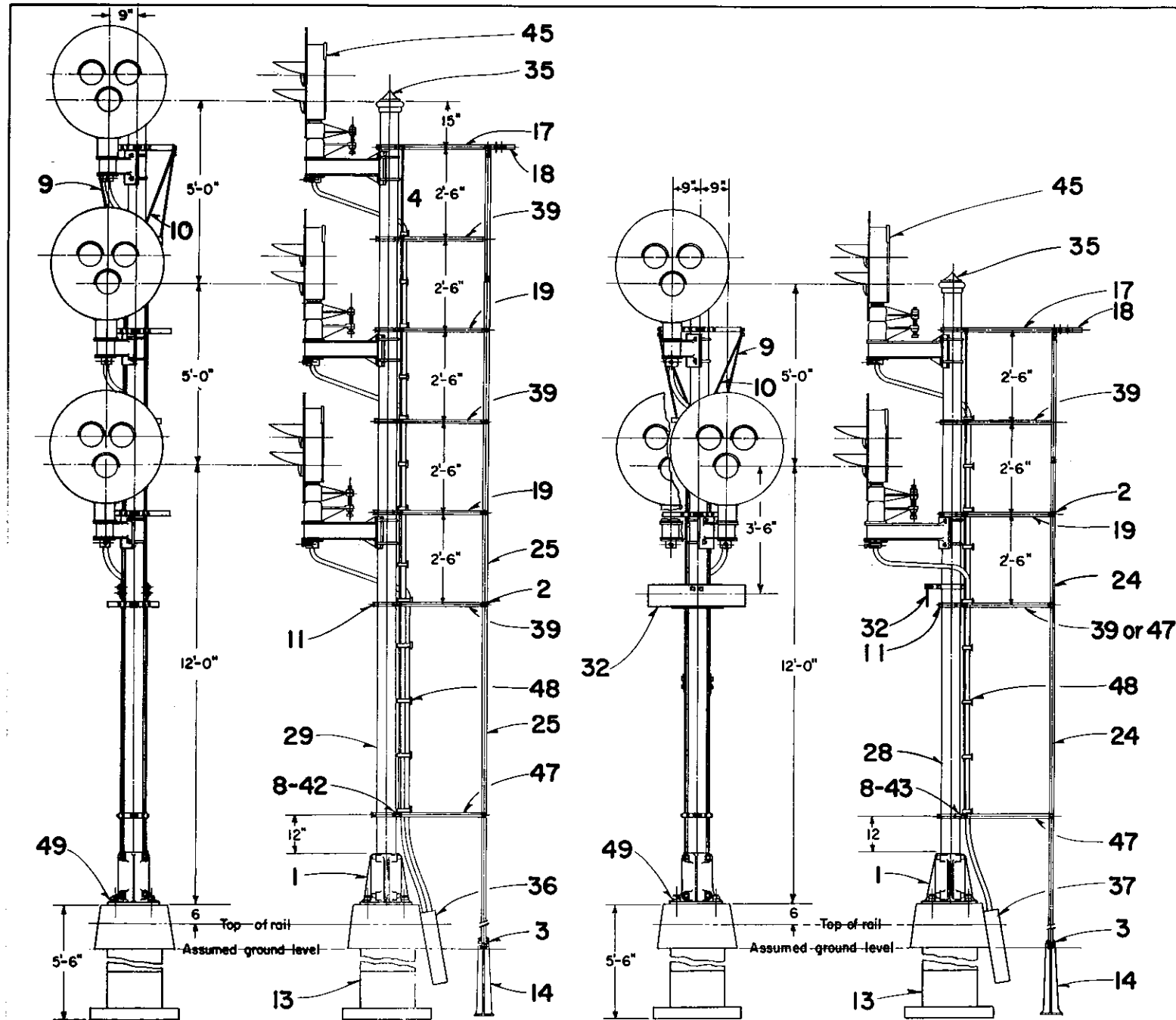
NOTES:

- 1.- Dimensions shown are typical for all assemblies.
- 2.- See standard plan for clearance requirements when locating signals.
- 3.- Cut ladder to length required in field and drill 9/16 in. diameter hole for ladder foundation.
- 4.- Bolts, Nuts and Threads shall be in accordance with AAR Sig. Section Manual, Part 17.
- 5.- Protective treatment -
Seal soil pipe with Cold Application Compound, Item 3, Instruction 405.
Hoods and backgrounds of signals to have two coats of Flat Black, Item 46, Instruction 350.
All other exposed metal to have two coats of Aluminum Paint, Instruction 350.

0 1 2 3 4 5 6
Scale in Feet

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNAL MOUNTING
GROUND MAST SIGNALS
SEARCHLIGHT TYPE

S-4550



TYPICAL ASSEMBLIES

NOTES:

- 1.- Dimensions shown are typical for all assemblies.
- 2.- See standard plan for clearance requirements when locating signals.
- 3.- Cut ladder to length required in field and drill 9/16 in. diameter hole for ladder foundation.
- 4.- Bolts, Nuts and Threads shall be in accordance with AAR Sig. Section Manual, Part 17.
- 5.- Protective treatment-
Seal soil pipe with Cold Application Compound, Item 3, Instruction 405.
Hoods and backgrounds of signals to have two coats of Flat Black, Item 46, Instruction 350.
All other exposed metal to have two coats of Aluminum Paint, Instruction 350.

0 1 2 3 4 5 6
Scale in Feet

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNAL MOUNTING
GROUND MAST SIGNALS
DOUBLET TYPE

S-4550

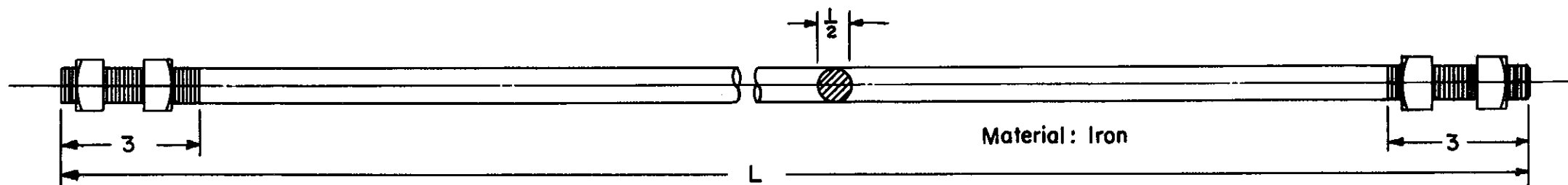
NO	ITEM	REF.	MATERIAL REQUIRED							REMARKS
			FIG. 1	FIG. 2 or 3	FIG. 4 or 5		FIG. 10	FIG. 11 or 12	FIG. 13 or 14	
1	Base	AAR 14471	1	1	1		1	1	1	
2	* Bolts, 1/2-13 X 1	Com'l.	32	24	20		32	24	20	Ladder assembly
3	* Bolts, 1/2-13 X 1-1/4	Com'l.	2	2	2		2	2	2	Ladder foundation
4	Bolts, U	GRS 29953	-	-	-		6	4	2	
5	Bolts, U	GRS 16209-4 Gr. 1	6	4	2		-	-	-	
6										
7										
8	Bracket	4551-3	7	5	4		7	5	4	
9	* Brace, Handrail Extension	GRS 319-219	2	2	2		2	2	2	
10	* Brace, Ladder Extension	GRS 319-226	2	2	2		2	2	2	
11	* Clamps, Complete	GRS 317-41	7	5	4		7	5	4	
12										
13	Foundation	Permacrete or equal S-2	1	1	1		1	1	1	
14	Foundation, Ladder	AAR 10521	1	1	1		1	1	1	
15										
16										
17	* Handrail, Top Front	GRS 314-142	2	2	2		2	2	2	
18	* Handrail, Top Rear	GRS 314-143	1	1	1		1	1	1	
19	* Handrail, Standard	GRS 314-144	4	2	-		4	2	-	
20										
21										
22										
23										
24	* Ladder Section	GRS 312-125 Gr. 4	-	2	2		-	2	2	
25	* Ladder Section	312-125 Gr. 5	2	-	-		2	-	-	
26										
27										
28	Moat, Standard 5 in. W. I. Pipe Length 17' ± 1"	Com'l.	-	1	1		-	1	1	
29	Moat, Standard 5 in. W. I. Pipe Length 22' ± 2"	Com'l.	1	-	-		1	-	-	
30										
31										
32	Number Plate,	2245-2	-	As Req.	As Req.		-	As Req.	As Req.	Specify Signal Number.
33										
34										
35	Pinnacle	AAR 1245-1	1	1	1		1	1	1	
36	Pipe, Soil	2440-4	1	-	-		1	-	-	
37	Pipe, Soil	2440-3	-	1	1		-	1	1	
38										
39	* Platform	GRS 313-97	3	2	1		3	2	1	
40										
41										
42	Rod, 1/2 in. Iron	4551-1	1	-	-		1	-	-	
43	Rod, 1/2 in. Iron	4551-2	-	1	1		-	1	1	
44	Signals, Searchlight Type, Compl. with mtg. bracket.	GRS Type SA or SC	3	2	1		-	-	-	Order by GRS drawing number as required.
45	Signals, Doublet Type	GRS Type G	-	-	-		3	2	1	Order by GRS drawing number as required.
46										
47	* Stay, Ladder	GRS 315-120	2	2	4		2	2	4	
48	Straps, Cabling	Raco 611	As Req.	As Req.	As Req.		As Req.	As Req.	As Req.	
49	Washer	GRS 47497	4	4	4		4	4	4	
50										

* Ladder assemblies may be ordered by specifying Ladder Complete, 4550 Fig. ____ (Specify figure number which applies.) Items indicated by asterisk will be furnished.

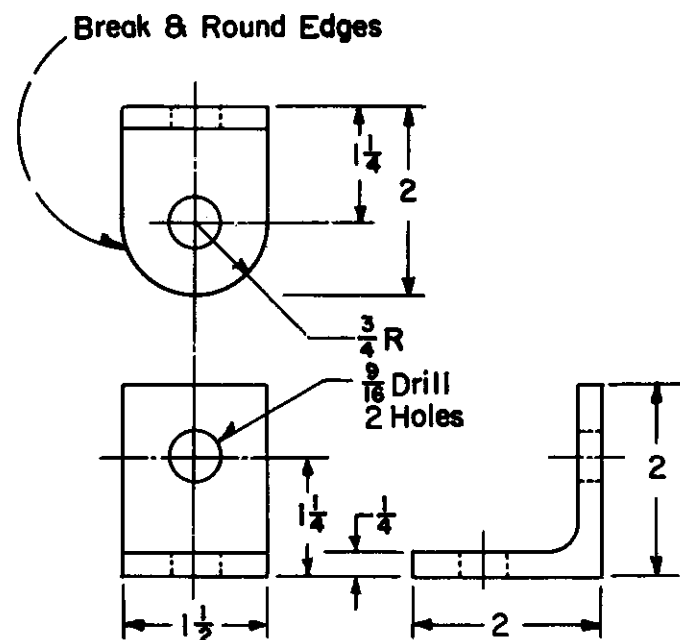
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNAL MOUNTING GROUND MAST SIGNALS

Approved L. J. Battinelli
Chief Signal Engineer

S-4550



4551-1 ROD, $L = 18'-8"$
4551-2 ROD, $L = 13'-8"$



4551-3 BRACKET

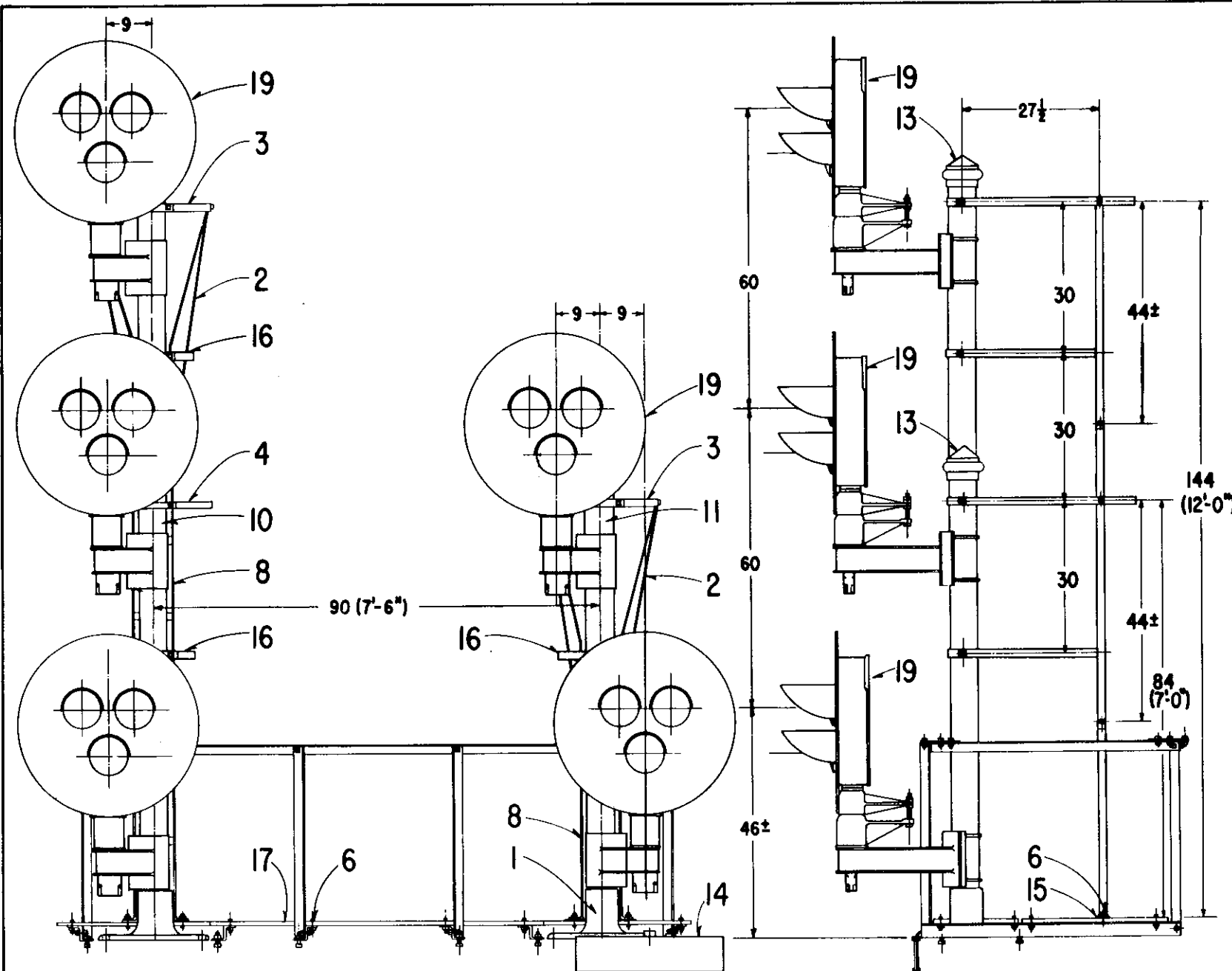
MATERIAL: STRUCTURAL STEEL ANGLE

0 1 2 3
 All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
CABLE SUPPORT.
GROUND MAST SIGNALS

Approved *L. J. Battinelli*
 Chief Signal Engineer

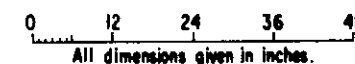
S-4551



MATERIAL REQUIREMENTS-SPECIFY QUANTITY REQUIRED	
1	Base GRS 3603-1
2	Braces AAR 13629 Modified. (Without head.)
3	Handrail, Top AAR 13631 Modified. Dimensions as indicated.
4	" AAR 13636 " " " " " " "
5	" " " " " " " " " " " "
6	J-Bolts 4565-12
7	" " " " " " " " " " " "
8	Ladder AAR 13628 Modified. Dimensions as indicated.
9	" " " " " " " " " " " "
10	Post-3 Arm 5 in. W. I. Pipe L=12'-6" ± 1'
11	" -2 Arm " " " L=7'-6" ± 1'
12	" -Dummy " " " L=7'-6" ± 1' (Not shown)
13	Pinnacle AAR 12451
14	Plate, Number 2245 Specify Requirements
15	Plate, Ladder Footing 4565-10
16	Platform, Compl. AAR 16197
17	" " 4565-1
18	" " " " " " " " " " " "
19	Signals, Type G See current GRS catalogue
20	" " " " " " " " " " " "

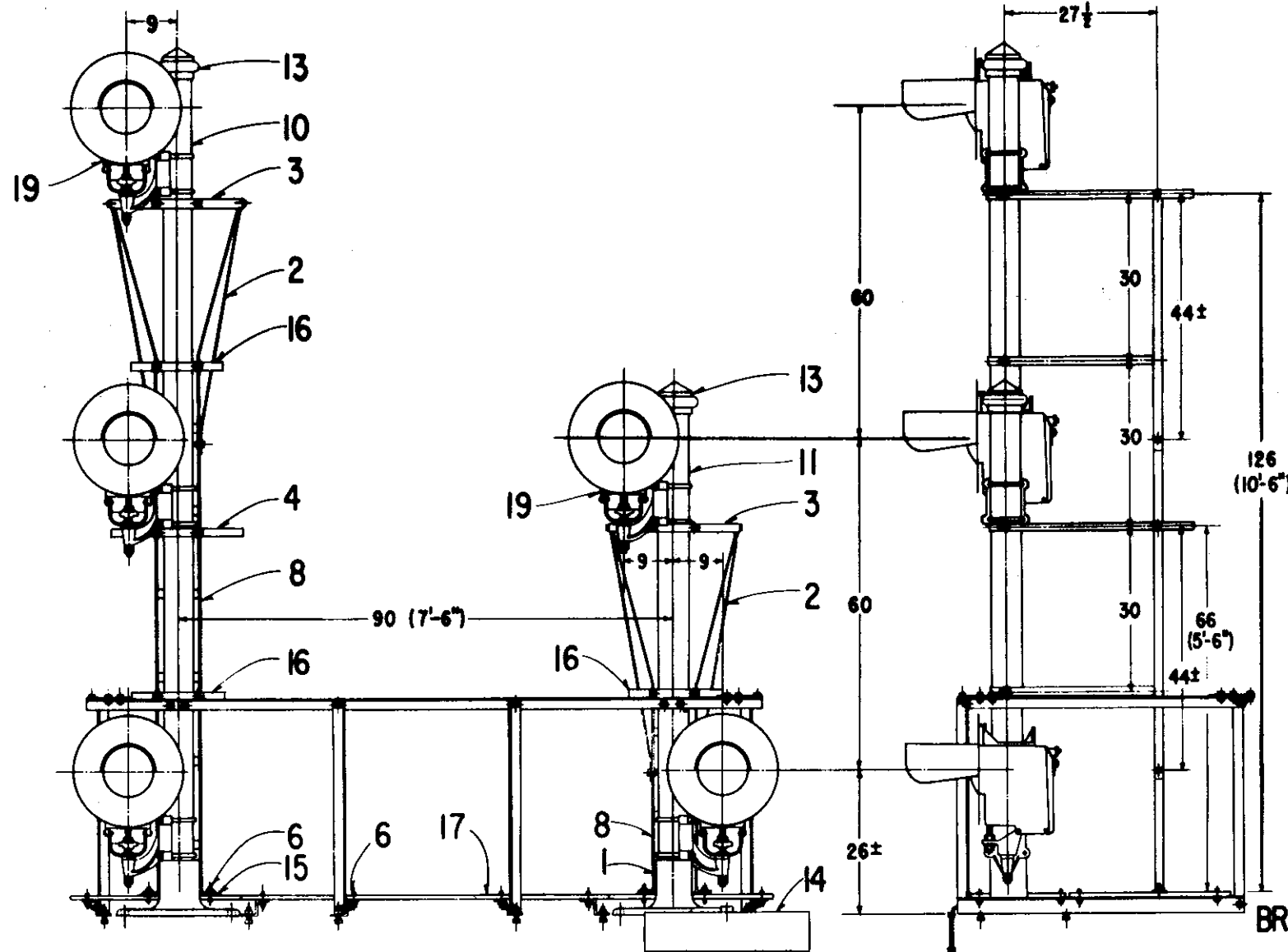
NOTES:

Protective treatment, Instruction 350.
 All parts to have one coat of Primer, Item 31.
 Signal hoods and face of background to have one additional coat of Black Enamel, Item 46 (Non-reflecting).
 All other surfaces to have two additional coats of Aluminum Paint, Item 53.



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNAL MOUNTING
BRACKET MAST WITH TYPE G SIGNALS

S-4560



MATERIAL REQUIREMENTS - SPECIFY QUANTITY REQUIRED			
1	Base	GRS 31603-1	
2	Brace	AAR 13629 Modified	(Without head)
3	Handrail	AAR 13631	Dimensions as indicated
4	"	AAR 13636	"
5	"	"	"
6	J-Boys	4565-12	
7	"	"	
8	Ladder	AAR 13628 Modified	Dimensions as indicated
9	"	"	
10	Mast - 3 Arm	5 in. W.I. Pipe	L = 12'-6" ± 1"
11	" - 2 Arm	"	L = 7'-6" ± 1"
12	" - 1 Arm	"	L = 7'-6" ± 1" (Not shown)
13	Pinnacle	AAR 12451	
14	Plate, Number	2245	Specify Requirements
15	Plate, Ladder Footing	4565-10	
16	Platform, Canal	AAR 16197	
17	"	4565-1	
18	"	"	
19	Signals, Type SA or SC	See current GRS catalogue.	
20	"		

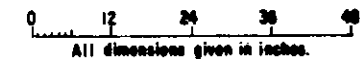
NOTES:

Protective treatment, Instruction 350.

All parts to have one coat of Primer, Item 31.

Signal head and face of background to have one additional coat of Black Enamel, Item 46. (Non-reflecting).

All other surfaces to have two additional coats of Aluminum Paint Item 53.

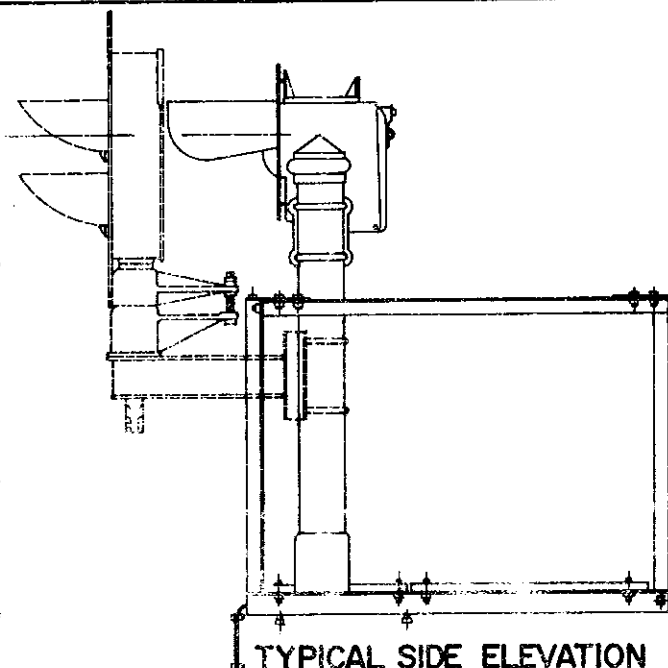
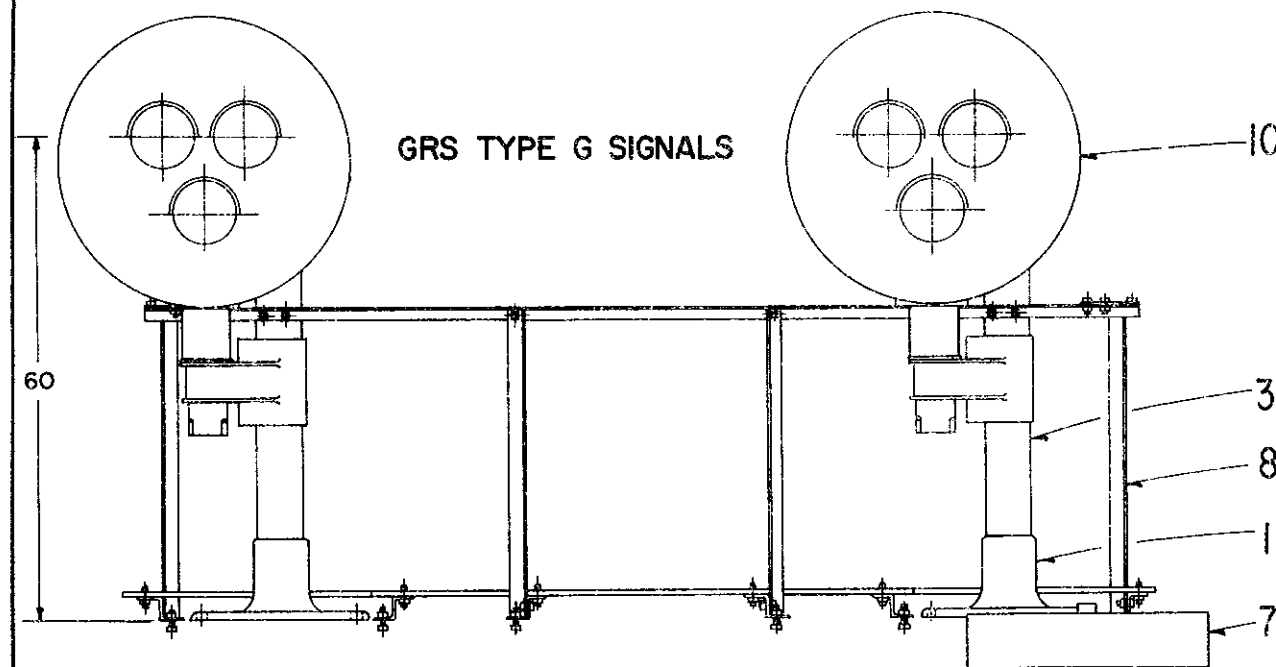
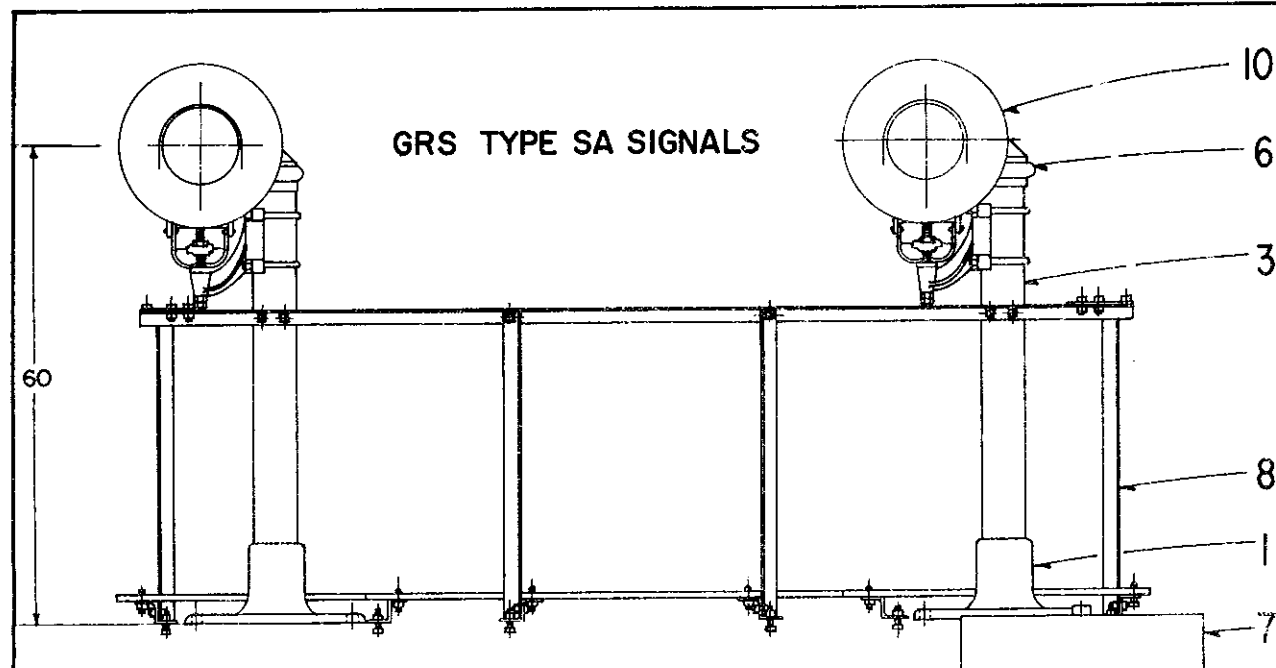


NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNAL MOUNTING

BRACKET MAST WITH SEARCHLIGHT TYPE SIGNALS

Approved *L. S. Battine*
Chief Signal Engineer

S-4560



NOTES:

1-Mounting shown on this sheet may be used only for two single arm signals, as shown, or for one single arm signal and dummy mast. When two or three unit signals are required, use Sheet 1 or Sheet 2.

2-Protective treatment, Instr. 350. All exposed metal parts; Primer, Item 31. Signal hood and face of background; Non-reflecting Black Enamel, Item 46. All other metal surfaces; Aluminum Paint, Item 53.

MATERIAL REQUIREMENTS - SPECIFY QUANTITY REQUIRED	
1	Base GRS 31603-1
2	
3	Mast - 1 Arm - 5 in. W. I. Pipe, Length 4'-6" $\pm$ 1"
4	Mast, Dummy - 5 in. W. I. Pipe, Length 4'-6" $\pm$ 1" (NOT SHOWN)
5	
6	Pinnacle, AAR 12451
7	Plate, Number S-2245. Specify numerals or letters as required.
8	Platform Complete, 4565-1
9	
10	Signals, See current GRS catalogue

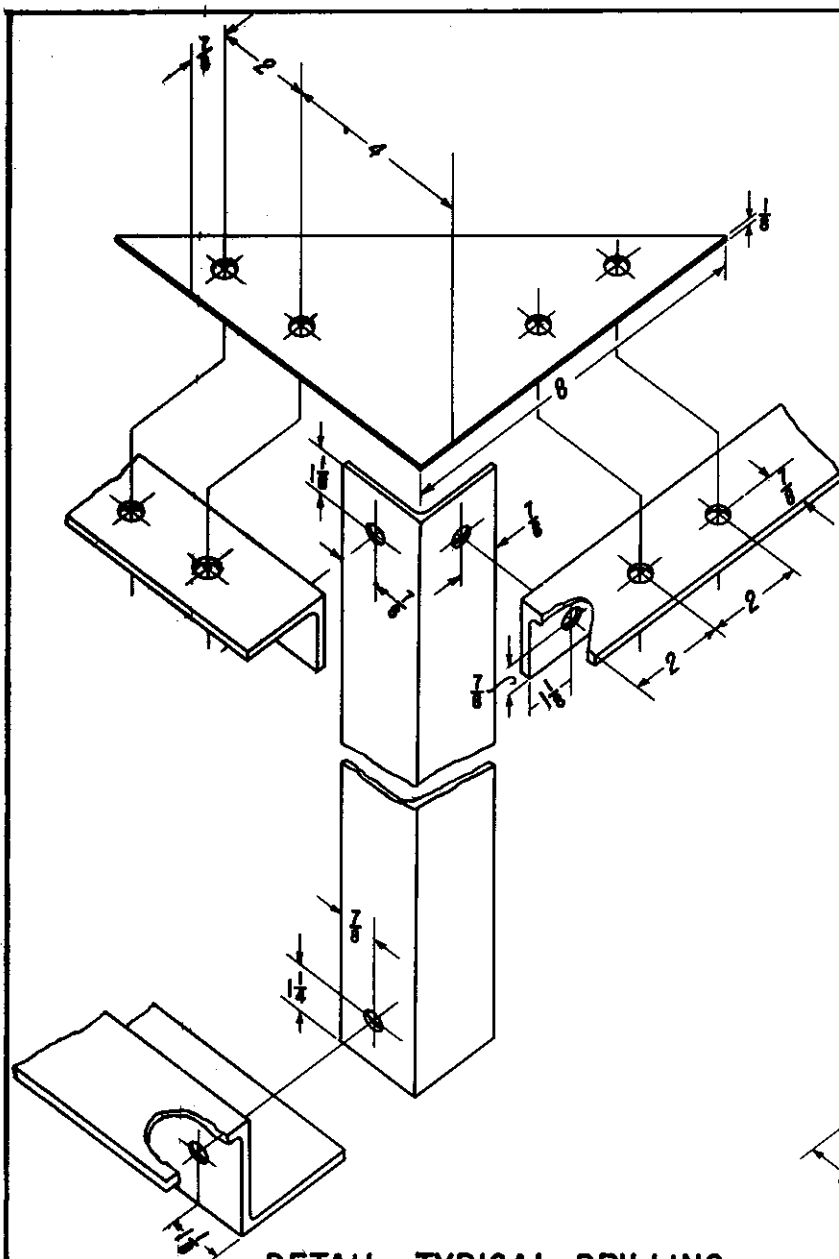
0 12 24 36
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNAL MOUNTING BRACKET MAST WITH SINGLE ARM SIGNALS

Approved *L. S. Rosinelli*
Chief Signal Engineer

S-4560

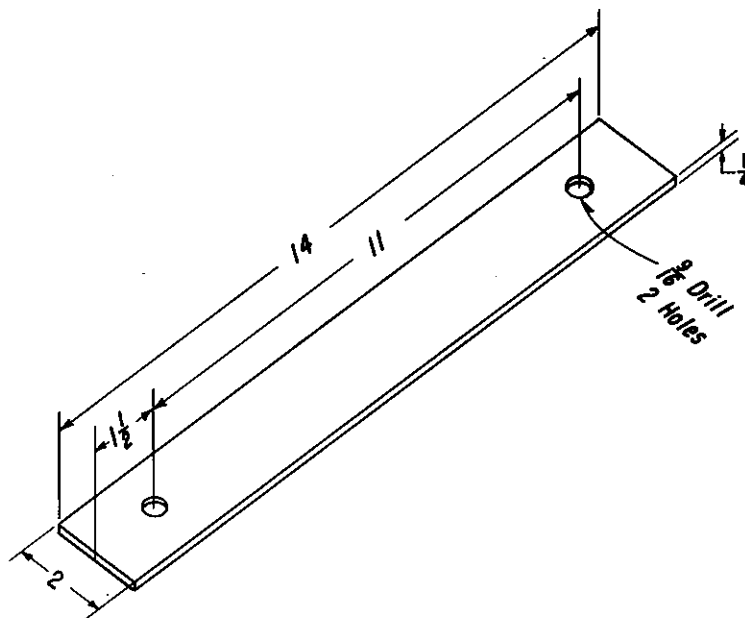
ISSUED 6-1-61
SHEET 3. Cont'd on Sh. 4



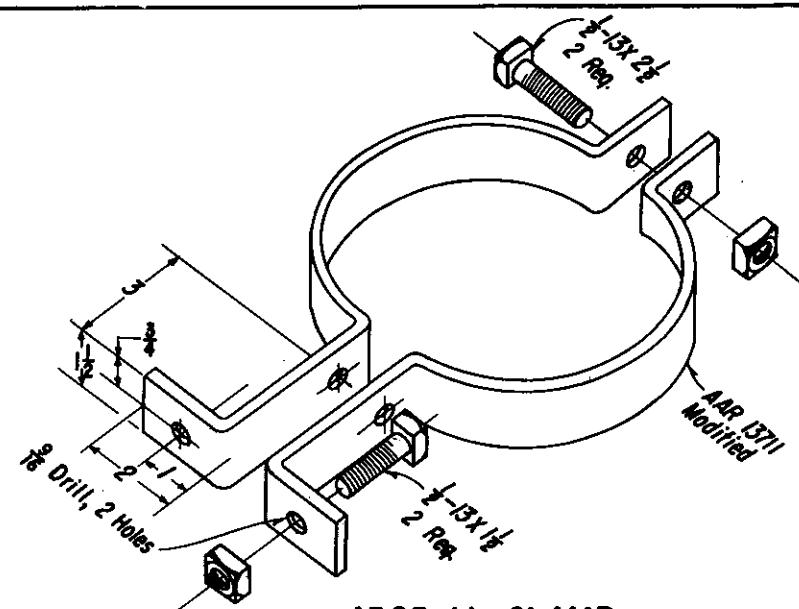
DETAIL - TYPICAL DRILLING
DIAMETER OF ALL HOLES 9/16 INCHES
STRUCTURAL STEEL ANGLES

NOTES:

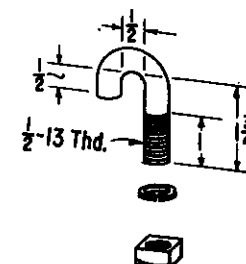
Bolts, Nuts and Threads shall be in accordance with AAR specifications Manual Part 17.
Protective treatment-Primer, Item 31, Instruction 350.



4565-10 PLATE, LADDER FOOTING
STRUCTURAL STEEL PLATE



4565-11 CLAMP
COMPL. WITH 4 BOLTS & NUTS



4565-12 J-BOLT
COMPL. WITH NUT & LOCK WASHER

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
PLATFORM
FOR BRACKET POST MOUNTING
DETAILS

Approved *L. J. Battinelli*
Chief Signal Engineer

S-4565

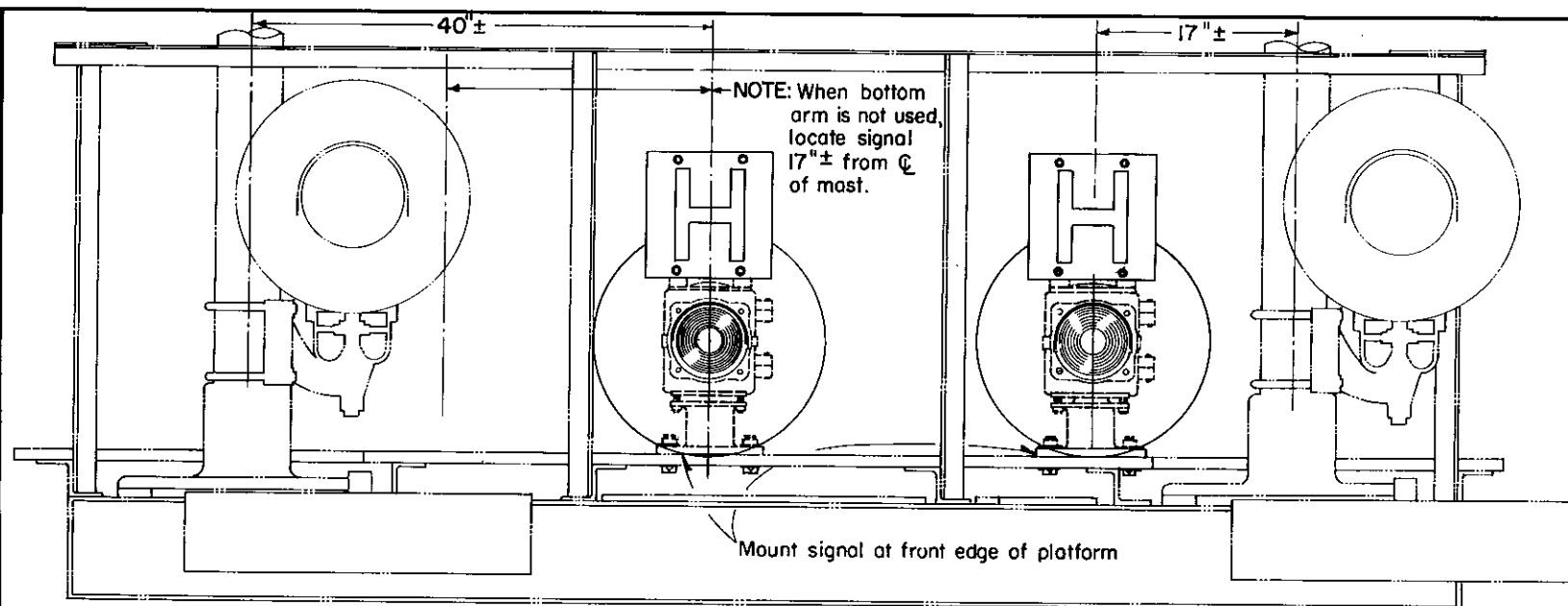


FIGURE 1

TYPICAL MOUNTING ON BRACKET POST

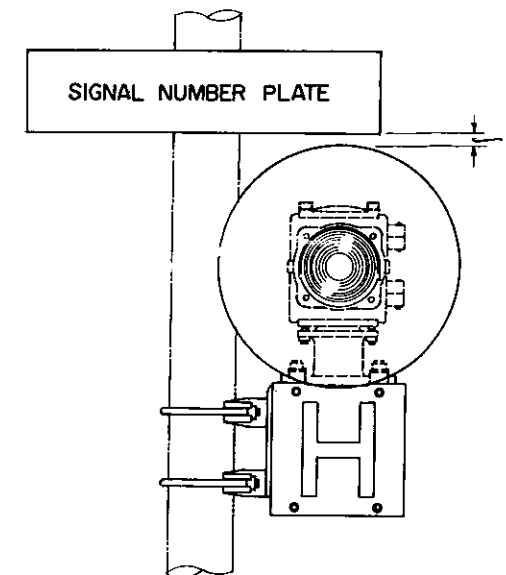


FIGURE 2

TYPICAL MOUNTING ON GROUND MAST

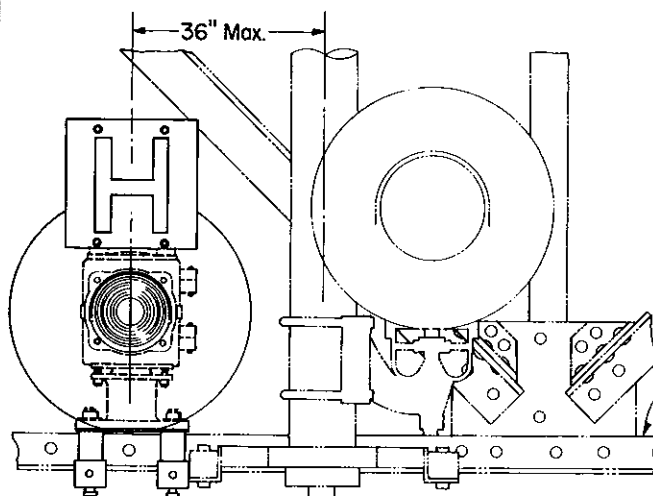


FIGURE 3

TYPICAL MOUNTING ON SIGNAL BRIDGE

Location of signals may be varied when obstructed by bridge members. When obstructions will not permit use of Fig. 4, Fig. 3 may be used.

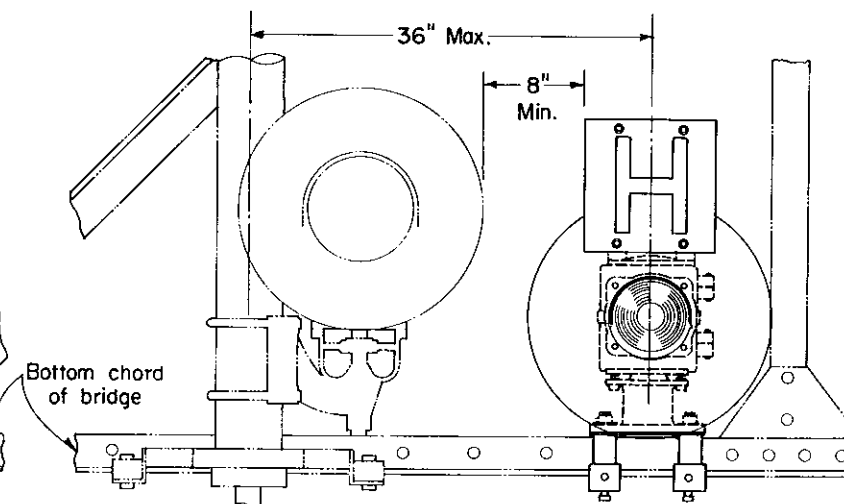


FIGURE 4

NOTES:

- 1- Signal will display the following aspects:
Steady lunar white light.
Flashing lunar white light.
- 2- Ordering references for complete assemblies shown on Sheet 4.
- 3- Protective treatment, Instruction 350.
All exposed metal surfaces except face of signal and aluminum sign to have one coat of primer, Item 31 followed by two additional coats of Aluminum Paint Item 53.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNAL MOUNTING
FOR HOT BOX OR DRAGGING EQUIPMENT
DETECTOR OR TAKE SIDING SIGNALS

S-4570

SIGNAL MOUNTED ON			GROUND MAST			BRACKET POST			5 FT. TRUSS BR.			7 FT. TRUSS BR.			CANTILEVER MAST			REMARKS
ORDER NO. 4570			-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	
NO.	ITEM	REFERENCE	H B D	D E D	T S S	H B D	D E D	T S S	H B D	D E D	T S S	H B D	D E D	T S S	H B D	D E D	T S S	HBD-HOT BOX DETECTOR DED-DRAGGING EQUIP. DET. TSS-TAKE SIDING SIGNAL
1	Bolts, $\frac{3}{4}$ "-10 X 2 $\frac{3}{4}$ "	Com'l.				4	4	4										
2	Bolt Grip	Raco 589-1				4	4	4										
3	Bracket, Complete	4841-55	2	2	2													
4	Bracket, Complete	4841-56				2	2	2	2	2	2	2	2	2	2	2	2	
5	Mounting Assembly	4570-20							1	1	1							
6	" "	4570-21										1	1	1				
7	" "	4570-22													1	1	1	
8	" "	4570-23	1	1	1													
9																		
10																		
11	Sign Complete	4841-50	1			1			1			1			1			
12	" "	4841-51		1			1			1			1			1		
13	" "	4841-52			1			1			1			1			1	
14																		
15																		
16																		
17																		
18	Signal, Type FA	GRS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	SEE NOTE
19																		
20	Washers $\frac{3}{4}$ " U. S. Std.	Com'l				4	4	4										

NOTE:

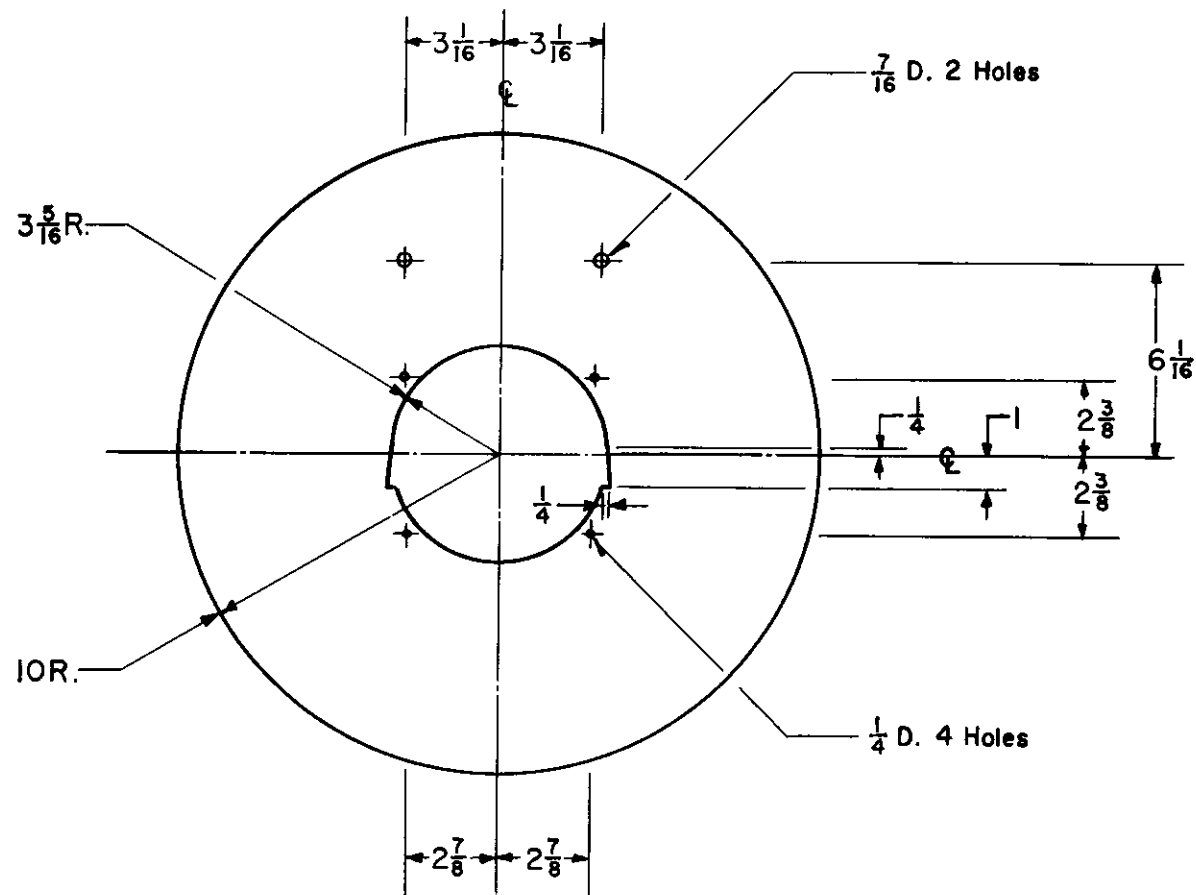
Signal to be furnished complete with Background 4572-1, GRS Post 52908-1 and equipped with the following:

Bezel Ring	Plate H2409	Fig. 3
Cover Glass, Convex, 25° Spreadlite Defl.	Plate H4003	Fig. 76
Hood	Plate H2409	Fig. 6
Hood Ring	Plate H2409	Fig. 7
Lamp	NYCS Spec. S750	Item 88
Lens, Lunar White Inner Doublet	Plate H4001	Fig. 44
Lens, Clear, Optical 40° Defl. Bulls-Eye	Plate H4001	Fig. 16
Outer Ring (Adapter)	Plate H2409	Fig. 29

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNAL MOUNTING
FOR HOT BOX OR DRAGGING EQUIPMENT
DETECTOR OR TAKE SIDING SIGNALS

Approved L. J. Doolittle
 Chief Signal Engineer

S-4570

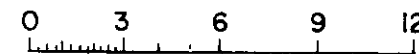


4572-I, BACKGROUND

GRS TYPE FA SIGNAL

NOTES:

1. - Material - No. 18 gage (.050) sheet steel.
2. - Protective Treatment, Instruction 350.
Primer, Item 31.
Front - Black Enamel, Item 46.
Back - Aluminum, Item 53.



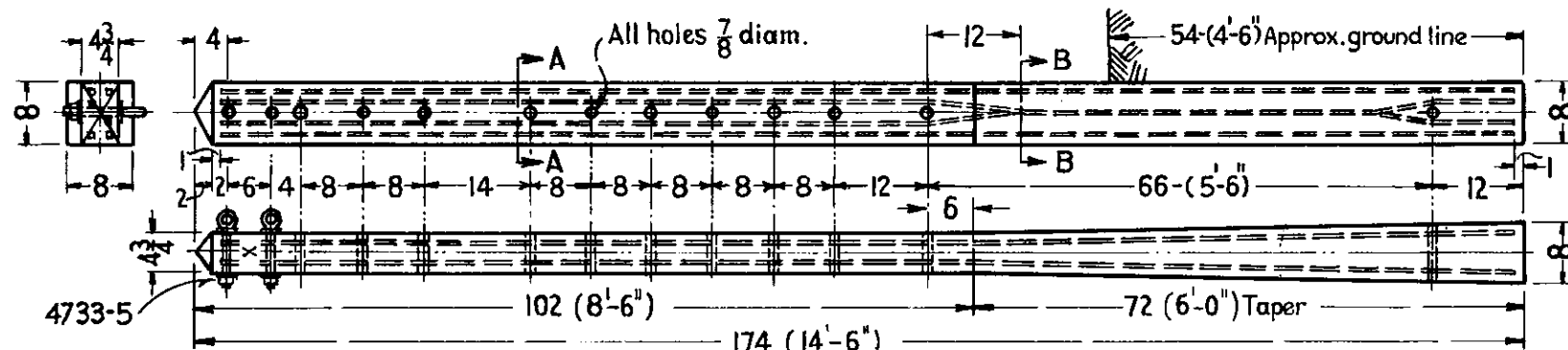
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
BACKGROUND
GRS TYPE FA SIGNAL

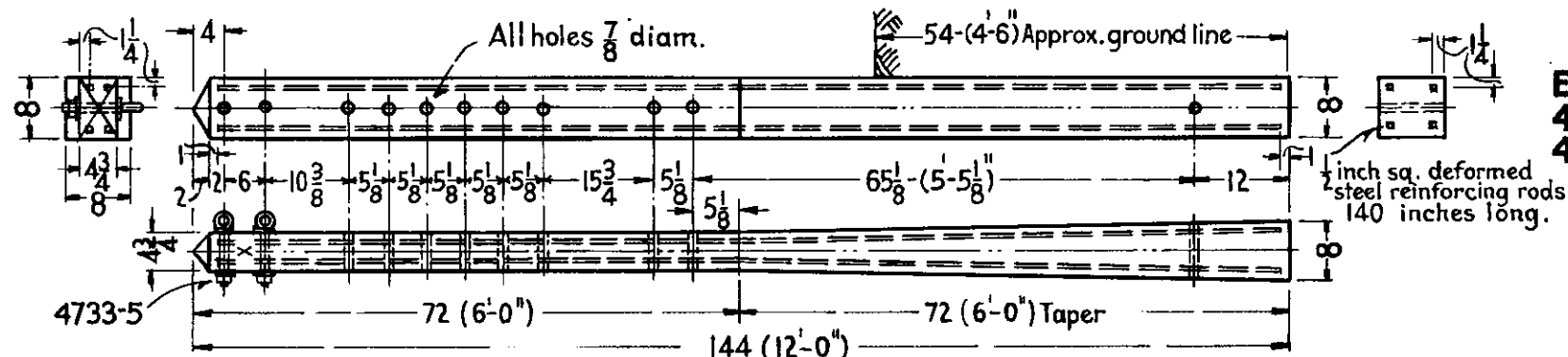
Approved *L. J. Bottinelli*
Chief Signal Engineer

S-4572

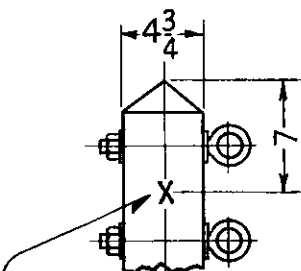
Plan revd. 12-20-40
and renumbered
4733 Issue: 1 of
12-20-40, was old
2325 Issue: 2 of
11-20-35 including
modifications by
N.Y.C. of 1-18-38.



4733-1 CONCRETE POST COMPL. - with eye bolts 4733-5.
4733-2 " " " " - with eye bolts 4733-6.
4733-11 " " " " **ONLY** - without eye bolts.

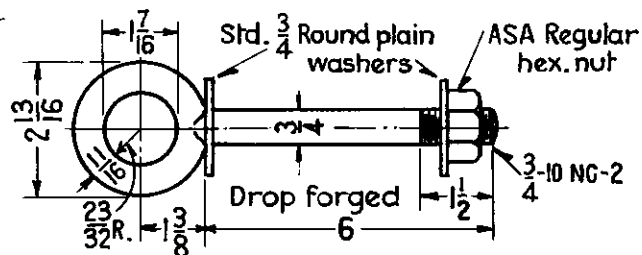
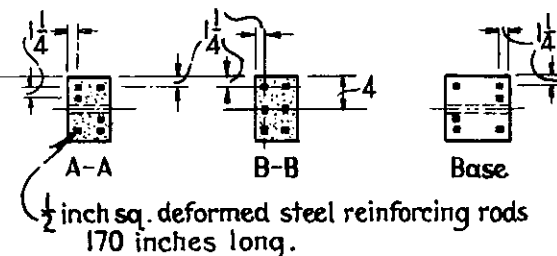


4733-3 CONCRETE POST COMPL. - with eye bolts 4733-5.
4733-4 " " " " - with eye bolts 4733-6.
4733-12 " " " " **ONLY** - without eye bolts.

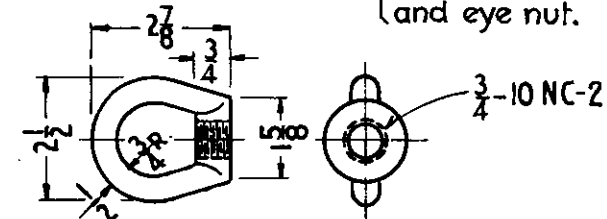


Manufacturer's identification to
be impressed on side of post as shown.

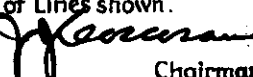
NOTES: Posts shall be in accordance
with Specification 865.
All eye bolts, nuts and washers
to be galvanized.
All dimensions given in inches.



EYE BOLT ONLY - Buckeye No. 2075 or equal.
4733-5 EYE BOLT COMPL. - as shown.
4733-6 " " " " with washers
and eye nut.

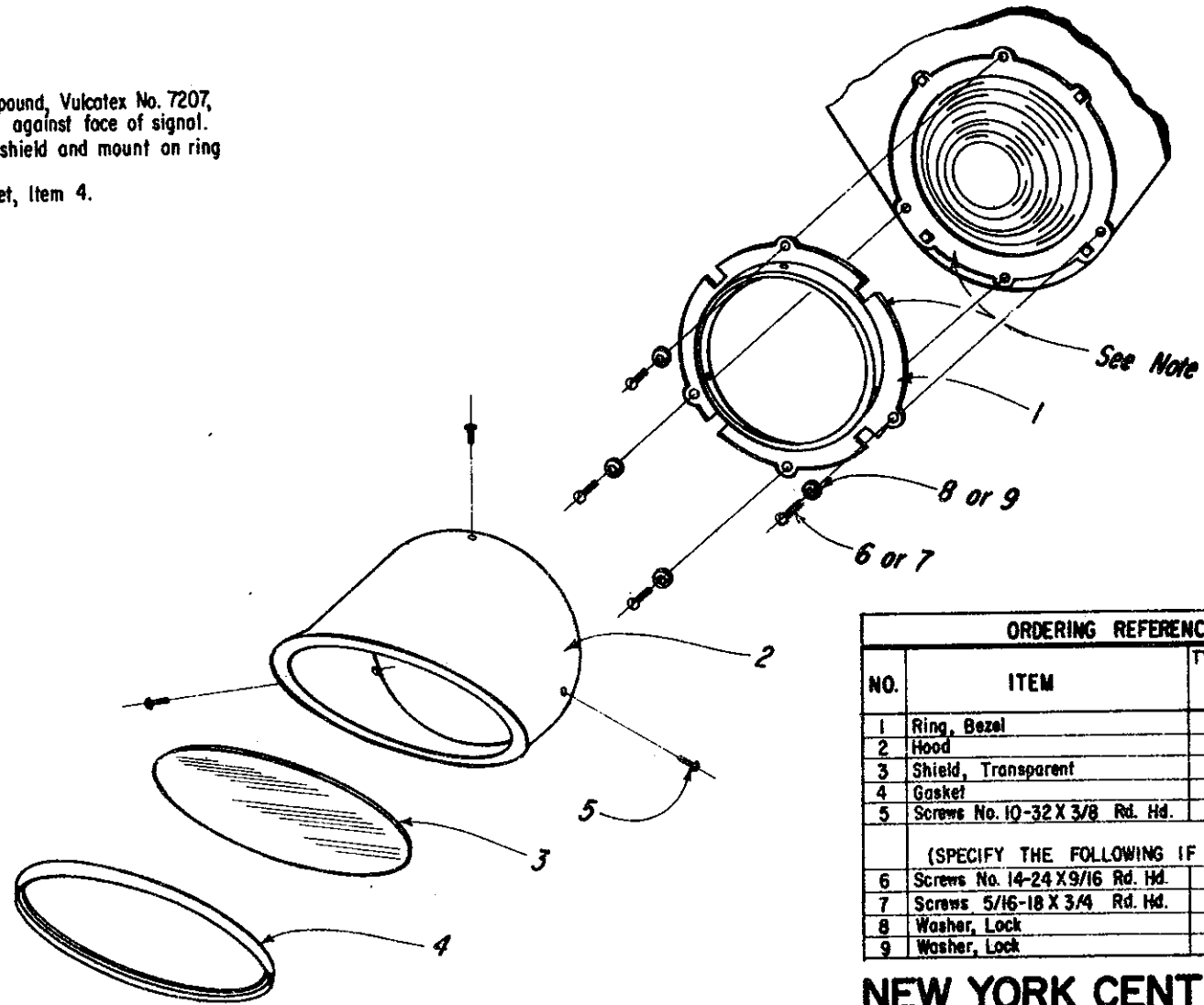


EYE NUT - Hubbard No. 7503 or equal.
Drop forged
Scales: 1/2 in. and 3 in. = 1 foot.

	SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R. M.C.R.R. C.C.&ST.L.R.Y. B.&A.R.R. P.&L.E.R.R. RUTL. R.R.		4733
				1 3-10-1941
CONCRETE POSTS		Approved by Representatives of Lines shown.  Chairman		

NOTE :

ASSEMBLY- Remove existing hood and ring. Apply sealing compound, Vulcatex No. 7207, to surface of Bezel Ring, Item 1, before mounting against face of signal.
After securing ring on the signal, assemble snow shield and mount on ring using screws provided, Item 5.
Transparent shield is secured in place using gasket, Item 4.

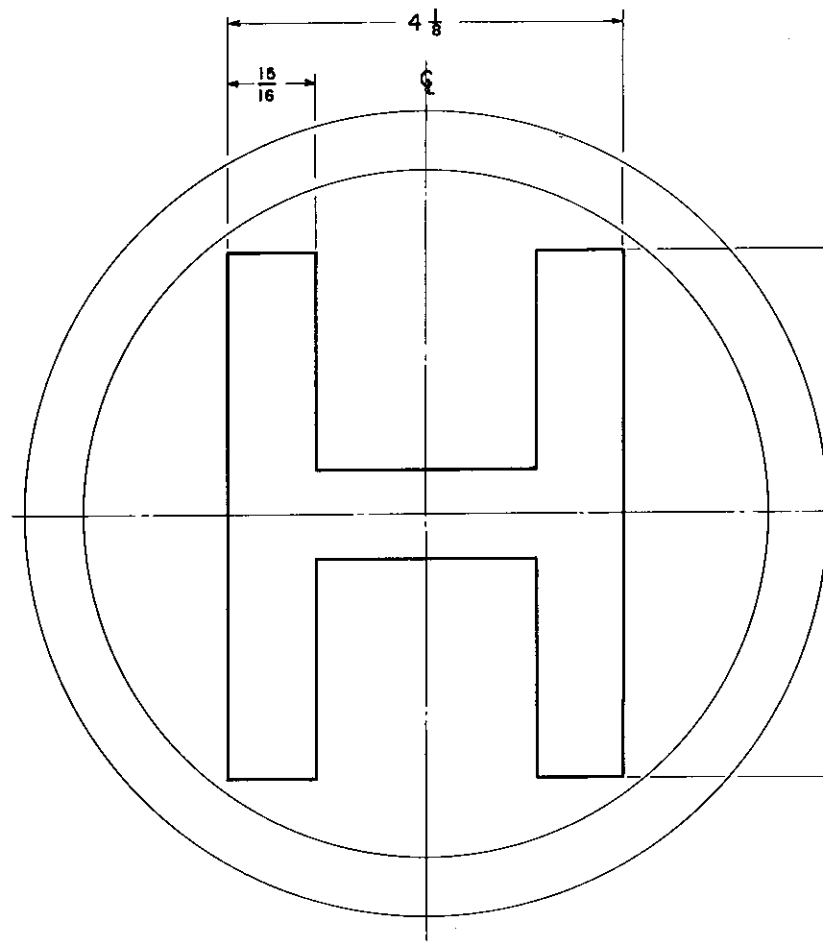


ORDERING REFERENCES - RACO				
NO.	ITEM	TYPE D OR G SIGNAL 630-2	TYPE SA OR SC SIGNAL 630-1	REQ.
1	Ring, Bezel	630-12	630-11	1
2	Hood	630-13	630-13	1
3	Shield, Transparent	630-14	630-14	1
4	Gasket	630-15	630-15	1
5	Screws No. 10-32 X 3/8 Rd. Hd.	COML.	COML.	3
(SPECIFY THE FOLLOWING IF REQUIRED)				
6	Screws No. 14-24 X 9/16 Rd. Hd.	COML.	COML.	4
7	Screws 5/16-18 X 3/4 Rd. Hd.	"	"	
8	Washer, Lock	"	"	4
9	Washer, Lock	"	"	

**NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SNOW SHIELD HOOD
FOR COLOR LIGHT SIGNALS**

Approved *R. J. Sartorelli*
Chief Signal Engineer

S-4830

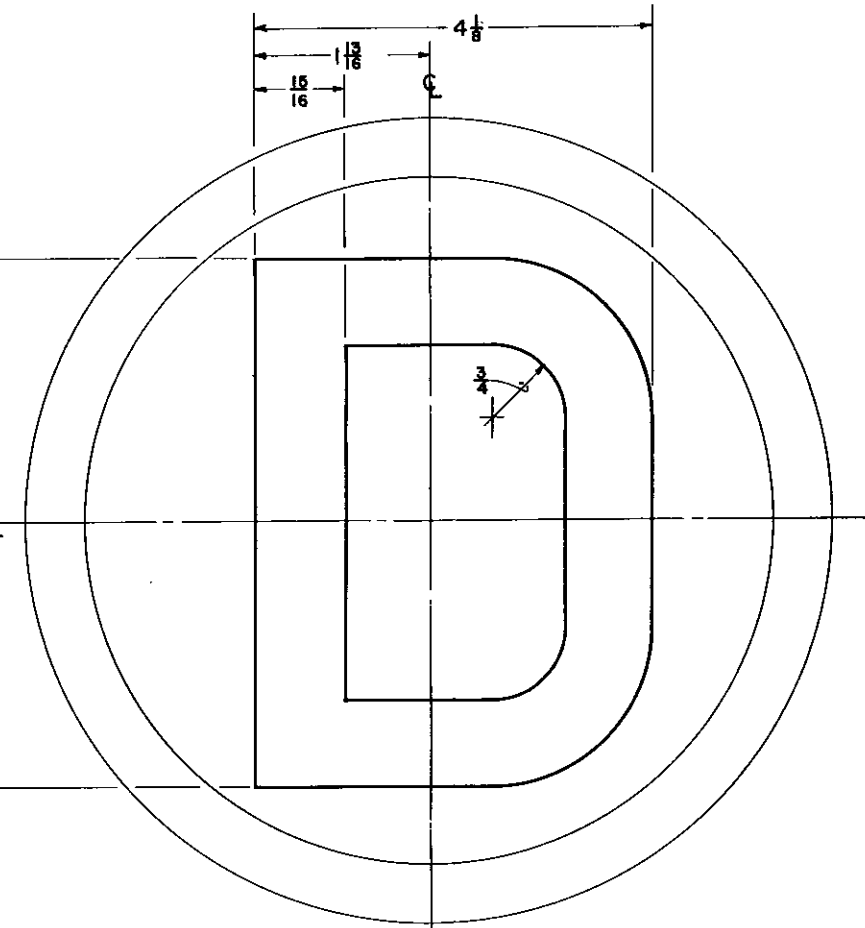


4831-1, LENS, SPECIAL
For Hot Box Detector Signal

Notes:

1. - Letters to be cut from non-reflecting black Scotchcol No. 605, (Minnesota Mining & Manufacturing Co.) or equal.
2. - Proportions of letters, as shown, to be in accord with N. Y. C. S. Plan J-2B.
3. - Letters to be mounted on standard, clear, 8-3/8 inch outer roundel for GRS Type D signal with lunar white inner lens.

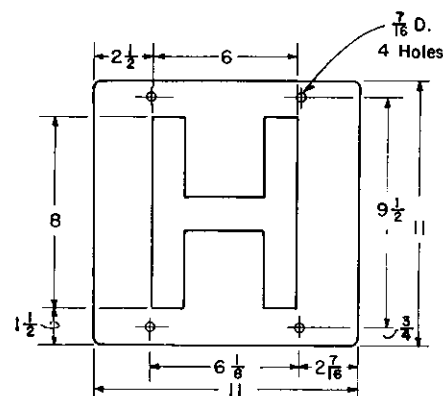
0 1 2 3
All dimensions given in inches.



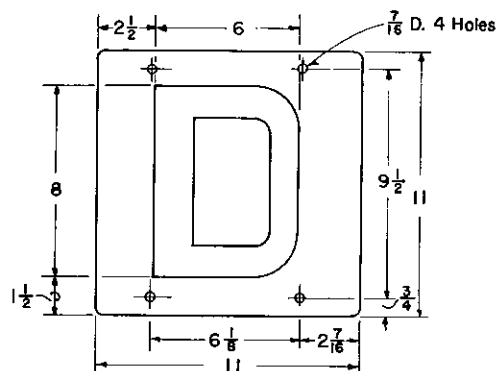
4831-2, LENS, SPECIAL
For Dragging Equipment Detector Signal
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SPECIAL SIGNAL LENSES

Approved *R. S. Bottinelli*
Chief Signal Engineer

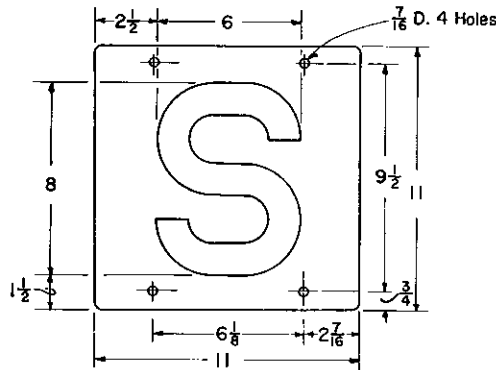
S-4831



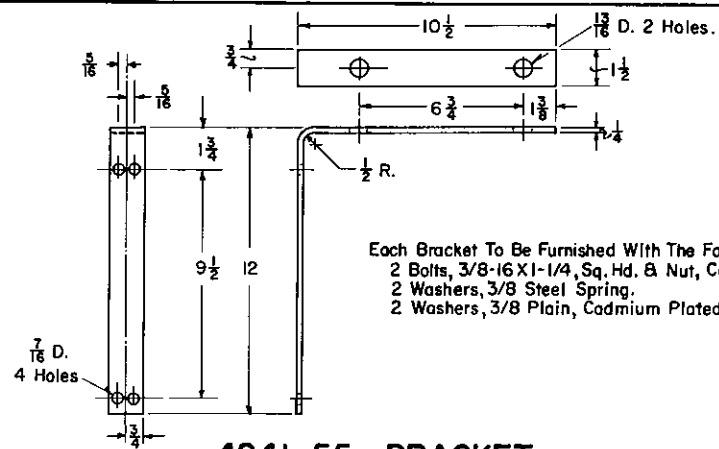
4841-50; SIGN, Letter "H"



4841-51; SIGN, Letter "D"

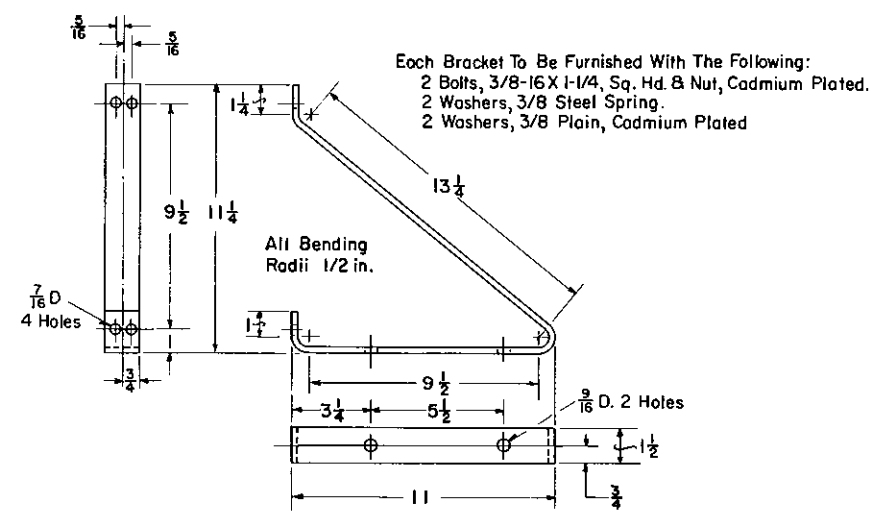


4841-52; SIGN, Letter "S"



4841-55; BRACKET
2 REQUIRED

Each Bracket To Be Furnished With The Following:
2 Bolts, 3/8-16 X 1-1/4, Sq. Hd. & Nut, Cadmium Plated.
2 Washers, 3/8 Steel Spring.
2 Washers, 3/8 Plain, Cadmium Plated.



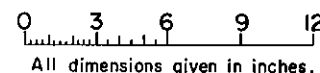
4841-56; BRACKET
2 REQUIRED

Each Bracket To Be Furnished With The Following:
2 Bolts, 3/8-16 X 1-1/4, Sq. Hd. & Nut, Cadmium Plated.
2 Washers, 3/8 Steel Spring.
2 Washers, 3/8 Plain, Cadmium Plated

All Bending
Radii 1/2 in.

NOTES:

- 1 - Material for sign plate to be .081-6061-T6 aluminum. Material for brackets to be 1-1/2 X 1/4 strap, C1020 steel.
- 2 - Face of sign to be covered with Minn. Mining & Mfg. Co. No. 605 Black Scotchcal. Letters to be No. 2270 wide angle Silver Flat-Top Scotchlite.
- 3 - Proportions of letters to be in accord with Roadway Standard Plan J-2B.
- 4 - Bolts and Nuts to be cadmium plated and in accordance with AAR Spec., Manual Part 17. Washers to be cadmium plated SAE standard.
- 5 - Details of sign mounting shown on Plan S-4570.
- 6 - Protective treatment, Instruction 350, as follows:
Bolt heads and washers appearing on face of sign, Primer-Item 31; Black Enamel-Item 46. Point before assembly.
Other metal surfaces, except aluminum, Primer-Item 31; Aluminum Paint-Item 53.



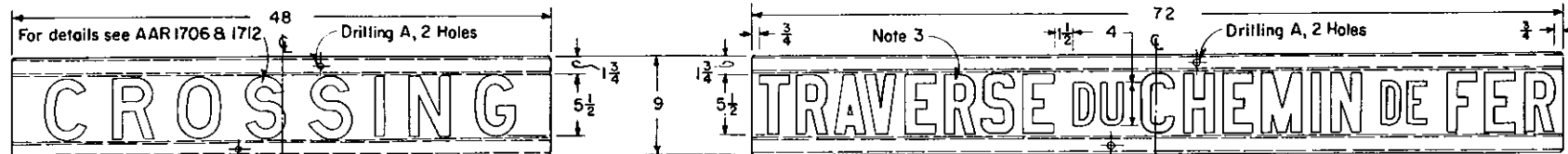
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNS

FOR HOT BOX OR DRAGGING EQUIPMENT
DETECTOR OR TAKE SIDING SIGNALS

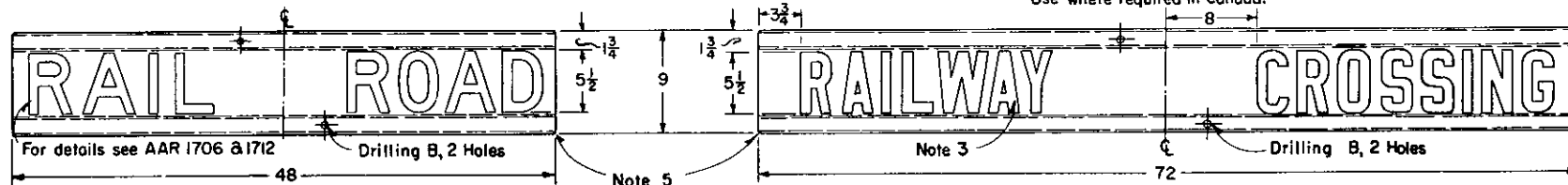
Approved *R. S. Battinelli*
Chief Signal Engineer

S-4841



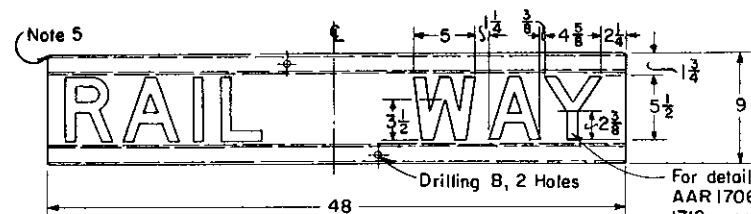
4844-1 CROSSING BLADE - Reflecting background; black letters.

4844-7 TRAVERSE DU CHEMIN DE FER BLADE - Reflecting background; black letters.
Use where required in Canada.

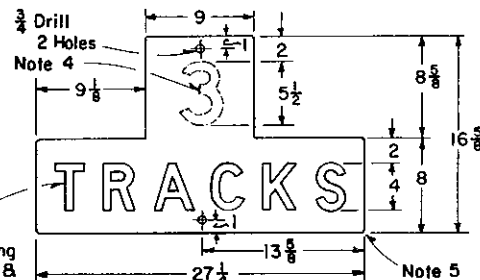


4844-3 RAILROAD BLADE - Reflecting background; black letters

4844-9 RAILWAY CROSSING BLADE - Reflecting background; black letters.
Use where required in Canada.



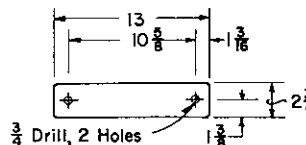
4844-5 RAILWAY BLADE - Reflecting background; black letters.
Use where required in Canada.



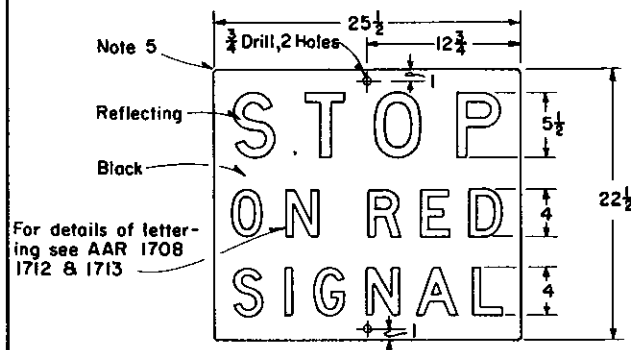
For details of lettering
see AAR 1707, 1713 &
1714.

4844-10 NUMBER OF TRACKS SIGN - Reflecting letters, black background.

4844-11 NUMBER OF TRACKS SIGN - Reflecting background, black letters.
For "1 TRACK" sign the word "TRACK" shall be centered.

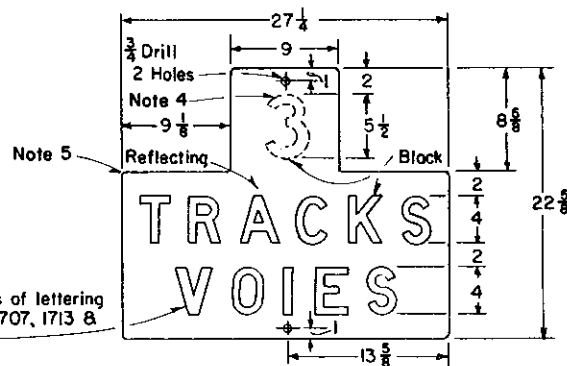


4844-13 BACKER PLATE
.081-6061 Aluminum sheet.



For details of lettering
see AAR 1708
1712 & 1713

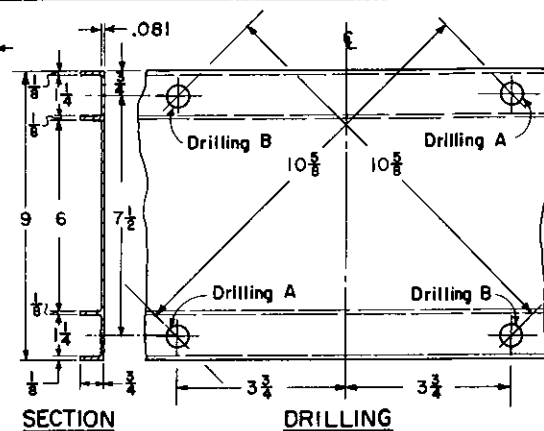
4844-12 STOP ON RED SIGNAL SIGN



For details of lettering
see AAR 1707, 1713 &
1714.

4844-14 NUMBER OF TRACKS SIGN

Use where required in Canada, for more than one track only.



2 HOLES, 3/4 IN. DIA., IN EACH BLADE AS SHOWN

DETAILS (NO SCALE)

CROSSING BLADES
EXTRUDED ALUMINUM 6063-T6

NOTES:

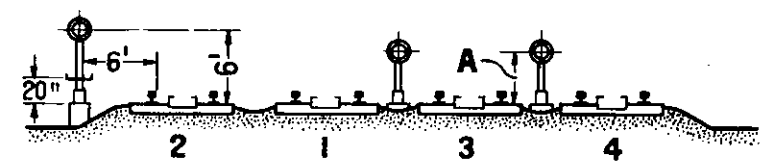
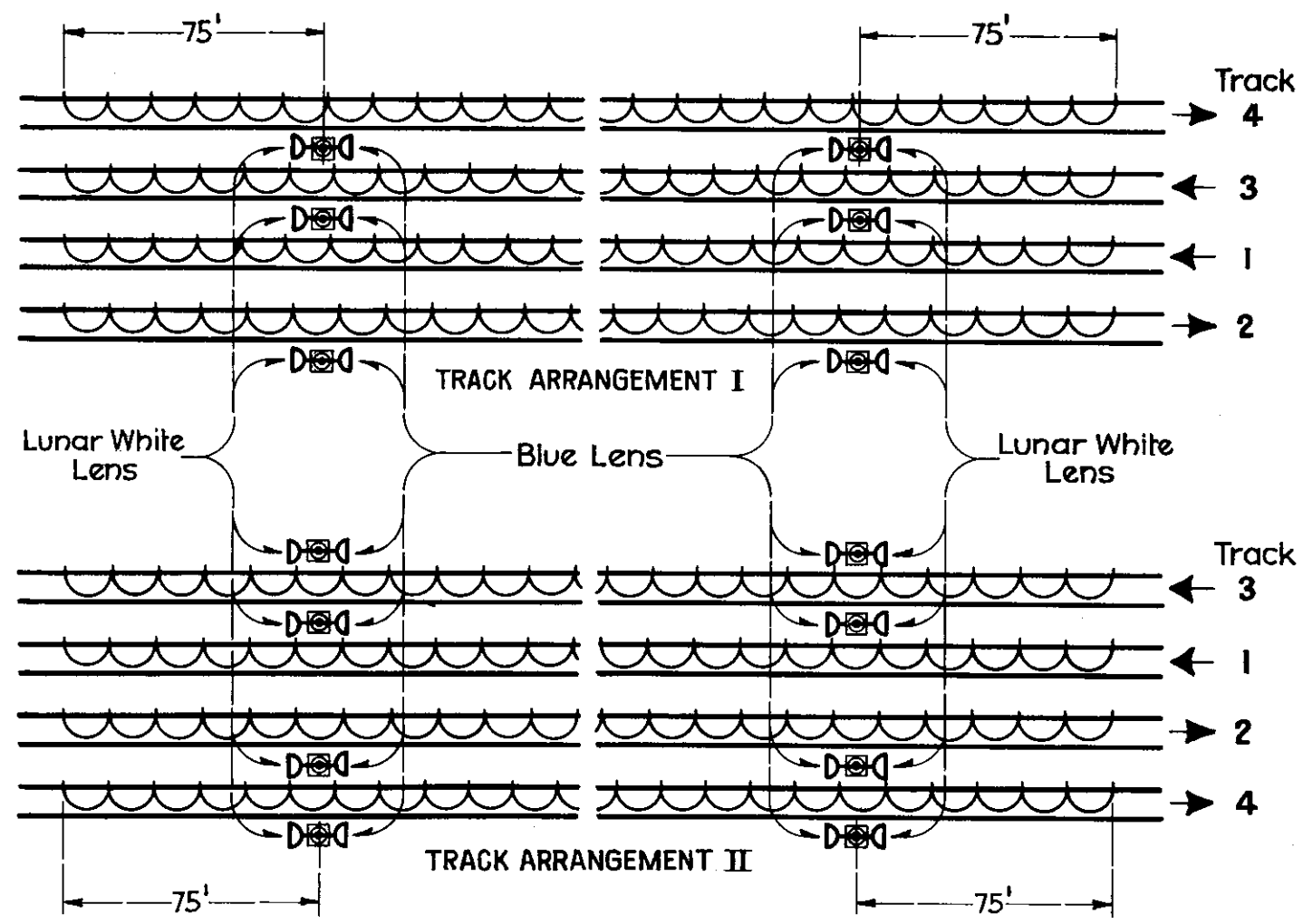
- 1 - Where Black is indicated use No. 605 Black Scotchcol (Minn. Mining & Mfg. Co.) or equal.
- 2 - Where Reflecting is indicated, use No. 2270 wide angle Silver Flat-Top Scotchlite (Minn. Mining & Mfg. Co.) or equal.
- 3 - Condensed lettering to conform to N.Y.C.S. Plan J-2B. Nominal spacing between letters, 3/4 inch.
- 4 - Specify numeral required.
- 5 - Break and round all corners.
- 6 - Sign material shall be .081-6061-T6 aluminum sheet except where indicated otherwise.



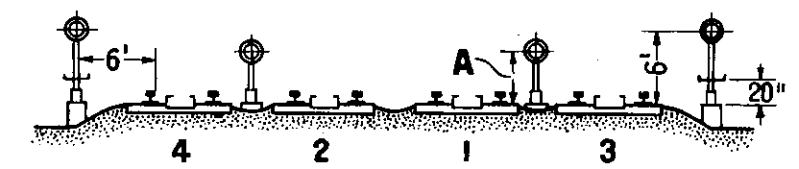
NEW YORK CENTRAL SYSTEM SIGNAL STANDARD SIGNS HIGHWAY CROSSING PROTECTION

Approved *R. K. ...*
Director Communications & Signals

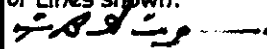
S-4844

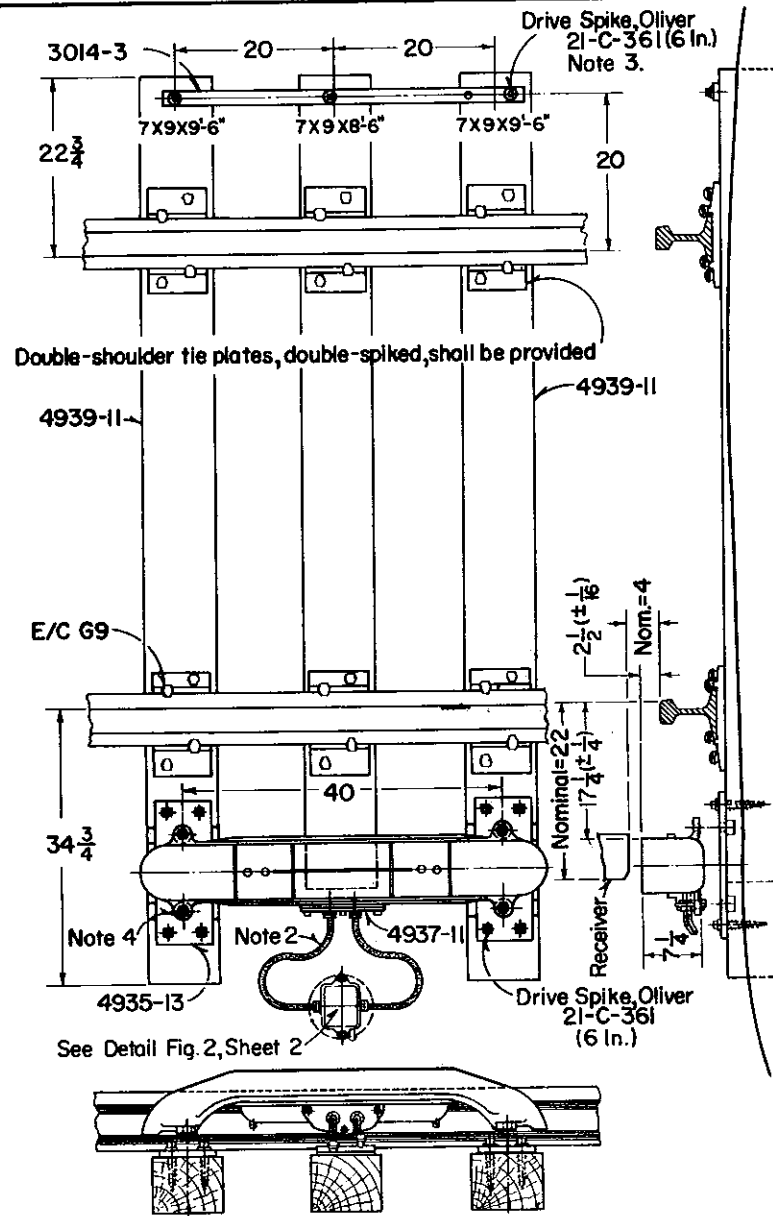


TRACK CENTERS	A
Less than 15'-0"	4'-6"
15'-0" or more	6'-0"

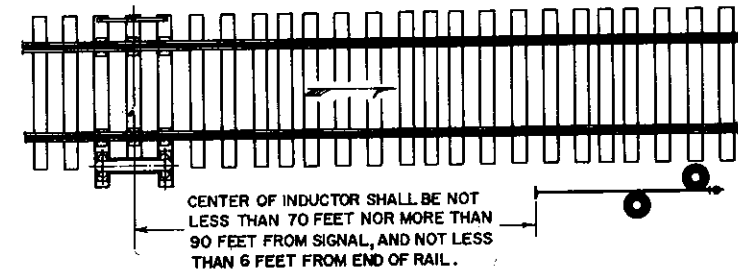


NOTE:
Center line of lamps shall be on center line between tracks.

	SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R. M.C.R.R. G.C.C. & S.T.L.R.Y. B. & A.R.R. P. & L.E.R.R. RUTL.R.R.	4890 1 2-28-1940
		Approved by Representatives of Lines shown.  man	
TRACK PAN LIGHTS LOCATION			



LAYOUT A
SEE NOTE 1.



RELATIVE LOCATION

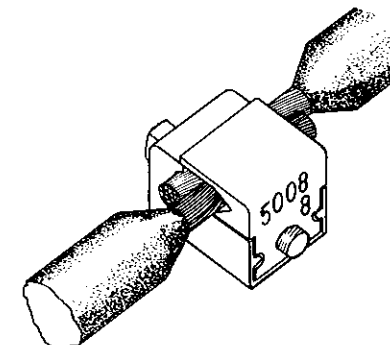
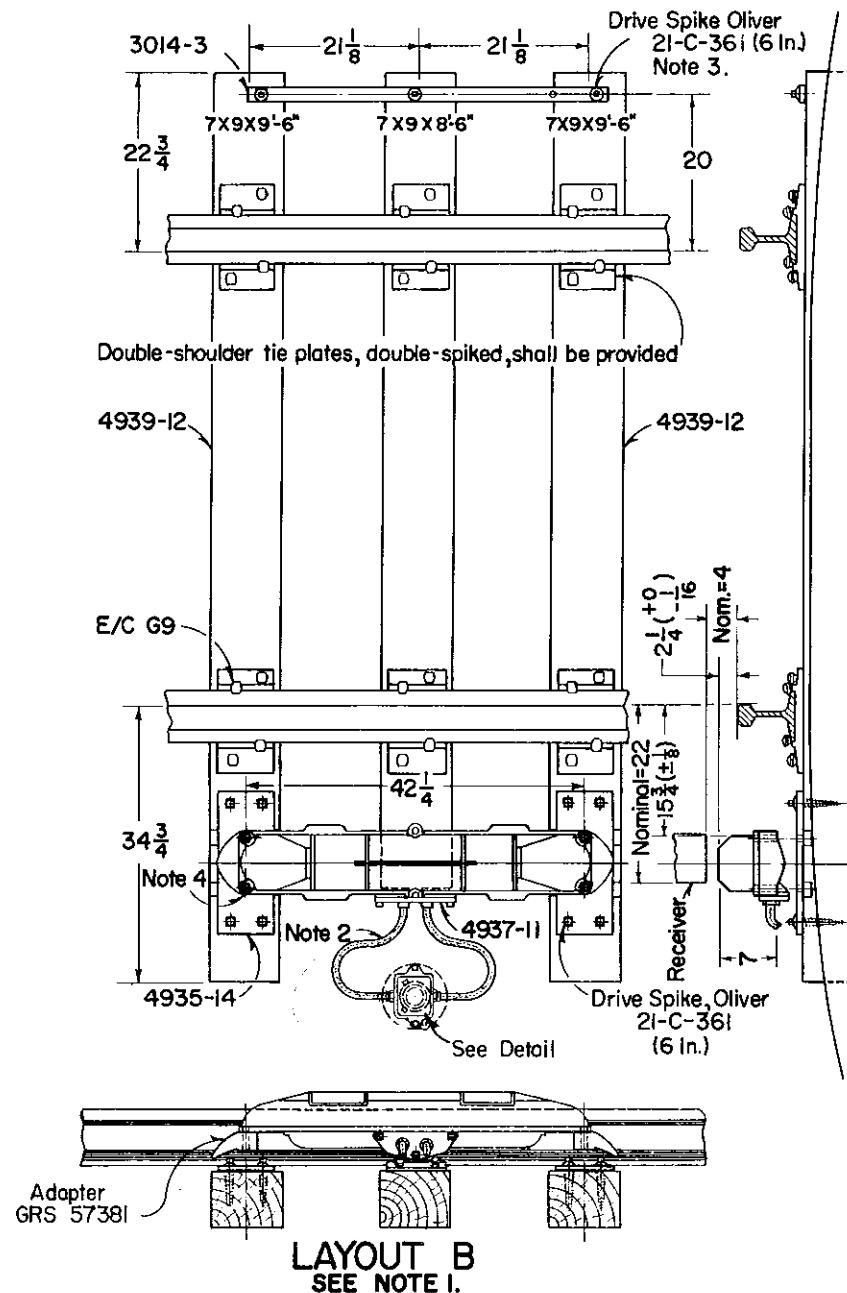
NOTES:

- 1.-Layout "A" is for use in territory where electric equipment with third-rail shoes is not operated. Layout "B" is for use in territory where electric equipment with third-rail shoes is operated.
- 2.- Single conductor No. 8 A.W.G., 19 strand trench cable, A.A.R. Spec. 161-52. To be installed approximately horizontal between inductor and junction box.
- 3.- Bore hole in tie $\frac{5}{8}$ diameter and 5 inches deep.
- 4.- For inductor fastenings required, see Plan 4935.
- 5.- Protective treatment, except ties, Pole faces: Paint, Item 36, Instruction 350. Other surfaces: Paint, Item 32, Instruction 350.

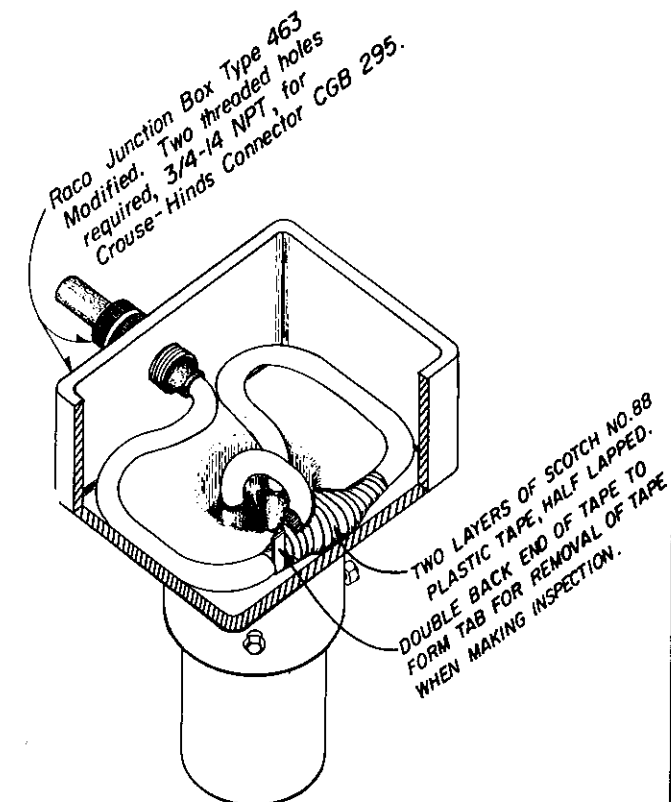
0 6 12 24 36
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT INDUCTOR LAYOUT AUTOMATIC TRAIN STOP

S-4930



DETAIL - FIG. 1
WIRE SPLICE WITH FARGO
TYPE CONNECTOR



DETAIL - FIG. 2
TYPICAL CONNECTION
IN JUNCTION BOX

0 6 12 24 36
All dimensions given in inches.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
INDUCTOR LAYOUT
AUTOMATIC TRAIN STOP

Approved *R. J. Battinelli*
Chief Signal Engineer

S-4930

Printed in U.S.A.

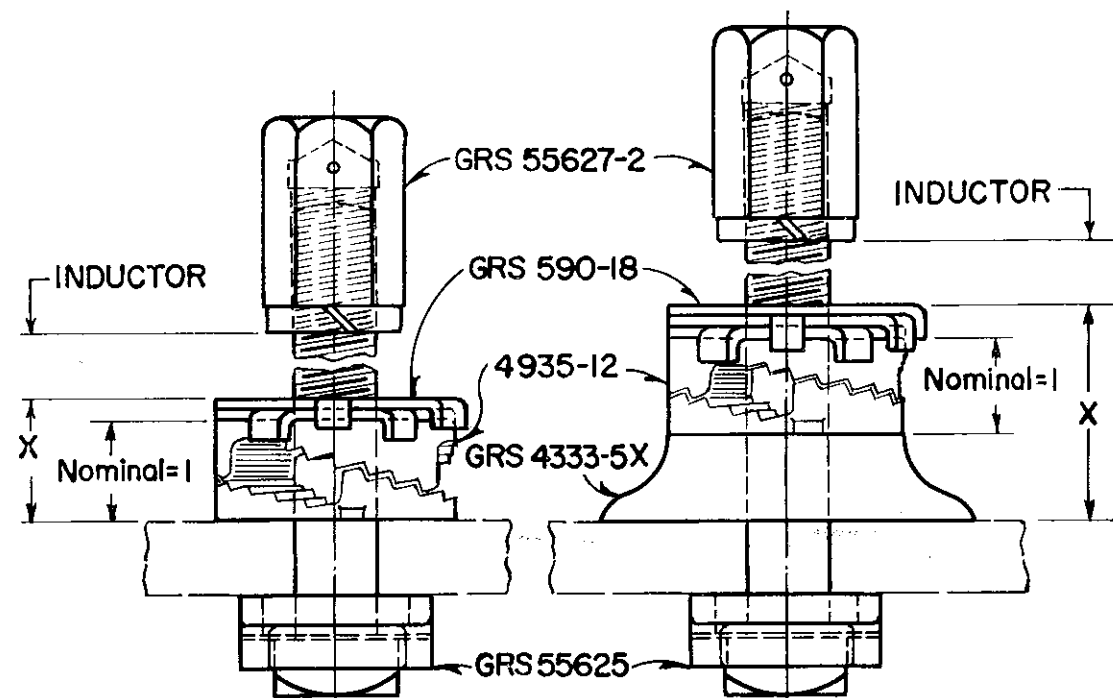
ISSUED 3-21-63
SHEET 2 Cont'd. on Sh.

FOR TERRITORY OTHER THAN WHERE ELECTRIC EQUIPMENT WITH
THIRD-RAIL SHOES IS MOVED OR OPERATED

WEIGHT OF RAIL	105	112	115	127	131
ORDER NO.	4935-1	4935-3	4935-9	4935-6	4935-10
HEIGHT OF RAIL	6	6-5/8	6-1/2	7	7-1/8
DIMENSION "X"	1-1/4	1-7/8	1-3/4	2-1/4	2-3/8
Bolt Length, See Note. (1 Req.)	4-1/2	5	5	5-1/2	5-1/2
Grease Nut, GRS 55627-2	1	1	1	1	1
Spring Washer 1/4X1/4X7/8	1	1	1	1	1
U Washer, GRS 590-18	2	0	6	3	4
Adjuster, Compl. 4935-12	1	1	1	1	1
Washer, C.I. GRS 4333-5X	0	1	0	1	1
Washer, Anchor, GRS 55625	1	1	1	1	1

FOR TERRITORY WHERE ELECTRIC EQUIPMENT WITH
THIRD-RAIL SHOES IS MOVED OR OPERATED

WEIGHT OF RAIL	105	112	115	127	131
ORDER NO.	4935-21	4935-23	4935-29	4935-26	4935-30
HEIGHT OF RAIL	6	6-5/8	6-1/2	7	7-1/8
DIMENSION "X"	1-1/4	1-7/8	1-3/4	2-1/4	2-3/8
Bolt Length, See Note. (1 Req.)	6-1/2	7	7	7-1/2	7-1/2
Grease Nut, GRS 55627-2	1	1	1	1	1
Spring Washer 1/4X1/4X7/8	1	1	1	1	1
U Washer, GRS 590-18	2	0	6	3	4
Adjuster, Compl. 4935-12	1	1	1	1	1
Washer, C.I., GRS 4333-5X	0	1	0	1	1
Washer, Anchor, GRS 55625	1	1	1	1	1



105-115 Lb. RAIL

112-127-131 Lb. RAIL

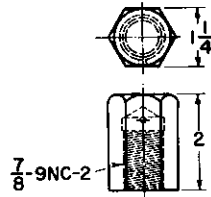
TYPICAL ASSEMBLIES

NOTE:

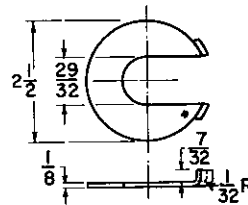
All bolts to be C-1020 steel, unfinished ASA Reg. Sq. Hd. and 7/8-9 NC-2 thread.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
INDUCTOR FASTENINGS
AUTOMATIC TRAIN STOP

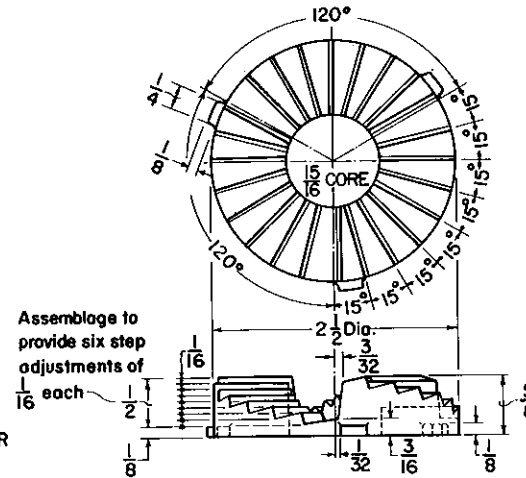
S-4935



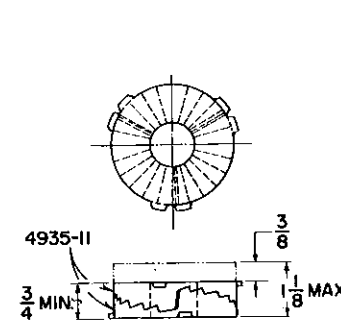
SPECIAL HEX. GREASE NUT
G.R.S. No. 55627-2 or equal
B - III2 C.D. Steel - Cadmium plated



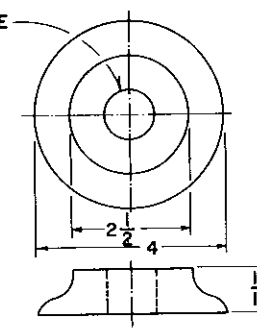
SPECIAL 'U' WASHER
G. R. S. No. 590-18 or equal
No. 11 U.S.S.G. sh. steel



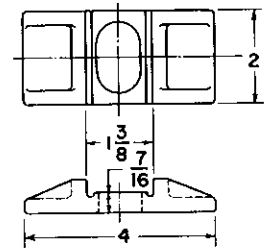
4935-II, HALF ADJUSTER
Malleable iron



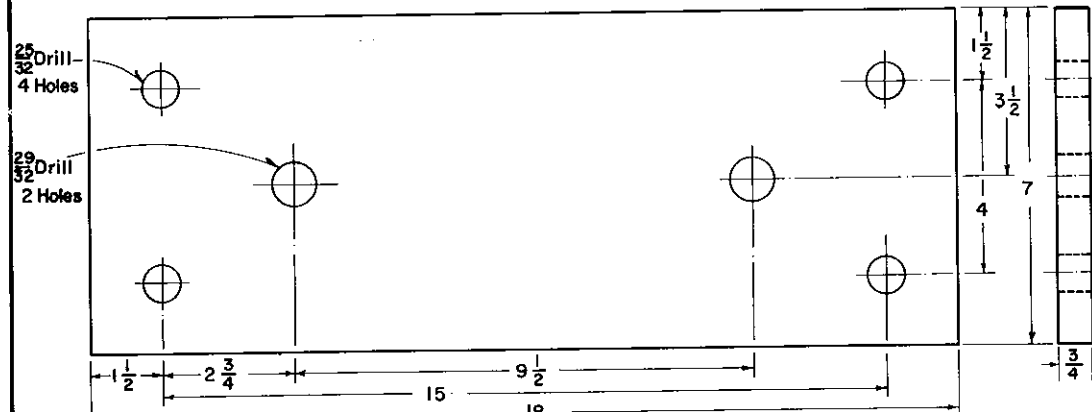
4935-12, ADJUSTER COMPL.



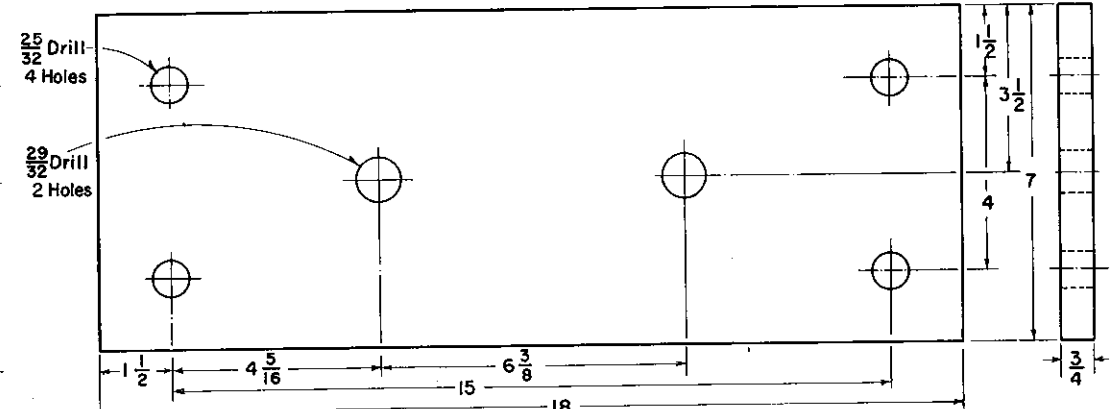
WASHER
G.R.S. No. 4333-5X or equal
Cast iron



ANCHOR WASHER
G.R.S. No. 55625 or equal
Cast steel

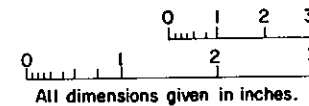


4935-13, INDUCTOR BASE PLATE, C-1020 STEEL
USE WITH INDUCTOR LAYOUT "A", PLAN 4930



4935-14, INDUCTOR BASE PLATE, C-1020 STEEL
USE WITH INDUCTOR LAYOUT "B", PLAN 4930

NOTE: Protective treatment-Primer, Item 31, Instruction 350.

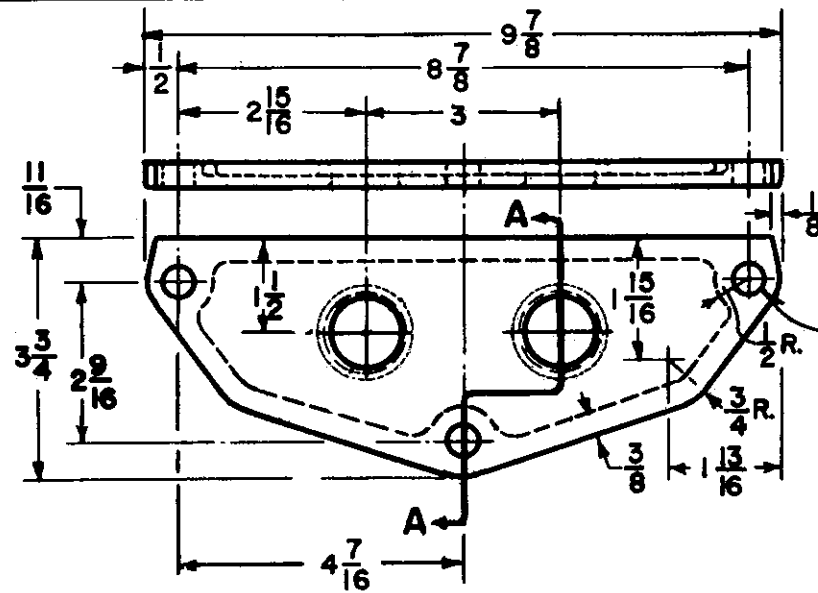


All dimensions given in inches.

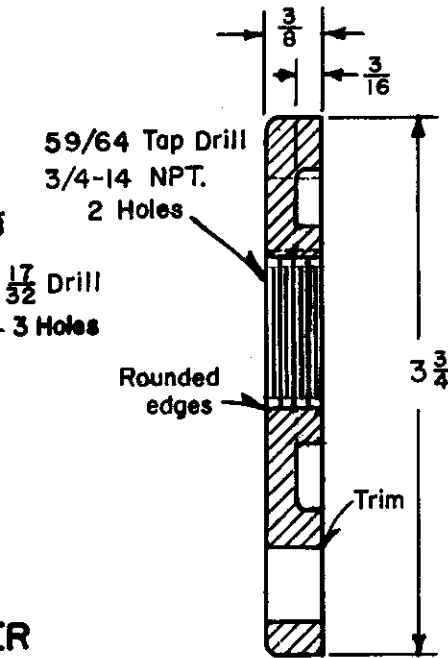
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
INDUCTOR FASTENINGS
AUTOMATIC TRAIN STOP

Approved *[Signature]*
Chief Signal Engineer

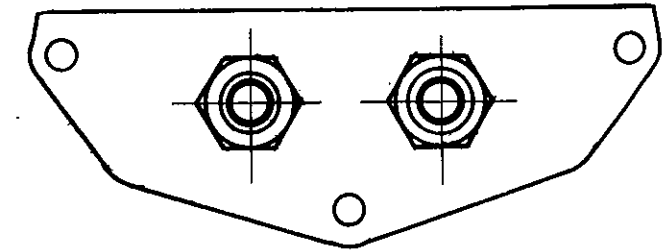
S-4935



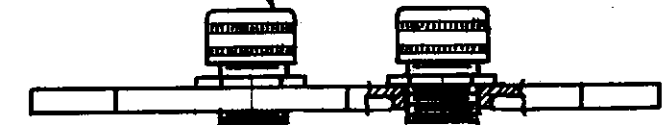
4937-I, INDUCTOR CABLE ENTRANCE COVER
G. R. S. No. 52032-29
Cast Brass



SECTION AA
Scale A

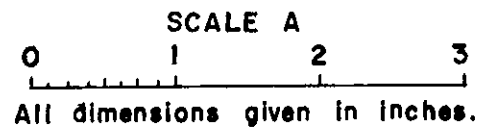
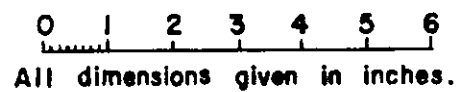


Crouse-Hinds CGB-295
Connector, or equal



4937-II, INDUCTOR CABLE ENTRANCE COMPLETE

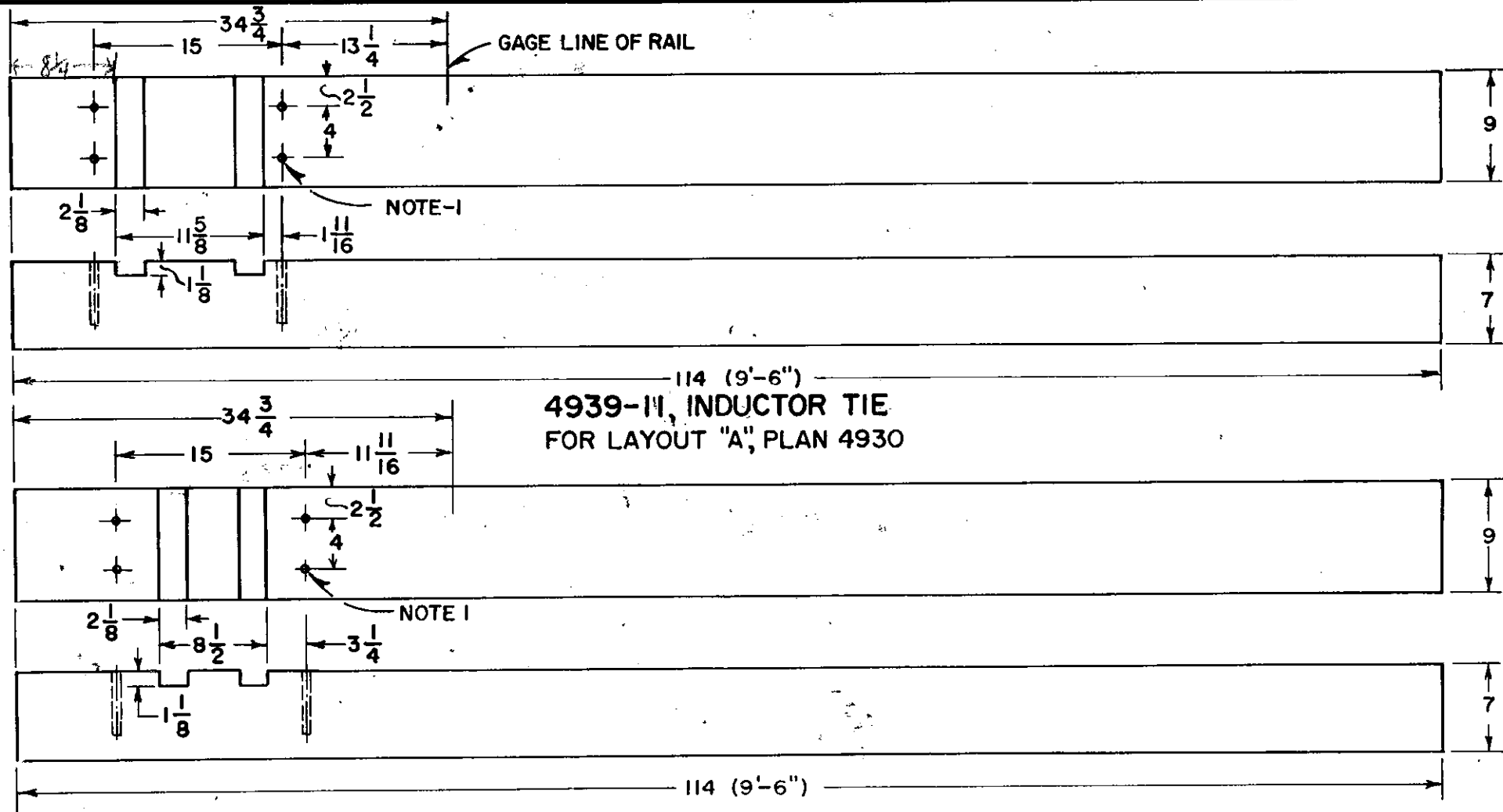
NOTE: Protective treatment, Paint, Item 32,
Instruction 350.



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
INDUCTOR CABLE ENTRANCE COVERS

Approved *H. Scott*
Chief Signal Engineer

S-4937



NOTES:

1 - BORE HOLE IN TIE ONE-HALF INCH IN DIAMETER
AND FIVE INCHES DEEP.

2 - TIES TO BE OAK; CREOSOTE AFTER FRAMING.

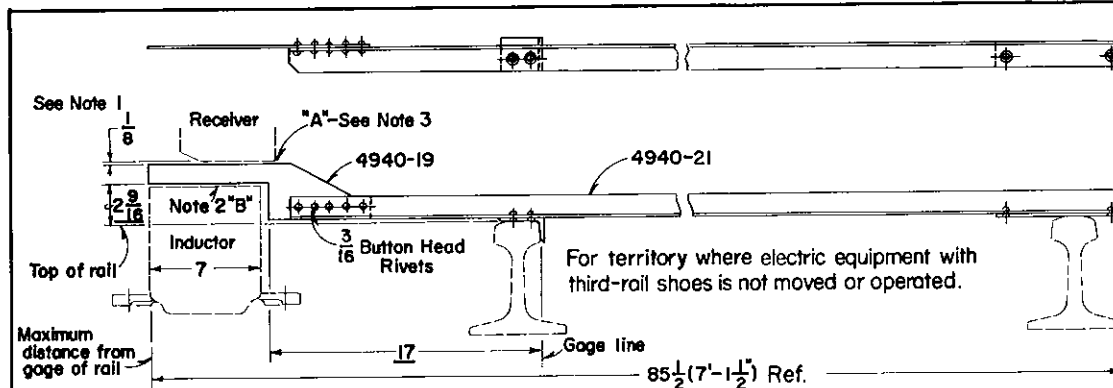
4939-12, INDUCTOR TIE
FOR LAYOUT "B", PLAN 4930



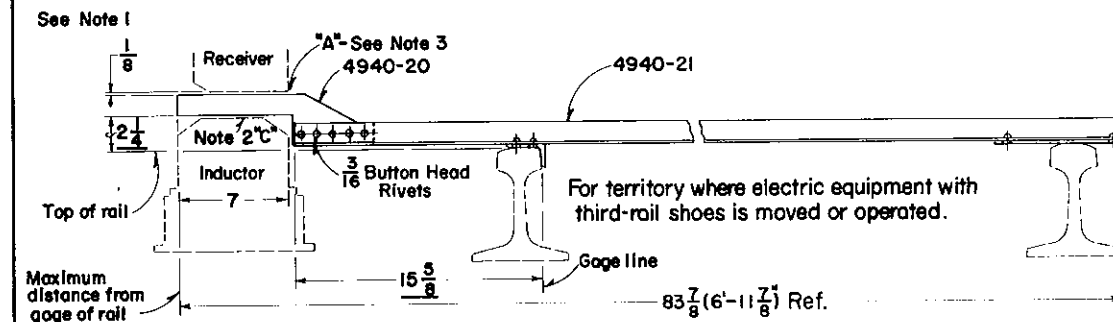
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
INDUCTOR TIES
AUTOMATIC TRAIN STOP

Approved *H. Scott*
Chief Signal Engineer

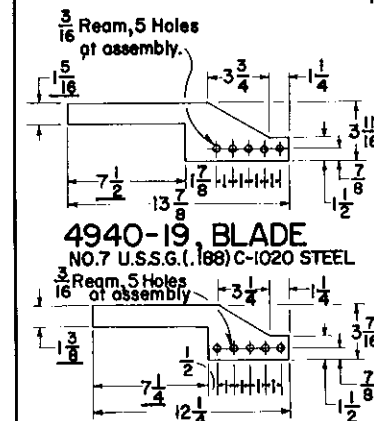
S-4939



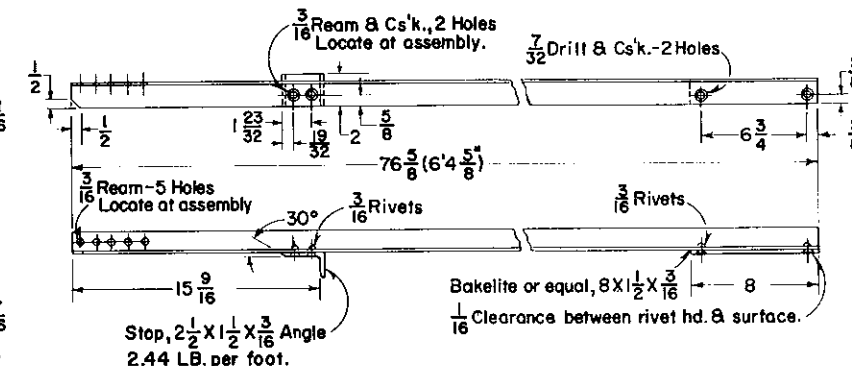
4940-3, GAGE COMPLETE



4940-4, GAGE COMPLETE

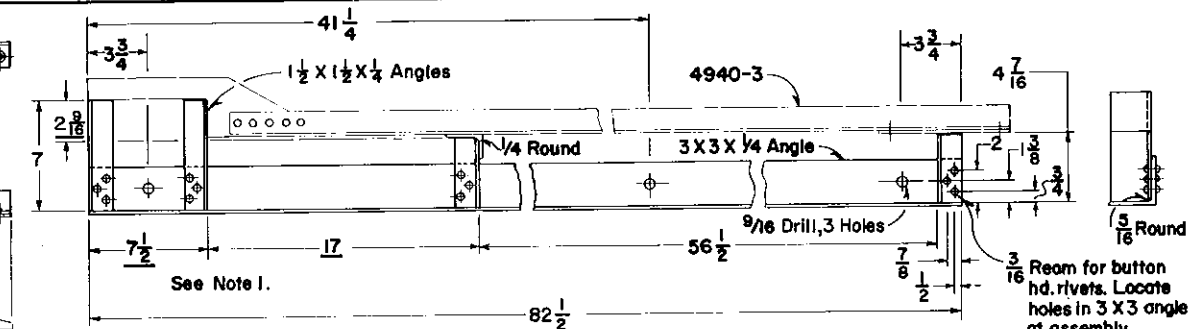


4940-20, BLADE
NO. 7 U.S.S.G. (.188) C-1020 STEEL

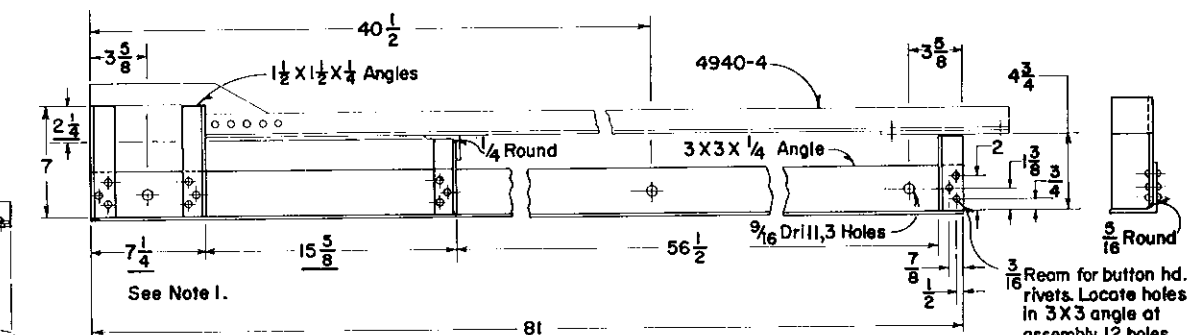


4940-21, SHAFT

1 1/2 X 1 1/2 X 3/16 ANGLE - 1.80 LB. PER FOOT.



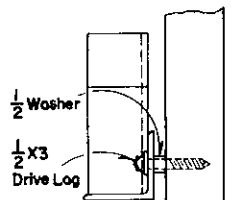
4940-23, TEMPLAT COMPLETE
USE WITH GAGE 4940-3



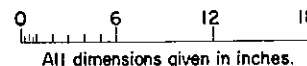
4940-24, TEMPLAT COMPLETE
USE WITH GAGE 4940-4

NOTES:

1. Dimensions underscored must be within 1/64 inch tolerance.
2. Inductor must not be more than 1/8 inch below gage at "B" and not more than 1/16 inch below gage at "C".
3. Receiver on engine must not be allowed to come lower than gage at "A". Preferably it should be kept as near 1/8 inch above gage as the notches in the washboard adjustment will allow.
4. Templet must be mounted at headquarters of maintenance force on sections where inductors are in use.
5. Gage must be checked with templet for proper alignment and any irregularity corrected before check of inductors is made.
6. Protective treatment - Primer, Item 31; Paint, Item 32, Instruction 350.



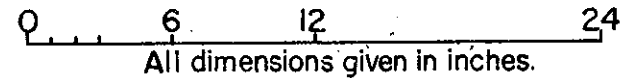
METHOD OF MOUNTING
TEMPLAT ON WALL
(NO SCALE)



NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT INDUCTOR-RECEIVER GAGE AUTOMATIC TRAIN STOP

Approved *H. H. H.*
Chief Signal Engineer

S-4940

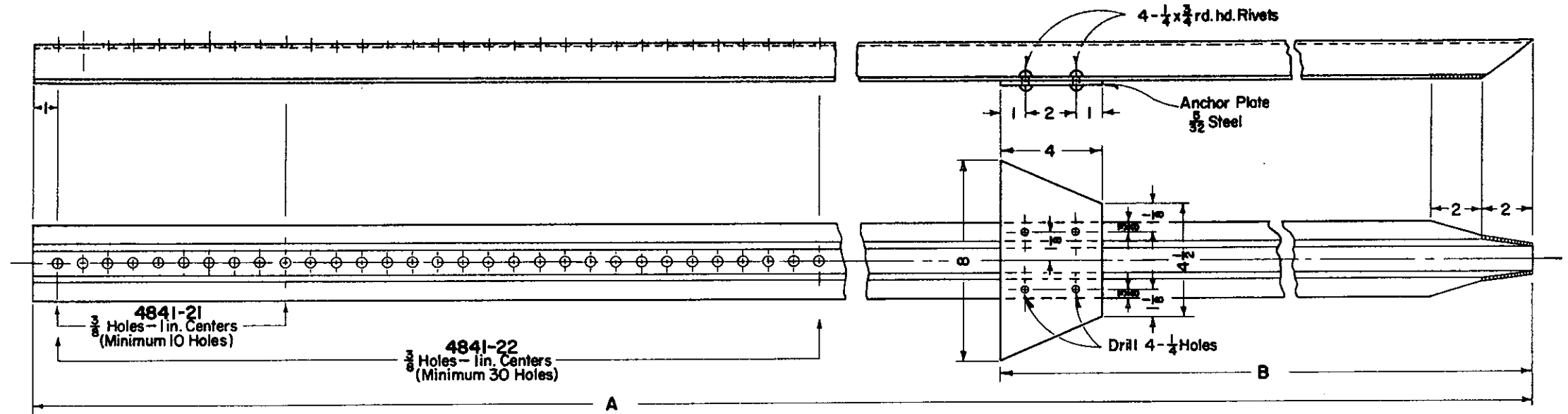


All material to be C-1020 steel.

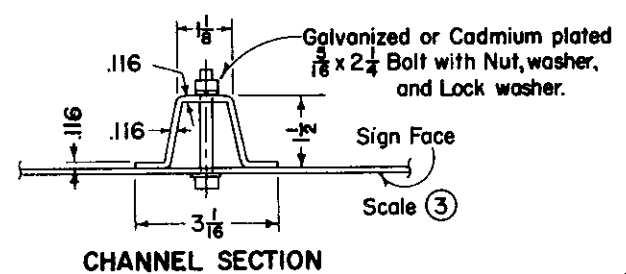
Protective treatment - Primer, Item 31, Instruction 350.
Paint, " 32, " 350.

S-4942

ISSUED 7-1-54



Scale (2)



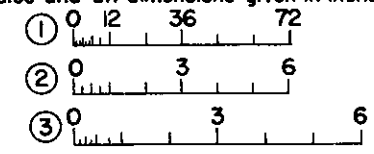
CHANNEL SECTION

POST COMPL. with necessary nuts, bolts and washers

ORDER NO.	Dim. A	Dim. B
4841-21	60 (5'-6")	27
4841-22	114 (9'-6")	30

- NOTES:
1. Protective Treatment- Primer, Item 31 ; Paint, Item 53, Instruction 350.
 2. When there is a driveway adjacent to the track for off-track equipment, the sign must clear the driveway.

Scales and all dimensions given in inches



Approved

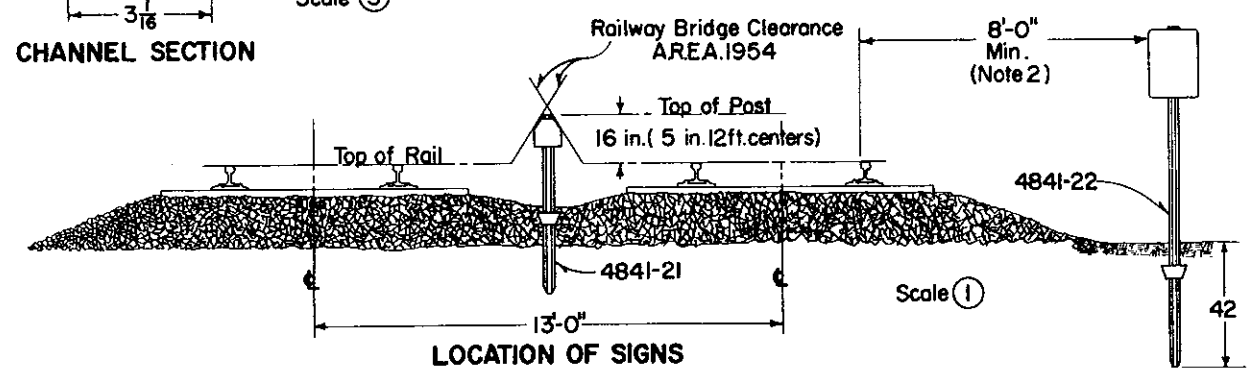
[Signature]
Asst. Vice President-Engineering

[Signature]
Engineer Maintenance of Way

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT SIGNS

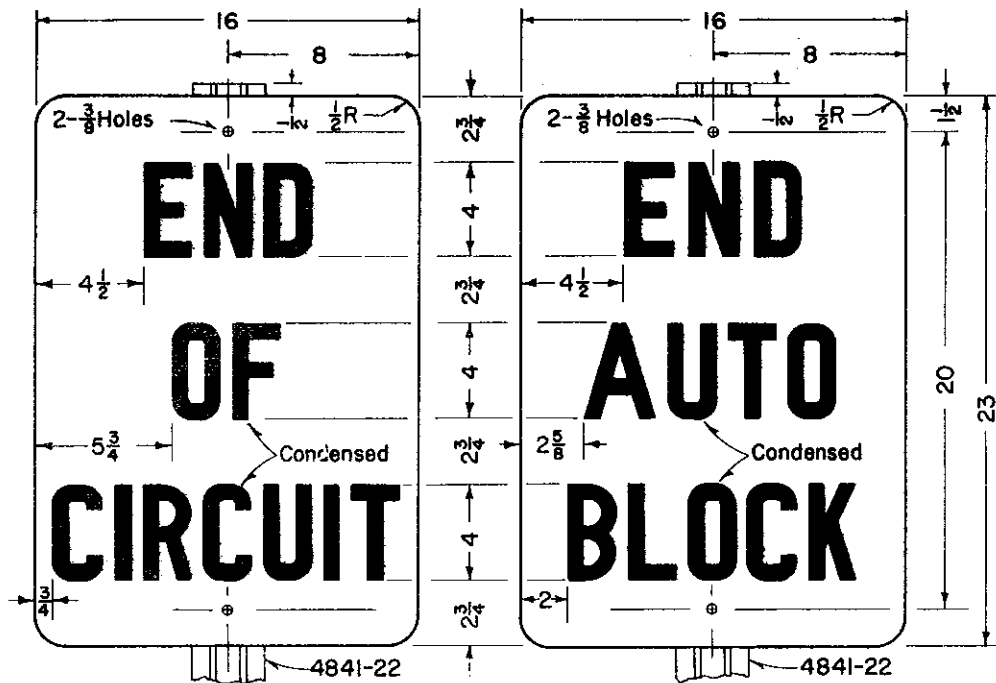
Approved *[Signature]*
Chief Signal Engineer

S-4841



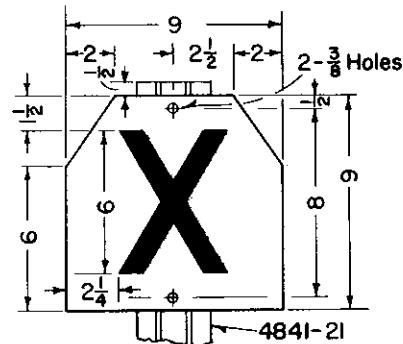
LOCATION OF SIGNS

Scale (1)



4841-1 SIGN ONLY
4841-11 SIGN COMPL. with Post
 Note 8

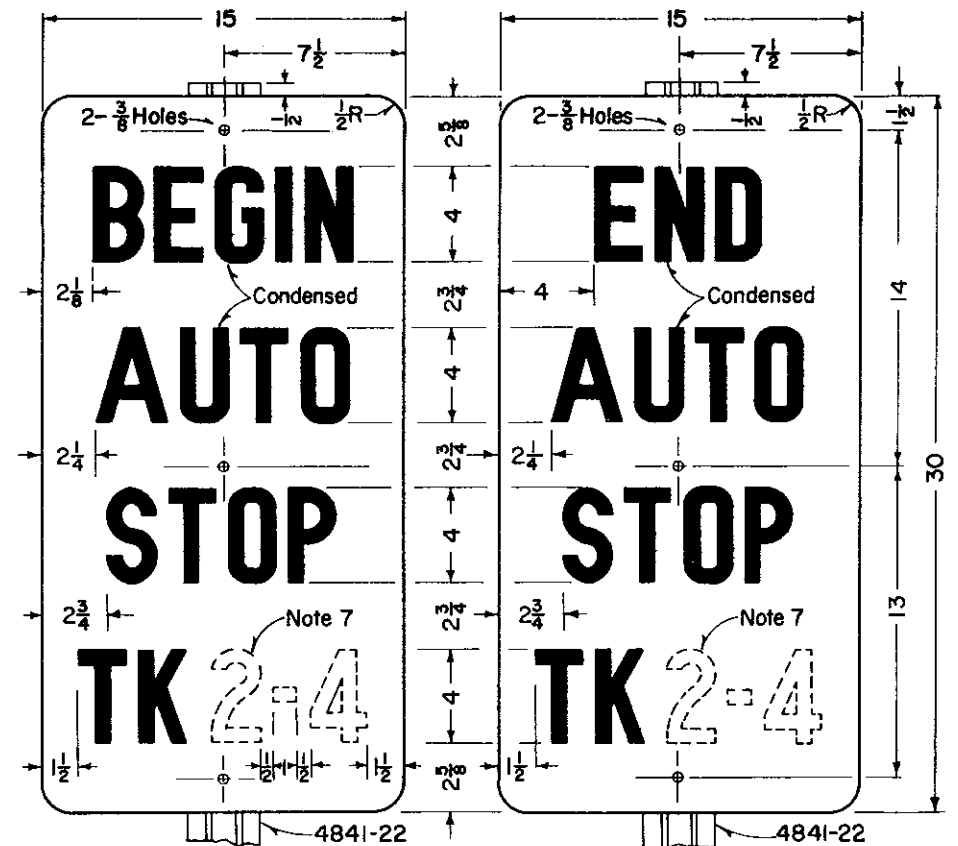
4841-2 SIGN ONLY
4841-12 SIGN COMPL. with Post



4841-1A SIGN ONLY
4841-11A SIGN COMPL. with Post
 Note 8

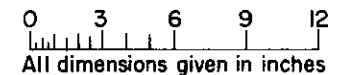
NOTES:

1. Spacing between letters shall be one half inch.
2. See Roadway Standard plan J-2B for proportion of letters and numerals.
3. Material for all sign plates shall be .081"-6061-T6 aluminum.
4. Face of sign plate shall be covered with No. 2270 wide angle Silver Flat-Top Scotchlite. (Minn. Mining & Mfg.)
5. Letters and numerals shall be No. 605 Black Scotchal. (Minn. Mining & Mfg.)
6. Signs shall be at right angles to track.
7. Indicate numerals desired on signs 4841-3 & 4.
8. Sign 4841-1A to be used in place of 4841-1 between tracks where track centers are less than eighteen feet.
9. Necessary bolts, nuts and washers to be furnished with each sign.



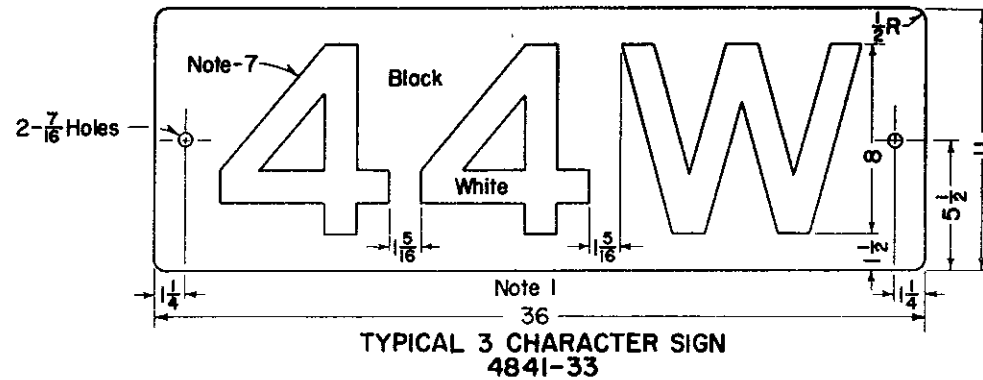
4841-3 SIGN ONLY
4841-13 SIGN COMPL. with Post

4841-4 SIGN ONLY
4841-14 SIGN COMPL. with Post



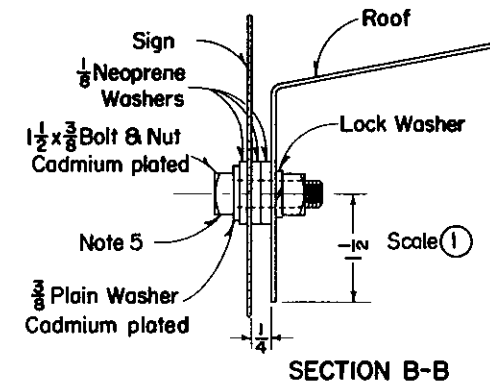
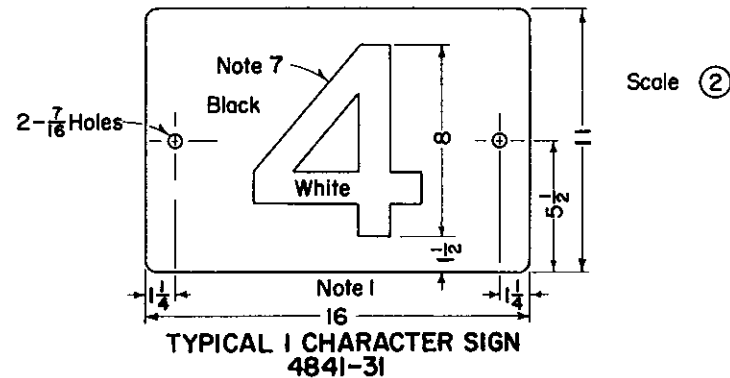
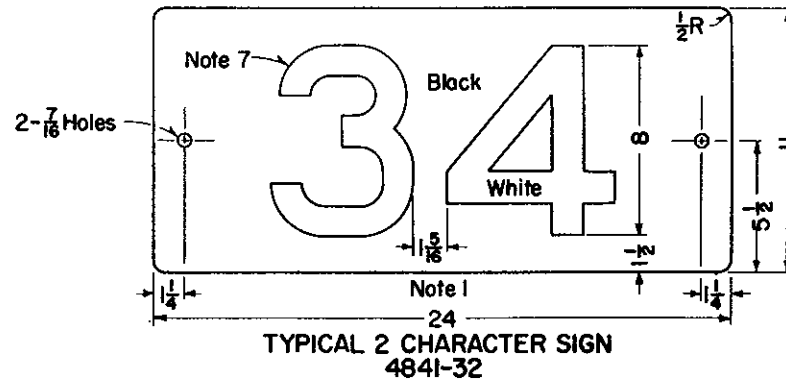
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNS

S-4841

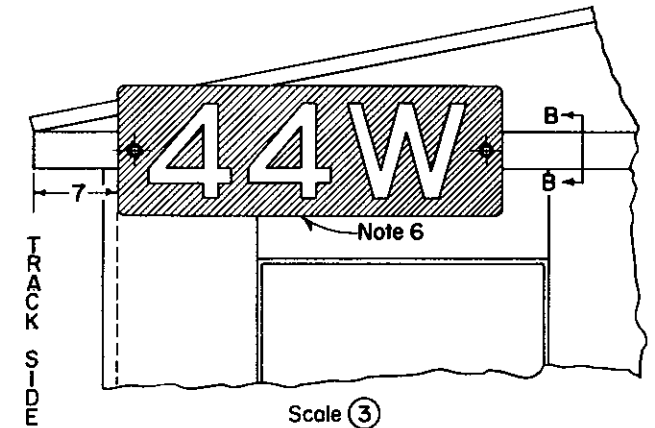
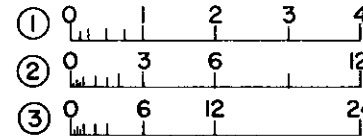


NOTES:

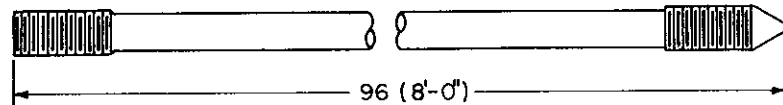
1. Specify numerals and (or) letters required for each sign.
2. Material for all sign plates shall be .081" 6061-T6 aluminum.
3. Face of sign to be covered with Minn. Mining & Mfg. No. 605 Black Scotchcal.
4. Letters and numerals to be Minn. Mining & Mfg. No. 2270 wide angle Silver Flat-Top Scotchlite.
5. Necessary nuts, bolts and washers to be furnished with each sign.
6. Signs to be mounted on both ends of house.
7. See Roadway Standard plan J-2B for proportion of letters and numerals.



Scales and all dimensions given in inches



NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SIGNS
IDENTIFICATION
REMOTE CONTROL LOCATIONS
 Approved: *H. H. H.*
 Chief Signal Engineer
S-4842

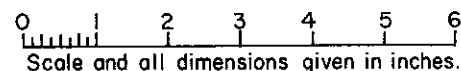


6315-14 SECTIONAL GROUND ROD



6315-15 COUPLING

6315-16 DRIVING STUD
STEEL



NOTE: For installation and maintenance of lightning arrester grounds see Instruction 256

For method of making welded ground wire connections see Sheet 2.

ORDER NO.	ITEM	ORDERING REFERENCES		REMARKS
6315-1	WELDER	Erico Products Co.	SB-1367 Gr. 3. No. 6 Solid-5/8 Ground Rod	For 3 wire connection only.
6315-11	MOLD	" " " " " " " " " " "	Mold only.	" " " " " "
6315-12	CARTRIDGE	" " " "	No. 25 Cartridges	" " " " " "
6315-14	SEC. GROUND ROD	Hubbard-Copperweld	No. 29438	
6315-15	COUPLING	" " " "	No. 9534	
6315-16	DRIVING STUD	" " " "	No. 29534	
6315-20	"ONE SHOT" UNIT *	Erico Products Co.	No. S219E No. 6 Solid-5/8 Ground Rod	For 1 or 2 wire connections

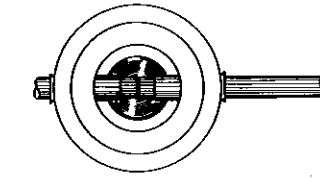
* "One-Shot" Unit contains one disposable mold, one Cadweld cartridge No. 45, a metal disc, a wrap seal and two sleeves.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SECTIONAL GROUND ROD

S-6315

INSTRUCTIONS-1 OR 2 GROUND WIRES

- 1 - Wires must be bright, clean and dry; rods to be filed bright on top to insure proper weld.
- 2 - Twist wrap seal on rod and position wires in sleeves as indicated, Fig. A. If one wire only is to be connected insert ground wire through both sleeves.
- 3 - Place metal disc in mold to retain welding metal. Gently empty welding metal from cartridge into mold followed by starting powder normally caked in bottom of cartridge. Charge is then ready to fire.



TOP VIEW
(Powder & Disc Removed)

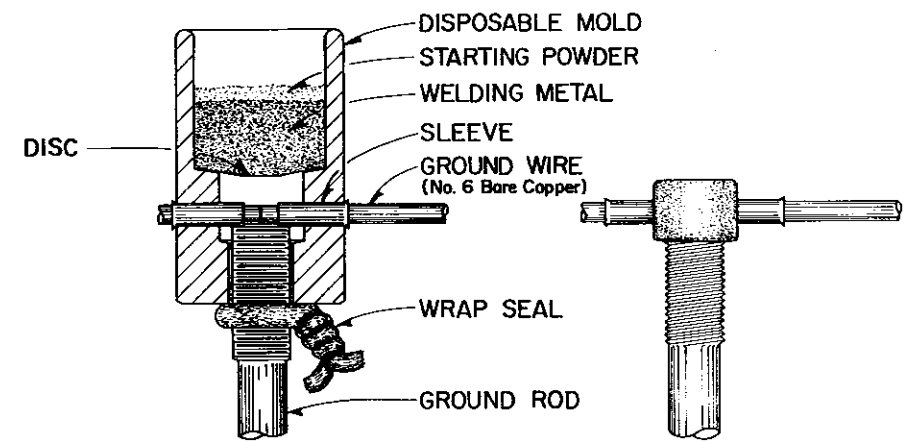
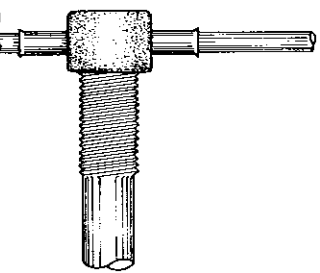


Fig. A
6315-20 "ONE-SHOT" UNIT
SECTION VIEW OF ASSEMBLY
READY FOR FIRING



COMPLETED WELD

ONE OR TWO WIRE CONNECTIONS

INSTRUCTIONS-3 GROUND WIRES

- 1 - Wires must be bright, clean and dry; rods to be filed bright on top to insure proper weld.
- 2 - Position wires in mold (as shown Fig. B) with end of wires directly under center of tap hole. Cover tap hole with a steel disc. Use three cartridges, 6315-12, as follows: Gently empty the welding metal only from two cartridges into the mold taking care not to disturb starting powder normally caked in the bottom of the cartridge. Empty entire contents of third cartridge into mold. Close cover and fire.

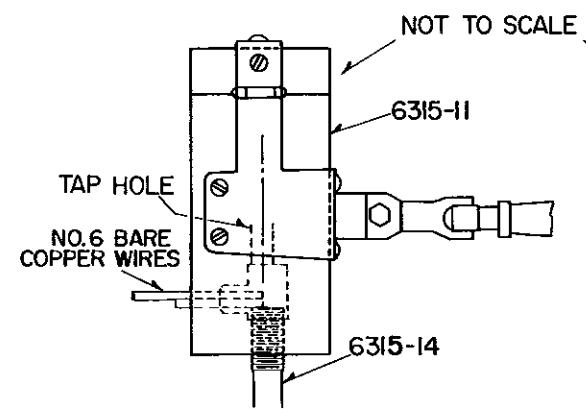
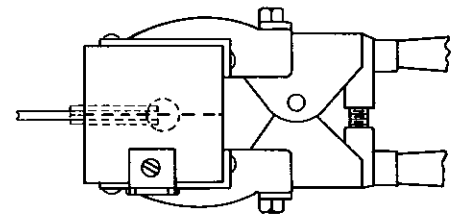
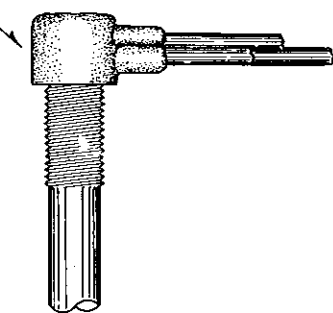


Fig. B
6315-I WELDER COMPL.
6315-II MOLD ONLY



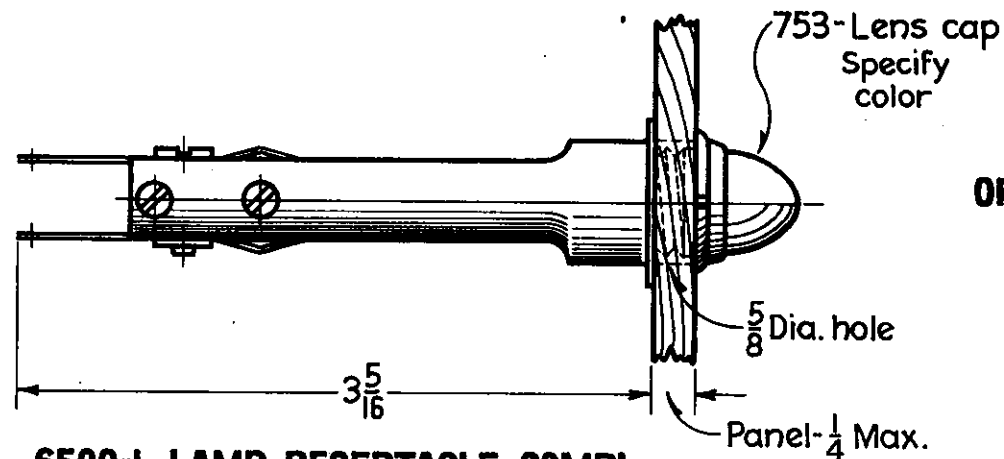
COMPLETED WELD

THREE WIRE CONNECTIONS ONLY

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
SECTIONAL GROUND ROD
WELDED GROUND WIRE CONNECTIONS

Approved *L. S. Bottinelli*
Chief Signal Engineer

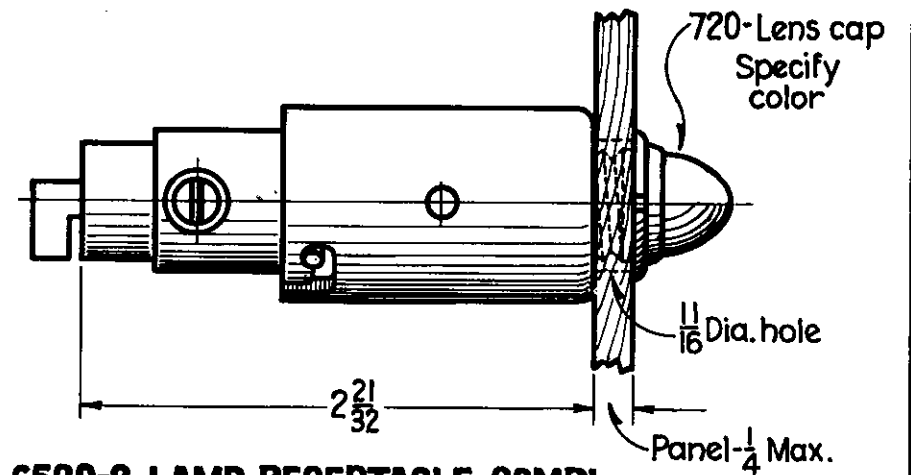
S-6315



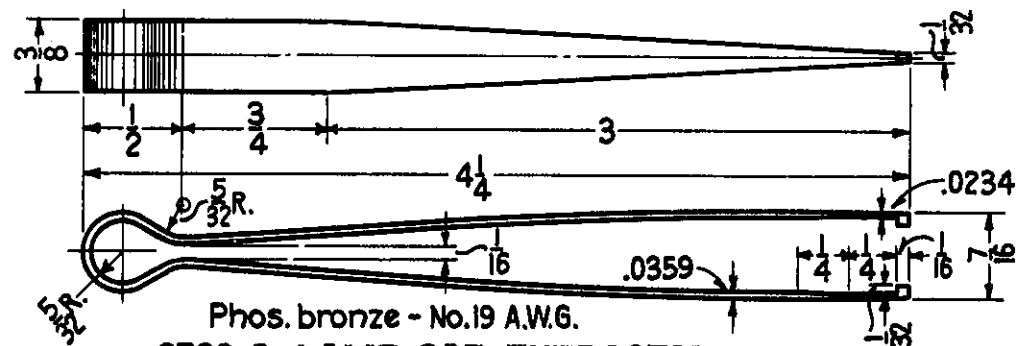
6500-1 LAMP RECEPTACLE COMPL.
Raco No. 749 or equal

**COLORS
OF LENS CAPS**

RED
OPAL
BLUE
GREEN
AMBER



6500-2 LAMP RECEPTACLE COMPL.
Raco No. 715-2 or equal
(Single contact)



6500-3 LAMP CAP EXTRACTOR



6500-4 BULB EXTRACTOR

Scale: Full
All dimensions given in inches

	SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R. M.C.R.R. G.C.G.&ST.L.R.Y. B.&A.R.R. P.&L.E.R.R. RUTL.R.R.	6500 10-8-1941
LAMP RECEPTACLES FOR INDICATORS AND TRACK CHARTS		Approved by Representatives of Lines shown. Chairman	

G.R.S. Co.

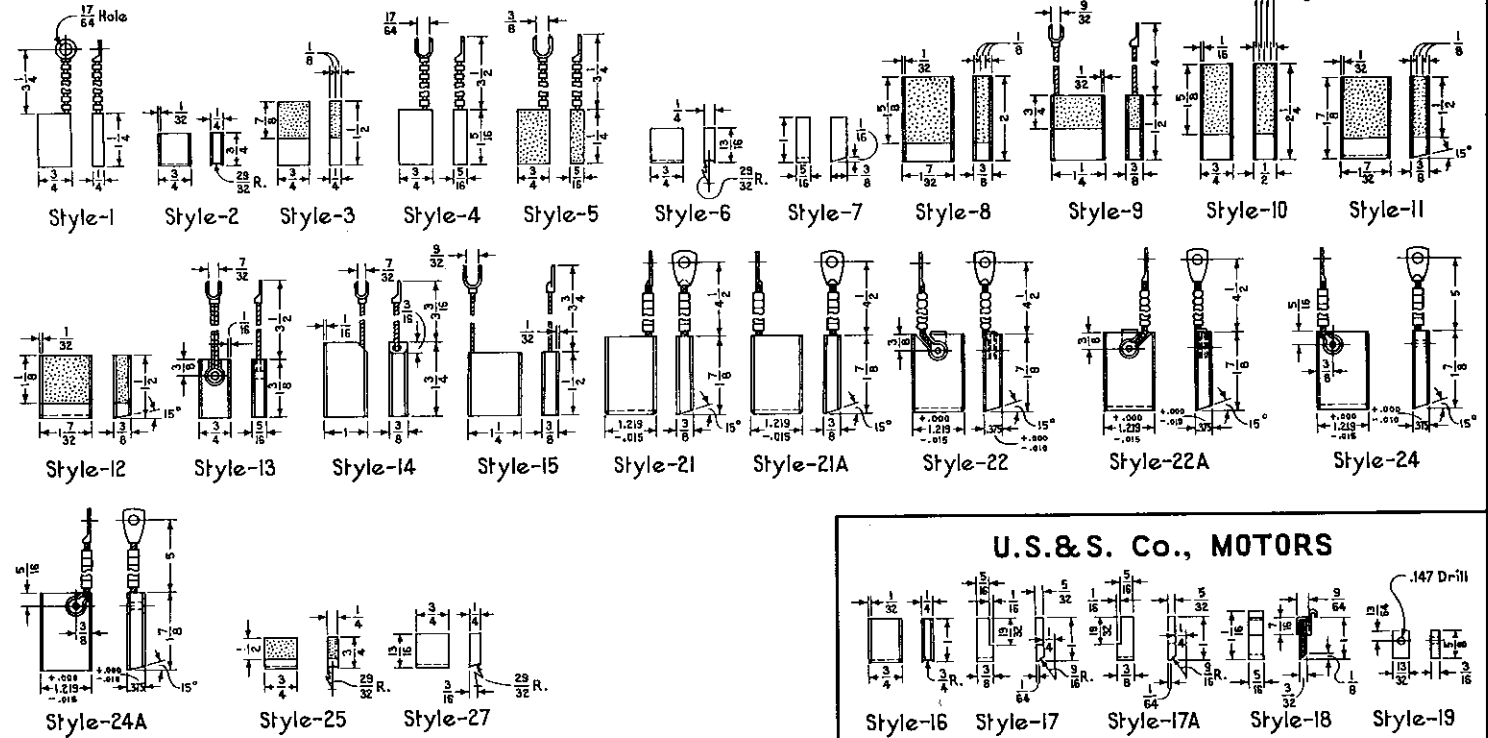
U.S. & S. Co.

MISCL.

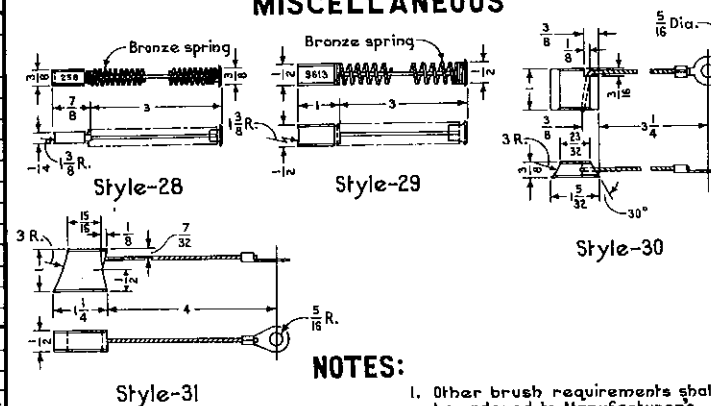
TYPE OF MOTOR	FOR	STYLE	ORDER NO.	NAME	GRADE
Model 2A-10V. D.C.	Signal	1	6580-1	N.C. Co.	NJ-25
" " " "	"	2	6580-2	" " "	D0
" " " "	Xing. Gate	6	6580-9	" " "	"
5A-B-C and D-20V. D.C.	Switch	2	6580-3	" " "	NJ-25
" " " "	"	21	LH-6580-17	" " "	"
" " " "	"	21A	RH-6580-17	" " "	"
Type B car retarder-110-220V. D.C.	Skate	2	6580-4	" " "	549
" " " "	"	25	6580-5	" " "	"
Model 2A-110V. D.C.	Signal	3	6580-6	" " "	"
" " " "	"	25	6580-18	" " "	"
Type 4-20V. D.C. (Federal)	"	4	6580-7	" " "	524
" " " "	"	5	6580-8	" " "	"
Special- " " dwarf- (Federal)	"	7	6580-10	" " "	"
Model 2 and 5-110V. D.C.	Switch	8	6580-11	" " "	549
Type 2-4 and 41-110V. D.C. (Federal)	"	9	6580-12	" " "	306
" 4 and 41-110V. D.C. (Federal)	"	15	6580-20	" " "	AY
Model 4-4A-B and C-110V. D.C.	"	10	6580-13	" " "	549
" 5A-B-C and D-110V. D.C.	"	11	6580-14	" " "	"
" " " "	"	12	6580-15	" " "	"
" " " "	"	21	LH-6580-20	" " "	NJ-25
" " " "	"	21A	RH-6580-20	" " "	"
" " " "	"	22	LH-6580-23	" " "	650
" " " "	"	22A	RH-6580-23	" " "	"
" " " "	"	24	LH-6580-27	" " "	549
" " " "	"	24A	RH-6580-27	" " "	"
" " " "	"	24	LH-6580-29	" " "	"
" " " "	"	24A	RH-6580-29	" " "	"
Type B car retarder-230V. D.C.	Mechan'm.	13	6580-16	" " "	SA-35 or 259
" " " "	"	"	"	" " "	25903
" " " "	"	"	"	" " "	G
Type B car retarder-230V. D.C. compound wound	Mechan'm.	14	6580-19	Westinghouse	WL-21
" " crossing gate L.V.D.C.	Xing. Gate	27	6580-28	N.C. Co.	D0
Style B-10V. D.C.	Signal	16	6580-21	N.C. Co.	NJ-15
" " and S-10V. D.C.	"	17	LH-6580-22	" " "	EL
" " " "	"	17A	RH-6580-22	" " "	"
" " " "	"	18	6580-24	U.S. & S. Co.	Pc.74289
" " " "	"	19	6580-25	N.C. Co.	NJ-25
" " " "	"	20	6580-26	" " "	"
" " " "	"	23	6580-30	" " "	"
" " " "	"	26	6580-34	Stackpole	C-1
" " " "	"	26A	6580-35	"	P-85
Type No. 3584 crossing gate mech.	Xing. Gate	32	6580-36	N.C. Co.	D0
Model 5D74AB8 (G.E. Dynamotor)	Power	28	6580-31	G.E. Co.	258A.C.
" 5H76AB1A (" ")	"	29	6580-32	" " "	9613 D.C.
" 5R21U Kohler Plant	"	30	6580-33	Kohler	D-7420 C.
" " " "	"	31	6580-34	"	156031 A.C.

Printed in U.S.A.

G.R.S. Co., MOTORS



MISCELLANEOUS

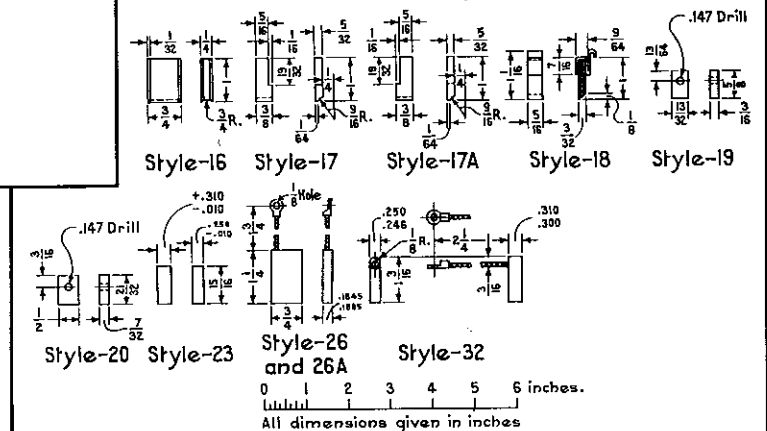


NOTES:

1. Other brush requirements shall be ordered to Manufacturer's Reference.

● = Copper plated brushes.

U.S. & S. Co., MOTORS



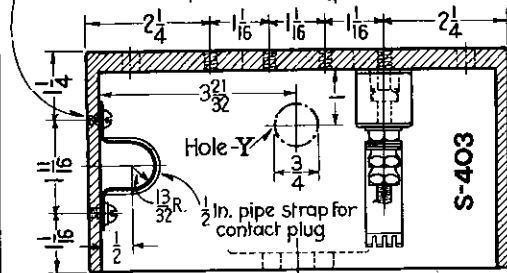
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT MOTOR BRUSHES

Approved *H. S. H.*
Chief Signal Engineer

S-6580

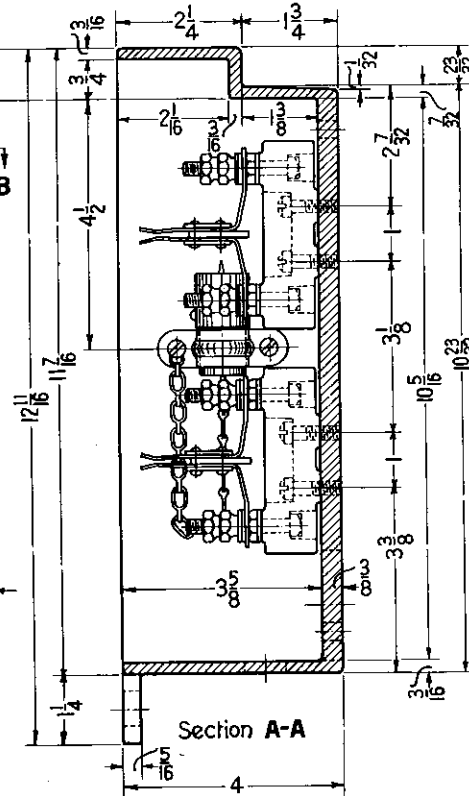
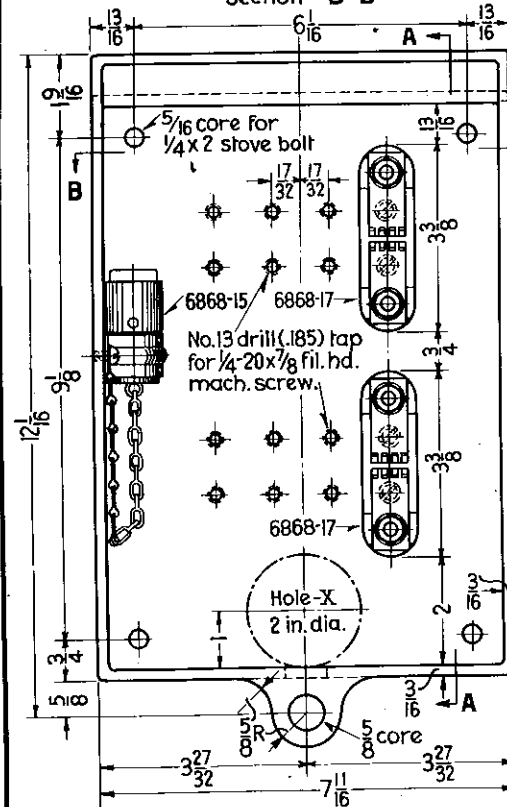
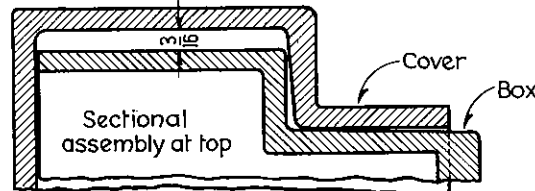
ISSUED 2-1-55...
SHEET...Cont'd on Sh.....

No.29 drill (.136) tap for No.8-32x1/4 rd.hd.brass mach. screw



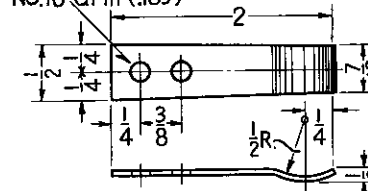
Section B-B

6868-11 BOX ONLY - With hole X only in back
6868-12 BOX ONLY - With hole Y only in bottom
Cast or mall. iron



Section A-A

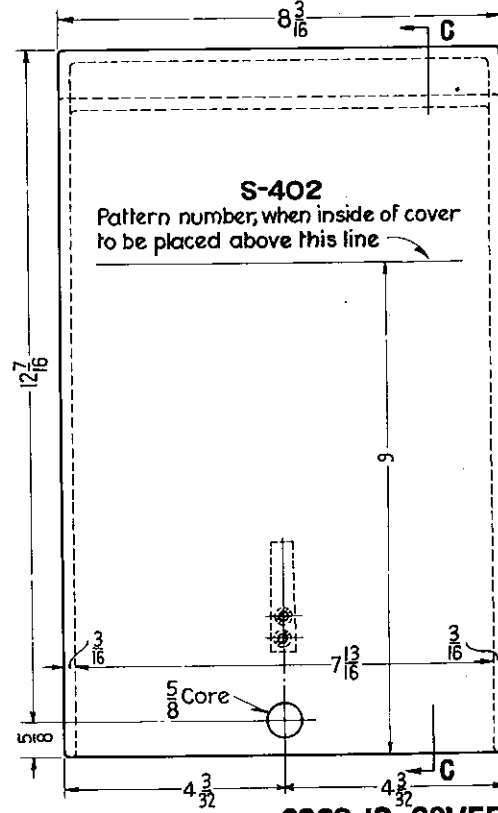
No.10 drill (.189)



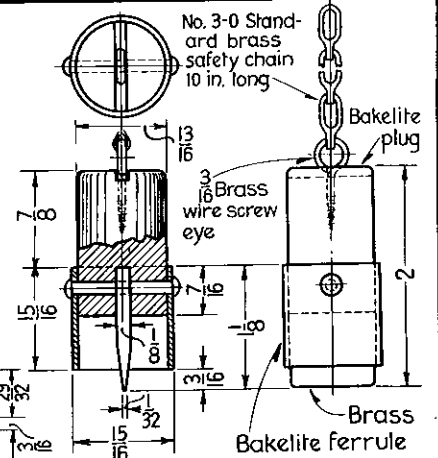
6868-14 CARD HOLDER
No.16 AWG Bronze

NOTES:

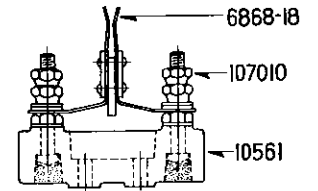
When installed on side of relay box or house, protection against corrosion between these surfaces must be provided.
Protective treatment shall be in accordance with Instruction 350.



6868-13 COVER ONLY
Cast or mall. iron

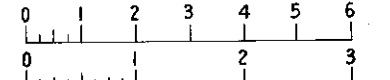


6868-15 TEST TERMINAL CONTACT PLUG
(Raco E-Z No.412-12 or equal)



6868-17 OPEN CIRCUIT TEST TERMINAL COMPLETE - AS SHOWN
(Raco E-Z No.727 or equal)

6868-18 OPEN CIRCUIT TEST TERMINAL ONLY - WITHOUT BASE OR POSTS
(Raco E-Z No.728 or equal)



Scales & all dimensions given in inches

TEST BOX COMPL.	BOX ONLY REF. NO.	HOLE	COVER	TEST TERMINALS NO. OF	CONTACT PLUG COMP.
6868-1	6868-11	X	6868-13	2	6868-17 6868-15
6868-2	6868-12	Y	6868-13	2	6868-17 6868-15
6868-3	6868-11	X	6868-13	4	6868-17 6868-15
6868-4	6868-12	Y	6868-13	4	6868-17 6868-15

TEST BOX COMPL.	BOX ONLY REF. NO.	HOLE	COVER	TEST TERMINALS NO. OF	CONTACT PLUG COMP.
6868-5	6868-11	X	6868-13	6	6868-17 6868-15
6868-6	6868-12	Y	6868-13	6	6868-17 6868-15
6868-7	6868-11	X	6868-13	8	6868-17 6868-15
6868-8	6868-12	Y	6868-13	8	6868-17 6868-15

**SIGNAL AND TRAIN
CONTROL COMMITTEE**

TEST BOX

FOR HIGHWAY CROSSING SIGNALS

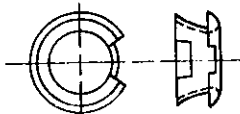
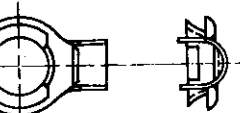
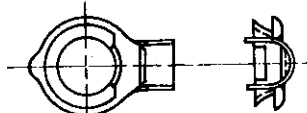
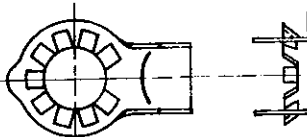
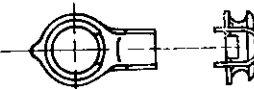
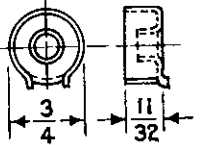
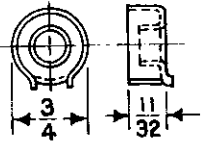
N.Y.C.R.R.
M.C.R.R.
C.G.C.&ST.LRY.
B.&A.R.R.
P.&L.E.R.R.

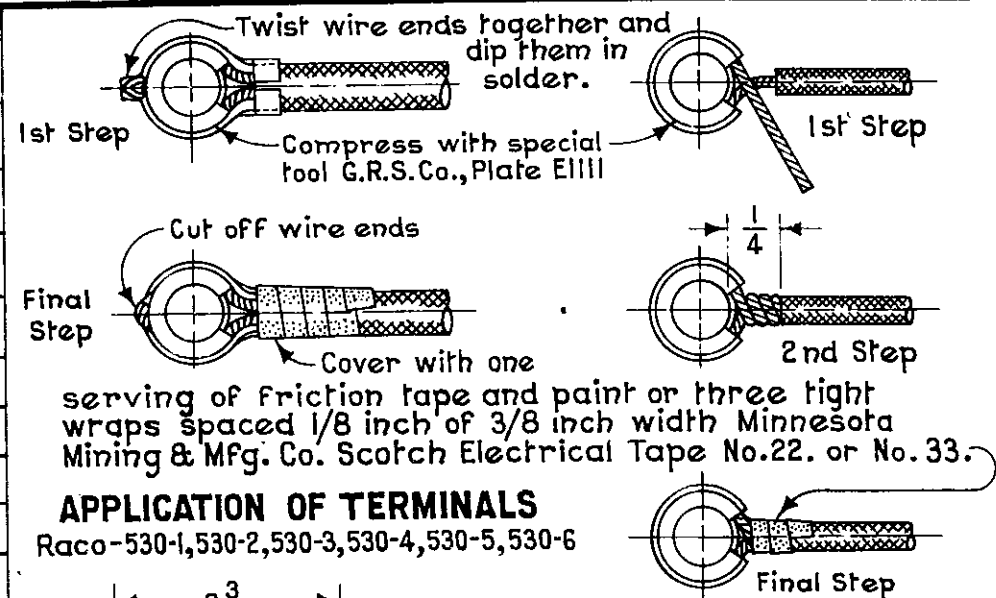
7-23-1942
4-12-1943

Approved by Representatives
of Lines shown.

Chairman

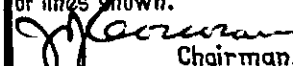
8-12-51

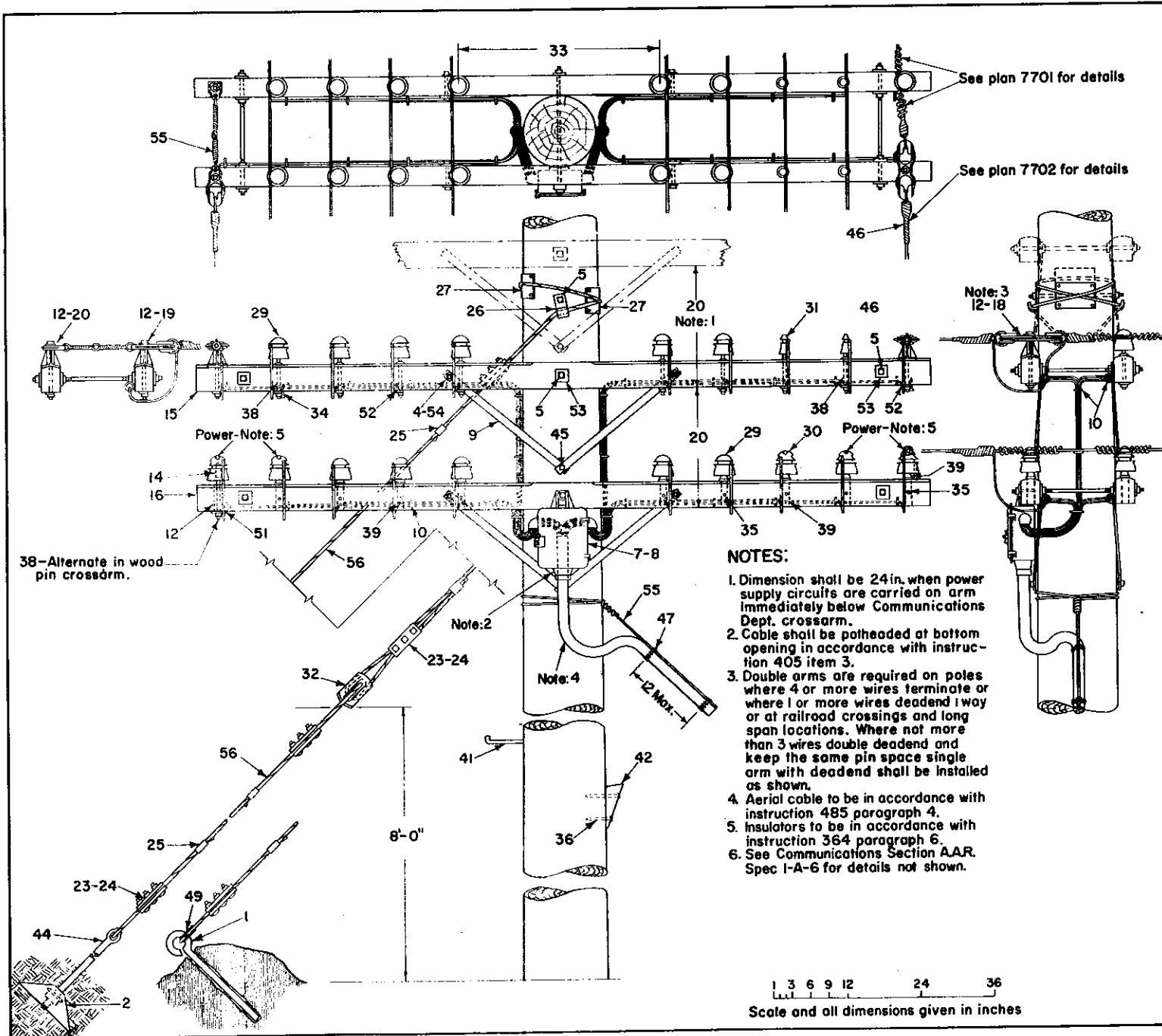
 WIRE EYELET	MANUFACTURERS REFERENCE NO. OR EQUAL	STRANDED CONDUCTORS		BINDING POST SIZE OR NO.
		A.W.G. WIRE SIZE	INSULATION OUTSIDE DIA.	
 WIRE EYELET	Raco. 5282	No.16 or 18	—	$\frac{1}{4}$ " or No.14
	U.S.&S. 45303	No.16 or 18	—	$\frac{3}{16}$ " or No.10
 WIRE EYELET	Raco. 5283	No.18	—	$\frac{5}{32}$ " or No.8
	U.S.&S. 45301	No.18	—	$\frac{1}{8}$ " or No.6
 BEE WIRE TERMINAL	Raco. 530-1	No.14,16 or 18	$\frac{12}{64}$ " to $\frac{14}{64}$ "	$\frac{1}{4}$ " or No.14
	Raco. 530-2	No.14,16 or 18	$\frac{16}{64}$ " to $\frac{20}{64}$ "	$\frac{1}{4}$ " or No.14 $\frac{5}{16}$ " or No.20
	Raco. 530-4	No.12	$\frac{16}{64}$ " to $\frac{20}{64}$ "	$\frac{1}{4}$ " or No.14
	Raco. 530-5	No.14,16 or 18	$\frac{10}{64}$ " or less	$\frac{1}{4}$ " or No.14
 BEE WIRE TERMINAL	Raco. 530-3	No.9,10 or 12	$\frac{24}{64}$ " or less	$\frac{1}{4}$ " or No.14 $\frac{5}{16}$ " or No.20
 BEE WIRE TERMINAL	Raco. 530-6	No.14,16 or 18	$\frac{10}{64}$ " or less	$\frac{3}{16}$ " or No.10
 CUP	Raco. Cup 289-1 Washer 289-3 Compl. 289-5	No.6,8 or 10	—	$\frac{1}{4}$ " or No.14
 CUP	Raco. Cup 289-11 Washer 289-12 Compl. 289-10	No.6,8 or 10	—	$\frac{5}{16}$ " or No.20



SPLIT POST TERMINAL

Raco - 290 or equal.
For No. 4 A.W.G. solid or stranded conductors

	SIGNAL AND TRAIN CONTROL COMMITTEE	N.Y.C.R.R.	6955C
		M.C.R.R.	
		C.C.C.&STL.RY.	1 - 25 - 1940
		B.&A.R.R.	4 - 2 - 1945
		P.&L.E.R.R.	11 - 1 - 1950
WIRE TERMINALS AND EYELETS			Approved by Representatives of lines shown.  Chairman.



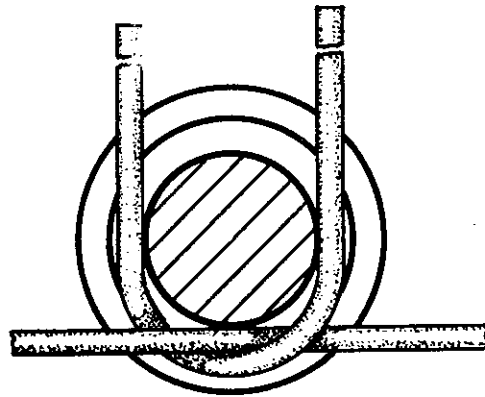
NO	ITEM	REF.	SPEC.
1	Anchor, rock guy - with thimble eye	T-T 1742	I-A-20
2	Anchor, cone type 12 in. Chance or equal		
3			
4	Bolt, Machine 3/8 x 4, galvanized	T-T 1745	I-A-20
5	double-arming 5/8 x 14 to 24 (by 2 inch steps)		
6			
7	Box, pole (Raco 480-1 less terminals) Mpx. Cable Dia. 1 1/2		
8	469-2		
9	Brace, flat crossarm - 26 in.	T-T 1747	I-A-20
10	Bridle ring, enameled (Graybar Electric Co.) or porcelain		
11	insulated screw eyes.		
12	Bushing, wood (for steel pin and deadend in wood pin arm)	T-T 3181	I-A-94
13			
14	Cob (for steel pins)	T-T 1776	I-A-20
15	Crossarm, special 10 ft., for steel pins	T-T 2790	I-A-28
16	for wood pins	T-T 2791	I-A-28
17			
18	Deadend, double Raco 239-13		
19	and Anchor eye Raco 239-12		
20	" Anchor Raco 239-7		
21			
22	Guy clamp, heavy 3 bolt (10M-16M strand)	T-T 2377	I-A-20
23	3 bolt (6 M strand)	T-T 1753	I-A-20
24	" clip (of approved type)	T-T 2650	I-A-6
25	" hook (16M strand) where required	T-T 1756	I-A-20
26	plates (10M-16M strand) where required	T-T 1772	I-A-20
27			
28			
29	Insulator, glass - side groove Hemingray No. 42	T-T 1999	I-A-33
30	" top groove Hemingray No. 43	T-T 2000	I-A-33
31	" rubber (Continental Rubber Works R-4)		
32	strain (pole guy) Pierce No. 506		
33			
34	Nail, 4d galvanized (steel pins)	T-T 2640	I-A-6
35	6d galvanized (wood pins)	T-T 2640	I-A-6
36	Nails, 30d and 50d galvanized (wood step)	T-T 2644	I-A-6
37			
38	Pin, crossarm - 1/2 in. steel	T-T 1759	I-A-20
39	" wood	T-T 3041	I-A-84
40			
41	Pole step - spike head	T-T 1767	I-A-20
42	" wood	T-T 2003	I-A-35
43			
44	Rod, anchor (thimbleless) specify length and diameter	T-T 2788	I-A-20
45	Screw, fender drive - 1/2 x 4 1/2	T-T 1766	I-A-20
46	Sleeve, line tapping (Nicotap) specify size	7702	
47	Strap, bead cabling (Raco 503) without hook - specify lgth.		
48			
49	Thimble, specify light or heavy	T-T 1773	I-A-20
50			
51	Washer, 3/4 outside diameter	T-T 2640	I-A-6
52	" 1 1/4	T-T 1759	I-A-20
53	" 2 1/4 square	T-T 1774	I-A-20
54	" 3/4 std. plate galvanized		
55	Wire, solid No. 6 Copperweld or equal		
56	pole guy (specify strand)	T-T 2656	I-A-6
57			
58			

NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT POLE LINE STRUCTURE WIRE CONNECTIONS AND FIXTURES

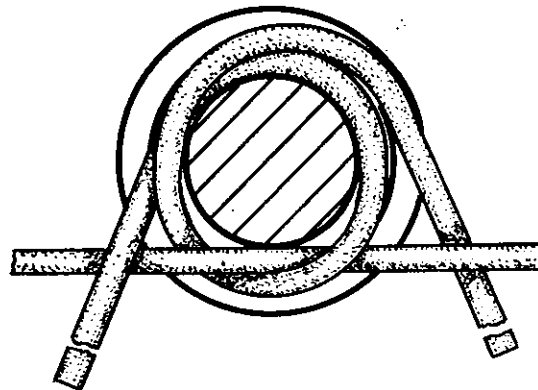
Approved *[Signature]*
Chief Signal Engineer

S-7700

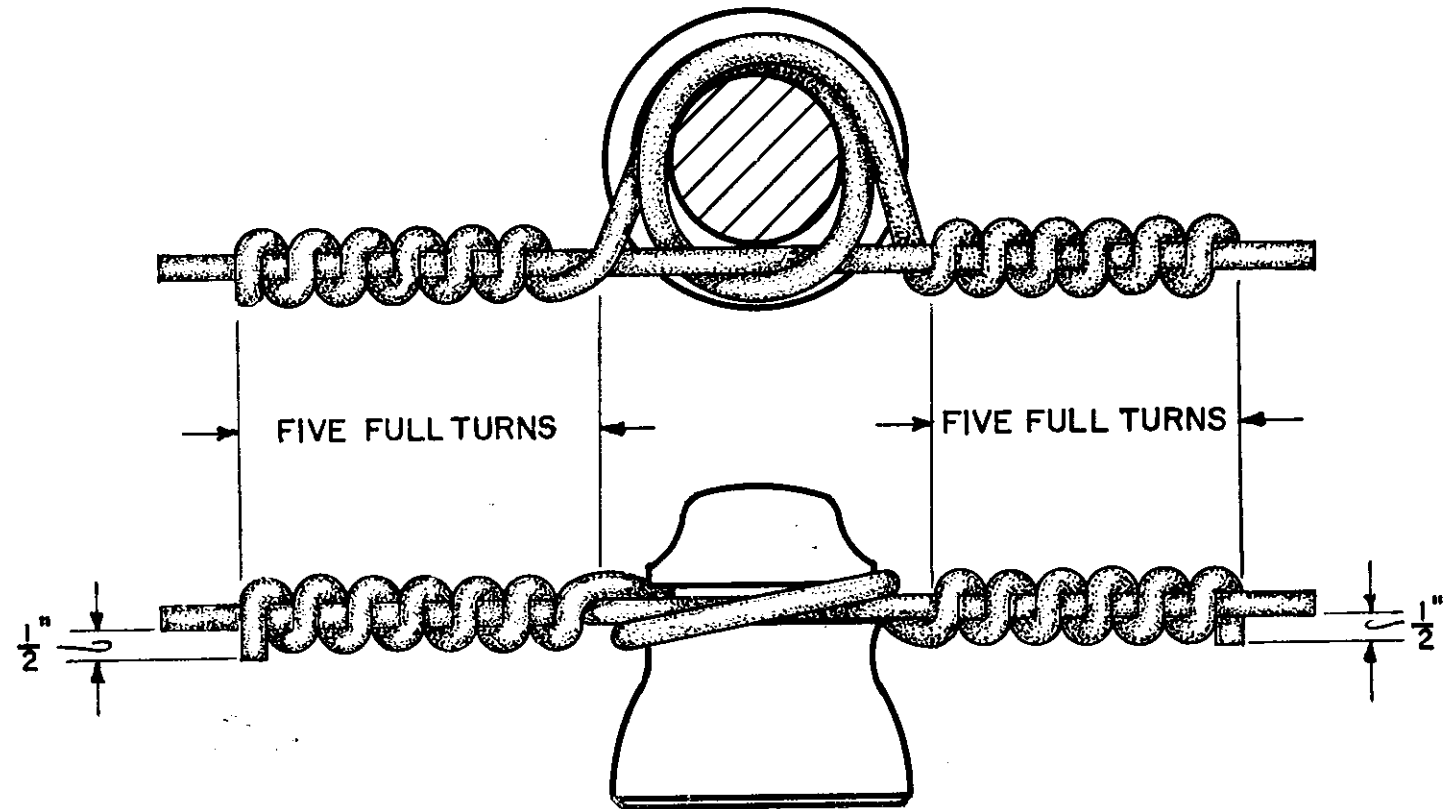
ISSUED 7-1-54



STEP ONE



STEP TWO



STEP THREE-COMPLETED TIE

NOTES:

- 1.-Where heavy side pull occurs, place line wire in the side of insulator opposite the pull and attach as shown.
- 2.-Tie wire to be No. 10 AWG annealed copper-weld with 2/64 covering of polyethylene.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
POLE LINE STRUCTURE
DETAILS

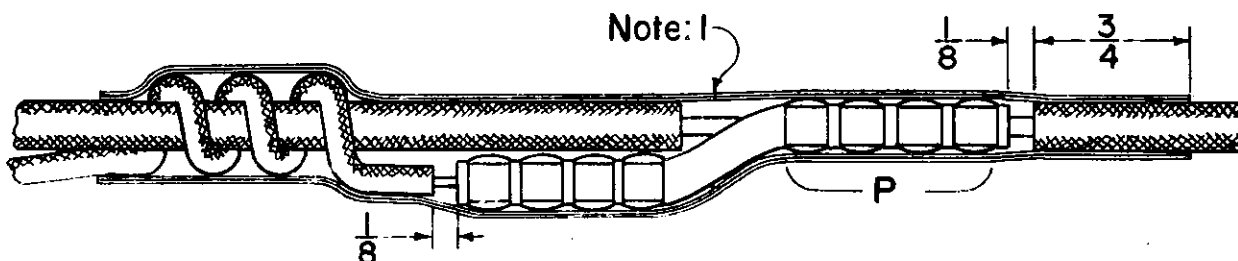
LINE WIRE TIES

Approved

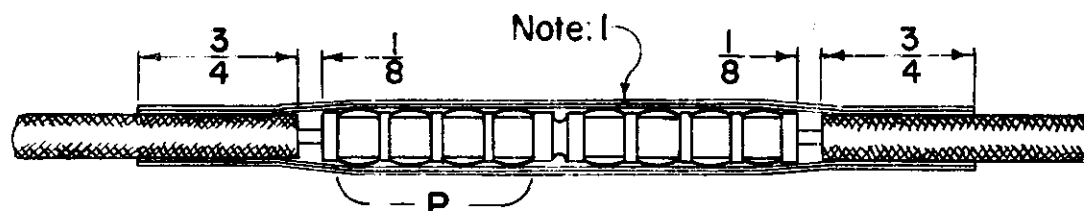
R. S. Bottinelli
Chief Signal Engineer

S-7701

S-7001



LINE CONNECTION
USED AT DEADEND OR FOR LINE TAP



SPLICE CONNECTION

All dimensions given in inches

SPLICING SLEEVES		
Wire Gage	Ordering Ref.	*P
NO.6	Nicopress I-162J	5
NO.8	" I-128J	4
NO.10	" I-102J	3

LINE TAPPING SLEEVES		
NO.6 to 12	Nicotap TI-162x080J	4
NO.8 to 12	" TI-128x080J	4
NO.10 to 12	" TI-102x080D	4

*P-indicates number of presses $\frac{1}{16}$ in. apart.

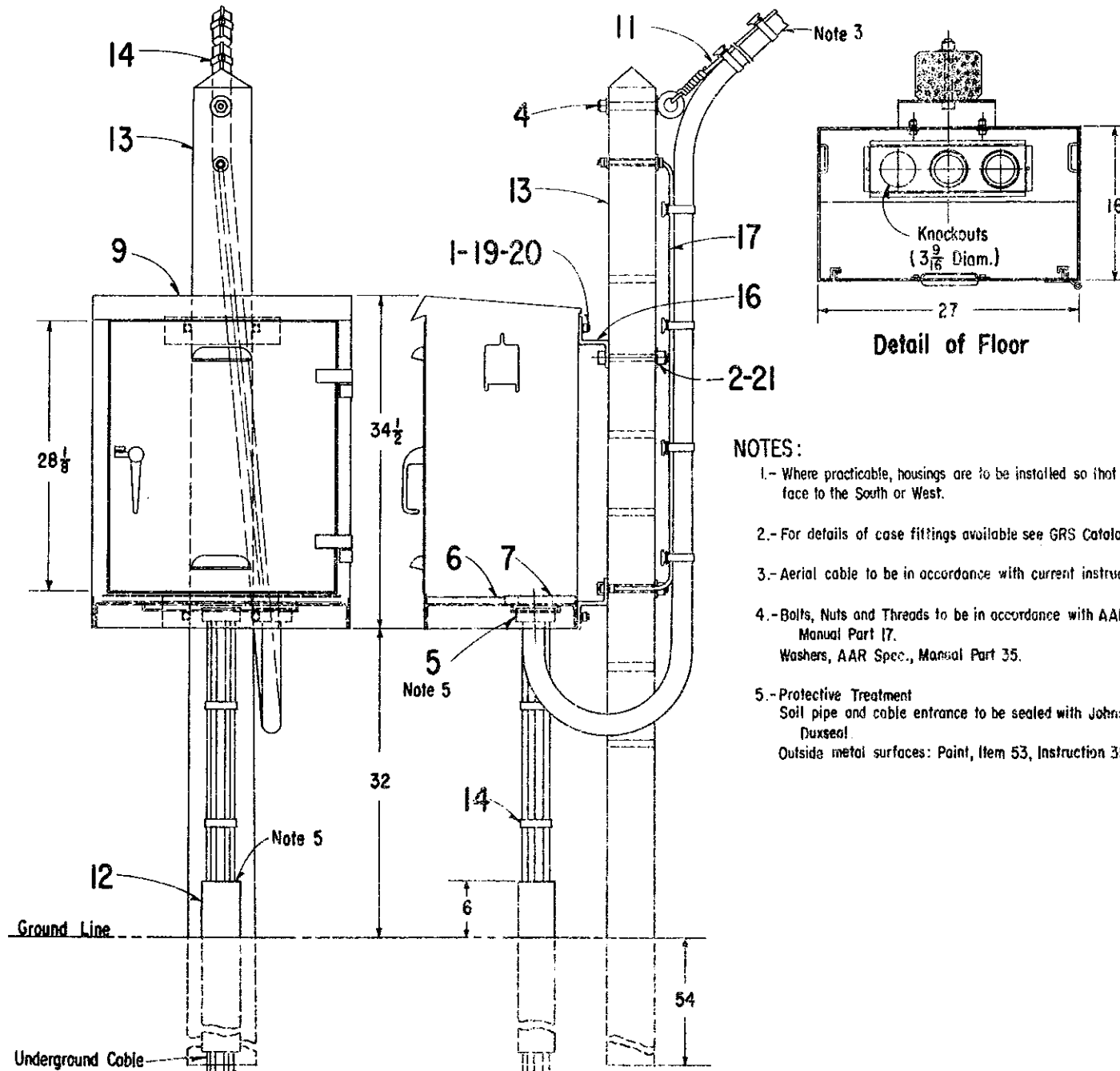
NOTE:

1. Two layers of friction tape half lapped and painted in accordance with Instruction 350 Item 38.
2. Line splicing and tapping sleeves to be applied with Nicopress tool No. 31-DJ.
3. No.6,8 and 12 wire referred to in the table is solid copper, No.10 is copperweld.
4. The last letter in the ordering reference number indicates the tool groove to be used.

NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
POLE LINE STRUCTURE
DETAILS
LINE WIRE JOINTS

Approved *[Signature]*
Chief Signal Engineer

S-7702



NOTES:

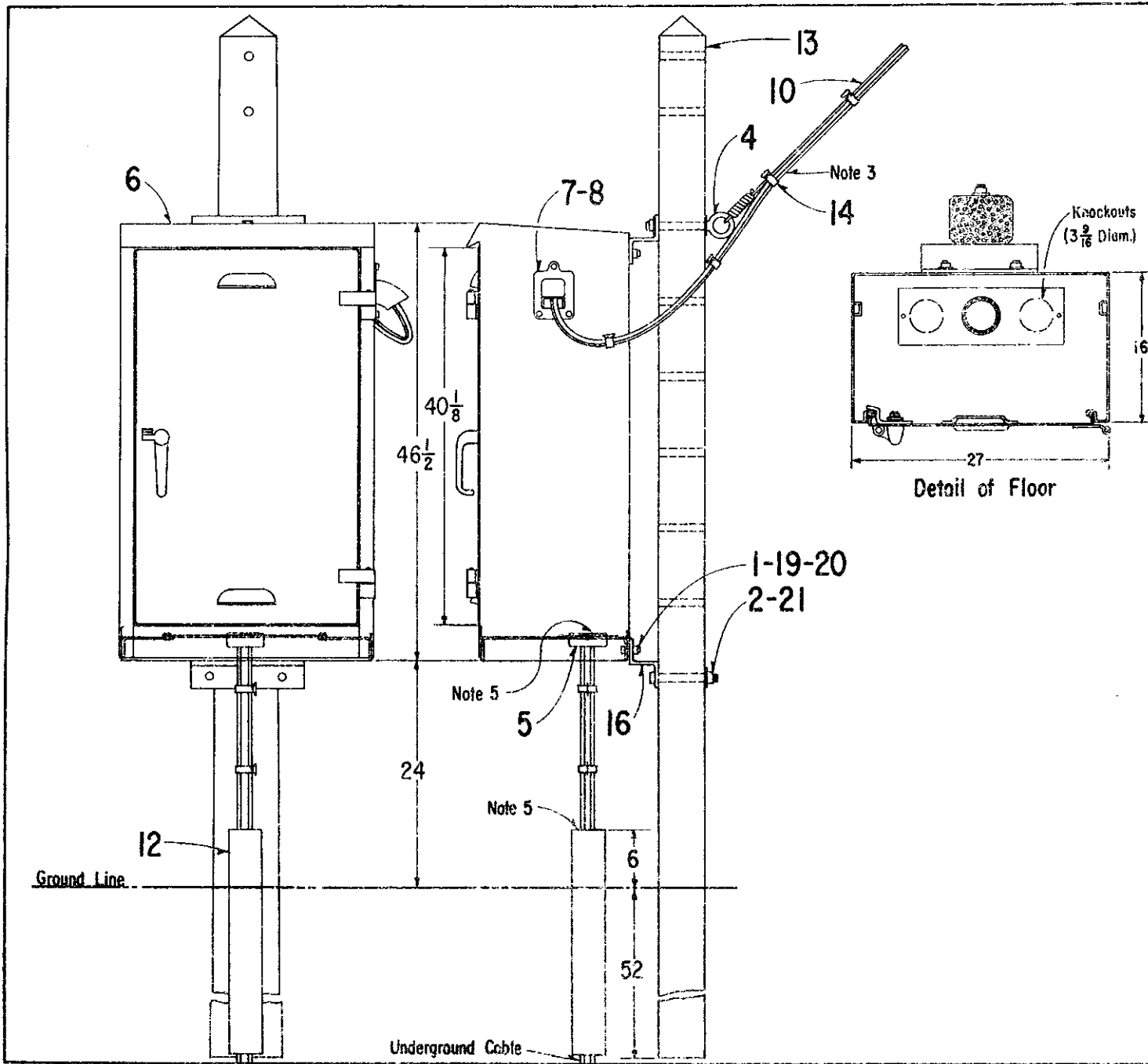
- 1.- Where practicable, housings are to be installed so that relays face to the South or West.
- 2.- For details of case fittings available see GRS Catalog, Sec. 5.
- 3.- Aerial cable to be in accordance with current instructions.
- 4.- Bolts, Nuts and Threads to be in accordance with AAR Spec., Manual Part 17.
Washers, AAR Spec., Manual Part 35.
- 5.- Protective Treatment
Soil pipe and cable entrance to be sealed with Johns-Manville Duxseal.
Outside metal surfaces: Paint, Item 53, Instruction 350.

NO	ITEM	REF.	REQ	REMARKS
1	Bolt 1/2-13 X 1-1/2 Sq. Hd. & Nut.	Coml.	4	Items 9 & 16
2	" 3/4-10 X 6-1/2 " " " Hex. Nut	"	2	Items 13 & 16
3				
4	Bolt, Eye AAR	12813	1	Item. 11
5	Bushing, Compl.	8520-23	As Req	
6	Board, Floor 8-1/8 In. Wide GRS	32108-315	1	
7	" " 7-1/2 In. " GRS	32108-316	1	
8				
9	Case, Single Door GRS	A5-160	1	See Note 2
10				
11	Messenger, Strand 3 No. 12 Copperweld	2.2 M	As Req	
12	Pipe, Soil	2440	As Req	Specify Size
13	Post, Concrete AAR	12812	1	
14	Straps, Cabling-Without hook Raco	611	As Req	Specify Length.
15				
16	Support, Case	8520-31	2	
17	Support, Cable	8520-9	1	
18				
19	Washer, Galv. 1/2 In.	Coml.	4	Note 4
20	" Lock 1/2 In.	"	4	"
21	" Galv. 3/4 In.	"	2	"
22				
23				
24				
25				

0 6 12 24
All dimensions given in inches.

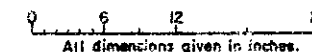
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
STEEL CASE
LOW CASE- ONE DOOR

S-8510



NO	ITEM	REF.	REQ	REMARKS
1	Bolt 1/2-13 X 1-1/2 Sq. Hd. & Nut	Compl.	4	
2	Bolt 3/4-10 X 6-1/2 Sq. Hd., Hex. Nut	"	1	
3				
4	Bolt, Eye - Compl.	AAR 12813	1	
5	Bushing - Compl.	8520-23	As Req.	
6	Case, Instrument - Single Door	GRS A5-170	1	Note 2
7	Coupling - Compl. 2 X 2	GRS P5-163		
8	" " 3-1/8 X 3-1/4	GRS P5-164	1	
9				
10	Messenger - Strand, 3 No. 12, Copperweld	2.2 M	As Req.	Specify length
11				
12	Pipe, Soil	2440	As Req.	Specify size
13	Post, Concrete	AAR 12812	1	
14	Straps, Cabling - Without hooks	Raco 611	As Req.	Specify length
15				
16	Support, Case	8520-31	2	
17				
18				
19	Washer, 1/2 In., Galv.	Compl.	4	Note 4
20	" , Spring Lock, 1/2 In.	"	4	"
21	" , 3/4 In., Galv.	"	2	"
22				
23				
24				
25				

See Notes on Sheet 1.



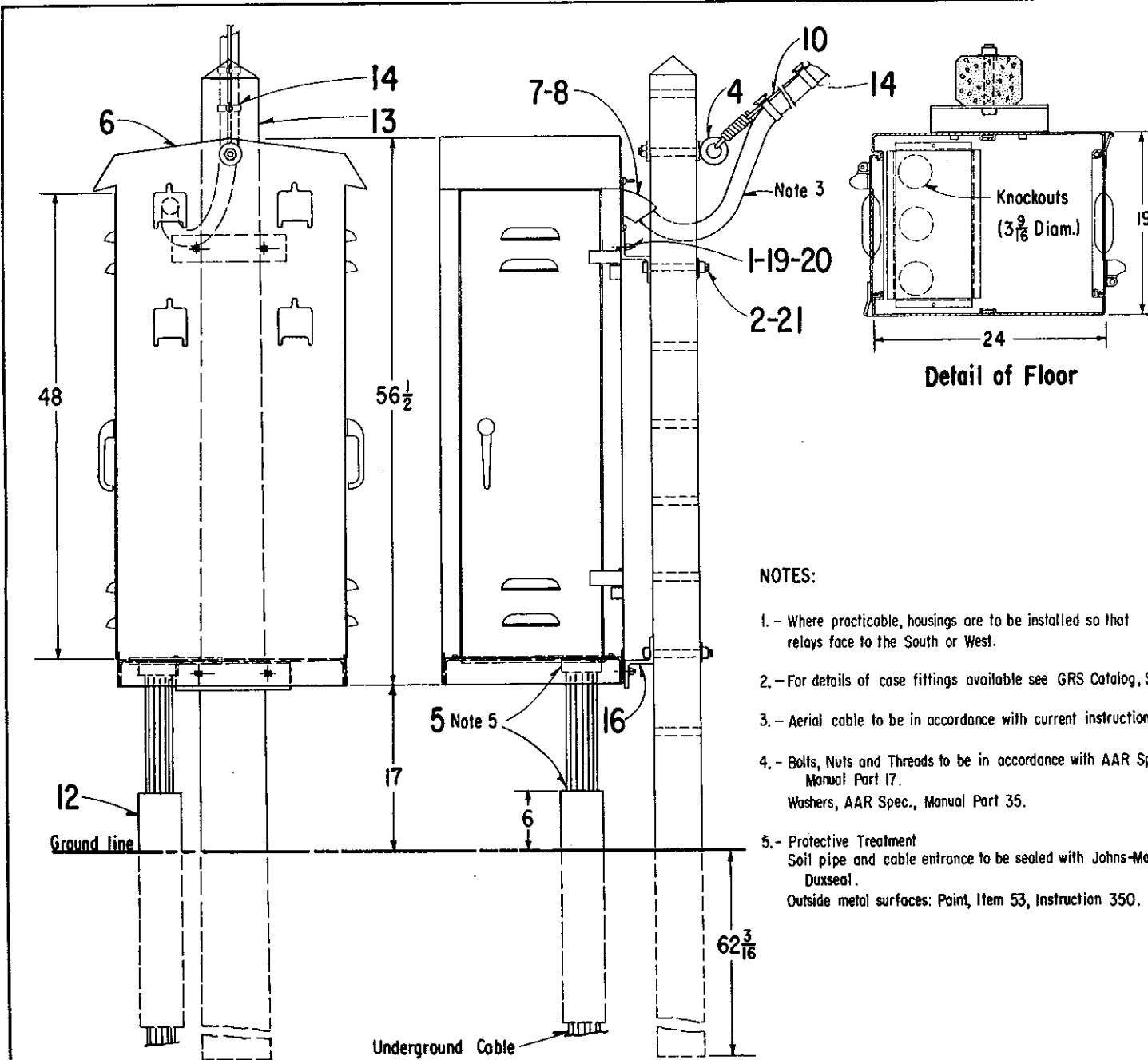
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
STEEL CASE
HIGH CASE-ONE DOOR

Approved *L. S. Rattinelli*
 Chief Signal Engineer

S-8510

Printed in U. S. A.

ISSUED 6-1-61
 SHEET 2 Cont'd on Sh.



NOTES:

1. - Where practicable, housings are to be installed so that relays face to the South or West.
2. - For details of case fittings available see GRS Catalog, Sec. 5.
3. - Aerial cable to be in accordance with current instructions.
4. - Bolts, Nuts and Threads to be in accordance with AAR Spec. Manual Part 17.
Washers, AAR Spec., Manual Part 35.
5. - Protective Treatment
Soil pipe and cable entrance to be sealed with Johns-Manville Duxseal.
Outside metal surfaces: Paint, Item 53, Instruction 350.

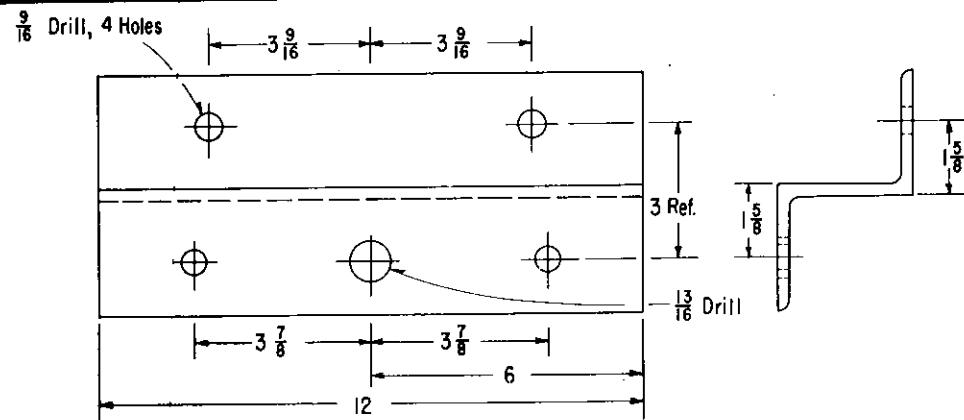
NO	ITEM	REF.	REQ.	USE
1	Bolt 1/2-13 X 1-1/2 Sq. Hd. & Nut.	Coml.	4	Items 6 & 16
2	" 3/4-10 X 6-1/2 " " Hex. Nut.	"	2	Items 13 & 16
3				
4	Bolt, Eye AAR	12813	1	Item 10
5	Bushing, Compl.	8520-23	As Req.	
6	Case, Half Size GRS	A5-150	1	See Note 2
7	Coupling, Compl. 2 X 2 GRS	P5-163	1	Specify
8	" " 3-1/8 X 3-1/4 GRS	P5-164		
9				
10	Messenger, Strand 3 No. 12 Copperweld	2.2 M	As Req.	
11				
12	Pipe, Soil	2440	As Req.	Specify Size
13	Post, Concrete AAR	12812	1	
14	Straps, Cabling, Without Hook Raco	611	As Req.	Specify Length
15				
16	Support, Case	8520-32	2	
17				
18				
19	Washer, Galv. 1/2 In.	Coml.	4	Item 1
20	" Lock 1/2 In. Med.	"	4	Item 1
21	" Galv. 3/4 In.	"	2	Item 2
22				
23				
24				
25				

0 6 12 24
All dimensions given in inches.

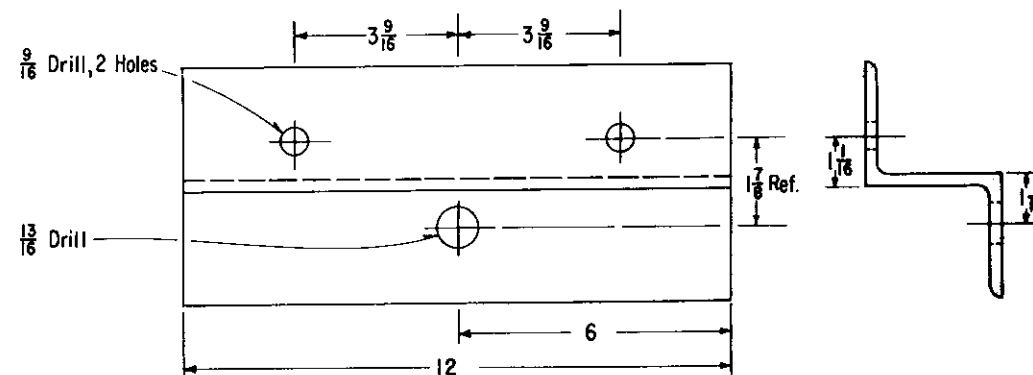
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT STEEL CASE HALF CASE

Approved *R. J. Battinelli*
Chief Signal Engineer

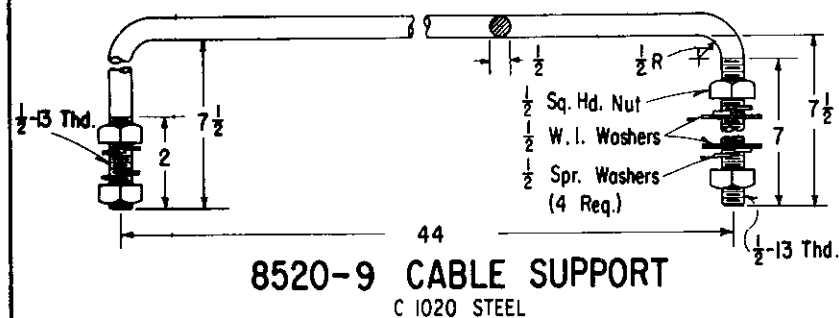
S-8515



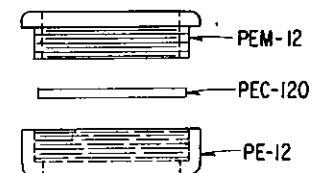
8520-31 CASE SUPPORT
3 X 2 3/4 - 6.7 Lb. STRUCTURAL STEEL Z



8520-32 CASE SUPPORT
3 X 2 3/4 - 6.7 Lb. STRUCTURAL STEEL Z



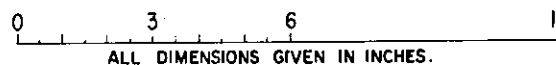
8520-9 CABLE SUPPORT
C 1020 STEEL



8520-23 BUSHING, COMPL.
ADALET CO. OR EQUAL

NOTES:

1. Nuts and Threads shall be in accordance with AAR Spec., Manual Part 17.
Washers shall be in accordance with AAR Spec., Manual Part 35.
2. Protective treatment, Primer, Item 31, Instruction 350.



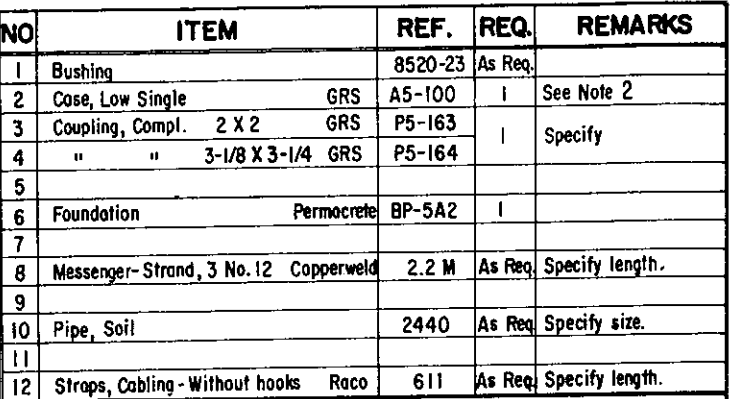
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
STEEL CASE
DETAILS

Approved *H. Seaton*
Chief Signal Engineer

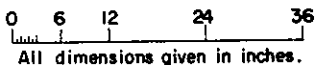
S-8520

ISSUED *10/10/50*

SHEET *1* Cont'd on Sh. *2*

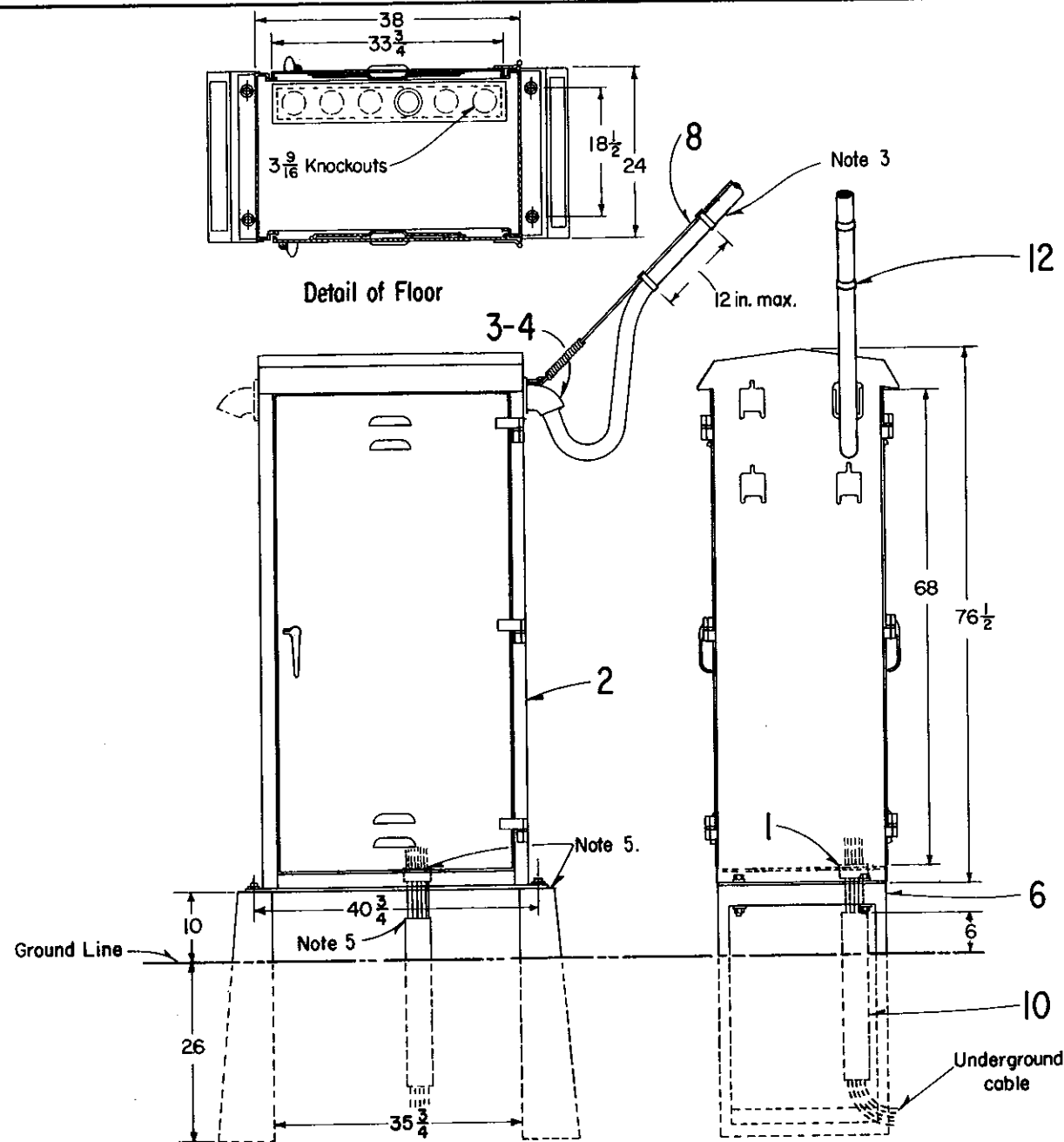


- 1.- Where practicable, housings are to be installed so that relays face to the South or West.
- 2.- For details of case fittings available see GRS Catalogue Section 5.
- 3.- Aerial cable to be in accordance with current instructions.
- 4.- Bolts, Nuts and Threads to be in accordance with AAR Spec., Manual Part 17. Washers, AAR Spec., Manual Part 35.
- 5.- Protective Treatment
Soil pipe and cable entrance to be sealed and foundation tops coated 1/8 inch thick with Johns-Manvill Duxseal.
Outside metal surfaces: Paint, Item 53, Instruction 350.



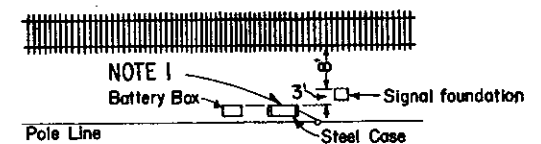
NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
STEEL CASE
LOW SINGLE

S-8550



NO	ITEM	REF.	REQ.	REMARKS
1	Bushing	8520-23	As Req.	
2	Case, High Single	A5-110	1	See Note 2.
3	Coupling, Compl. 2 X 2	GRS P5-163	1	Specify
4	" " 3-1/8 X 3-1/4	GRS P5-164	1	Specify
5				
6	Foundation	Permacrete BP-5A2	1	
7				
8	Messenger-Strand, 3 No. 12	Copperweld 2.2 M	As Req.	Specify length
9				
10	Pipe, Soil	2440	As Req.	Specify size.
11				
12	Straps, Cabling-Without hooks	Raco 6 11	As Req.	Specify length.

See Notes on Sheet 1.

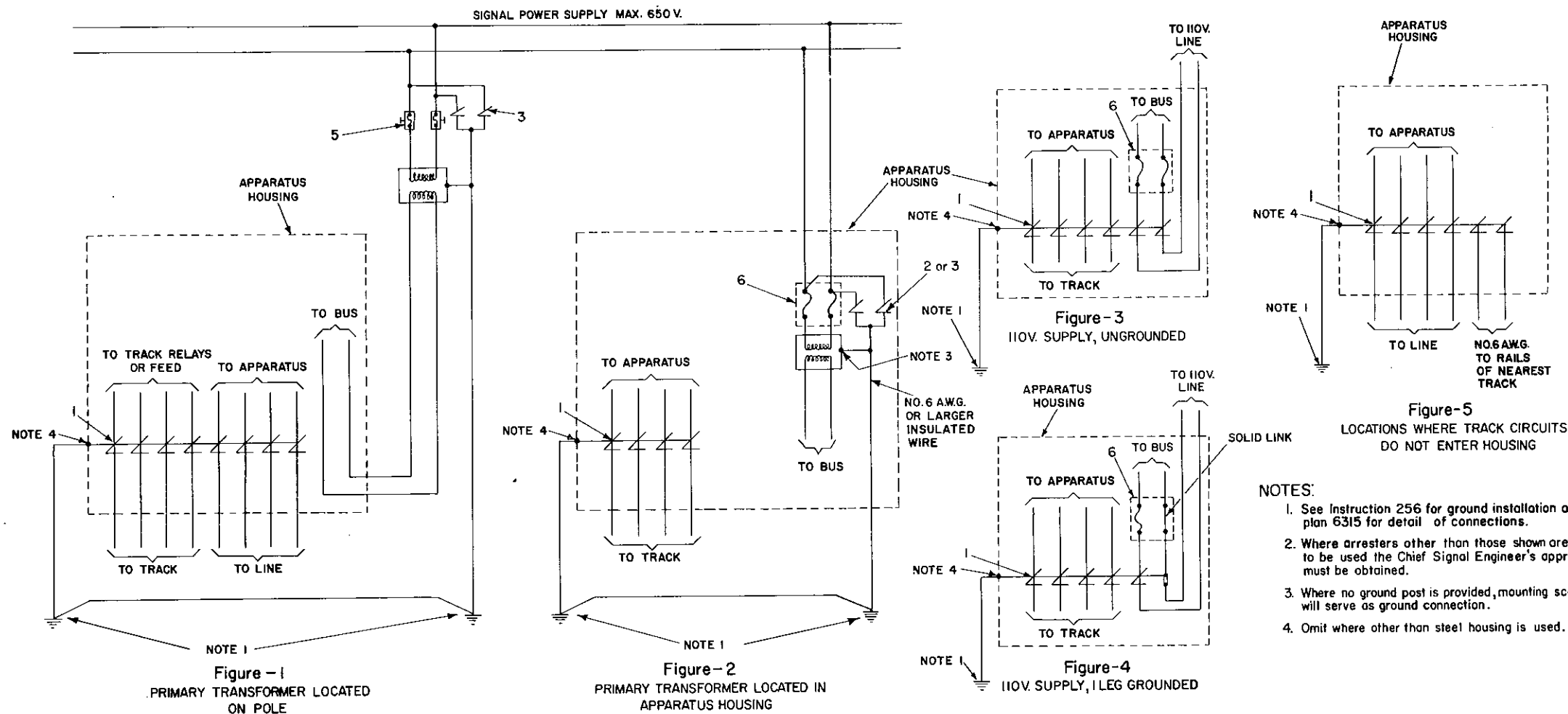


0 6 12 24 36
All dimensions given in inches.

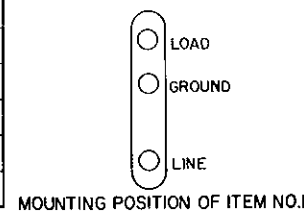
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT STEEL CASE HIGH SINGLE

Approved *R. J. Battinell*
Chief Signal Engineer

S-8550



NO.	ITEM	VOLTAGE RANGE		ORDERING REFERENCE	USE
		AC	DC		
1	ARRESTER	0-125	0-30	RACO NO.485-3 CLEARVIEW	SIGNAL CONTROL CIRCUITS
2	ARRESTER	110-650		G.E. NO.9LA12B2 THYRITE PROTECTOR	SIGNAL POWER TRANS. LINES
3	ARRESTER	110-650		G.E. NO.9LA10A204 PELLET TYPE	" " " "
4					
5	SWITCH ENCLOSED DISTRIBUTION CUTOUTS WITH BRACKETS			G.E. NO.9F19A11 OR EQUAL	SIGNAL POWER SUPPLY
6	DISCONNECT SWITCH	0-600		RACO NO.506 OR EQUAL	" " "

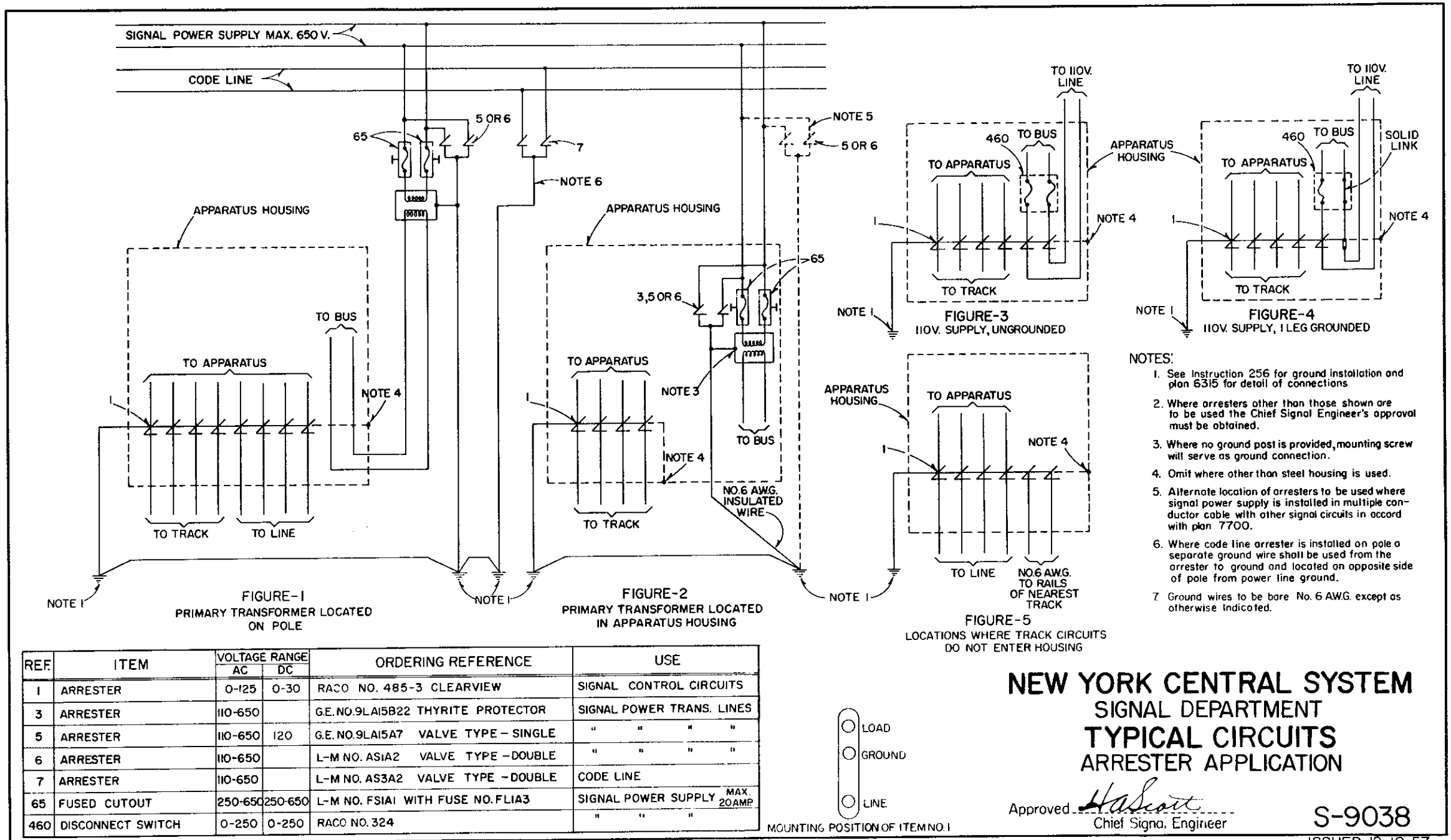


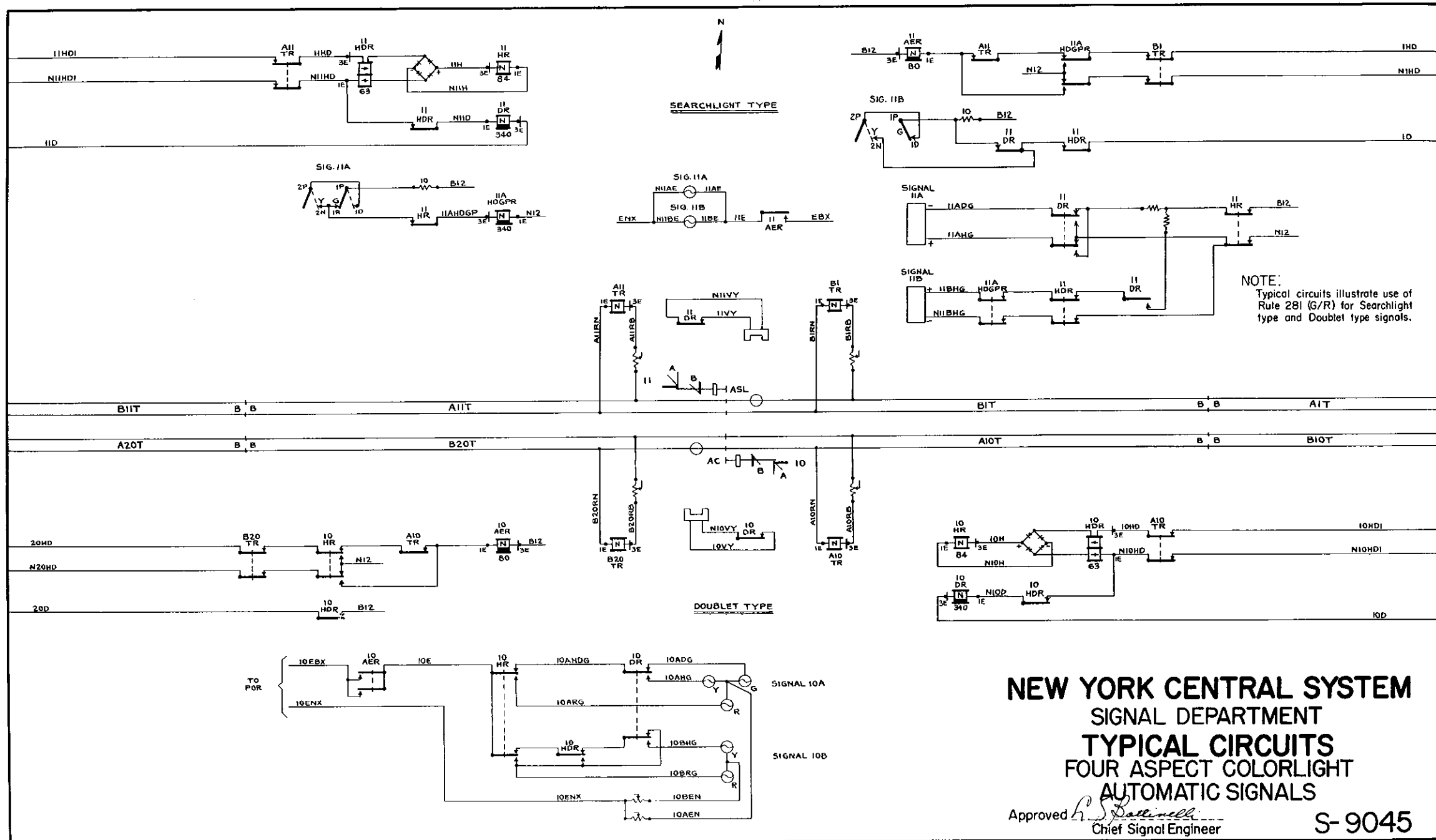
NEW YORK CENTRAL SYSTEM SIGNAL DEPARTMENT TYPICAL CIRCUITS ARRESTER APPLICATION

Approved: *H. H. H.*
Chief Signal Engineer

S-9038

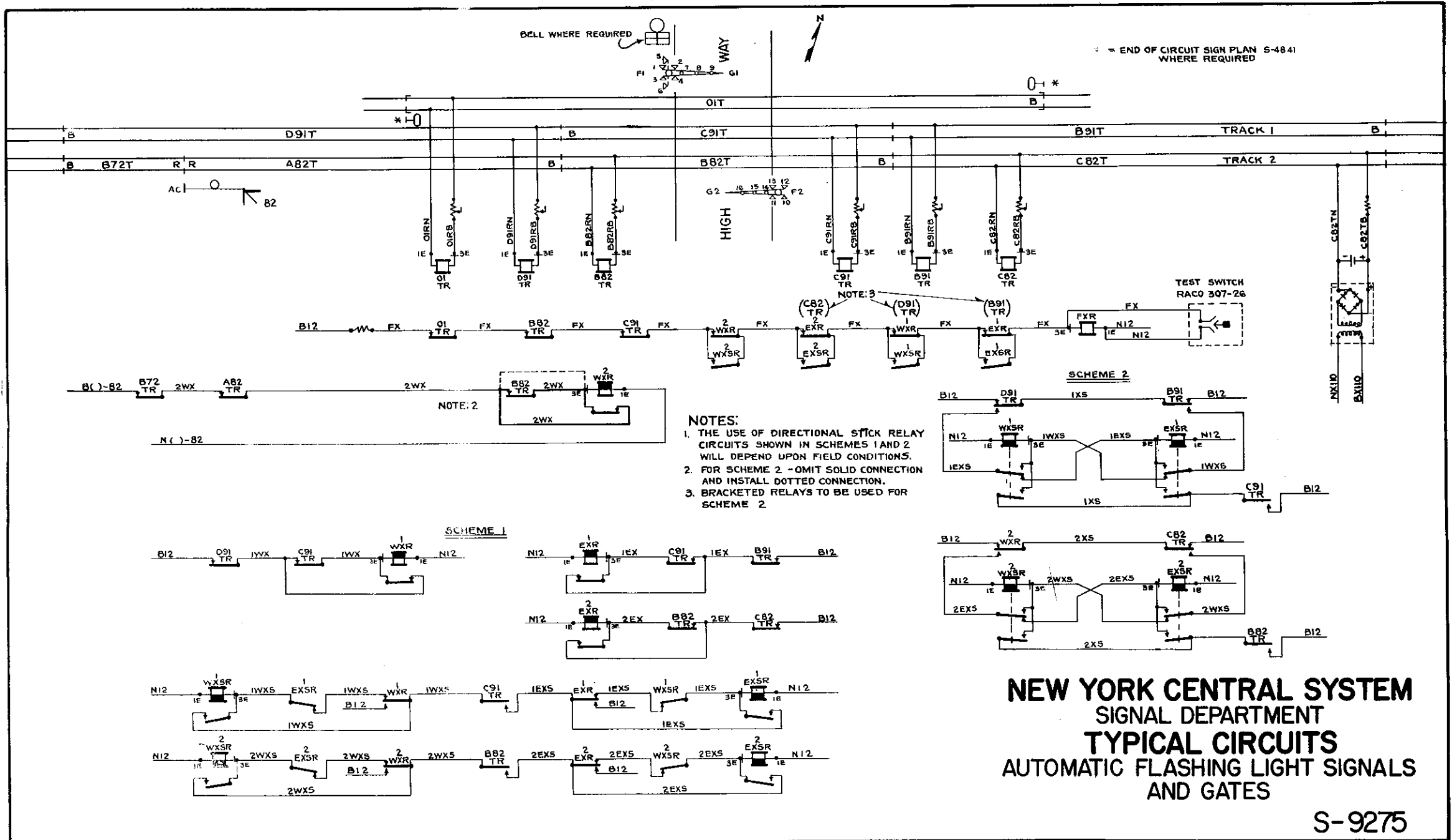
ISSUED 2-1-55

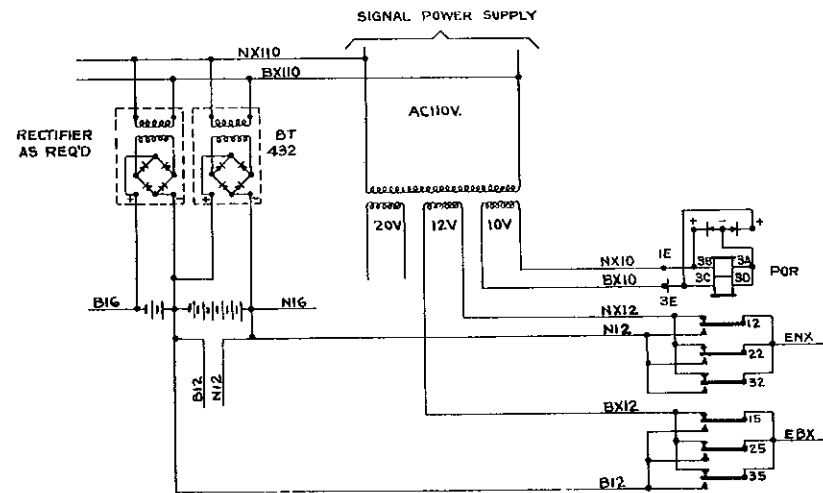




Printed in U.S.A.

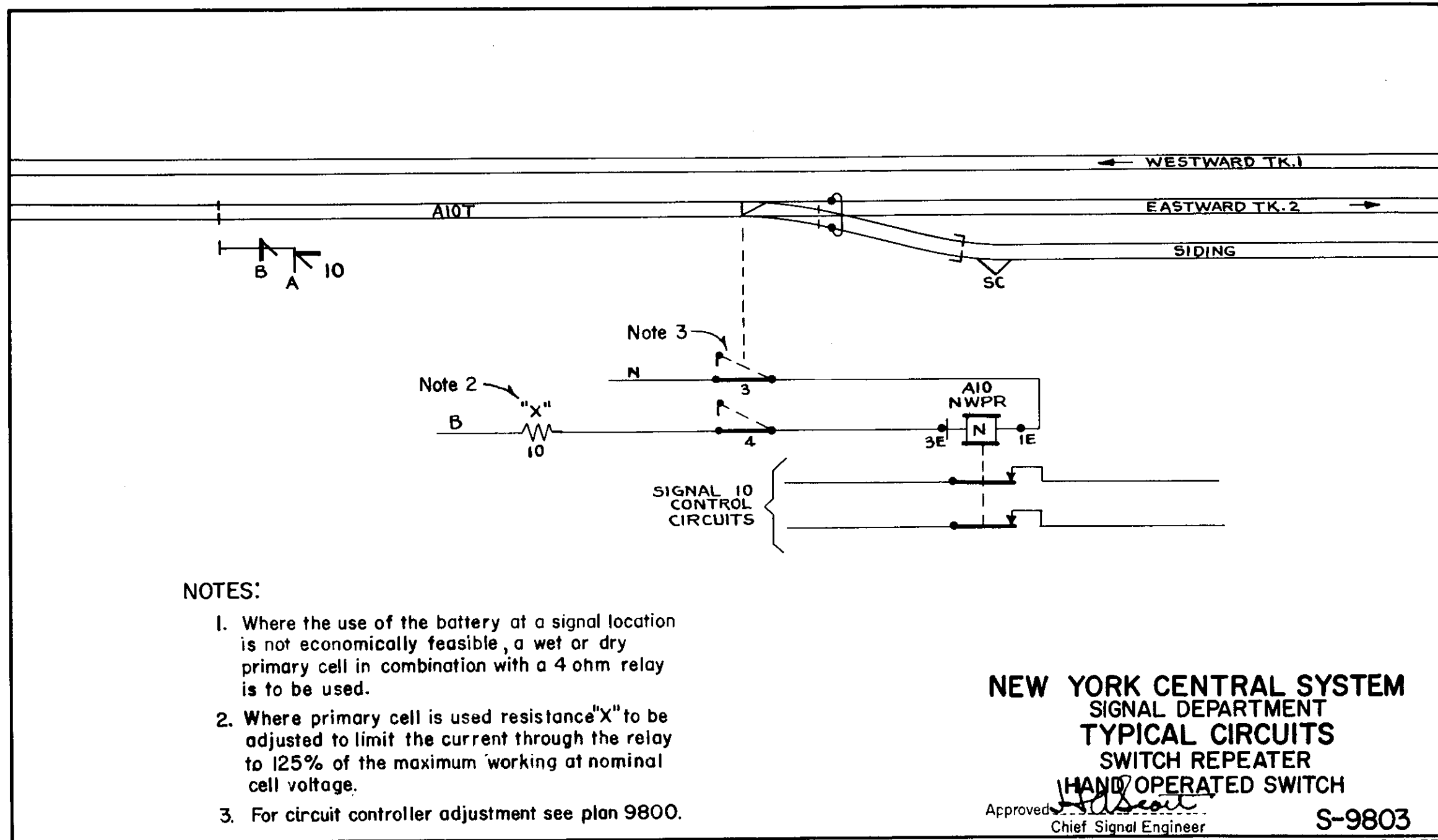
ISSUED 11-8-63
SHEET 1 Cont'd on Sh.





NEW YORK CENTRAL SYSTEM
SIGNAL DEPARTMENT
TYPICAL CIRCUITS
AUTOMATIC FLASHING LIGHT SIGNALS
AND GATES

S-9275



<u>Plan</u>	<u>Date</u>	<u>Title</u>
1002B	M-1940	Pipe Adjusting Screw
~~1007B~~	"	~~Forged Cranks~~
1008B	M-1927	One-Way Horizontal Crank Stand
1010E	M-1935	Crank and Jaw Pins
1011C	M-1934	One-Way Horizontal Crank Assembly
1013B	M-1927	Pipe Compensator Cranks
1014C	M-1934	One-Way Horizontal Pipe Compensator
1015A	M-1923	One-Inch Signal Pipe and Coupling
1016C	M-1940	Screw and Solid Jaws
1017B	M-1934	Tang End - Lug and Comp. Link
1018	Nov. 1913	Solid Jaws With Tang Ends
1019C	M-1940	Jaws - Tang End and Adjustable Link
1021	Jun. 1917	Guide Clamps For Vertical Connections On Signals
1022B	M-1935	Guide Supports and Caps For Vertical Connections on Signals
1023B	" "	Guides For Vertical Connections On Signals
1036B	" "	Socket Base For Bridge Mast
1040B	M-1931	Semaphore Spectacle - Design "A"
1041B	M-1926	Semaphore Spectacle
1049A	Mar. 1914	Details and Assembly Of Adjustable Lamp Bracket
1052	Dec. 1913	Ladder Foundation
1054B	M-1940	Multiple Unit Terminal Block
1055C	M-1936	Switch-Rod Insulation
1058B	M-1938	Anchor Post
1059A	Dec. 1915	Clamp for Base Of Ground Mast Signals
1060	Oct. 1912	Rocking Shaft Arms
1066B	M-1934	Details and Assembly Of Single Vertical Crank Stand
1067	Nov. 1913	Details of Multiple Vertical Crank Stands
1074B	M-1938	One-Way Pipe Carriers
1082	Mar. 1920	Mechanical Semaphore Bearing - Details
1083	Feb. 1914	"U" Bolt and Clamp
1084B	M-1928	Pipe Carrier - Assembly
1085B	" "	" " - Details
1094C	M-1934	Pipe Line Insulation
1193A	M-1936	Suspension Base For 5-Inch Mast
1194	Mar. 1920	Details and Assembly Of Mechanical Semaphore Bearing
1195	Mar. 1917	Operating Connections For Mechanical Signals
1197	Dec. 1915	Two-Lever Wall Machine

<u>Plan</u>	<u>Date</u>	<u>Title</u>
1225B	M-1926	Stuffing Box
1238A	Mar. 1914	Details and Assembly Of Marker Lights
1239	Sep. 1914	Mechanical Dwarf Signal Fittings
1250A	M-1935	Socket Base For 5 Inch Mast
1266B	M-1939	Concrete Battery Box - Assemblies
1267B	" "	" " " - Details
1268B	" "	" " " - " "
1269B	" "	" " " - " "
1360	Dec. 1915	Tang Ends With Screw Jaws
1362B	M-1926	Ladder Parts
1363	Mar. 1918	" Hand-Rails
1364B	M-1934	" Platforms
1365B	M-1936	" For Ground Mast Signals
1366B	M-1935	" For Bridge Masts
1371B	" "	" Clamps and Stays
1375B	" "	Thermometer
1376	Mar. 1918	Double Tang Ends
1397	Dec. 1915	Two-Lever Wall Machine
1399B	M-1928	Low Target Stand
1425D	M-1940	Plunger Switch Lock
1426D	" "	" " " - Details
1694A	M-1939	Precast Foundation For 4 Inch Mast - Assemblies
1695A	" "	" " " " " - Details

N.Y.C. R.R.
West of Buffalo

Signal Department Cleveland, Ohio.

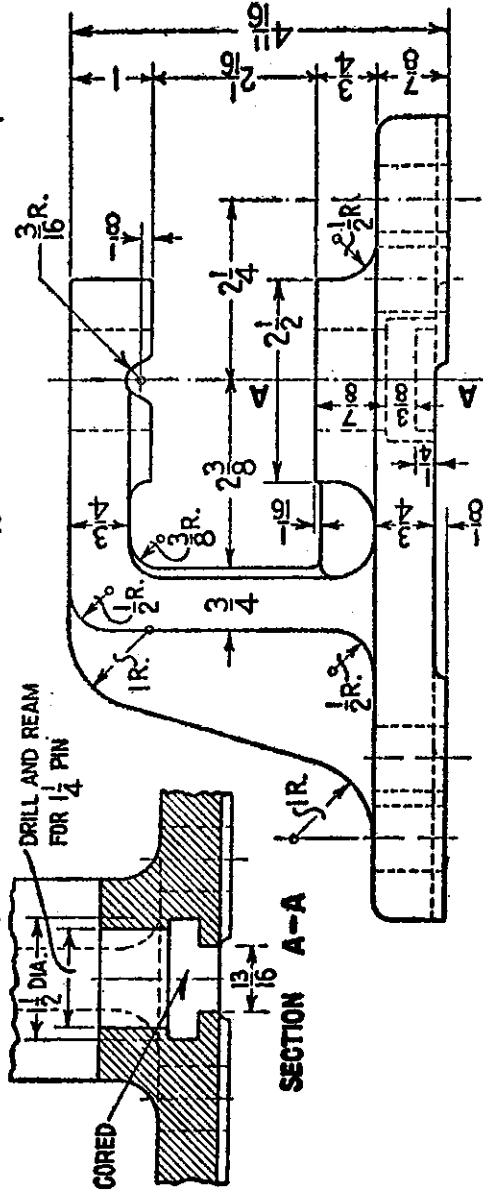
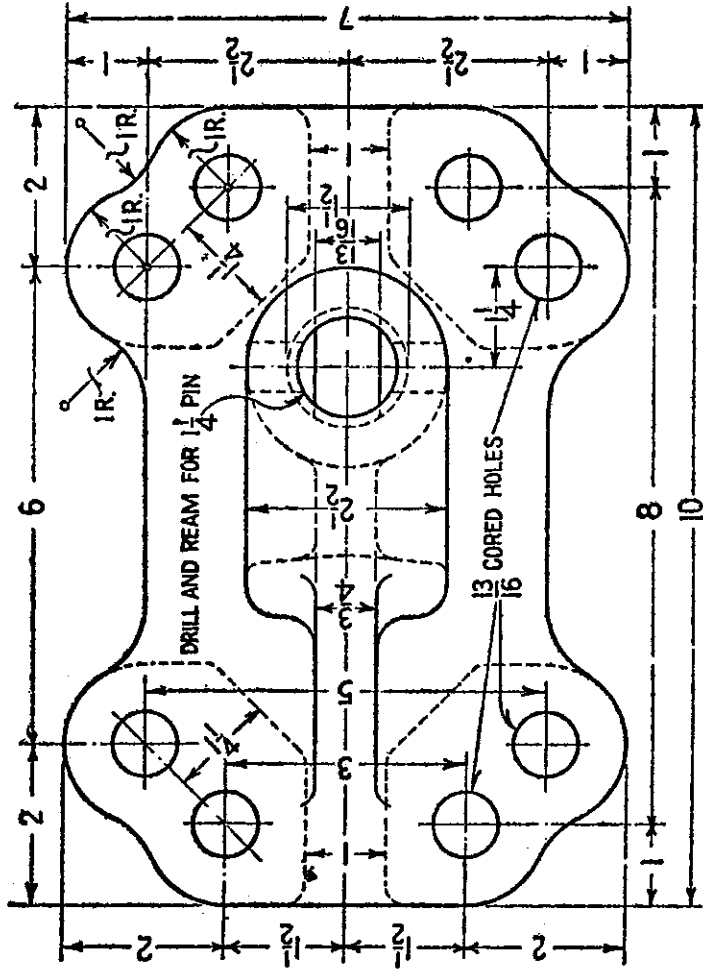
STANDARD PLAN INDEX

A. A. R. SIGNAL SECTION PLANS

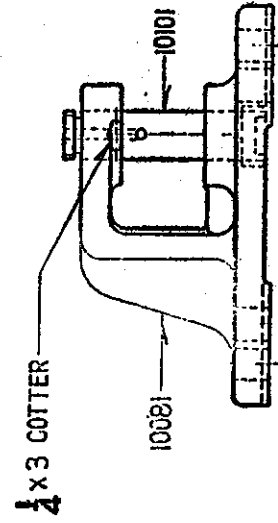
Revision No.

March 3rd, 1942

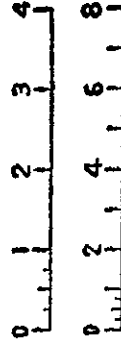
Sheet 1 of 1 sheet



10081 ONE-WAY CRANK STAND
CAST IRON



10082 ASSEMBLY



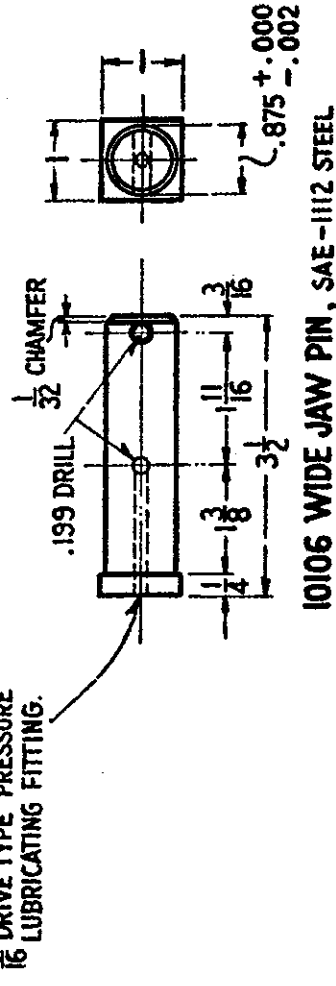
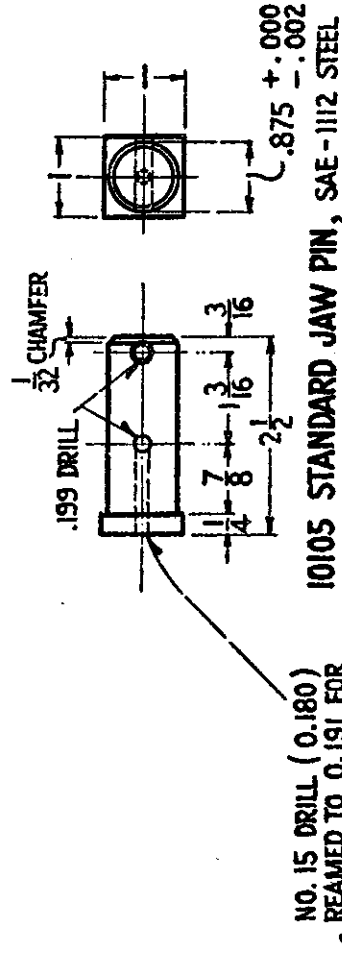
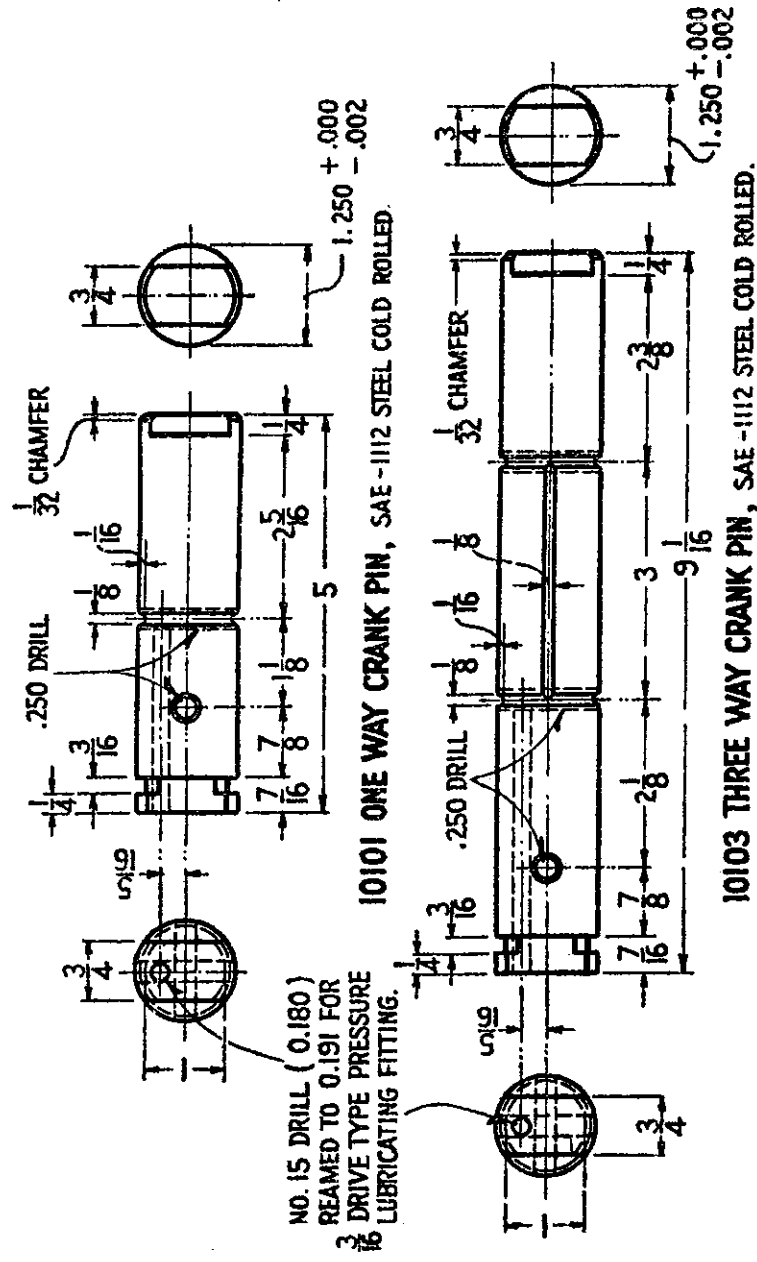
SCALES AND ALL DIMENSIONS GIVEN IN INCHES

ONE-WAY HORIZONTAL CRANK STAND DETAILS

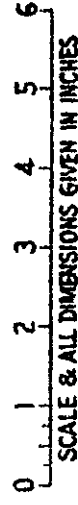
AAR
SIG. SEC
1008C

M-1946 OCT. 1946 M-1927 MAR. 1927 SEPT. 1926 JUN. 1913 DEC. 1908

Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88.



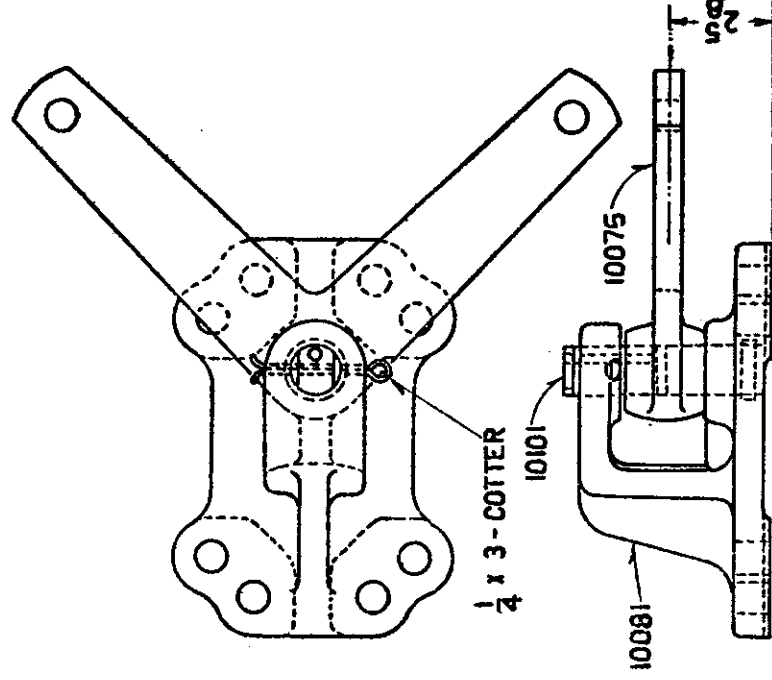
NOTE: SHARP EDGES SHALL BE REMOVED FROM ALL HOLES.
WHEN ORDERING PINS SPECIFY WITH OR WITHOUT
LUBRICATING FITTINGS. IF FITTINGS ARE REQUIRED,
SPECIFY KIND.



CRANK AND JAW PINS

AAR
SIG. SEC.
1010 G

M-1934	MAR 1934	M-1929	SEP. 1928	M-1927	MAR. 1927	MAR. 1927	SEP. 1926	JUL. 1920	DEC. 1919	SEP. 1915	M-1913	M-1935	MAR. 1935	SIG. SEC.	AAR



10115 ASSEMBLY

ASSEMBLY OF ONE-WAY CRANK STANDS

THREE-ARM CRANK

10111 - WITH 10071

STRAIGHT-ARM CRANKS

10112 - WITH 10072

10113 - WITH 10073

RIGHT-ANGLE CRANKS

10114 WITH 10074

10115 WITH 10075

10116 WITH 10076

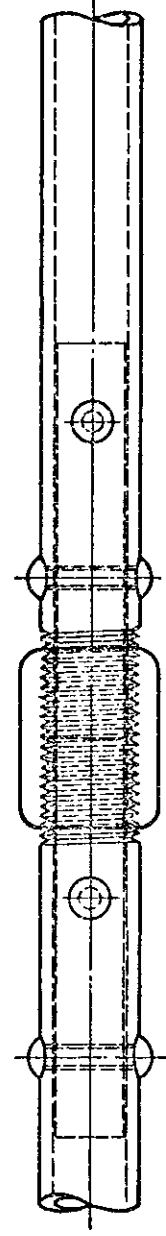
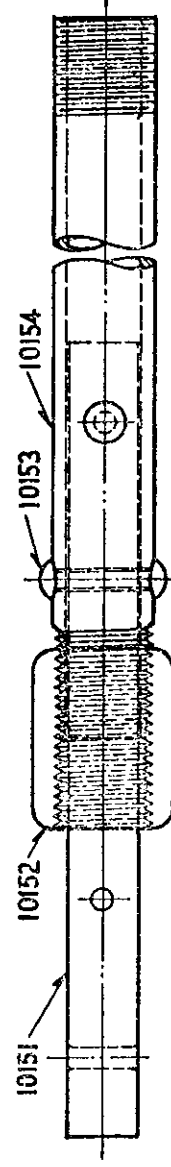
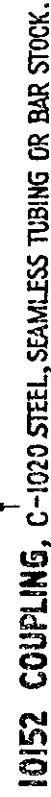
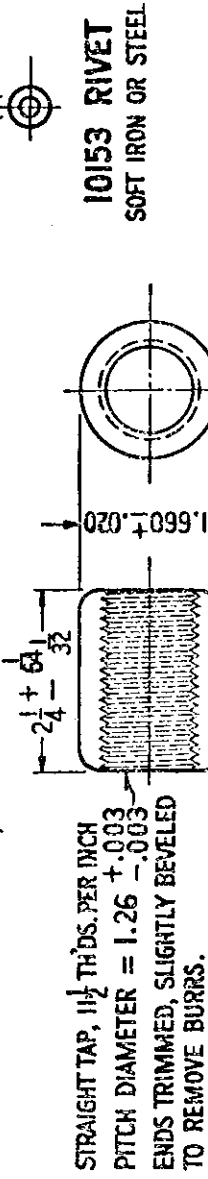
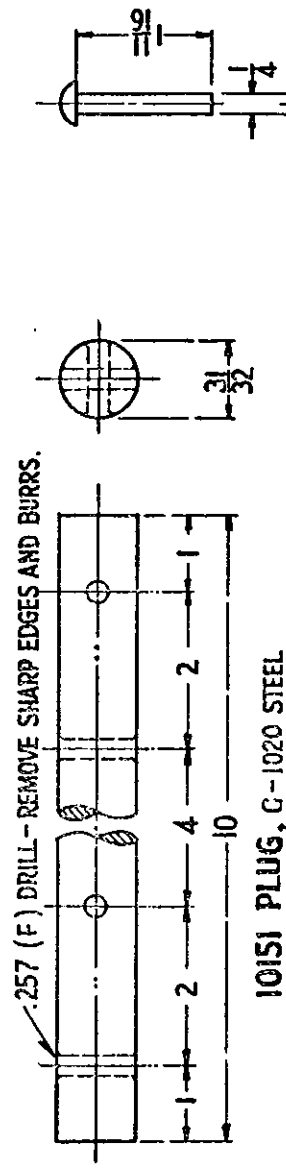
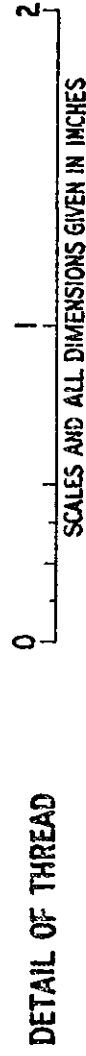
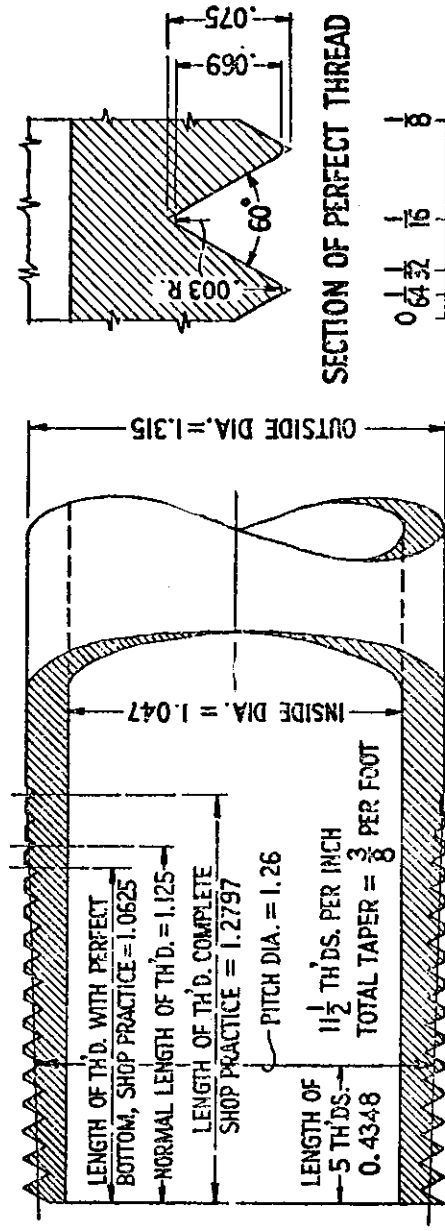
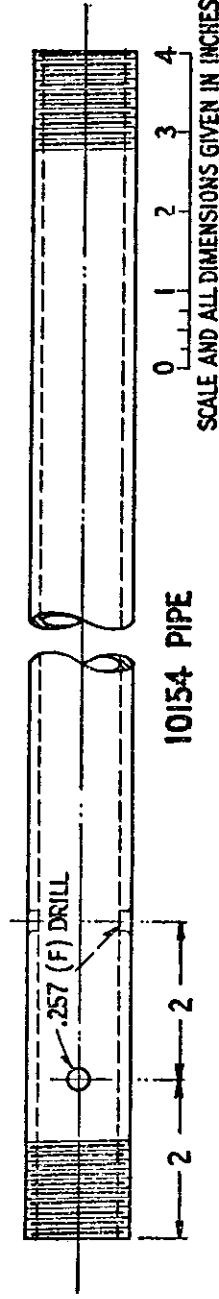
10117 WITH 10077



ONE-WAY HORIZONTAL CRANK STAND ASSEMBLY

AAR
SIG. SEC.
1011D

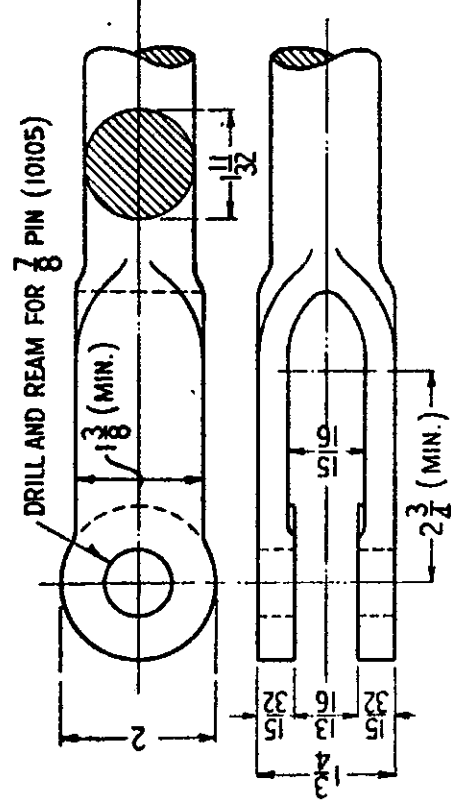
M-1946 OCT 1946 M-1934 MAR 1934 MH9'27 MAR 1927 SEP 1928 MH913 DEC 908



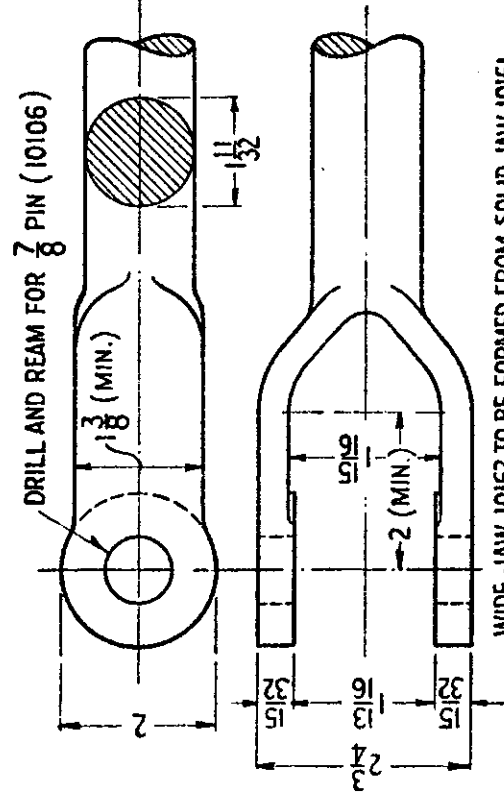
ONE INCH SIGNAL PIPE AND COUPLING

AAR
SIG SEC.
1015C

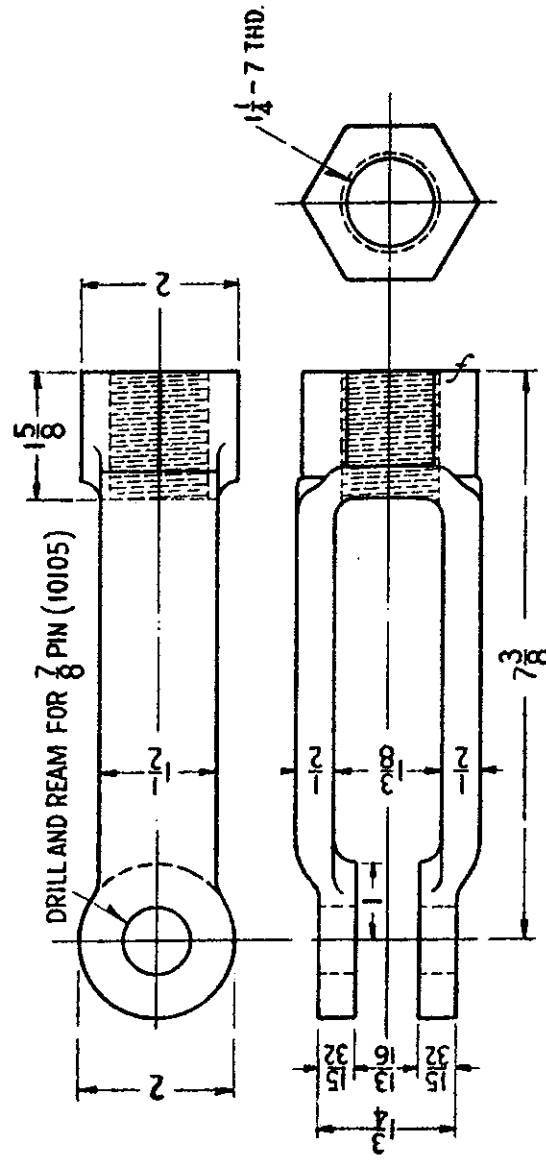
M-1948	SEP:1948	M-1944	OCT. 1944	M - 1923	MAR.1922	JULY 1920	DEC. 1919	MAR. 1915	DEC. 1910	DEC. 1908



10161 SOLID JAW
SAE-1020 STEEL FORGED



10162 WIDE JAW
SAE-1020 STEEL FORGED



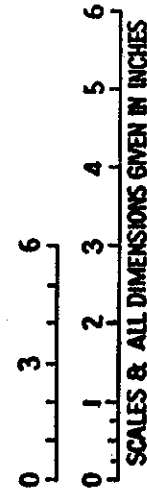
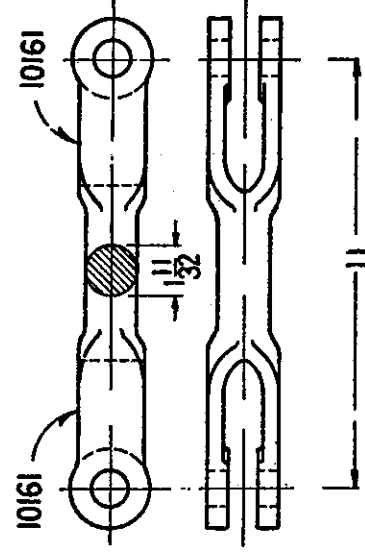
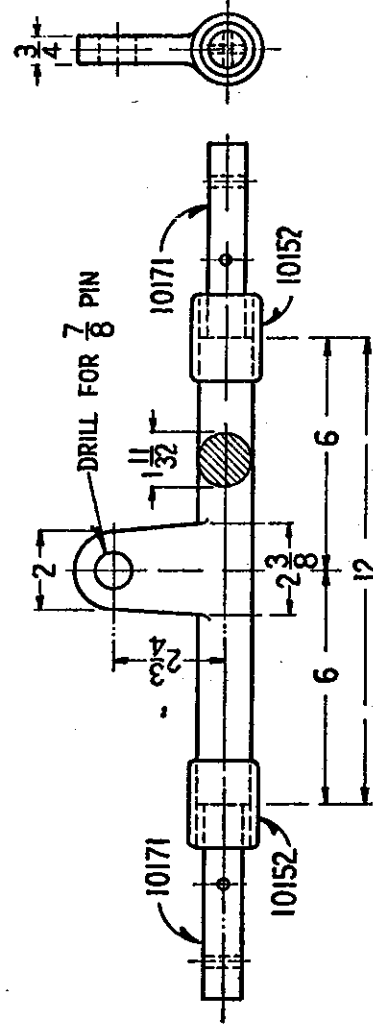
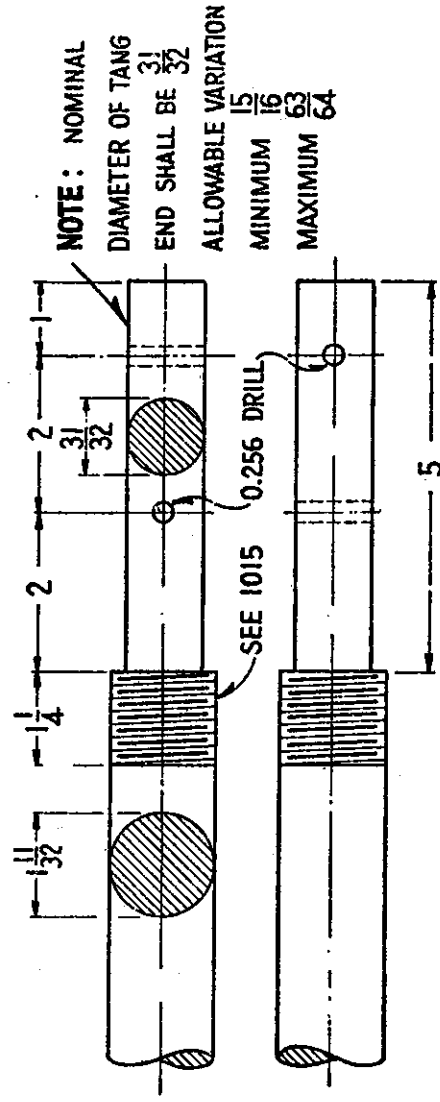
10164 SCREW JAW
SAE-1020 STEEL FORGED

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

SCREW AND SOLID JAWS (-DETAILS)

AAR
SIG. SEC.
1016C

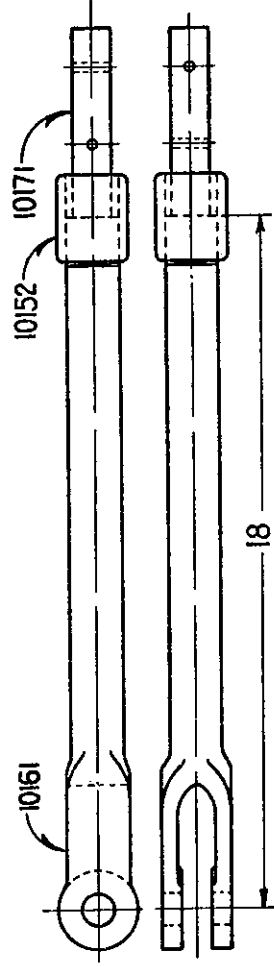
M-1940 OCT. 1940 | M-1934 | MAR. 1934 | SEP. 1916 | MANUAL - NOV. 1913 | DEC. 1908



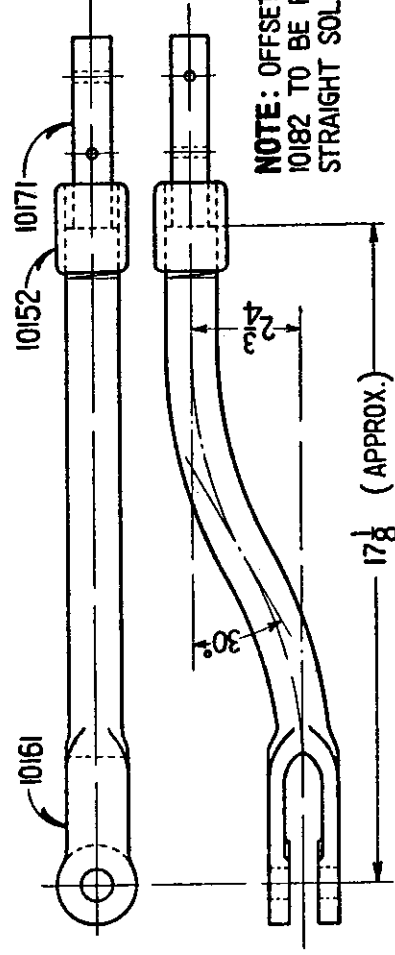
TANG END - LUG AND COMP. LINK (DETAILS AND ASSEMBLY)

AAR
SIG. SEC.
1017C

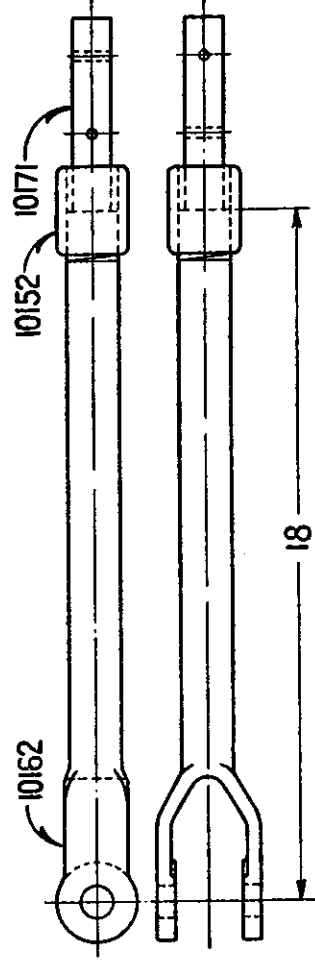
M-1942 [OCT. 1942] M-1934 [MAR. 1934] SEP. 1916 MANUAL - NOV. 1913 [DEC. 1908]



10181 STRAIGHT SOLID JAW (TANG END)



10182 OFFSET SOLID JAW (TANG END)



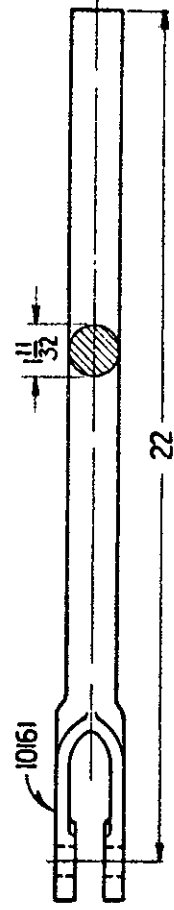
10183 WIDE JAW (TANG END)

0 1 2 3 4 5 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

SOLID JAWS WITH TANG ENDS (ASSEMBLY)

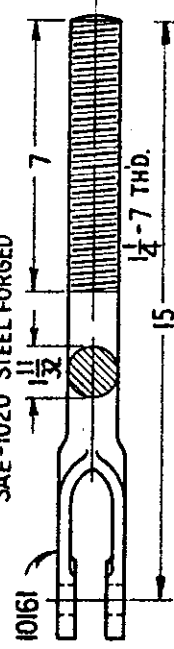
AAR
SIG. SEC.
1018B

M-1941 SEP. 1941 MANUAL- NOV. 1913 DEC. 1908



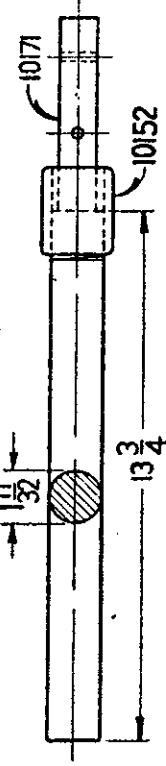
10161 SOLID JAW (PLAIN END)

SAE-1020 STEEL FORGED



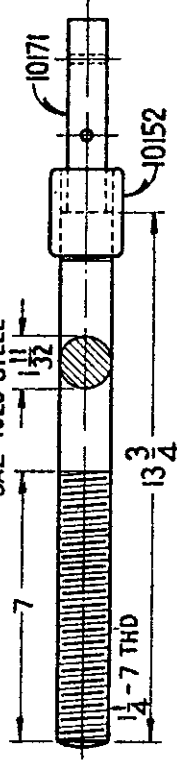
10161 SOLID JAW (THREADED END)

SAE-1020 STEEL FORGED



10192 SOLID JAW (PLAIN TANG END)

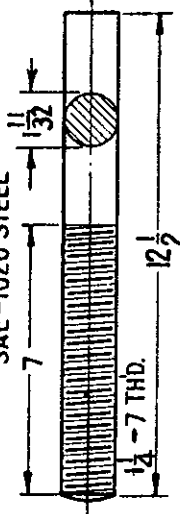
SAE-1020 STEEL



10194 THREADED TANG END (R. H. THREAD)

10195 THREADED TANG END (L. H. THREAD)

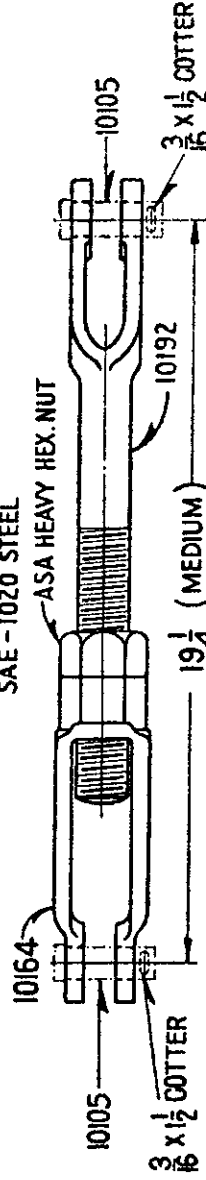
SAE-1020 STEEL



10196 THREADED PLAIN END (R. H. THREAD)

10197 THREADED PLAIN END (L. H. THREAD)

SAE-1020 STEEL



10198 ADJUSTABLE LINK

101910 ADJUSTABLE LINK - WITH PINS AND COTTERS

ASA HEAVY HEX. NUT



10199 TANG END WITH SCREW JAW

101911 TANG END WITH SCREW JAW - PIN AND COTTER

101912 THREADED PLAIN END WITH SCREW JAW

101913 THREADED PLAIN END WITH SCREW JAW - PIN AND COTTER

0 1 2 3 6 9
SCALE AND ALL DIMENSIONS
GIVEN IN INCHES

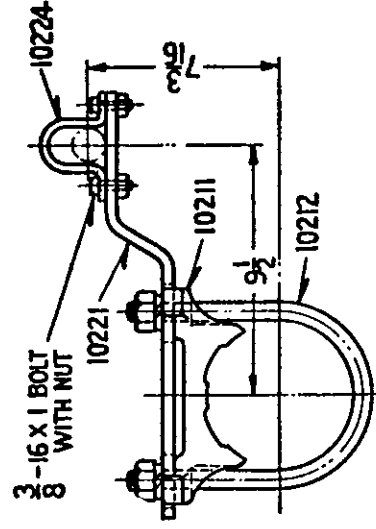
JAWS - TANG END AND ADJUSTABLE LINK

(DETAILS AND ASSEMBLY)

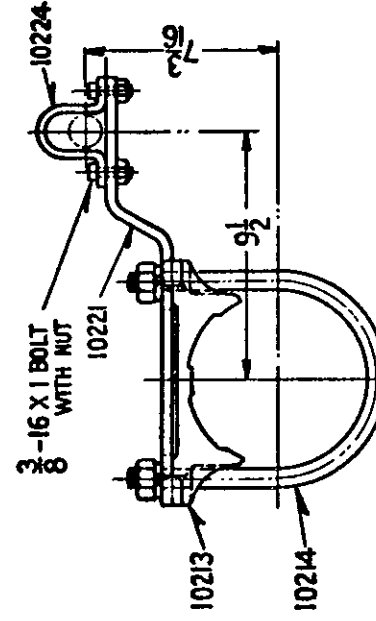
AAR
SIG. SEC.

1019 C

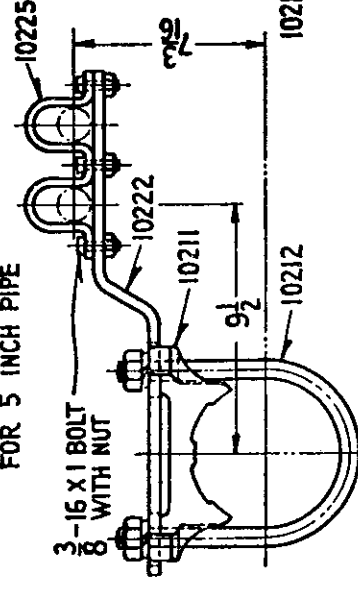
M-1940 OCT. 1940 M 1934 [MAR 1934] DEC. 1916 [SEP 1916] MANUAL-FEB. 1914 DEC. 1908



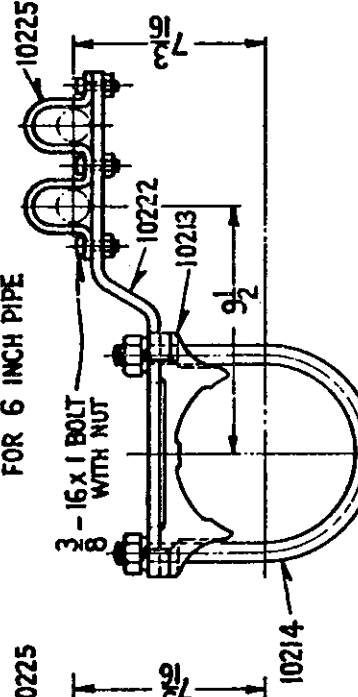
10231 GUIDE COMPL. 1-WAY
FOR 5 INCH PIPE



10232 GUIDE COMPL. 1-WAY
FOR 6 INCH PIPE



10233 GUIDE COMPL. 2-WAY
10234 GUIDE COMPL. WITH 1-WAY CAP 10224
FOR 5 INCH PIPE

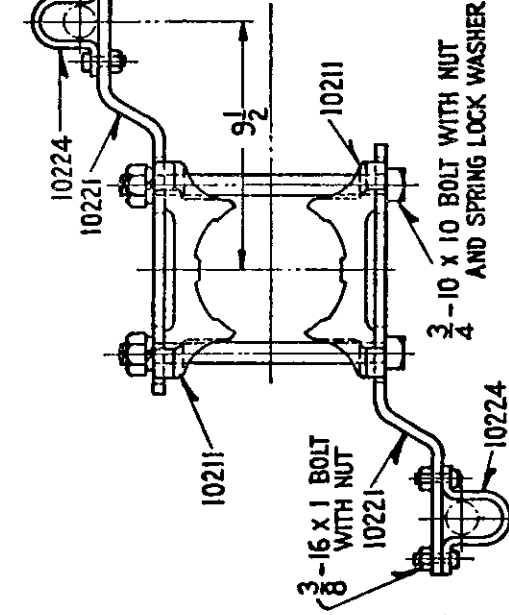


10235 GUIDE COMPL. 2-WAY
10236 GUIDE COMPL. WITH 1-WAY CAP 10224
FOR 6 INCH PIPE

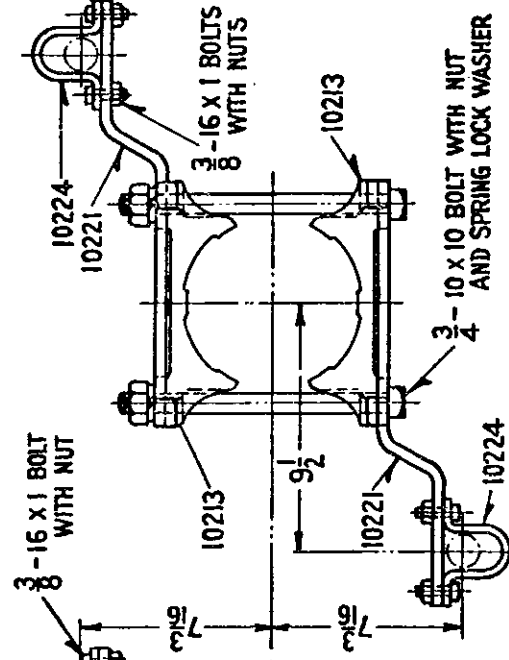
STRAIGHT BOLTS AND NUTS SHALL BE
GALVANIZED OR CADMIUM PLATED
AFTER THREADS HAVE BEEN CUT.

0 3 6 9 12

SCALE AND ALL DIMENSIONS GIVEN IN INCHES



102313 GUIDE COMPL. DOUBLE 1-WAY
FOR 5 INCH PIPE



102315 GUIDE COMPL. DOUBLE 1-WAY
FOR 6 INCH PIPE

GUIDES FOR VERTICAL MECHANICAL CONNECTIONS

FOR 5 AND 6 INCH MASTS - ASSEMBLIES

AAR
SIG. SEC.
1023D

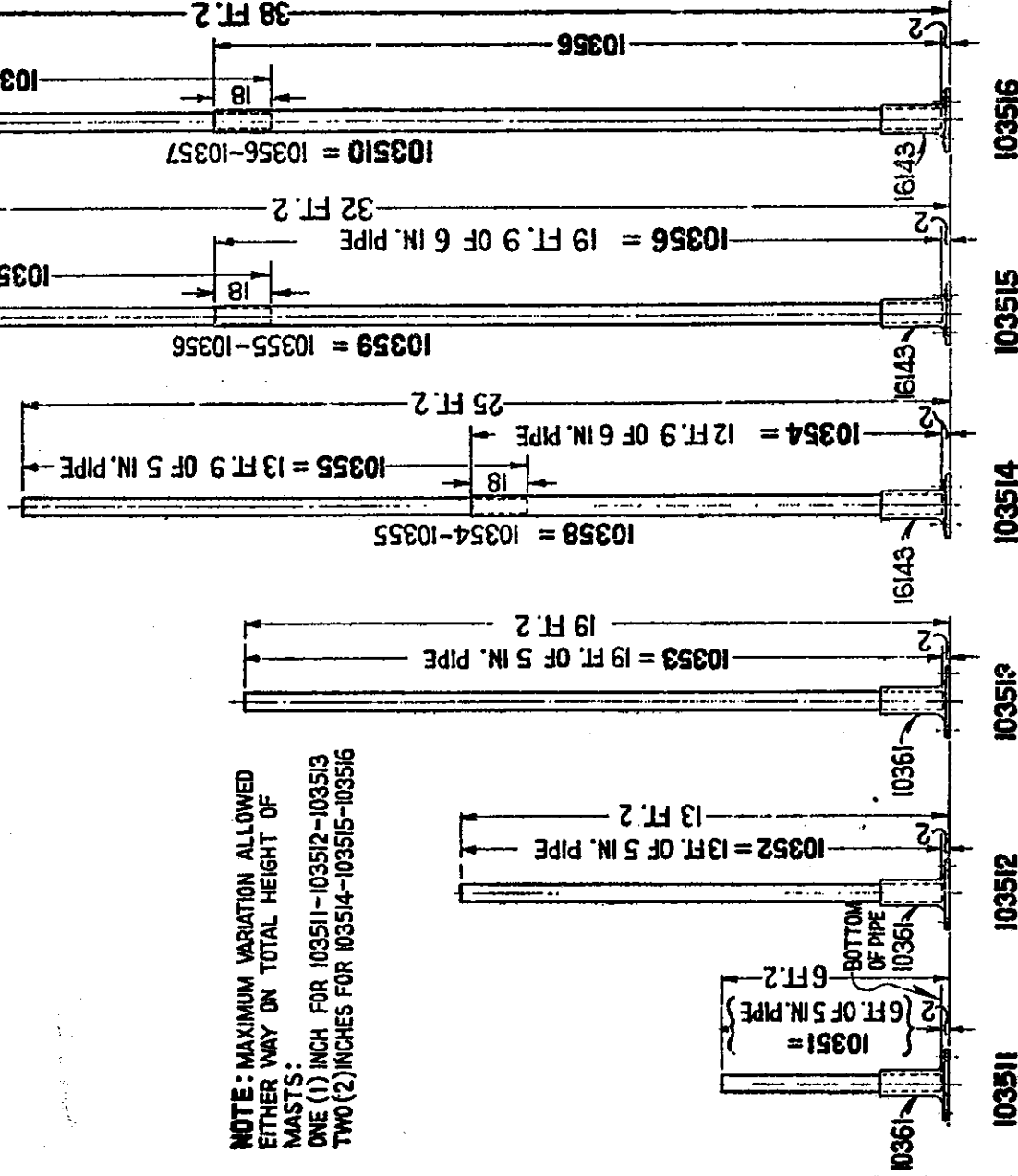
M-1948 SEP 1948 M-1945 OCT 1945 M-1935 MAR 1915

Spring lock washers shall be carbon steel (A.S.A. current Specification B27.1 is preferred, where practicable). Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17.

10351	PIPE SECTION	5 INCH
10352	"	5 "
10353	"	5 "
10354	"	6 "
10355	"	5 "
10356	"	6 "
10357	"	5 "
10358	"	FOR MAST
10359	"	"
103510	"	"
103511	BRIDGE	"
103512	"	"
103513	"	"
103514	GROUND	"
103515	"	"
103516	"	"

SECTIONS 10354-10355 ASSEMBLED
 SECTIONS 10355-10356 ASSEMBLED
 SECTIONS 10356-10357 ASSEMBLED
 COMPL. 10351 WITH BASE 10361
 " 10352 WITH BASE "
 " 10353 WITH BASE "
 " 10358 WITH BASE 16143
 " 10359 WITH BASE "
 " 103510 WITH BASE "

DOES NOT INCLUDE
 BASE



NOTE: MAXIMUM VARIATION ALLOWED
 EITHER WAY ON TOTAL HEIGHT OF
 MASTS:
 ONE (1) INCH FOR 103511-103512-103513
 TWO (2) INCHES FOR 103514-103515-103516

FOR POWER SIGNALS WITH MECHANISM AT SEMAPHORE SHAFT AND FOR MECHANICAL SIGNALS

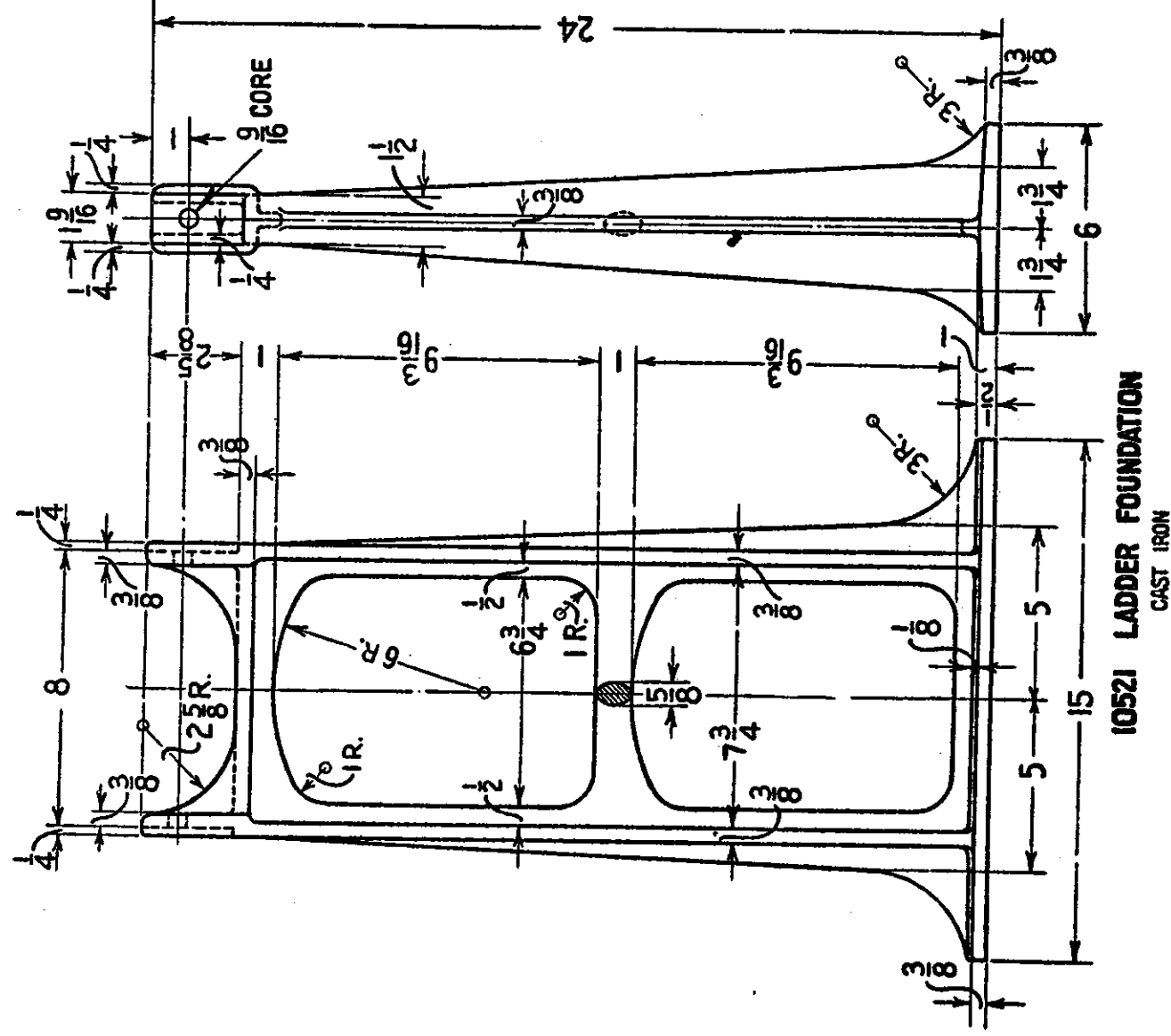
SCALE AND ALL DIMENSIONS GIVEN IN INCHES
 UNLESS OTHERWISE INDICATED

SIGNAL MASTS

DETAILS AND ASSEMBLY

AAR
 SIG. SEC.
 1035C

M-1946 OCT. 1946 M-1938 APR. 1938 DEC. 1915 SEP. 1914 MAR. 1910



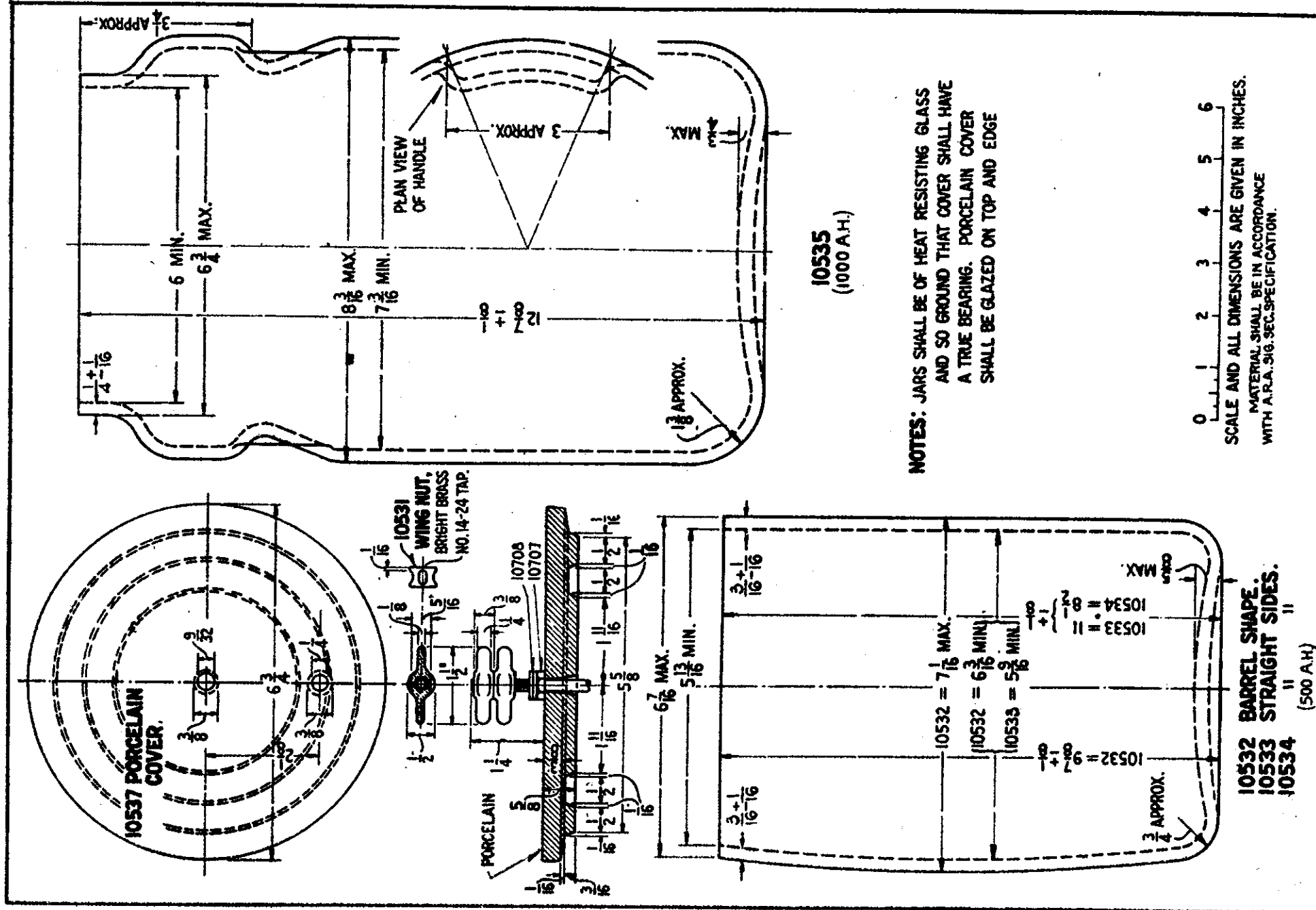
0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

LADDER FOUNDATION

AAR
SIG. SEC.
1052 B

M-1946 OCT. 1946 MANUAL-DEC. 1913 JUN. 1910

Cast iron shall be in accordance with Specification for Gray Iron Castings,
Manual Part 88.



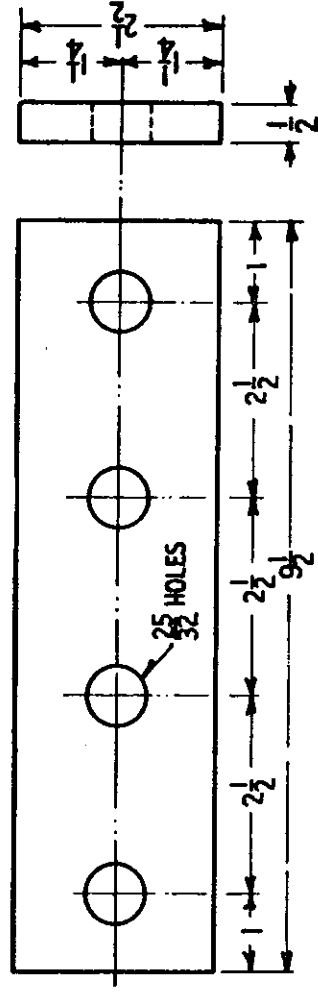
ROUND JARS AND COVER (P.R.I.M.A.R.Y BATTERY)

ARA
SIG. SEC.

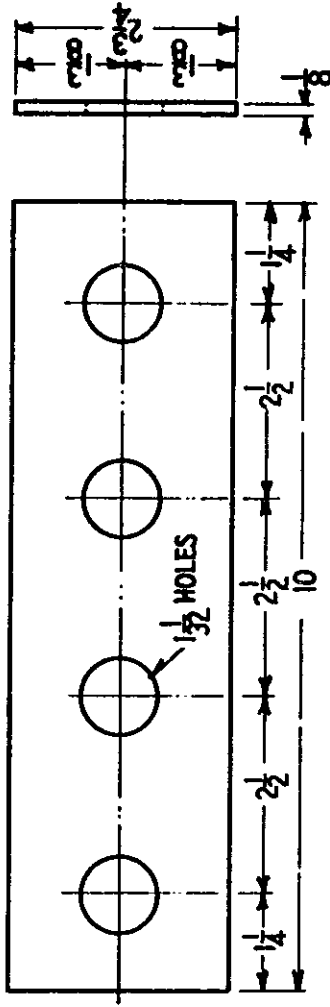
M-1926 MAR. 1926 SEPT. 1925 JULY 1920 MAR. 1920 JUNE 1918 OCT. 1912

Material shall be in accordance with Specification 113.

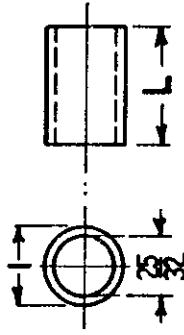
1053B



10551 SPLICE PLATE, STEEL

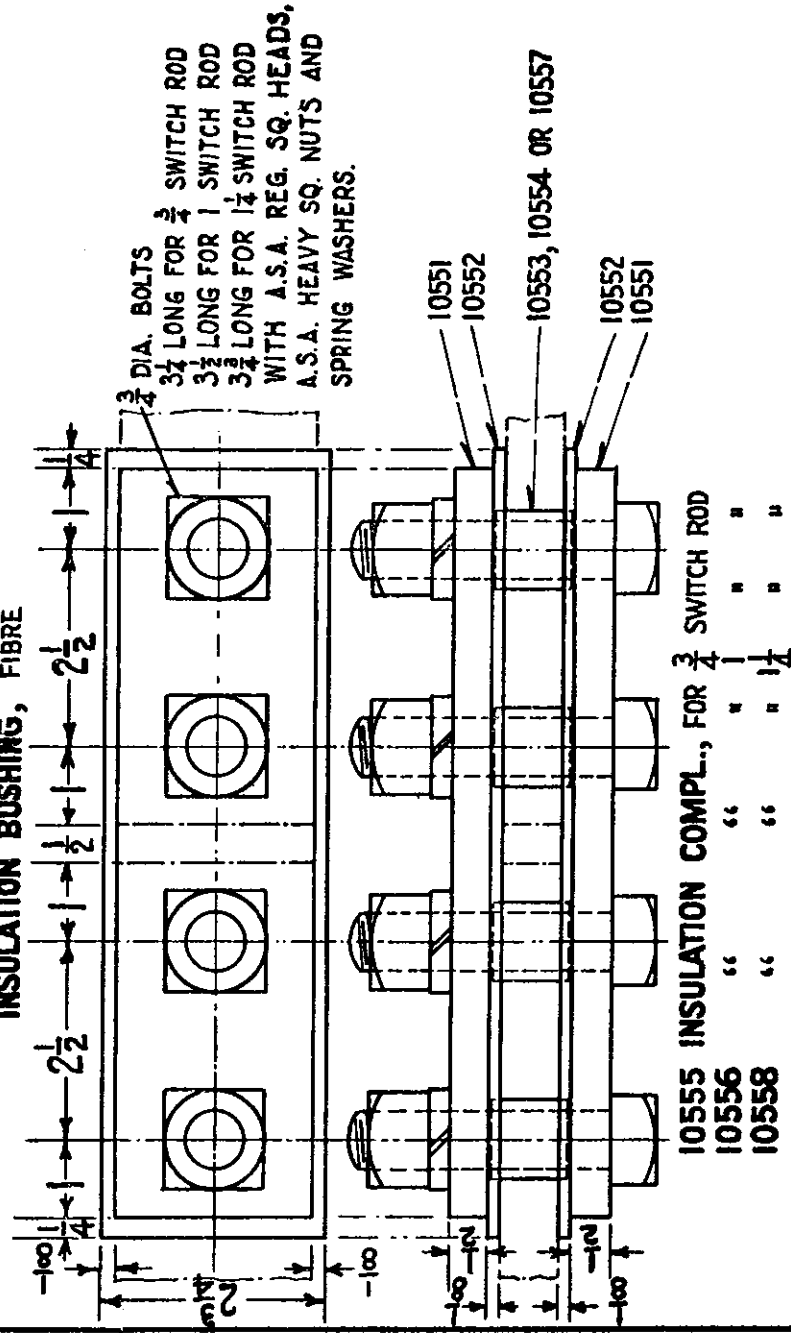


10552 INSULATION PLATE, FIBRE



10553, L = $\frac{31}{32}$	FOR $\frac{3}{4}$	SWITCH ROD
10554, L = $\frac{17}{32}$	"	"
10557, L = $\frac{15}{32}$	"	"

INSULATION BUSHING, FIBRE



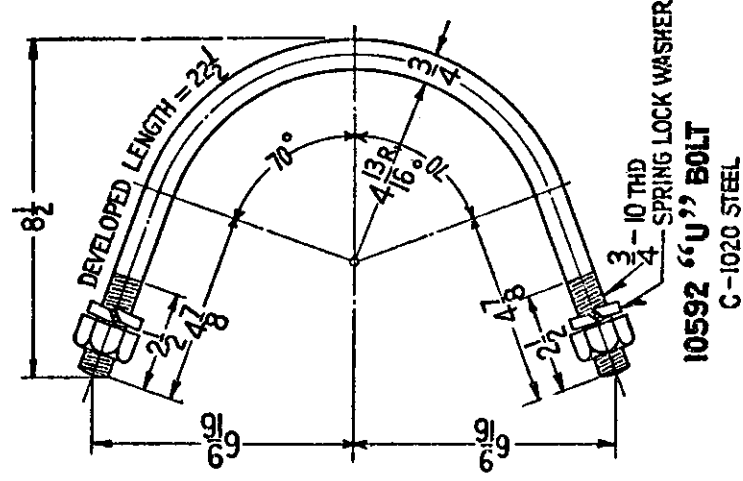
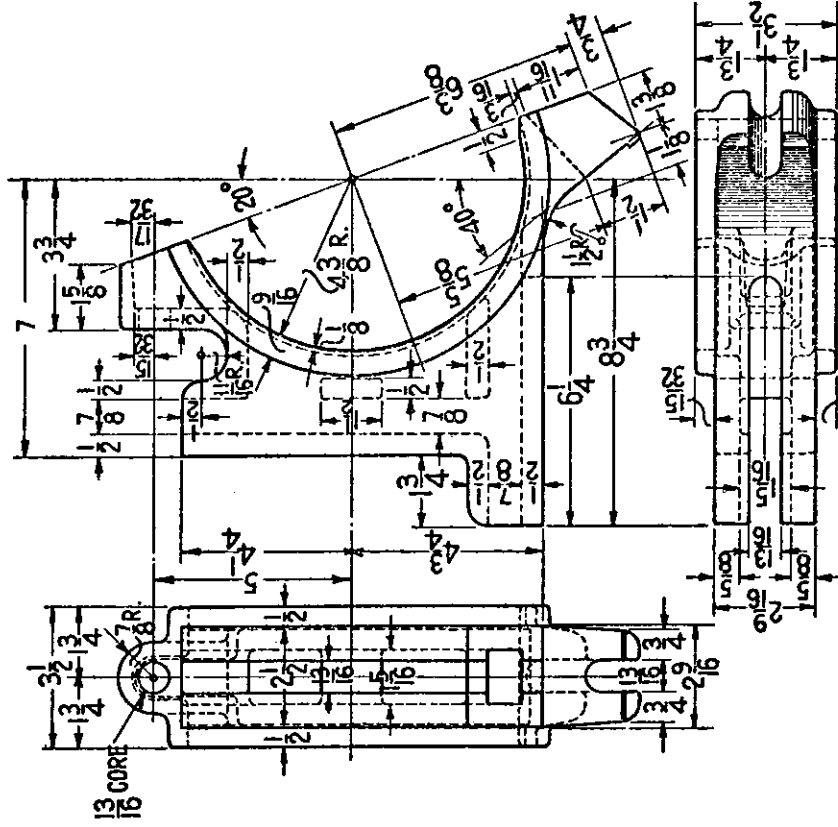
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

SWITCH-ROD INSULATION

AAR
SIG SEC
1055E

M-1952 SEP 1952 M-1943 OCT 1943 M-1936 MAR 1936 MAR 1925 SEP 1914 OCT 1910

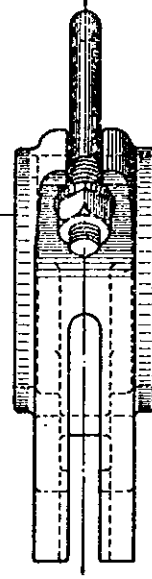
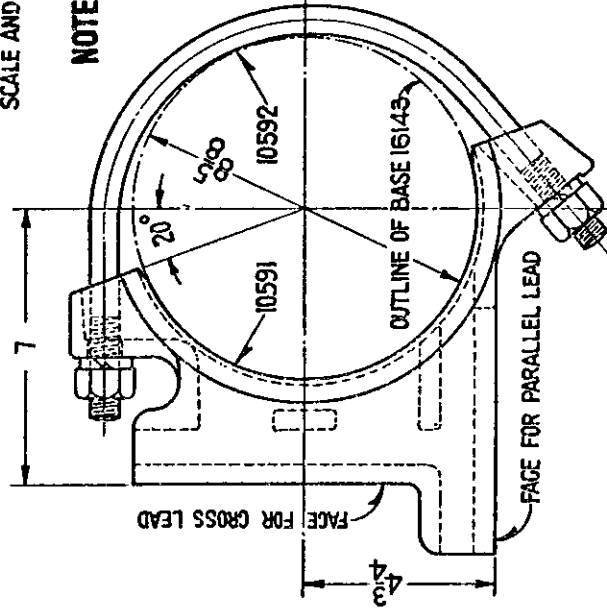
Switch-rod insulation shall conform to detail 3001, A.R.E.A. Plan No. 222.



10591 CLAMP - FRONT HALF
CAST IRON

0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

NOTE: BOLTS SHALL BE PAINTED WITH PRIMING COAT OR GALVANIZED OR CADMIUM PLATED. NUTS SHALL BE GALVANIZED OR CADMIUM PLATED. GALVANIZING OR CADMIUM PLATING SHALL BE DONE AFTER THREADS HAVE BEEN CUT AND BOLTS FORMED.



10593 CLAMP COMPL.

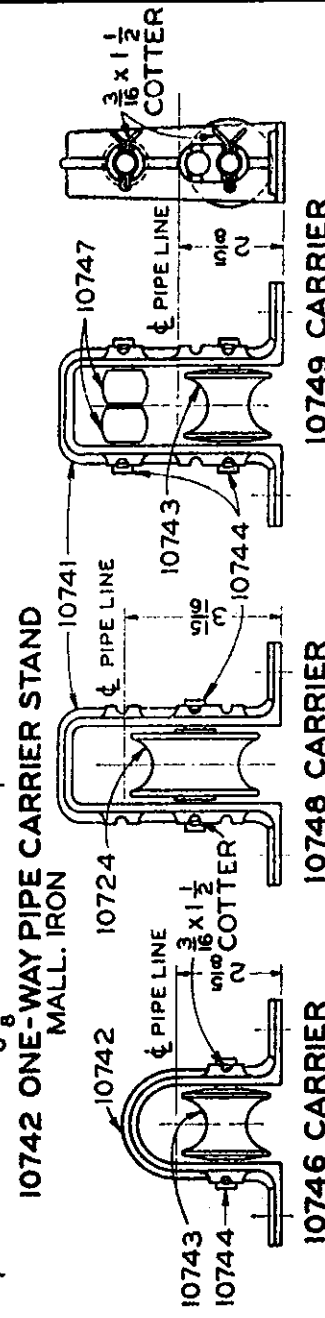
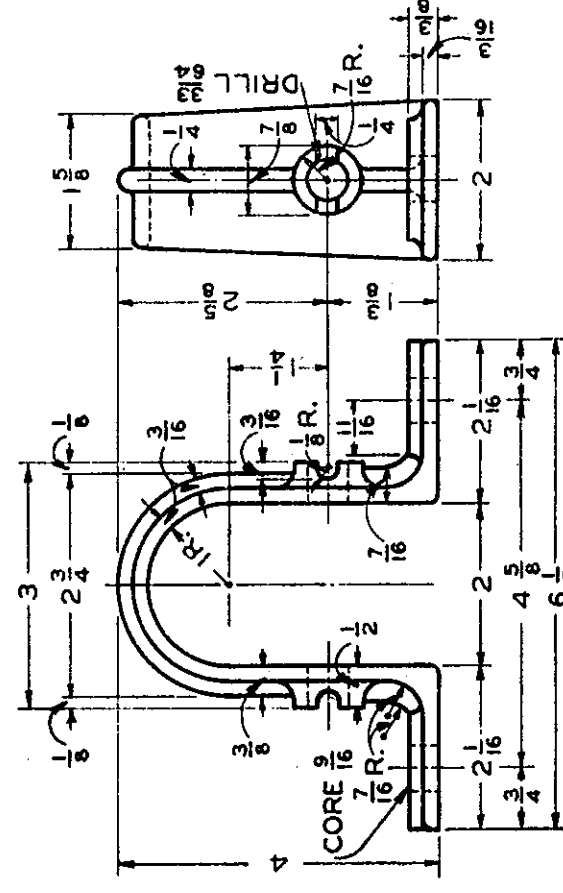
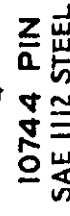
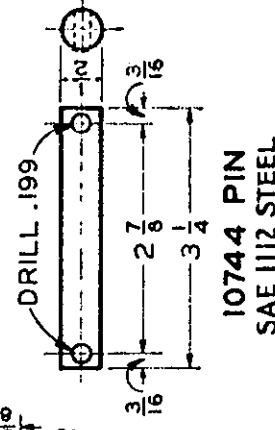
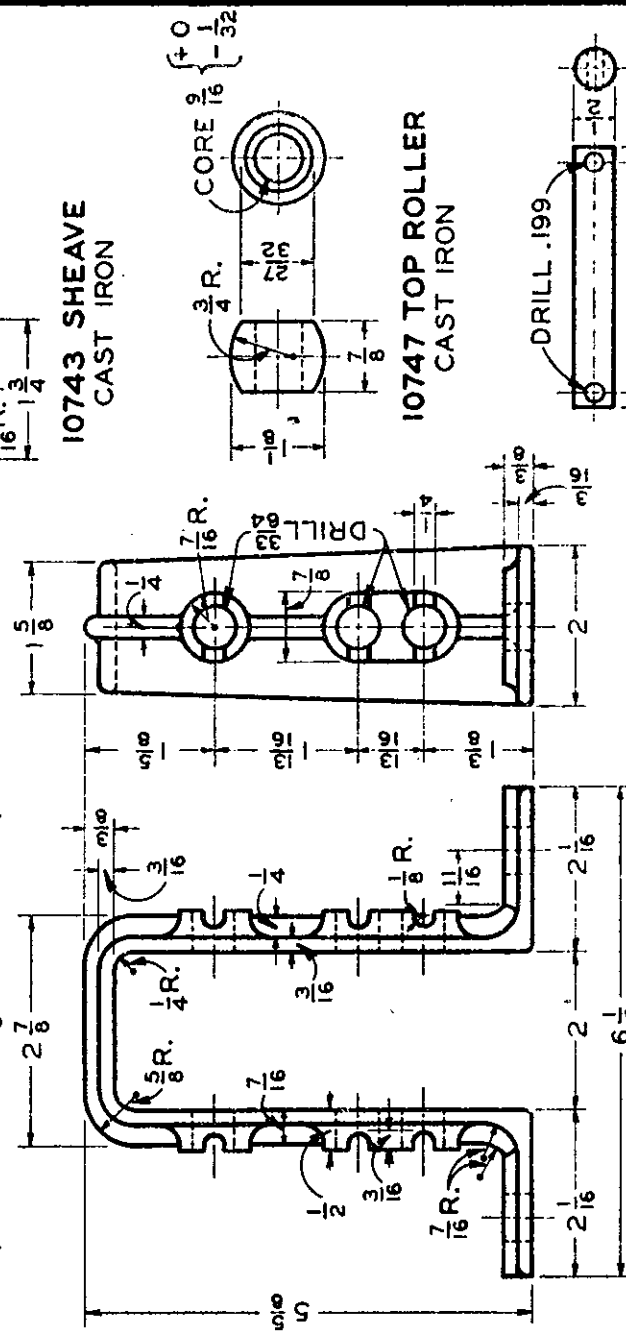
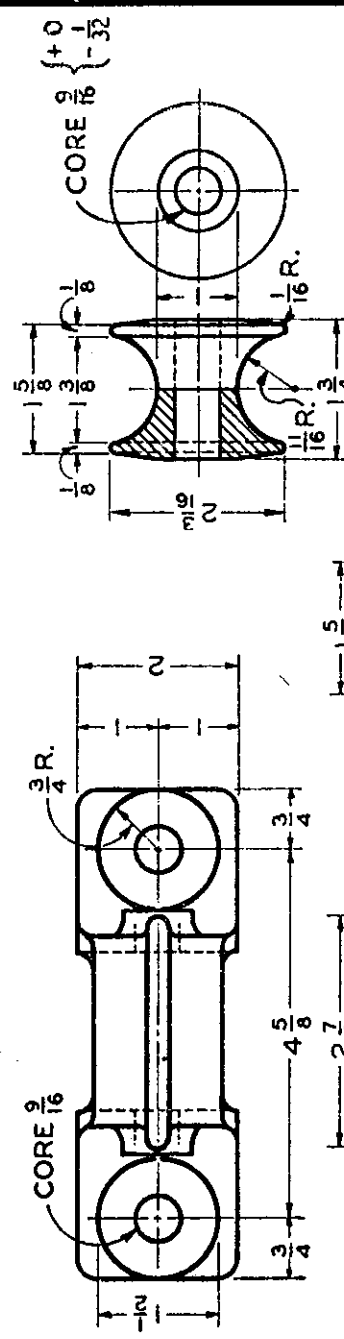
CLAMP FOR BASE OF 6 INCH GROUND MASTS

DETAILS AND ASSEMBLY

AAR
SIG-SEC.

M-1948 [SEP.1948] M-1945 [OCT.1945] [DEC.1915] [SEP.1915] [MAY.1915] [M-1-1914] [OCT.1911] **10592**

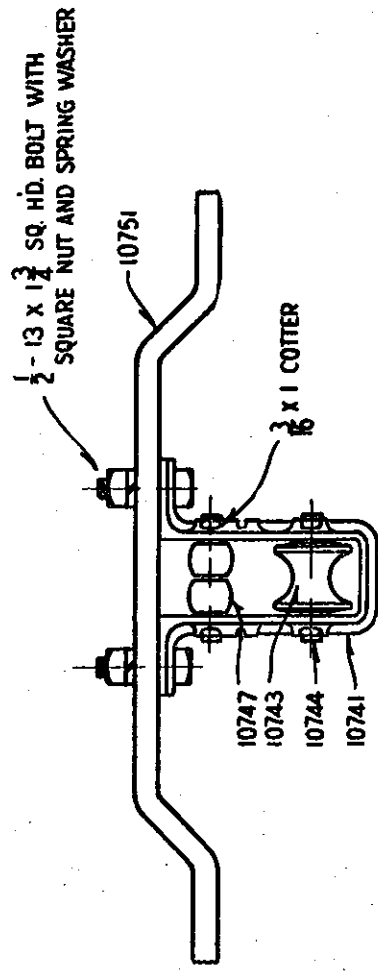
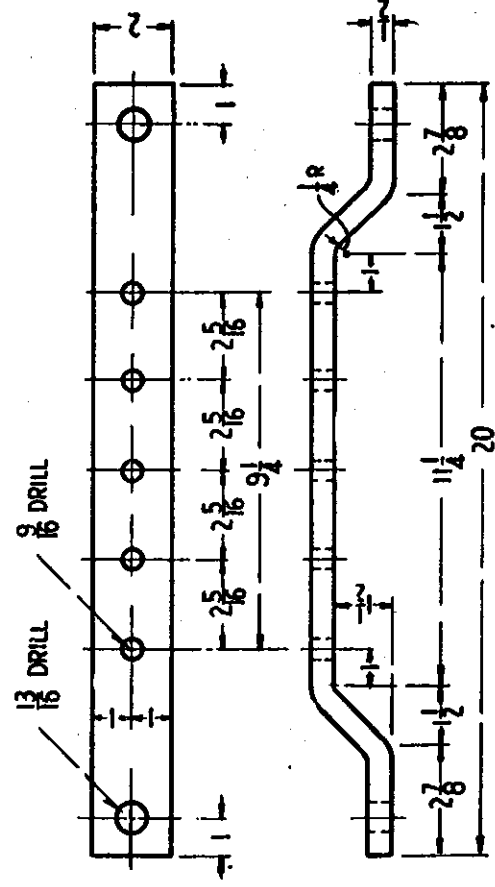
Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88; Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17; Painting shall be in accordance with Specification 120, Manual Part 110; Spring lock washers shall be carbon steel (A.S.A. current Specification B27.1 is preferred, where practicable).



AAR
SIG. SEC.
1074C

M-1944	OCT 1944	M-1938	APR 1938	M-1935	MAR 1935

Cast iron shall be in accordance with Specification for Gray Iron Castings. Malleable iron shall be in accordance with Specification for Malleable Iron Castings.



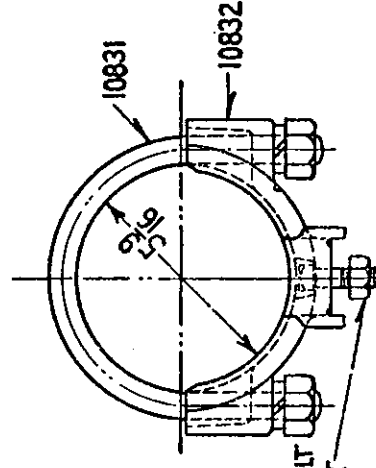
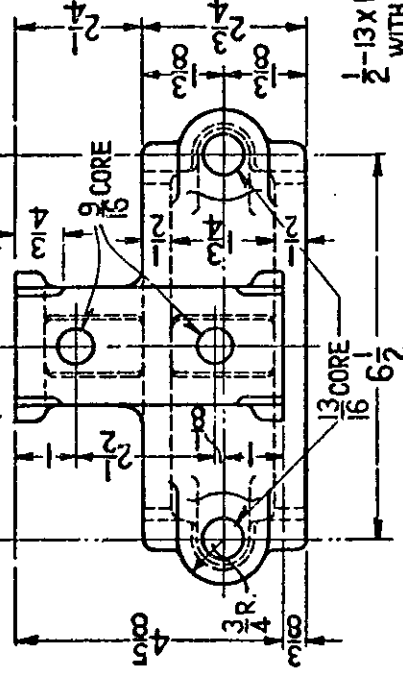
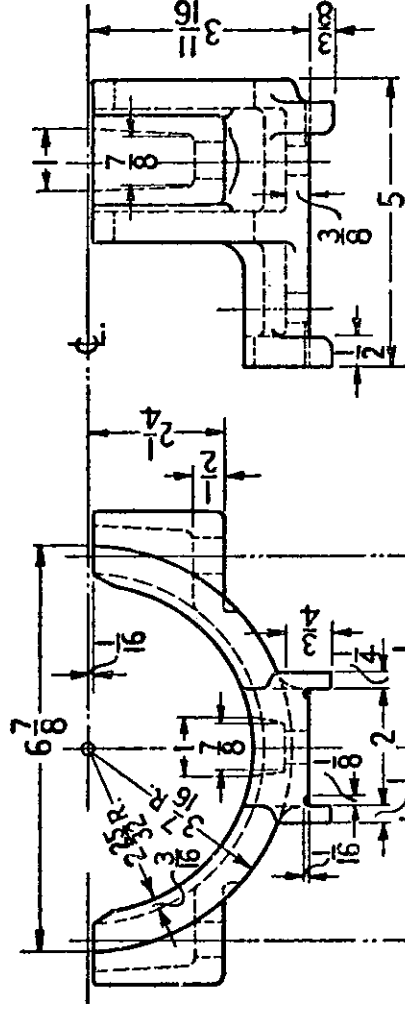
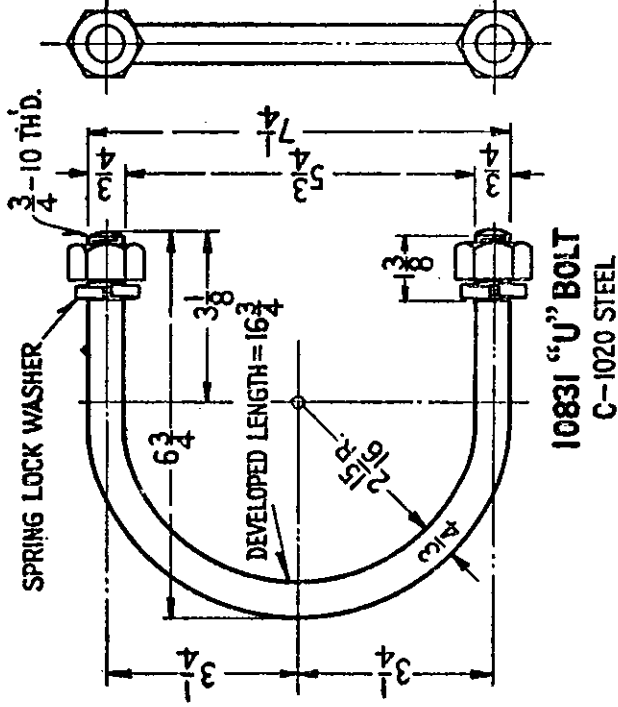
0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

TRANSVERSE STRAP PIPE CARRIER

DOUBLE ROLLER TYPE

AAR
SIG. SEC.
1075C

M-1941	SEP.1941	M-1938	APR.1938	M-1935	MAR.1935



10832 CLAMP - FRONT HALF
CAST IRON

10831 ASSEMBLY

NOTE: FORMED BOLT SHALL BE PAINTED WITH PRIMING COAT OR GALVANIZED OR CADMIUM PLATED. ALL NUTS AND STRAIGHT BOLTS SHALL BE GALVANIZED OR CADMIUM PLATED. GALVANIZING OR CADMIUM PLATING SHALL BE DONE AFTER THREADS HAVE BEEN CUT AND BOLTS FORMED.

0 1 2 3 4 5 6
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

BOLT AND CLAMP FOR 5 INCH MASTS

AAR
SIG. SEC.
1083D

M-1948 SEP.1948 M-1947 SEP.1947 M-1945 OCT.1945 MANUAL-FEB.1914 OCT.1910

Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88; Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17; Painting shall be in accordance with Specification 120, Manual Part 110; Spring lock washers shall be carbon steel (A.S.A. current Specification B27.1 is preferred, where practicable).



Technical drawing of a mechanical assembly, likely a valve or pump component. The drawing includes a side view and a cross-sectional view.

Side View Labels:

- 10853
- 10854
- 3 x 1/2 COTTERS
- 10855
- 10851
- 10852
- 10855

Cross-sectional View:

- Shows internal components and a central shaft.
- Includes a dimension line labeled 4.

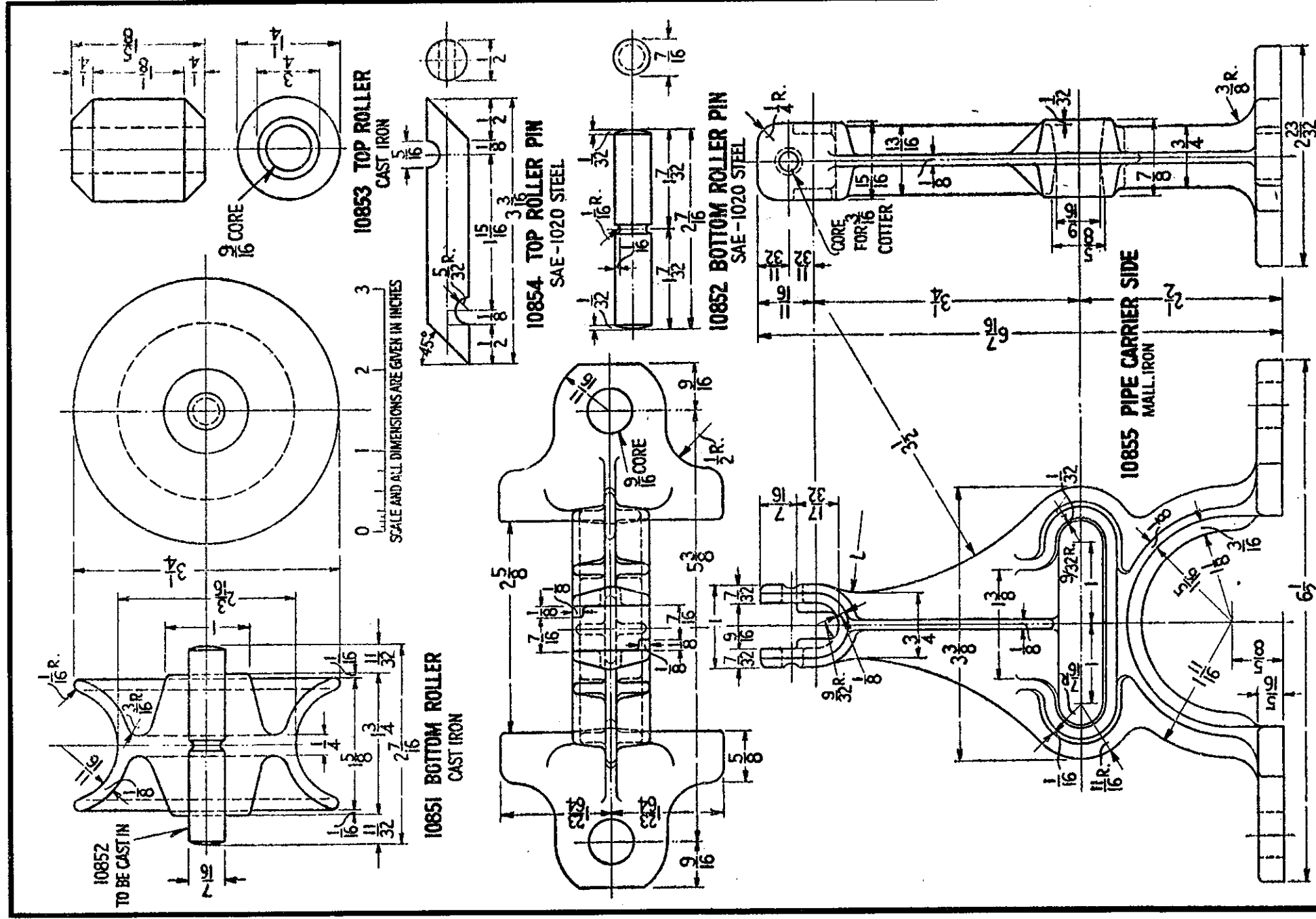
PIPE CARRIER - ASSEMBLY

(FOR DETAILS SEE NO.1085)

ARA
SIG. SEC.

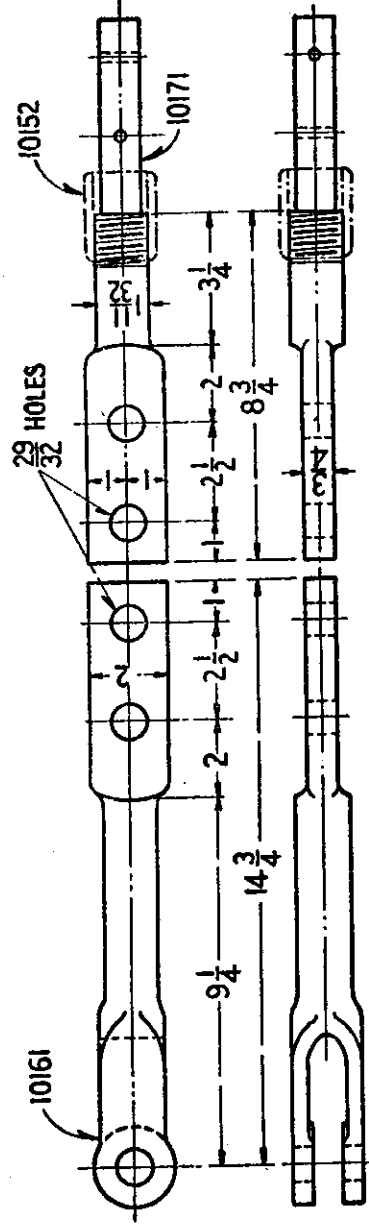
1084B

1	M-1928	MAR. 1928	OCT. 1913	JUN. 1913	JUN. 1912



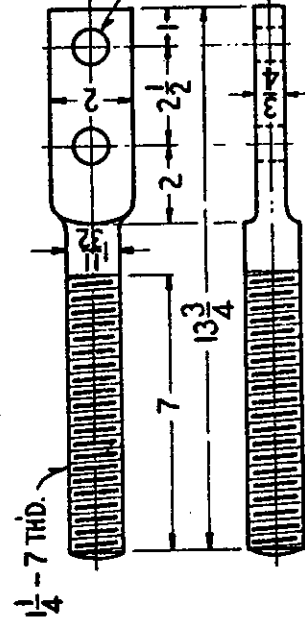
See 1084 for assembly.

Cast iron shall be in accordance with Specification for Gray Iron Castings. Malleable iron shall be in accordance with Specification for Malleable Iron Castings.

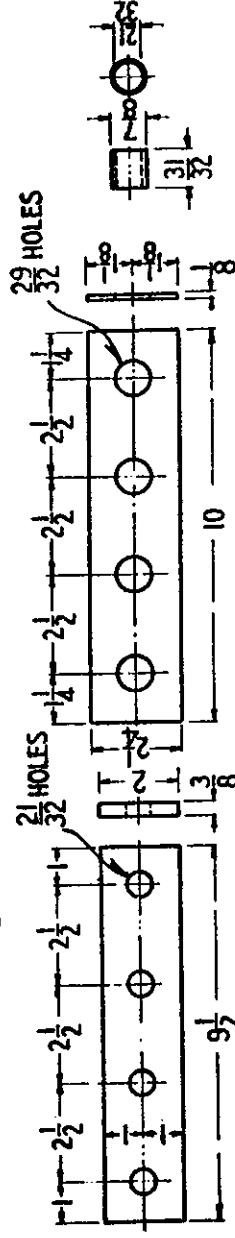


10941 SOLID JAW END
SAE-1020 STEEL

10942 TANG END (ONLY)
10943 TANG END (WITH 10152)
SAE-1020 STEEL



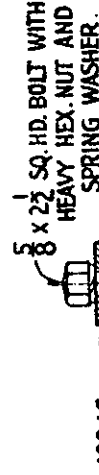
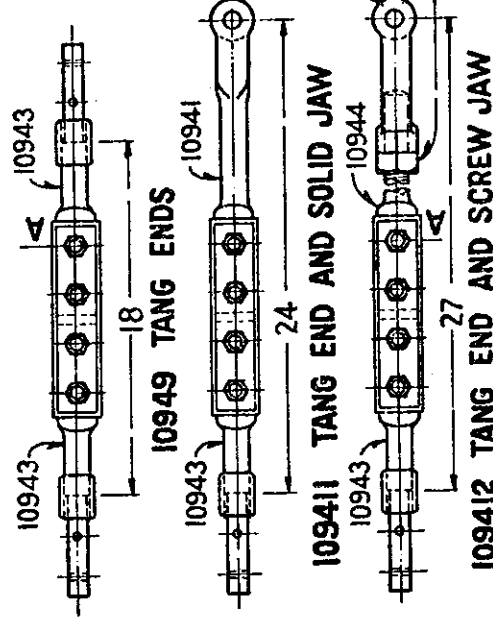
10944 THREADED END
SAE-1020 STEEL



10946 SPLICE PLATE
SAE-1020 STEEL

10947 INSULATION PLATE
FIBRE

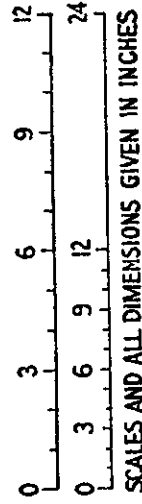
10948 INSULATION BUSHING
FIBRE



SECTION A - A

PIPE-LINE INSULATION

FOR ONE-INCH PIPE

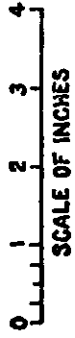


SCALES AND ALL DIMENSIONS GIVEN IN INCHES

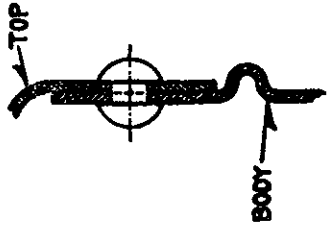
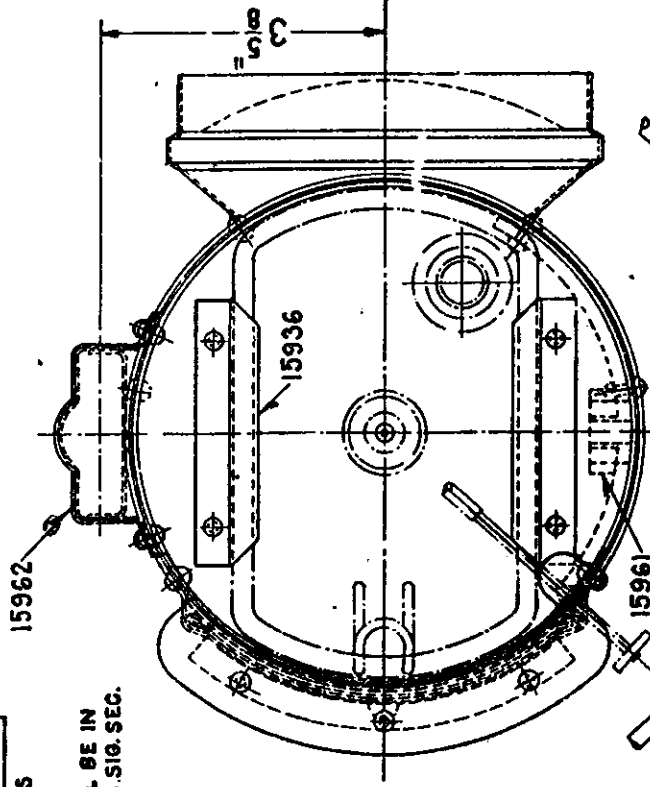
AAR
SIG. SEC.
1094E

M-1943 OCT. 1943 M-1941 SEP. 1941 M-1934 MAR. 1934 MAN-1926 MAR. 1925 SEP. 1916 MAR. 1914 OCT. 1911

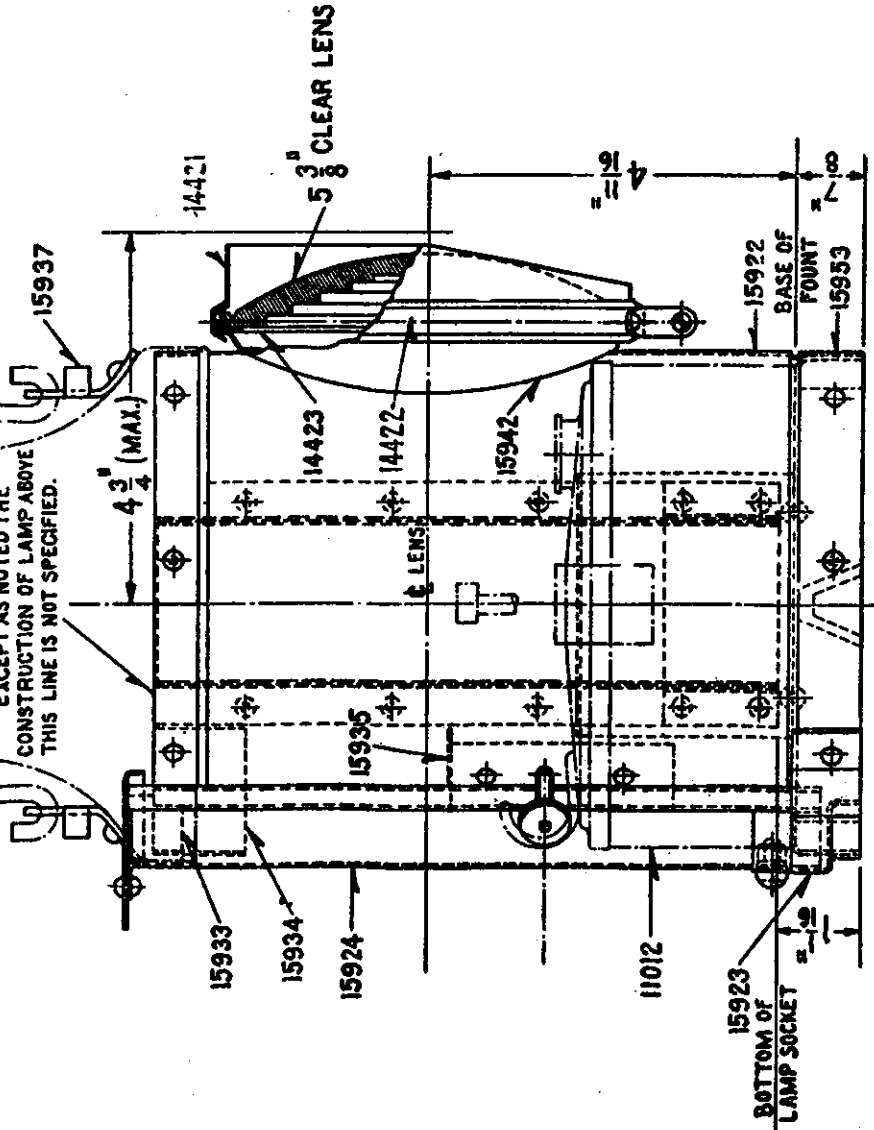
Fibre shall be in accordance with Specification 13.



NOTE: MATERIAL SHALL BE IN ACCORDANCE WITH A.R.A. SIG. SEC. SPECIFICATION.



EXCEPT AS NOTED THE CONSTRUCTION OF LAMP ABOVE THIS LINE IS NOT SPECIFIED.

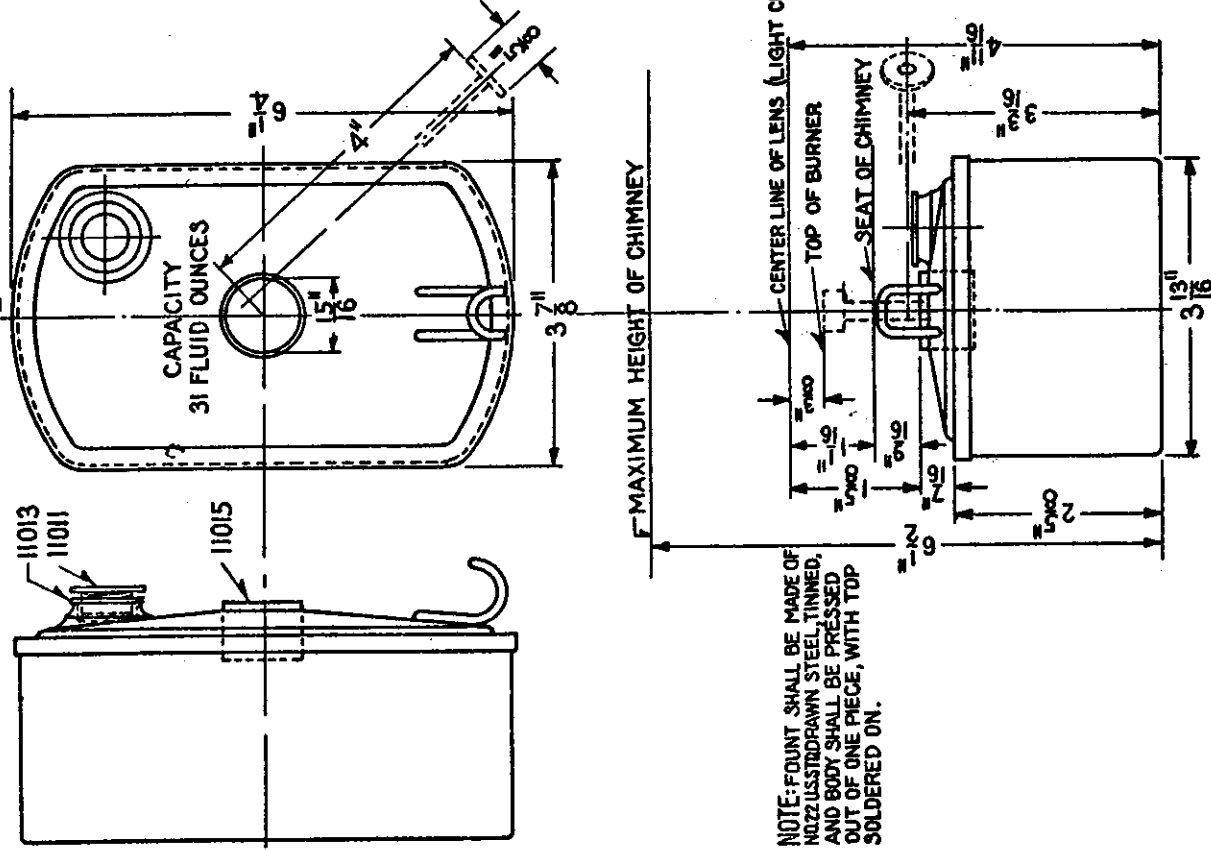


SEMAPHORE LAMP-ONE LENS

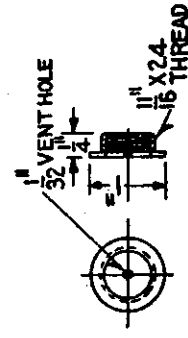
ARA
SIG. SEC.
1100B

M-1926 SEP. 1925 JUN-1918 M-8-1914 M-5-1912 OCT. 1910 JUN. 1910 DEC. 1908

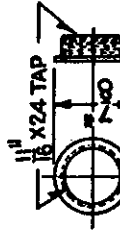
Material shall be in accordance with Specification 137.



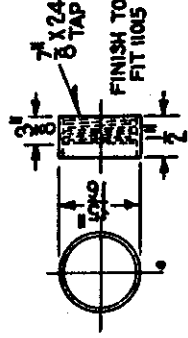
11012 FOUNT



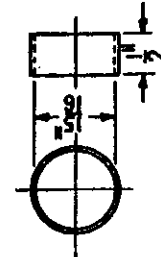
11011 FEEDER CAP
NO. 20 A.W.G. BRASS



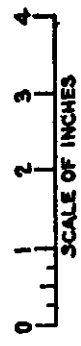
11013 FEEDER COLLAR
NO. 20 A.W.G. BRASS



11014 BURNER COLLAR
NO. 20 A.W.G. BRASS TUBING.



11015 FOUNT COLLAR
NO. 20 A.W.G. BRASS TUBING



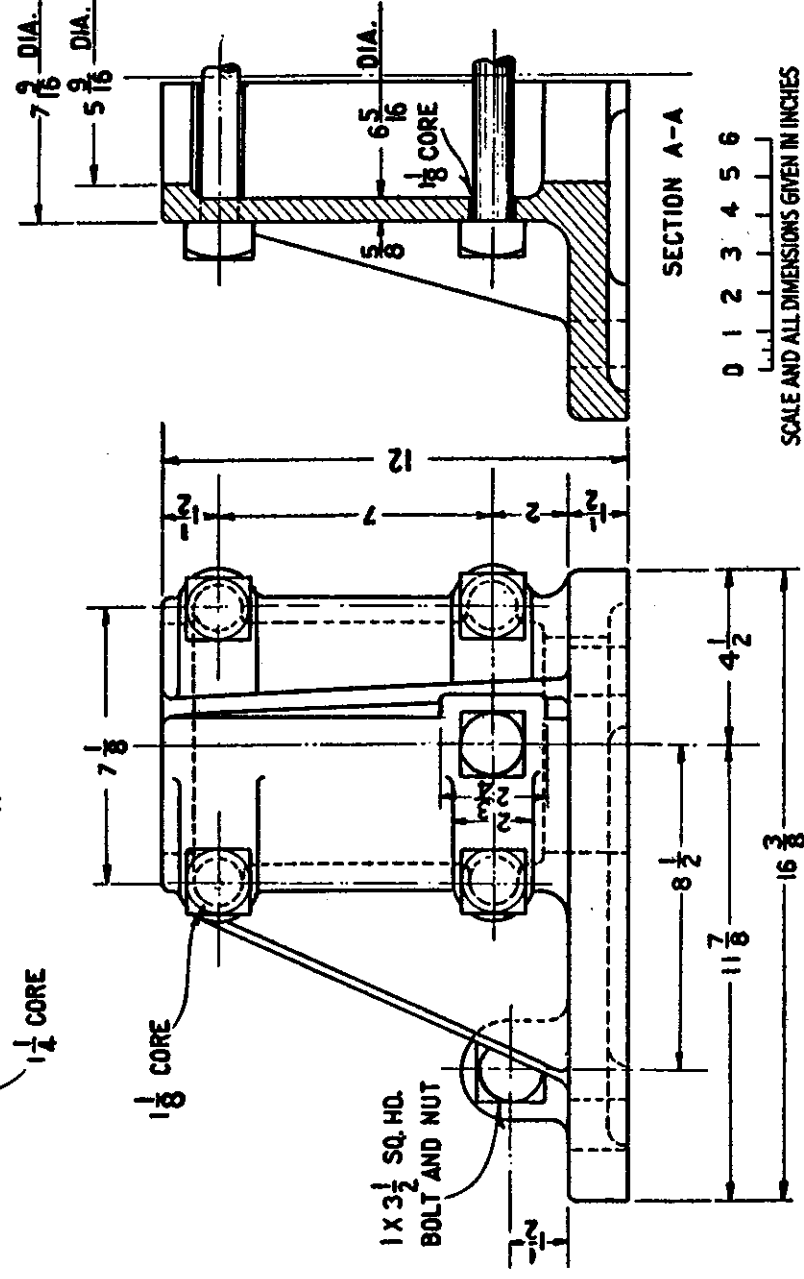
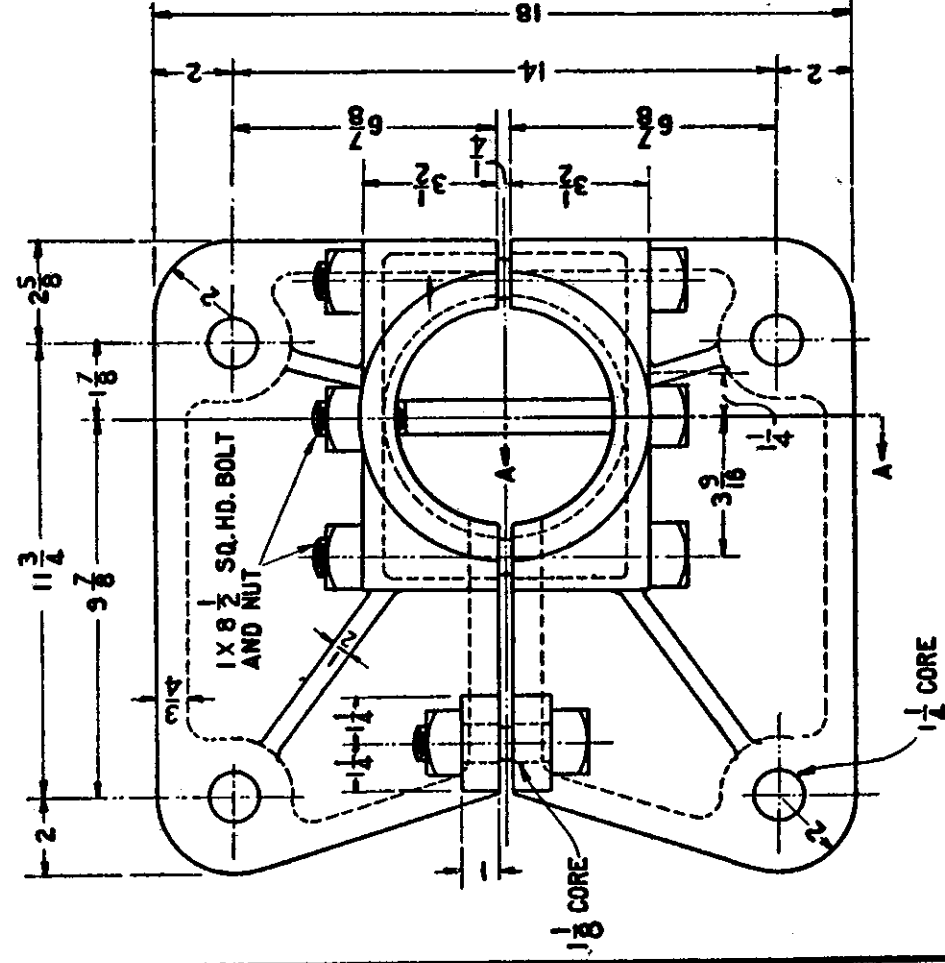
NOTE: MATERIAL SHALL BE IN ACCORDANCE WITH A.R.A. SPECIFICATION.

OIL FOUNT

ARA
SIG. SEC.
1101B

M-1926 MAR 1926 SEP 1925 M. APR 1924 JUN 1910

Material shall be in accordance with Specification 137.



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

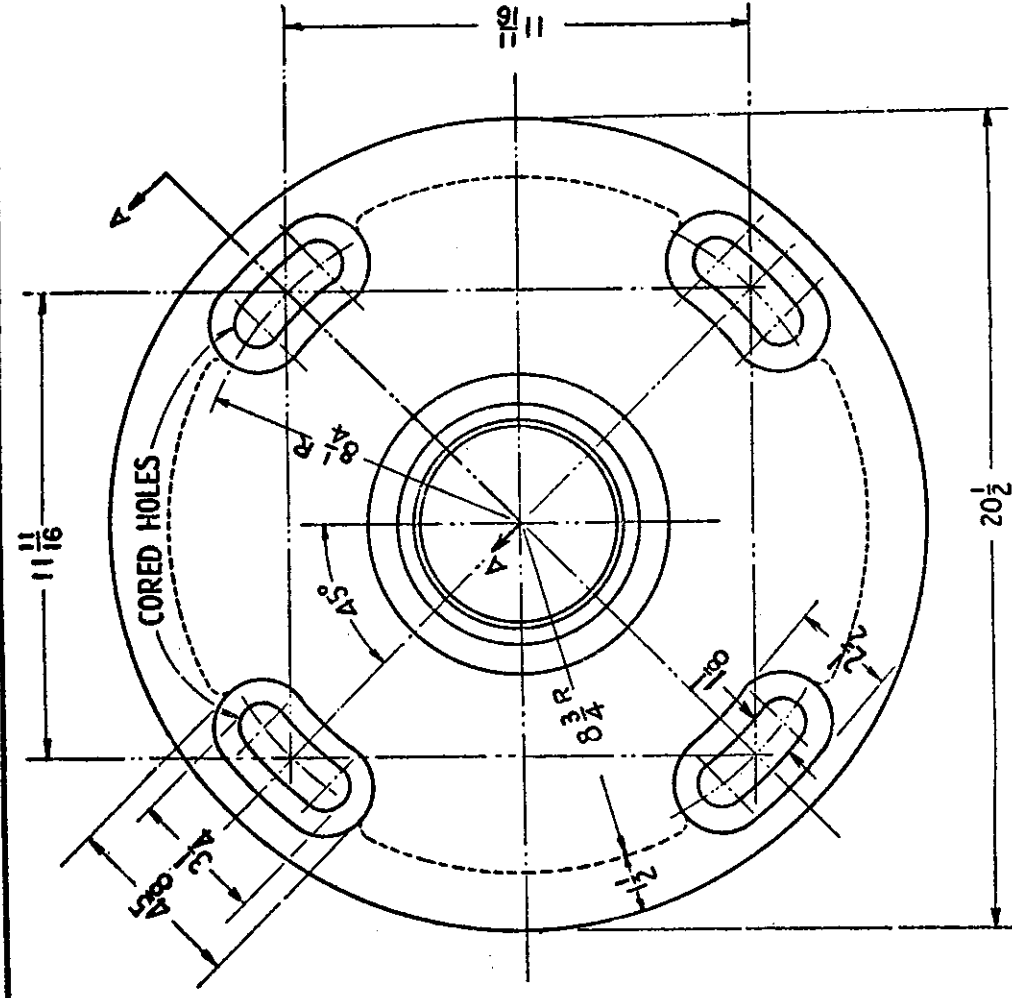
11931 BASE COMPLETE
CAST IRON

SUSPENSION BASE FOR 5-INCH MAST

AAR
SIG. SEC.
1193B

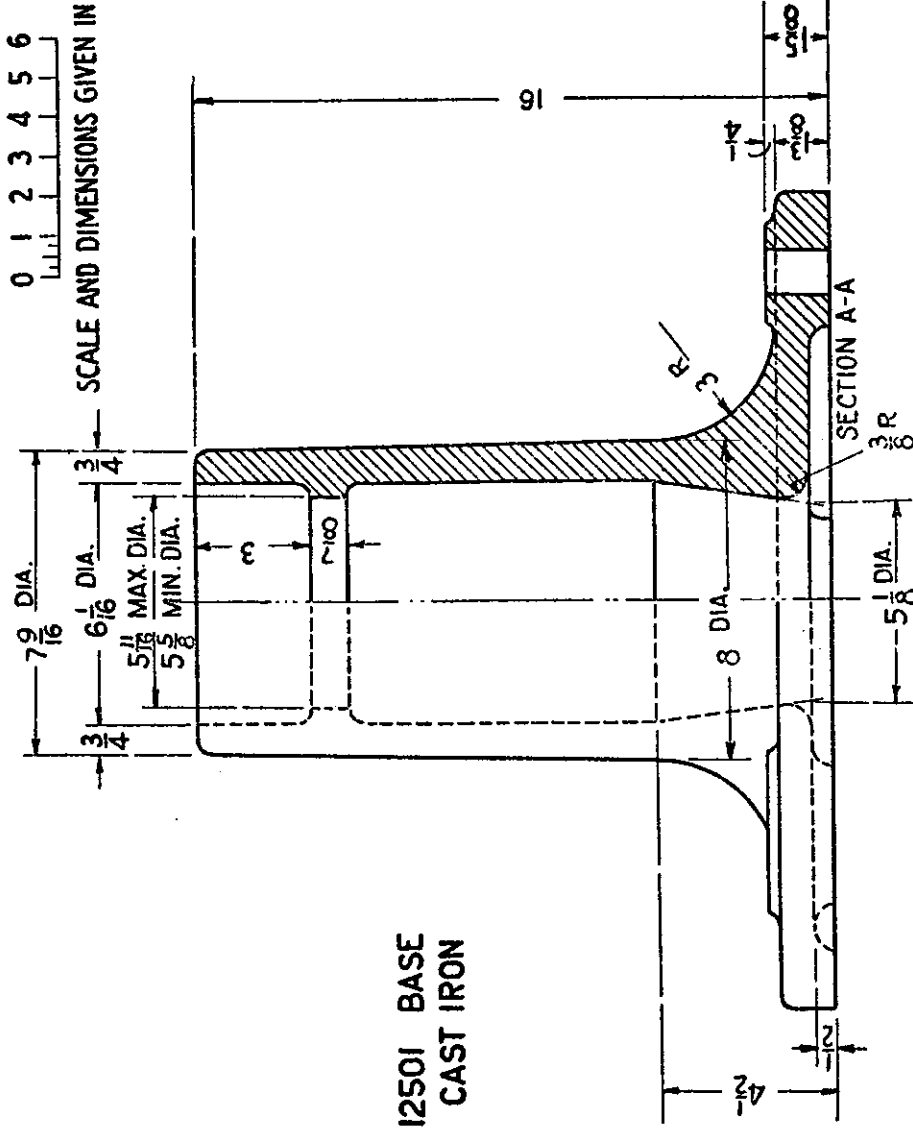
M-1941 SEP. 1941 M-1936 MAR 1936

Cast iron shall be in accordance with Specification for Gray Iron Castings.



0	1	2	3	4	5	6
0	1	2	3	4	5	6

SCALE AND DIMENSIONS GIVEN IN INCHES



**I250I BASE
CAST IRON**

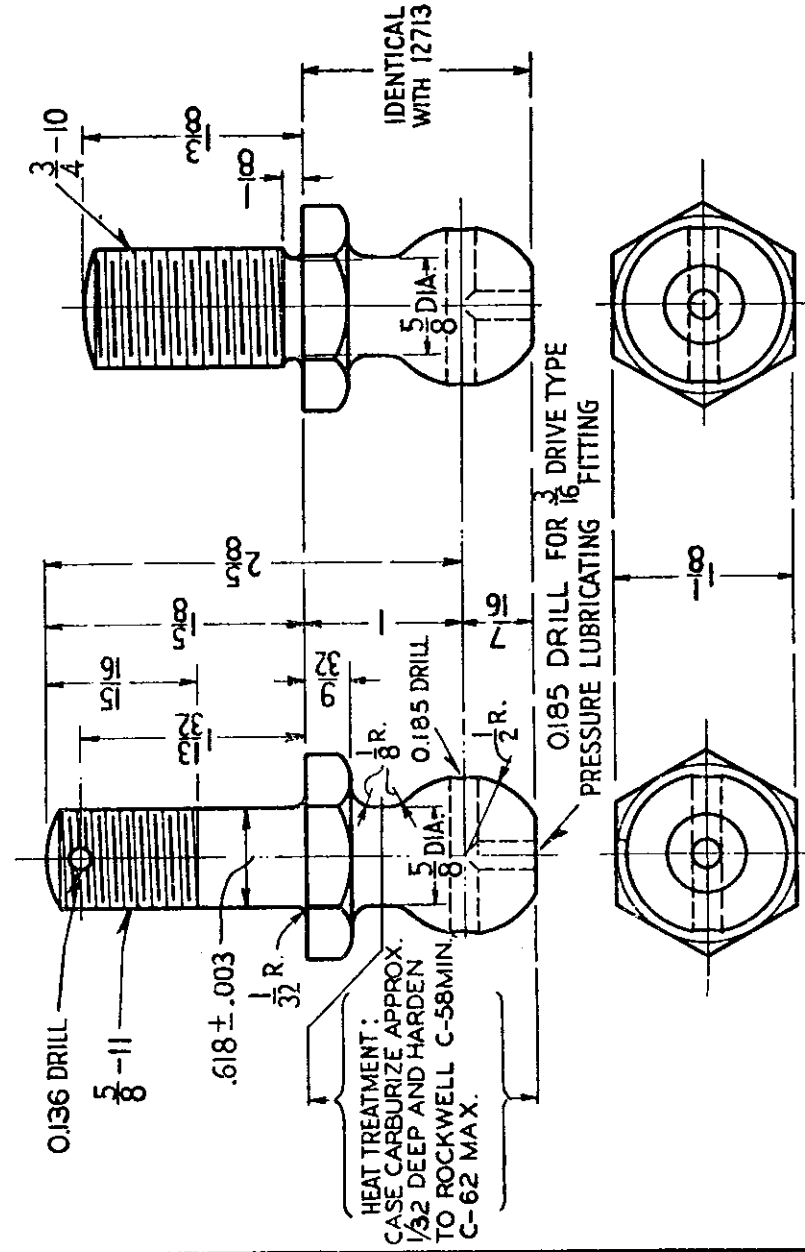
BASE FOR 5 INCH MAST

AAR
SIG.SEC.
I250B

M-1947	SEP. 1947	M-1935	MAR1935

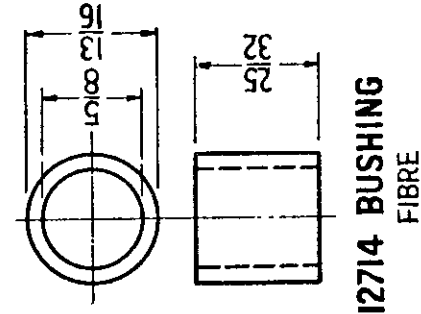
Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88.

PRINTED IN U. S. A.

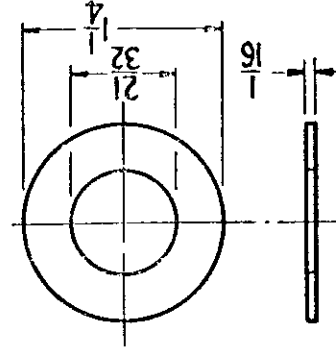


12713 INSULATING BALL STUD
C1118 STEEL

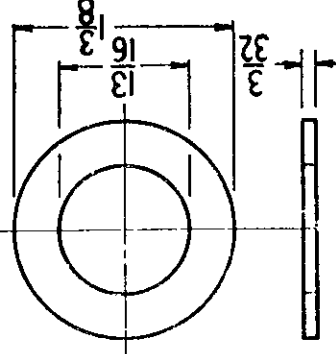
12717 NON-INSULATING BALL STUD
C1118 STEEL



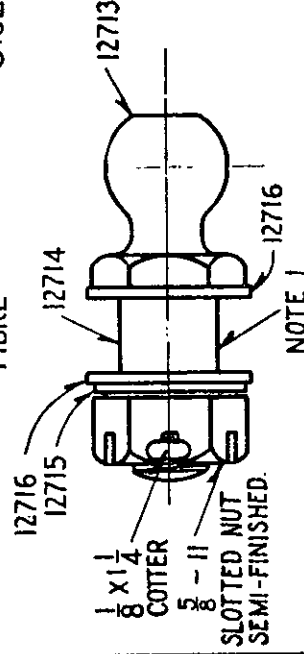
12714 BUSHING
FIBRE



12715 WASHER
C1020 STEEL



12716 WASHER
FIBRE

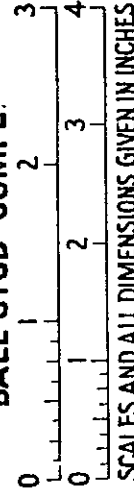


12711 INSULATING
BALL STUD COMPL.

12712 NON-INSULATING
BALL STUD COMPL.

NOTES:

1. DESIGNED FOR SWITCH CIRCUIT CONTROLLER CRANK ARM 3/8 INCH THICK, WITH 1/8 INCH REAMED HOLE FOR 12711; WITH 3/4-10 TAPPED HOLE FOR 12712.
2. NUTS, AFTER THREADS HAVE BEEN CUT, AND PLAIN WASHER SHALL BE GALVANIZED OR CADMIUM PLATED.



SCALES AND ALL DIMENSIONS GIVEN IN INCHES

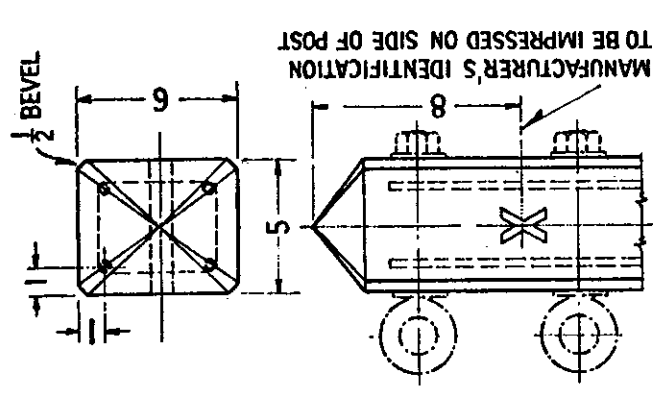
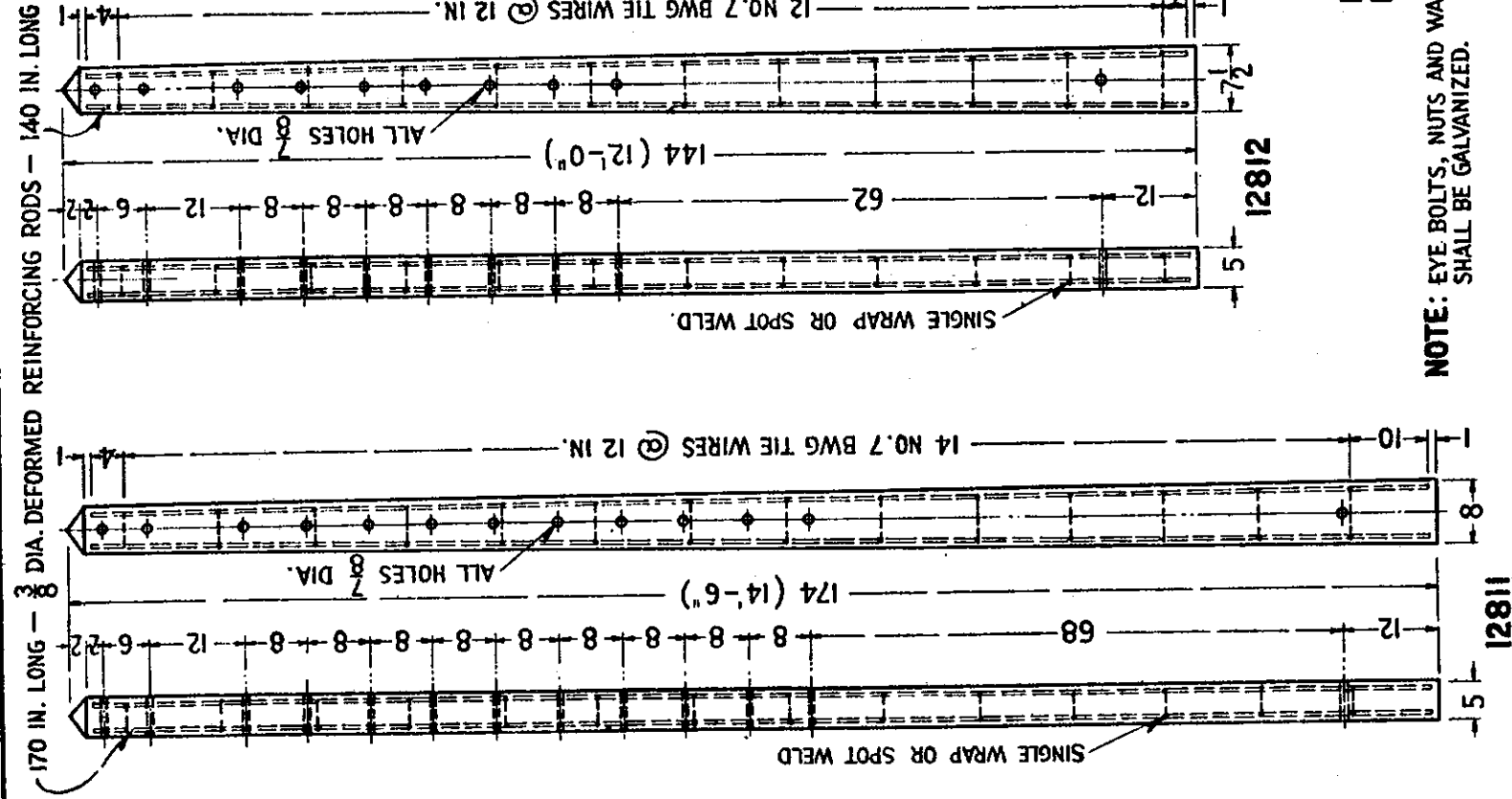
BALL STUDS

FOR SWITCH CIRCUIT CONTROLLER - DETAILS AND ASSEMBLIES

AAR
SIGSEC
1271B

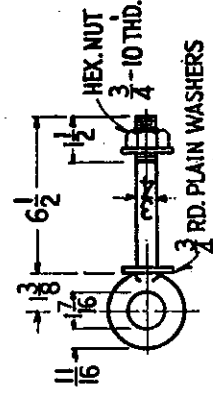
M-1952 SEP 1952 M-1940 OCT 1940

Fibre shall be in accordance with Specification 13, Manual Part 58; Spring lock washers shall be of carbon steel (A.S.A. current Specification B27.1 is preferred, where practicable); Nuts and threads shall be in accordance with Specifications for Bolts, Nuts and Threads, Manual Part 17.



VIEW AT TOP

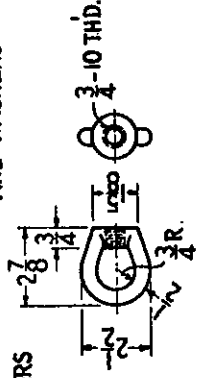
BOTTOM VIEW



SAE-1020 STEEL
DROP FORGED

12813 EYE BOLT AS SHOWN
12814 " " WITH 12815
AND WASHERS

NOTE: EYE BOLTS, NUTS AND WASHERS
SHALL BE GALVANIZED.

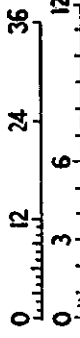


SAE-1020 STEEL
DROP FORGED

12815 EYE NUT

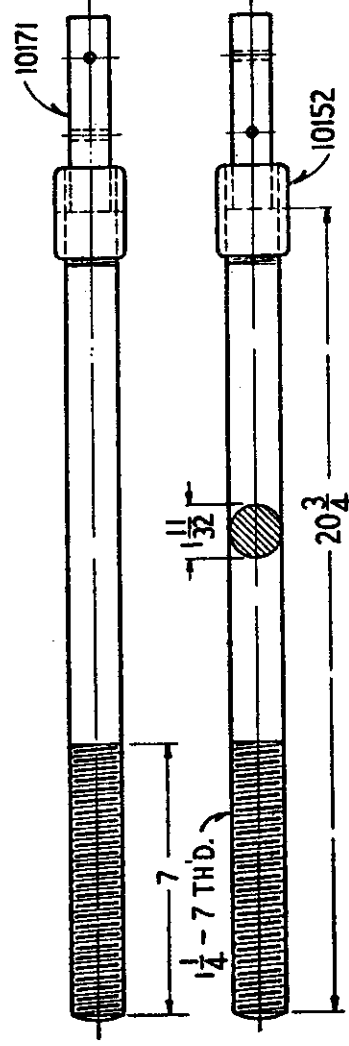
CONCRETE:

PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH AMERICAN RAILWAY
ENGINEERING ASSOCIATION SPECIFICATION SHALL BE USED.
COARSE AGGREGATE SHALL CONSIST OF 3/4 IN. MAXIMUM SIZE STONE OR GRAVEL.
NOT LESS THAN 7 SACKS OF CEMENT SHALL BE USED PER CUBIC YARD OF CONCRETE.
WATER CONTENT PER 94 LB. SACK OF CEMENT SHALL NOT EXCEED 6 GALLONS.
COMPRESSIVE STRENGTH AFTER 28 DAYS SHALL NOT BE LESS THAN 3750 LBS.
PER SQUARE INCH.
HIGH FREQUENCY VIBRATOR SHALL BE USED IN COMPACTING CONCRETE.

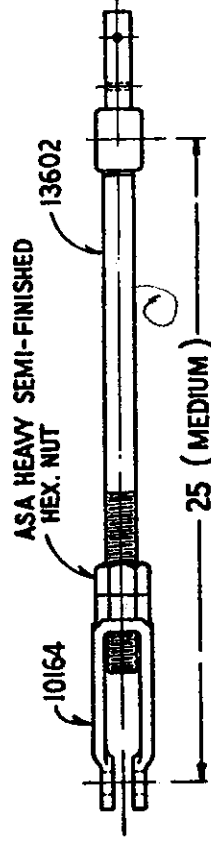


SCALES & ALL DIMENSIONS GIVEN IN INCHES

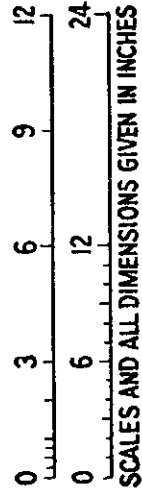
CONCRETE POSTS



13602 STRAIGHT THREADED TANG END
SAE - 1020 STEEL



13605 STRAIGHT TANG END WITH SCREW JAW

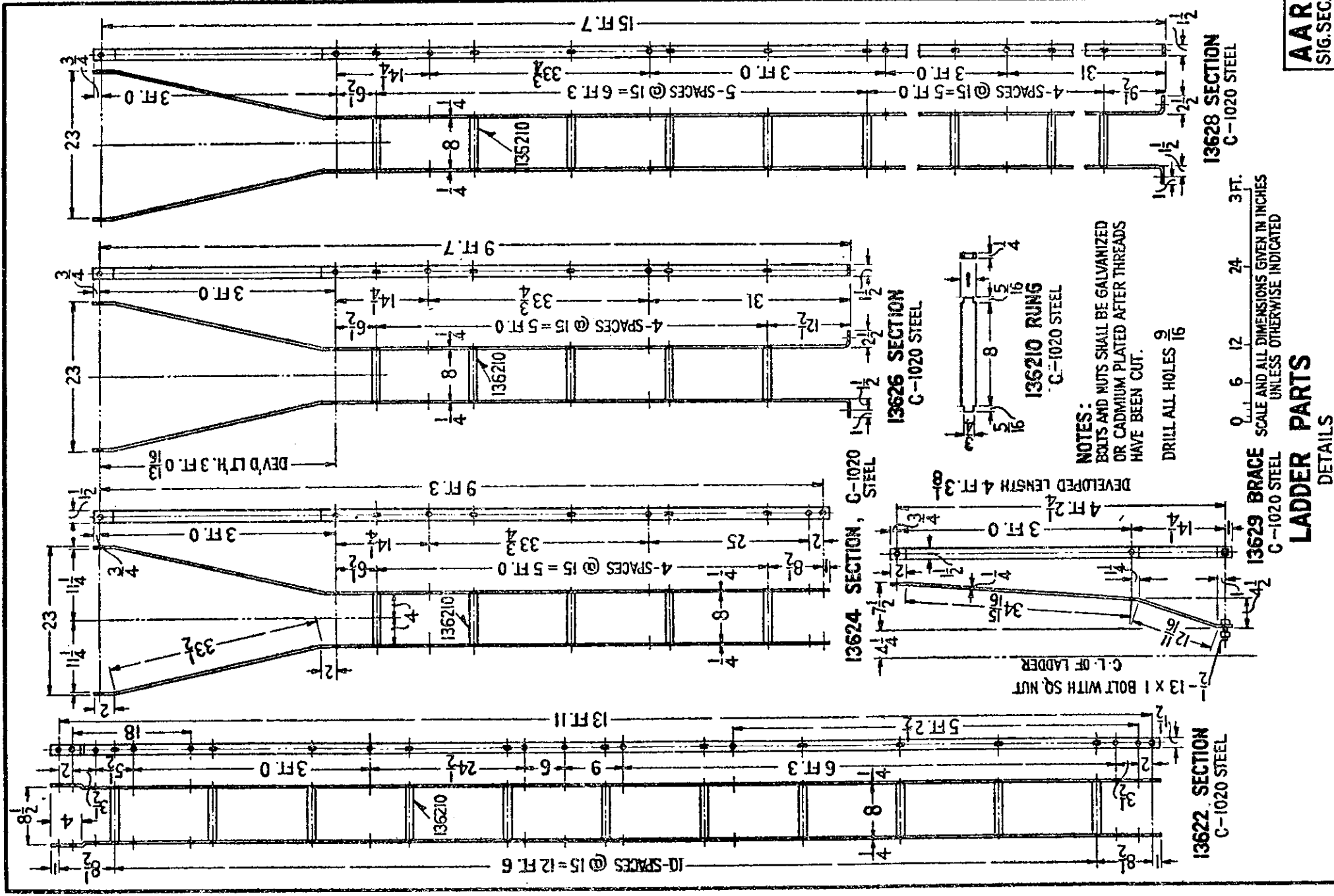


TANG END WITH SCREW JAW

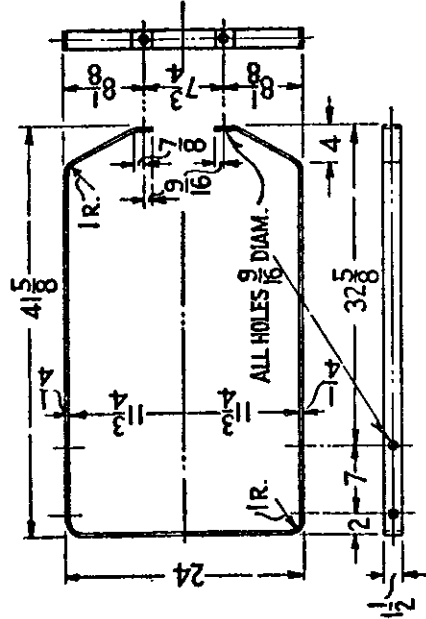
AAR
SIG. SEC.

1360B

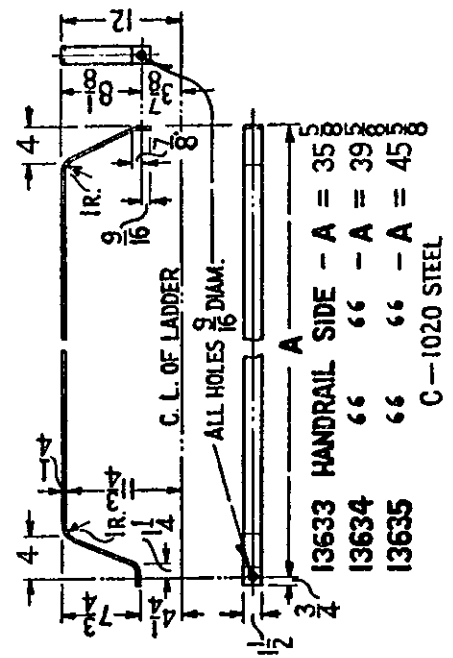
M-1941 SEP. 1941 DEC. 1915 SEP. 1915 MAY 1915



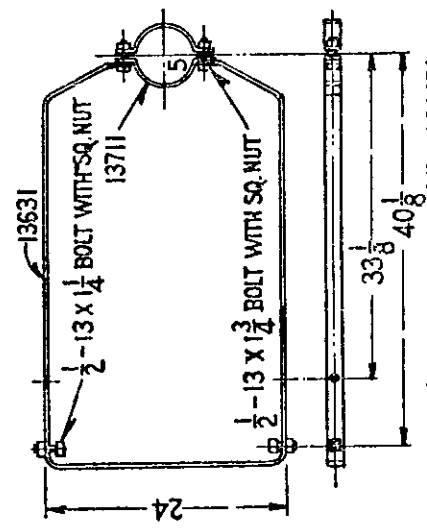
Painting shall be in accordance with Specification 120, Manual Part 110;
Bolts, nuts and threads shall be in accordance with Specification for Bolts,
Nuts and Threads, Manual Part 17.



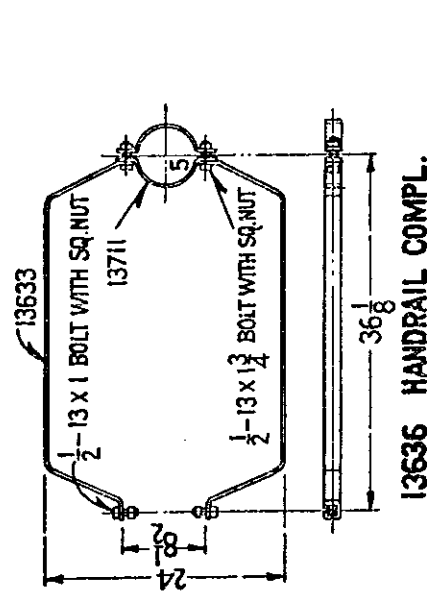
13631 TOP HANDRAIL
C-1020 STEEL



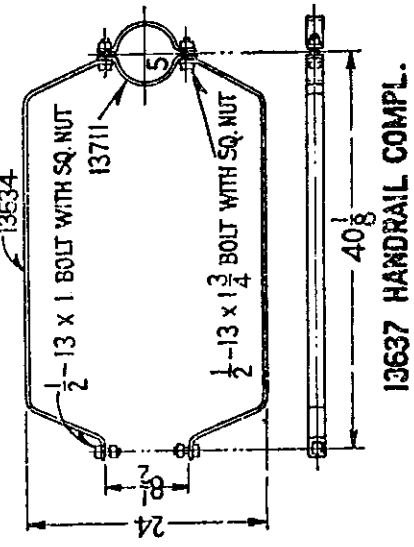
13633 HANDRAIL SIDE - A = 35 3/8
13634 " " - A = 39 1/8
13635 " " - A = 45 3/8
C-1020 STEEL



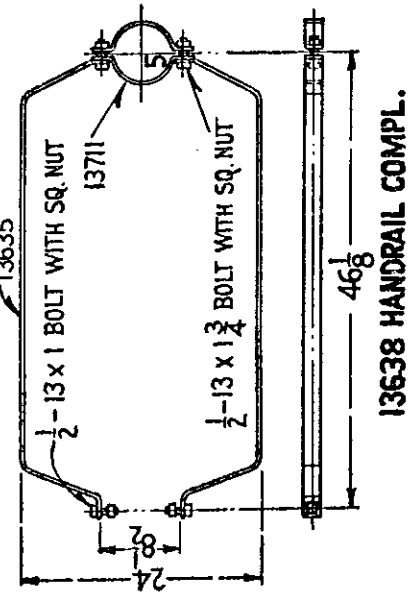
13632 TOP HANDRAIL COMPL.



13636 HANDRAIL COMPL.



13637 HANDRAIL COMPL.



13638 HANDRAIL COMPL.

NOTE: BOLTS AND NUTS SHALL BE GALVANIZED OR CADMIUM PLATED AFTER THREADS HAVE BEEN CUT.

0 3 6 9 12 24 36
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

LADDER HANDRAILS DETAILS AND ASSEMBLIES

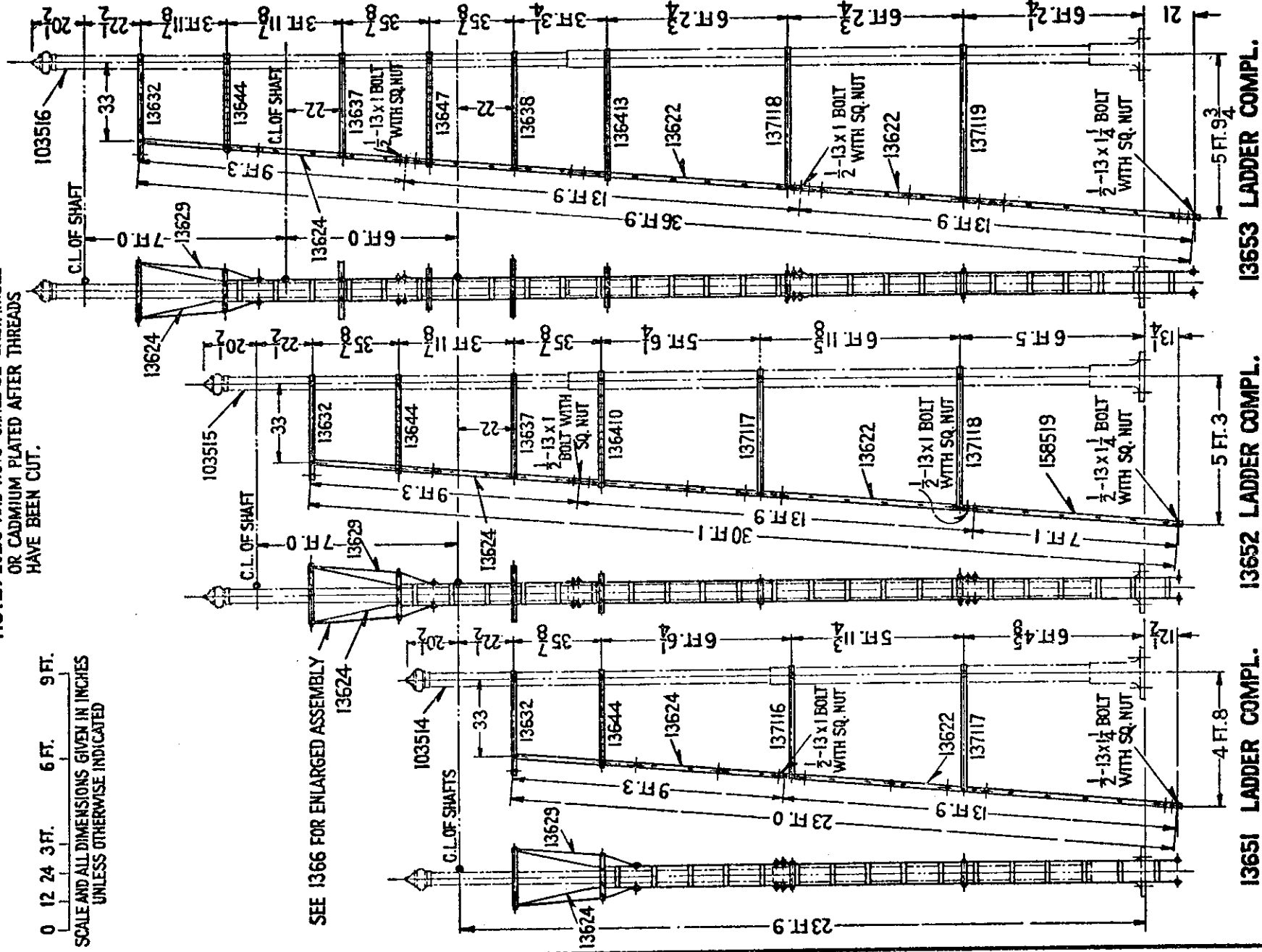
AAR
SIG. SEC.
1363C

M-1948 SEP. 1948 M-1941 SEP. 1941 MAR. 1918

Painting shall be in accordance with Specification 120, Manual Part 110;
Bolts, nuts and threads shall be in accordance with Specification for Bolts,
Nuts and Threads, Manual Part 17.

NOTE: BOLTS AND NUTS SHALL BE GALVANIZED
OR CADMIUM PLATED AFTER THREADS
HAVE BEEN CUT.

0 12 24 3 FT. 6 FT. 9 FT.
SCALE AND ALL DIMENSIONS GIVEN IN INCHES
UNLESS OTHERWISE INDICATED

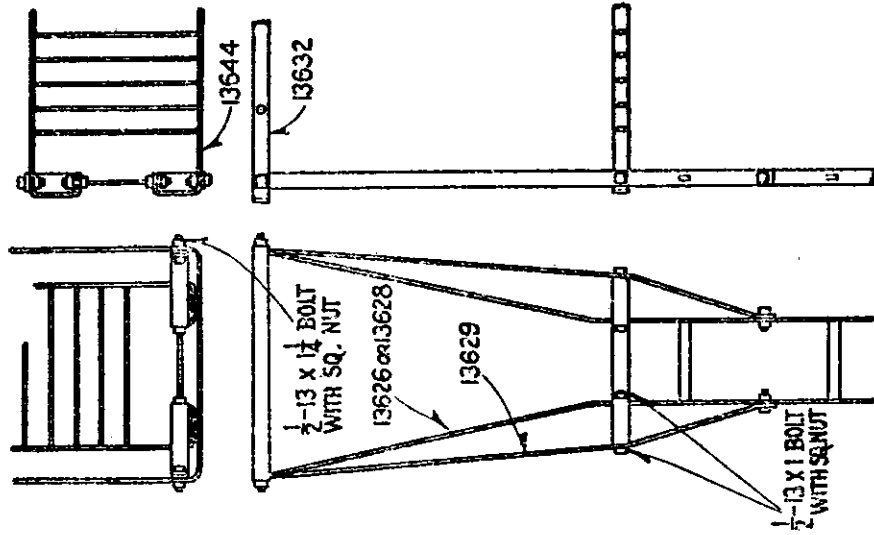


LADDERS FOR GROUND MASTS WITH PLATFORMS - ASSEMBLIES

AAR
SIG. SEC.
1365D

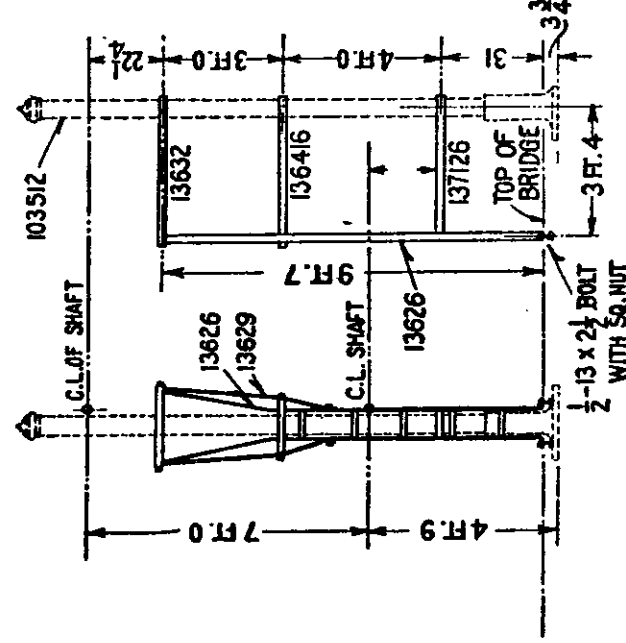
M-1948 [SEP. 1948] M-1941 [SEP. 1941] M-1936 [MAR. 1936] MAR. 1918 JUN. 1917 MAR. 1917

Bolts, nuts and threads shall be in accordance with Specification for Bolts,
Nuts and Threads, Manual Part 17.

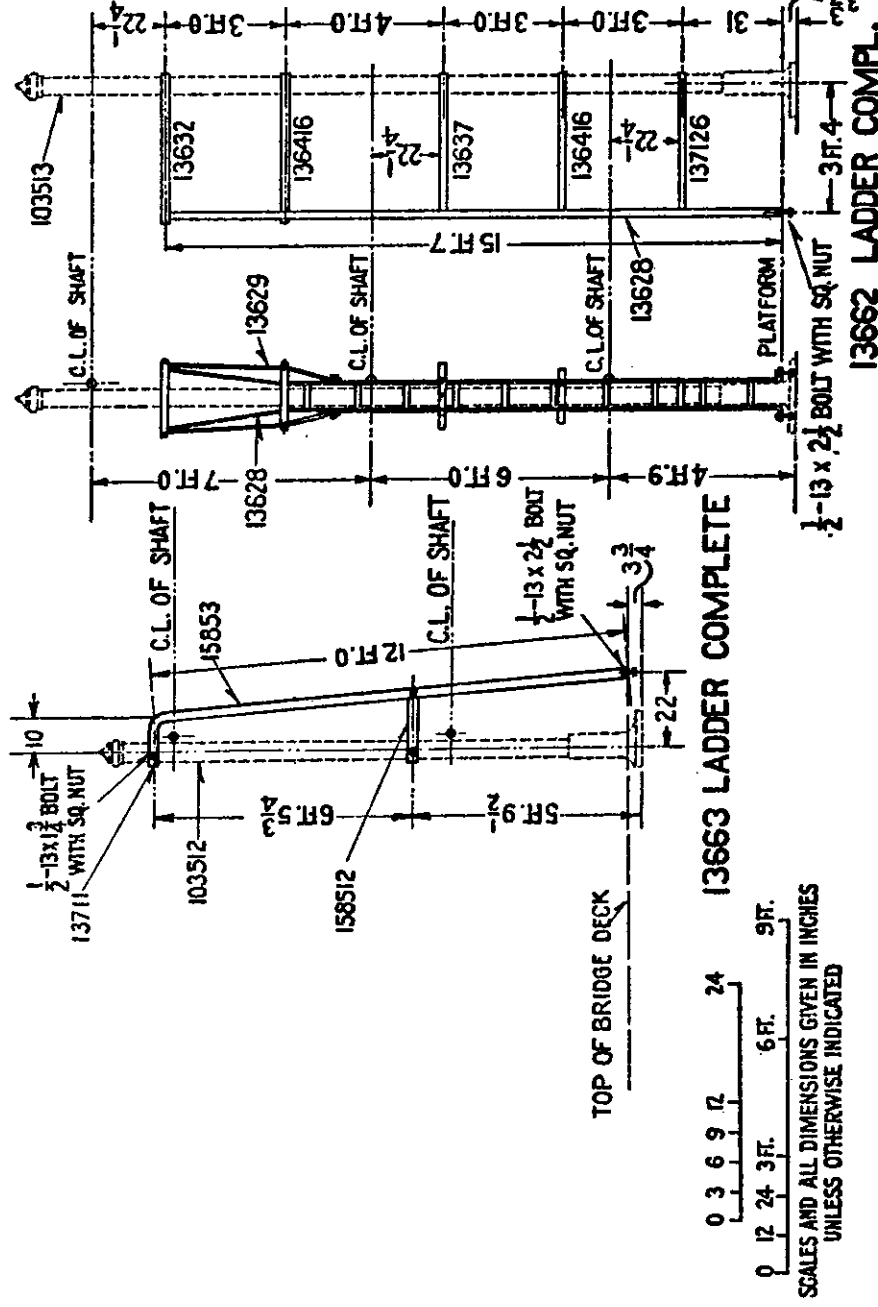


ENLARGED ASSEMBLY

NOTE: BOLTS AND NUTS SHALL BE GALVANIZED OR CADMIUM PLATED AFTER THREADS HAVE BEEN CUT.

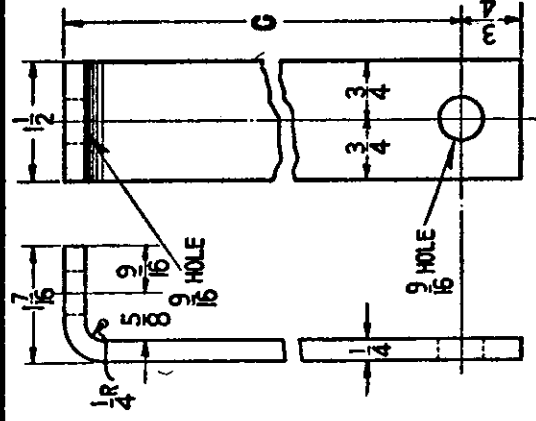


13661 LADDER COMPLETE



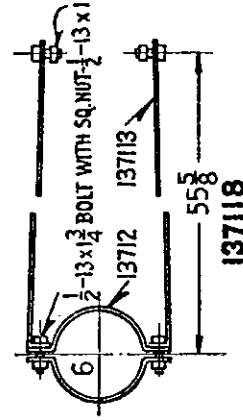
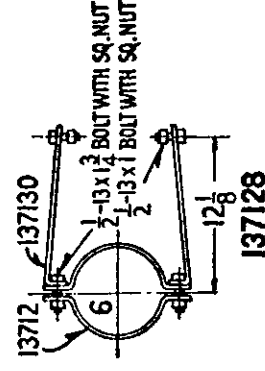
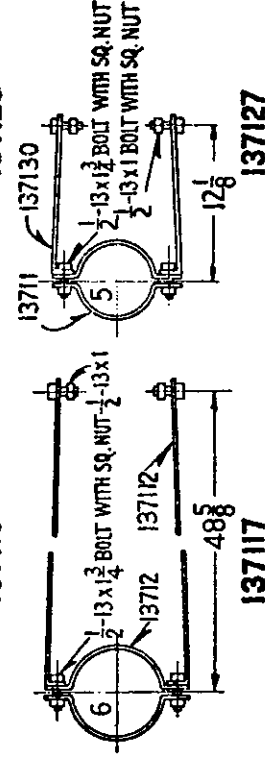
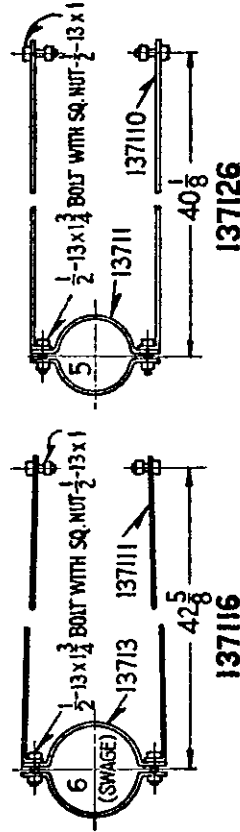
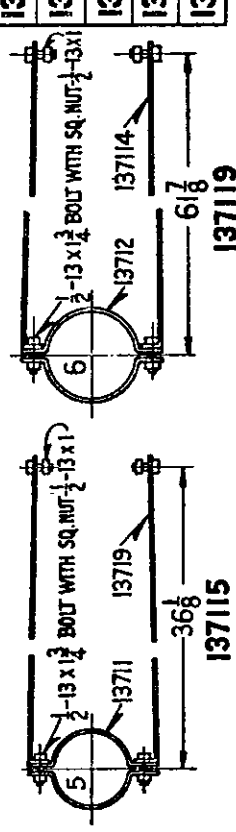
13662 LADDER COMPLETE

0 3 6 9 12 24 36 48 60 72 84 96 108 120 132 144 156 168 180 192 204 216 228 240 252 264 276 288 300 312 324 336 348 360 372 384 396 408 420 432 444 456 468 480 492 504 516 528 540 552 564 576 588 600 612 624 636 648 660 672 684 696 708 720 732 744 756 768 780 792 804 816 828 840 852 864 876 888 900 912 924 936 948 960 972 984 996 1008 1020 1032 1044 1056 1068 1080 1092 1104 1116 1128 1140 1152 1164 1176 1188 1200 1212 1224 1236 1248 1260 1272 1284 1296 1308 1320 1332 1344 1356 1368 1380 1392 1404 1416 1428 1440 1452 1464 1476 1488 1500 1512 1524 1536 1548 1560 1572 1584 1596 1608 1620 1632 1644 1656 1668 1680 1692 1704 1716 1728 1740 1752 1764 1776 1788 1800 1812 1824 1836 1848 1860 1872 1884 1896 1908 1920 1932 1944 1956 1968 1980 1992 2004 2016 2028 2040 2052 2064 2076 2088 2100 2112 2124 2136 2148 2160 2172 2184 2196 2208 2220 2232 2244 2256 2268 2280 2292 2304 2316 2328 2340 2352 2364 2376 2388 2400 2412 2424 2436 2448 2460 2472 2484 2496 2508 2520 2532 2544 2556 2568 2580 2592 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5004 5016 5028 5040 5052 5064 5076 5088 5100 5112 5124 5136 5148 5160 5172 5184 5196 5208 5220 5232 5244 5256 5268 5280 5292 5304 5316 5328 5340 5352 5364 5376 5388 5400 5412 5424 5436 5448 5460 5472 5484 5496 5508 5520 5532 5544 5556 5568 5580 5592 5604 5616 5628 5640 5652 5664 5676 5688 5700 5712 5724 5736 5748 5760 5772 5784 5796 5808 5820 5832 5844 5856 5868 5880 5892 5904 5916 5928 5940 5952 5964 5976 5988 6000 6012 6024 6036 6048 6060 6072 6084 6096 6108 6120 6132 6144 6156 6168 6180 6192 6204 6216 6228 6240 6252 6264 6276 6288 6300 6312 6324 6336 6348 6360 6372 6384 6396 6408 6420 6432 6444 6456 6468 6480 6492 6504 6516 6528 6540 6552 6564 6576 6588 6600 6612 6624 6636 6648 6660 6672 6684 6696 6708 6720 6732 6744 6756 6768 6780 6792 6804 6816 6828 6840 6852 6864 6876 6888 6900 6912 6924 6936 6948 6960 6972 6984 6996 7008 7020 7032 7044 7056 7068 7080 7092 7104 7116 7128 7140 7152 7164 7176 7188 7200 7212 7224 7236 7248 7260 7272 7284 7296 7308 7320 7332 7344 7356 7368 7380 7392 7404 7416 7428 7440 7452 7464 7476 7488 7500 7512 7524 7536 7548 7560 7572 7584 7596 7608 7620 7632 7644 7656 7668 7680 7692 7704 7716 7728 7740 7752 7764 7776 7788 7800 7812 7824 7836 7848 7860 7872 7884 7896 7908 7920 7932 7944 7956 7968 7980 7992 8004 8016 8028 8040 8052 8064 8076 8088 8100 8112 8124 8136 8148 8160 8172 8184 8196 8208 8220 8232 8244 8256 8268 8280 8292 8304 8316 8328 8340 8352 8364 8376 8388 8400 8412 8424 8436 8448 8460 8472 8484 8496 8508 8520 8532 8544 8556 8568 8580 8592 8604 8616 8628 8640 8652 8664 8676 8688 8700 8712 8724 8736 8748 8760 8772 8784 8796 8808 8820 8832 8844 8856 8868 8880 8892 8904 8916 8928 8940 8952 8964 8976 8988 9000 9012 9024 9036 9048 9060 9072 9084 9096 9108 9120 9132 9144 9156 9168 9180 9192 9204 9216 9228 9240 9252 9264 9276 9288 9300 9312 9324 9336 9348 9360 9372 9384 9396 9408 9420 9432 9444 9456 9468 9480 9492 9504 9516 9528 9540 9552 9564 9576 9588 9600 9612 9624 9636 9648 9660 9672 9684 9696 9708 9720 9732 9744 9756 9768 9780 9792 9804 9816 9828 9840 9852 9864 9876 9888 9900 9912 9924 9936 9948 9960 9972 9984 9996 10008 10020 10032 10044 10056 10068 10080 10092 10104 10116 10128 10140 10152 10164 10176 10188 10200 10212 10224 10236 10248 10260 10272 10284 10296 10308 10320 10332 10344 10356 10368 10380 10392 10404 10416 10428 10440 10452 10464 10476 10488 10500 10512 10524 10536 10548 10560 10572 10584 10596 10608 10620 10632 10644 10656 10668 10680 10692 10704 10716 10728 10740 10752 10764 10776 10788 10800 10812 10824 10836 10848 10860 10872 10884 10896 10908 10920 10932 10944 10956 10968 10980 10992 11004 11016 11028 11040 11052 11064 11076 11088 11100 11112 11124 11136 11148 11160 11172 11184 11196 11208 11220 11232 11244 11256 11268 11280 11292 11304 11316 11328 11340 11352 11364 11376 11388 11400 11412 11424 11436 11448 11460 11472 11484 11496 11508 11520 11532 11544 11556 11568 11580 11592 11604 11616 11628 11640 11652 11664 11676 11688 11700 11712 11724 11736 11748 11760 11772 11784 11796 11808 11820 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17808 17820 17832 17844 17856 17868 17880 17892 17904 17916 17928 17940 17952 17964 17976 17988 18000 18012 18024 18036 18048 18060 18072 18084 18096 18108 18120 18132 18144 18156 18168 18180 18192 18204 18216 18228 18240 18252 18264 18276 18288 18300 18312 18324 18336 18348 18360 18372 18384 18396 18408 18420 18432 18444 18456 18468 18480 18492 18504 18516 18528 18540 18552 18564 18576 18588 18600 18612 18624 18636 18648 18660 18672 18684 18696 18708 18720 18732 18744 18756 18768 18780 18792 18804 18816 18828 18840 18852 18864 18876 18888 18900 18912 18924 18936 18948 18960 18972 18984 18996 19008 19020 19032 19044 19056 19068 19080 19092 19104 19116 19128 19140 19152 19164 19176 19188 19200 19212 19224 19236 19248 19260 19272 19284 19296 19308 19320 19332 19344 19356 19368 19380 19392 19404 19416 19428 19440 19452 19464 19476 19488 19500 19512 19524 19536 19548 19560 19572 19584 19596 19608 19620 19632 19644 19656 19668 19680 19692 19704 19716 19728 19740 19752 19764 19776 19788 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23784 23796 23808 23820 23832 23844 23856 23868 23880 23892 23904 23916 23928 23940 23952 23964 23976 23988 24000 24012 24024 24036 24048 24060 24072 24084 24096 24108 24120 24132 24144 24156 24168 24180 24192 24204 24216 24228 24240 24252 24264 24276 24288 24300 24312 24324 24336 24348 24360 24372 24384 24396 24408 24420 24432 24444 24456 24468 24480 24492 24504 24516 24528 24540 24552 24564 24576 24588 24600 24612 24624 24636 24648 24660 24672 24684 24696 24708 24720 24732 24744 24756 24768 24780 24792 24804 24816 24828 24840 24852 24864 24876 24888 24900 24912 24924 24936 24948 24960 24972 24984 24996 25008 25020 25032 25044 25056 25068 25080 25092 25104 25116 25128 25140 25152 25164 25176 25188 25200 25212 25224 25236 25248 25260 25272 25284 25296 25308 25320 25



REF. NO.	NAME	PIPE (SIZE)	A	B
13711	STAY CLAMP	5	2 ³ / ₄	7 ³ / ₄
13712	" "	6	3 ⁵ / ₁₆	8 ⁷ / ₈
13713	" "	6 (SWAGE)	3 ¹ / ₁₆	8 ³ / ₈

REF.NO	NAME	C
13719	STAY SIDE	35
137110	“ “	39
137111	“ “	42
137112	“ “	48
137113	“ “	55
137114	“ “	61
137130	“ “	11



13713

137130

12 1/8

137129

6

1

1 1/2 - 13 x 1 1/4 BOLT WITH SQ NUT

1 1/2 - 13 x 1 BOLT WITH SQ NUT

(SWAGE)

137129

DETAILS AND ASSEMBLIES

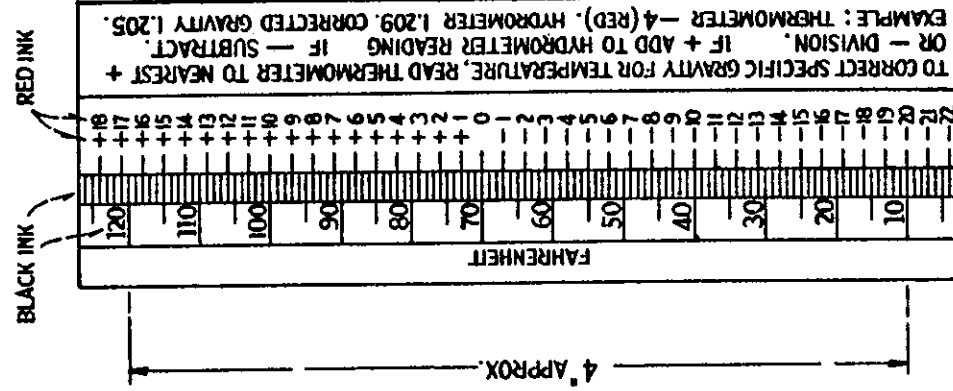
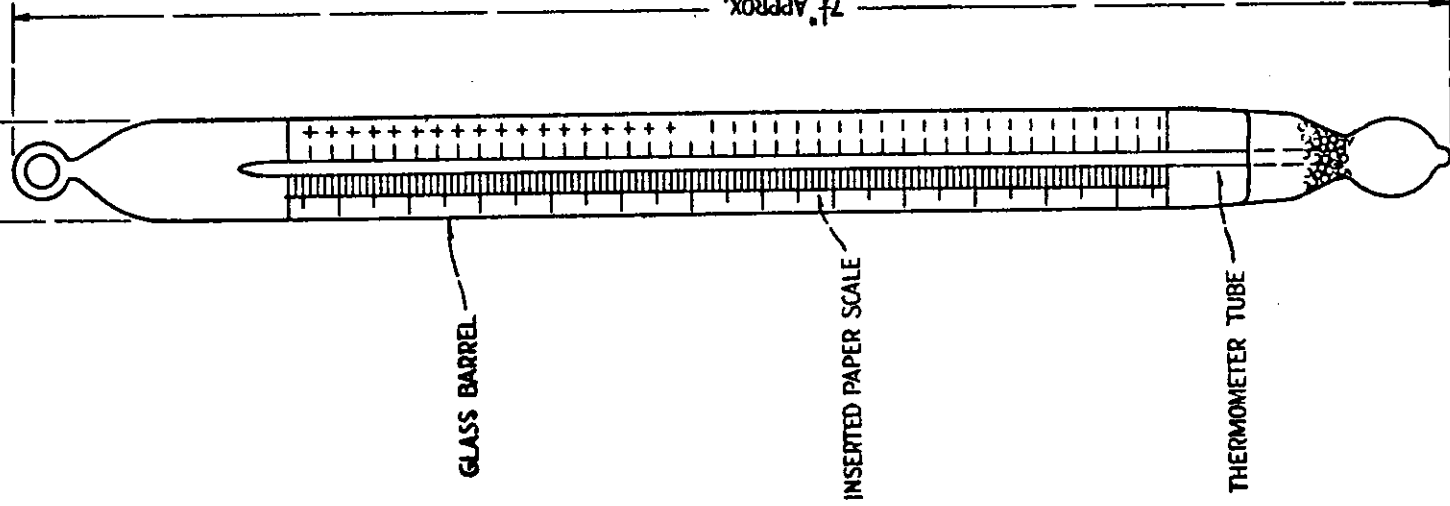
AAR
SIG.SEC.

1371D

1371D

Painting shall be in accordance with Specification 120, Manual Part 110; Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17.

$\frac{1}{2}$ " ROUND, APPROX.



DETAIL OF SCALE

NOTE:

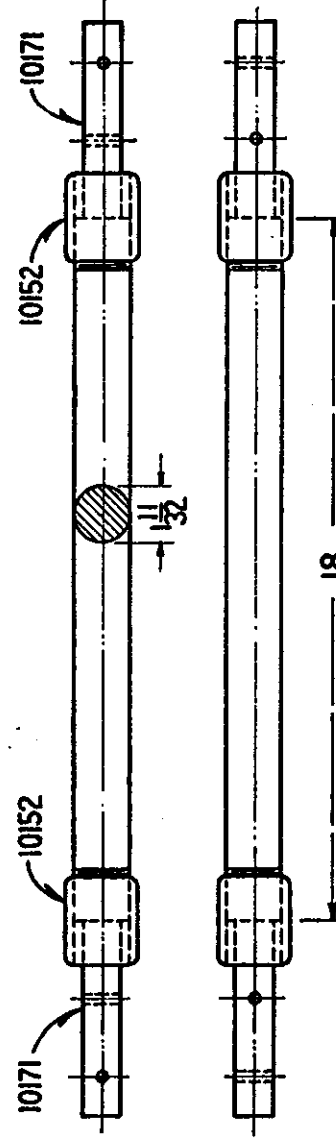
THERMOMETER SHALL BE ACCURATE WITHIN THREE (3) DEGREES.
SCALE SHALL BE FIRMLY FIXED IN PLACE SO THAT IT CANNOT
CHANGE POSITION IN RELATION TO THERMOMETER TUBE
THERMOMETER SHALL BE WEIGHTED SO THAT IT WILL JUST
FLOAT IN AN UPRIGHT POSITION IMMERSUED TO AT LEAST
TOP OF SCALE IN WATER AT 70° F.
THERMOMETER SHALL BE FURNISHED IN TUBULAR CONTAINER
WITH TELESCOPE COVER.
THE LIQUID USED IN THERMOMETER SHALL BE MERCURY.

13752 - THERMOMETER

THERMOMETER
LEAD TYPE STORAGE BATTERY

AAR
SIG.SEC.
1375B

M-1935 MAR 1935 NOV 1917 OCT 1917



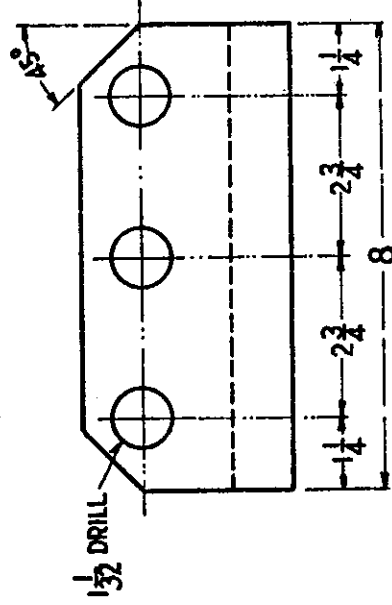
13761 STRAIGHT ROD WITH TANG ENDS
SAE - 1020 STEEL

0 1 2 3 6 9 12
SCALE & ALL DIMENSIONS GIVEN IN INCHES

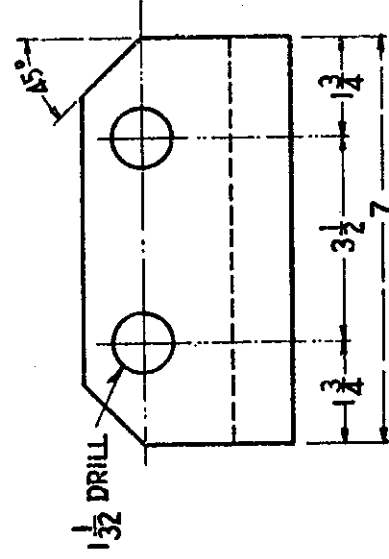
DOUBLE TANG END

AAR
SIG. SEC.
1376B

M-1942 OCT. 1942 MAR 1918



13831 FOR $\frac{3}{4}$, 1 OR $1\frac{1}{8}$ INCH PLATE



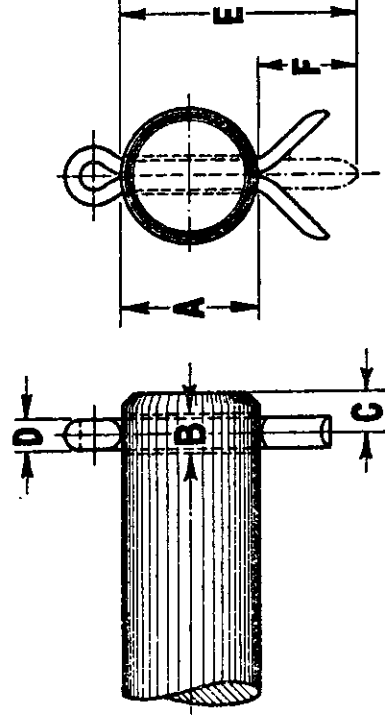
13832 FOR $\frac{3}{4}$, 1 OR $1\frac{1}{8}$ INCH PLATE

0 1 2 3 4 5 6
SCALE & ALL DIMENSIONS GIVEN IN INCHES

BUTT END PLATES INSULATED GAGE PLATES

AAR
SIG. SEC.
1383A

M-1942 OCT. 1942

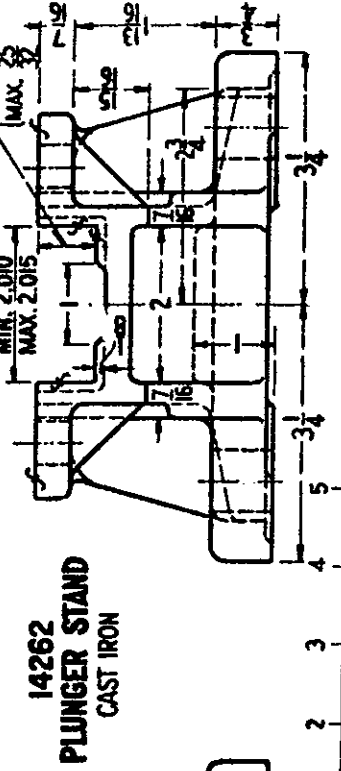
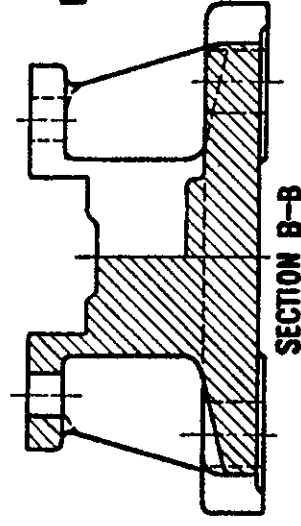
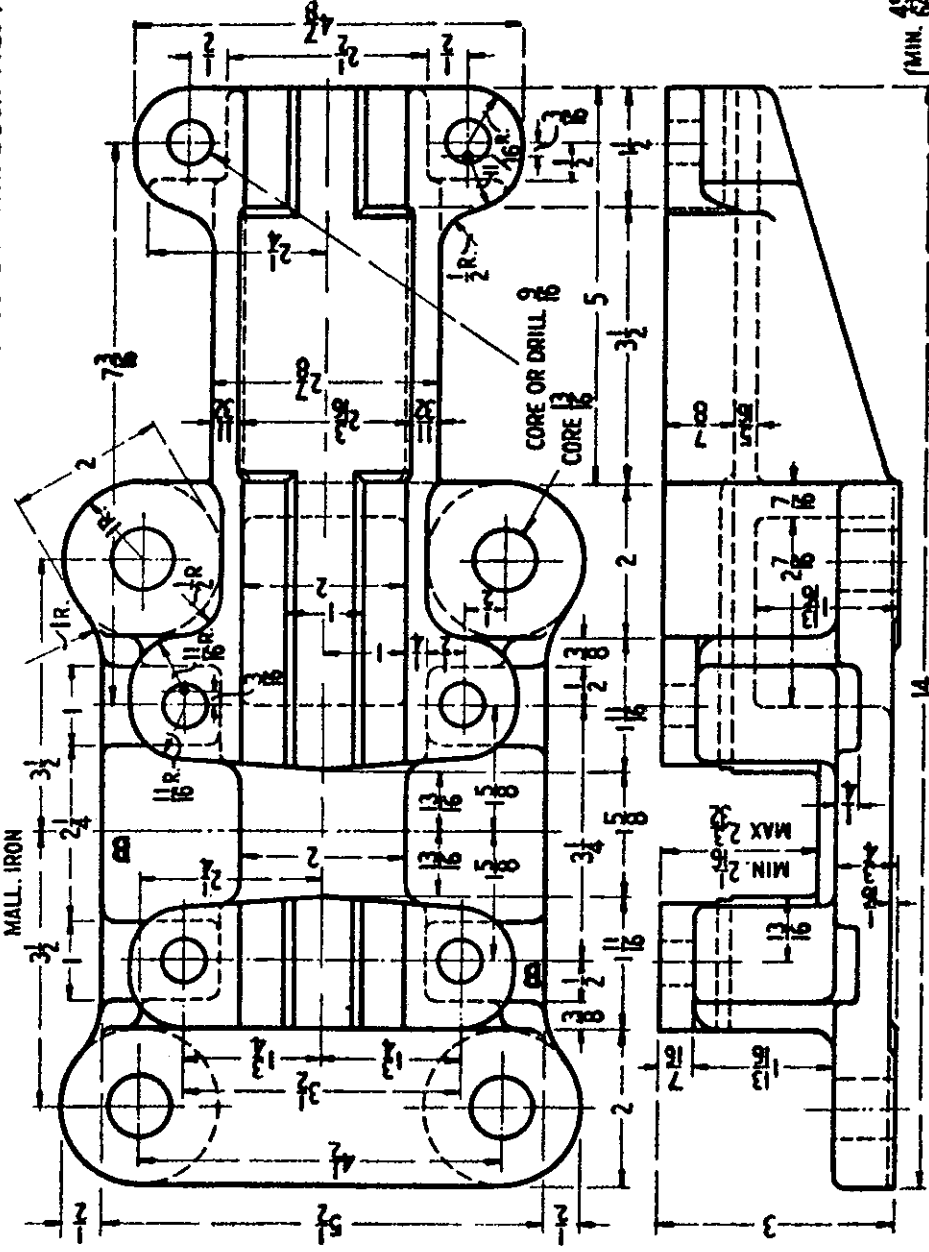
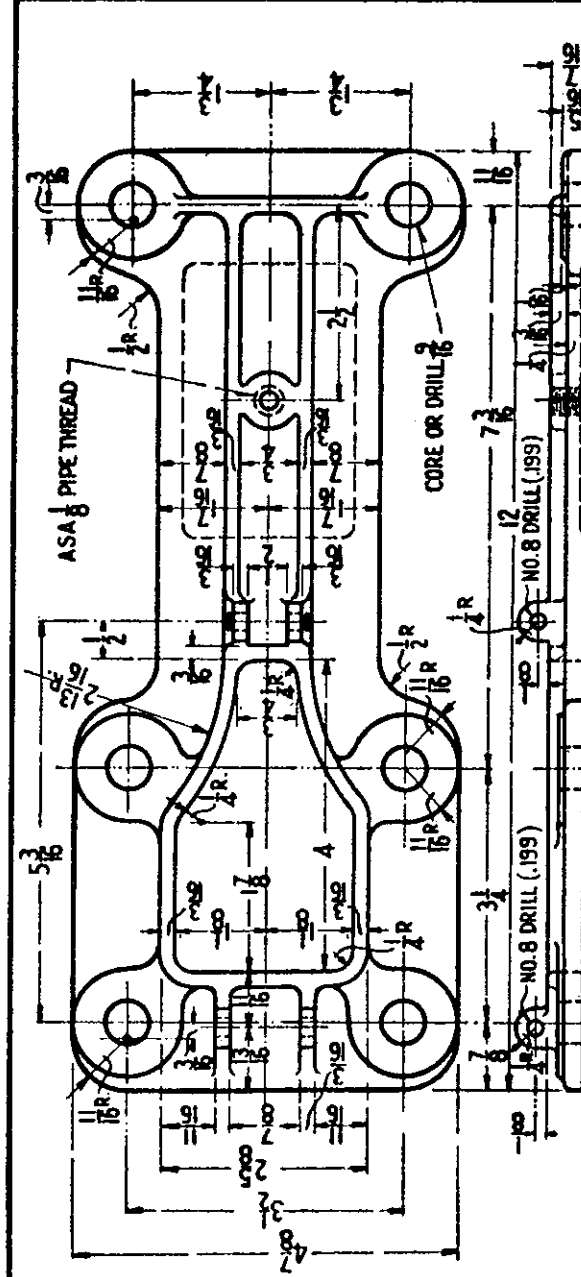


NOTE: FIGURES SHOWN IN THE TABLE ARE IN INCHES EXCEPT AS NOTED.

SIZE OF PIN - SHAFT OR BOLT				COTTER REQUIRED				
A	B		C	D		E	F	CLEARANCE BETWEEN HOLE AND COTTER (B-D)
	DRILL NO. OR SIZE	DECIMAL EQUIVALENT		NOMINAL	ACTUAL			
DIAMETER	OF COTTER HOLE		LOCATION OF COTTER HOLE		A.S.B. W. GAUGE	DECIMAL EQUIVALENT	LENGTH OVER DIAMETER OF SHAFT (E-A)	
			MAXIMUM (REQ.)	MINIMUM (UNWEIGHTED)				
1/8			3/32	5/64				
3/16	No 49	.073	1/8	3/32	No 16	.063	3/8	.010
1/4	No 49	.073	1/8	3/32	No 16	.063	1/2	.010
5/16	No 29	.136	3/16	5/32	No 11	.121	3/4	.015
3/8	No 29	.136	3/16	5/32	No 11	.121	3/4	.015
7/16	No 29	.136	3/16	5/32	No 11	.121	3/4	.015
1/2	No 8	.199	1/4	3/16	No 7	.177	1	.022
5/8	No 8	.199	1/4	3/16	No 7	.177	1 1/4	.022
3/4	No 8	.199	1/4	3/16	No 7	.177	1 1/4	.022
7/8	No 8	.199	1/4	3/16	No 7	.177	1 1/2	.022
1	1/4	.250	3/8	5/16	No 4	.225	1 3/4	.025
1 1/8	1/4	.250	3/8	5/16	No 4	.225	1 3/4	.025
1 1/4	1/4	.250	3/8	5/16	No 4	.225	2	.025
1 1/2	5/16	.313	1/2	3/8	No 1	.283	2	.030
1 3/4	5/16	.313	1/2	3/8	No 1	.283	2 1/2	.030
2	5/16	.313	1/2	3/8	No 1	.283	2 3/4	.030
2 1/4	3/4	.390	5/8	7/8	No 3/8	.363	3	.027
2 1/2	3/4	.390	5/8	7/8	No 3/8	.363	3 1/4	.027
2 3/4	1 1/2	.469	3/4	5/8	No 5/8	.430	3 3/4	.039
3	1 1/2	.469	3/4	5/8	No 5/8	.430	4	.039
3 1/4	1 3/4	.500	7/8	3/4	No 6/8	.460	5	.040
3 1/2	1 3/4	.500	7/8	3/4	No 6/8	.460	5	.040
3 3/4	2	.625	1	7/8		.590	6	.035
4	2	.625	1	7/8		.590	6	.035

COTTERS

(SIZE - DRILLING - LOCATION)



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

PLUNGER SWITCH LOCK — DETAILS

RECTANGULAR PLUNGER

AAR
SIG. SEC.

1426D

M-1940	OCT. 1940	MAN-1936	MAR. 1936	MAN-1926	SEP. 1924	JUN. 1921

Cast iron shall be in accordance with Specification for Gray Iron Castings. Malleable iron shall be in accordance with Specification for Malleable Iron Castings.

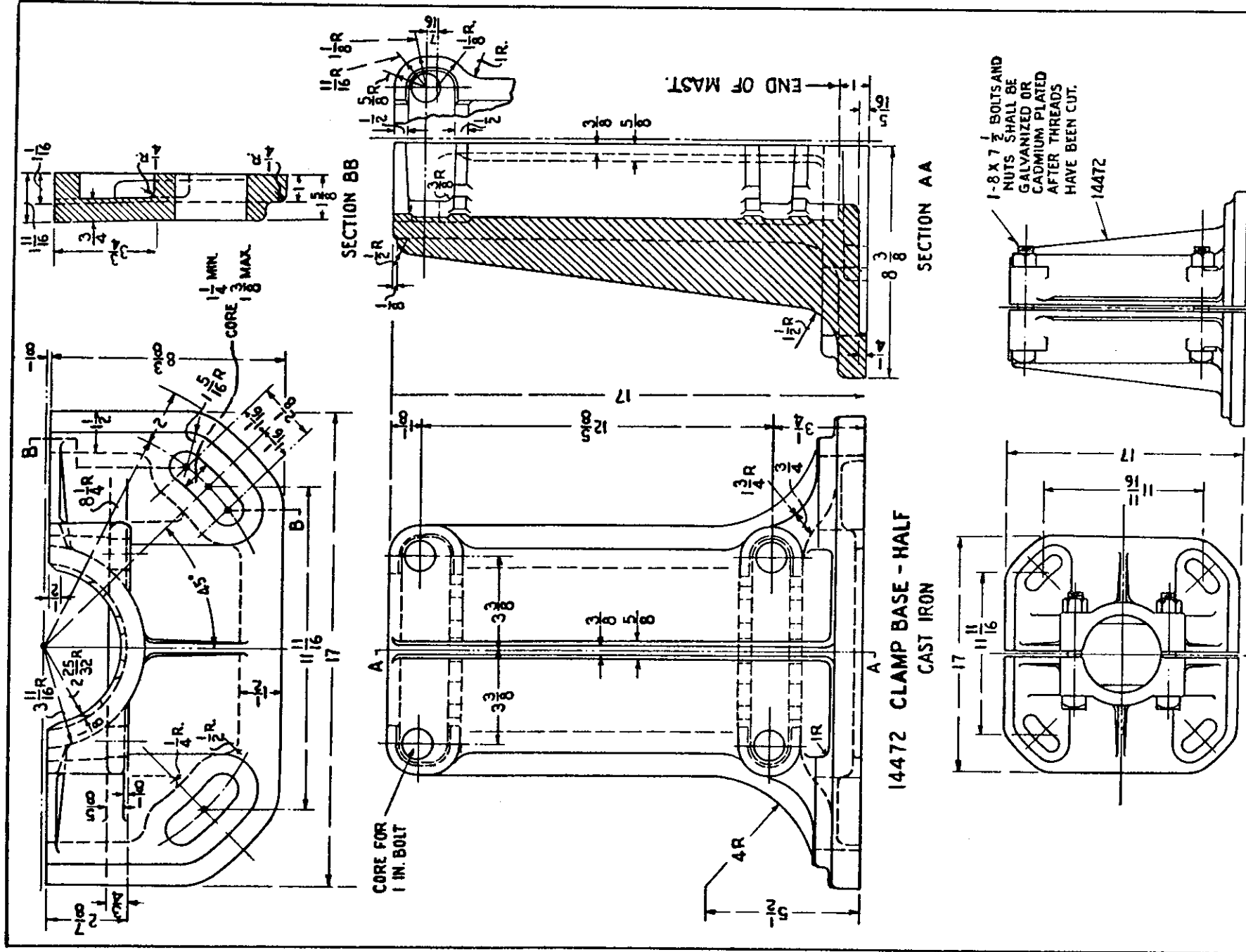
AMERICAN STANDARD B 32.1 - 1941						
THICKNESS IN INCHES						
	0.180	0.090	0.045	0.022	0.011	
	0.160	0.080	0.040	0.020	0.010	0.005
	0.140	0.071	0.036	0.018	0.009	
	0.125	0.063	0.032	0.016	0.008	0.004
0.224	0.112	0.056	0.028	0.014	0.007	
0.200	0.100	0.050	0.025	0.012	0.006	

NOTE: IF INTERMEDIATE THICKNESSES ARE REQUIRED, SELECTIONS SHALL BE MADE FOR ALL METALS AND ALLOYS BY THE USE OF THICKNESSES BASED ON THE 40-SERIES OF AMERICAN STANDARD PREFERRED NUMBERS (Z 17.1 - 1936).
SEE DRAWING 1427 B FOR COMPARISON WITH PREVIOUS GAGE NUMBER SYSTEMS.

PREFERRED THICKNESSES FOR UNCOATED THIN FLAT METALS
UNDER 0.250 INCH

AAR
SIG. SEC.
1437A

M-1942 OCT. 1942



SCALES AND ALL DIMENSIONS GIVEN IN INCHES

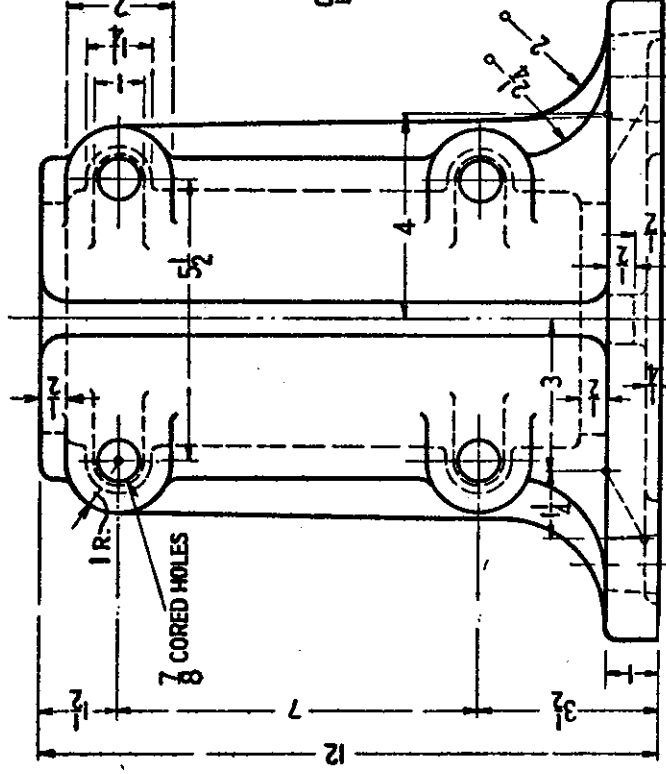
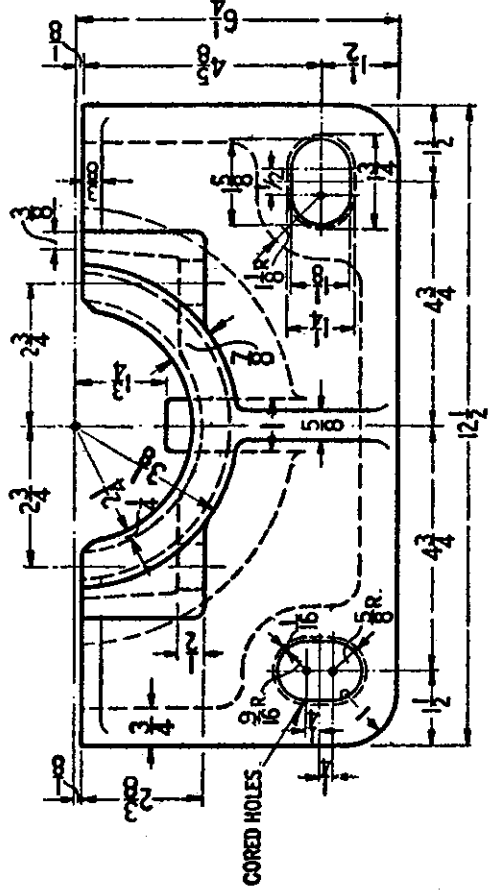
BASE FOR 5 INCH MAST

FOR HEAVY LOADING-DETAILS AND ASSEMBLY

AAR
SIG. SEC.
14478

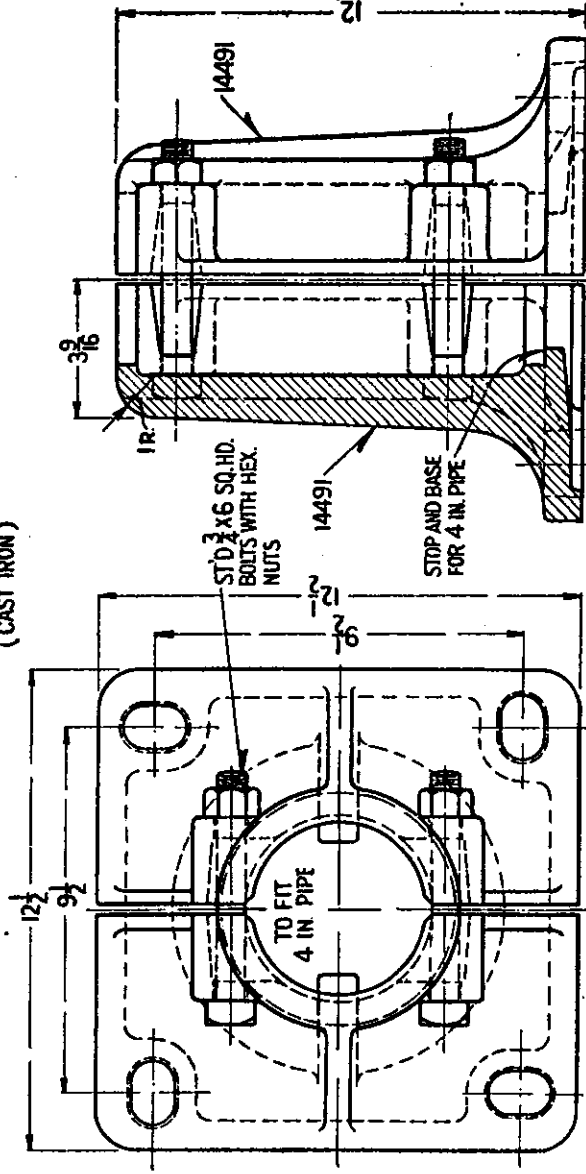
M-1952	SEPT.1952	M-1940	OCT.1940

Cast iron shall be Class 20 in accordance with Specification for Gray Iron Castings, Manual Part 88; Bolts, nuts and threads shall be in accordance with Specifications for Bolts, Nuts and Threads, Manual Part 17; Painting shall be in accordance with Specification 120, Manual Part 110.



0 1 2 3 6
0 1 2 3 6
SCALE AND ALL DIMENSIONS
ARE GIVEN IN INCHES

14491 CLAMP BASE-HALF
(CAST IRON)



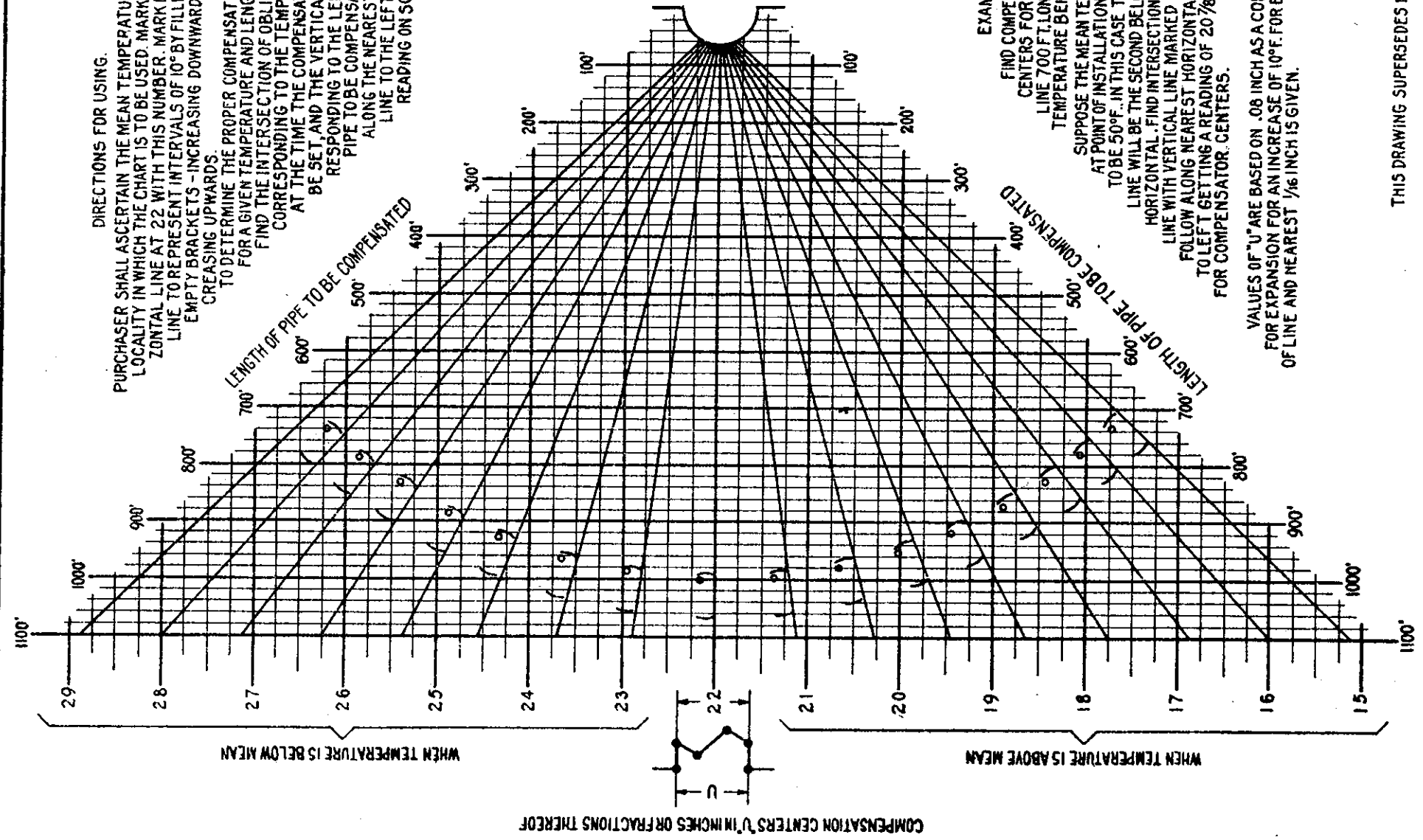
14492 CLAMP BASE COMPL.

BASE FOR 4 INCH MAST

AAR
SIG. SEC.
1449B

M-1939 MAR 1939 DEC 1919

Cast iron shall be in accordance with Specification for Gray Iron Castings.



DIRECTIONS FOR USING.

PURCHASER SHALL ASCERTAIN THE MEAN TEMPERATURE OF THE LOCALITY IN WHICH THE CHART IS TO BE USED. MARK THE HORIZONTAL LINE AT 22 WITH THIS NUMBER. MARK EACH OBLIQUE LINE TO REPRESENT INTERVALS OF 10° BY FILLING IN THE EMPTY BRACKETS - INCREASING DOWNWARDS AND DECREASING UPWARDS.

TO DETERMINE THE PROPER COMPENSATION CENTERS FOR A GIVEN TEMPERATURE AND LENGTH OF PIPE:

FIND THE INTERSECTION OF OBLIQUE LINE CORRESPONDING TO THE TEMPERATURE AT THE TIME THE COMPENSATOR IS TO BE SET, AND THE VERTICAL LINE CORRESPONDING TO THE LENGTH OF PIPE TO BE COMPENSATED. FOLLOW ALONG THE NEAREST HORIZONTAL LINE TO THE LEFT AND GET READING ON SCALE.

EXAMPLE:

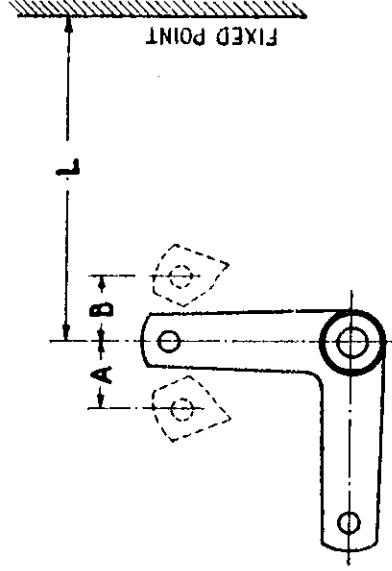
FIND COMPENSATOR CENTERS FOR A PIPE LINE 700 FT LONG, THE TEMPERATURE BEING 70°F.

SUPPOSE THE MEAN TEMPERATURE AT POINT OF INSTALLATION IS FOUND TO BE 50°F. IN THIS CASE THE 70° LINE WILL BE THE SECOND BELOW THE HORIZONTAL. FIND INTERSECTION OF THIS LINE WITH VERTICAL LINE MARKED 700 FT., FOLLOW ALONG NEAREST HORIZONTAL LINE TO LEFT GETTING A READING OF 20 7/8 INCHES FOR COMPENSATOR CENTERS.

VALUES OF "U" ARE BASED ON .08 INCH AS A COEFFICIENT FOR EXPANSION FOR AN INCREASE OF 10°F. FOR EACH 100 FT. OF LINE AND NEAREST 1/16 INCH IS GIVEN.

THIS DRAWING SUPERSEDES No. 1102

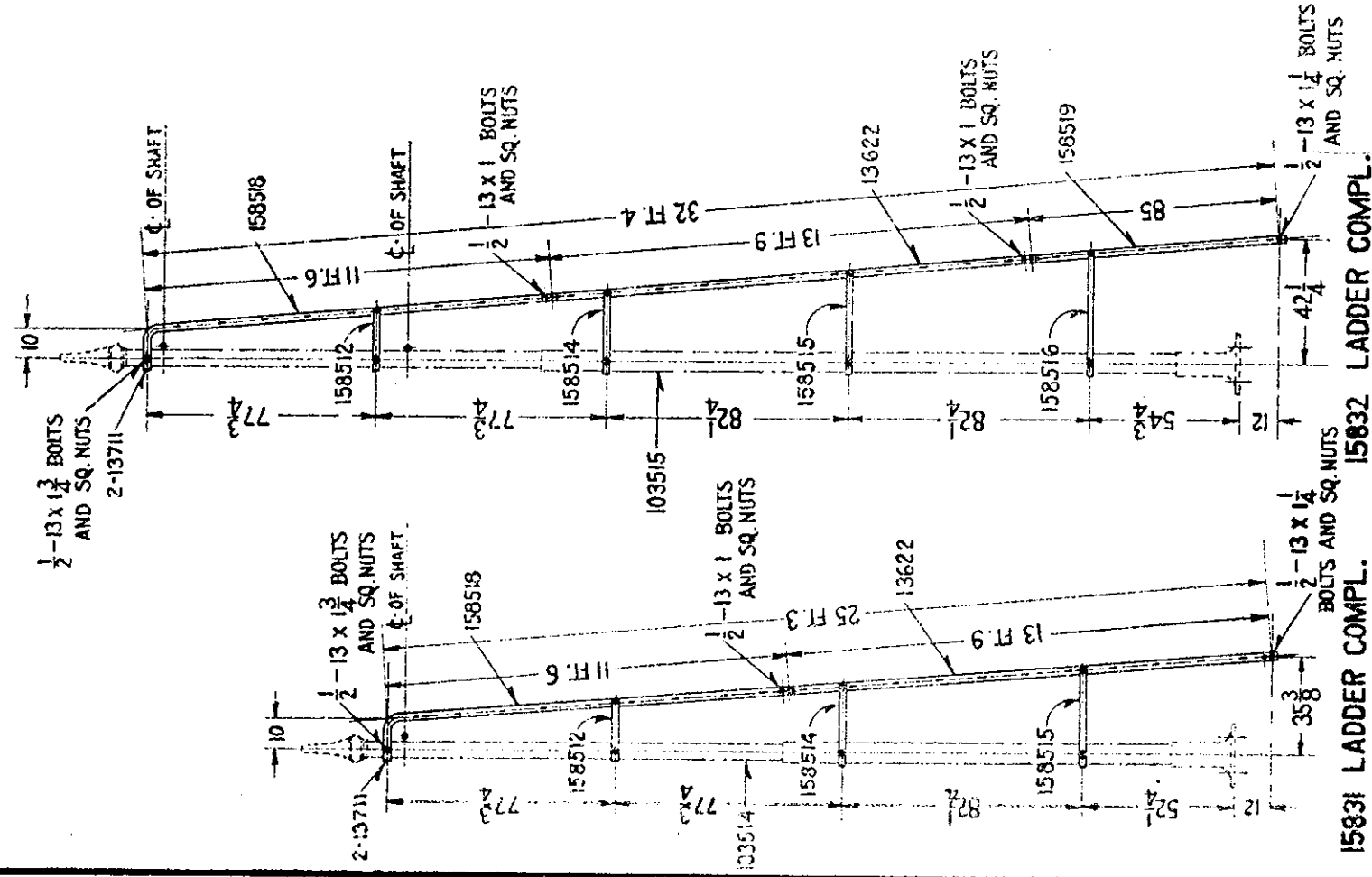
COMPENSATION CHART



DIRECTIONS FOR USING
WRITE THE MEAN TEMPERATURE (IN F. DEGREES) FOR LOCALITY IN WHICH THE CHART IS TO BE USED IN DEGREE COLUMN OPPOSITE MEAN TEMPERATURE, GRADUATING 10° FOR EACH SPACE, INCREASING UPWARD AND DECREASING DOWNWARD. THE FIGURE IN SQUARE OPPOSITE TEMPERATURE AT TIME OF INSTALLATION AND UNDER THE NUMBER OF FEET (L) BETWEEN CRANK AND FIXED POINT, IS THE DISTANCE (A OR B) IN INCHES. THE CRANK SHOULD BE SET TOWARDS OR AWAY FROM THE FIXED POINT.

A - AWAY FROM FIXED POINT																	B - TOWARDS FIXED POINT																			
F°	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	220'	240'	260'	280'	300'		F°	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	220'	240'	260'	280'	300'				
0	1/8	5/16	1 1/2	5/8	3/4	7/8	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 15/16	2 1/16	2 1/4	2 3/8		0	1/8	5/16	1 1/2	5/8	3/4	7/8	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 15/16	2 1/16	2 1/4	2 3/8				
1	1/8	1/4	7/16	9/16	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8		1	1/8	1/4	7/16	9/16	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8				
2	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8		2	1/8	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8			
3	1/8	1/4	5/16	7/16	9/16	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/16		3	1/8	1/4	5/16	7/16	9/16	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 3/16				
4	1/8	3/16	5/16	3/8	1/2	9/16	1 1/16	3/4	7/8	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8		4	3/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8			
5	1/16	3/16	1/4	5/16	3/8	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8		5	1/16	1/4	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8		
6	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		6	1/16	1/8	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
7	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		7	1/16	1/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	
8	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		8	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
9	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		9	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
10	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		10	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
11	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		11	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
12	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		12	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
13	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		13	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
14	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		14	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
15	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		15	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
16	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		16	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
17	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		17	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
18	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		18	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
19	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		19	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
20	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		20	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
21	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		21	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
22	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		22	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
23	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		23	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
24	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		24	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
25	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		25	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
26	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		26	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
27	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		27	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
28	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		28	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
29	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		29	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8
30	1/16	1/16	1/8	1/8	3/16	1/4	5/16	7/16	1/2	9/16	5/8	3/4	1 1/16	1 1/8	1 1/4	1 1/2	1 5/8	2	2 1/8		30	1/16	1/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8

0 12 24 36 72 9 FT.
SCALE AND ALL DIMENSIONS GIVEN IN INCHES
UNLESS OTHERWISE INDICATED

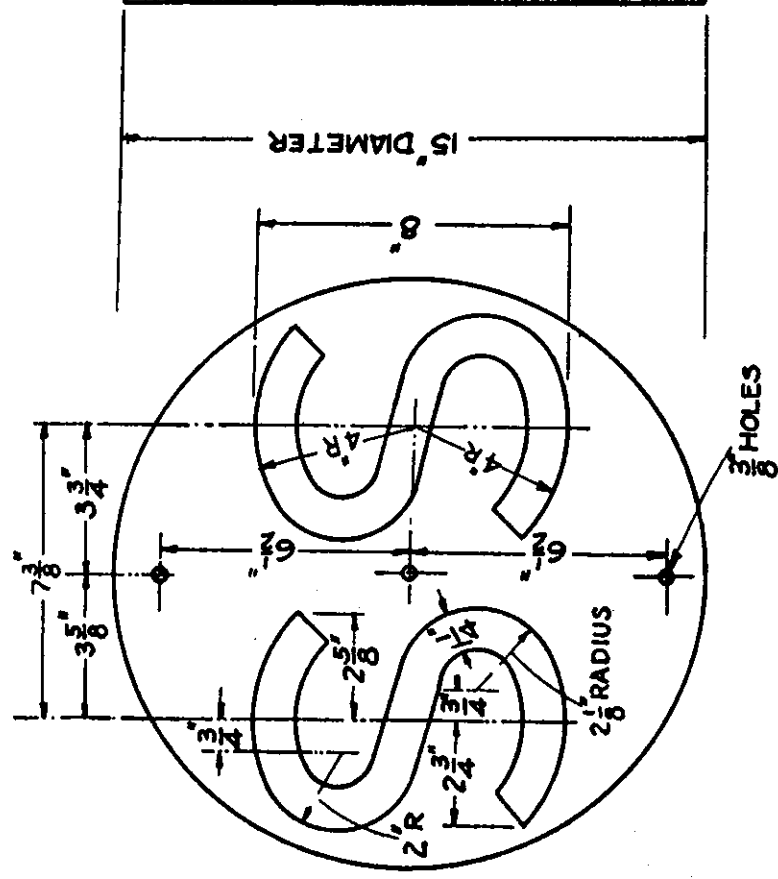


LADDERS FOR GROUND MASTS (ASSEMBLY)

AAR
SIG. SEC.
15830

M-1945 OCT. 1945 M-1935 MAR 1935 M-1926 SEP 1925

Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17.



MATERIAL: 12 U.S. STANDARD GAUGE (.109") SHEET STEEL.
ENAMELED, BOTH SIDES WHITE WITH BLACK LETTERS, SEMI-GLOSS FINISH.
MARKER TO BE SET AT RIGHT ANGLES TO TRACK AND MAY BE MOUNTED ON
SWITCH STAND OR ON SEPARATE POST.

0 1 2 3 4 5 6



SCALE IN INCHES

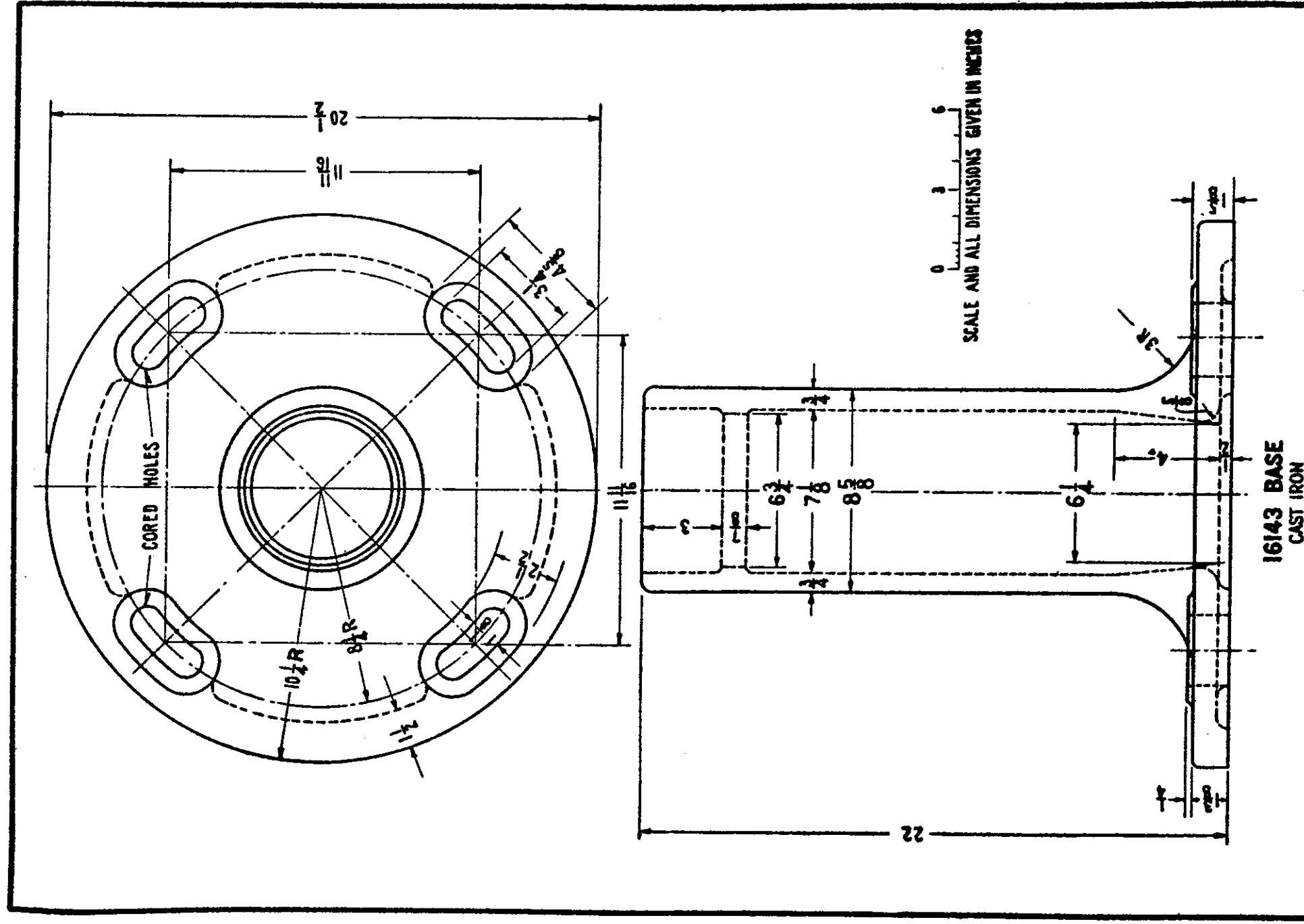
SPRING SWITCH MARKER

ARA
SIG. SEC.

1613A

M-1934 MAR 1934

Material shall be in accordance with Specification 155.



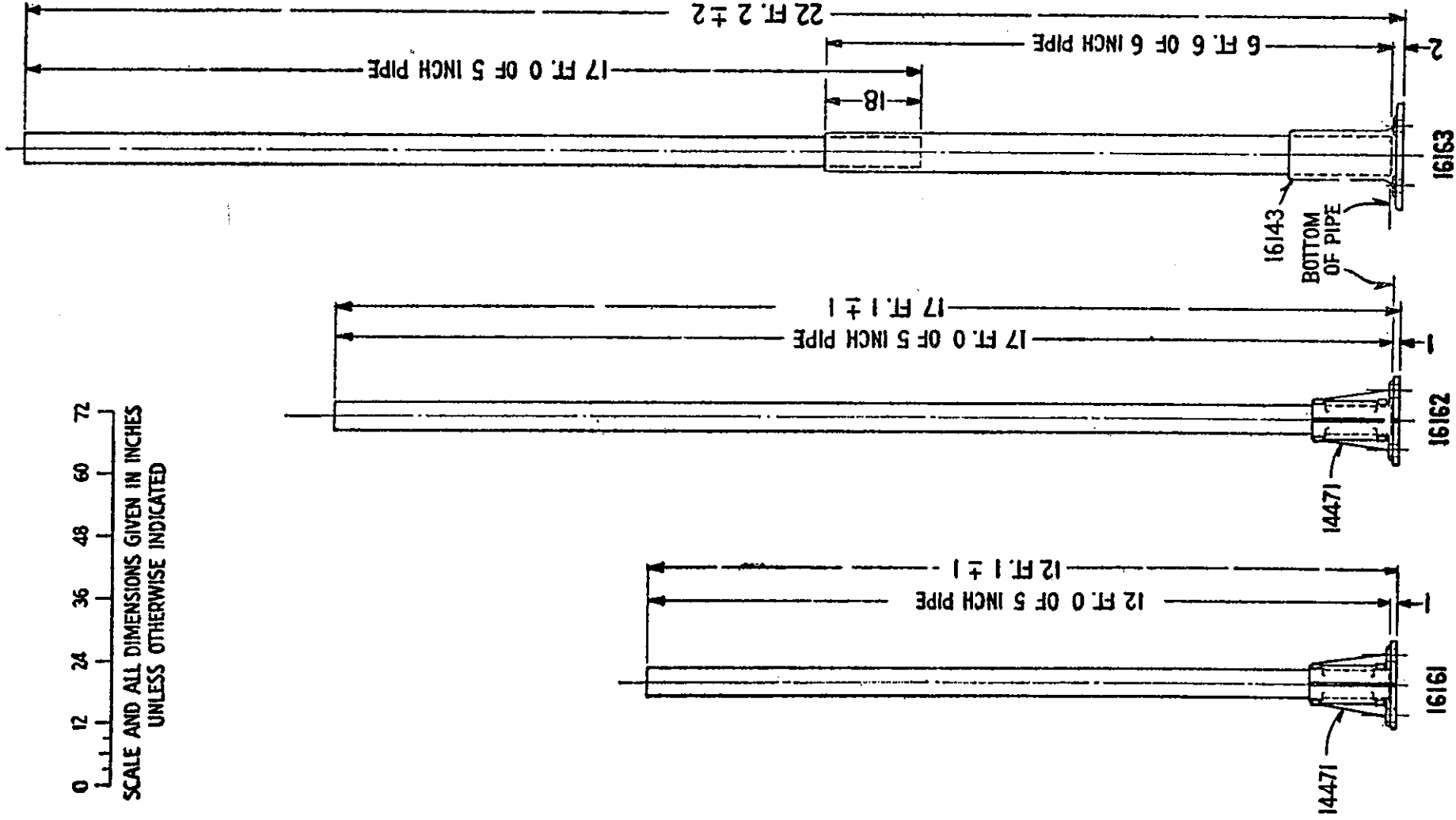
BASE FOR 6-INCH GROUND MAST

AAR
SIG. SEC.
1614B

M-1946	OCT. 1946	M-1928	SEP. 1927

Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88.

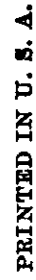
0 12 24 36 48 60 72
 SCALE AND ALL DIMENSIONS GIVEN IN INCHES
 UNLESS OTHERWISE INDICATED

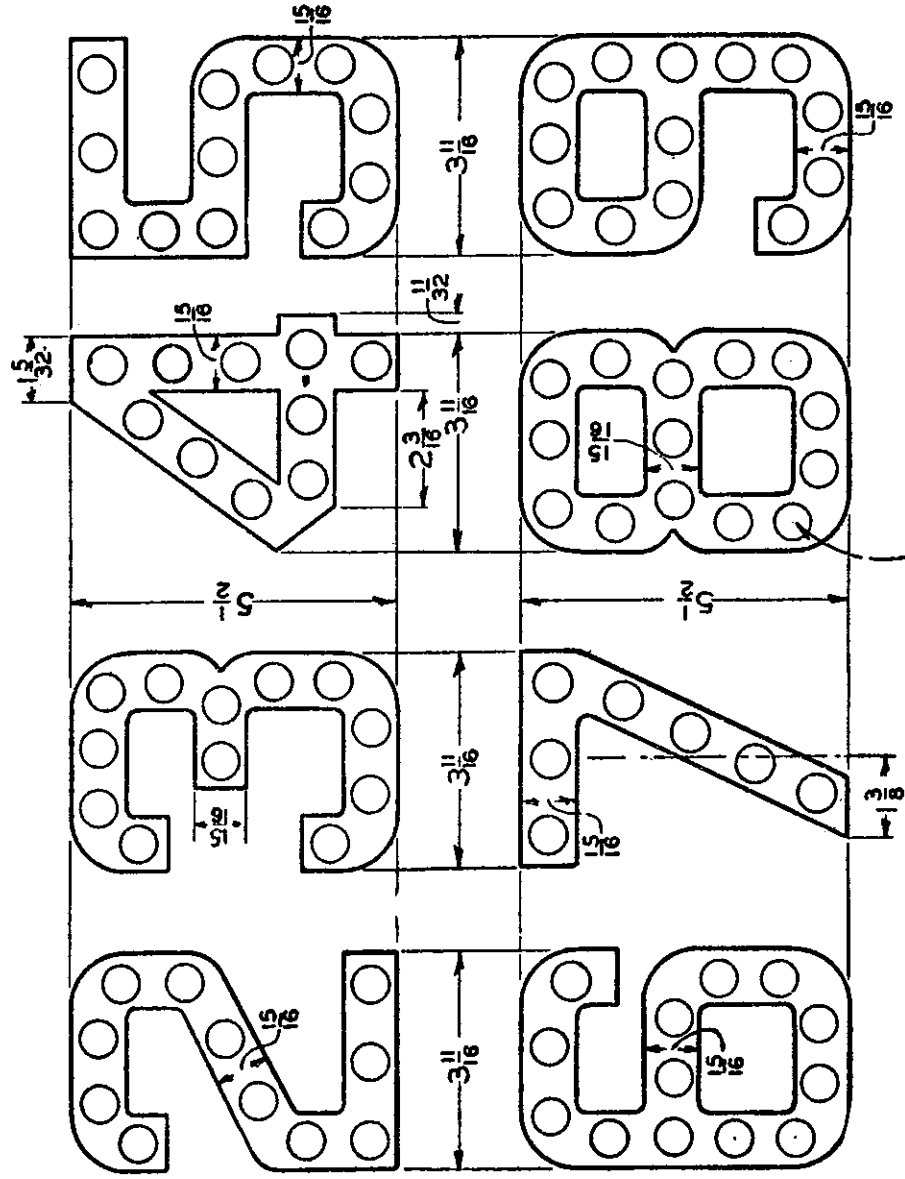


LIGHT SIGNAL MASTS

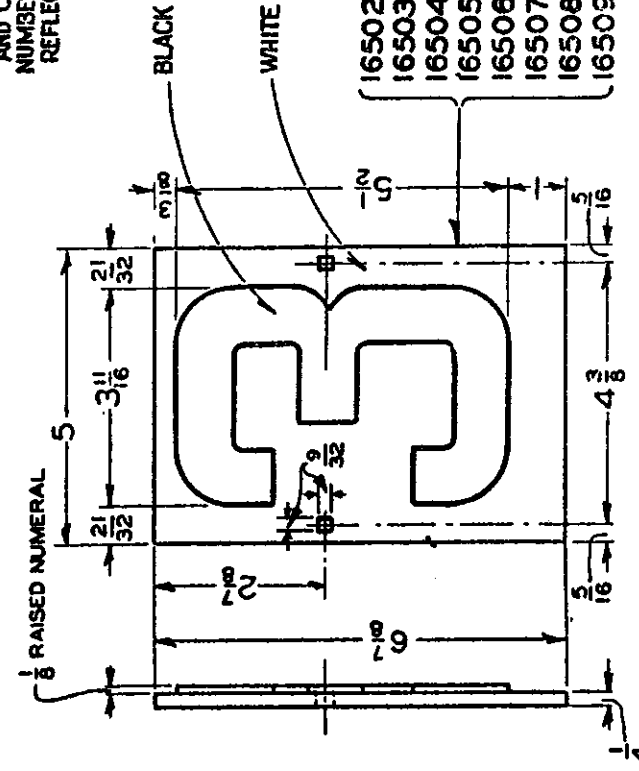
AAR
 SIG. SEC.
 1616C

M-1947 SEP. 1947 M-1943 OCT. 1943 M-1929 MAR. 1928

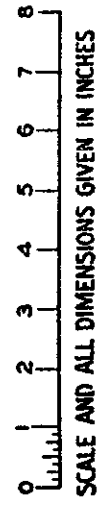




OUTLINES OF NUMERALS FOR REFLECTOR AND CAST IRON SIGNS ARE IDENTICAL. NUMBER AND SPACING OF HOLES FOR REFLECTOR UNITS SHALL BE AS SHOWN.



DETAIL OF NUMERAL SIGN
CAST IRON



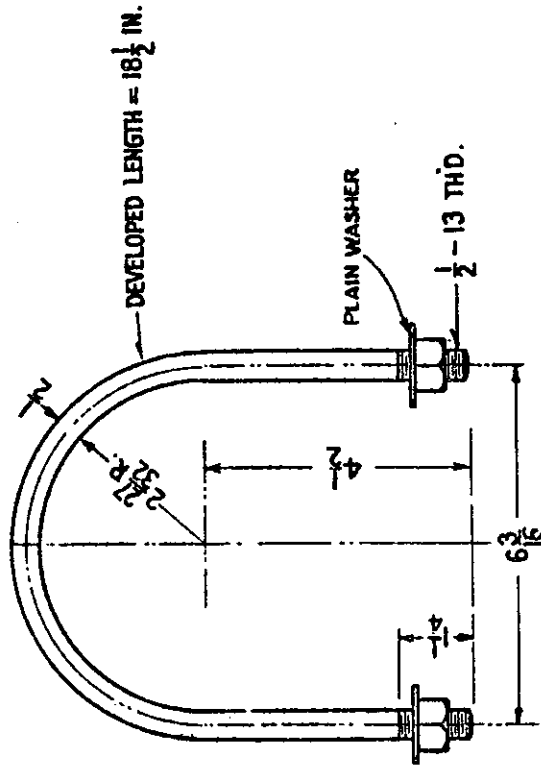
16502 NUMERAL SIGN WITH FIGURE 2	2	3	4	5	6	7	8	9
16503	"	"	"	"	"	"	"	"
16504	"	"	"	"	"	"	"	"
16505	"	"	"	"	"	"	"	"
16506	"	"	"	"	"	"	"	"
16507	"	"	"	"	"	"	"	"
16508	"	"	"	"	"	"	"	"
16509	"	"	"	"	"	"	"	"

DETAILS OF NUMERALS FOR TRACK SIGNS

AAR
SIG. SEC.
1650C

M-1947/SEP. 1947/M-1937/MAR 1937 M-1933/MAY 1933

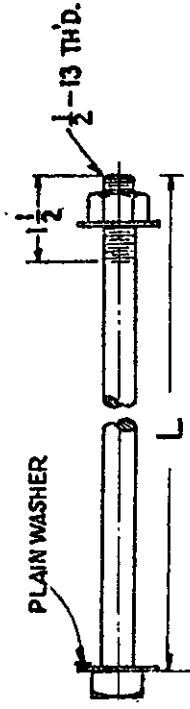
Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88; Painting shall be in accordance with Specification 155, Manual Part 44.



16551 "U" BOLT FOR 5 INCH PIPE

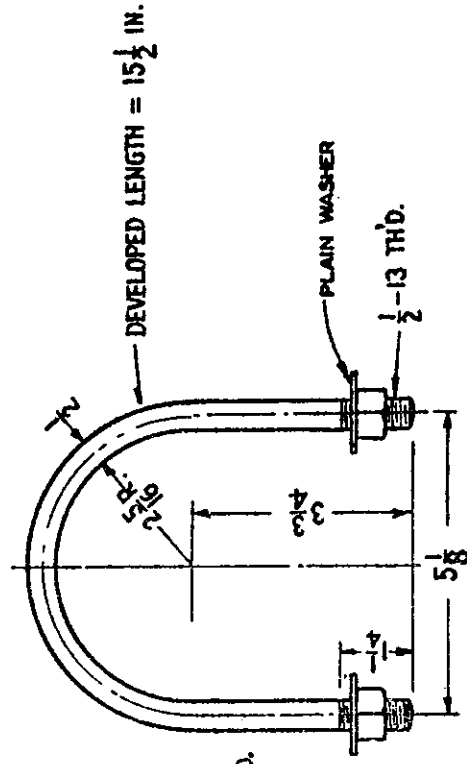
SAE-1020 STEEL

0 1 2 3 4 5 6
SCALE AND ALL DIMENSIONS GIVEN IN INCHES



16552 BOLT FOR 5 INCH PIPE L = 8 1/2 IN.

16553 " " " " L = 7 IN.



16554 "U" BOLT FOR 4 INCH PIPE

SAE-1020 STEEL

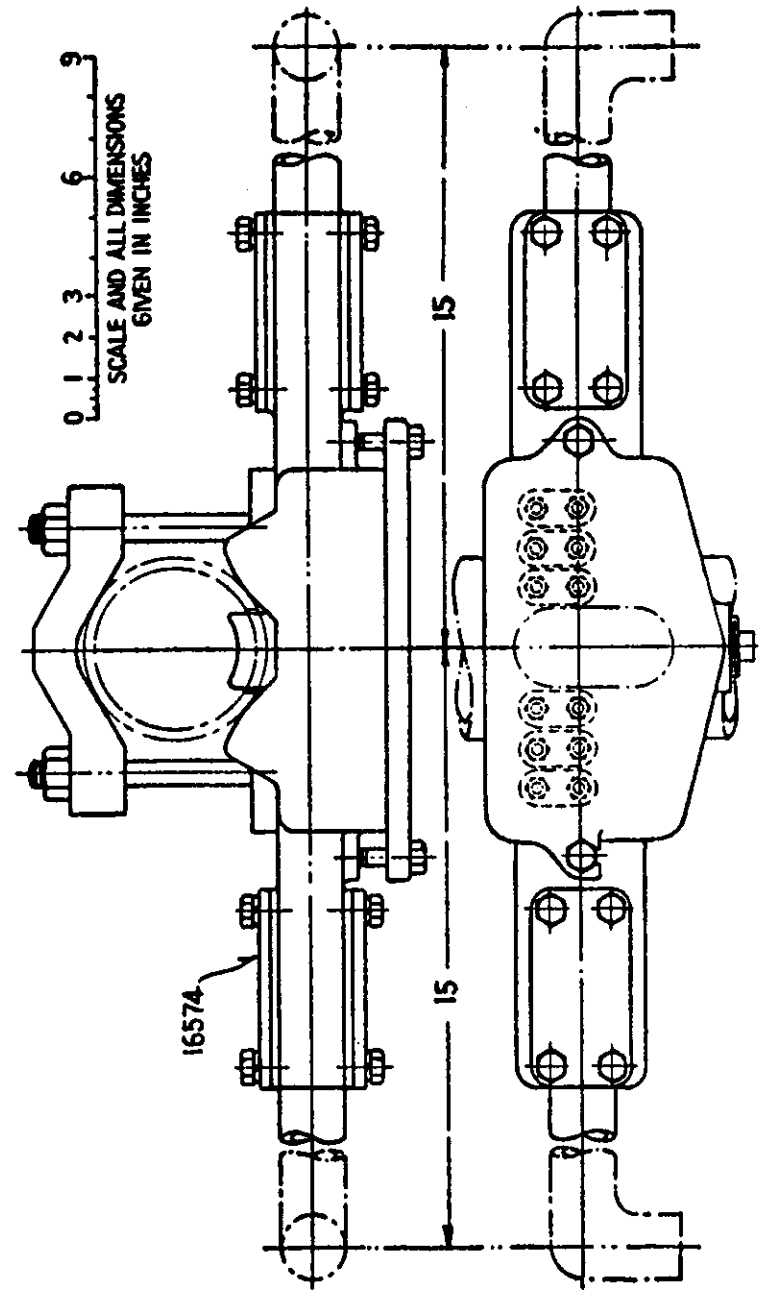
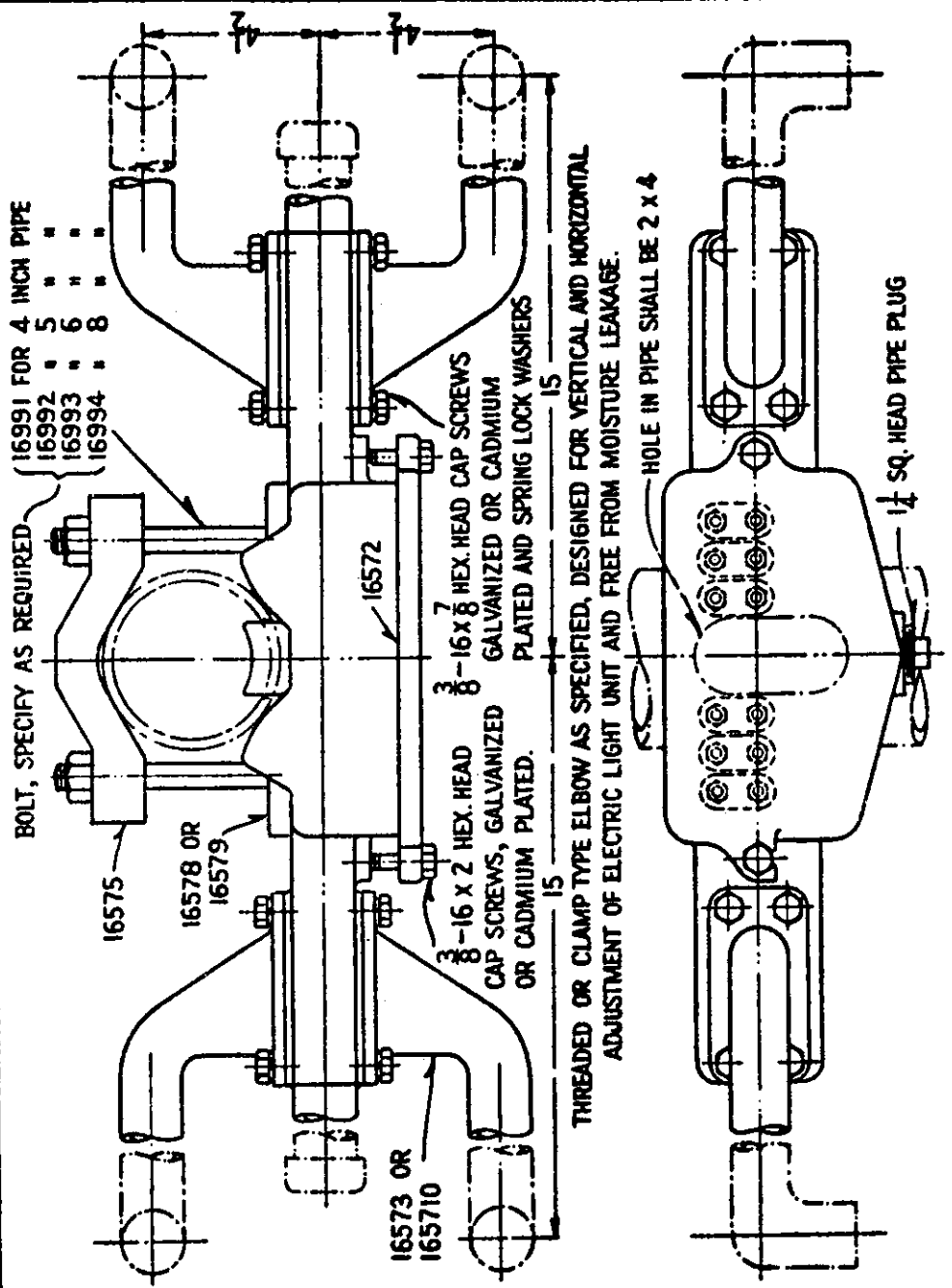
NOTE:
FORMED BOLTS SHALL BE PAINTED WITH
PRIMING COAT OR GALVANIZED OR CADMIUM
PLATED. STRAIGHT BOLT, NUTS AND WASHERS
SHALL BE GALVANIZED OR CADMIUM PLATED.
GALVANIZING OR CADMIUM PLATING SHALL
BE DONE AFTER THREADS HAVE BEEN CUT
AND BOLTS FORMED.

BOLTS FOR CROSSING SIGNS FOR 4 OR 5 INCH PIPE

AAR
SIG. SEC.
16555C

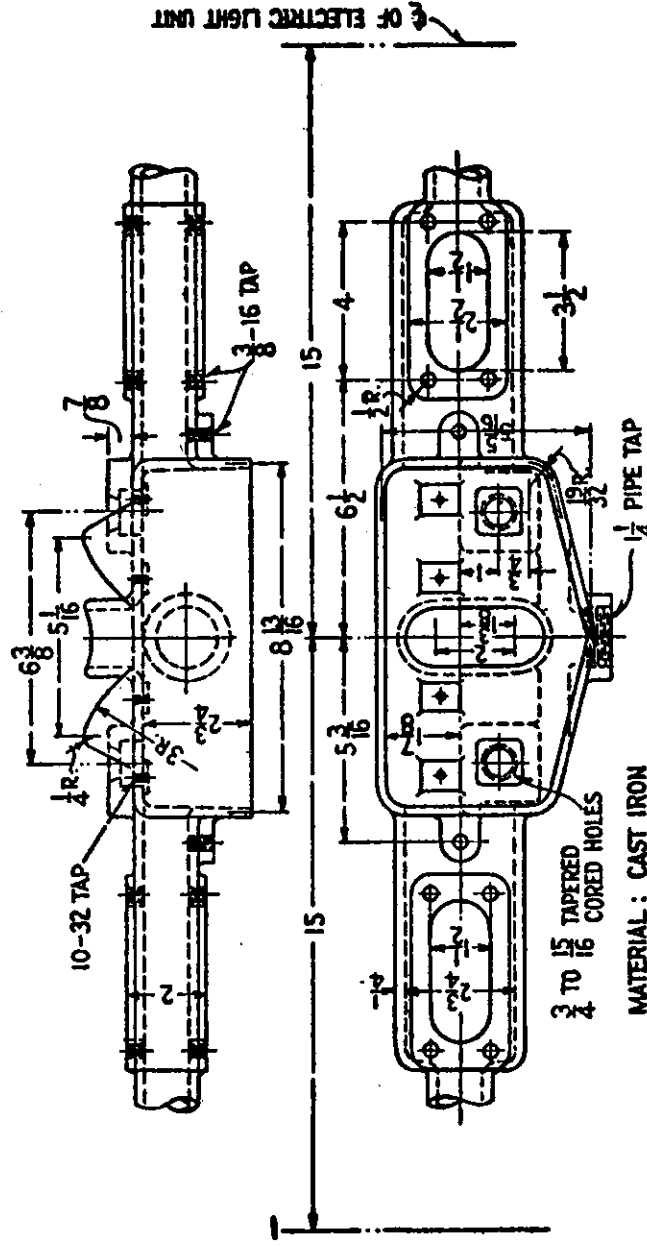
M-1947/SEP.1947/M-1937/MAR.1937/M-1935/MAR.1935

Painting shall be in accordance with Specification 120, Manual Part 110; Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17.

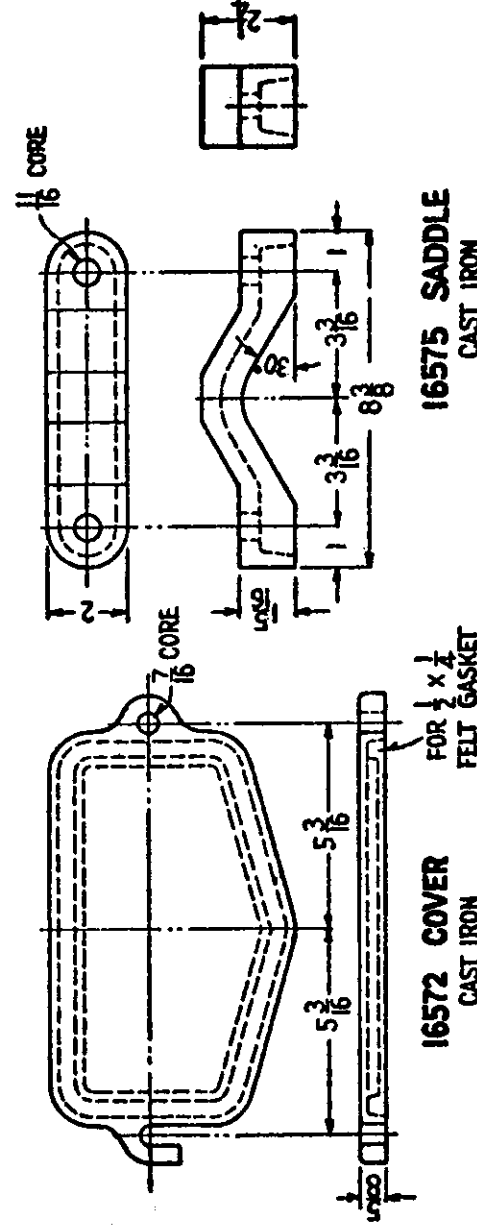


CROSS-ARMS				AAR	
FOR FLASHING LIGHT HIGHWAY CROSSING SIGNALS WITHOUT GATES - 4 TO 8 INCH PIPE - ASSEMBLIES				SIG. SEC.	
				16566D	
	M-1949	SEP. 1949	M-1947	SEP. 1947	M-1936
				MAR. 1936	MAR. 1935

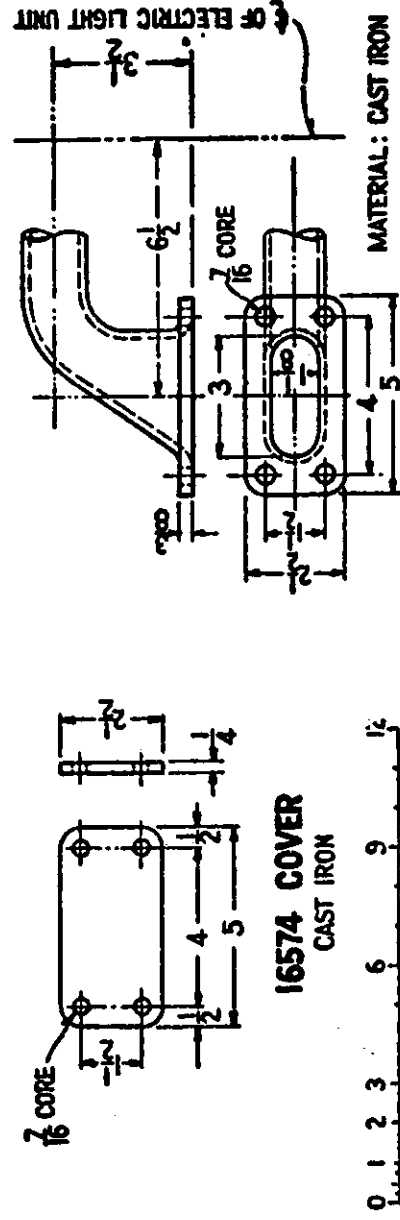
Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17. Spring lock washers shall be carbon steel (A.S.A. current Specification B27.1 is preferred where practicable).



16578 CROSS-ARM ONLY, THREADED TYPE
16579 " " " CLAMP TYPE



16575 SADDLE
CAST IRON



16573 BRACKET, THREADED TYPE
165710 " " CLAMP TYPE

0 1 2 3 4 5 6 7 8 9 10 11 12
 SCALE AND ALL DIMENSIONS GIVEN IN INCHES

CROSS-ARMS

FOR FLASHING LIGHT HIGHWAY CROSSING SIGNALS - 4 TO 8 INCH PIPE - DETAILS

AAR
 SIG. SEC.
 1657D

M-1949 SEP 1949 M-1947 SEP 1947 M-1936 MAR 1936 MAR 1935

Cast iron shall be in accordance with Specification for Gray Iron Castings, Manual Part 88; Bolts, nuts and threads shall be in accordance with Specification for Bolts, Nuts and Threads, Manual Part 17; Spring lock washers shall be carbon steel (A.S.A. current Specification B27.1 is preferred where practicable); Painting shall be in accordance with Specification 120, Manual Part 110.

GRAPHICAL SYMBOLS

POSITION OR EQUIVALENT	NON-AUTOMATIC	SEMI-AUTOMATIC		AUTO-MATIC	SPECIAL REQUIRES REFERENCE TO NOTES
		STICK	NON-STICK		
0° U.Q. 45°					
0° L.Q. 45°					
0° U.Q. 90°					
U.Q. 45 L.Q. 45					
U.Q. 45° 90°					
L.Q. 45° U.Q. 90°					
0° U.Q. 45° L.Q. 45°					
0° U.Q. 45° 90°					
0° U.Q. 90° L.Q. 45°					
U.Q. 45° 90° L.Q. 45°					
0° U.Q. 45° 90° L.Q. 45°					

EXPLANATORY DATA



THREE-POSITION
SEMI-AUTOMATIC STICK 45° TO 90°
SEMI-AUTO. NON-STICK 0° TO U.Q. 45°



FOUR-POSITION
SEMI-AUTO. STICK 0° TO U.Q. 45° TO 90°
NON-AUTO. 0° TO L.Q. 45°



NON-OPERATING



FLASHING SIGNAL ANY ASPECT

MARKERS



NORMALLY LIGHTED: NON-STICK



NORMALLY NOT LIGHTED: NON-STICK



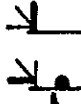
NORMALLY LIGHTED: STICK



NORMALLY NOT LIGHTED: STICK



GRADE SIGNAL



HEAVY LINE INDICATES NORMAL POSITION OR ITS EQUIVALENT—THUS PREFIX THE LETTER "A" TO ABBREVIATION IF USED FOR APPROACH LIGHTING ABBREVIATIONS TO BE USED ONLY WHERE MORE THAN ONE TYPE OF SIGNAL IS SHOWN ON PLAN.

ABBREVIATIONS

E-ELECTRIC SEMAPHORE
P-POSITION LIGHT
CP-COLOR POSITION LIGHT
M-MECHANICAL
C-COLOR LIGHT
SL-SEARCHLIGHT

SMASHBOARD SIGNALS

POWER MECHANICAL

GRAPHICAL SYMBOLS

WAYSIDE SIGNAL OPERATING CHARACTERISTICS

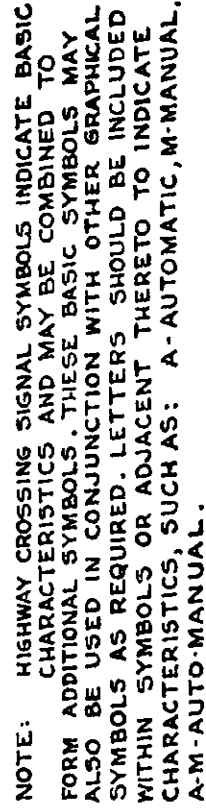
AAR
SIG. SEC.
1660B

M-1956 SEP 1956 M-1934 MAR 34

**SIGNIFY STEAM OR ELECTRIC WHERE ELECTRIC TRACKS
CROSS OR JOIN STEAM TRACKS**

**NOTE: WHERE OTHER COLORS ARE USED,
COLOR IS TO BE SHOWN ON PLAN.**

**STOP ON RED
SIGNAL-SIGN**



GRAPHICAL SYMBOLS TRACKS AND HIGHWAY CROSSINGS

BUILDINGS

			
PASSENGER STATION	FREIGHT STATION	GENERATING STATION	SUB-STATION

INTERLOCKING OR BLOCK STATION



		
OPERATOR FACING TRACK	OPERATOR WITH BACK TO TRACK	COAL STATION

BRIDGES



TRESTLE

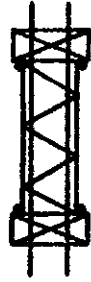


GIRDER



TRUSS

NOTE: - STATE WHETHER DECK, HALF THRU OR THRU BRIDGE



LIFT SPAN



BASCULE, DOUBLE LEAF



BASCULE, SINGLE LEAF

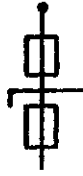


MOVABLE SPAN

MOVABLE BRIDGE DEVICES



RAIL LOCK



LOCK

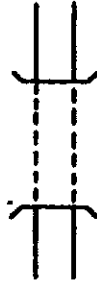


PIPE COUPLER



CIRCUIT CONTROLLER

TUNNEL



TUNNEL

GRAPHICAL SYMBOLS BUILDINGS, BRIDGES AND TUNNELS

AAR
SIG. SEC.
663C

M-1954 OCT. 1954 M-1944 OCT. 1944 M-1934 MAR. 1934

15

MILE POST	MAIL CRANE	DRAWING EQUIPMENT DETECTOR	WATER TANK	WATER COLUMN OIL COLUMN GAS COLUMN (LETTER IN CIRCLE TO DESIGNATE KIND OF COLUMN)	TRACK PAN

HOUSINGS

ABOVE SURFACE	HALF ABOVE SURFACE	BELOW SURFACE	INSTRUMENT HOUSE

NOTE: USE "T" FOR TELEPHONE
 "I" FOR INSTRUMENT BOX
 "J" FOR JUNCTION BOX
 "M" FOR MANHOLE
 "L" FOR LIGHTNING ARRESTER BOX
 "R" FOR RELAY BOX
 "B" FOR BATTERY BOX AND CAPACITY

INDICATOR	TRAIN INDICATOR	SWITCH INDICATOR	SWITCH INDICATOR AND SWITCH CIRCUIT CONTROLLER

NOTE: A
 USE "S" TAKE OR LEAVE SIDING.
 "DE" DRAGGING EQUIPMENT.

NOTE: B
 TYPE OF INDICATOR TO BE COVERED BY GENERAL NOTE. LETTER E, W, N OR S INDICATES TRACK CONTROLLING INDICATOR.

CABLE POST ONLY	WITH ONE INDICATOR	WITH TWO INDICATORS	WITH RELAY BOX	WITH RELAY BOX AND ONE INDICATOR	WITH RELAY BOX AND TWO INDICATORS

POLE LINE	GROUND LEVERS	DWARF MACHINE	RELAY BOX AND POST	BATTERY CHUTE, RELAY BOX AND POST COMBINED

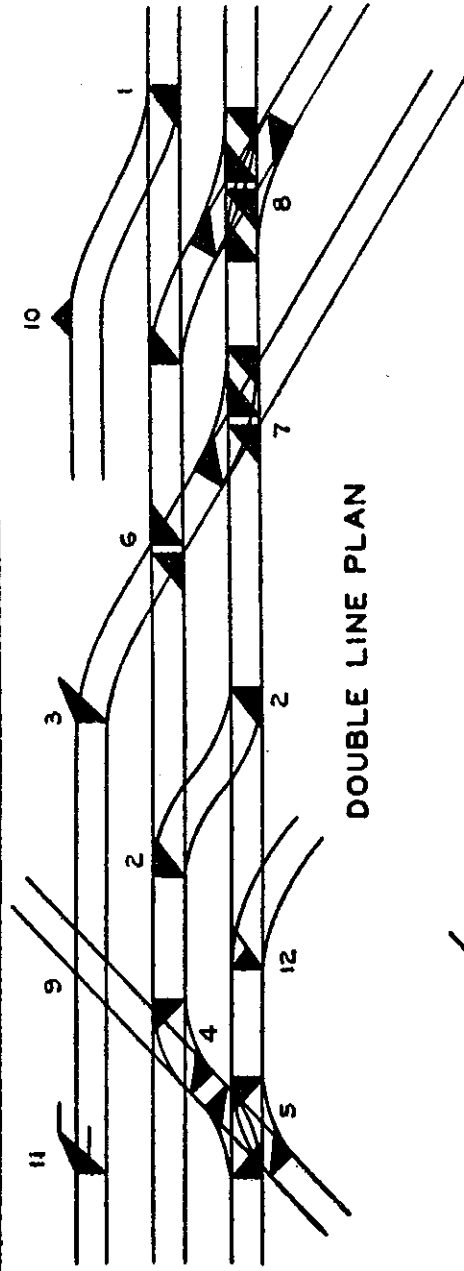
ROADWAY SIGNS

GRAPHICAL SYMBOLS

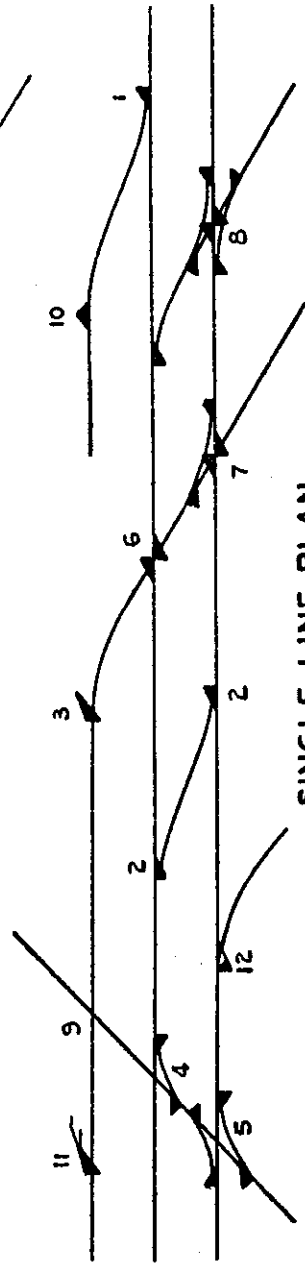
WAYSIDE FIXTURES

AAR
SIG. SEC.
1664C

M-1949 SEPT-1949 M-1944 OCT-1944 M-1934 MAR-1934



DOUBLE LINE PLAN



SINGLE LINE PLAN

EXPLANATION

1-SINGLE SWITCH	7-SINGLE SLIP SWITCH WITH M.P.F.
2-CROSSOVER	8-DOUBLE SLIP SWITCH WITH M.P.F.
3-SINGLE POINT DERAIL	9-RIGID CROSSING FROG
4-SINGLE SLIP SWITCH	10-LIFTING BLOCK DERAIL
5-DOUBLE SLIP SWITCH	11-LIFTING RAIL DERAIL
6-MOVABLE POINT CROSSING FROG	12-DUAL CONTROL SWITCH.

SINGLE SWITCH



SET FOR TURNOUT

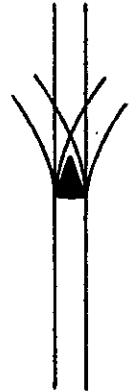


SET FOR STRAIGHT TRACK

THREE-WAY SWITCH



SET FOR LEFT TURNOUT



SET FOR STRAIGHT TRACK



SET FOR RIGHT TURNOUT

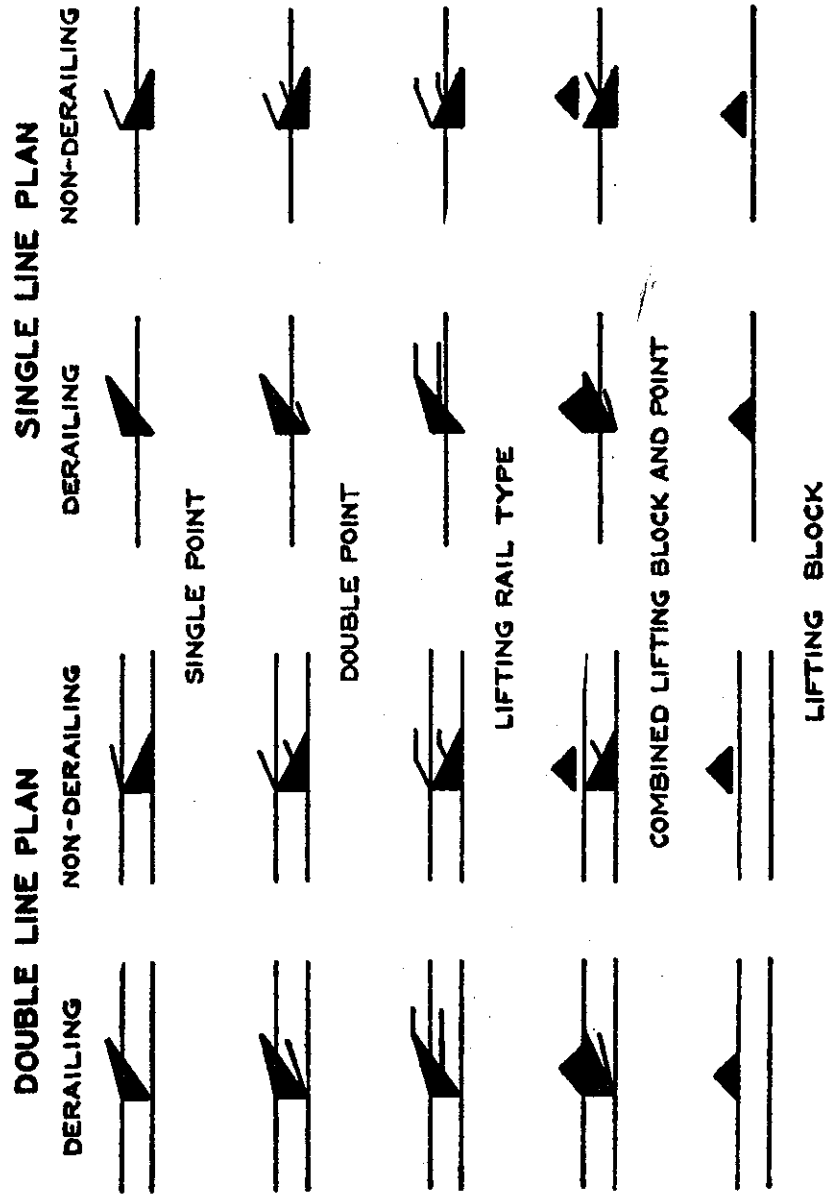
NOTE: THE ABOVE SYMBOLS ARE FOR INTERLOCKED SWITCHES.

NON-INTERLOCKED SWITCHES TO BE SHOWN SAME AS ABOVE EXCEPT SHADING IN TRIANGLES OMITTED. WHERE HAND-THROWN SWITCHES ARE PIPE-CONNECTED TO OTHERS, AT LEAST ONE SWITCH (THE ONE FARTHEST FROM POINT OF OPERATION) SHOULD HAVE LETTERS "PC" PLACED BESIDE IT.

GRAPHICAL SYMBOLS SWITCHES

AAR
SIG. SEC.
1665B

M-1944 OCT 1944 M-1934 MAR 1934



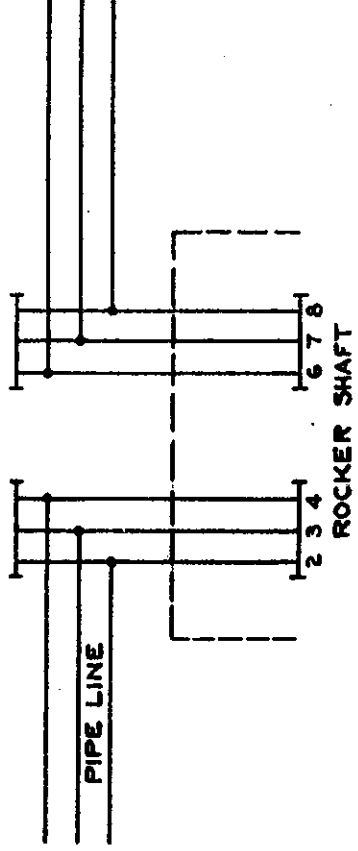
NOTE :- THE ABOVE SYMBOLS ARE FOR INTERLOCKED DERAILS.
 NON-INTERLOCKED DERAILS TO BE SHOWN AS ABOVE EXCEPT
 SHADING TO BE OMITTED. WHERE HAND THROW DERAILS ARE PIPE
 CONNECTED TO OTHERS, AT LEAST ONE DERAIL (THE ONE FARTHEST
 FROM POINT OF OPERATION) SHOULD HAVE LETTERS "PC" PLACED
 BESIDE IT.

GRAPHICAL SYMBOLS DERAILS

AAR
SIG. SEC.
16668

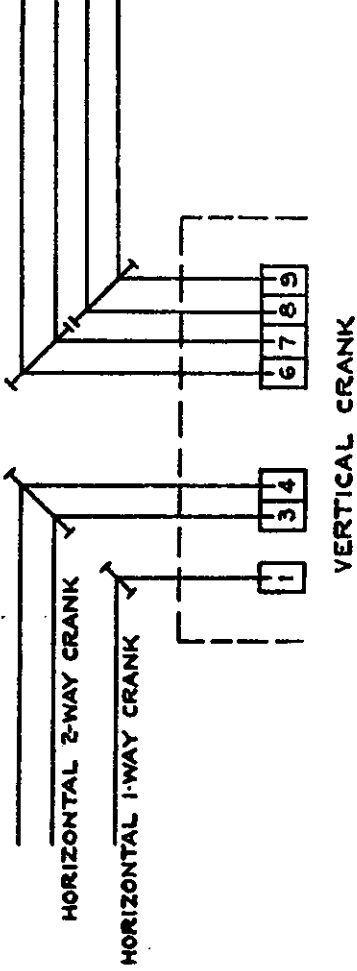
M-1944 OCT.1944 M-1934 MAR.1934

LEAD-OUTS

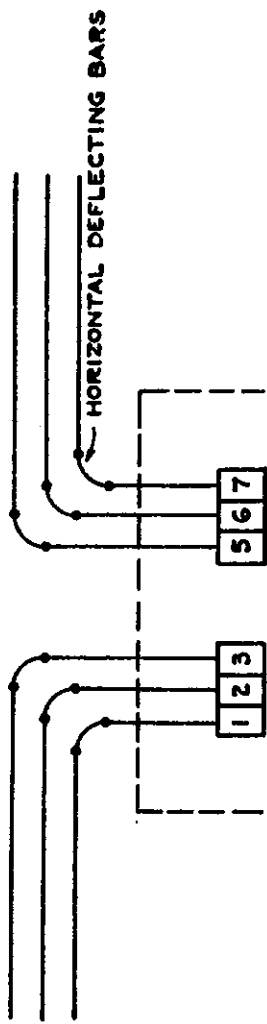


HORIZONTAL 2-WAY CRANK

HORIZONTAL 1-WAY CRANK



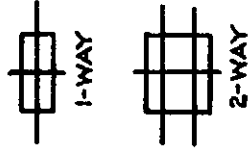
VERTICAL CRANK



HORIZONTAL DEFLECTING BARS

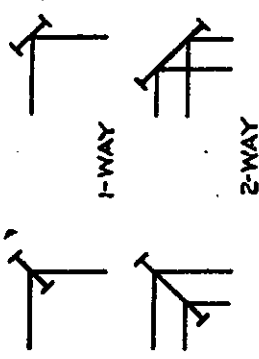
VERTICAL DEFLECTING BAR

BOLT LOCKS



CRANKS

CONTINUOUS MOTION REVERSED MOTION



GRAPHICAL SYMBOLS

LEAD-OUTS, BOLT LOCKS, CRANKS AND DEFLECTING BARS

AAR
SIG. SEC.
1668B

M-1944 OCT 1944 M-1934 MAR 1934

RUNS OF CONNECTIONS

PIPE (MECHANICAL)

UNDERGROUND OR AERIAL CABLE
(NOT IN DUCT)

WIRE DUCT

COMPRESSED AIR

MECHANICAL PIPE AND DUCT

MECHANICAL PIPE AND AIR

DUCT AND AIR

MECHANICAL PIPE DUCT AND AIR

OIL ENCLOSED PIPE LINE

PIPE ADJUSTING SCREW

COMPENSATOR

ARROW INDICATES DIRECTION
OF MOVEMENT OF PIPE LINE
NORMAL TO REVERSE

SPLICING CHAMBER

AIR PIPE AND FITTINGS

EXPANSION
JOINT

TEE

PIPE
ANCHOR

REDUCER OR
BUSHING
(POINT TO SMALLER PIPE)

UNION

COMBINATION
COCK AND UNION



MANIFOLD CONDENSER



MAIN
RESERVOIR



AUXILIARY
RESERVOIR



PLUG COCK
(DRAIN OR BLOW OFF)



VALVE

GRAPHICAL SYMBOLS PIPE AND WIRE LINES

AAR
SIG. SEC.
16698

M-1944 OCT. 1944 M-1934 MAR 1934

	SINGLE WINDING		3-POSITION
	DOUBLE WINDING		THREE-WIRE CONTROL
	TRIPLE WINDING		INTERLOCKING
	RETAINED		DOUBLE ACTING
	SLOW DROP AWAY		THERMAL
	SLOW PICK UP		TUNED ALTERNATOR
	QUICK DROP AWAY		
	QUICK PICK UP		
	MAGNETIC STICK		
	BIASED		
	2 ELEMENT		

THE FOLLOWING LETTERS SHOULD BE INCLUDED WITHIN SYMBOLS OR ADJACENT THERETO, EXCEPT WHERE SYMBOL INDICATES CHARACTERISTICS CLEARLY. RELAY WILL BE CONSIDERED AS NEUTRAL (FORMERLY "N") UNLESS OTHERWISE INDICATED.

P- POLARIZED - SEE NOTE
F- FLASHER
TE- TIME ELEMENT
O- OVERLOAD
OS- OVERLOAD STICK
CT- CODE TRANSMITTER - NUMBER
INDICATES CODE PER MINUTE
CF- CODE FOLLOWING
PT- POWER TRANSFER

NOTE:

SYMBOLS INDICATE BASIC RELAY CHARACTERISTICS AND MAY BE COMBINED AS REQUIRED. THESE BASIC SYMBOLS MAY ALSO BE USED IN CONJUNCTION WITH SYMBOLS FOR CIRCUIT APPURTENANCES AS REQUIRED.

SYMBOLS AS SHOWN ARE FOR RELAYS DESIGNED FOR VITAL CIRCUITS.

SYMBOLS FOR RELAYS DESIGNED FOR NON-VITAL CIRCUITS TO BE COVERED BY NOTE ON PLAN OR SHOWN THUS: INFORMATION NOT COVERED BY SYMBOLS TO BE NOTED ON PLAN. ON BIASED RELAYS ARROW INDICATES DIRECTION OF CURRENT FLOW TO ENERGIZE RELAY.

SYMBOL FOR POLARIZED RELAY MAY BE USED FOR POLAR RELAY WHEN EXPLAINED BY NOTE.

OPTIONAL CONNECTIONS, THUS: MAY BE USED.

SYMBOLS AS SHOWN MAY BE MODIFIED THUS: TO

DESIGNATE DETACHABLE TYPE RELAYS.

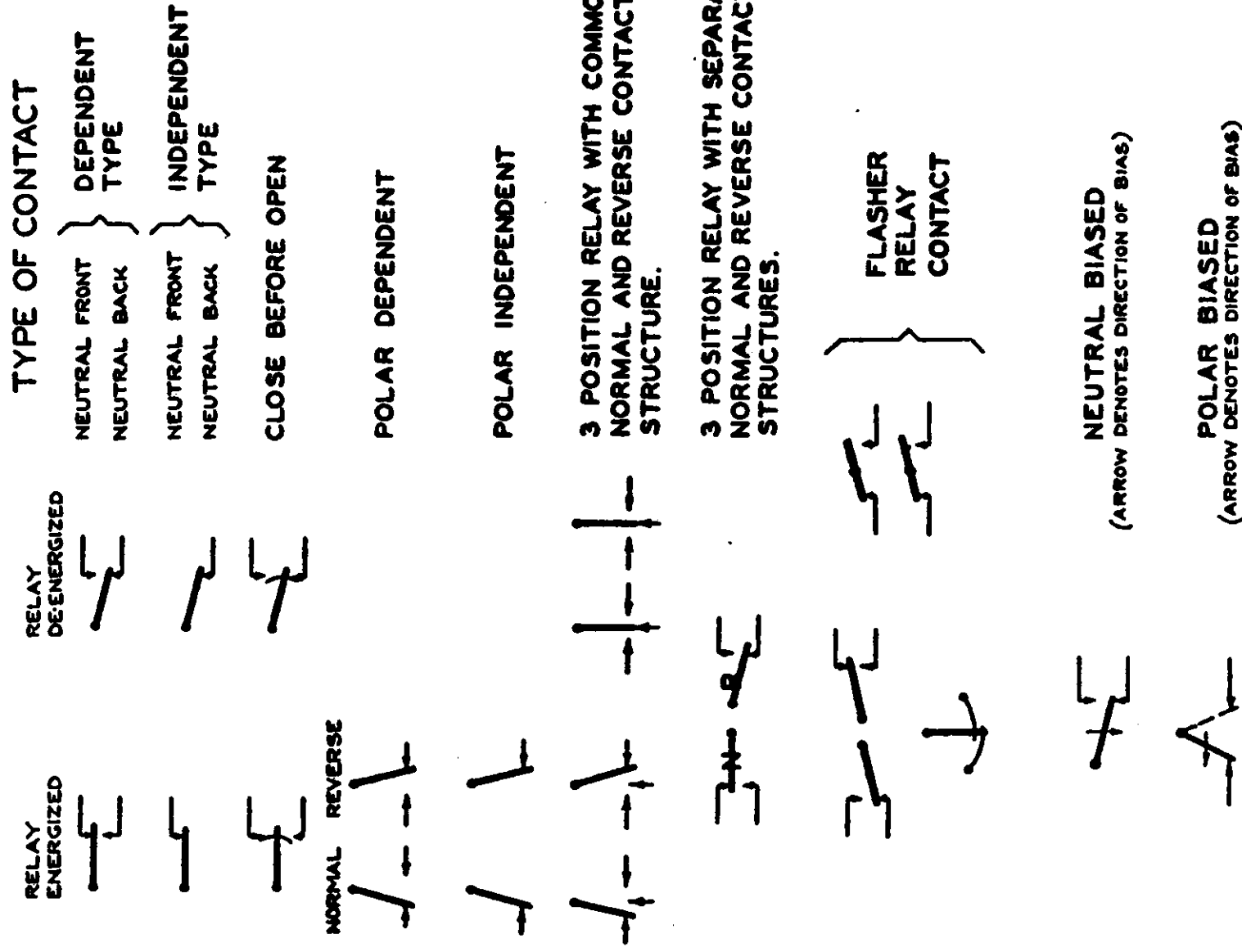
SYMBOLS MAY BE MODIFIED THUS: FOR ALTERNATING CURRENT RELAYS.

ADDITIONAL CONTROL WIRES TO BE SHOWN AS REQUIRED.

GRAPHICAL SYMBOLS RELAYS

AAR
SG. SEC.
1673F

M-1954 OCT. 1954 M-1950 SEPT. 1950 M-1949 SEPT. 1949 M-1948 SEPT. 1948 M-1943 OCT. 1943 M-1934 MAR. 1934

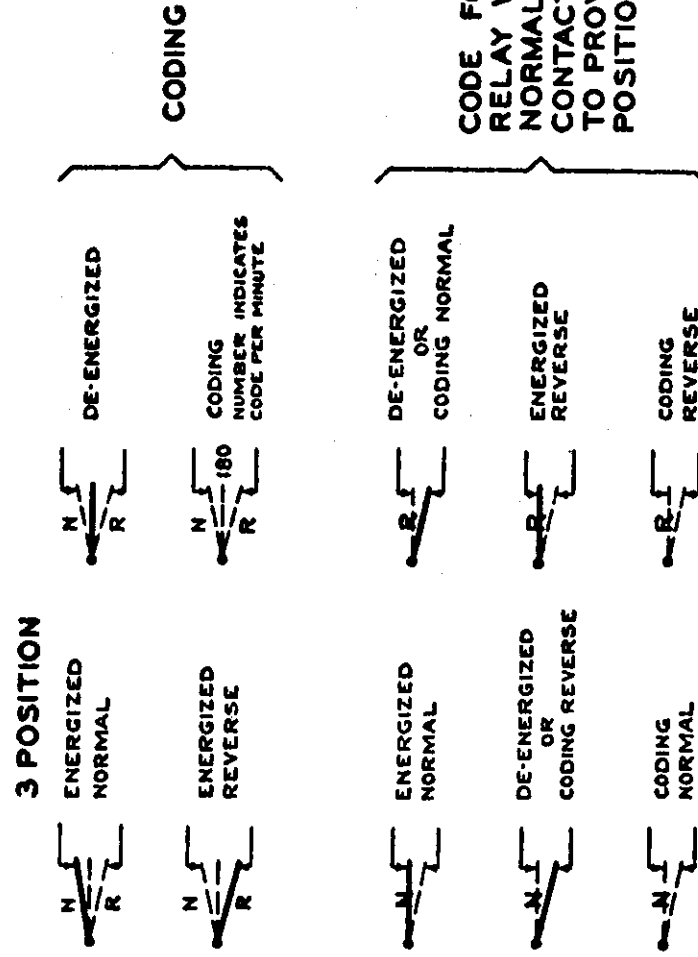
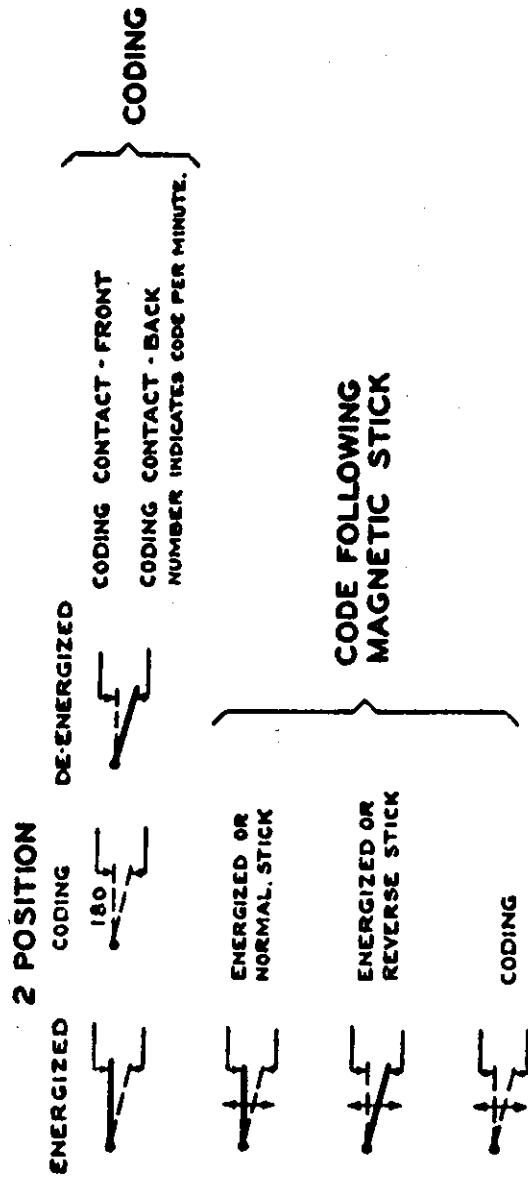


GRAPHICAL SYMBOLS **RELAY CONTACTS**

AAR
SIG. SEC.
1674E

M-1949 SEPT-1949 M-1948 SEPT-1948 M-1946 OCT-1946 M-1943 OCT-1943 M-1934 MAR-1934

CODING CONTACTS



DECODING UNIT

[180 DU]

NUMBER INDICATES CODE PER MINUTE TO WHICH UNIT IS TUNED.

GRAPHICAL SYMBOLS RELAY CONTACTS

AAR
SIG. SEC.
1674E

M-1949 SEPT-1949 M-1948 SEPT-1948 M-1946 OCT-1946 M-1943 OCT-1943 M-1934 MAR-1934

(Sheet 2 of 3 sheets)

RELAY CONTACTS WITH SPECIAL CHARACTERISTICS

—  HIGH CURRENT



CHECKING CONTACT
FOR TIME ELEMENT RELAY.

—  HIGH VOLTAGE



CONTACT ON
INTERLOCKING
RELAY WHICH
REMAINS CLOSED
WITH ARMATURE
IN INTERMEDIATE
POSITION.

—  HIGH VOLTAGE AND
HIGH CURRENT



+ —  MAGNETIC BLOWOUT

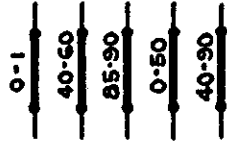
GRAPHICAL SYMBOLS RELAY CONTACTS

AAR
SIG. SEC.
1674E

M-1949 SEPT-1943 M-1948 SEPT-1948 M-1946 OCT-1946 M-1943 OCT-1943 M-1934 MAR-1934

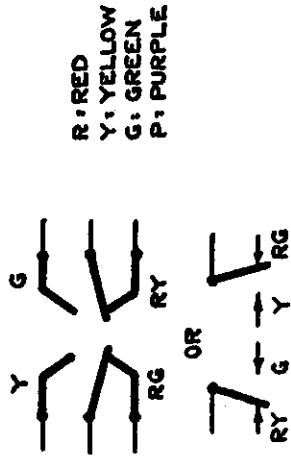
(Sheet 3 of 3 sheets)

SEMAPHORE



NUMERALS INDICATE DEGREES IN THE MOVEMENT OF THE SIGNAL ARM THROUGH WHICH THE CONTACT IS CLOSED.

COLOR LIGHT (SEARCHLIGHT TYPE)



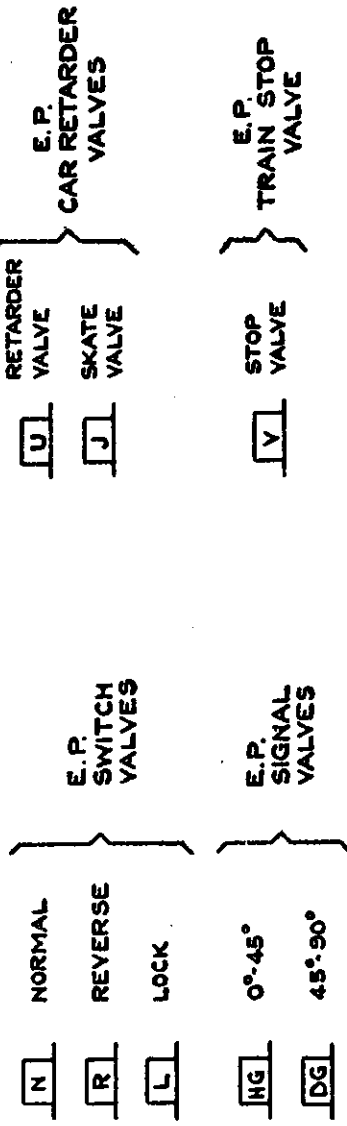
LETTERS INDICATE THE COLOR DISPLAYED BY THE SIGNAL WHEN THE CONTACT IS CLOSED.

POWER OPERATED SIGNAL MECHANISM



SPECIAL FEATURES TO BE NOTED ON PLAN

ELECTRO PNEUMATIC VALVES



POLE CHANGING CONTACTS

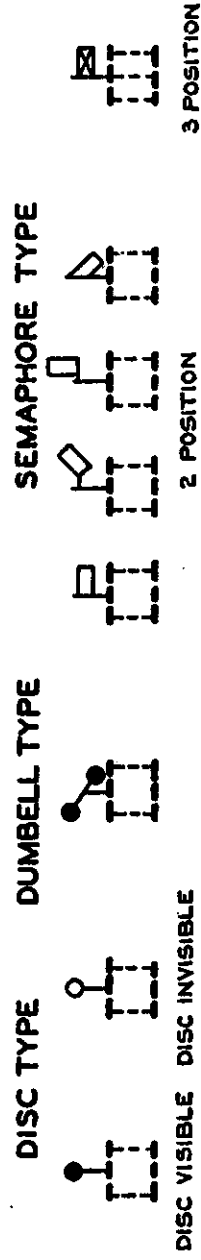


GRAPHICAL SYMBOLS SIGNAL AND ELECTRO-PNEUMATIC

AAR
SIG. SEC.
1678B

M-1943 OCT-1943 M-1934 MAR-1934

INDICATORS



DISC VISIBLE DISC INVISIBLE

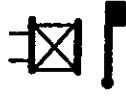
2 POSITION

3 POSITION

ELECTRIC LOCKS

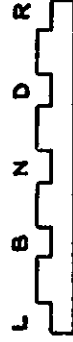
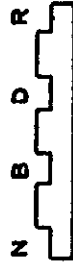


DIRECT CURRENT



ALTERNATING CURRENT

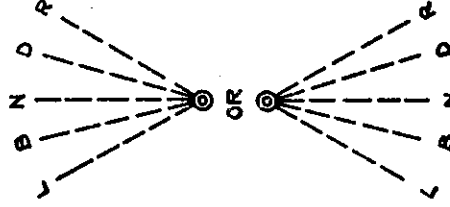
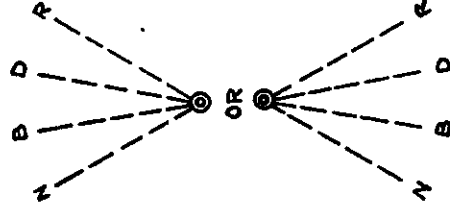
LOCKING POSITIONS TO BE AS SPECIFIED AND APPLIES TO LATCH OR LEVER OPERATED LOCKS.



LEVERS WITH END POSITION AS NORMAL LEVERS WITH MIDDLE POSITION AS NORMAL

N- NORMAL POSITION.
B- NORMAL INDICATION POSITION.
D- REVERSE INDICATION POSITION.
R- REVERSE POSITION.

L- REVERSE POSITION TO LEFT.
B- NORMAL INDICATION FROM LEFT.
N- NORMAL POSITION.
D- NORMAL INDICATION FROM RIGHT.
R- REVERSE POSITION TO RIGHT.



BUZZER



D.C.



A.C.

BELL



D.C.



A.C.

ANNUNCIATOR
INDICATE SINGLE
STROKE BELL-SS



D.C.-A.C.



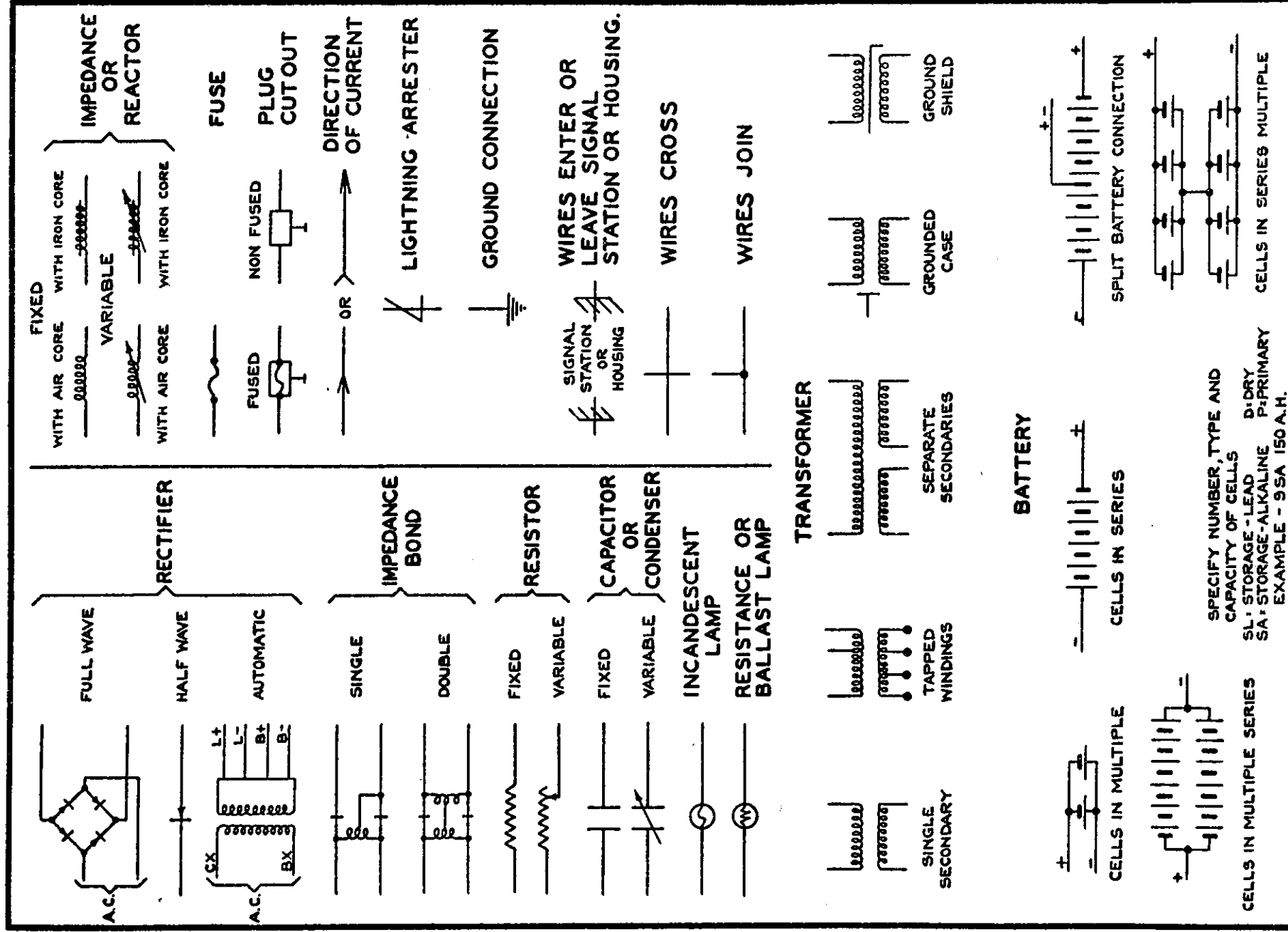
A.C.-D.C.

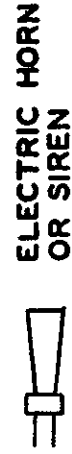
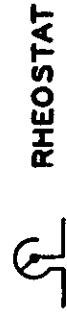
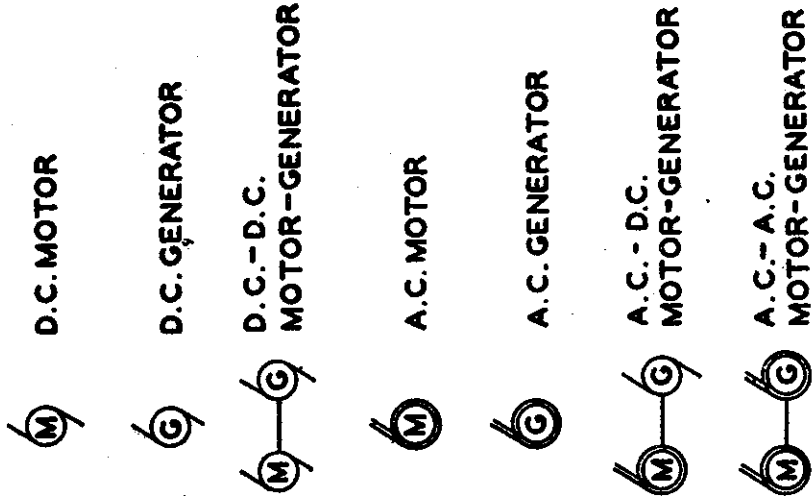
GRAPHICAL SYMBOLS
INDICATORS, LOCKS, BUZZERS AND BELLS

AAR
SIG. SEC.

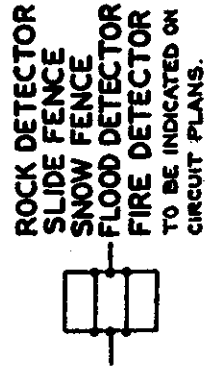
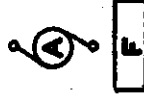
M-1943 OCT-1943 M-1934 MAR-1934

1679B

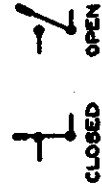




WHERE CIRCUIT REQUIREMENTS NECESSITATE -
ARMATURE AND FIELD MAY BE DESIGNATED
AS FOLLOWS:-



SINGLE THROW
SINGLE POLE



SINGLE THROW
DOUBLE POLE



DOUBLE THROW
SINGLE DOUBLE
POLE



AIR BREAK
SWITCH

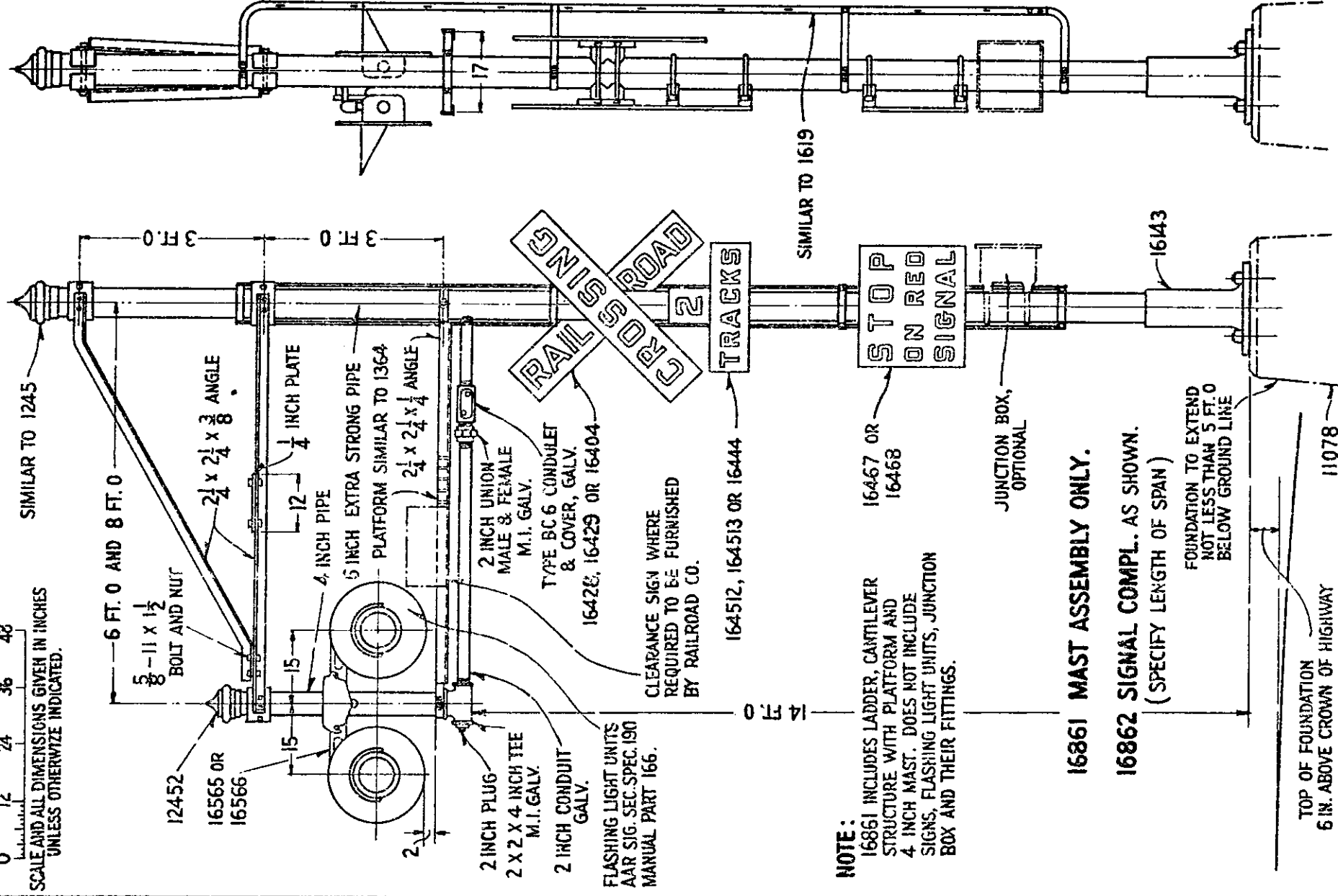
GRAPHICAL SYMBOLS MISCELLANEOUS APPARATUS

AAR
SIG. SEC.
1681B

M-1943 OCT-1943 M-1934 MAR-1934

0 12 24 36 48

SCALE AND ALL DIMENSIONS GIVEN IN INCHES
UNLESS OTHERWISE INDICATED.



NOTE:

16861 INCLUDES LADDER, CANTILEVER
STRUCTURE WITH PLATFORM AND
4 INCH MAST. DOES NOT INCLUDE
SIGNS, FLASHING LIGHT UNITS, JUNCTION
BOX AND THEIR FITTINGS.

16861 MAST ASSEMBLY ONLY.

16862 SIGNAL COMPL. AS SHOWN.
(SPECIFY LENGTH OF SPAN)

FOUNDATION TO EXTEND
NOT LESS THAN 5 FT. 0
BELOW GROUND LINE

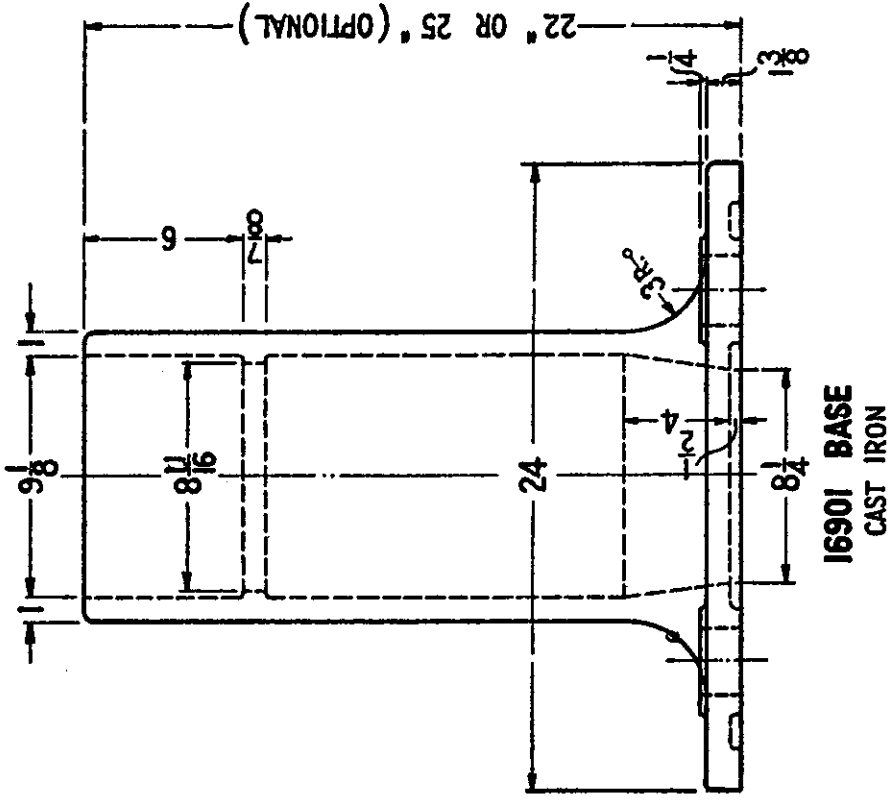
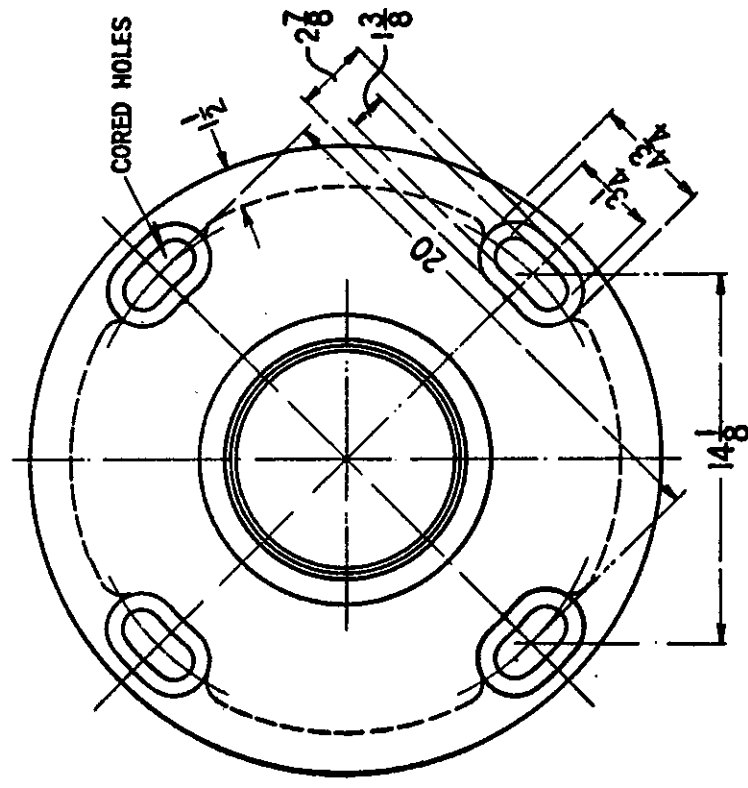
TOP OF FOUNDATION
6 IN. ABOVE CROWN OF HIGHWAY

HIGHWAY CROSSING FLASHING LIGHT SIGNAL ASSEMBLY

6 FT. AND 8 FT. CANTILEVER SPAN

AAR
SIG. SEC
1686E

M-1947 SEP 1947 M-1945 OCT 1945 M-1942 OCT 1942 M-1940 OCT 1940 M-1937 MAR 1937



0 1 2 3 6 9 12
SCALE & ALL DIMENSIONS GIVEN IN INCHES

BASE FOR 8 INCH MAST

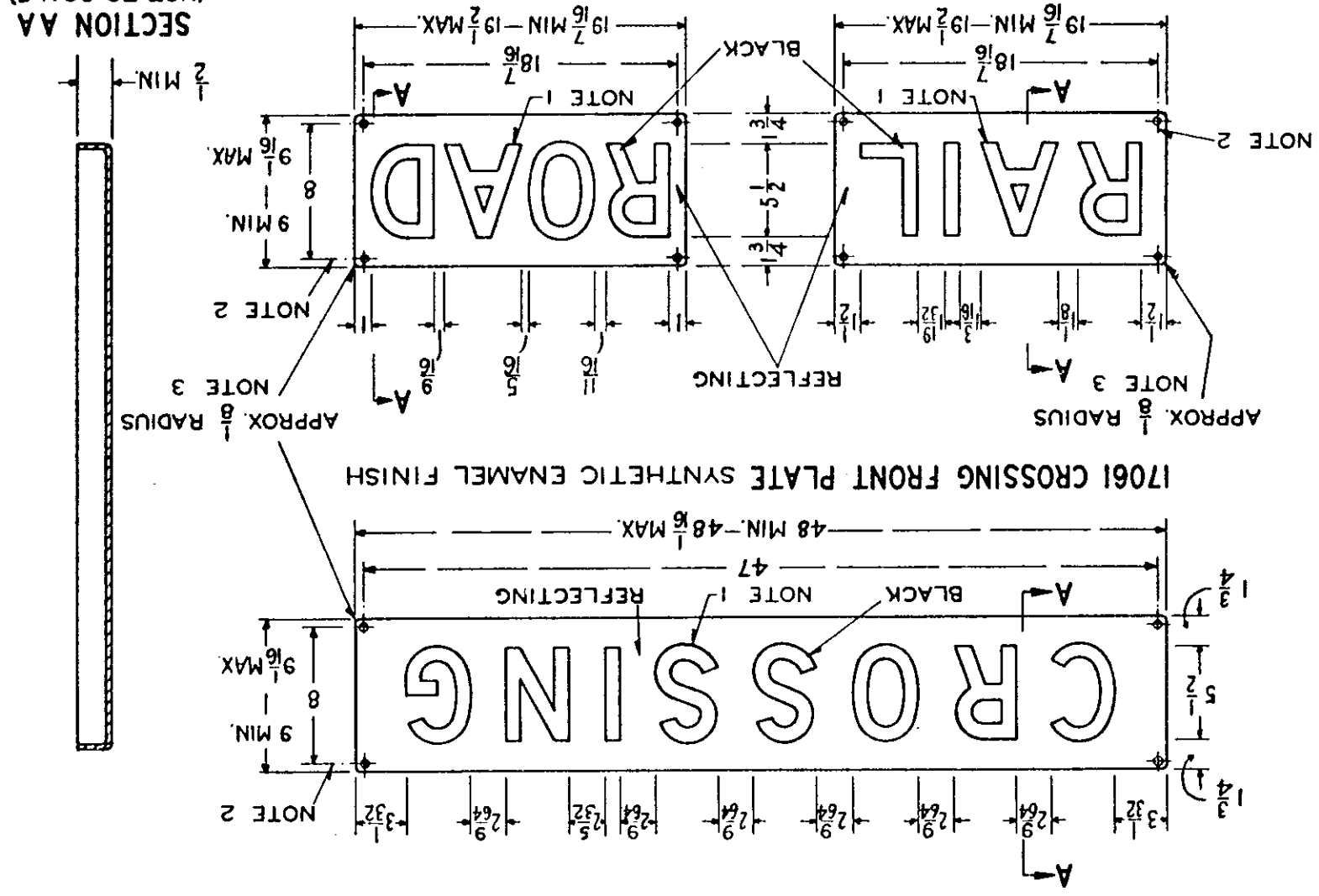
AAR
SIG. SEC.
1690A

M-1942 OCT. 1942

Cast iron shall be in accordance with Specification for Gray Iron Castings.

SECTION AA
(NOT TO SCALE)

17062 RAIL FRONT PLATE SYNTHETIC ENAMEL FINISH 17063 ROAD FRONT PLATE SYNTHETIC ENAMEL FINISH



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

FRONT PLATES FOR 90° RAILROAD CROSSING SIGN

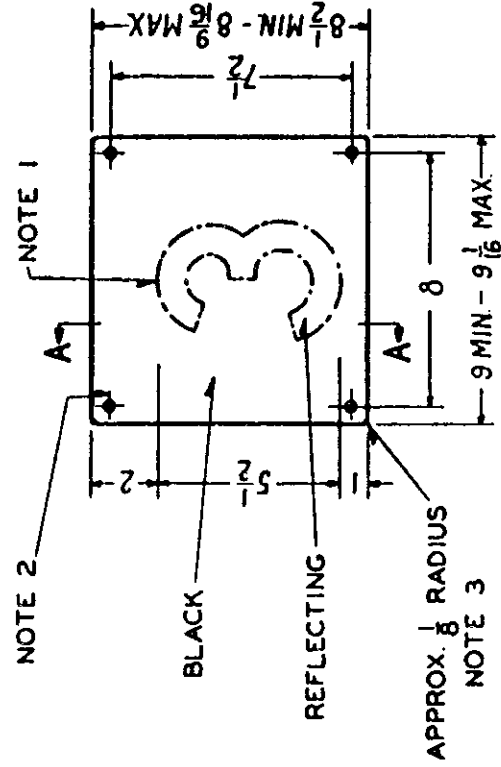
REFLEX-REFLECTING SHEET TYPE FOR BACK PLATES 17011 AND 17012 — DETAILS

AAR
SIG. SEC.
1706A

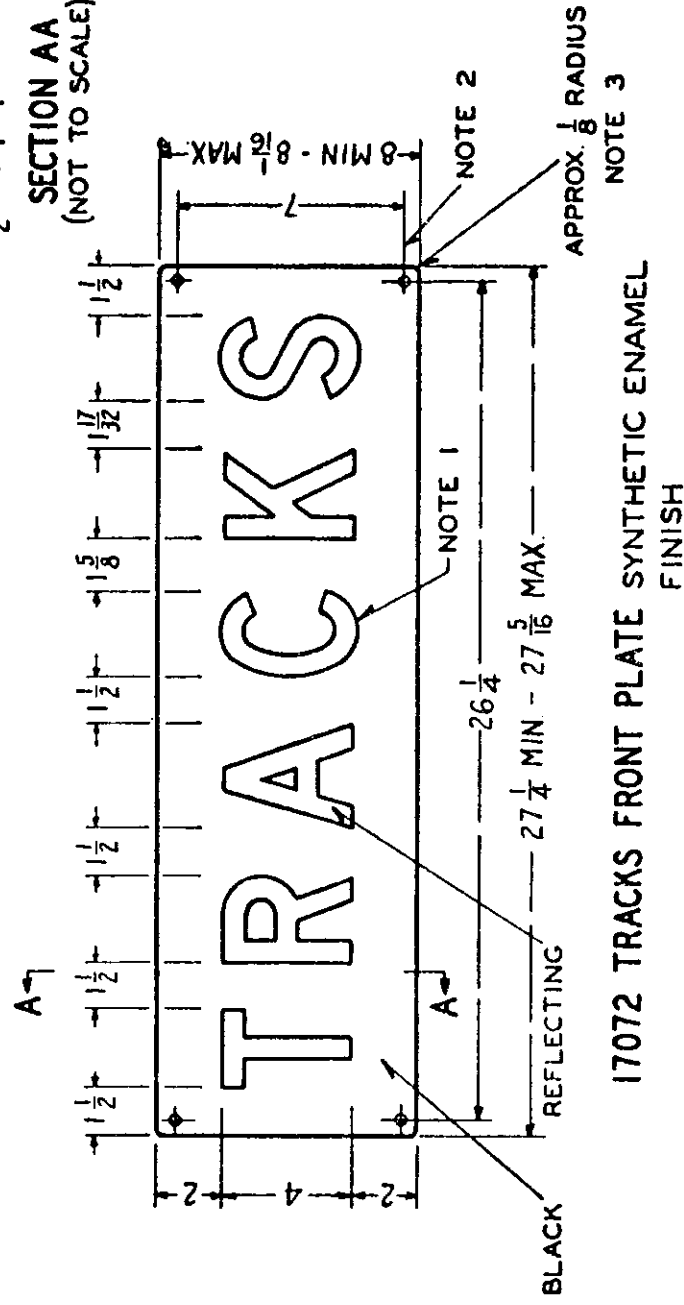
M-1951 SEP 1951

Material, painting and construction shall be in accordance with Specification 155, Manual Part 44.

- NOTE 1: SEE 1712 FOR DETAILS.
- NOTE 2: HOLES SUITABLE FOR THEFT-RESISTING TYPE SCREWS AND NUTS.
- NOTE 3: UNLESS DRAWN, CORNERS SHALL BE CLOSED BY WELDING.



17071 NUMERAL FRONT PLATE SYNTHETIC ENAMEL FINISH,
SPECIFY NUMERAL



17072 TRACKS FRONT PLATE SYNTHETIC ENAMEL
FINISH

NOTE 1: SEE 1713 AND 1714 FOR DETAILS.

NOTE 2: HOLES SUITABLE FOR THEFT-RESISTING TYPE
SCREWS AND NUTS.

NOTE 3: UNLESS DRAWN, CORNERS SHALL BE CLOSED BY
WELDING

0 3 6 9 12 15 18

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

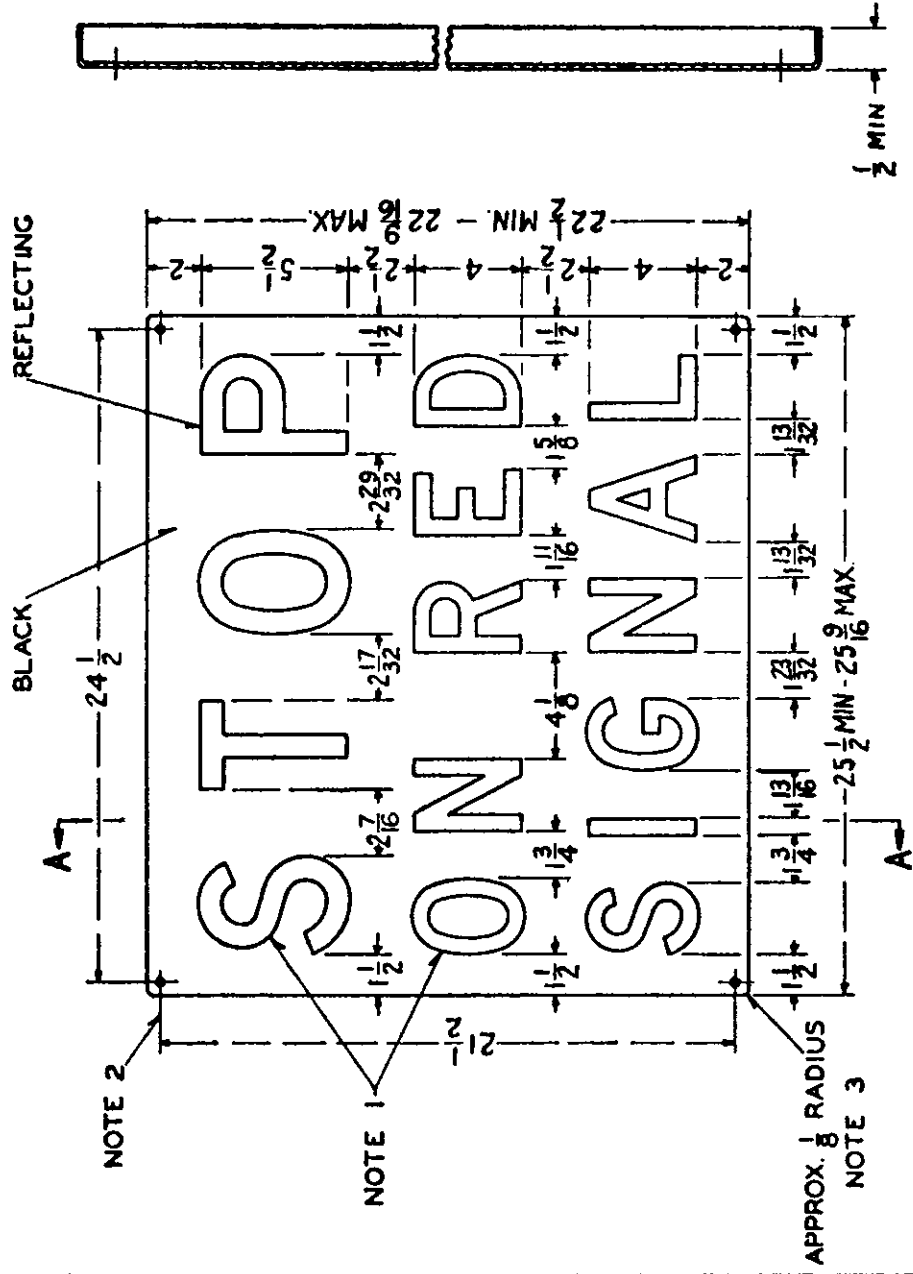
FRONT PLATES FOR NUMBER OF TRACKS SIGN

REFLEX-REFLECTING SHEET TYPE FOR BACK PLATE 17001-DETAILS

AAR
SIG. SEC.
1707A

M-1951SEP1951

Material, painting and construction shall be in accordance with Specification 155,
Manual Part 44.



17081 FRONT PLATE SYNTHETIC ENAMEL FINISH

NOTE 1: SEE 1712 AND 1713 FOR DETAILS.

NOTE 2: HOLES SUITABLE FOR THEFT-RESISTING TYPE
SCREWS AND NUTS

NOTE 3: UNLESS DRAWN, CORNERS SHALL BE CLOSED
BY WELDING

0 3 6 9 12 18
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

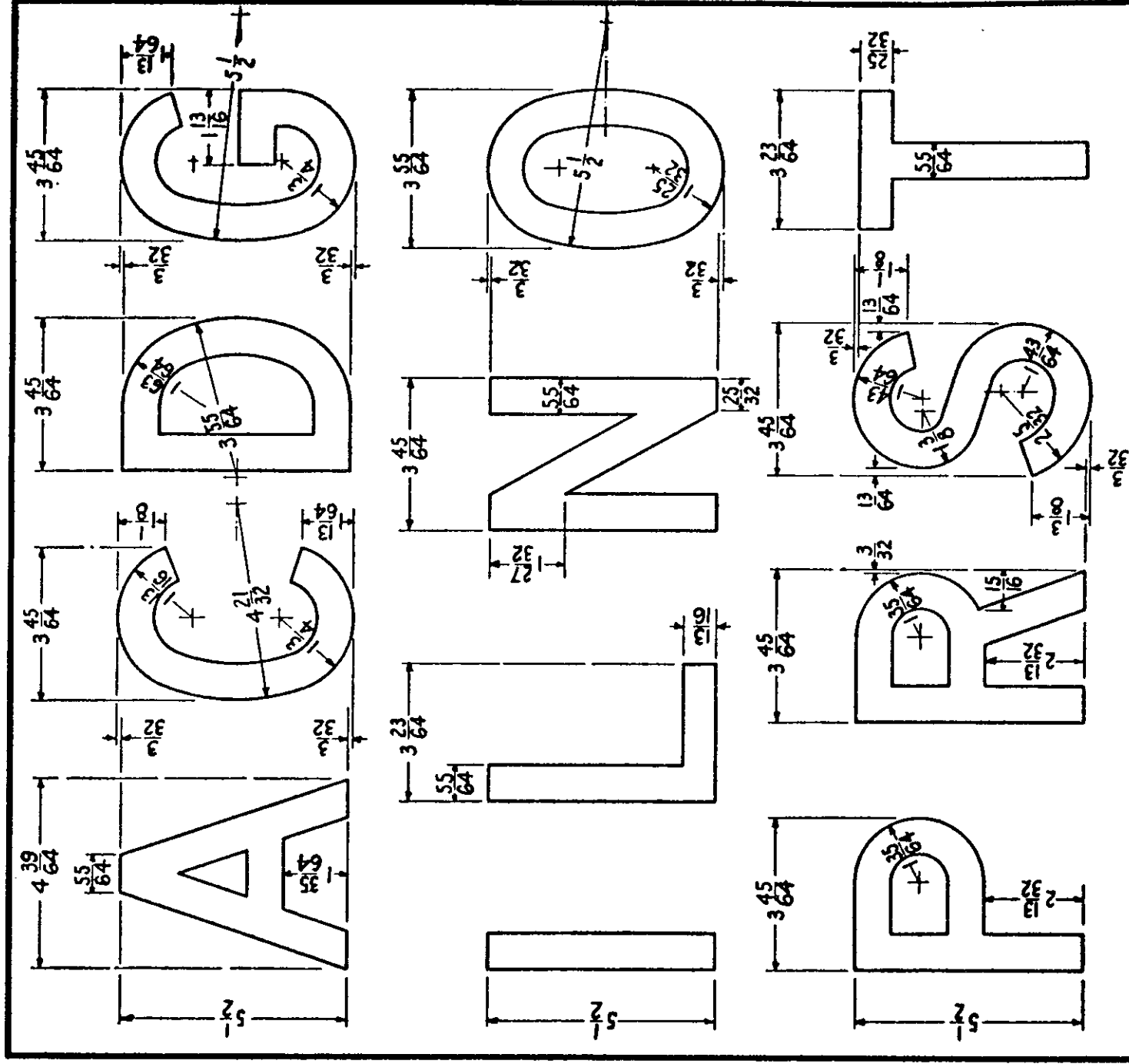
FRONT PLATE FOR STOP ON RED SIGNAL SIGN

REFLEX-REFLECTING SHEET TYPE FOR BACK PLATE 17021 - DETAIL

AAR
SIG. SEC.
1708A

1M-1951 ISEP 1951

Material, painting and construction shall be in accordance with Specification 155,
Manual Part 44.



NOTE: STROKE-WIDTH SHALL BE $\frac{55}{64}$ UNLESS OTHERWISE SHOWN.

0 3 6 9 12

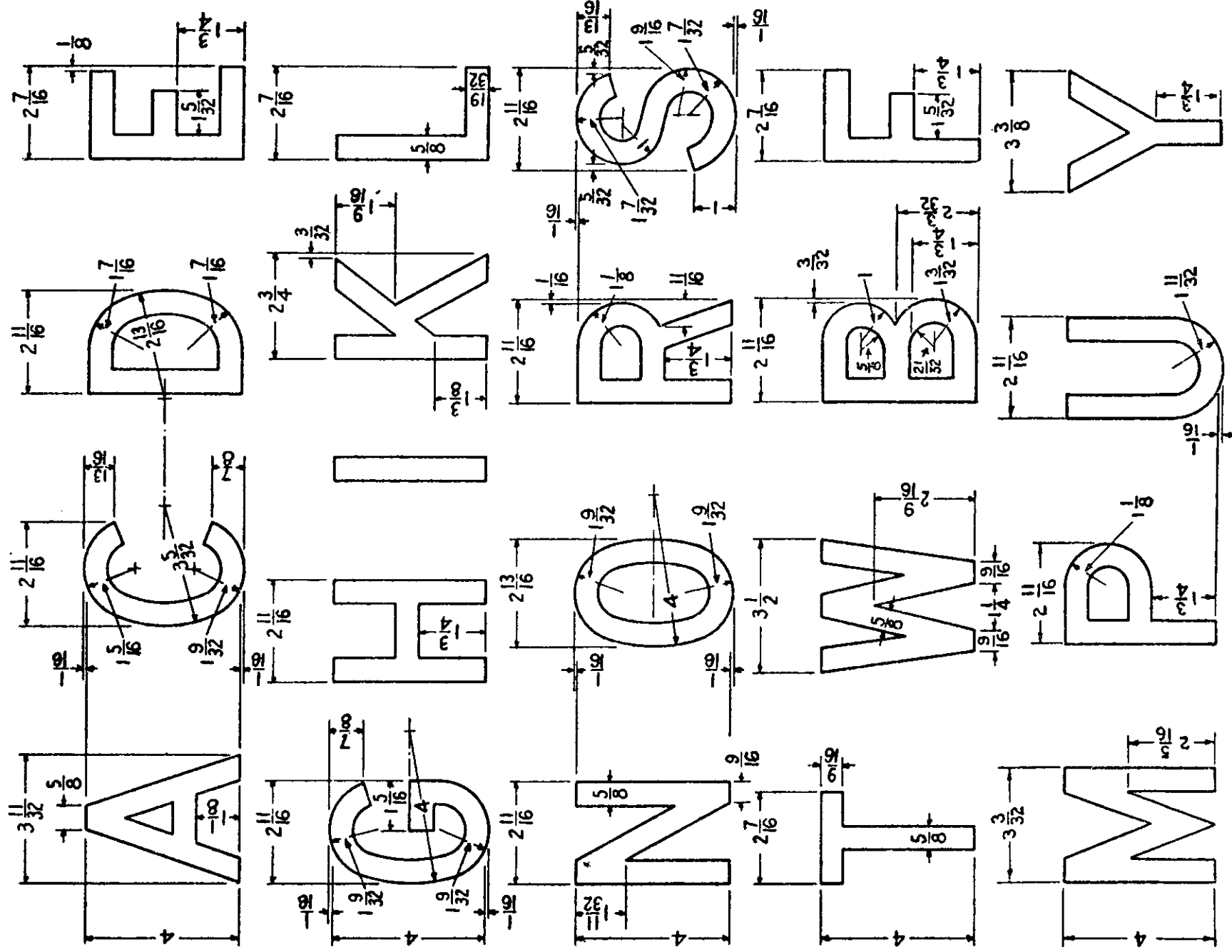
SCALE AND ALL DIMENSIONS GIVEN IN INCHES.

LETTERS-ROUNDED TYPE

$5\frac{1}{2}$ INCH-DETAILS

AAR
SIG. SEC.
1712 A

M-1951 SEP 1951



0 3 6

SCALE AND ALL DIMENSIONS
GIVEN IN INCHES.

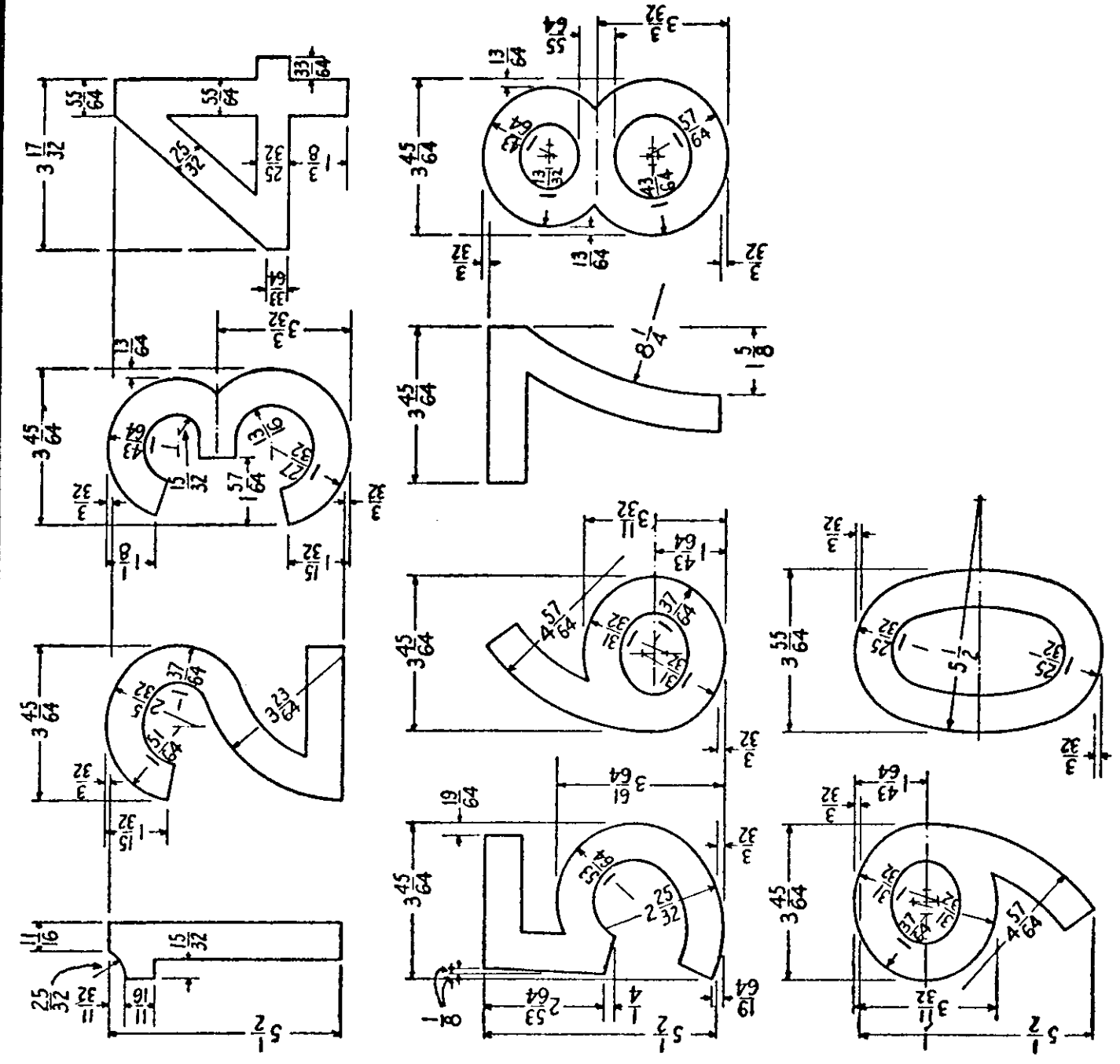
NOTE: STROKE-WIDTH SHALL BE $\frac{5}{8}$
UNLESS OTHERWISE SHOWN.

LETTERS-ROUNDED TYPE

4 INCH-DETAILS

AAR
SIG. SEC.
1713B

M-1954 OCT 1954 M-1951 SEP 1951



NOTE: STROKE-WIDTH SHALL BE $\frac{55}{64}$ UNLESS OTHERWISE SHOWN



NUMERALS - ROUNDED TYPE

$\frac{5}{16}$ INCH-DETAILS

A - CLASSIFICATION - PLAN - PLAN SIZE

S-A1A1 Classification of Standard Plans
S-A2A to S-A2G Inclusive - Standard Plan Index
S-A3A1 Standard Plan Size
S-A3B1 Location Plan Size

B-ENGINEERING DATA - CHARTS - TABLES - CLEARANCE DIAGRAMS

S-B7A Schematic Arrangement Remote Controlled Manual Block Stations
S-B8A Capacity of Battery Boxes
S-B9A4 Schematic Numbering - C.T.C. Type Electric Interlocking
S-B9B1 Schematic Machine Numbering - Two Tracks Mechanical Interlocking
S-B9C Schematic Machine Numbering - Three Tracks - Mechanical Interlocking
S-B18A2 Road Diagram Symbols
S-B20A1 Pole Line Arrangement - Auto Block Signals Single Track
S-B20B1 Pole Line Arrangement - Auto Block Signals Two Tracks
S-B20C1 Pole Line Arrangement - Auto Block Signals Three Tracks
S-B20D1 Pole Line Arrangement - Auto Block Signals Four Tracks
S-B21A Signal Clearance - C. L. High Signals

S-B21B Signal Clearance - C. L. Dwarf Signals
S-B21C Signal Clearance - C. L. Dwarf Signals
S-B21D Signal Clearance - Semaphore High Signals
S-B21E Signal Clearance - C. L. Signals - 5 Ft. Truss Bridge
S-B21F Signal Clearance - C. L. Signals - 7 Ft. Truss Bridge
S-B21G Track Pan Lights Clearance
S-B22B1 120 V. and 460 V. Signal Transformer Terminal Arrangement
S-B23A1 Wire Tagging
S-B27A1 to S-B27C1 Inclusive - Circuit Nomenclature
S-B29A5 Schematic Arrangement of Cable Ground Outlets for Switch Lamp Lighting S-A 1769-4
S-B31A Apparatus Reference List - 3 Sheets

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S-F3A4 Concrete Foundation - For Electric Switch Lock
S-F4A5 Concrete Foundations - For Ground and Bracket Mast Signals
S-F4B4 Concrete Foundation - Type "SA" and "SC" Dwarf Signal
S-F5A2 Foundation Extensions
S-F5B2 Foundation Extensions
S-F5C2 Foundation Extensions
S-F5D2 Foundation Extensions
S-F5E2 Foundation Extensions
S-F8A Foundation and Adaptors - For C. L. Dwarf Signals

N.Y.C.R.R.

Signal Department

Cleveland, Ohio

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August 3, 1953

S-A2A

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S-G3B4 Standard Renewal Parts for Continuous One End Insulated
Joint 105# Rail EC G-27
S-G3C5 Standard Renewal Parts for Continuous One End Insulated
Joint 127# Rail EC G-28
S-G3D1 Standard Renewal Parts for Continuous Full Insulated
Joint, Electric Zone, 127# Rail EC G-28A
S-G3E3 Standard Renewal Parts for Continuous Frog & Switch
Insulated Joint 105# Rail EC G-29
S-G3F3 Standard Renewal Parts for Continuous One End Insulated
Joint 112# R.E. Rail EC G-30
S-G3G3 Standard Renewal Parts for Continuous Full Insulated
Joint 112# R.E. Rail EC G-31
S-G5C2 ~~Trench Cable Bootleg - For Track Connection~~ *Cane*
S-G5D ~~Trench Cable Bootleg - For Terminating Conductors~~ *Cane*
S-G5E3 ~~Trench Cable Bootleg Application - For Track Connections~~ *Cane*
S-G5F3 ~~Trench Cable Bootleg Application - For Track Connections~~ *Cane*

H - SWITCH, DERAIL AND M.P. FROG LAYOUTS

S-H3A Electric Switch Lock Connections - Hand Operated Switch
No. 20 Switch Stand
S-H10A Switch Connected Hayes Derail Layout-Interlocked Switch
S-C 1868-26
S-H10B Order References for Material - Switch Connected Hayes
Derail Layout - Interlocked Switch S-A 1868-27
S-H11A Movable Point Frog Layout-G.R.S. Model 5A Switch Machine
127 lb. Rail - S-C 1868-34
S-H12A Double Slip & M.P. Frog Layout - G.R.S. Model 5A
Switch Machine - 127 lb. Rail - S-C 1868-5

S-H12B Order Reference for Material - Double Slip Switch &
M.P. Frog Layout G.R.S. Model 5A Switch Machine
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J - SWITCH FITTINGS - DETAILS

S-J12D Connections - Electric Switch Lock - Details
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S-J22C Switch Rod - Double Slip Switch - 127 lb. Rail -
S-A 1868-14
S-J23C1 Lock Rods - G.R.S. Co. Model 4 Switch Machine
S-J23D1 Lock Rods - G.R.S. Co. Model 4 Switch Machine
S-J24B2 Adjustable Lock Rod - G.R.S. Model 5A Switch Machine
S-J26A8 Adjustable Lock Rod - U.S.&S. Model 14 S.&L. Movement
S-J27A5 Adjustable Lock Rod - U.S.&S. Style "M" Switch Machine
S-J29B Throw Rods - Double Slip & M.P. Frog Layout - S-A 1868-23
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S-A2B

L - LEADOUTS - PIPE LINES

M - INTERLOCKING MACHINES & LEVER STANDS - PARTS & ATTACHMENTS

S-M7A2 Circuit Controller Rods - G.R.S. Model 2 N.Y.C. Modified
Type Interlocking Machine - Assembly
S-M7B2 Circuit Controller Rods - G.R.S. Model 2 N.Y.C. Modified
Type Interlocking Machine - Details
S-M7C2 Circuit Controller Rods - G.R.S. Model 2 N.Y.C. Modified
Type Interlocking Machine - Details
S-M9A Tappet Connecting Link - For Style "A" Interlocking Machine
S-M10A Stop - For Locking Tappets of Spare Levers on G.R.S.
Model 5B Interlocking Machine
S-M12A2 Lever Notching & Filler Block - For Mech. Time Lock
G.R.S. Co.'s Interlocking Machine
S-M13A1 Electric Lock Stop Block and Replacer Bar - G.R.S. Model 2
Interlocking Machine
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Unit Interlocking Machine
S-M13C1 Electric Lock Stop Block and Replacer Bar - G.R.S. Model 2
Unit Interlocking Machine
S-M15A1 Type "L" Lever Lock Connections - Style "A" Machine -
S-A 1282E
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S-N4A1 Fusee Rack - For Interlocking Towers
S-N5A1 Fuse Holder - For Interlocking Towers
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S-N9A1 Relay Support - Assembly
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S-N10A1 Switch Block and Board
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S-N13A4 Tools
S-N14C Socket Wrenches
~~S-N15A4 Soil Pipe Assembly~~ *Cane*
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S-N18A Front Board for Motor Car Tool Tray
S-N19A Locking Stop - S. & F. Interlocking Machine
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S-A2C

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S-P4D1 Battery Box - Cast Iron - Details
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S-P10A2 Color Light (Yellow) Train Order Signal Control Box-Assembly
S-P10B1 Color Light (Yellow) Train Order Signal Control Box-Details
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~~S-P13A1 Instrument Case, High Single - One Door - Assembly~~ *Cane*
S-P13B1 Terminal Case, Low Single - One Door - Assembly
~~S-P13C2 Instrument Case, Hangers - Details~~ *Cane*
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S-S5A Station Flag Signal
S-S7A Pole Target Assembly - S-A 1598-1
S-S9A Railway Crossing Gate - Assembly
S-S10A1 Grade Signal - Assembly
S-S15A6 Track Fan Lights - Assembly
S-S16A Color Light Signals - Doublet Type - Bridge & Bracket Mast-
S-A 1174-1
~~S-S16B Color Light Signals - Doublet Type - Ground Mast - S-A 1174-9~~ *e*
S-S17A Color Light Signals - Doublet Type - Cable Arrangement on
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Ground Mast~~ *e*

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S-T4A Deck for Pipe and Channel Column Bracket Posts-Details
and Assembly - A.A.R. 1030
S-T4B Pipe Bracket Post - A.A.R. 1039
S-T6B Ladders For Two Way Single Lamp Signal-A.A.R. 1357
S-T6H Ladders for Bracket Posts - A.A.R. 1372
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S-T7C Semaphore Spectacle for Two Way Single Lamp Signal
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S-T17C Mechanical Dwarf Signal - Details - A.A.R. 1567
S-T17D Mechanical Dwarf Signal - Details - A.A.R. 1568
S-T19B Masts - C.L. Signal - Doublet Type - S-A 1174-6
S-T20A Pole Target Details - S-A 1598-2
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S-T20D Pole Target Details - S-A 1598-5
S-T20E Pole Target Details - S-A 1598-6
S-T21A Railway Crossing Gate - Details
S-T21B Railway Crossing Gate - Details
S-T21C Railway Crossing Gate - Details
S-T21D Railway Crossing Gate - Details
S-T24A1 Grade Signal - Details
S-T25A2 Track Pan Lights - Details
S-T28A3 Highway Crossing Gate Arm - Double Bearing - Assembly
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S-T28B3 Highway Crossing Gate Arm - Double Bearing - Assembly
with Mechanism 3563-41GL
S-T28C2 Highway Crossing Gate Arm - Double Bearing - Order
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S-T28D2 Highway Crossing Gate Arm - Double Bearing - Details
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S-T28G2 Highway Crossing Gate Arm - Double Bearing - Wiring Detail
S-T28H Highway Crossing Gate Arm - Double Bearing - Location Plan
S-T28J2 Highway Crossing Gate Arm - Double Bearing-Assembly
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S-T28K2 Highway Crossing Gate Arm - Double Bearing - Assembly
with Mechanism 3566
S-T28L Highway Crossing Gate Arm - Double Bearing - Assembly
with Mechanism 3566
S-T28M Highway Crossing Gate Arm - Double Bearing - Details
S-T29A Cable Clamps Color Light Signals Doublet Type - S-A1174-5
S-T30A Grab Irons Color Light Signals

U - AUTOMATIC TRAIN STOP APPARATUS

W - POLE LINES AND EQUIPMENT

S-W2A Line Cable Connections
S-W2B Line Cable Splice

X - ELECTRICAL MATERIAL NOT OTHERWISE CLASSIFIED

S-X16A1 Track Shunt

Y - WIRING DIAGRAM

Z - CIRCUITS

~~S-Z1A Highway Signal Circuits - Flashing Lights on Single Track
Operated for Train Movements in Either Direction
Non-Automatic Territory.~~
~~S-Z1B Highway Signal Circuits - Flashing Lights Operated for Train
Movements in Either Direction - Automatic Territory~~
~~S-Z1C Highway Signal Circuits - Flashing Lights on Multiple Track
Operated For Train Movements With the Current of Traffic
Only~~

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S-Z1E Highway Signal Circuits - Cut Out Feature Using Switch
Circuit Controller - Non-Automatic Territory
S-Z1F Highway Signal Circuits - Cut Out Feature Using Push Button
Automatic Territory
~~S-Z1G Highway Signal Circuits - Wiring For G.R.S. Model 9A
Flashing Relay~~
~~S-Z1H Highway Signal Circuits - Flashing Lights for Use at
Locations Where More Than 8 Lamps Are To Be Operated~~
S-Z2D Switch Repeating Relay Circuits - Derail, Switch Or
Crossover
S-Z2E Switch Repeating Relay Circuits - Switch and Derail
S-Z3A Automatic Signal Control - For Station Protection
S-Z5A Trap Circuit
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S-Z6C Fouling Circuits - Auto. Sig. Territory - For Use Where
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S-Z7A Approach Annunciator Circuits
S-Z9A Circuits For 110 V. - D.C. 4-4A & 4B Switch Machines
S-Z9B Operating Characteristics For 110 V. D.C. 4 - 4A & 4B
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S-Z9C Circuits For 110 V. D.C. 5A Switch Machine - Buffalo
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S-Z9J Circuits For 110 V. D.C. 5A Switch Machine - Without Lever
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S-Z9K Circuits For Style "M" Switch Machine - With Type "F"
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S-Z10A Track Pan Lighting Circuits
S-Z11A Remote Controlled Manual Block Signal Circuits
S-Z11B Remote Controlled Manual Block Signal Circuits
S-Z12A Route Locking Circuits - Elect. Int. With Dead Section of Track
S-Z12B Route Locking Circuits - Elect. Int. With Dead Section of Track

S-Z12C Route Locking Circuits - Mechanical Interlocking
S-Z12D Route Locking Circuits - Mechanical Interlocking
S-Z13A Check Lock Circuits
S-Z15A Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15B Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15C Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15D Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15E Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15F Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15G Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15H Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15J Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z15K Color Light Signal Circuits - Doublet Type-4 Ind.Signal
S-Z16A Electric Switch Lock Circuits - S-A 799-1
S-Z16B Electric Switch Lock Circuits - S-A 799-2
S-Z16C Electric Switch Lock Circuits - S-A 799-3
S-Z17A Auto. Sema. Signal Circuits - Style "B" L.Q. - S-A 996A
S-Z17B Auto. Sema. Signal Circuits Style "B" U. Q. - 3 Indication
S-A 996B
S-Z18A2 Auto. Sema. Signal Circuits
S-Z18B2 Auto. Sema. Signal Circuits
S-Z18C2 Auto. Sema. Signal Circuits

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S-Z18F2 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18G2 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18H2 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18J2 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18K1 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18L2 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z18M1 Auto. Sema. Signal Circuits - Restricted speed indication
S-Z19A G.R.S. Model 2 Dwarf Signal Circuit - S-A1298-13
S-Z20A Cross Protection & Operating Board Wiring - G.R.S.
Interlocking - S-A 1298-16
S-Z21A Train Order Signal Control Circuits - S-A 1620-1
S-Z22A C. L. Home Signal Control Circuits - S-A 1775-1
S-Z23A Tell Tale Circuits for Signal Power Lines - S-A 1787-1

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Signal Department

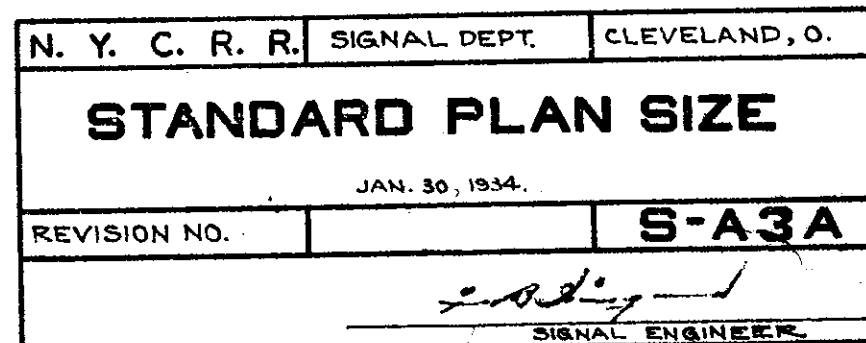
Cleveland, Ohio

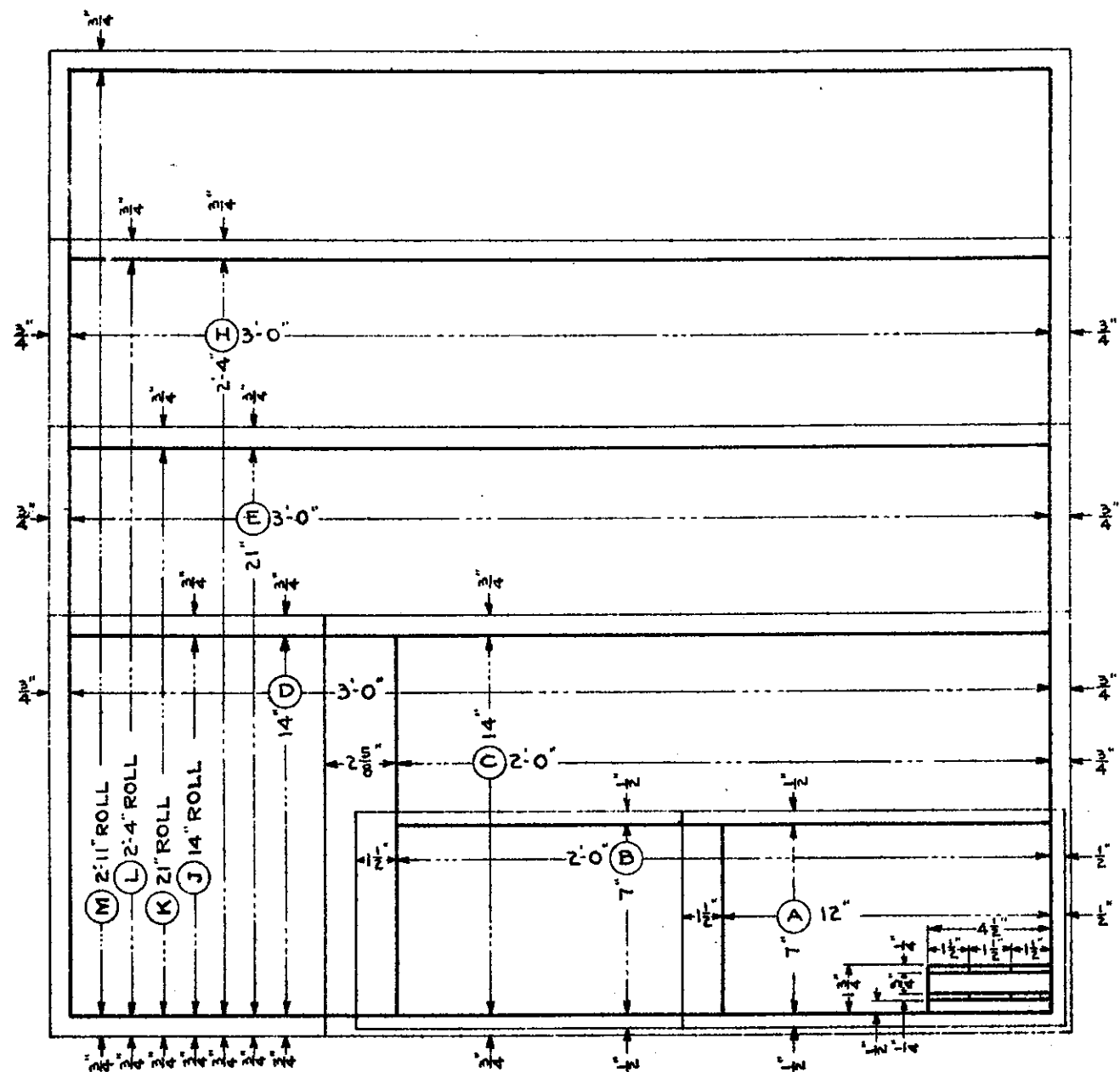
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Revision No.

January 7, 1953

S-A26





SHEET	SIZE INSIDE	SIZE OUTSIDE
A	7" X 12"	8" X 14"
B	7" X 2'-0"	8" X 2'-2"
C	14" X 2'-0"	15½" X 2'-3⅝"
D	14" X 3'-0"	15½" X 3'-1½"
E	21" X 3'-0"	22½" X 3'-1½"
H	2'-4" X 3'-0"	2'-5½" X 3'-1½"
J	14" ROLL	15½" ROLL
K	21" ROLL	22½" ROLL
L	2'-4" ROLL	2'-5½" ROLL
M	2'-11" ROLL	3'-0½" ROLL

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

PLAN SIZE

FEB. 13, 1936.

REVISION NO.

S-A3B

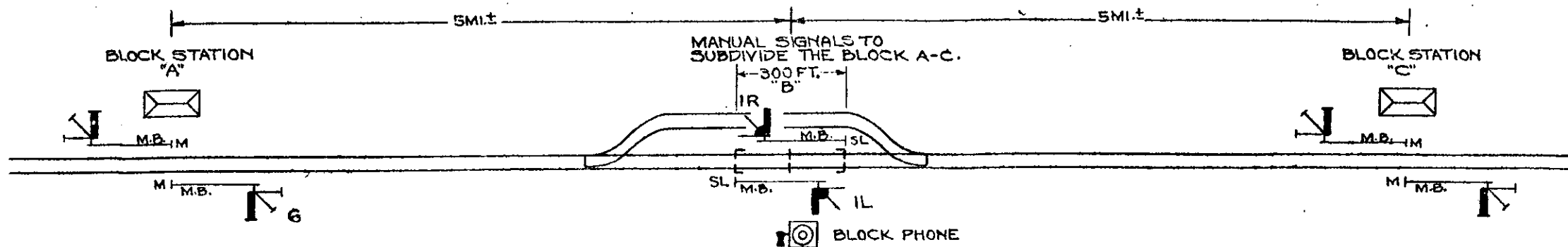
SIGNAL ENGINEER

STORAGE BATTERY					
AMPERE HOUR CAPACITY OF CELL DISCHARGE RATE.		BATTERY BOX NUMBER OF CELLS			
8 HOUR	72 HOUR	12661	12662	12663	12664
120	174	3	6	12	16
160	232		6	12	16
200	290		6	8	12
240	248		4	8	12
280	406		4	6	10

NOTE:
WHERE SPACE IS AVAILABLE IN
RELAY HOUSE BATTERY BOX WILL
NOT BE USED.

PRIMARY BATTERY				
AMPERE HOUR CAPACITY OF CELL	BATTERY BOX NUMBER OF CELLS			
	12661	12662	12663	12664
500	6	12	18	24
1000	2	6	12	18

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CAPACITY OF BATTERY BOXES		
APRIL 14, 1934.		
REVISION NO. 1	APRIL 14, 1937.	S-B8A
 SIGNAL ENGINEER		



EQUIPMENT "A"

USUAL 3 POSITION MECHANICAL
MANUAL BLOCK SIGNALS
WITH MANUAL BLOCK
OPERATORS.

EQUIPMENT "B"

(EASTWARD SIGNAL) 3 POSITION
(WESTWARD SIGNAL) SEMI-AUTOMATIC STICK
MANUAL BLOCK SIGNALS CONTROLLED
FROM BLOCK STATION "A"
TRACK CIRCUITS AT "B" TO ANNOUNCE
TO BLOCK STATION "A" WHEN TRAIN
PASSES AND ITS DIRECTION.
SIGNALS G AND IR INTERCONNECTED
SO BOTH CANNOT THROUGH ERROR
BE CLEARED AT SAME TIME.

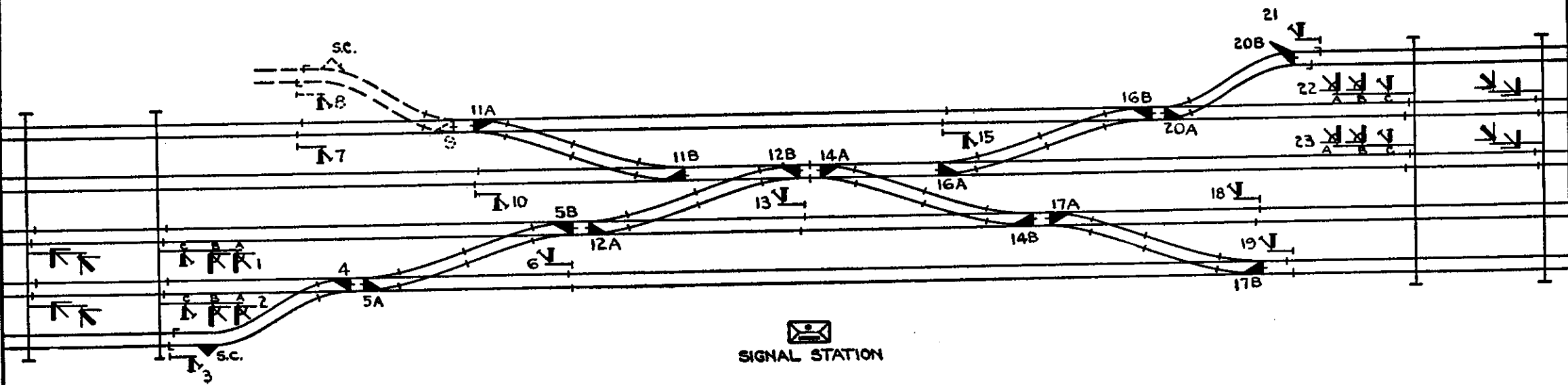
EQUIPMENT "C"

USUAL 3 POSITION MECHANICAL
MANUAL BLOCK SIGNALS
WITH MANUAL BLOCK
OPERATORS.

NOTE:
FOR USE WHERE AUTHORIZED BY
THE SIGNAL ENGINEER.

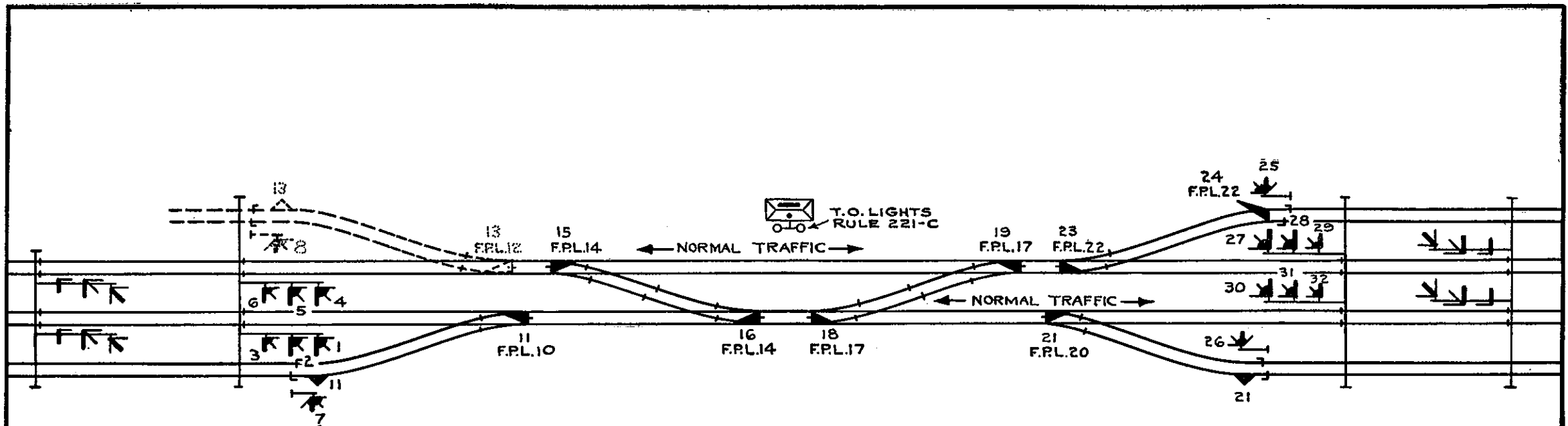
NOTE: PASSING SIDINGS MAY
BE INSERTED AS REQUIRED AS
FAR AS BLOCKING IS CONCERNED,
BUT IT IS DESIRABLE TO KEEP THE
TRACK CIRCUITS OUTSIDE OF
SWITCHING TERRITORY.
STATION "A" KEEPS BLOCK
SHEET ON THE USUAL COOPERATIVE
BLOCKS AND IN ADDITION THE BLOCK
SHEET FOR STATION "B".

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SCHEMATIC ARRANGEMENT		
REMOTE CONTROLLED MANUAL BLOCK STATION.		
OCT. 5, 1935.		
REVISION NO.		S-B7A
 SIGNAL ENGINEER		



JN=613-52
LPH

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SCHEMATIC NUMBERING ALL RELAY TYPE ELECTRIC INTERLOCKING		
DATED APRIL 5, 1934.	REV. MAR. 24, 1952.	S-B9A4
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



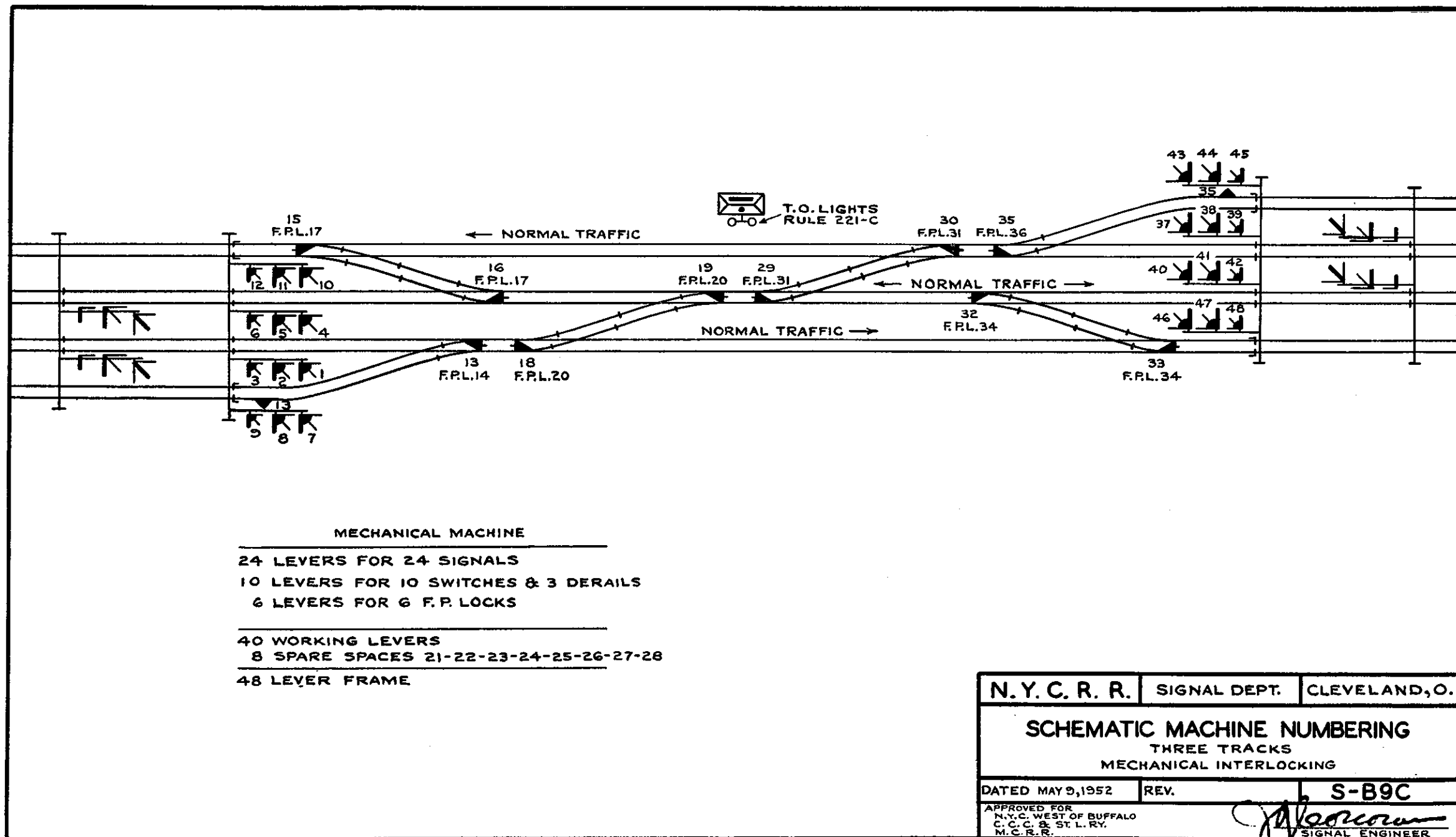
MECHANICAL MACHINE

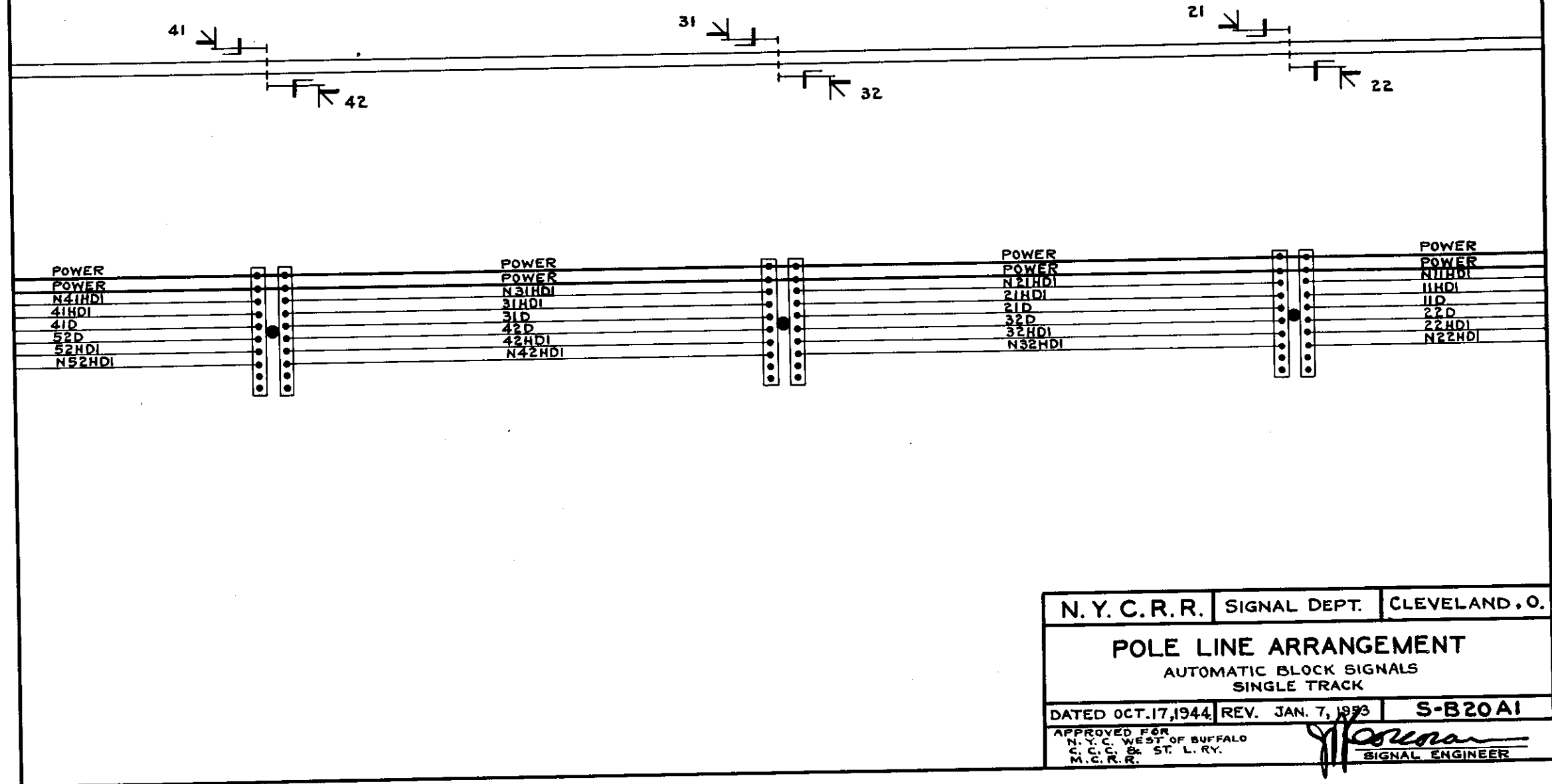
15 LEVERS FOR 16 SIGNALS
8 LEVERS FOR 7 SWITCHES & 3 DERAILS
5 LEVERS FOR 8 F.P. LOCKS

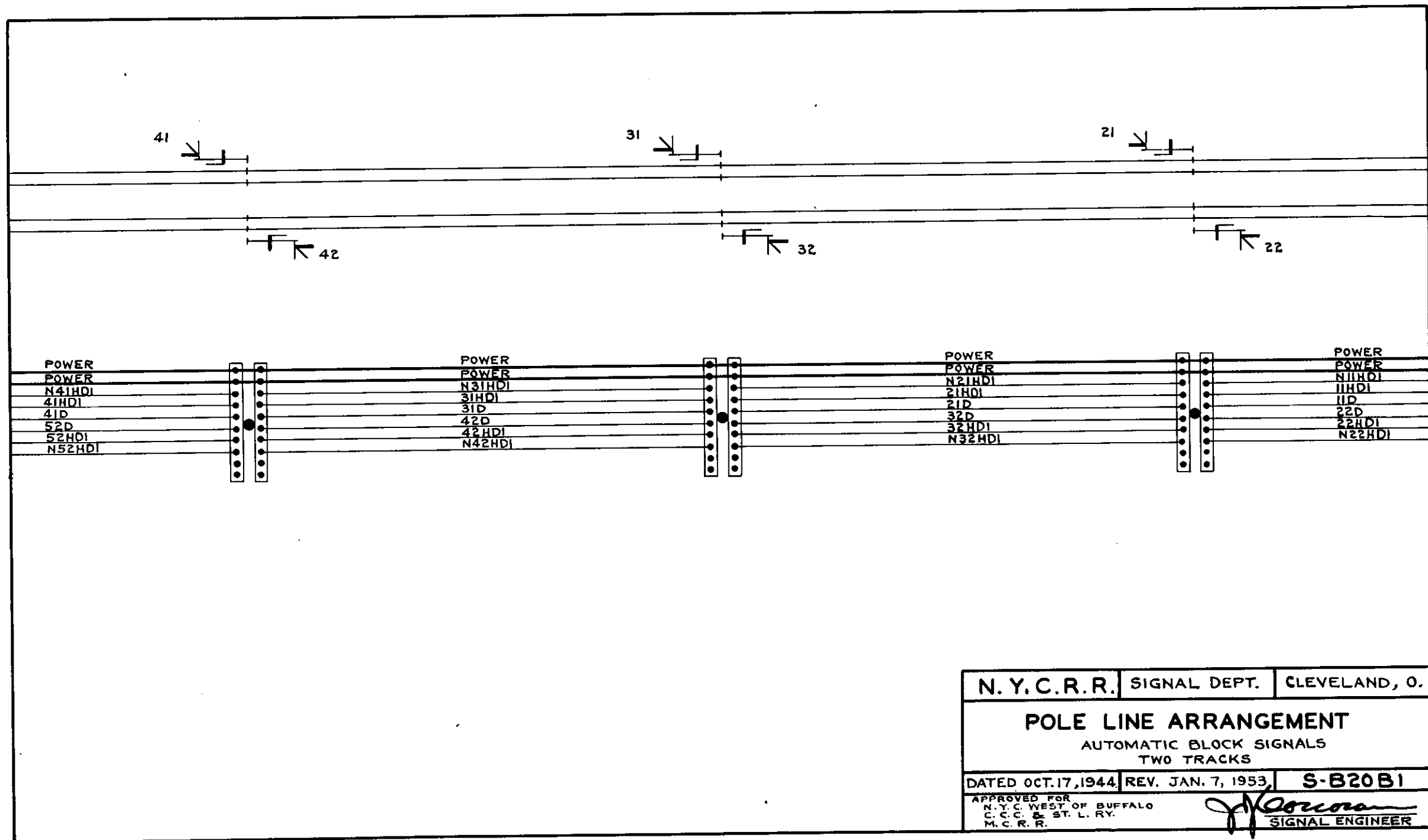
28 WORKING LEVERS
4 SPARE SPACES 8-9-12-13

32 LEVER FRAME

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SCHEMATIC MACHINE NUMBERING		
TWO TRACKS		
MECHANICAL INTERLOCKING		
DATED DEC. 8, 1942.	REV. MAY 9, 1952	S-B9B1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. R. V. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER







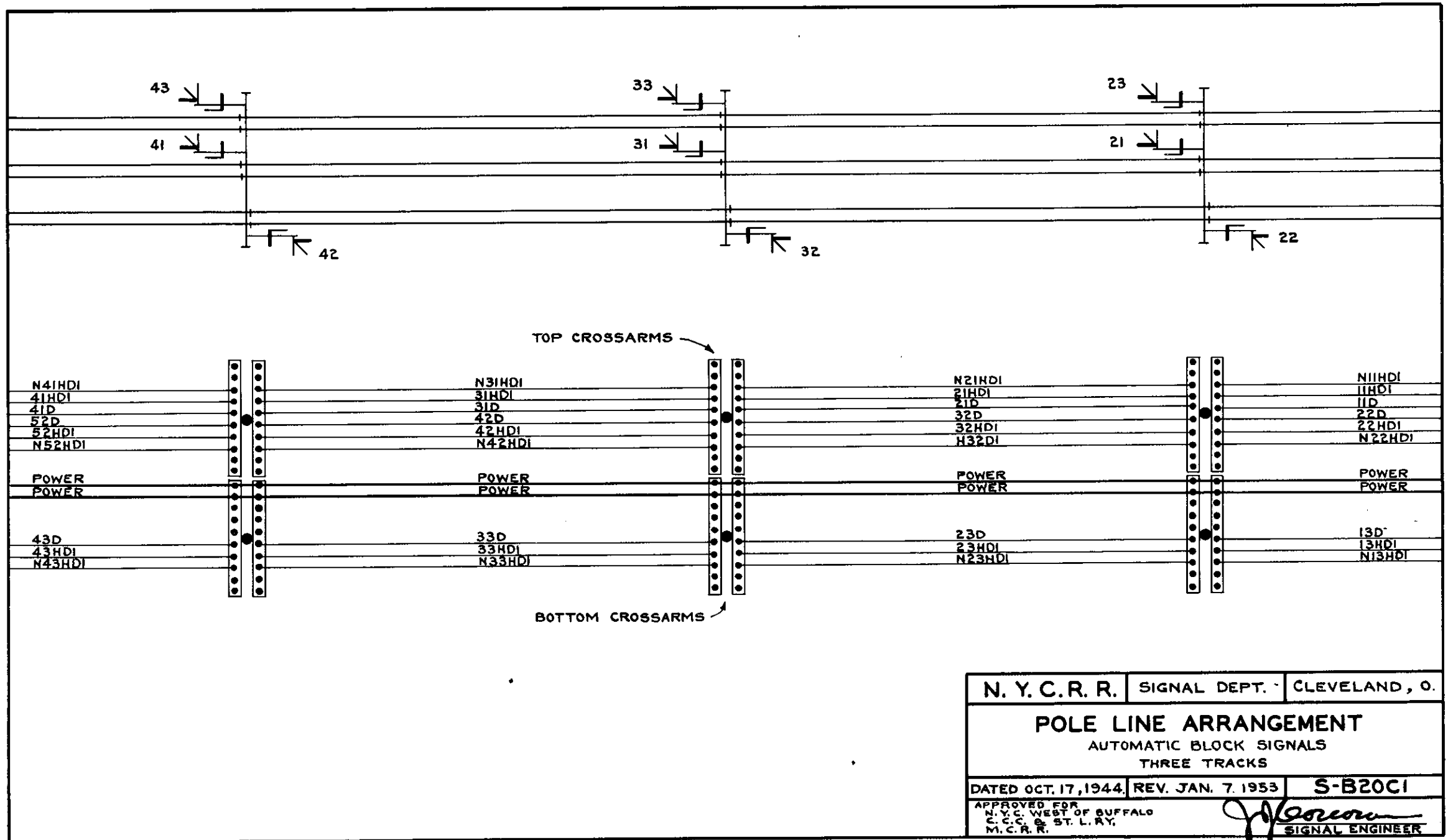
N. Y. C. R. R. | SIGNAL DEPT. | CLEVELAND, O.

POLE LINE ARRANGEMENT
AUTOMATIC BLOCK SIGNALS
TWO TRACKS

DATED OCT. 17, 1944 | REV. JAN. 7, 1953 | S-B20B1

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

J. J. Conner
SIGNAL ENGINEER



N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
POLE LINE ARRANGEMENT		
AUTOMATIC BLOCK SIGNALS		
THREE TRACKS		
DATED OCT. 17, 1944.	REV. JAN. 7, 1953	S-B20C1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER

REF.	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS	REF.	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS	REF.	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS
1	ARRESTER - CLEARVIEW RACO 485-3	L.V.	56937-8	LINE	26	CONNECTOR 6060-11 N.Y.C.S. & T.C.C. PLAN 6060				51				
2	ARRESTER-BALKITE FANSTEEL	(2)	56937-10	SIGNAL	27	CONNECTOR 1 3/16 TO 1 1/2		4906-7		52	INSULATOR NUT 110 V.		56482	
3	ARRESTER-BALKITE FANSTEEL	L-5	56937-13	SIGNAL	28	CONNECTOR 1 1/8		4906-14		53				
4	ARRESTER RACO 560 B	HYSTATIC SHUNT	56868	TRACK	29	CONNECTOR 3/8" OFF-SET		4906-17		54	PLUG BOARD FOR B1 RELAY		59686-5	
5					30	CONNECTOR 6 1/4		4906-72		55	PLUG BOARD FOR B2 RELAY		59686-7	
6					31	CONNECTOR 1 1/8		4906-86		56	RECEPTACLE	L.V.	56582-1	
7					32	CONNECTOR 3 1/8		4906-94		57				
8					33	CONNECTOR 1" OFF-SET		4906-100		58				
9	BUS BAR - 8" HOLES ON 1 1/8" CENTERS		2421-75		34					59	RECTIFIER-MAX. D.C. OUTPUT 3V. 2.2 AMPS. A.C. INPUT 5V.	B3X 104	57163 GR.1	1 CELL ITEM-3
10	BUS BAR - 12" HOLES ON 1 1/8" CENTERS		2421-76		35	CONVENIENCE OUTLET	110V.	56582-1		60	RECTIFIER-MAX. D.C. OUTPUT 13.5V. 5AMPS. A.C. INPUT 110V.	BT116	54935-100GR1	
11	BUS BAR - 20" HOLES ON 1 1/8" CENTERS		2421-77		36					61	RECTIFIER-H.V. MAX. D.C. OUTPUT 13.5V. 2.2AMPS. A.C. INPUT 110V.	BT 432	54935-103GR1	FOR CHARGING 4-6 LEAD CELLS ITEM-13
12					37					62	RECTIFIER-H.V. MAX. D.C. OUTPUT 3V-2.2AMPS. A.C. INPUT 110V.	BT 104	57162 GR.1	TRACK RECTIFIER ITEM-1
13					38					63	RECTIFIER-L.V. D.C. OUTPUT 12V-.05 AMPS.	BT 1	57170 GR.1	L.V. RECTIFIER FOR USE WITH HD RELAYS.
14					39					64	RECTIFIER-13.5 D.C. VOLTS .05 AMPS.	BT 1	59605-3 GR.2	RECT. ONLY 59605-4 GR.1 USED TO MAKE RELAY S.R.
15	BUTTON AND SHIELD 550 Y.		29493-16 47474-14		40	EYELET FOR #10 WIRE		37695-8		65	RECTIFIER-MAX. D.C. OUTPUT 13.5V. .15AMPS.	B 1/4	54728-60GR1	RECTIFIER ONLY 54728-5 GR. 4 USED WITH B1 POWER TRANSFER RELAYS REF. 111 & 112
16					41	EYELET FOR #12 WIRE		17819-1		66	RECTIFIER- MAX. D.C. OUTPUT 15.4V. -1.7 AMPS. A.C. INPUT 110V.	B3QX 208	57276 GR.1	7 CELLS
17	CASE FOR 5'-6" X 2'-9" BOLTED RELAY RACKS *		54311-113 GR.2		42	EYELET FOR #14 & #16 WIRE		37695-26		67	RECTIFIER- MAX. D.C. OUTPUT 22V-1.5AMPS. A.C. INPUT 30V.	B432	54941-3GR.8	7-10 CELLS
18	CASE- 24 WAY WITH 2 BOLTED RACKS *		56495-4	FOR NEW TYPE PLUG BOARD	43					68	RECTIFIER-MAX.D.C. OUTPUT 13.5 V. - 2.7 AMPS. A.C. INPUT 20V.	BX 432	54942-103GR.2	4-6 CELLS ITEM 14
19	CASE- 6 WAY WITH BOLTED RACKS *		54311-126	FOR NEW TYPE PLUG BOARD	44	FILLER PLATE FOR B1 SPACE		42812		69	RECTIFIER- MAX. D.C. OUTPUT 22V. 1.5 AMPS. A.C. INPUT 110 V.	BT 432	54935-3GR.9	7-10 CELLS
20	CASE- 24 WAY WITH 2 TYPE B RACKS *		56495-2 GR.1		45					70	RECTIFIER	B 1/4	54728-62GR.1	USED WITH B1 LIGHT-OUT RELAY REF. 114
21	CASE-INSTRUMENT WELDED SHEET STEEL WITH FRONT AND REAR DOORS. CELOTEX LINED.	HIGH SINGLE DOOR	58271-2 GR.2	6'-6" HIGH, 3'-2" WIDE, 2'-0" DEEP	46	FUSE 250V. 10 AMP.		0839-6		71	RECTIFIER	B 1/2	54941-104GR.1	USED WITH B1 LIGHT-OUT RELAY REF. 114.
22	CASE-INSTRUMENT WELDED SHEET STEEL WITH FRONT AND REAR DOORS. CELOTEX LINED	HIGH DOUBLE DOOR	58271-3 GR.2	6'-6" HIGH, 6'-3 3/4" WIDE, 2'-0" DEEP	47	FUSE 250V. 15AMP		0839-8	RENEWABLE	72	RECTIFIER		54728-19GR1	USED TO MAKE B2 RELAY SLOW RELEASE.
23	CASE-INSTRUMENT WELDED SHEET STEEL WITH FRONT AND REAR DOORS. CELOTEX LINED	LOW SINGLE DOOR	58271-GR.2	4'-10" HIGH, 3'-2" WIDE, 2'-0" DEEP	48					73				
24	CASE-INSTRUMENT WELDED SHEET STEEL WITH FRONT AND REAR DOORS. CELOTEX LINED	LOW DOUBLE DOOR	58271-1GR.2	4'-10" HIGH, 6'-3 3/4" WIDE, 2'-0" DEEP	49	FUSE BLOCK WITH 10 AMP FUSE. EVERETT NO. 840		50037-3 GR.3		74				
25					50					75				

* PAST PRACTICE - NOT TO BE ORDERED EXCEPT ON AUTHORITY OF SIGNAL ENGINEER

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND. O.
APPARATUS REFERENCE LIST		
DATED MAY 29, 1953	REV.	S-B31A
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY M.C.R.R.		<i>C. J. Moran</i> SIGNAL ENGINEER

REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REMARKS
151	RESISTOR - 7 WATT 4.3 Ω	ADJ.	46450-14 GR.3		176	TAG RACO 583-1 CLEAR		65900-68 GR.5		201				
152	RESISTOR - 20 WATT 2 Ω	FIXED	46450-18 GR.3		177					202				
153	RESISTOR 10 Ω	FIXED	50482-12 GR.1		178					203				
154	RESISTOR 20 Ω	ADJ.	46450-15 GR.2		179	TERMINAL STRIP 12 RACO 390		56140-17		204				
155	RESISTOR 100 Ω	FIXED	50482-12 GR.4		180	TERMINAL MULTI-UNIT RACO 274	6 WAY	46048-40 GR.1		205				
156	RESISTOR 200 Ω	"	50482-12 GR.7		181					206				
157	RESISTOR 500 Ω	"	57376-1 GR.2		182	TEST LINK - SAFETY EVERETT NO. 865 1"				207				
158	RESISTOR 3000 Ω	"	50482-18 GR.12		183					208				
159	RESISTOR 25 Ω	"	50482-4 GR.27		184					209				
160	RESISTOR 2 Ω	ADJ.	50482-4 GR.20	N.Y.C.S. SPEC. 881 TYPE A	185	TERMINAL - FOR 14 AND 16 WIRE AIRCRAFT - MARINE PRODUCTS INC. CATALOG NO. 55828		59825-30 59825-31	(YELLOW) FOR #14 WIRE (BLUE) FOR #16 WIRE	210				
161					186	TERMINAL - FOR 10 AND 12 WIRE AIRCRAFT - MARINE PRODUCTS INC. CATALOG NO. 55267		59825-48	(BLACK) FOR #10 WIRE	211				
162					187					212				
163					188					213				
164					189					214				
165					190					215				
166					191					216				
167					192					217				
168					193	TRANSFORMER B22B1 110V. N.Y.C. PLAN S-B22B1	K 2	38270-2GR.5 13D-185	L.V. RECTIFIER & SIG. LIGHTING	218				
169					194	TRANSFORMER H.D. 110 V.	K 2	38270-2GR.6 13D-56	FOR FLASHING LIGHTING	219				
170	SWITCH - DISCONNECT 250 V. RACO 324	2 WAY	58863		195	TRANSFORMER 440V-110V.	K 2	38270-2GR.4 13D-56		220				
171	SWITCH - DISCONNECT 600V. RACO 506-1	2 WAY	58747-2	RENEWABLE 5AMP FUSE	196	TRANSFORMER 550V. 110V.	K 2	38270-2GR.16 13D-205		221				
172	SWITCH - D.P.D.T. 125 V. TRUMBULL 710				197	TRANSFORMER B22B3 220V N.Y.C. PLAN S-B22B3	K 2	38270-2GR.5 13D-110		222				
173					198	TRANSFORMER B22B4 550V N.Y.C. PLAN S-B22B4	K 2	38270-2GR.6 13D-176		223				
174					199					224				
175					200					225				

N. Y. C. R. R.

SIGNAL DEPT.

CLEVELAND, O.

APPARATUS REFERENCE LIST

DATED MAY 29, 1953 REV.

S-B31A

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

SIGNAL ENGINEER

SHEET 3 OF 3 SHEETS

REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REGISTRY	REMARKS	REF	DESCRIPTION	TYPE	G.R.S. DRAWING NO.	REGISTRY	REMARKS
76						101	RELAY-6FB 1.5 SEC. AT 11 VOLTS 230Ω	BIN SPU	56001-736 GR. 1	1-2-6-24	TABLE 276	126	RELAY-12FB 4Ω	B2N	56002-702 GR. 1	1-2-4-25	TABLE 31
77	RELAY-6FB 4Ω	BIN	56001-714 GR. 1	1-2-3-26	TABLE 18	102	RELAY-4FB 2.3 SEC. AT 10 VOLTS 300Ω	BIN SPU	56001-729 GR. 1	1-2-4-24	TABLE 282	127	RELAY-8FB-2F (EHD) 330Ω	B2N	56002-710 GR. 1	1-2-10-12	
78						103						128	RELAY-12FB 500Ω	B2N	56002-703 GR. 1	1-2-4-33	TABLE 127
79						104						129					
80	RELAY-6FB HD BACK SERIES 84Ω	BIN	56001-785 GR. 31	1-2-12-32		105	RELAY-6FB BIASED 63Ω	BIBN	56001-801 GR. 5	1-2-4-13	USE WITH RECT. REF 63 TABLE 295	130	RELAY-12FB 500Ω	B2N SR	56002-708 GR. 1	1-2-3-12	TABLE 269 USED WITH RECT. REF 64.
81	RELAY-6FB 100Ω	BIN	56001-762 GR. 5	1-2-9-14	TABLE 85	106	RELAY-6FB BIASED 250Ω	BIBN	56001-801 GR. 1	1-2-4-13		131					
82	RELAY-6FB 200Ω	BIN	56001-762 GR. 6	1-2-3-4	TABLE 98	107	RELAY-6FB BIASED 1000Ω	BIBN	56001-801 GR. 4	1-2-4-13		132					
83	RELAY-6FB 200Ω	BIN	56001-874		28 VOLTS- OPERATES FROM CODE UNIT	108						133	RELAY-4FB-4NR 200Ω	B2P	56003-701 GR. 3	1-2-3-12	TABLE 413
84	RELAY-2F-4B 210Ω	BIN	56001-880 GR. 1	1-2-24-28	LAMP CONTROL	109						134					
85	RELAY-6FB 900Ω	BIN	56001-762 GR. 1	1-2-3-4	NEUTRAL OR AS SR WHEN USED WITH RECT. REF. 64 TABLE 188	110						135					
86	RELAY-6FB 500Ω	BIN	56001-701 GR. 2	1-2-3-4	TABLE 121	111	RELAY-2FB 50-50Ω	BIPT	56001-721 GR. 1	1-2-3-35	TABLE-362 USE WITH RECT. REF 65	136					
87	RELAY-6FB 900Ω	BIN	56001-859 GR. 1	1-2-20-24	H.D.C.	112	RELAY-6FB 100-100Ω	BIPT	56001-745 GR. 1	1-2-6-15	TABLE-368 USE WITH RECT. REF 65	137					
88						113						138	RELAY-4FB-4NR 120Ω	B2P SR	56003-709 GR. 2	1-2-6-93	TABLE 453
89						114	RELAY-4FB 450-12Ω	BILO	56001-873 GR. 1	1-2-22-25	LIGHT-OUT USED WITH RECT. REF 71	139					
90	RELAY-2F-4B 1 SEC. AT 2 VOLTS 80Ω	BIN SR	56001-759 GR. 1	1-2-9-10	TABLE 215	115	RELAY-2FB 158Ω	BI	56001-858 GR. 2	1-2-20-22	DO	140					
91	RELAY-6FB SINGLE COIL 3 SEC. AT 12 VOLTS 194Ω	BIN SR	56001-779 GR. 1	1-2-10-17	USED IN SERIES WITH REF. 118.	116						141					
92	RELAY-6FB SINGLE COIL 1.7 SEC. AT 8.4 VOLTS 300Ω	BIN SR	56001-744 GR. 1	1-2-6-14	TABLE 252	117						142	RELAY-4FB FLASHER	B2FL	57261-802 GR. 4	1-2-6-7	MOTOR OPERATED TABLE 603
93	RELAY-6FB 1 SEC. AT 10 VOLTS 340Ω	BIN SR	56001-780 GR. 1	1-2-4-23	TABLE 257	118	RELAY-4FB 46Ω	BIMS	56001-791 GR. 2	1-2-12-13	TABLE 651	143					
94	RELAY-2F 5 SEC. AT 9 VOLTS 460Ω	BIN SR	56001-735 GR. 24	1-2-5-22	TABLE 262	119	RELAY-4FB 34Ω	BIMS	58645-172 GR. 4	1-2-12-15	ADJ. COIL CONNECTIONS OPERATES FROM CODE UNIT-180Ω BUILT-IN RES.	144					
95						120						145					
96						121	RELAY-1F-1B 30-35 SEC 11.3 OHM HEATER RES.	BITJ	57100-702 GR. 5	1-2-5-9	TIME AND CHECK CONTACTS INDEPENDENT	146					
97	RELAY-6F-6B 48Ω	BIN SR	56001-801 GR. 9	1-2-4-13	USE IN SERIES WITH SC MECHANISM	122	RELAY-1F-1B 15 SEC. 18.6 OHM HEATER RES.	BITJ	57100-702 GR. 2	1-2-5-6	DO	147					
98	RELAY-2F-1B 105-105Ω 18-25 SEC. AT 5 VOLTS	BIN SR	56001-719 GR. 2	1-2-3-25	COMPOUND TABLE 342	123	RELAY-1F-1B 5 MIN. 18.6 OHM HEATER RES.	BITG	57100-701 GR. 8	1-2-20-28	DO	148	RELAY 1F-1B 4-64 SEC. 12V. 400Ω	B2 MT	57263-802 GR. 3	1-2-4-27	TIME NOT SEALED TIME AND CHECK CONTACTS INDEPENDENT.
99	RELAY-6FB 165-165Ω .08 SEC. AT 10 VOLTS	BIN SR	56001-754 GR. 1	1-2-7-32	COMPOUND TABLE 347	124						149	RELAY 1F-1B 8 MIN. 12V. 400Ω	B2 MT	57263-802 GR. 2	1-2-4-26	DO
100						125						150					

N. Y. C. R. R.

SIGNAL DEPT.

CLEVELAND. O.

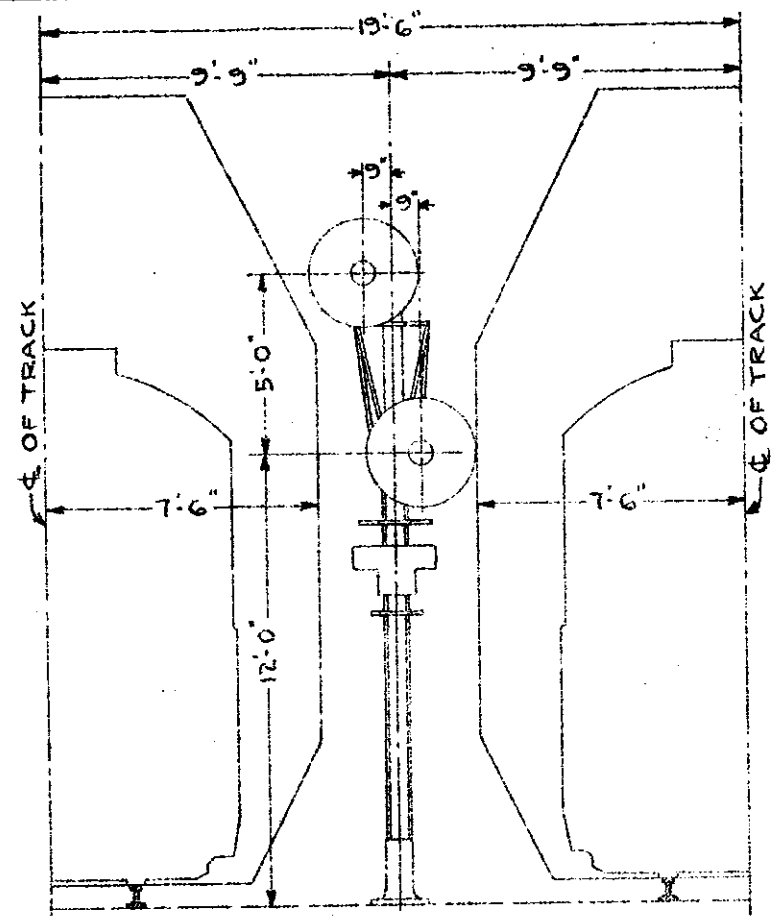
APPARATUS REFERENCE LIST

DATED MAY 29, 1953 REV.

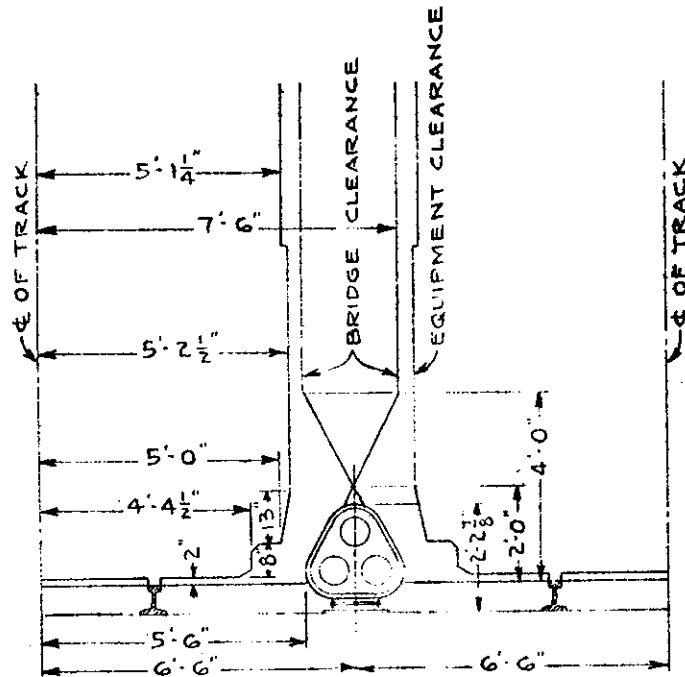
S-B31A

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

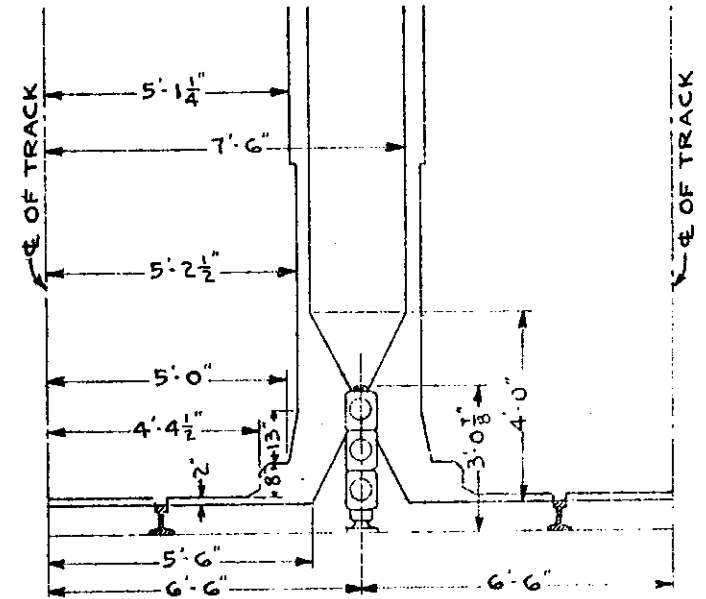
J. K. Kenna
SIGNAL ENGINEER

[illegible]

SIGNAL ENGINEER



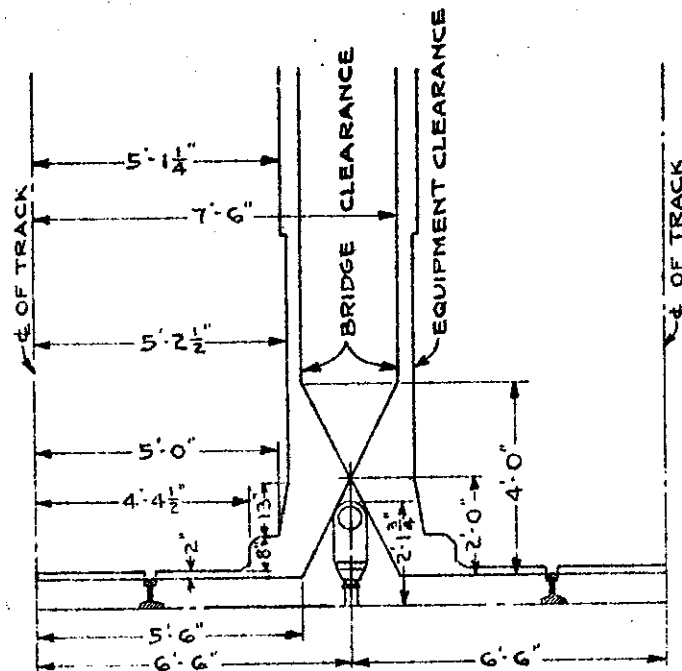
3 INDICATION
TYPE "L" COLOR LIGHT DWARF SIGNAL



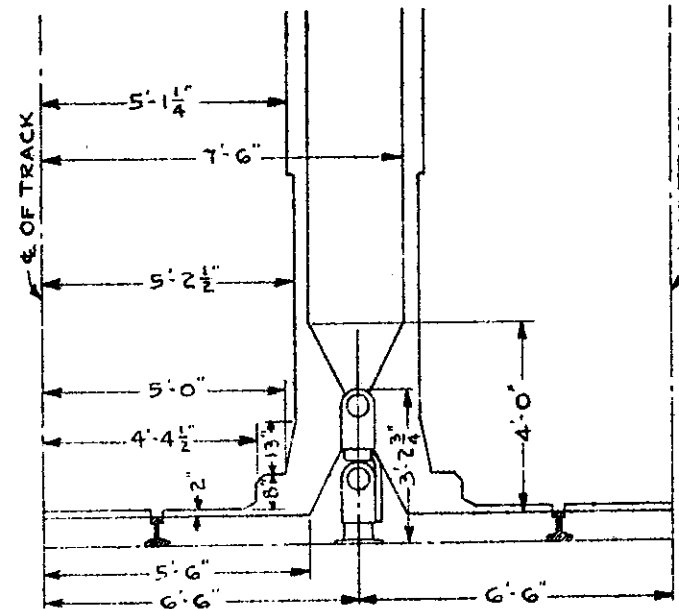
3 INDICATION
TYPE "F" COLOR LIGHT DWARF SIGNAL

NOTE:
APPROVED BY THE PUBLIC UTILITIES
COMMISSION OF OHIO, MARCH 25, 1931
FILE R.R. 8426 FOR USE ON N. Y. C. R. R.

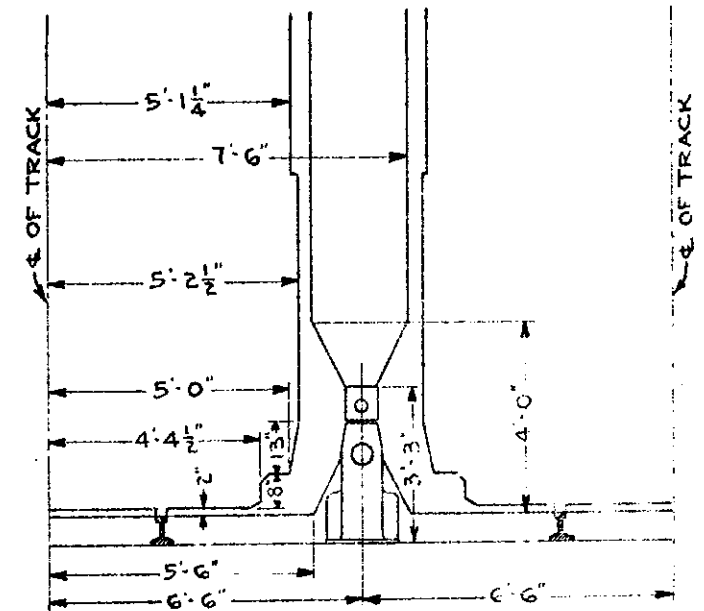
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL CLEARANCE COLOR LIGHT DWARF SIGNALS DEC. 5, 1935.		
REVISION NO.		S-B21B
 SIGNAL ENGINEER		



3 INDICATION
TYPE "SA" COLOR LIGHT DWARF SIGNAL



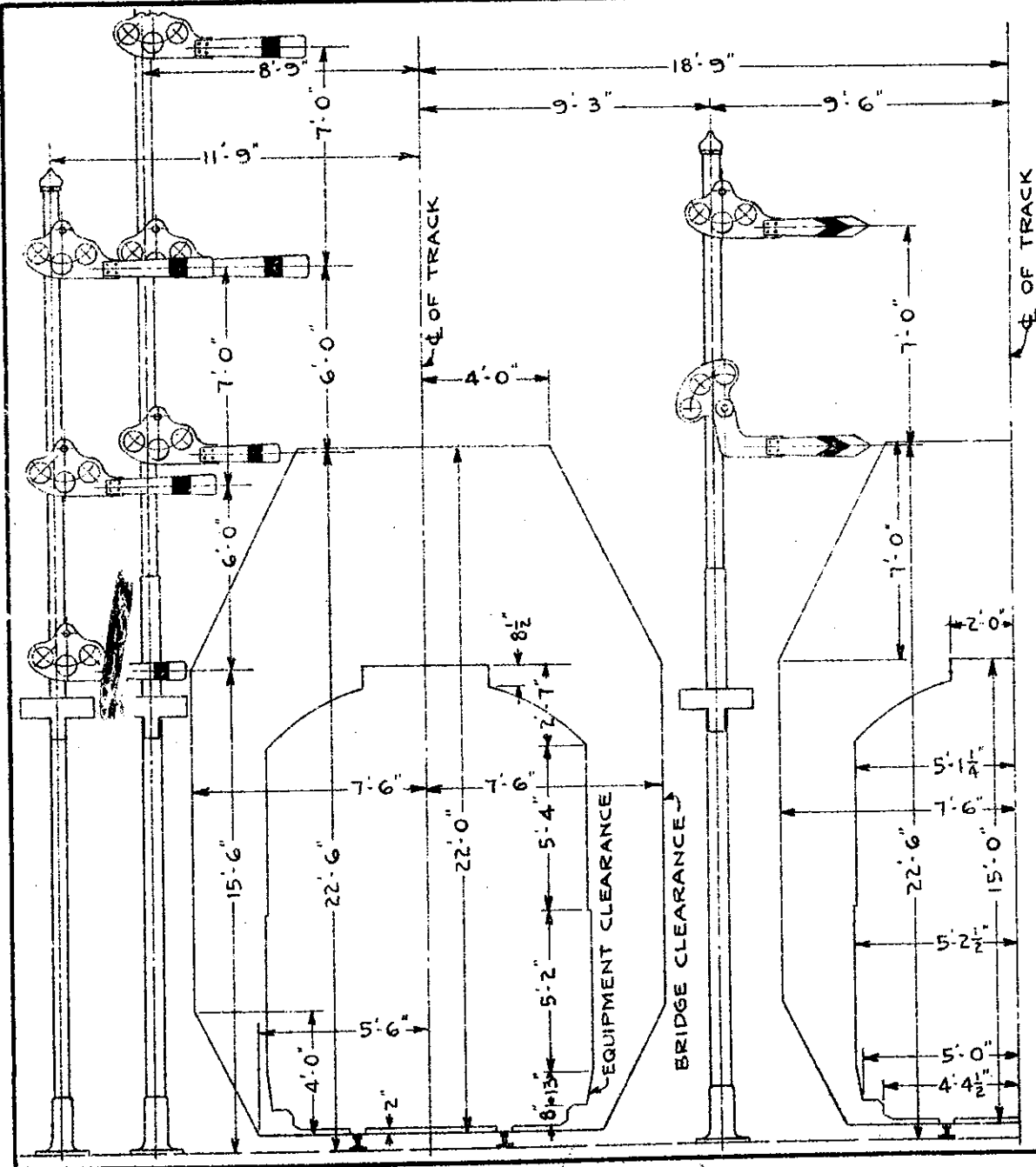
6 INDICATION
TYPE "SA" COLOR LIGHT DWARF SIGNAL



4 INDICATION
TYPE "SA" COLOR LIGHT DWARF SIGNAL

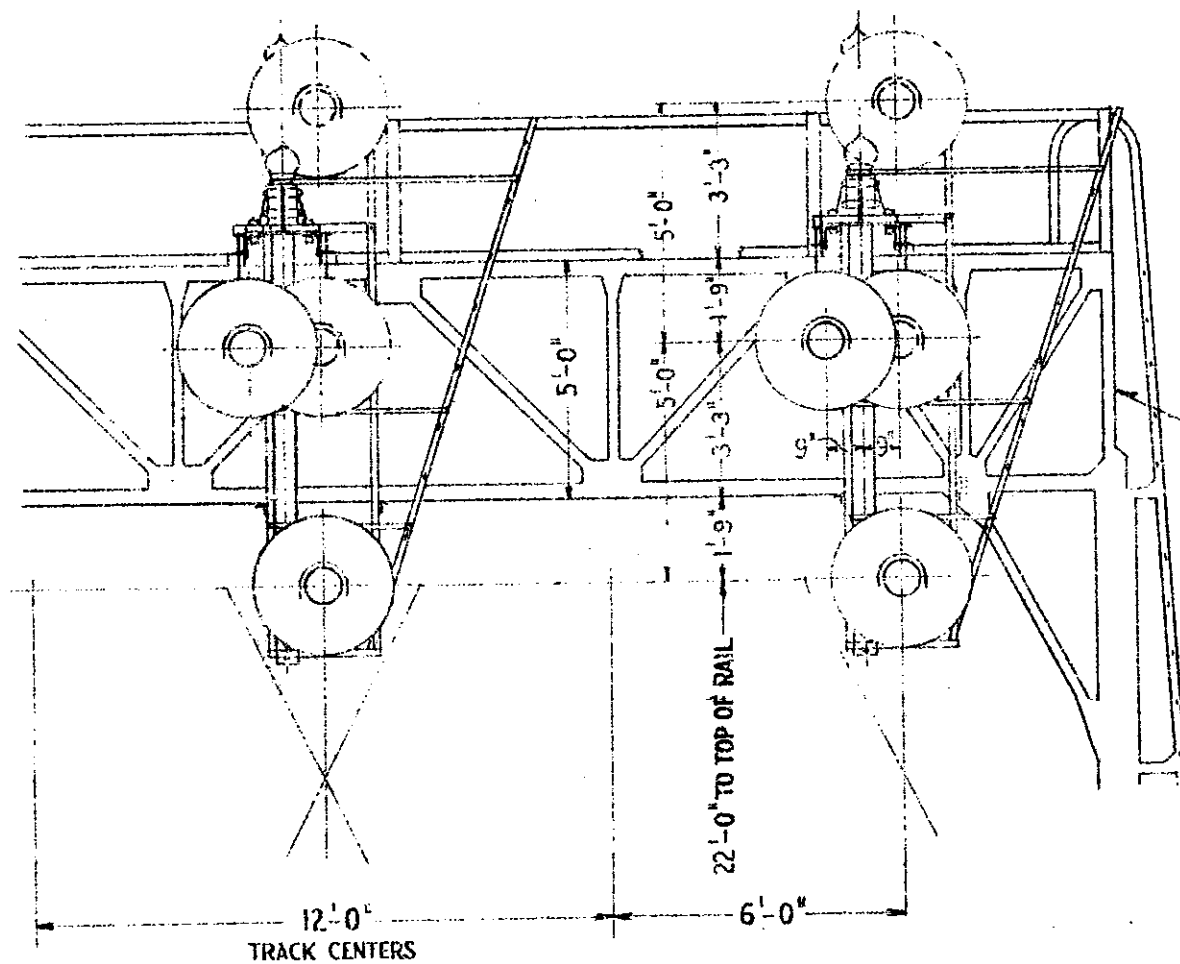
NOTE:
APPROVED BY THE PUBLIC UTILITIES
COMMISSION OF OHIO, MARCH 25, 1931
FILE R.R. 8428 FOR USE ON N.Y.C.R.R.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL CLEARANCE COLOR LIGHT DWARF SIGNALS DEC. 5, 1935.		
REVISION NO.		S-B21C
 SIGNAL ENGINEER		

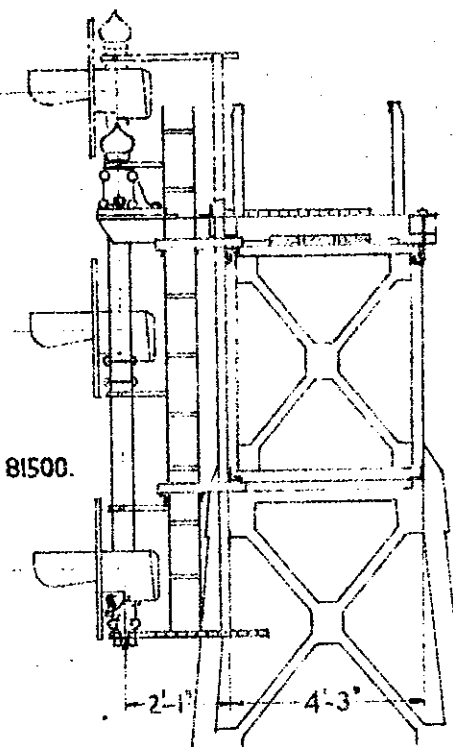


NOTE:
APPROVED BY THE PUBLIC UTILITIES COMMISSION
OF CHICAGO FEBRUARY 18, 1938 FOR USE ON THE
NEW YORK CENTRAL.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL CLEARANCE SEMAPHORE HIGH SIGNALS DEC. 5, 1935.		
REVISION NO. 1	FEB. 21, 1938	S-B21D
 SIGNAL ENGINEER		

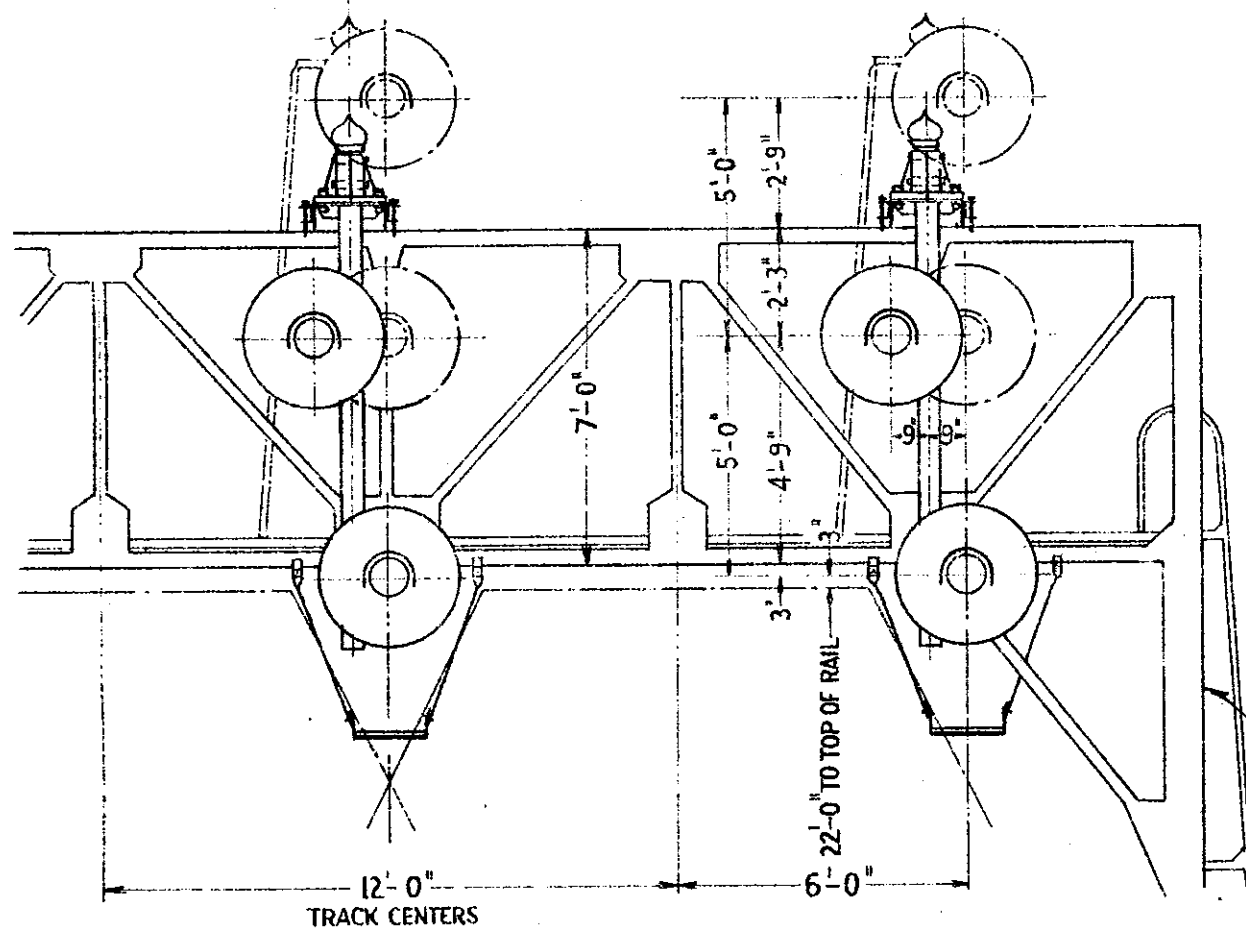


SIGNAL BRIDGE FOR
4 OR 5 TRACKS.
LINES EAST PLAN 81500.

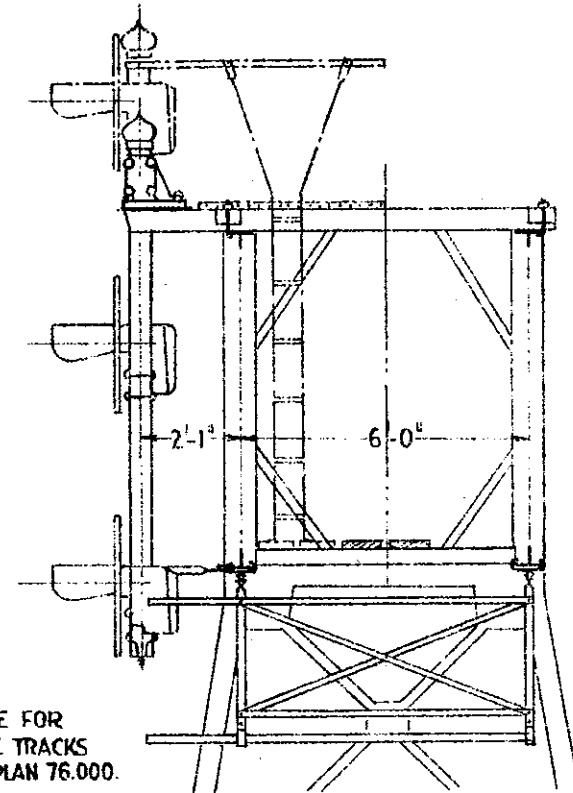


NOTE:
APPROVED BY THE PUBLIC UTILITIES COMMISSION
OF OHIO FEBRUARY 18, 1938 FOR USE ON THE
NEW YORK CENTRAL.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL CLEARANCE		
COLOR LIGHT SIGNALS - 5 FT. TRUSS BRIDGE		
JULY 25 - 1936		
REVISION No. 1	FEB. 21, 1938	S-B21E
 SIGNAL ENGINEER.		

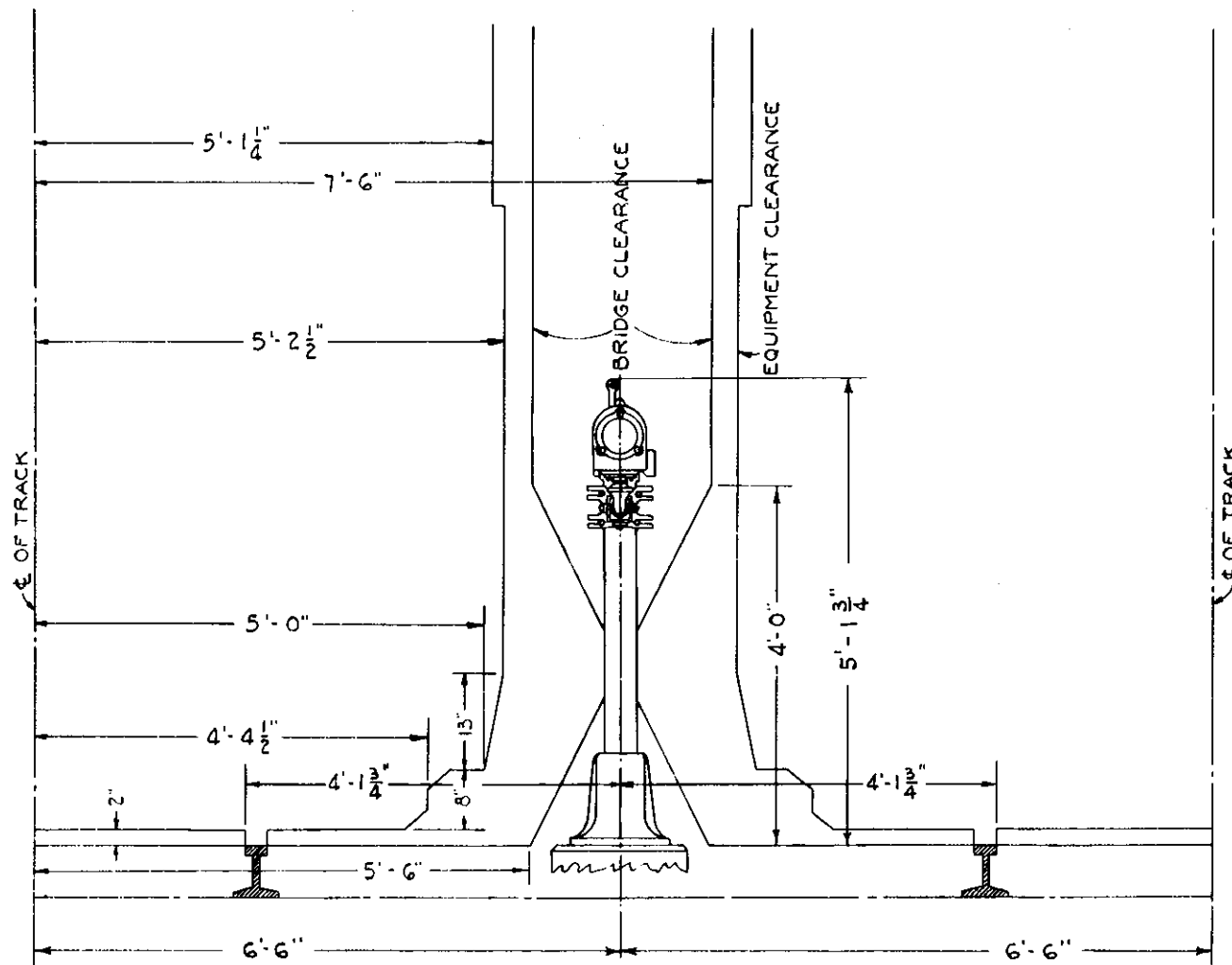


NOTE:
APPROVED BY THE PUBLIC UTILITIES COMMISSION
OF OHIO FEBRUARY 18, 1938 FOR USE ON THE
NEW YORK CENTRAL.



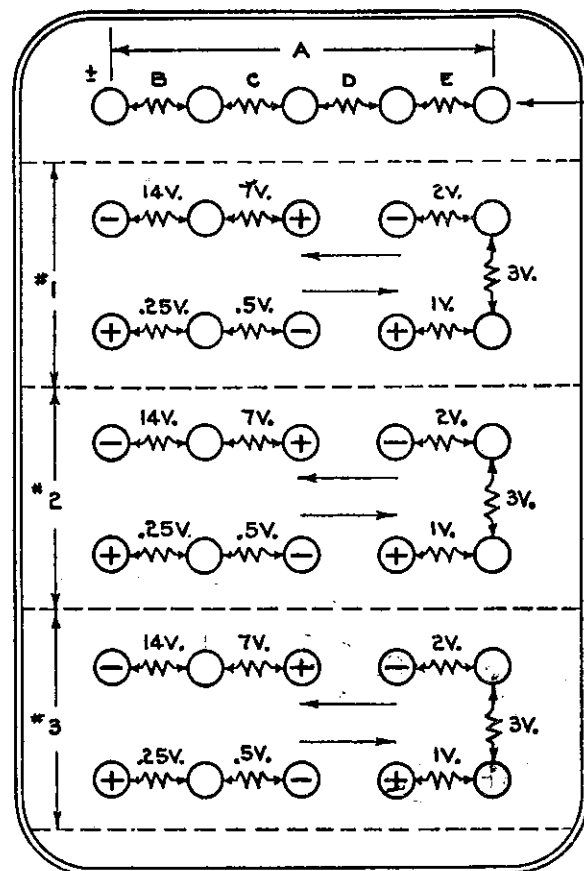
SIGNAL BRIDGE FOR
SIX OR MORE TRACKS
LINES EAST PLAN 76.000.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL CLEARANCE COLOR LIGHT SIGNALS - 7 FT. TRUSS BRIDGE JULY 25 - 1936		
REVISION No. 1	FEB. 21, 1938	S-B21F
 SIGNAL ENGINEER		



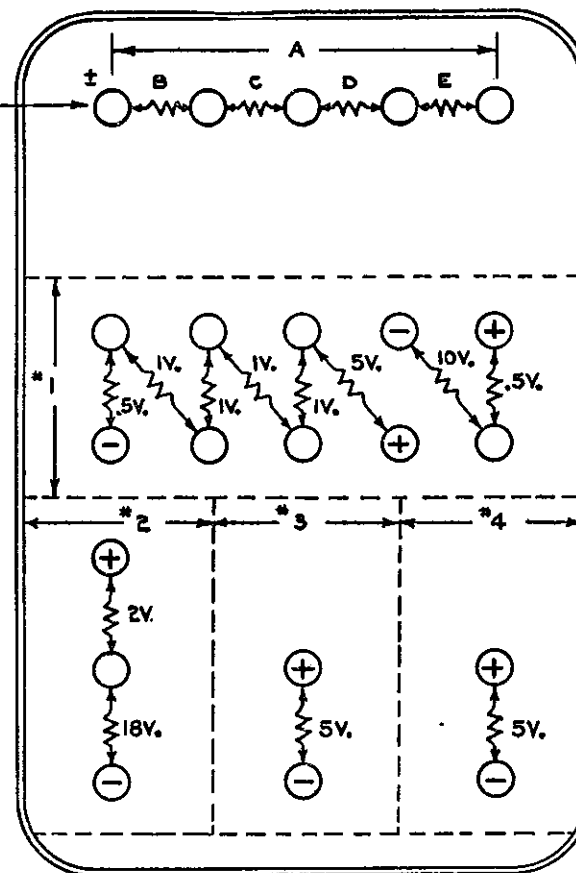
NOTE:
 APPROVED BY THE PUBLIC UTILITIES COMMISSION
 OF OHIO FEBRUARY 18, 1938 FOR USE ON THE
 NEW YORK CENTRAL.
 SEE PLANS 4890 AND S-S15A FOR INSTALLATION
 DETAILS.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.
TRACK PAN LIGHTS CLEARANCE		
AUG. 12, 1937		
REVISION NO. 4	DEC. 8, 1941.	S-B21G
 SIGNAL ENGINEER		



B22B1-B22B2-B22B4

CAPACITY OF SECONDARY WINDINGS IN SECTIONS
#1 - #2 AND #3 SHALL BE AS FOLLOWS:
21 VOLT - 3.6 AMP - 75.6 V.A.
6 VOLT - 3.6 AMP - 21.6 V.A.
7.5 VOLT - 3.6 AMP - 27 V.A.



B22B3

CAPACITY OF SECONDARY WINDINGS IN SECTIONS
SHALL BE AS FOLLOWS:

- * 1 - 20 VOLT - 12 AMP. - 240 V.A.
- * 2 - 20 VOLT - 2 AMP. - 40 V.A.
- * 3 - 5 VOLT - 2 AMP. - 10 V.A.
- * 4 - 5 VOLT - 2 AMP. - 10 V.A.

PRIMARY VOLTAGES					
REFERENCE	A	B	C	D	E
B22B1	120	5	70	30	15
B22B2	460	20	280	110	40
B22B3	220	10	100	100	10
B22B4	575	25	390	110	50

NOTE:

MAXIMUM OVERLOAD ON ANY SECONDARY WINDING
NOT TO EXCEED 25% AND TOTAL LOAD NOT TO
EXCEED RATED CAPACITY.

ALL VALUES FOR CONTINUOUS RATING.
WIRE USED IN PRIMARY WINDINGS SHALL BE NO
SMALLER THAN # 20 AWG

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SIGNAL TRANSFORMERS		
DATED JAN. 6, 1937.	REV. DEC. 8, 1942.	S-B22B1
APPROVED FOR: N. Y. C. WEST OF BUFFALO S. C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER

OPERATED UNITS RELATING TO TRACK CIRCUITS

T — Track section.

A track section shall be designated by the letter T preceded by a signal number governing over the track circuit. For example: 42T.

Where signal is governed by more than one track circuit, progressive alphabetical prefixes in addition to the signal number shall be used. For example: A42T — B42T — C42T.

Track sections over which no signals govern shall be numbered 01T — 02T — 03T.

TR — Track relay.
 TPR — Relay repeating a track relay.
 TPPR — Relay repeating a track repeating relay.
 TSR — Track stick relay.
 TSPR — Relay repeating track stick relay.
 TK — Indicator, indicating condition of a track circuit.
 TPSR — Stick relay repeating track relay.
 BPR — Block repeater relay, relay repeating the track circuits in a block.
 BK — Block indicator.

WIRES RELATING TO TRACK CIRCUITS

TB — Track positive—Positive energy to rail.
 TN — Track negative—Negative energy from rail.
 RB — Relay positive—Wire from positive rail to relay.
 RN — Relay negative—Wire from negative rail to relay.
 TQ — Positive control of local coil, double—element A.C. track relay.
 TP — Positive control of TPR.
 TPP — Positive control of TPPR.
 TPS — Positive control of TPSR.
 TK — Positive control of TK.
 BP — Positive control of BPR.
 WB — Positive rail to switch circuit controller.
 WN — Negative rail to switch circuit controller.

OPERATED UNITS RELATING TO SWITCHES

W — Switch operating mechanism or lock valve.
 WR — Relay, controller or contactor controlling both normal and reverse operations of a switch or an electric switch lock.

WNR — Relay, controller or contactor controlling the normal operation of a switch or an electric switch lock.
 WRR — Relay, controller or contactor controlling the reverse operation of a switch or an electric switch lock.
 WRPR — Relay repeating WR.
 WNRPR — Relay repeating WNR or normal position of WR.
 WRRPR — Relay repeating WRR or reverse position of WR.
 WPR — Relay repeating position of switch.
 NWPR — Relay repeating normal position of switch or normal position of WPR.
 RWPR — Relay repeating reverse position of switch or reverse position of WPR.
 WK — Indicator indicating the positions of a switch.
 WL — Switch lock operating mechanism on a switch.
 NWLPR — Relay repeating normal position of switch lock.
 RWLPR — Relay repeating reverse position of switch lock.
 NWK — Indicator indicating the normal position of a switch.
 RWK — Indicator indicating the reverse position of a switch.
 WAK — Indicator indicating the condition approaching a switch.
 WCR — Switch correspondence relay.

WIRES RELATING TO SWITCHES

NW — Normal control of switch operating mechanism.
 RW — Reverse control of switch operating mechanism.
 N10W — Individual return wire to 10 switch operating mechanism.
 WR — Positive control of WR.
 N10WR — Negative control of 10WR.
 WNR — Positive control of WNR.
 WRR — Positive control of WRR.
 WRP — Positive control of WRPR.
 WNRPR — Positive control of WNRPR.
 WRRPR — Positive control of WRRPR.
 WP — Positive control of WPR.
 N10WP — Negative control of 10WPR.
 NWP — Positive control of NWPR.
 RWP — Positive control of RWPR.
 NWLPR — Positive control of NWLPR.
 WK — Positive control of WK.
 N10WK — Negative control of 10WK.
 NWK — Positive control of NWK.
 RWK — Positive control of RWK.

WA — Positive control of WAK.
 WL — Positive control of WL.
 RWLPR — Positive control of RWLPR.
 WC — Positive control of WCR.

OPERATING UNITS RELATING TO SIGNALS

HR — Relay controlling approach indication of a three-position signal or the proceed indication of a two-position signal in one-arm signaling.
 DR — Relay controlling proceed indication of a signal.
 HDR — Relay controlling approach and proceed indication of a signal.
 HPR — Relay repeating HR or approach indication position of HDR.
 HSR — Home stick relay controlling the approach indication of a signal.
 DPR — Relay repeating DR or proceed indication position of HDR.
 RGPR — Relay repeating signal mechanism at stop.
 HGPR — Relay repeating signal mechanism at approach.
 DGPR — Relay repeating signal mechanism at proceed.
 RGK — Indicator indicating signal mechanism at stop.
 HGK — Indicator indicating signal mechanism at approach.
 DGK — Indicator indicating signal mechanism at proceed.
 ETOHR — East train order HR, likewise west, north and south.
 ETOHDR — East train order HDR, likewise west, north and south.
 ETOPHR — East train order repeater HR, likewise west, north and south.
 ETOPDR — East train order Repeater DR, likewise west, north and south.
 HDGPR — Relay repeating signal mechanism in the approach and proceed position.

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

CIRCUIT NOMENCLATURE

DATED APRIL 8, 1937 REV. MAY 24, 1943 S-B27A1

APPROVED FOR
 N. Y. C. WEST OF BUFFALO
 C. C. & ST. L. RY.
 M. C. R. R.

SIGNAL ENGINEER

OPERATING UNITS RELATING TO SIGNALS—Continued.

HDGK — Indicator indicating signal mechanism in the approach and proceed position.
 HY — Hold clear or retaining mechanism of the approach indication of a signal.
 DY — Hold clear or retaining mechanism of the proceed indication of a signal.
 HG — Approach indication operating mechanism of a signal.
 DG — Proceed indication operating mechanism of a signal.
 RG — Stop indication operating mechanism of a signal.

WIRES RELATING TO SIGNALS

H — Positive control of HR.
 D — Positive control of DR.
 HD — Positive control of HDR.
 N10HD — Negative control of 10HDR.
 HP — Positive control of HPR.
 HS — Positive control of HSR.
 DP — Positive control of DPR.
 RGP — Positive control of RGPR.
 HGP — Positive control of HGPR.
 DGP — Positive control of DGPR.
 ETOH — Positive control of ETOHR.
 ETOHD — Positive control of ETOHDR.
 ETOPH — Positive control of ETOPHR.
 ETOPD — Positive control of ETOPDR.
 HDGP — Positive control of HDGPR.
 HDGK — Positive control of HDGK.
 RGK — Positive control of RGK.
 HGK — Positive control of HGK.
 DGK — Positive control of DGK.
 HG — Positive control of HG.
 DG — Positive control of DG.
 RG — Positive control of RG.
 N10HG — Negative control of 10HG.
 HY — Positive control of HY.
 DY — Positive control of DY.

STICK, TRAFFIC AND DIRECTIONAL OPERATED UNITS

SR — Stick relay.
 ESR — East stick relay, likewise north, south and west.
 LSR — Locking stick relay.

EASR — East approach stick relay, likewise north, south and west.
 ASR — Approach stick relay.
 FL — Traffic lock preventing initial movement of a traffic lever from normal or reverse.
 FLM — Traffic lock preventing initial movement of a traffic lever from normal or reverse and also preventing final or indicating movement of same lever.
 FR — Traffic relay.
 FLR — Traffic lock relay controlling FL.
 FLMR — Traffic lock relay controlling FLM.
 FLK — Traffic lock indicator.
 FSR — Traffic stick relay.
 EFSR — East traffic stick relay, likewise north, south and west.

WIRES RELATING TO STICK, TRAFFIC AND DIRECTIONAL UNITS

S — Positive control of SR.
 ES — Positive control of ESR.
 LS — Positive control of LSR.
 EAS — Positive control of EASR.
 AS — Positive control of ASR.
 FL — Positive control of FL.
 FLM — Positive control of FLM.
 F — Positive control of FR.
 FLR — Positive control of FLR.
 FLMR — Positive control of FLMR.
 FLK — Positive control of FLK.
 FS — Positive control of FSR.
 EFS — Positive control of EFSR.

OPERATED UNITS RELATING TO INDICATORS, LOCKS, INDICATION MAGNETS, AND RELAYS USED FOR LOCKING PURPOSES

M — Lock preventing the final movement of a lever.
 L — Lock preventing the initial movement of a controlled function or lever.
 NK — Normal indicator indicating normal position of a unit.

RK — Reverse indicator indicating reverse position of a unit.
 TER — Time element relay.
 NM — Lock preventing the final movement of a lever to the normal position.
 RM — Lock preventing the final movement of a lever to the reverse position.
 NL — Lock preventing the movement of a lever or a controlled function from its normal position.
 RL — Lock preventing the movement of a lever or a controlled function from its reverse position.
 LR — Relay controlling L Lock.
 LPR — Repeater of L lock relay.
 MR — Relay controlling M lock.
 MPR — Repeater of M lock relay.
 TE — Time element.
 TESR — Time element stick relay.
 LK — Lock indicator repeating electric locking.

WIRES RELATING TO LOCKS, INDICATION MAGNETS and RELAYS FOR LOCKING PURPOSES

M — Positive control of M.
 L — Positive control of L.
 NK — Positive control of NK.
 RK — Positive control of RK.
 TE — Positive control of TER.
 NM — Positive control of NM.
 RM — Positive control of RM.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CIRCUIT NOMENCLATURE		
DATED APRIL 8, 1937	REV. MAY 24, 1943	S-B27B1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>J. J. Corcoran</i> SIGNAL ENGINEER

WIRES RELATING TO LOCKS, INDICATION MAGNETS and RELAYS FOR LOCKING PURPOSES—Continued.

NL — Positive control of NL.
RL — Positive control of RL.
LR — Positive control of LR.
LP — Positive control of LPR.
MR — Positive control of MR.
MPR — Positive control of MPR.
TES — Positive control of TESR.
LK — Positive control of LK.

OPERATED UNITS RELATING TO HIGHWAY CROSSING SIGNALS

XX — Crossing bell.
EXR — Eastward interlocking or crossing relay, likewise
north, south and west.
XG — Wig-wag mechanism.
XY — Slot for wig-wag mechanism.
EOR — Electric light operating relay (flasher relay)

WIRES RELATING TO HIGHWAY CROSSING SIGNALS

XG — Positive control of XG.
E1 — Positive wire to No. 1 unit of flashing light signal
E2 — Positive wire to No. 2 unit of flashing light signal.
EX — Positive control of EXR.
EO — Positive control of EOR.

OPERATED UNITS RELATING TO APPROACH AND ANNUNCIATING OF TRAINS

AX — Annunciator indicating approach traffic.
EAX — Eastward annunciator indicating approach of east-
ward traffic, likewise north, south and west.
AER — Relay used for approach lighting.

WIRES RELATING TO APPROACH AND ANNUNCIATING OF TRAINS

AX — Positive control of AX.
EA — Positive control of EA.
E — Positive control of ER.

MISCELLANEOUS OPERATED UNITS

AK — Approach indicator.
AR — Approach relay.
PCR — Pole changing relay.
NLPR — Relay repeating the normal position of a lever.
RLPR — Relay repeating the reverse position of a lever.
E — Electric light.
TO — Train order.
WTO — West train order signal governing westward traffic,
likewise north, south and east.
RR — Route relay.
VR — Train stop relay.
VSR — Train stop stick relay.
VPR — Train stop repeater relay.
VY — Train stop retaining mechanism.
XR — Interlocking relay.
TOR — Train order relay.
POR — Power off relay.
LOR — Light out relay.
ME — Marker light.
OR — Overload relay.
GDR — Ground detector relay.
CT — Code transmitter.
DU — Decoding unit.

WIRES RELATING TO MISCELLANEOUS OPERATED UNITS

AK — Positive control of AK.
A — Positive control of AR.
PC — Positive control of PCR.
NLP — Positive control of NLPR.
RLP — Positive control of RLPR.
R — Positive control of RR.
V — Positive control of VR.
VS — Positive control of VSR.
VP — Positive control of VPR.
VY — Positive control of VY.
X — Positive control of XR.
TO — Positive control of TOR.
PO — Positive control of POR.

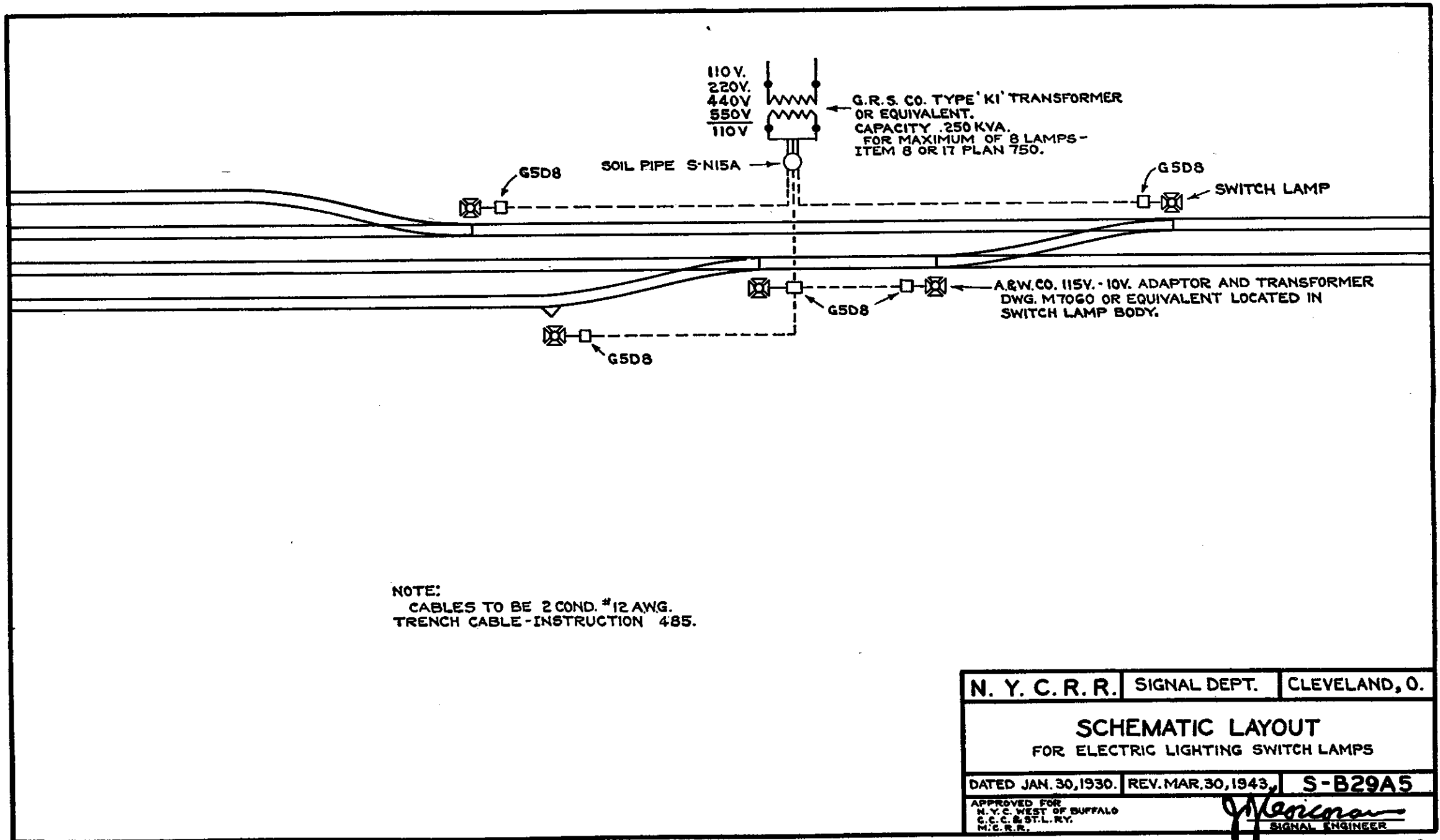
LO — Positive control of LOR.
ME — Positive control of ME.
O — Positive control of OR.
GD — Positive control of GDR.
CT — Positive control of CT.
DU — Positive control of DU.

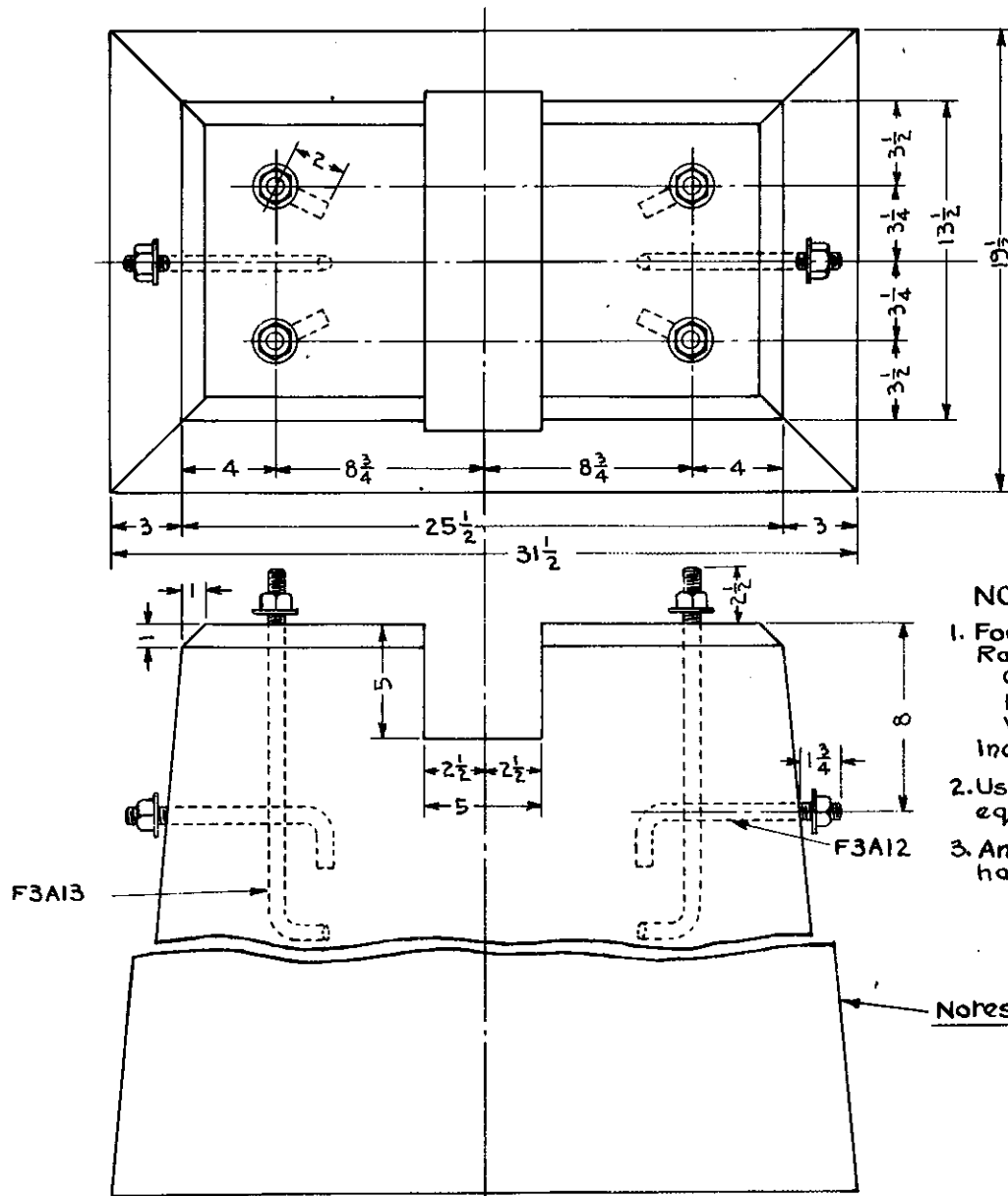
ENERGY WIRES

(Suffix figure should be used to indicate voltages; for ex-
ample, CX110 meaning common A.C. 110 volts.)

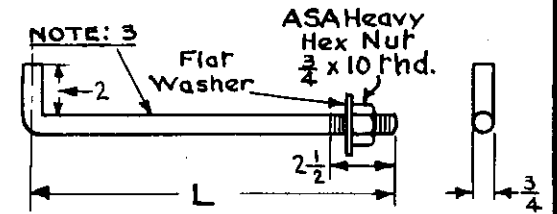
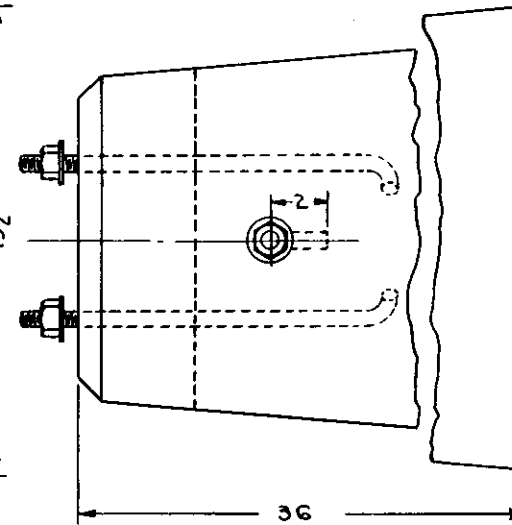
C — Common D. C.
EC — Common east, meaning D. C. from system east,
likewise north, south and west.
FC — Common traffic locking.
CX — Common A. C.
ENX — Negative energy A. C. from POR for an electric
light, or east negative A. C. energy, likewise
north, south and west.
NX — Negative A.C. energy.
BL — Positive side of split battery.
NL — Negative side of split battery.
CL — Common of split battery.
N — Negative D. C. energy.
B — Positive D. C. energy.
EB — Positive energy east, likewise north, south and west.
BB — Battery, second battery.
BBB — Battery, third battery.
BX — Positive A. C. energy.
EBX — Positive energy A. C. for POR for an electric light
or east positive A. C. energy, likewise north, south
and west.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CIRCUIT NOMENCLATURE		
DATED APRIL 8, 1937	REV. MAY 24, 1943	S-B27C1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>J. J. Corcoran</i> SIGNAL ENGINEER





F3AI FOUNDATION



ANCHOR BOLT

F3AI2 L=8
F3AI3 L=15

NOTES:

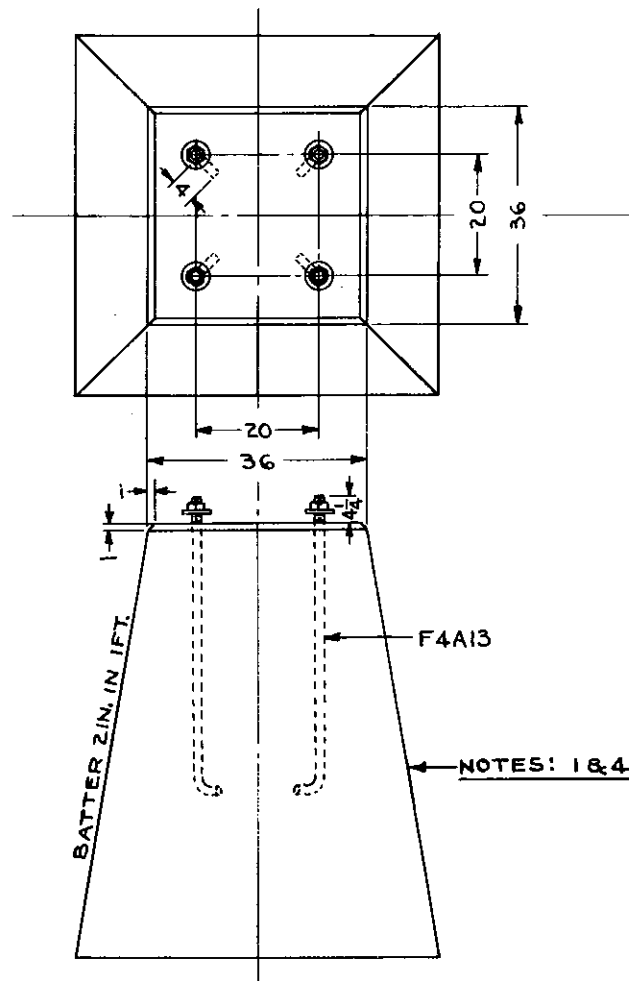
1. Foundation shall be made of Portland cement concrete in accordance with American Railway Engineering Association Specification.
Coarse aggregate shall consist of 3/4 inch maximum size stone or gravel.
Not less than 6 sacks of cement shall be used per cubic yard of concrete.
Water cement ratio to produce a compressive strength of 2500 pounds per square inch after 28 days shall be used.
2. Use of precast foundation (Permacrete Foundation S-8 with 6 1/2 x 17 1/2 inch centers or equal) in place of F3AI is optional.
3. Anchor bolt shall be C1020 steel, galvanized or cadmium plated after threads have been cut.

Notes: 1 & 2

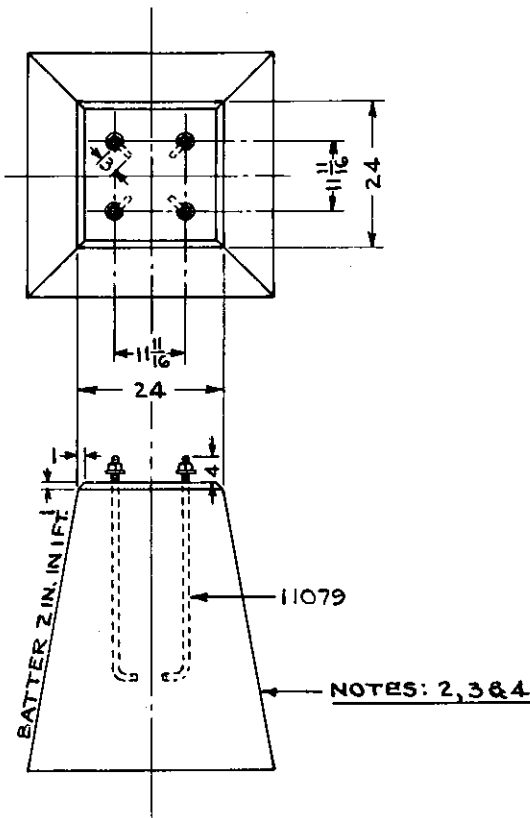
0 3 6 9 12

Scale and all dimensions given in inches

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONCRETE FOUNDATION FOR ELECTRIC SWITCH LOCK		
DATED APR. 20, 1934	REV. FEB. 19, 1953	S-F3A4
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST.L. RY. M.C.R.R.		<i>J. Horvath</i> SIGNAL ENGINEER



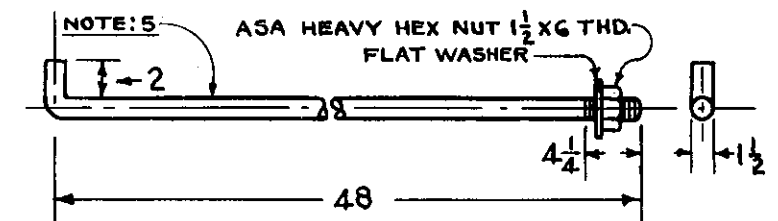
F4A1 FOUNDATION
FOR BRACKET MAST SIGNALS



F4A2 FOUNDATION
FOR GROUND MAST SIGNALS

NOTES:

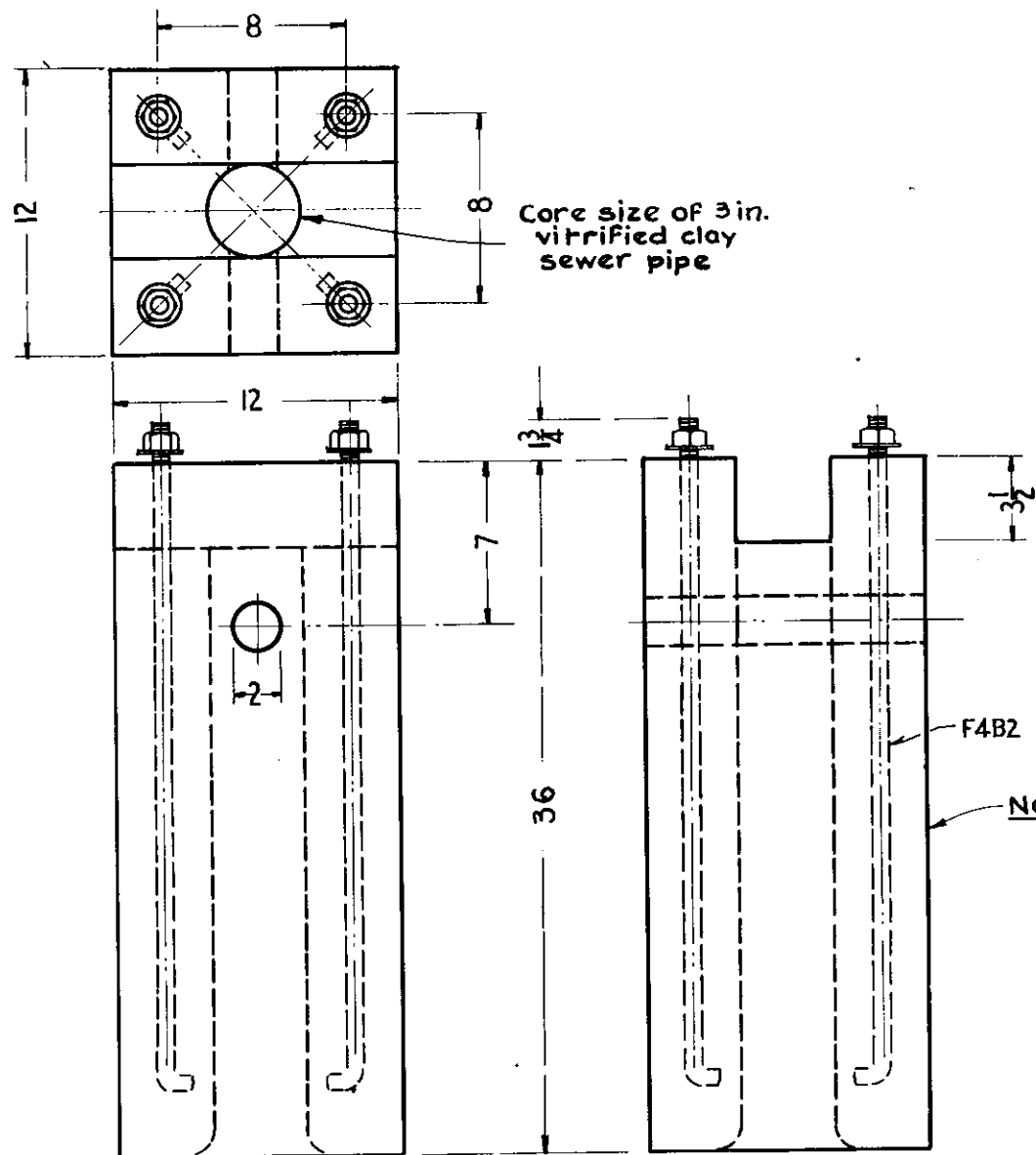
1. BOTTOM OF FOUNDATION F4A1 SHALL BE NOT LESS THAN 5 FT. IN GROUND AND NOT LESS THAN 6 FT. IN GROUND WHEN BRACKET MAST IS FOR THREE ARM SIGNAL.
2. BOTTOM OF FOUNDATION F4A2 SHALL BE NOT LESS THAN 4 FT. IN GROUND.
3. USE OF PRECAST FOUNDATION (PERMACRETE S-2, WITH 4 S-2 2PIECE SPIDERS - OR EQUAL) IN PLACE OF FOUNDATION F4A2 IS OPTIONAL.
4. FOUNDATION SHALL BE MADE OF PORTLAND CEMENT CONCRETE IN ACCORDANCE WITH AMERICAN RAILWAY ENGINEERING ASSOCIATION SPECIFICATION. COARSE AGGREGATE SHALL CONSIST OF 3/4 IN. MAXIMUM SIZE STONE OR GRAVEL. NOT LESS THAN 6 SACKS OF CEMENT SHALL BE USED PER CUBIC YARD OF CONCRETE. WATER CEMENT RATIO TO PRODUCE A COMPRESSIVE STRENGTH OF 2500 POUNDS PER SQUARE INCH AFTER 28 DAYS SHALL BE USED.
5. ANCHOR BOLT SHALL BE C1020 STEEL, GALVANIZED OR CADMIUM PLATED AFTER THREADS HAVE BEEN CUT.



F4A13-ANCHOR BOLT

ALL DIMENSIONS GIVEN IN INCHES

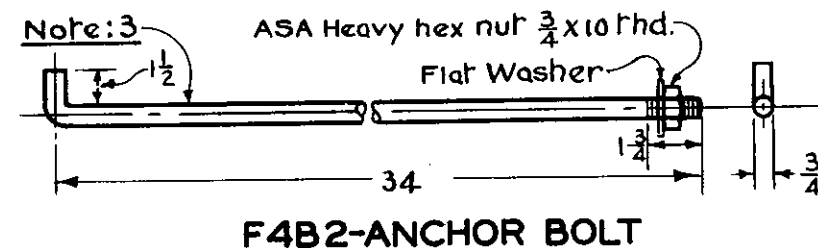
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONCRETE FOUNDATION FOR GROUND AND BRACKET MAST SIGNALS		
DATED MAY 14, 1934	REV. FEB. 19, 1953	S-F4A5
APPROVED FOR N. Y. C. & H. R. R. C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



F 4BI - FOUNDATION.

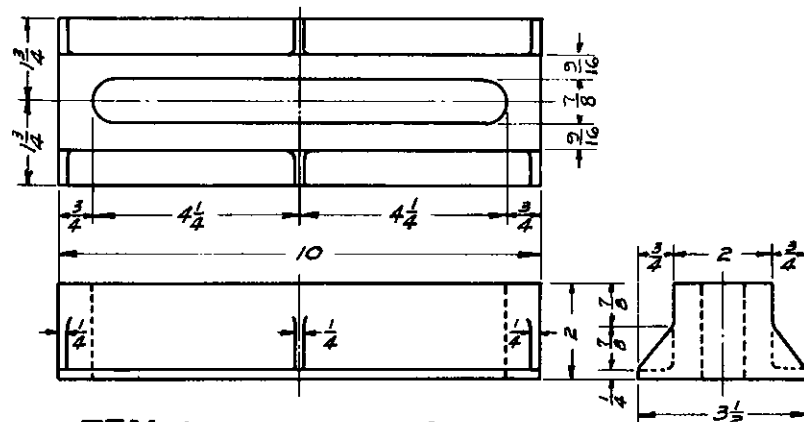
NOTES:

1. Foundation shall be made of Portland cement concrete in accordance with American Railway Engineering Association Specification.
Coarse aggregate shall consist of $\frac{3}{4}$ inch maximum size stone or gravel.
Not less than 6 sacks of cement shall be used per cubic yard of concrete.
Water cement ratio to produce a compressive strength of 2500 pounds per square inch after 28 days shall be used.
2. Use of precast Foundation (Permacrete Foundation H13 or equal) in place of F4BI is optional.
3. Anchor bolt shall be C1020 steel, galvanized or cadmium plated after the threads have been cut.

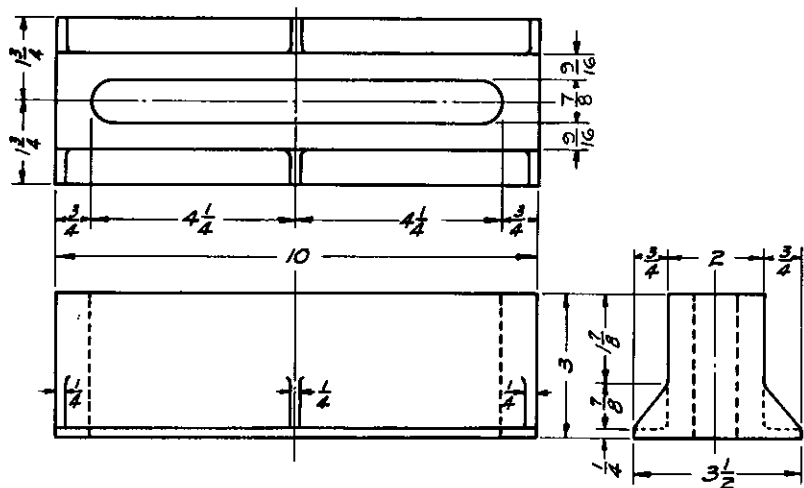


All Dimensions given in inches

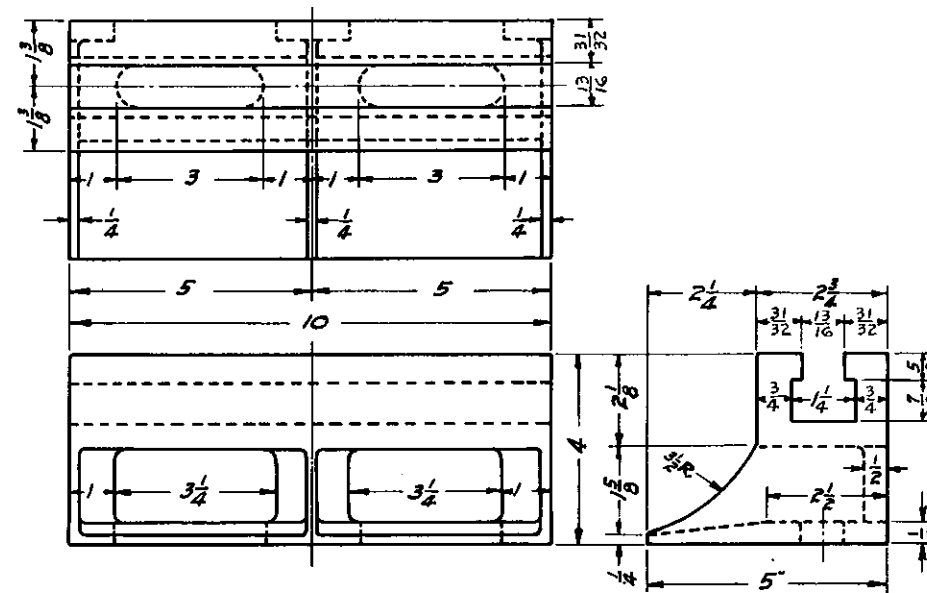
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONCRETE FOUNDATION TYPE "SA" AND "SC" DWARF SIGNAL		
DATED MAR. 25, 19	REV. FEB. 19, 1953	S-F4B4
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



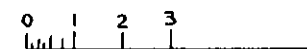
F5A1 2" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-339



F5A2 3" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-340



F5A3 4" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-341



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

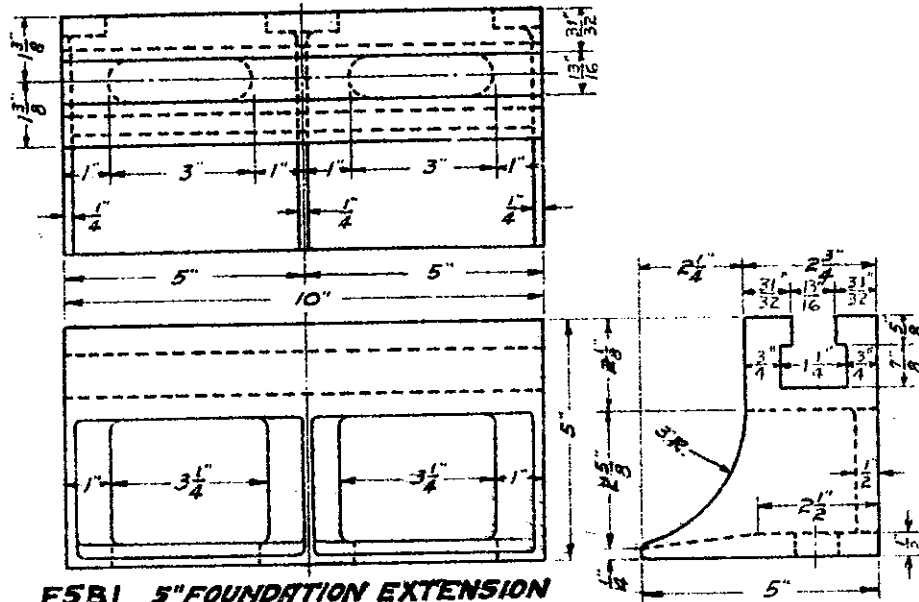
N. Y. C. R. R.	SIGNAL DEPT	CLEVELAND, O.

FOUNDATION EXTENSIONS

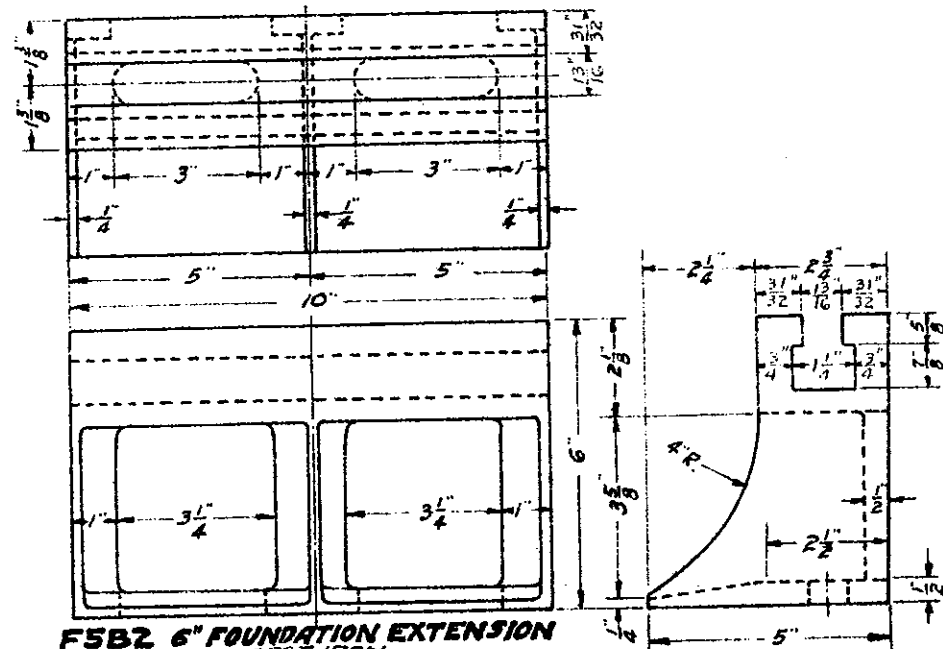
DATED APRIL 12, 1934	REV. JAN. 7, 1953	S-F5A2

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

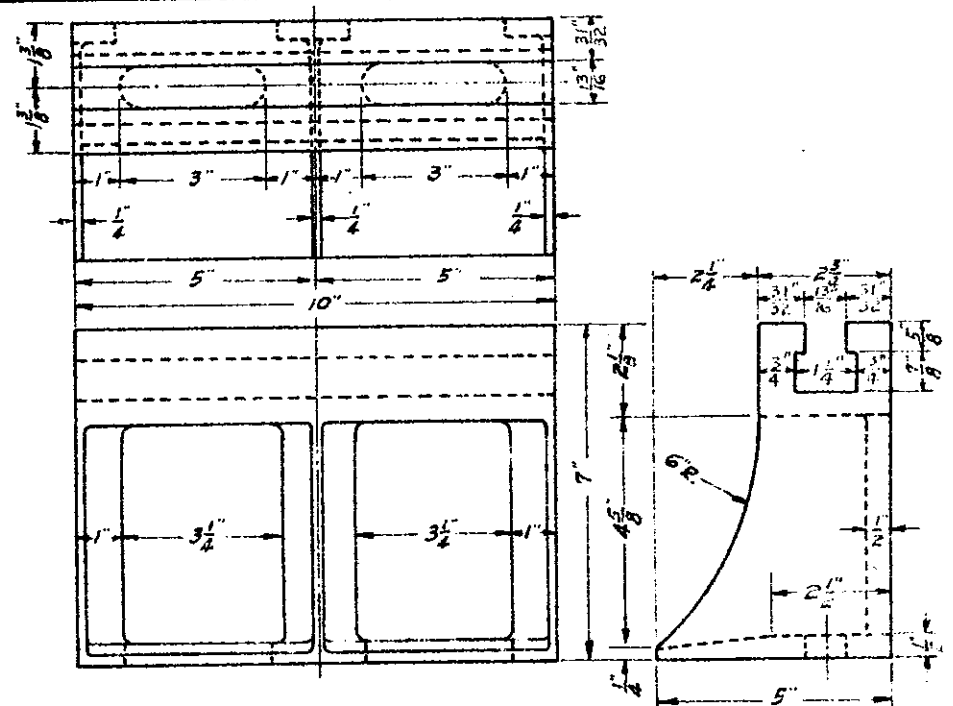
[Signature]
SIGNAL ENGINEER



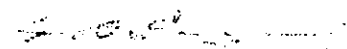
F5B1 5" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-342

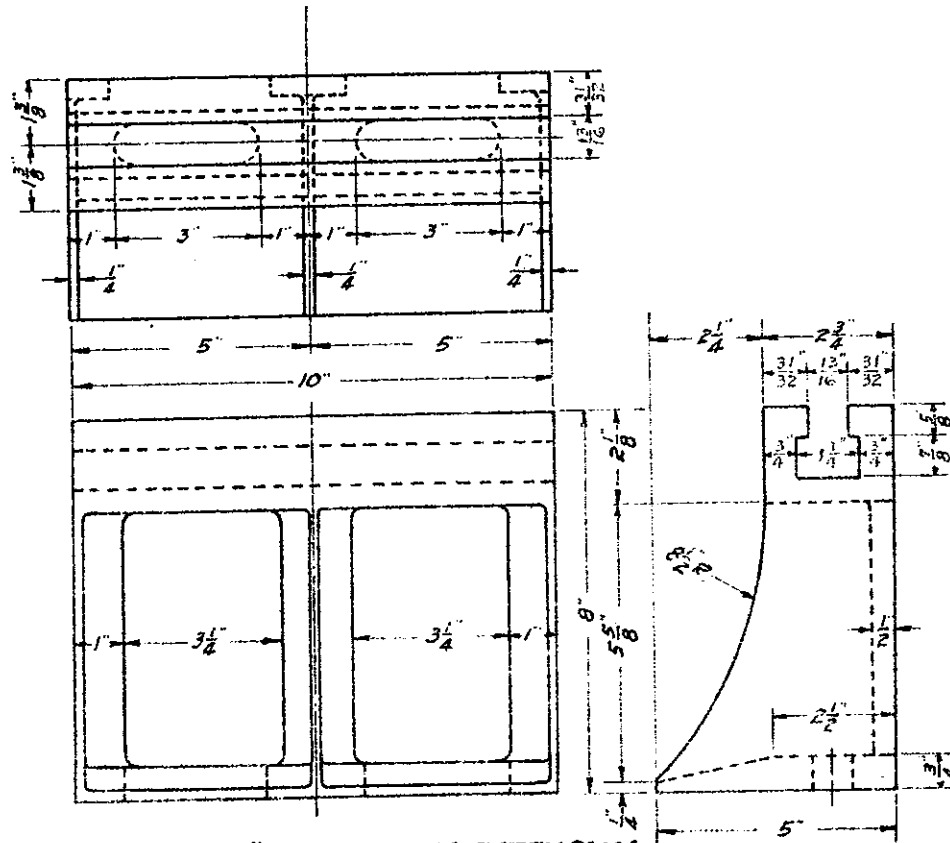


F5B2 6" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-343

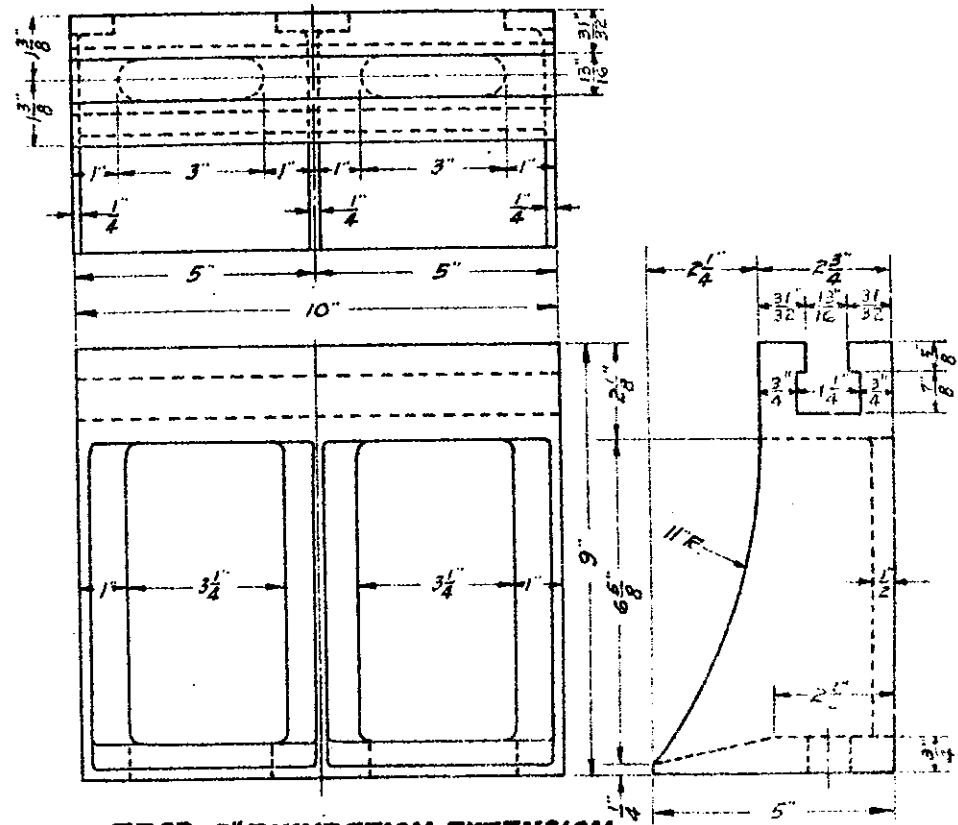


F5B3 7" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-344

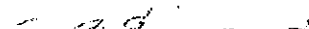
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
FOUNDATION EXTENSIONS		
APRIL 12, 1934.		
REVISION NO. 1	JUNE 7, 1937.	S-F5B
 SIGNAL ENGINEER		

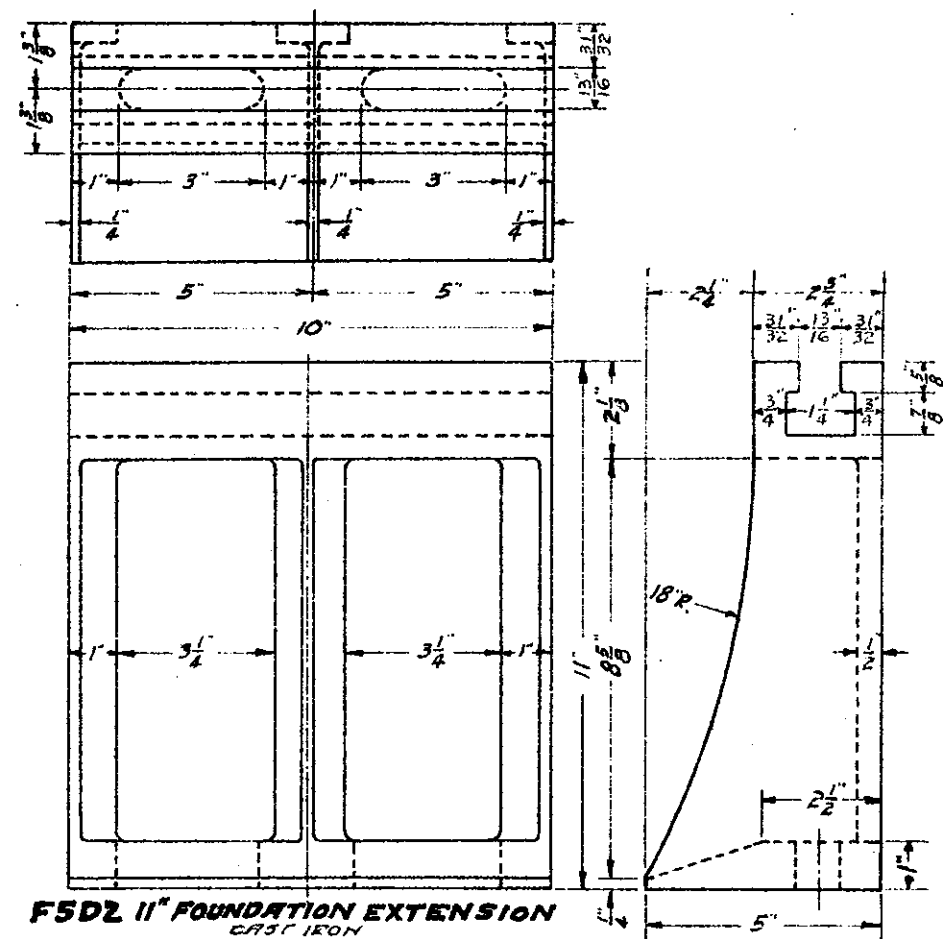
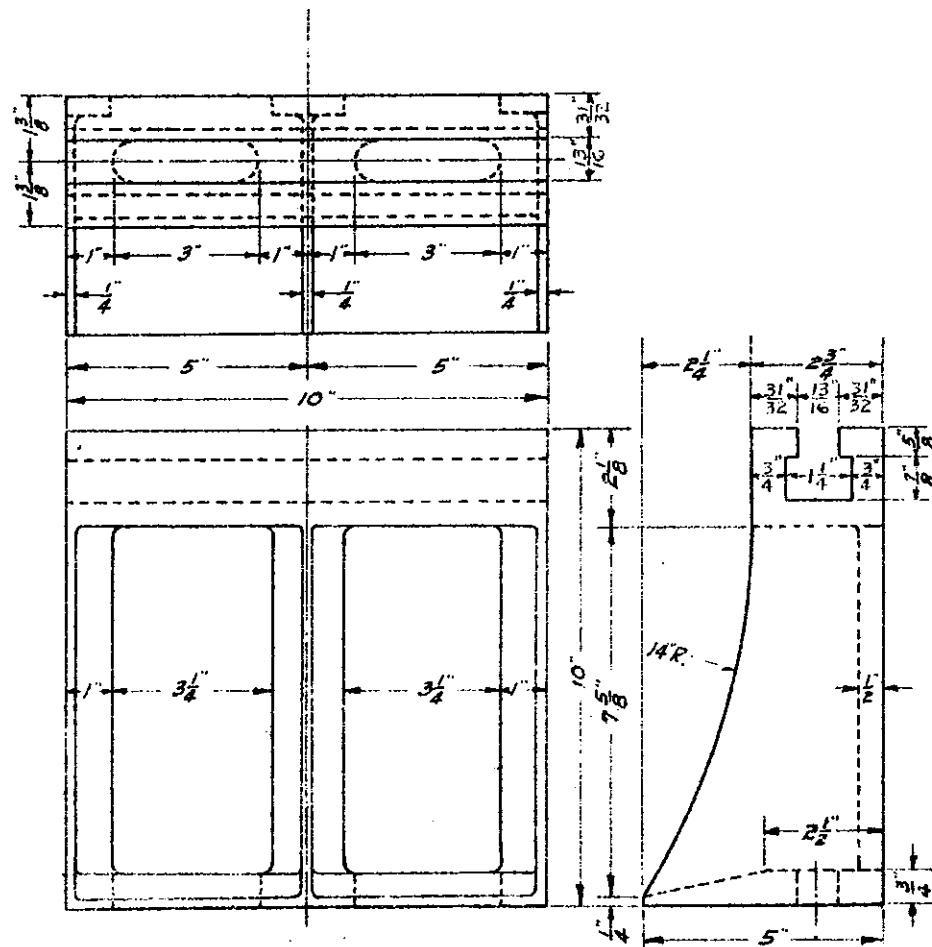


F5C! 8" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-345



F5C2 9" FOUNDATION EXTENSION
CAST IRON
PATTERN NO. 5-346

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
FOUNDATION EXTENSIONS		
APRIL 12, 1934.		
REVISION NO. 1	JUNE 7, 1937.	S-F5C
 _____ SIGNAL ENGINEER		



N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

FOUNDATION EXTENSIONS

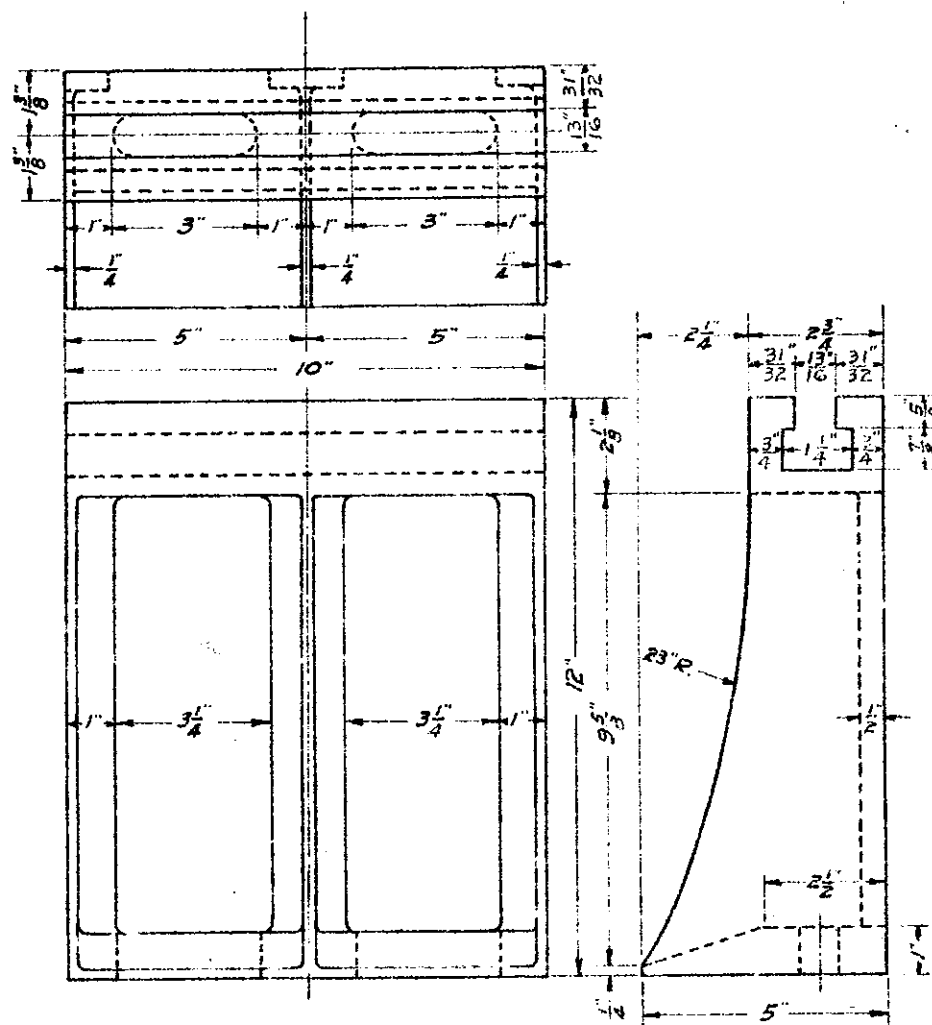
APRIL 12, 1934.

REVISION NO. 1

JUNE 7, 1937.

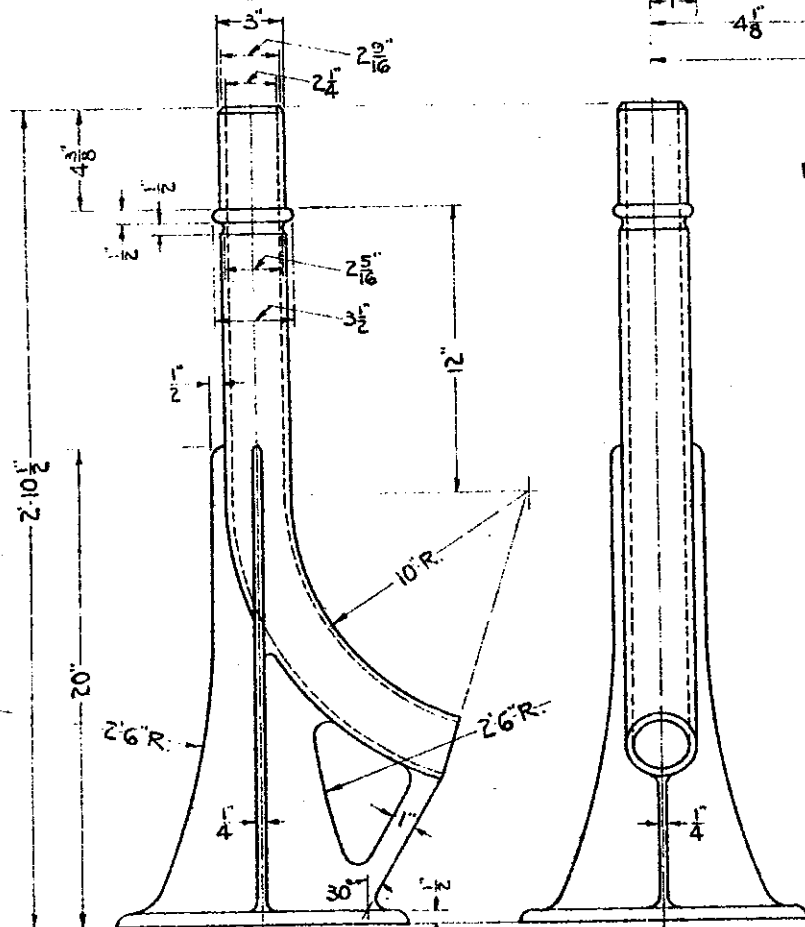
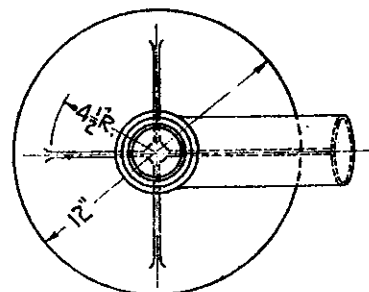
S-F5D

SIGNAL ENGINEER



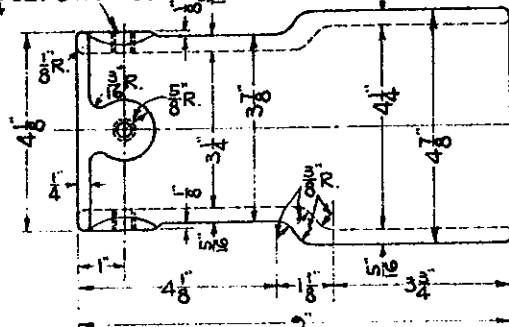
F5E1 12" FOUNDATION EXTENSION
 CAST IRON
 PATTERN NO 5-343

N. Y. C. R.R.	SIGNAL DEPT.	CLEVELAND, O.
FOUNDATION EXTENSIONS		
APRIL 12, 1934.		
REVISION NO. 1	JUNE 7, 1937.	S-F5E
 SIGNAL ENGINEER		

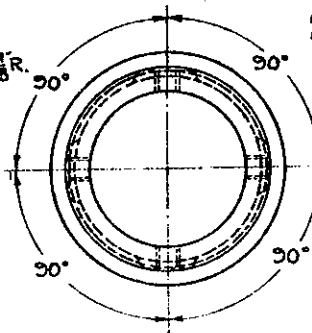


F8A1 FOUNDATION
CAST IRON
PATT. # 5-480

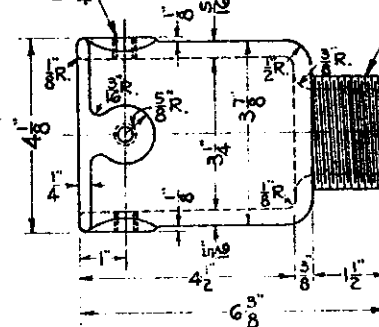
$\frac{27}{64}$ " DRILL - 4 HOLES $\frac{1}{2}$ "-13 U.S. STD. TAP
AND 4- $\frac{1}{2}$ "x $\frac{3}{4}$ " SET SCREWS.



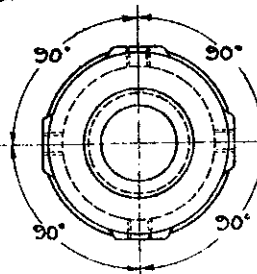
F8A2 ADAPTER
CAST IRON
PATT. # 5-481
FOR U.S. & S. C. L. SIGNAL PL. B-2560



$\frac{27}{64}$ " DRILL - 4 HOLES $\frac{1}{2}$ "-13 U.S. STD. TAP
AND 4- $\frac{1}{2}$ "x $\frac{3}{4}$ " SET SCREWS. 2"-11 $\frac{1}{2}$ " STD. PIPE
THREAD.



F8A3 ADAPTER
CAST IRON
PATT. # 5-484
FOR G.R.S. TYPE "A" C.L. DWARF SIGNAL
PL. H-2505



NOTE:

FOUNDATION F8A1 IS FOR FOLLOWING UNITS:-

TYPE OF SIGNAL	SIGNAL OR INDICATOR	ORDER REFERENCE ADAPTER
G.R.S. TYPE "S" OR "SA" C. L. SIGNAL	PL. SB 60401	G.R. S. SKETCH #4319
G.R.S. C. L. SWITCH SIGNAL	#36722-28	NONE
G.R.S. C. L. DWARF SIGNAL TYPE "F"	PL. H2405	NONE
G.R.S. C. L. DWARF SIGNAL TRIANGULAR	#21211-6	NONE
G.R.S. C. L. DWARF SIGNAL TYPE "A"	PL. H2505	F8A3
U.S. & S. C. L. SIGNAL	PL. B2560	F8A2

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

FOUNDATION AND ADAPTERS

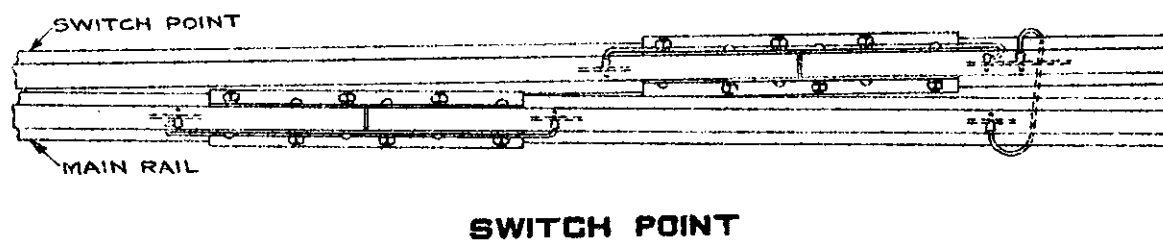
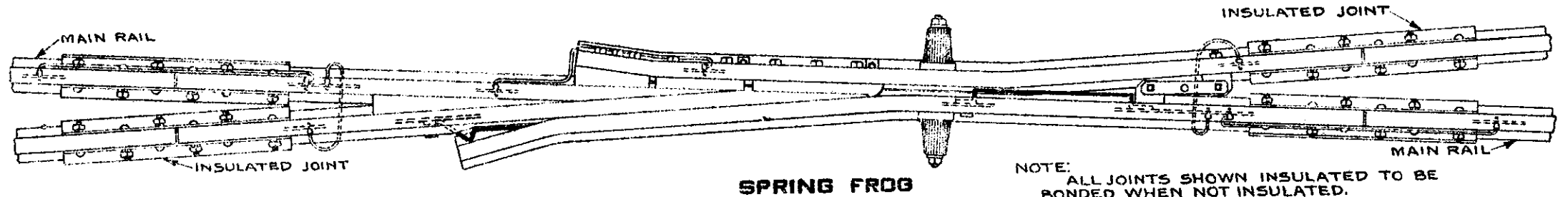
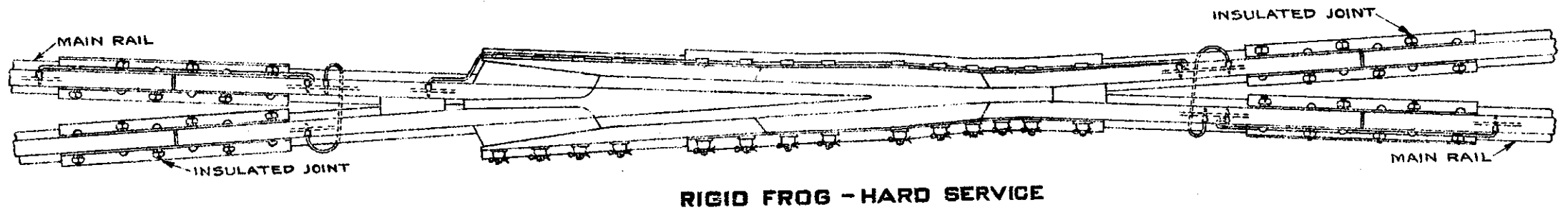
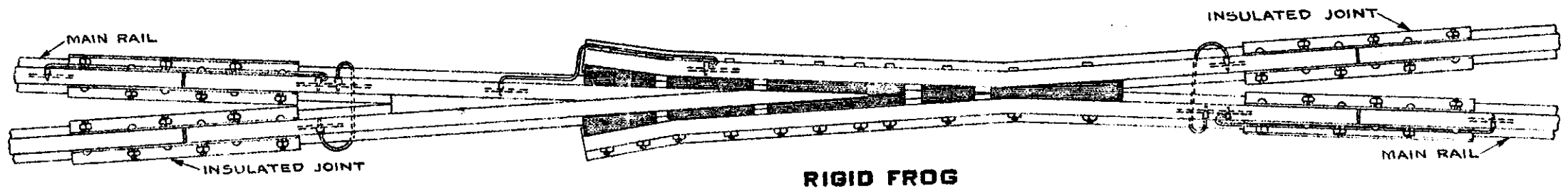
FOR COLOR LIGHT DWARF SIGNALS

NOV. 28, 1934.

REVISION NO.

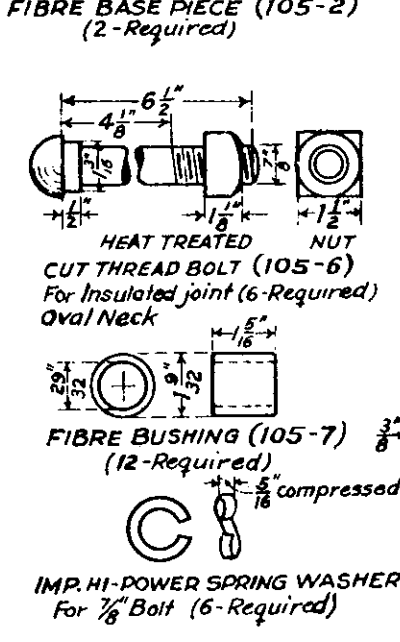
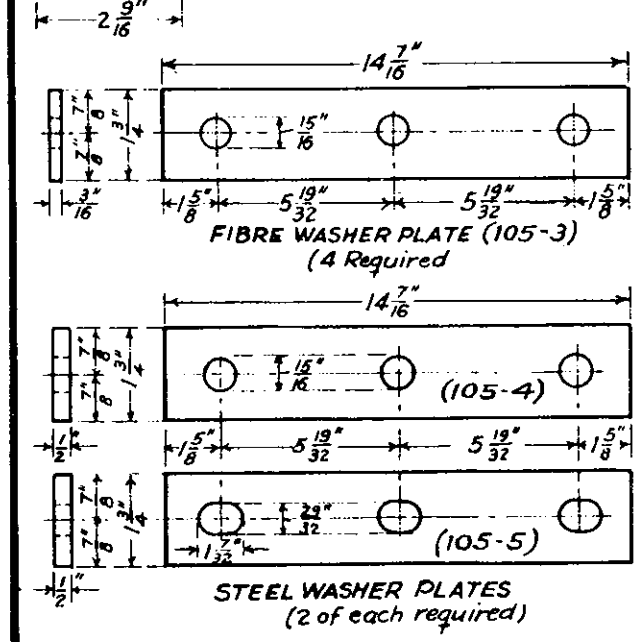
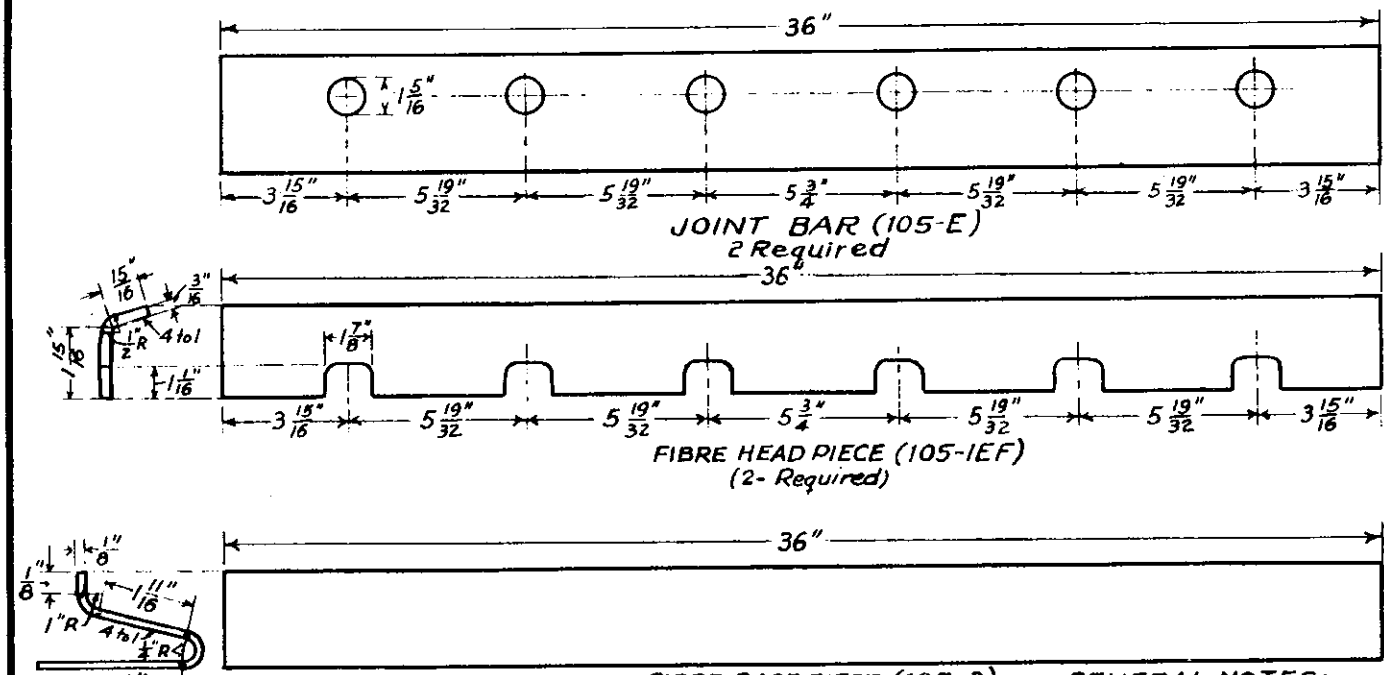
S-F8A

SIGNAL ENGINEER

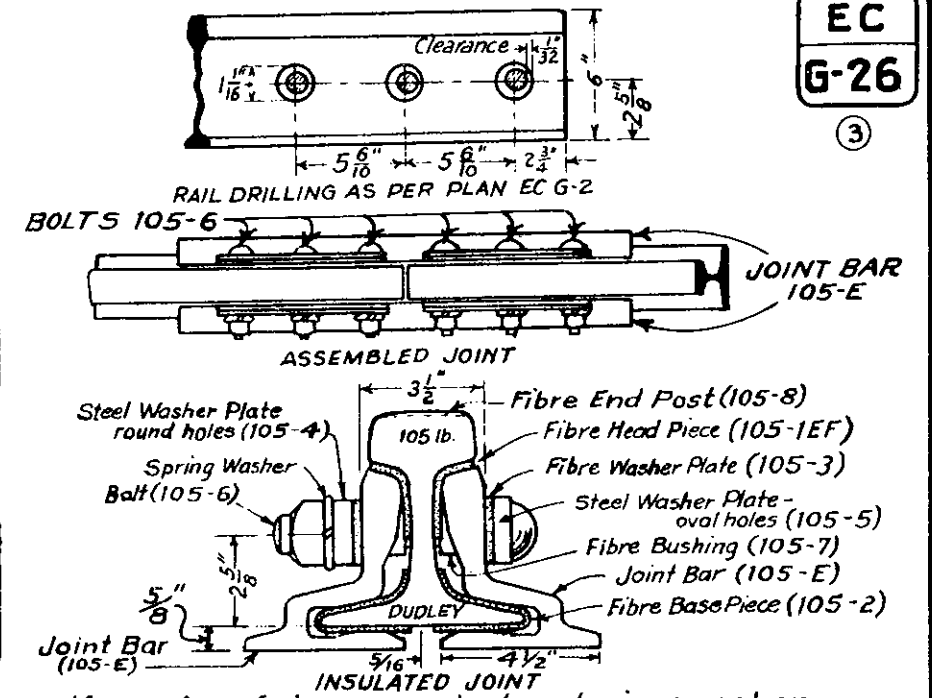


NOTE:
ALL JOINTS SHOWN INSULATED TO BE
BONDED WHEN NOT INSULATED.
INSTALL BONDS AS SHOWN ON S-G2A
AND SPECIFY LENGTH REQUIRED.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
BONDING FROGS AND SWITCH POINTS		
FEB. 26, 1934.		
REVISION NO.		S-G2B
 SIGNAL ENGINEER		



GENERAL NOTES:-
When ordering parts specify number of pieces required and give number indicated in brackets.
Mark all parts for renewal purposes except bushings, bolts and spring washers with wt. of rail and all fibre parts except bushings with Mfrs. name or symbol.

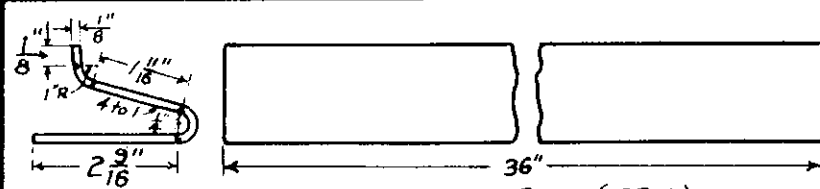


NEW YORK CENTRAL SYSTEM
STANDARD
RENEWAL PARTS FOR
CONTINUOUS FULL
INSULATED JOINT
ELECTRIC ZONE
105 LB-6" DUD. SEC. RAIL

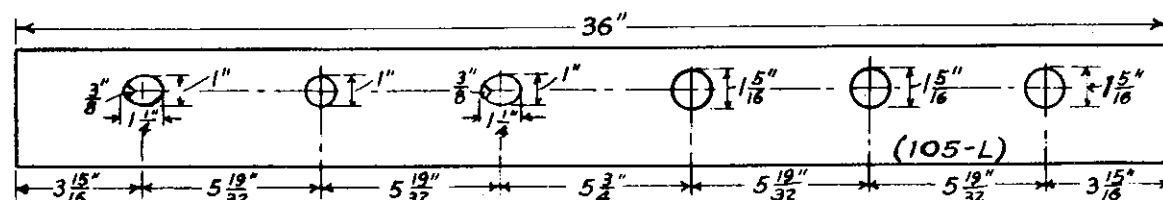
A.E. Magnity
VICE PRESIDENT

EC
6-27

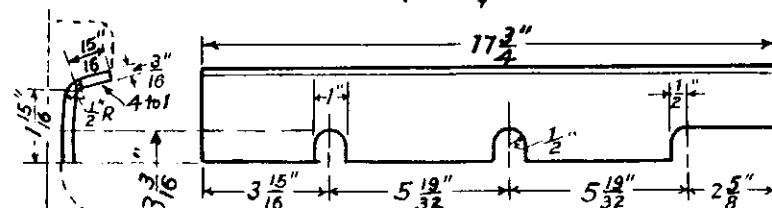
(4)



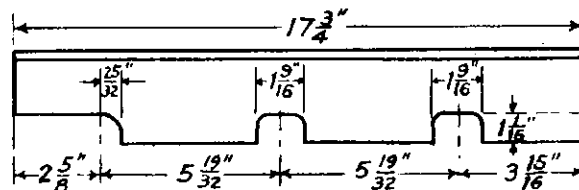
FIBRE BASE PIECE (105-2)
(2- Required)



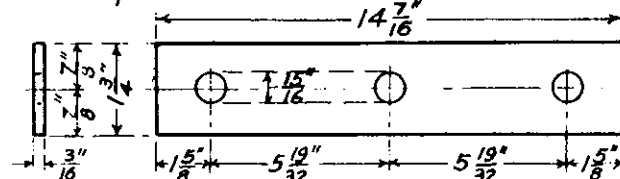
JOINT BAR (2 Required) 1-R.H. & 1-L.H.



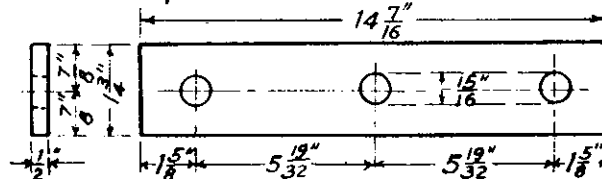
STEEL HEAD PIECE (105-9L)
(2- Required; 1-right hand & 1-left hand)
L.H. piece shown- Non-Insulated End



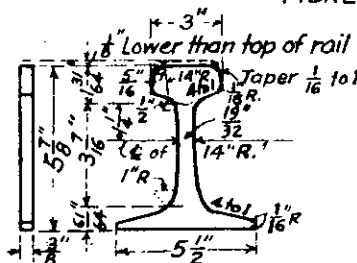
FIBRE HEAD PIECE (105-1R)
(2 Required; 1-right hand & 1-left hand)
R.H. piece shown- Insulated End



FIBRE WASHER PLATE (105-3)
(2 Required)



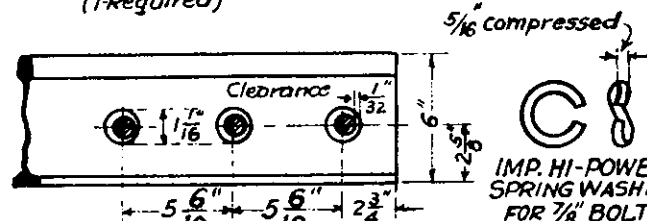
STEEL WASHER PLATE (105-4)
(1- Required)



FIBRE END POST (105-8)
(1- Required)



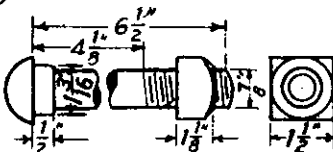
FIBRE BUSHING (105-7)
(6- Required)



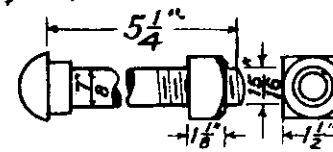
RAIL DRILLING AS PER PLAN EC G-2



IMP. HI-POWER
SPRING WASHER
FOR 7/8 BOLT
(6- Required)



HEAT TREATED
CUT THREAD BOLT (105-6) NUT
For Insulated end (3- Required)
Oval Neck



HEAT TREATED
OIL QUENCHED TRACK BOLT EC G-7A
For non-insulated end (3- Required)
Elliptic Neck

GENERAL NOTES:-
When ordering parts specify number of pieces required and give number indicated in brackets.
To identify L.H. or R.H. head pieces face side of Jt. for piece req'd.
Mark all parts for renewal purposes except bushings, bolts, and spring washers with wt. of rail and all fibre parts except bushings with Mfr's. name or symbol.

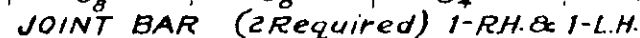
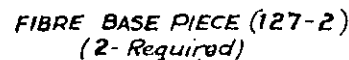
NEW YORK CENTRAL SYSTEM

STANDARD
RENEWAL PARTS FOR
CONTINUOUS ONE END
INSULATED JOINT

105 LB.-6" DUD. SEC. RAIL

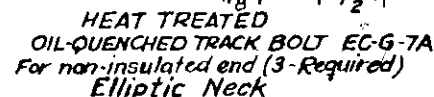
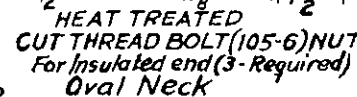
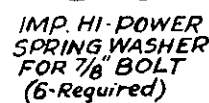
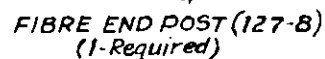
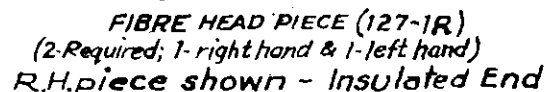
A. E. Ungewitter
VICE PRESIDENT

S-G3B4



Base of rail. (2-Required: 1-right hand & 1-left hand)

LH. piece shown - Non-Ins. End



GENERAL NOTES :-

When ordering parts specify number of pieces required and give number indicated in brackets.
To identify L.H. or R.H. head pieces face side of joint for piece re'qd.
Mark all parts for renewal purposes except bushings, bolts and spring washers with wt. of rail and all fibre parts except bushings with Mfg'r's. name or symbol.

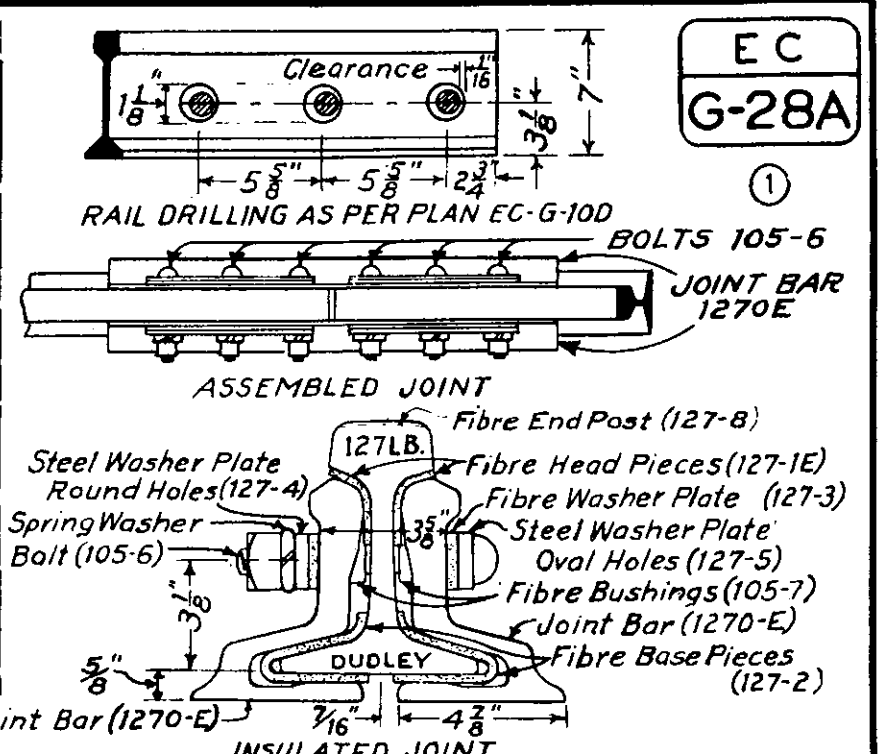
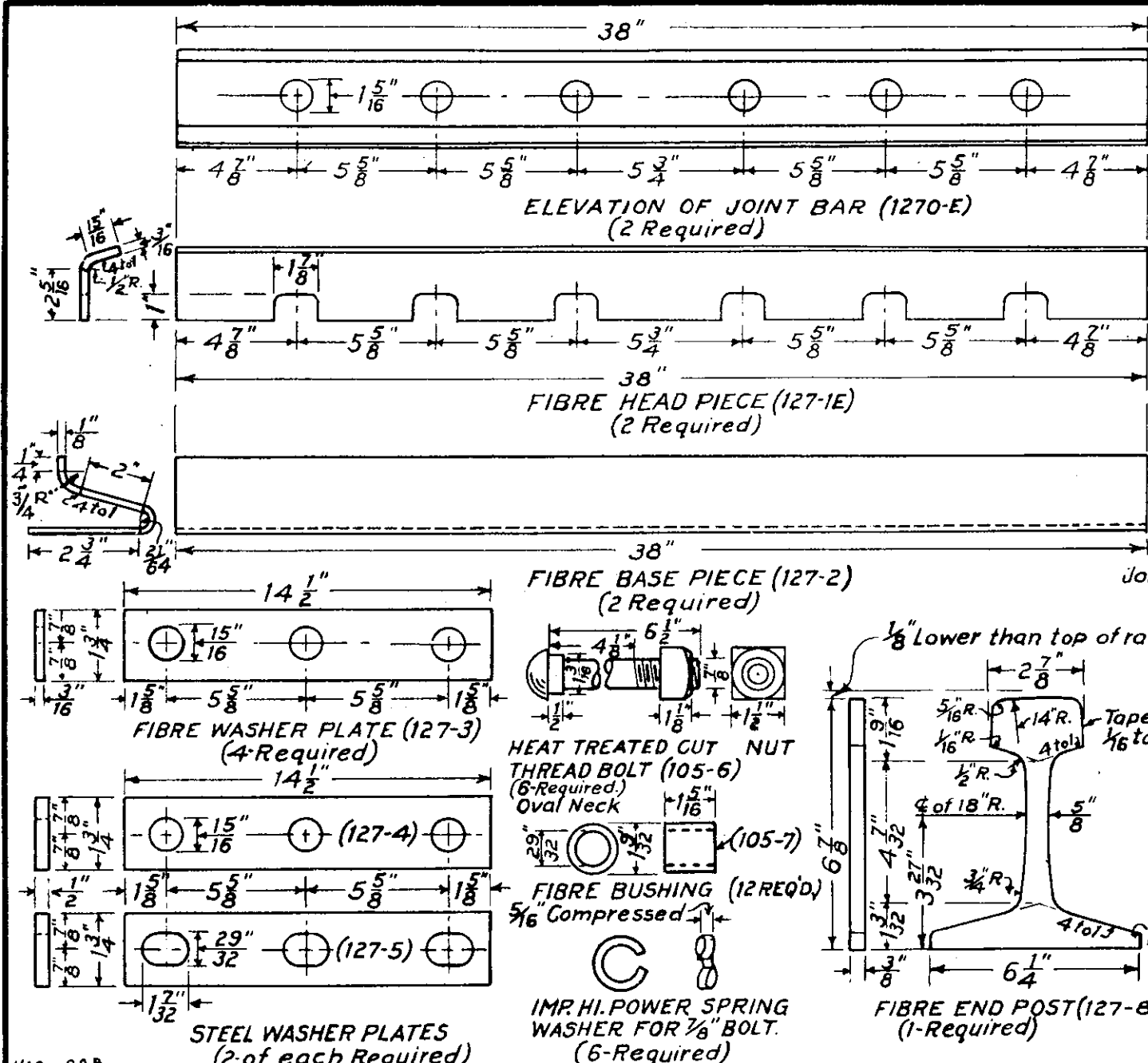
NEW YORK CENTRAL SYSTEM
STANDARD

RENEWAL PARTS FOR CONTINUOUS ONE END INSULATED JOINT

127 LB.-7" DUD. SEC. RAIL

A.E. Ungewitter
VICE PRESIDENT

S-G3C5

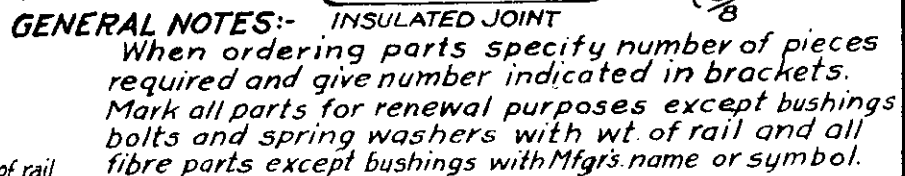
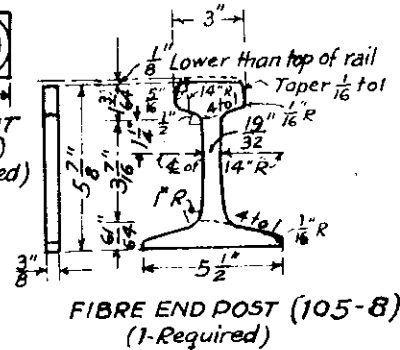
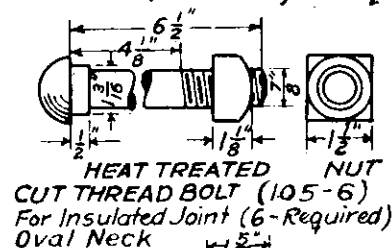
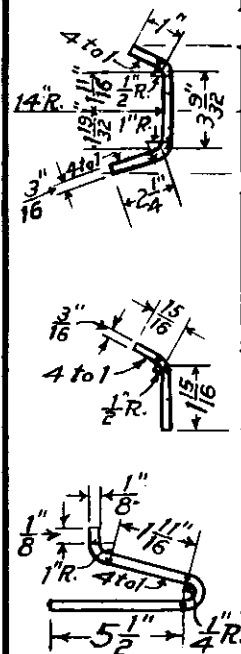


EC
G-28A

GENERAL NOTES: When ordering parts specify number of pieces required and give number indicated in brackets. Mark all parts for renewal purposes except bushings, bolts and spring washers with wt. of rail and all fibre parts except bushings with Mfr's. name or symbol.

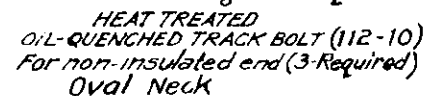
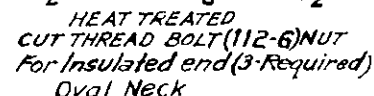
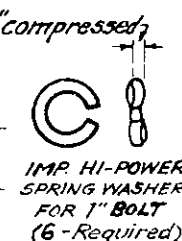
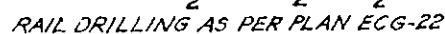
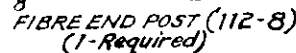
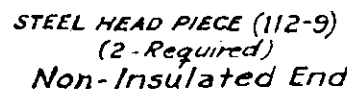
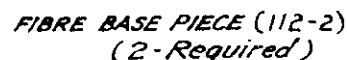
NEW YORK CENTRAL SYSTEM
STANDARD
RENEWAL PARTS FOR
CONTINUOUS FULL
INSULATED JOINT
ELECTRIC ZONE, 127LB. DUD. RAIL

R. E. Ellingbury
VICE PRESIDENT

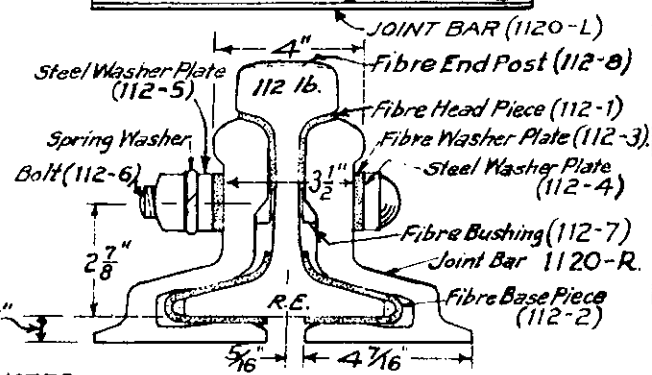
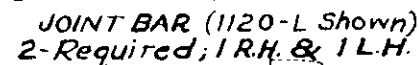


A.E. Ungar
VICE PRESIDENT

③



For Replacement Bolt
use 1" x 5 1/4", plan EC-G-8.



GENERAL NOTES:- **INSULATED END**
When ordering parts specify number of pieces required and give number indicated in brackets.
Order head pieces for renewal by pairs or pieces.
Mark all parts for renewal purposes except bushings bolts and spring washers with wt. of rail and all fibre parts except bushings with Mfg'r's name or symbol.

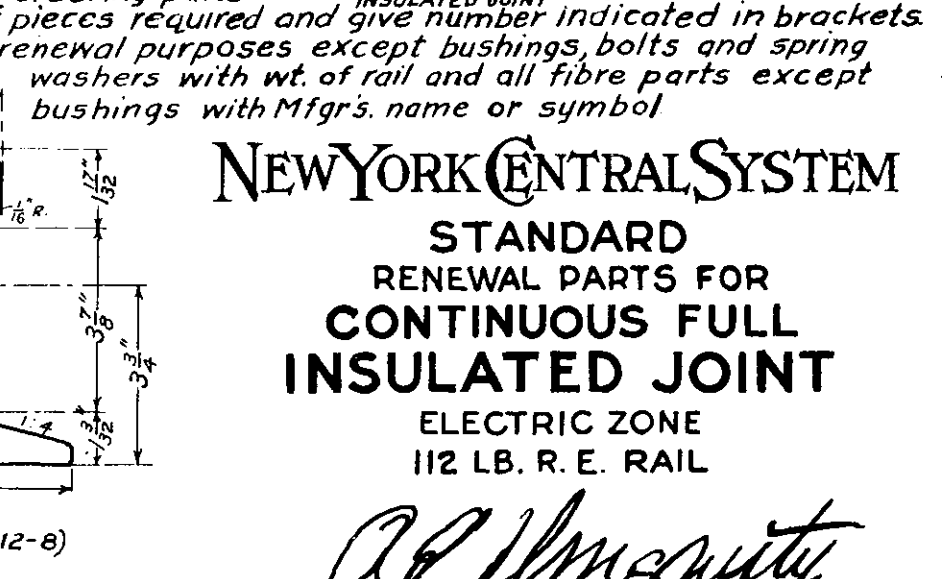
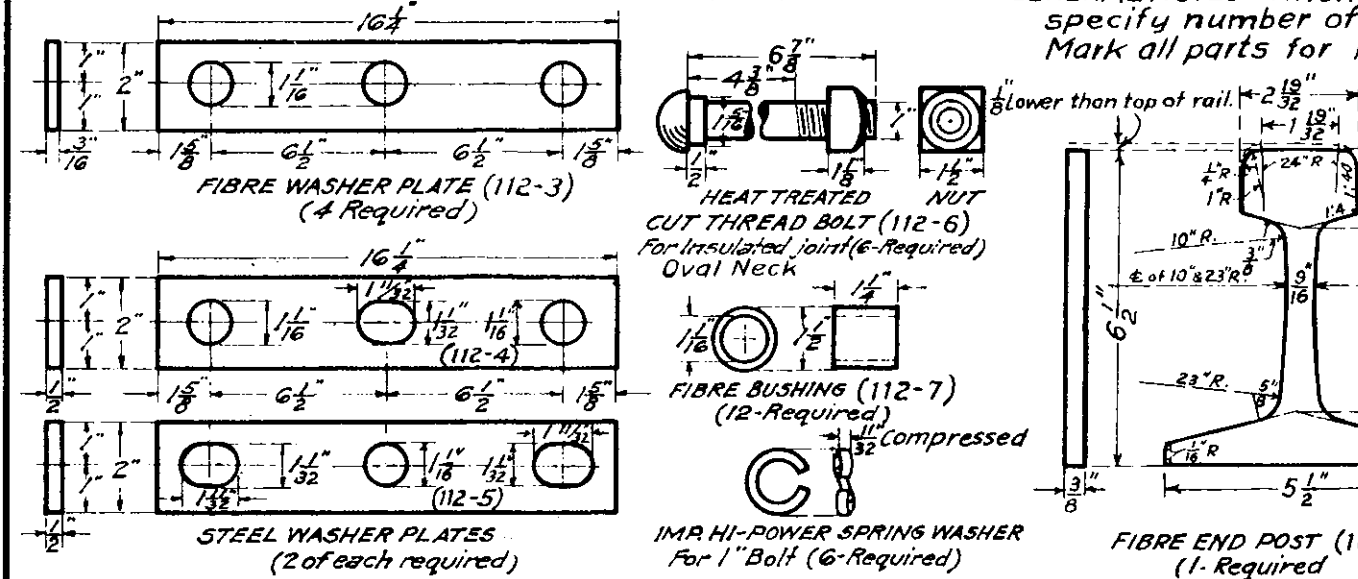
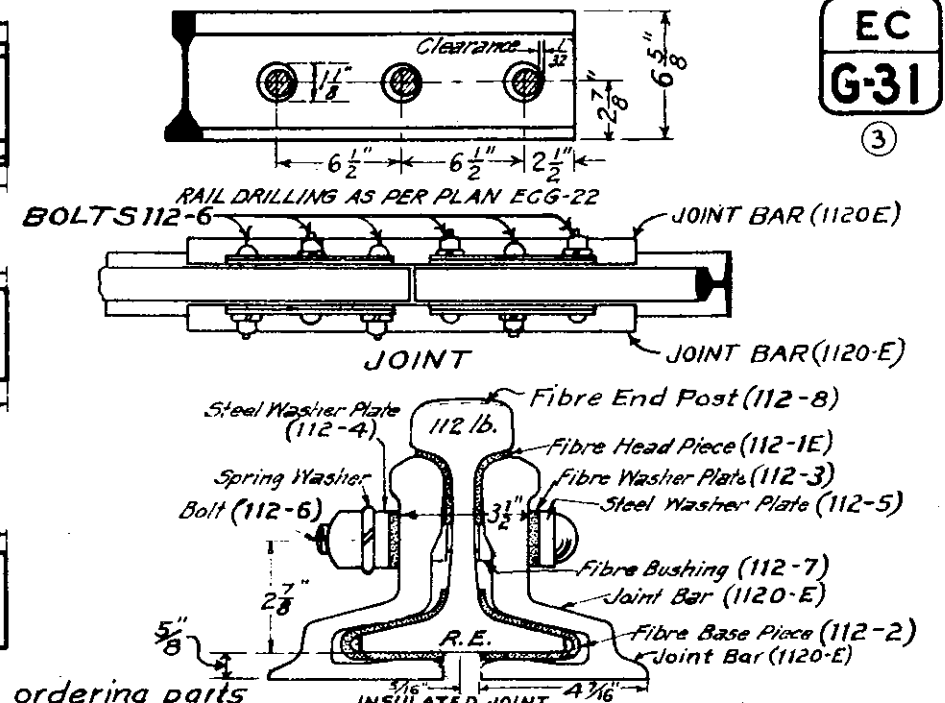
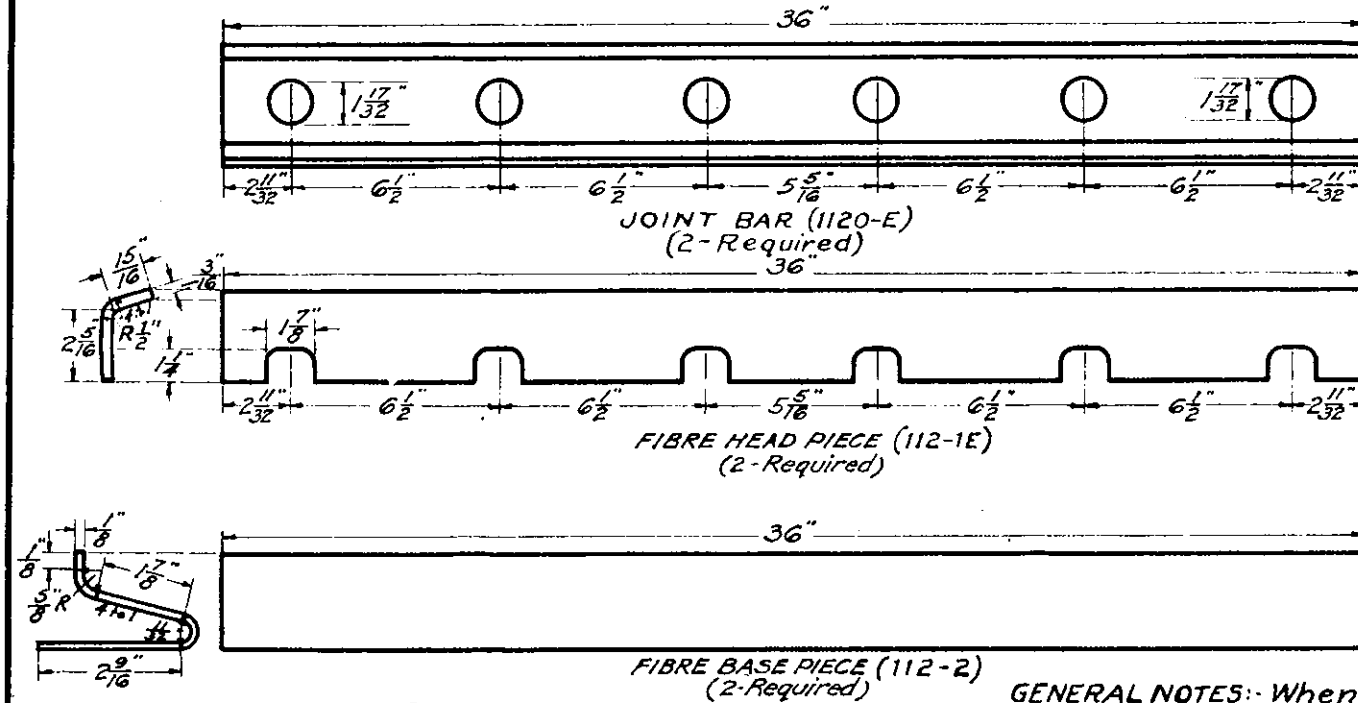
NEW YORK CENTRAL SYSTEM

STANDARD RENEWAL PARTS FOR CONTINUOUS ONE END INSULATED JOINT

112 L.B. R.E. RAIL

VICE PRESIDENT

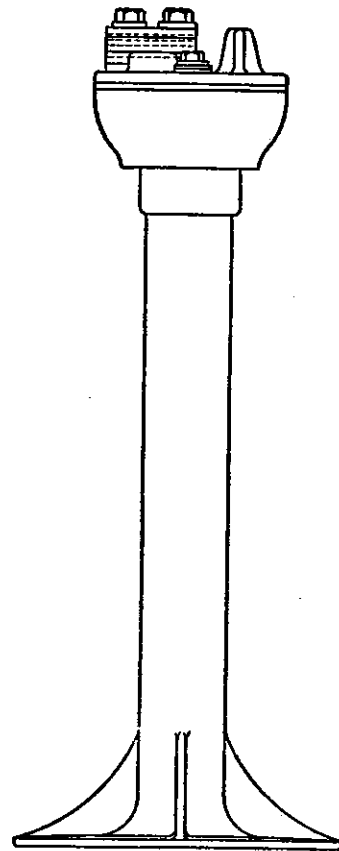
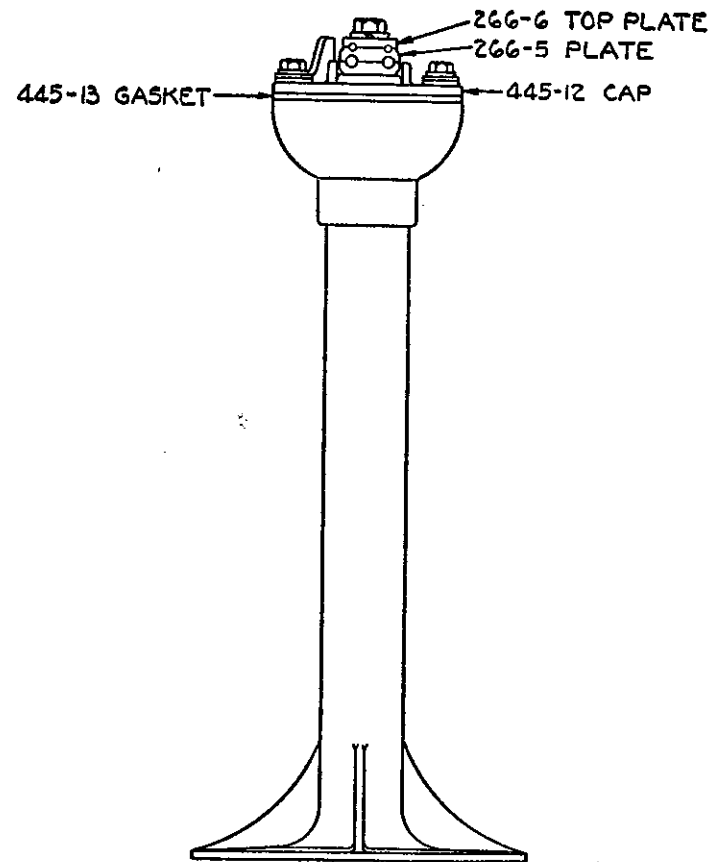
S-G3F3



GENERAL NOTES: When ordering parts specify number of pieces required and give number indicated in brackets. Mark all parts for renewal purposes except bushings, bolts and spring washers with wt. of rail and all fibre parts except bushings with Mfg'r's name or symbol.

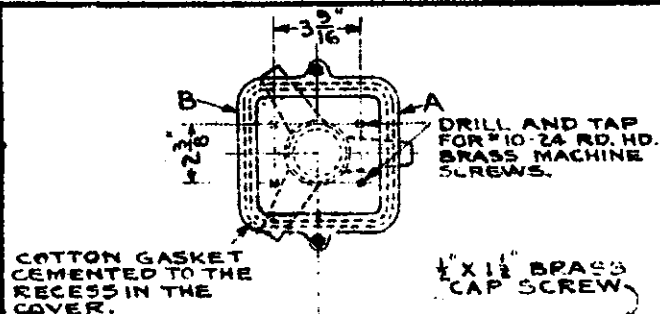
NEW YORK CENTRAL SYSTEM
STANDARD
RENEWAL PARTS FOR
CONTINUOUS FULL
INSULATED JOINT
ELECTRIC ZONE
112 LB. R. E. RAIL

A.E. Magnity
VICE PRESIDENT
S-G3G3



BOOTLEG COMPLETE
 RACO 445-1 OR EQUIVALENT (PEDESTAL 1 $\frac{3}{8}$ " I.D.)
 RACO 445-310R EQUIVALENT (PEDESTAL 2" I.D.)

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
TRENCH CABLE BOOTLEG FOR TRACK CONNECTIONS		
DATED OCT. 27, 1934.	REV. JAN. 27, 1942.	S-G5C2
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		
 SIGNAL ENGINEER		

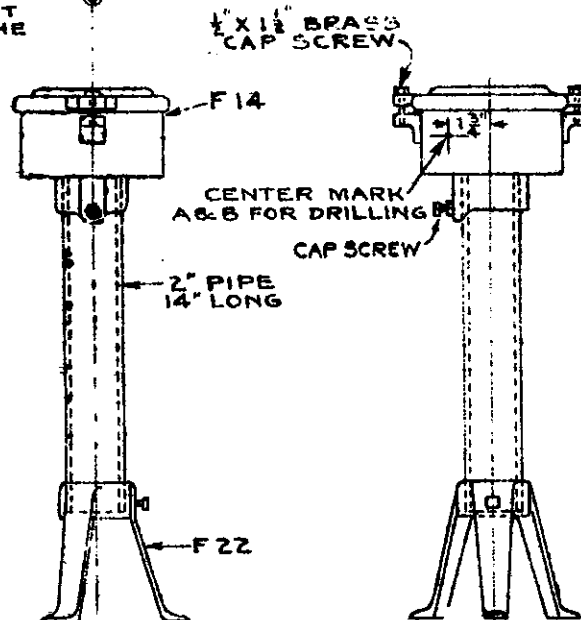


TERMINAL BOX AND COVER
TRENCH CABLE HOUSING FLATH NO. F14 OR
EQUIVALENT COMPLETE WITH GASKET,
CAP SCREWS AND FOUR 3/4"-10-24 RD. HD.
BRASS MACHINE SCREWS.

G5D1 (A-B NOT DRILLED)

G5D2 (A 1 1/8" DRILL)

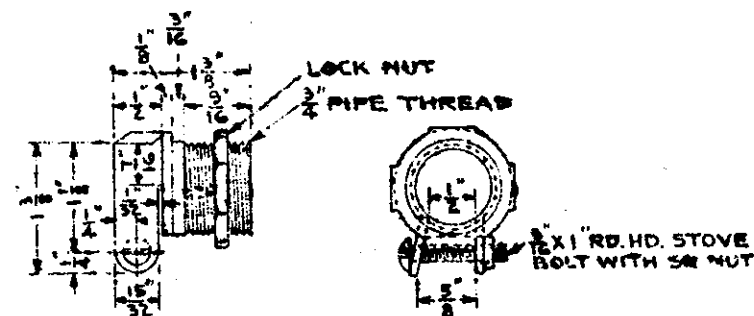
G5D3 (A-B 1 1/8" DRILL)



G5D7 TRENCH CABLE BOOTLEG
COMPLETE WITH TERM. BOX AND COVER G5D1

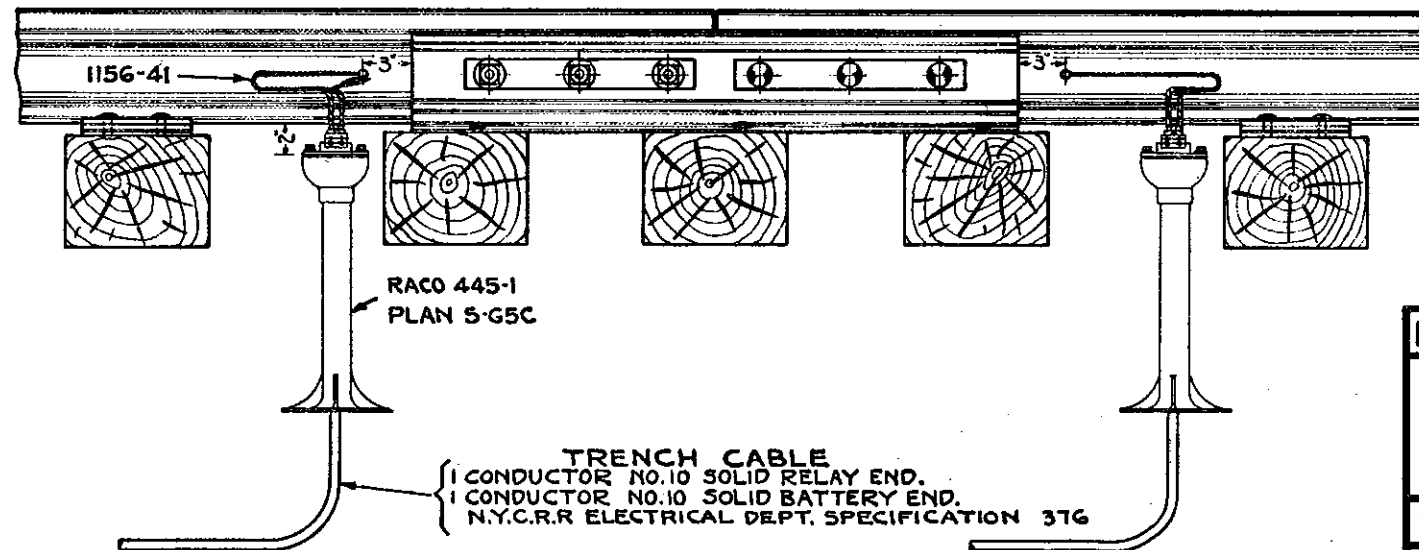
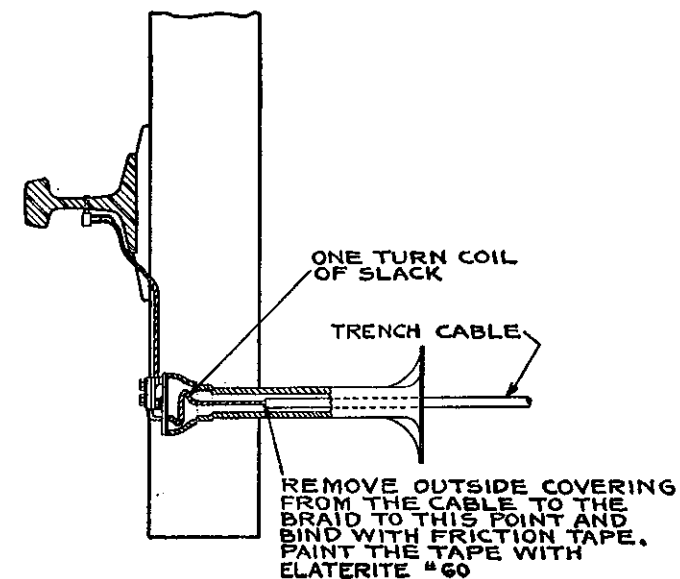
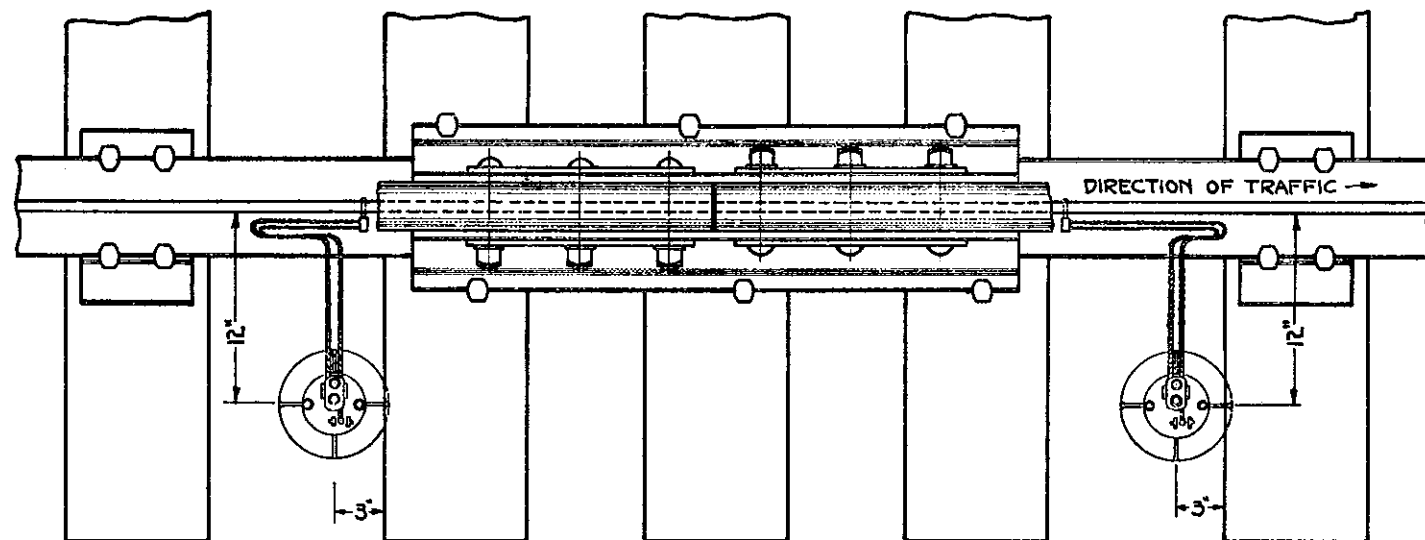
G5D8 TRENCH CABLE BOOTLEG
COMPLETE WITH TERM. BOX AND COVER G5D2
AND ONE CABLE CLAMP G5D14

G5D9 TRENCH CABLE BOOTLEG
COMPLETE WITH TERM. BOX AND COVER G5D3
AND TWO CABLE CLAMPS G5D14



G5D14 CABLE CLAMP
MALLEABLE IRON

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
TRENCH CABLE BOOTLEG		
FOR TERMINATING CONDUCTORS		
OCT. 27, 1934.		
REVISION NO. 5	NOV. 20, 1940	S-G5D
 SIGNAL ENGINEER.		



NOTE:
BOND PINS TO BE DRIVEN THROUGH THE WEB OF THE RAIL UP TO WITHIN $\frac{3}{8}$ OF THE SHOULDER WITH A 3" HAMMER.

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

TRENCH CABLE BOOTLEG APPLICATION FOR TRACK CONNECTIONS

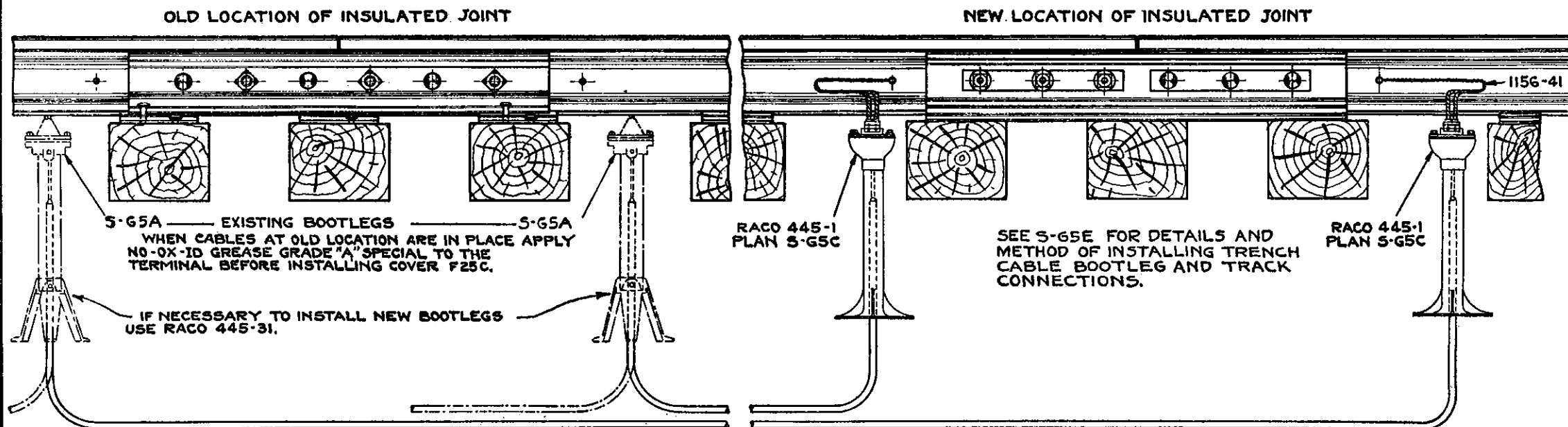
DATED OCT. 27, 1934.

REV. JAN. 27, 1942.

S-G5E3

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

J. K. Moran
SIGNAL ENGINEER.



NOTE:

WHEN LOCATION OF INSULATED RAIL JOINTS ARE CHANGED IN CONNECTION WITH NEW RAIL AND TRENCH CABLES ARE IN GOOD CONDITION, INSTALL NEW CABLES FROM THE BOOTLEGS AT THE OLD LOCATION TO THE BOOTLEGS AT THE NEW LOCATION.

IF THE CONDITION OR THE ARRANGEMENT OF THE CABLES IS SUCH THAT IT IS MORE ECONOMICAL TO INSTALL NEW CABLES FROM THE RELAY BOX DIRECT TO THE BOOTLEGS LOCATED AT THE NEW INSULATED RAIL JOINT LOCATION THAN TO USE THE OLD LOCATION AS A SPLICING POINT, THE MORE ECONOMICAL ARRANGEMENT SHALL BE USED.

WHEN TRENCH CABLE IS RENEWED THE TERMINAL ARRANGEMENT AT THE OLD LOCATION SHALL BE ELIMINATED.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

TRENCH CABLE BOOTLEG APPLICATION FOR TRACK CONNECTIONS

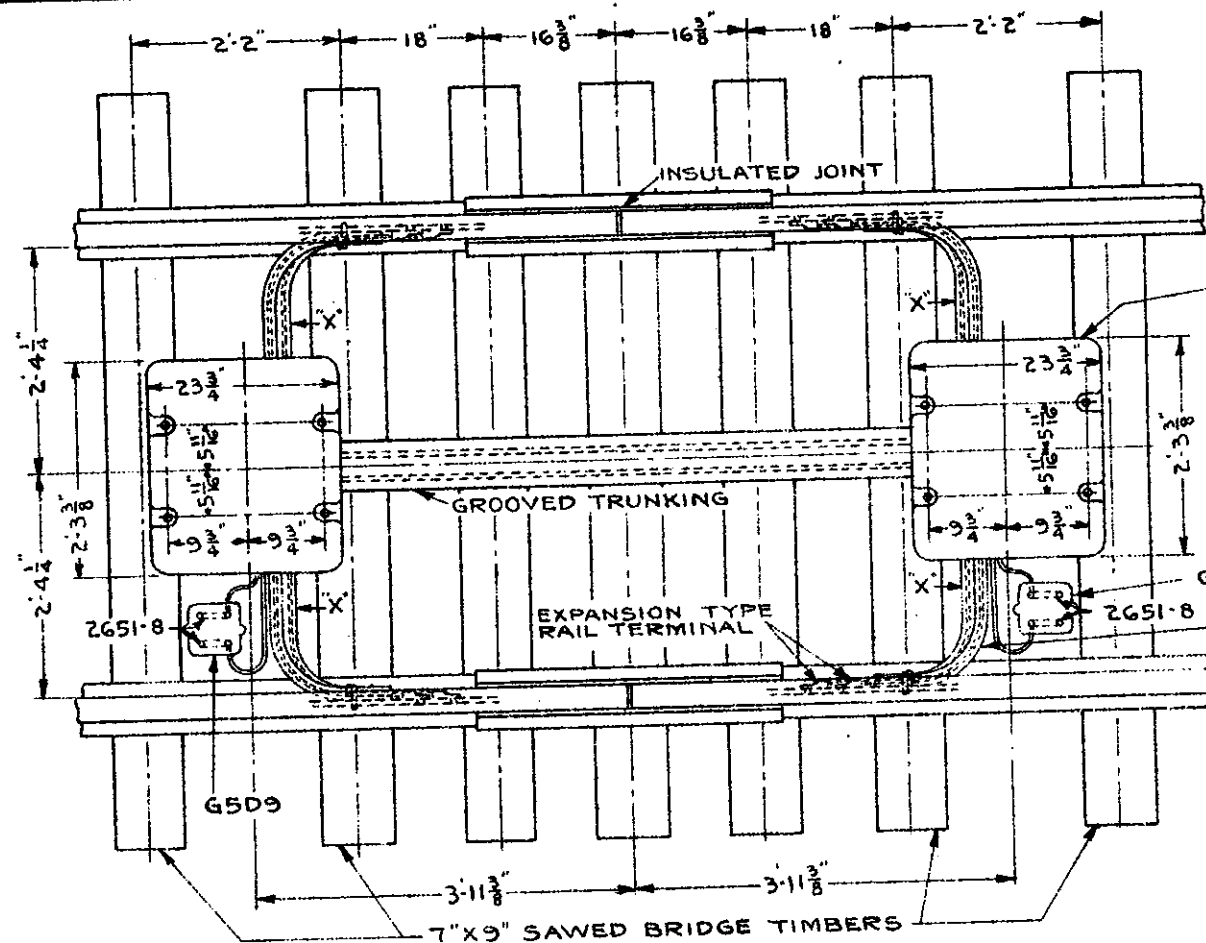
DATED OCT. 27, 1934.

REV. JAN. 27, 1942.

S-G5F3

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
N. C. R. R.

J. McManis
SIGNAL ENGINEER.

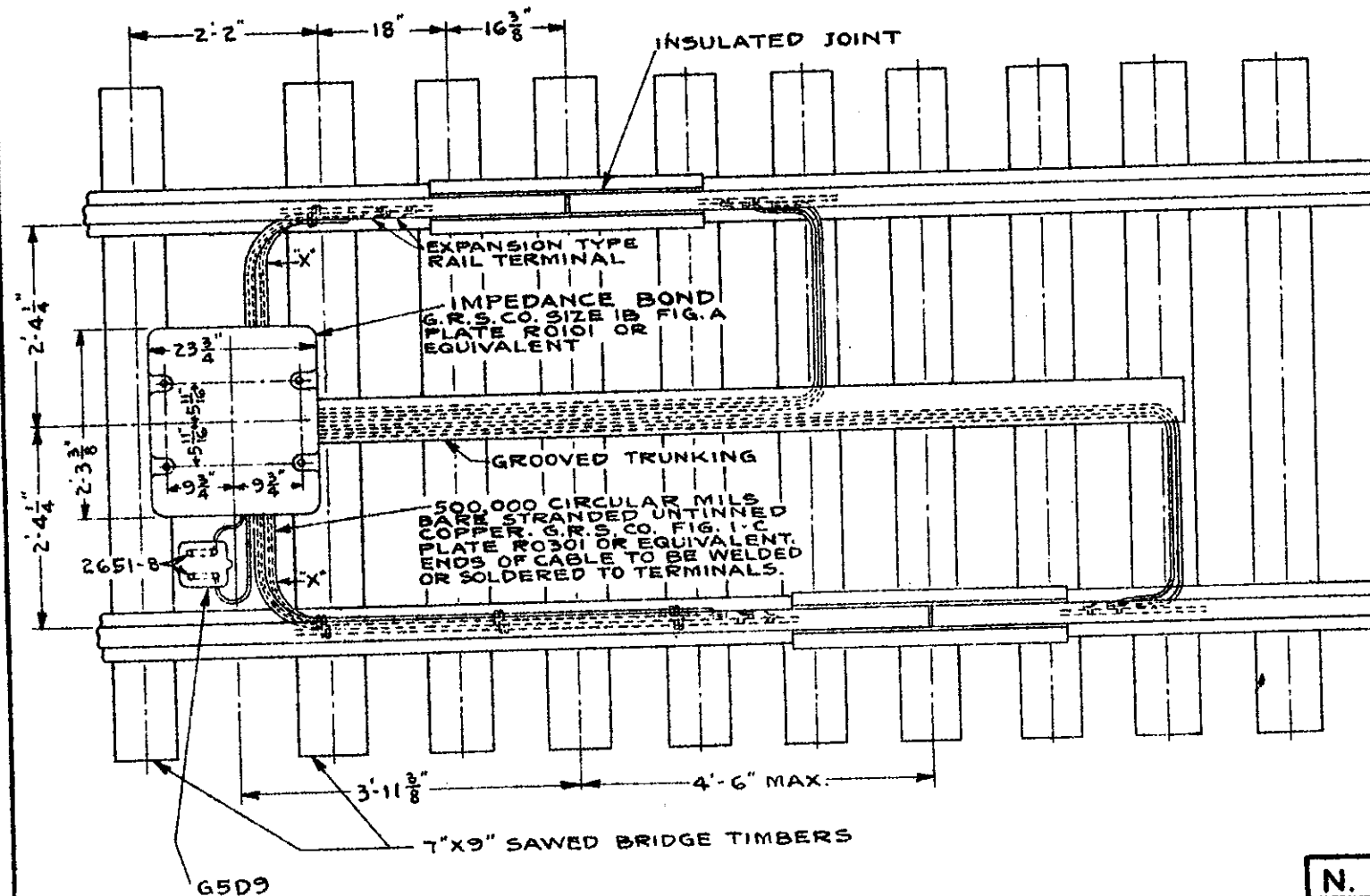


IMPEDANCE BOND
G.R.S. CO. SIZE 1B FIG. A
PLATE R0101 OR EQUIVALENT

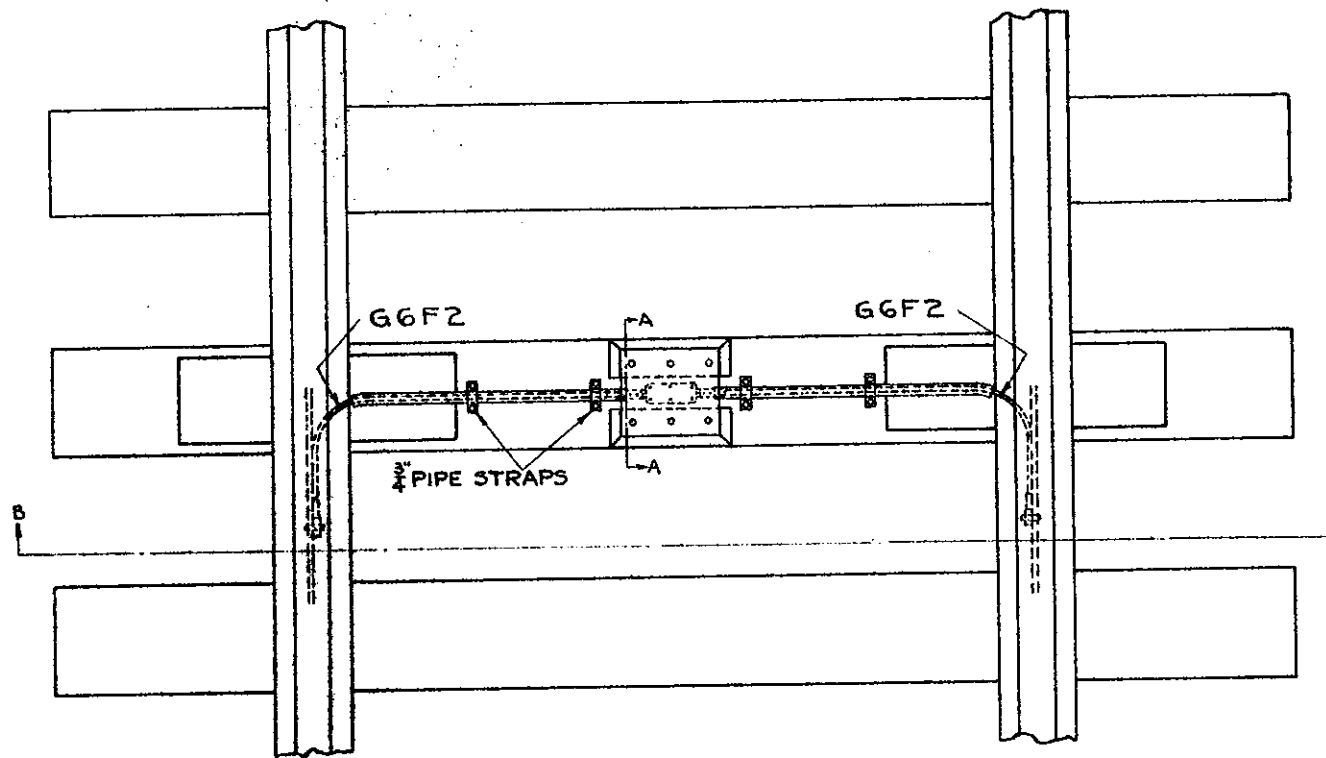
500,000 CIRCULAR MILS. BARE
STRANDED UNTINNED COPPER.
G.R.S. CO. FIG. 1-C PLATE R0301 OR
EQUIVALENT. ENDS OF CABLE TO BE
WELDED OR SOLDERED TO TERMINALS.

NOTE:
X = $\frac{7}{8}$ " CIRCULAR LOOM WELL PAINTED
TO BE PUT ON BEFORE TERMINALS ARE
WELDED OR SOLDERED.

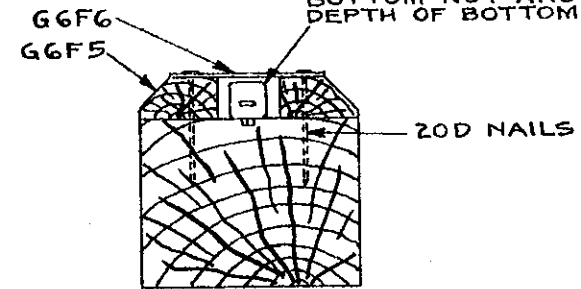
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
IMPEDANCE BOND LAYOUT CLEVELAND ELECTRIFIED TERRITORY DOUBLE RAIL TRACK CIRCUIT ABUTTING DOUBLE RAIL TRACK CIRCUIT DEC. 27, 1935.		
REVISION NO. 1	JAN. 22, 1937.	S-G6B
 SIGNAL ENGINEER		



N. Y. C. & H. R. R.	SIGNAL DEPT.	CLEVELAND, O.
IMPEDANCE BOND LAYOUT CLEVELAND ELECTRIFIED TERRITORY DOUBLE RAIL TRACK CIRCUIT ABUTTING NO TRACK CIRCUIT DEC. 27, 1935.		
REVISION NO. 1	JAN. 22, 1937.	S-G6C
 SIGNAL ENGINEER.		

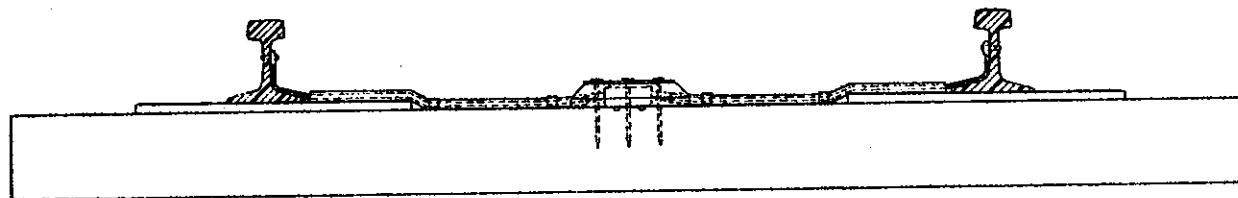


TRACK PROTECTOR RAILROAD SUPPLY CO. # R-2008 OR EQUIVALENT WITH HOLDING BOLTS CUT OFF ABOVE THE BOTTOM NUT AND SUNK INTO TIE THE DEPTH OF BOTTOM NUT.

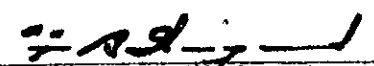


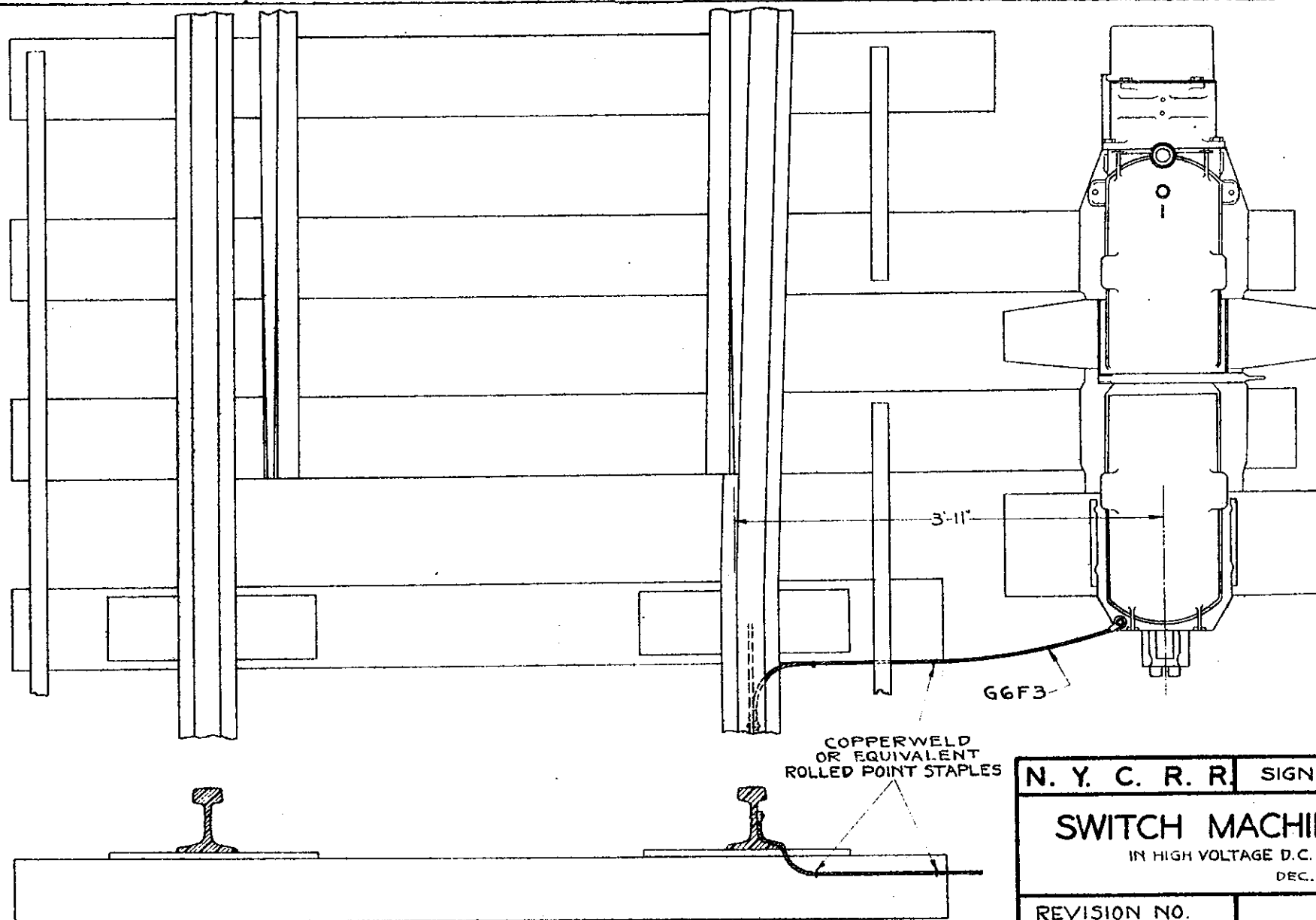
SECTION "AA"

NOTE:
FOR SINGLE RAIL TRACK CIRCUITS NOT MORE THAN 800 FT. IN LENGTH INSTALL A PROTECTOR IN CENTER OF TRACK CIRCUIT.
FOR TRACK CIRCUITS IN EXCESS OF 800 FT. IN LENGTH INSTALL A PROTECTOR AT EACH END.



SECTION "BB"

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
PROTECTOR BOND LAYOUT FOR SINGLE RAIL TRACK CIRCUIT IN HIGH VOLTAGE D.C. PROPULSION TERRITORY DEC. 27, 1935.		
REVISION NO.		S-G6D
 SIGNAL ENGINEER.		

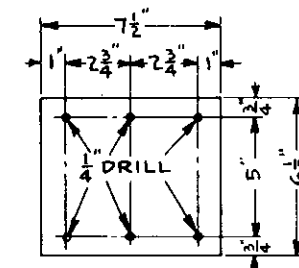
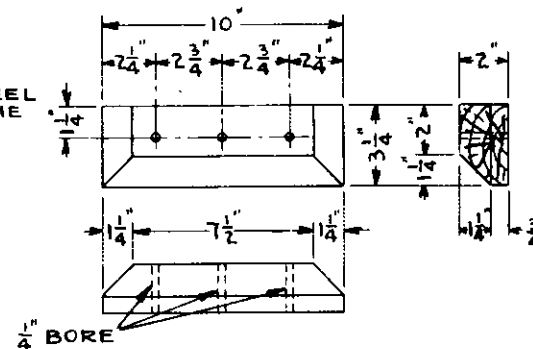
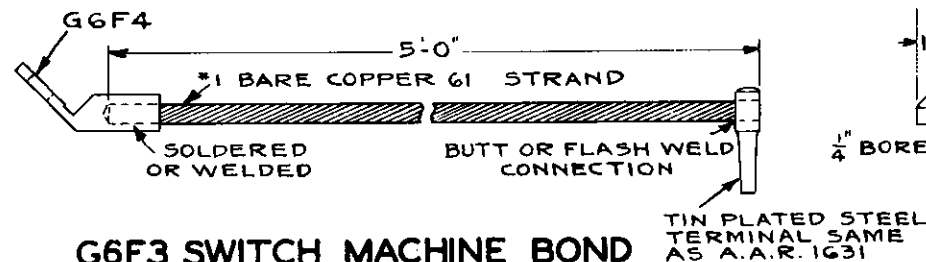
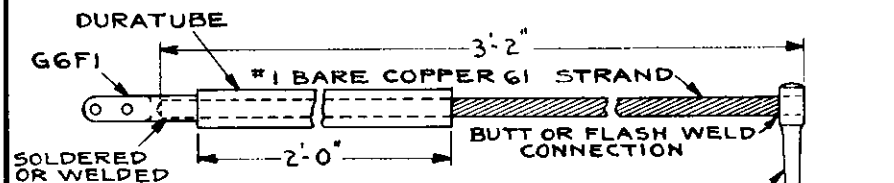
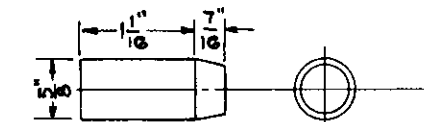
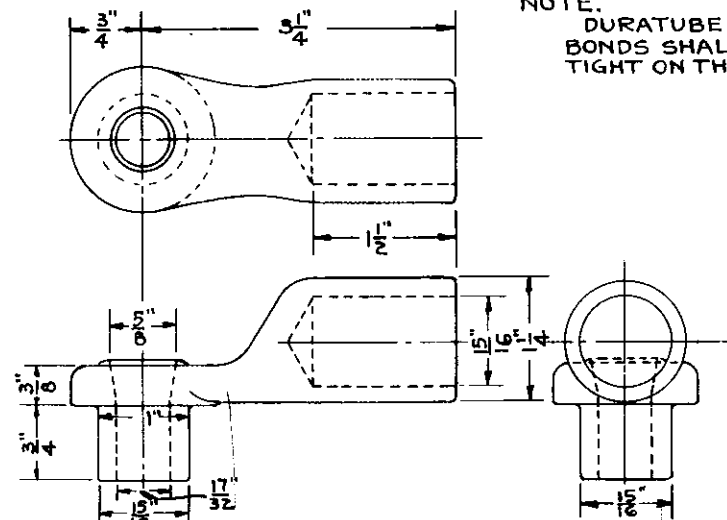
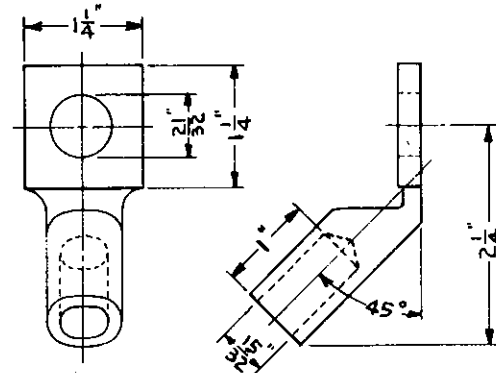
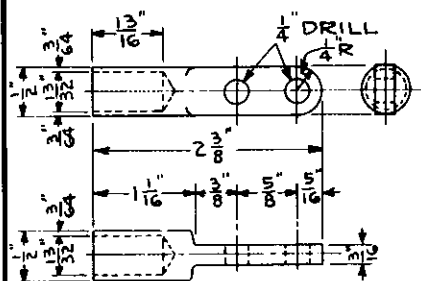


N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

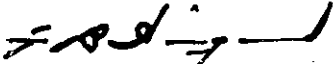
SWITCH MACHINE BOND LAYOUT
 IN HIGH VOLTAGE D.C. PROPULSION TERRITORY.
 DEC. 27, 1935.

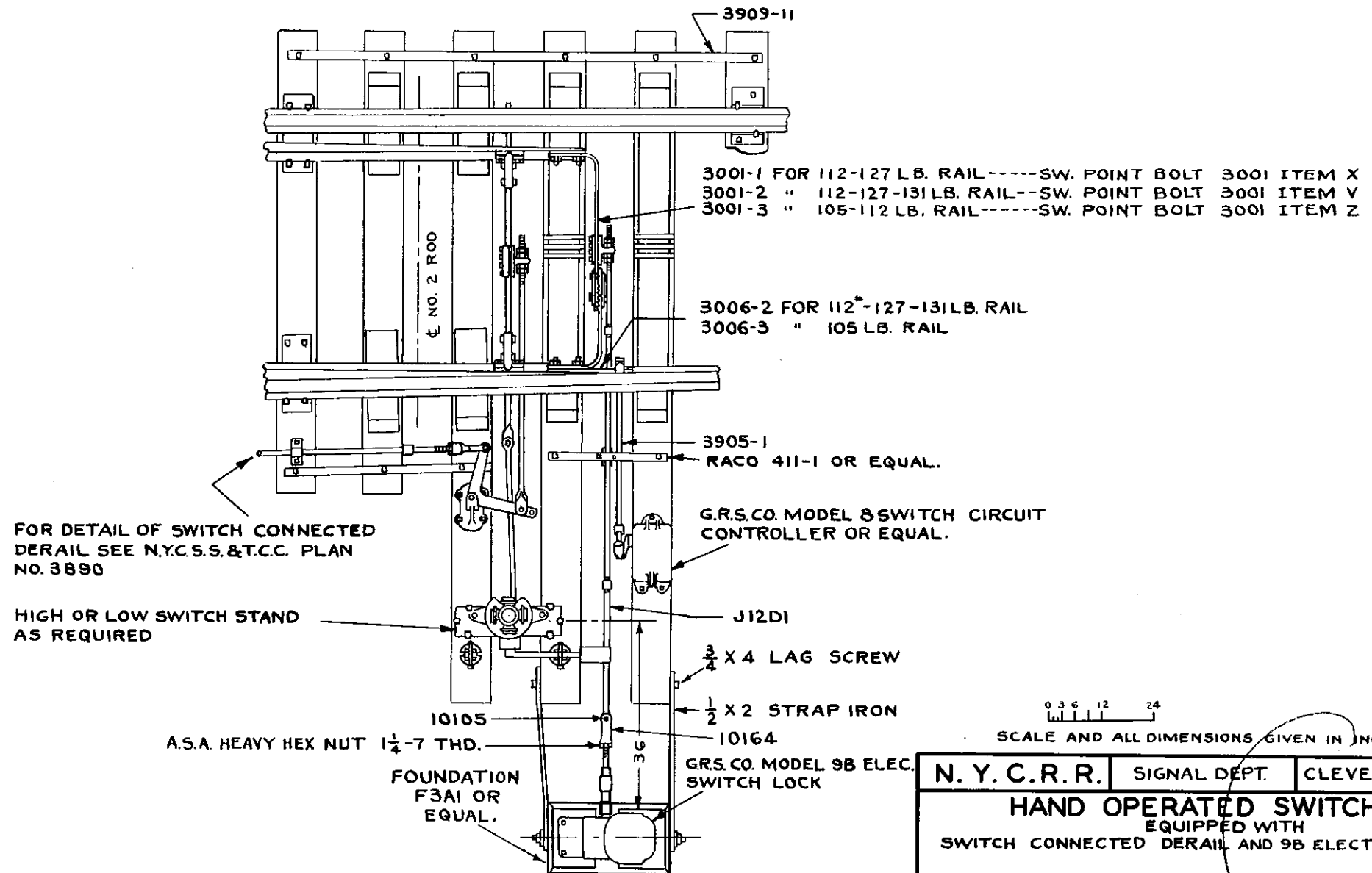
REVISION NO.		S-G6E

[Signature]
 SIGNAL ENGINEER.

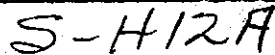


NOTE:
DURATUBE COVERING FOR PROTECTOR
BONDS SHALL BE OF SUCH SIZE AS TO FIT
TIGHT ON THE STRAND.

N. Y. C. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.
IMPEDANCE AND PROTECTOR BONDS FOR TRACK CIRCUITS AND SWITCH MACHINES IN HIGH VOLTAGE D.C. PROPULSION TERRITORY DETAILS DEC. 27, 1935.		
REVISION NO. 2	APRIL 25, 1940	S-G6F
 _____ SIGNAL ENGINEER		



N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HAND OPERATED SWITCH EQUIPPED WITH SWITCH CONNECTED DERAIL AND 9B ELECTRIC LOCK		
DATED APRIL 20, 1934	REV. DEC. 9, 1952	S-H3A2
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST.L. RY. M.C.R.R.		<i>[Signature]</i> SIGNAL ENGINEER



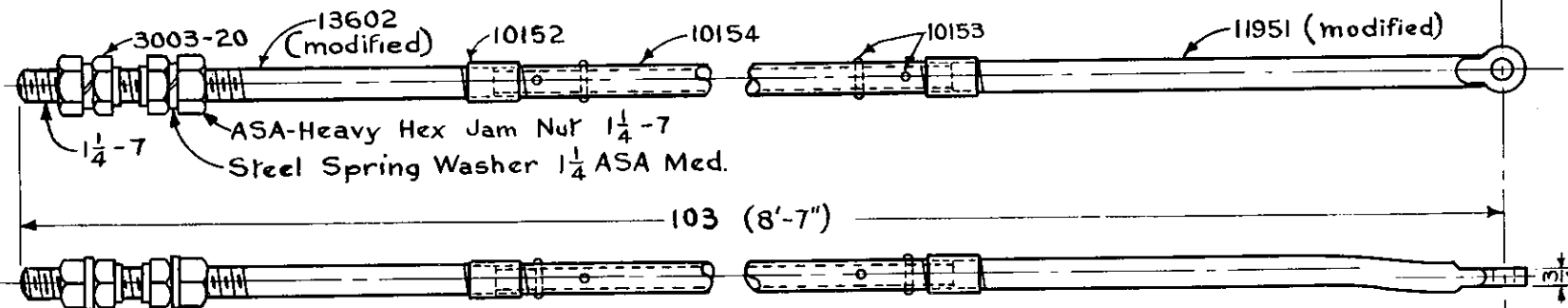
NAME	REF. NO.	NUMBER REQD.
ADJUSTABLE LOCK ROD	1868-181	2
" " "	1868-182	1
" " PLATE	1868-184 OR 1868-185	3
BOLTS	1868-125	8
"	1868-133	2
"	1868-135	2
" SQ. HD. WITH NUTS ($\frac{3}{4} \times 2\frac{1}{2}$ ")		4
"	1868-203	8
"	1868-139	4
BRACKET	1868-241	2
CRANK	1868-243	1
" STAND	10082	1
DETECTOR ROD	1868-131	1
" "	1868-132	2
" "	1868-136	1
JAW PIN	10105	4
LUGS	1868-245	2
NUT (JAM)	800-1	1
NUT (JAM)	800-2	1
PLATE	1868-244	1

NAME	REF. NO.	NUMBER REQD.
SCREW SPIKES ($\frac{3}{4} \times 5\frac{1}{2}$ ")		12
" " ($\frac{1}{8} \times 6$ ")		8
SWITCH ADJUSTMENT (BOSSERT INSULATED TYPE 2-A OR EQUIVALENT.)		3
" ROD	1868-141	1
THROW ROD	1868-231	2
" "	1868-232	1
" "	1868-233	1
TIE PLATES	1868-202	4
TURNBUCKLE	10021	1
WASHERS ($\frac{1}{2}$ " LOCK)		4
" ($1\frac{1}{4}$ " ")		12

NOTE: MATERIAL NOT SPECIFIED TO BE FURNISHED BY TRACK DEPARTMENT.

N. Y. C. & H. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.
DOUBLE SLIP SWITCH & M. P. FROG LAYOUT		
APPLICATION OF G. R. S. MODEL 5A SWITCH MACHINE.		
ORDER REFERENCE FOR MATERIAL		
127" RAIL		
JULY 26, 1933.		
REVISION NO. 6	AUG. 26, 1933.	S-A1868-6
 SIGNAL ENGINEER		

S-H12B

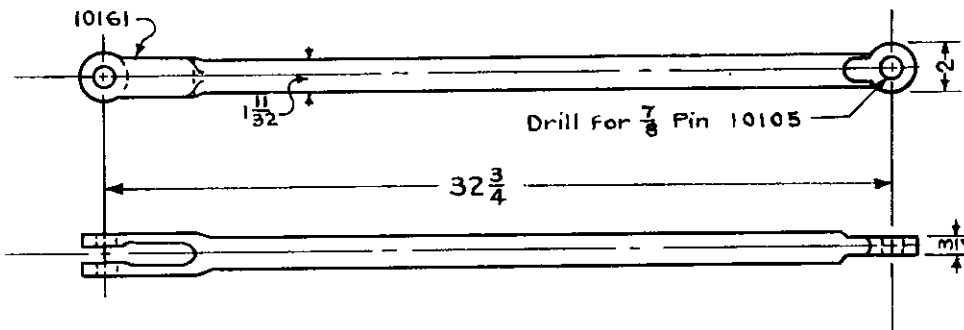


NOTES:

1. Protective treatment to be in accordance with N.Y.C.S. S.&T.C.C. Instruction 350.
2. External threads shall be ASA-UNC-2A with rounded root throughout.
Internal threads shall be ASA-UNC-2B.

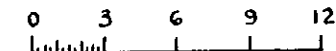
J12D1 ROD COMPLETE

For Layout S-H3A2



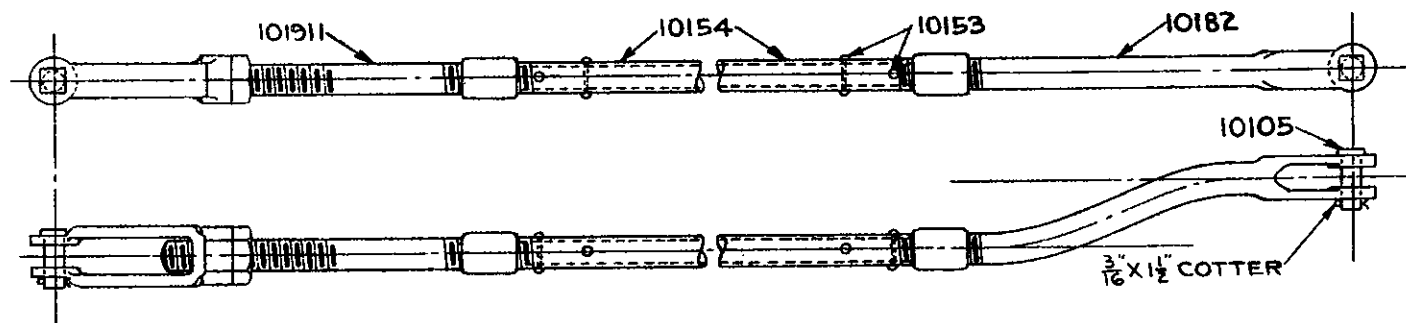
J12D2 ROD (C1020 Steel)

For Layout S-H3B

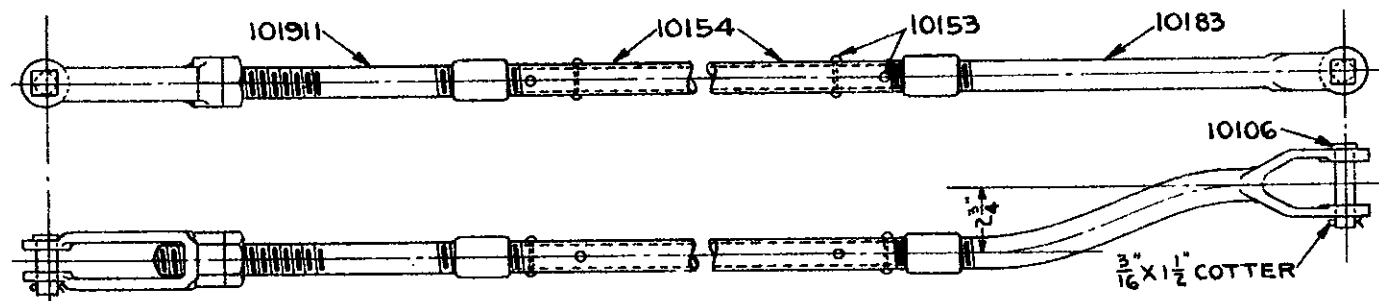


Scale and all dimensions given in inches

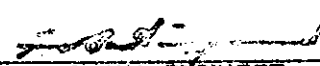
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONNECTING RODS FOR MODEL 9B ELECTRIC SWITCH LOCK APPLICATIONS		
DATED APR. 20, 1934	REV. DEC. 9, 1952	8-J12D1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		 SIGNAL ENGINEER

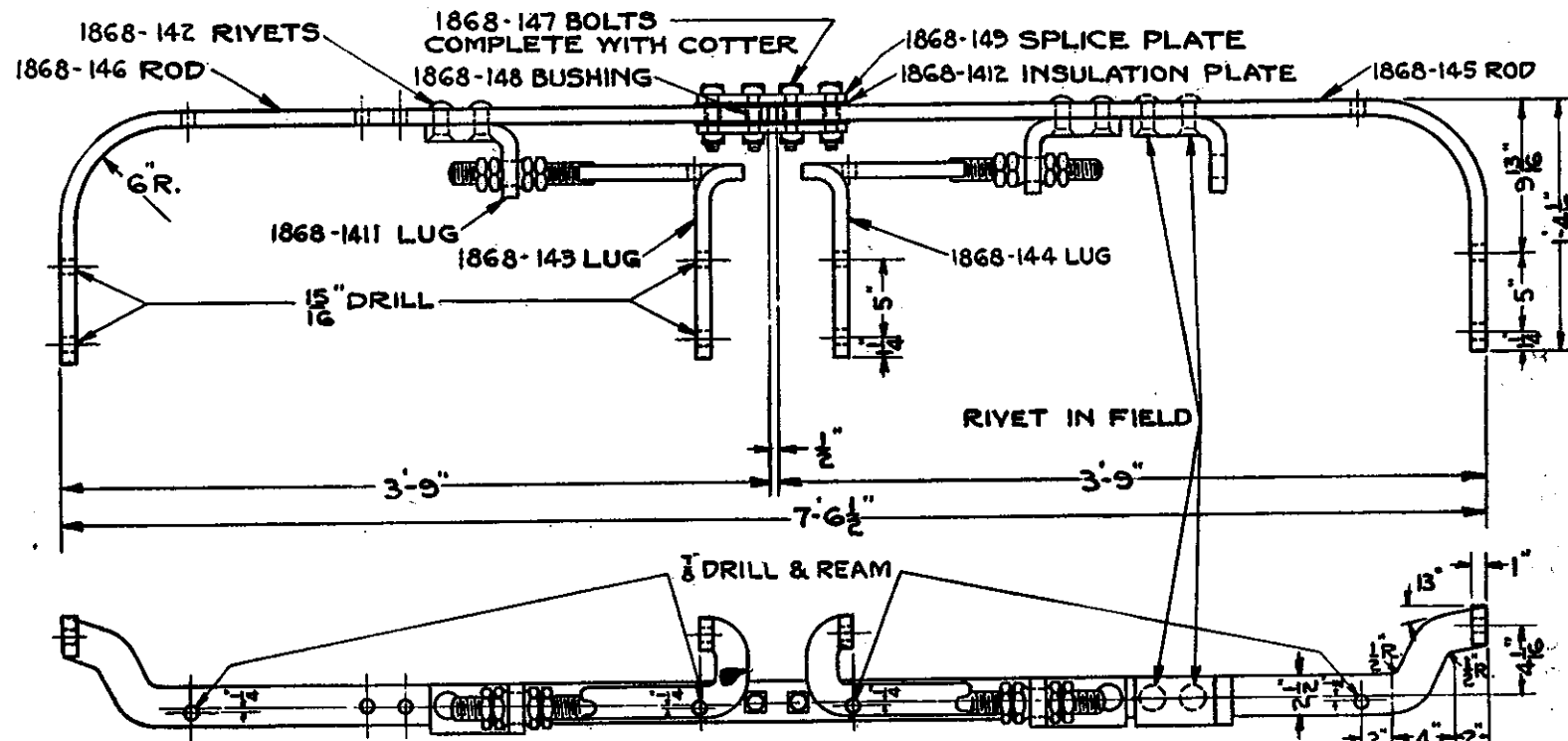


J12E1 ROD COMPLETE
(LENGTH AS REQUIRED)



J12E2 ROD COMPLETE
(LENGTH AS REQUIRED)

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONNECTIONS ELECTRIC SWITCH LOCK DETAILS APRIL 20, 1934.		
REVISION NO.		S-J12E
 SIGNAL ENGINEER		

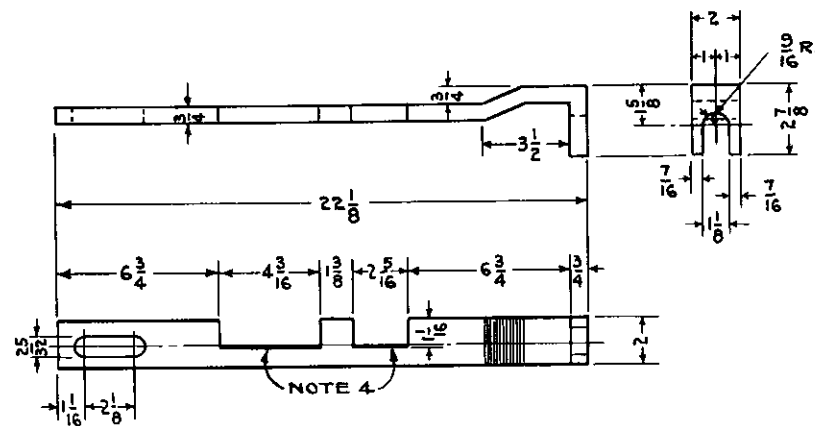


1868-141 FRONT ROD COMPLETE

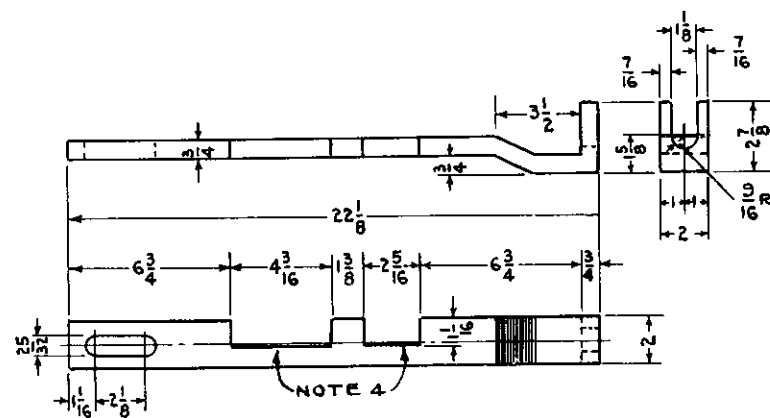
SCALE: 1 IN. = 1 FT.

N. Y. C. & P. D. R. R. WEST OF BUFFALO	SIGNAL DEPT.	CLEVELAND, O.
SWITCH ROD FOR DOUBLE SLIP SWITCH #127 RAIL JULY 26, 1929.		
REVISION NO. 3	JAN. 27, 1932.	S-A1868-14
 SIGNAL ENGINEER		

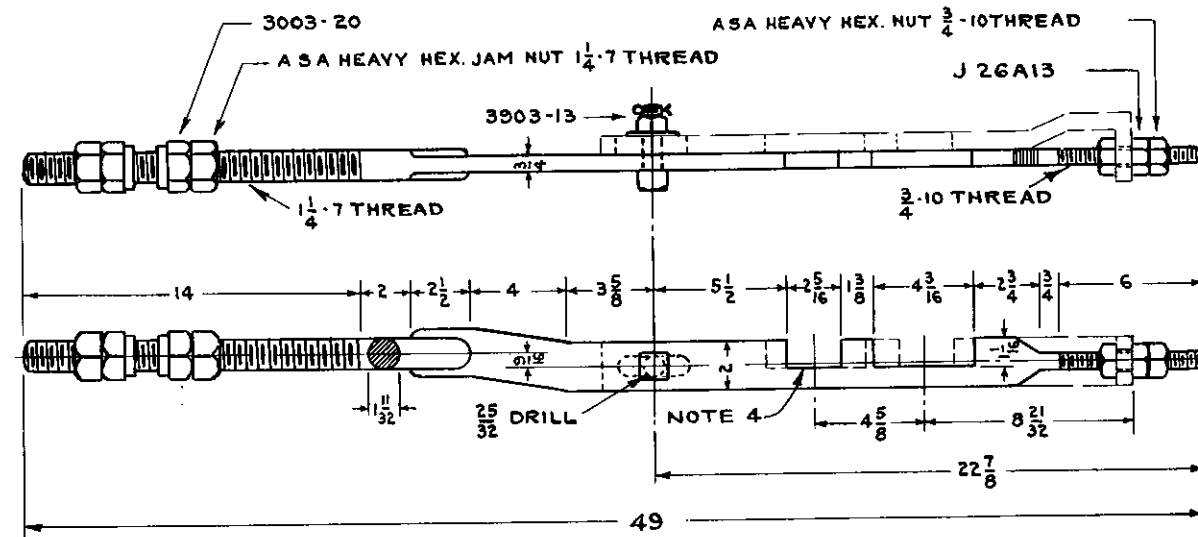
S-22C



J23C4 - L.H. LOCK PLATE



J23C5 - R.H. LOCK PLATE



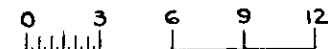
J23C1 - LOCK ROD COMPLETE

J23C2 - LOCK ROD COMPLETE WITH LOCK PLATE J23C4

J23C3 - LOCK ROD COMPLETE WITH LOCK PLATE J23C5

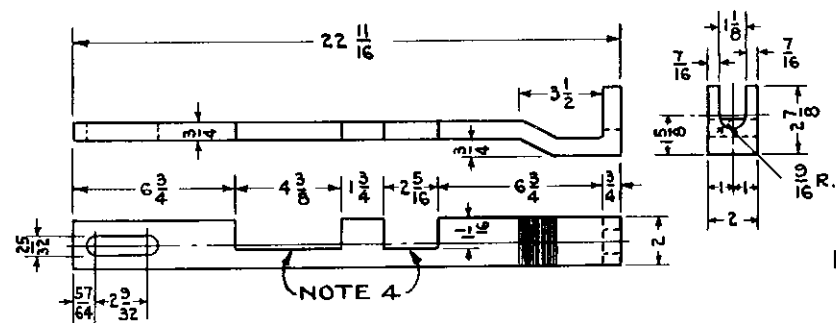
NOTES:

- 1- ALL NUTS TO BE C1020, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.
- 2- EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT.
INTERNAL THREADS SHALL BE ASA-UNC-2B.
- 3- LOCK RODS AND LOCK PLATES SHALL BE C1020 STEEL FORGED.
- 4- LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS FREE FROM BURRS AND HAVE STRAIGHT EDGES.
- 5- PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH INSTRUCTIONS 350.



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
LOCK RODS		
G. R. S. CO. MODEL 4 SWITCH MACHINE		
DATED JUNE 7, 1946.	REV. JAN. 14, 1953	S-J23C1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER

[illegible]

J23D1 - LOCK ROD COMPLETE ("A"= 8FT. 4IN. "B"= 3FT. 11 $\frac{1}{16}$ IN.)
 J23D2 - LOCK ROD COMPLETE ("A"= 7FT. 3IN. "B"= 2FT. 10 $\frac{1}{16}$ IN.)
 J23D3 - LOCK ROD COMPLETE WITH LOCK PLATE J23D8 ("A"= 8FT. 4IN. "B"= 3FT. 11 $\frac{1}{16}$ IN.)
 J23D4 - LOCK ROD COMPLETE WITH LOCK PLATE J23D8 ("A"= 7FT. 3IN. "B"= 2FT. 10 $\frac{1}{16}$ IN.)
 J23D5 - LOCK ROD COMPLETE WITH LOCK PLATE J23D7 ("A"= 8FT. 4IN. "B"= 3FT. 11 $\frac{1}{16}$ IN.)
 J23D6 - LOCK ROD COMPLETE WITH LOCK PLATE J23D7 ("A"= 7FT. 3IN. "B"= 2FT. 10 $\frac{1}{16}$ IN.)

- 1- ALL NUTS TO BE C1020, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.
- 2- EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT.
INTERNAL THREADS SHALL BE ASA-UNC-2B
- 3- LOCK RODS AND LOCK PLATES SHALL BE C1020 STEEL FORGED
- 4- LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS FREE FROM BURRS AND HAVE STRAIGHT EDGES.
- 5- PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH INSTRUCTIONS 350.



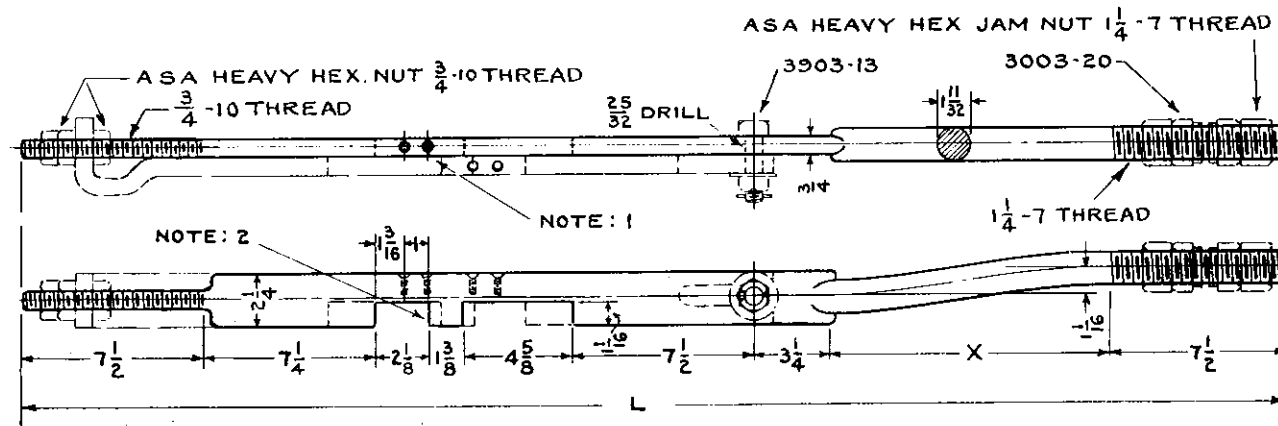
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

G. R. S. CO. MODEL 4 SWITCH MACHINE

DATED JUNE 7, 1946.	REV. JAN. 14, 1953	S-J23DI

APPROVED FOR:
N. Y. C. WEST OF BUFFALO
C. C. C. & ST. L. RY.
M. C. R. R.

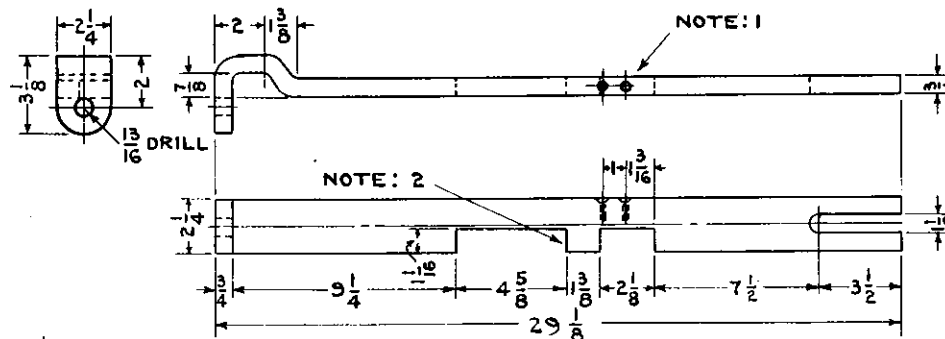
SIGNAL ENGINEER



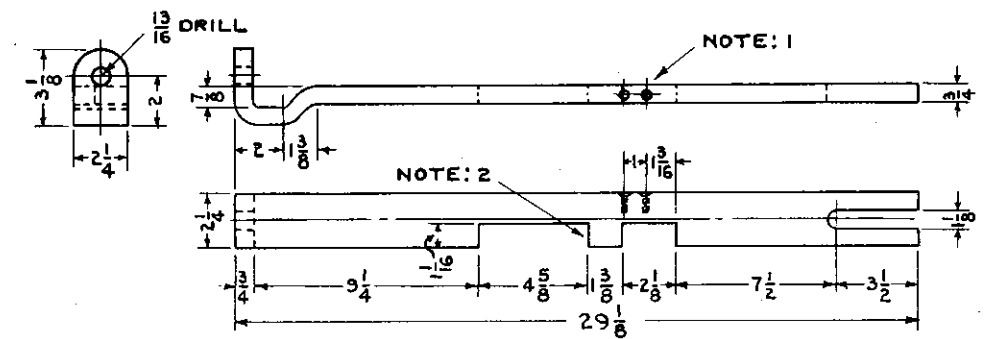
LOCK ROD R.H. LOCK PLATE SHOWN
C1020 STEEL FORGED

NOTES:

1. TAP $\frac{5}{16}$ -18UNC-2 $\times \frac{7}{8}$, CSK. 82° TO $\frac{3}{8}$ DIA., CENTER LINE OF HOLES MUST BE PARALLEL WITH SIDE OF PLATE.
2. LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS FREE FROM BURRS AND HAVE STRAIGHT EDGES.
3. ASSEMBLY SHOWN FOR 4 IN. THROW AND MAY BE ADJUSTED FROM $3\frac{5}{8}$ IN. TO 6 IN. THROW.
4. ALL NUTS TO BE C1020, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.
5. PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH INSTRUCTION 350.
6. EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT. INTERNAL THREADS SHALL BE ASA-UNC-2B.

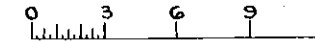


J24B-13 L.H. LOCK PLATE
C1020 STEEL FORGED



J24B-14 R.H. LOCK PLATE
C1020 STEEL FORGED

SCALE AND ALL DIMENSIONS GIVEN IN INCHES



LOCK ROD COMPL.		LOCK ROD ONLY		
L.H. WITH LOCK PLATE J-24B-13, BOLT 3903-13, 3/4 IN. AND 1 1/4 IN. NUTS.	R.H. WITH LOCK PLATE J-24B-14, BOLT 3903-13, 3/4 IN. AND 1 1/4 IN. NUTS.	WITHOUT LOCK PLATES, BOLT 3903-13, 3/4 IN. AND 1 1/4 IN. NUTS.		
ORDER NO.	ORDER NO.	ORDER NO.	L	X
J24B-1	J24B-3	J24B-11	52 $\frac{5}{8}$	11 $\frac{1}{2}$
J24B-2	J24B-4	J24B-12	58 $\frac{1}{8}$	17

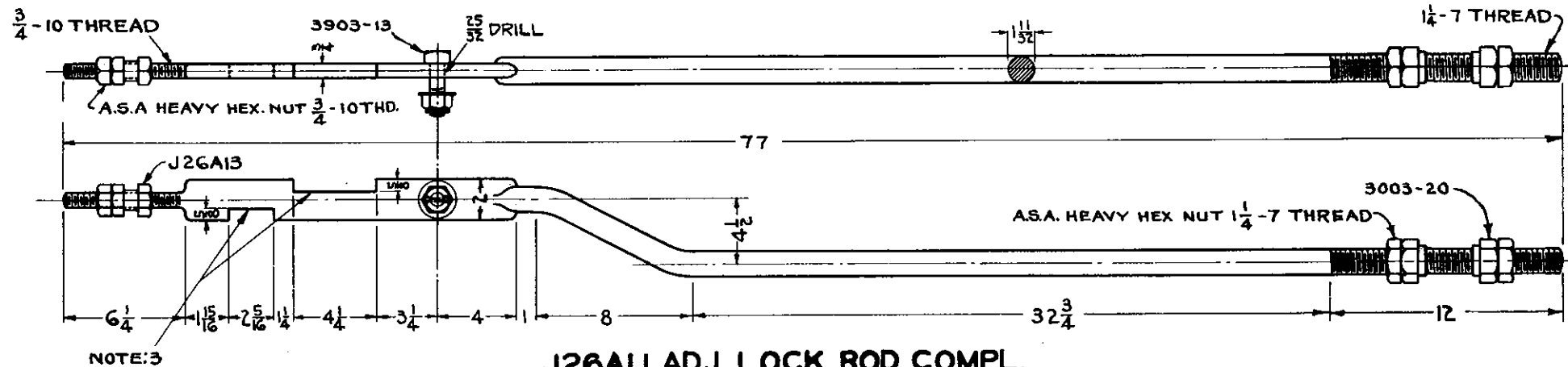
N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

ADJUSTABLE LOCK ROD
G.R.S. MODEL 5A SWITCH MACHINE
FOR M. R. F.

DATED APRIL 6, 1948. REV. JAN. 14, 1953 S-J24B2

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

Merona
SIGNAL ENGINEER

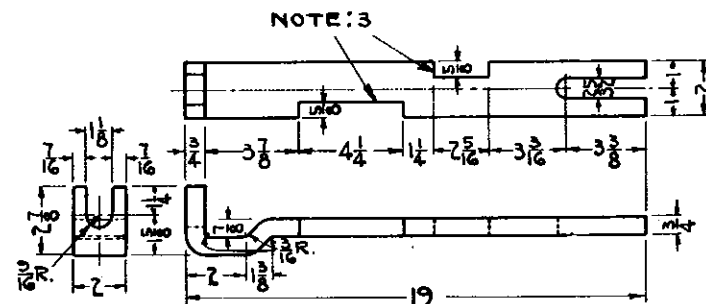


J26A11 ADJ. LOCK ROD COMPL.

C1020 STEEL FORGED

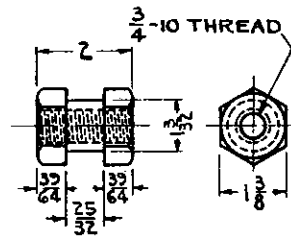
NOTES:

1. ALL NUTS TO BE C1020, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.
2. EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT. INTERNAL THREADS SHALL BE ASA-UNC-2B.
3. LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS FREE FROM BURRS AND HAVE STRAIGHT EDGES.
4. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTIONS 350.



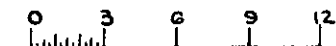
J26A12 LOCK ROD ADJ. PLATE

C1020 STEEL FORGED



J26A13 SPECIAL NUT

C1020 STEEL



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

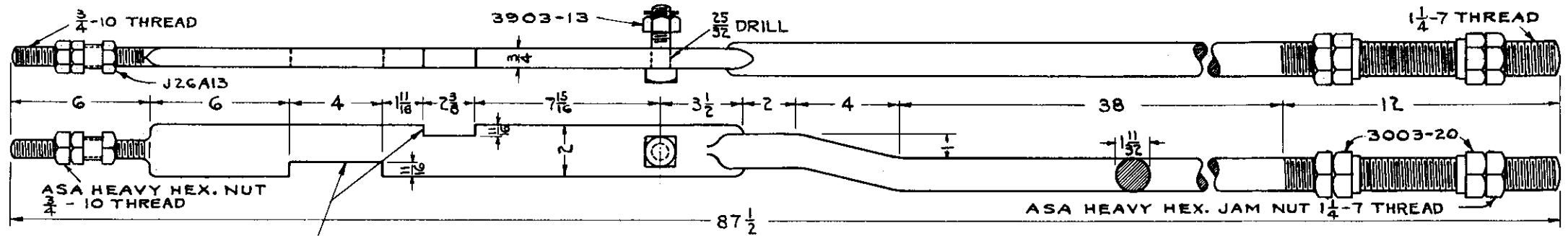
N. Y. C. R. R. | **SIGNAL DEPT.** | **CLEVELAND, O**

ADJUSTABLE LOCK ROD
U.S. & S. CO. MODEL # 14 SWITCH & LOCK MOVEMENT

DATED JULY 26, 1929 | REV. JAN. 14, 1953 | **S-J26A8**

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY
M.C.R.R.

[Signature]
SIGNAL ENGINEER.



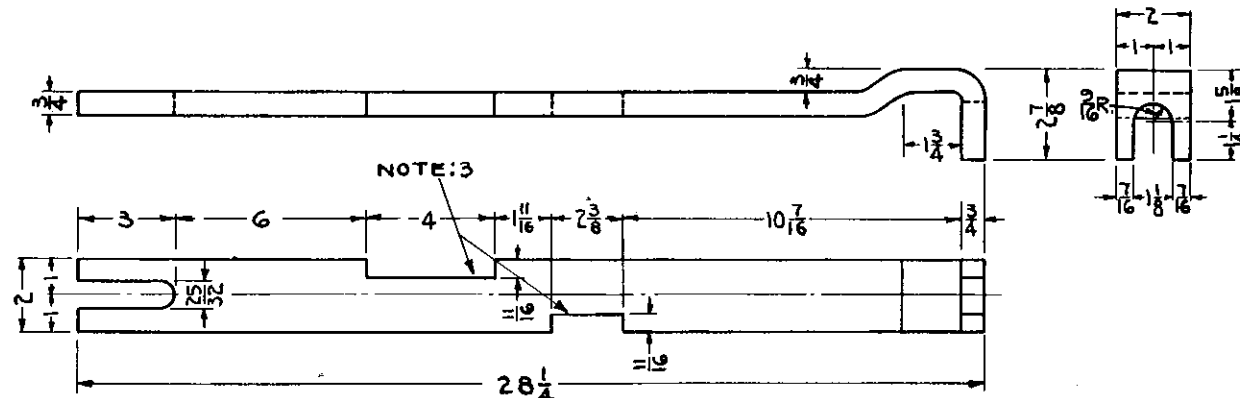
NOTE:3

J27A11 ADJ. LOCK ROD COMPL.

C1020 STEEL FORGED

NOTES:

1. ALL NUTS TO BE C1020 STEEL, SHALL BE HOT FORGED, COLD TRIMMED, NORMALIZED, CHAMFERED AND FACED.
2. EXTERNAL THREADS SHALL BE ASA-UNC-2A ROUNDED ROOT THROUGHOUT. INTERNAL THREADS SHALL BE A.S.A-UNC-2B.
3. LOCKING NOTCHES MUST BE ACCURATE TO DIMENSIONS FREE FROM BURRS AND HAVE STRAIGHT EDGES.
4. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350.



NOTE:3

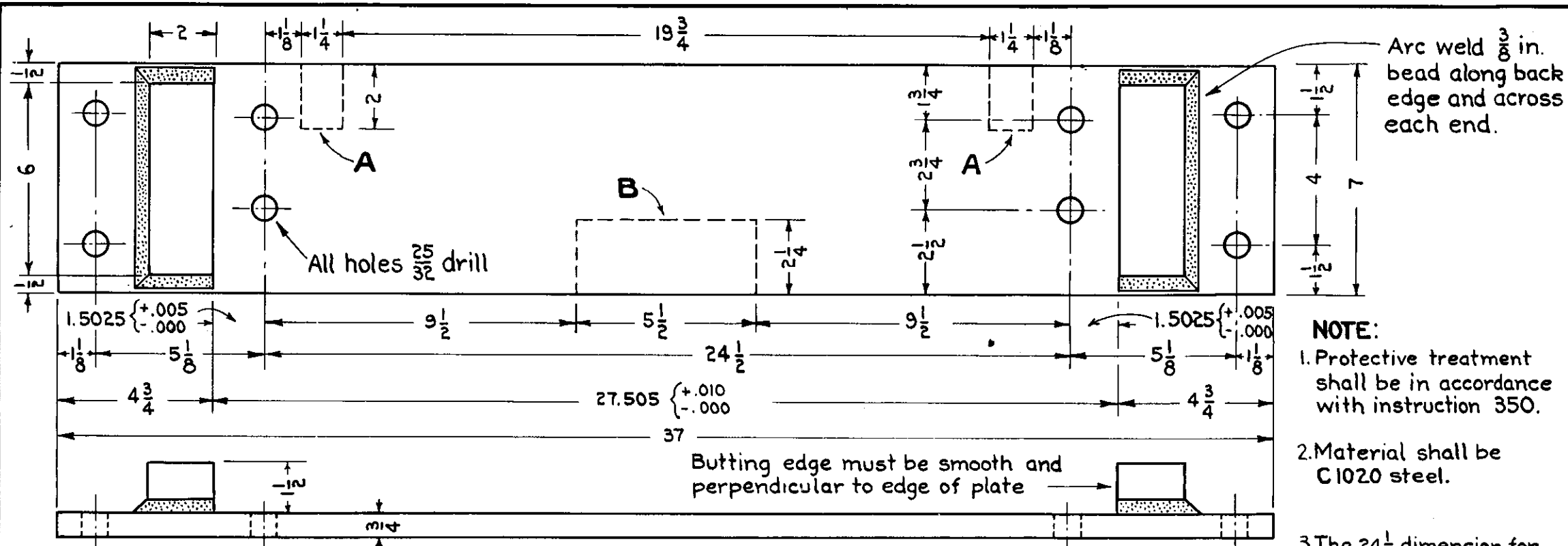
J27A12 LOCK ROD ADJ. PLATE

C1020 STEEL FORGED



SCALE AND ALL DIMENSIONS GIVEN IN INCHES.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
ADJUSTABLE LOCK ROD		
U.S.&S.CO. STYLE "M" SWITCH MACHINE		
DATED AUG. 11, 1930	REV. JAN. 16, 1953	S-J27A5
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		<i>[Signature]</i> SIGNAL ENGINEER

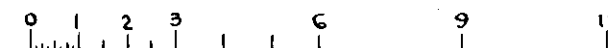


NOTE:

1. Protective treatment shall be in accordance with instruction 350.
2. Material shall be C1020 steel.
3. The 24 1/2 dimension for anchor bolts should be checked with the individual machines for variations.

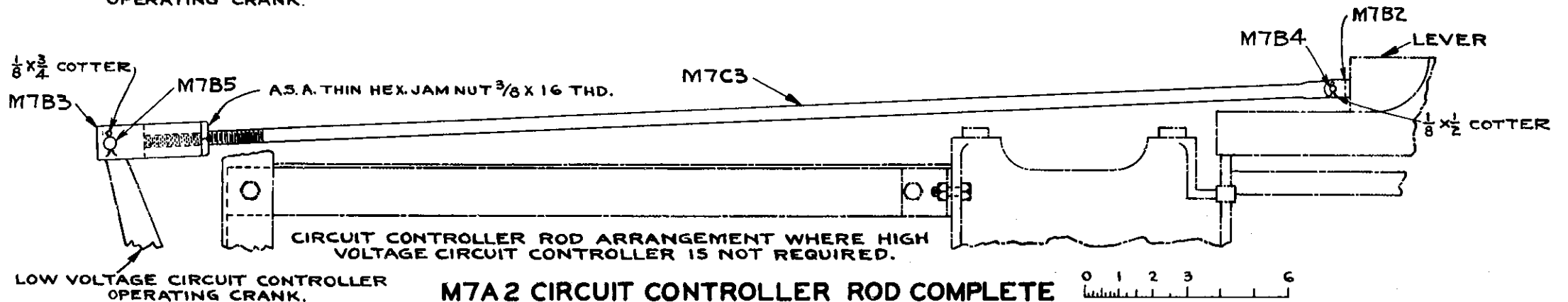
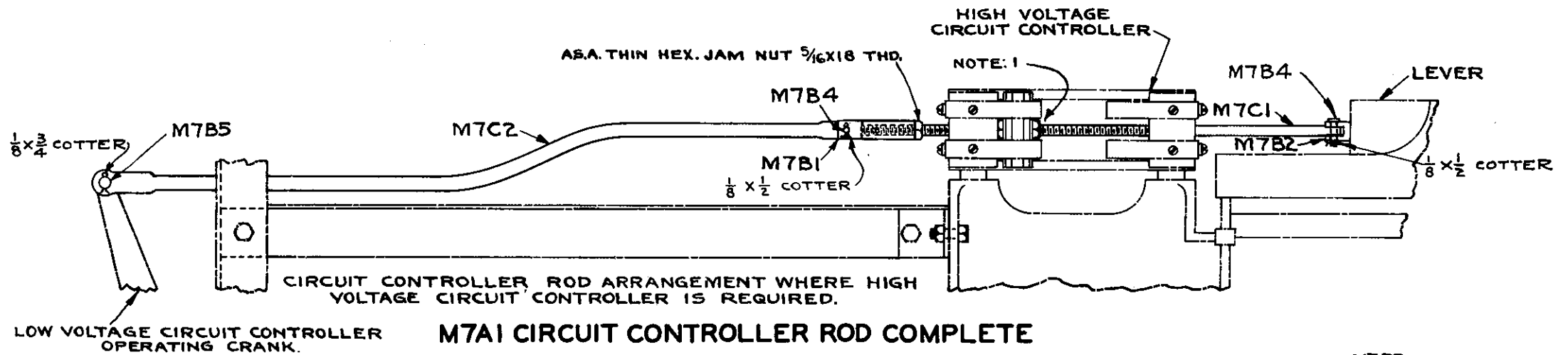
INSTALLATION: Facing point of switch, mount plate J32A1 or J32A2 on tie No.1 (1st tie under pts.) for N. Y. C. layout with holes positioned as shown above. With above exception mount all plates reversed to conform with set-up in table.

ORDER NO.	SADDLE PLATES COMPL.					
	NOTCHING	MACHINE	LOCK ROD	TIE	FRONT EDGE OF TIE	LAYOUT
J32A1	Without 'A' or 'B'	Mod. 4A	5 5/8 Ahead of pt.	No. 1	9, Flush with point	N. Y. C.
J32A2	With 'A'	Mod. 4	"	"	"	N. Y. C.
J32A3	With 'B'	Mod. 4 & 4A	"	No. 2	8, Spaced 22 ctrs.	N. Y. C.
J32A4	Without 'A' or 'B'	"	5/8 Back of pt.	No. 1	7, 4 5/8 Back of pt.	M. C.
J32A5	"	"	"	No. 2	7, Spaced 22 ctrs.	M. C.



Scale and all dimensions given in inches.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SADDLE PLATES		
FOR G. R. S. MOD. 4 AND 4A SWITCH MACHINES		
DATED MAY 3, 1943.	REV. MAR. 13, 1953	S-J32A1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. R. Y. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



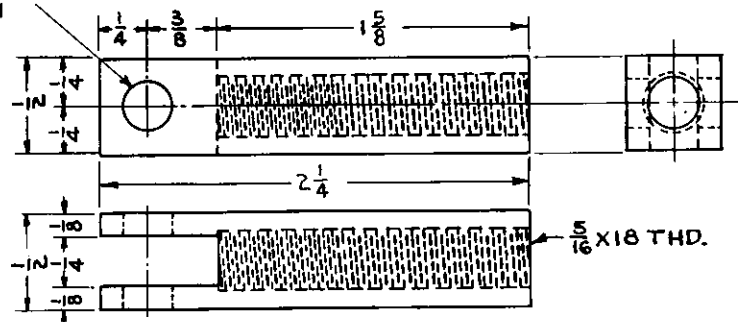
NOTES:

1. BEFORE APPLYING ROD M7C1, ENLARGE THE HOLE IN THE CONTROLLER BLOCK WITH $\frac{17}{64}$ IN. DRILL AND RETHREAD THE BLOCK WITH $\frac{5}{16} \times 18$ THREADS.
2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350
3. EXTERNAL THREADS SHALL BE ASA-UNC-2A ROUNDED ROOT THROUGHOUT.
INTERNAL THREADS SHALL BE ASA-UNC-2B.

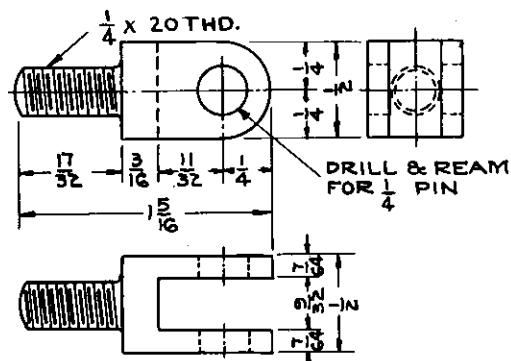
0 1 2 3 4 5 6
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.		SIGNAL DEPT.		CLEVELAND, O.	
CIRCUIT CONTROLLER RODS ASSEMBLY					
G.R.S. MODEL 2 N.Y.C. MODIFIED TYPE INTERLOCKING MACHINE					
DATED FEB. 23, 1937		REV. MAR. 26, 1953		S-M7A2	
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.					
 SIGNAL ENGINEER					

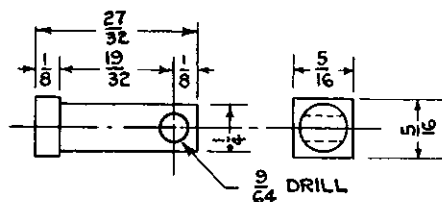
DRILL & REAM
FOR $\frac{1}{4}$ PIN



M7B1 JAW
O.H. STEEL

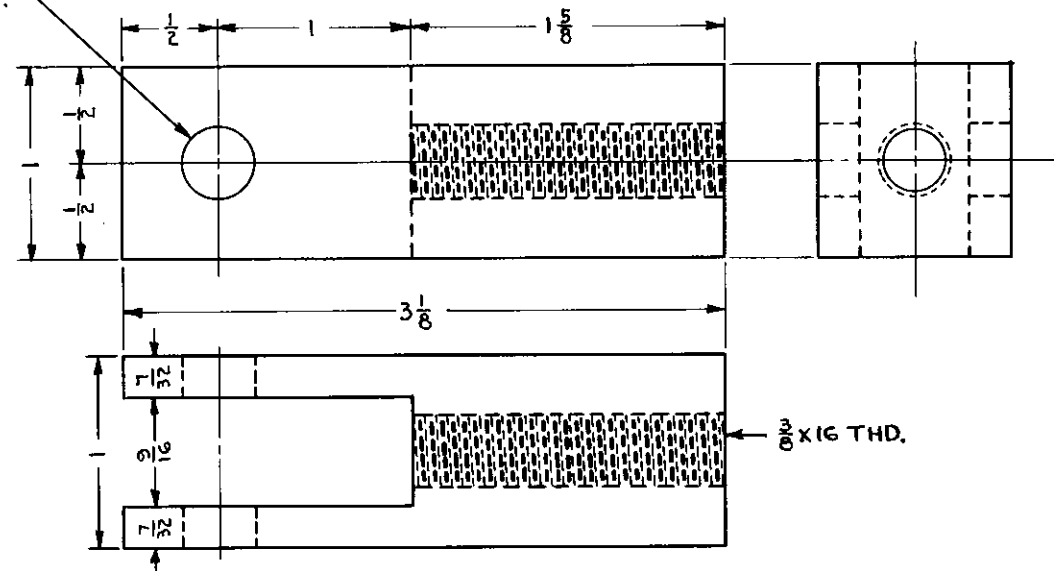


M7B2 JAW
O.H. STEEL

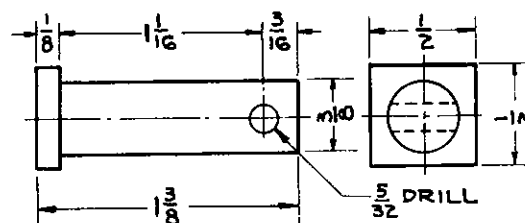


M7B4 PIN
C. R. STEEL

DRILL & REAM
FOR $\frac{3}{8}$ PIN.



M7B3 JAW
O. H. STEEL



M7B5 PIN
C.R. STEEL

NOTE:

1. PROTECTIVE TREATMENT TO BE IN. ACCORDANCE WITH INSTRUCTION 350
2. EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT. INTERNAL THREADS SHALL BE ASA-UNC-2B

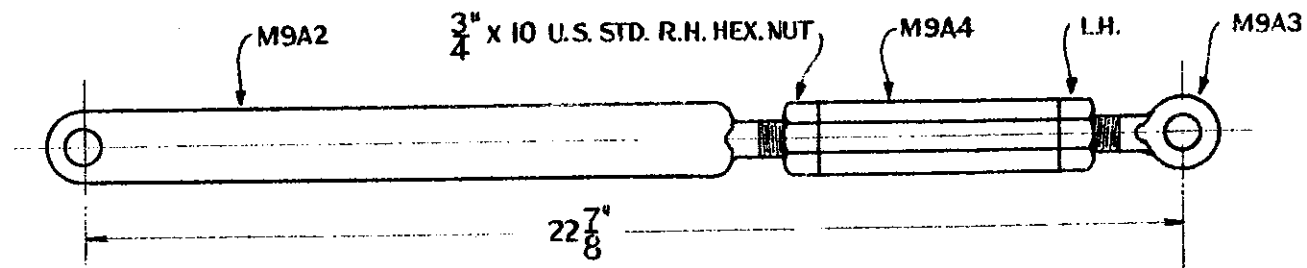
SCALE: FULL SIZE
ALL DIMENSIONS TO BE GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CIRCUIT CONTROLLER RODS DETAILS		
G.R.S. MODEL 2 N.Y.C. MODIFIED TYPE INTERLOCKING MACHINE		
DATED FEB. 23, 1937	REV. MAR. 26, 1953	S-M7B2
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		

[Signature]
SIGNAL ENGINEER

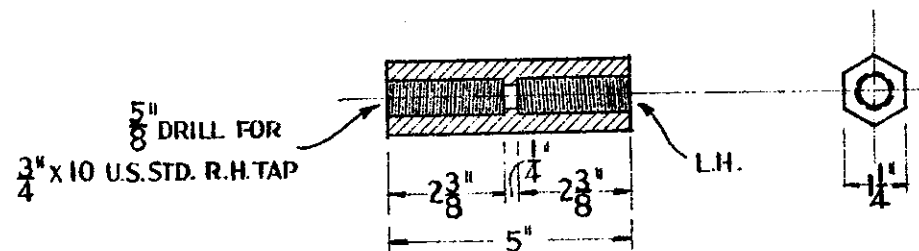
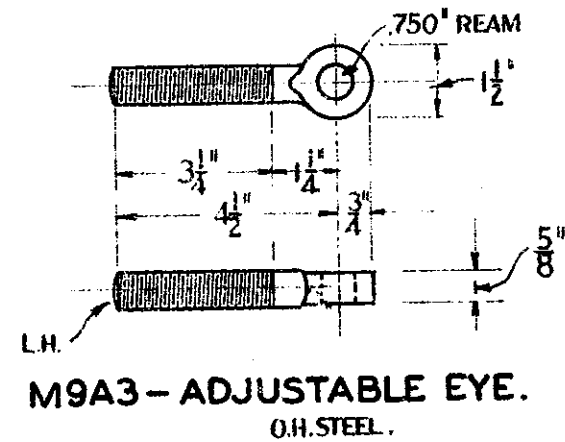
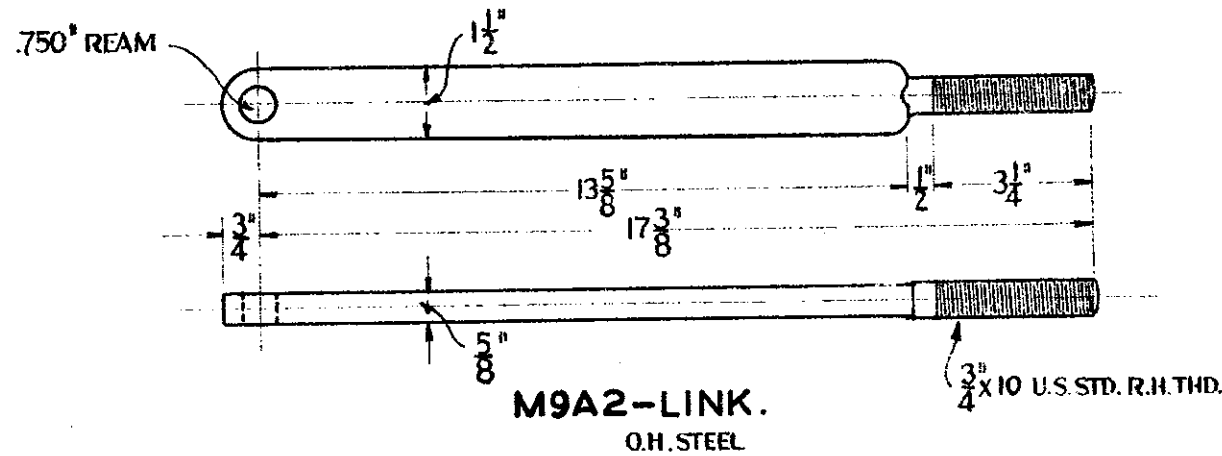


- [Signature]*
SIGNAL ENGINEER



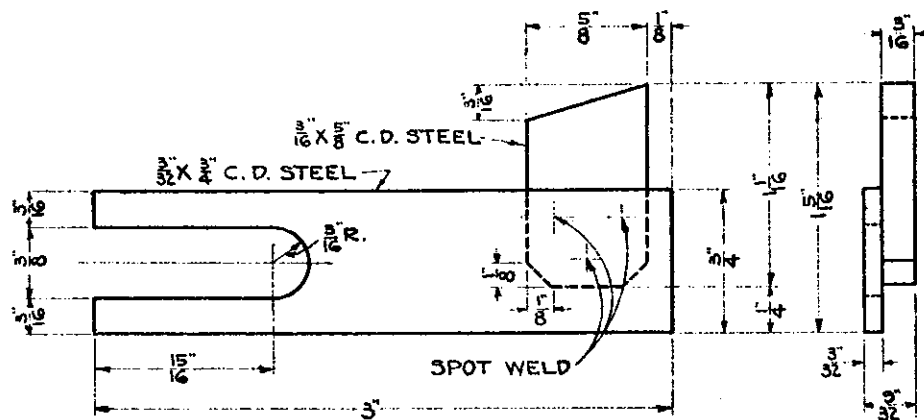
M9A1 — ASSEMBLY.

NOTE : THREAD SHALL BE WRENCH TIGHT.



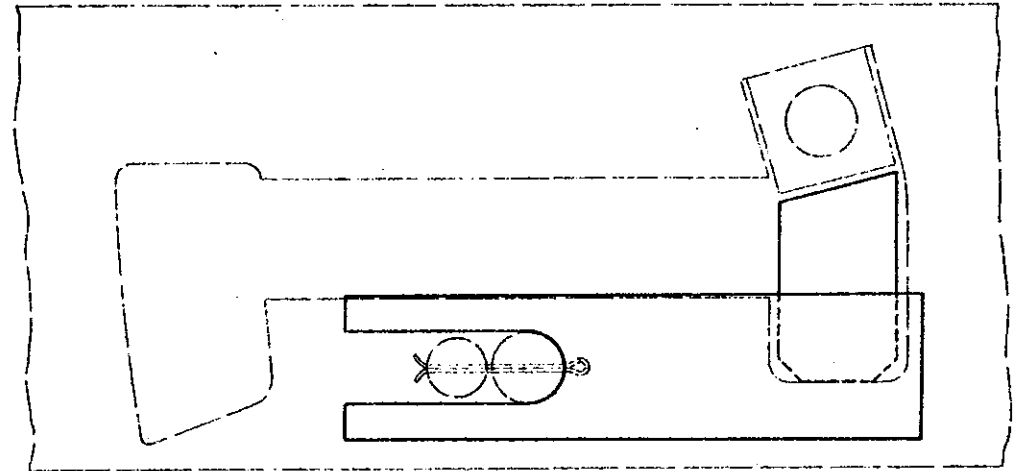
M9A4-ADJUSTING NUT.
O.H. STEEL.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
TAPPET CONNECTING LINK		
FOR STYLE "A" INTERLOCKING MACHINE		
JULY 26, 1934		
REVISION NO.		S-M9A
		SIGNAL ENGINEER.



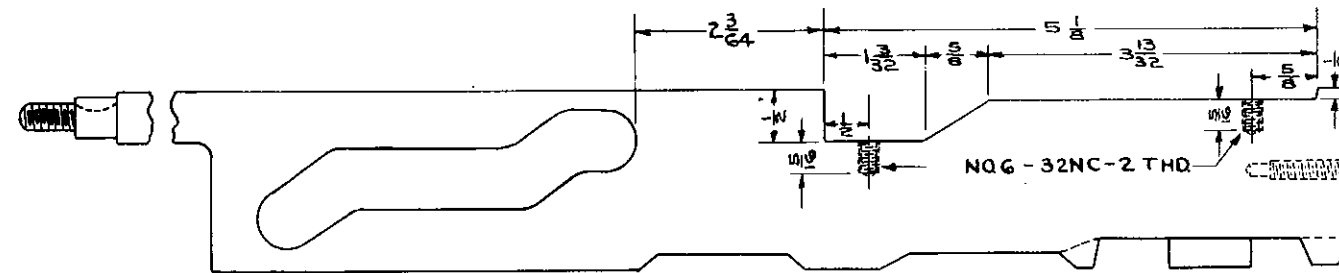
MIOAI STOP

NOTE:
TO BE GIVEN 2 (TWO) COATS
OF BLACK ENAMEL (DIPPED)



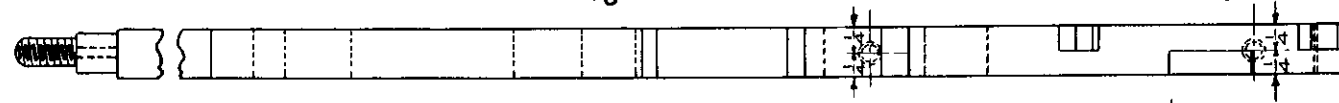
APPLICATION OF STOP ON LEVER
BLOCKED NORMAL

N. Y. C. R.R.	SIGNAL DEPT.	CLEVELAND, O.
STOP FOR LOCKING TAPPETS OF SPARE LEVERS ON G. R. S. MODEL 5B INTERLOCKING MACHINE. JUNE 27, 1934.		
REVISION NO.		S-MIOA
 SIGNAL ENGINEER.		



FOR MODEL 2 INTERLOCKING MACHINE LEVER
WITH $\frac{5}{8}$ TAPPET ROLLER.

SCALE: ②

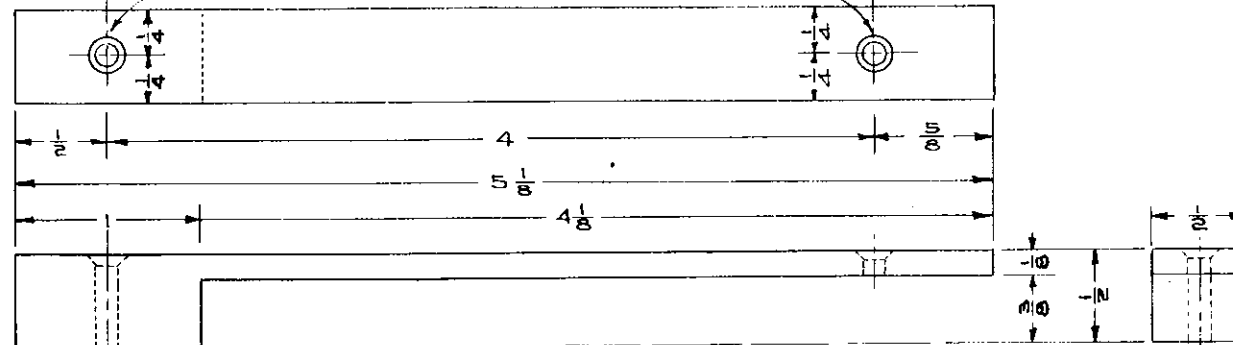


FOR MODEL 2 UNIT LEVER TYPE INTERLOCKING MACHINE LEVER
WITH $\frac{5}{8}$ TAPPET ROLLER - $A = 1\frac{27}{64}$.
WITH $\frac{3}{4}$ TAPPET ROLLER - $A = 1\frac{23}{64}$.

SCALE: ②



NO. 28 DRILL
COUNTERSINK FOR NO. 6 FL. HD. MACH. SCREW



M12A1 FILLER BLOCK
MACHINE STEEL

SCALE: ①

NOTES:

1. NOTCHING FOR MECHANICAL TIME LOCK *46100, OR CLOCKWORK CONTACTOR *46101
2. FILLER BLOCK TO BE USED WHEN G.R.S. CO'S TIME LOCK 46100 IS REMOVED.

① FULL SIZE

② 0 1 2 3

SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

LEVER NOTCHING & FILLER BLOCK

FOR
MECHANICAL TIME LOCK
G. R. S. CO'S. INTERLOCKING MACHINE

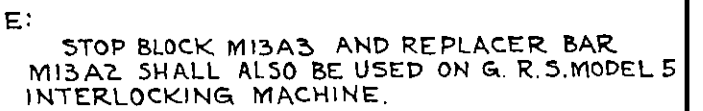
DATED DEC. 21, 1934

REV APRIL 6, 1953

S-M12A2

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

M. J. Gorman
SIGNAL ENGINEER



SCALE: FULL SIZE
ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

**ELECTRIC LOCK
STOP BLOCK AND REPLACER BAR
G.R.S. MODEL 2 INTERLOCKING MACHINE.**

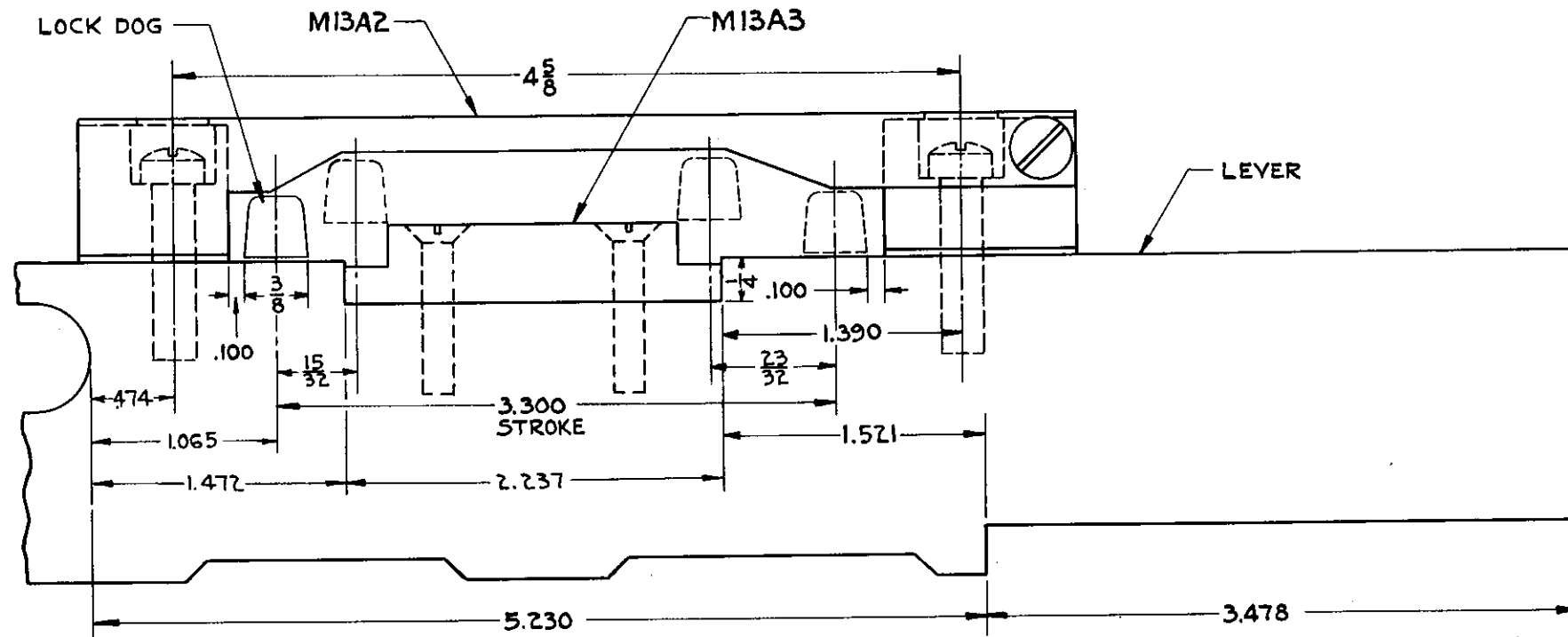
DATED DEC. 16, 1936

REV. APRIL 3, 1953

S-MI3AI

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

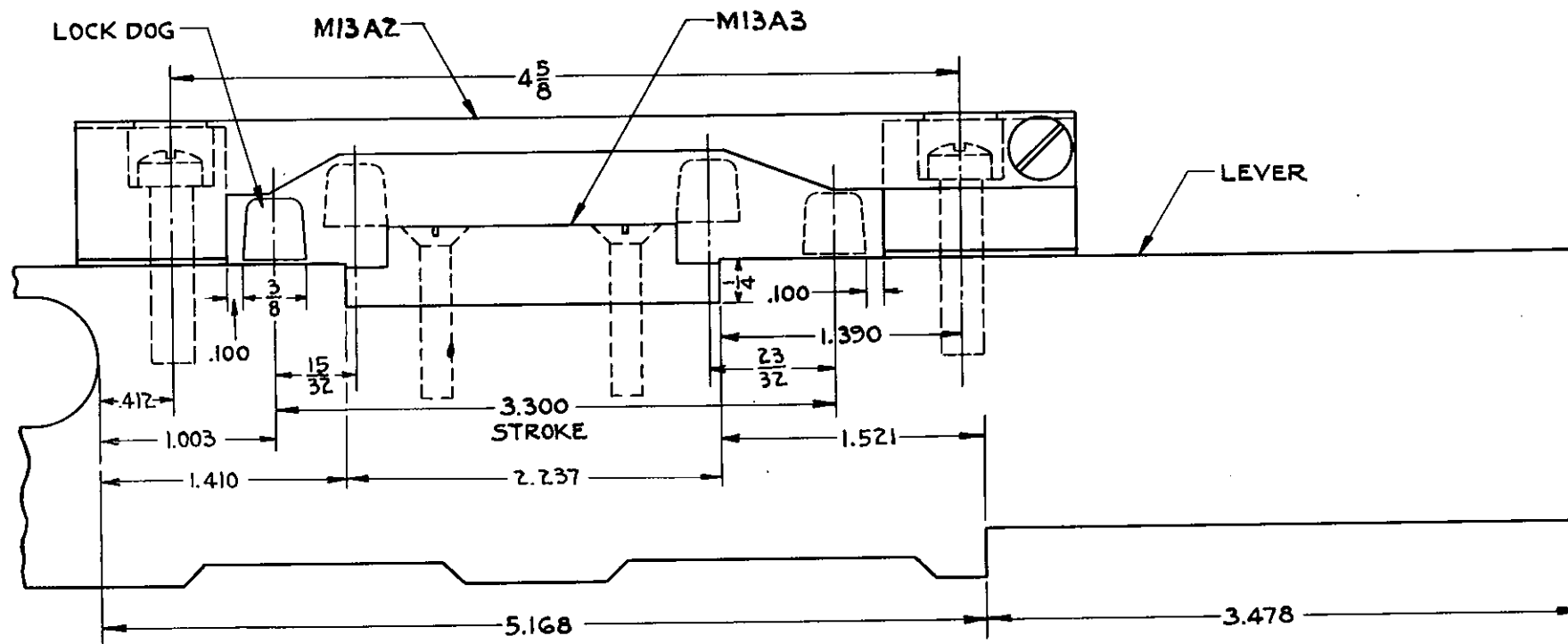
SIGNAL ENGINEER



M13BI ASSEMBLY
FOR MODEL 2 UNIT WITH $\frac{5}{8}$ TAPPET ROLLER

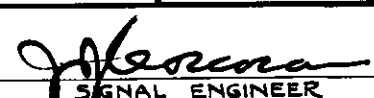
SCALE: FULL SIZE
ALL DIMENSIONS GIVEN IN INCHES

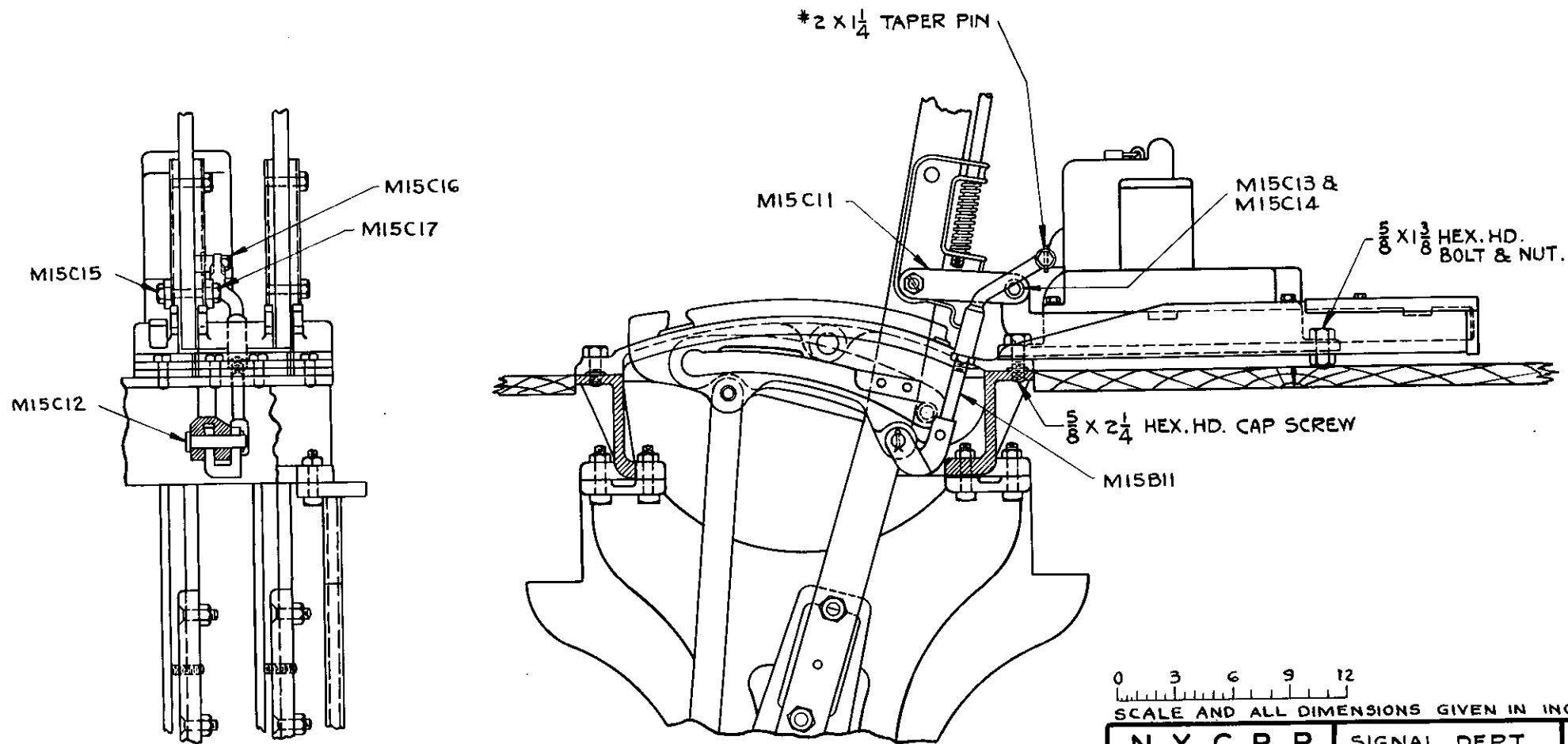
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
ELECTRIC LOCK STOP BLOCK AND REPLACER BAR G.R.S. MODEL 2 UNIT INTERLOCKING MACHINE.		
DATED DEC. 16, 1936	REV. APRIL 3, 1953	S-M13BI
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		<i>[Signature]</i> SIGNAL ENGINEER



M13C1 ASSEMBLY
FOR MODEL 2 UNIT WITH $\frac{3}{4}$ TAPPET ROLLER

SCALE: FULL SIZE
ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
ELECTRIC LOCK STOP BLOCK AND REPLACER BAR G. R. S. MODEL 2 UNIT INTERLOCKING MACHINE.		
DATED DEC. 16, 1936	REV. APRIL 3, 1953	S-M13C1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		 SIGNAL ENGINEER



NOTE:

1. LEVER LOCK MUST LOCK LEVER AT APPROXIMATELY 1" FROM FULL NORMAL OR FULL REVERSE POSITION MEASURED ON TOP SURFACE OF LEVER QUADRANT. LOCKING NOTCH IN SLIDE BAR MUST PROVIDE AT LEAST 1/2" BACK CLEARANCE FROM LOCKING DOG. THE FIRST 3/8" INITIAL DOWNWARD MOVEMENT OF LATCH BLOCK MUST FORCE LOCKING DOG OF ELECTRIC LOCK SUFFICIENT TO PROVIDE A MINIMUM OF 1/8" LOCKING.

2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350

0 3 6 9 12

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

CONNECTIONS
TYPE "L" LEVER LOCK
STYLE "A" MACHINE.

DATED MAR 2, 1932

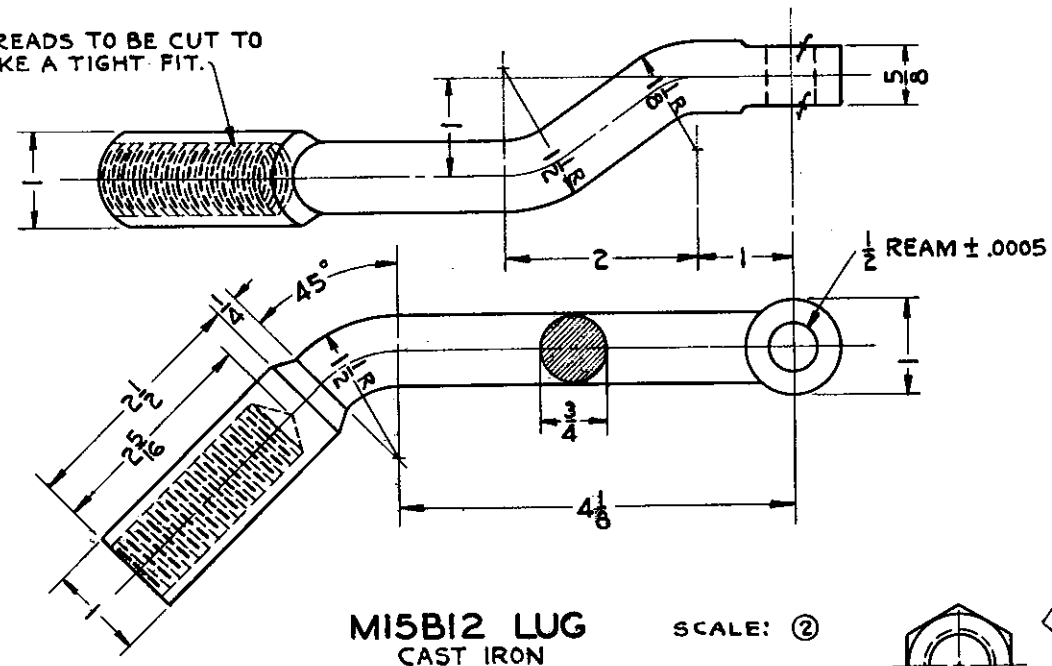
REV. MAR. 13, 1953

S-M15A1

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M.C.R.R.

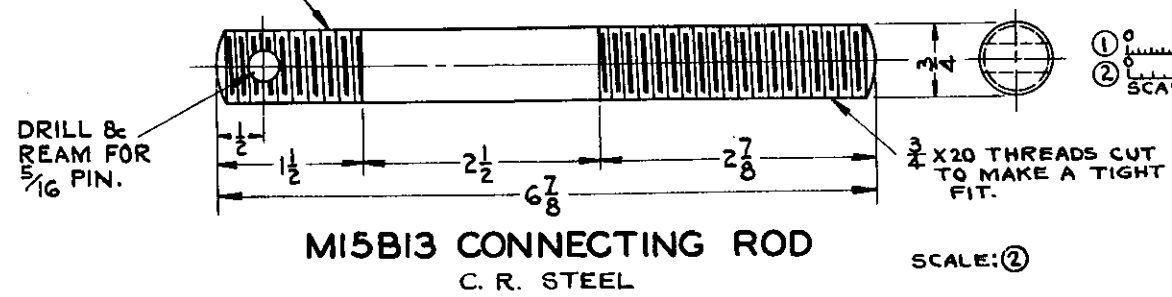
[Signature]
SIGNAL ENGINEER

$\frac{3}{4}$ X 20 THREADS TO BE CUT TO MAKE A TIGHT FIT.



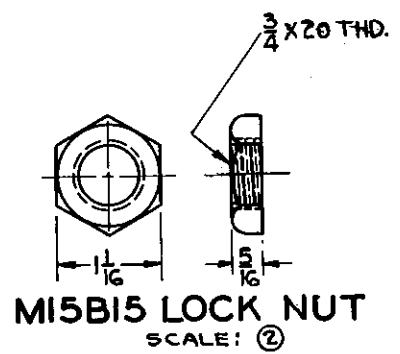
MI5B12 LUG
CAST IRON
SCALE: ②

$\frac{3}{4}$ X 20 THD.

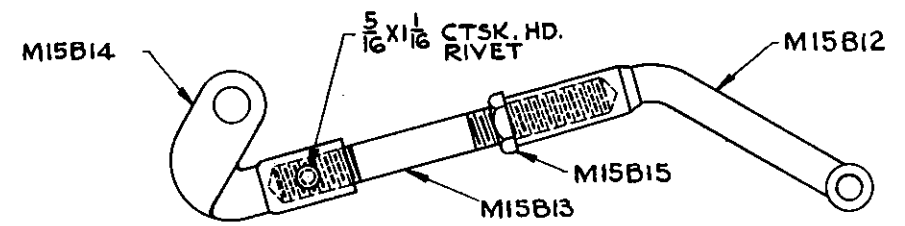


MI5B13 CONNECTING ROD
C. R. STEEL
SCALE: ②

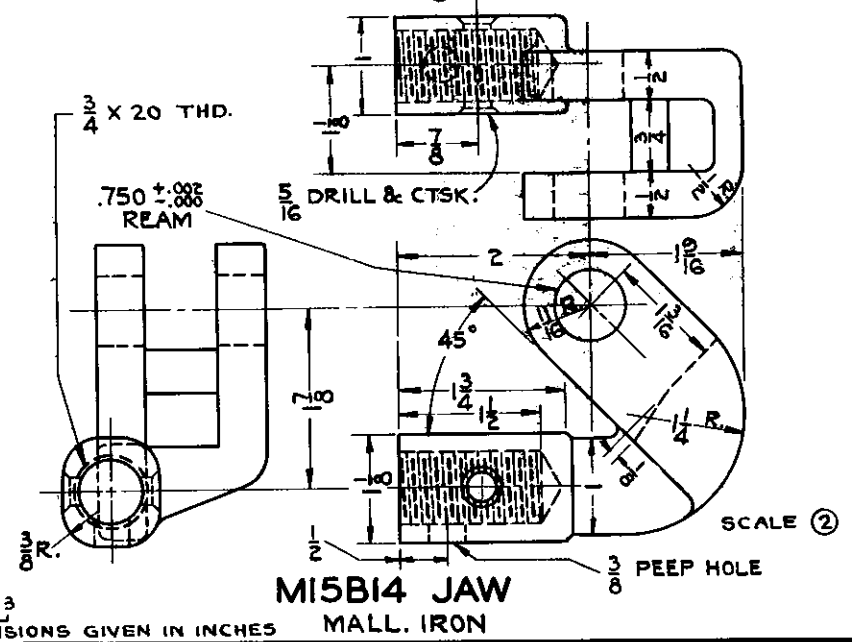
NOTE:
EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH ROUNDED ROOT THROUGHOUT
INTERNAL THREADS SHALL BE ASA-UNC-2B



MI5B15 LOCK NUT
SCALE: ②



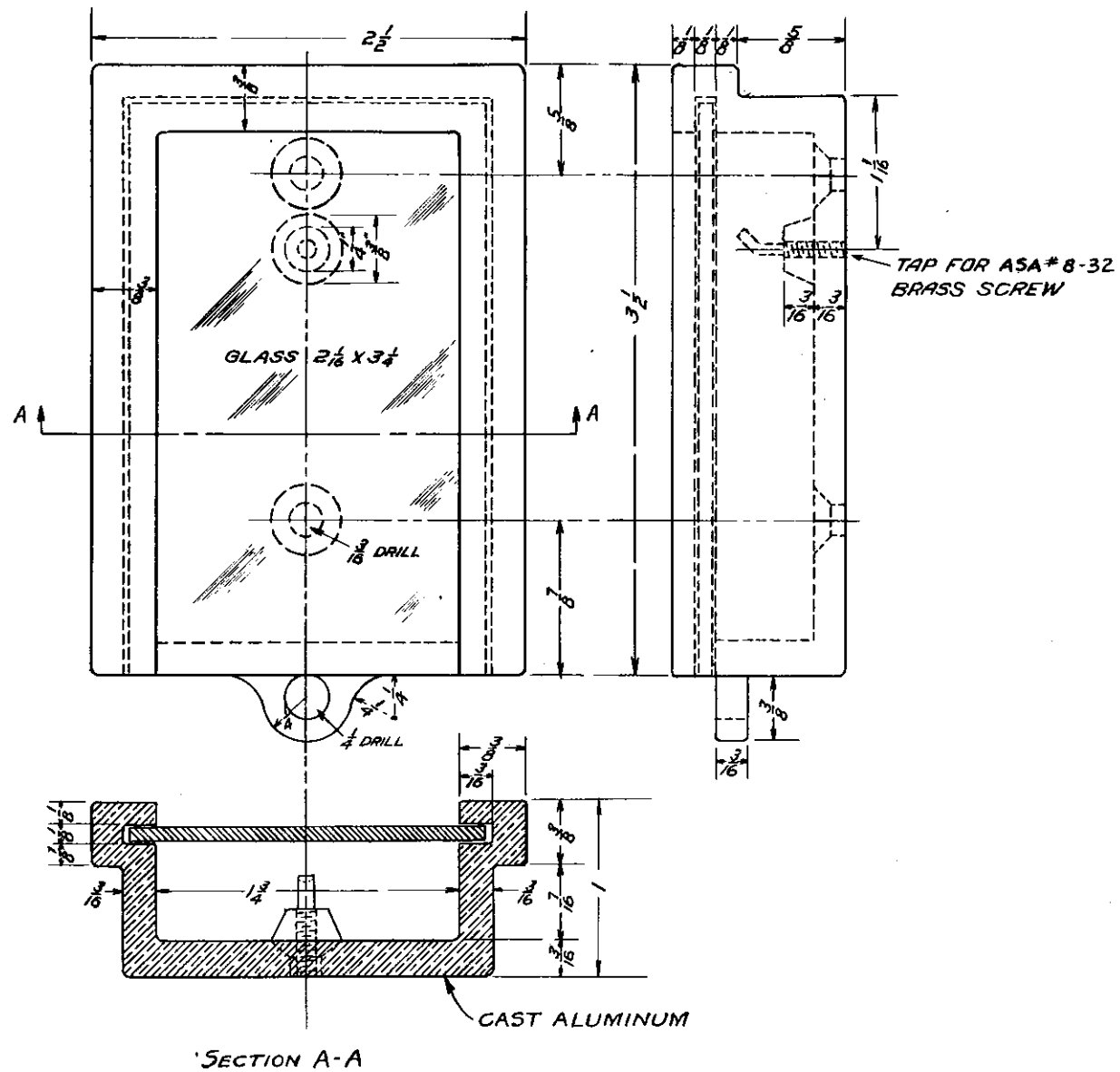
MI5B11 CONNECTING ROD COMPLETE
SCALE: ①



MI5B14 JAW
MALL. IRON
SCALE: ②

① 0 1 2 3
② 0 1 2 3
SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONNECTIONS TYPE 'L' LEVER LOCK STYLE "A" MACHINE. DETAILS		
DATED MAR. 2, 1932	REV. MAR. 13, 1953	S-MI5B1
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		 SIGNAL ENGINEER



SCALE: FULL SIZE
ALL DIMENSIONS GIVEN IN INCHES.

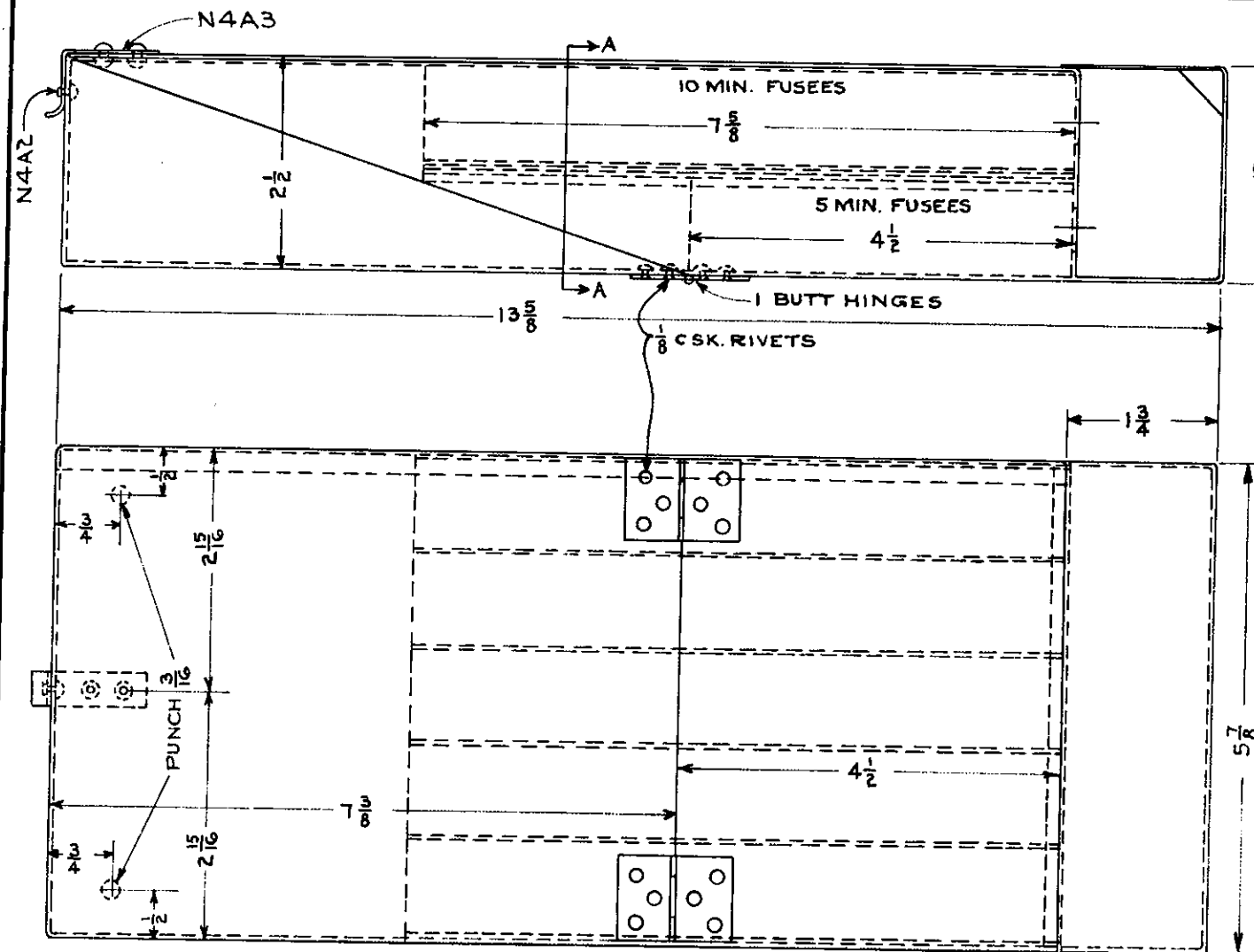
N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

KEY BOX
FOR
INTERLOCKING TOWER

DATED MAR. 21, 1934 REV. MAR. 25, 1953 S-N3A1

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY.
M.C.R.R.

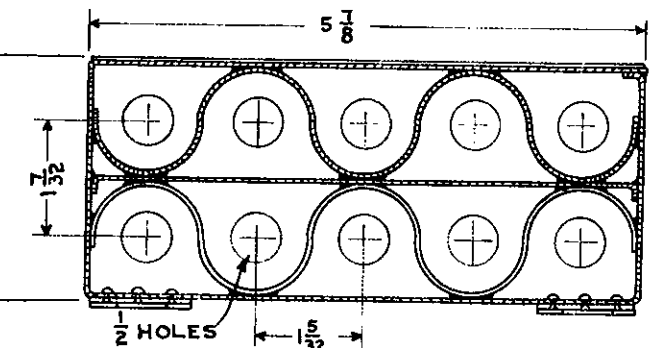
J. J. Morrison
SIGNAL ENGINEER



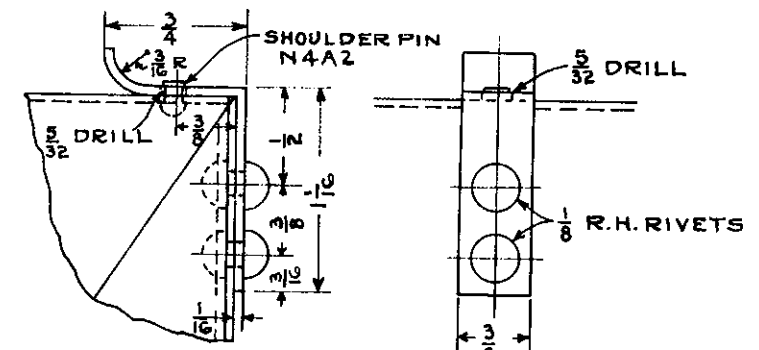
N4A1 FUSEE RACK COMPLETE
#22 GA. GALVANIZED IRON
SCALE: ①

NOTES:

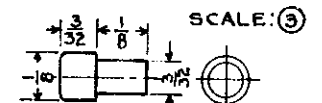
1. ALL SEAMS TO BE SOLDERED
2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350
3. FUSE HOLDER TO BE PAINTED BLACK



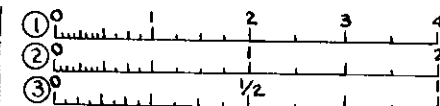
SECTION "A-A"



N4A3 HASP
SPRING STEEL
SCALE: ②



N4A2 SHOULDER PIN
C. R. S.



SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. | **SIGNAL DEPT.** | **CLEVELAND, O.**

FUSEE RACK
FOR INTERLOCKING TOWERS

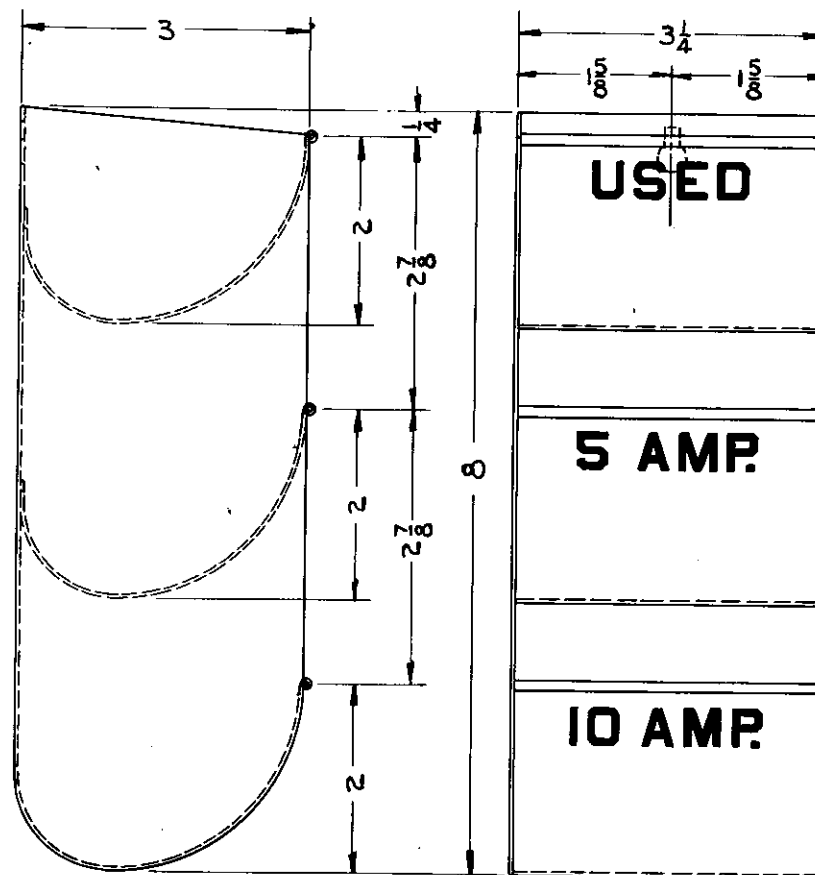
DATED MAY 10, 1934

REV. MAR. 25, 1953

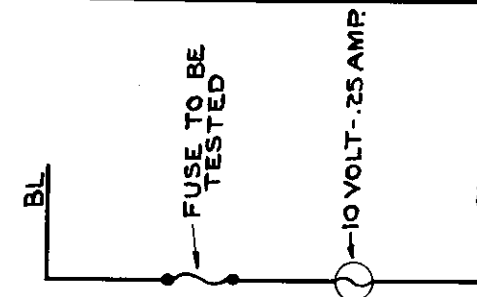
S-N4A1

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

[Signature]
SIGNAL ENGINEER



N5A1 FUSE HOLDER
#22 GA. GALVANIZED IRON



NOTES:

1. IF THERE IS NO FUSE TESTING CLIP ON THE INTERLOCKING MACHINE, SUCH TEST OUTFIT TOGETHER WITH LAMP SHALL BE LOCATED ADJACENT TO FUSE HOLDER.
2. ALL SEAMS TO BE SOLDERED
3. PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH INSTRUCTION 350.
4. FUSE HOLDER TO BE PAINTED BLACK WITH WHITE LETTERS.

0 1 2 3

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. | SIGNAL DEPT. | CLEVELAND, O.

FUSE HOLDER
FOR INTERLOCKING TOWERS

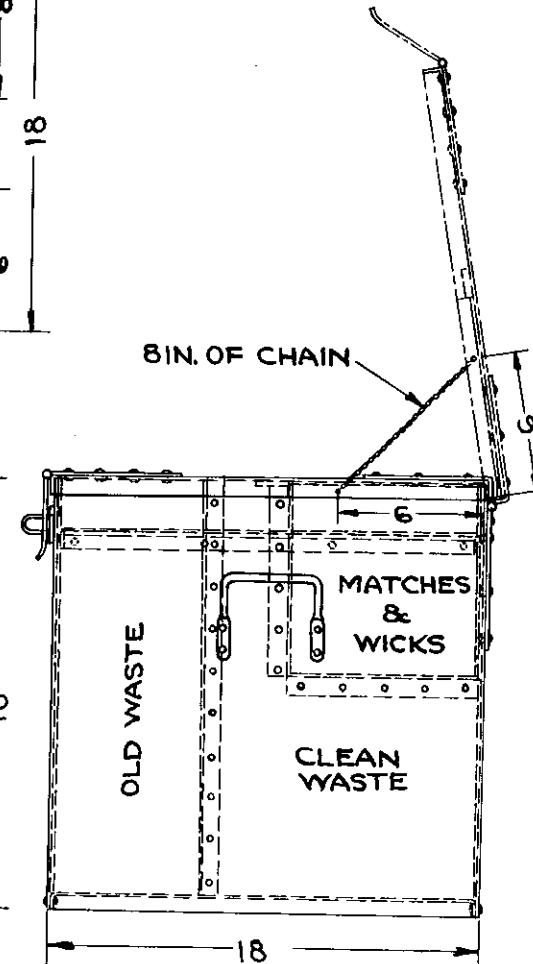
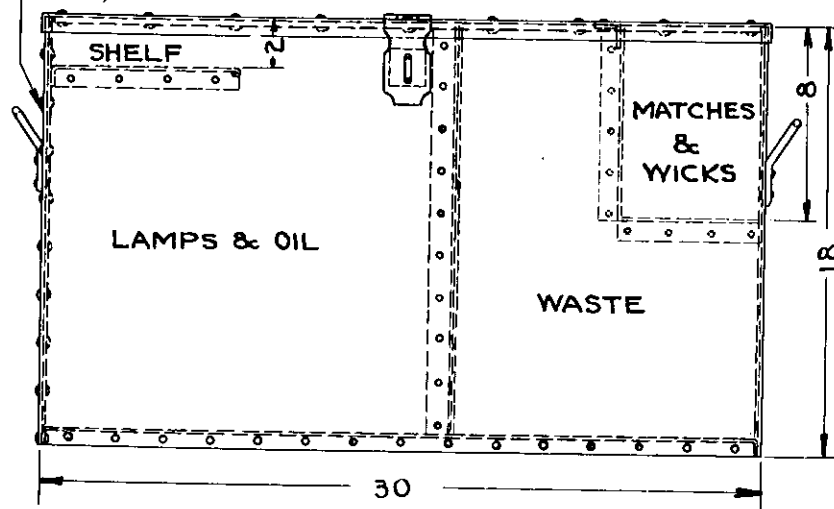
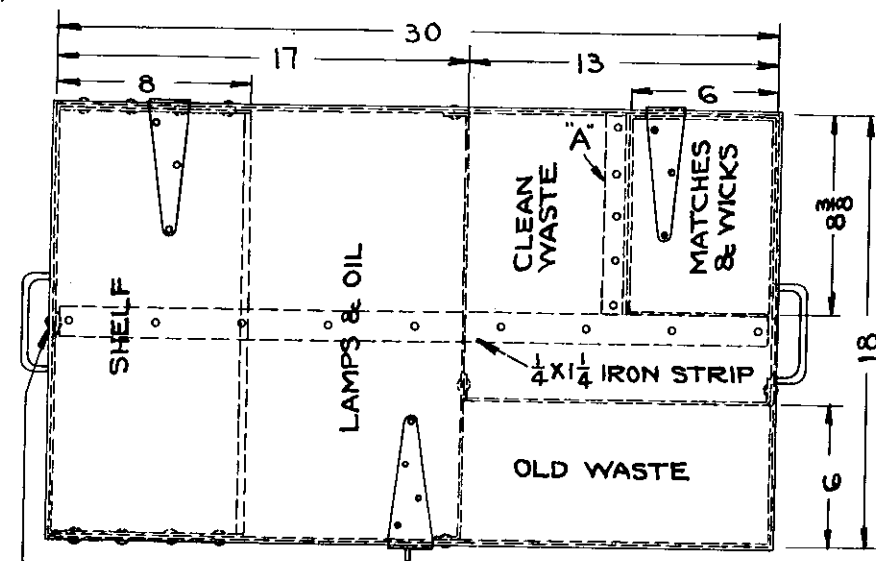
DATED MAY 10, 1934

REV MAR. 25, 1953

S-N5A1

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST.L.RY.
M.C.R.R.

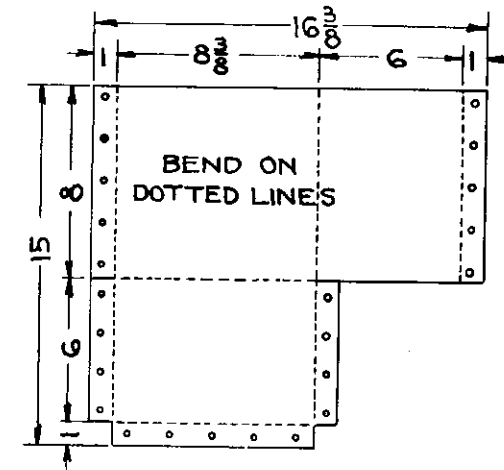
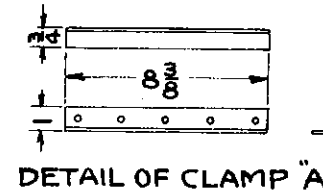
[Signature]
SIGNAL ENGINEER



NOTES:

1. ALL SEAMS TO BE RIVETED AND THEN SOLDERED.
USE 8 IN. OF #2 COPPER STEEL SASH CHAIN ON EACH
SIDE OF LID.

2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE
WITH INSTRUCTION 350

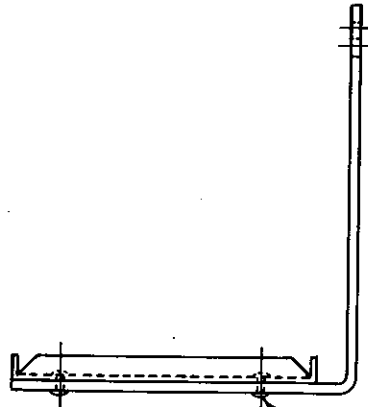
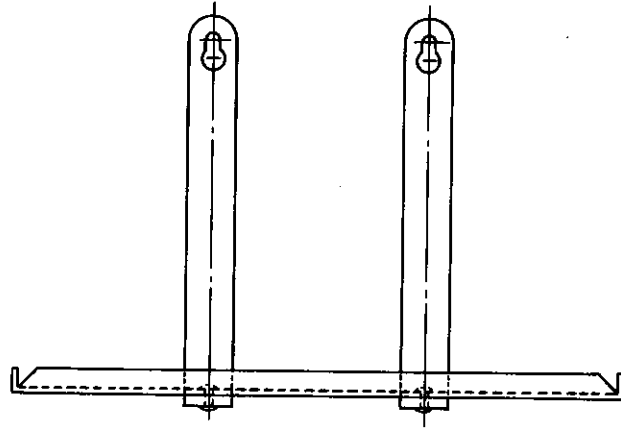


DETAIL OF MATCH BOX

0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
WICK, MATCH, WASTE, LAMP & OIL BOX		
FOR STATIONS OR INTERLOCKING TOWERS.		
DATED MAY 10, 1934	REV. MAR. 25, 1953	S-N6AI
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		
 SIGNAL ENGINEER		

NGAI BOX COMPLETE
#18 GA. GALVANIZED IRON

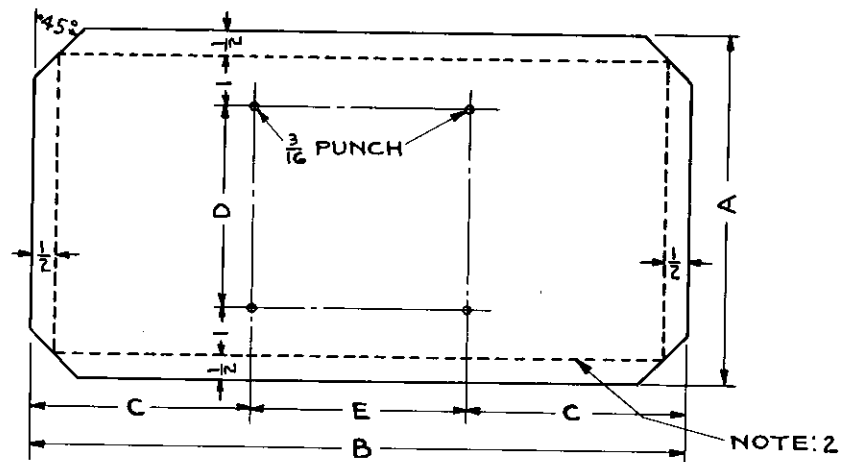


NOTE:
PROTECTIVE TREATMENT TO BE IN ACCORDANCE
WITH INSTRUCTION 350.

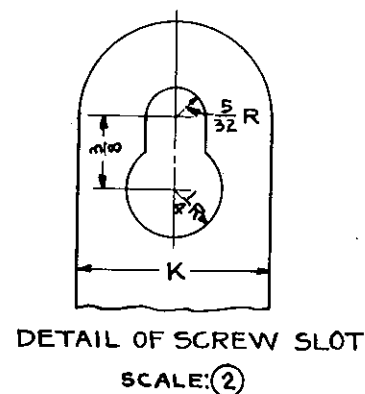
RELAY SUPPORT COMPLETE

TYPE OF RELAY	RELAY SUPPORT COMPLETE	TRAY NO.	BRACKET NO.
G.R.S. MODEL 9D FLASHING	N9A1	N9B1	N9B20
G.R.S. MODEL 9 INTERLOCKING	N9A1	N9B1	N9B20
HALL POLARIZED NEUTRAL	N9A2	N9B2	N9B21
HALL INTERLOCKING-FLASHING	N9A3	N9B3	N9B22
R.R. SUPPLY TIME ELEMENT	N9A4	N9B4	N9B23
G.R.S. INT.-A.C.-MODEL 2B	N9A5	N9B5	N9B24
G.R.S.-A.C.-MODEL 2A-6 WAY	N9A6	N9B6	N9B25
G.R.S.-A.C.-MODEL 2A-4 WAY	N9A7	N9B7	N9B26

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
RELAY SUPPORT ASSEMBLY		
DATED DEC. 5, 1934	REV. MAR. 25, 1953	S-N9A1
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		 SIGNAL ENGINEER



TRAY
#16 GA. GALV. IRON
SCALE: ①



BRACKET
C.R. STEEL
SCALE: ①

NOTE:

1. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350.
2. SIDES TO BE FORMED BY BENDING AT RIGHT ANGLES ON DOTTED LINES.

RELAY SUPPORT COMPLETE	TRAY	A	B	C	D	E	BRACKET (2 REQ.)	F	G	H	J	K
N9A1	N9B1	8 ³ / ₁₆	12 ¹¹ / ₁₆	4 ³ / ₃₂	5 ³ / ₁₆	4 ¹ / ₂	N9B20	8 ¹¹ / ₁₆	5 ³ / ₁₆	7 ¹³ / ₁₆	1 ¹ / ₄	1
N9A2	N9B2	8 ¹ / ₈	9 ¹ / ₄	2 ³ / ₈	5 ¹ / ₈	4 ¹ / ₂	N9B21	8 ⁵ / ₈	5 ¹ / ₈	7 ³ / ₄	1 ¹ / ₄	1
N9A3	N9B3	8 ¹ / ₄	11 ¹ / ₄	3 ³ / ₈	5 ¹ / ₄	4 ¹ / ₂	N9B22	8 ³ / ₄	5 ¹ / ₄	7 ⁷ / ₈	1 ¹ / ₄	1
N9A4	N9B4	9	13 ¹ / ₂	4 ¹ / ₂	6	4 ¹ / ₂	N9B23	9 ¹ / ₂	6	7 ¹ / ₂	1 ¹ / ₄	1
N9A5	N9B5	9	14	3 ¹ / ₂	6	7	N9B24	9 ¹ / ₂	6	9 ¹ / ₂	3 ³ / ₈	1 ¹ / ₂
N9A6	N9B6	13	12 ¹ / ₄	2 ⁵ / ₈	10	7	N9B25	13 ¹ / ₂	10	9 ³ / ₄	1 ¹ / ₂	1 ³ / ₄
N9A7	N9B7	13	9 ¹ / ₄	1 ³ / ₈	10	7	N9B26	13 ¹ / ₂	10	9 ³ / ₄	1 ¹ / ₂	1 ³ / ₄

① 0 1 2 3

② 0 1/2 1

SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

RELAY SUPPORT
DETAILS

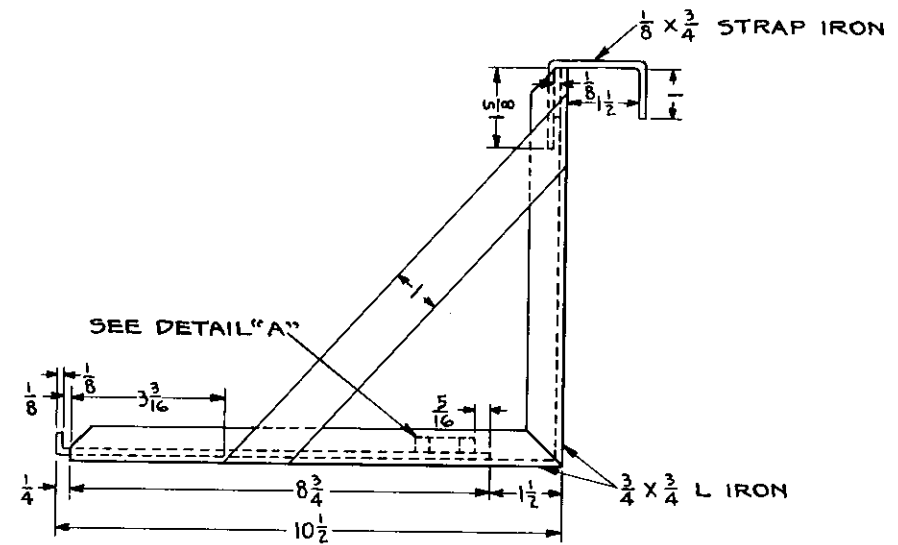
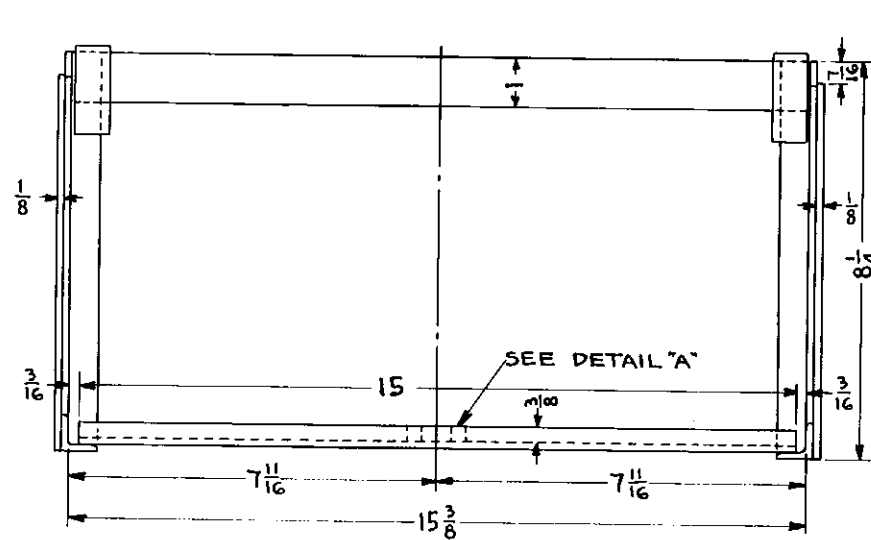
DATED DEC. 5, 1934

REV. MAR. 25, 1953

S-N9BI

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. R.Y.
M.C.R.R.

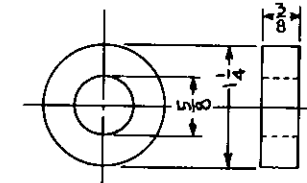
[Signature]
SIGNAL ENGINEER



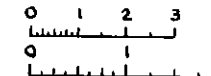
N9CI RELAY SUPPORT COMPLETE FOR G.R.S.-A.C.-MODEL 2A-10WAY RELAY

NOTES:

1. ALL JOINTS SPOT WELDED.
2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350.



DETAIL "A"



SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

RELAY SUPPORT

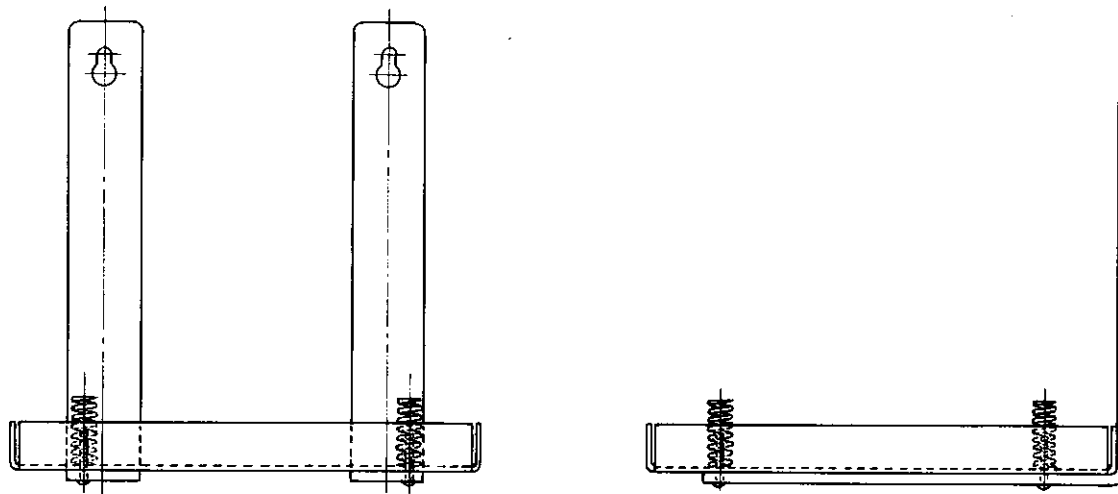
DATED DEC. 5, 1934

REV. MAR. 25, 1953

S-N9CI

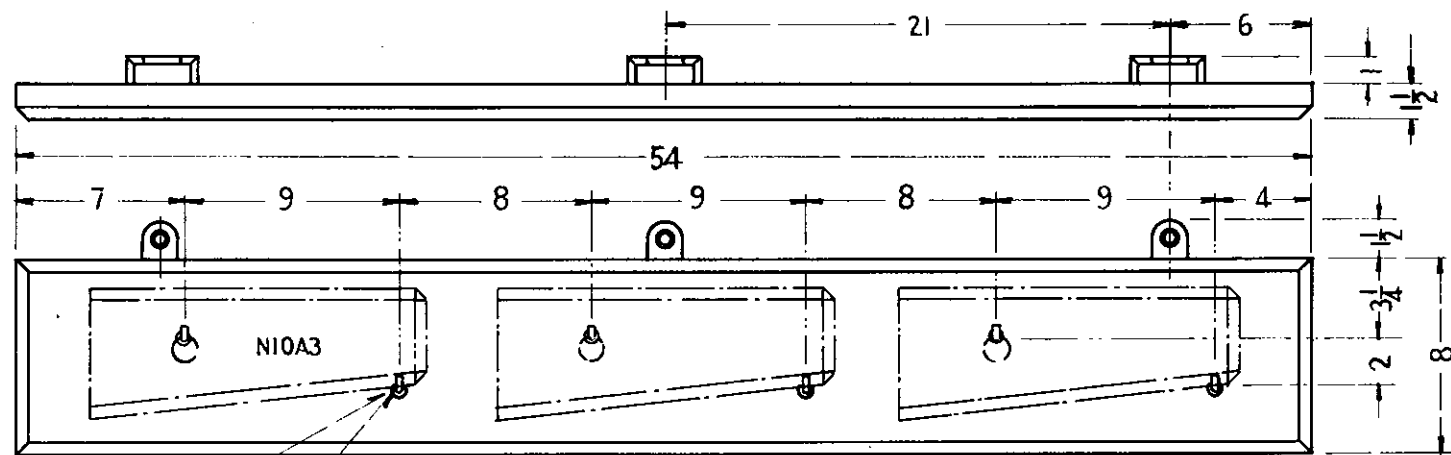
APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY.
M.C.R.R.

[Signature]
SIGNAL ENGINEER



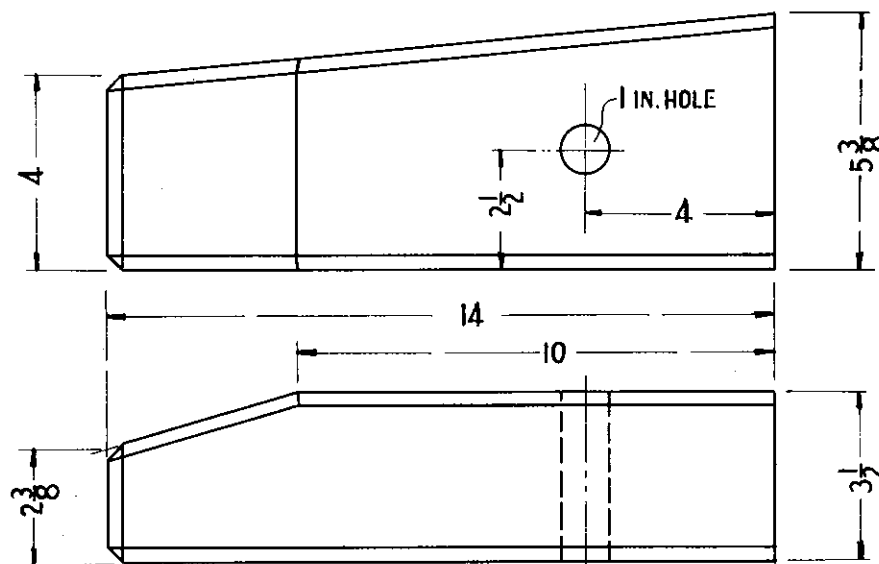
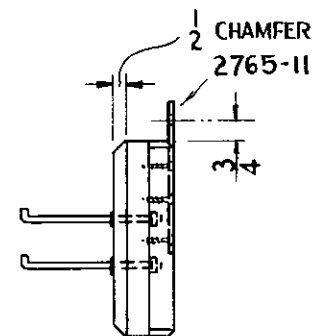
RELAY SUPPORT COMPLETE
G.R.S. 55116-1 OR EQUIVALENT
FOR G.R.S. TYPE "N" CLASS A 2 POS. VANE RELAY.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
RELAY SUPPORT		
DATED DEC. 5, 1934	REV. MAR. 25, 1953	S-N9DI
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L.R.Y. M.C.R.R.		 SIGNAL ENGINEER.

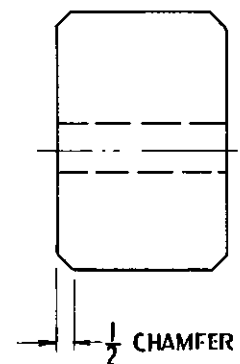


1/4 BORE
2765-24

NIOA1 - BOARD COMPL. WITHOUT SWITCH BLOCKS.
NIOA2 - " " WITH SWITCH BLOCKS.



NIOA3-SWITCH BLOCK.



FINISH:

BOARD SHALL BE MADE OF WELL SEASONED
OAK AND GIVEN ONE COAT FILLER AND
TWO COATS VARNISH.

BOARD NIOA2 SHALL BE MOUNTED ABOVE
TOOL BOARD 2765.

SWITCH BLOCKS SHALL BE MADE OF CLEAR
SEASONED OAK AND GIVEN TWO COATS
VARNISH.

N. Y. C. R. R.

SIGNAL DEPT.

CLEVELAND, O.

SWITCH BLOCK AND BOARD

DATED NOV. 12, 1934

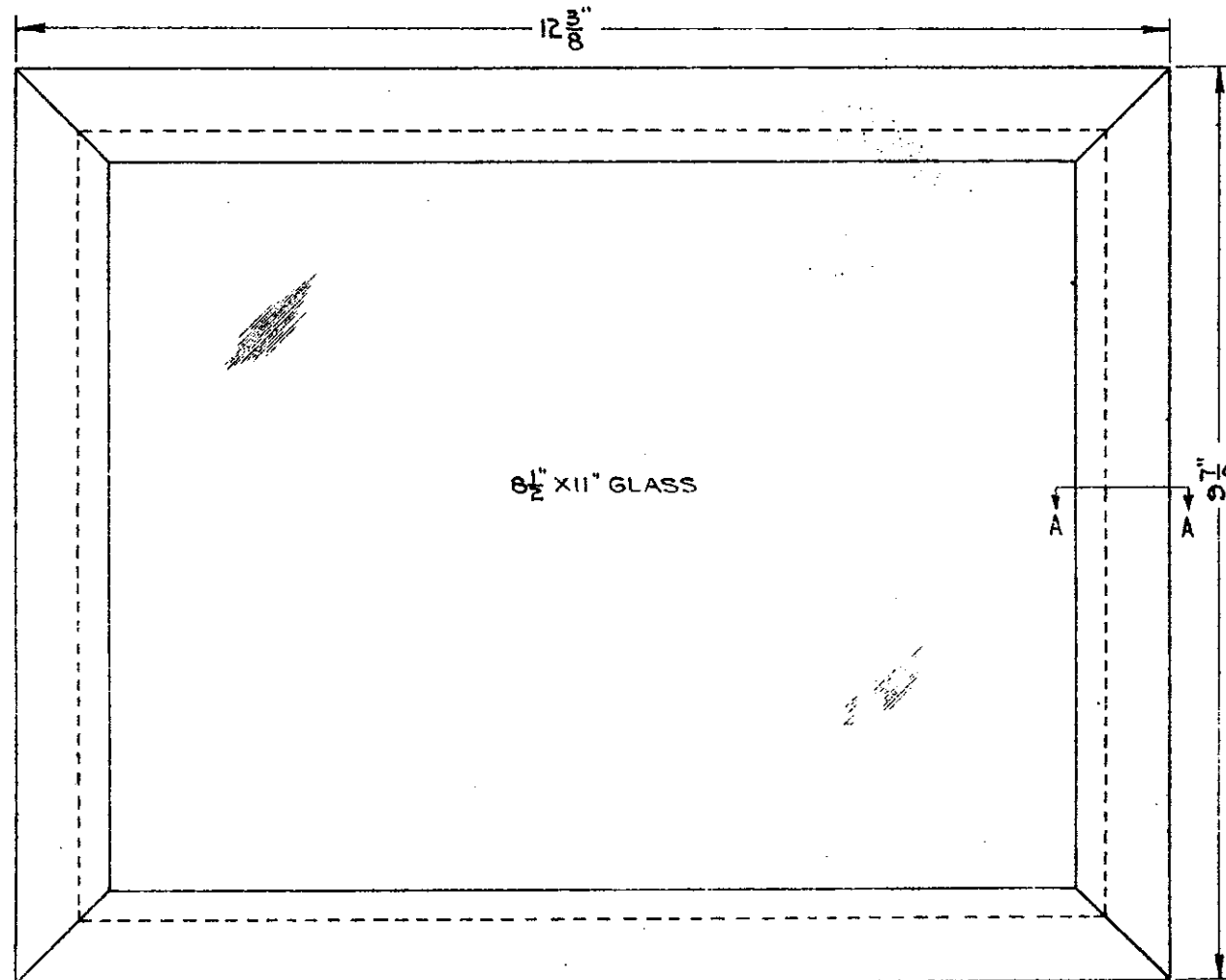
REV. APRIL 3, 1953

S-NIOA1

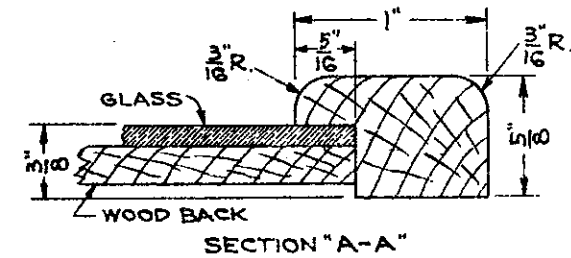
APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

SIGNAL ENGINEER.

0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES



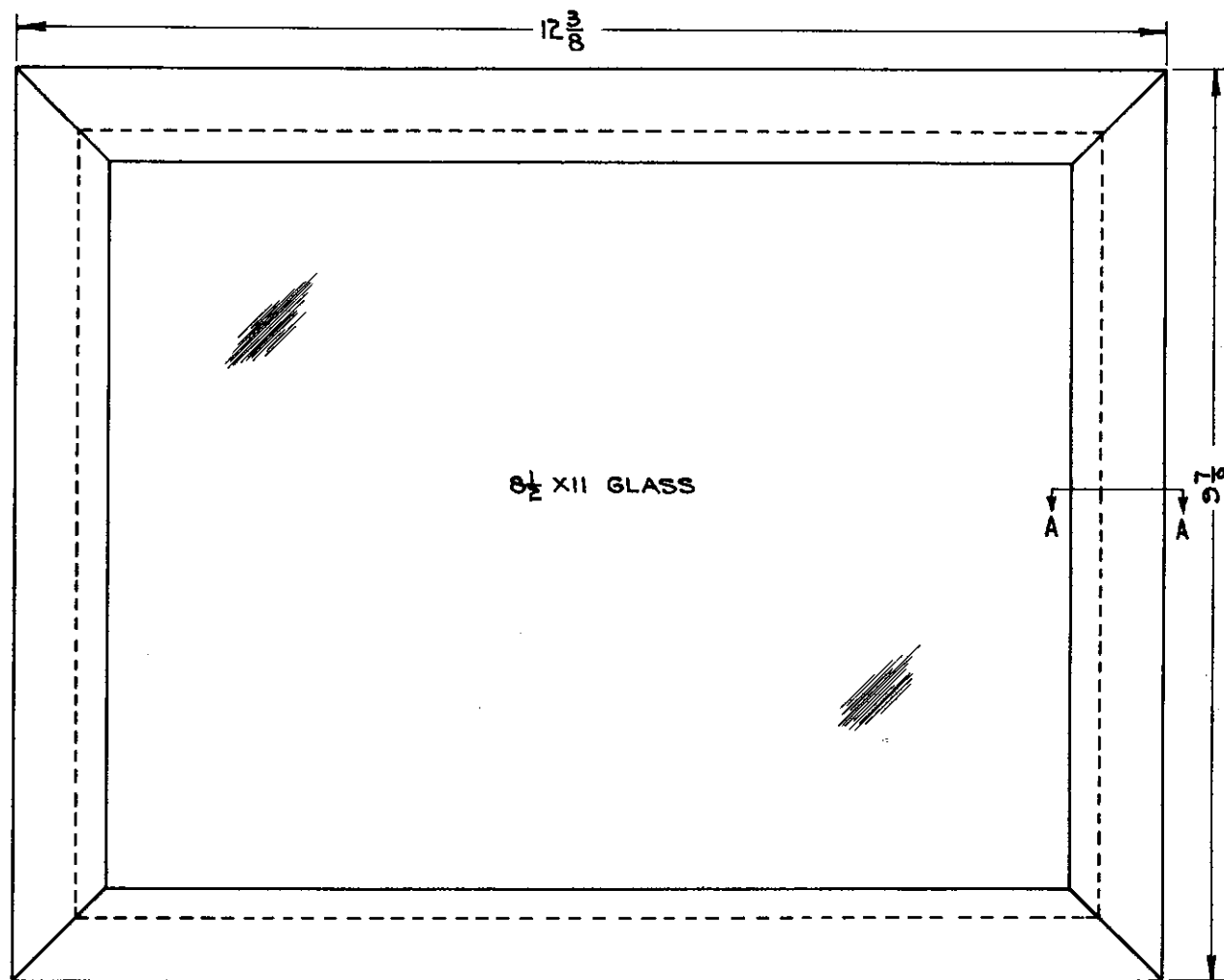
N12A FRAME
OAK



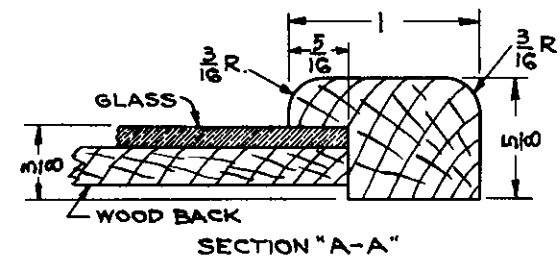
NOTE:

FRAME TO BE GIVEN ONE COAT OF ORANGE SHELLAC
AND ONE COAT OF VARNISH.
DIMENSIONS OF MOULDING ARE APPROXIMATE AND
STANDARD PICTURE FRAME MOULDING SHOULD
BE USED.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
FRAME FOR INSTRUCTIONS GOVERNING THE OPERATION OF INTERLOCKING MACHINE DEC. 14, 1934.		
REVISION NO.		S-N12A
<i>[Signature]</i> SIGNAL ENGINEER		



NI2 AI FRAME



- NOTES: 1. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350.
2. FRAME TO BE GIVEN ONE COAT OF ORANGE SHELLAC AND ONE COAT OF VARNISH.
3. STANDARD PICTURE FRAME MOULDING SHOULD BE USED. DIMENSIONS GIVEN ARE APPROXIMATE.
4. FRAME TO BE MADE OF OAK.

0 1 2 3 4 5 6

SCALE AND ALL DIMENSION GIVEN IN INCHES

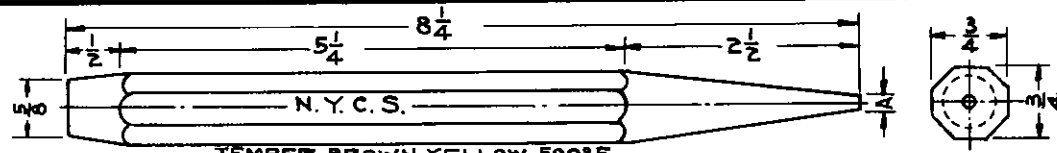
N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

FRAME
FOR INSTRUCTIONS GOVERNING THE OPERATION OF
INTERLOCKING MACHINE

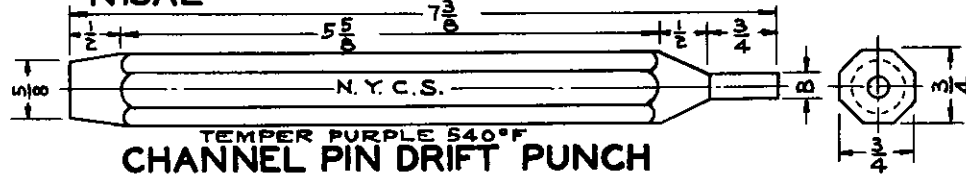
DATED DEC. 14, 1934 REV. JUNE 15, 1953 S-NI2 AI

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY.
M.C.R.R.

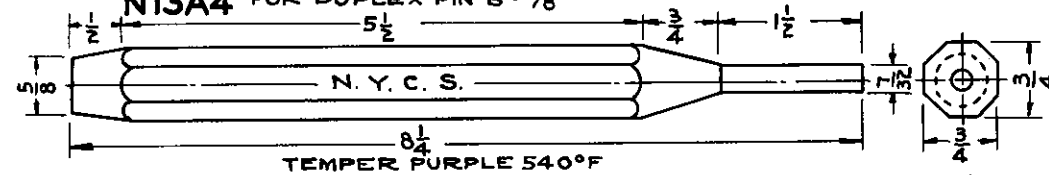
[Signature]
SIGNAL ENGINEER



CHANNEL PIN STARTING PUNCH
N13A1 FOR SINGLE PIN A = $\frac{3}{16}$
N13A2 FOR DUPLEX PIN A = $\frac{5}{16}$



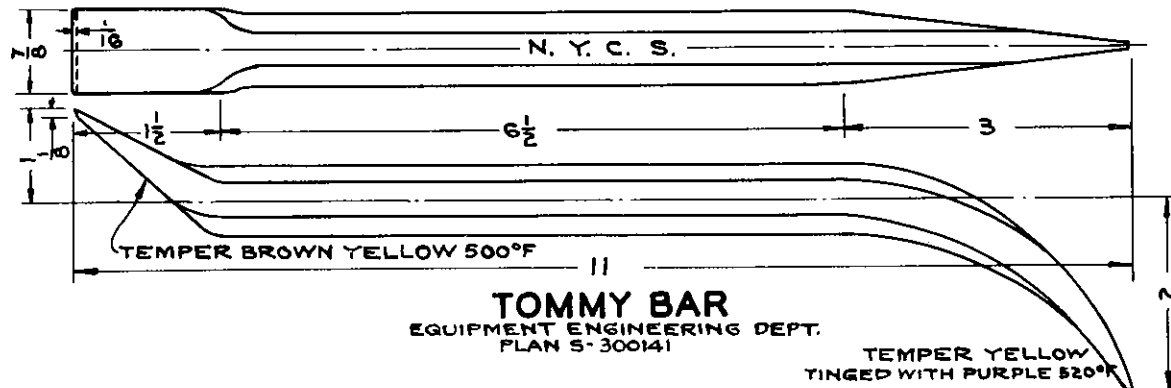
CHANNEL PIN DRIFT PUNCH
N13A3 FOR SINGLE PIN B = $\frac{1}{4}$
N13A4 FOR DUPLEX PIN B = $\frac{3}{8}$



N13A5 PIPE RIVET & CHANNEL PIN STARTING PUNCH

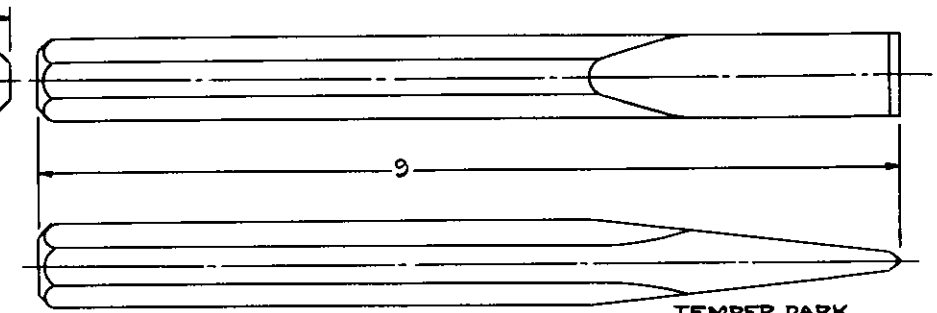
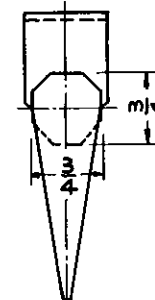
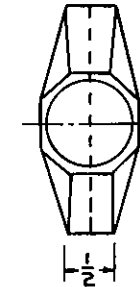
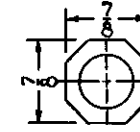


N13A6 CHANNEL PIN SET

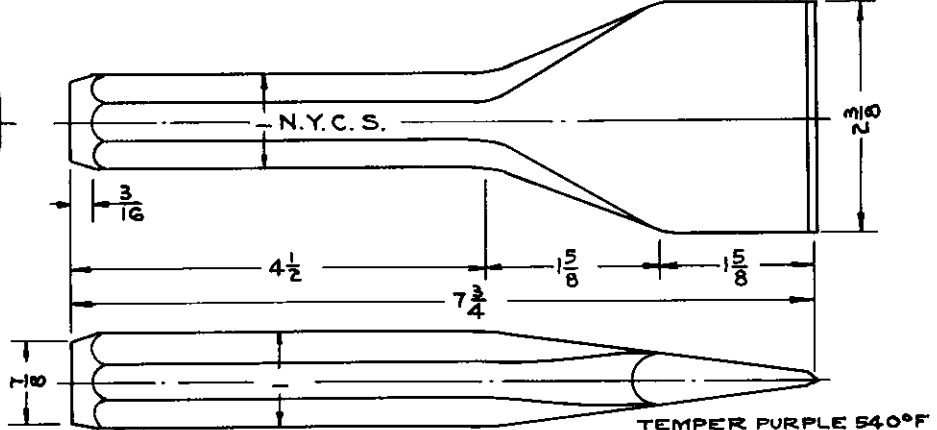


TOMMY BAR
EQUIPMENT ENGINEERING DEPT.
PLAN S-300141

TEMPER YELLOW
TINGED WITH PURPLE 520°F



COLD CHISEL
EQUIPMENT ENGINEERING DEPT.
PLAN T-300097



N13A9 RAIL SPREADING WEDGE

0 1 2 3 4

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

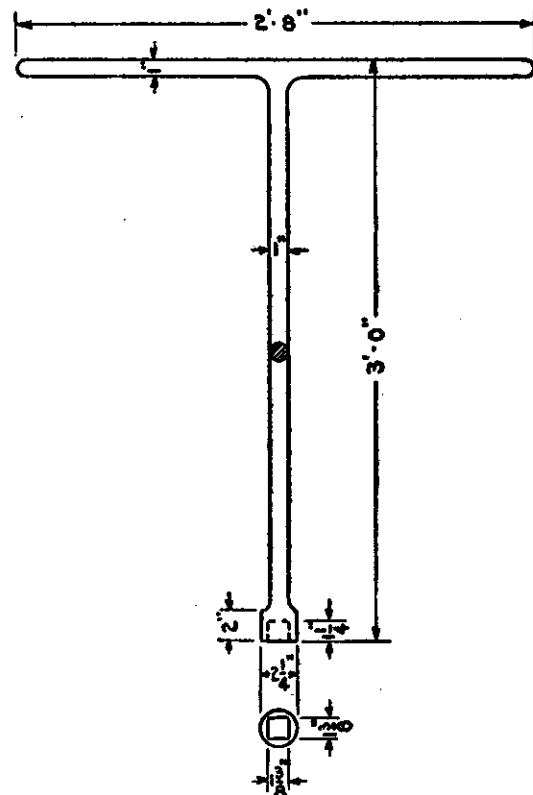
TOOLS

DEC. 18, 1934

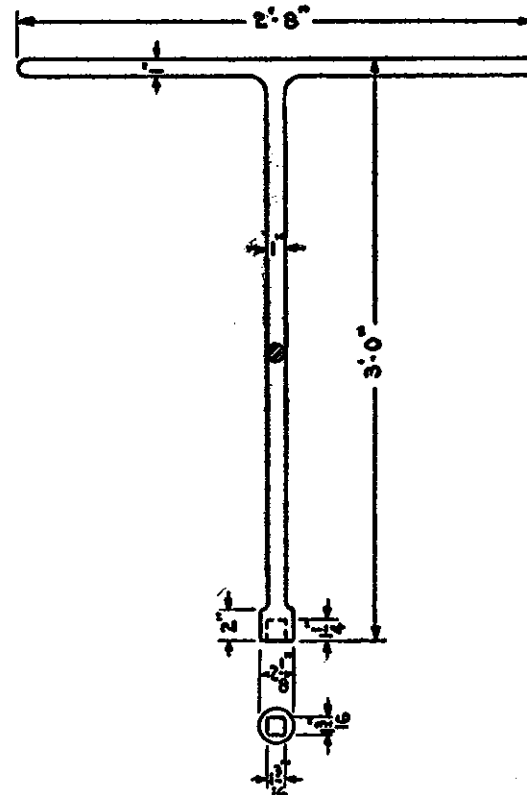
DATED DEC. 18, 1934 REV. JUNE 22, 1953 S-N13A4

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY
M. C. R. R.

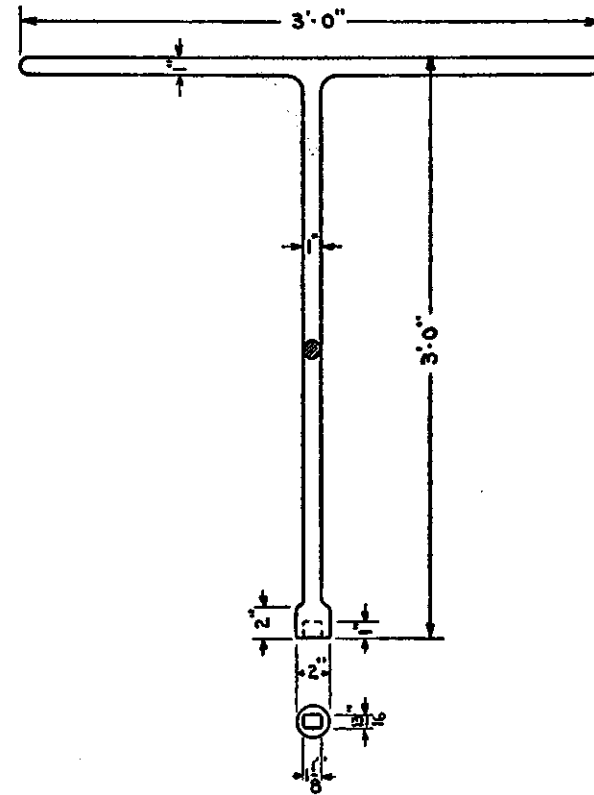
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SIGNAL ENGINEER



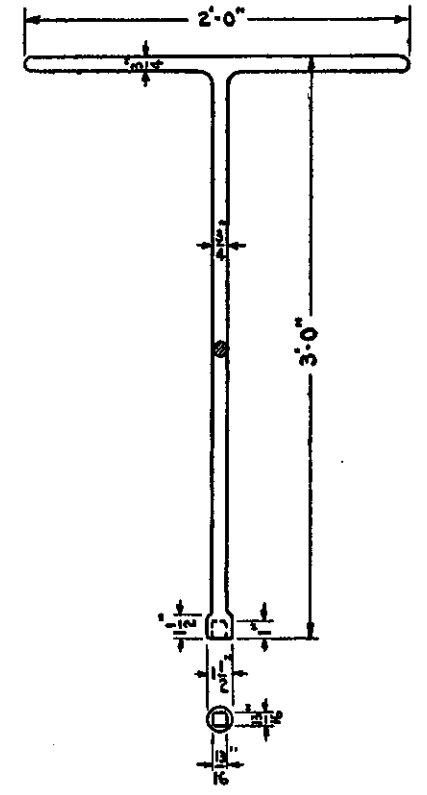
NI4C11 - SOCKET WRENCH
FOR STD. $\frac{1}{8}$ " BOLT
WROUGHT IRON



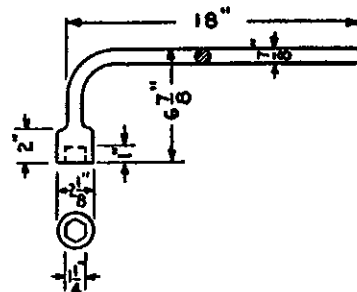
NI4C12 - SOCKET WRENCH
FOR STD. $\frac{3}{4}$ " LAG SCREW
WROUGHT IRON



NI4C13 - SOCKET WRENCH
FOR STD. SCREW SPIKE
WROUGHT IRON
SEE TRACK DEPT. PLAN EC-K-21

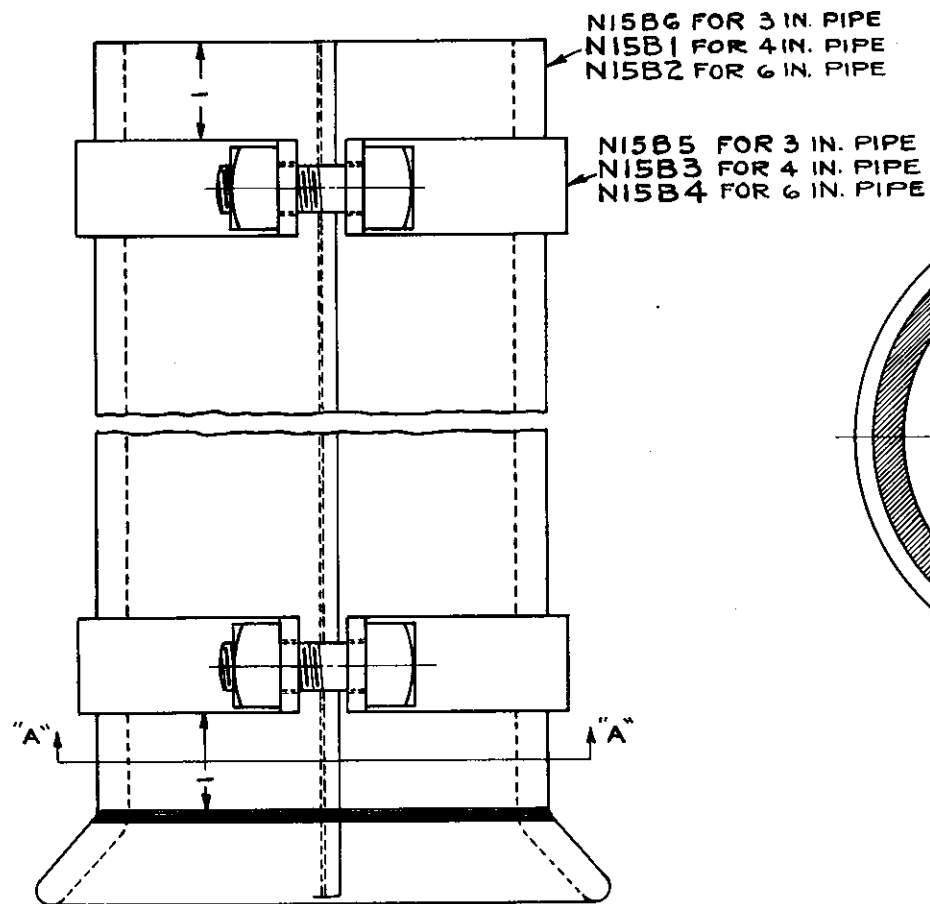


NI4C14 - SOCKET WRENCH
FOR STD. $\frac{1}{2}$ " LAG SCREW
WROUGHT IRON

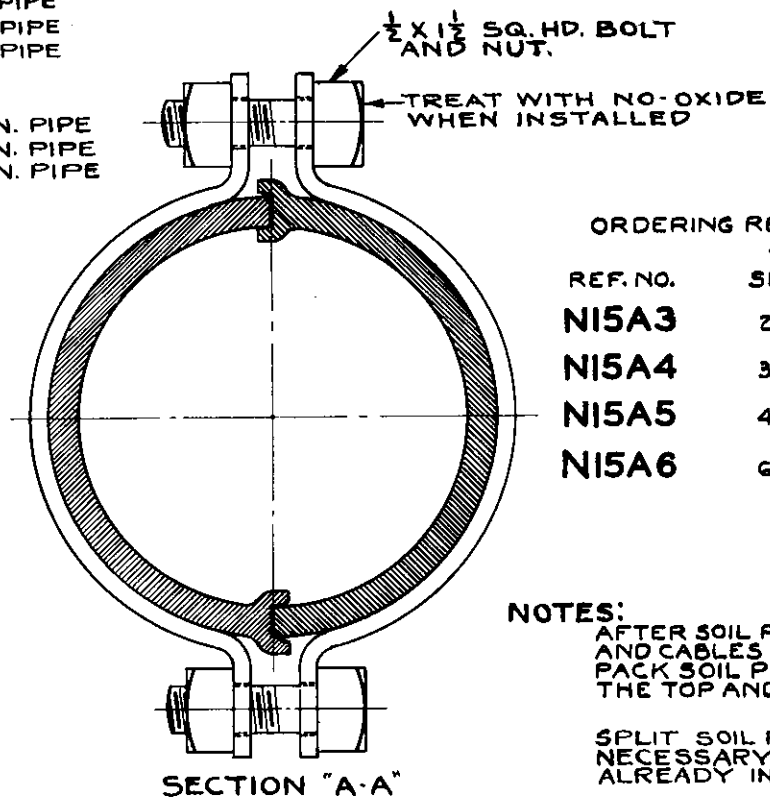


NI4C15 - SOCKET WRENCH
FOR STD. $\frac{3}{4}$ " HEX. NUT
WROUGHT IRON

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SOCKET WRENCHES		
DATED FEB. 26, 1946.	REV.	S-NI4C
APPROVED FOR: N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. N. Y. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



N15A7 SPLIT SOIL PIPE COMPLETE (3 IN.)
 N15A1 SPLIT SOIL PIPE COMPLETE (4 IN.)
 N15A2 SPLIT SOIL PIPE COMPLETE (6 IN.)



ORDERING REFERENCE FOR ONE PIECE
 SOIL PIPE

REF. NO.	SIZE	LENGTH	PATTERN NO.
N15A3	2 IN.	18 IN.	5912
N15A4	3 IN.	18 IN.	5913
N15A5	4 IN.	18 IN.	5914
N15A6	6 IN.	18 IN.	5917

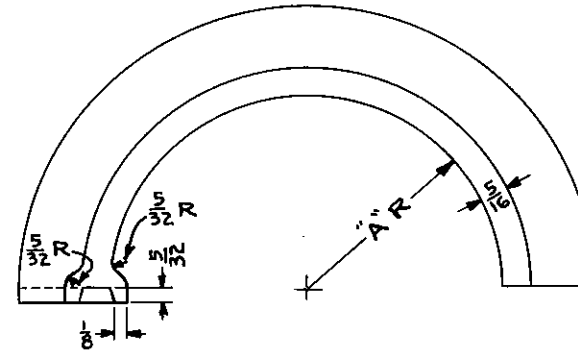
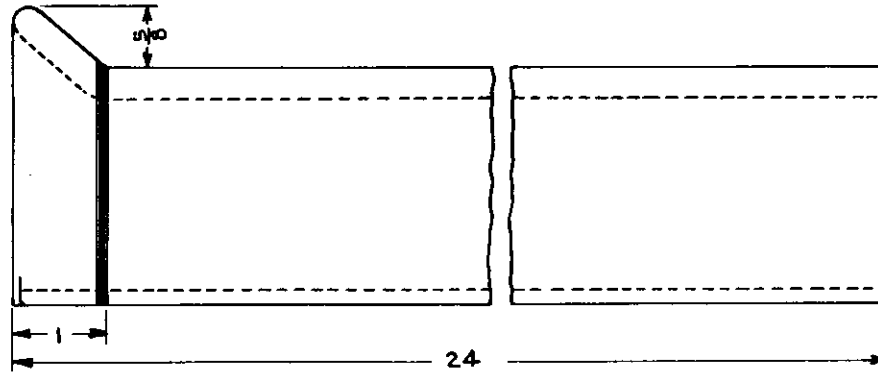
NOTES:

AFTER SOIL PIPE HAS BEEN INSTALLED
 AND CABLES ARE IN PERMANENT POSITION
 PACK SOIL PIPE WITH WASTE 4 INCHES BELOW
 THE TOP AND FILL WITH COMPOUND.

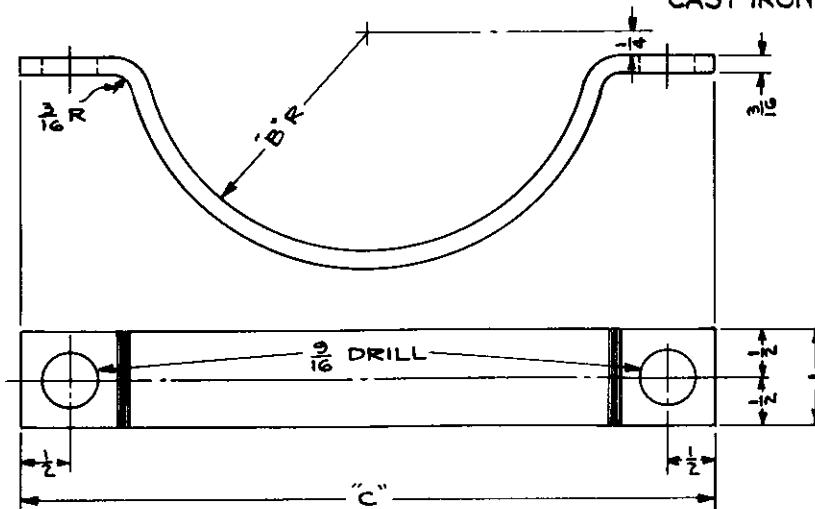
SPLIT SOIL PIPE TO BE USED ON WHERE
 NECESSARY TO ADD SOIL PIPE TO CABLE
 ALREADY IN SERVICE.

0 1 2 3 4 5
 SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SOIL PIPE ASSEMBLY		
DATED JAN. 27, 1936	REV. JUNE 15, 1953	S-N15A4
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		 SIGNAL ENGINEER



NI5B6 SPLIT SOIL PIPE - HALF (FOR 3 IN. PIPE) "A" = $1\frac{1}{2}$
 NI5B1 SPLIT SOIL PIPE - HALF (FOR 4 IN. PIPE) "A" = 2
 NI5B2 SPLIT SOIL PIPE - HALF (FOR 5 IN. PIPE) "A" = 3
 CAST IRON



NI5B5 CLAMP - HALF (FOR 4 IN. PIPE) "B" = $1\frac{13}{16}$ - "C" = $6\frac{1}{8}$
 NI5B3 CLAMP - HALF (FOR 5 IN. PIPE) "B" = $2\frac{5}{8}$ - "C" = $7\frac{1}{8}$
 NI5B4 CLAMP - HALF (FOR 6 IN. PIPE) "B" = $3\frac{3}{8}$ - "C" = $9\frac{1}{8}$
 O.H. STEEL

NOTE:
 PROTECTIVE TREATMENT TO BE IN
 ACCORDANCE WITH INSTRUCTION 350

0 1 2 3 4 5 6
 SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

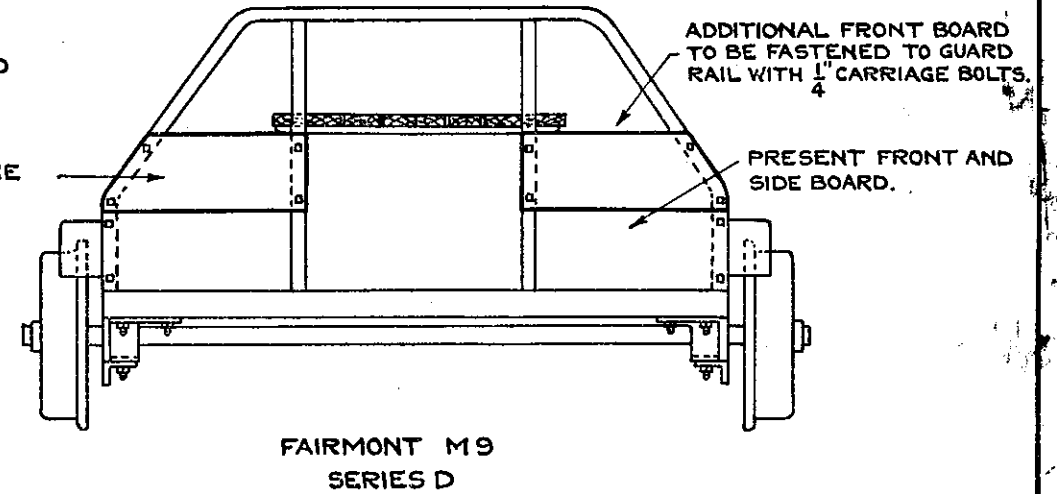
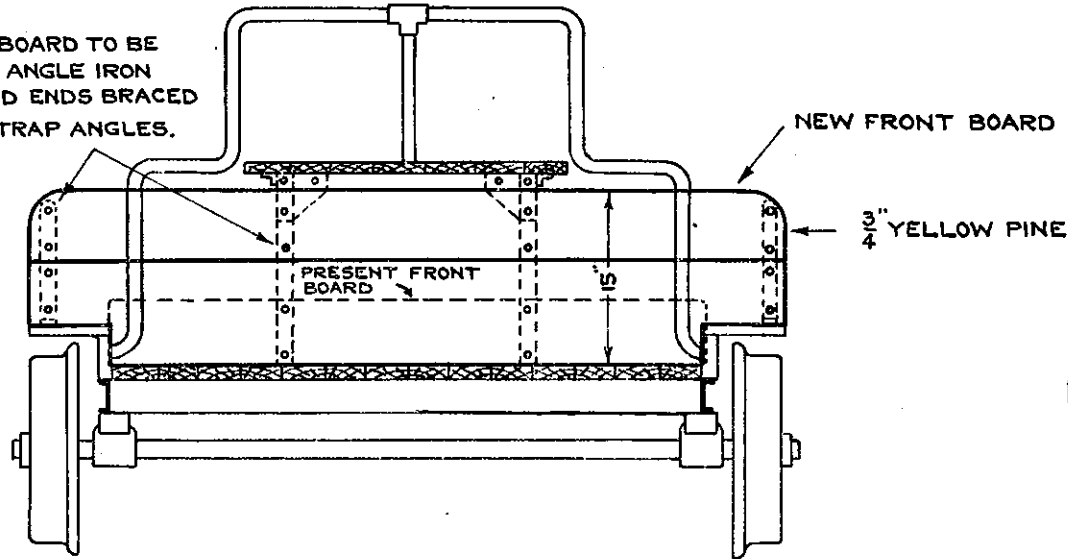
SPLIT SOIL PIPE
 DETAILS

DATED JAN. 27, 1936 REV. JUNE 15, 1953 S-NI5B2

APPROVED FOR
 N.Y.C. WEST OF BUFFALO
 C.C.C. & ST. L. RY.
 M.C.R.R.

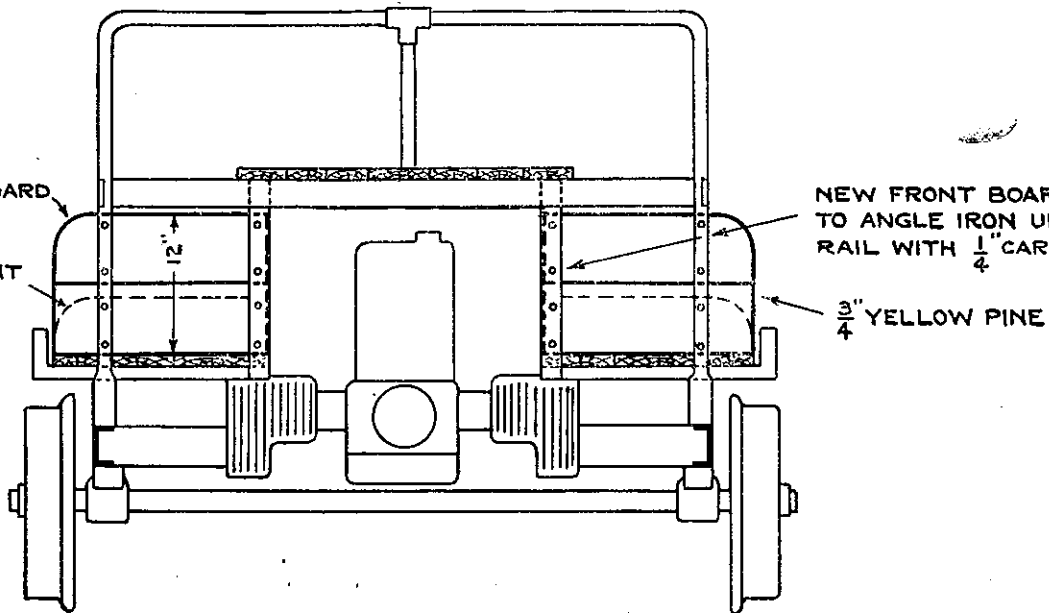

 SIGNAL ENGINEER

NEW FRONT BOARD TO BE FASTENED TO ANGLE IRON UPRIGHTS AND ENDS BRACED WITH $\frac{1}{4}$ " X $\frac{1}{4}$ " STRAP ANGLES.

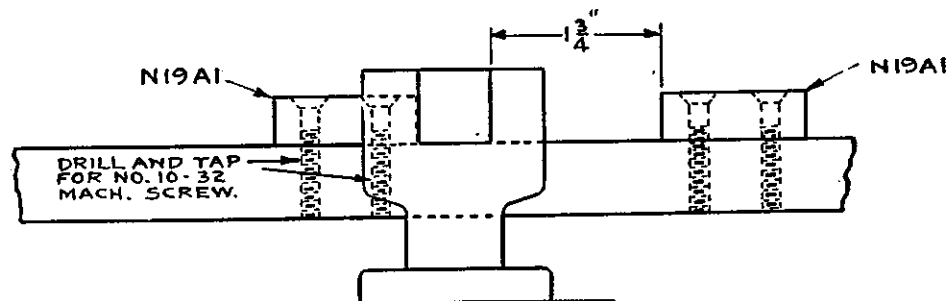
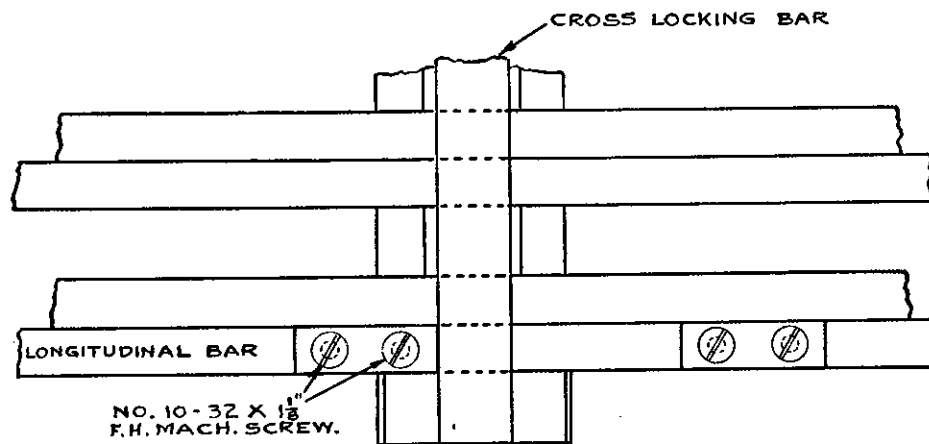


NEW FRONT BOARD

PRESENT FRONT BOARD.

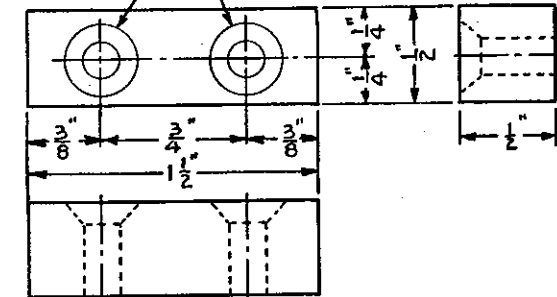


N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
FRONT BOARD FOR MOTOR CAR TOOL TRAY		
DATED APR. 12, 1943.		S-N18A
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. R. Y. M. C. R. R.		<i>W. J. Koscior</i> SIGNAL ENGINEER



APPLICATION OF LOCKING STOP

DRILL AND CSK. FOR NO. 10
F.H. MACH. SCREW.

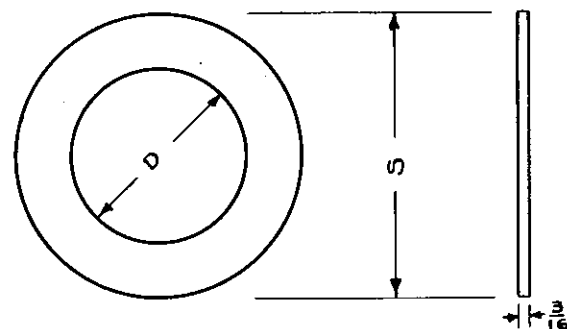
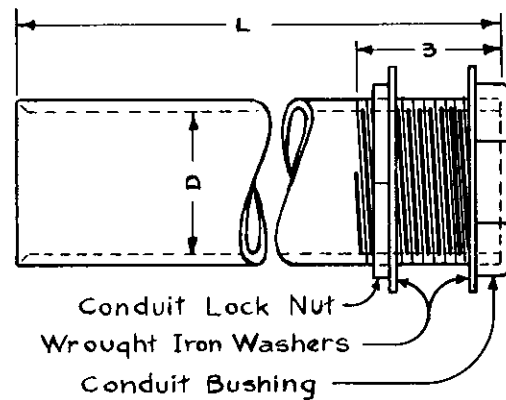


N19A1 LOCKING STOP
COLD DRAWN STEEL

NOTE:
NORMAL AND REVERSE LOCKING STOPS ARE
TO BE PROVIDED ON EACH LONGITUDINAL BAR
AND THE TWO LOCKING STOPS LOCATED AT
THE SAME CROSS LOCKING BAR WHERE
PRACTICABLE.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
LOCKING STOP S. & F. INTERLOCKING MACHINE		
DATED APR. 21, 1943		S-N19A
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. R.Y. M.C.R.R.		<i>J. J. Moran</i> SIGNAL ENGINEER

12-21-43

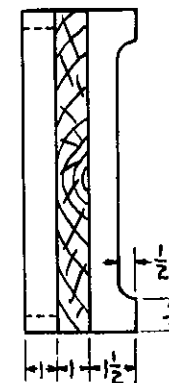
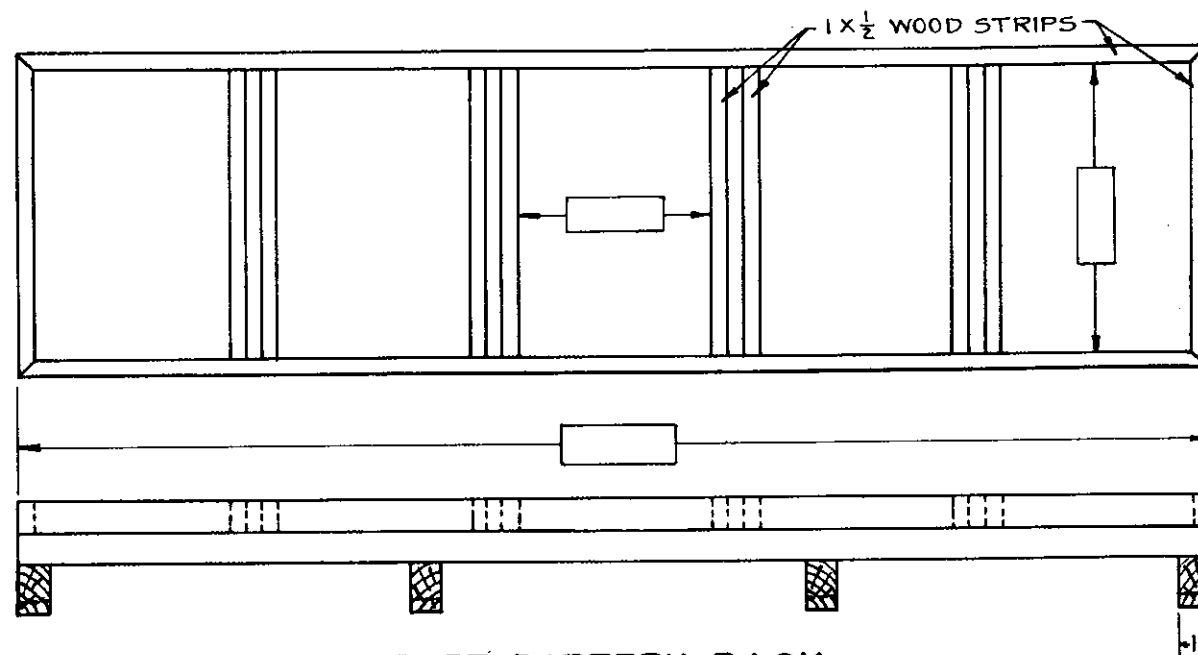


NIPPLES COMPL. With lock nut, bushing and washers			
ORDER NO.	D	L	USE
N20A11	2	10	Between Relay Box and Soil Pipe.
N20A12	3	10	Between Relay Box and Soil Pipe.
N20A13	3	23	Between Relay Box and Ground.
N20A14	4	10	Between Relay Box and Soil Pipe.

WROUGHT IRON WASHERS			
ORDER NO.	D	S	USE
N20A15	2 1/2	5	With Nipple N20A11
N20A16	3 5/8	6	With Nipple N20A12 & N20A13
N20A17	4 5/8	7	With Nipple N20A14

All dimensions given in inches

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
ENTRANCE NIPPLES FOR INSTRUMENT CASE ASSEMBLIES		
DATED JAN. 30, 1953	REV.	S-N20A1
APPROVED FOR: N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		 SIGNAL ENGINEER



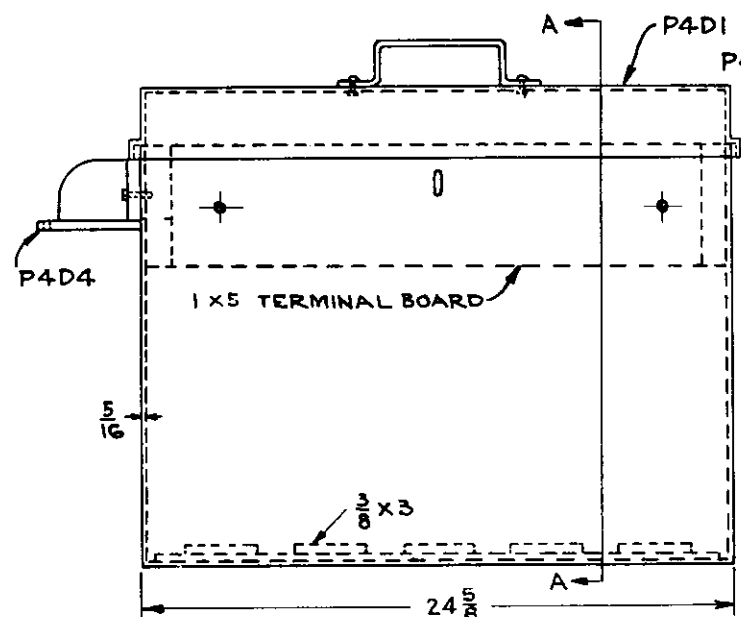
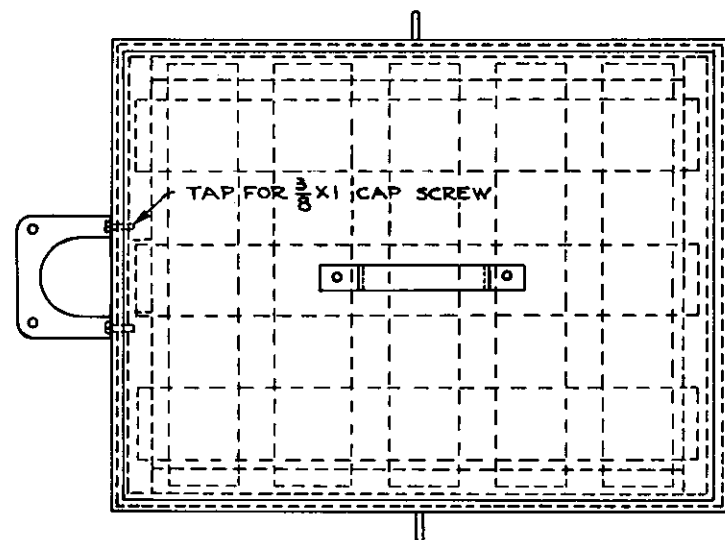
P4B7 BATTERY RACK

NOTES:

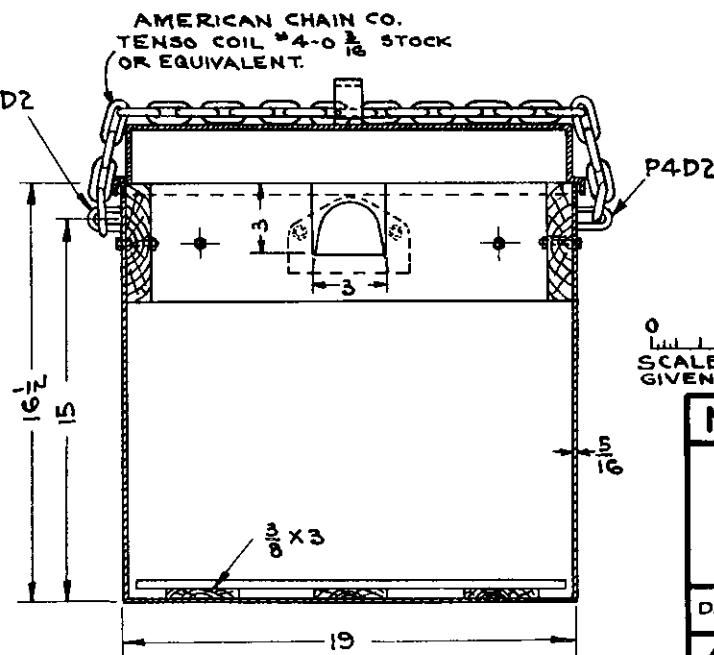
1. BATTERY STAND P4B7 TO BE USED IN PLACE OF SLAT FLOOR SHOWN ON A.R. PLAN 1269 AND SHALL BE MADE TO FIT SIZE, TYPE AND NUMBER OF CELLS IN USE.
2. WHEN BATTERIES ARE SHIPPED IN A CONTAINER WITH TREATED WOOD, CONVERTABLE TOP, THE TOP MAY BE USED AS A STAND (PLACING CROSS CLEATS UNDERNEATH FOR VENTILATION) IN PLACE OF P4B7.
3. WHEN ORDERING BATTERY BOXES SPECIFY "LESS SLAT FLOOR"
4. WHERE SEALED TYPE BATTERY IS USED INSTALL FOUR PURE GUM BATTERY CUSHIONS, 2 IN. O.D. X 1 IN. I.D. X 3/8 IN. THICK, PER CELL.
5. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350

ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
CONCRETE BATTERY BOX DETAILS		
DATED DEC. 16, 1936	REV JUNE 16, 1953	S-P4B2
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		<i>[Signature]</i> SIGNAL ENGINEER



P4C1 BOX COMPLETE
CAST IRON



0 3 6 9 12
SCALE AND ALL DIMENSIONS
GIVEN IN INCHES

NOTES:
BOX SHOULD BE BURIED ABOUT TWO
THIRDS ITS DEPTH EXCEPT AT LOCATIONS
WHERE DRAINAGE CONDITIONS WOULD
PREVENT.

PROTECTIVE TREATMENT TO BE IN
ACCORDANCE WITH INSTRUCTION 350

WIRES SHALL BE FASTENED TO TERMINAL
BOARD WITH PORCELAIN COVERED SCREW
EYES OR TWO PIECE PORCELAIN KNOBS.
NO MORE BOXES TO BE PURCHASED
AFTER PRESENT STOCK IS EXHAUSTED.

STANDARD WEIGHT CAST IRON SOIL
PIPE 20 LONG TO BE OF SIZE REQUIRED
TO HOUSE CABLES.
TOP OF SOIL PIPE TO BE PACKED AND
FILLED FLUSH WITH COMPOUND.

GROUND
LINE

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

BATTERY BOX
CAST IRON
ASSEMBLY

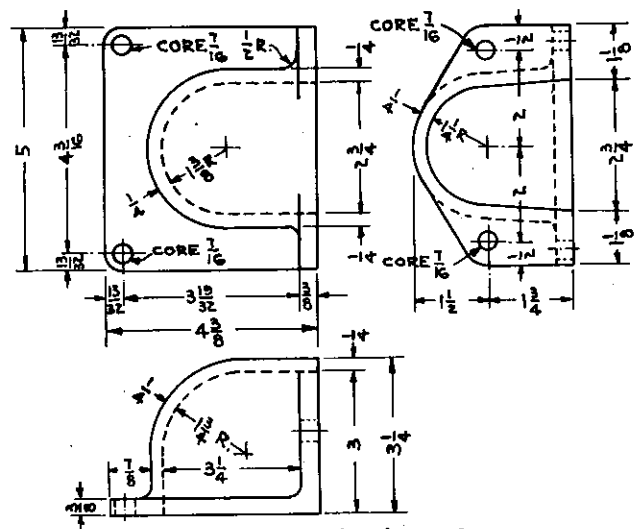
DATED APRIL 14, 1934

REV. JUNE 16, 1953

S-P4C1

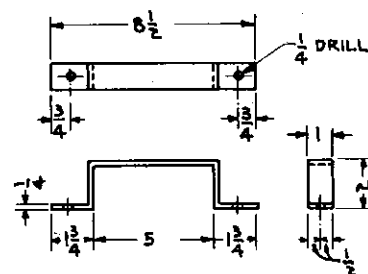
APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C.C. & ST. L. RY.
M.C.R.R.

[Signature]
SIGNAL ENGINEER



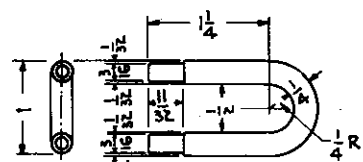
P4D4 CAP
CAST IRON
PAT. 3523

SCALE: ②



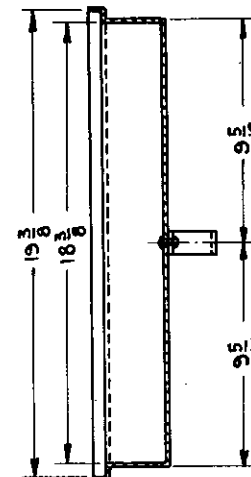
P4D3 HANDLE
STRAP IRON

SCALE: ①

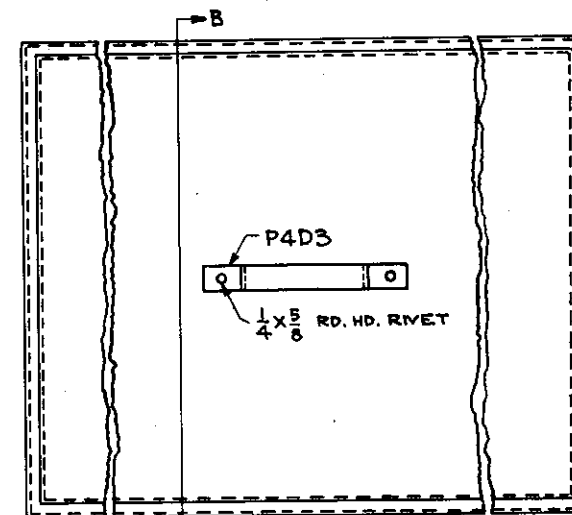


P4D2 STAPLE
O. H. STEEL

SCALE: ③



SECTION B-B



P4D1 COVER
1/8 SHEET STEEL

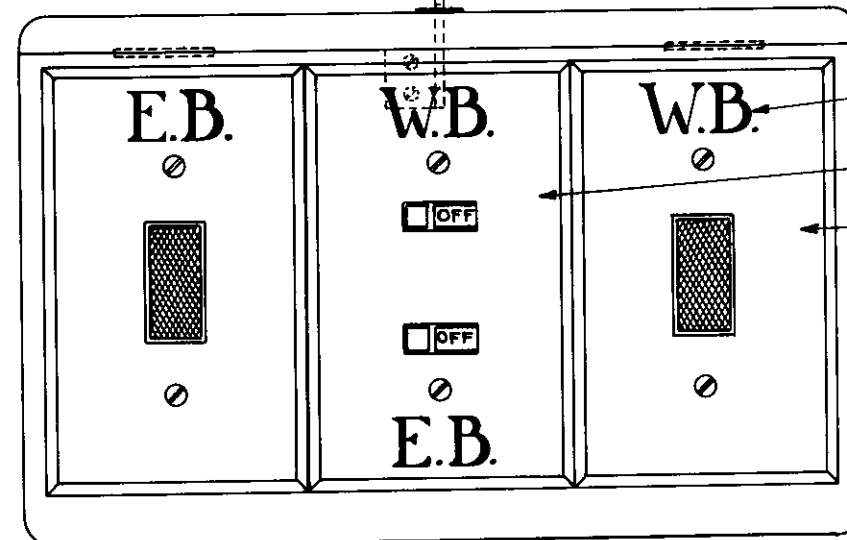
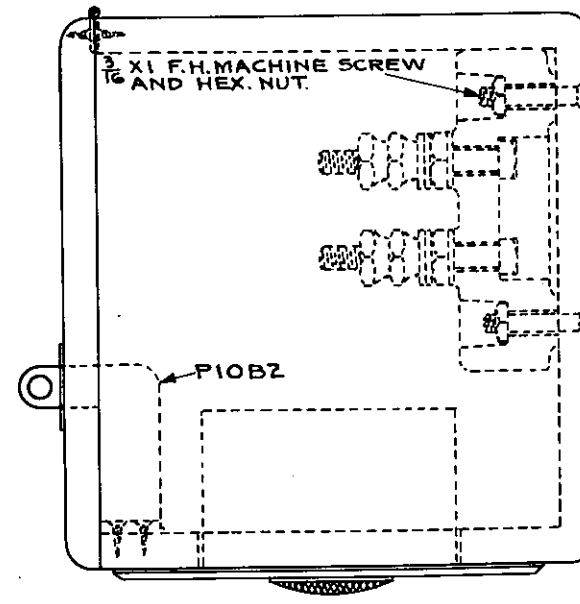
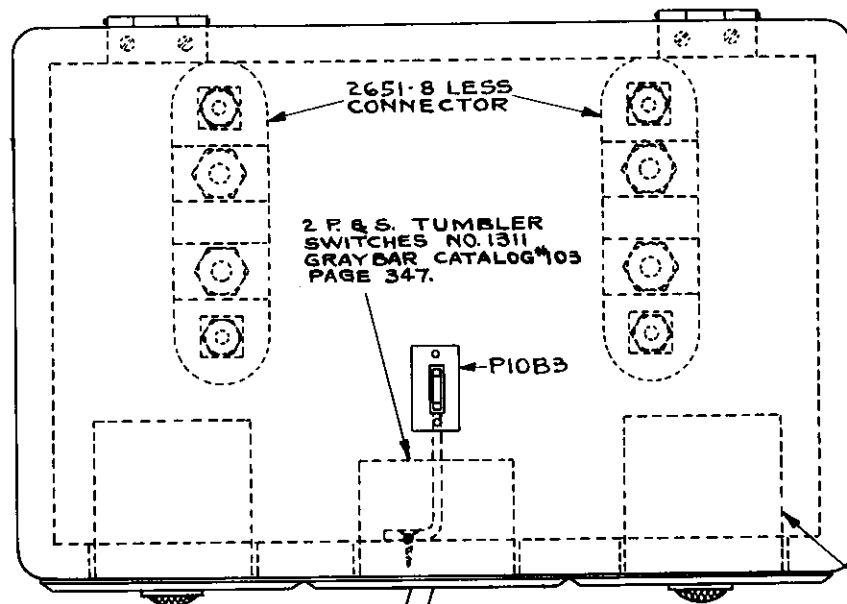
SCALE: ①



NOTE: PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350

SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
BATTERY BOX CAST IRON DETAILS		
DATED APRIL 14, 1934	REV. JUNE 16, 1953	S-P4D1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



PI0A1 CONTROL BOX COMPLETE

BRYANT BULLS EYE FLUSH RECEPTACLE #427 GRAYBAR CATALOG #103 PAGE 313 OR EQUIVALENT. MODIFIED TO TAKE 6-8 VOLT 15 C.P. LAMP AND EQUIPPED WITH S.C.B. BASE.

1/2 BLACK LETTERS TO BE PAINTED ON PLATES.

F & S. 2 LEVER PLATE NO. 1881B GRAYBAR CATALOG #103 PAGE 349. OR EQUIVALENT.

BRYANT FLUSH PLATE "5" GRAYBAR CATALOG #100, PAGE 304. WITH RECTANGULAR YELLOW BULLS EYE NO. 746 GRAYBAR CATALOG #103 PAGE 347.

PI0B1

SPECIFICATIONS

COLOR LIGHT TRAIN ORDER LAMPS FOR TRAIN ORDER SIGNAL AT SIGNAL STATIONS.

1. A & W. 1184-B-2 LAMP OR ITS EQUIVALENT EQUIPPED WITH YELLOW LENS AND ANTIPHAN DISC SHALL BE USED.
2. THE ANTIPHAN DISC SHALL BE MADE OF 30 MESH .010 INCH DIAMETER IRON WIRE GALVANIZED. IT SHALL BE 7 INCHES IN DIAMETER AND PLACED BACK OF THE YELLOW LENS.
3. TRAIN ORDER LAMP SHALL BE EQUIPPED WITH 6-8 VOLT 21 C. P. LAMP S.C.B. BASE.
4. TRAIN ORDER SIGNAL LAMP SHALL BE CONNECTED IN SERIES WITH LAMP IN CONTROL BOX ON OPERATORS DESK AND CONTROLLED BY SNAP SWITCH.
5. TRAIN ORDER LAMP SHALL BE MOUNTED PERMANENTLY ON BRACKET FACING THE DIRECTION OF TRAFFIC.
6. TRAIN ORDER LAMPS SHALL OPERATE FROM INTERLOCKING "LOCKING BATTERY" THE VOLTAGE BEING ADJUSTED THROUGH A RESISTANCE UNIT.
7. CONTROL BOX TO BE MOUNTED ON TOP OF ANNUNCIATOR BOX WHERE USED.

0 1 2 3 4
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

COLOR LIGHT (YELLOW) TRAIN
ORDER SIGNAL CONTROL BOX

ASSEMBLY
DEC. 17, 1934.

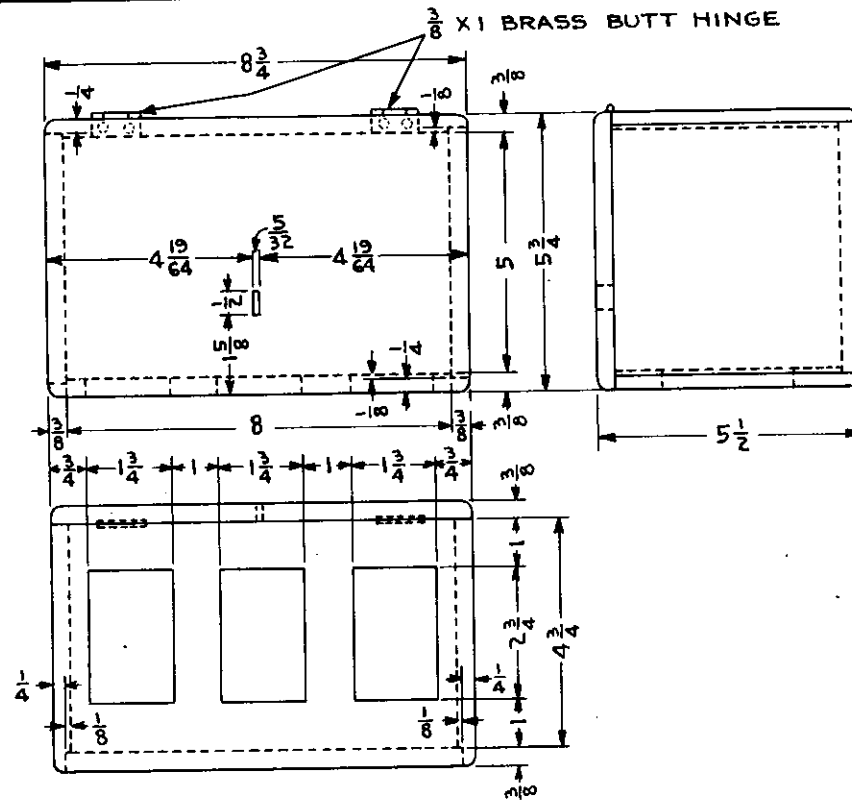
DATED DEC 17, 1934

REV. JUNE 17, 1953

S-PI0A2

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C. C. & ST. L. RY.
M. C. R. R.

McGowan
SIGNAL ENGINEER

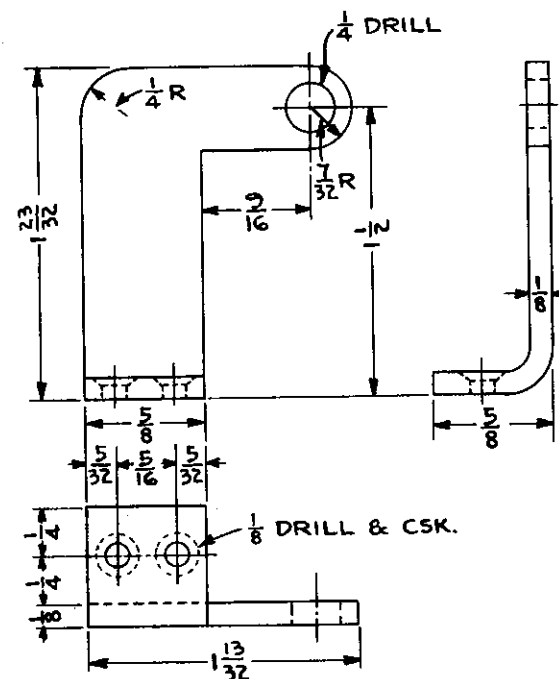


PI0BI CONTROL BOX

SCALE: ②

NOTES:

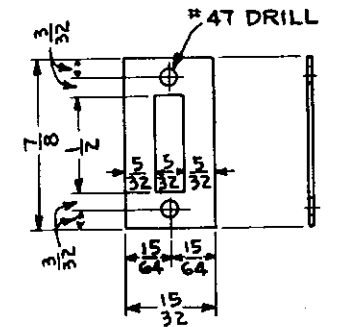
BOX TO BE GLUED TOGETHER AND
FINISHED WITH TWO COATS OF VARNISH.
CONTROL BOX TO BE MADE OF OAK



PI0B2 HASP

BRASS

SCALE: ①



PI0B3 HASP PLATE

BRASS
#20 A.W.G.

SCALE: ①

①

FULL SIZE

②

0 3 6 9 12

SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. SIGNAL DEPT CLEVELAND, O.

COLOR LIGHT (YELLOW) TRAIN
ORDER SIGNAL CONTROL BOX
DETAILS

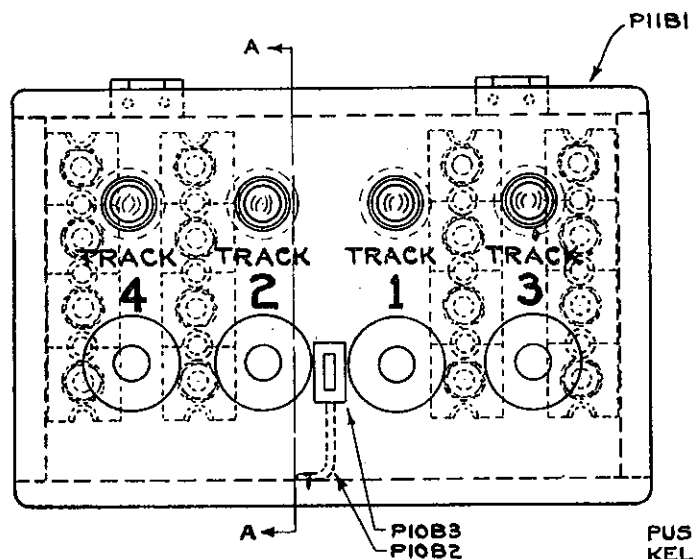
DATED DEC. 17, 1934

REV. JUNE 17, 1953

S-PI0BI

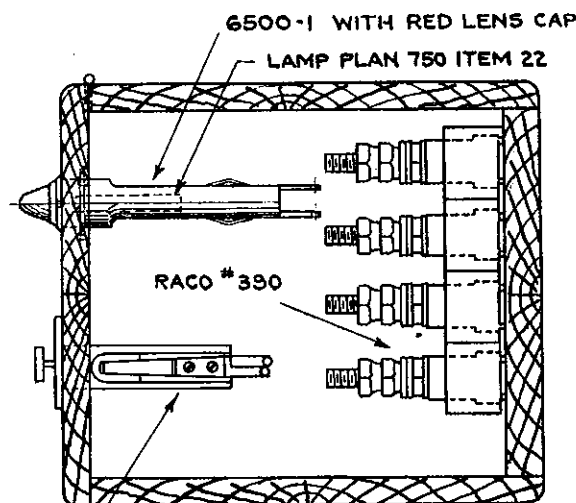
APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. R. Y.
M. C. R. R.

J. H. Mason
SIGNAL ENGINEER



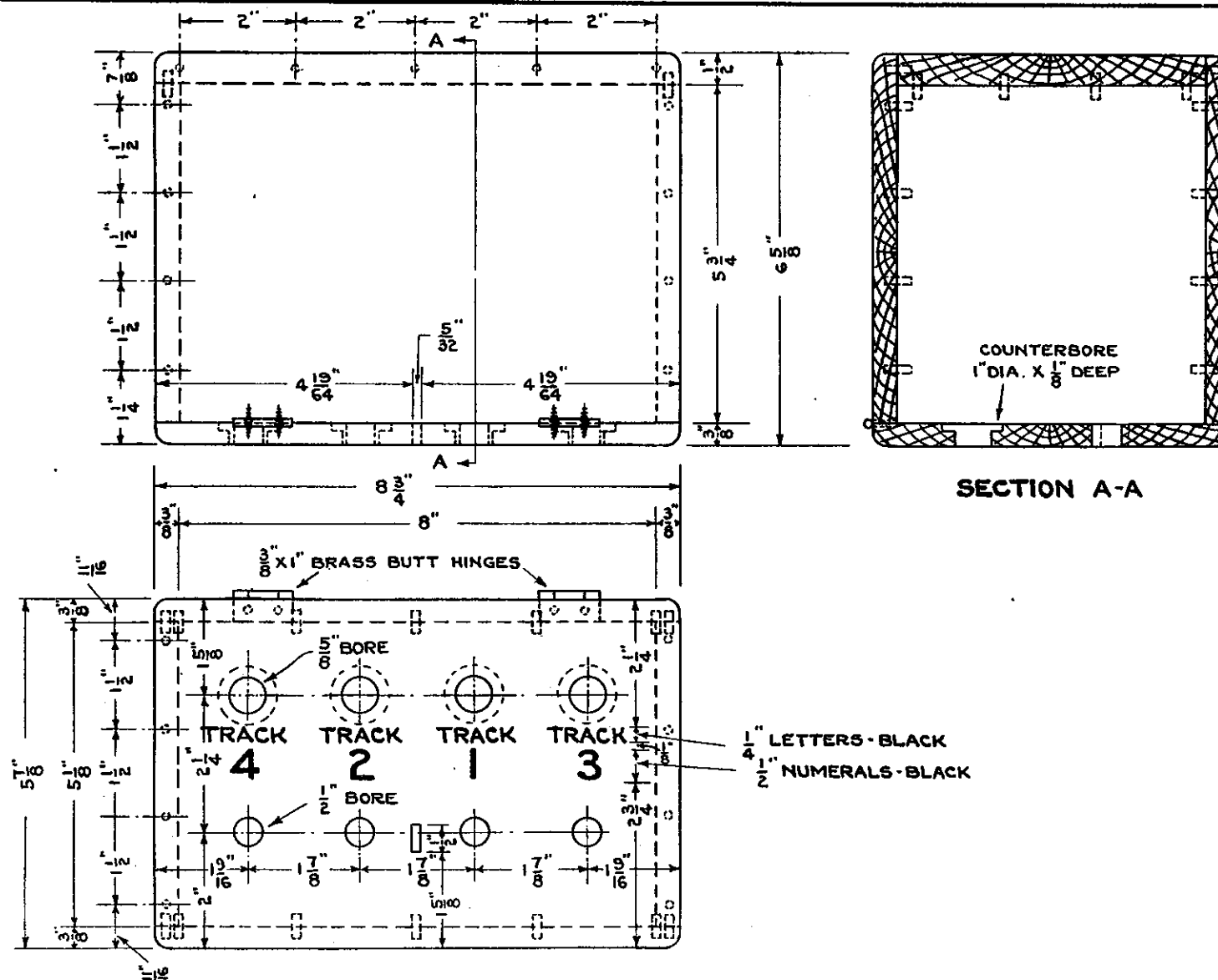
PIIAI-ANNUNCIATOR BOX COMPLETE

PUSH BUTTON #172
KELLOGG CAT. OR
EQUIVALENT.



SECTION A-A

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
4 TRACK ANNUNCIATOR BOX ASSEMBLY		
DATED JUNE 20, 1935	REV. SEPT. 2, 1942	S-PIIAI
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER



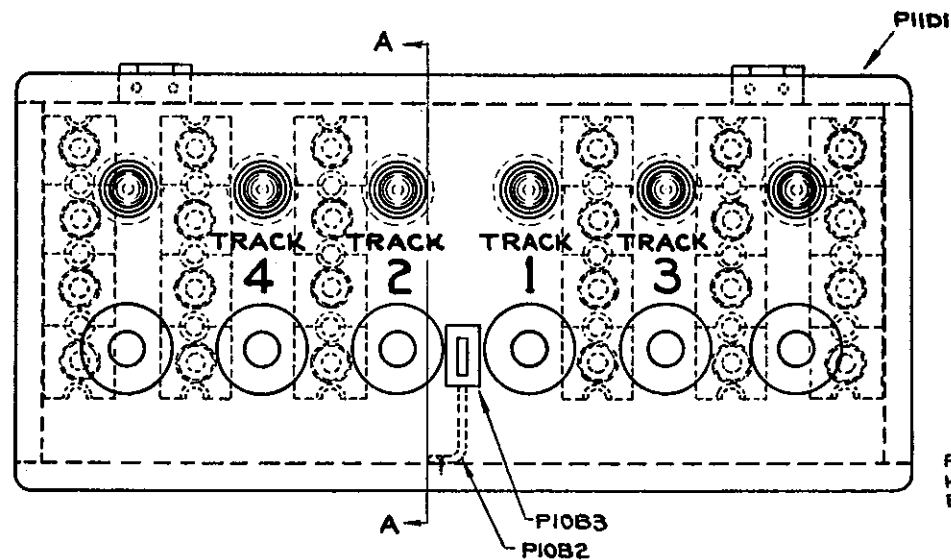
SECTION A-A

NOTE:

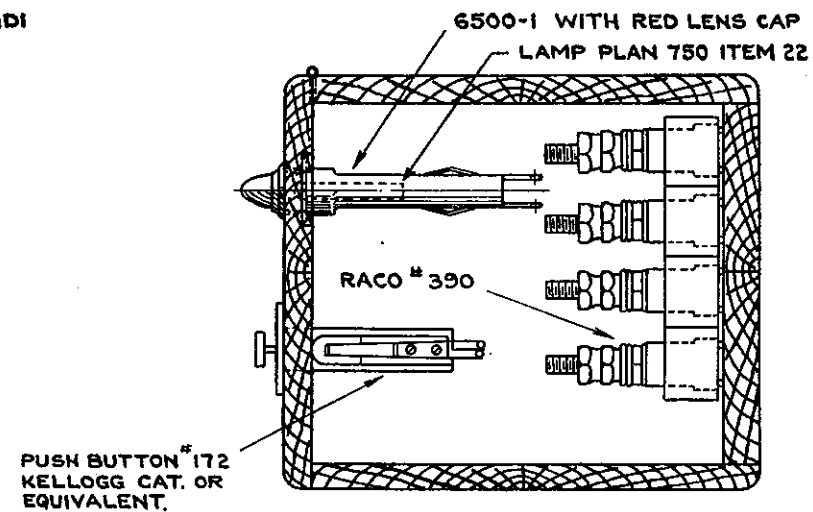
BOX TO BE GLUED AND DOWELLED TOGETHER
AND FINISHED WITH TWO COATS OF VARNISH.

PIIBI-ANNUNCIATOR BOX
OAK

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
4 TRACK ANNUNCIATOR BOX DETAILS		
DATED JUNE 20, 1935	REV. SEPT. 4, 1942.	S-PIIBI
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>[Signature]</i> SIGNAL ENGINEER

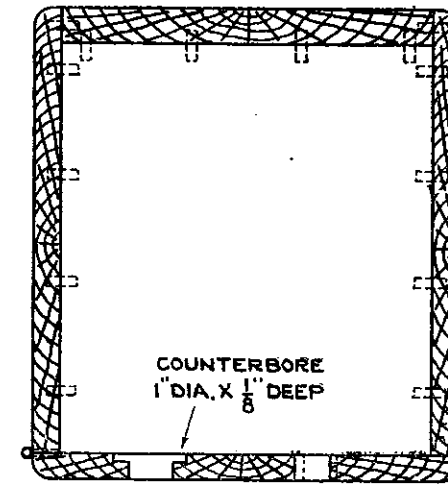


P11C1-ANNUNCIATOR BOX COMPLETE



SECTION A-A

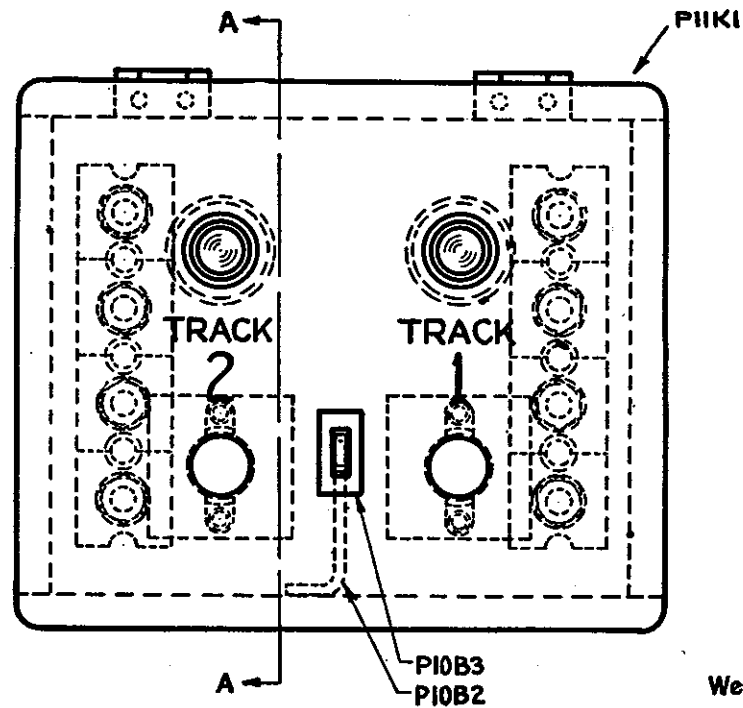
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
6 TRACK ANNUNCIATOR BOX ASSEMBLY		
DATED JUNE 20 1935	REV. SEPT. 4, 1942.	S-P11C1
APPROVED FOR N. Y. C. WEST OF BUFFALO C. C. & ST. L. RY. M. C. R. R.		<i>J. J. Conner</i> SIGNAL ENGINEER



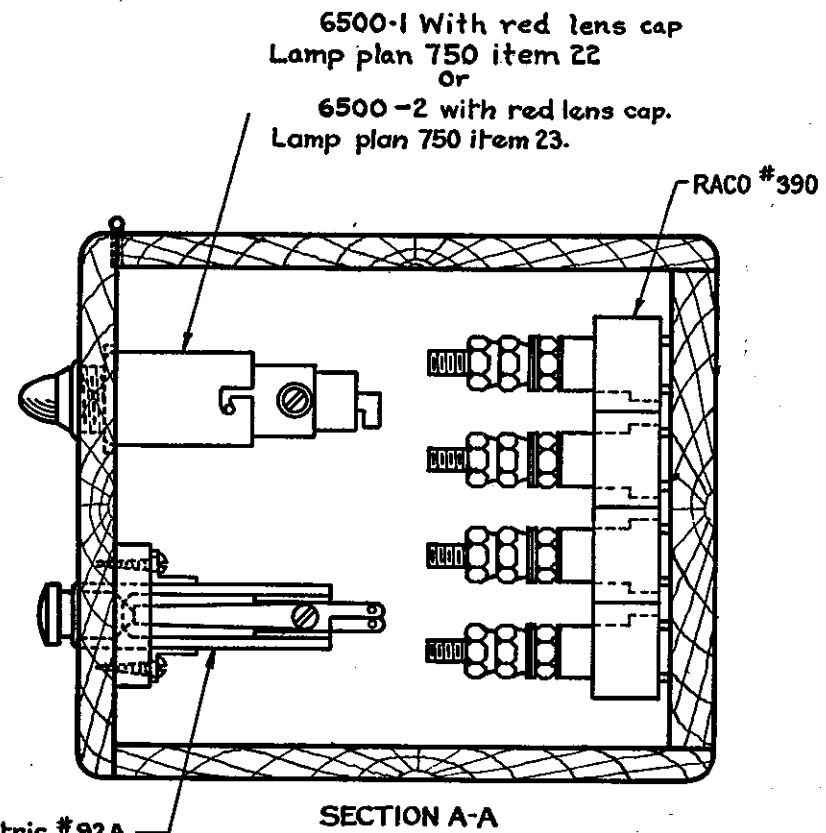
BOX TO BE GLUED AND DOWELLED TOGETHER
AND FINISHED WITH TWO COATS OF VARNISH.

$\frac{1}{2}$ " NUMERALS - BLACK

SIGNAL ENGINEER

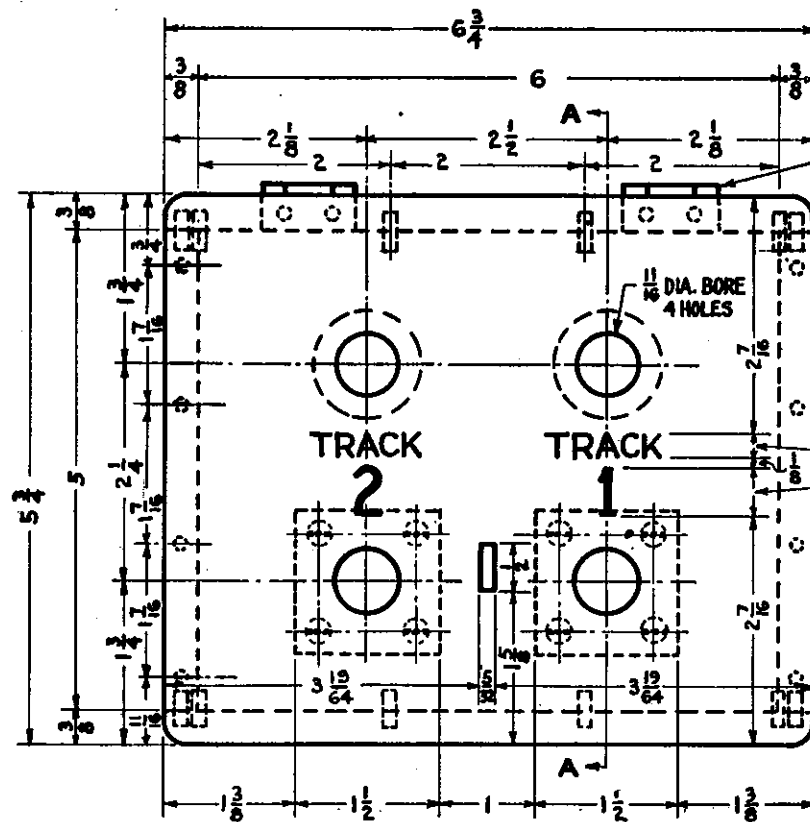


PIIJI-ANNUNCIATOR BOX COMPLETE



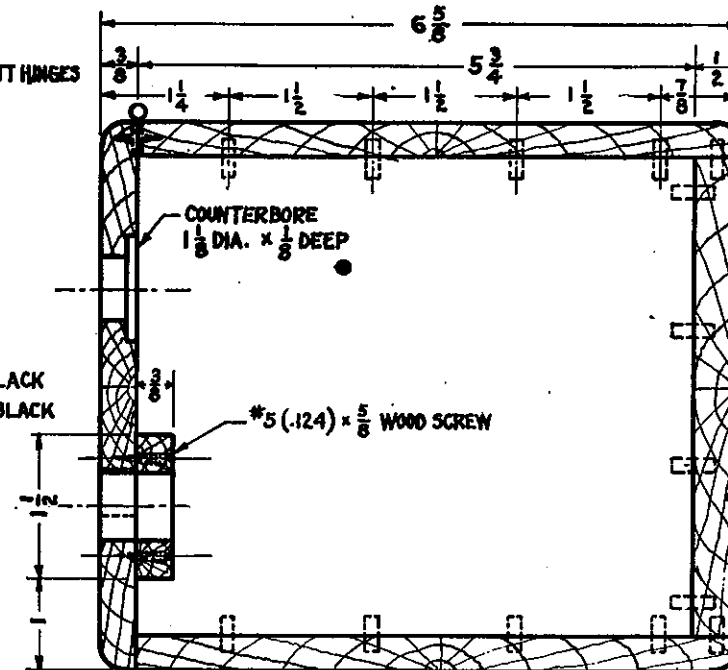
Western Electric #92A
Or
#172 Kellogg Cat.

N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.
2 Track Annunciator Box ASSEMBLY		
DATED MAY 13, 1944	REV.	S-PII J
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		<i>J. J. Conner</i> SIGNAL ENGINEER



3/8 x 1 BRASS BUTT HINGES

1/2 LETTERS - BLACK
1/2 NUMERALS - BLACK



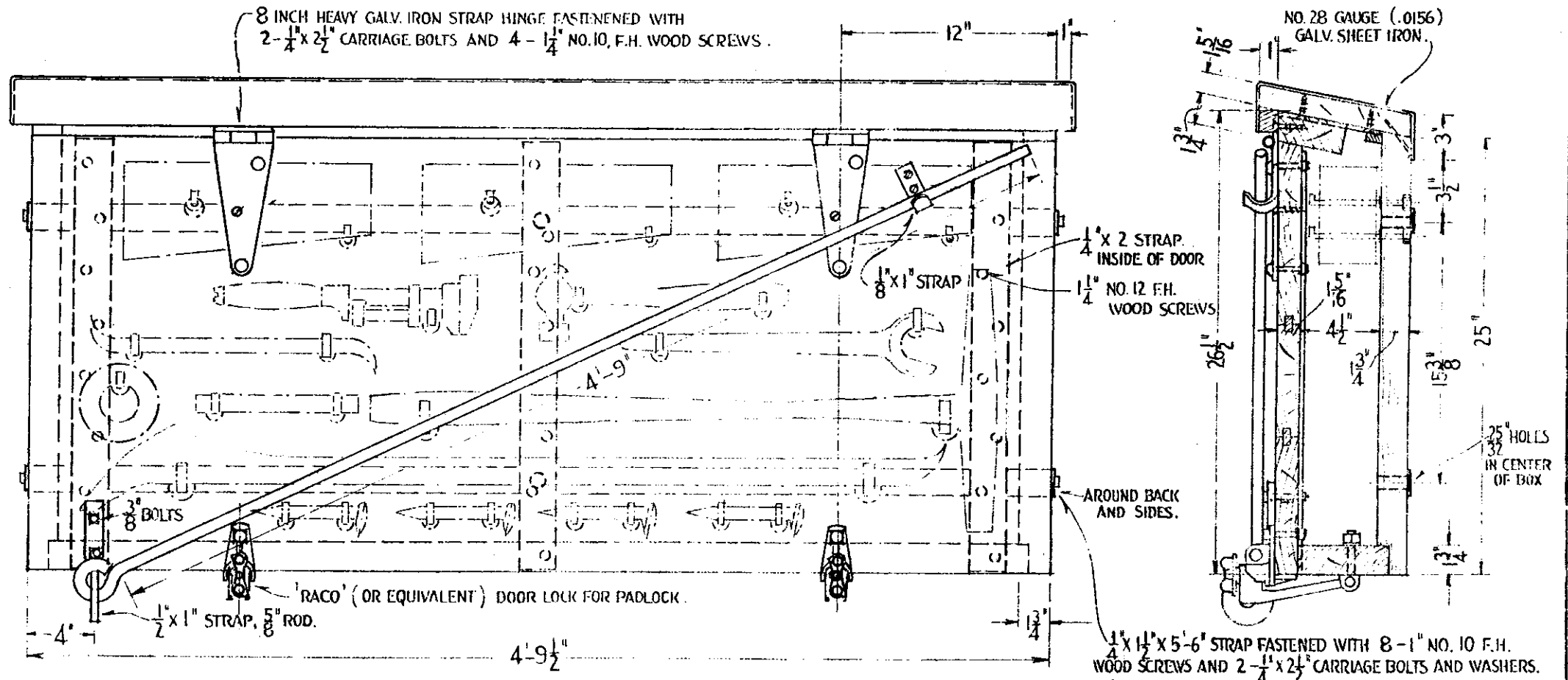
SECTION A-A

PIKI-ANNUNCIATOR BOX

NOTE:

All dimensions shown in inches.
Box shall be constructed of oak, glued
and doweled together and finished
with two coats of varnish.

N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.
2 Track Annunciator Box DETAILS		
DATED MAY 13, 1944	REV.	S-PIIK
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		
 SIGNAL ENGINEER		



PI2AI-HOUSING WITHOUT EQUIPMENT.

NOTE: BOX SHALL BE CONSTRUCTED OF THOROUGHLY SEASONED WHITE PINE OR CYPRESS, FREE FROM CHECKS AND LOOSE KNOTS, DRESSED FOUR SIDES AND NAILED WITH BARBED COMMON WIRE NAILS. ALL JOINTS SHALL BE LAID IN AIRPLANE GLUE. KNOTS SHALL BE SHELLACKED BEFORE FIRST COAT OF PAINT IS APPLIED. INTERIOR SHALL BE PAINTED TWO COATS OF GREY PAINT, EXTERIOR TWO COATS OF FORMULA 'F' PAINT. WHEN PAINTING OR SPRAYING MACHINE IS USED, THREE COATS SHALL BE APPLIED. CONTENTS OF BOX SHALL BE PAINTED OR VARNISHED AND ARRANGED AS PER N.Y.C.L. 2000 AND S-N10A.

N. Y. C. R. R.

SIGNAL DEPT.

CLEVELAND, O.

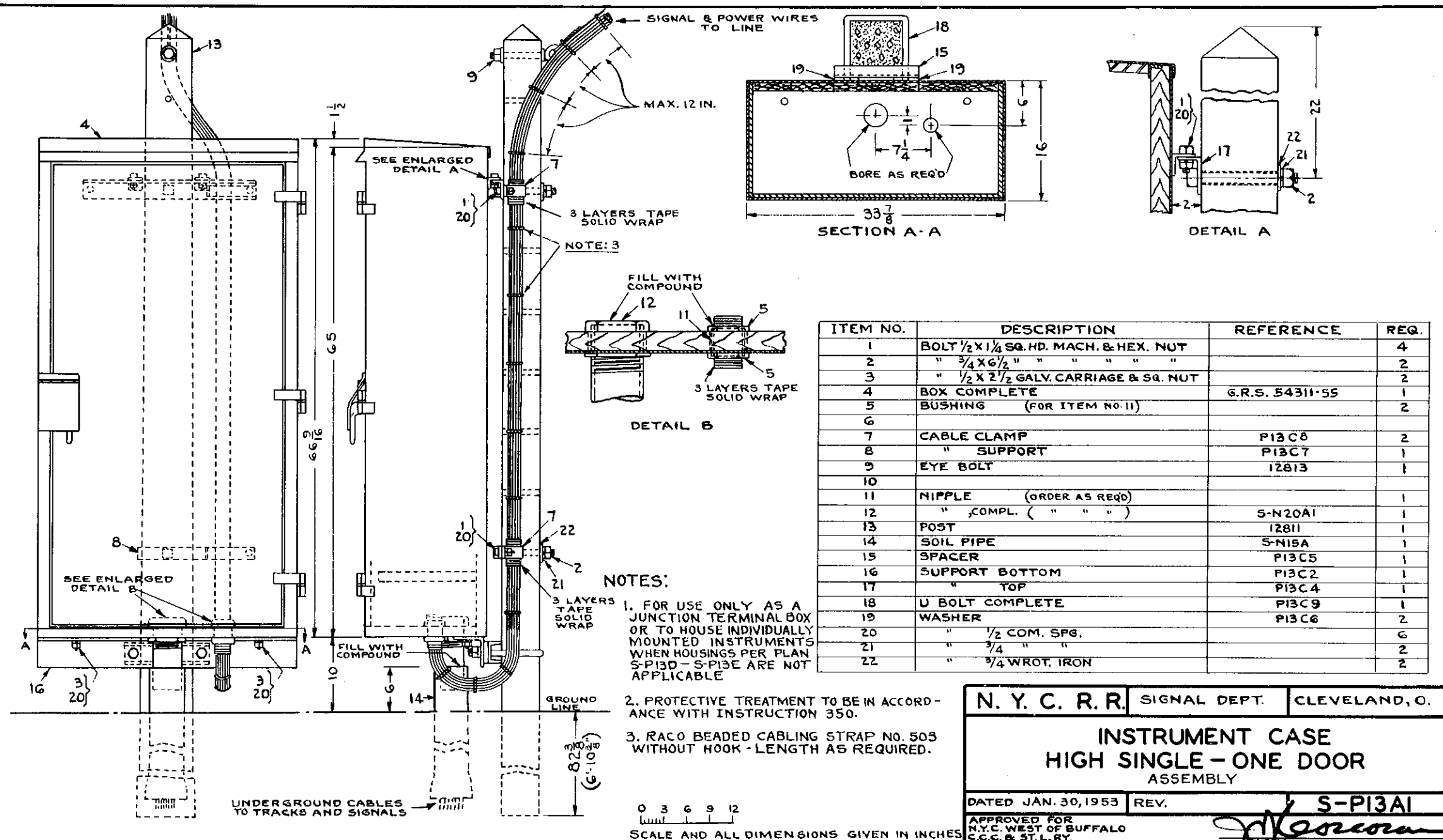
OUTDOOR HOUSING
FOR EMERGENCY TOOLBOARD

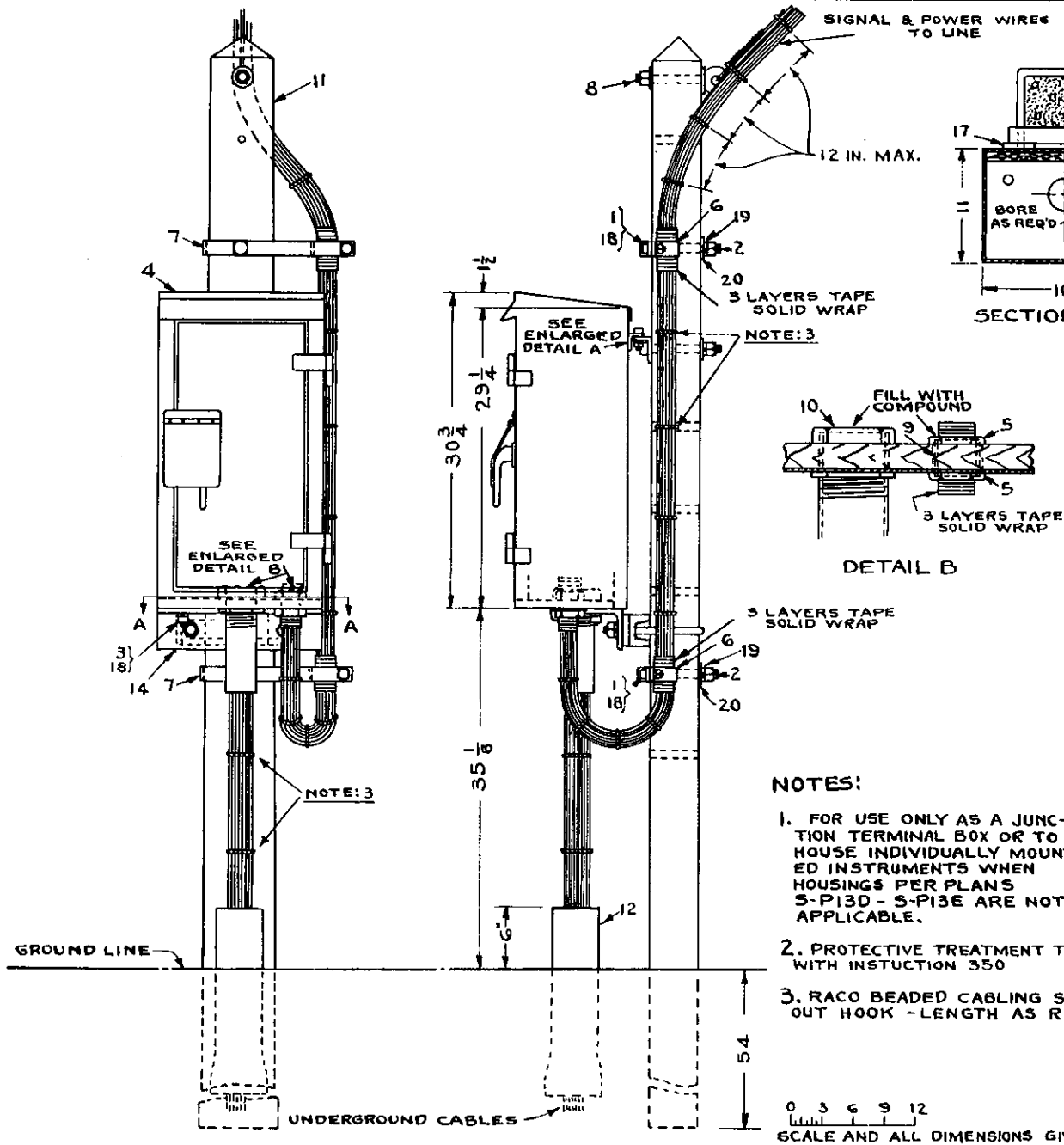
FEB. 7 - 1935

REVISION NO.

S-PI2A

SIGNAL ENGINEER



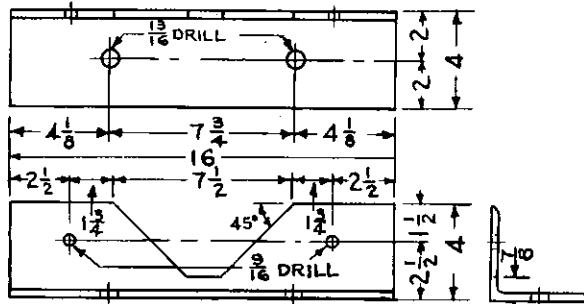


ITEM NO.	DESCRIPTION	REFERENCE	REQ.
1	BOLT 1/2 X 1/4 SQ. HD. MACH. & HEX. NUT		4
2	" 3/4 X 6/2 " " " " " "		3
3	" 1/2 X 1 3/4 GALV. CARRIAGE & SQ. NUT		2
4	BOX COMPLETE	G.R.S. 54311-476R.1	1
5	BUSHING (FOR ITEM NO. 9)		2
6	CABLE CLAMP	P13C8	2
7	" SUPPORT	P13C7	2
8	EYE BOLT	12813	1
9	NIPPLE (ORDER AS REQUIRED)		1
10	NIPPLE COMPL. (" " ")	S-N20A1	1
11	POST	12812	1
12	SOIL PIPE	S-N15A	1
13	SPACER	P13C5	1
14	SUPPORT, BOTTOM	P13C1	1
15	" , TOP	P13C3	1
16	U BOLT COMPLETE	P13C9	1
17	WASHER	P13C6	2
18	" 1/2 COM. SPG.		6
19	" 3/4 " "		3
20	3/4 WROUGHT IRON		3

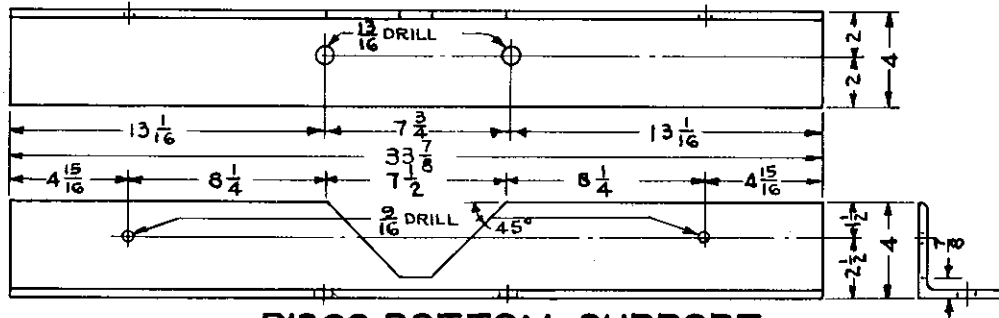
- NOTES:
1. FOR USE ONLY AS A JUNCTION TERMINAL BOX OR TO HOUSE INDIVIDUALLY MOUNTED INSTRUMENTS WHEN HOUSINGS PER PLANS S-P13D - S-P13E ARE NOT APPLICABLE.
 2. PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350
 3. RACO BEADED CABLING STRAP NO. 503 WITHOUT HOOK - LENGTH AS REQUIRED.

0 3 6 9 12
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

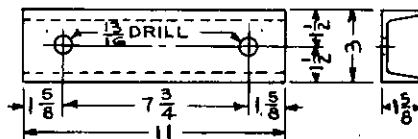
N. Y. C. R. R.		SIGNAL DEPT.	CLEVELAND, O.
TERMINAL CASE LOW SINGLE - ONE DOOR ASSEMBLY			
DATED JAN. 30, 1953		REV.	S-P13BI
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		 SIGNAL ENGINEER	



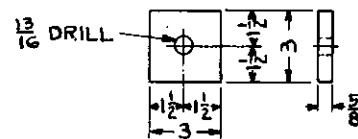
PI3CI BOTTOM SUPPORT
9.8" ANGLE IRON



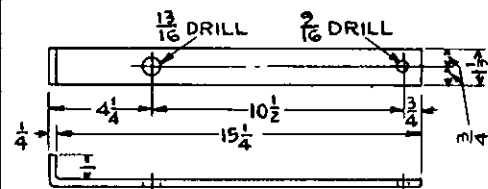
PI3C2 BOTTOM SUPPORT
9.8" ANGLE IRON



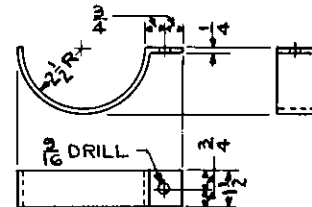
PI3C5 SPACER
6" CHANNEL IRON



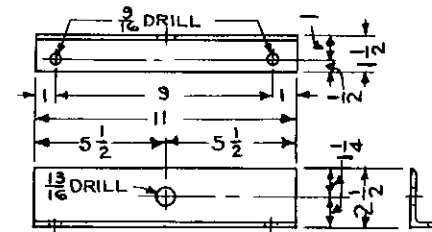
PI3C6 WASHER
O. H. STEEL



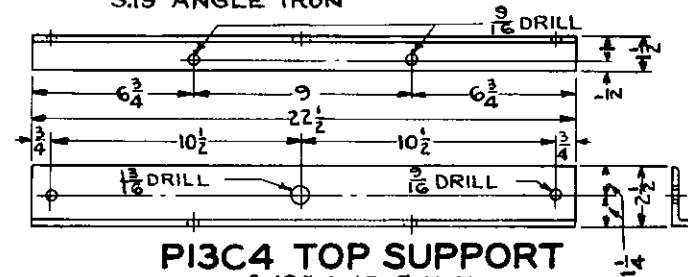
**PI3C7 CABLE SUPPORT
STRAP IRON**



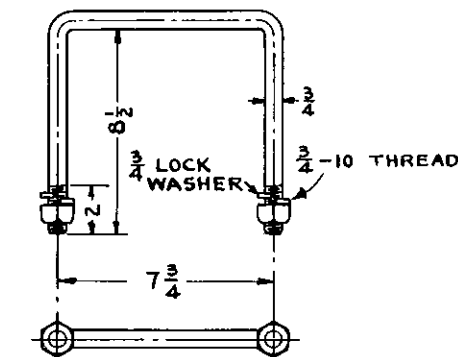
PI3C8 CABLE CLAMP
STRAP IRON



PI3C3 TOP SUPPORT
3.19" ANGLE IRON



PI3C4 TOP SUPPORT
3.19# ANGLE IRON

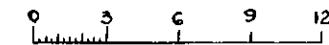


PI3C9 U BOLT
O. H. STEEL

NOTES:

I. EXTERNAL THREADS SHALL BE ASA-UNC-2A WITH
ROUNDED ROOT THROUGHOUT.

2.INTERNAL THREADS SHALL BE ASA-UNC-2B.



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

INSTRUMENT CASE HANGERS

DETAILS

DETAILS

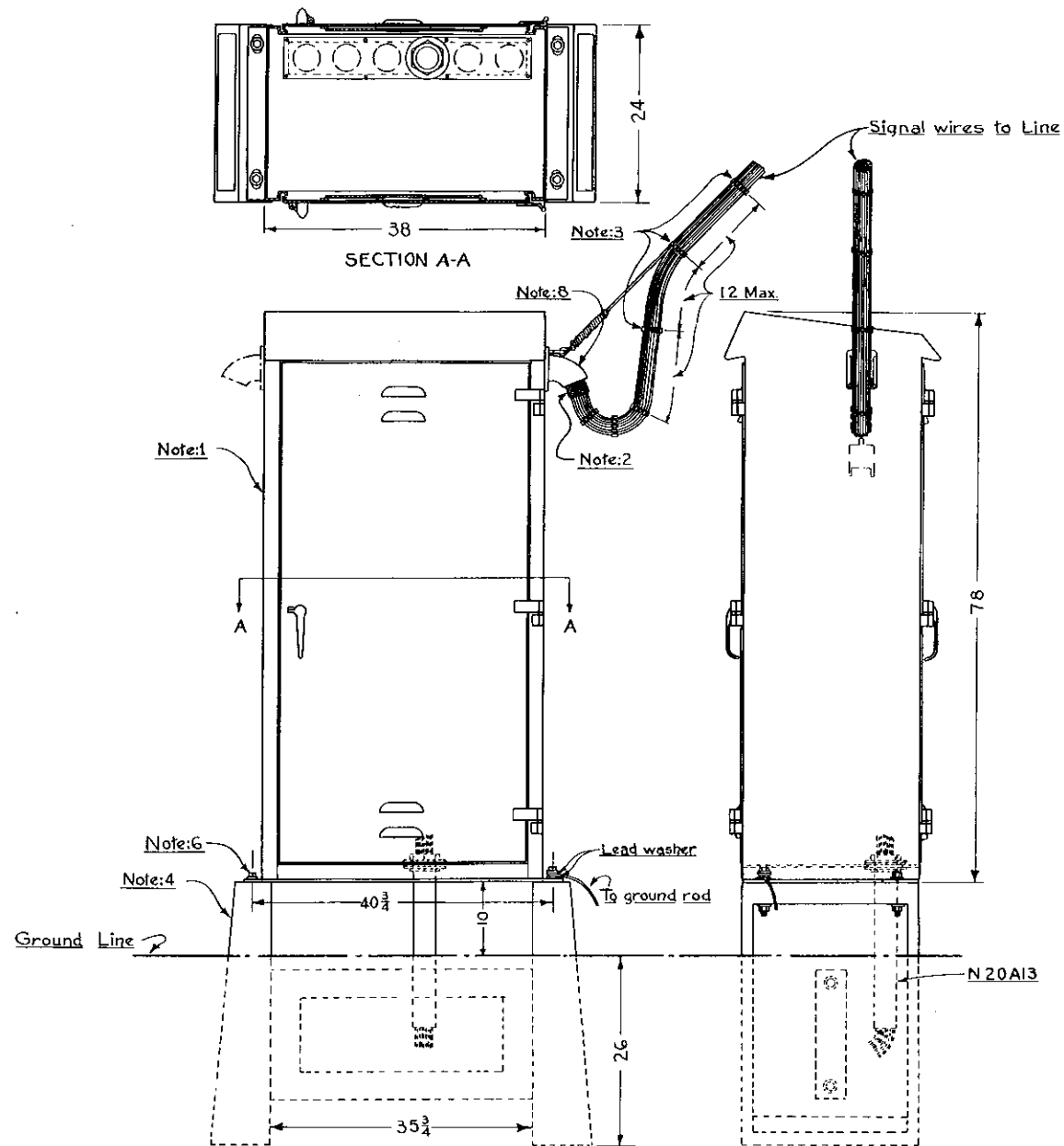
DATED JAN.30,1953

REV. JUNE 10, 1953,

S-PI3C2

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY.
M.C.R.R.

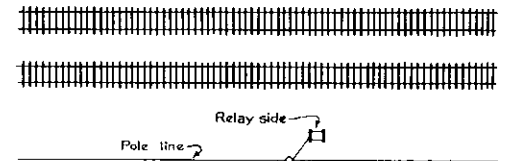
SIGNAL ENGINEER



NOTES:

1. G.R.S. Co Plan 58271-2 or equivalent.
2. Signal wires through case outlet to be wrapped with tape.
3. Raco Beaded Cabling Strap No. 503 without hook - length as req'd.
4. Permacrete Foundation BP-5-N.
5. Protective treatment to be in accordance with Instruction 350
6. Foundation bolts and nuts to be treated per Instruction 325 Item 20.
7. Relay case to be located with relay side parallel and adjacent to track.
8. One cable entrance coupling and ground post furnished with each case. Additional couplings must be ordered if required
Specify size: $3\frac{1}{4} \times 3\frac{1}{4}$ opening-G.R.S. Co. Ref. 58276 Gr.1
 2×2 " " " " 58276 Gr.2

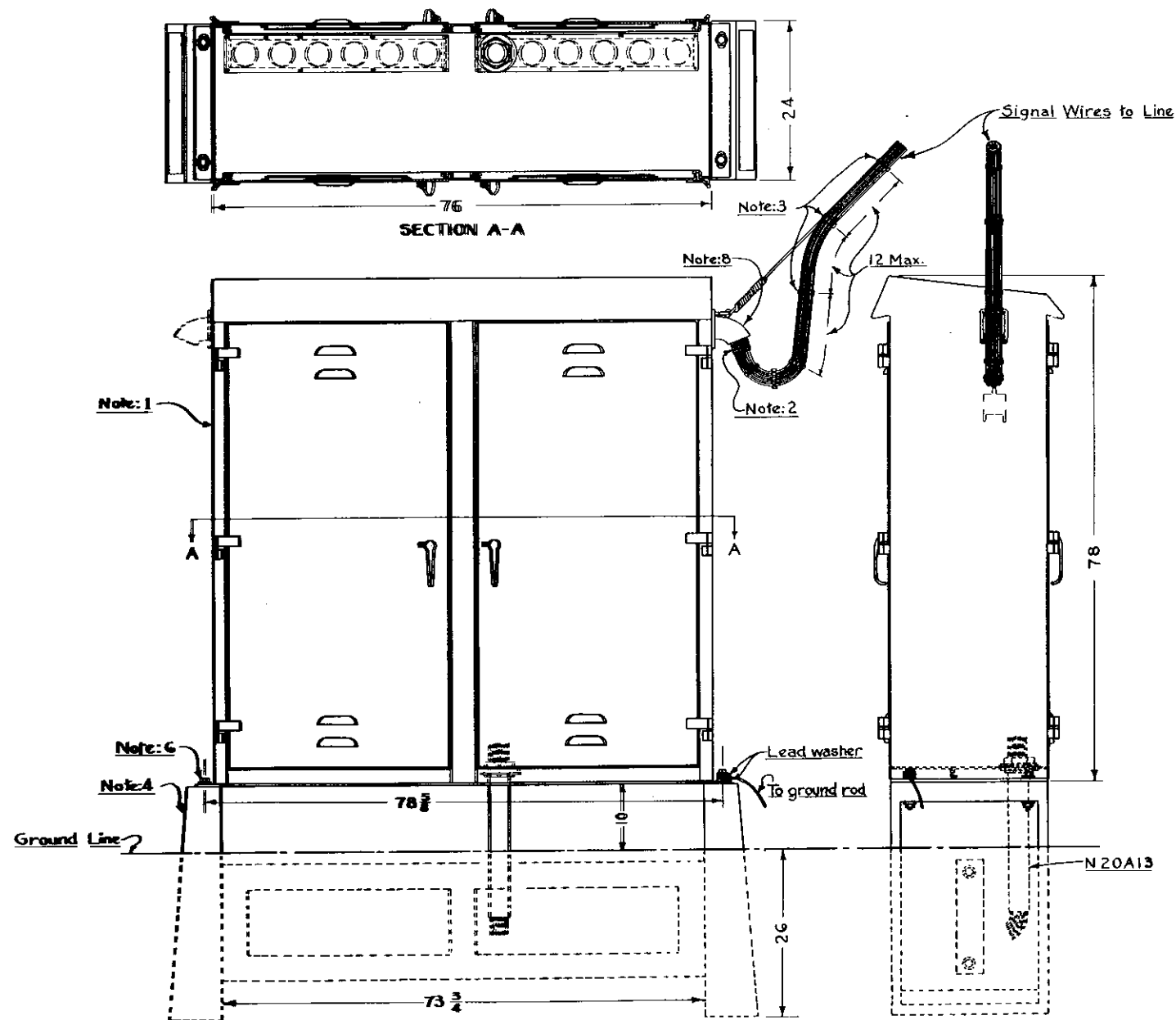
LOCATION PLAN



0 3 6 9 12

Scale and all dimensions given in inches

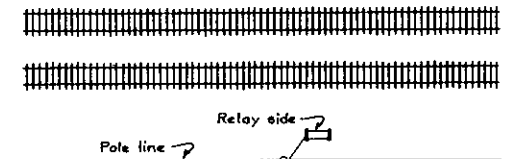
NY.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.
INSTRUMENT CASE HIGH SINGLE — FRONT AND BACK DOORS ASSEMBLY		
DATED DEC. 8, 1952	REV. APRIL 14, 1953	S-P13D2
APPROVED FOR N.Y.C.R.R. WEST OF BUFFALO C.C.C. & ST. L. RY. M.C.R.R.		 SIGNAL ENGINEER



NOTES:

1. G.R.S. Co. Plan 58271-3 or equivalent.
2. Signal wires through case outlet to be wrapped with tape.
3. Raco Beaded Cabling Strap No 503 without hook-length as req'd.
4. Permacrete Foundation BP-5-0.
5. Protective treatment to be in accordance with Instruction 350
6. Foundation bolts and nuts to be treated per Instruction 325 Item 20.
7. Relay Case to be located with relay side parallel and adjacent to track.
8. One cable entrance coupling and ground post furnished with each case. Additional couplings must be ordered if required.
Specify size: 3 1/2 x 3 1/2 opening-G.R.S. Co. Ref. 58276 Gr. 1
2 x 2 " " " " 58276 Gr. 2

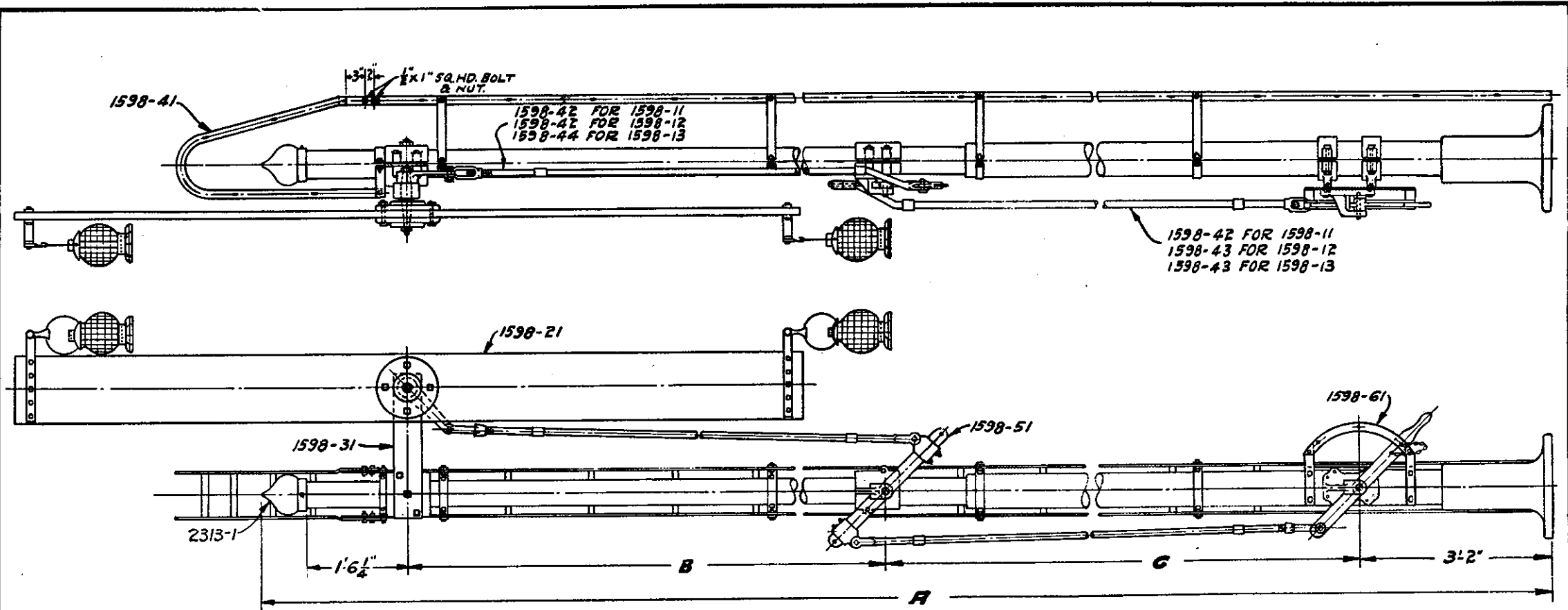
LOCATION PLAN



0 3 6 9 12

Scale and all dimensions given in inches.

N.Y.C.R.R.	SIGNAL DEPT.	CLEVELAND, O.
INSTRUMENT CASE HIGH DOUBLE — FRONT AND BACK DOORS ASSEMBLY		
DATED DEC. 8, 1952	REV. APRIL 14, 1953	S-P13E2
APPROVED FOR N.Y.C.R.R. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		 SIGNAL ENGINEER



REF. NO.	POLE NO.	LADDER NO.	A	B	C
1598-11	R.S.R. 103514	R.S.R. 135710	25'-8 1/2"	10'-2"	10'-2"
1598-12	R.S.R. 103515	R.S.R. 135711	32'-8 1/2"	10'-2"	17'-2"
1598-13	R.S.R. 103516	R.S.R. 135712	38'-8 1/2"	16'-2"	17'-2"

SCALE: 1/2" = 1 FT.

N. Y. C. R. R.
WEST OF BUFFALO.

SIGNAL DEPT.

CLEVELAND, O.

POLE TARGET ASSEMBLY

APRIL 6, 1923.

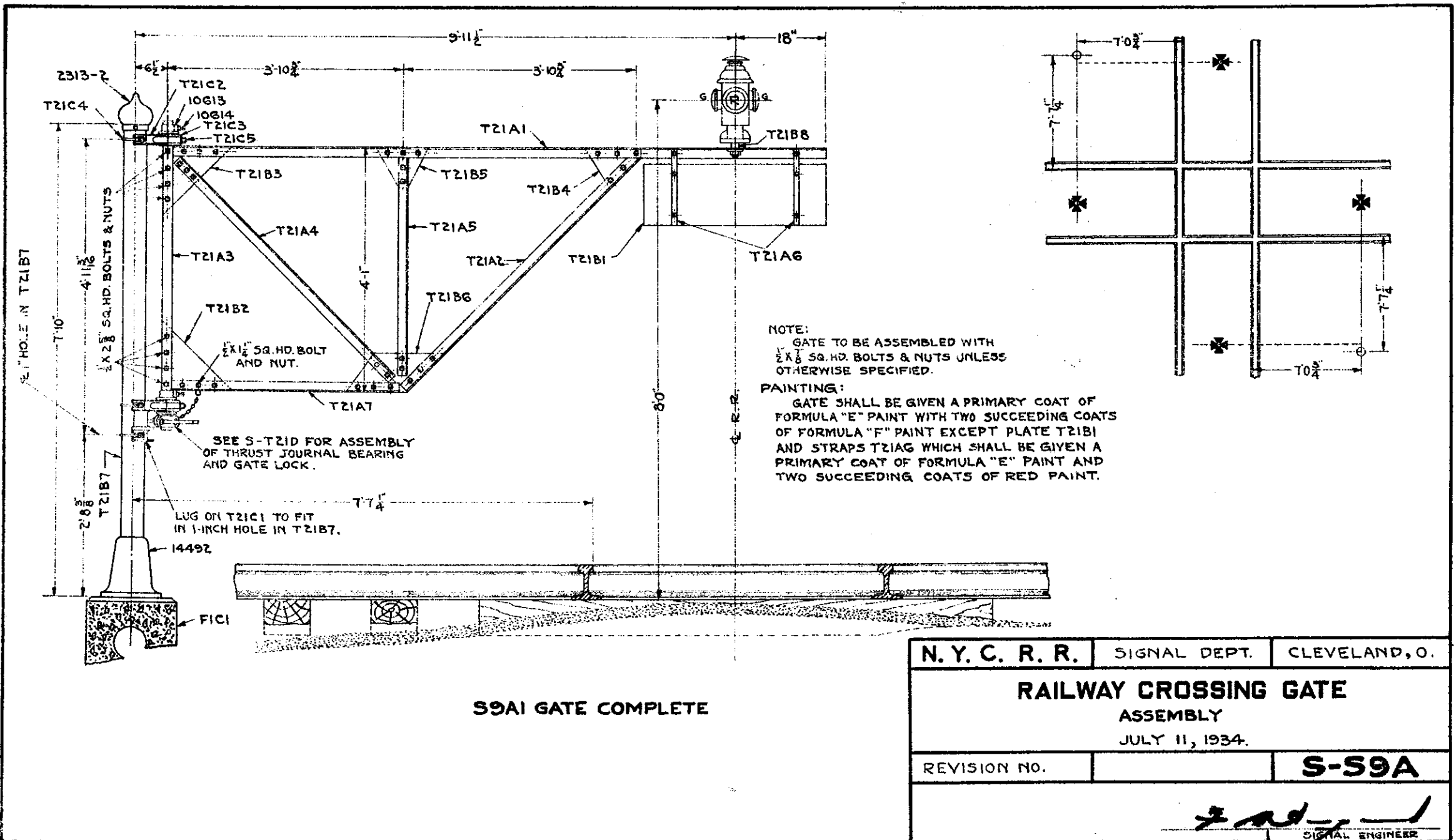
REVISION NO. 2

MARCH 23, 1932.

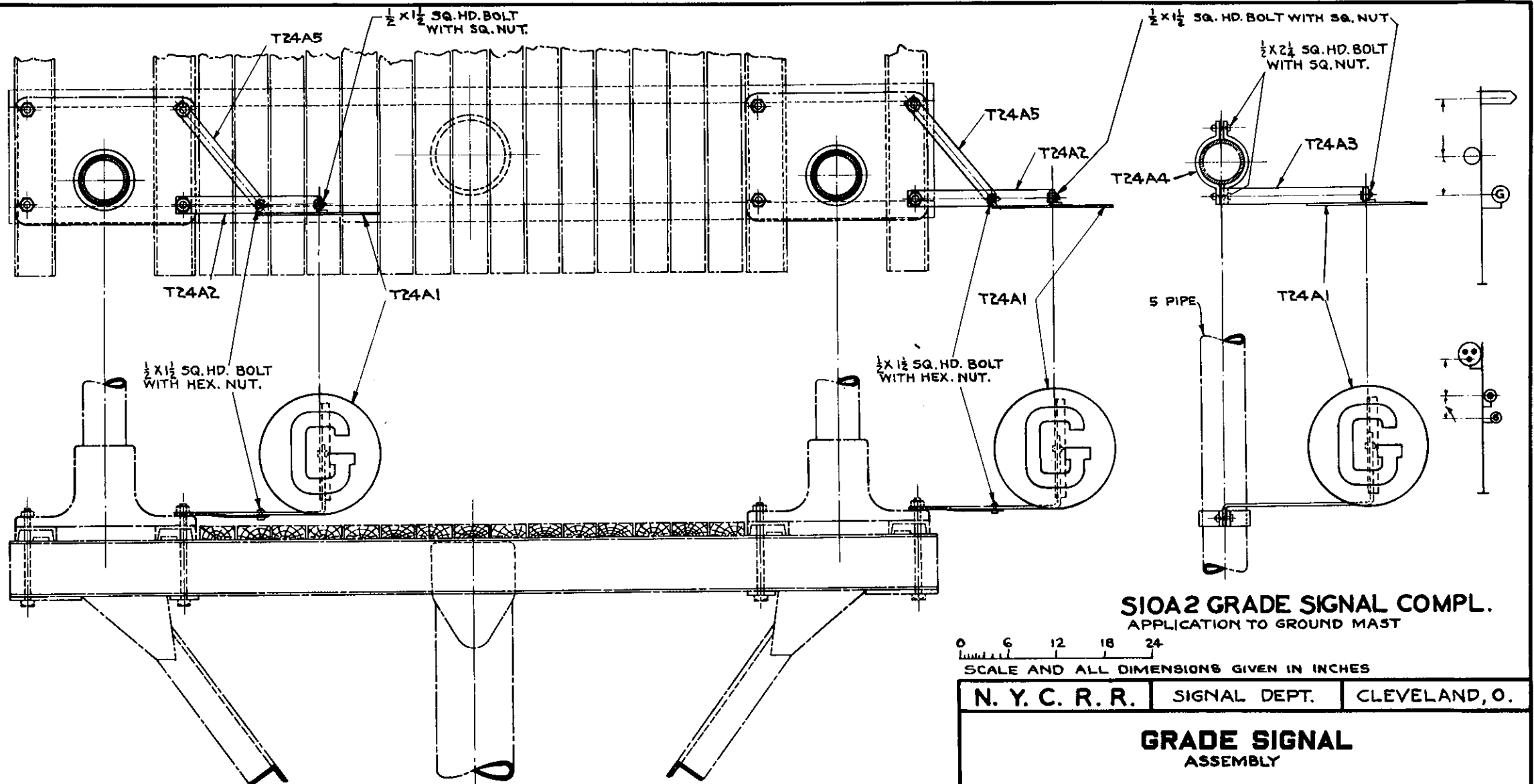
S-A1598-1

[Signature]
SIGNAL ENGINEER

S-57A



N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
RAILWAY CROSSING GATE		
ASSEMBLY		
JULY 11, 1934.		
REVISION NO.		S-S9A
 SIGNAL ENGINEER		



SIOA1 GRADE SIGNAL COMPL.
APPLICATION TO BRACKET POST

SIOA2 GRADE SIGNAL COMPL.
APPLICATION TO GROUND MAST

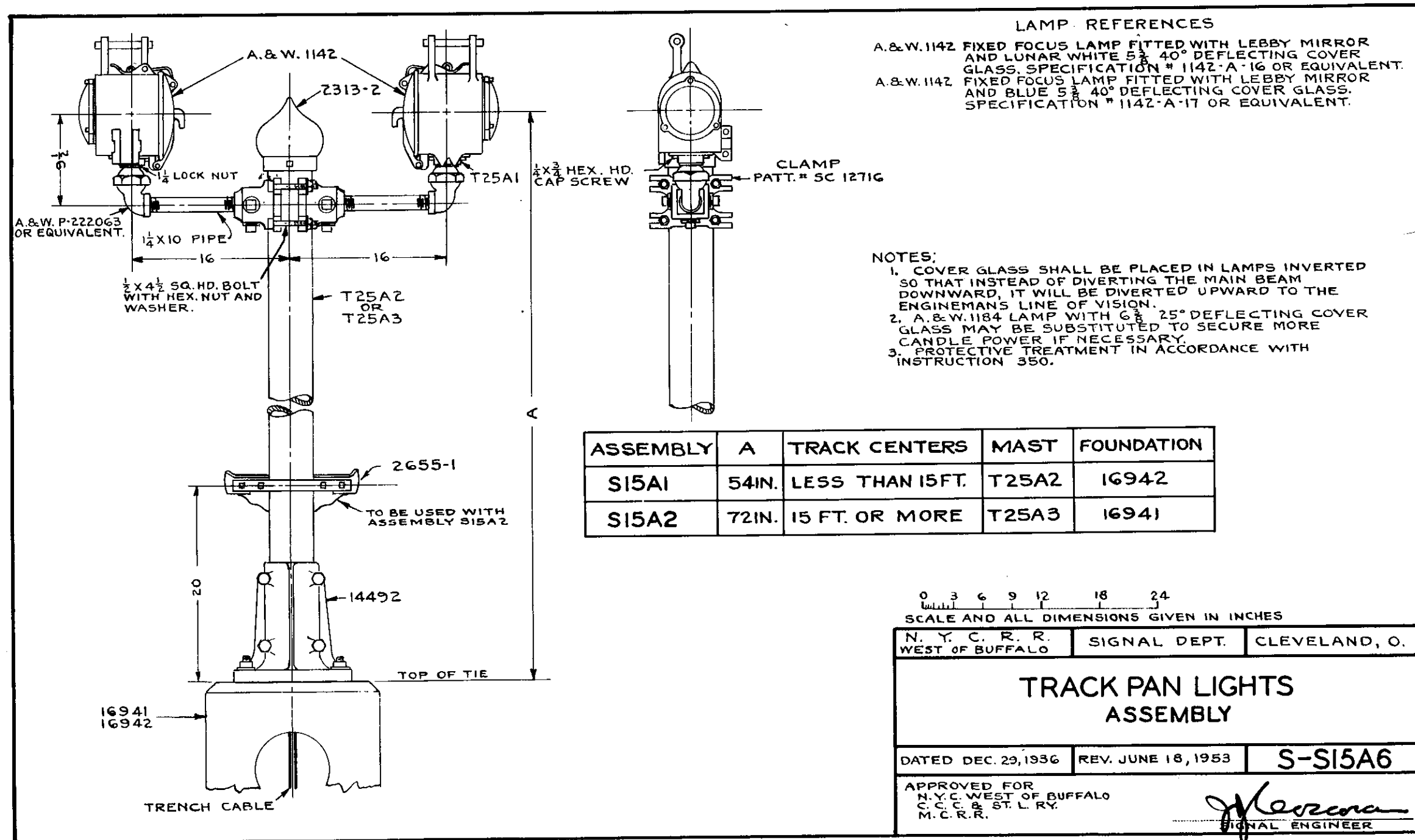
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

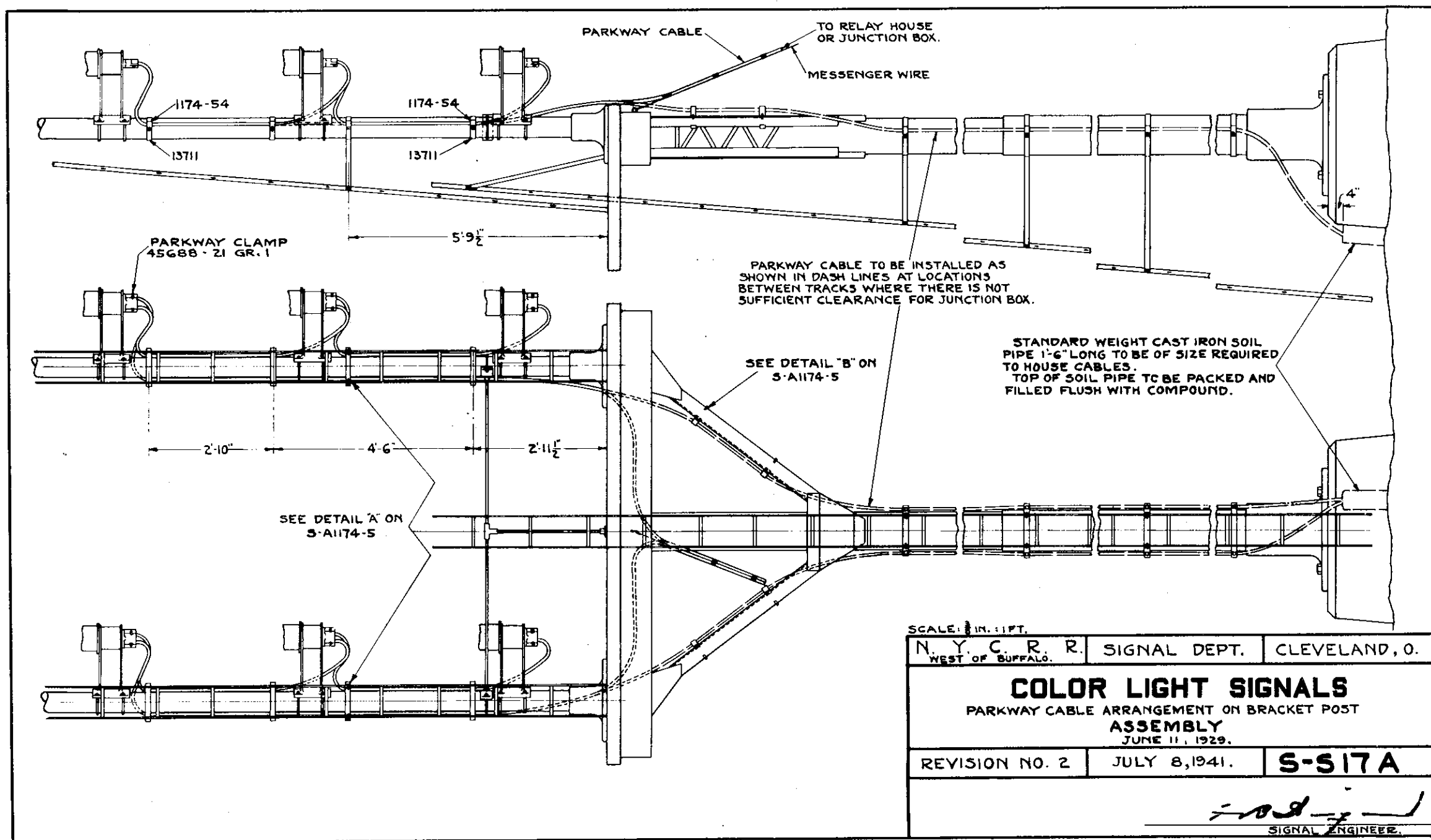
**GRADE SIGNAL
ASSEMBLY**

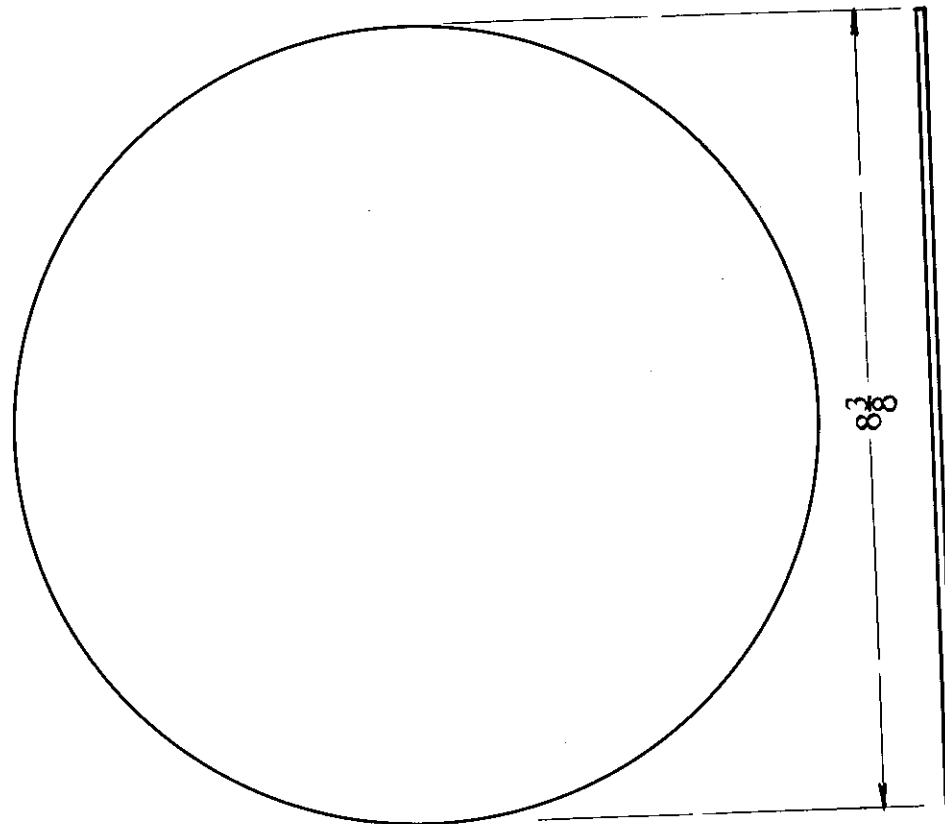
DATED DEC. 7, 1934	REV. JUNE 17 1953	S-SIOA1

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. & ST. L. RY
M. C. R. R.

Flanagan
SIGNAL ENGINEER

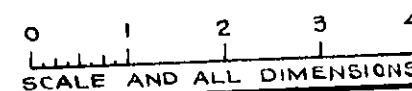






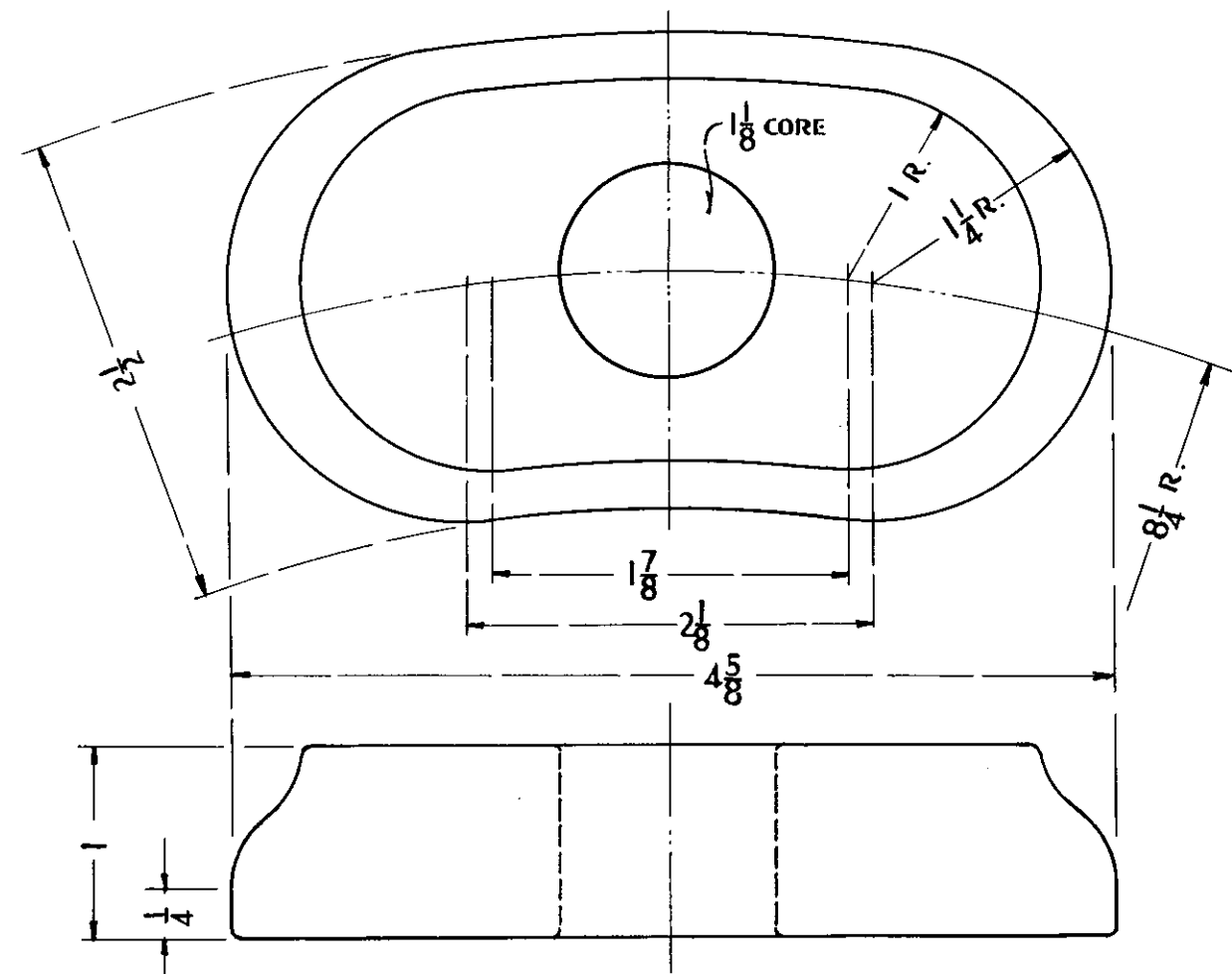
T7DI—SPECTACLE DISC.
No 16 U.S.STD. GAUGE (.0625) GALV. SHEET IRON,
PAINTED BLACK

NOTE: SPECTACLE DISC SHALL BE USED WHERE
ROUNDEL IS NOT REQUIRED.



SCALE AND ALL DIMENSIONS GIVEN IN INCHES

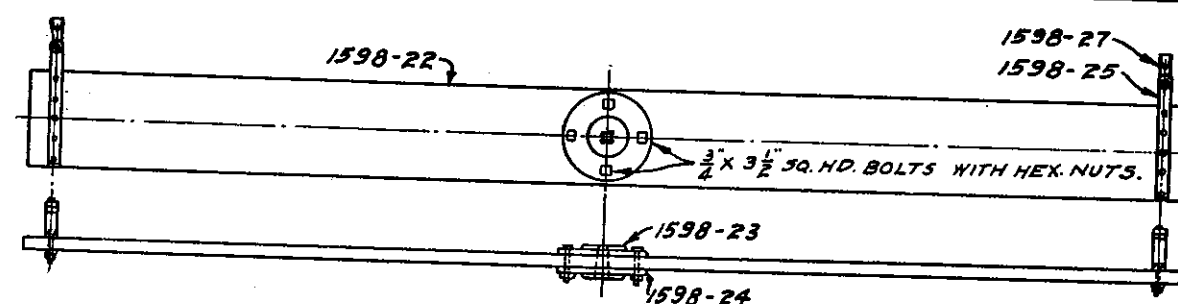
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
SPECTACLE DISC		
DATED JULY 26, 1934	REV. JUNE 18, 1953	S-T7DI
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C.C. & ST. L.R.Y. M.C.R.R.		 SIGNAL ENGINEER



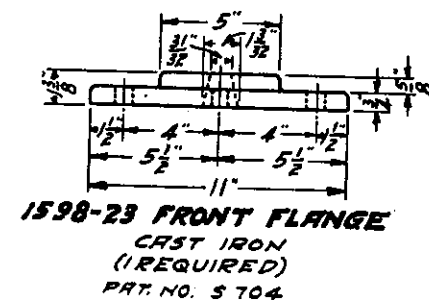
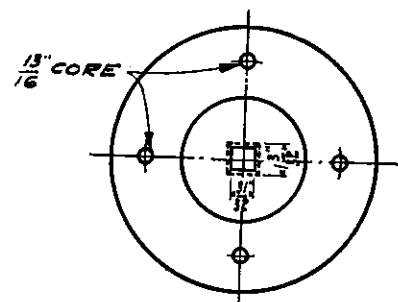
T 10HI, WASHER
CAST IRON.

FULL SIZE
SCALE AND ALL DIMENSIONS GIVEN IN INCHES

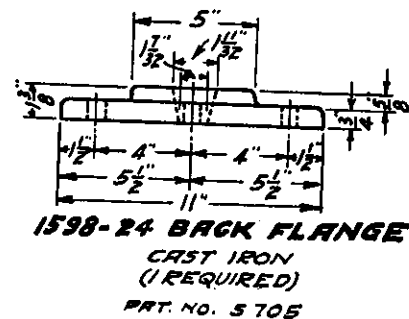
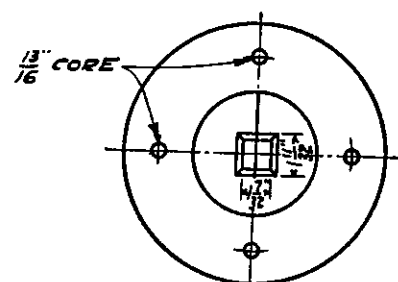
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
WASHER GROUND SIGNAL BASE		
DATED APRIL 5, 1934	REV. JUNE 18, 1953	S-TIOHI
APPROVED FOR N.Y.C. WEST OF BUFFALO C.C. & ST. L. RY. M.C.R.R.		<i>J. K. Kenna</i> SIGNAL ENGINEER.



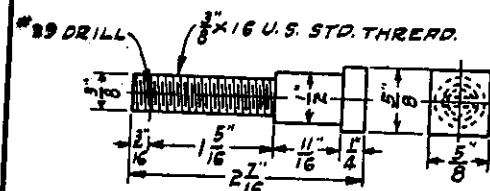
1598-21 BLADE COMPLETE
(1 REQUIRED)



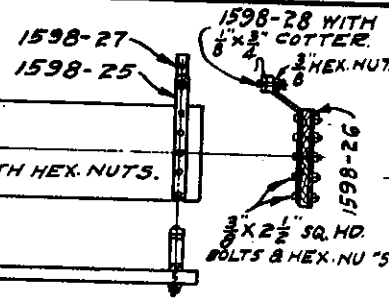
1598-23 FRONT FLANGE
CAST IRON
(1 REQUIRED)
PAT. NO. 5704



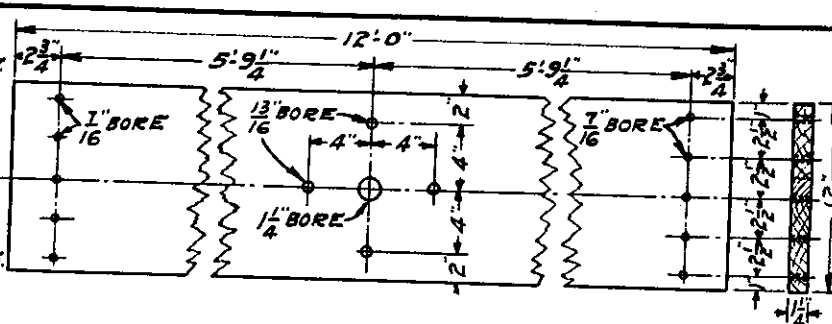
1598-24 BACK FLANGE
CAST IRON
(1 REQUIRED)
PAT. NO. 5705



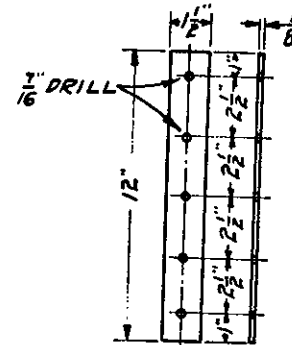
1598-28 PIN
C. R. S.
(2 REQUIRED)



1598-25 HANGER ARM
O. H. STEEL
(2 REQUIRED)

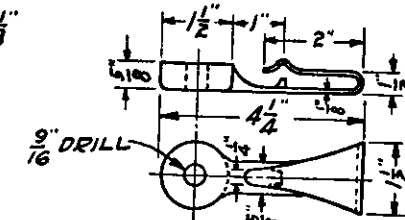


1598-22 BLADE
POPLAR
(1 REQUIRED)

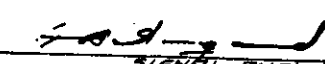


1598-26 BRACE
O. H. STEEL
(2 REQUIRED)

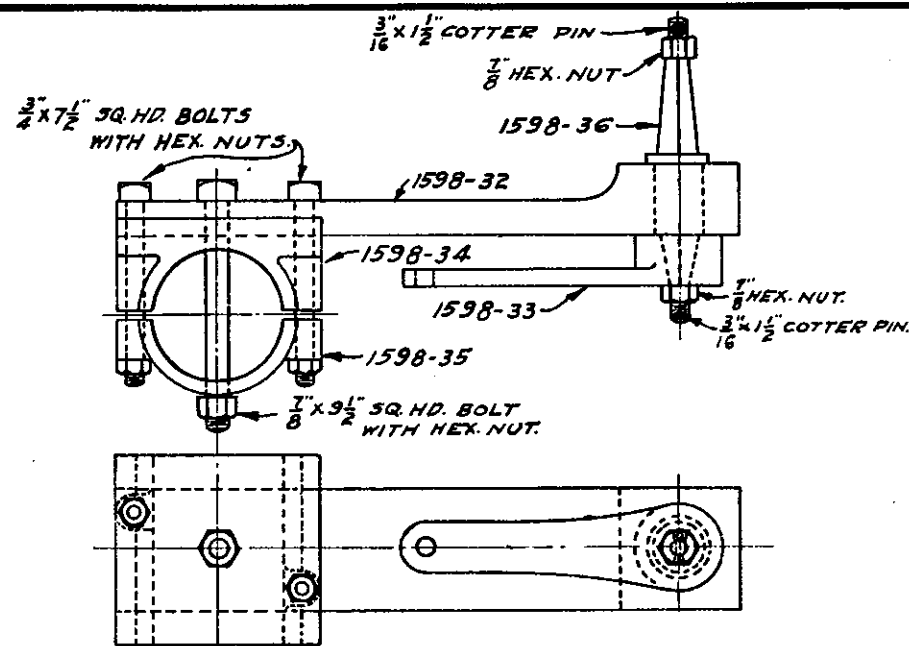
SCALES: 6 IN. = 1 FT.
3 IN. = 1 FT.
1 1/2 IN. = 1 FT.
1 IN. = 1 FT.
1/2 IN. = 1 FT.



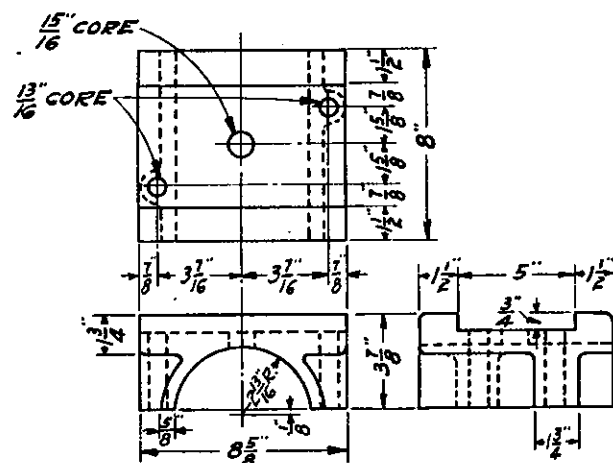
1598-27 HANGER
O. H. STEEL
(2 REQUIRED)

N. Y. C. & P. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.
POLE TARGET DETAILS		
APRIL 6, 1923.		
REVISION NO.	S-A1598-2	
 SIGNAL ENGINEER		

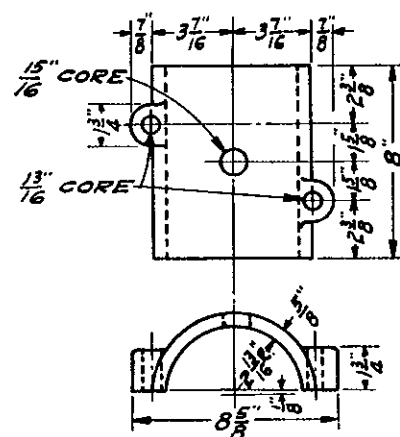
S-T 20A



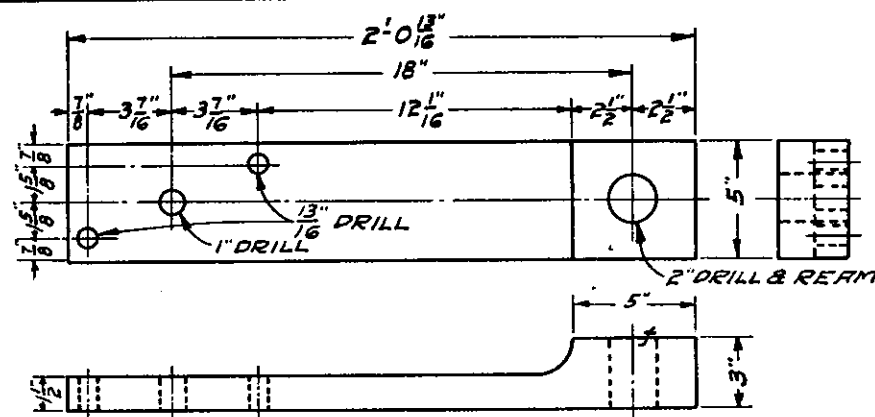
1598-31 BOARD SUPPORT COMPLETE
(1 REQUIRED)



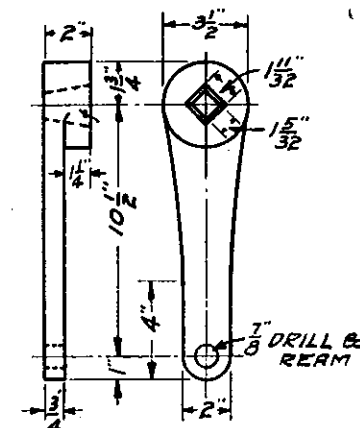
1598-34 FRONT CLAMP
CAST IRON
(1 REQUIRED)
PAT. NO. 5708



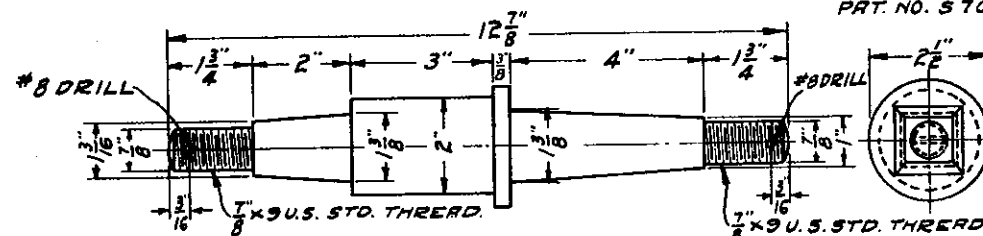
1598-35 BACK CLAMP
CAST IRON
(2 REQUIRED)
PAT. NO. 5709



1598-32 SUPPORTING ARM
FORGED STEEL
(1 REQUIRED)



1598-33 CRANK
CAST IRON
(1 REQUIRED)
PAT. NO. 5706



1598-36 SHAFT
C. R. S.
(1 REQUIRED)

SCALES: 3 IN. = 1 FT.
1 1/2 IN. = 1 FT.

N. Y. C. & H. R. R.
WEST OF BUFFALO.

SIGNAL DEPT.

CLEVELAND, O.

POLE TARGET DETAILS

APRIL 6, 1923.

REVISION NO.

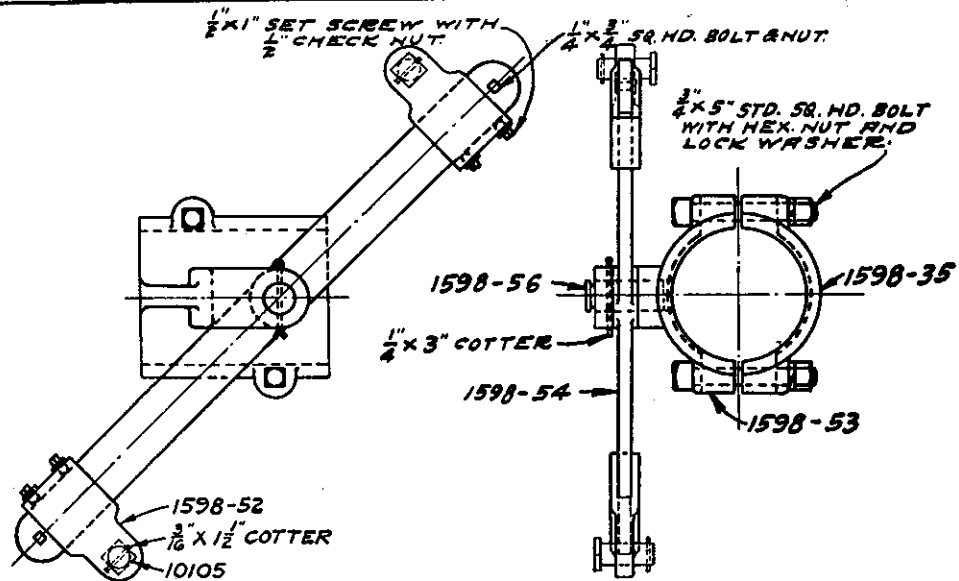
S-A1598-3

SIGNAL ENGINEER

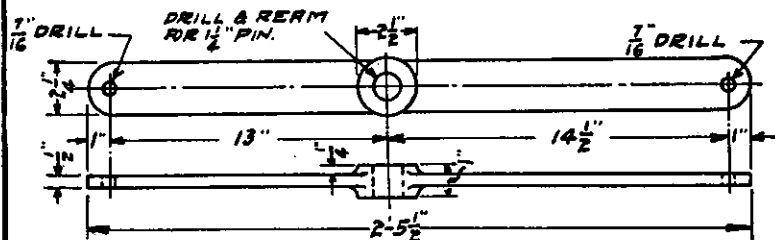
JCO80

S-T20B

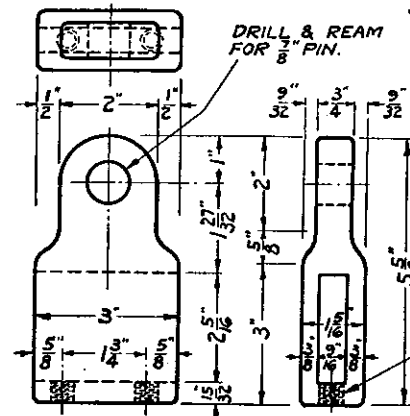
5-720C



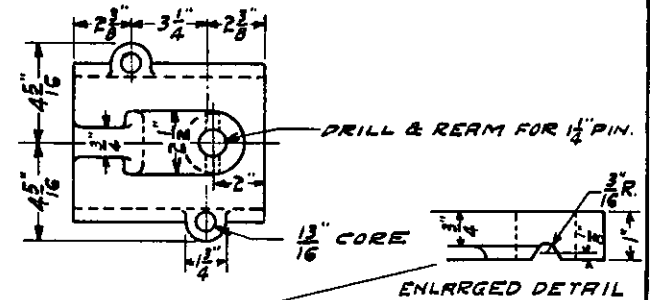
1598-51 EQUALIZER COMPLETE
(1 REQUIRED)



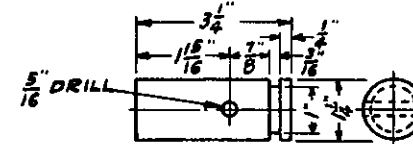
1598-54 EQUALIZER
FORGED STEEL
(1 REQUIRED)



1598-52 ADJUSTABLE CONNECTION
CAST IRON
(2 REQUIRED)
PAT. NO. 5707



1598-53 FRONT CLAMP
CAST IRON
(1 REQUIRED)

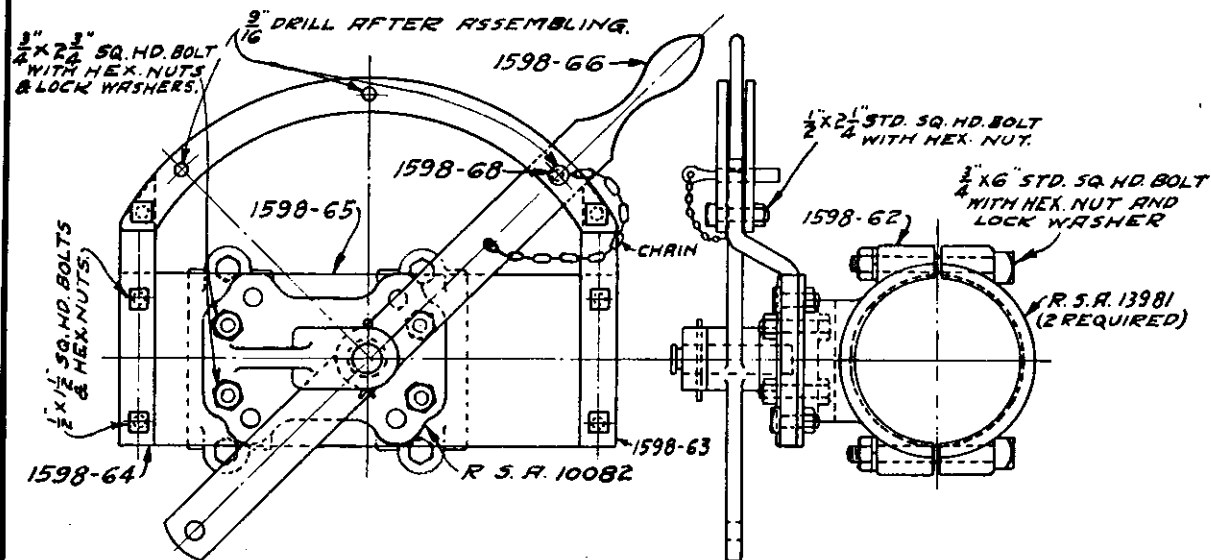


1598-56 PIN
C. R. STEEL
(1 REQUIRED)

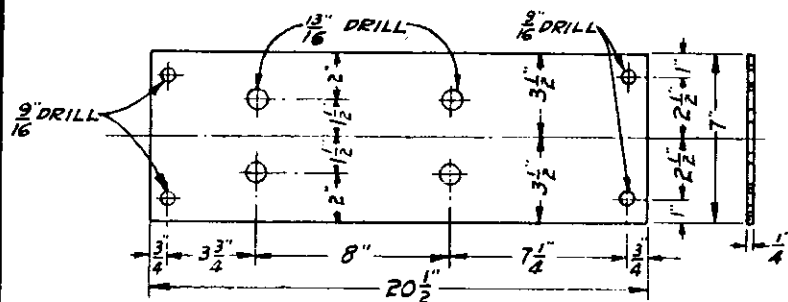
6 IN. = 1 FT.
3 IN. = 1 FT.
1 1/2 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.
POLE TARGET DETAILS		
APRIL 6, 1923.		
REVISION NO. 2	MARCH 23, 1932.	S-A1598-5

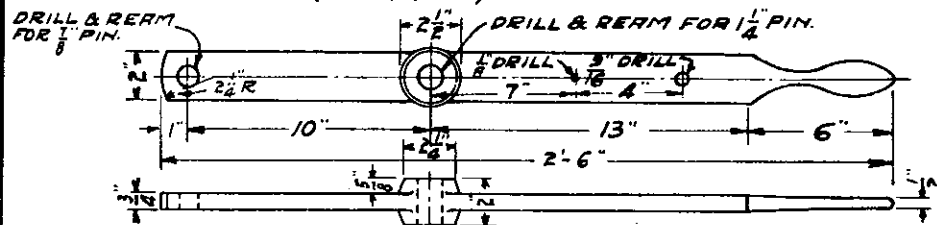
S-T 20 D



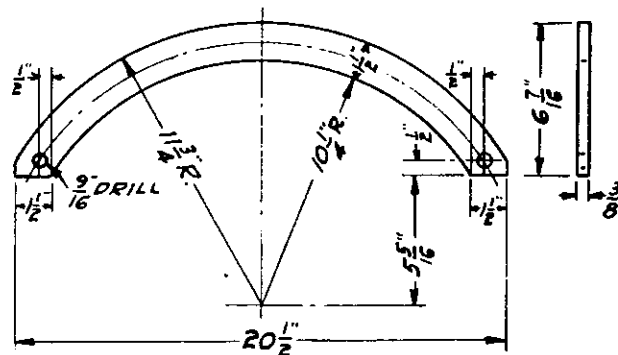
1598-61 QUADRANT COMPLETE
(1 REQUIRED)



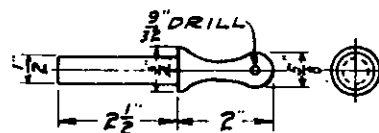
1598-65 BACK PLATE
O.H. STEEL
(1 REQUIRED)



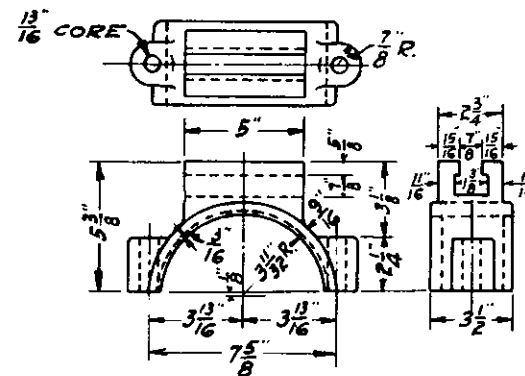
1598-66 OPERATING LEVER
FORGED STEEL
(1 REQUIRED)



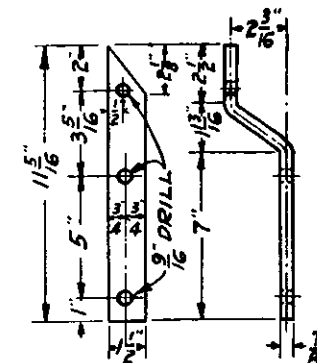
1598-67 QUADRANT
O.H. STEEL
(2 REQUIRED)



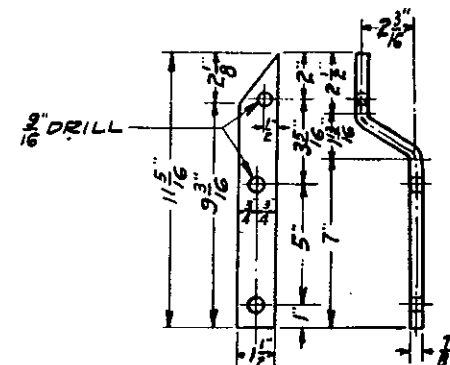
1598-68 PIN
C.R.S.
(1 REQUIRED)



1598-62 FRONT CLAMP
CAST IRON
(2 REQUIRED)



1598-63 R.H. SUPPORT
O.H. STEEL
(1 REQUIRED)



1598-64 L.H. SUPPORT
O.H. STEEL
(1 REQUIRED)

SCALES: 3 IN. = 1 FT.
1 1/2 IN. = 1 FT.

N. Y. C. & R. R. WEST OF BUFFALO. SIGNAL DEPT. CLEVELAND, O.

POLE TARGET DETAILS

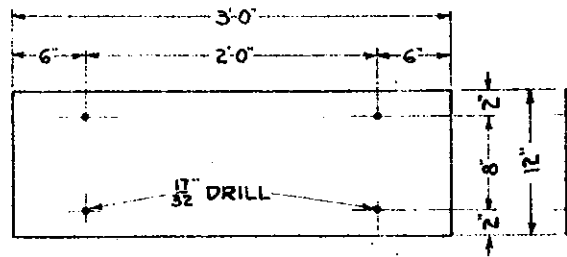
APRIL 6, 1923.

REVISION NO.

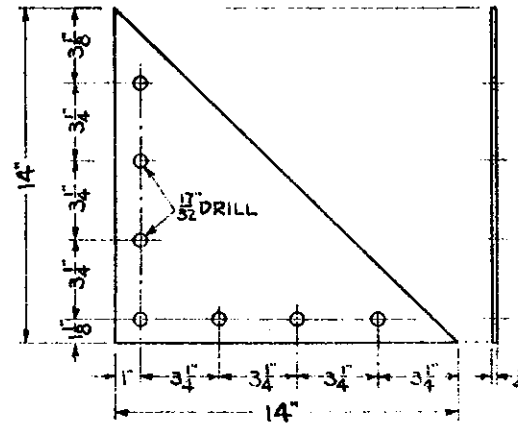
S-A1598-6

SIGNAL ENGINEER

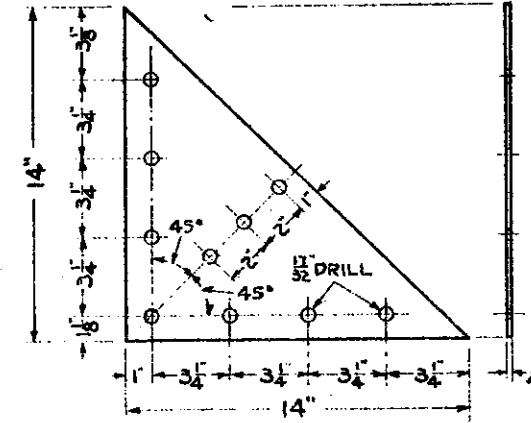
S-T20E



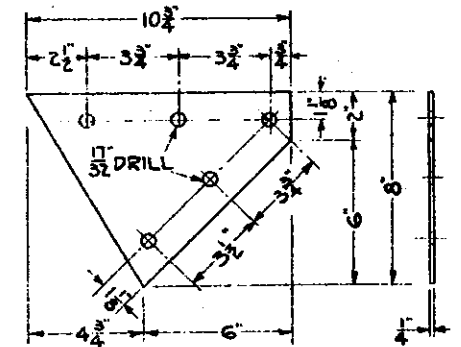
T21B1 PLATE
#12 B. & S. GAUGE PLATE STEEL
(1-REQUIRED)



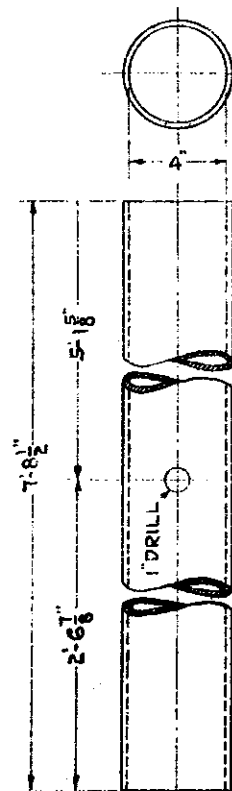
T21B2 PLATE
PLATE STEEL
(1-REQUIRED)



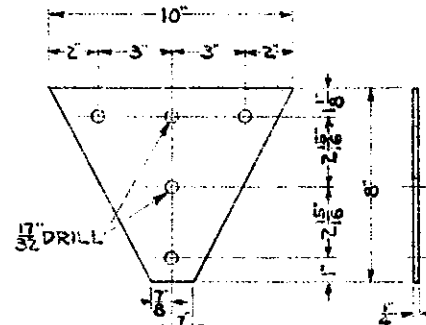
T21B3 PLATE
PLATE STEEL
(1-REQUIRED)



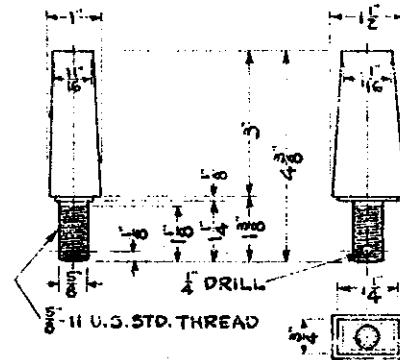
T21B4 PLATE
PLATE STEEL
(1-REQUIRED)



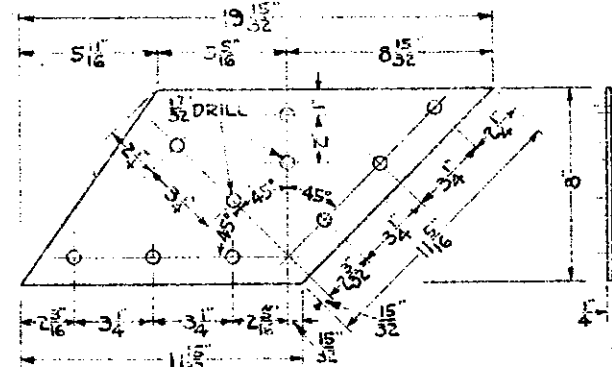
T21B7 MAST
4" IRON PIPE
(1-REQUIRED)



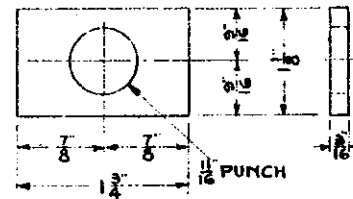
T21B5 PLATE
PLATE STEEL
(1-REQUIRED)



T21B8 LAMP STAFF
WROUGHT IRON
COMPLETE WITH 5/8" HEX. NUT, 5/8" X 1 1/2"
COTTER AND PLATE WASHER T21B9
(1-REQUIRED)



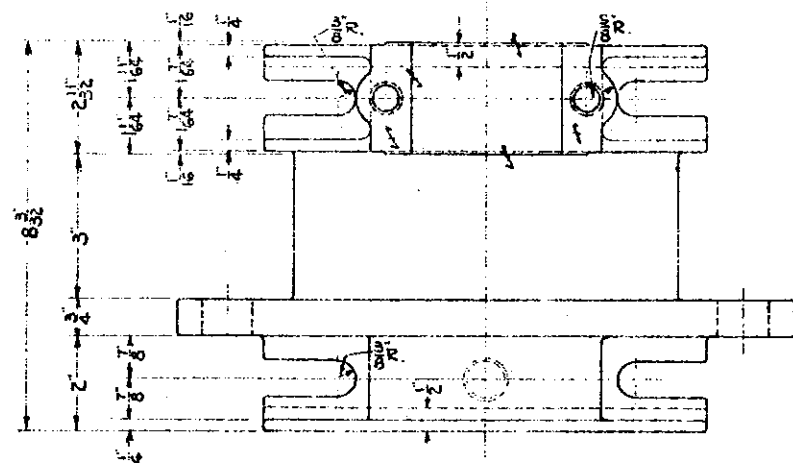
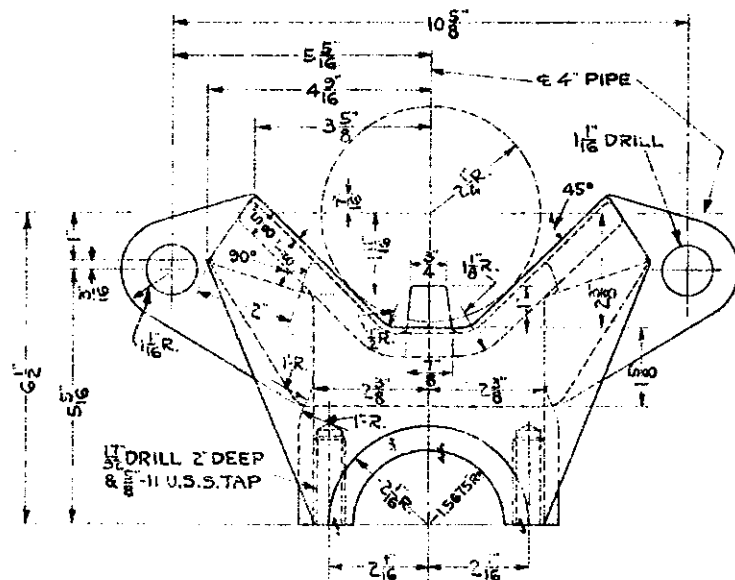
T21B6 PLATE
PLATE STEEL
(1-REQUIRED)



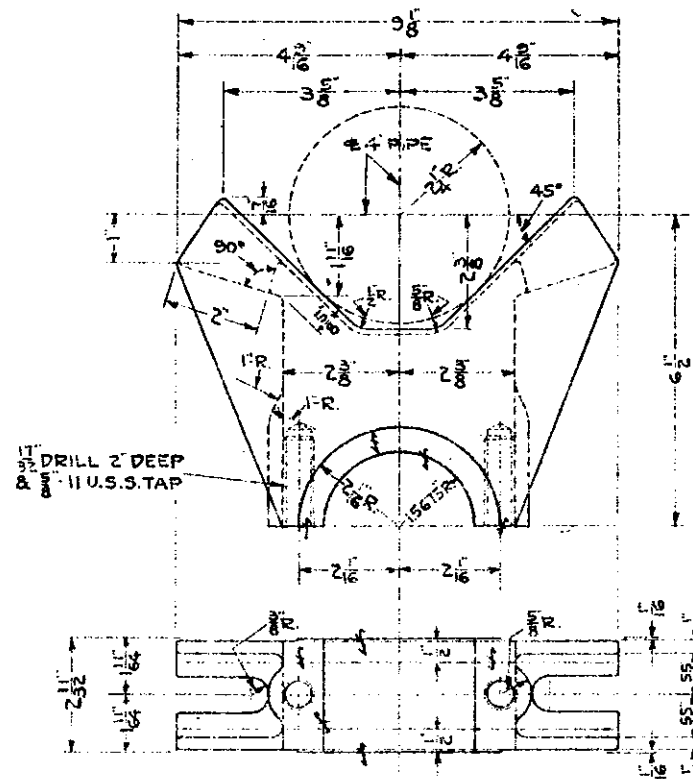
T21B9 PLATE WASHER
(1-REQUIRED)

NOTE:
THE INSIDE SURFACE OF MAST T21B7 SHALL
BE GIVEN A COAT OF THICK, SOFT TAR APPLIED
WHILE HOT.

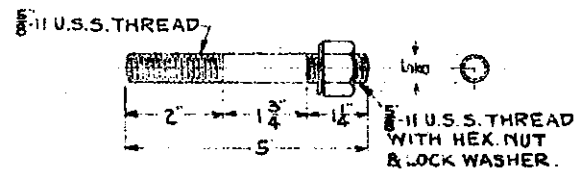
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
RAILWAY CROSSING GATE		
DETAILS		
JULY 11, 1934.		
REVISION NO.		S-T21B
		<i>[Signature]</i> SIGNAL ENGINEER



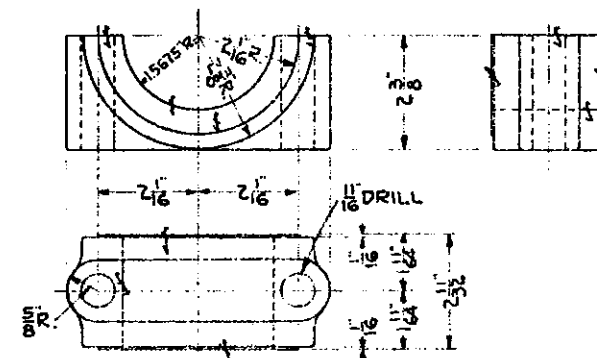
TZICI THRUST JOURNAL BRG. & GATE LOCK
 CAST IRON
 PATT. NO. S-468
 (1-REQUIRED)



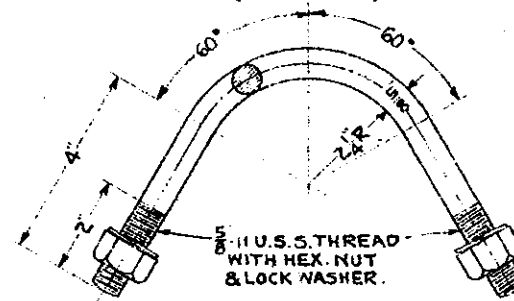
TRIC2 THRUST JOURNAL BRG.
CAST IRON
PATT. NO. 3-467
(1-REQUIRED)



T21C5 STUD
C. R. STEEL
(4-REQUIRED)

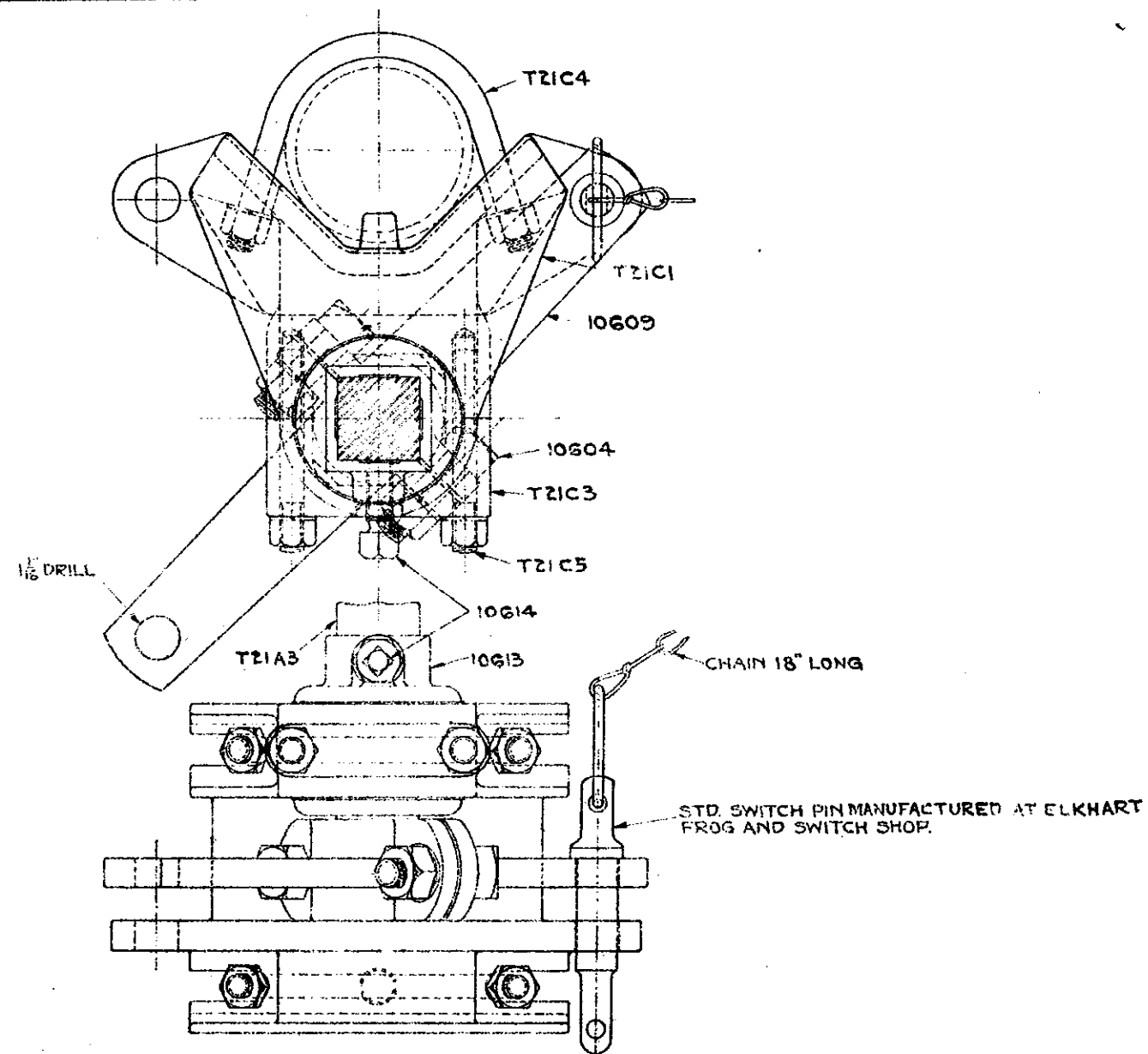


T21C3 THRUST JOURNAL CAP
CAST IRON
PATT. NO. S-469
(1-REQUIRED)



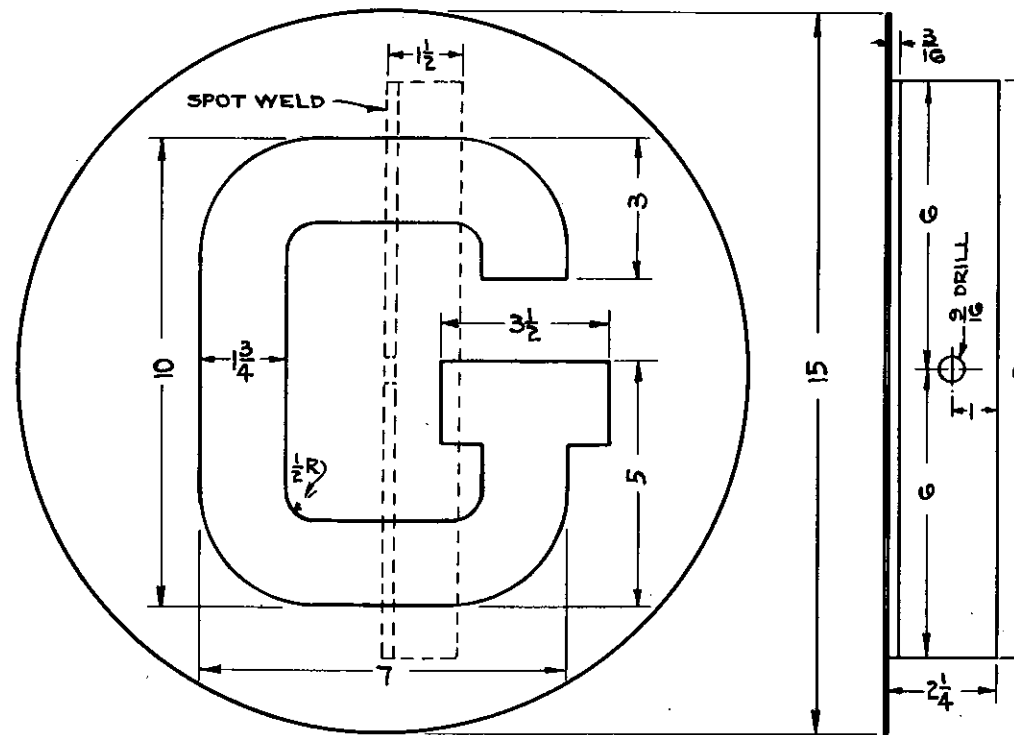
T21C4 PIPE CLAMP
H.R. STEEL
(3-REQUIRED)

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
RAILWAY CROSSING GATE		
DETAILS		
JULY '11, 1934.		
REVISION NO.		S-T21C
 SIGNAL ENGINEER.		



T2ID1 THRUST JOURNAL BRG. & GATE VALVE ASSEMBLY

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND
RAILWAY CROSSING GATE		
DETAILS JULY 11, 1934.		
REVISION NO.		
<i>E. A.</i>		



T24A1 DISC. COMPLETE

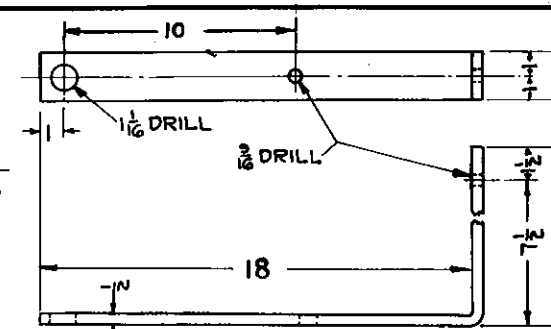
NO. 12 U.S.G. SH. STEEL (.109)

SCALE: ②

NOTES:

PROTECTIVE TREATMENT TO BE IN ACCORDANCE WITH INSTRUCTION 350.

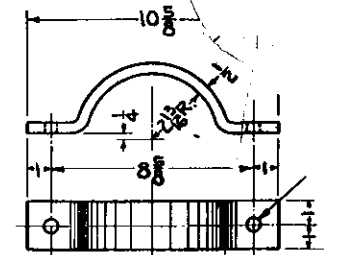
DISC T24A1 SHALL BE PAINTED FRONT ENAMELED YELLOW LETTER AND



T24A2 BRACKET

C1020 STEEL
(1 REQ. FOR BRACKET POST)

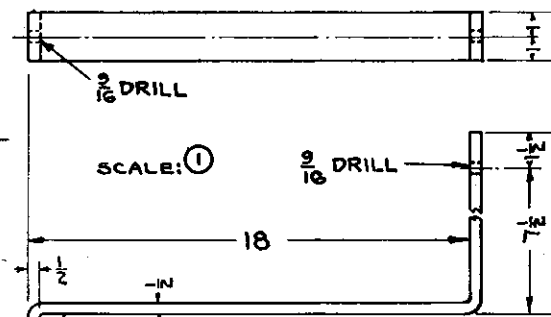
SCALE: ①



T24A4 CLAMP

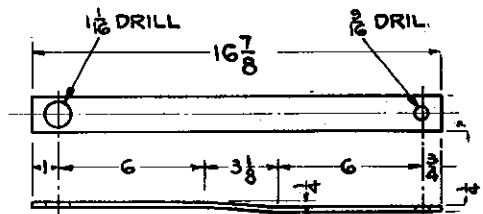
C1020 STEEL
(2 REQ. FOR GROUND POST)

SCALE: ①



T24A3 BRACKET

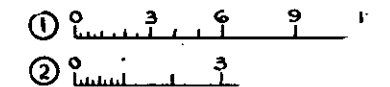
C1020 STEEL
(1 REQ. FOR GROUND POST)



T24A5 STR/P

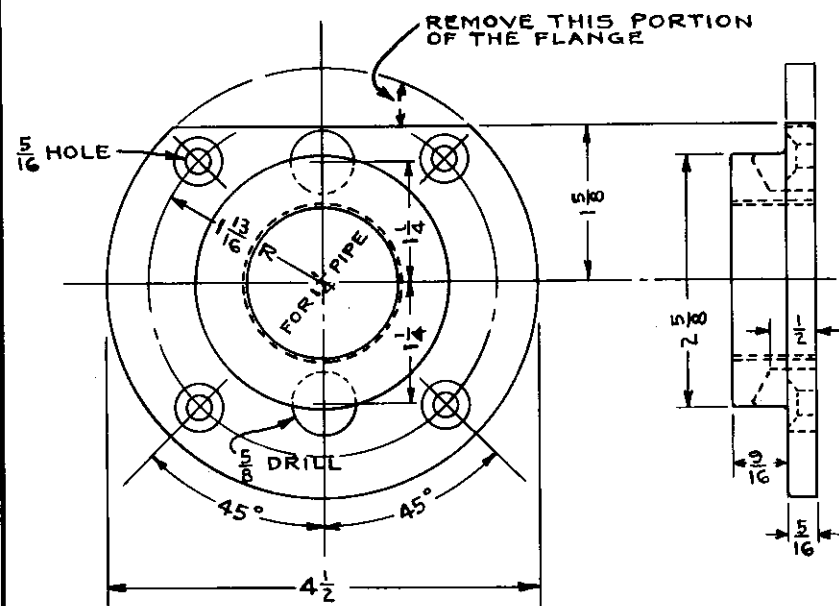
C1020 STEEL
(1 REQ. FOR BRACKET POST)

SCALE: ①



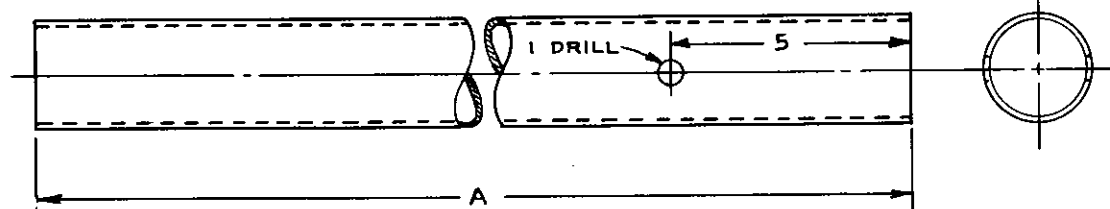
SCALES AND ALL DIMENSIONS

N. Y. C. R. R. | SIGNAL



T25A1 FLANGE
MADE FROM N.Y.C.R.R. BLDG.
DEPT. FLANGE. PATT. # 1967

SCALE: ②

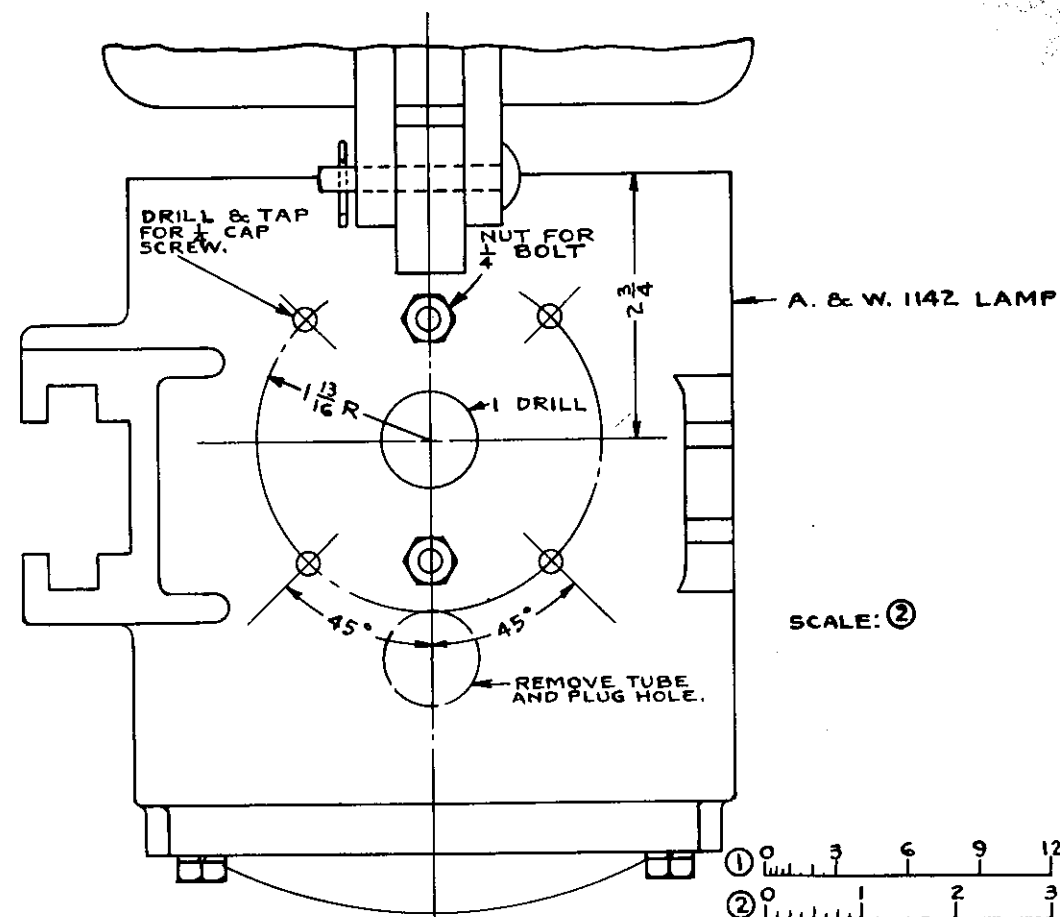


T25A2 MAST (A = 48 IN.)

T25A3 MAST (A = 66 IN.)
(4 IN. W. I. PIPE)

SCALE: ①

NOTE:
PROTECTIVE TREATMENT TO BE IN
ACCORDANCE WITH INSTRUCTION
350.



**LAMP BASE DRILLING FOR APPLICATION OF
FLANGE T25A1**

SCALE AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. R. R. | **SIGNAL DEPT.** | **CLEVELAND, O.**

TRACK PAN LIGHTS DETAILS

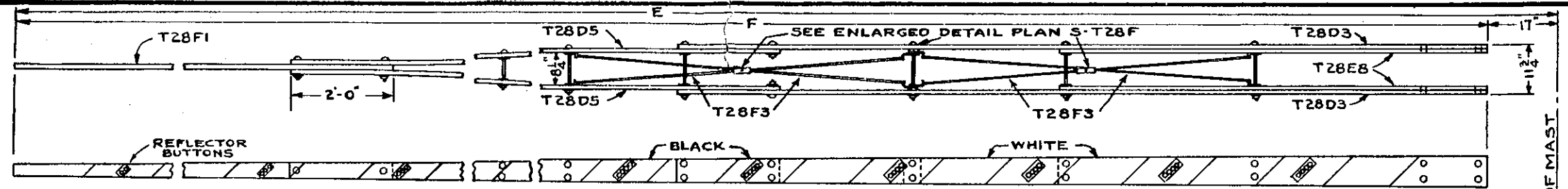
DATED JULY 20, 1937

REV. JUNE 19, 1953

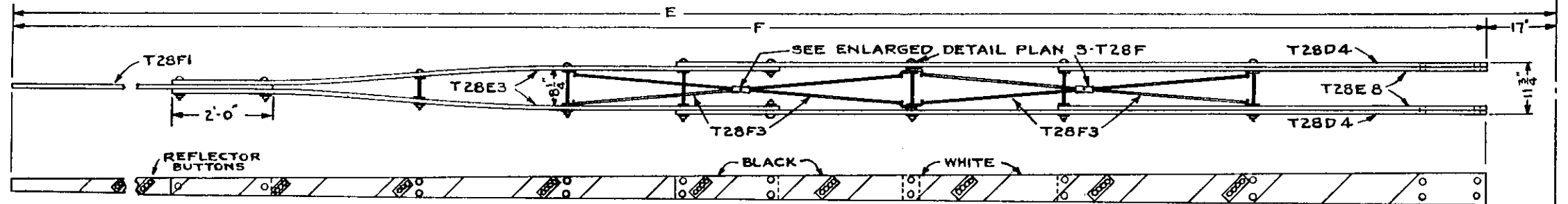
S-T25A2

APPROVED FOR
N.Y.C. WEST OF BUFFALO
C.C. & ST. L. RY.
M.C.R.R.

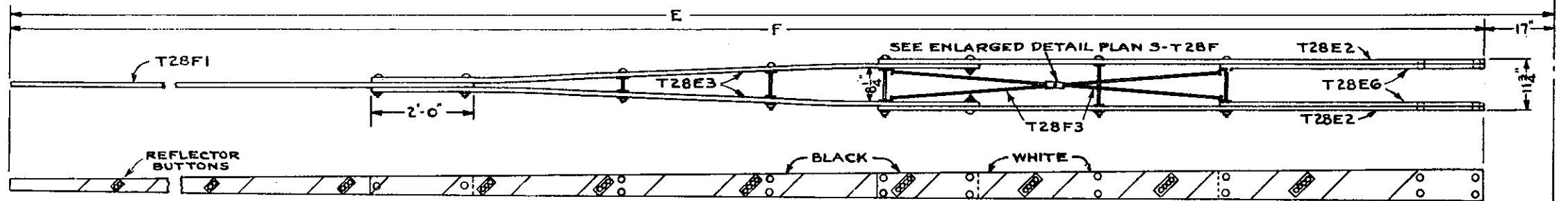
Glascow
SIGNAL ENGINEER



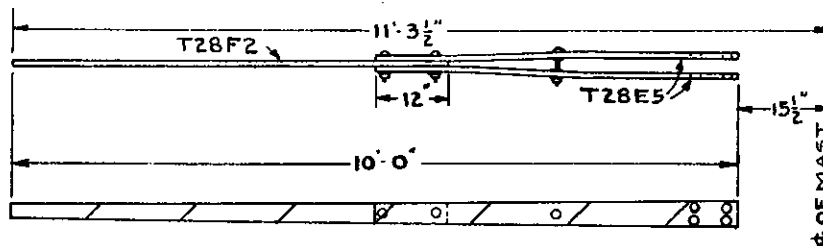
T28A1 HIGHWAY CROSSING GATE ARM COMPLETE (E = 35'-5" TO 39'-5") (F = 34'-0" TO 38'-0")



T28A2 HIGHWAY CROSSING GATE ARM COMPLETE (E = 31'-5" TO 35'-4") (F = 30'-0" TO 33'-11")



T28A3 HIGHWAY CROSSING GATE ARM COMPLETE (E = 27'-5" TO 31'-4") (F = 26'-0" TO 29'-11")



T28A4 SIDEWALK GATE ARM COMPLETE

NOTE:

REFLECTOR BUTTONS TO BE MOUNTED ON BLACK STRIPES ONLY AND ON SIDE OF GATE FACING APPROACHING HIGHWAY TRAFFIC.

GATE ARMS 30'-0" OR LONGER TO BE EQUIPPED WITH WESTERN RAILROAD SUPPLY CO. BUFFER LEG # 3562-316A.

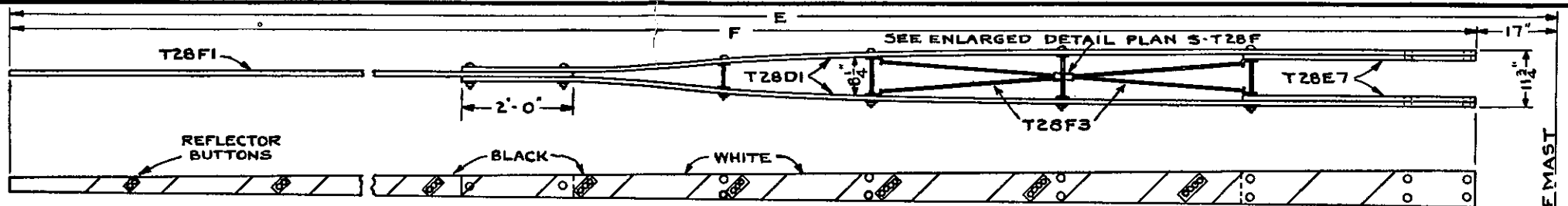
N. Y. C. R. R. SIGNAL DEPT. CLEVELAND, O.

HIGHWAY CROSSING GATE ARM
DOUBLE BEARING WITH MECHANISM 3563-41GL
ASSEMBLY

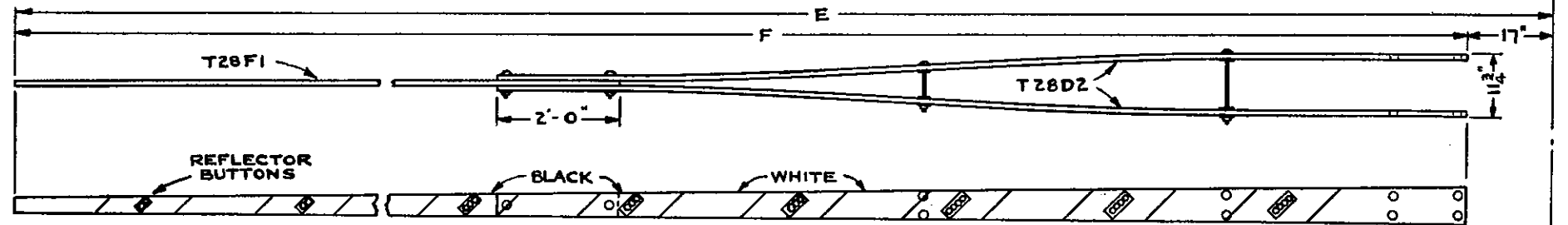
DATED DEC. 17, 1948 REV. APR. 27, 1951 **S-T28A3**

APPROVED FOR
N.Y.C. WEST OF BUFFALO

H.D. Albrecht
ASST. SIGNAL ENGINEER

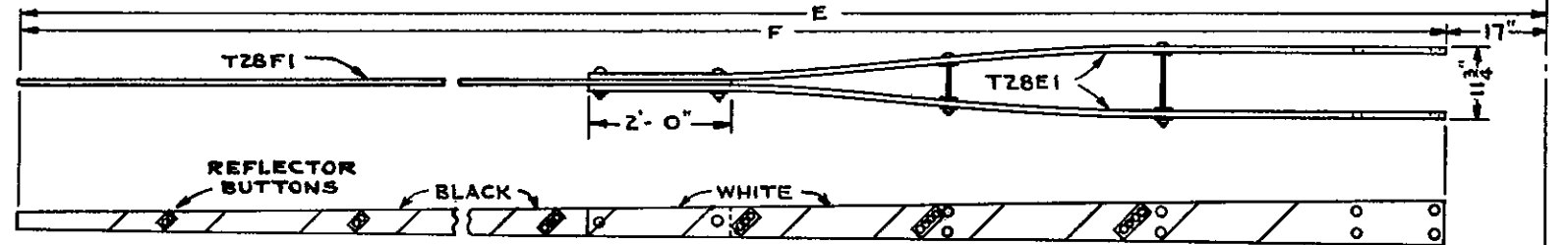


T28B1 HIGHWAY CROSSING GATE ARM COMPLETE (E = 25'-5" TO 27'-4") (F = 24'-0" TO 25'-11")

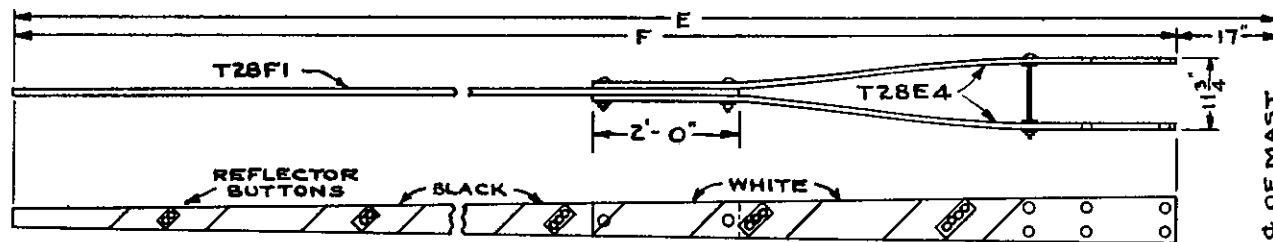


T28B2 HIGHWAY CROSSING GATE ARM COMPLETE (E = 21'-5" TO 25'-4") (F = 20'-0" TO 23'-11")

NOTE:
REFLECTOR BUTTONS TO BE MOUNTED
ON BLACK STRIPES ONLY AND ON SIDE OF
GATE FACING APPROACHING HIGHWAY TRAFFIC.



T28B3 HIGHWAY CROSSING GATE ARM COMPLETE (E = 17'-5" TO 21'-4") (F = 16'-0" TO 19'-11")



T28B4 HIGHWAY CROSSING GATE ARM COMPLETE (E = 12'-6" TO 17'-4") (F = 11'-1" TO 15'-11")

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING WITH MECHANISM 3563-41GL ASSEMBLY		
DATED DEC. 17, 1948	REV. APR. 27, 1951	S-T28B3
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H.D. [Signature]</i> ASST. SIGNAL ENGINEER

[illegible]

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.

HIGHWAY CROSSING GATE ARM

DOUBLE BEARING

ORDER REFERENCE FOR MATERIAL

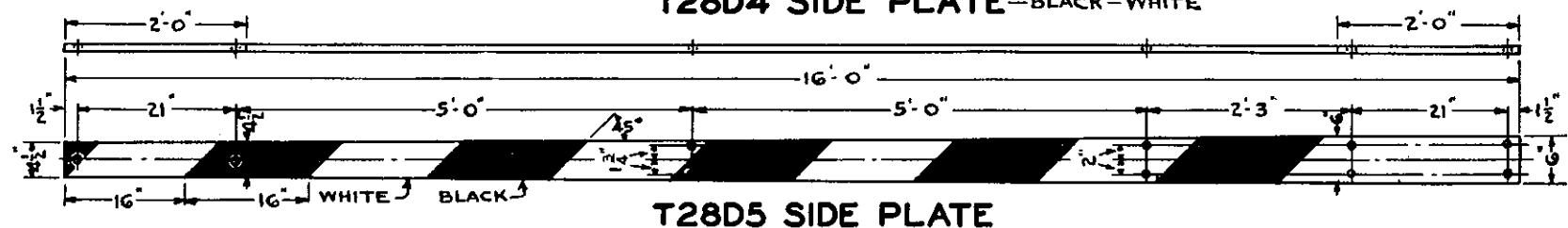
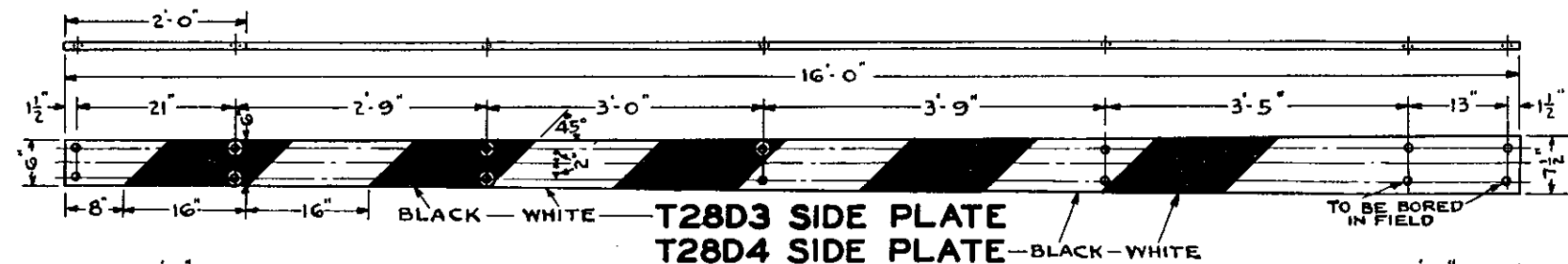
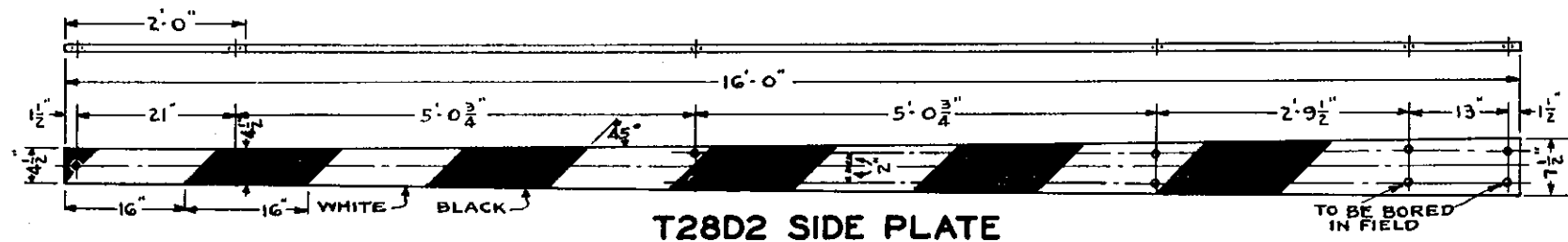
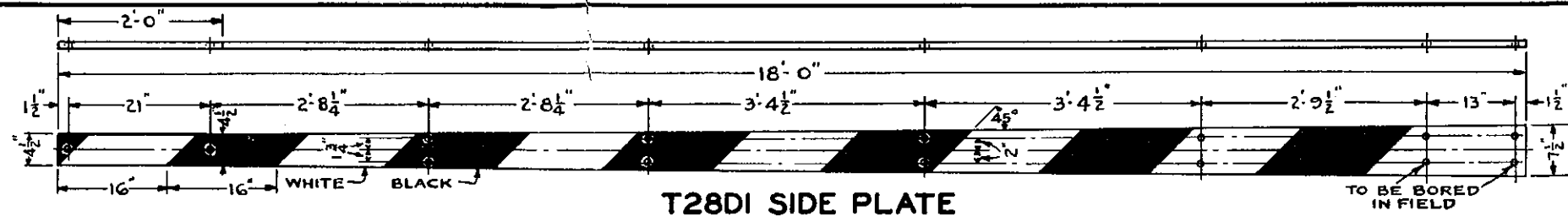
DATED DEC.17, 1948

REV. APR. 27, 1951

S-T28C2

APPROVED FOR:
N.Y.C. WEST OF BUFFALO

H. D. Barnaby
ASST. SIGNAL ENGINEER



NOTE:

ORDER MATERIAL 1"X8" S4S, LENGTH AS REQUIRED, MUST BE EITHER SUGAR PINE, WHITE PINE OR CLEAR PRINCE RUPERT CEDAR, KILN DRIED, FREE FROM KNOTS, WEIGHT NOT TO EXCEED 2.00 LBS. PER BOARD FOOT.

PAINTING

SIDE PLATES SHALL BE GIVEN 2 COATS OF WHITE PAINT. STRIPING TO CONSIST OF 16" BLACK AND 16" WHITE STRIPES ALTERNATED ON FACE SIDE ONLY. PAINTING SHALL BE IN ACCORDANCE WITH INSTRUCTION 350.

NOTE:

ALL HOLES 7/16" DIA.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING DETAILS		
DATED DEC. 17, 1948	REV. APR. 27, 1951	S-T28D2
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H.D. Barnaby</i> ASST. SIGNAL ENGINEER



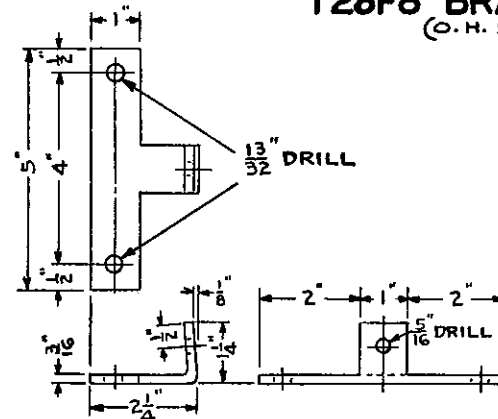
T28EI SIDE PLATE



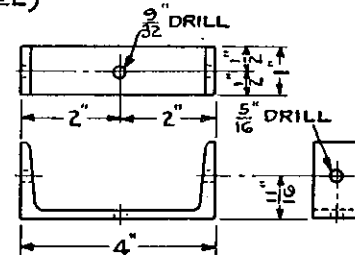
H. D. Abarnathy
ASST. SIGNAL ENGINEER



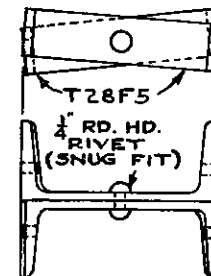
T28F3 BRACE ROD (Y=3'-4")
T28F7 BRACE ROD (Y=2'-0")
T28F8 BRACE ROD (Y=4'-0")
 (O. H. STEEL)



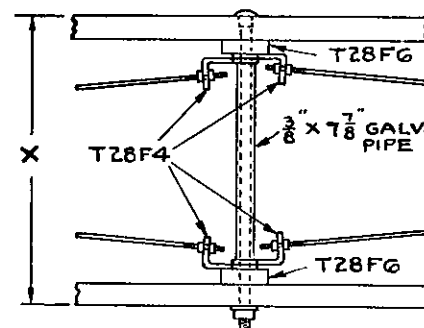
T28F4 BRACE ROD BRACKET
 (O. H. STEEL)



T28F5 CLEVIS
 (4" STD. CHANNEL S. 4 LB.)

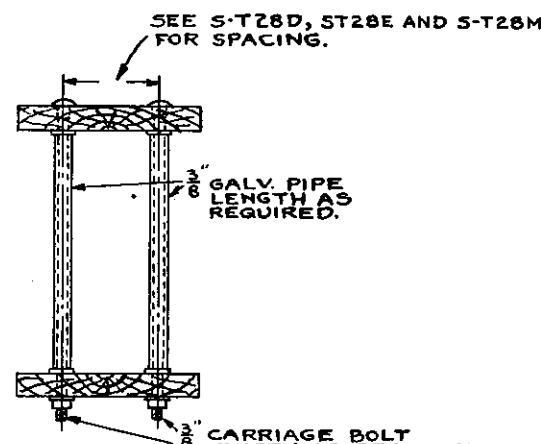


T28F9 CLEVIS ASSEMBLY



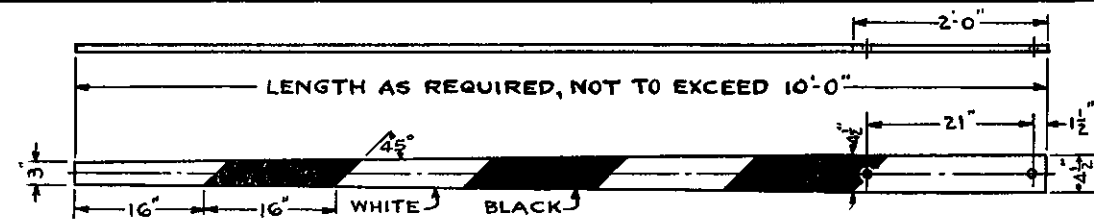
ENLARGED DETAIL

X=11 3/4" WITH MECHANISM 3563-41GL
 X=16" WITH MECHANISM 3566
 X=21 1/4" WITH MECHANISM 3566



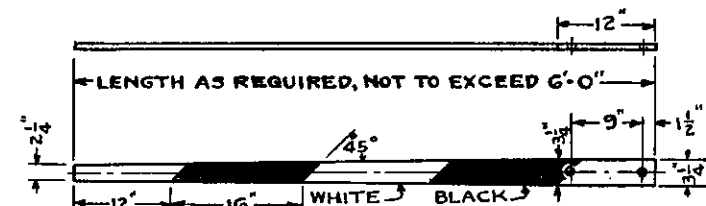
PAINTING

TONGUES AND FILLER BLOCK SHALL BE GIVEN 2 COATS OF WHITE PAINT. STRIPING ON TONGUES TO CONSIST OF 16" BLACK AND 16" WHITE STRIPES ALTERNATED. PAINTING SHALL BE IN ACCORDANCE WITH INSTRUCTION 350.

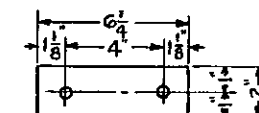


T28F1 TONGUE

NOTE: MATERIAL 1" S4S, MUST BE EITHER SUGAR PINE, WHITE PINE OR CLEAR PRINCE RUPERT CEDAR, KILN DRIED, FREE FROM KNOTS, WEIGHT NOT TO EXCEED 2.00 LBS. PER BOARD FOOT.



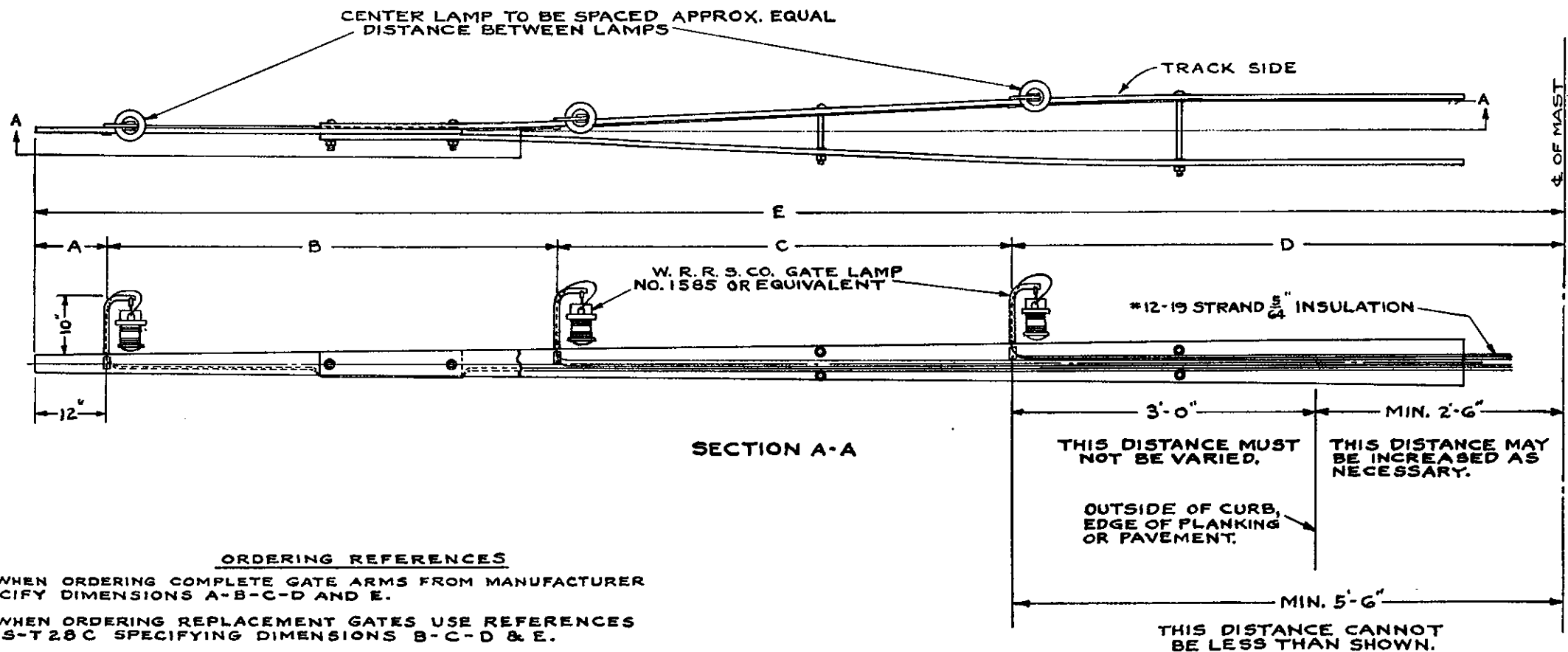
T28F2 TONGUE



T28F6 FILLER BLOCK

NOTE: ALL HOLES 1/16" EXCEPT AS NOTED.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING DETAILS		
DATED DEC. 17, 1948	REV. APR. 27, 1951	S-T28F3
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H.D. Ahern</i> ASST. SIGNAL ENGINEER



ORDERING REFERENCES

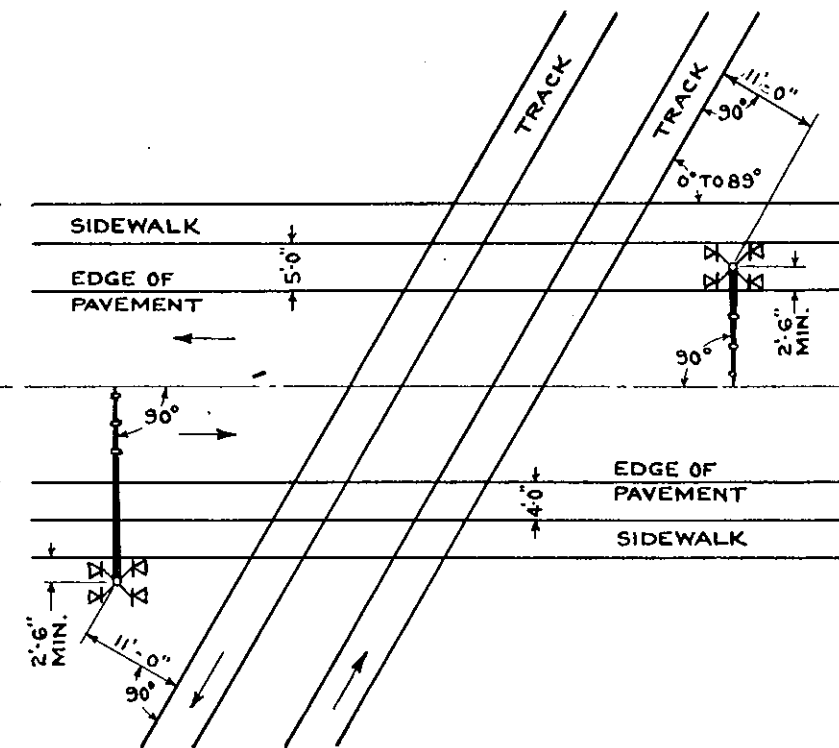
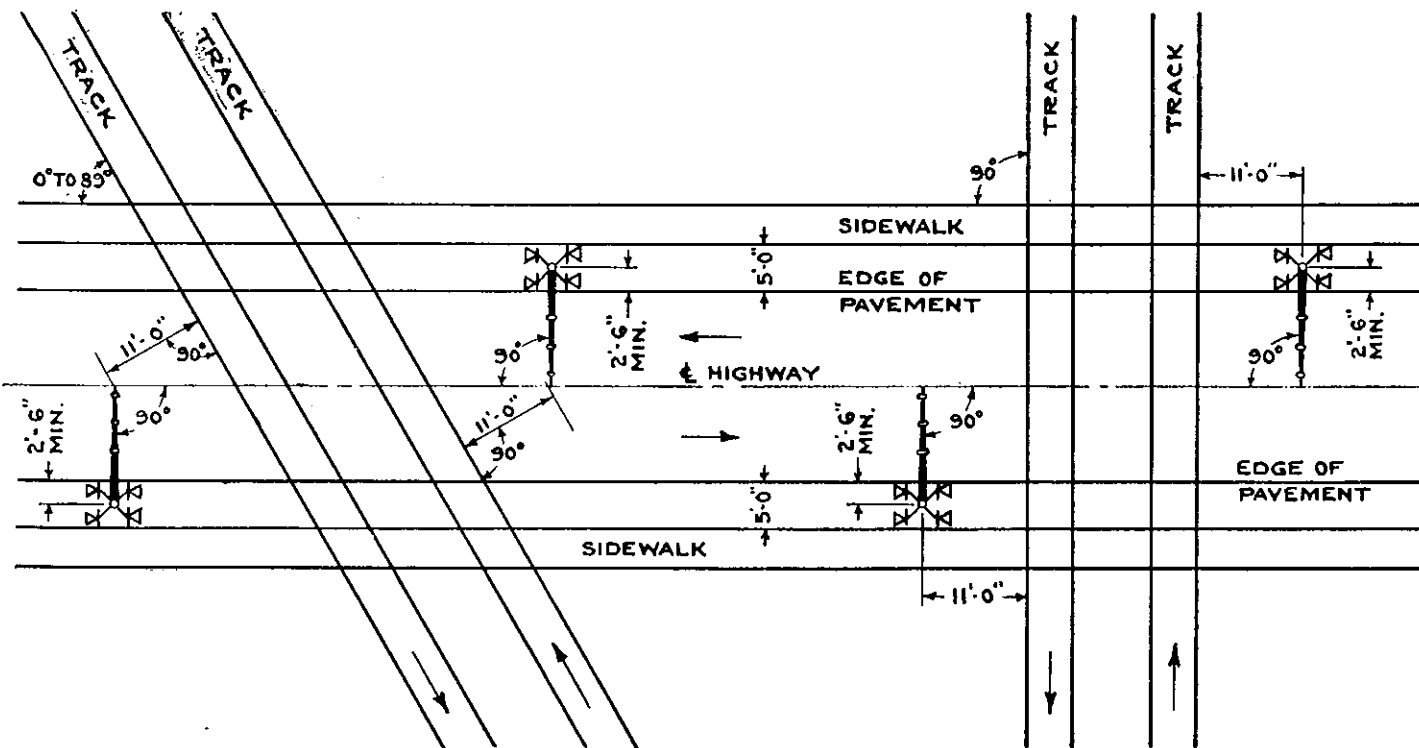
WHEN ORDERING COMPLETE GATE ARMS FROM MANUFACTURER
SPECIFY DIMENSIONS A-B-C-D AND E.

WHEN ORDERING REPLACEMENT GATES USE REFERENCES
ON S-T28C SPECIFYING DIMENSIONS B-C-D & E.

NOTE:
WIRES TO BE STAPLED SEPARATELY AS
REQUIRED WITH COPPER WELD INSULATED STAPLES.

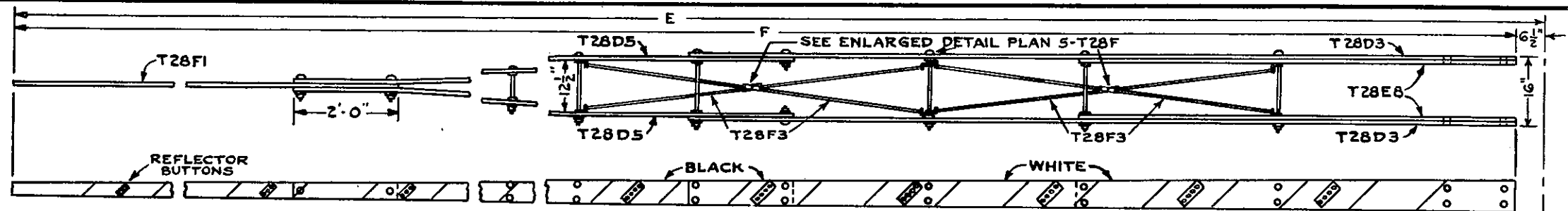
LAMP SPACING DOES NOT APPLY
TO THE STATE OF MICHIGAN.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING		
WIRING DETAIL		
DATED DEC. 17, 1948	REV. APR. 27, 1951	S-T28G2
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H. P. Alsmuth</i> ASST. SIGNAL ENGINEER

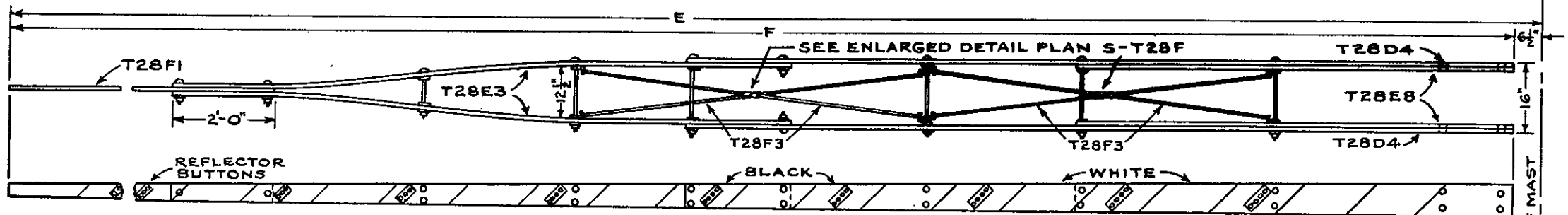


NOTE:
FLASHING LIGHT SIGNALS AND AUTOMATIC GATES TO BE LOCATED
MIDWAY BETWEEN EDGE OF PAVEMENT AND SIDEWALK. NOT TO
EXCEED 6'-0" FROM EDGE OF PAVEMENT.
WHERE SIDEWALK IS LESS THAN 5'-0" FROM EDGE OF PAVEMENT
FLASHING LIGHT SIGNALS AND AUTOMATIC GATES SHALL BE LOCATED
2'-6" ON OTHER SIDE OF SIDEWALK.

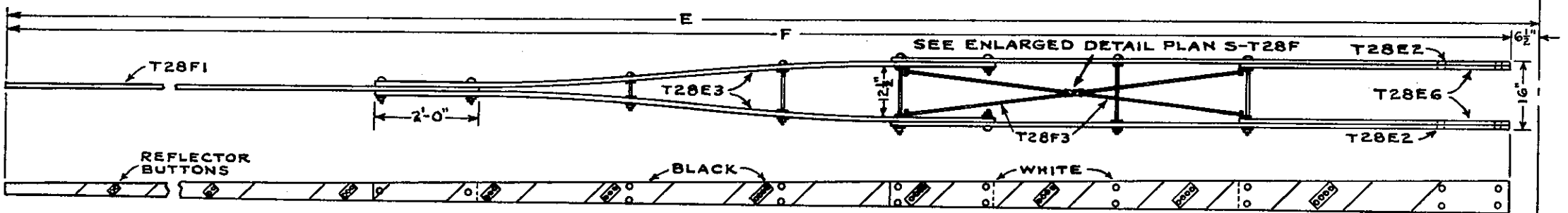
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING LOCATION PLAN		
DATED DEC. 17, 1948.		S-T28H
APPROVED FOR: N.Y.C. WEST OF BUFFALO		<i>H.D. Abner</i> ASST. SIGNAL ENGINEER



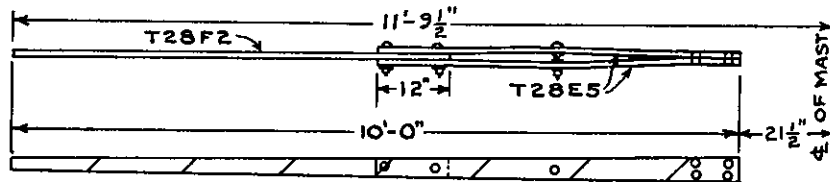
T28J1 HIGHWAY CROSSING GATE ARM COMPLETE (E = 34'-6½" TO 38'-6½") (F = 34'-0" TO 38'-0")



T28J2 HIGHWAY CROSSING GATE ARM COMPLETE (E = 30'-6½" TO 34'-5½") (F = 30'-0" TO 33'-11")



T28J3 HIGHWAY CROSSING GATE ARM COMPLETE (E = 26'-6½" TO 30'-5½") (F = 26'-0" TO 29'-11")



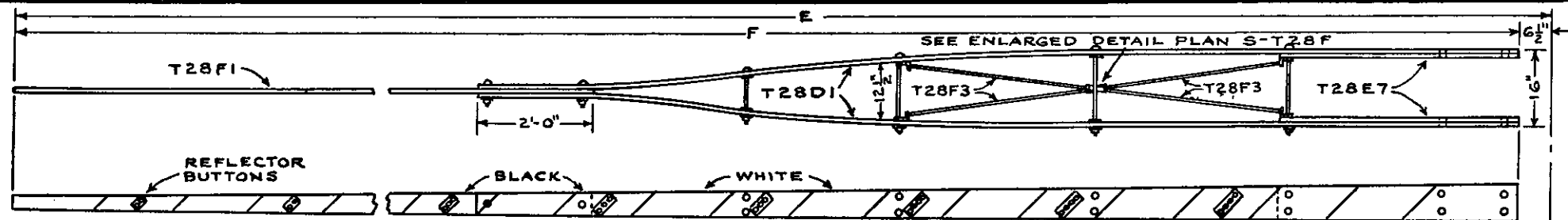
T28J4 SIDEWALK GATE ARM COMPLETE

NOTE:

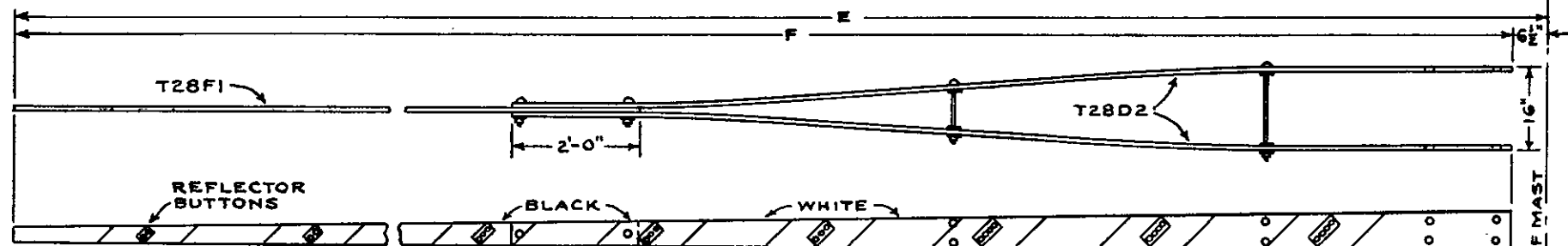
REFLECTOR BUTTONS TO BE MOUNTED ON BLACK STRIPES ONLY AND ON SIDE OF GATE FACING APPROACHING HIGHWAY TRAFFIC.

GATE ARMS 30'-0" OR LONGER TO BE EQUIPPED WITH WESTERN RAILROAD SUPPLY CO. BUFFER LEG # 3562-31GA.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING WITH MECHANISM 3566 ASSEMBLY		
DATED NOV. 21, 1949	REV. APR. 27, 1951	S-T28J2
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H.D. Anthony</i> ASST. SIGNAL ENGINEER

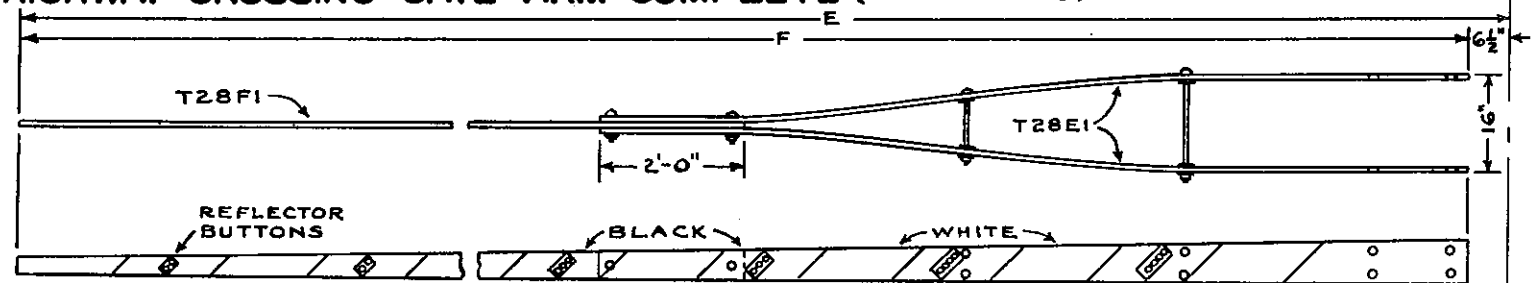


T28K1 HIGHWAY CROSSING GATE ARM COMPLETE ($E=24'-6\frac{1}{2}"$ TO $26'-5\frac{1}{2}"$) ($F=24'-0"$ TO $25'-11"$)

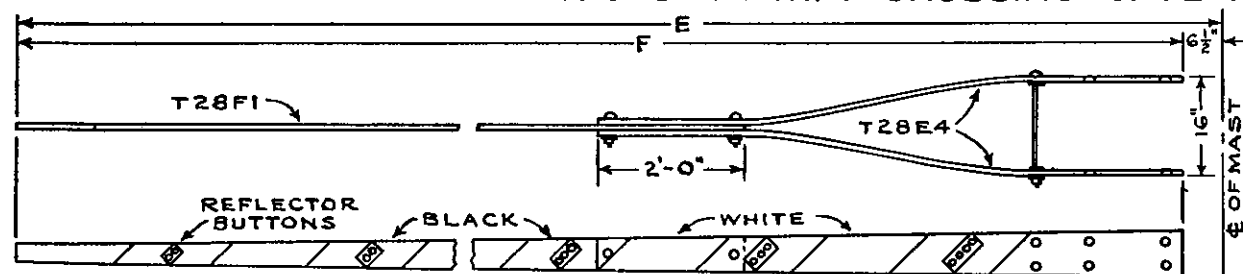


T28K2 HIGHWAY CROSSING GATE ARM COMPLETE ($E=20'-6\frac{1}{2}"$ TO $24'-5\frac{1}{2}"$) ($F=20'-0"$ TO $23'-11"$)

NOTE: REFLECTOR BUTTONS TO BE MOUNTED ON BLACK STRIPES ONLY AND ON SIDE OF GATE FACING APPROACHING HIGHWAY TRAFFIC.

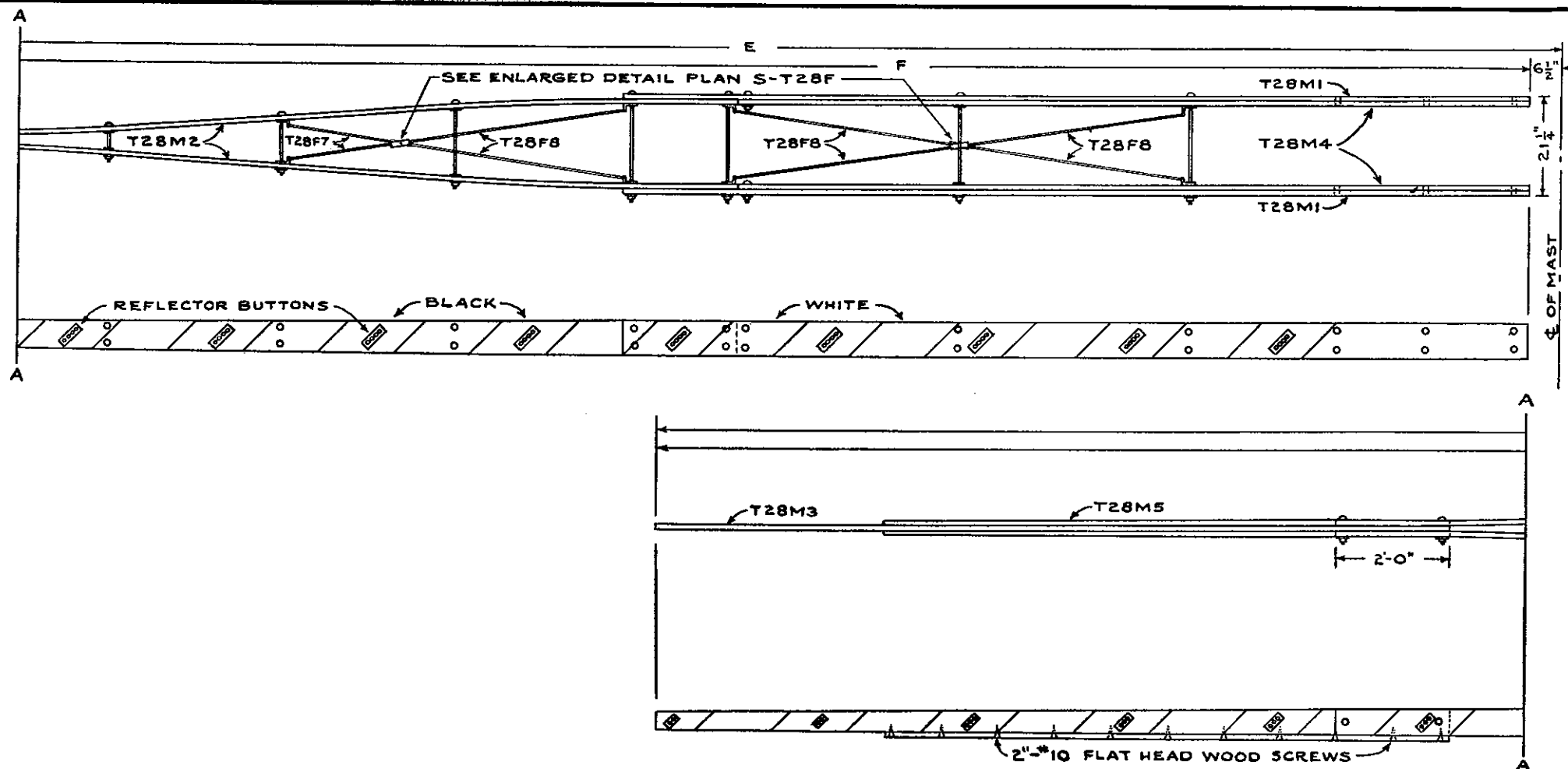


T28K3 HIGHWAY CROSSING GATE ARM COMPLETE ($E=16'-6\frac{1}{2}"$ TO $20'-5\frac{1}{2}"$) ($F=16'-0"$ TO $19'-11"$)



T28K4 HIGHWAY CROSSING GATE ARM COMPLETE ($E=11'-7\frac{1}{2}"$ TO $16'-5\frac{1}{2}"$) ($F=11'-1"$ TO $15'-11"$)

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM		
DOUBLE BEARING WITH MECHANISM 3566 ASSEMBLY		
DATED NOV. 21, 1949	REV. APR. 27, 1951	S-T28K2
APPROVED FOR N.Y.C. WEST OF BUFFALO		<i>H.D. O'Brien</i> ASST. SIGNAL ENGINEER

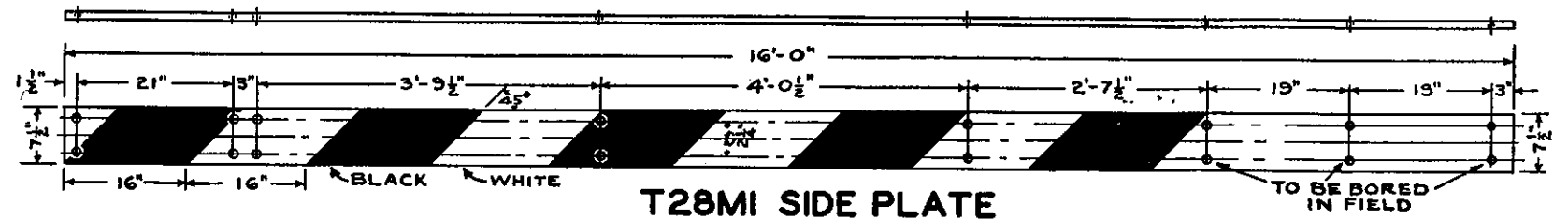


T28LI HIGHWAY CROSSING GATE ARM COMPLETE (E = 38'-6 1/2" TO 42'-6 1/2") (F = 38'-0" TO 42'-0")

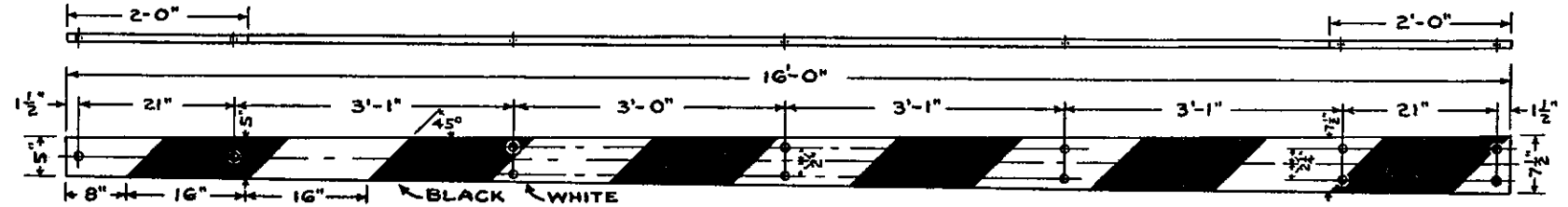
NOTE:
REFLECTOR BUTTONS TO BE MOUNTED
ON BLACK STRIPES ONLY AND ON SIDE OF
GATE FACING APPROACHING HIGHWAY TRAFFIC.

GATE ARM TO BE EQUIPPED WITH
WESTERN RAILROAD SUPPLY CO.
BUFFER LEG NO. 3562-31GA.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM DOUBLE BEARING WITH MECHANISM 3566 ASSEMBLY		
DATED APR. 27, 1951		S-T28L
APPROVED FOR N. Y. C. WEST OF BUFFALO		<i>H. D. Abernethy</i> ASST. SIGNAL ENGINEER



T28M1 SIDE PLATE

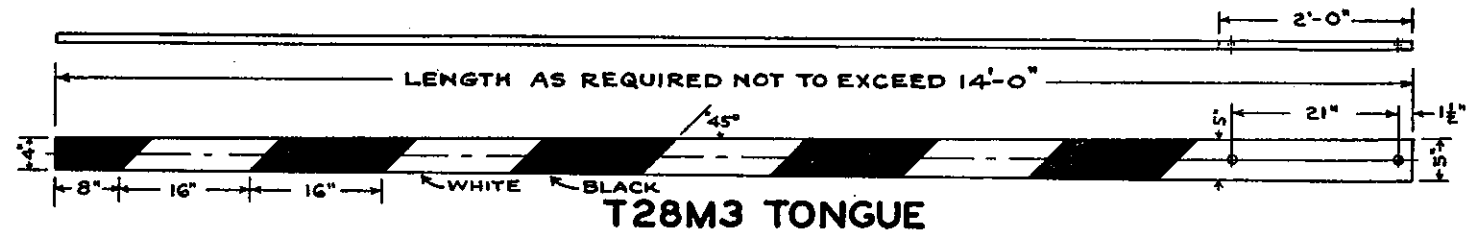


T28M2 SIDE PLATE

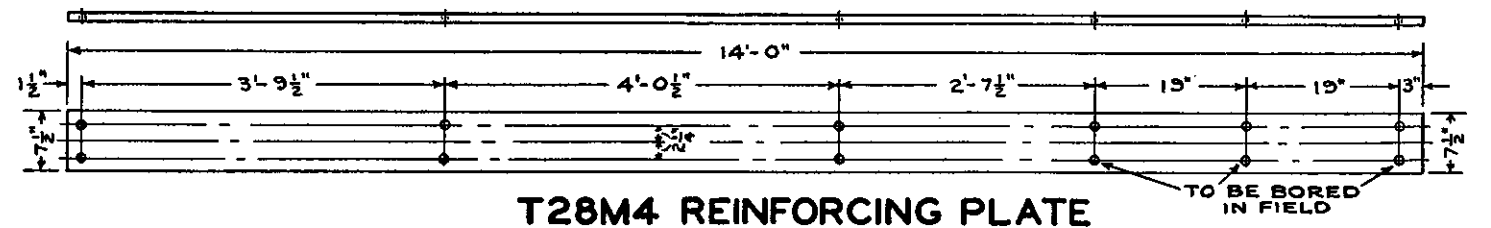
NOTE:

MATERIAL 1"X8"S4S, LENGTH AS REQUIRED. MUST BE EITHER SUGAR PINE, WHITE PINE OR CLEAR PRINCE RUPERT CEDAR, KILN DRIED, FREE FROM KNOTS, WEIGHT NOT TO EXCEED 2.00 LBS. PER BOARD FOOT.

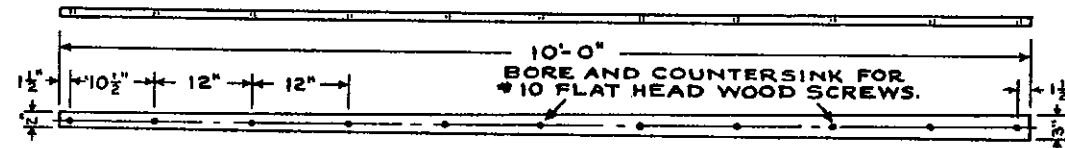
PAINTING
TONGUE, SIDE AND REINFORCING PLATES SHALL BE GIVEN 2 COATES OF WHITE PAINT.
STRIPING ON TONGUE AND SIDE PLATES TO CONSIST OF 16" BLACK AND 16" WHITE STRIPES ALTERNATED ON FACE SIDE ONLY. PAINTING SHALL BE IN ACCORDANCE WITH INSTRUCTION 350.



T28M3 TONGUE



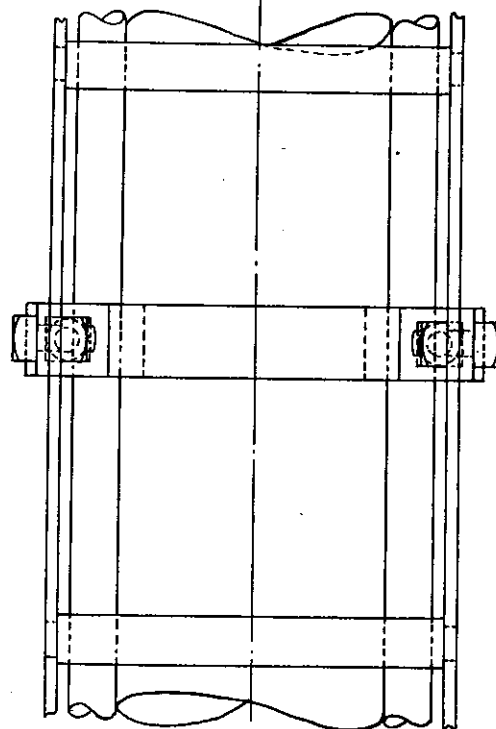
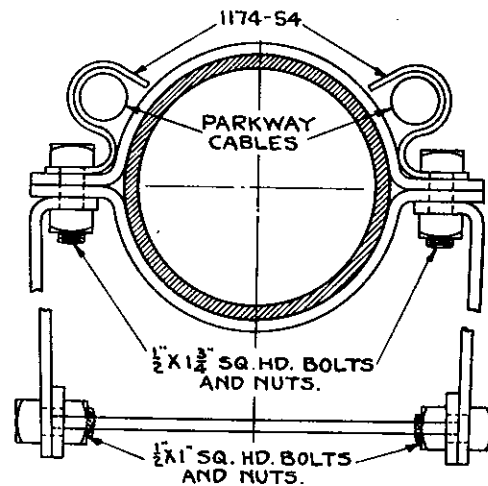
T28M4 REINFORCING PLATE



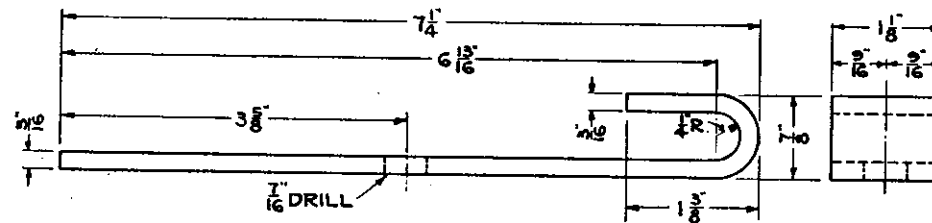
T28M5 REINFORCING PLATE

NOTE:
ALL HOLES 7/16" EXCEPT AS NOTED.

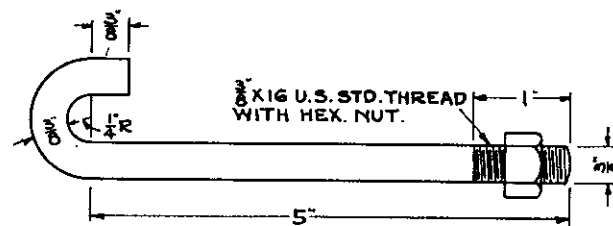
N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
HIGHWAY CROSSING GATE ARM DOUBLE BEARING DETAILS		
DATED APR. 27, 1951	S-T28M	
APPROVED FOR N. Y. C. WEST OF BUFFALO		<i>H. D. Abner</i> ASST. SIGNAL ENGINEER



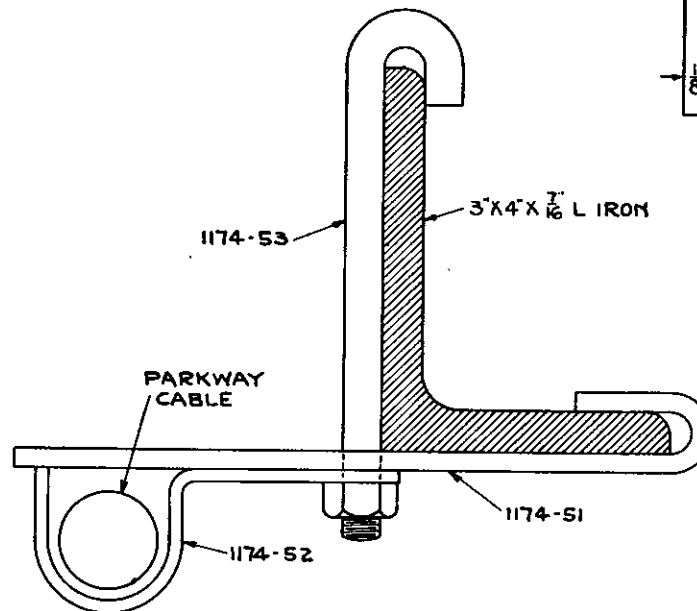
DETAIL "A"



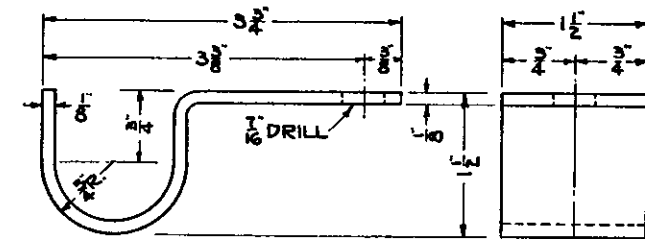
1174-S1 SUPPORT
(O. H. STEEL)



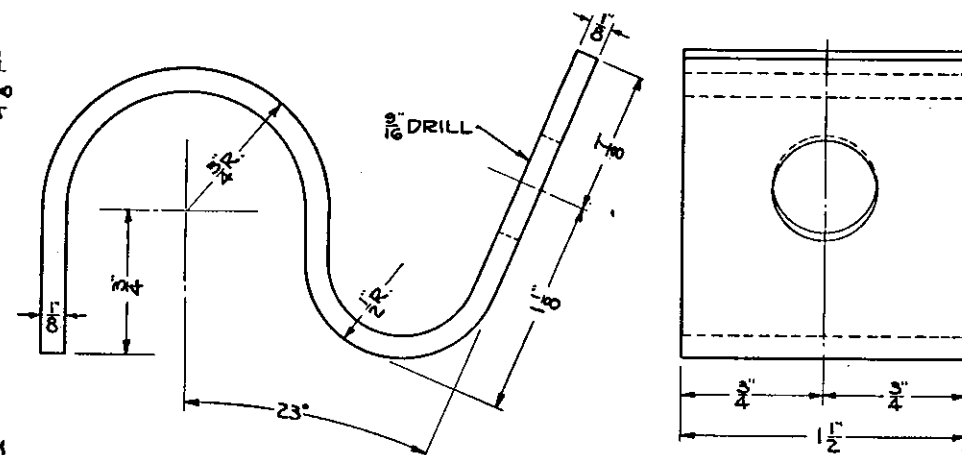
1174-S3 HOOK BOLT
(O. H. STEEL)



DETAIL "B"



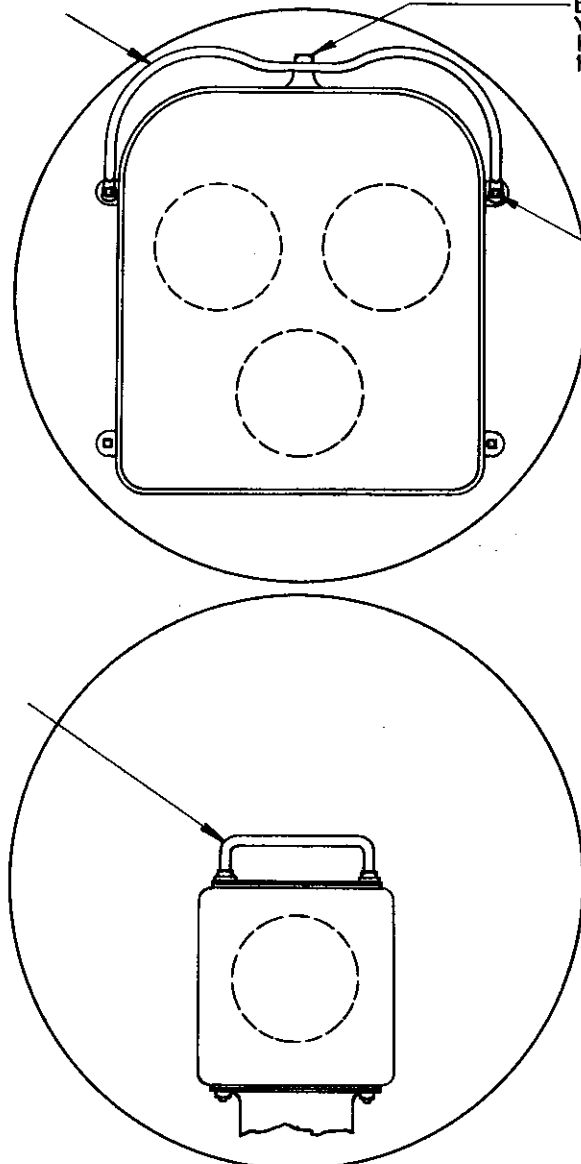
1174-S2 BRACKET
(O. H. STEEL)



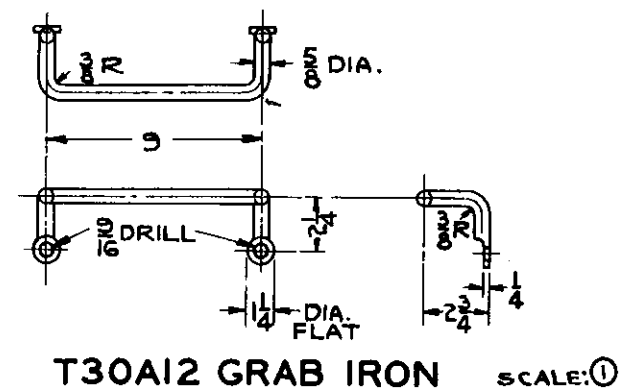
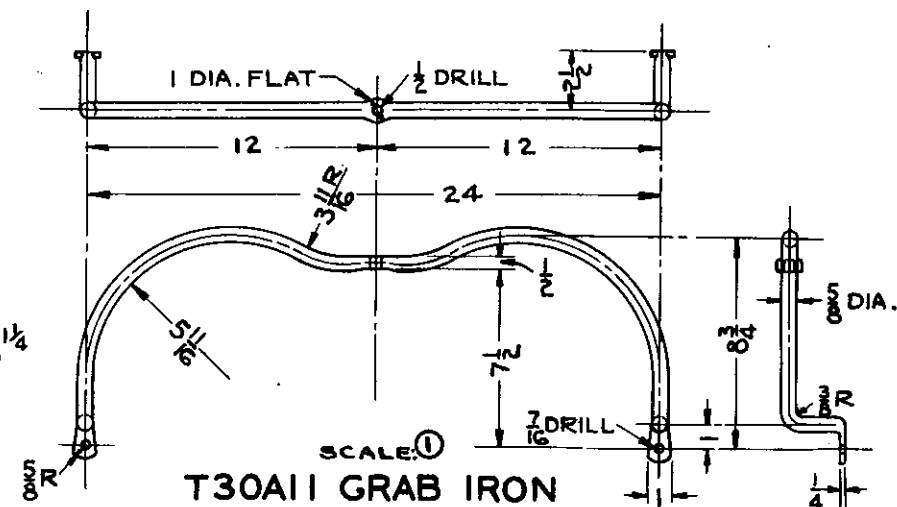
1174-S4 BRACKET
(O. H. STEEL)

SCALE: 3 IN. = 1 FT. 6 IN. = 1 FT. 12 IN. = 1 FT.

N. Y. C. R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.
COLOR LIGHT SIGNALS PARKWAY CABLE ARRANGEMENT DETAILS JUNE 11, 1929.		
REVISION NO.	S-A1174-5	
 SIGNAL ENGINEER.		



APPLICATION
BACK OF TOP UNITS
SCALE: ②



SCALES AND ALL DIMENSIONS GIVEN IN INCHES

N. Y. C. & R. R. WEST OF BUFFALO.	SIGNAL DEPT.	CLEVELAND, O.

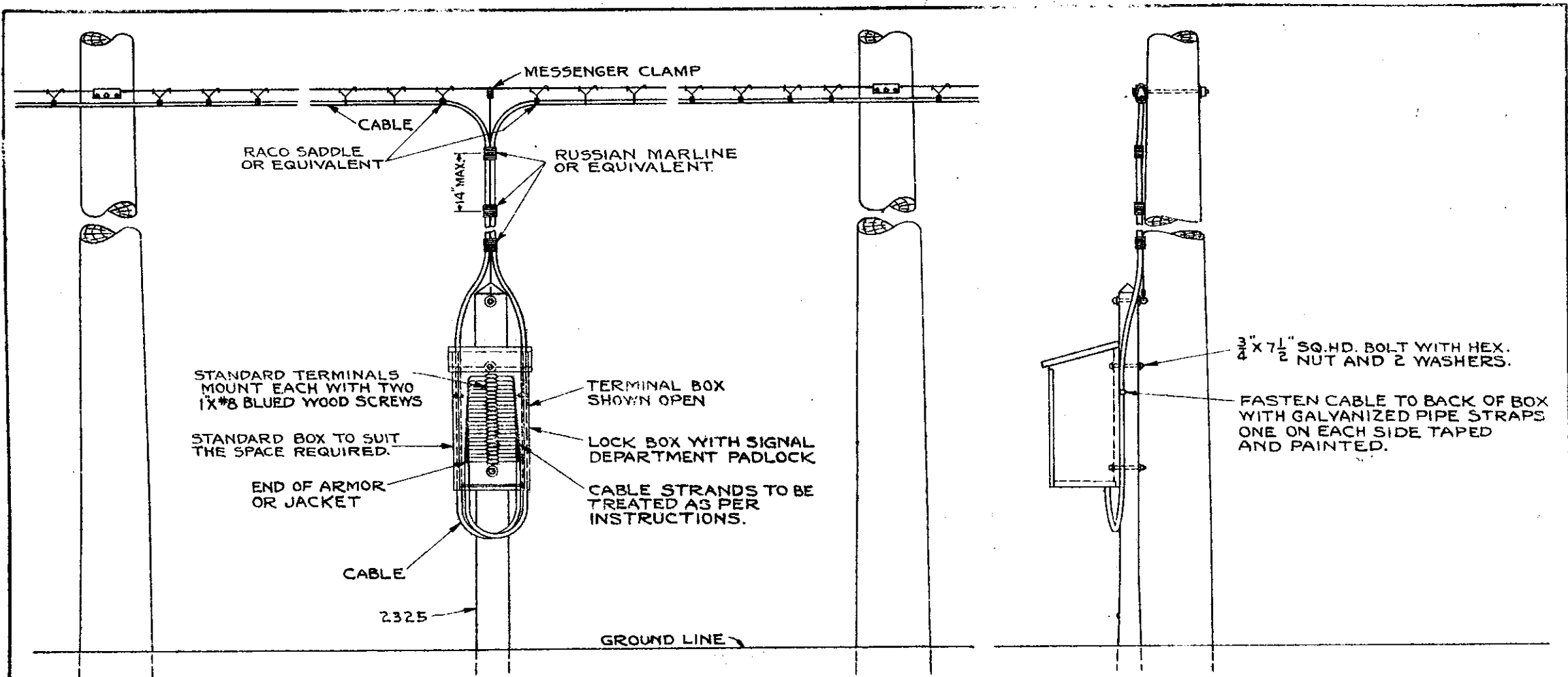
COLOR LIGHT SIGNALS
GRAB IRONS

DATED APRIL 10, 1930	REV. JUNE 19, 1953

S-T30A

APPROVED FOR
N. Y. C. WEST OF BUFFALO
C. C. C. & ST. L. RY.
M. C. R. R.

Merced
SIGNAL ENGINEER



NOTE:
 RACO CABLE DROPS OR EQUIVALENT MAY BE USED FOR SPECIAL CONDITIONS SUCH AS HEAVY CABLES OR ARMORED CABLES WHEN AUTHORIZED BY SIGNAL ENGINEER.
 RACO CABLING STRAPS WITHOUT HOOK OR EQUIVALENT OR MARLINE TIES MAY BE USED TO BAND THE VERTICAL DROP TO THE MESSENGER.

N. Y. C. R. R.	SIGNAL DEPT.	CLEVELAND, O.
LINE CABLE SPLICE		
AUG. 3, 1934.		
REVISION NO.		S-W2B
 SIGNAL ENGINEER		

