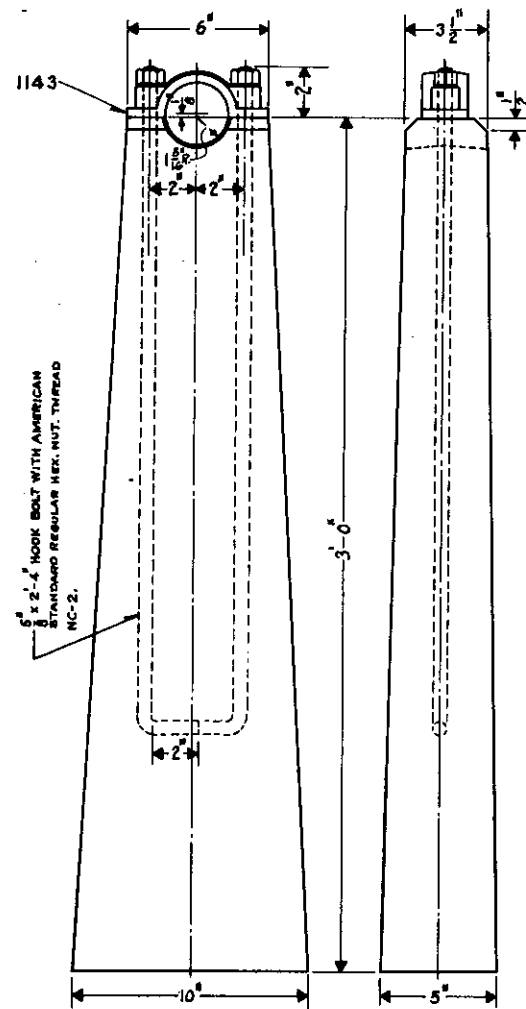
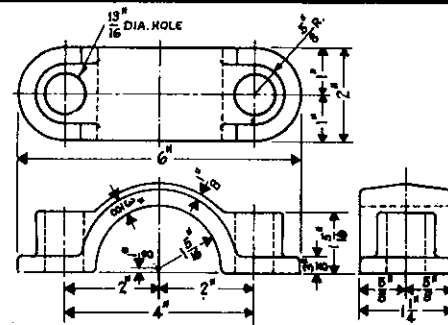
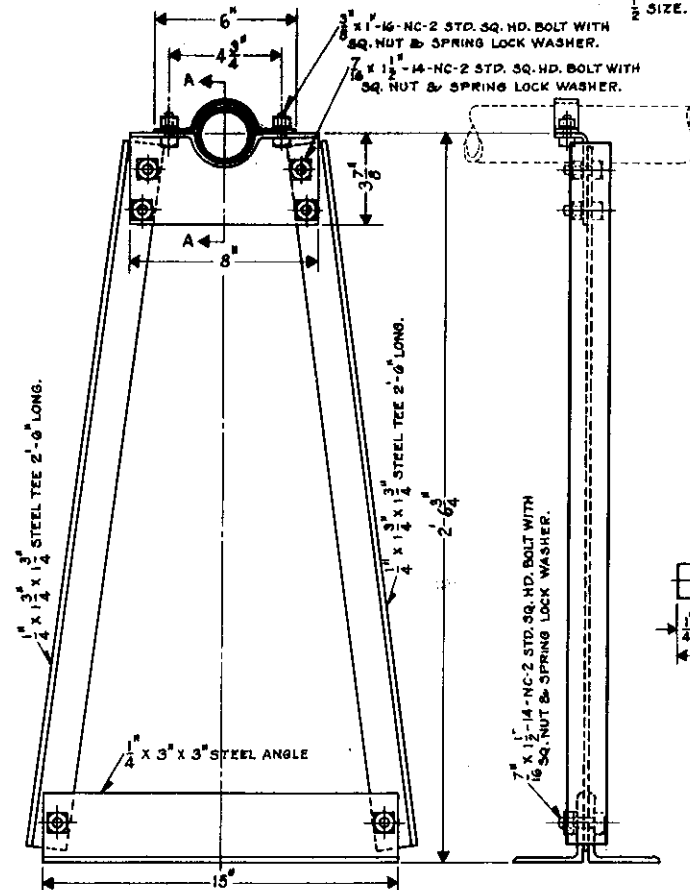




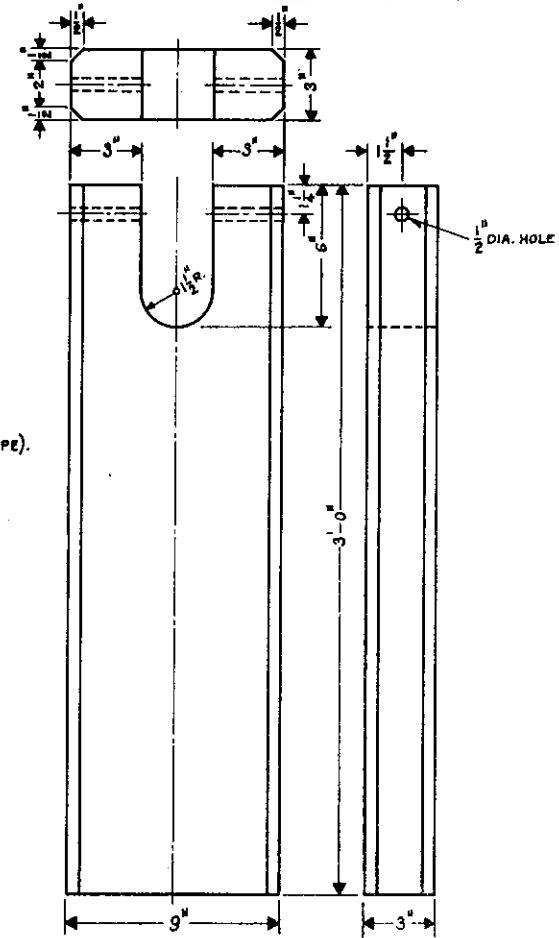
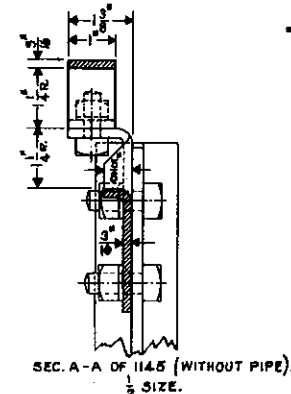
1141 FOUNDATION COMPLETE AS SHOWN.
(FOR 2 INCH AIR LINE)
CONCRETE.
STORES CAT. REF. NO. 2A-1047.
A. A. R. SIB. SEC. M-1935.



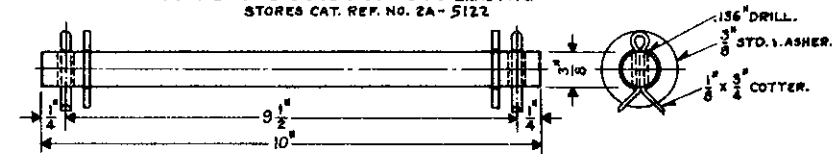
1143 CAP CAST IRON.
STORES CAT. REF. NO. 2A-3591
A. A. R. SIB. SEC. M-1935.



1145 FOUNDATION COMPLETE AS SHOWN.
(FOR 2 INCH AIR LINE)
STORES CAT. REF. NO. 2A-3543.



1146 FOUNDATION COMPLETE AS SHOWN.
(FOR 2 INCH AIR LINE)
ELASTITE.
STORES CAT. REF. NO. 2A-5122.



1147 PIN COMPLETE AS SHOWN.
O. H. S.
STORES CAT. REF. NO. 2A-5121.

- NOTE:-
- FOUNDATIONS SHALL BE NOT LESS THAN TWO (2) FEET UNDERGROUND.
 - FOUNDATIONS SHALL BE SPACED APPROXIMATELY TWELVE (12) FEET APART ON TANGENT.
 - CONCRETE SHALL BE IN ACCORDANCE WITH SPECIFICATION C. E. 77, (CLASS B) PROPORTIONING PER PARA. 306.
 - ALL PARTS OF FOUNDATION 1145 SHALL BE HOT DIP GALVANIZED.
 - PIN 1147 FOR USE WITH FOUNDATION 1146.

REVISIONS
REDRAWN FROM APPROVED PLAN S-114-C, DATED JAN. 31, 1941, LAST. REVISED JULY 15, 1941, FOLLOWING CHANGES MADE: CONCRETE FOUNDATION 1145 AND CAP 1143 FOR 2 INCH AIR LINE REMOVED. ELASTITE FOUNDATION 1146 AND PIN 1147 ADDED.

1 SHEET

S-114-D

THE PENNSYLVANIA RAILROAD

STANDARD

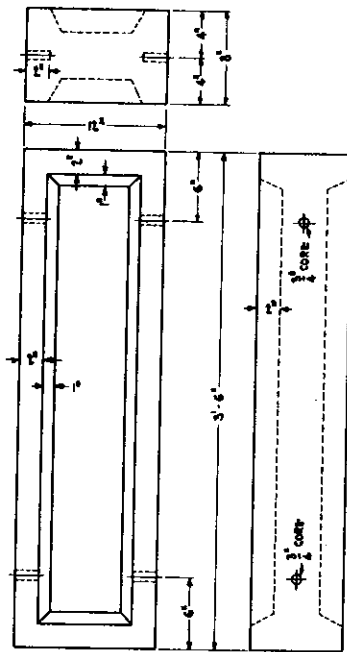
FOUNDATIONS

AIR LINE

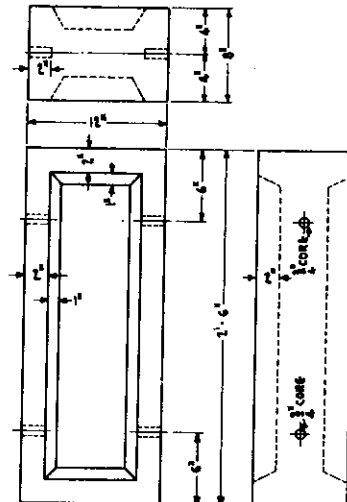
OFFICE OF CHIEF ENGINEER, PHILA., PA., APRIL 24, 1943.

Approved *N. C. Stanton* Assistant Chief Engineer-Signals

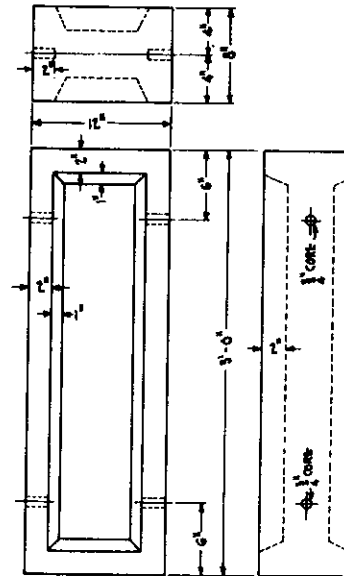
Approved *W. H. H. H.* Chief Engineer



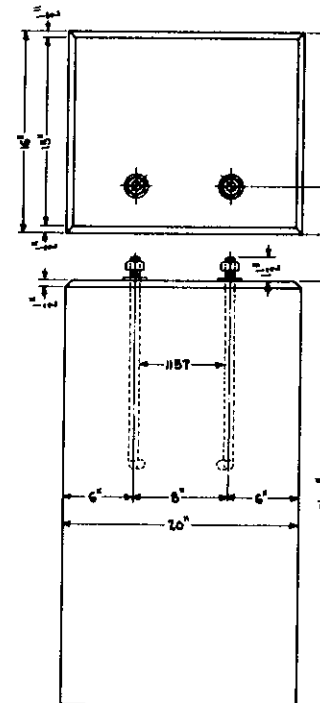
1151 - FOUNDATION
CONCRETE



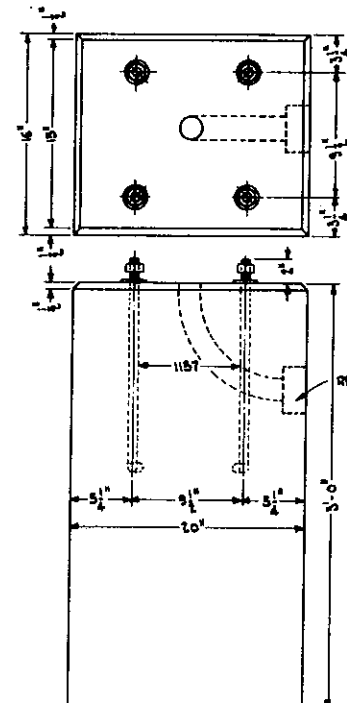
1152 - FOUNDATION
CONCRETE



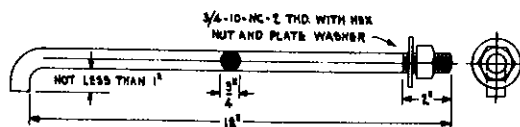
1153 - FOUNDATION
CONCRETE



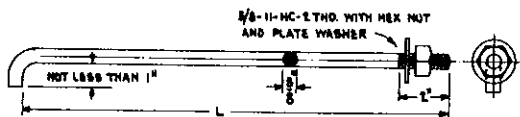
1155 - FOUNDATION
CONCRETE



1156 - FOUNDATION
CONCRETE



1157 - HOOK BOLT D.H.S.



1158 - HOOK BOLT L = 7 1/2" (FOR USE WITH 1157)

1159 - " " L = 9"

11510 - " "

SPECIFY LENGTH WHEN ORDERING.

D.H.S.

- NOTE:
1. FOUNDATIONS SHALL BE NOT LESS THAN TWO (2) FEET UNDERGROUND.
 2. CONCRETE SHALL BE IN ACCORDANCE WITH A.R.A. SIGNAL SECTION SPEC. IIII.

REVISIONS
REDRAWN FROM APPROVED PLAN S-115-B, DATED JULY 27, 1927, AND REVISED.

1 SHEET

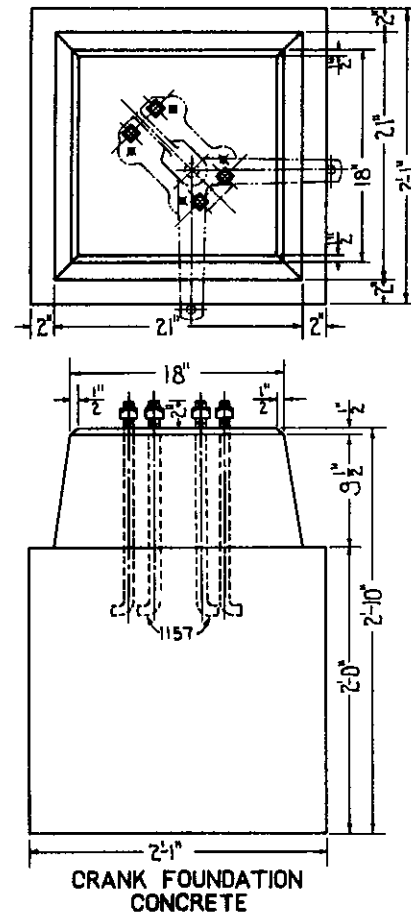
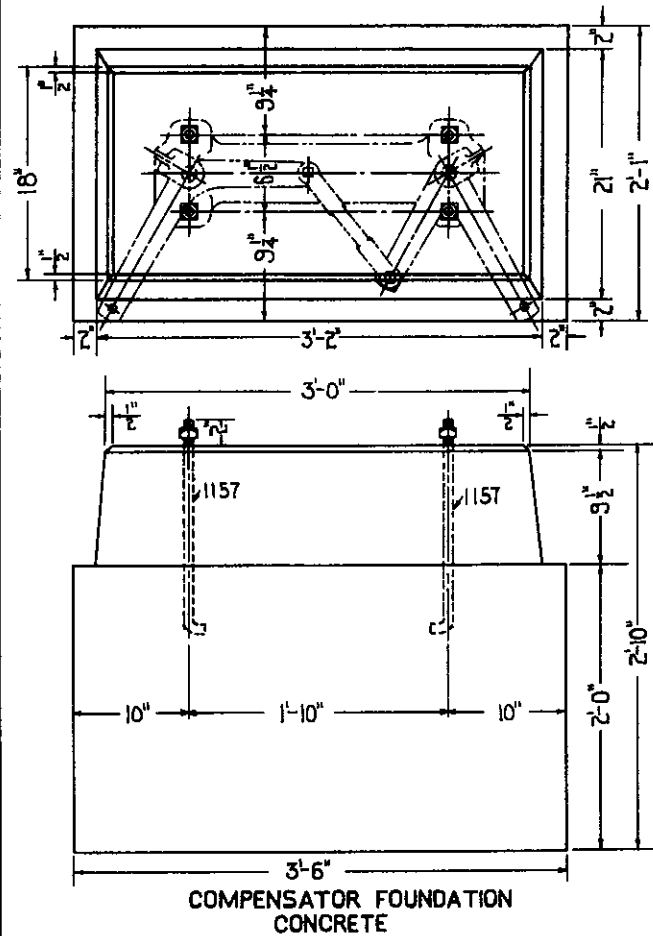
S-115-C

THE PENNSYLVANIA RAILROAD
 STANDARD
FOUNDATIONS
 PIPE CARRIERS AND INSTRUMENT CASES

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., JULY 11, 1928.

Approved: Chief Signal Engineer

Approved: Chief Engineer



NOTE:

1. FOREMEN SHOULD USE THEIR BEST JUDGMENT AS TO THE PROPER DEPTH OF FOUNDATIONS, BEING GOVERNED BY LOCAL CONDITIONS. FOUNDATIONS SHOWN ARE ADAPTABLE TO GOOD SOLID GROUND.
2. THE TOP SURFACE SHALL BE SLIGHTLY SLOPING AWAY FROM MECHANISM TO PROVIDE ADEQUATE DRAINAGE.
3. CONCRETE SHALL BE IN ACCORDANCE WITH A. R. A. SIGNAL SECTION SPECIFICATION 1111.

REVISIONS

11-22-20. Crank Stand formerly shown parallel with Foundation.

Approved: *ant*

C- November 23, 1927.

Approved: *ant*

D- JULY 11, 1934.

Approved: *ant*

1 SHEET

S-116-D

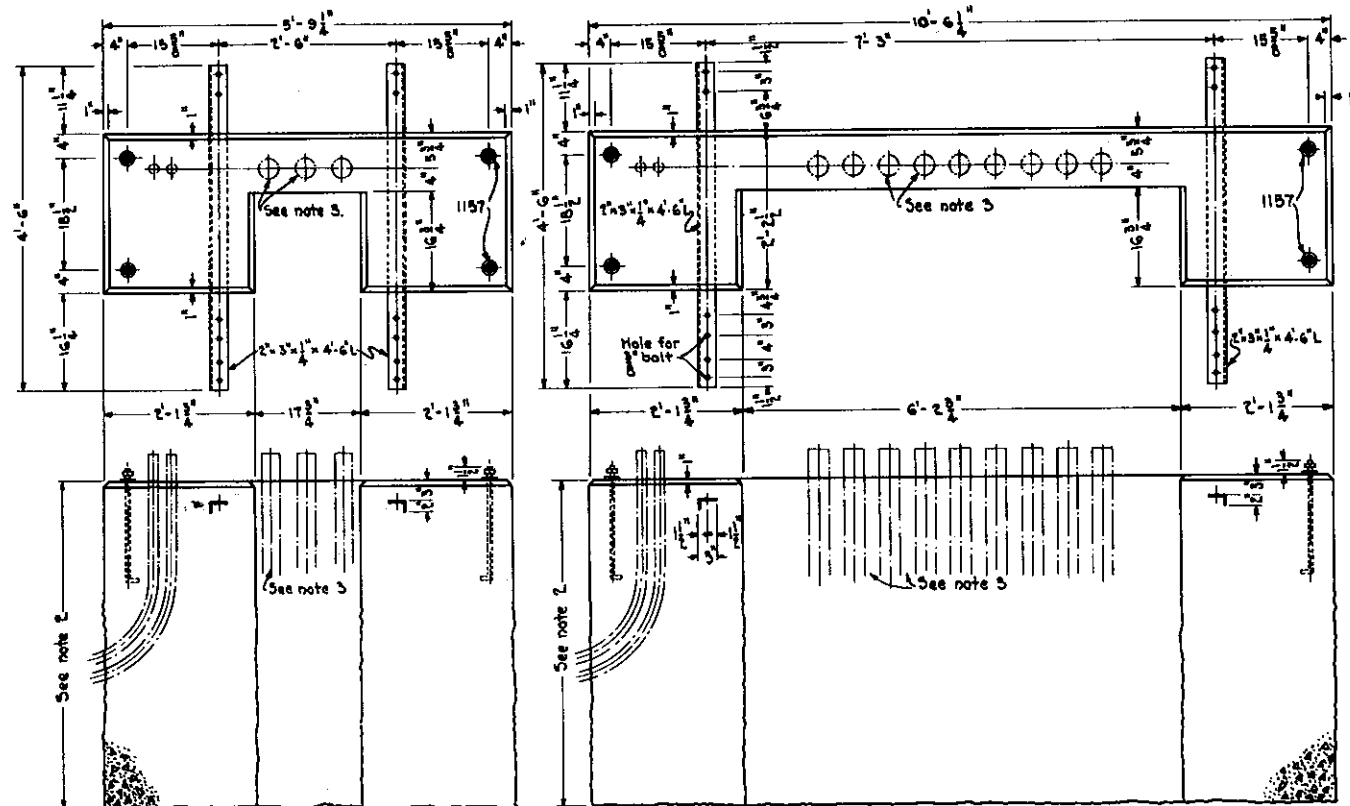


THE PENNSYLVANIA RAILROAD
STANDARD
FOUNDATIONS FOR COMPENSATORS
AND CRANKS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., AUGUST 3, 1920

Correct *ant*
Chief Signal Engineer

Approved *ant*
Chief Engineer



1171 - FOUNDATION
(FOR USE WITH CASE "A" - PLAN S-530)

1172 - FOUNDATION
(FOR USE WITH CASE "B" - PLAN S-530)

NOTE:
1. CONCRETE SHALL BE IN ACCORDANCE WITH A.R. SIGNAL SECTION SPBC 1111.
2. FOUNDATION SHALL BE NOT LESS THAN 3'-6" UNDERGROUND. FACING SHALL EXTEND NOT LESS THAN 6" BELOW GROUND LINE.
3. NUMBER, SIZE, LOCATION AND TERMINATION OF DUCTS TO BE DETERMINED BY LOCAL REQUIREMENTS. SPARE DUCTS FOR FUTURE ADDITIONS SHOULD BE GIVEN CONSIDERATION.

REVISIONS

1 SHEET

S-117-A



THE PENNSYLVANIA RAILROAD
STANDARD
FOUNDATIONS

FOR INSTRUMENT CASES

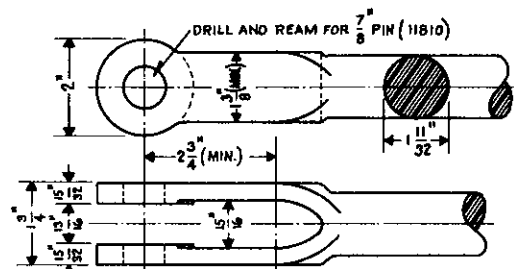
Office of Chief Signal Engineer, Phila., Pa. July 12, 1930

Approved:

Approved:

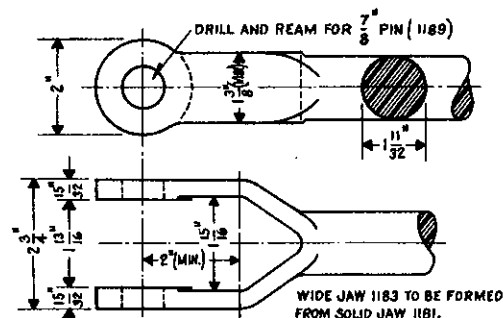
Chief Signal Engineer

Chief Engineer



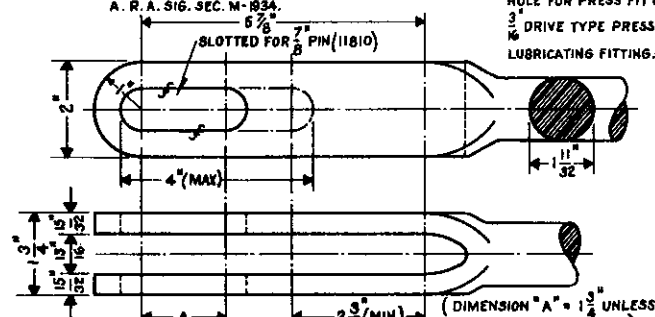
1181 SOLID JAW.

O. H. STEEL.
A. R. A. SIG. SEC. M-1934.



1183 WIDE JAW.

O. H. STEEL.
A. R. A. SIG. SEC. M-1934.

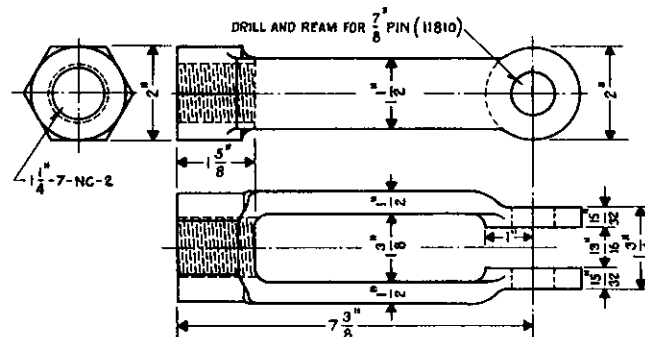


1185 SLOTTED JAW.

O. H. STEEL.
A. R. A. SIG. SEC. M-1934.

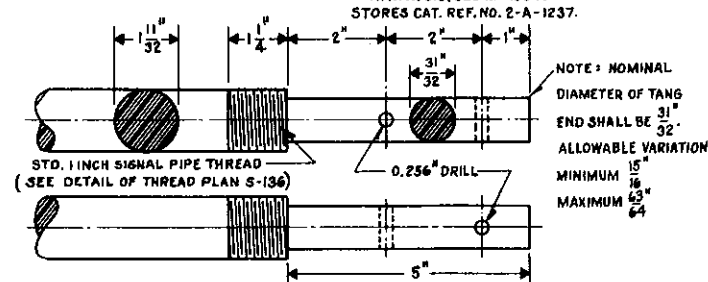
HOLE FOR PRESS FIT OF
3/8 DRIVE TYPE PRESSURE
LUBRICATING FITTING.

(DIMENSION "A" = 1 1/2 UNLESS
OTHERWISE SPECIFIED)



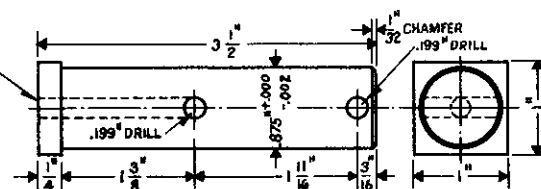
1187 SCREW JAW.

O. H. STEEL.
A. R. A. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2-A-1237.



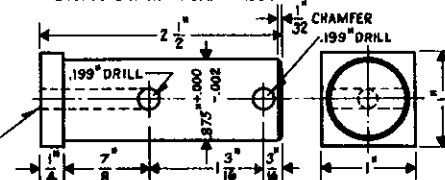
1188 DETAIL OF TANG END.

FOR 1 INCH SIGNAL PIPE.
O. H. STEEL.
A. R. A. SIG. SEC. M-1934.



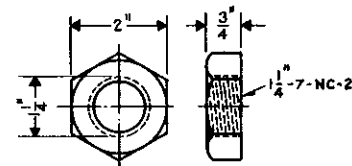
1189 WIDE JAW PIN.

MACHINERY OR C. R. STEEL.
A. R. A. SIG. SEC. M-1935.
STORES CAT. REF. NO. 2-A-1684.



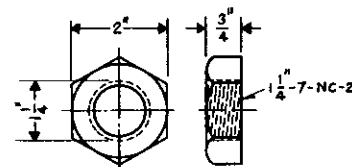
11810 STANDARD JAW PIN.

MACHINERY OR C. R. STEEL.
A. R. A. SIG. SEC. M-1935
STORES CAT. REF. NO. 2-A-1685



11811 JAM NUT.

RIGHT HAND THREAD.
O. H. STEEL. COLD PUNCHED.
A. R. A. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2-A-1593.



11812 JAM NUT.

LEFT HAND THREAD.
O. H. STEEL. COLD PUNCHED.
A. R. A. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2-A-1592

NOTE:

1. REMOVE SHARP EDGES FROM ALL HOLES IN PINS 1189 AND 11810.
2. FURNISH ONE 3/8 x 1 1/2 COTTER WITH EACH PIN 1189 AND 11810.
3. IF LUBRICATING FITTING IS REQUIRED WITH PINS 1189 AND 11810, SPECIFY ON REQUISITION.

REVISIONS

REDRAWN FROM APPROVED PLAN
S-118-A, DATED JUNE 4, 1920 AND
REVISED.

1 SHEET



S-118-B

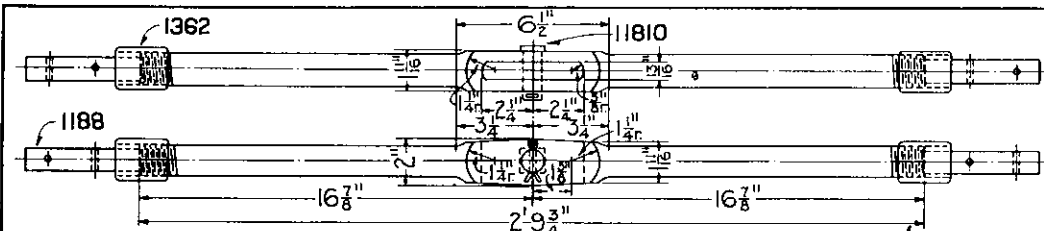
THE PENNSYLVANIA RAILROAD
STANDARD
SCREW AND SOLID JAWS

DETAILS:

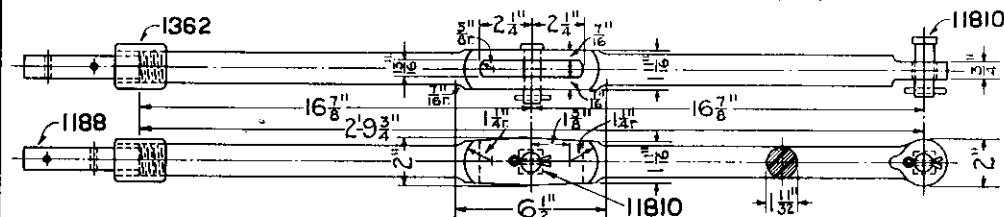
OFFICE OF CHIEF ENGINEER, PHILA., PA. MAY 20, 1940.

Approved
N. C. Stanton
Assistant Chief Engineer-Signals

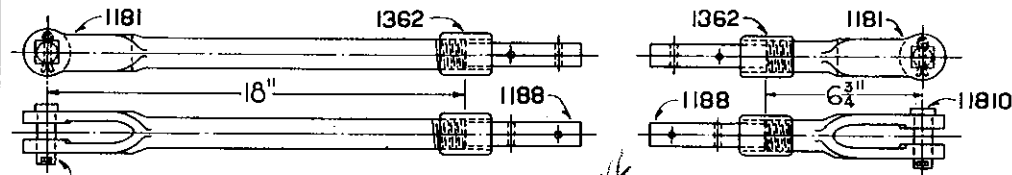
Approved
W. J. Higgins
Chief Engineer



1211-DOUBLE JAW. - 2A-1234

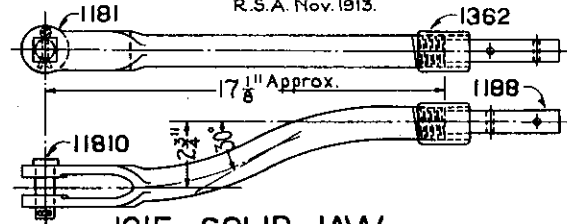


1212-DOUBLE JAW.

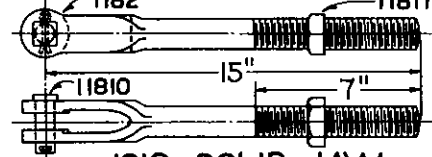


1213-SOLID JAW STRAIGHT. - 2A-1246
R.S.A. Nov. 1913.

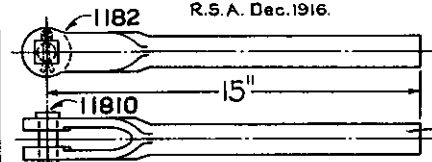
1214-SOLID JAW SHORT.



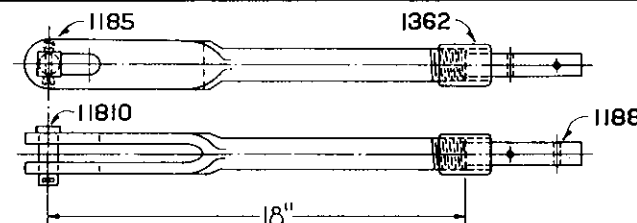
1215-SOLID JAW OFFSET.
R.S.A. Nov. 1913.



1216-SOLID JAW.
R.S.A. Dec. 1916.

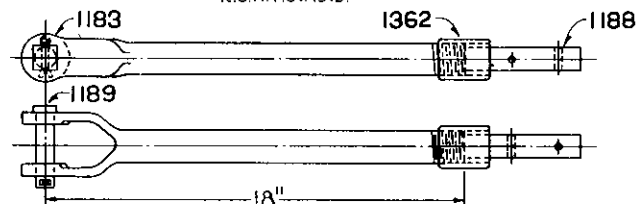


1217-SOLID JAW. R.S.A. Dec. 1916.



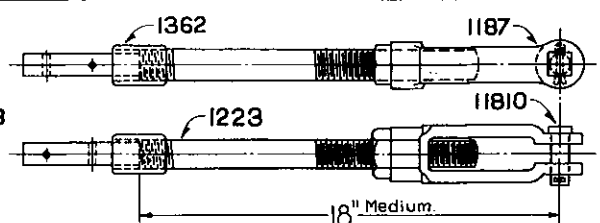
1218-SLOTTED JAW.

R.S.A. Nov. 1913.



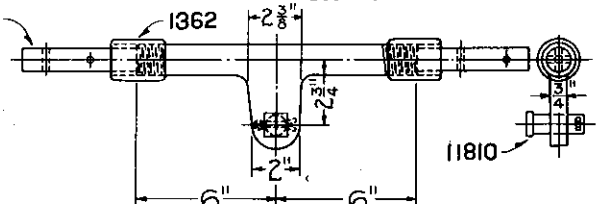
12110-WIDE JAW. - 2A-1254

R.S.A. Nov. 1913.



1219-SCREW JAW. - 2A-1238

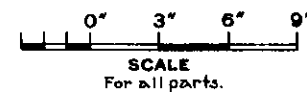
R.S.A. Dec. 1916.



12111-LUG - 2A-1454

R.S.A. Sept. 1916.

REVISIONS.



1 SHEET

S-121-A

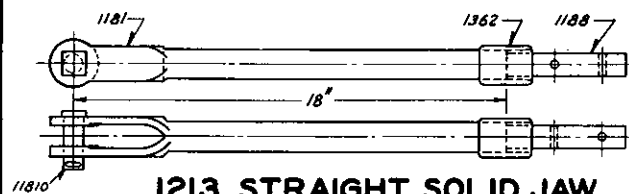
PENNSYLVANIA SYSTEM

STANDARD
JAWS AND LUGS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., AUGUST 2, 1920

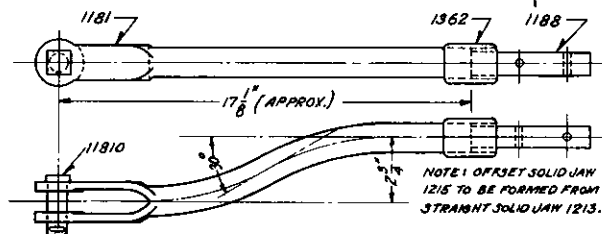
Correct
Chief Signal Engineer

Approved
Chief Engineer



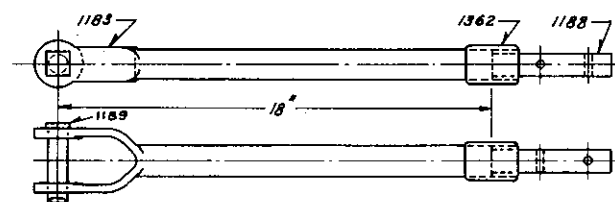
1213 STRAIGHT SOLID JAW

(TANG END) STORES CAT. REF. NO. 2A-1246
SAE-1020 STEEL FORGED. AAR SIG. SEC. M-1941.



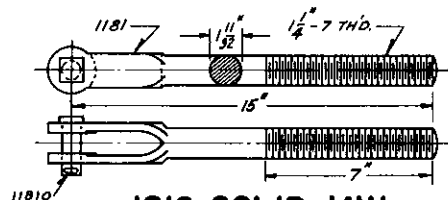
1215 OFFSET SOLID JAW

(TANG END) STORES CAT. REF. NO. 2A-1250
SAE-1020 STEEL FORGED. AAR SIG. SEC. M-1941.



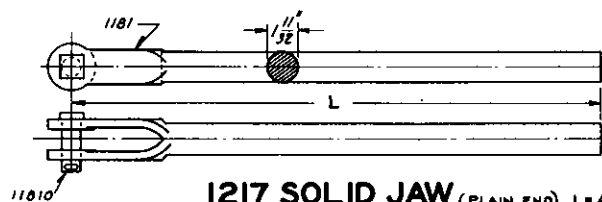
12110 WIDE JAW (TANG END)

STORES CAT. REF. NO. 2A-1254
SAE-1020 STEEL FORGED. AAR SIG. SEC. M-1941.



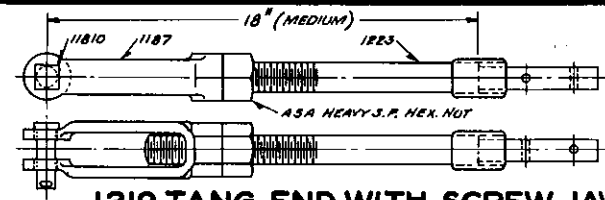
1216 SOLID JAW (THREADED END)

SAE-1020 STEEL FORGED.
STORES CAT. REF. NO. 2A-1247 AAR SIG. SEC. M-1940



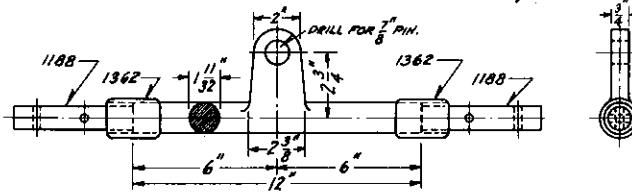
1217 SOLID JAW (PLAIN END)

L=AS ORDERED
SAE-1020 STEEL FORGED
STORES CAT. REF. NO. 2A-1248
SIMILAR TO AAR SIG. SEC. M-1940



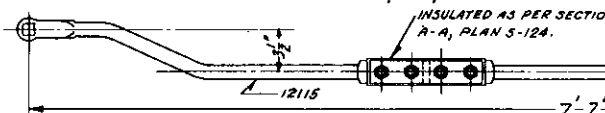
1219 TANG END WITH SCREW JAW

STORES CAT. REF. NO. 2A-1238 AAR SIG. SEC. M-1940.



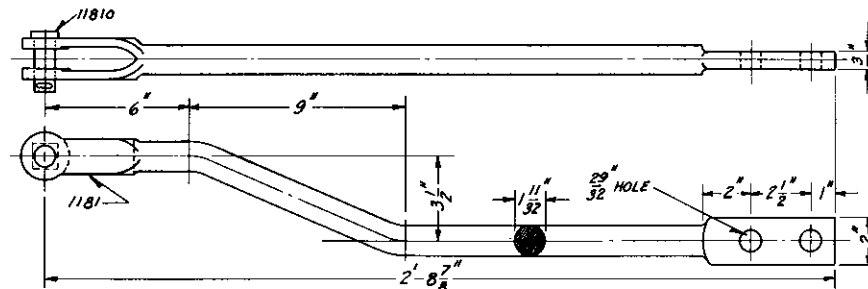
12111 LUG

SAE-1020 STEEL FORGED.
STORES CAT. REF. NO. 2A-1454
AAR SIG. SEC. M-1942.



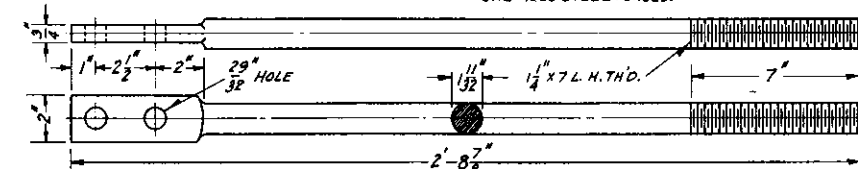
12114 ADJUSTABLE LINK

INSULATED
STORES CAT. REF. NO. 2A-5682



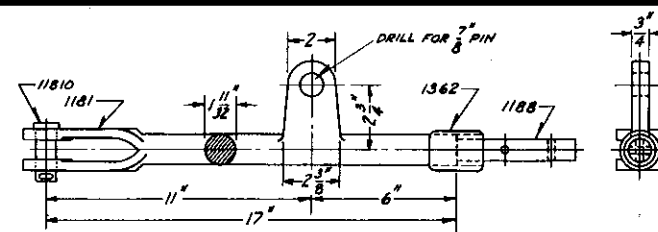
12115 OFFSET SOLID JAW

STORES CAT. REF. NO. 2A-5683
SAE-1020 STEEL FORGED.



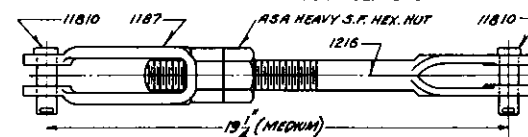
12116 THREADED END

STORES CAT. REF. NO. 2A-5684
SAE-1020 STEEL FORGED.



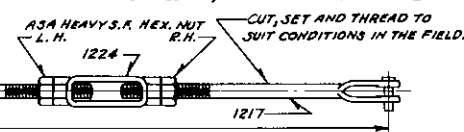
12112 LUG

SAE-1020 STEEL FORGED.
STORES CAT. REF. NO. 2A-5680



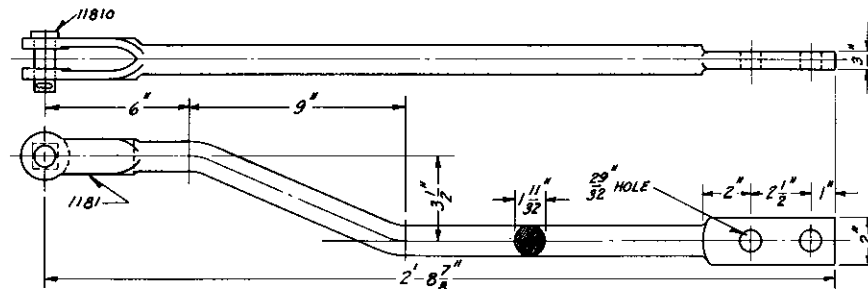
12113 ADJUSTABLE LINK

AAR SIG. SEC. M-1940 STORES CAT. REF. NO. 2A-5681



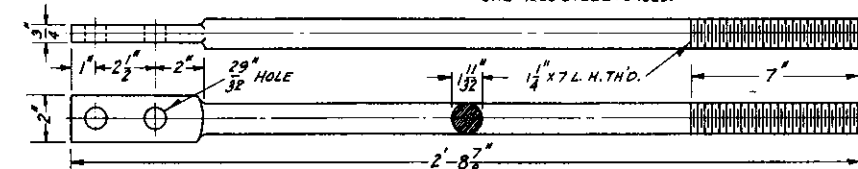
12114 ADJUSTABLE LINK

INSULATED
STORES CAT. REF. NO. 2A-5682



12115 OFFSET SOLID JAW

STORES CAT. REF. NO. 2A-5683
SAE-1020 STEEL FORGED.



12116 THREADED END

STORES CAT. REF. NO. 2A-5684
SAE-1020 STEEL FORGED.

REVISIONS
REDRAWN FROM APPROVED DRAWING
S-121-A, DATED AUGUST 2, 1920
AND REVISED, FORMER ITEMS 1211,
1212, 1214, 1218 REMOVED FROM DRAWING.

1 SHEET



S-121-B

THE PENNSYLVANIA RAILROAD

STANDARD

JAWS, LUGS AND LINKS

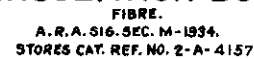
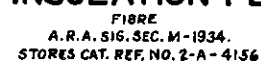
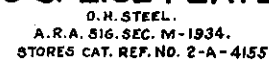
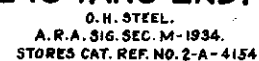
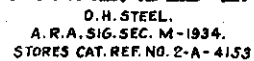
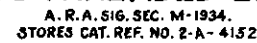
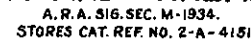
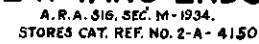
OFFICE OF CHIEF ENGINEER, PHILA., PA., DECEMBER 30, 1948.

Approved

McGuffey
Assistant Chief Engineer-T.C. & S.

Approved

W. B. Smith
Chief Engineer

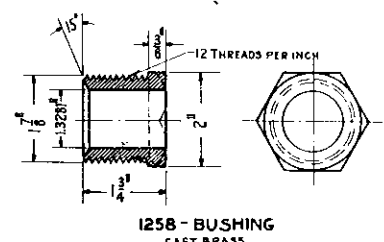
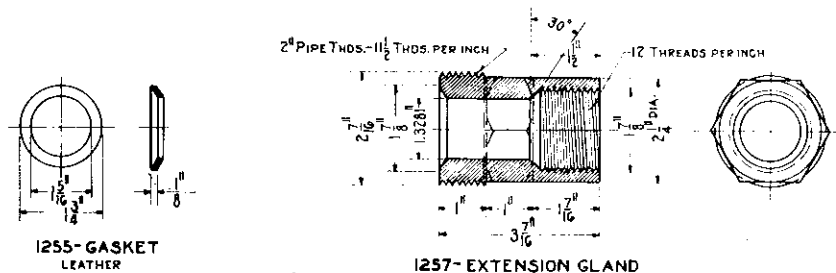
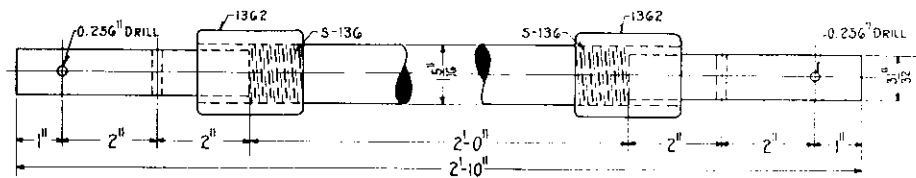
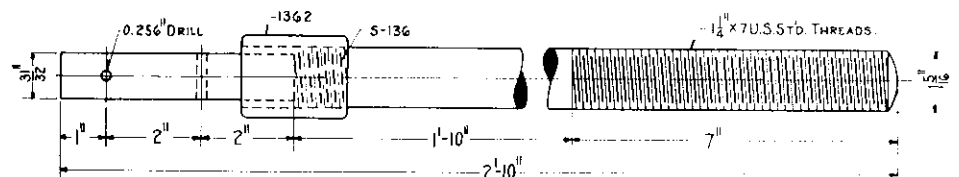
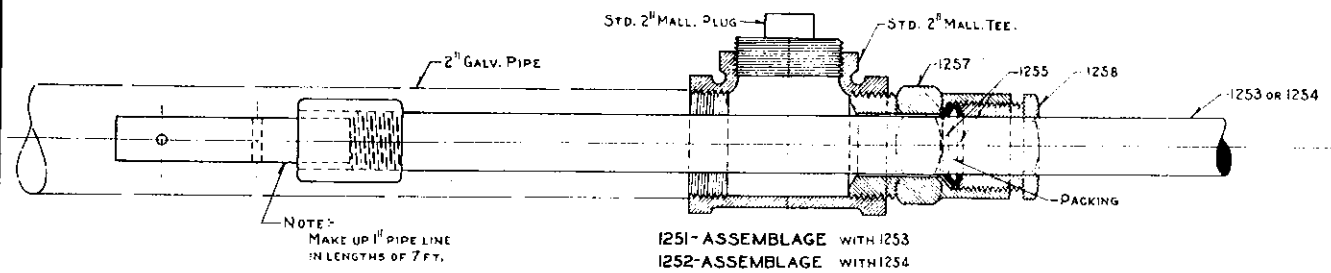


1. FIBRE SHALL BE IN ACCORDANCE WITH A.A.R. SIGNAL SECTION SPECIFICATION NO. 13.

REVISIONS



Chief Engineer



NOTE
STUFFING BOXES SHALL NOT BE USED INSIDE OF BUILDINGS.

A.R.A.-M 1926.
REVISIONS.
REDRAWN FROM APPROVED PLANS 125-A DATED 8-29-26 AND REVISED.
C- FEBRUARY 9, 1928
APPROVED: <i>[Signature]</i>

1 SHEET

S-125-C

THE PENNSYLVANIA RAILROAD
STANDARD
STUFFING BOX FOR 1" PIPE

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., APR. 20, 1925

Approved

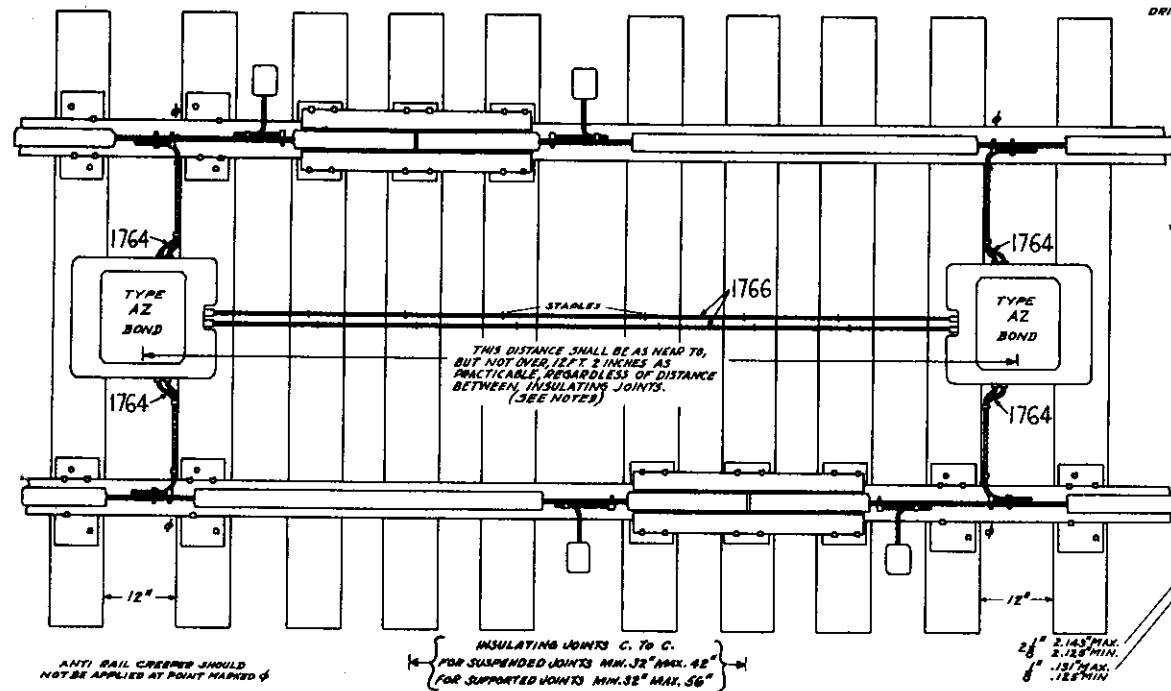
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Chief Signal Engineer

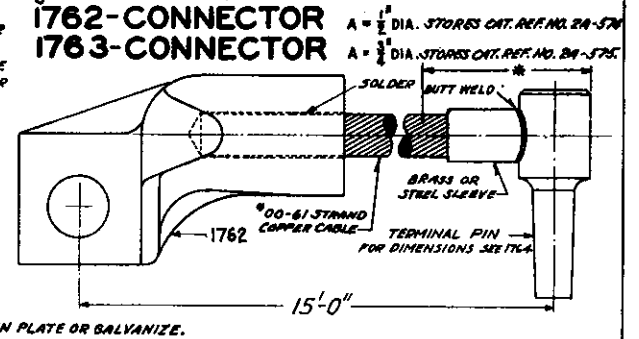
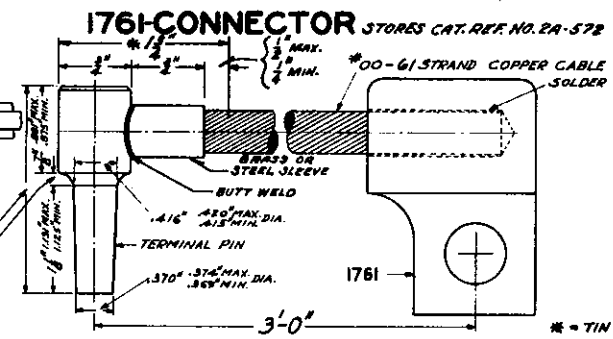
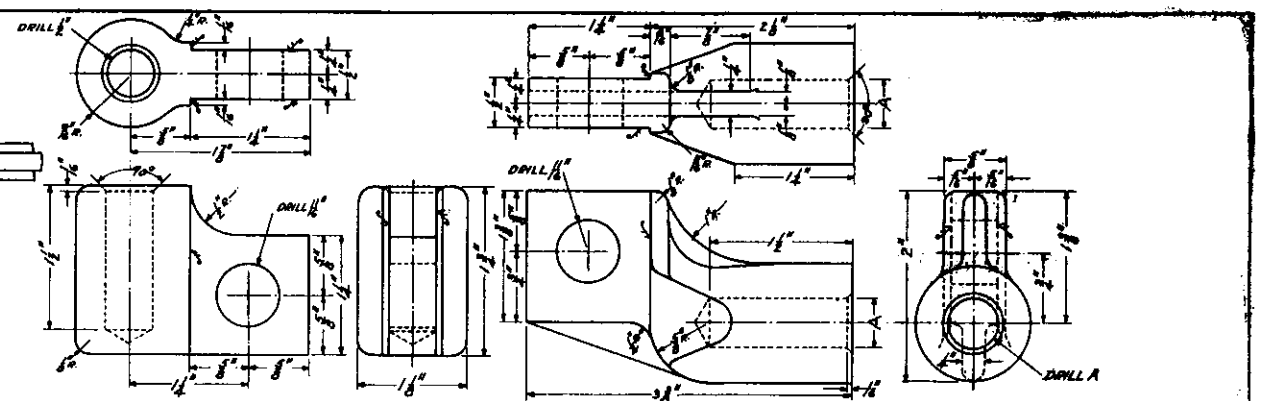
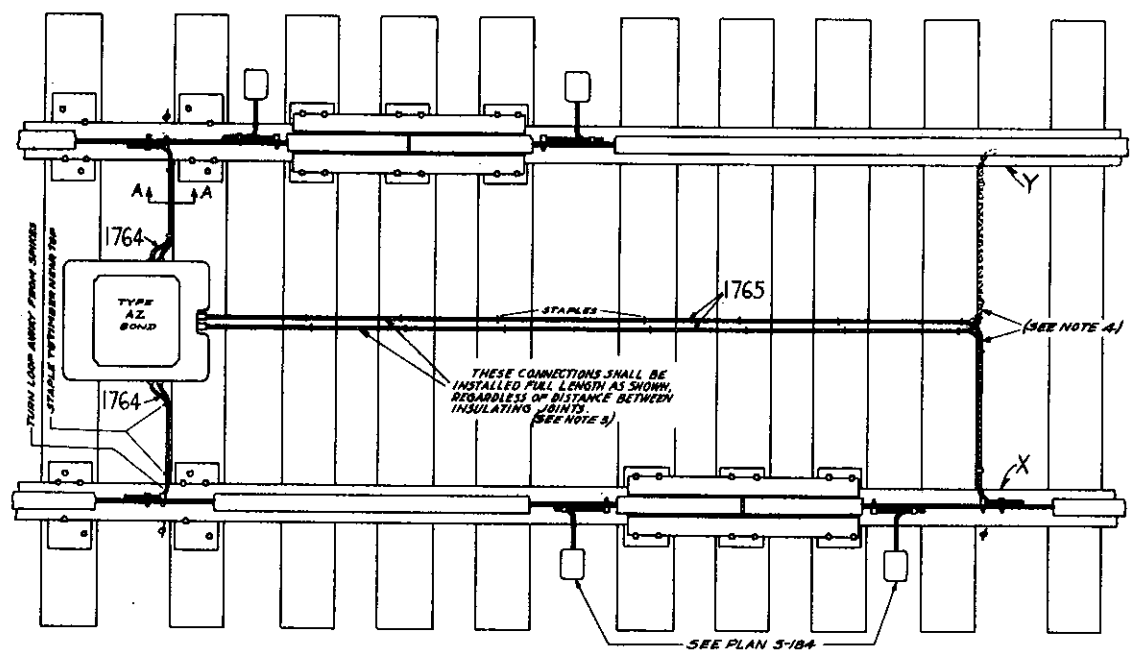
Approved

[Signature]

Chief Engineer

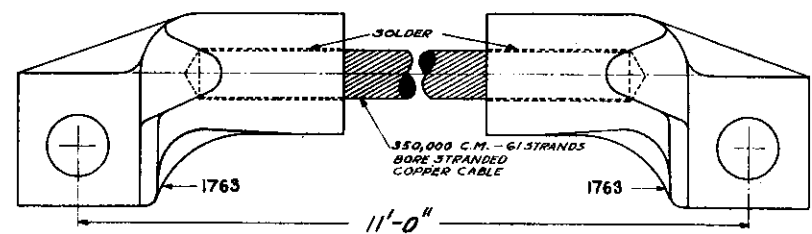


ANTI RAIL CREEPER SHOULD NOT BE APPLIED AT POINT MARKED 4



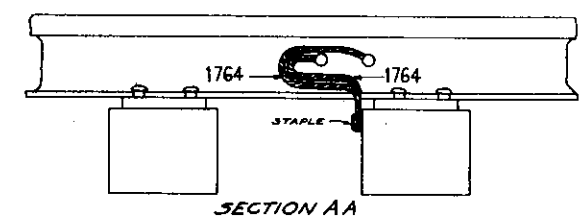
1764-CONNECTION STORES CAT. REF. NO. 2A-555

1765-CONNECTION STORES CAT. REF. NO. 2A-596



1766-CONNECTION STORES CAT. REF. NO. 2A-577

- CONNECTORS 1761, 1762 AND 1763 SHALL BE MADE OF CAST BRASS TINNED ALL OVER WITH HARD SOLDER.
- WHERE APPLICABLE, TERMINAL PINS, WELDING AND GALVANIZING SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATIONS SHOWN ON CURRENT ISSUE OF PLAN 3-179.
- WHEN INSTALLING, SUFFICIENT SLACK MUST BE LEFT IN CONNECTIONS 1762 AND 1764 TO PREVENT STRESS ON CONNECTORS.
- CONNECT 1765 TO RAIL X WHEN X IS POWER RETURN RAIL.



REVISIONS
B - MAY 31, 1938 c.o.
APPROVED <i>N.C. Stanton</i>
C - APRIL 25, 1942 c.o.
APPROVED <i>N.C. Stanton</i>
THE FOLLOWING CHANGES MADE:
COPPER CABLE IN CONNECTIONS 1764 & 1765 FORMERLY 37 STRAND. USE OF BRASS FOR SLEEVES AT THE WELD ON TERMINAL PINS ADDED. REF TO C. TO C. OF JOINTS CHANGED. NOTE 3, CHANGED

1 SHEET

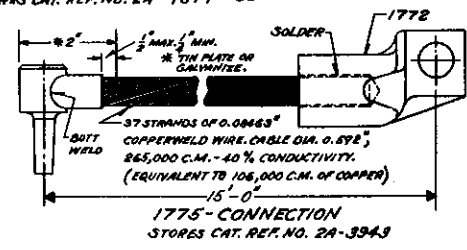
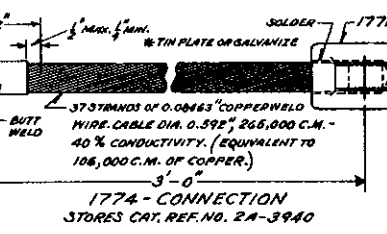
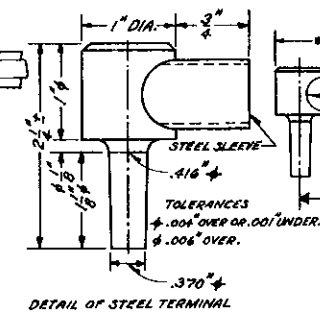
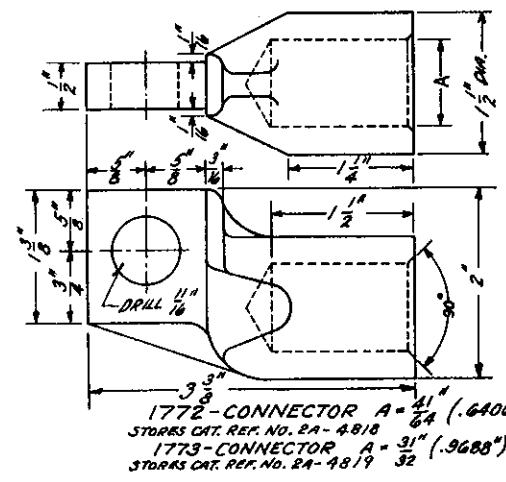
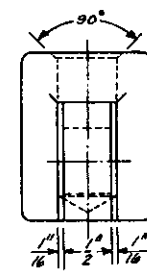
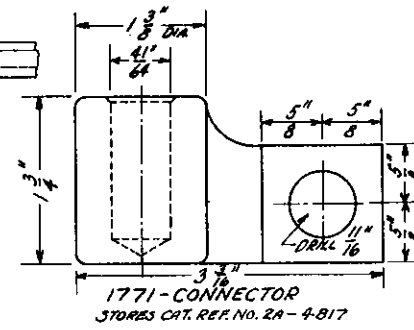
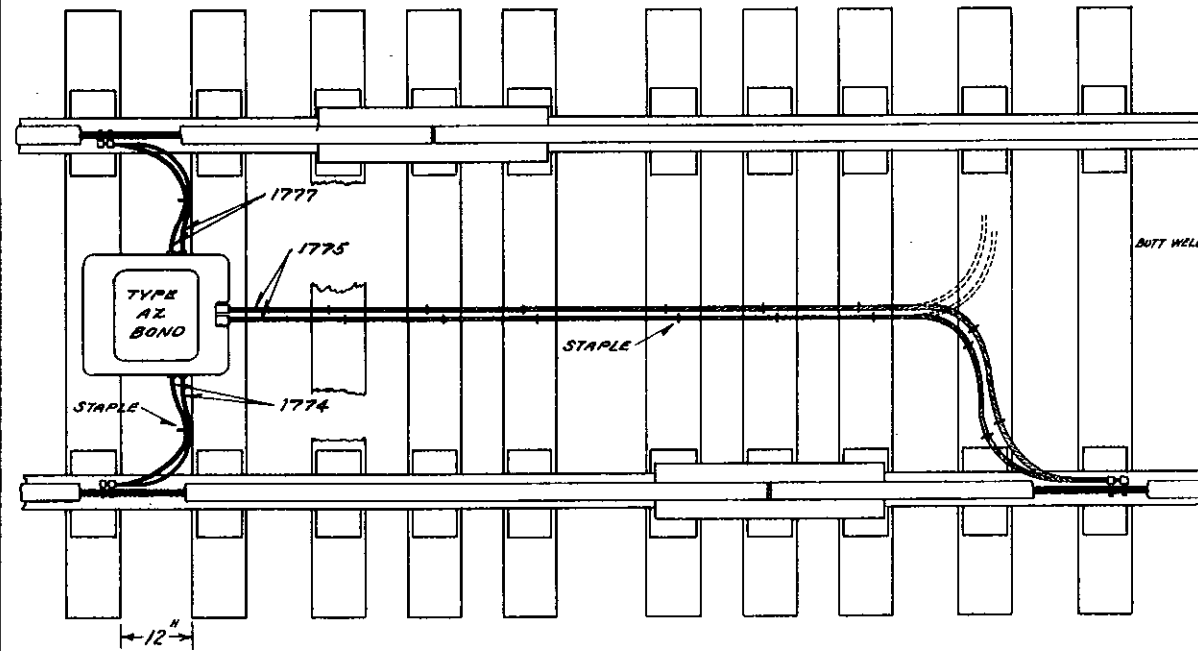
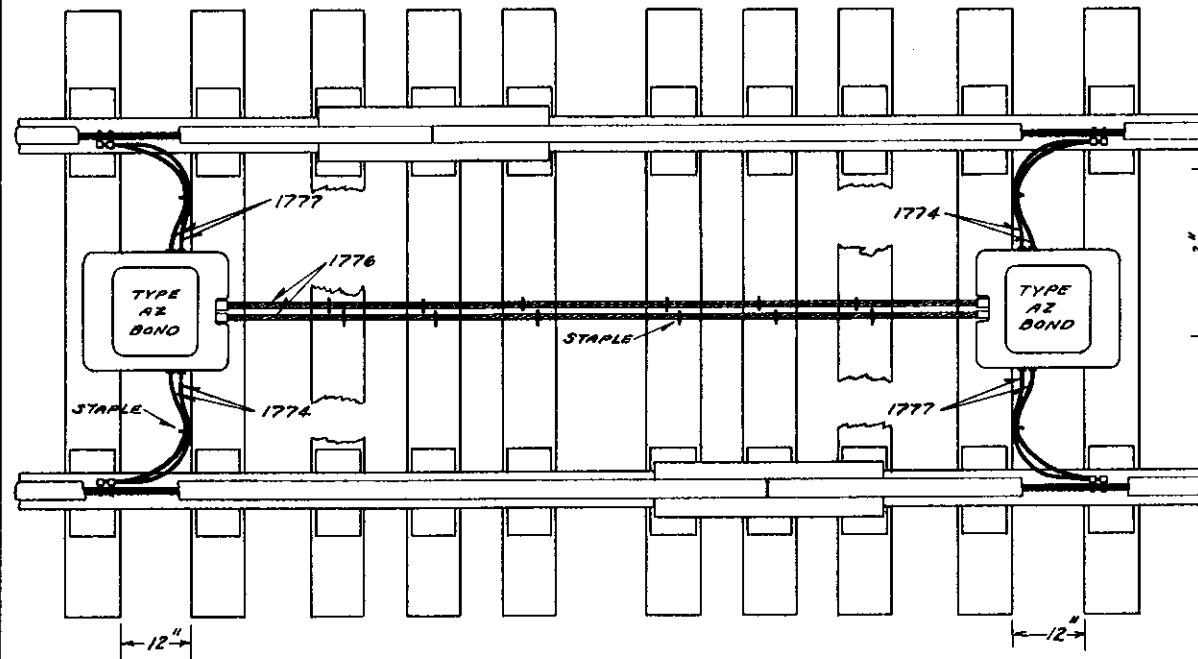
S-176-C

THE PENNSYLVANIA RAILROAD
STANDARD
LAYOUT
FOR TYPE AZ IMPEDANCE BONDS

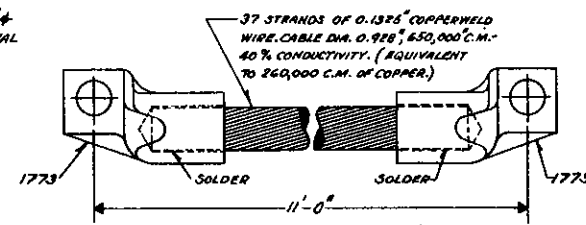
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAY 4, 1942

Approved *N.C. Stanton*
Chief Signal Engineer

Approved *N.C. Stanton*
Chief Signal Engineer



DETAIL OF STEEL TERMINAL

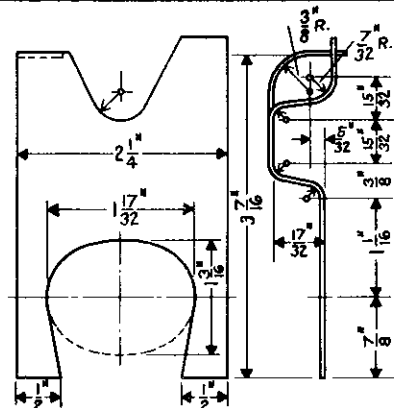


REVISIONS
B-AUGUST 10, 1942. C.A.
APPROVED: [Signature]
THE FOLLOWING CHANGES MADE:
DETAILS OF CONNECTORS AND CON-
NECTIONS ADDED. STORES CAT.
REF. NOS. SHOWN IN FIGS. 3, 4
& 5 ADDED.

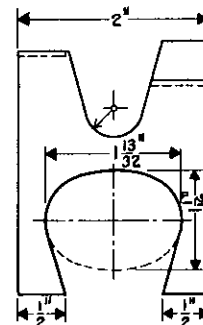
- NOTE:-
1. CONNECTIONS SHOWN ON THIS PLAN FOR USE ONLY IN TERRITORY WHERE THEFT IS PREVALENT.
 2. FOR ADDITIONAL INFORMATION SEE PLAN NO. 3-176.
 3. WHERE APPLICABLE, TERMINAL PINS, WELDING AND GALVANIZING SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATIONS SHOWN ON CURRENT ISSUE OF PLAN NO. 3-179.
 4. CONNECTORS 1771, 1772 & 1773 SHALL BE MADE OF CAST BRASS AND TINNED ALL OVER WITH HARD SOLDER.
 5. STEEL SLEEVE SHOWN AT JUNCTION OF CABLE AND TERMINAL ON 1774, 1775 & 1777 MAY BE OMITTED IF NOT REQUIRED BY MANUFACTURER.

ISSUED FOR TRIAL INSTALLATIONS

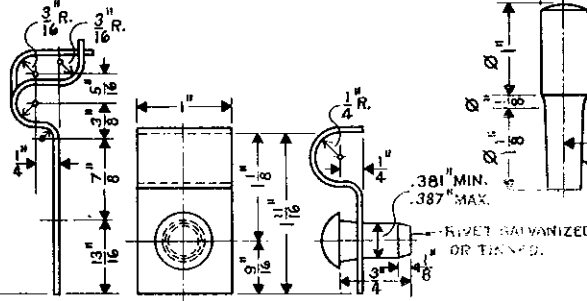
1 SHEET
S-177-B
THE PENNSYLVANIA RAILROAD
LAYOUT
FOR TYPE AZ IMPEDANCE BONDS
OFFICE OF CHIEF ENGINEER, PHILA., PA., NOV. 15, 1939.



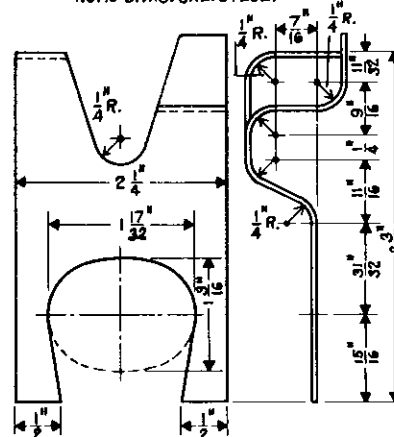
1791-CLIP FOR 130 LB. P.S. RAIL.
NO. 15 B.W.G. GAL. STEEL.



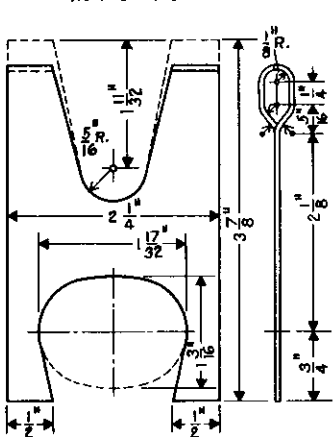
1792-CLIP FOR 100 LB. RAIL.
NO. 15 B.W.G. GAL. STEEL.



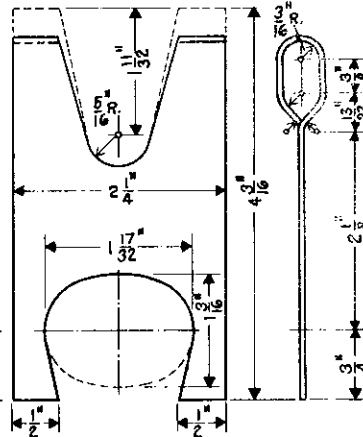
1793-CLIP
NO. 13 B.W.G. GAL. STEEL.



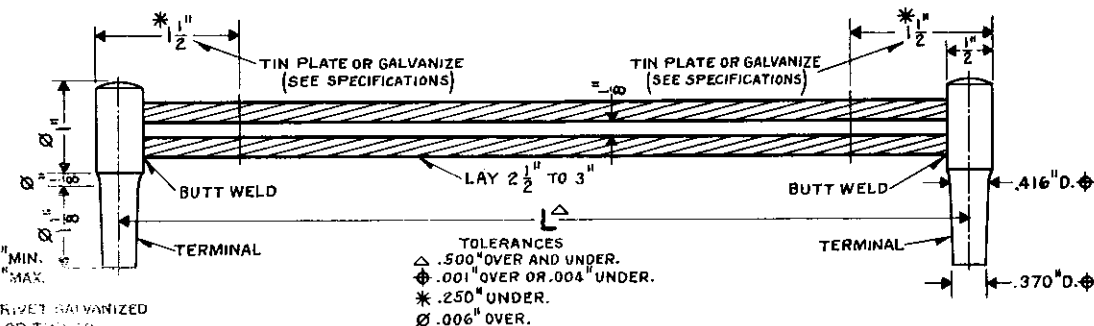
17910-CLIP FOR 130 LB. P.S. RAIL.
NO. 15 B.W.G. GAL. STEEL.
(FOR USE WITH A.C. TRACTION RAIL BOND.)



17911-CLIP FOR 131 AND 152 LB. P.S. RAIL.
NO. 15 B.W.G. GAL. STEEL



17912-CLIP FOR 131 & 152 LB. P.S. RAIL.
NO. 15 B.W.G. GAL. STEEL.
(FOR USE WITH A.C. TRACTION RAIL BOND.)



TOLERANCES
△ .500" OVER AND UNDER.
Φ .001" OVER OR .004" UNDER.
* .250" UNDER.
Ø .006" OVER.

FOR 24" JOINT BAR	1794-RAIL BOND	L = 34"	(STEEL STRANDS WITH CENTER STRAND COPPER)
	1795 -	" "	L = 34" (COPPER COVERED STRANDS)
FOR 26" JOINT BAR	1796 -	" "	L = 40" (STEEL STRANDS WITH CENTER STRAND COPPER)
	1797 -	" "	L = 40" (COPPER COVERED STRANDS)
FOR 38 1/2" JOINT BAR	1798 -	" "	L = 48" (STEEL STRANDS WITH CENTER STRAND COPPER)
	1799 -	" "	L = 48" (COPPER COVERED STRANDS)

REVISIONS

REDRAWN FROM APPROVED
PLAN S-179-J, DATED OCTOBER
23, 1931 AND REVISED.

FOR SPECIFICATIONS SEE SHEET NO. 2.

SHEET 1 OF 2.

S-179- K



THE PENNSYLVANIA RAILROAD

STANDARD

RAIL BONDS AND CLIPS

OFFICE OF ASSISTANT CHIEF ENGINEER-SIGNALS, PHILA., PA., NOV. 4, 1937.

Approved

N. C. Schaefer
Assistant Chief Engineer-Signals

Approved

W. J. Timmer
Chief Engineer

SPECIFICATION.

1. PURPOSE.

(a) THE PURPOSE OF THIS SPECIFICATION IS TO PROVIDE REQUIREMENTS FOR RAIL BONDS AND RAIL BOND CLIPS FOR RAILWAY SIGNALING TRACK CIRCUITS.

2. MATERIAL AND WORKMANSHIP.

(a) MATERIAL AND WORKMANSHIP SHALL BE FIRST CLASS IN EVERY RESPECT.

3. DESIGN.

(a) GENERAL CONSTRUCTION AND DIMENSIONS OF RAIL BONDS AND RAIL BOND CLIPS SHALL BE IN ACCORDANCE WITH CURRENT ISSUE OF DWG. S-179.

4. CONDUCTORS.

(a) CONDUCTORS FOR RAIL BONDS 1794, 1796 AND 1798 SHALL CONSIST OF ONE ANNEALED COPPER WIRE SURROUNDED BY SIX GALVANIZED STEEL WIRES WITH SUCH A LAY THAT THE AXIAL LENGTH OF ONE TURN OF WIRE WILL BE MIN. 2½ IN., MAX. 3 IN.

(b) CONDUCTORS FOR RAIL BONDS 1795, 1797 AND 1799 SHALL CONSIST OF SEVEN ANNEALED COPPER COVERED WIRES WITH SUCH A LAY THAT THE AXIAL LENGTH OF ONE TURN OF WIRE WILL BE MIN. 2½ IN., MAX. 3 IN.

(c) CONDUCTORS SHALL BE CYLINDRICAL IN FORM, FREE FROM SCALES, INEQUALITIES, SPLITS AND ALL IMPERFECTIONS.

(d) COPPER, STEEL AND COPPER COVERED STEEL WIRES SHALL MEET THE FOLLOWING REQUIREMENTS AS TO MECHANICAL AND ELECTRICAL PROPERTIES:-

	COPPER COVERED		
	STEEL	COPPER	STEEL
DIAMETER IN MILS	77 OR 83	77 OR 81	81
BREAKING STRENGTH MIN. LBS. PER SQ. IN.	50,000	38,500	55,000
ELONGATION IN 10 IN. EACH WIRE, MIN. PERCENT	8	25	15
AVER. ELONGATION IN 10 IN. ALL WIRES, MIN. PERCENT	11	-	18
RESISTIVITY, OHMS PER MIL. FT. MAX. AT 68° F.	81.37	10.56	28.59

(e) DIAMETER OF COPPER WIRE WILL BE 77 MILS WHERE USED WITH 77 MILS STEEL WIRE AND 81 MILS WHERE USED WITH 83 MILS STEEL WIRE.

(f) COMMERCIAL TOLERANCES FOR DIAMETERS SHALL BE USED.

5. TERMINALS.

(a) TERMINALS SHALL BE MADE OF OPEN HEARTH STEEL CONTAINING NOT MORE THAN 0.20 PER CENT OF COMBINED CARBON.

(b) TERMINALS SHALL WITHSTAND BEING DRIVEN THE ENTIRE LENGTH OF THE PIN INTO A HOLE ¾ IN. IN DIA., DRILLED IN A STEEL PLATE ¾ IN. THICK, WITHOUT SHOWING A CRACK OR FLAW OF ANY KIND. IN ADDITION THE TERMINAL, AFTER BEING DRIVEN INTO THE STEEL PLATE APPROXIMATELY ONE-HALF ITS LENGTH, SHALL WITHSTAND BENDING AT 90° WITHOUT CRACKING OR SHOWING A FRACTURE OF ANY KIND.

6. WELDING.

(a) WELDING SHALL BE DONE WITH ELECTRIC DEVICES CAPABLE OF PRODUCING UNIFORMLY GOOD RESULTS. THE WELD SHALL BE SO MADE THAT THE ENDS OF ALL WIRES ARE UNITED DIRECTLY WITH THE TERMINAL TO INSURE A DENSE AND HOMOGENEOUS METAL WHICH SHALL BE FREE FROM BLOW HOLES AFTER FUSION.

7. IDENTIFICATION.

(a) EACH TERMINAL SHALL BE SO MARKED THAT THE MANUFACTURER CAN BE READILY IDENTIFIED.

8. GALVANIZING AND TINNING.

(a) AFTER WELDING, TERMINALS OF BONDS 1794, 1796 AND 1798 SHALL BE GALVANIZED IN ACCORDANCE WITH DRAWING, BY THE HOT DIP PROCESS.

(b) AFTER WELDING, TERMINALS OF BONDS 1795, 1797 AND 1799 SHALL BE GALVANIZED OR TINNED IN A MANNER IN ACCORDANCE WITH DRAWING. TINNING OR GALVANIZING SHALL BE HEAVY, WELL DONE, EVEN IN THICKNESS THROUGHOUT, SMOOTH AND FREE FROM LUMPS.

(c) TINNING SHALL BE OF LEAD TIN ALLOY, CONTAINING 70 PER CENT PURE TIN AND 30 PER CENT PURE LEAD.

9. ELONGATION.

(a) MANUFACTURER MUST SUBJECT EACH RAIL BOND TO A STRETCHING PROCESS SUFFICIENT TO ELONGATE BOND (REGARDLESS OF LENGTH) TO PERMANENT SET OF ¼ IN. TO DETERMINE THE QUALITY OF THE WELDS. BONDS SHALL BE HELD BY THEIR TERMINALS IN SUCH A MANNER THAT THE WELDS ARE SUBJECTED TO THE FULL

STRAIN DEVELOPED IN THE STRETCHING OPERATION.

(b) STRETCHING MACHINE SHALL BE OF SUCH DESIGN THAT THE STRAIN WILL BE APPLIED TO EACH TERMINAL FOR NOT MORE THAN ONE SECOND.

10. INSPECTION.

(a) PURCHASER MAY INSPECT MATERIAL AT ALL STAGES OF MANUFACTURE.

(b) PURCHASER MAY INSPECT THE COMPLETED PRODUCT TO DETERMINE THAT THE REQUIREMENTS OF THIS SPECIFICATION HAVE BEEN MET.

(c) IF MATERIAL HAS NOT BEEN ACCEPTED AT POINT OF PRODUCTION AND IF, UPON ARRIVAL AT DESTINATION, IT DOES NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, IT MAY BE REJECTED, AND THE CONTRACTOR, UPON REQUEST, SHALL ADVISE THE PURCHASER WHAT DISPOSITION IS TO BE MADE OF THE DEFECTIVE MATERIAL. CONTRACTOR SHALL PAY ALL FREIGHT CHARGES.

(d) IF PURCHASER IS TO MAKE INSPECTION AT POINT OF PRODUCTION, IT SHALL BE SO STATED.

11. TESTS.

(a) TESTS MAY BE MADE AT POINT OF PRODUCTION, OR ON SAMPLES SUBMITTED, AND MAY ALSO BE MADE AT DESTINATION.

(b) UNLESS OTHERWISE AUTHORIZED BY THE PURCHASER, THE CONTRACTOR SHALL GIVE THE ENGINEER OF TESTS, AT ALTOONA, PA., SUFFICIENT NOTICE OF TIME WHEN MATERIAL WILL BE READY FOR TESTING.

(c) CONTRACTOR SHALL PROVIDE, AT POINT OF PRODUCTION, APPARATUS AND LABOR FOR MAKING REQUIRED TESTS UNDER SUPERVISION OF THE PURCHASER.

(d) TESTS ARE TO BE MADE AT POINT OF PRODUCTION, UNLESS OTHERWISE STATED.

(e) THREE BONDS TAKEN AT RANDOM FROM EACH SET OF 1000 OR LESS SHALL BE SELECTED BY THE PURCHASER FOR TESTS.

(f) TERMINALS OF ALL SAMPLE BONDS SHALL BE CHECKED AGAINST THE REQUIRED DIMENSIONS.

(g) TWO-THIRDS OF THE SAMPLES SHALL BE TESTED TO DESTRUCTION.

1. ON THE SAMPLES TESTED TO DESTRUCTION, THE TERMINALS SHALL BE GRIPPED IN THE TENSILE MACHINE AND UNIFORM STRESS APPLIED ALONG THE AXIS OF THE BOND. FAILURE SHALL NOT OCCUR AT LESS THAN 3300 LBS. AND SHALL NOT OCCUR IN THE WELD, THAT IS; EACH INDIVIDUAL WIRE SHALL SHOW FRACTURE AND NOT PULL OUT OF THE WELDED AREA.

IF ONE SAMPLE FAILS TO MEET THE 3300 LBS. LIMIT OR FAILS IN THE WELD, TWO ADDITIONAL SAMPLES TAKEN FROM THE SAME LOT SHALL BE SIMILARLY TESTED. IF MORE THAN ONE SAMPLE FROM A GIVEN LOT OR EITHER OF THE ADDITIONAL SAMPLES FAIL, THE ENTIRE LOT SHALL BE REJECTED.

2. TERMINALS FROM THE SAMPLES USED FOR MECHANICAL TESTS SHALL BE TESTED FOR DRIVING AND BENDING REQUIREMENTS OF SECTION 5 (b). IF ONE OF THESE TERMINALS FAILS IN EITHER OF THESE TESTS, TWO ADDITIONAL SAMPLES TAKEN FROM THE SAME LOT SHALL BE SIMILARLY TESTED. IF MORE THAN ONE SAMPLE FROM A GIVEN LOT OR EITHER OF THE ADDITIONAL SAMPLES FAIL THE ENTIRE LOT SHALL BE REJECTED.

(h) ONE THIRD OF THE SAMPLES SHALL BE USED FOR TINNING OR GALVANIZING TEST OF TERMINALS, GALVANIZING TEST OF STEEL WIRES, PHYSICAL TEST OF INDIVIDUAL WIRES AND ELECTRICAL TEST OF INDIVIDUAL WIRES. IF ANY SAMPLE FAILS ON ANY TEST, THE ENTIRE LOT SHALL BE REJECTED.

1. TINNING TEST.

(a) SOLUTION.

(1) POTASSIUM FERRICYANIDE SOLUTION: 5 GRAMS OF THE SALT ARE DISSOLVED IN 1000 C.C. OF DISTILLED WATER.

(2) NITRIC ACID SOLUTION SHALL HAVE A SPECIFIC GRAVITY OF 1.027 AT 60 DEG. F. MADE BY DILUTING 50 C.C. OF NITRIC ACID CHEMICALLY PURE, HAVING A SPECIFIC GRAVITY OF 1.42, WITH 950 C.C. OF DISTILLED WATER.

(b) METHOD.

(1) THE SAMPLES SELECTED FOR THE TEST SHALL BE THOROUGHLY CLEANED WITH GASOLINE AND THEN WITH SOAP AND WATER. AFTER RINSING THE CLEAN SAMPLES WITH DISTILLED WATER, THEY SHALL BE IMMERSUED IN THE NITRIC ACID SOLUTION FOR ONE MINUTE, AND WITHOUT WIPING, DIPPED INTO THE FERRICYANIDE SOLUTION; IF A BLUE PRECIPITATE OR DISCOLORATION TAKES PLACE, IT INDICATES THE COATING HAS BEEN DISSOLVED OR PITTED.

THE SAMPLES SHALL THEN BE WASHED WITH DISTILLED WATER TO FREE THEM FROM THE FERRICYANIDE SOLUTION AND THE ABOVE OPERATION REPEATED. SAMPLES WHICH HAVE BEEN COATED IN A SATISFACTORY MANNER SHALL STAND FOUR IMMERSIONS OF ONE MINUTE EACH IN THE NITRIC ACID SOLUTION WITHOUT SHOWING A BLUE PRECIPITATE OR DISCOLORATION IN THE FERRICYANIDE SOLUTION. IF BLUE PRECIPITATE APPEARS THE WHOLE SHIPMENT SHALL BE REJECTED.

(2) GALVANIZING TEST SHALL BE IN ACCORDANCE WITH G.S.T. SPECIFICATION NO. 1002.

(1) GALVANIZING OF RAIL BOND CLIPS SHALL BE TESTED IN ACCORDANCE WITH G.S.T. SPECIFICATION NO. 1002.

12. PACKING.

(a) UNLESS OTHERWISE SPECIFIED, BONDS SHALL BE SECURELY TIED IN BUNDLES OF 50, WITH THE TERMINALS COMPLETELY AND CAREFULLY WRAPPED IN BURLAP OR EQUIVALENT PROTECTION.

(b) RAIL BOND CLIPS SHALL BE PACKED SO AS TO FACILITATE HANDLING AND SHIPPING.

13. MARKING.

(a) PURCHASER'S ORDER, NAME OF CONSIGNOR, AND NAME AND ADDRESS OF CONSIGNEE, SHALL BE PLAINLY MARKED ON OUTSIDE OF PACKAGE.

14. WARRANTY.

(a) 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 MAKING, AT POINT OF PRODUCTION, ANY PART OR PARTS TO REPLACE THOSE WHICH SHALL BE FOUND DEFECTIVE AFTER SHIPMENT TO THE PURCHASER. THIS WARRANTY SHALL NOT APPLY TO ANY APPARATUS WHICH HAS BEEN SUBJECTED TO MISUSE, NEGLIGENCE OR ACCIDENT.

(b) CONTRACTOR SHALL COVENANT AND AGREE TO SAVE HARMLESS, AND INDEMNIFY THE PURCHASER AGAINST ALL CLAIMS, SUITS, ACTIONS OR PROCEEDINGS, DAMAGES, COSTS, FEES AND EXPENSES BY REASON OF INFRINGEMENT OR ALLEGED INFRINGEMENT OF PATENTS, OR PATENT ROYALTIES INVOLVED, IN CONSEQUENCE OF THE PURCHASE OR THE USE OF MATERIAL COVERED HEREBY.

15. FIELD WORK.

(a) 1795, 1797 OR 1799 SHALL BE USED THROUGH ROAD CROSSINGS, STATION PLATFORMS AND TUNNELS. 1794, 1796 OR 1798 SHALL BE USED AT ALL OTHER POINTS.

(b) AT POINTS WHERE JOINTS IN ROAD CROSSINGS AND STATION PLATFORMS CANNOT BE AVOIDED, THE PLANKING SHALL BE CUT BACK ¾ OF AN INCH FROM HEAD OF RAIL TO ALLOW FOR INSPECTION OF BONDS.

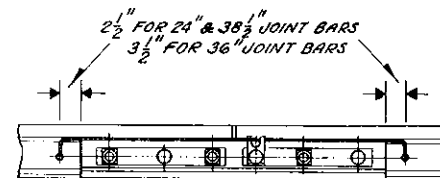
(c) HOLES FOR TERMINALS SHALL BE DRILLED IN OIL WITH ¾ OF AN INCH DRILL AND PLUGGED SAME DAY AS DRILLED.

(d) WHERE PRACTICABLE HOLES SHALL BE DRILLED FROM OUTSIDE OF TRACK AND NOT FROM GAUGE SIDE OF RAIL. TERMINAL SHALL BE DRIVEN INTO RAIL FROM SAME SIDE OF HOLE AS DRILLED.

(e) GAUGE 5803, PLAN S-580, SHALL BE USED FREQUENTLY TO DETERMINE IF HOLE DRILLED IN RAIL IS WITHIN THE LIMITS INDICATED ON THE GAUGE.

(f) WHERE CONDITIONS CAUSE EXCESSIVE CORROSION, RAIL BONDS SHALL BE GIVEN A PROTECTIVE COATING OF NO. 0X-10, CONSISTENCY "A SPECIAL" OR NO. 2 SLUSHING OIL.

(g) HOLES SHALL BE DRILLED AS SHOWN IN FIG. "A", SO AS TO BE PROPERLY LOCATED FOR CROPPING RAIL ENDS.



APPLICATION OF RAIL BOND AND CLIP
FIGURE "A"

FOR DRAWINGS SEE SHEET NO. 1.

SHEET 2 OF 2

S-179-K



THE PENNSYLVANIA RAILROAD

STANDARD

RAIL BONDS AND CLIPS

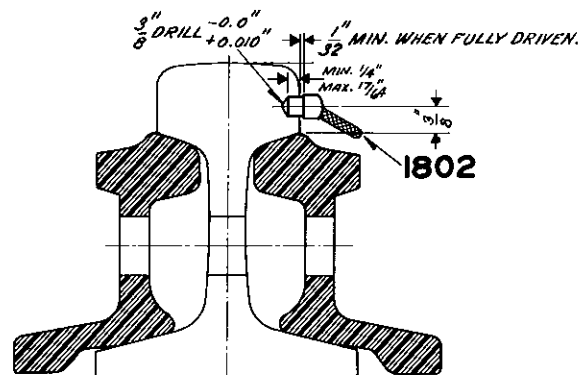
OFFICE OF ASSISTANT CHIEF ENGINEER-SIGNALS, PHILA., PA., NOVEMBER 4, 1937

Approved

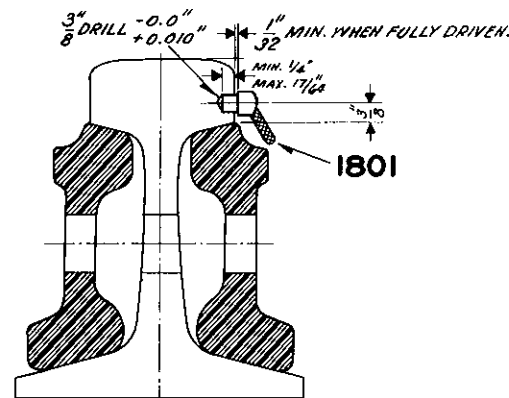
N. C. Stanton
Assistant Chief Engineer-Signals

Approved

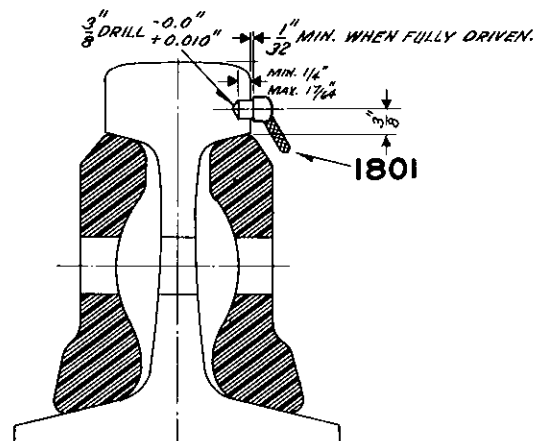
W. J. Wagner
Chief Engineer



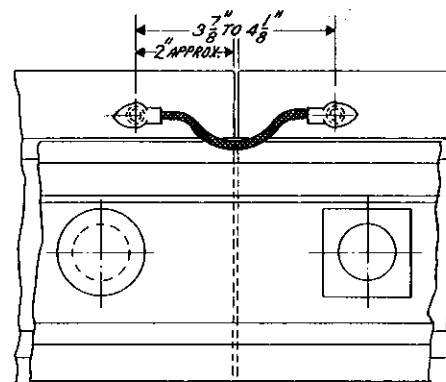
130* P.S. RAIL - 130* P.S. L-3 JOINT BARS.



131* R.E. RAIL - 131 R.E. F-7 JOINT BARS.



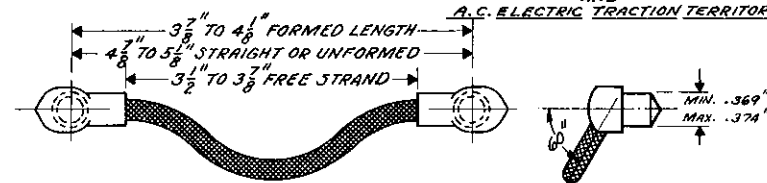
152* P.S. RAIL - 152* P.S. F-2 JOINT BARS.



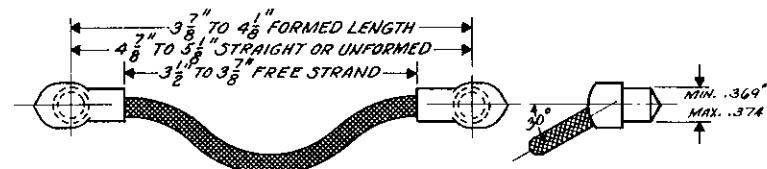
APPLICATION OF BOND
AND DRILLING OF RAIL.

STEAM ROAD TERRITORY
AND

A.C. ELECTRIC TRACTION TERRITORY.



1801 - RAIL BOND STORES CAT. REF. NO. 2A-3707



1802 - RAIL BOND STORES CAT. REF. NO. 2A-3708

- NOTE:-
1. BOND 1801 OR 1802 SHOULD BE ORDERED, AND USED (1 BOND PER JOINT), FOR BOTH STEAM AND A.C. ELECTRIFIED TERRITORY, WHEN MAKING RAIL RENEWALS OR GENERAL REPLACEMENTS. THE USE OF THE WEB TYPE DOUBLE STRAND LONG BOND PLAN S-179 (FOR STEAM ROAD) OR PLAN M.P. 412914 (FOR A.C. ELECTRIFIED TERRITORY) SHOULD BE CONFINED TO LOCATIONS WHERE FLANGE WORN RAILS DO NOT PERMIT SATISFACTORY APPLICATION OF THE RAIL HEAD TYPE BOND.
 2. BONDS SHALL BE IN ACCORDANCE WITH A. A. R. SIGNAL SECTION SPECIFICATION 173-42 AND DRAWING 1048-B.
 3. AT POINTS WHERE JOINTS IN ROAD CROSSINGS AND STATION PLATFORMS CANNOT BE AVOIDED THE PLANKING SHALL BE CUT BACK $\frac{3}{4}$ OF AN INCH TO ALLOW FOR INSPECTION OF BONDS.
 4. HOLES FOR BONDS SHALL BE DRILLED FROM OUTSIDE OF TRACK AND NOT FROM GAUGE SIDE OF RAIL. HOLES SHALL BE PLUGGED SAME DAY AS DRILLED.
 5. AFTER RAIL BONDS ARE INSTALLED, THEY SHALL BE GIVEN A PROTECTIVE COATING OF "NO-OX-ID," CONSISTENCY "A-SPECIAL" OR NO. 2 SLUSHING OIL.

REVISIONS

B-SEPTEMBER 11, 1940, CO NOTE 4 CHANGED AND NOTE 0 ADDED
C- AUGUST 25, 1942, C.O. MIN. & MAX. DIM. OF BOND AND ADDING NOTE 1 ADDED. NOTES 2, 3, 4 & 5 FORMERLY 1, 2, 3 & 4. DRAWING SHOWING APPLICATION OF BOND FORMERLY SPECIFIED FOR STEAM ROAD ONLY. LOCATION OF 3" HOLE IN RAIL FORMERLY 1" FROM TOP OF RAIL.
APPROVED AS STANDARD SEPT. 19-1942

1 SHEET



S-180-C

THE PENNSYLVANIA RAILROAD

STANDARD

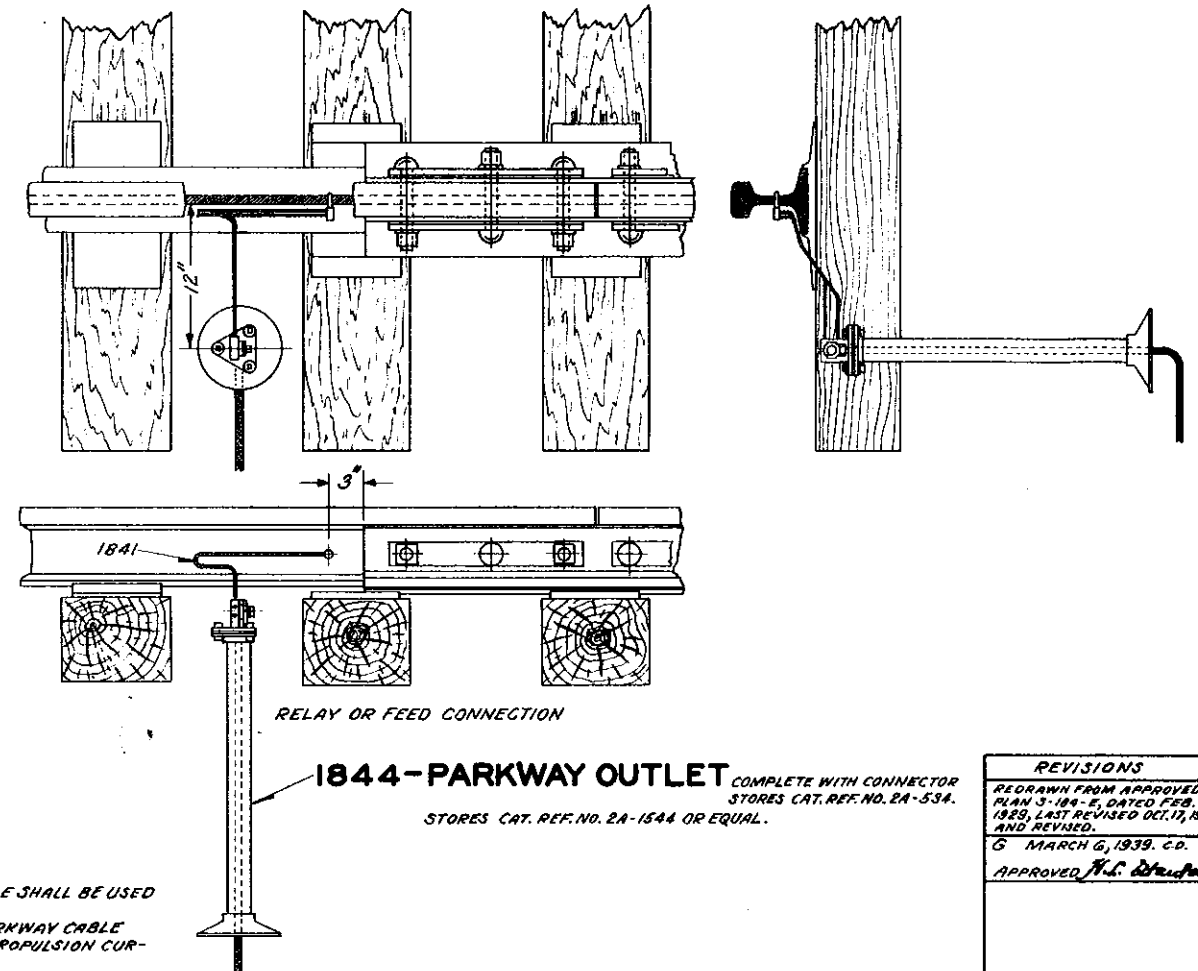
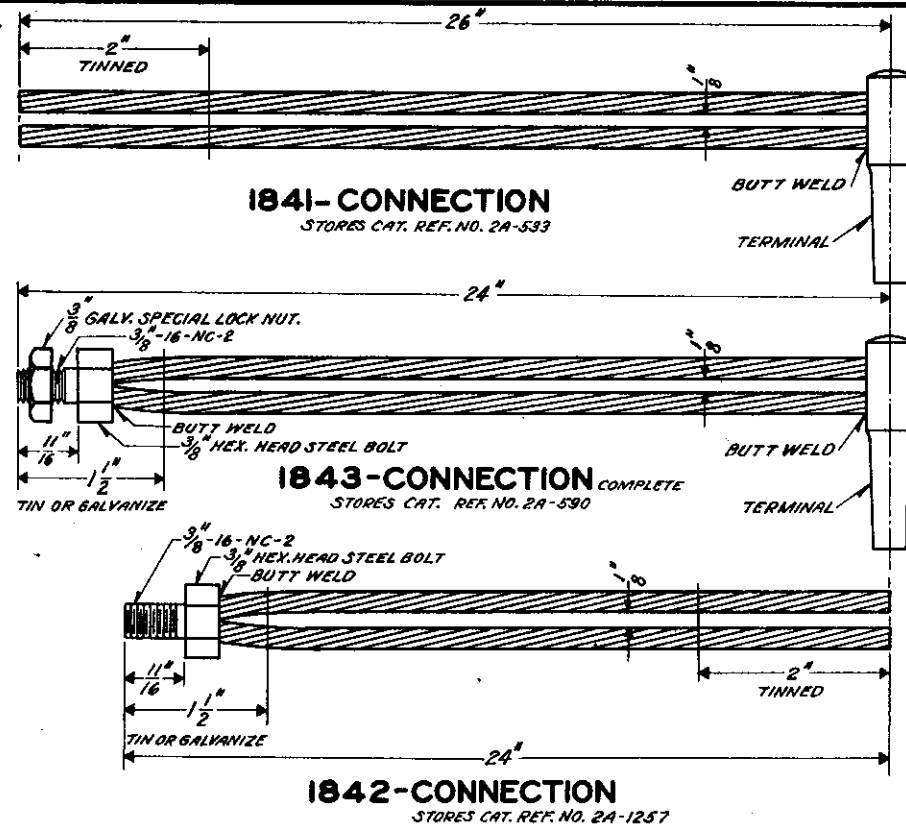
RAIL BOND

RAIL HEAD TYPE

OFFICE OF CHIEF ENGINEER, PHILA., PA., MAY 12, 1939.

Approved
N. L. Stanton
Assistant Chief Engineer-Signals

Approved
W. J. H. H. H.
Chief Engineer



NOTES:-

1. **PARKWAY OUTLET.**
PARKWAY OUTLET STORES CAT. REF. NO. 2A-1544, OR SIMILAR, TO BE FURNISHED ASSEMBLED.
2. **MATERIAL FOR RAIL CONNECTIONS.**
(a) CONDUCTOR SHALL CONSIST OF ONE (1) COPPER STRAND IN CENTER AND SIX (6) GALVANIZED STEEL STRANDS IN ACCORDANCE WITH SPECIFICATION FOR STRANDED WIRES CURRENT ISSUE OF PLAN NO. S-179.
(b) TERMINALS SHALL BE IN ACCORDANCE WITH CURRENT ISSUE OF PLAN NO. S-179.
3. **TINNING OF CONDUCTORS.**
(a) STUB ENDS OF CONNECTIONS 1841 AND 1842 SHALL BE TINNED FOR A LENGTH OF 2 INCHES.
(b) STUB ENDS SHALL BE CLOSELY BUNCHED AND FINISHED TINNED DIAMETER APPROXIMATING THE NOMINAL DIAMETER OF THE STRAND. TEST II (H-1) PLAN S-179 NOT REQUIRED.

FIELD WORK:

1. NON-INDUCTIVE PARKWAY CABLE SHALL BE USED FOR A.C. TRACK CIRCUITS.
2. NO. 6 A.W.G. NON-INDUCTIVE PARKWAY CABLE SHALL BE USED WHERE THERE IS PROPULSION CURRENT RETURN.
3. WHEN IN PLACE, CONNECTION AND TOP OF PARKWAY OUTLET SHALL BE GIVEN A HEAVY COAT OF A RUST PREVENTATIVE APPROVED BY THE ASSISTANT CHIEF ENGINEER-SIGNALS.
4. PARKWAY OUTLETS SHALL BE FILLED WITH SAND OR COMPOUND.
5. PARKWAY CABLE SHALL BE NOT LESS THAN 2 FEET 6 INCHES BELOW THE BOTTOM OF TIE.
6. THE FILL AROUND PARKWAY CABLE SHALL BE FREE FROM CINDERS.

REVISIONS
REDRAWN FROM APPROVED PLAN S-184-G, DATED FEB. 8, 1939, LAST REVISED OCT. 17, 1939, AND REVISED.
5 MARCH 6, 1939, C.D.
APPROVED <i>H.C. Stanton</i>

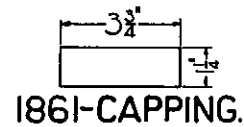
1 SHEET

S-184-G

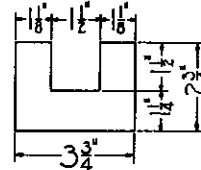
THE PENNSYLVANIA RAILROAD
STANDARD
TRACK CIRCUIT CONNECTIONS
PARKWAY CABLE

OFFICE OF ASSISTANT CHIEF ENGINEER-SIGNALS, PHILA., PA., MAY 16, 1938.

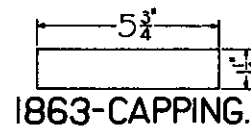
Approved *H.C. Stanton* Assistant Chief Engineer-Signals
Approved *H.C. Stanton* Chief Engineer



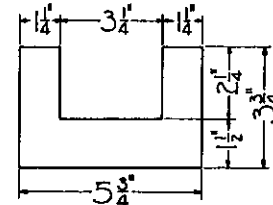
1861-CAPPING.



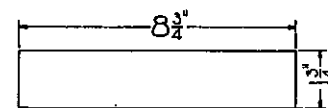
1862-TRUNKING.



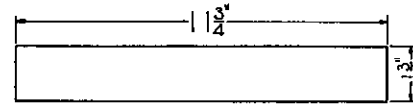
1863-CAPPING.



1864-TRUNKING.



1865-CAPPING.



1866-CAPPING.

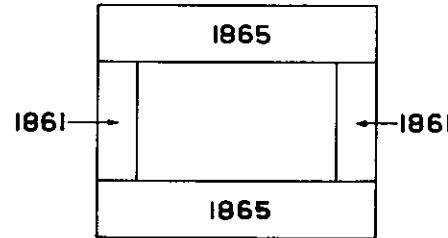


FIG-A.

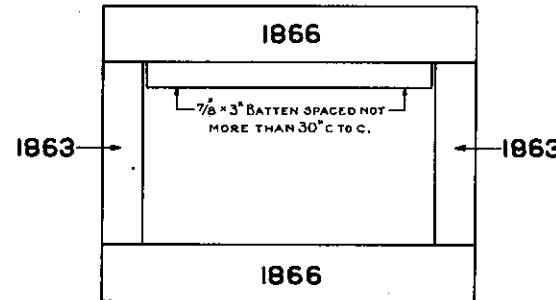


FIG-B.

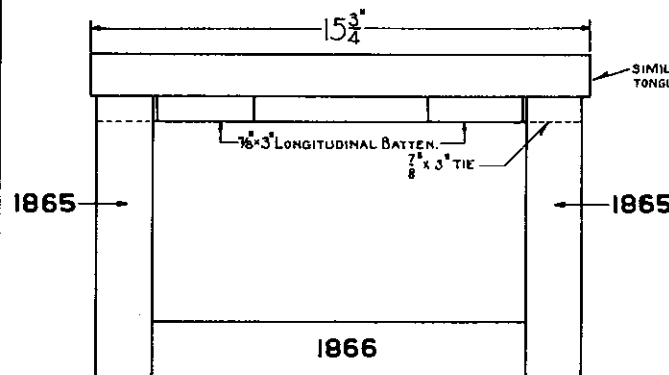
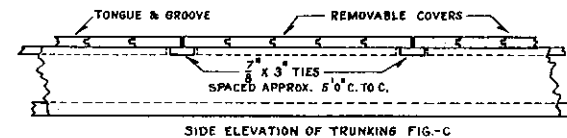


FIG-C.



SIDE ELEVATION OF TRUNKING FIG-C

NOTE:-
FIGURES A-B & C SHOW METHOD OF ASSEMBLING BUILT UP TRUNKING.
UNLESS OTHERWISE SPECIFIED, PARTS SHOWN IN FIGURES A, B & C SHALL
BE ORDERED SEPARATELY IN LINEAL FEET AND SHIPPED KNOCKED-DOWN.
TONGUE & GROOVE WHEN USED AS ASSEMBLED IN FIG. C MAY BE CUT IN
LENGTHS OF 15 3/4 AT THE MILL, IF SO ORDERED.

MATERIAL

SPECIFICATION

1. PURPOSE:
The purpose of this specification is to provide material adequate for the protection of insulated wires.
2. KIND OF WOOD:
Red cypress, cedar, or redwood.
3. GENERAL QUALITY:
(a) Trunking and capping shall be free from any defects which will impair the durability, strength or water tightness of the piece, such as decay, holes, splits, shakes, large, loose or numerous knots, or wane, and be free of sap wood elsewhere than on bottom corners of trunking.
(b) Sapwood shall not be wider than 1 1/2 inches, measured across the face of sap.
4. STRENGTH:
Trunking and capping shall be of compact wood, and have an average of six (6) or more rings of annual growth per inch.
5. DIMENSIONS:
All trunking and capping shall conform to the dimensions specified, and may be 8 to 20 feet long; but 50 per cent. of each shipment shall be 16 to 20 feet in length; 35 per cent. shall be 10 feet and over.
6. MANUFACTURE:
All trunking and capping shall be straight, well manufactured and surfaced on all exterior planes, with ends squared.
7. INSPECTION:
(a) Trunking and capping will be rejected when decayed, or split more than 1/4 inch deep and 6 inches in length.
(b) A shake is a separation of one ring of annual growth from another.
(c) A large knot is one more than 1 inch in diameter in capping and more than 2 inches in diameter in trunking.
(d) A loose knot is one not firmly held in place by growth or position.
(e) Numerous knots are any number equalling a large knot in damaging effect.
(f) Wane is bark, or lack of wood from any cause on corners.
(g) Trunking and capping is not well sawed and surfaced, and trunking is not well grooved, when their surfaces are not even.
(h) All dimension requirements are minimum measurements. An excess of 1/4 inch in outside dimensions, and of 1/8 inch in groove dimensions are maximum tolerances.
(i) Trunking and capping will be inspected at points of shipment by Pennsylvania Railroad System Inspectors. The Manufacturer shall afford the Inspector, free of cost, all reasonable facilities to satisfy him that the trunking and capping supplied is in accordance with this specification.

FIELD WORK

1. Top of trunking, inside of ballast line, shall be level with the surface of the ballast.
2. Where trunking and capping is above ground, the exposed surface shall be given not less than two (2) coats of SLATE COLORED FIRE RETARDING PAINT that meets the approval of the Chief Signal Engineer.
3. After fire retarding paint is applied, the top of capping for cross runs, running under tracks, other than for track connections, shall be covered, from the ballast line, with sheet steel of number 16 U. S. Standard gauge, except under and two inches each side of the rail.
4. Capping, where run lengthwise, shall be secured to built up trunking by 3/4" x 3 1/2" lag screws with flat washers.
5. The joints in capping and bottom of built up trunking, shall be staggered not less than 1 foot in relation to the joints in the sides.
6. All joints in grooved trunking shall be reinforced on the bottom with a piece of capping ten inches long and the width of the trunking.
7. Nails shall not be driven through the trunking from the inside of the groove, nor shall they be driven into the groove from the outside.
8. Inside corner of trunking at turns shall be rounded to prevent injury to wire insulation.

REVISIONS.

REDRAWN FROM APPROVED PLAN S-186-A
DATED 4-25-21 AND REVISED
C. SEPTEMBER 6, 1929.
APPROVED: *Arthur*

1 SHEET

S-186-C



PENNSYLVANIA RAILROAD SYSTEM

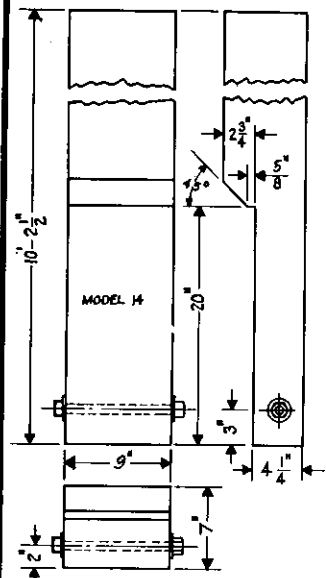
STANDARD

TRUNKING AND CAPPING

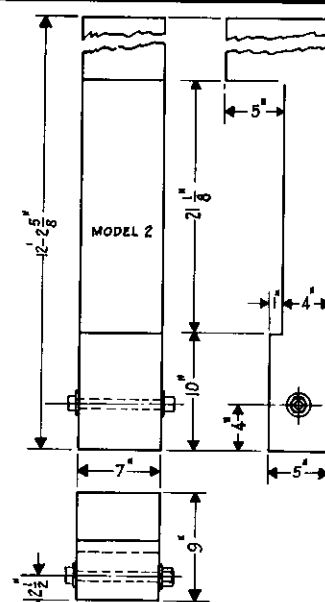
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAR. 6, 1929

Correct
Arthur
Chief Signal Engineer

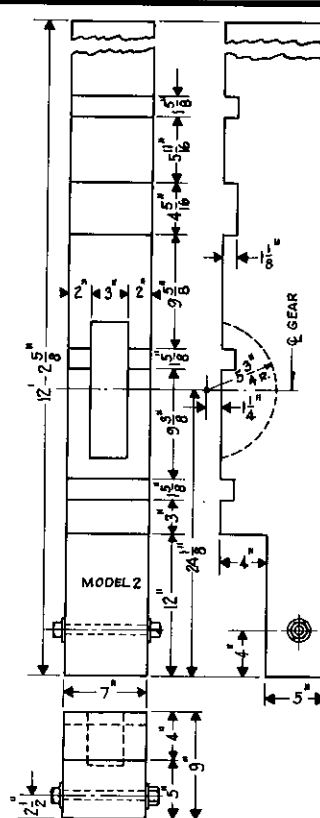
Approved
Arthur
Chief Engineer



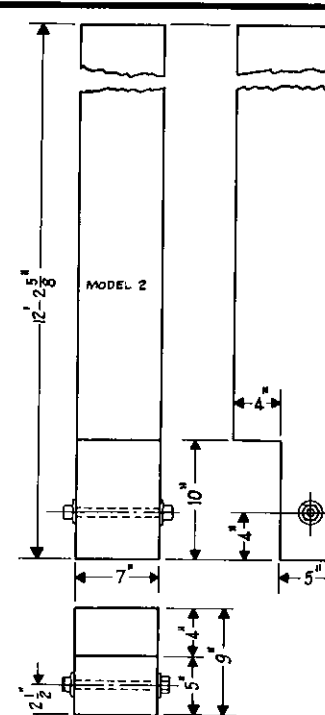
19513 SWITCH TIE.
STORES CAT. REF. NO. 5A-87



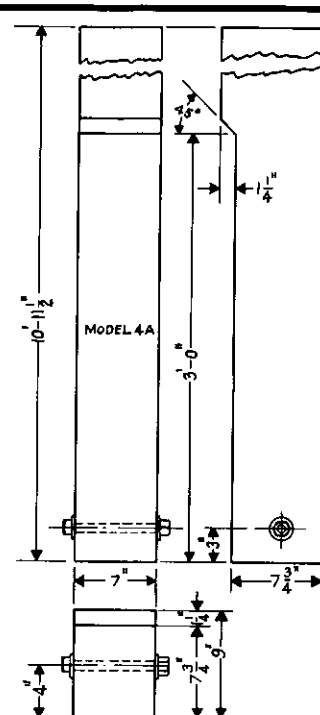
19515 SWITCH TIE.
STORES CAT. REF. NO. 5A-88



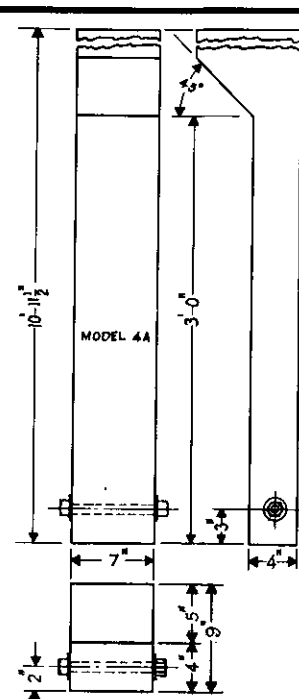
19516 SWITCH TIE.
STORES CAT. REF. NO. 5A-89



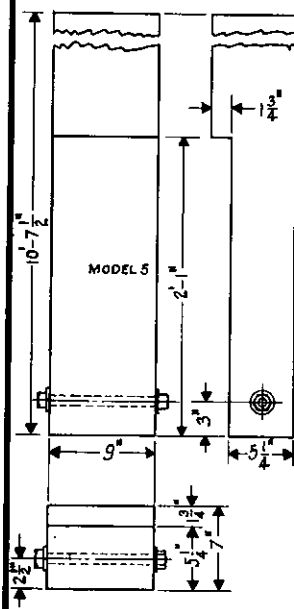
19517 SWITCH TIE.
STORES CAT. REF. NO. 5A-90



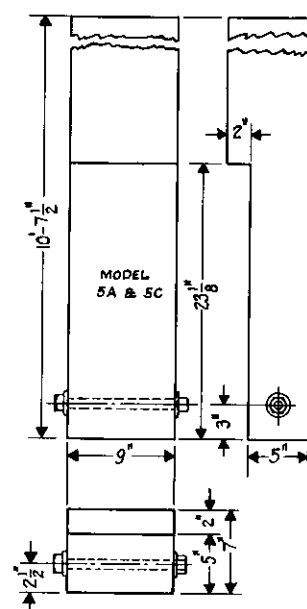
19518 SWITCH TIE.
STORES CAT. REF. NO. 5A-91



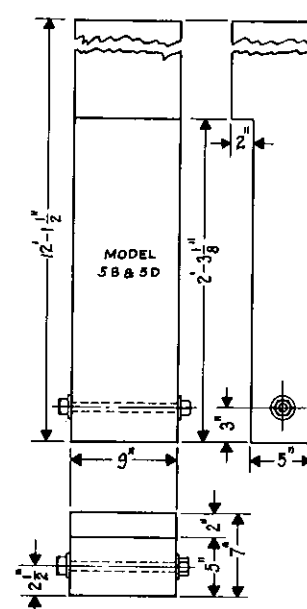
19519 SWITCH TIE.
STORES CAT. REF. NO. 5A-92



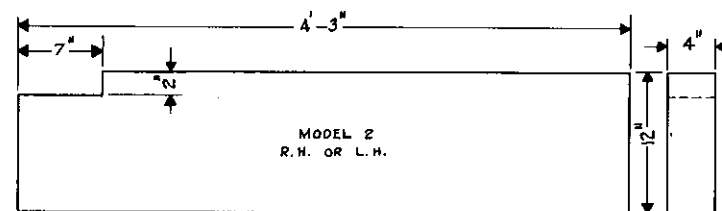
19520 SWITCH TIE.
STORES CAT. REF. NO. 5A-93



19521 SWITCH TIE.
STORES CAT. REF. NO. 5A-94



19522 SWITCH TIE.
STORES CAT. REF. NO. 5A-95



19523 TIMBER.
STORES CAT. REF. NO. 5A-96

FOR NOTES SEE SHEET 2.

SHEET 3 OF 3.



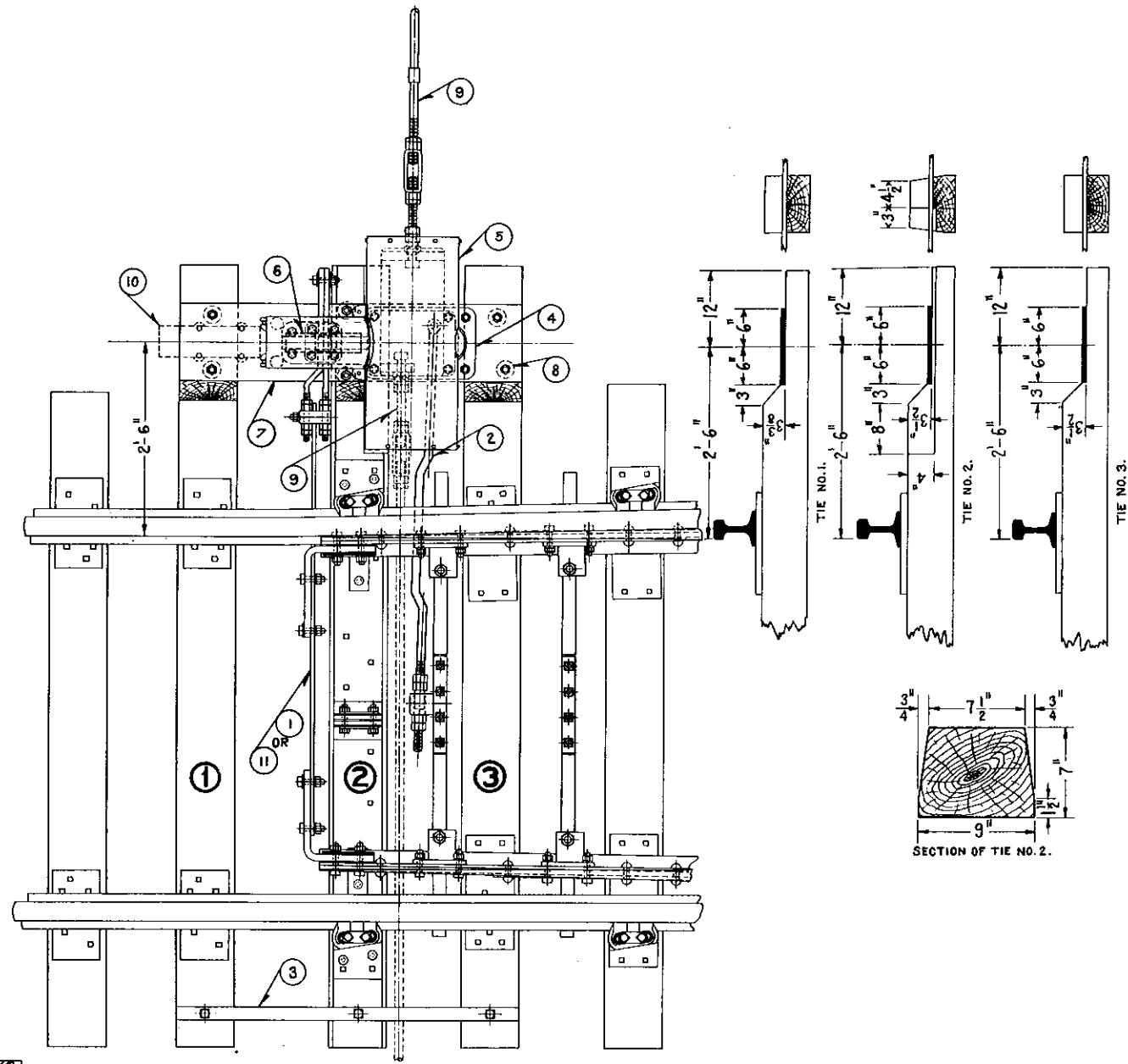
S-195-B

THE PENNSYLVANIA RAILROAD
STANDARD
SWITCH TIES

FOR INTERLOCKED SINGLE SWITCHES.
OFFICE OF CHIEF ENGINEER, PHILA., PA., DECEMBER 4, 1947.

Approved
McGuffee
Assistant Chief Engineer-T.C. & S.

Approved
McGuffee
Chief Engineer



ASSEMBLAGE

ITEM	REQD.	NAME	FIG.	PLAN
1	1	FRONT & LOCK ROD 100 & 130 LB. RAIL.	3054	S-305
2	1	OPERATING ROD.	3312	S-331
3	1	TIE STRAP.	2002	S-200
4	1	L.H. TYPE "G" SWITCH MECHANISM.	2582	S-258
5	1	L.H. MECHANISM COVER.	25818	S-258
6	1	INDICATION BOX.		
7	1	BASE PLATE.	2586	S-258
8	6	WASHERS	2161	S-216
9	1	MECHANISM ROD.	25816	S-258
10	1	ELECTRIC LOCK (WHEN REQUIRED).		
11	1	FRONT & LOCK ROD 131 & 152 LB. RAIL.	30538	S-305

NOTE:-
 SWITCH RODS, GAUGE PLATE AND RAIL BRACES SHALL BE FURNISHED WITH SWITCH POINTS; FOR DETAILS SEE STANDARD M.W. MATERIAL PLANS.
 WHERE NO DETAIL REFERENCE IS GIVEN, THE MANUFACTURER'S STANDARD APPARATUS SHOULD BE FURNISHED.

REVISIONS

REDRAWN FROM APPROVED PLAN
 S-201-B, DATED 11-24-20, LAST
 REVISION 10-18-22 AND REVISED.
 D-AUGUST 21, 1934.

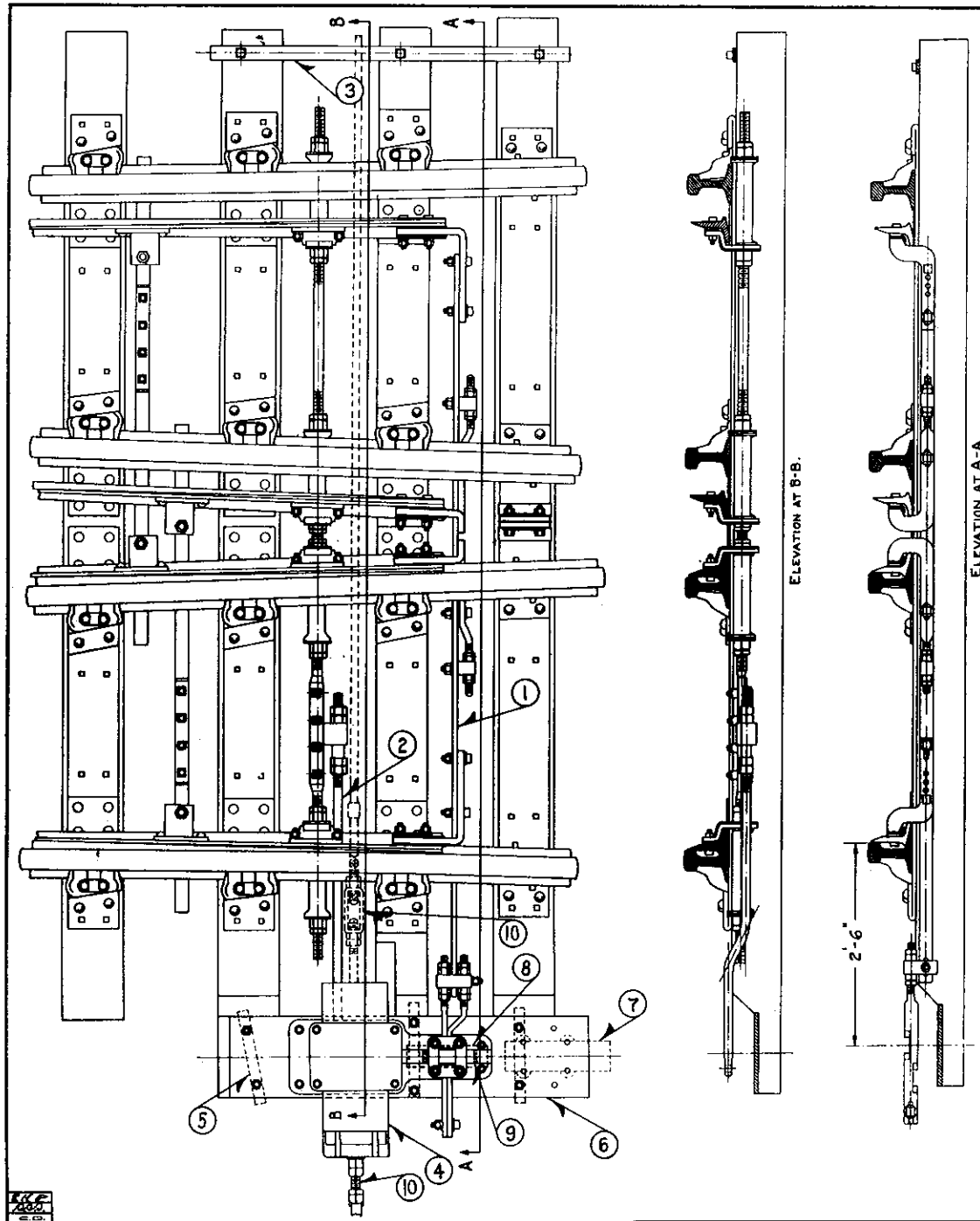
APPROVED:-

1 SHEET

S-201-D

THE PENNSYLVANIA RAILROAD
 STANDARD
 LAYOUT
 SINGLE SWITCH, TYPE "G" MECHANISM

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., APRIL 10, 1926
 Approved *A.H. Russell* Chief Signal Engineer
 Approved *[Signature]* Chief Engineer



ASSEMBLAGE				
ITEM	REQ'D.	NAME	FIGURE	PLAN
1	1	FRONT AND LOCK ROD.	30821	S-308
2	1	OPERATING ROD.	3331	S-333
3	1	TIE STRAP	2002	S-200
4	1	L.H. MECHANISM.	2581	S-258
5	3	WASHER PLATES.	2001	S-200
6	1	BASE PLATE.	2586	S-258
7	1	ELECTRIC LOCK (WHEN REQUIRED).		
8	1	INDICATION BOX.	25812	S-258
9	2	CONTACT BLOCKS.	25819	S-258
10	1	MECHANISM ROD	25816	S-258

Note:-

Switch Rods, Gauge Plates and Rail Braces to be furnished with Switch Points: for details see Standard M.W. Plans.

Where no detail reference is given, the Manufacturer's Standard Apparatus should be furnished.

Mechanism for facing point switch in main track, shall be located on the normally closed side of the switch.

For details and parts of Mechanism see Plan S-258.
For framing of Timbers see Plan S-200.

REVISIONS
B-DEC., 3, 1922
APPROVED: *Arthur*

1 SHEET

S-202-B

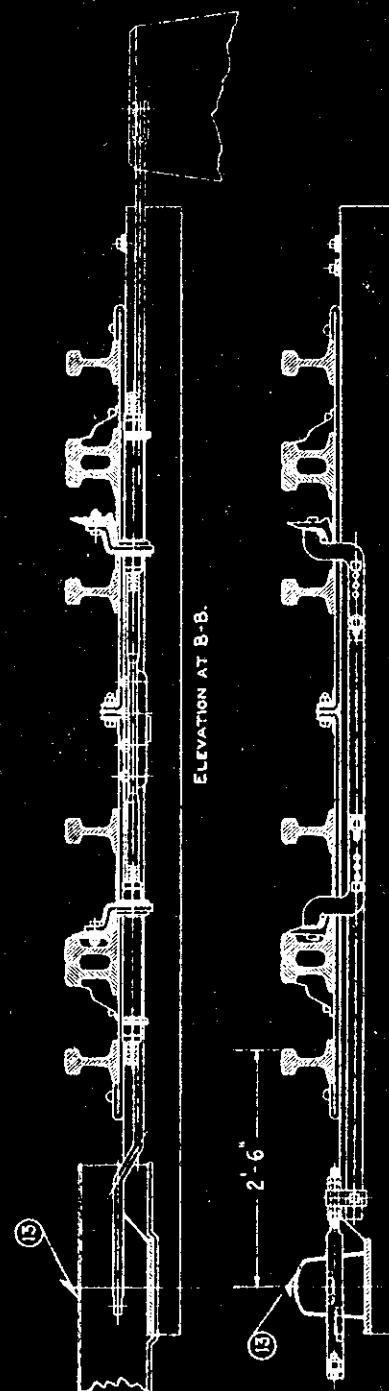
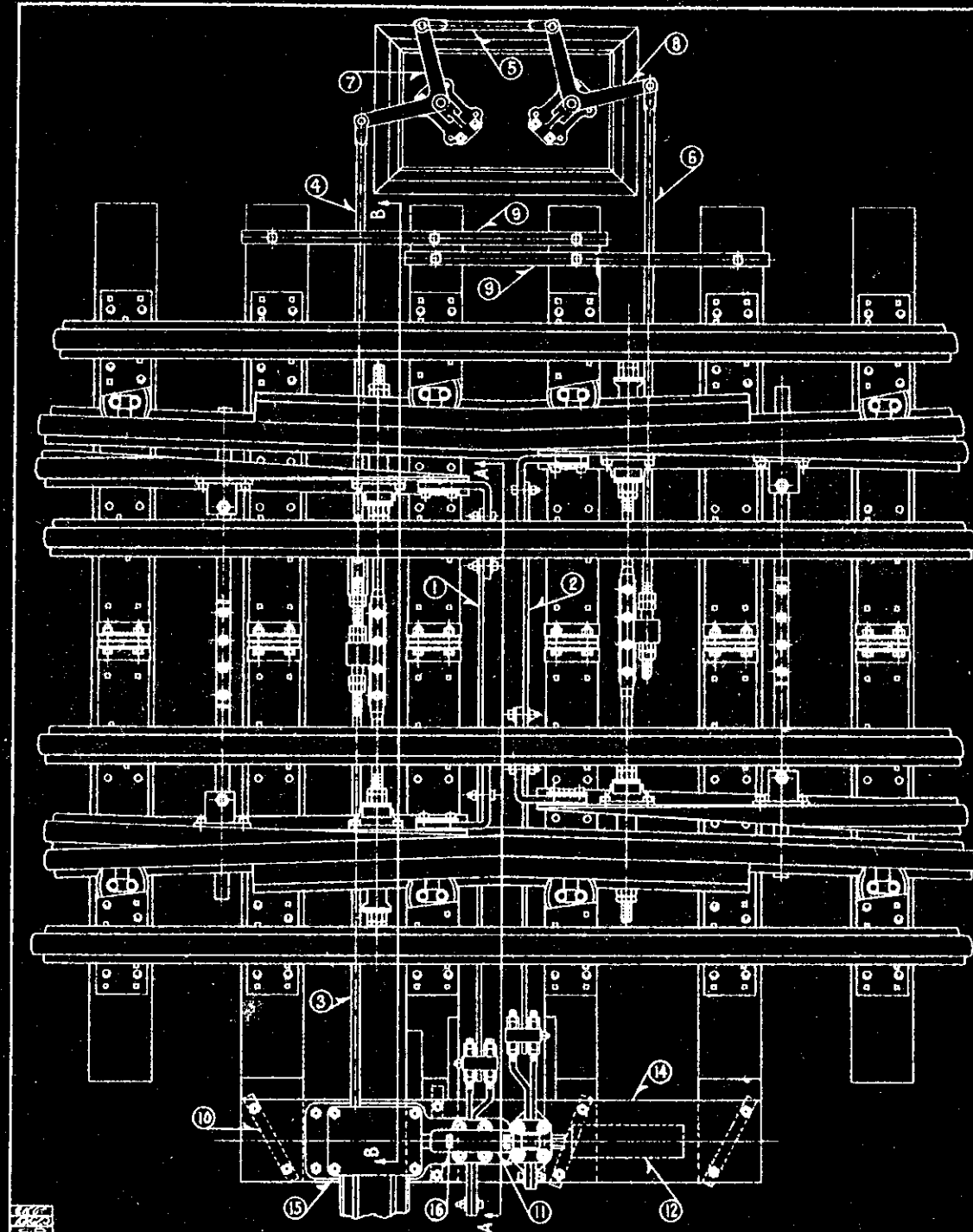
PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAYOUT
DOUBLE SLIP SWITCH TYPE "Q" MECHANISM
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAY 12, 1904.

Approved

Arthur
Chief Signal Engineer

Approved

Arthur
Chief Engineer



Note: Switch Rods, Rail Braces and Bridle Plates to be furnished with Switch Points, for details see Standard M.M. Plans. Where no detail reference is given, the Manufacturer's Standard Apparatus should be furnished. For framing of Timbers see Plan S-200. For details and parts of Mechanism see Plan S-258 (Except Slide Bar and extra Lock Rod Box which are special). Movements should, where practicable, be located on side of track nearest pipe line, otherwise use motion plate with side connection. (Shown dotted on Plan S-202).

ASSEMBLAGE				
ITEM	REQ'D.	NAME	FIGURE	PLAN
1	1	L.H. FRONT AND LOCK ROD.	3091	S-309
2	1	R.H. FRONT AND LOCK ROD.	3094	S-309
3	1	OPERATING ROD.	3351	S-335
4	1	OPERATING ROD.	3353	S-335
5	1	OPERATING ROD.	3357	S-335
6	1	OPERATING ROD.	3355	S-335
7	1	CRANK AND STAND.	1003	S-100
8	1	CRANK AND STAND.	1002	S-100
9	2	TIE STRAPS.	2002	S-200
10	4	WASHER PLATES.	2001	S-200
11	1	INDICATION BOX.	25812	S-258
12	1	ELECTRIC LOCK (WHEN REQUIRED).		
13	1	COVER (SIMILAR TO 25818)		
14	1	BASE PLATE.		
15	1	MECHANISM (L.H. SHOWN). When ordering specify R.H. or L.H.	Similar to 2581	S-258
16	2	CONTACT BLOCKS.	25818	S-258

REVISIONS	

1 SHEET
S-203-A

PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAYOUT
M. P. FROOS TYPE "O" MECHANISM
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAY 12, 1924

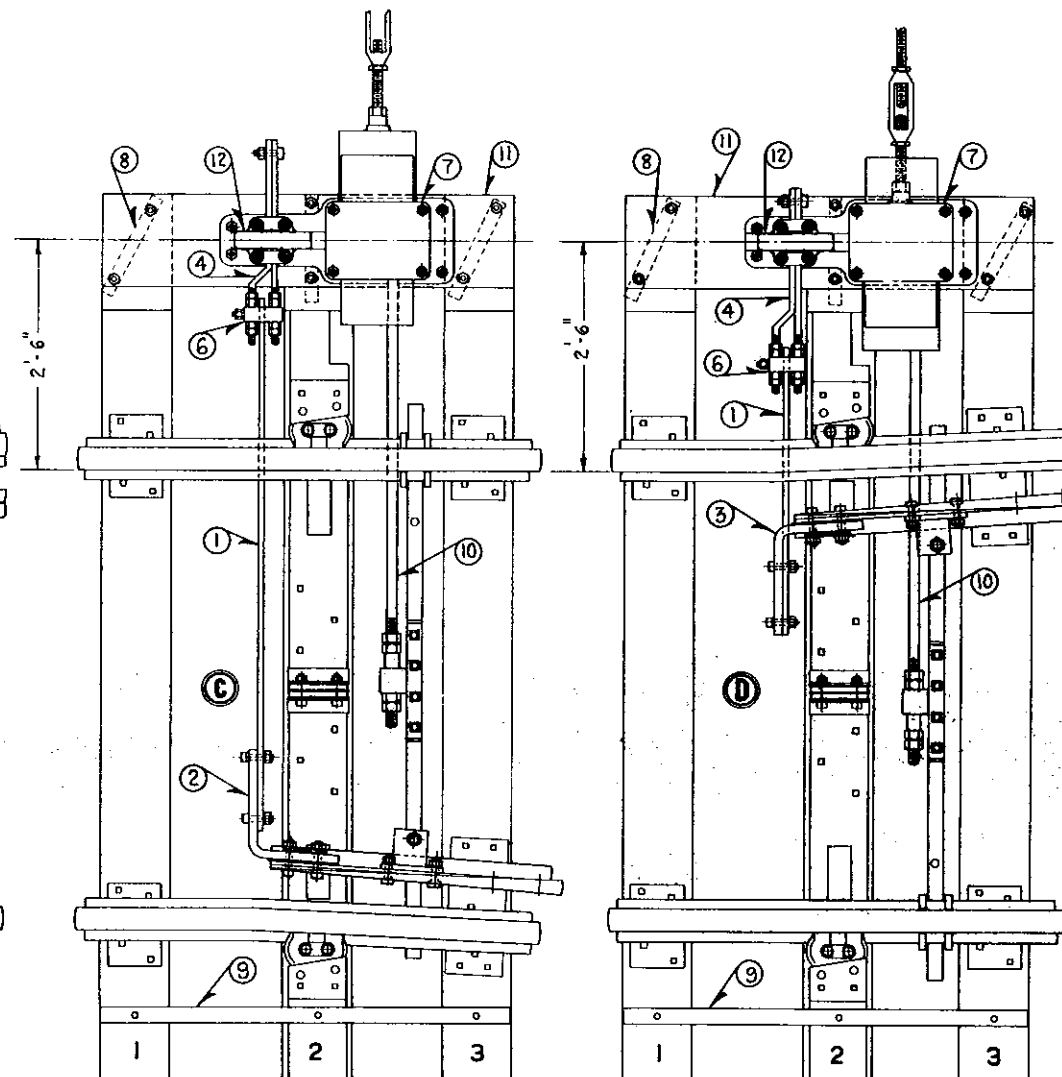
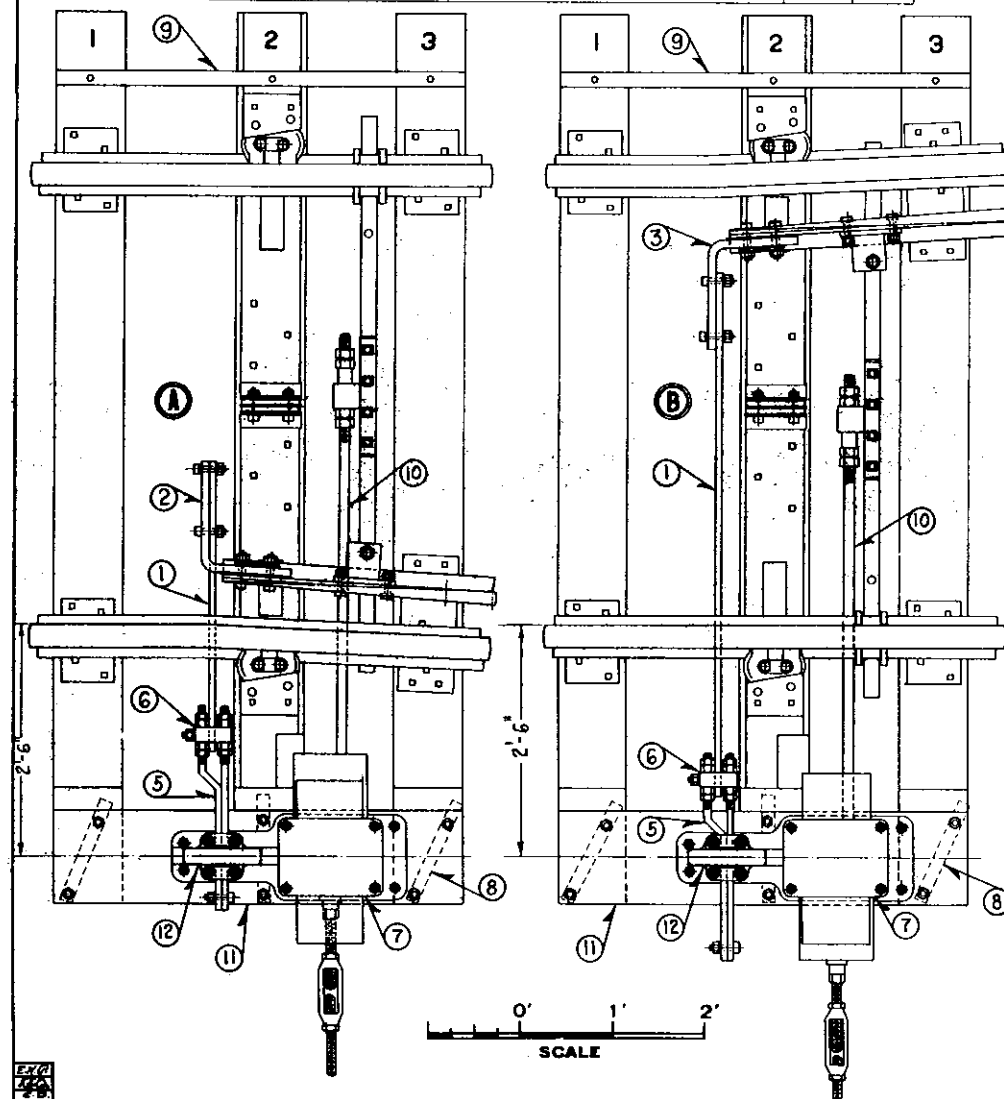
Approved

Chief Signal Engineer

Approved

Chief Engineer

ASSEMBLY			
Item	Req'd	Name	Figure
1	1	Bar #3213 with 1-3214, 1-3215, 2-3216, 1-3219	3211
2	1	Sq. head bolts with hex. nuts and lock washers	S-321
3	1	Foot #3212 with 1-3214, 1-3215, 2-3216, 1-3219 and 2-3/4" x 4"	S-321
4	1	Sq. head bolts with hex. nuts and lock washers	S-311
5	1	Lock rods #3111 and #3113 and 1-3/4" x 2 1/2" Sq. hd. bolts with hex. nuts and flat washers	S-311
6	1	Lock rods #3111 and #3112 and 1-3/4" x 2 1/2" Sq. hd. bolts with hex. nuts and flat washers	S-311
7	1	Lug	3218
8	3	Type "G" Switch mechanism	2581
9	1	Washer plates	2001
10	1	Tie strap	2002
11	1	Operating rod	3311
12	1	Base plate	S-258
12	1	Indication box	



NOTES:

* When movement is located on same side of track as switch point, bar 3211 must be cut to accommodate one foot as shown.
 For framing of timbers see plan S-260.
 Switch Rods, Bridle Plates, Rail Braces and Switch Rod Guides to be furnished with Switch Points; for details see Standard M. W. Material Plans.
 Where no detail reference is given, the Manufacturer's Standard Apparatus should be furnished.
 Ties Nos. 1, 2 and 3 are 9'-6" long.

1 SHEET

S-206-A

PENNSYLVANIA SYSTEM

STANDARD LAYOUTS

FOR DERAILS, TYPE "G" MECHANISM

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAY 31, 1922

Correct

Chief Signal Engineer

Approved

Chief Engineer

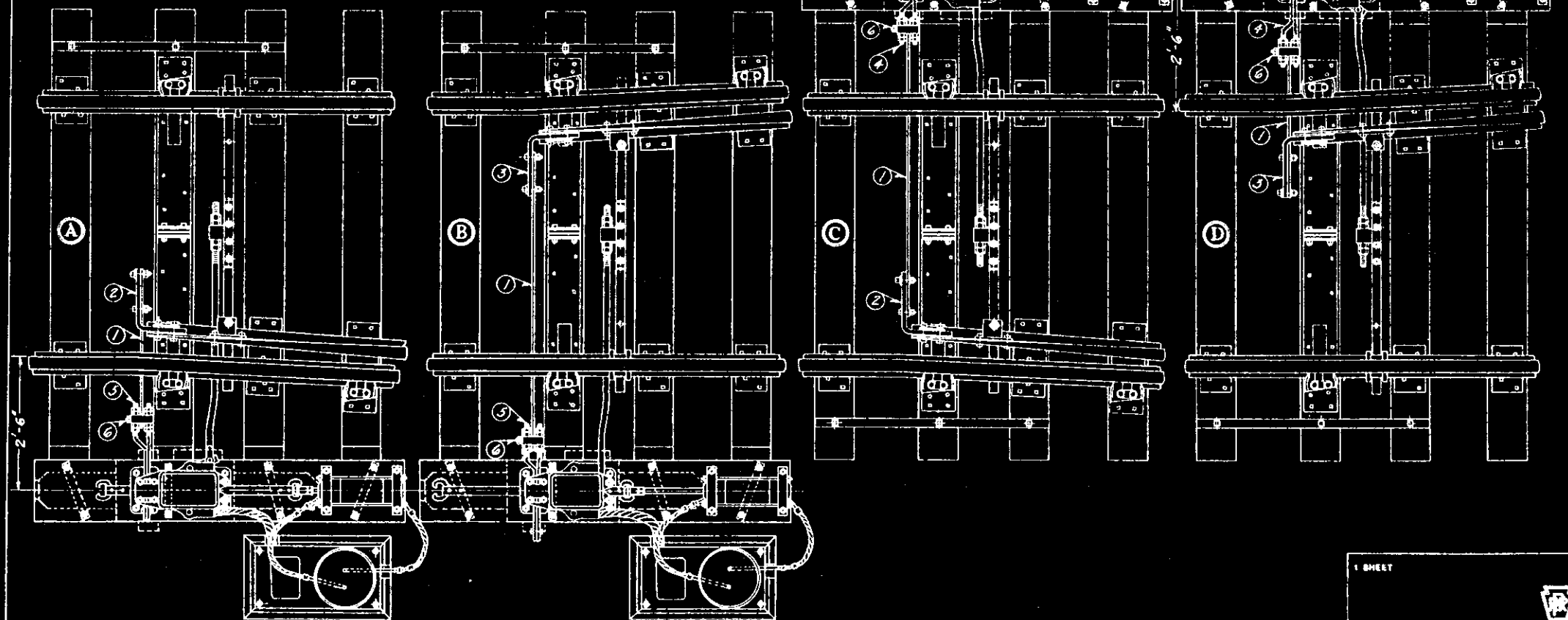
REVISIONS

ASSEMBLY			
ITEM	REQD.	NAME	FIGURE PLAN
1	1	BAR	3211 S-321
2	1	FOOT #3213 WITH 1-3214, 1-3215, 2-3216, 1-3219 AND 2-3/4" x 4" Sq. Hd. BOLTS WITH HEX. NUTS AND LOCK WASHERS	S-321
3	1	FOOT #3212 WITH 1-3214, 1-3215, 2-3216, 1-3219 AND 2-3/4" x 4" Sq. Hd. BOLTS WITH HEX. NUTS AND LOCK WASHERS	S-321
4	2	LOCK RODS 1-32120, 1-32122 AND 1-3/4" x 2-3/4" Sq. Hd. BOLT WITH HEX. NUT AND FLAT WASHER	S-311
5	2	LOCK RODS 1-32120, 1-32121 AND 1-3/4" x 2-3/4" Sq. Hd. BOLT WITH HEX. NUT AND FLAT WASHER	S-311
6	1	LUG	3218 S-321

FOR DETAILS OF SWITCH AND VALVE MECHANISMS, OPERATING RODS, FRAMING OF TIES, ETC., FOR LAYOUTS A & B SEE PLAN S-210, FOR LAYOUTS C & D SEE PLAN S-211.

NOTE:

* WHEN MOVEMENT IS LOCATED ON SAME SIDE OF TRACK AS SWITCH POINT, BAR #3211 MUST BE CUT TO ACCOMMODATE ONE FOOT AS SHOWN. SWITCH RODS, RAIL BRACES, BRIDLE PLATES & SW. ROD GUIDES TO BE FURNISHED WITH SWITCH POINTS, FOR DETAILS SEE STANDARD M. W. MATERIAL PLANS.



REVISIONS

1 SHEET

S-207-A



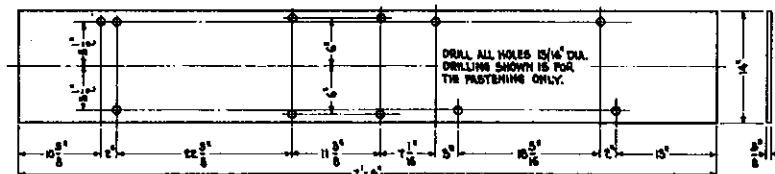
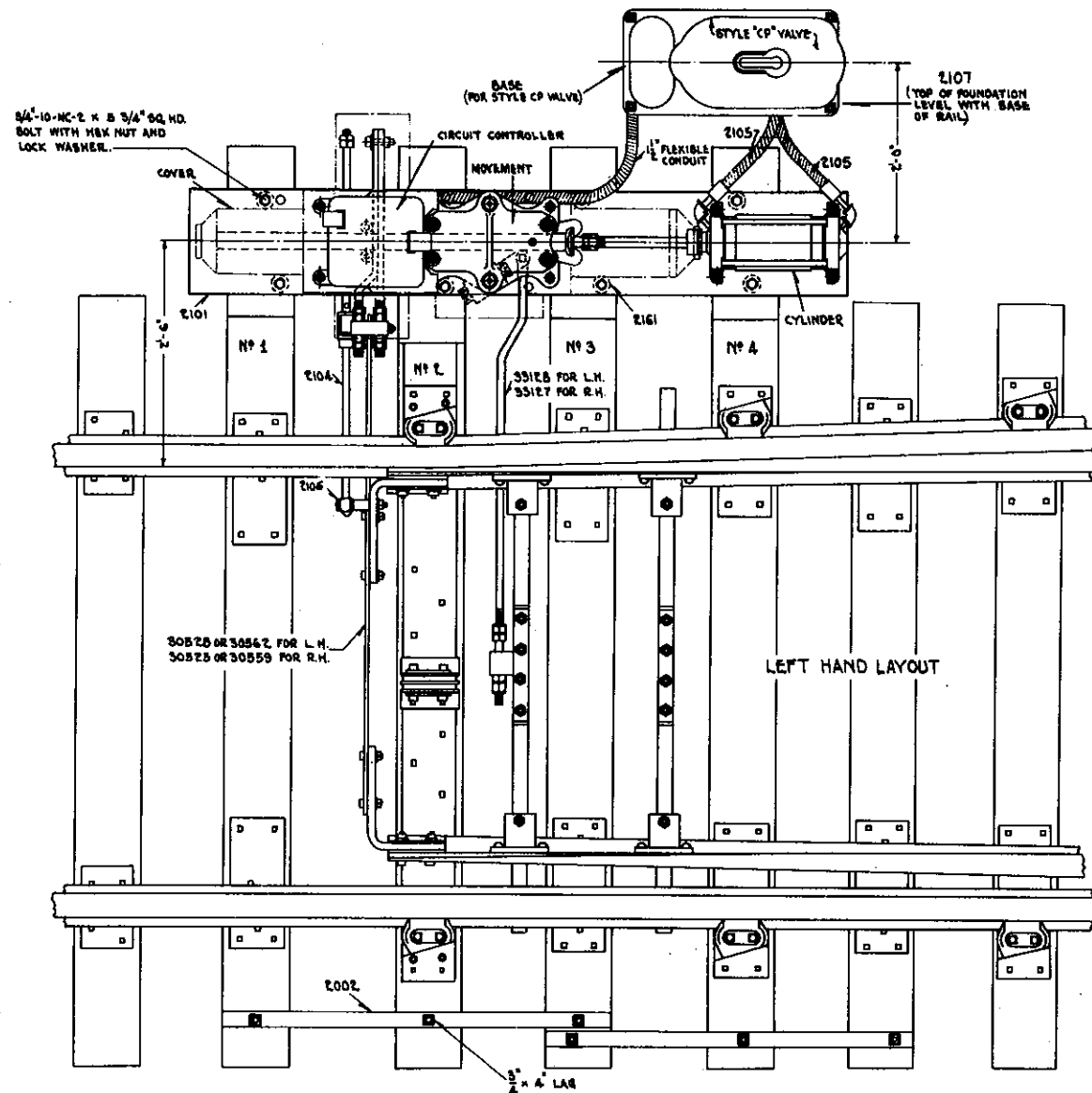
PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAYOUTS
FOR DERAILS, TYPE "AI" MECHANISM

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., JUNE 9, 1929.

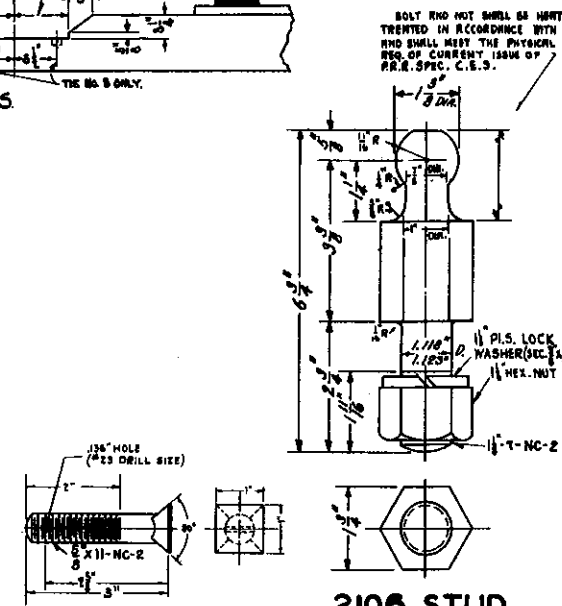
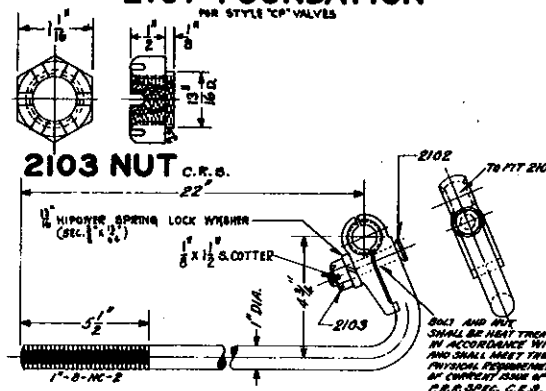
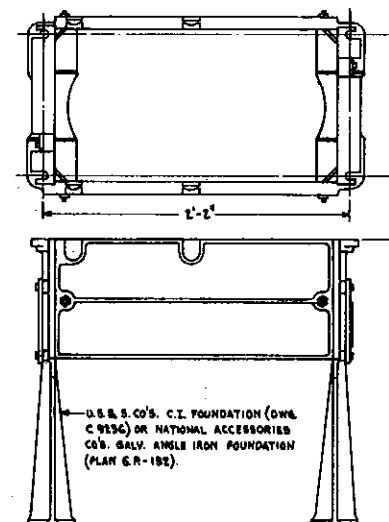
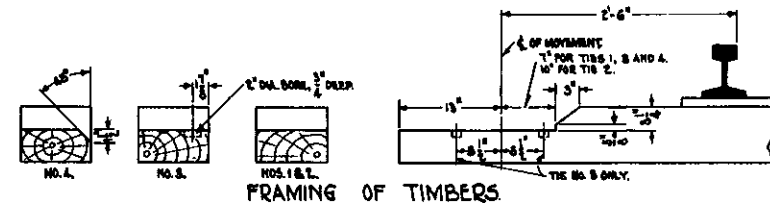
Approved

A. H. R.
Chief Signal Engineer

E. B. Temple
Asst. Chief Engineer



2101 BASE PLATE C.E.S.



- NOTE:
1. DIMENSIONS OF BOLT HEADS AND NUTS SHALL BE IN ACCORDANCE WITH A.S.A. ROUGH OR SEMI FINISH SIZES.
 2. SPRING LOCK WASHERS SHALL MEET THE REQUIREMENTS IN CURRENT ISSUE OF R.R. SPEC. C.E.S.
 3. SWITCH RODS, GAUGE PLATE AND RAIL BRACES TO BE FURNISHED WITH SWITCH POINTS; FOR DETAILS SEE STANDARD M.V. MATERIAL PLANS.
 4. WHERE NO DETAIL REFERENCE IS GIVEN, THE MANUFACTURER'S STANDARD APPARATUS SHALL BE FURNISHED.
 5. WHEN ORDERING MOVEMENT WITH OR WITHOUT CIRCUIT CONTROLLER OR COMPLETE WITH CYLINDER AND COVER - SPECIFY RIGHT OR LEFT HAND.

REVISIONS	
REVISION FROM APPROVED PLAN S-210-B, DATED 10-28-16 AND REVISED.	
D AUGUST 28, 1933. C.E.S.	
APPROVED <i>A.H. Redd</i>	
E JAN. 15, 1934	
APPROVED <i>A.H. Redd</i>	
F JULY 20, 1934	
APPROVED <i>A.H. Redd</i>	

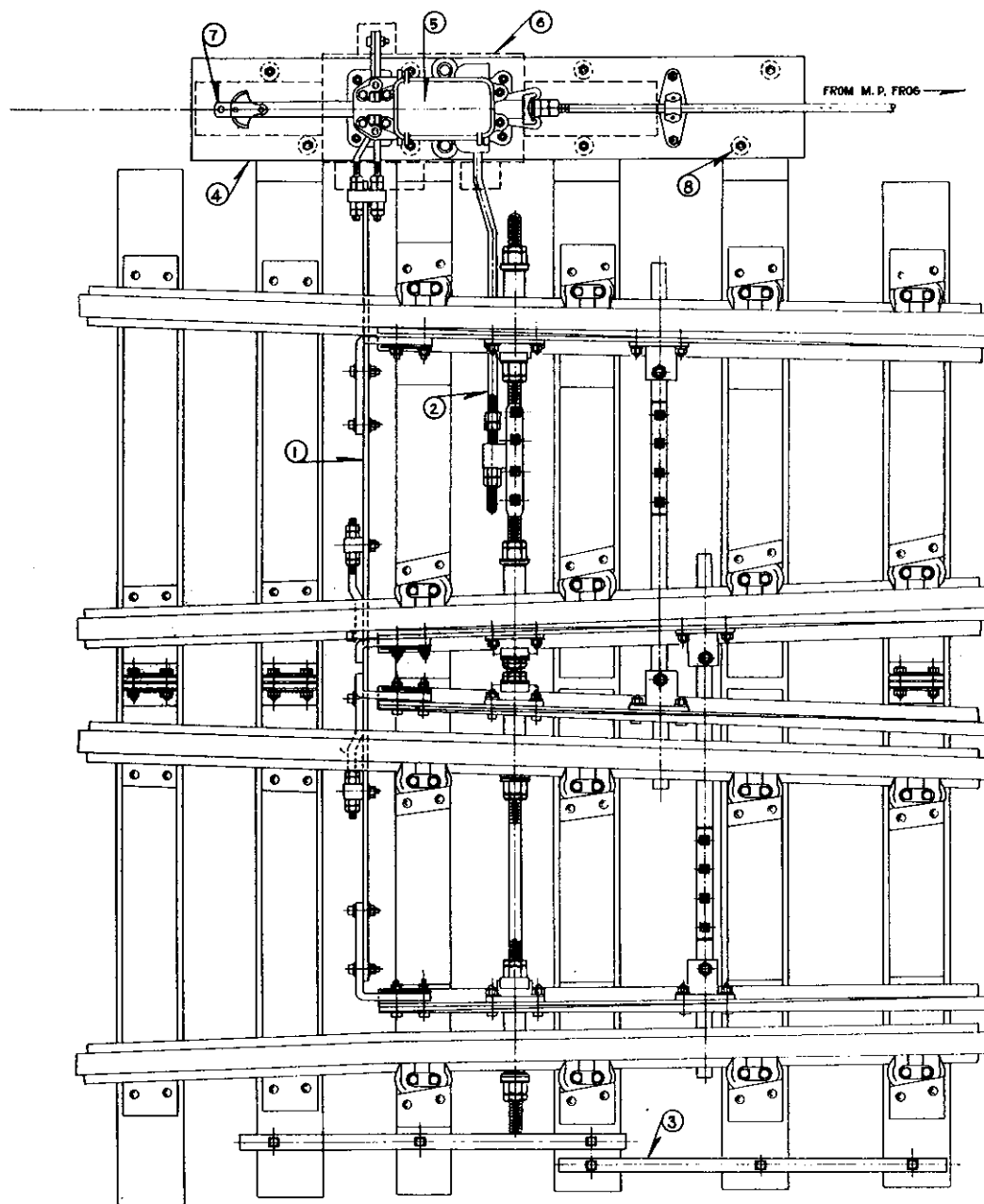
1 SHEET

S-210-F

THE PENNSYLVANIA RAILROAD
STANDARD
LAYOUT
SINGLE SWITCH - TYPE "A-5" MECHANISM
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. OCT. 11, 1932

Approved *A.H. Redd* Chief Signal Engineer

Approved *A.H. Redd* Chief Engineer



ASSEMBLAGE			
ITEM	REQD	NAME	FIGURE PLAN
1	1	FRONT AND LOCK ROD.	30622 S-306
2	1	OPERATING ROD.	3353 S-335
3	2	TIE STRAPS.	2002 S-200
4	1	BASE PLATE.	
5	1	MOVEMENT COMPLETE WITH CIRCUIT CONTROLLER.	
6	1	COVER COMPLETE.	
7	1	SWITCH MECHANISM COMPLETE WITH 4, 5 & 6.	
8	8	WASHERS.	2161 S-216

NOTE:-
 SWITCH RODS, GAUGE PLATE AND
 RAIL BRACES TO BE FURNISHED WITH
 SWITCH POINTS; FOR DETAILS SEE
 STANDARD M.W. MATERIAL PLANS.
 WHERE NO DETAIL REFERENCE
 IS GIVEN, THE MANUFACTURER'S
 STANDARD APPARATUS SHOULD BE
 FURNISHED.
 FOR FRAMING OF TIMBERS
 SEE PLAN S-210.

REVISIONS

1 SHEET

S-212-A

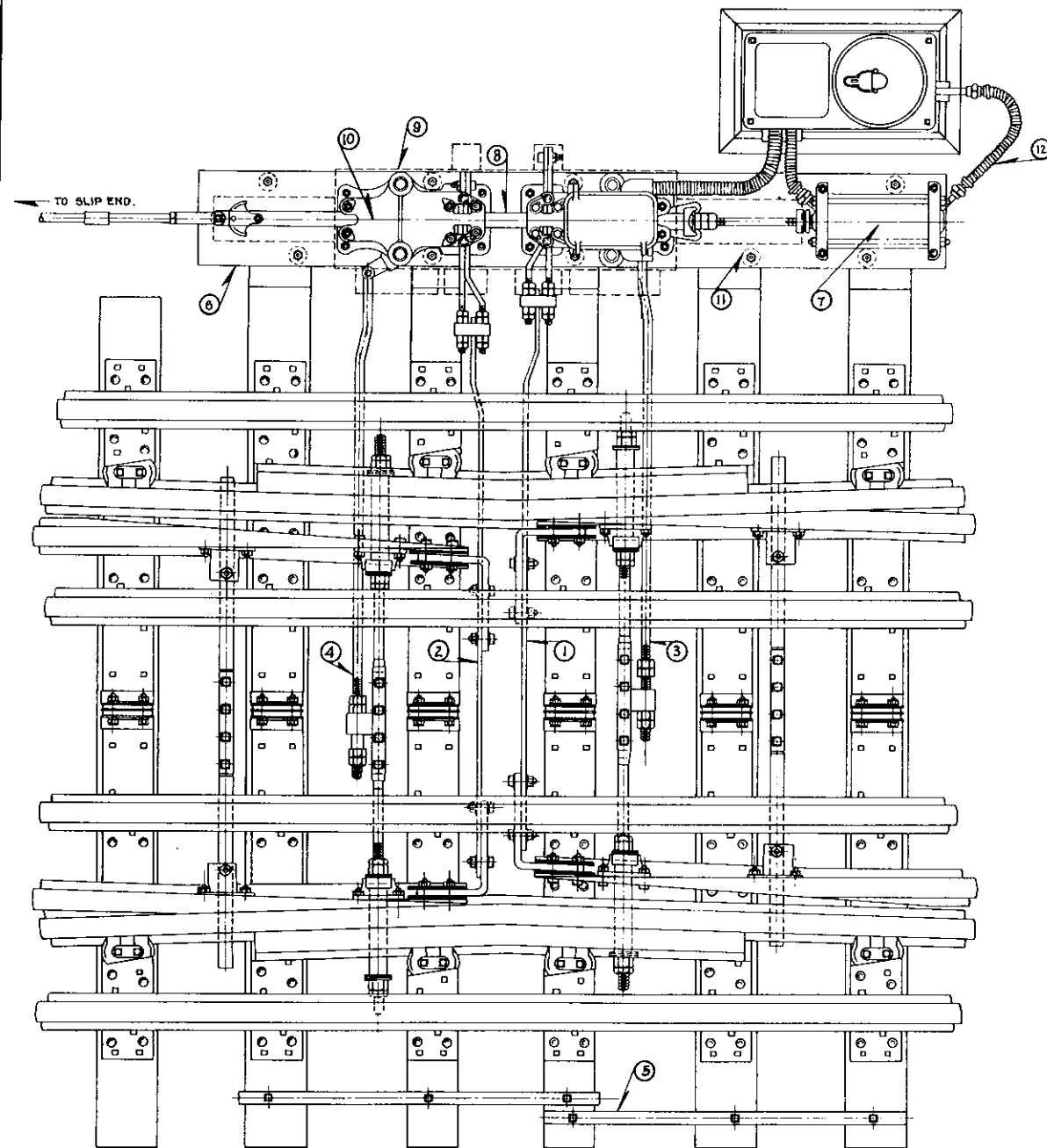


THE PENNSYLVANIA RAILROAD
 STANDARD
 LAYOUT

SLIP SWITCH - "A" MECHANISM WITHOUT CYLINDER
 OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. NOV. 22, 1927

Approved *[Signature]*
 Chief Signal Engineer

Approved *[Signature]*
 Chief Engineer



ASSEMBLAGE					
ITEM	REQ'D.	NAME		FIGURE	PLAN
1	1	L.H. FRONT AND LOCK ROD		3097	5-309
2	1	R.H. " " "		30810	"
3	1	OPERATING ROD		3317	5-331
4	1	" " "		3318	"
5	2	TIE STRAPS		2002	5-200
6	1	BASE PLATE			
7	1	CYLINDER			
8	1	TANDEM MOVEMENT COMPLETE WITH SLIDE BAR AND CIRCUIT CONTROLLER			
9	1	COVER COMPLETE			
10	1	SWITCH MECHANISM COMPLETE WITH 6, 7, 8, & 9.			
11	10	WASHERS		2161	5-216
12	2	1/2" ARMORED HOSE CONNECTIONS			

NOTE :-
 SWITCH RODS, GAUGE PLATE AND
 RAIL BRACES TO BE FURNISHED WITH
 SWITCH POINTS; FOR DETAILS SEE
 STANDARD M.V. MATERIAL PLANS.
 WHERE NO DETAIL REFERENCE
 IS GIVEN, THE MANUFACTURER'S
 STANDARD APPARATUS SHOULD
 BE FURNISHED.
 FOR DETAILS OF VALVE AND
 FRAMING OF TIMBERS SEE PLAN 5-
 210.

REVISIONS

1 SHEET

S-213-A

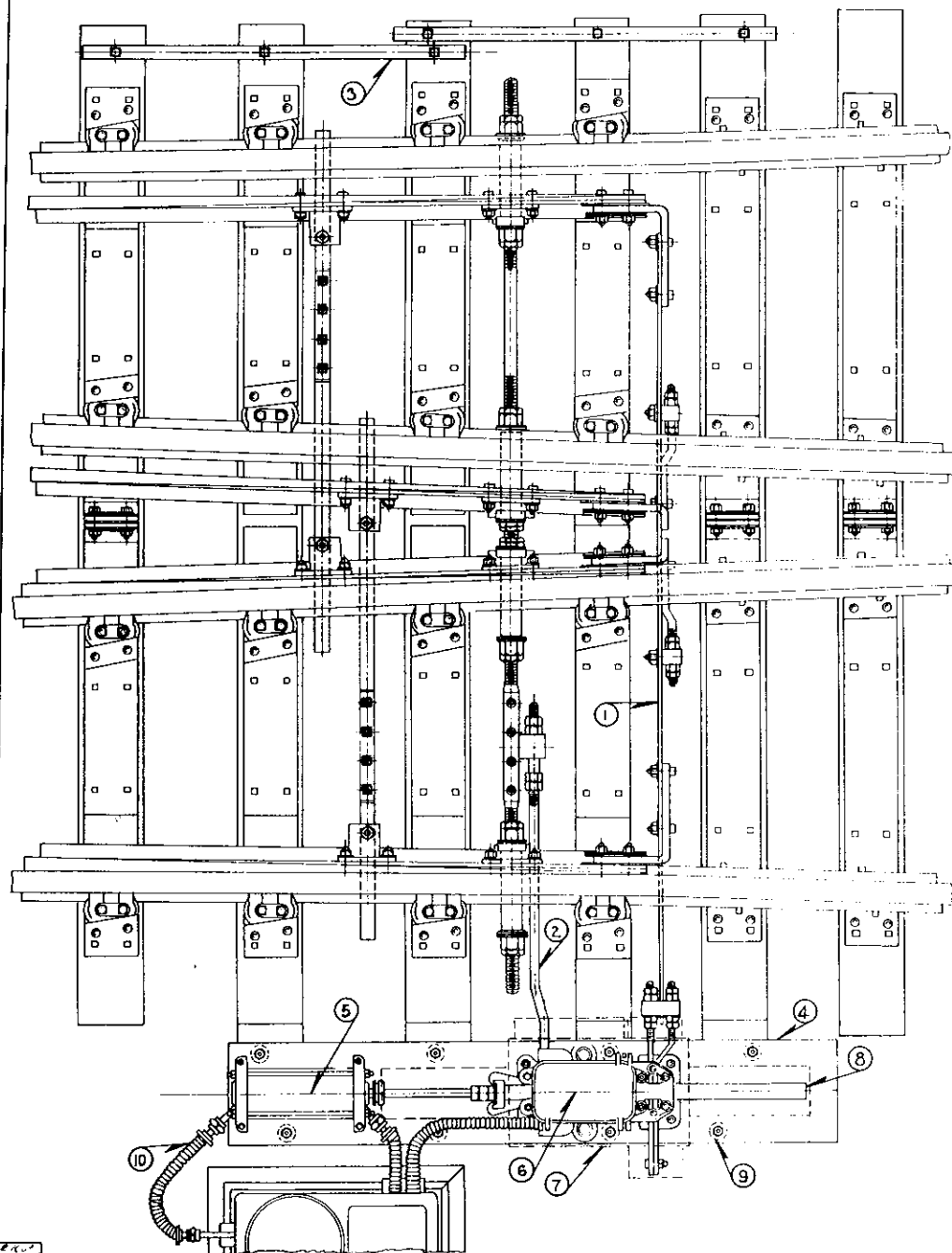
THE PENNSYLVANIA RAILROAD
 STANDARD
 LAYOUT
 M. P. FROGS - TYPE "AI" MECHANISM
 OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. NOV. 22, 1927.

Approved

[Signature]
 Chief Signal Engineer

Approved

[Signature]
 Chief Engineer



ASSEMBLY			
ITEM	REQD.	NAME	FIGURE PLAN
1	1	FRONT AND LOCK ROD	30822 S-308
2	1	OPERATING ROD	3333 S-333
3	2	TIE STRAPS	2002 S-200
4	1	BASE PLATE	
5	1	CYLINDER	
6	1	MOVEMENT COMPLETE WITH CIRCUIT CONTROLLER	
7	1	COVER COMPLETE	
8	1	SWITCH MECHANISM COMPLETE WITH 4, 5, 6 & 7.	
9	8	WASHERS	2161 S-216
10	2	1/2" ARMORED HOSE CONNECTIONS	

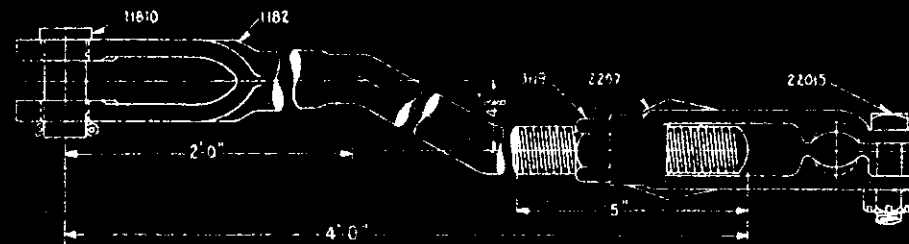
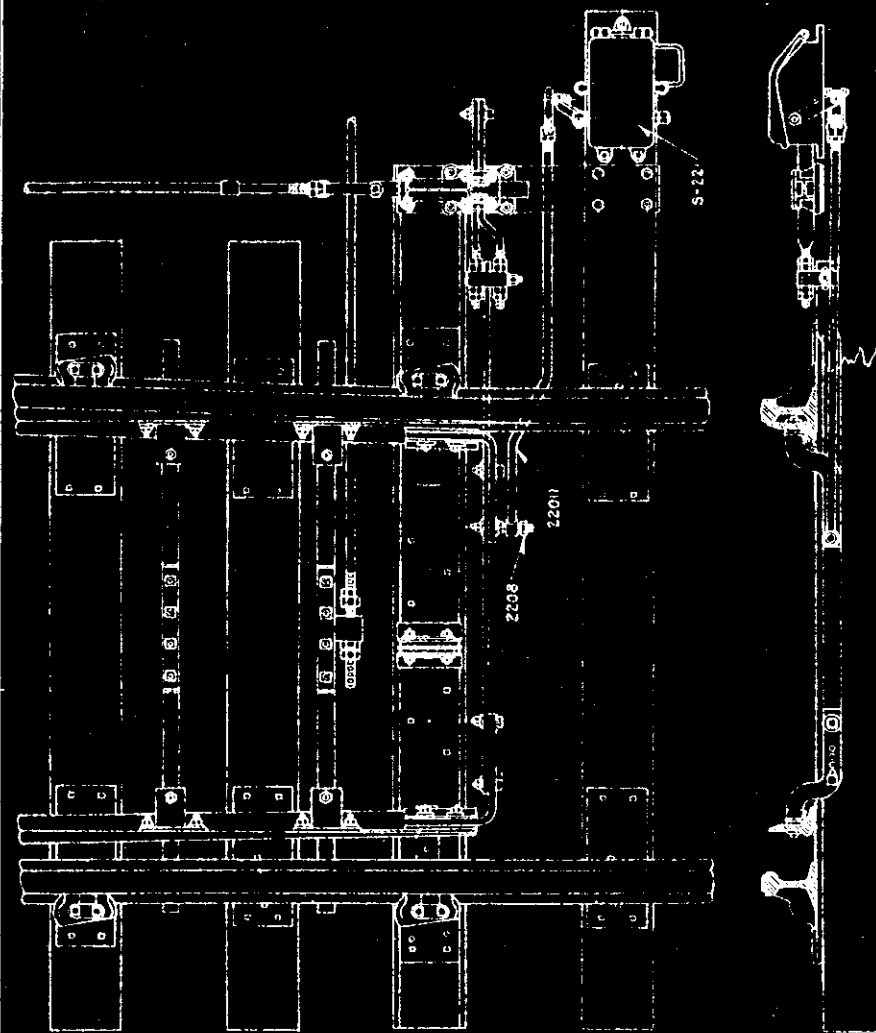
NOTE :-
 SWITCH RODS, GAUGE PLATE AND
 RAIL BRACES TO BE FURNISHED WITH
 SWITCH POINTS; FOR DETAILS SEE
 STANDARD M.W. MATERIAL PLANS.
 WHERE NO DETAIL REFERENCE
 IS GIVEN, THE MANUFACTURER'S
 STANDARD APPARATUS SHOULD BE
 FURNISHED.
 FOR DETAILS OF VALVE AND
 FRAMING OF TIMBERS SEE PLAN
 S-210.

REVISIONS

S-214-A

THE PENNSYLVANIA RAILROAD
 STANDARD
 LAYOUT
 SLIP SWITCH "A" MECHANISM WITH CYLINDER
 OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. NOV. 22, 1927.

Approved *A. H. Reed* Chief Signal Engineer
 Approved *J. H. Miller* Chief Engineer



22016-CONNECTING ROD



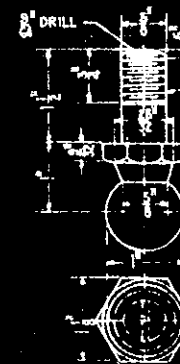
2201-BUSHING
FIBRE
R.S.A. MAN. 1925



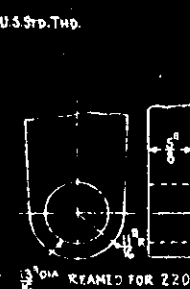
2202-WASHER
STEEL
R.S.A. MAN. 1925



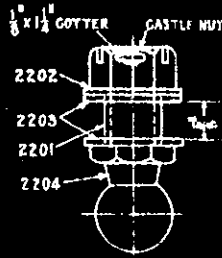
2203-WASHER
FIBRE
R.S.A. MAN. 1925



2204-INSULATING BALL STUD
ROLLED ALLOY STEEL
R.S.A. MAN. 1925

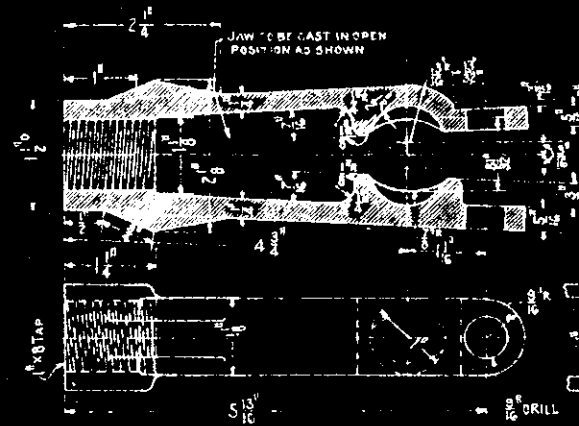


CIRCUIT CONTROLLER ARM

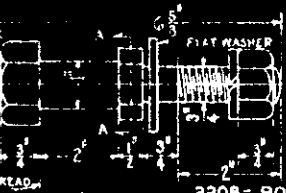


2208-ASSEMBLY OF
INSULATING BALL STUD
R.S.A. MAN. 1925

NOTE:
FIBRE SHALL BE IN ACCORDANCE WITH
R.R.P. SPECIFICATION C.E. 50



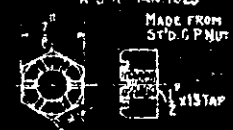
2207-ADJ. SOCKET SCREW JAW
MALL IRON
R.S.A. MAN. 1925



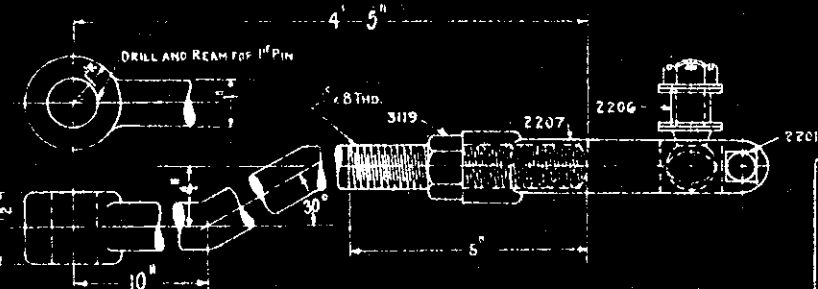
2208-BOLT
O.H.S.



2209-SQ. HD. BOLT O.H.S.
R.S.A. MAN. 1925



22010-HEX NUT
R.S.A. MAN. 1925



CONNECTING ROD O.H.S.
ORDERING REFERENCE FOR CONNECTING ROD
REQUIRED

ORDER NO.	CONNECTING ROD AS SHOWN
22011	22011 WITHOUT 2206 AND 22014.
22012	22011 WITH 2206.
22013	22011 WITH 22014.
22014	22011 WITH 2206 AND 22014.
22015	22011 WITH 2206 AND 22014 AND 1/2\"/>

1 SHEET

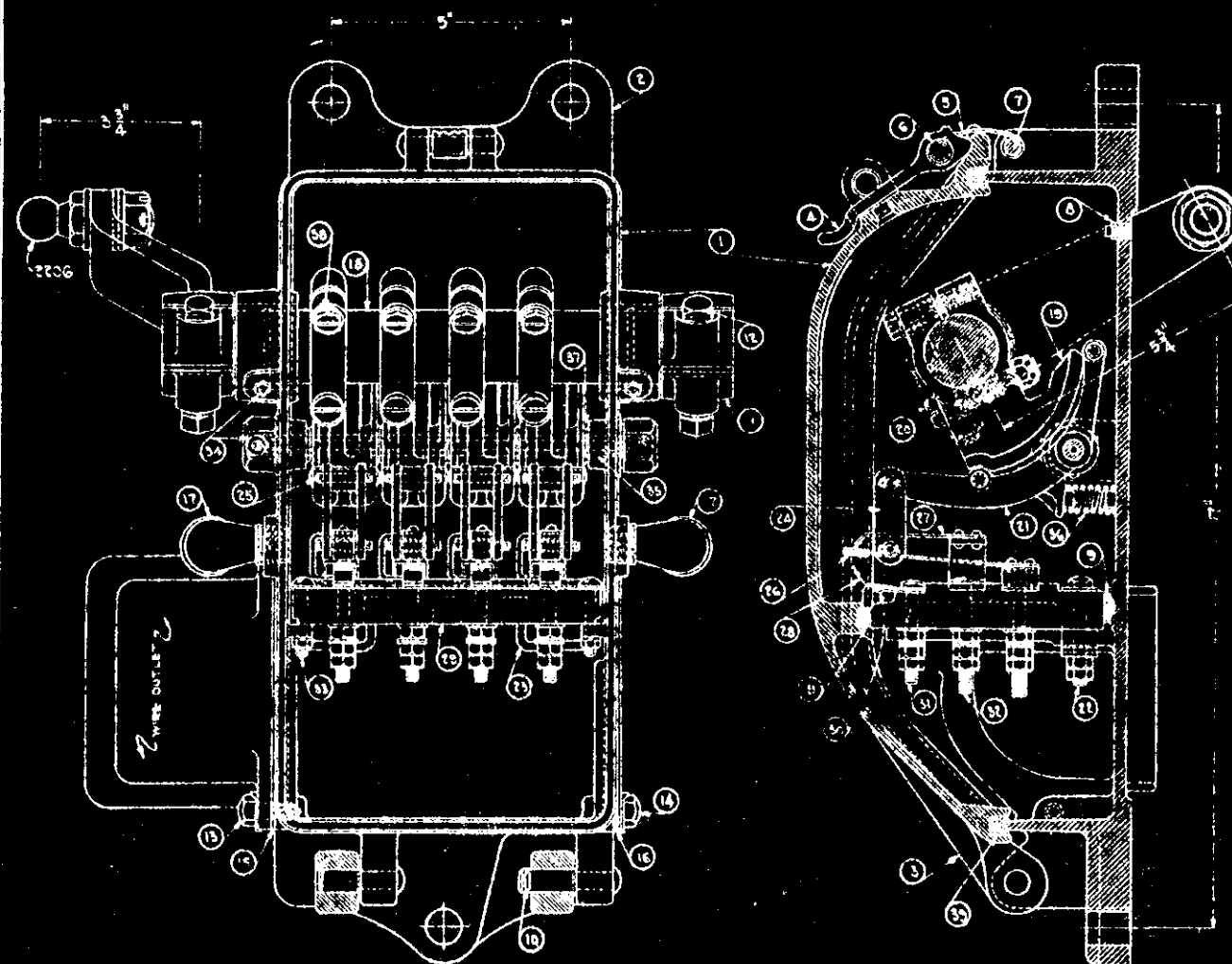
S-220-D

THE PENNSYLVANIA RAILROAD
STANDARD
SWITCH CIRCUIT
CONTROLLER CONNECTION

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA. PA. SEP. 11, 1924.

Approved
Chief Signal Engineer

Approved
Chief Engineer



ORDER NO.	REF.	NAME
2211	-	CONTROLLER COMPLETE, 2 POS. AP 40 CONTACTS
2212	-	3 " AP 40
2213	1	CASE AND COVER COMPLETE FOR 2211 OR 2212
2214	2	CASE WITH BUSHINGS AND STUDS.
2215	3	COVER COMPLETE WITH STAPLE AND GASKET.
2216	4	HASP
2217	5	HASP LINK
2218	6	RIVET 3/4" x 1 1/4" RD. HD. 1
2219	7	3/4" x 2 1/4" " "
22110	8	PIN PLUG 1/4"
22111	9	VELT GASKET 5 1/2" LONG
22112	10	COILER 1/2" x 3/4" (KAB PL.)
22113	11	CLAMP COMPLETE WITH BOLT REF 12 FOR SHAFT
22114	12	BOLT 3/4" - 16 x 2 3/4" WITH HEX NUT AND LOCK WASHER
22115	13	CAP SCREW 3/8" x 3/4" WITH LOCK WASHER
22116	14	3/8" - 16 x 1/4"
22117	15	GASKET FOR WIRE OUTLET
22118	16	COVER PLATE
22119	17	VENTILATOR COMPLETE
22120	18	CAM SHAFT FOR 2 POS. CONTROL ER
22121	19	CAM ONLY- TWO POSITION
22122	20	ADJUSTING SCREW WITH NUT AND COILER
22123	21	OPERATING ARM WITH FELLER AND PIN
22124	22	CAP SCREW 1/4" x 2 1/2" WITH PLATE WASHER AND HEX NUTS
22125	23	CLAMP FOR TERMINAL BOARD
22126	24	INS. LINK
22127	25	PIN WITH TWO 1/4" x 5/8" DR COILERS
22128	26	CONTACT SPRING COMPLETE WITH 2 DR COILERS
22129	27	
22130	28	CONTACT STRING WITH TWO
22131	29	TERMINAL BOARD
22132	30	REINFORCING SPRING
22133	31	TERMINAL POST COMPLETE WITH NUTS AND WASHERS
22134	32	
22135	33	MACHINE SCREW NO. A-24 x 1 1/2" x 1 LOCK WASHER AND
22136	34	ALUMINUM PUSH TYPE STRAIGHT 6" x 3/8" PT. BALL CHIEF
22137	35	ROCKERSHAFT COMPLETE WITH NUT
22138	36	COIL SPRING
22139	37	WASHER
22140	38	SCREW WITH 1/2" PLAIN S LOCK WASHER
22141	39	GASKET 3/4" x 3/4" x 5" O.D. FOR REF 3

PARTS NOT ITEMIZED SHOULD BE ORDERED FROM MANUFACTURER'S CATALOGUE OR DRAWING REFERENCE.

NOTE:-
 * IF POLARIZED INDICATION IS DESIRED, REQUESTION SHOULD SO STATE IN ORDER
 THAT CAMS MAY BE ADJUSTED BEFORE LEAVING FACTORY.
 WHEN ORDERING REPAIR PARTS SPECIFY NAME OF MANUFACTURER OF CONTROLLER
 ON WHICH THE PARTS ARE TO BE USED.

REVIEWED
DRAWN FROM APPROVED
5-22-A DATED 2-4-75 AND
REVISED
SEPT 7, 1975
APPROVED

1 SHEET

5-221-C

THE PENNSYLVANIA RAILROAD
STANDARD
SWITCH CIRCUIT CONTROLLER

Office of Chief Signal Engineer, Phila., Pa., June 20, 1935

Approved:

A. H. Hines
Chief Signal Engineer

Approved:

Chief Engineer

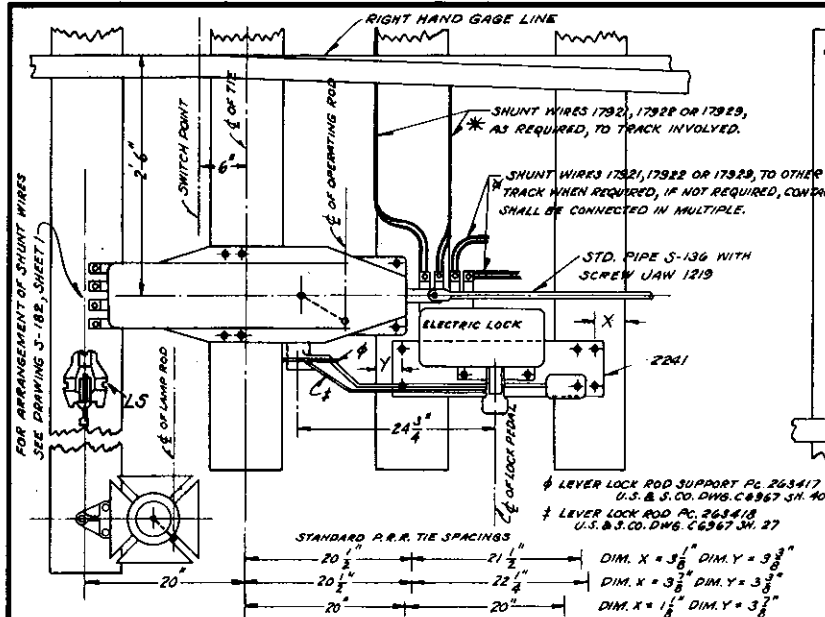


FIG. A - R. H. LAYOUT T-20 MECHANISM APPLIED TO SINGLE SWITCH.

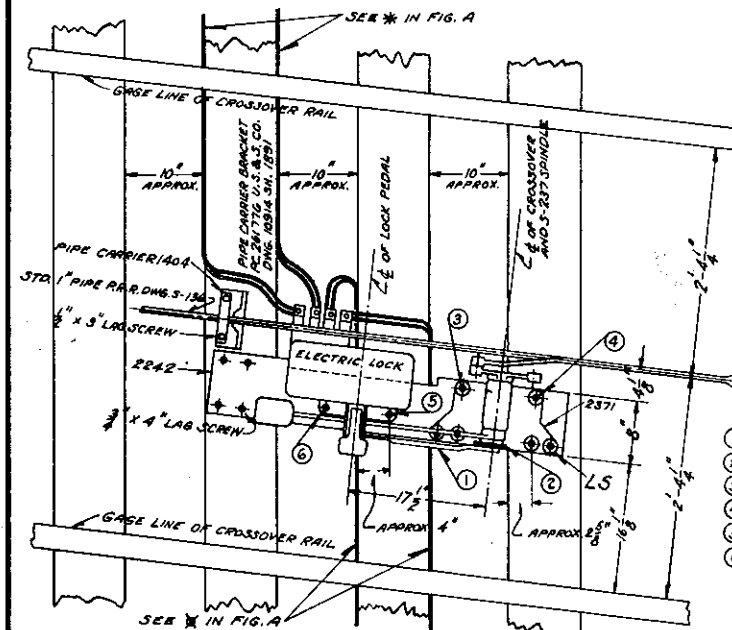


FIG. C - CENTER LOCK LEVER LAYOUT.

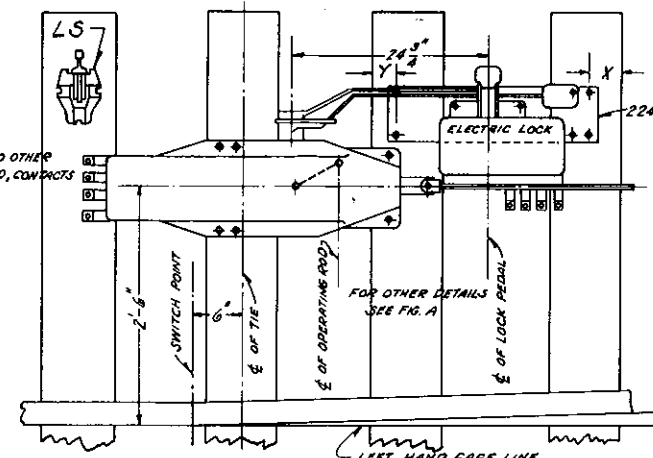
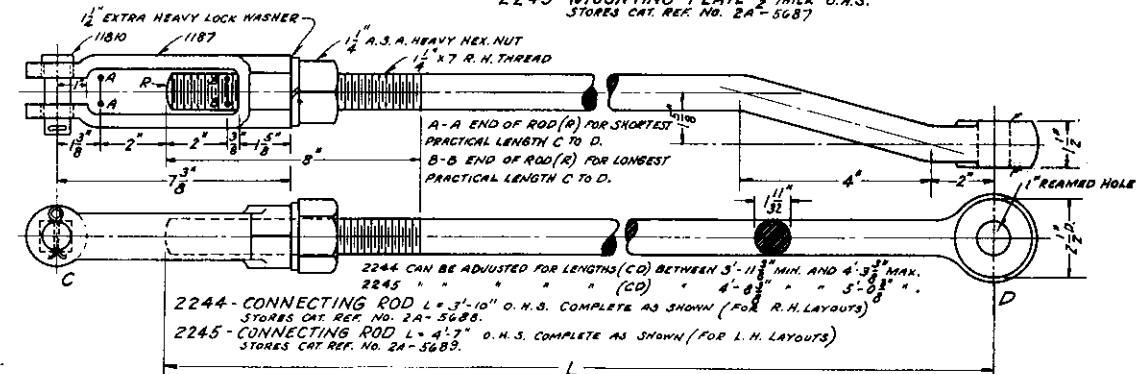
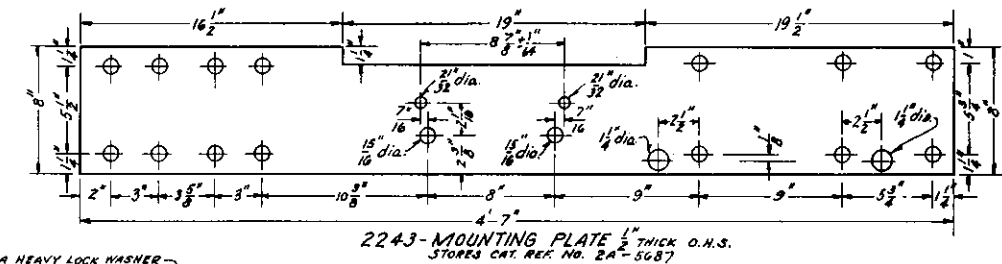
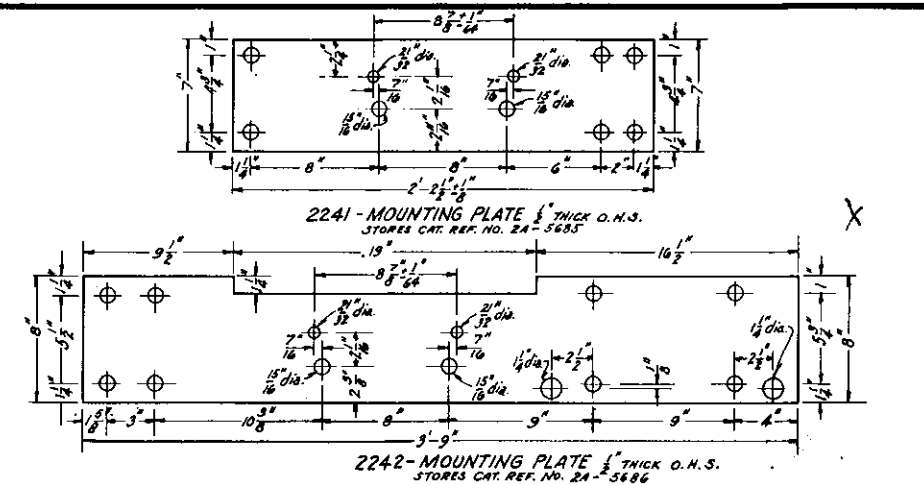


FIG. B - L. H. LAYOUT T-20 MECHANISM APPLIED TO SINGLE SWITCH.



- ① LEVER LOCK ROD PC. 262360, U.S. & S. CO. DWG. C-6967, SHEET 39.
- ② LEVER LOCK ROD SUPPORT PC. 262361, U.S. & S. CO. DWG. C-6967, SHEET 39.
- ③ 2-3/8\"/>

- NOTES:-
1. EXCEPT AS SPECIFIED, ALL HOLES IN PLATES 2241, 2242 AND 2243 SHALL BE 13\"/>

SHEET 1 OF 2

S-224-A

THE PENNSYLVANIA RAILROAD
STANDARD
MOUNTING OF T-20 H. O. MECHANISM
AND SL-26 ELECTRIC SWITCH LOCK.

OFFICE OF CHIEF ENGINEER, PHILA., PA., FEBRUARY 21, 1949.

Approved

H. C. Griffith
Assistant Chief Engineer-T. C. & S.

Approved

J. H. Smith
Chief Engineer

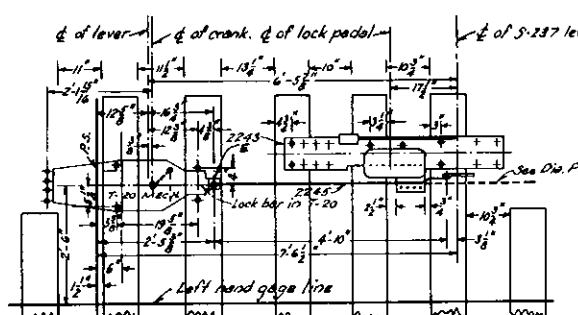


FIG. 1 - L.H. LAYOUT 18 FT. SWITCH RAIL - 2 HOLE 100 LB. & 130 LB. RAIL.

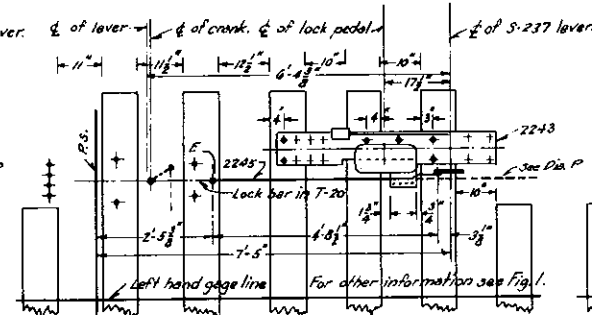


FIG. 3 - L.H. LAYOUT 18 FT. SWITCH RAIL - 3 HOLE 130 LB. RAIL.

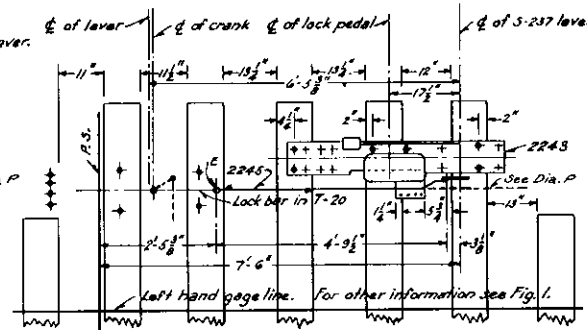


FIG. 5 - L.H. LAYOUT 30 FT. SWITCH RAIL - 3 HOLE 130 LB. RAIL.

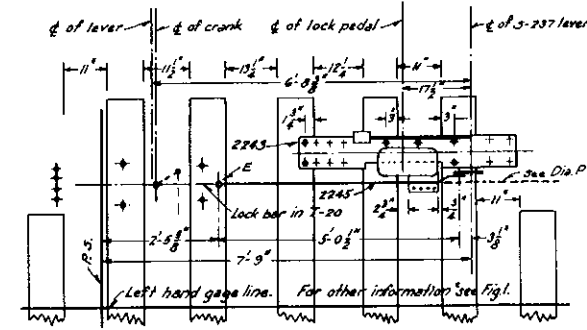


FIG. 7 - L.H. LAYOUT 30 FT. SWITCH RAIL - 2 HOLE 100 LB. & 130 LB. RAIL.

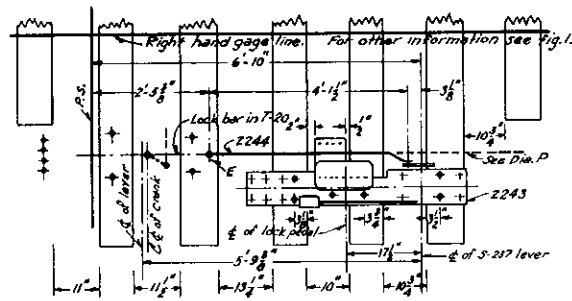


FIG. 2 - R.H. LAYOUT 18 FT. SWITCH RAIL - 2 HOLE 100 LB. & 130 LB. RAIL.

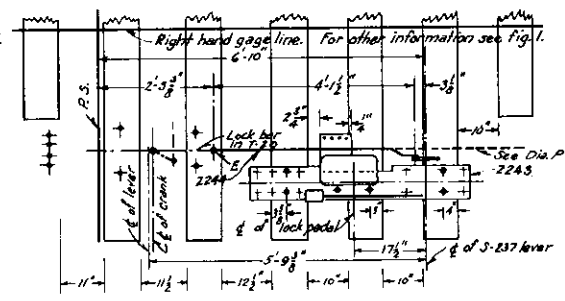


FIG. 4 - R.H. LAYOUT 18 FT. SWITCH RAIL - 3 HOLE 130 LB. RAIL.

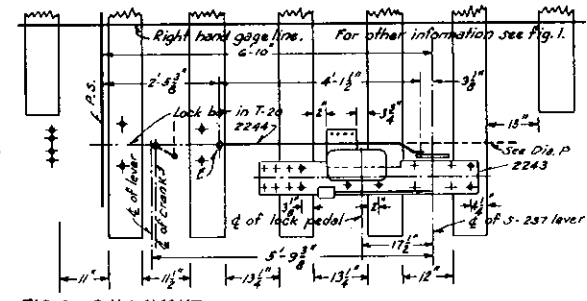


FIG. 6 - R.H. LAYOUT 30 FT. SWITCH RAIL - 3 HOLE 130 LB. RAIL.

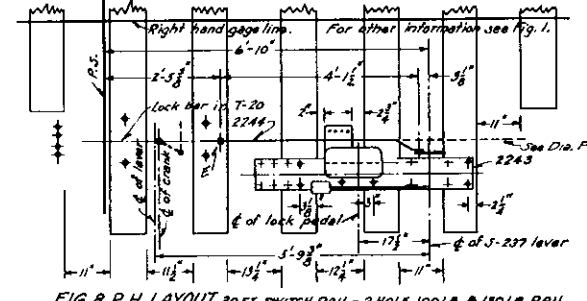


FIG. 8 - R.H. LAYOUT 30 FT. SWITCH RAIL - 2 HOLE 100 LB. & 130 LB. RAIL.

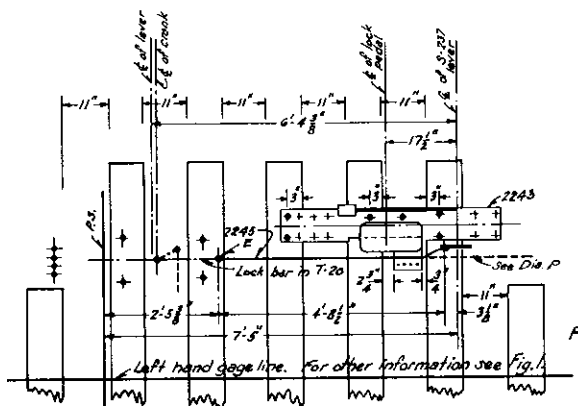


FIG. 9 - L.H. LAYOUT 30 FT. SWITCH RAIL - 3 HOLE 131 LB., 140 LB., 152 LB., & 155 LB. RAIL.

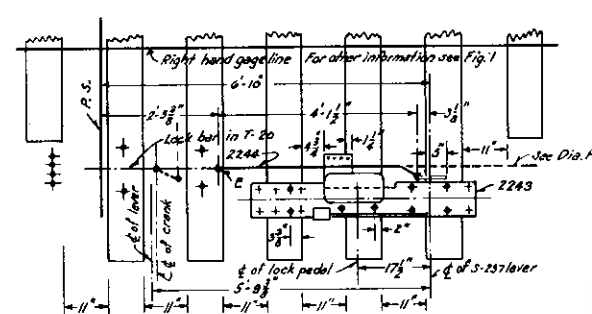


FIG. 10 - R.H. LAYOUT 30 FT. SWITCH RAIL - 3 HOLE 131 LB., 140 LB., 152 LB., & 155 LB. RAIL.

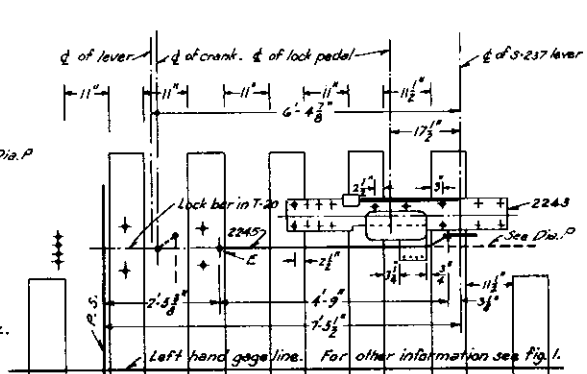


FIG. 11 - L.H. LAYOUT 20 FT. SWITCH RAIL - 3 HOLE 131 LB., 140 LB., 152 LB., & 155 LB. RAIL.

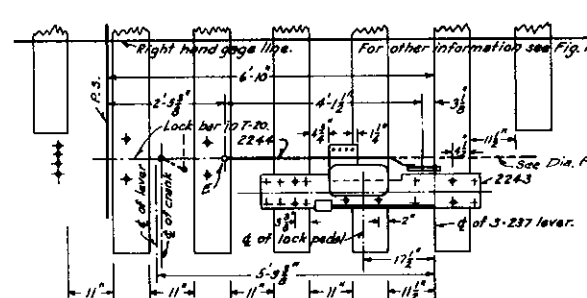


FIG. 12 - R.H. LAYOUT 20 FT. SWITCH RAIL - 3 HOLE 131 LB., 140 LB., 152 LB., & 155 LB. RAIL.

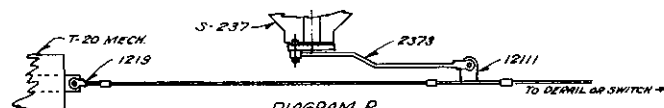


DIAGRAM P
ARRANGEMENT OF CONNECTIONS BETWEEN T-20 AND S-237 LEVER.
NOTE - FOR USE, IN LIEU OF ARRANGEMENTS SHOWN IN THE VARIOUS FIGURES, WHERE PIPE LINE IS EXTENDED FROM T-20 SEPARATE LOCKING BAR TO DERAIL, OR TO OTHER END OF CROSSOVER, AND S-237 LEVER IS LOCATED AS INDICATED ON THIS DRAWING.

NOTE - WHERE ROD 2244 OR 2245 IS APPLIED, PROVIDE EYE BOLT 241990-3H, 243-8034 U.S. & S.CO. AT POINT E ON T-20 SLIDE BAR.

FOR DETAILS OF PLATES AND CONNECTING RODS SEE SHEET 1 OF THIS DRAWING.

SHEET 2 OF 2



S-224-A

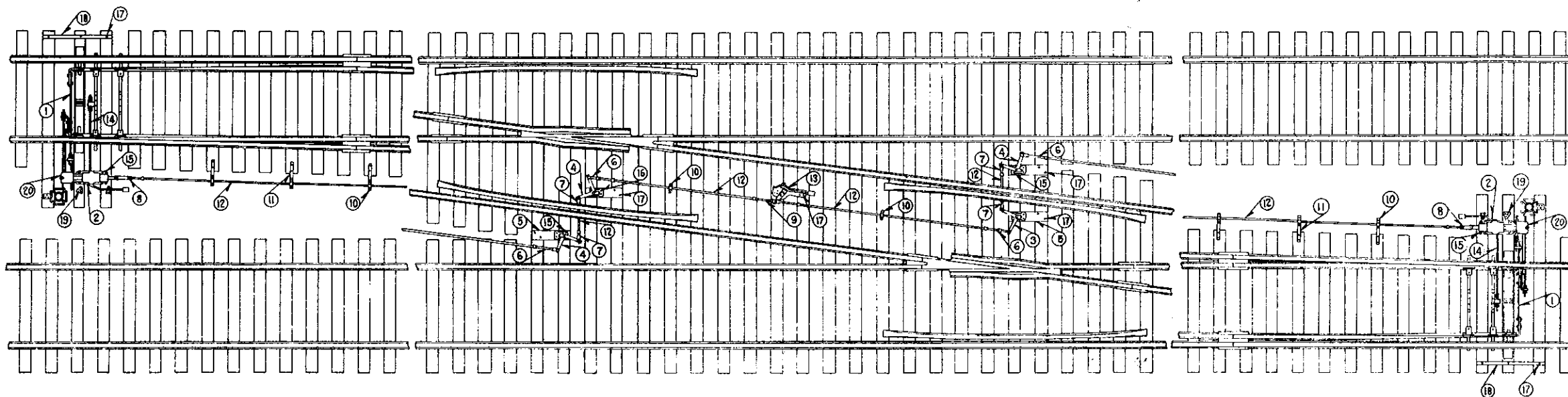
THE PENNSYLVANIA RAILROAD
STANDARD
MOUNTING OF T-20 H. O. MECHANISM
AND SL-26 ELECTRIC SWITCH LOCK
OFFICE OF CHIEF ENGINEER, PHILA., PA., FEBRUARY 21, 1949.

Approved

Assistant Chief Engineer-T.C. & S.

Approved

Chief Engineer



ASSEMBLAGE

ITEM	REQD.	NAME	FIG.	PLAN
1	2	FRONT AND LOCK RODS.	30515	S-305
2	2	SWITCH MECHANISMS.		73905
3	1	CRANK AND STAND.	1002	S-100
4	3	CRANKS AND STANDS.	1003	
5	4	SUPPORTING PLATES.	1013	S-101
6	4	SOLID JAWS.	1213	
7	4	SOLID JAWS.	1214	S-121
8	2	SCREW JAWS.	1219	
9	1	DOUBLE JAW.	1211	
10	22	PIPE CARRIERS - NO. 8 CROSSOVER.	1404	S-140
	26	PIPE CARRIERS - NO. 10 CROSSOVER.		
11	20	PIPE CARRIER SUPPORTS - NO. 8 CROSSOVER.	13810	S-138
	24	PIPE CARRIER SUPPORTS - NO. 10 CROSSOVER.		
12	185'	SIGNAL PIPE AND COUPLINGS - NO. 8 CROSSOVER.	1364	S-136
	220'	SIGNAL PIPE AND COUPLINGS - NO. 10 CROSSOVER.		
13	1	LEVER AND STAND.	2361	S-236
14	2	OPERATING RODS	33114	S-331
15	16	3/4" X 5/8" 98. HD. BOLTS WITH PLATE WASHERS & HEX. NUTS.		
16	8	3/4" X 2" SQ. HD. BOLTS WITH HEX. NUTS.		
17	18	3/4" X 4" GAL. IRON LAG SCREWS.		
18	2	TIE STRAPS	2002	S-200
19	4	LEVER STANDS	176884	73905
20	2	CIRCUIT CONTROLLER WITH POINT DETECTOR AND ROD.		73905

NOTE:-

- PIPE CARRIERS SHALL BE NOT MORE THAN 6'-0" CENTERS.
- FOR BONDING AND INSULATION SEE PLAN S-803.
- WHERE SWITCHES ARE PROTECTED BY SIGNAL:
CROSSOVER BETWEEN MAIN TRACKS SHALL BE EQUIPPED AS SHOWN WITH LOCK LEVER 13 IN CENTER OF CROSSOVER.
- WHERE SWITCHES ARE NOT PROTECTED BY SIGNALS AND MECH. SWITCH LOCKING IS APPROVED BY THE GENERAL MANAGER:
(a) CROSSOVER BETWEEN MAIN TRACK AND SIDING WHERE DERAIL PROTECTION ONLY IS DESIRED, THE PIPE LINE SHALL BE OPERATED BY THE MAIN TRACK SWITCH STAND, OMITTING LOCK LEVER 13.
(b) IF A SWITCH IS LOCATED LESS THAN 200 FT. FROM A SWITCH OF A CROSSOVER BETWEEN MAIN TRACKS, OR MAIN TRACK AND SIDING, AND BECAUSE OF LOCAL CONDITIONS, THESE SWITCH STANDS ARE LOCATED ON SAME SIDE OF TRACK, THE CROSSOVER SWITCH MUST BE LOCKED NORMAL BY PIPE LINE OPERATED BY THE SWITCH STAND ON OTHER END OF CROSSOVER, OMITTING LOCK LEVER 13.
(c) CIRCUIT CONTROLLERS SHALL BE OMITTED.

REVISIONS

REDRAWN FROM APPROVED PLAN S-228-A, DATED 2-20-22 AND REVISED.
G OCTOBER 9, 1926
APPROVED: <i>[Signature]</i>
D DECEMBER 30, 1932
APPROVED: <i>[Signature]</i>

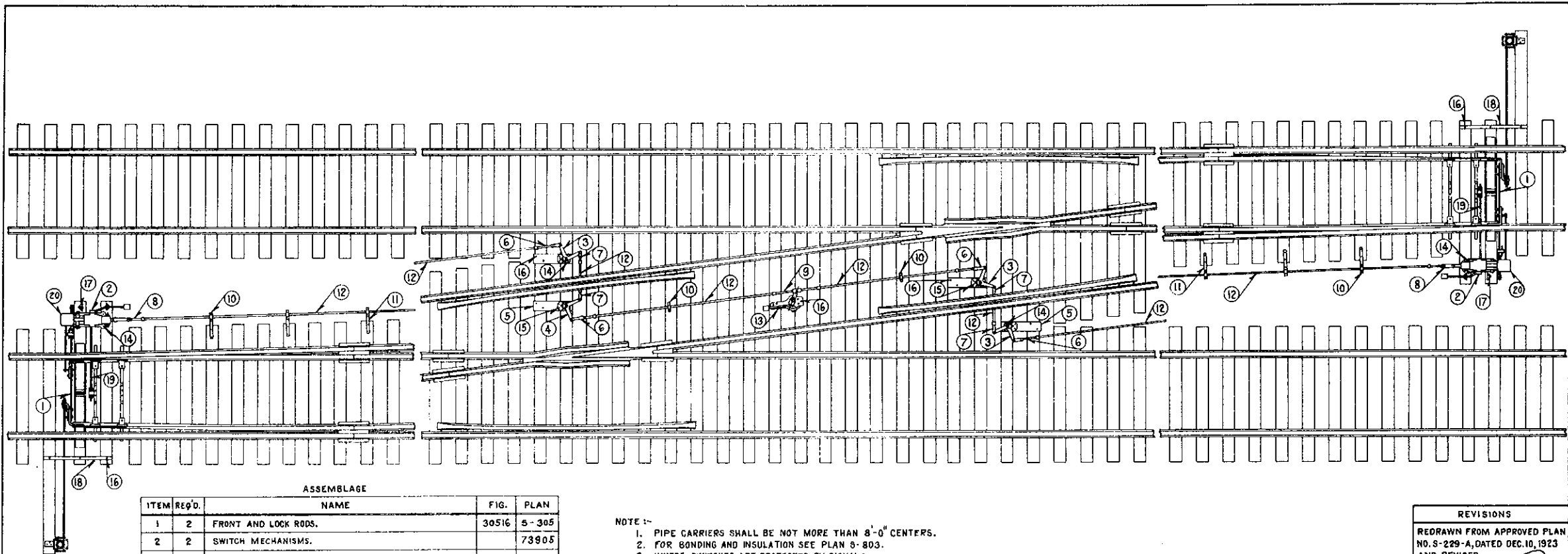
1 SHEET

S-228-D



THE PENNSYLVANIA RAILROAD STANDARD ARRANGEMENT FOR LOCKING NON-INTERLOCKED CROSSOVER

Approved: *[Signature]* Chief Signal Engineer
[Signature] Engr. of Standards
[Signature] Chief Engineer
 OFFICE OF CHIEF SIGNAL ENGINEER PHILA. PA. APR. 12, 1925
 Approved: *[Signature]* A-1



ITEM	REQ'D.	NAME	FIG.	PLAN
1	2	FRONT AND LOCK RODS.	30516	S-305
2	2	SWITCH MECHANISMS.		73905
3	3	CRANKS AND STANDS.	1002	S-100
4	1	CRANK AND STAND.	1003	
5	4	SUPPORTING PLATES.	1013	S-101
6	4	SOLID JAWS.	1213	
7	4	SOLID JAWS.	1214	
8	2	SCREW JAWS.	1219	S-121
9	1	DOUBLE JAW.	1211	
10	22	PIPE CARRIERS - NO. 8 CROSSOVER.	1404	S-140
	26	PIPE CARRIERS - NO. 10 CROSSOVER.		
11	20	PIPE CARRIER SUPPORTS - NO. 8 CROSSOVER.	13810	S-138
	24	PIPE CARRIER SUPPORTS - NO. 10 CROSSOVER.		
12	185	SIGNAL PIPE AND COUPLINGS - NO. 8 CROSSOVER.	1364	S-136
	220	SIGNAL PIPE AND COUPLINGS - NO. 10 CROSSOVER.		
13	1	LEVER AND STAND.	2361	S-236
14	16	3/4" X 8-3/4" SQ. HD. BOLTS WITH HEX. NUTS & PL. WASHERS.		
15	8	3/4" X 2" SQ. HD. BOLTS WITH HEX. NUTS.		
16	16	3/4" X 4-1/2" GAL. IRON LAG SCREWS.		
17	4	LEVER STANDS.	176886	73905
18	2	TIE STRAPS.	2002	S-200
19	2	OPERATING RODS	33114	S-331
20	2	CIRCUIT CONTROLLER WITH POINT DETECTOR AND ROD.		73905

NOTE 1-

- PIPE CARRIERS SHALL BE NOT MORE THAN 8'-0" CENTERS.
- FOR BONDING AND INSULATION SEE PLAN S-803.
- WHERE SWITCHES ARE PROTECTED BY SIGNAL:
CROSSOVER BETWEEN MAIN TRACKS SHALL BE EQUIPPED AS SHOWN WITH LOCK LEVER 13 IN CENTER OF CROSSOVER.
- WHERE SWITCHES ARE NOT PROTECTED BY SIGNALS AND MECHANICAL SWITCH LOCKING IS APPROVED BY THE GENERAL MANAGER.
(a) CROSSOVER BETWEEN MAIN TRACK AND SIDING WHERE DERAIL PROTECTION ONLY IS DESIRED, THE PIPE LINE SHALL BE OPERATED BY THE MAIN TRACK SWITCH STAND, OMITTING LOCK LEVER 13.
(b) IF A SWITCH IS LOCATED LESS THAN 200 FT. FROM A SWITCH OF A CROSSOVER BETWEEN MAIN TRACKS, OR MAIN TRACK AND SIDING, AND BECAUSE OF LOCAL CONDITIONS, THESE SWITCH STANDS ARE LOCATED ON SAME SIDE OF TRACK, THE CROSSOVER SWITCH MUST BE LOCKED NORMAL BY THE PIPE LINE OPERATED BY THE SWITCH STAND ON OTHER END OF CROSSOVER, OMITTING LOCK LEVER 13.
(c) CIRCUIT CONTROLLERS SHALL BE OMITTED.

REVISIONS

REDRAWN FROM APPROVED PLAN NO. S-229-A, DATED DEC. 10, 1923 AND REVISED.

C DECEMBER 30, 1932

APPROVED: *Amos*

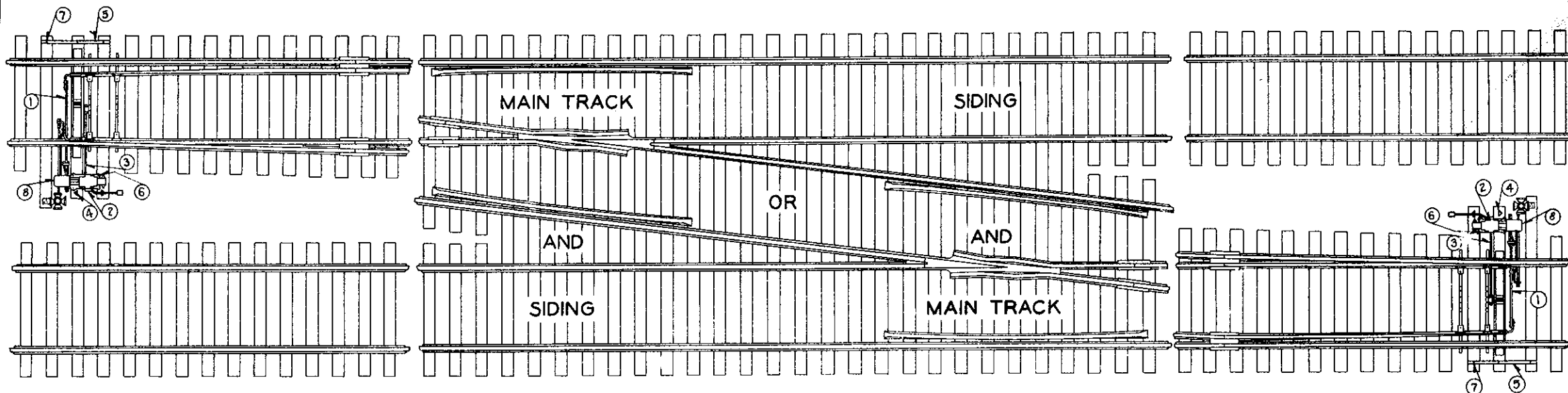
1 SHEET

S-229-C



THE PENNSYLVANIA RAILROAD
STANDARD
ARRANGEMENT FOR LOCKING
NON-INTERLOCKED CROSSOVER

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCTOBER 8, 1926
Approved: *Amos* Chief Signal Engineer
Approved: *W. C. Leach* Engineer of Standards
Approved: *W. C. Leach* Chief Engineer



ASSEMBLAGE

ITEM	REQ'D.	NAME	FIGURE	PLAN
1	2	FRONT AND LOCK RODS	30513	S-305
2	2	SWITCH MECHANISMS		73905
3	2	OPERATING RODS	33114	S-331
4	4	LEVER STANDS	176886	73905
5	2	TIE STRAPS	2002	S-200
6	8	$\frac{1}{2} \times 8$ SQ. HD. BOLTS WITH PL. WASHERS AND HEX. NUTS		
7	6	$\frac{3}{4} \times 4$ GAL. IRON LAG SCREWS		
8	2	CIRCUIT CONTROLLER WITH POINT DETECTOR AND ROD.		73905

NOTE:-

1. FOR BONDING AND INSULATION SEE PLAN S-803.
2. IF LOCAL CONDITIONS WILL NOT PERMIT A SWITCH STAND BEING INSTALLED WITH THROWING ROD IN TENSION WHEN SWITCH POINTS ARE SET NORMAL FOR MAIN TRACK TRAFFIC, AND EITHER SWITCH OF THE CROSSOVER MIGHT BE OPERATED IN ERROR FOR ANOTHER SWITCH WITHIN 200 FT., ARRANGEMENT SHOWN ON PLAN S-228 OR S-229 NOTE 4-(b) SHALL BE INSTALLED.

REVISIONS

REDRAWN FROM APPROVED PLAN S-230-A, DATED 2-20-22 AND REVISED.

C DECEMBER 30, 1932.

APPROVED:- *Arthur*

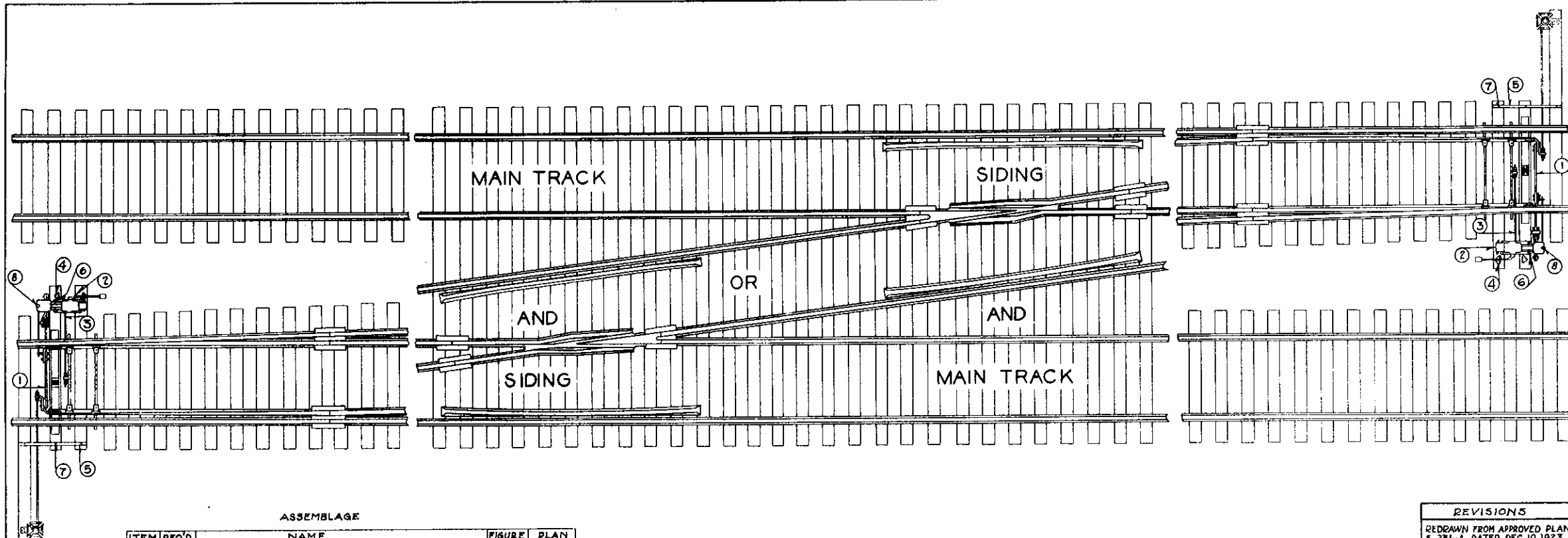
1 SHEET

S-230-C



THE PENNSYLVANIA RAILROAD
STANDARD
ARRANGEMENT FOR LOCKING
NON-INTERLOCKED CROSSOVER
PROTECTED BY SIGNAL

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., NOV. 20, 1932
Approved *Arthur* Chief Signal Engineer
Approved *W. L. Lush* Engineer of Standards
Approved *W. L. Lush* Chief Engineer



ASSEMBLAGE

ITEM	REQ'D	NAME	FIGURE	PLAN
1	2	FRONT AND LOCK RODS	30816	5-303
2	2	SWITCH MECHANISMS		73905
3	2	OPERATING RODS	33114	5-331
4	4	LEVER STANDS	176886	73905
5	2	TIE STRAPS	2002	5-200
6	8	3/4 X 8 1/2 SQ. IN. BOLTS WITH HEX. NUTS & PL. WASHERS		
7	6	3/4 X 4 1/2 GAL. IRON SCREWS		
8	2	CIRCUIT CONTROLLER WITH POINT DETECTOR AND ROD.		73905

NOTE:-

1. FOR BONDING AND INSULATION SEE PLAN S-803.
2. IF LOCAL CONDITIONS WILL NOT PERMIT A SWITCH STAND BEING INSTALLED WITH THROWING ROD IN TENSION WHEN SWITCH POINTS ARE SET NORMAL FOR MAIN TRACK TRAFFIC, AND EITHER SWITCH OF THE CROSSOVER MIGHT BE OPERATED IN ERROR FOR ANOTHER SWITCH WITHIN 200 FT., ARRANGEMENT SHOWN ON PLAN S-228 OR S-229 NOTE 4-(b) SHALL BE INSTALLED.

REVISIONS

REDRAWN FROM APPROVED PLAN
S-231-A, DATED DEC. 10, 1923
AND REVISED.
C. DECEMBER 30, 1932.
APPROVED: *Art. Huddell*

1 SHEET

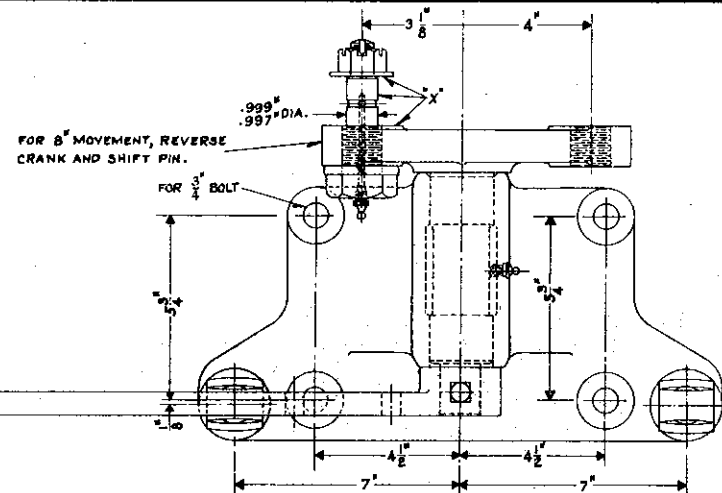
S-231-C



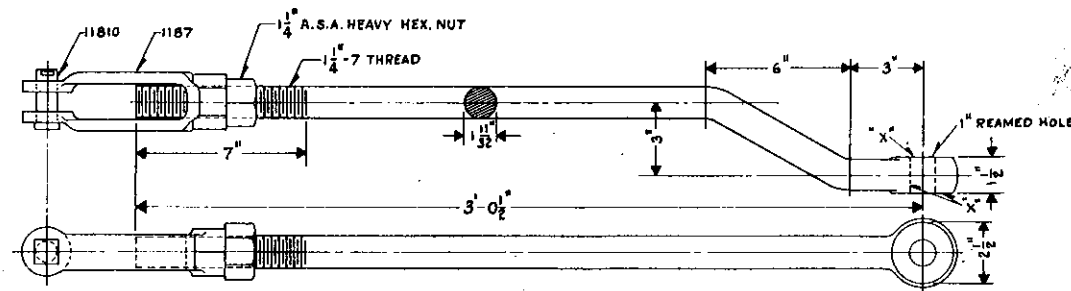
THE PENNSYLVANIA RAILROAD
STANDARD
ARRANGEMENT FOR LOCKING
NON-INTERLOCKED CROSSOVER
PROTECTED BY SIGNAL

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., NOV. 20, 1920

Approved: *Art. Huddell* Chief Signal Engineer
Approved: *Wm. C. Bushing* Engineer of Standards
Approved: *Wm. C. Bushing* Chief Engineer



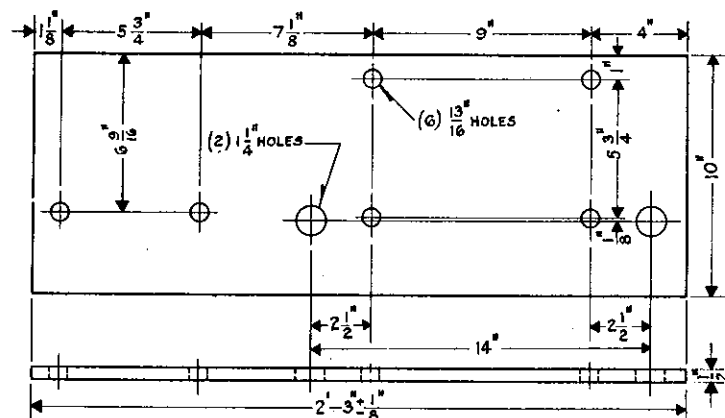
2371 LEVER & STAND COMPLETE AS SHOWN.
STORES CAT. REF. NO. 2A-4890



2373 CONNECTION COMPLETE AS SHOWN.
O. H. S.
STORES CAT. REF. NO. 2A-4892

NOTE:- FURNISH 4-3/4 x 2 1/2 SQ. HD. BOLTS WITH HEX. NUTS & SPRING LOCK WASHERS WITH EACH LEVER & STAND.

NOTE:-
1. BEFORE SHIPMENT, MANUFACTURER SHALL PAINT ALL EXPOSED SURFACES OF APPARATUS, EXCEPT SURFACES MARKED 'X', WITH A GOOD GRADE OF BLACK PAINT. SURFACES MARKED 'X' SHALL BE WELL GREASED.



2372 BASE PLATE O. H. S.
STORES CAT. REF. NO. 2A-4891.

REVISIONS

SUPERSEDES PLAN S-238-C, DATED OCT. 21, 1924 AND LAST REVISED DEC. 15, 1926.

1 SHEET



S-237-A

THE PENNSYLVANIA RAILROAD

STANDARD

LEVER AND STAND

OFFICE OF CHIEF ENGINEER, PHILA., PA.

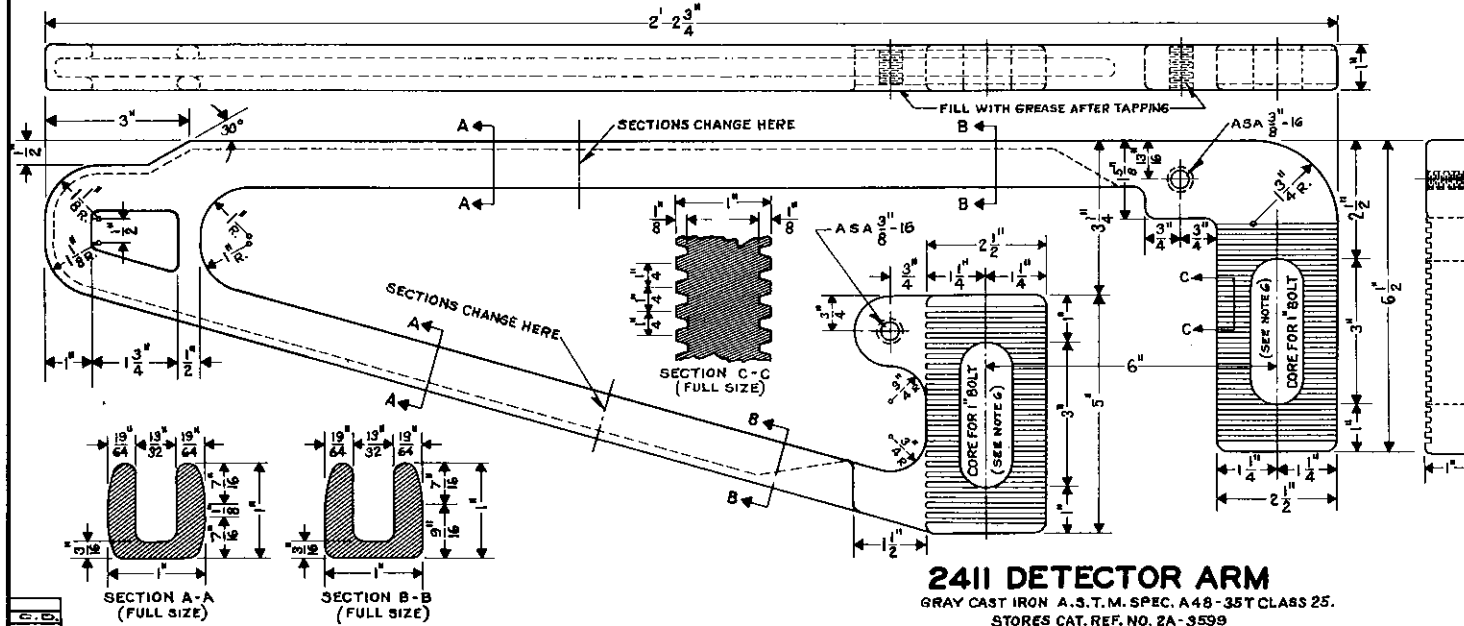
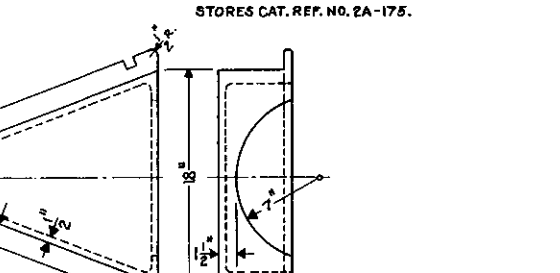
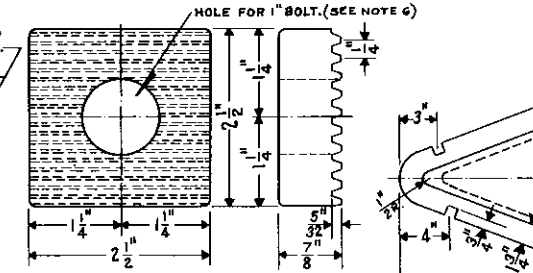
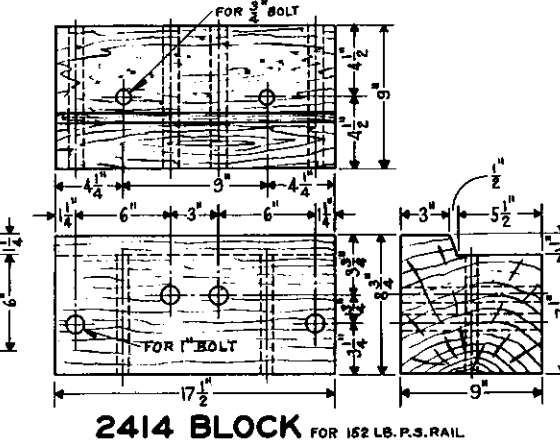
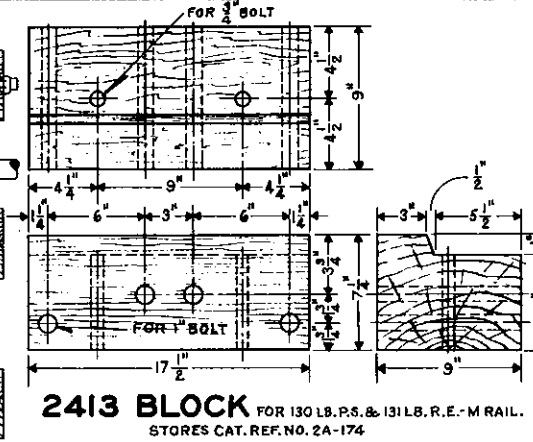
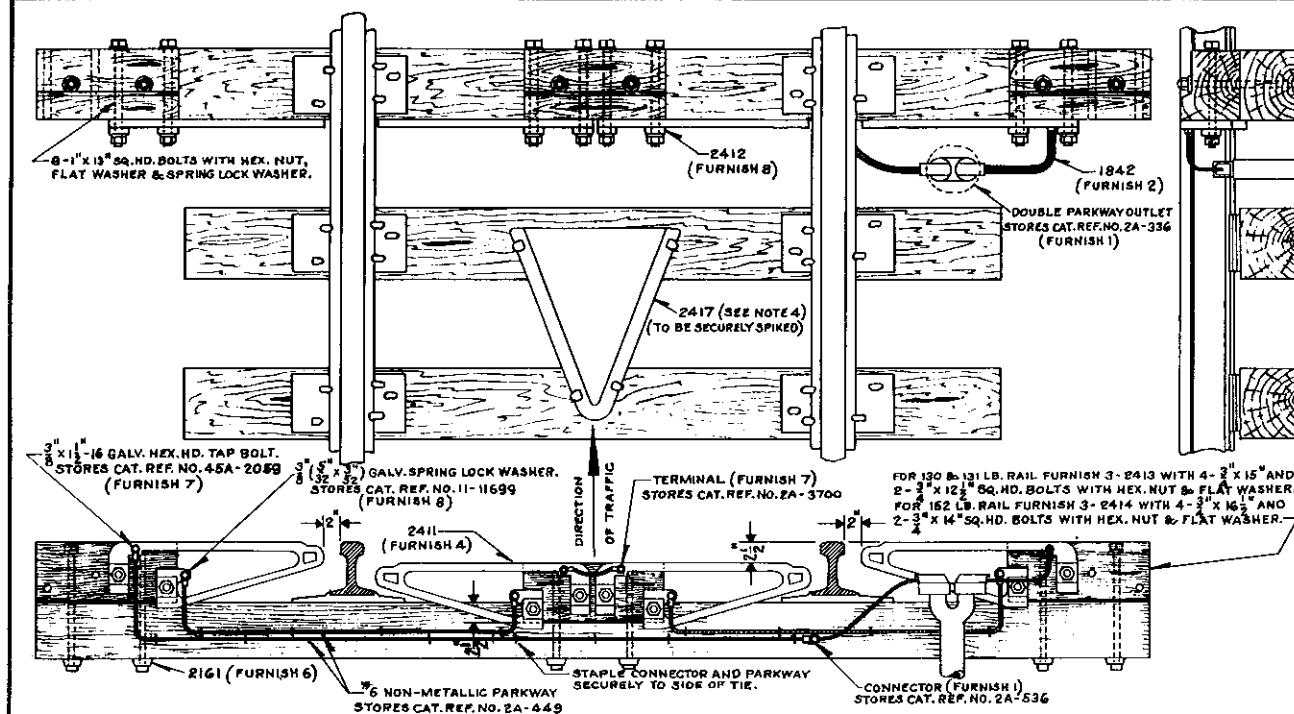
JUNE 15, 1944.

Approved

N. L. Stanton
Assistant Chief Engineer - Signals

Approved

Wm. H. ...
Chief Engineer



- NOTES 1-
1. FOR TYPICAL CIRCUITS SEE PLAN NO. 5-879.
 2. DETECTOR ARMS SHALL BE BOXED FOR SHIPMENT IN LOTS OF NOT EXCEEDING EIGHT.
 3. WHERE 152 LB. RAIL IS USED, RAMP 2417 SHALL BE INSTALLED WITH WOOD FILLER BLOCKS 2 INCHES THICK UNDER EACH END AND SECURED WITH 4 - 3/4\" x 8\" LAG SCREWS.
 4. WHERE TRACK IS SIGNALLED FOR TRAFFIC IN BOTH DIRECTIONS, A RAMP 2417 SHALL BE LOCATED ON EACH SIDE OF DETECTOR ARMS.
 5. BLOCKS 2413 AND 2414 SHALL BE OF OAK FREE OF SPLITS AND KNOTS.
 6. CORE FOR 1\" BOLT IN 2411 AND HOLE FOR 1\" BOLT IN 2412 SHALL BE GROUND OUT FREE OF ROUGH SPOTS, SO THAT 1\" BOLT WILL NOT BIND ON SIDES.
 7. BLOCKS 2413 AND 2414 SHALL BE CREOSOTED, UNDER PRESSURE, AFTER BEING FRAMED AND DRILLED. THE BOLT HOLES SHALL BE OF SUCH DIAMETER THAT AFTER CREOSOTING, THE BOLTS WILL NOT BIND WHEN BEING APPLIED.

REVISIONS
REDRAWN FROM APPROVED PLAN S-241-H, DATED DEC. 22, 1937, LAST REVISED AUG. 29, 1940 AND REVISED JUNE 8, 1942.
APPROVED <i>N. L. Stanton</i>

1 SHEET

S-241-J

THE PENNSYLVANIA RAILROAD

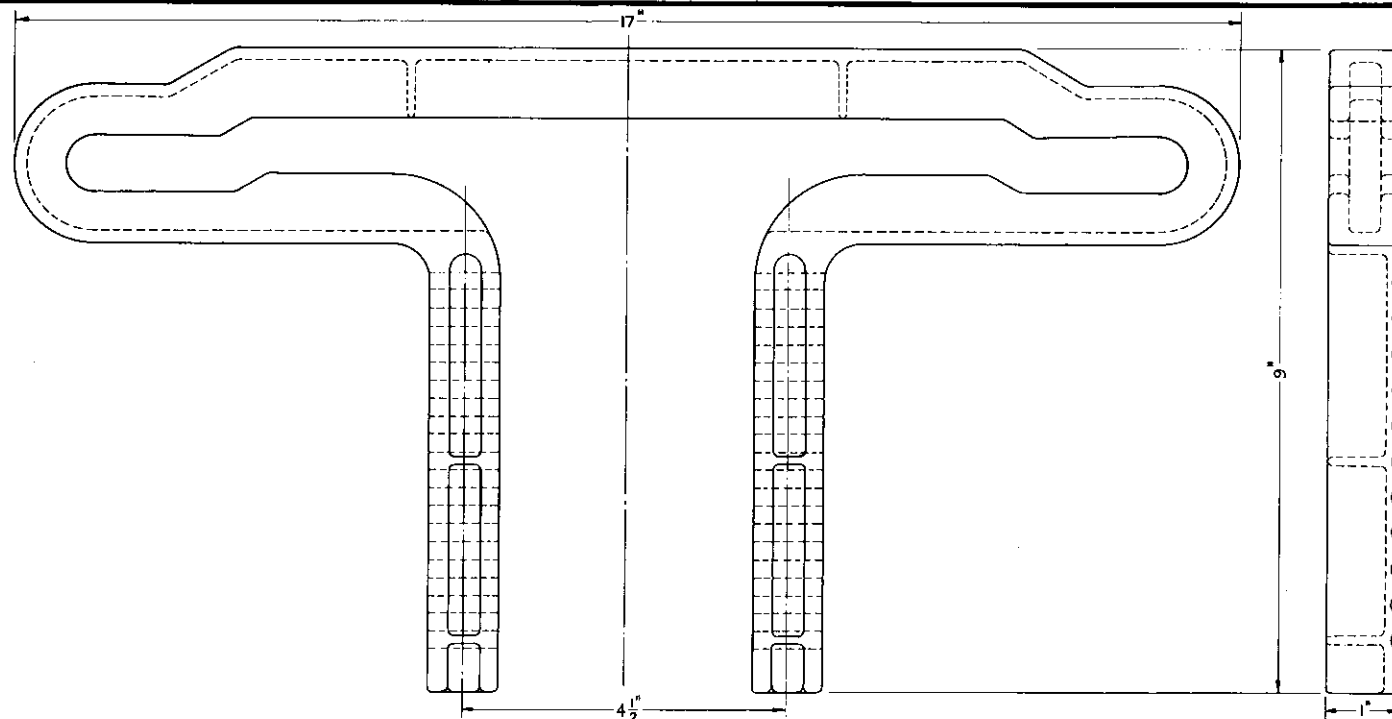
STANDARD

DRAGGING EQUIPMENT DETECTOR

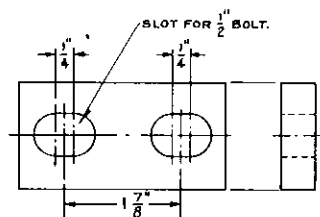
OFFICE OF CHIEF ENGINEER, PHILA., PA., FEBRUARY 18, 1941.

Approved *N. L. Stanton* Assistant Chief Engineer-Signals

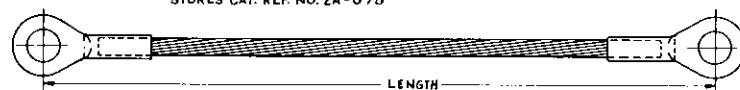
Approved *M. J. Higgins* Chief Engineer



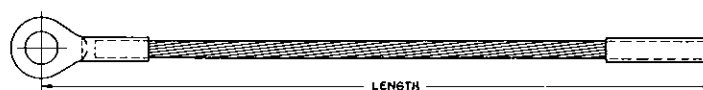
2411 DETECTOR ARM GALVANIZED.
GRAY CAST IRON A. S. T. M. SPEC. A48-37 CLASS 25.
STORES CAT. REF. NO. 2A-856



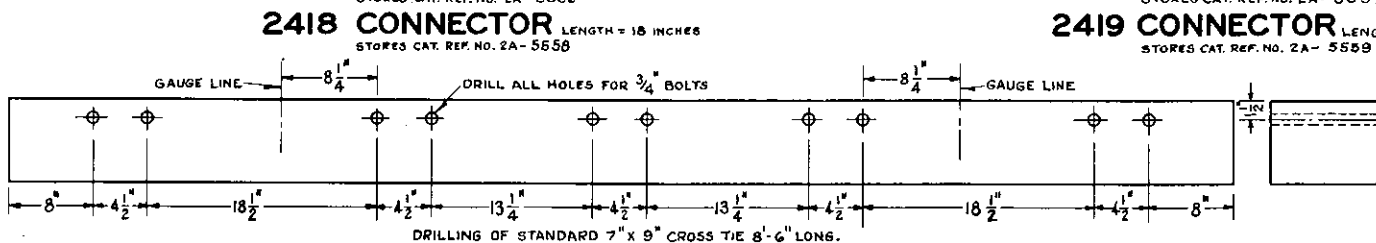
2414 CAP O. H. STEEL GALVANIZED.
STORES CAT. REF. NO. 2A-878



2416 CONNECTOR LENGTH = 12 INCHES
STORES CAT. REF. NO. 2A-5556

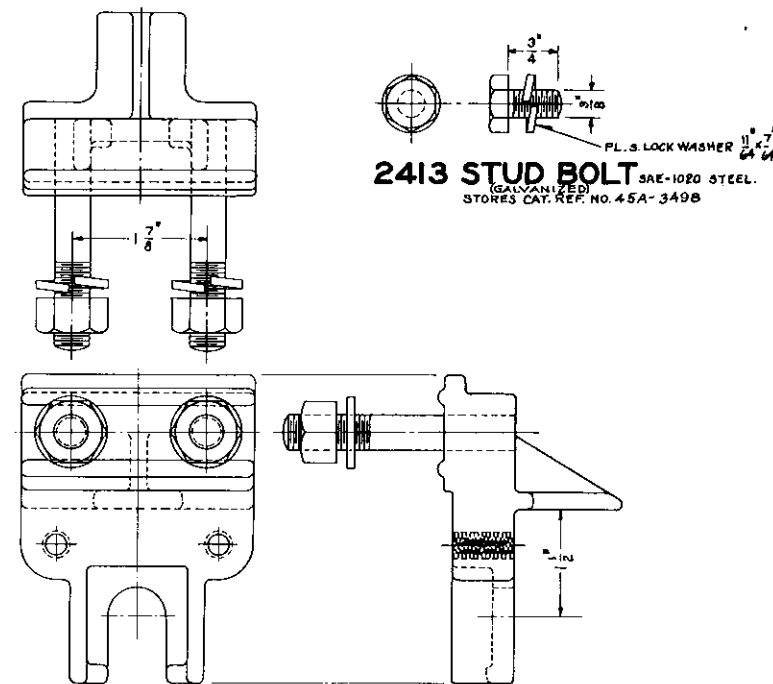


2417 CONNECTOR LENGTH = 14 INCHES
STORES CAT. REF. NO. 2A-5557



2418 CONNECTOR LENGTH = 18 INCHES
STORES CAT. REF. NO. 2A-5558

2419 CONNECTOR LENGTH = 10 FEET
STORES CAT. REF. NO. 2A-5559



2413 STUD BOLT GALVANIZED
(GALVANIZED)
SAE-1020 STEEL.
STORES CAT. REF. NO. 45A-3498

2412 SUPPORT GALVANIZED
MALLEABLE IRON
STORES CAT. REF. NO. 2A-2751

REVISIONS
SUPERSEDES PLANS 241-J, DATED
FEB. 18, 1941, LAST REVISED JUNE 5,
1942. DESIGN OF ALL PARTS CHANGED.

FOR ORDERING AND INSTALLATION SEE SHEET 2.

SHEET 1 OF 2



S-241-K

THE PENNSYLVANIA RAILROAD
STANDARD
DRAGGING EQUIPMENT DETECTOR

PARTS AND DETAILS.
OFFICE OF CHIEF ENGINEER, PHILA., PA., AUG. 20-1947

Approved
W. C. Griffith
Assistant Chief Engineer-T.C. & S.

Approved
W. H. Smith
Chief Engineer

BILL OF MATERIAL FOR 1 TRACK.

ITEM	NUMBER REQUIRED	NAME	STORES CAT. REF. NUMBER	FIGURE	PLAN
1	5	DETECTOR ARM	2A-856	2411	S-241
2	10	SUPPORT	2A-2751	2412	S-241
3	10	CAP	2A-878	2414	S-241
4	10	STUD BOLT	45A-3498	2413	S-241
5	10	$\frac{3}{4}$ " X 11" STD. SQ. HD. BOLT WITH HEX. NUT & PLATE WASHER.			
6	2	CONNECTOR	2A-5556	2416	S-241
7	2	CONNECTOR	2A-5558	2418	S-241
8	1 FOR FIG. A 2 FOR FIG. B	CONNECTOR	2A-5557	2417	S-241
9	1 FOR FIG. A 4 FOR FIG. B	CONNECTOR	2A-5559	2419	S-241
10	10 FOR FIG. A 4 FOR FIG. B	CLIP	2A-398	1846	S-184
11	1 FOR FIG. A	PARKWAY OUTLET	2A-336	24115	S-241
12	2 FOR FIG. B	PARKWAY OUTLET	2A-1544	1844	S-184

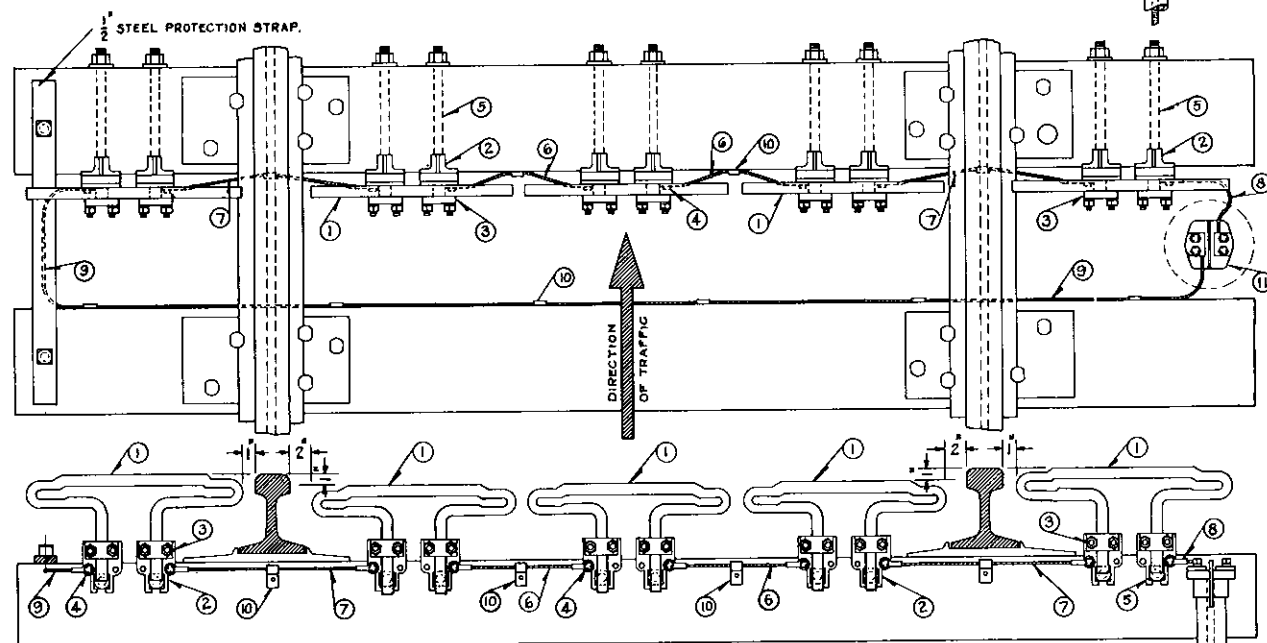


FIGURE A

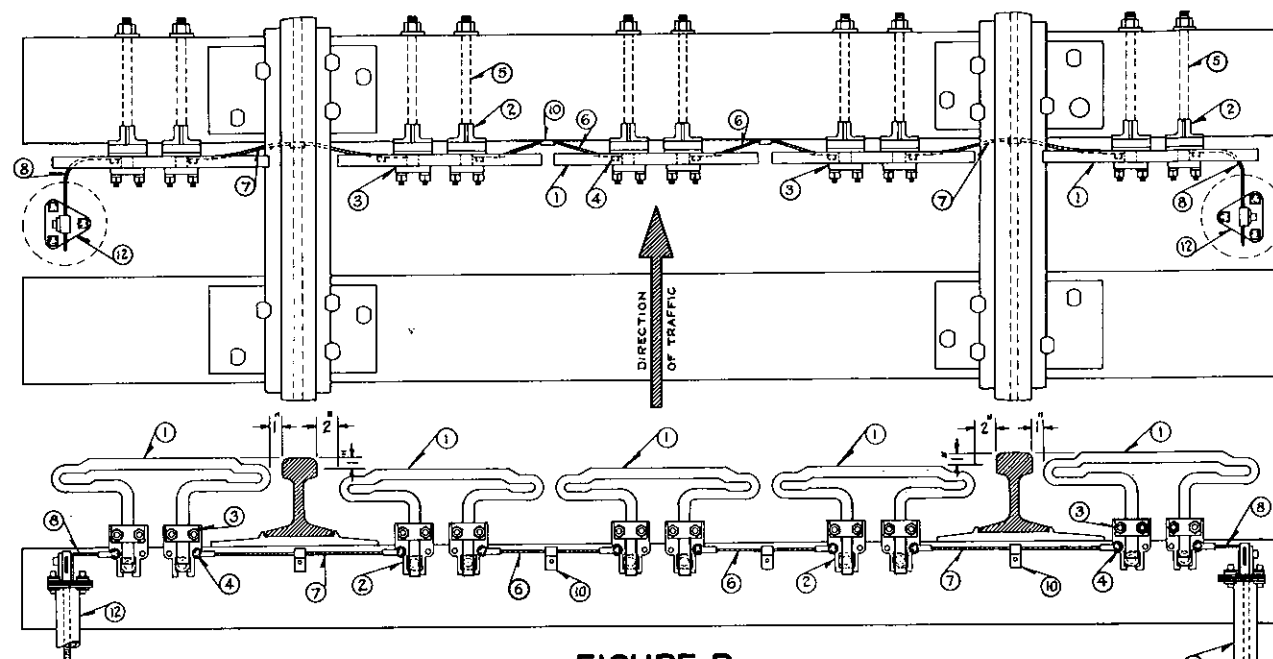


FIGURE B

- NOTES:-
1. AT LOCATIONS WHERE SNOW AND ICE DEFLECTORS ARE REQUIRED THEY SHALL BE INSTALLED IN ACCORDANCE WITH SKETCH DATED NOV-17-1945, LAST REVISED SEPT 16, 1947.
 2. FIBRE INSULATION IN PARKWAY OUTLETS SHALL MEET THE REQUIREMENTS OF THE ELECTRICAL AND ABSORPTION TEST OF P.R.R. SPEC. C.E. 50 (b).
 3. FOR TYPICAL CIRCUITS SEE STANDARD CIRCUIT PLAN S-879.
 4. DETECTOR ARMS SHALL BE SHIPPED IN LOTS OF NOT EXCEEDING 5, AND PREPARED FOR SHIPMENT TO PROTECT AGAINST BREAKAGE.
 5. SUPPORTS WITH CAPS SHALL BE SHIPPED IN LOTS OF NOT EXCEEDING 10 AND PREPARED FOR SHIPMENT TO PROTECT AGAINST BREAKAGE.
 6. WHEN IN PLACE, CONNECTOR AND TOP OF HEAD OF PARKWAY OUTLET SHALL BE GIVEN A HEAVY COAT OF A RUST PREVENTIVE APPROVED BY THE ASSISTANT CHIEF ENGINEER-T.C. & S.
 7. PARKWAY OUTLETS SHALL BE INSTALLED AS SHOWN WITH TOP OF OUTLET $\frac{1}{2}$ INCH BELOW TOP OF TIE.
 8. THE FILL AROUND PARKWAY CABLE SHALL BE FREE OF CINDERS.
 9. PARKWAY CABLE SHALL BE NOT LESS THAN 2 FEET 6 INCHES BELOW THE BOTTOM OF TIE.
 10. PARKWAY OUTLETS SHALL BE FILLED WITH SAND OR COMPOUND.

SHEET 2 OF 2.



S-241-K

THE PENNSYLVANIA RAILROAD
STANDARD
DRAGGING EQUIPMENT DETECTOR
LAYOUTS

OFFICE OF CHIEF ENGINEER, PHILA., PA., AUG. 20-1947

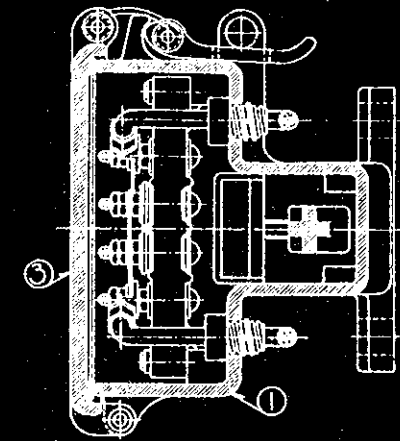
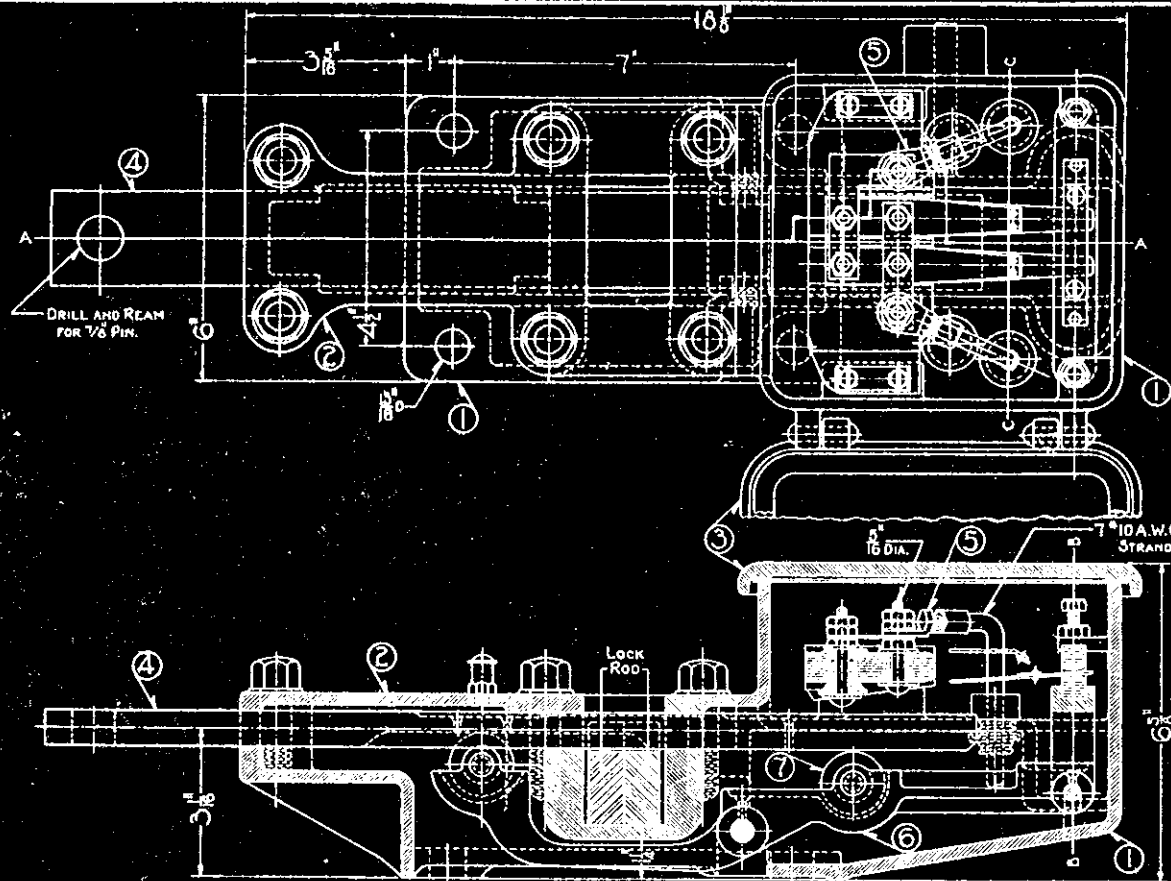
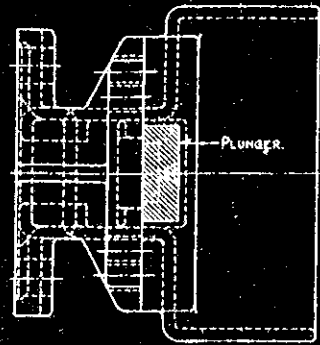
Approved

W. C. Griffith
Assistant Chief Engineer-T.C. & S.

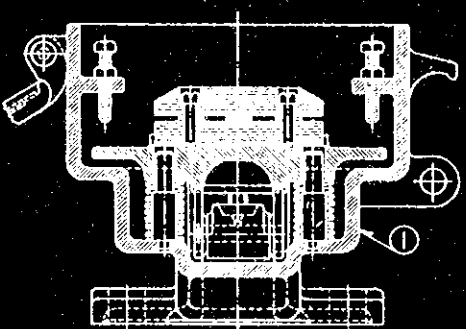
Approved

W. C. Griffith
Chief Engineer

24115 PARKWAY OUTLET COMPLETE
STORES CAT. REF. NO. 2A-336

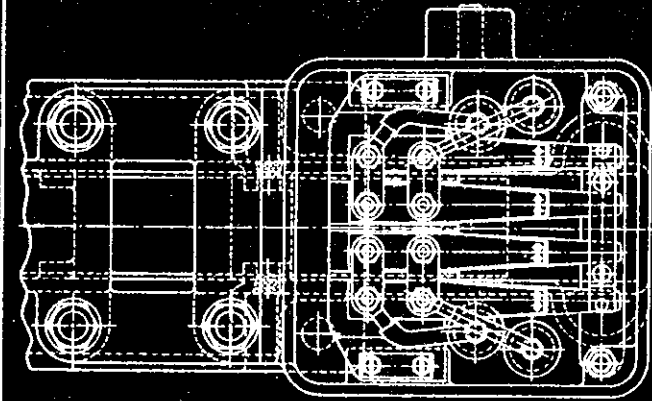


ORDER NO.	NAME	ITEM
2553	CASE	1
2554	LOCK COVER	2
2555	CIRCUIT CONTROLLER COVER	3
2556	PLUNGER	4
2557	DOSSERY CONNECTING LUG	5
2558	OPERATING CRANK	6
2559	ROLLER	7



NOTE:
PARTS NOT ITEMIZED SHOULD BE ORDERED FROM
CATALOG OR MFGRS. DWG. REF.
FOR BASE PLATE SEE PLAN S-256.
* ARRANGE CIRCUIT CONTROLLER AS SHOWN IN
PLAN D.

2551-PLUNGER LOCK COMPLETE AS SHOWN.
2552- " " " " SEE NOTE.*



PLAN D.
SHOWING CIRCUIT CONTROLLER ARRANGED
FOR 4 CONTACTS



S-255-A

1 SHEET

PENNSYLVANIA SYSTEM

STANDARD

PLUNGER LOCK

AND CIRCUIT CONTROLLER

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., FEB. 1, 1922

Correct

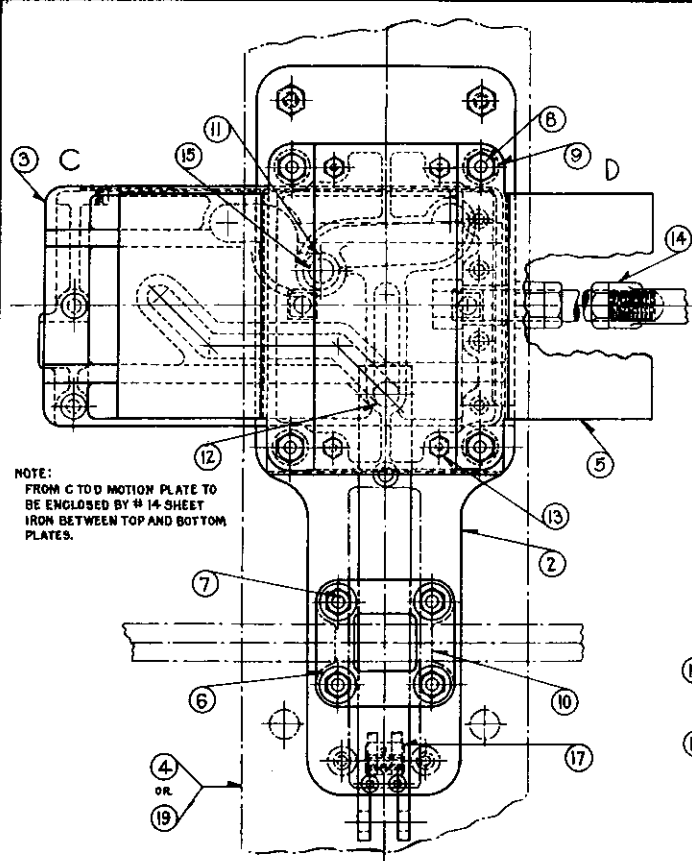
A. H. H.

Chief Signal Engineer

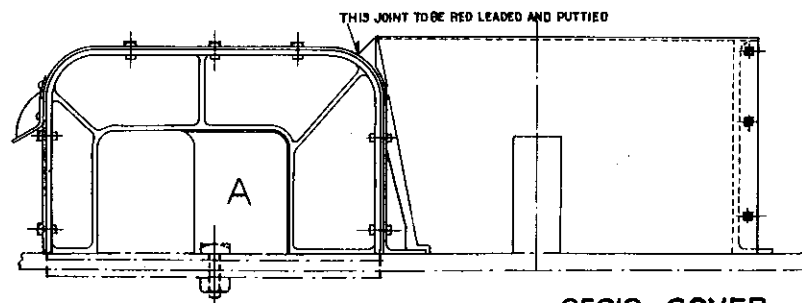
Approved

[Signature]

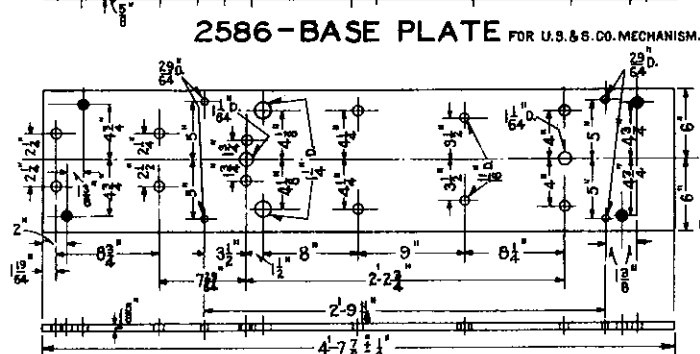
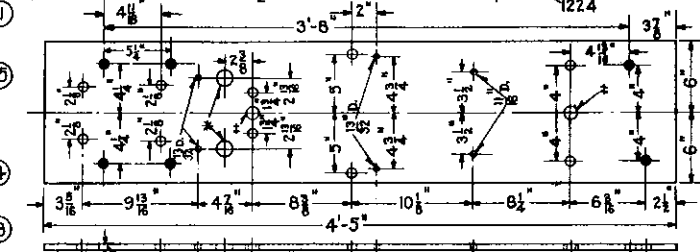
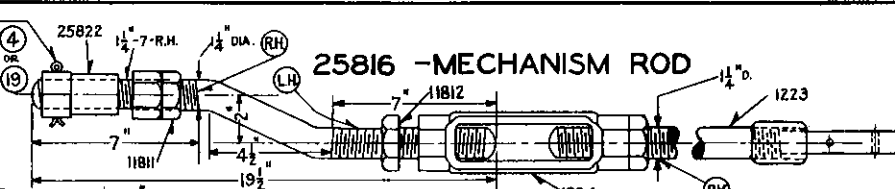
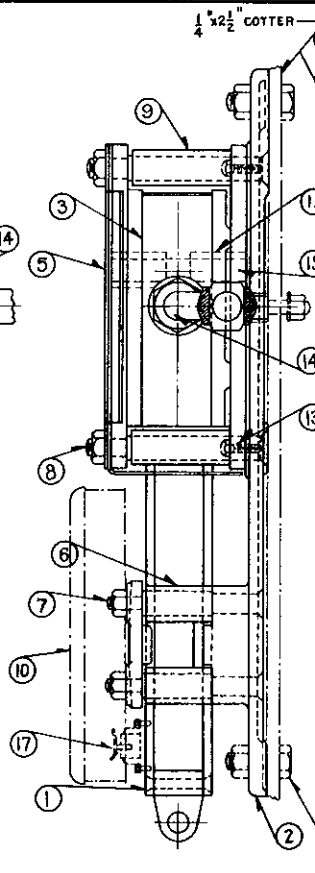
Chief Engineer



2581-MECHANISM COMPLETE AS SHOWN WITH 25818
2582- " " " " WITHOUT 25818
SPECIFY RIGHT OR LEFT HAND



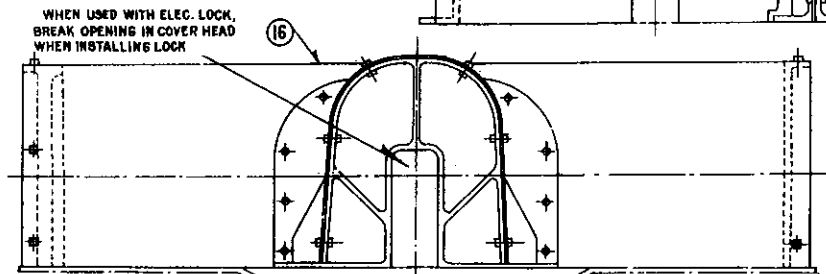
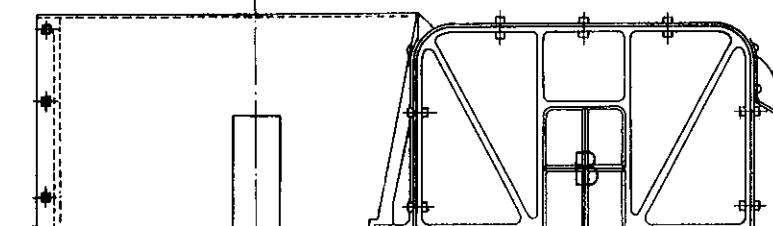
LEFT ELEVATION 25818-COVER COMPLETE AS SHOWN
SPECIFY RIGHT OR LEFT HAND



25822-SLEEVE

NOTE:
WHEN ORDERING REPAIR PARTS SPECIFY NAME OF MANU-
FACTURER OF THE SWITCH MECHANISM ON WHICH THE
PARTS ARE TO BE USED.
CONTACT PLATE, ON CONTACT BLOCK 25819, SHALL BE MADE
OF HARD CAST BRONZE.
ON 2586 (± = 1 1/4" DIA. (PLUGGED WITH PUNCHINGS)
± = REAMED HOLES, 1.000" TO 1.001"
VARIATION ALLOWED EITHER WAY ON HOLES MARKED THUS: ±,
UNLESS OTHERWISE MARKED, HOLES IN 2586 AND 25821 ARE 13/16 D.
BREAK OPENINGS AT A OR B, DEPENDING UPON THE DIRECTION
OF PIPE LINE.

ORDERING REFERENCE		
ORDER NO.	ITEM	NAME
2583	1	SLIDE BAR
2584	2	BASE
2585	3	MOTION PLATE
2586	4	BASE PLATE
2587	5	TOP PLATES
2588	6	ROLLER
2589	7	STUD WITH HEX. NUT
25810	8	STUD WITH HEX. NUT
25811	9	ROLLER
25812	10	INDICATION BOX COMPLETE
25813	11	ROLLER
25814	12	ROLLER
25815	13	CAP BOLT
25816	14	MECHANISM ROD
25817	15	PIN
25818	16	COVER COMPLETE AS SHOWN
25819	17	CONTACT BLOCK
25820	18	COVER SUPPORT
25821	19	BASE PLATE
25822	20	SLEEVE FOR MECHANISM ROD



1 SHEET

S-258-0

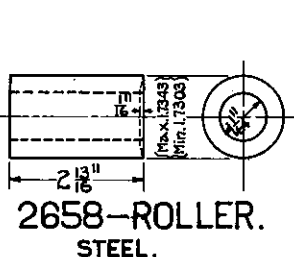
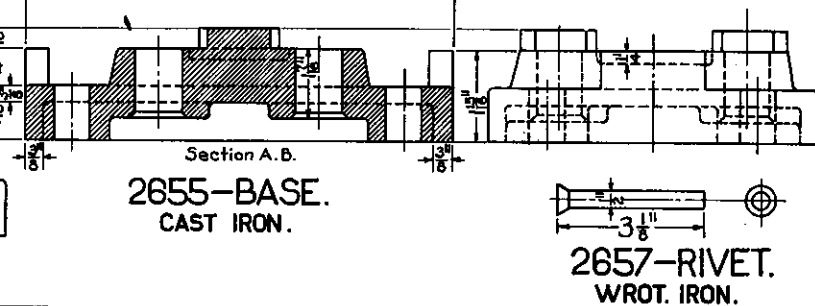
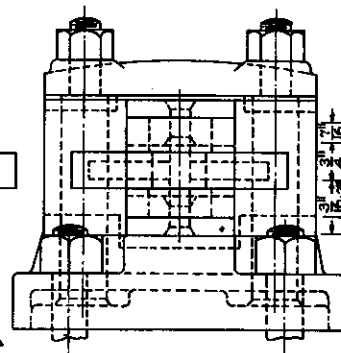
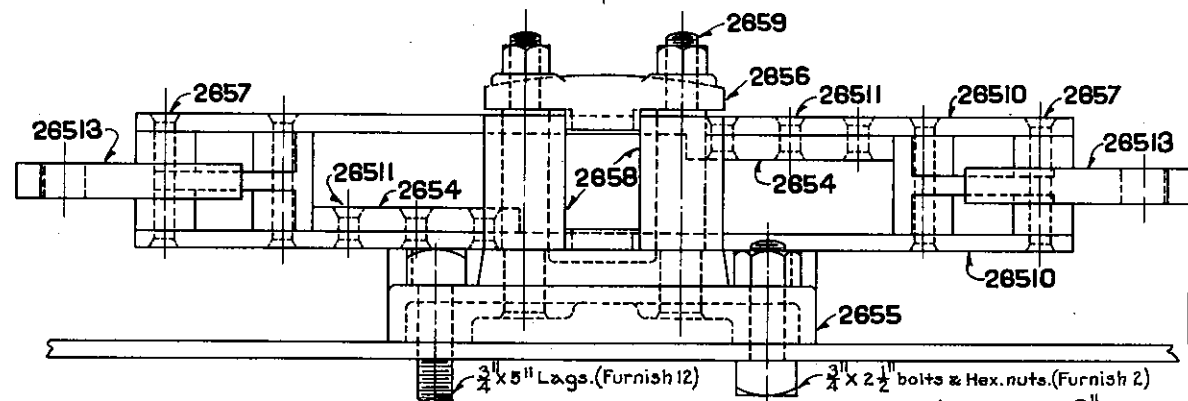
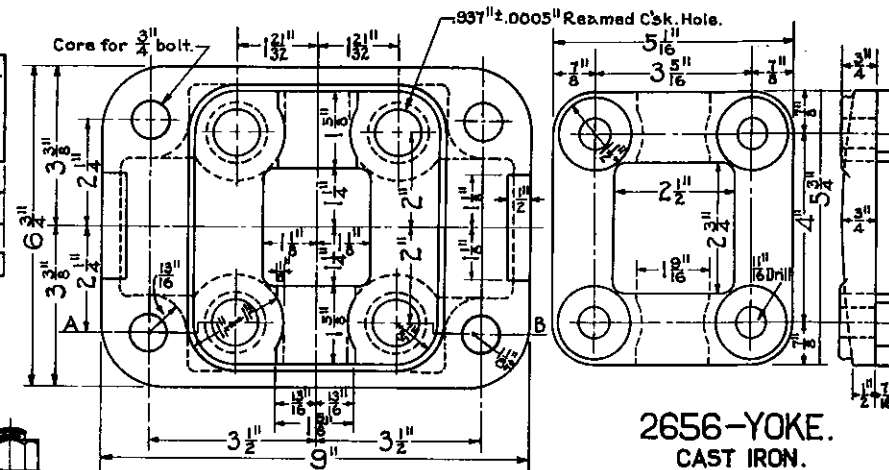
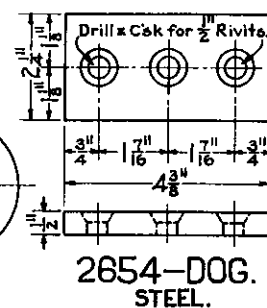
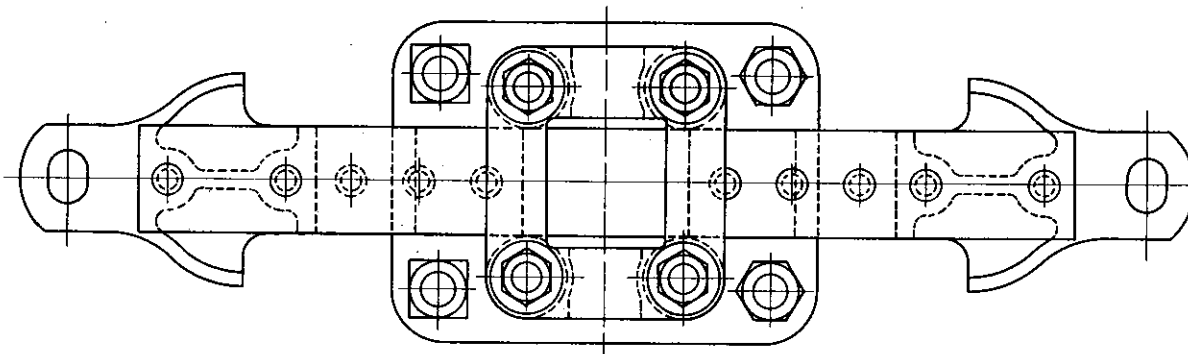
THE PENNSYLVANIA RAILROAD
STANDARD
SWITCH MECHANISM
TYPE "G"

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., DEC. 17, 1928

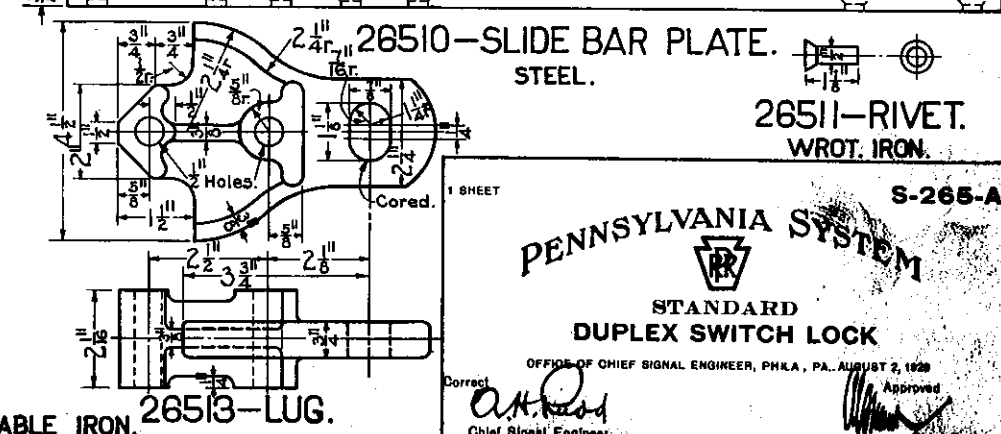
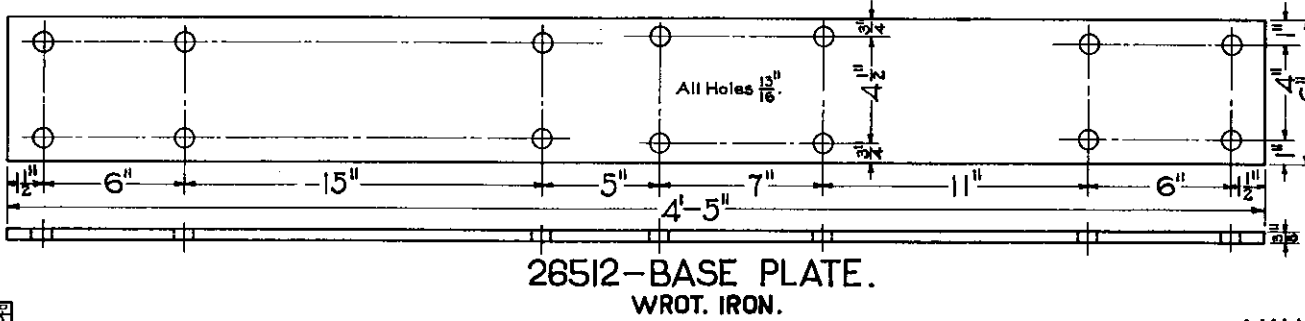
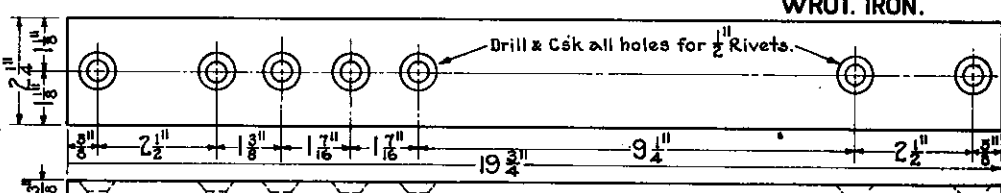
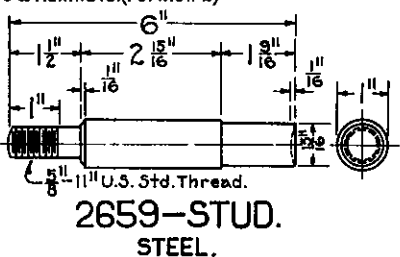
Approved *A. H. Rust* Chief Signal Engineer

Approved *V. J. Miller* Chief Engineer

REVISIONS
REDRAWN FROM APPROVED PLAN
S-258-0, DATED 10-8-28, AND
REVISED.



2651-DUPLEX SWITCH LOCK COMPLETE AS SHOWN WITH BASE PLATE, LAGS AND BOLTS.
2652-SLIDE BAR ONLY.
2653-BASE COMPLETE WITH 1-2655, 4-2658, 4-2659, 1-2656, 4- $\frac{3}{8}$ U.S. STD. HEX. NUTS.



1 SHEET

PENNSYLVANIA SYSTEM

**STANDARD
DUPLEX SWITCH LOCK**

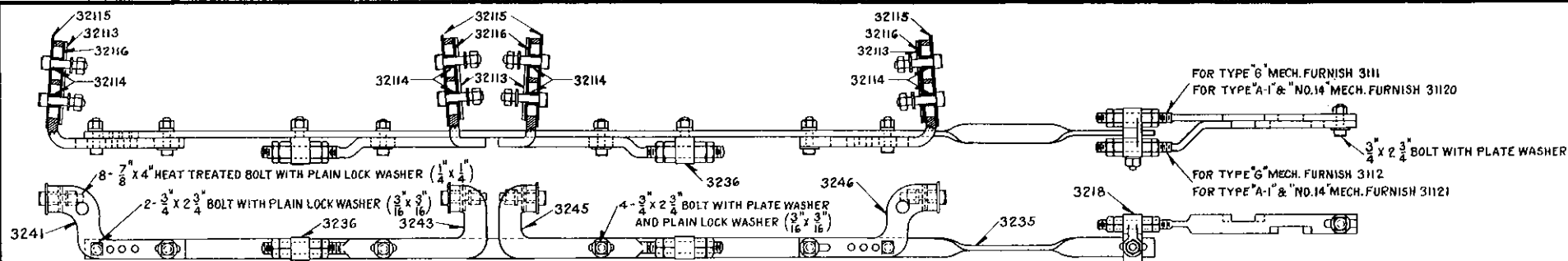
OFFICE OF CHIEF SIGNAL ENGINEER, PHKA, PA., AUGUST 2, 1929

Correct *A.N.O.* Chief Signal Engineer

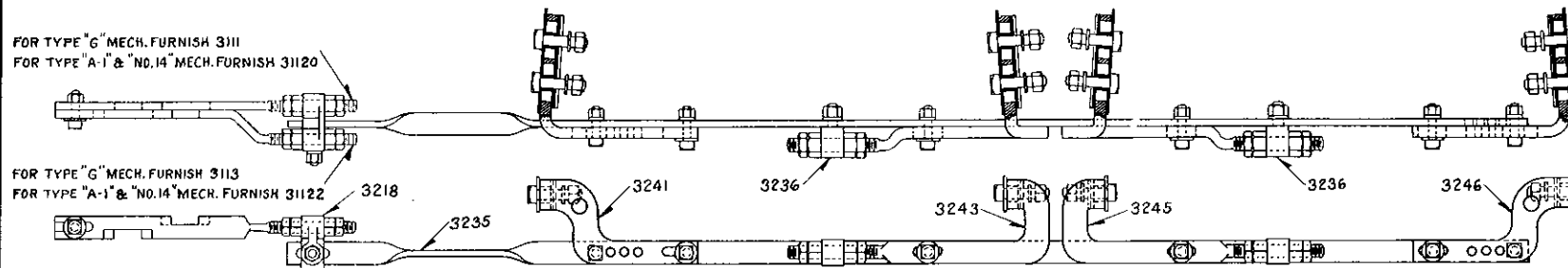
Approved *[Signature]* Chief Engineer

S-265-A

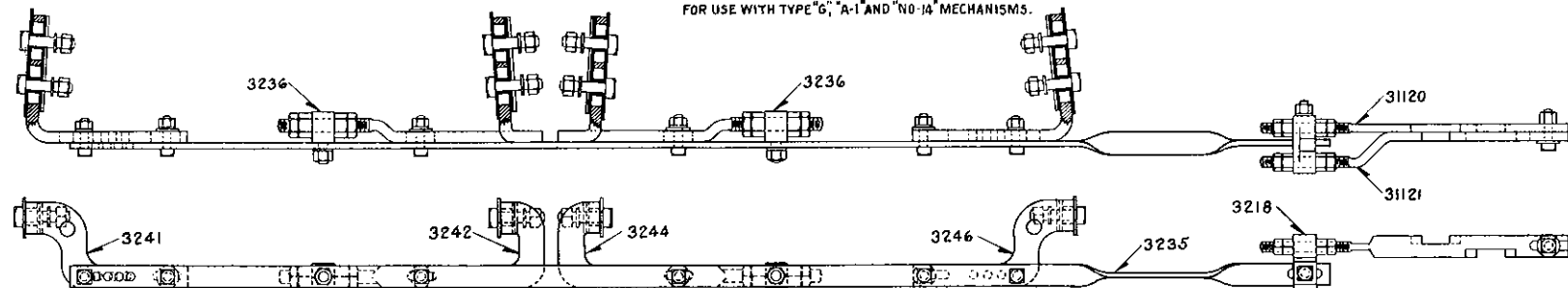
RED WITH ALL RODS SEE 3051 AND 30535. IN ACCORDANCE WITH A S.A. ROUGH OR SEMI. FINISH BE HEAT TREATED IN ACCORDANCE WITH AND SHALL BE OF P.R.R. SPEC. C.E.B. (3218) AND LOCK ROD NUTS PER SKETCH "A".	REVISIONS REDRAWN FROM APPROVED PLAN S-305-30 DATED MAR. 30, 1919 AND REVISED.
 1 SHEET  THE PENNSYLVANIA RAILROAD STANDARD FRONT AND LOCK RODS FOR SINGLE SWITCHES OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCT. 11, 1919. Approved:  Chief Signal Engineer	S-305-30 Approved:  Chief Engineer



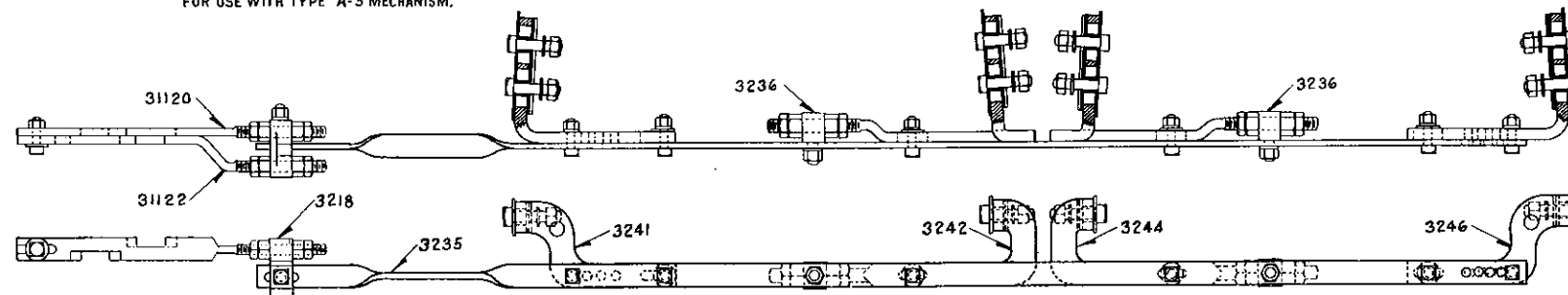
3071-R.H. ROD COMPLETE AS SHOWN. **3072-R.H. ROD** AS SHOWN WITHOUT LUG 3218 AND LOCK RODS.
FOR USE WITH TYPE "G," "A-1" AND "NO. 14" MECHANISMS.



3073-L.H. ROD COMPLETE AS SHOWN **3074-L.H. ROD** AS SHOWN WITHOUT LUG 3218 AND LOCK RODS.
FOR USE WITH TYPE "G," "A-1" AND "NO. 14" MECHANISMS.



3075-R.H. ROD COMPLETE AS SHOWN **3076-R.H. ROD** AS SHOWN WITHOUT LUG 3218 AND LOCK RODS 31120 & 31121.
FOR USE WITH TYPE "A-5" MECHANISM.



3077-L.H. ROD COMPLETE AS SHOWN **3078-L.H. ROD** AS SHOWN WITHOUT LUG 3218 AND LOCK RODS 31120 & 31122.
FOR USE WITH TYPE "A-5" MECHANISM.

NOTE:-

1. RODS SHOWN ARE FOR DOUBLE SLIP SWITCHES, FOR RODS FOR SINGLE SLIP SWITCHES ORDER AS FOR DOUBLE SLIP SWITCHES AND OMIT FEET NOT REQUIRED ON REQUISITION.
2. SPECIFY ON REQUISITION TYPE OF SWITCH MECHANISM.
3. FOR BOLTS, NUTS, WASHERS, INSULATION ETC. REQUIRED WITH ALL RODS SEE 3071.
4. BOLTS SHALL BE AMERICAN STANDARD REGULAR SQUARE HEAD WITH HEX. NUTS. THREAD TO BE NC-2.
5. HEAT TREATED BOLTS AND NUTS SHALL CONFORM TO AND SHALL BE MARKED (C) OR (M) IN ACCORDANCE WITH CURRENT ISSUE OF P.R.R. SPECIFICATION NO. C.E.S.

REVISIONS

1 SHEET



S-307-A

THE PENNSYLVANIA RAILROAD

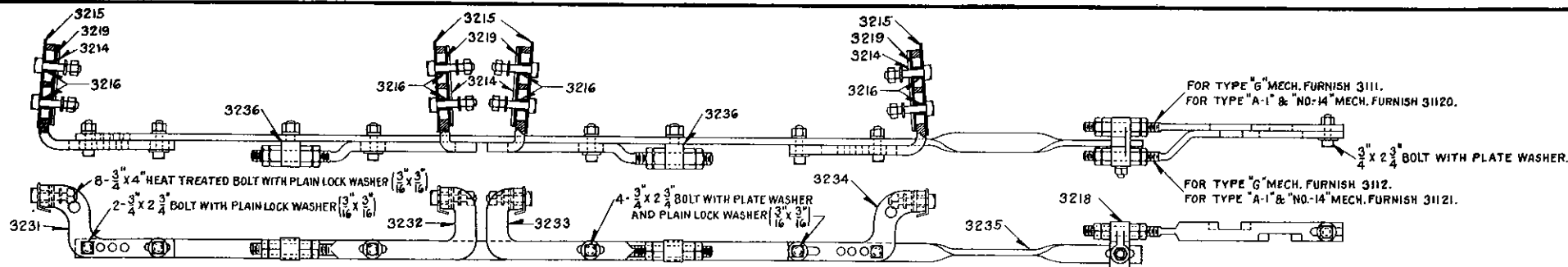
STANDARD

FRONT AND LOCK RODS

FOR SLIP SWITCHES 131 LB. R.E. AND 152 LB. P.S. RAIL.
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., AUGUST 12, 1935.

Approved *A. H. Hurd*
Chief Signal Engineer

Approved *W. J. Higgins*
Acting Chief Engineer

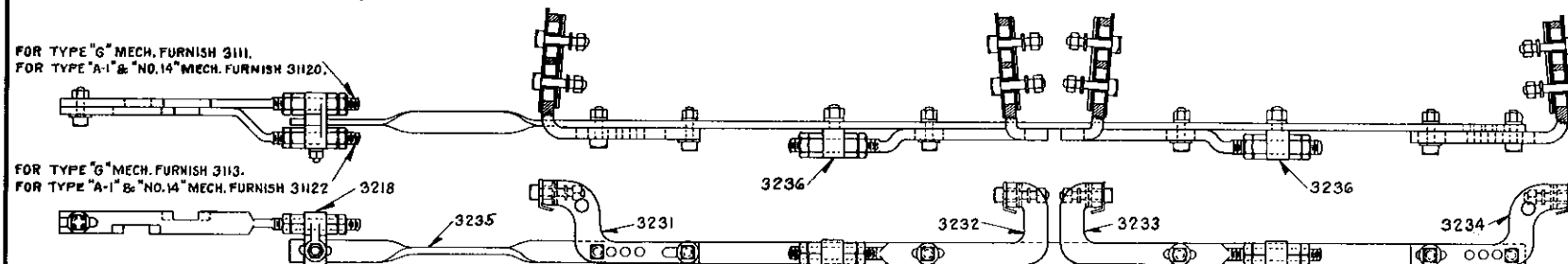


3081-R.H.ROD COMPLETE AS SHOWN.

FOR USE WITH TYPE "G", "A-1" AND "NO-14" MECHANISMS.

3082-R.H.ROD AS SHOWN WITHOUT LUG 3218 AND LOCK RODS.

FOR USE WITH TYPE "G", "A-1" AND "NO-14" MECHANISMS.

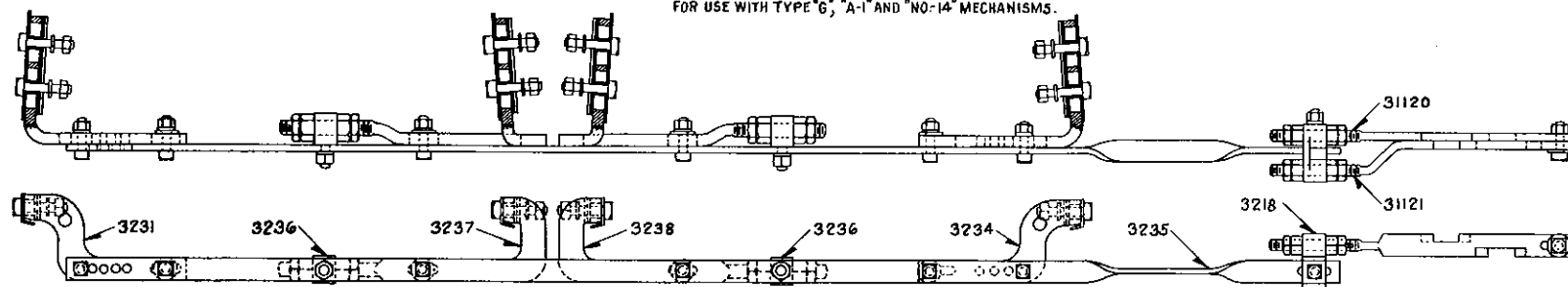


3083-L.H.ROD COMPLETE AS SHOWN.

FOR USE WITH TYPE "G", "A-1" AND "NO-14" MECHANISMS.

3084-L.H.ROD AS SHOWN WITHOUT LUG 3218 AND LOCK RODS.

FOR USE WITH TYPE "G", "A-1" AND "NO-14" MECHANISMS.

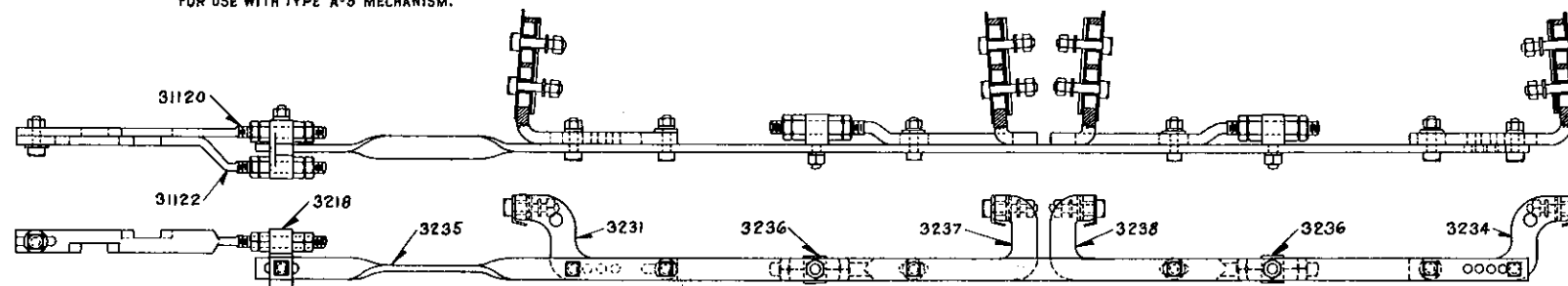


3085-R.H.ROD COMPLETE AS SHOWN.

FOR USE WITH TYPE "A-5" MECHANISM.

3086-R.H.ROD AS SHOWN WITHOUT LUG 3218 AND LOCK RODS 31120 & 31121.

FOR USE WITH TYPE "A-5" MECHANISM.



3087-L.H.ROD COMPLETE AS SHOWN.

FOR USE WITH TYPE "A-5" MECHANISM.

3088-L.H.ROD AS SHOWN WITHOUT LUG 3218 AND LOCK RODS 31120 & 31122.

FOR USE WITH TYPE "A-5" MECHANISM.

NOTE 1:-

1. RODS SHOWN ARE FOR DOUBLE SLIP SWITCHES, FOR RODS FOR SINGLE SLIP SWITCHES ORDER AS FOR DOUBLE SLIP SWITCHES AND OMIT FEET NOT REQUIRED ON REQUISITION.
2. SPECIFY ON REQUISITION TYPE OF SWITCH MECHANISM.
3. FOR BOLTS, NUTS, WASHERS, INSULATION ETC. REQUIRED WITH ALL RODS SEE 3081.
4. BOLTS SHALL BE AMERICAN STANDARD REGULAR SQUARE HEAD WITH HEX. NUTS. THREAD TO BE NC-2.
5. HEAT TREATED BOLTS AND NUTS SHALL CONFORM TO AND SHALL BE MARKED (C) OR (D) IN ACCORDANCE WITH CURRENT ISSUE OF P.R.R. SPECIFICATION NO. C.E.9.

REVISIONS

REDRAWN FROM APPROVED
PLAN S-308-A, DATED 7-11-1923
AND REVISED.

1 SHEET



S-308-B

THE PENNSYLVANIA RAILROAD

STANDARD

FRONT AND LOCK RODS

FOR SLIP SWITCHES 100 LB. P.S. AND 130 LB. P.S. RAIL.

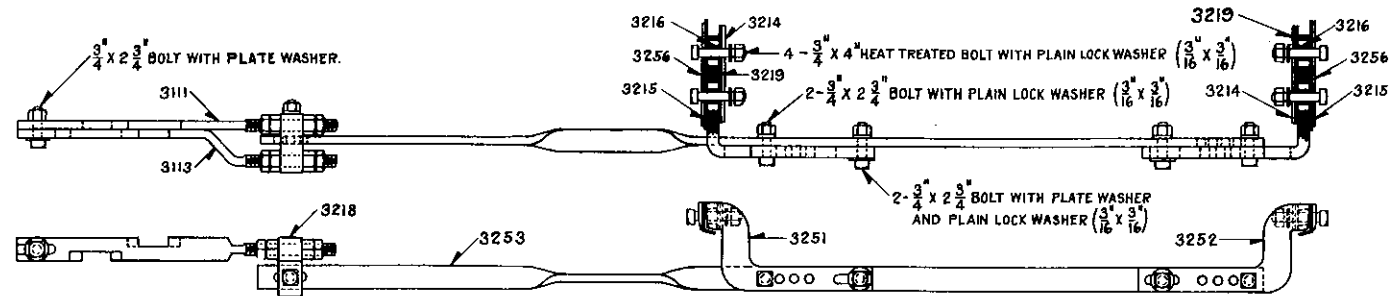
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., AUGUST 17, 1935.

Approved

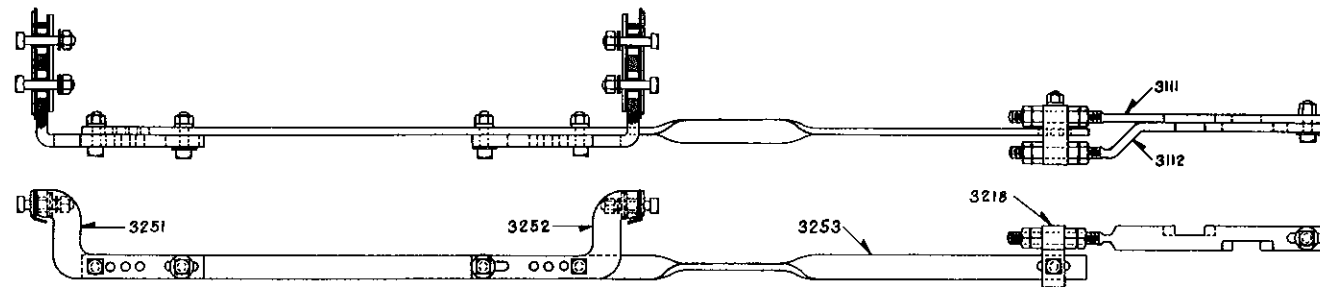
Chief Signal Engineer

Approved

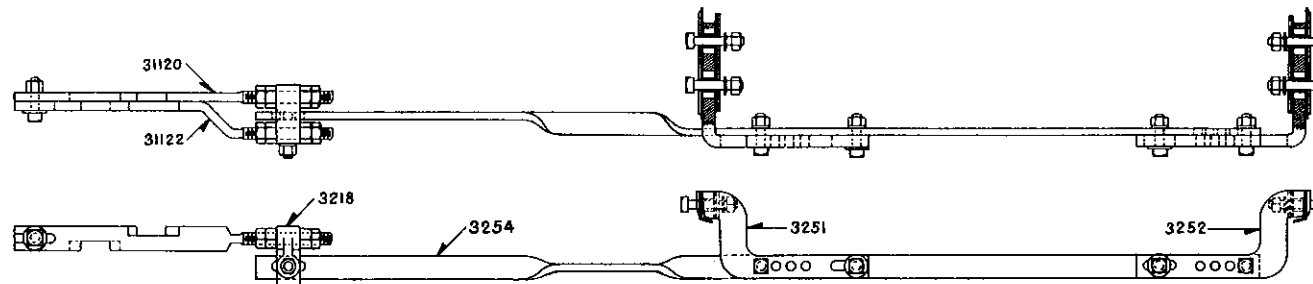
Acting Chief Engineer



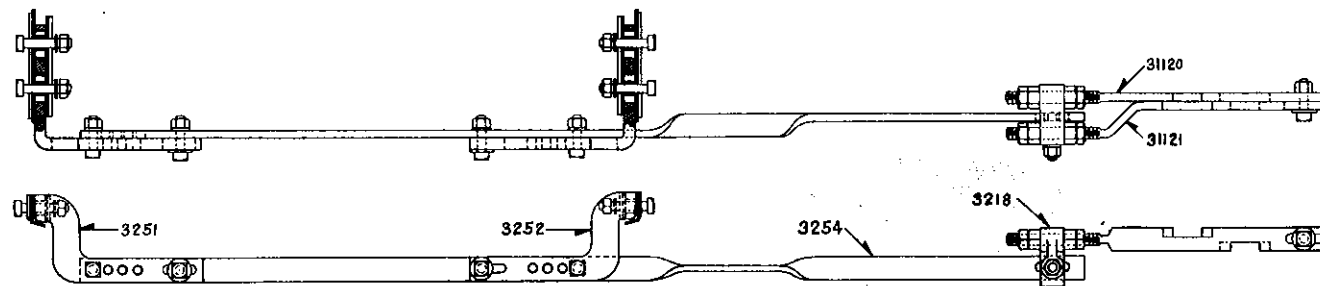
3091-L.H. ROD COMPLETE.



3093-R.H. ROD COMPLETE.



3095-L.H. ROD COMPLETE.



3097-R.H. ROD COMPLETE.

ORDERING REFERENCE

ORDER NO.	APPLICATION	FURNISH
3091	L.H. ROD FOR TYPE "G" MECHANISM.	AS SHOWN.
3092	" " " " " " " " " " " "	" " WITHOUT 3111, 3113 & 3218.
3093	R.H. " " " " " " " " " " " "	" " " "
3094	" " " " " " " " " " " "	" " WITHOUT 3111, 3112 & 3218.
3095	L.H. " " " " " " " " " " " "	" " " "
3096	" " " " " " " " " " " "	" " WITHOUT 31120, 31122 & 3218.
3097	R.H. " " " " " " " " " " " "	" " " "
3098	" " " " " " " " " " " "	" " WITHOUT 31120, 31121 & 3218.

FOR TYPE "A-1" MECHANISM USE SAME RODS AS FOR TYPE "A-5" MECHANISM.
FOR NO. 14 MECHANISM, FRONT RODS SHALL BE SAME AS FOR TYPE "G" MECHANISM, LOCK RODS SHALL BE SAME AS FOR TYPE "A-5" MECHANISM.

NOTE:-

1. BOLTS SHALL BE AMERICAN STANDARD REGULAR SQUARE HEAD WITH HEX. NUTS. THREAD TO BE NC-2.
2. FOR BOLTS, NUTS, WASHERS, INSULATION ETC. REQUIRED WITH ALL RODS SEE 3091.
3. HEAT TREATED BOLTS AND NUTS SHALL CONFORM TO AND SHALL BE MARKED © OR ® IN ACCORDANCE WITH CURRENT ISSUE OF P.R.R. SPECIFICATION NO. C.E.9.

REVISIONS

Redrawn from approved plan S-309-B, dated July 11, 1923, last revised April 3, 1924 and revised.

1 SHEET

S-309-C



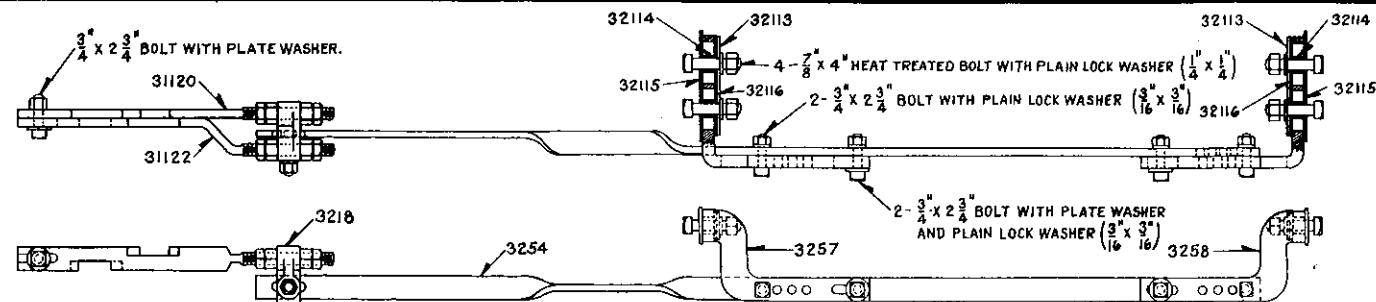
THE PENNSYLVANIA RAILROAD STANDARD

FRONT AND LOCK RODS

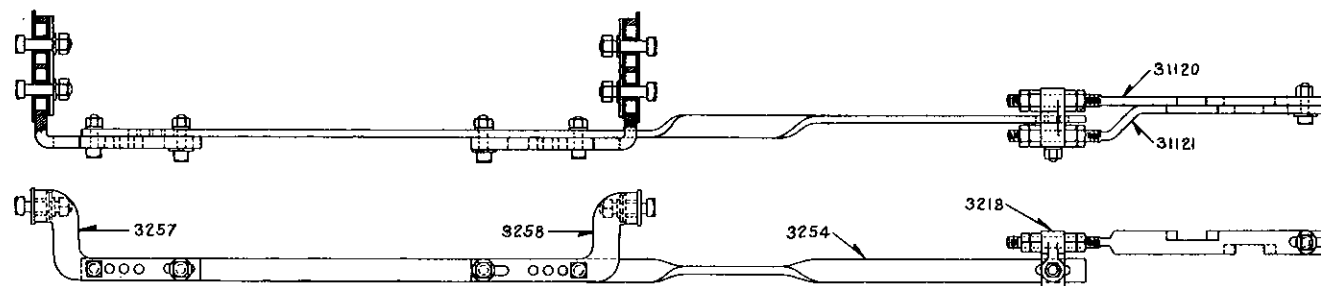
FOR MOVABLE POINT FROGS 100 LB. P.S. AND 130 LB. P.S. RAIL.
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MARCH 23, 1935.

Approved
Chief Signal Engineer

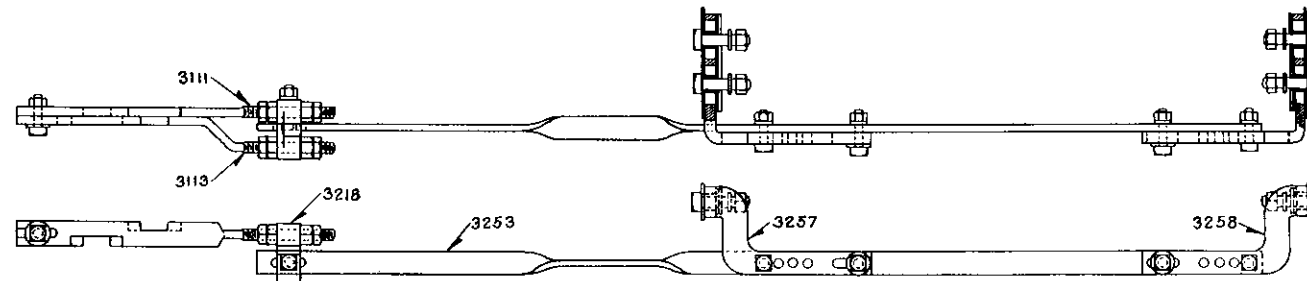
Approved
Acting Chief Engineer



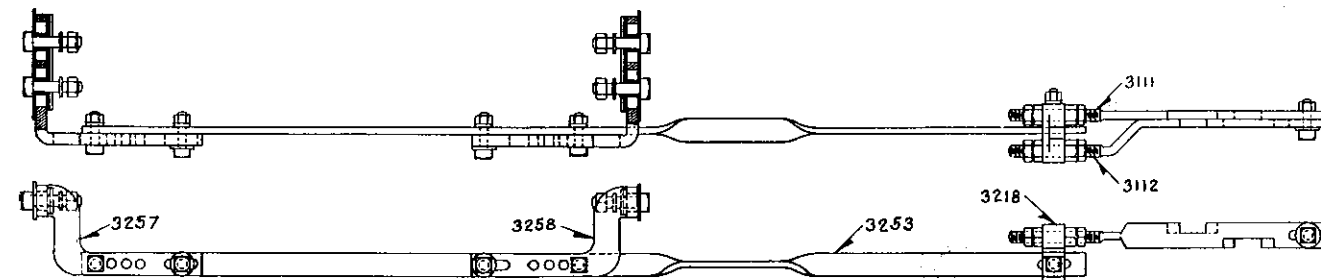
3101-L.H. ROD COMPLETE.



3103-R.H. ROD COMPLETE.



3105-L.H. ROD COMPLETE.



3107-R.H. ROD COMPLETE.

ORDERING REFERENCE

ORDER NO.	APPLICATION	FURNISH
3101	L.H. ROD FOR TYPE "A-5" MECHANISM.	AS SHOWN.
3102	" " " " " " " "	" " WITHOUT 31120, 31122 & 3218.
3103	R.H. " " " " " " " "	" " " "
3104	" " " " " " " "	" " WITHOUT 31120, 31121 & 3218.
3105	L.H. " " " " " " " "	" " " "
3106	" " " " " " " "	" " WITHOUT 3111, 3113 & 3218.
3107	R.H. " " " " " " " "	" " " "
3108	" " " " " " " "	" " WITHOUT 3111, 3112 & 3218.

FOR TYPE "A-1" MECH. USE SAME FRONT AND LOCK RODS AS FOR TYPE "A-5" MECH.
FOR TYPE "NO. 14" MECH. USE SAME FRONT RODS AS FOR TYPE "6" MECH. AND SAME LOCK RODS AS FOR TYPE "A-5" MECH.

NOTE:-

1. BOLTS SHALL BE AMERICAN STANDARD REGULAR SQUARE HEAD WITH HEX. NUTS. THREAD TO BE NC-2.
2. FOR BOLTS, NUTS, WASHERS, INSULATION ETC. REQUIRED WITH ALL RODS SEE 3101.
3. HEAT TREATED BOLTS AND NUTS SHALL CONFORM TO AND SHALL BE MARKED (C) OR (N) IN ACCORDANCE WITH CURRENT ISSUE OF P.R.R. SPECIFICATION NO. C.E. 9.

REVISIONS

1 SHEET

S-310-A



THE PENNSYLVANIA RAILROAD STANDARD FRONT AND LOCK RODS

FOR MOVABLE POINT FROGS 131 LB. R.E. AND 152 LB. P.S. RAIL.
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MAR. 30, 1935.

Approved
Chief Signal Engineer

Approved
Acting Chief Engineer



- REVISIONS**
- REDRAWN FROM APPROVED PLAN
3-311-F, DATED JULY 5, 1927, LAST
REVISED MARCH 20, 1929 AND REVISED
AS FOLLOWS- SHEETS 1 & 2 FORMERLY
1 SHEET. RODS 31123, 31124, 31185 &
31126 FORMERLY 2 1/2" LONG. SHEET 3,
NOTE 2 SHEET 1, AND STORES CAT.
REF. NUMBERS ADDED.
RODS 31127 & 31128 3/4", ADDED.

TO DETERMINE CORRECT LOCK RODS FOR USE
WITH EACH TYPE OF OPERATING MECHANISM,
SEE SHEET NO.3 OF THIS PLAN.



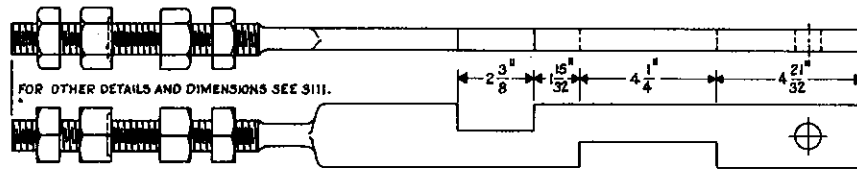
THE PENNSYLVANIA RAILROAD

STANDARD LOCK RODS

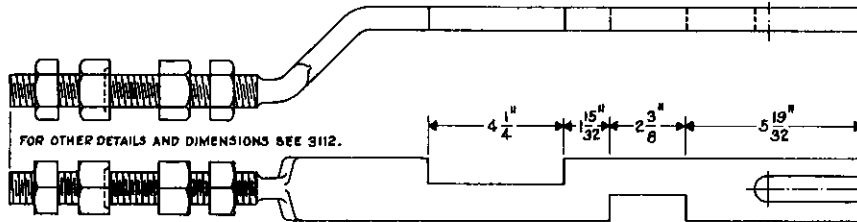
OFFICE OF CHIEF ENGINEER, PHILA., PA., MAY 10, 1945.

Approved
H.C. Griffith
Assistant Chief Engineer - T.C.E.S.

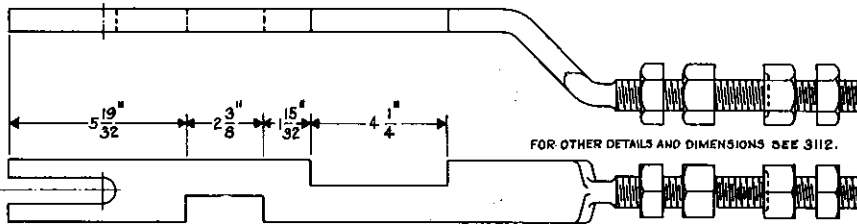
Approved *J. W. Smith*
Chief Engineer



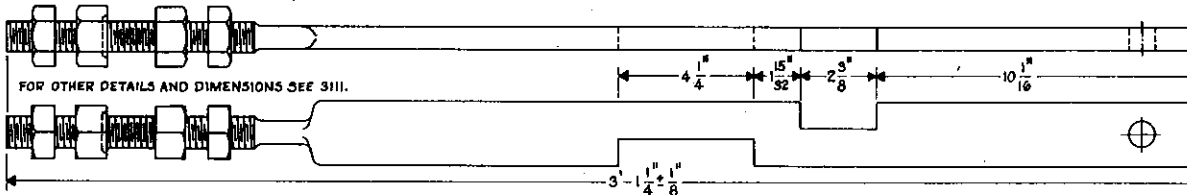
31120 LOCK ROD RIGHT OR LEFT HAND
STORES CAT. REF. NO. 2A-2125



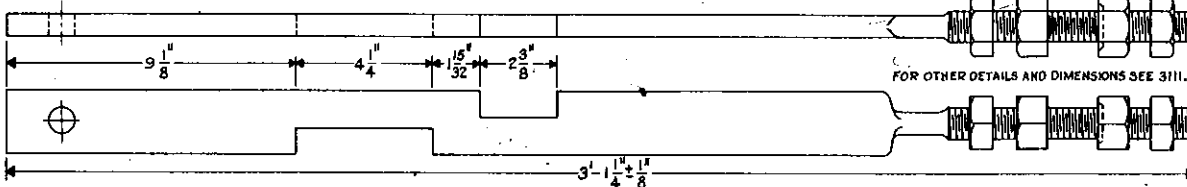
31121 LOCK ROD RIGHT HAND
STORES CAT. REF. NO. 2A-2126 R



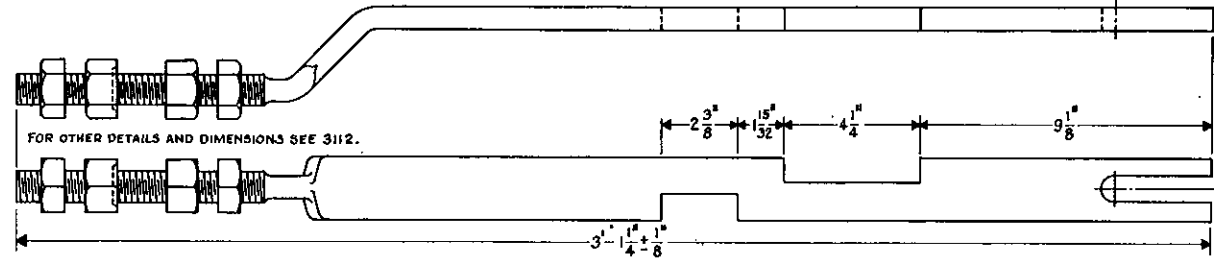
31122 LOCK ROD LEFT HAND
STORES CAT. REF. NO. 2A-2126 L



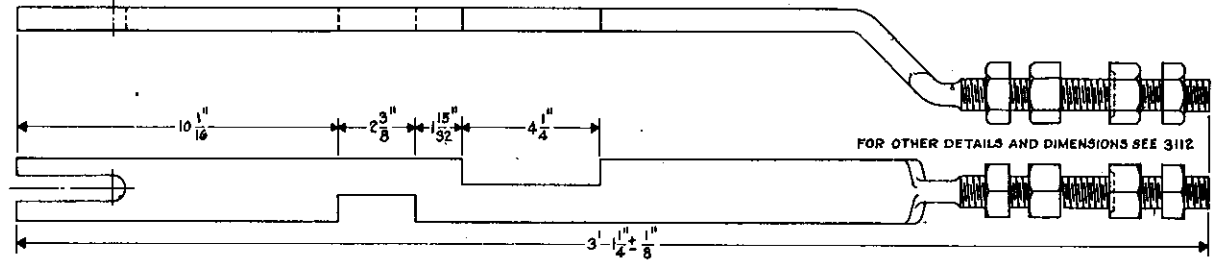
31123 LOCK ROD RIGHT HAND
STORES CAT. REF. NO. 2A-2129 R



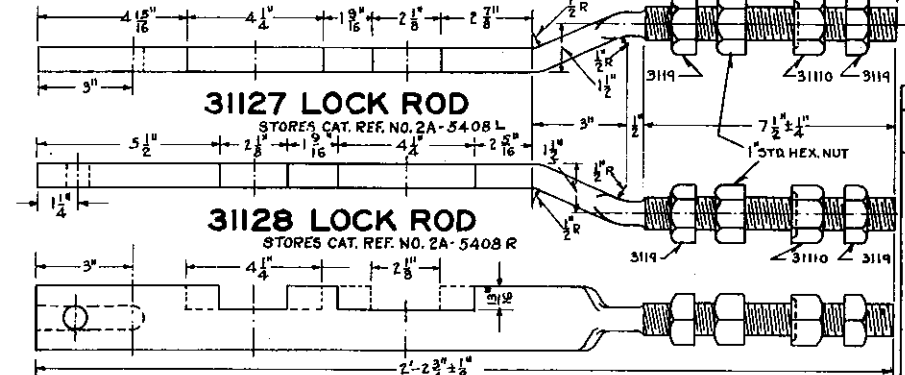
31126 LOCK ROD LEFT HAND
STORES CAT. REF. NO. 2A-2129 L



31124 LOCK ROD RIGHT HAND
STORES CAT. REF. NO. 2A-2130 R



31125 LOCK ROD LEFT HAND
STORES CAT. REF. NO. 2A-2130 L



31127 LOCK ROD LEFT HAND
STORES CAT. REF. NO. 2A-5408 L

31128 LOCK ROD RIGHT HAND
STORES CAT. REF. NO. 2A-5408 R

NOTES:-
1. ALL RODS SHALL BE MADE OF FORGING STEEL CONTAINING 0.30 PER CENT TO 0.40 PER CENT CARBON, WITH A MAXIMUM OF 0.045 PER CENT PHOSPHOROUS. THEY SHALL BE HEATED TO A TEMPERATURE OF 1550° F., QUENCHED IN OIL, REHEATED TO 1200° F. AND ALLOWED TO COOL SLOWLY.
2. MANUFACTURER SHALL PAINT EACH LOCK ROD WITH ONE COAT OF A GOOD GRADE BLACK PAINT.

FOR DETAILS OF LOCK RODS 3111 TO 3118 INCLUSIVE, SEE SHT. 1 OF THIS DWG. TO DETERMINE CORRECT LOCK RODS FOR USE WITH EACH TYPE OPERATING MECHANISM, SEE SHEET 3 OF THIS DRAWING.

REVISIONS

REDRAWN FROM APPROVED DRAWING S-311-F, DATED 7-5-27, LAST REV. 9-20-28. SEE SHEET NO. 1 FOR CHANGES.

SHEET 2 OF 3.



S-311-G

THE PENNSYLVANIA RAILROAD

STANDARD

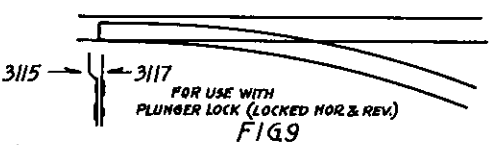
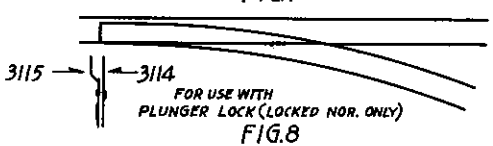
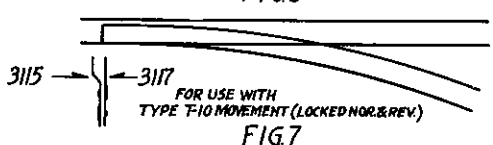
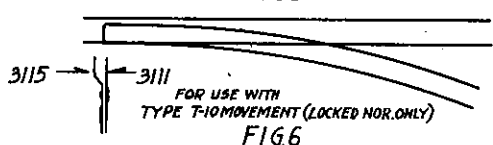
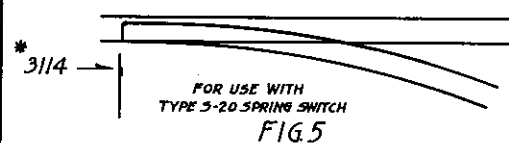
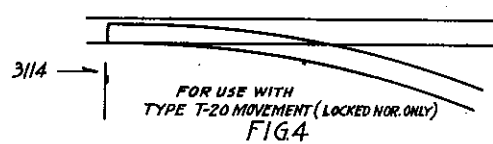
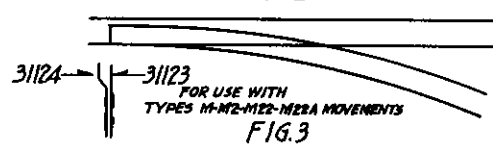
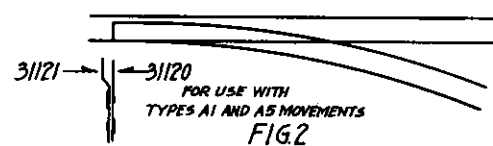
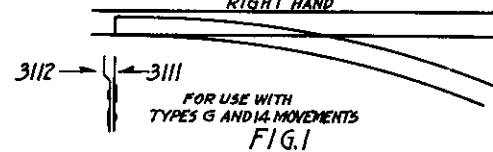
LOCK RODS

OFFICE OF CHIEF ENGINEER, PHILA., PA., MAY 10, 1945.

Approved
W. Griffith
Assistant Chief Engineer - T.C. & S.

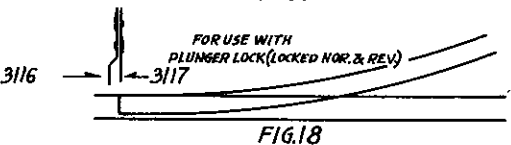
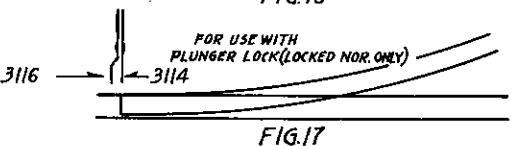
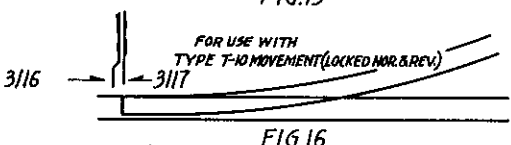
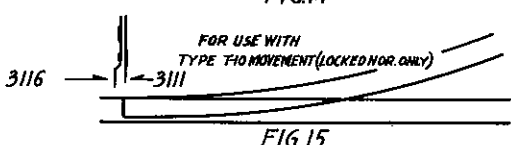
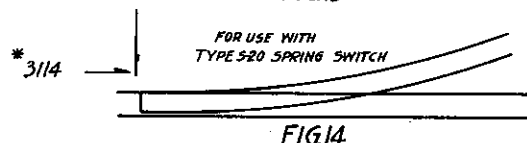
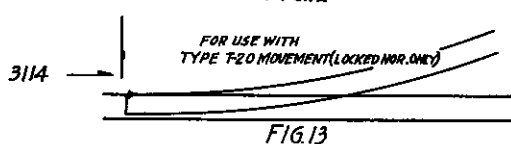
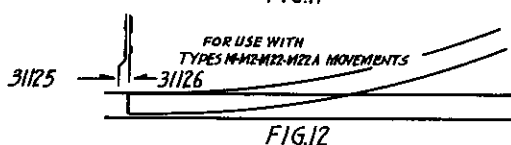
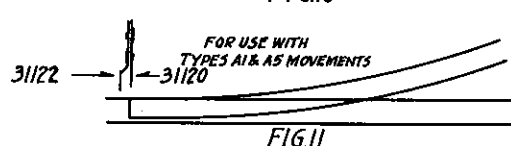
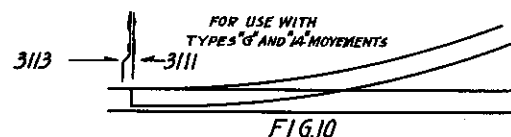
Approved
J. H. Smith
Chief Engineer

LAYOUTS FOR SINGLE SWITCHES RIGHT HAND

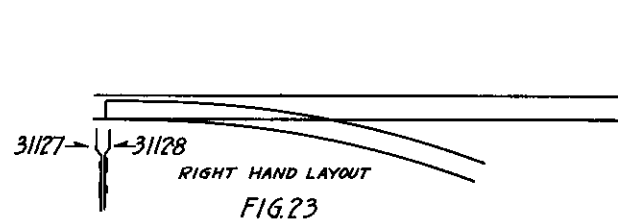
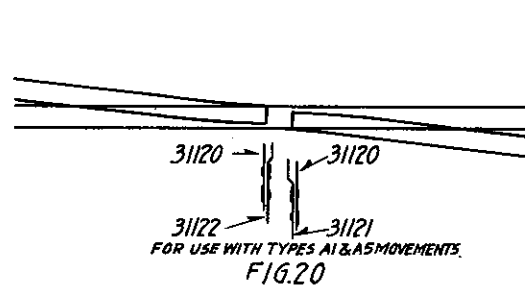
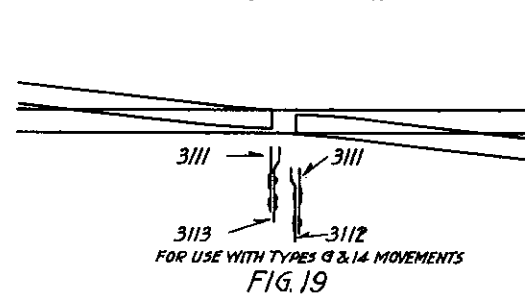


* WHEN 3114 IS TO BE USED FOR SPRING SWITCH, SPECIFY ON ORDER THAT NOTCH IS TO BE WIDENED $\frac{1}{8}$ " ON FIELD SIDE, BOTH FACES OF NOTCH TO BE TORCH HARDENED.

LAYOUTS FOR SINGLE SWITCHES LEFT HAND



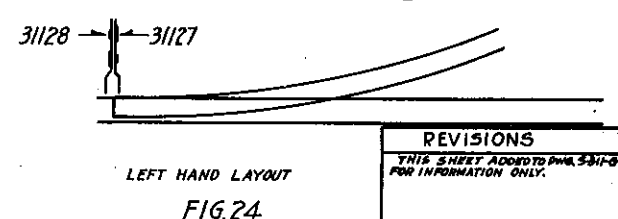
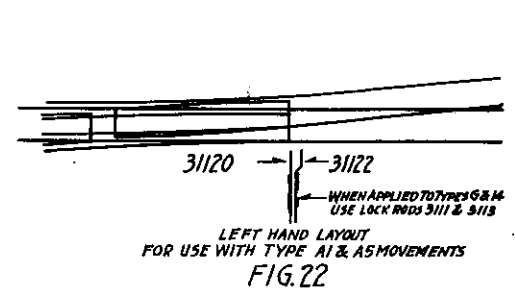
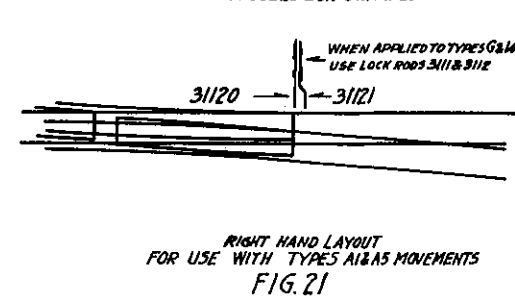
LAYOUTS FOR MOVABLE POINT FROGS



WHEN A T-20 MOVEMENT IS EQUIPPED WITH SEPARATE LOCK BAR, LOCKING THE LOCK ROD WITH SWITCH IN BOTH NORMAL AND REVERSE POSITIONS, USE LOCK RODS AS SHOWN IN FIGS. 23 AND 24.

- NOTES:
1. PLUNGER OR LOCKING DOG FOR LOCKING LOCK RODS FOR SWITCH MOVEMENTS, WILL ENTER LOCK RODS AS FOLLOWS:-
 2. FOR A1 AND A5, FIRST INTO TOP SMALL NOTCH IN STRAIGHT LOCK ROD FOR BOTH LEFT HAND AND RIGHT HAND LAYOUTS WHEN SWITCH IS IN THE NORMAL POSITION.
 3. FOR M-M2-M22-M22A FIRST INTO BOTTOM SMALL NOTCH IN BENT LOCK ROD FOR RIGHT HAND LAYOUT, AND INTO TOP SMALL NOTCH IN STRAIGHT LOCK ROD FOR LEFT HAND LAYOUT, BOTH WITH SWITCH IN THE NORMAL POSITION.
 4. FOR MODEL 14, FIRST INTO TOP LARGE NOTCH IN STRAIGHT LOCK ROD FOR BOTH R.H. AND L.H. LAYOUTS WHEN SWITCH IS IN THE NORMAL POSITION.
 5. FOR T-20 OR S-20 WITH SWITCH LOCKED NOR. ONLY, LOCK BAR ENTERS SMALL NOTCH IN LOCK ROD, WHICH IS LOCATED IN FAR LOCK ROD SPACE, FOR BOTH R.H. & L.H. LAYOUTS.
 6. FOR T-20 WITH SWITCH LOCKED BOTH NOR. AND REV., SEE FIGS. 23 & 24. LOCK BAR ENTERS LARGE OR SMALL NOTCH FIRST, DEPENDING UPON CONDITIONS.
 7. FOR T-10 WITH SWITCH LOCKED NORMAL ONLY, FIRST INTO TOP LARGE NOTCH IN STRAIGHT LOCK ROD FOR BOTH RIGHT HAND AND LEFT HAND LAYOUTS, WHEN IN THE NOR. POSITION.
 8. FOR T-10 WITH SWITCH LOCKED BOTH NOR. AND REV., FIRST INTO TOP LARGE NOTCH IN STRAIGHT LOCK ROD, FOR BOTH RIGHT HAND AND LEFT HAND LAYOUTS, WHEN IN THE NOR. POSITION.
 9. FOR TYPE G, FIRST INTO TOP SMALL NOTCH IN BENT LOCK ROD FOR BOTH RIGHT HAND AND LEFT HAND LAYOUTS WHEN SWITCH IS IN THE NORMAL POSITION.
 10. FOR PLUNGER LOCK WITH SWITCH LOCKED NORMAL ONLY, FIRST INTO TOP SMALL NOTCH IN STRAIGHT LOCK ROD, WHEN IN THE NORMAL POSITION.
 11. FOR PLUNGER LOCK WITH SWITCH LOCKED NORMAL AND REVERSE, FIRST INTO TOP LARGE NOTCH IN STRAIGHT LOCK ROD, FOR BOTH RIGHT HAND AND LEFT HAND LAYOUTS, WHEN SWITCH IS IN THE NORMAL POSITION.
 12. OTHER COMBINATIONS OF LOCK RODS ARE SPECIAL. RODS SHOULD BE SELECTED FOR EACH INDIVIDUAL CASE.

LAYOUTS FOR DOUBLE SLIP SWITCHES



THIS SHEET FOR INFORMATION ONLY, ORDER LOCK RODS FROM SHEETS 1 & 2 DRAWING S-311-G. FOR DETAILS OF LOCK RODS 3111 TO 3118 INCL., SEE SHEET 1 OF DRAWING S-311-G. FOR DETAILS OF LOCK RODS 31120 TO 31128 INCL., SEE SHEET 2 OF DRAWING S-311-G.

SHEET 3 OF 3.



S-311-G

THE PENNSYLVANIA RAILROAD

STANDARD

LOCK RODS

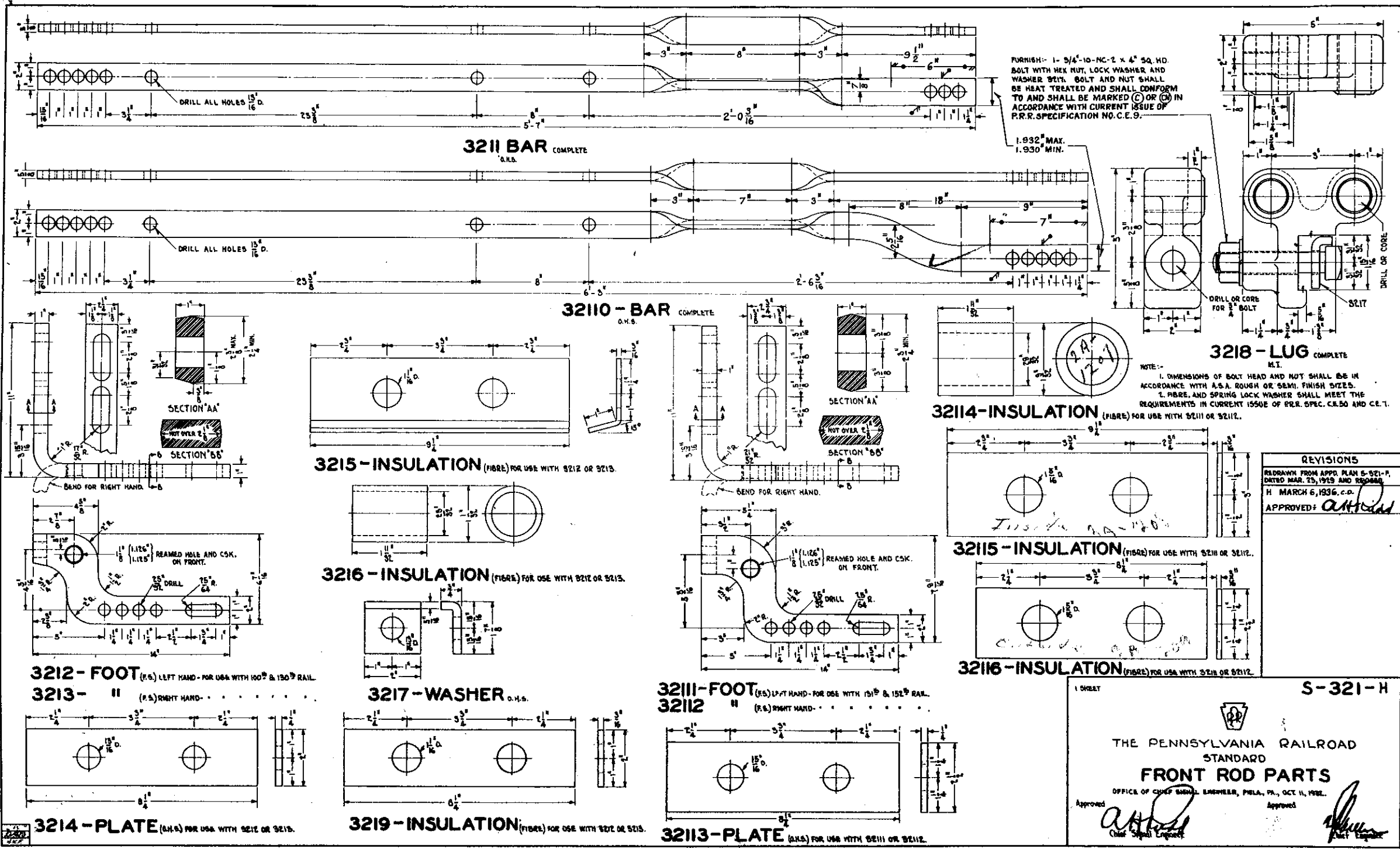
OFFICE OF CHIEF ENGINEER, PHILA., PA., MAY 10, 1945.

Approved

McGriffith
Assistant Chief Engineer - T. C. & S.

Approved

Whitt
Chief Engineer



REVISIONS	
REDRAWN FROM APPD. PLAN S-321-P, DATED MAR. 25, 1919 AND REDRAWN H. MARCH 6, 1936, C.D.	
APPROVED: <i>[Signature]</i>	

1 SHEET

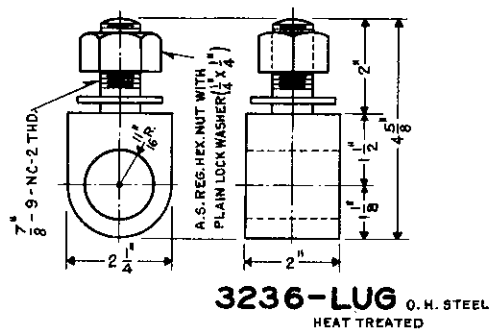
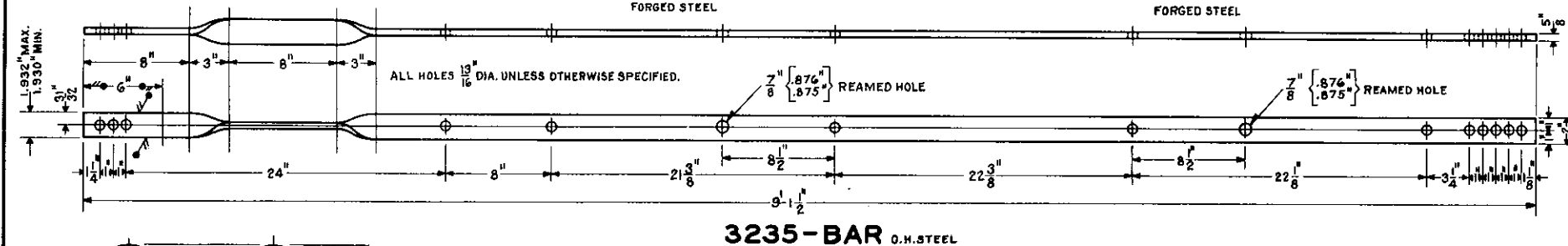
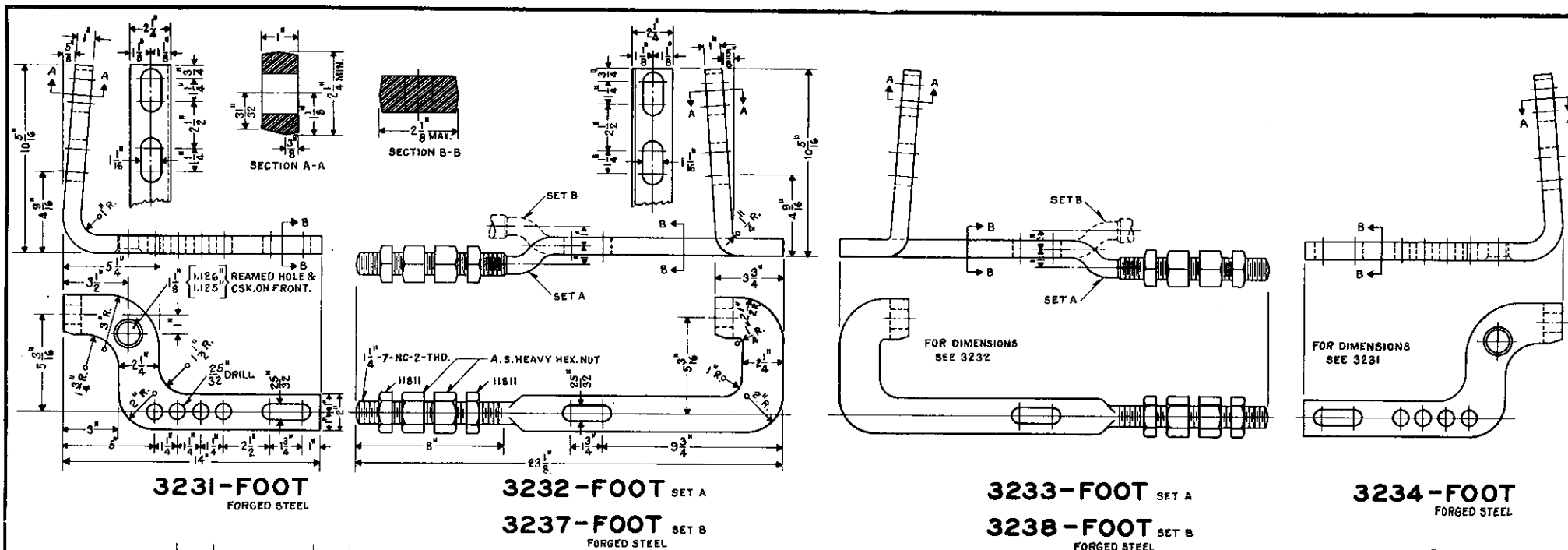
S-321-H

THE PENNSYLVANIA RAILROAD
STANDARD
FRONT ROD PARTS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCT 11, 1936.

Approved: *[Signature]* Chief Signal Engineer

Approved: *[Signature]* Chief Engineer



REVISIONS
REDRAWN FROM APPROVED PLAN S-323-G, DATED JULY 11, 1923, LAST REVISED SEPT. 18, 1925 AND REVISED.

1 SHEET



S-323-H

THE PENNSYLVANIA RAILROAD

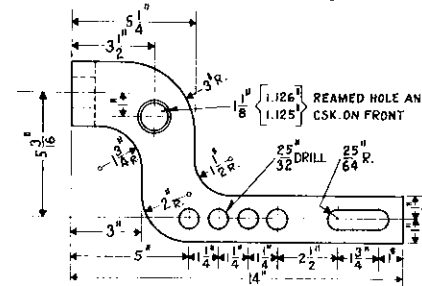
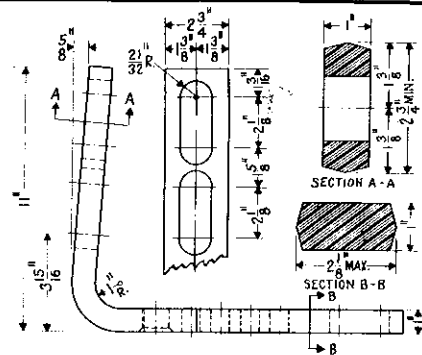
STANDARD

FRONT ROD PARTS

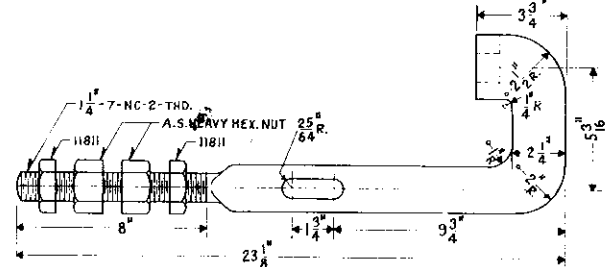
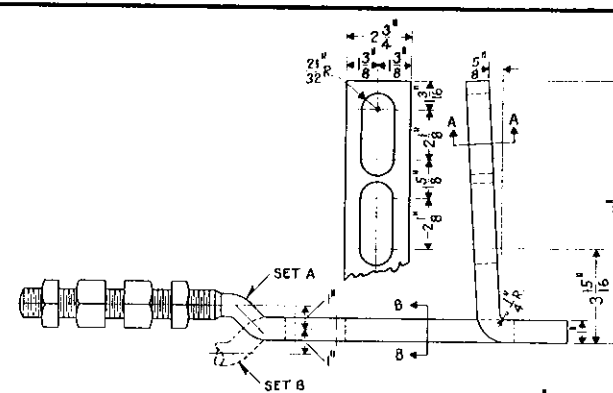
FOR SLIP SWITCHES 100 LB. P.S. AND 130 LB. P.S. RAIL.
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., AUGUST 27, 1935.

Approved
Chief Signal Engineer

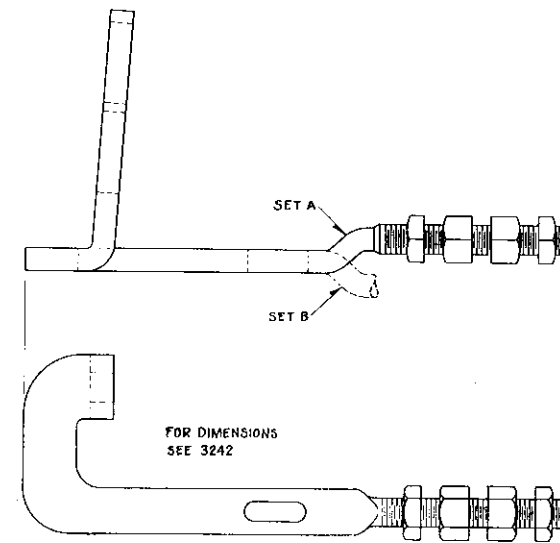
Approved
Acting Chief Engineer



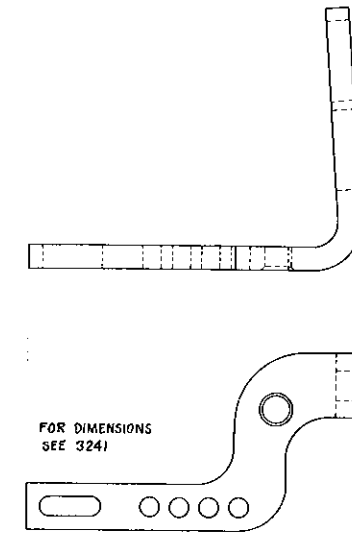
3241 FOOT
FORGED STEEL



3242 FOOT SET A
3243 FOOT SET B
FORGED STEEL



3244 FOOT SET A
3245 FOOT SET B
FORGED STEEL



3246 FOOT
FORGED STEEL

[illegible]

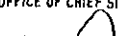
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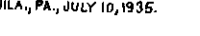


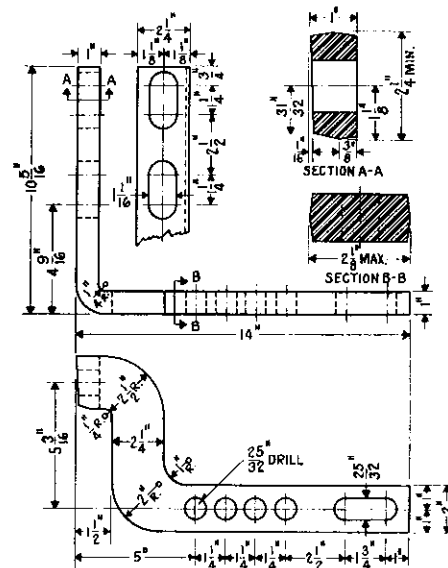
S-324-A

THE PENNSYLVANIA RAILROAD
STANDARD
FRONT ROD PARTS

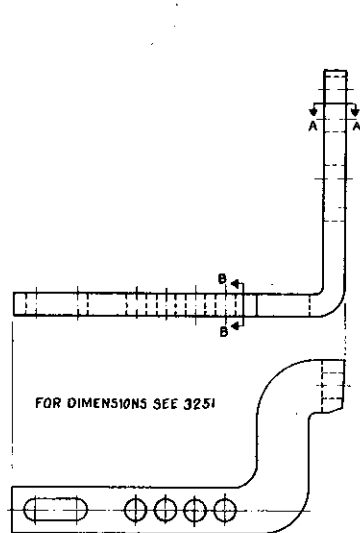
FOR SLIP SWITCHES 131LB.R.E. AND 152LB.P.S.RAIL.
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., JULY 10, 1935.

Approved 
Chief Signal Engineer

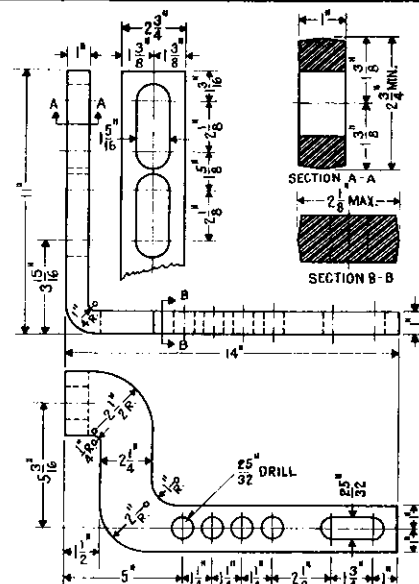
Approved 
Acting Chief Engineer



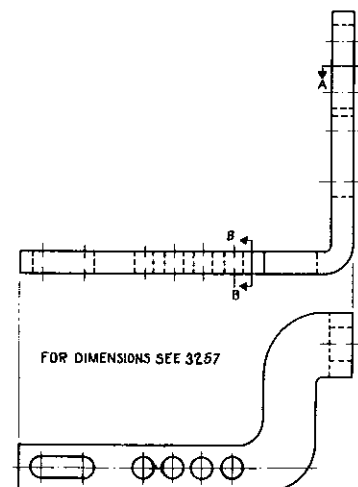
3251 FOOT FORGED STEEL
FOR #100 P.S. & #130 P.S. RAIL.



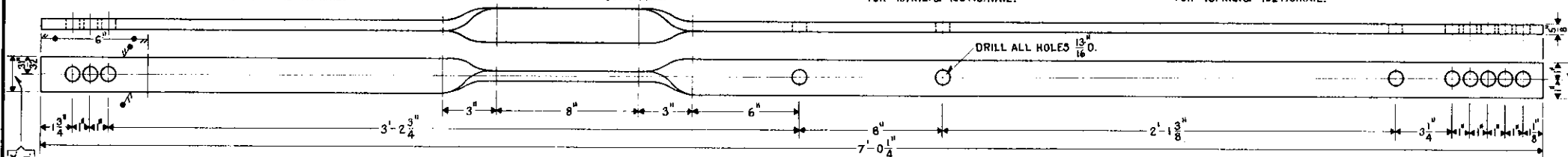
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FOR #100 P.S. & #130 P.S. RAIL.



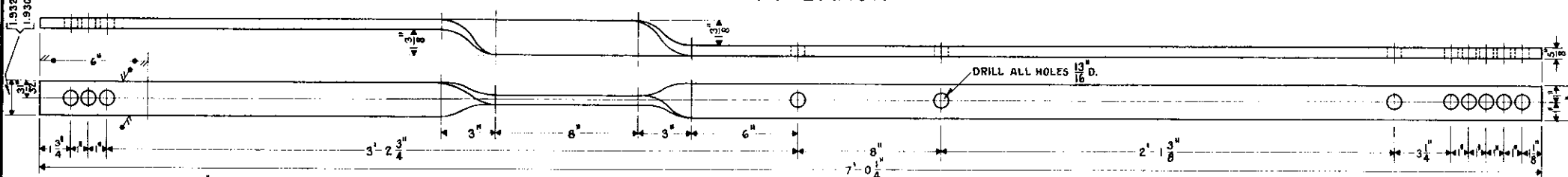
3257 FOOT FORGED STEEL
FOR #131 R.E. & #152 P.S. RAIL.



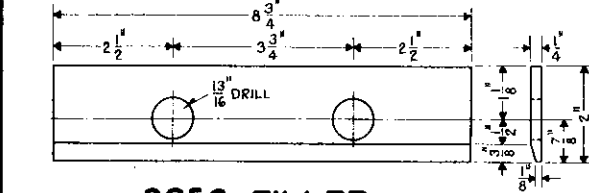
3258 FOOT FORGED STEEL
FOR #131 R.E. & #152 P.S. RAIL.



3253 BAR O.H.S.



3254 BAR O.H.S.



3256 FILLER O.H.S.

REVISIONS

Redrawn from approved plan
S-325-B, dated July 11, 1923, last
revised April 3, 1924 and revised.

1 SHEET

S-325-C

THE PENNSYLVANIA RAILROAD
STANDARD
FRONT ROD PARTS
FOR MOVABLE POINT FR065

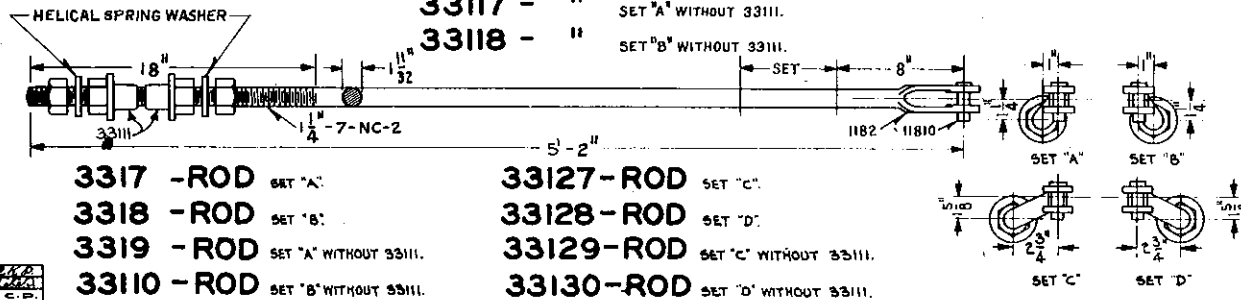
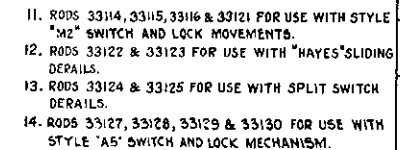
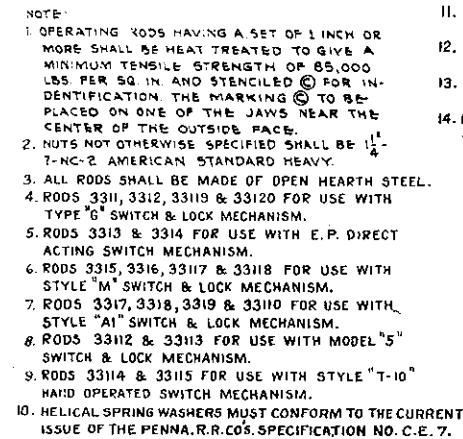
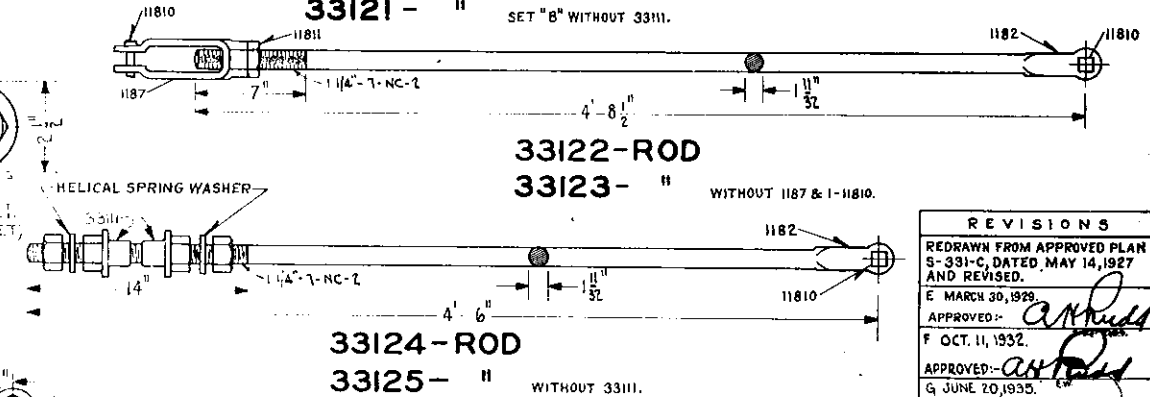
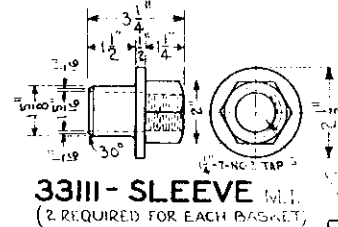
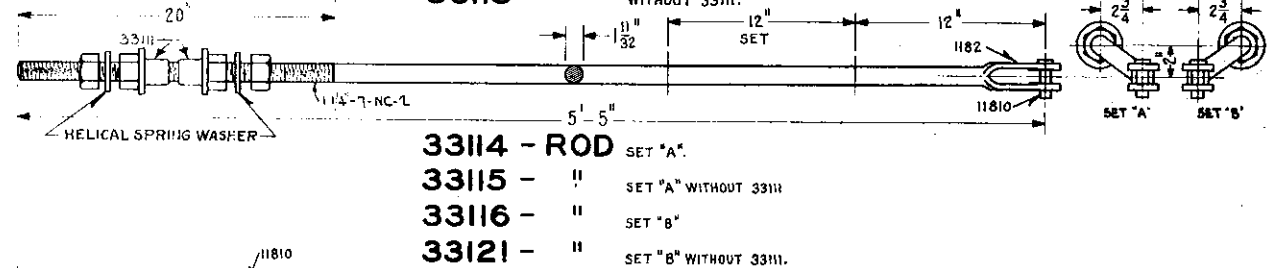
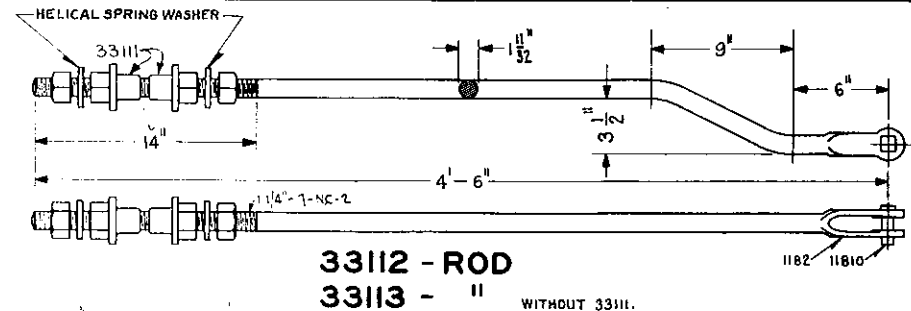
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., FEB. 20, 1935.

Approved

Approved

Chief Signal Engineer

Acting Chief Engineer



REVISIONS	
REDRAWN FROM APPROVED PLAN S-331-C, DATED MAY 14, 1927 AND REVISED.	
E MARCH 30, 1929.	
APPROVED:-	<i>A. H. Smith</i>
F OCT. 11, 1932.	
APPROVED:-	<i>A. H. Smith</i>
G JUNE 20, 1935.	EW
APPROVED:-	<i>A. H. Smith</i>
H DECEMBER 6, 1937.	
APPROVED:-	<i>N. C. Stanton</i>

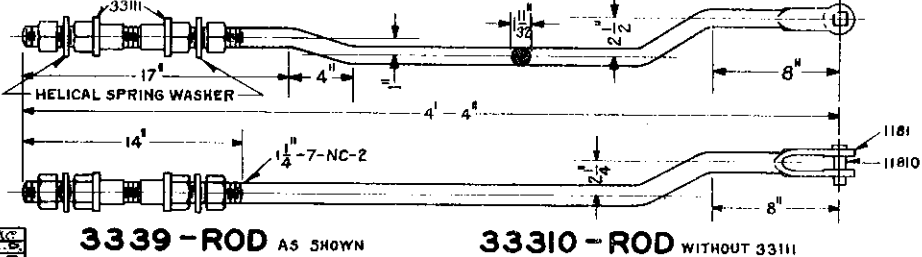
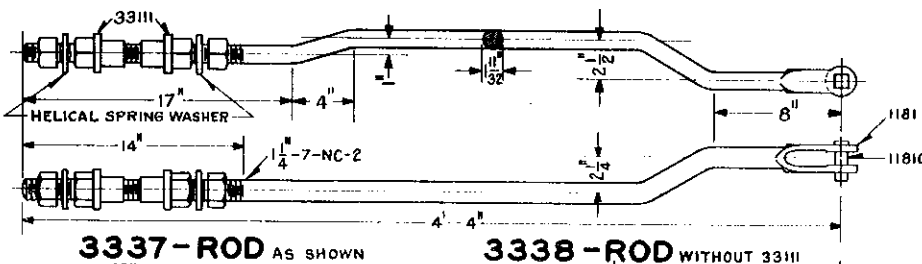
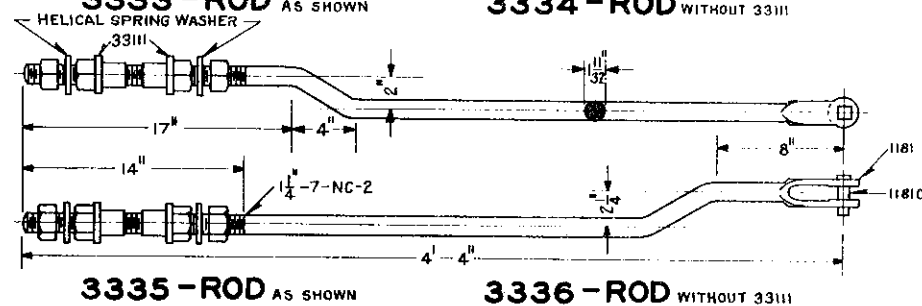
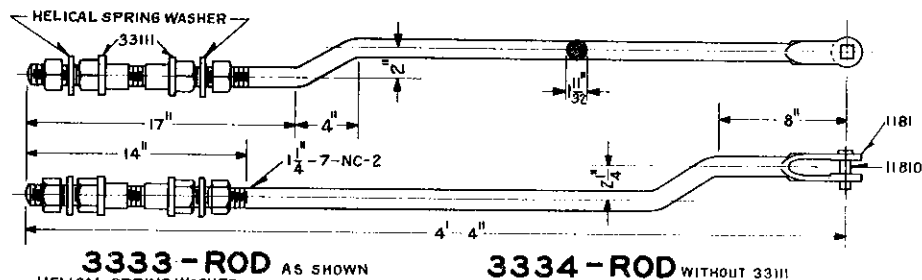
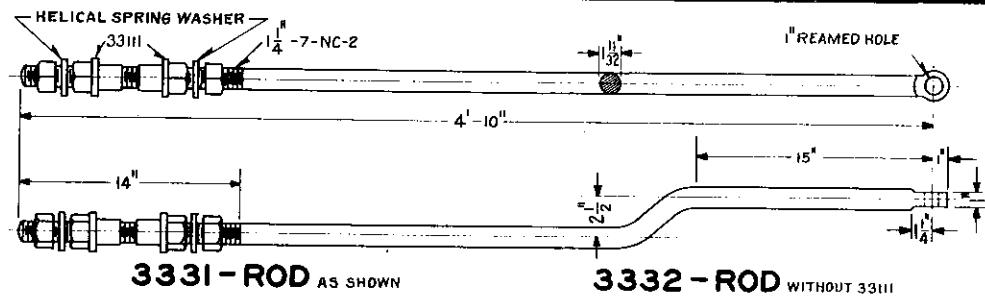
S-331-H

**THE PENNSYLVANIA RAILROAD
STANDARD
OPERATING RODS
FOR SINGLE SWITCHES**

RECEIVED JONAS VINEER PHILA. PA. FEB 16, 1928

Approved
A. H. Reed
Engineer

Approved: *[Signature]*
Chief Engineer



NOTE:-

1. OPERATING RODS HAVING A SET OF 1 INCH OR MORE SHALL BE HEAT TREATED TO GIVE A MINIMUM TENSILE STRENGTH OF 85,000 LBS. PER SQ. IN. AND STENCILED © FOR IDENTIFICATION. THE MARKING © TO BE PLACED ON ONE OF THE JAWS NEAR THE CENTER OF THE OUTSIDE FACE.
2. ALL RODS SHALL BE MADE OF OPEN HEARTH STEEL.
3. NUTS NOT OTHERWISE SPECIFIED SHALL BE 1 1/4" - 7-NC-2 AMERICAN STANDARD HEAVY.
4. RODS 3331 & 3332 FOR USE WITH TYPE "G" MECH.
5. RODS 3333, 3334, 3335 & 3336 FOR USE WITH TYPE "A-1" MECH.
6. RODS 3337, 3338, 3339 & 33310 FOR USE WITH TYPE "A-5" MECH.
7. HELICAL SPRING WASHERS MUST CONFORM TO THE CURRENT ISSUE OF THE PENNA. R.R. CO'S SPECIFICATION NO. C.E. 7.

REVISIONS
REDRAWN FROM APPROVED PLAN 3-333-A, DATED MAY 12, 1924 AND REVISED.
C DEC. 6, 1937.
APPROVED: <i>H. P. Stanton</i>

1 SHEET

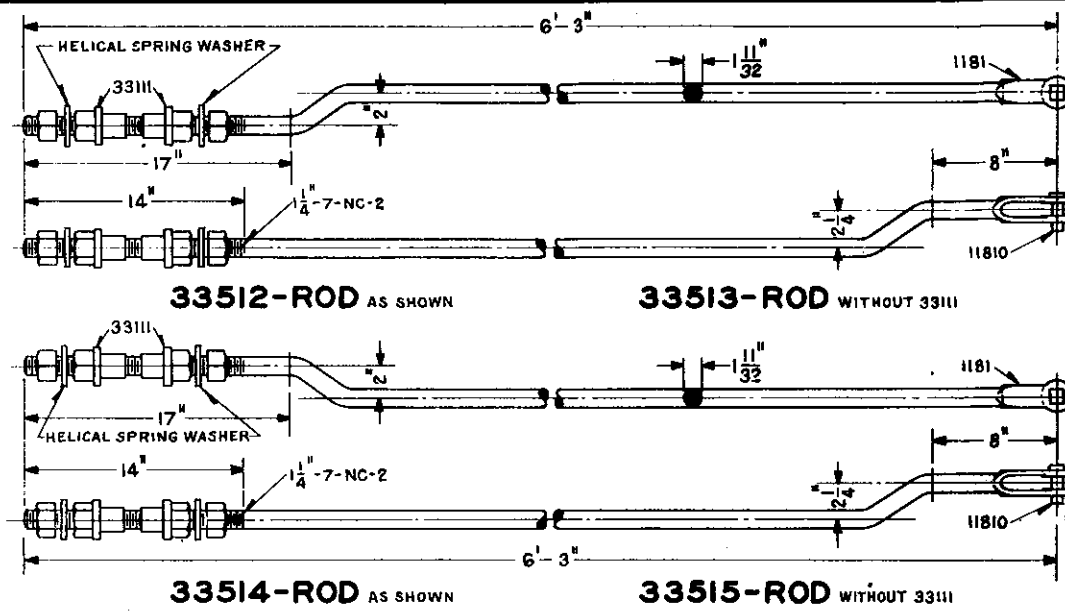
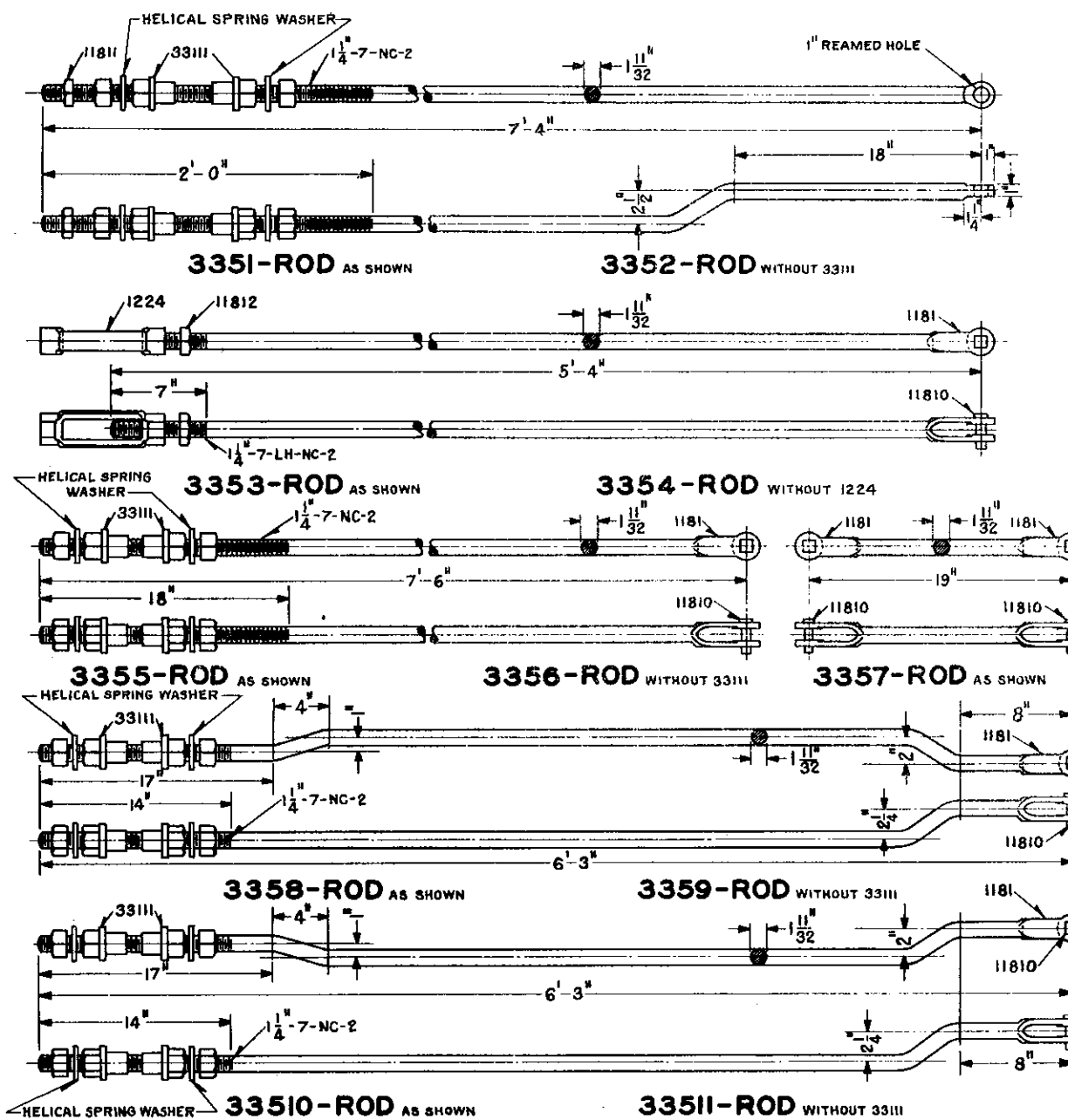
S-333-C

THE PENNSYLVANIA RAILROAD
STANDARD
OPERATING RODS
FOR DOUBLE SLIP SWITCHES

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., NOV. 12, 1936

Approved *A. H. Hall* Chief Signal Engineer

Approved *W. J. Higgins* Chief Engineer



NOTE:-

1. OPERATING RODS HAVING A SET OF 1 INCH OR MORE SHALL BE HEAT TREATED TO GIVE A MINIMUM TENSILE STRENGTH OF 85,000 LBS. PER SQ. IN. AND STENCILED (C) FOR IDENTIFICATION. THE MARKING (C) TO BE PLACED ON ONE OF THE JAWS NEAR THE CENTER OF THE OUTSIDE FACE.
2. ALL RODS SHALL BE MADE OF OPEN HEARTH STEEL.
3. NUTS NOT OTHERWISE SPECIFIED SHALL BE 1 1/4"-7-NC-2 AMERICAN STANDARD HEAVY.
4. RODS 3351 TO 3357 INCL. FOR USE WITH TYPE "G" MECH.
5. RODS 3358 TO 33511 INCL. FOR USE WITH TYPE "A-1" MECH.
6. RODS 33512 TO 33515 INCL. FOR USE WITH TYPE "A-5" MECH.
7. HELICAL SPRING WASHERS MUST CONFORM TO THE CURRENT ISSUE OF THE PENNA. R.R. CO'S. SPECIFICATION NO. C.E. 7.

REVISIONS

REDRAWN FROM APPROVED PLAN S-335-A DATED MAY 12, 1924 AND REVISED.

C DECEMBER 6, 1937.

APPROVED: *H. P. Hoffman*

1 SHEET

S-335-C



THE PENNSYLVANIA RAILROAD

STANDARD

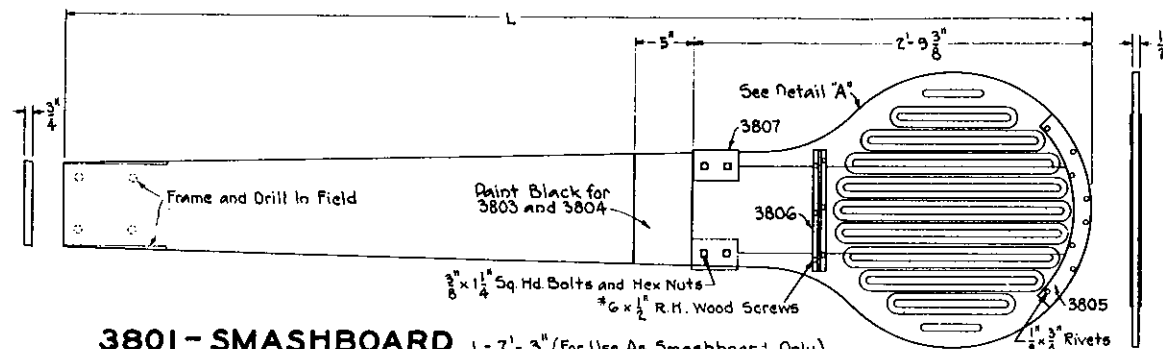
OPERATING RODS

FOR M.P. FROM 65

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., NOV. 12, 1936.

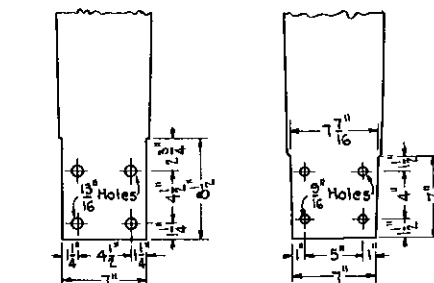
Approved *[Signature]* Chief Signal Engineer

Approved *[Signature]* Chief Engineer

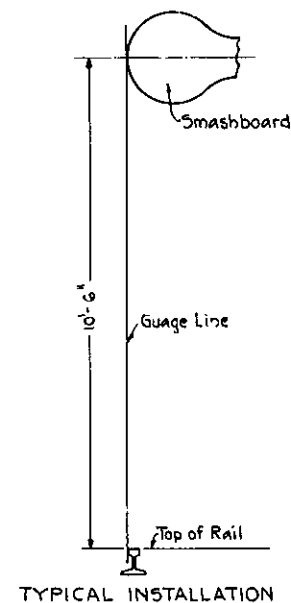


- 3801 - SMASHBOARD**, L = 7'-3" (For Use As Smashboard Only)
3802- " , L = As Specified (For Use As Smashboard Only)
3803- " , L = 7'-3" (For Use As Combined Signal and Smashboard)
3804- " , L = As Specified (For Use As Combined Signal and Smashboard)

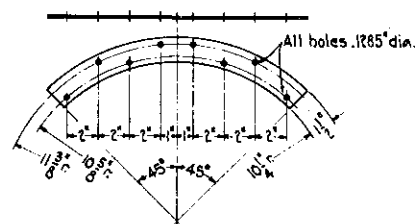
Paint 3801 and 3802 - Black all over.
 Paint 3803 and 3804 - (Front, Medium Chrome Yellow with Black Stripes.
 (Back and Edges, Black.
 When installed as 3803 or 3804, the usual semaphore lamp must be provided
 showing Green when board is Clear, Red for all other positions.



Old Style Semaphore A.R. Sig. Sec. Semaphore
 FRAMING AND DRILLING OF BOARDS



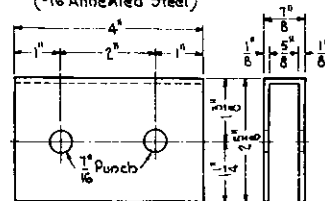
TYPICAL INSTALLATION



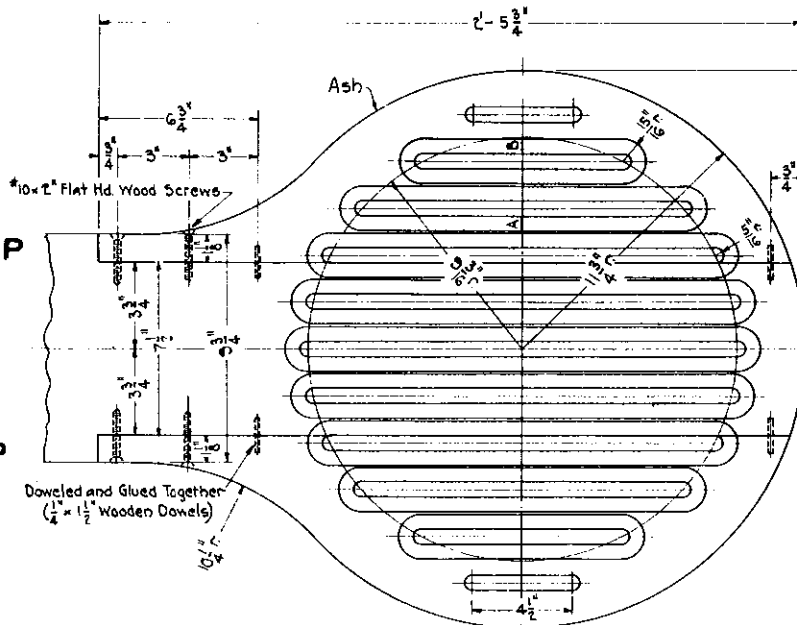
3805 - REINFORCING STRAP
 (#14 Galv. Iron)



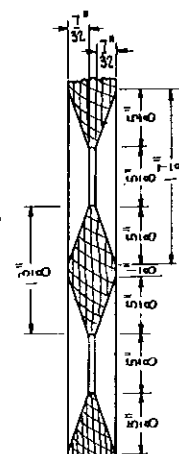
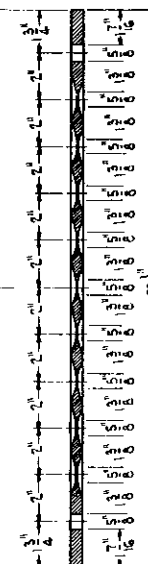
3806 - REINFORCING STRAP
 (#16 Annealed Steel)



3807 - CLAMP (Sheet Steel)



DETAIL "A"



SECTION "A-B"
 (Enlarged)

Revisions

1 Sheet

5-380-A

THE PENNSYLVANIA RAILROAD
 STANDARD
 SMASHBOARDS

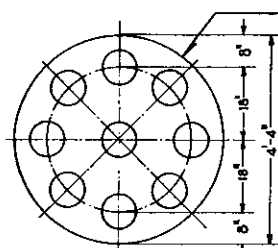
Office of Chief Signal Engineer, Phila., Pa., July 25, 1936.

Approved:

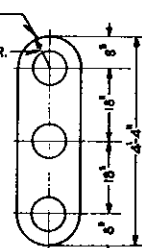
C. H. Naff
 Chief Signal Engineer

Approved:

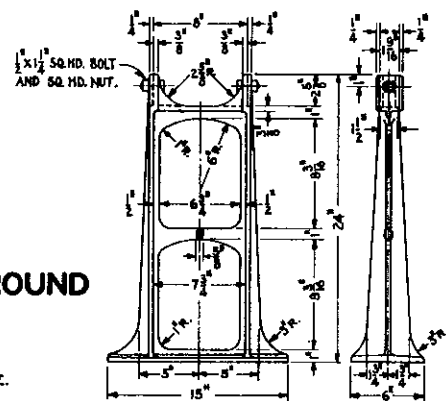
W. J. Higgins
 Acting Chief Engineer



4011 - BACKGROUND



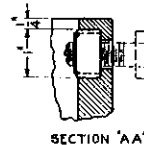
4012 - BACKGROUND



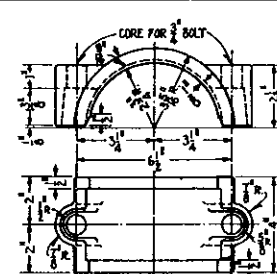
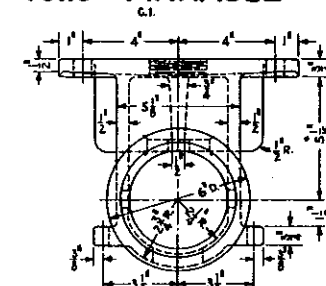
4019 - LADDER FOUNDATION R.S.A. DEC. 1913.

4016 - REFERENCE TABLE

ORD. NO.	A	B	C	REMARKS
4017	7'-0"	2'-3 1/2"	7'-0"	BOTTOM ARM - OTHER THAN MARKER ONLY.
4018	"	5'-7"	"	MARKER ONLY.
4019	6'-0"	3'-3 1/2"	"	OTHER THAN MARKER ONLY.
4020	"	5'-7"	"	MARKER ONLY.
4021	5'-0"	3'-6 1/2"	"	OTHER THAN MARKER ONLY.
4022	"	5'-7"	"	MARKER ONLY.
4023	5'-0"	3'-6 1/2"	"	OTHER THAN MARKER ONLY.
4024	"	5'-7"	"	MARKER ONLY.

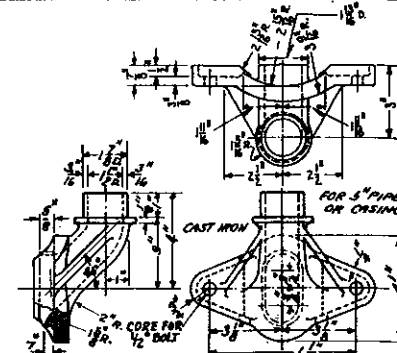


4010 - PINNACLE

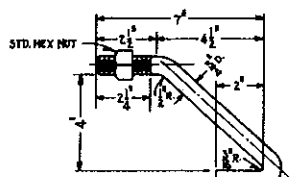


40112 - CLAMP

40128 - " 40112 WITH 2-40115.

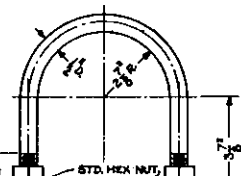


40113 - OUTLET 40129 - " 40113 WITH 1-40116.

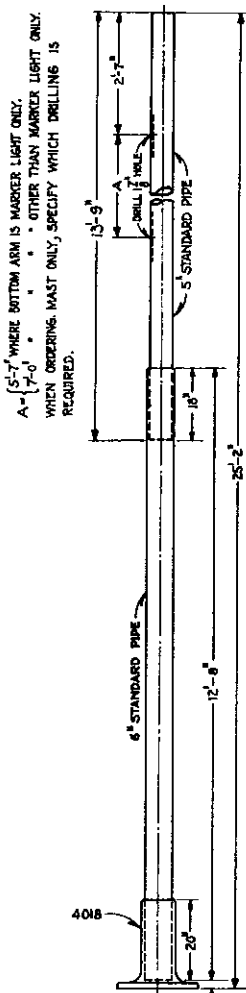


40114 - BOLT

40115 - BOLT

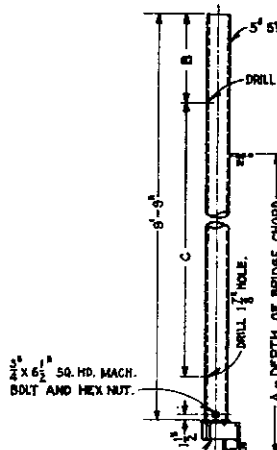


40116 - BOLT

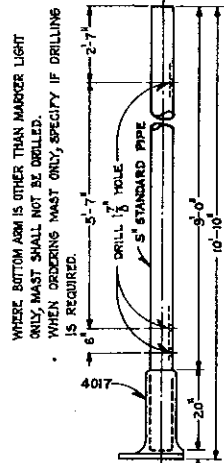


4013 - MAST

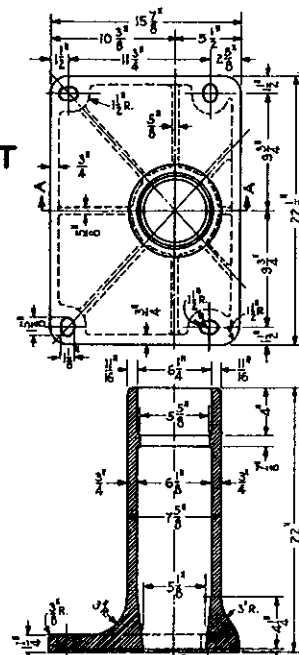
R.S.A. DEC. 1915.



BRIDGE MAST (SEE TABLE)

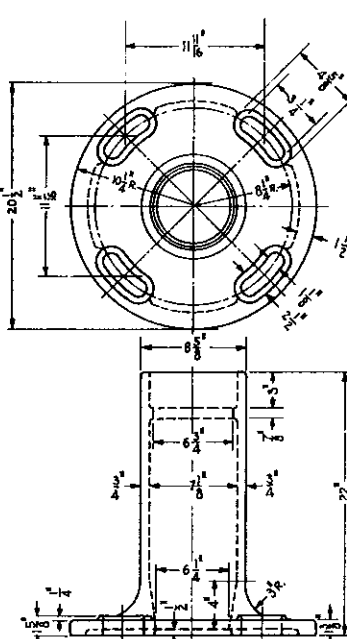


4014 - MAST



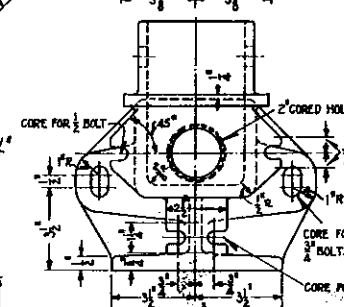
4017 - BASE

C.I.



4018 - BASE

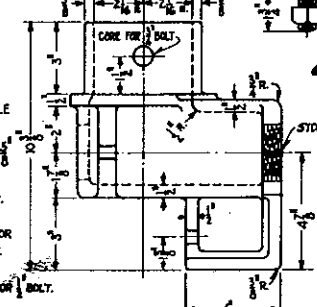
A.R.A. MAR. 1921.



40111 - SOCKET

40126 - " 40111 WITH 2-40114.

40127 - " 40111 - 2- 3/4" X 3" STD. SQ. HD. BOLTS AND SQ. HD. NUTS.



REVISIONS

REDRAWN FROM APPROVED PLAN S-401-C.
DATED NOV. 17, 1921, LAST REVISED
FEB. 17, 1927 AND REVISED
22 MARCH 23, 1933
APPROVED N.C. Stanton

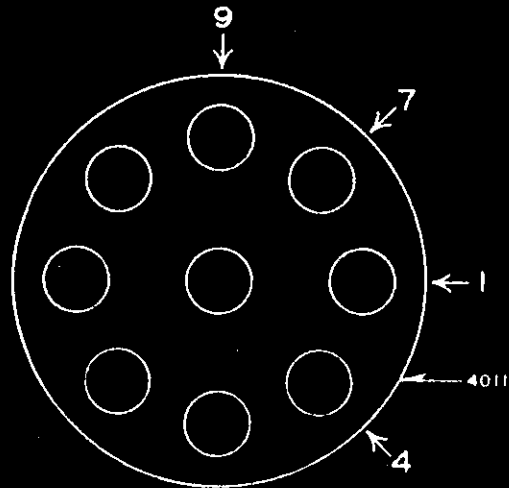
1 SHEET

S-401-E

THE PENNSYLVANIA RAILROAD
STANDARD
POSITION LIGHT SIGNAL PARTS
OFFICE OF CHIEF SIGNAL ENGINEER PHILA., PA. JUN. 15, 1928.

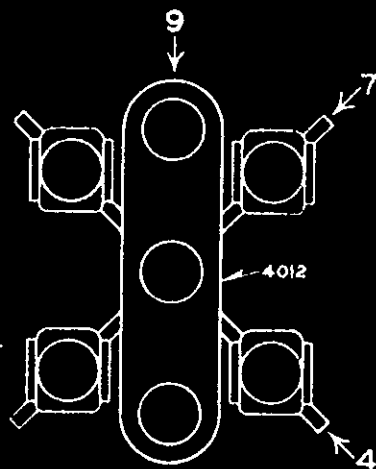
Approved *A.H. Ross* Chief Signal Engineer

Approved *W.H. Smith* Chief Engineer



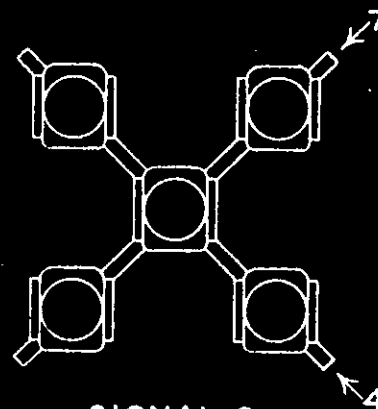
SIGNAL A

ORDER NO.	SIGNAL ASPECTS
4051	1
4052	4
4053	7
4054	7-9
4055	1-9
4056	4-9
4057	1-7-9
4058	4-7-9
4059	1-4-7-9
40510	1-4-9
40511	1-7
40512	4-7
40513	1-4-7
40514	1-4



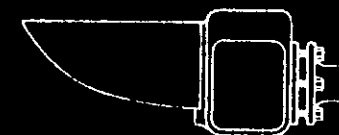
SIGNAL B

ORDER NO.	SIGNAL ASPECTS
40517	9
40518	7-9
40519	4-9
40520	4-7-9



SIGNAL C

ORDER NO.	SIGNAL ASPECTS
40523	7
40524	4
40525	4-7



MARKER

ORDER NO.	SIGNAL UNIT
40528	COMPLETE FOR ATTACHING TO 3" STANDARD MAST
40529	COMPLETE FOR ATTACHING TO 1 1/4" LORICATED PIPE.

NOTE: SIGNALS SHALL BE COMPLETE WITH HUB, NECESSARY RADIAL PIPING, JUNCTION BOX, FLEXIBLE CONDUIT AND WIRING BETWEEN JUNCTION BOX AND LIGHT UNITS, BACKGROUND (AS SHOWN), BOLTS ETC., FOR ATTACHING TO 3" STANDARD MAST, UNLESS OTHERWISE SPECIFIED.

REVISIONS

1 SHEET

S-405-A


PENNSYLVANIA RAILROAD SYSTEM
 STANDARD
SIGNALS
 POSITION LIGHT

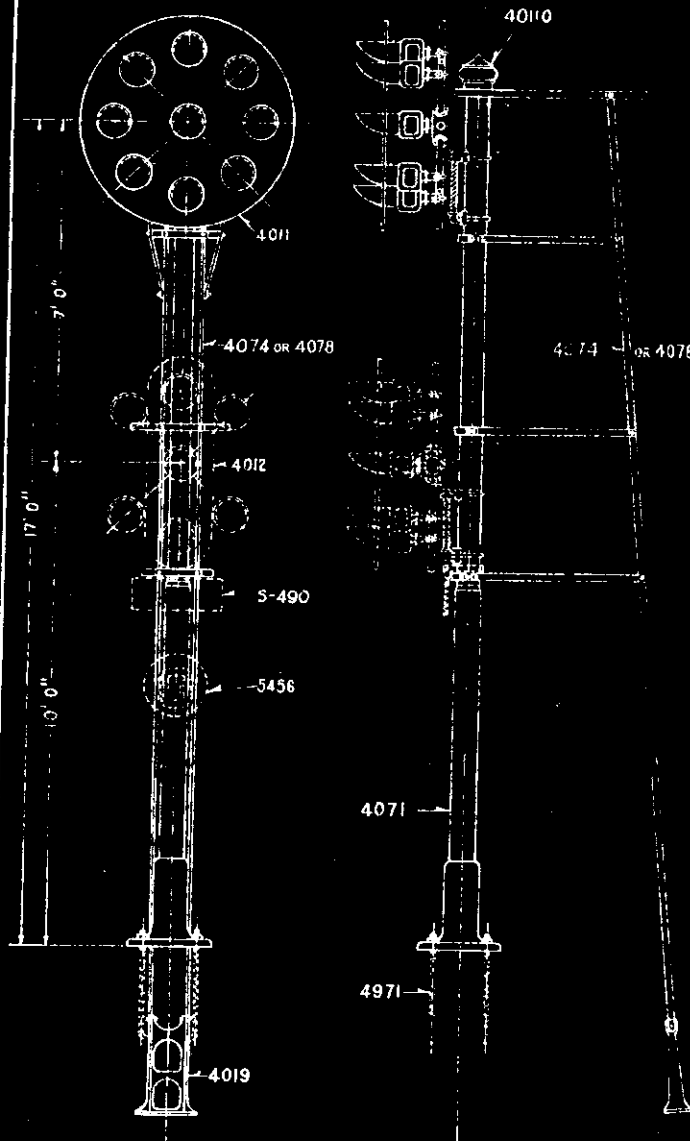
OFFICE OF CHIEF SIGNAL ENGINEER PHILA., PA., AUG. 31, 1925.

Approved

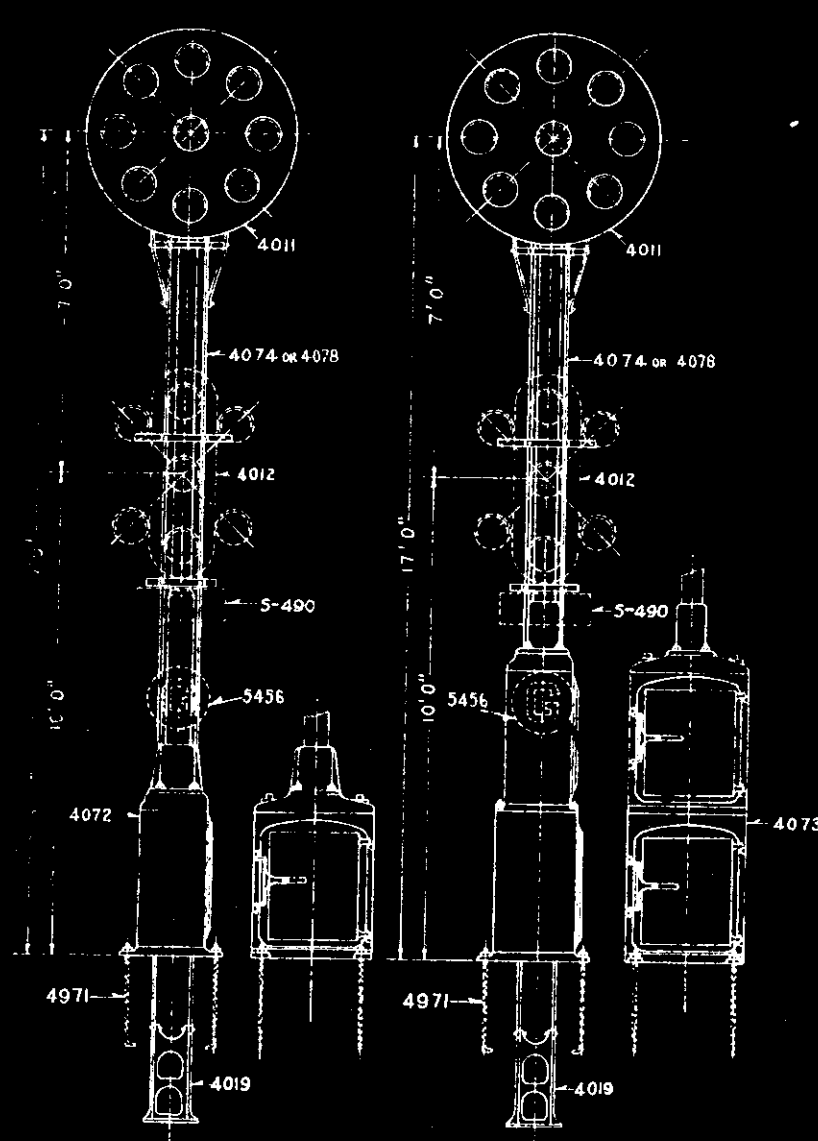
 Chief Signal Engineer

Approved

 Chief Engineer



4061-SIGNAL



4062-SIGNAL

4063-SIGNAL

SIGNAL ASPECTS											
1	2	3	4	5	6	7	8	9	10	11	12
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•

- NOTES:
1. MARKER LIGHT SHALL BE SINGLE LAMP UNIT WITHOUT BACKGROUND BUT WITH NECESSARY FITTINGS FOR ATTACHING TO 5" STANDARD PIPE
 2. SIGNALS SHALL BE COMPLETE WITH HUB, NECESSARY RADIAL PIPING, JUNCTION BOX, BACKGROUND, LAMP UNITS AS ORDERED, BOLTS, ETC., FOR INSTALLATION, EXCEPT FOUNDATION BOLTS WHICH SHALL BE ORDERED FROM STANDARD PLAN S-497
 3. ALL OPENINGS IN BACKGROUND SHALL BE CUT, THOSE NOT USED SHALL BE COVERED WITH SHEET IRON DISCS.
 4. FOR WIRING OF TERMINALS SEE STANDARD PLAN S-858
 5. WHERE SIGNAL IS LOCATED BETWEEN TRACKS, THE TRACKS SHALL BE NOT LESS THAN 20'-0" CENTERS
 6. WHEN ORDERING SIGNALS SPECIFY FIGURE NUMBER, TOGETHER WITH ASPECTS DESIRED.
 7. CIRCULAR BACKGROUND SHALL BE FURNISHED FOR TOP ARM OF ALL SIGNALS.
 8. BACKGROUND 4012 SHALL BE FURNISHED FOR BOTTOM ARM, ONLY WHERE ASPECT NO. 8 OR NO. 8 IS TO BE DISPLAYED.
 9. WHEN NO DETAILED REFERENCE IS SHOWN, THE MANUFACTURER'S STANDARD APPARATUS SHALL BE FURNISHED.
 10. FOUNDATION BOLT HOLES IN BASE CASTINGS SHALL BE FILLED WITH PUTTY AFTER INSTALLATION

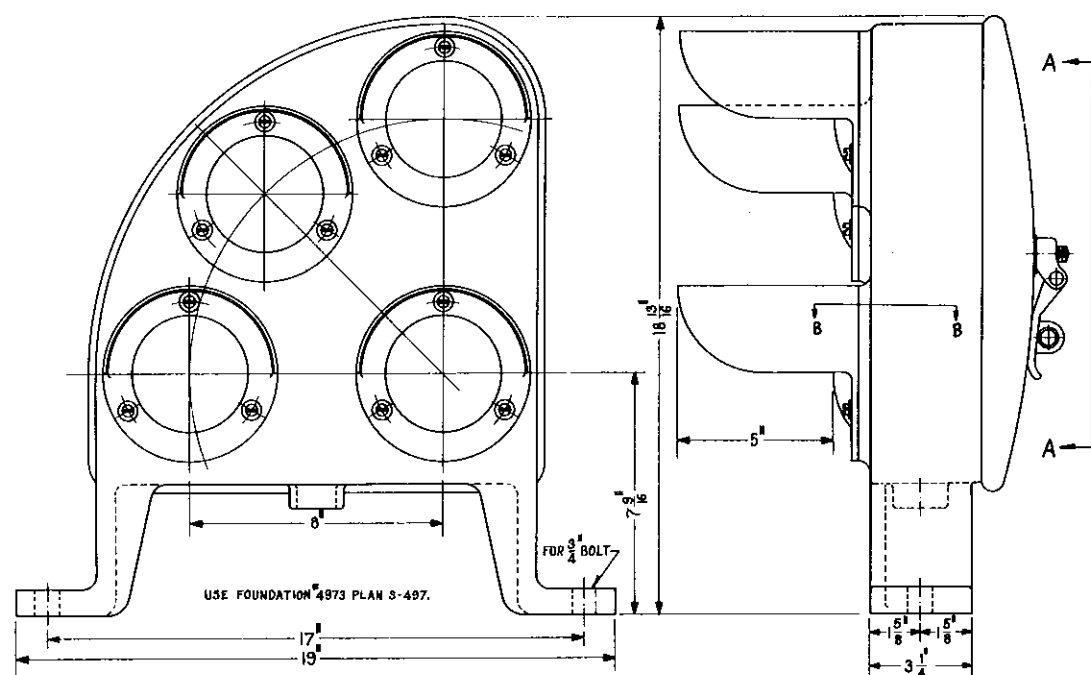
REVISIONS

1 SHEET

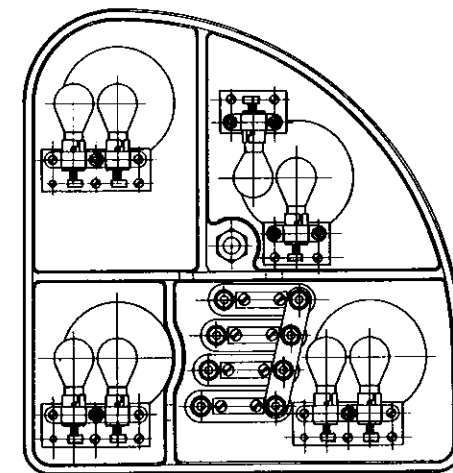
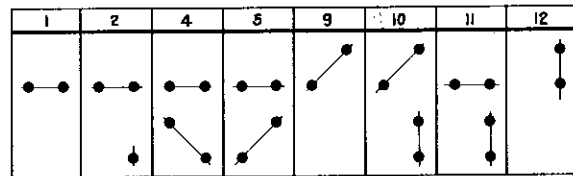
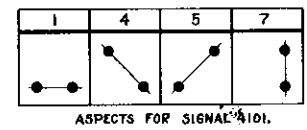
S-406-A

THE PENNSYLVANIA RAILROAD
STANDARD
SIGNALS
POSITION LIGHT

OFFICE OF CHIEF SIGNAL ENGINEER PHILA. PA., MAY 14, 1907
Approved *Art. Lusk* Chief Signal Engineer
Approved *W. H. Lusk* Chief Engineer

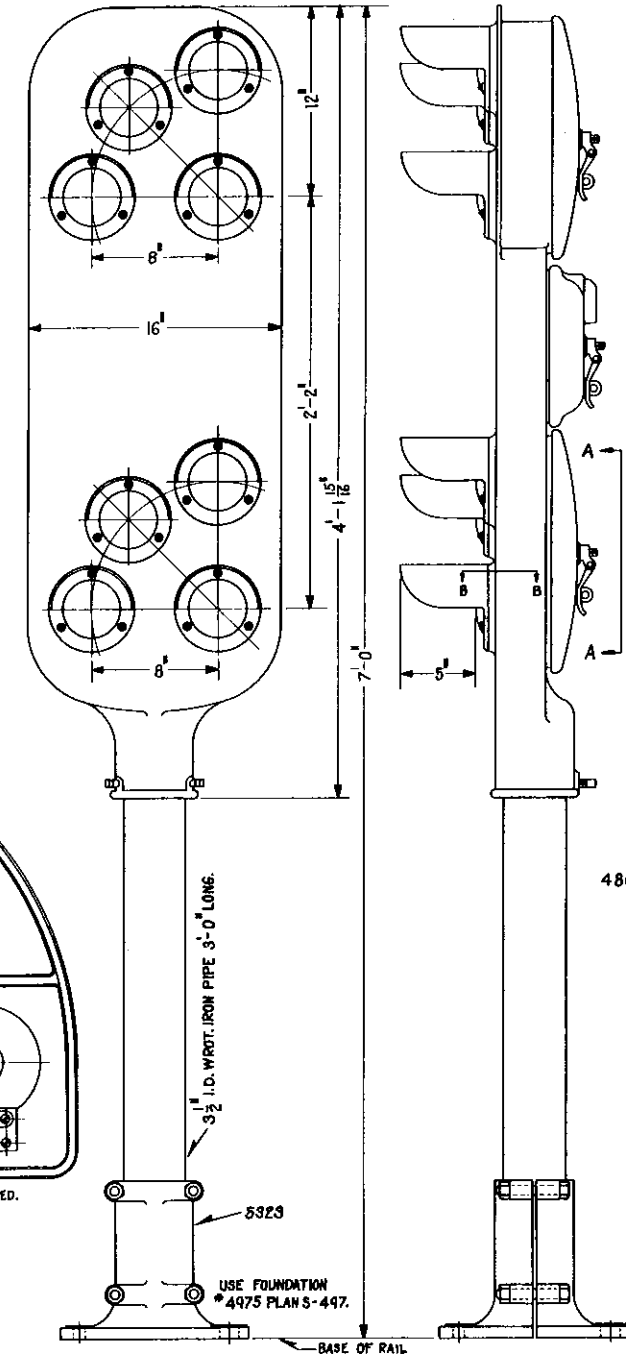


4101-DWARF SIGNAL

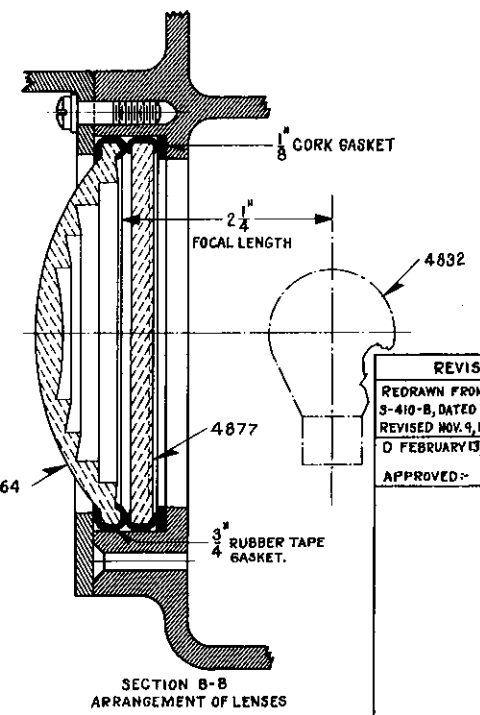


VIEW A-A WITH BACK COVER PLATE REMOVED.

4102-PEDESTAL SIGNAL



- NOTE:-
1. WHEN ORDERING SIGNALS, SPECIFY FIGURE NUMBER, TOGETHER WITH ASPECTS DESIRED.
 2. SIGNALS SHALL BE FURNISHED COMPLETE AS SHOWN WITHOUT LAMPS.
 3. WHEN INSTALLING, SIGNALS SHALL BE WIRED IN ACCORDANCE WITH STANDARD PLAN S-858.
 4. ALL INDICATIONS NOT USED SHALL BE BLANKED.



REVISIONS

1	REDRAWN FROM APPROVED PLAN S-410-B, DATED FEB. 11, 1922, LAST REVISED NOV. 9, 1926 AND REVISED.
2	D. FEBRUARY 13, 1934. E.P.

APPROVED: *att*

1 SHEET

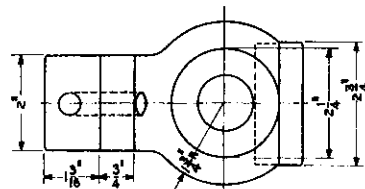
S-410-D

THE PENNSYLVANIA RAILROAD
STANDARD
SIGNALS
POSITION LIGHT

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., FEB. 2, 1935.

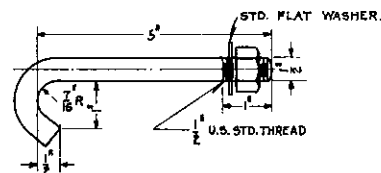
Approved: *A.H. D.* Chief Signal Engineer

Approved: *W.H.* Chief Engineer

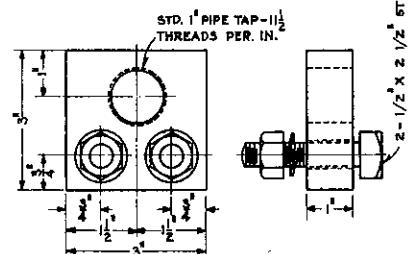


4291 - FLANGE

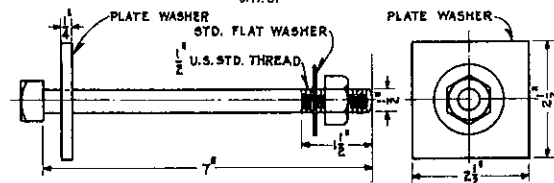
4292 - "
G. I. WITH 4293.



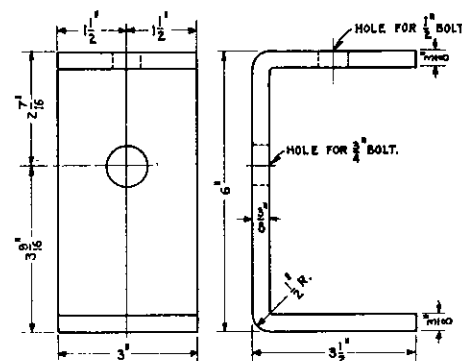
4293 - BOLT
O. H. S.



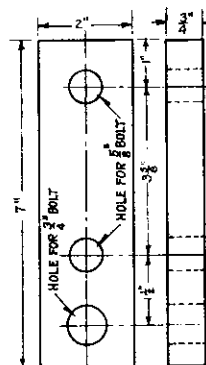
4294 - FLANGE
O. H. S.



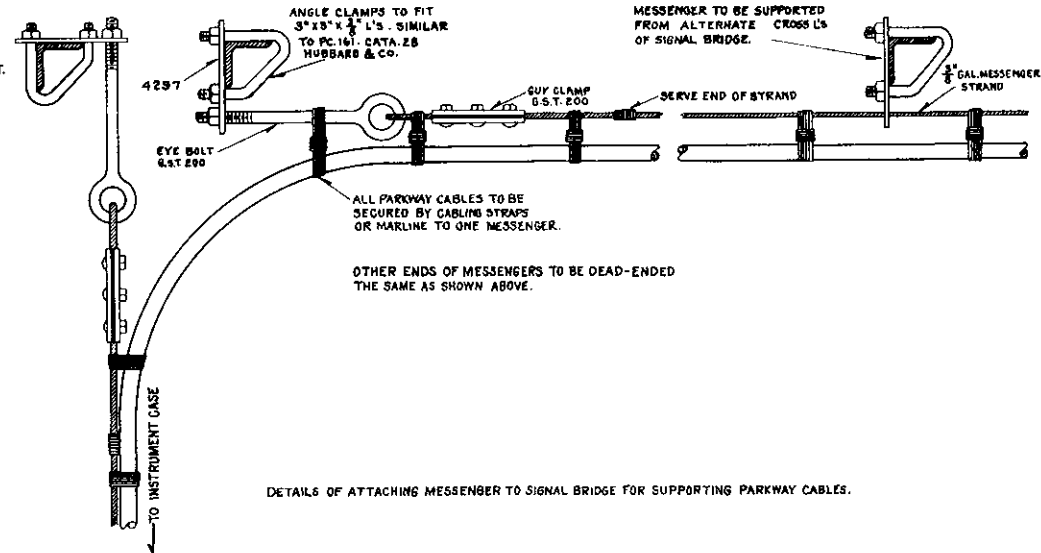
4295 - BOLT
O. H. S.



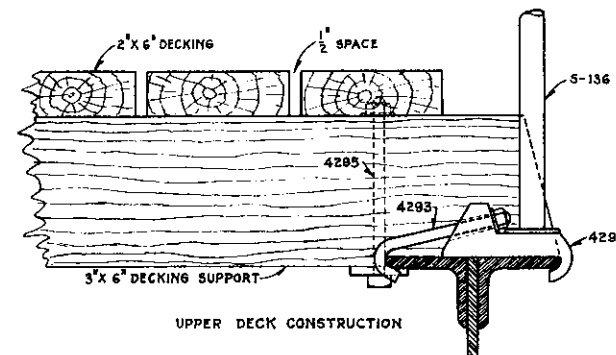
4296 - FILLER
O. H. S.



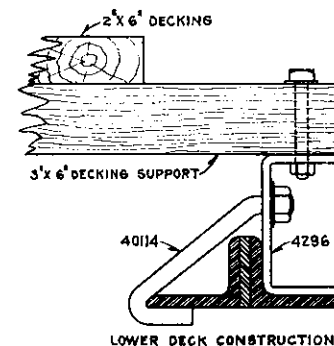
4297 - ANGLE CLAMP WASHER
O. H. S.



DETAILS OF ATTACHING MESSENGER TO SIGNAL BRIDGE FOR SUPPORTING PARKWAY CABLES.



UPPER DECK CONSTRUCTION



LOWER DECK CONSTRUCTION

REVISIONS
REDRAWN FROM APPROVED PLAN 6-429-B, DATED 2-11-22, LAST REVISED 1-26-27, AND REVISED.
D AUGUST 26, 1931, A.K.A.
APPROVED: <i>A.H. Duff</i>

1 SHEET

S-429-D

THE PENNSYLVANIA RAILROAD
STANDARD
PARTS FOR DECKING, RAILING
AND CABLE SUPPORTS
FOR SIGNAL BRIDGES AND CANTILEVERS

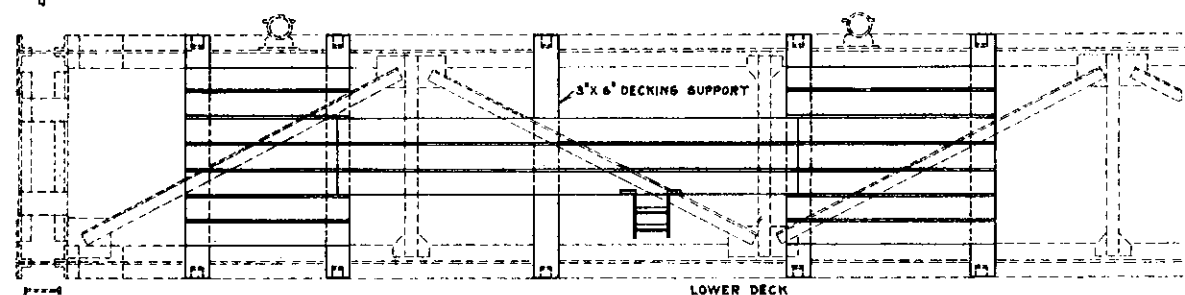
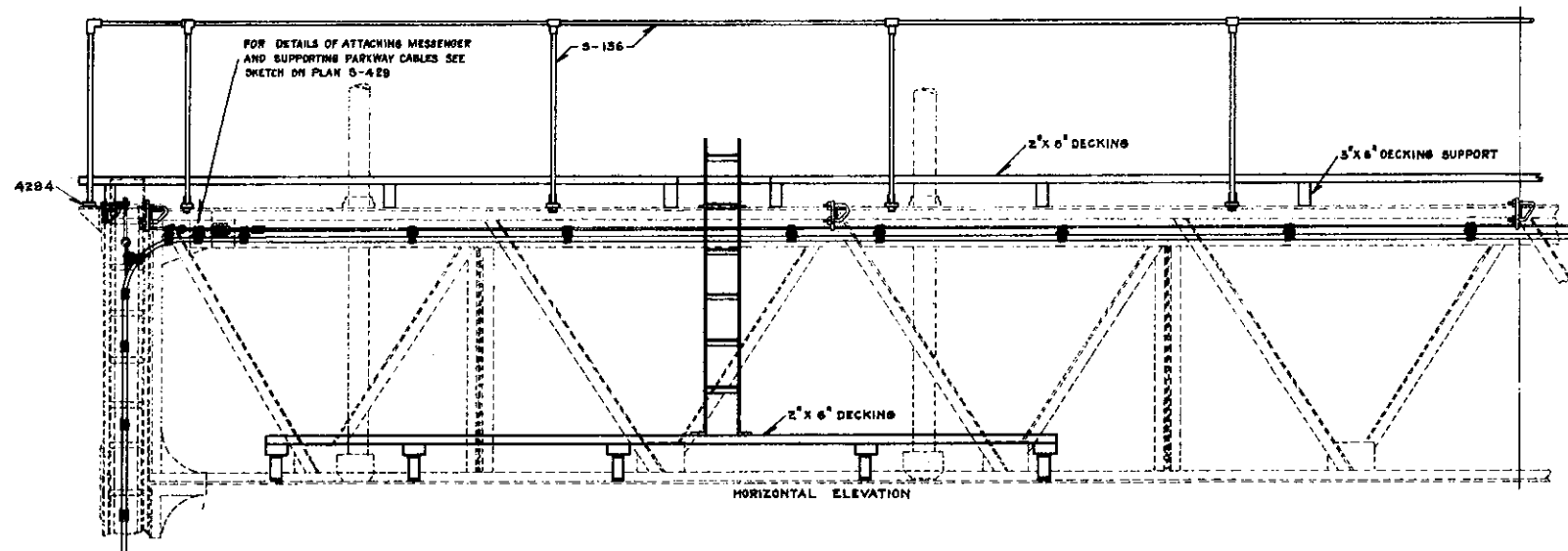
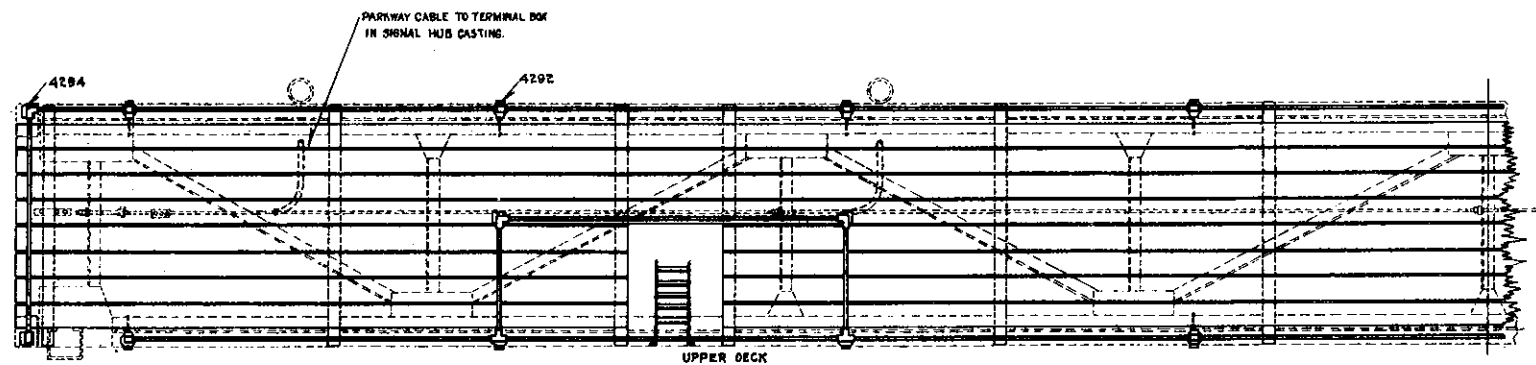
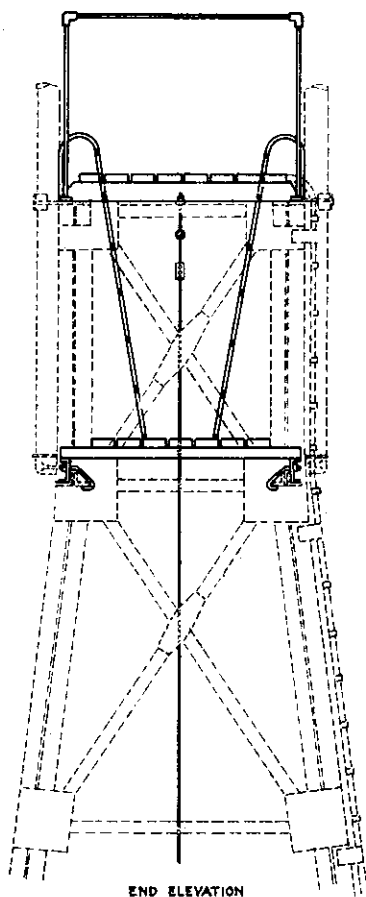
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. MAY 22 1928

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

Approved: *W. H. Duff*
Chief Engineer

NOTE:-

DECKING SHALL BE PAINTED WITH NOT LESS THAN TWO COATS OF SLATE COLORED FIRE RETARDING PAINT APPROVED BY THE CHIEF SIGNAL ENGINEER.



REVISIONS

REVISION IN PART FROM APPROVED PLAN S-430-A, DATED 2-11-22, AND REVISED.

B AUGUST 26, 1921.

APPROVED - *A.H. Hunt*

1 SHEET

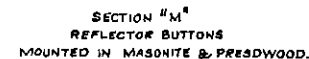
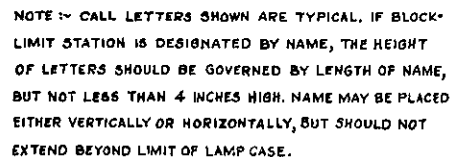
S-432-B

THE PENNSYLVANIA RAILROAD
STANDARD
ARRANGEMENT OF DECKING
RAILING AND CABLE SUPPORTS
ON SIGNAL BRIDGES

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. MAY 22, 1922

Approved *A.H. Hunt* Chief Signal Engineer

Approved *J. Williams* Chief Engineer



O. H. S.
STORES CAT. REF. NO. 2A-384



O. H. S.
STORES CAT. REF. NO. 2A-41C9.

REVISIONS

REDRAWN FROM APPROVED PLAN
S-464-B, DATED AUGUST 4, 1922,
LAST REVISED JULY 31, 1924 AND
REVISED AS FOLLOWS:-
TITLE FORMERLY "SIGN FOR UN-
ATTENDED BLOCK STATION"
APPROACH BLOCK LIMIT SIGN AND
NOTES ADDED.

D. MAY 17, 1944.
NOTE 7 AMPLIFIED. NOTES 8, 9 & SECTION
"M" ADDED. SECTION FOR WOOD SIGN
DESIGNATED AS "W." DISTANCE FROM
GAUGE LINE FORMERLY 7'-6".

APPROVED:- N. L. Stanku

NOTES :-

BLOCK-LIMIT SIGNAL

1. PAINT FRONT, BACK AND EDGES OF CALL BOARD BLACK, AND THE LETTERS WHITE.
2. PAINT MAST AND LAMP CASE BLACK.
3. LETTERS SHALL BE CONDENSED TYPE IN ACCORDANCE WITH M.W. PLAN NO. 78000-C.

APPROACH BLOCK-LIMIT SIGN.

4. PAINT FACE OF SIGN, CLEVELAND BUFF WITH LETTERS BLACK
5. PAINT EDGES & BACK OF SIGN AND PIPE POST BLACK.
6. LETTERS SHALL BE FULL WIDTH IN ACCORDANCE WITH M.W. PLAN NO. 78000-C.
7. REFLECTOR BUTTONS SHALL BE CLEAR (COLORLESS) SIMILAR TO TYPE 2A "REFLEX" BUTTON, PEERLESS MFG. CO. ($\frac{11}{16}$ " DIA.) OR CODE M, STIMSONITE REFLECTOR BUTTON ($\frac{11}{16}$ " DIA.)
8. BOILER TUBING AND $\frac{1}{2}$ x 3" BOLTS AND WASHERS TO BE FURNISHED BY THE P.R.R.CO.
9. SIGN MAY BE ATTACHED TO BUILDING OR OTHER STRUCTURE TO SUIT LOCAL CONDITIONS, BUT NOT TO SIGNAL MAST.

1 SHEET



S-464-D

THE PENNSYLVANIA RAILROAD

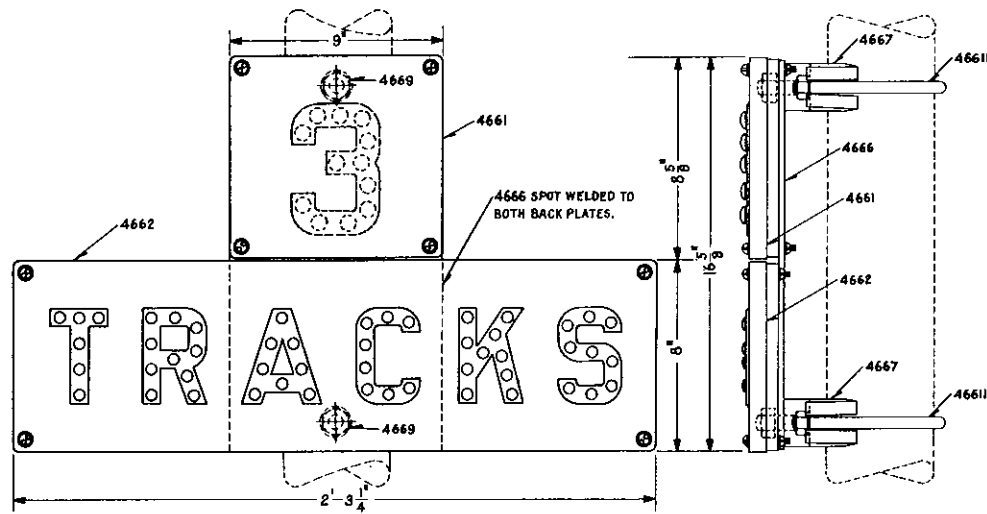
STANDARD
BLOCK-LIMIT SIGNAL

APPROACH BLOCK-LIMIT SIGN

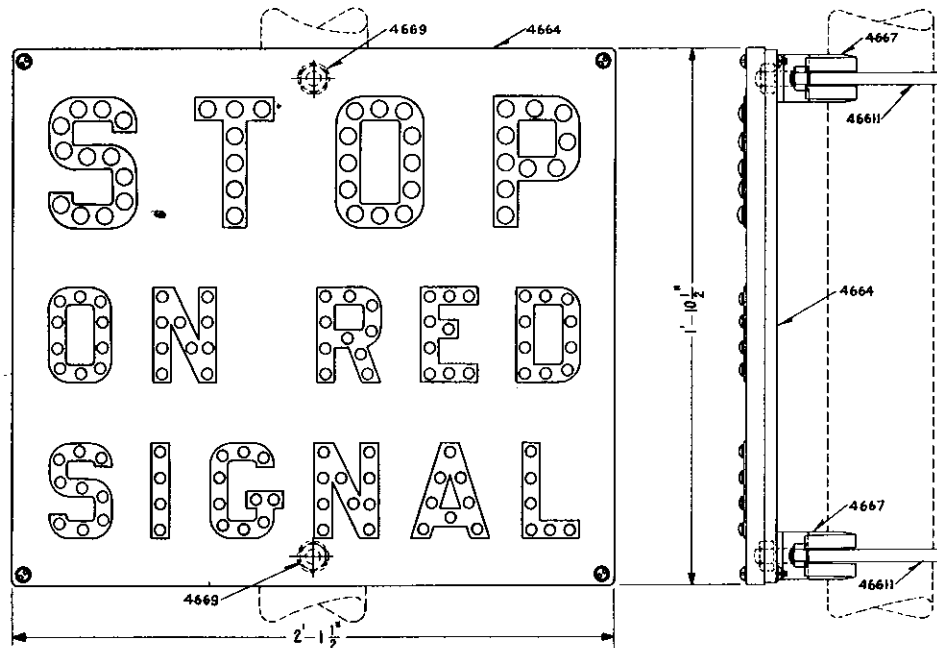
OFFICE OF CHIEF ENGINEER, PHILA., PA., JUNE 18, 1943.

Approved
H. L. Stanton.
Assistant Chief Engineer - Signals

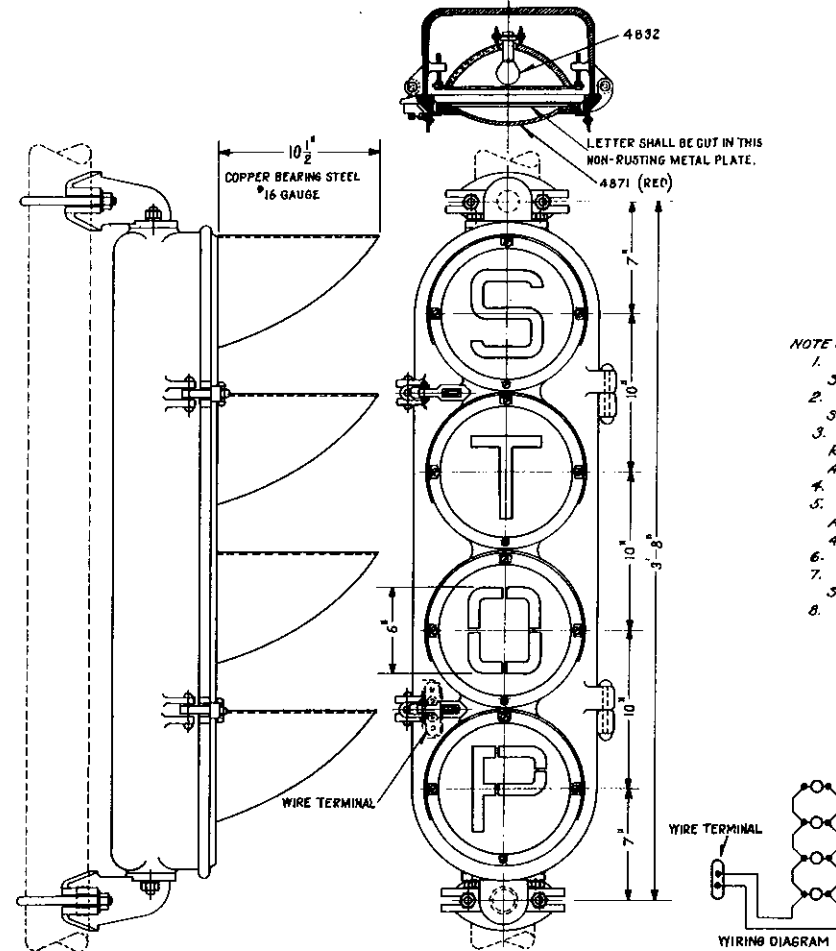
Approved 
Chief Engineer



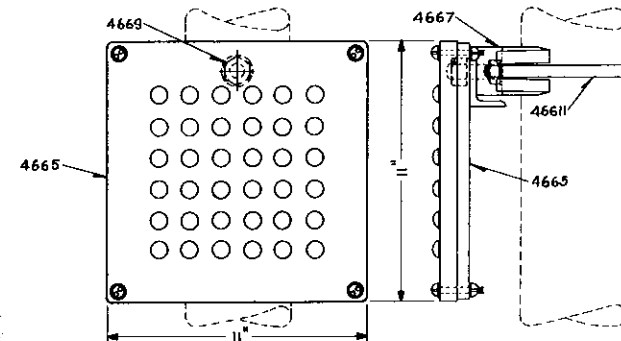
4651 REFLECTOR TRACKS SIGN COMPLETE
SPECIFY NUMERAL REQUIRED ON REQUISITION.
A. R. A. MANUAL MAY 1933.



4652 REFLECTOR STOP ON RED SIGNAL SIGN COMPLETE
A. R. A. MANUAL MAY 1933



4653 ILLUMINATED STOP SIGN COMPLETE



4654 REFLECTOR CROSSING SIGNAL MARKER COMPLETE
A. R. A. MANUAL MAY 1933

- NOTE:-
1. WHERE NO DETAIL REFERENCE IS GIVEN, THE MANUFACTURER'S STANDARD APPARATUS SHALL BE FURNISHED.
 2. SIGN 4653 SHALL BE WIRED IN ACCORDANCE WITH DIAGRAM SHOWN.
 3. LIGHT UNITS OF SIGN 4653 SHALL BE EQUIPPED WITH INSULATED RECEPTACLES FOR SINGLE CONTACT BAYONET CANDELABRA BASES AND WIRE TERMINAL.
 4. FOR CONTROL CIRCUITS FOR SIGN 4653 SEE PLAN NO. S-860.
 5. UNLESS OTHERWISE SPECIFIED, SIGNS SHALL BE FURNISHED ASSEMBLED COMPLETE WITH ALL PARTS FOR ATTACHING TO 4\" O.D. PIPE POST.
 6. FOR APPLICATION OF SIGNS SEE PLAN NO. 66207.
 7. FOR SPECIFICATIONS FOR REFLECTOR SIGNS AND REFLECTOR BUTTONS SEE PLAN S-467.
 8. FOR DETAILS OF REFLECTOR SIGNS SEE PLAN S-466.

REVISIONS
REDRAWN FROM APPROVED PLAN
S-465-A, DATED JUNE 28, 1932
AND REVISED.

1 SHEET

S-465-B

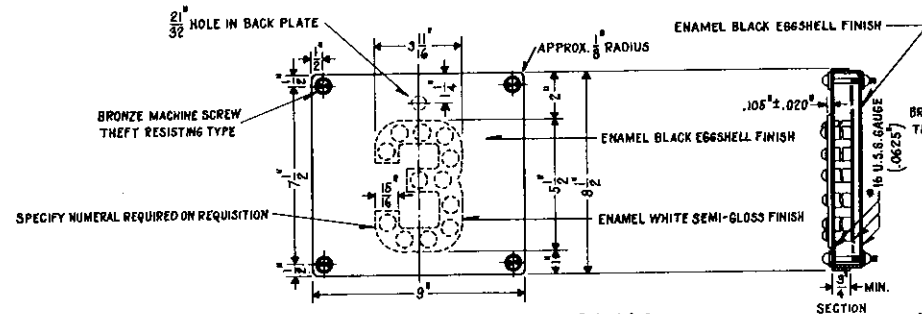
THE PENNSYLVANIA RAILROAD
STANDARD
SIGNS

ILLUMINATED AND REFLECTING
FOR HIGHWAY CROSSINGS

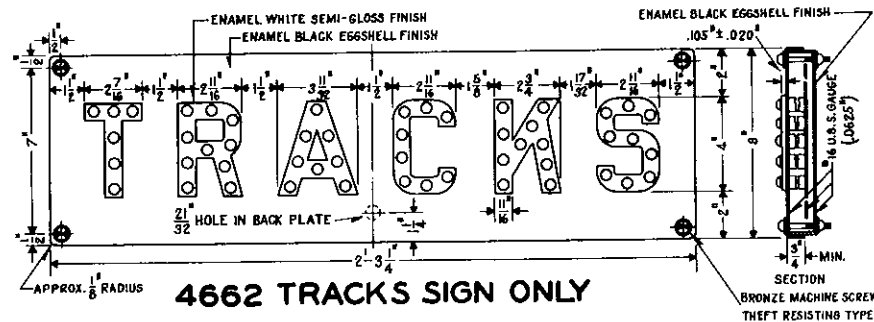
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCTOBER 31, 1933.

Approved
Chief Signal Engineer

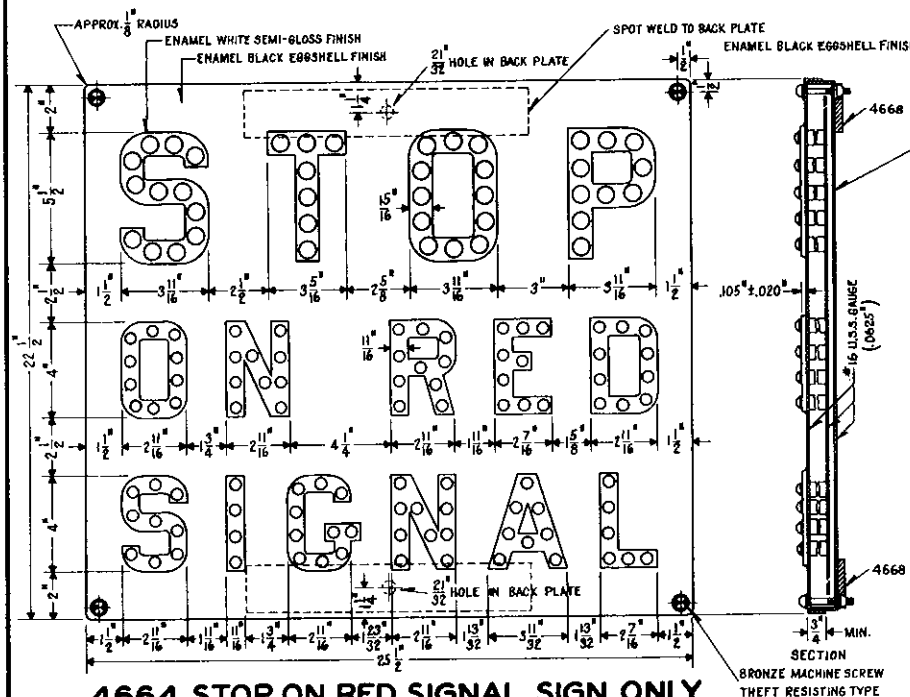
Approved
Chief Engineer



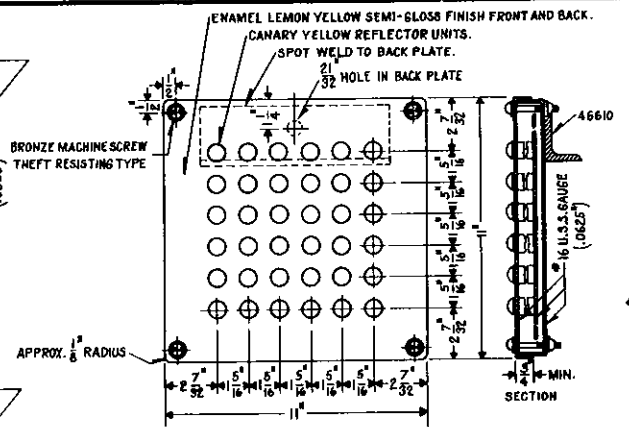
4661 NUMERAL SIGN ONLY



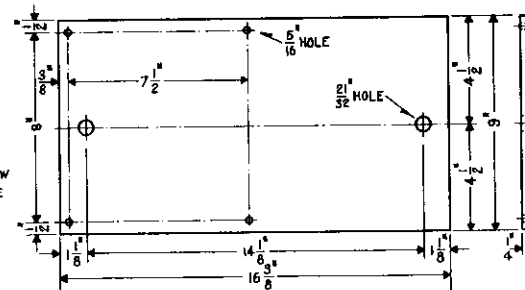
4662 TRACKS SIGN ONLY



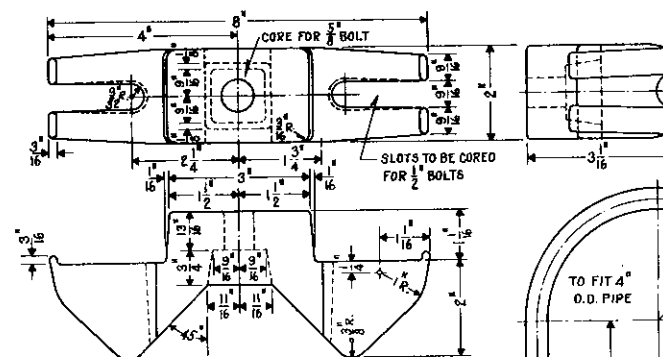
4664 STOP ON RED SIGNAL SIGN ONLY



4665 CROSSING SIGNAL MARKER ONLY



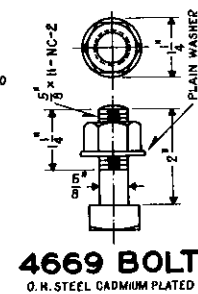
4666 SUPPORTING PLATE
O.H. STEEL



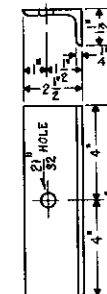
4667 ADAPTER CLAMP
CAST IRON



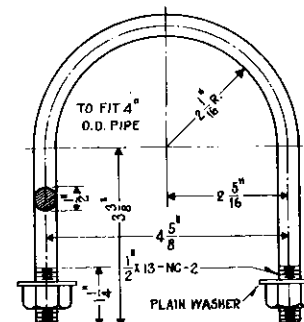
4668 STRAP
O.H. STEEL



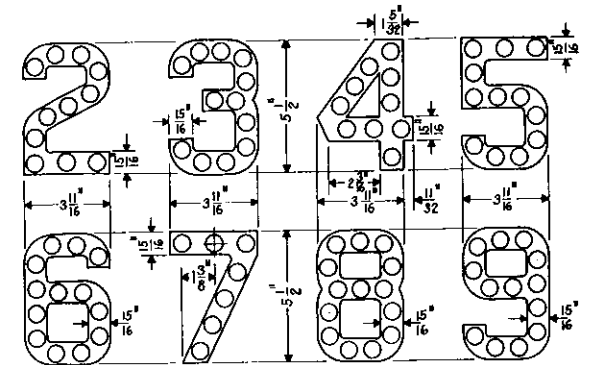
4669 BOLT
O.H. STEEL CADMIUM PLATED



46610 ANGLE
O.H. STEEL



46611 U BOLT
O.H. STEEL
NOT A.R.A. STD.



OUTLINES OF NUMERALS FOR SIGN 4661

- NOTE 1-
1. NUMBER AND SPACING OF REFLECTOR UNITS SHALL BE AS SHOWN.
2. FOR SPECIFICATIONS FOR REFLECTOR SIGNS AND REFLECTOR UNITS SEE PLAN S-467.
3. FOR ASSEMBLY OF REFLECTOR SIGNS SEE PLAN S-465.

A. R. A. MANUAL MAY 1933.

REVISIONS

1 SHEET

S-466-A

THE PENNSYLVANIA RAILROAD
STANDARD
SIGNS

DETAILS OF REFLECTOR SIGNS
FOR HIGHWAY CROSSINGS

Approved
A. H. [Signature]
Chief Signal Engineer

Approved
[Signature]
Chief Engineer

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCTOBER 9, 1933.

SPECIFICATION FOR REFLECTOR UNITS.
(A. R. A. SIGNAL SECTION SPECIFICATION 156-33.)

1. PURPOSE.
(a) THE PURPOSE OF THIS SPECIFICATION IS TO PROVIDE A REFLECTOR UNIT FOR REFLECTOR SIGNS FOR RAILROAD HIGHWAY GRADE CROSSING PROTECTION.
2. TENDER.
(b) THE TENDER SHALL BE FOR APPARATUS MEETING THE REQUIREMENTS OF THIS SPECIFICATION. IF THE CONTRACTOR WISHES TO VARY FROM THE SPECIFICATION, A TENDER MAY BE SUBMITTED COVERING THE APPARATUS HE DESIRES TO FURNISH. THIS TENDER SHALL BE ACCOMPANIED BY FULL INFORMATION SHOWING WHEREIN THE REQUIREMENTS OF THIS SPECIFICATION ARE NOT MET.
3. MATERIAL AND WORKMANSHIP.
(a) MATERIAL AND WORKMANSHIP SHALL BE FIRST-CLASS IN EVERY RESPECT.
4. TYPE.
(a) THE REFLECTOR UNIT SHALL BE OF THE SINGLE OR DOUBLE REFRACTION TYPE AND SHALL BE IN ACCORDANCE WITH PURCHASER'S REQUIREMENTS.
5. LENSES.
(b) THE LENS SHALL BE MADE OF CLEAR COLORLESS OR CANARY YELLOW GLASS OF UNIFORM REFLECTING POWER. IT SHALL BE ACCURATELY FORMED AND FREE FROM ALL DEFECTS WHICH WOULD AFFECT ITS OPTICAL OR PHYSICAL PROPERTIES. IT SHALL BE PRACTICALLY FREE FROM CHROMATIC ABERRATION WHEN VIEWED WITHIN AN ANGLE OF 30 DEG. FROM ITS AXIS.
(b) THE LENS SHALL BE SO DESIGNED THAT A LIGHT AT ANY POINT WITHIN 30 DEG. OF THE AXIS OF THE LENS WILL BE REFLECTED TO A POINT 40 IN. ABOVE THE SOURCE WITH SATISFACTORY INTENSITY. THE SOURCE OF LIGHT SHALL BE AN APPROVED TYPE OF AUTOMOBILE HEADLIGHT AND SHALL BE LOCATED 300 FT. FROM REFLECTOR UNIT.
6. REFLECTOR UNITS.
(a) THE REFLECTOR UNIT SHALL BE OF SUBSTANTIAL DESIGN, ACCURATELY FORMED AND CONSTRUCTED FOR CORRECT FOCUS.
(b) IF THE REFLECTOR UNIT IS OF THE DOUBLE REFRACTION TYPE, IT SHALL BE ACCURATELY FITTED TO THE LENS AND THE TWO SHALL BE SEALED INTO A CORROSION RESISTING RETAINER SO AS TO FORM A JOINT THAT WILL PREVENT THE ADMISSION OF LIQUID OR GAS BETWEEN THE REFLECTOR AND LENS.
(c) IF THE REFLECTOR UNIT IS OF THE SINGLE REFRACTION TYPE, THE REFLECTOR BACKING SHALL CONSIST OF A HEAVY COAT OF METALLIC SILVER. IT SHALL BE HOMOGENEOUS, EVENLY APPLIED TO THE SURFACE OF THE GLASS AND BE SO FITTED AS TO FORM AN AIR-TIGHT JOINT BETWEEN IT AND THE GLASS. THE BACKING SHALL BE SUCH THAT IT WILL PREVENT THE ADMISSION OF AIR OR ANY FOREIGN SUBSTANCE BETWEEN IT AND THE GLASS. OVER THE REFLECTIVE BACKING SHALL BE PLACED A PROTECTIVE BACKING OF ONE HEAVY COAT OF METALLIC COPPER, AND OVER THIS COPPER PLATE A COATING OF PROTECTIVE MATERIAL WHICH SHALL SO SEAL THE BACKING AS TO RENDER IT WATERPROOF AND AIR-TIGHT.
7. MOUNTING.
(a) THE REFLECTOR UNIT SHALL BE DESIGNED SO AS TO ENTER THE APERTURE IN THE FACE OF SIGN FROM THE REAR AND SHALL BE HELD IN A FIXED RELATION TO THE FACE OF SIGN WITH ITS AXIS NORMAL TO THE APERTURE.
(b) THE REFLECTOR UNIT SHALL BE SO CONSTRUCTED THAT NOT MORE THAN 1/32 IN. OF THE RETAINER OR HOUSING SHALL BE EXPOSED TO VIEW WHEN THE REFLECTOR UNIT IS ASSEMBLED IN THE SIGN.
8. INSPECTION.
(a) PURCHASER MAY INSPECT MATERIAL AT ALL STAGES OF MANUFACTURE.
(b) PURCHASER MAY INSPECT THE COMPLETED PRODUCT TO DETERMINE THAT THE REQUIREMENTS OF THIS SPECIFICATION HAVE BEEN MET.
(c) IF MATERIAL HAS NOT BEEN ACCEPTED AT POINT OF PRODUCTION AND, UPON ARRIVAL AT DESTINATION, IT DOES NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, IT MAY BE REJECTED, AND THE CONTRACTOR, UPON REQUEST, SHALL ADVISE THE PURCHASER WHAT DISPOSITION IS TO BE MADE OF THE DEFECTIVE MATERIAL. CONTRACTOR SHALL PAY ALL FREIGHT CHARGES.
(d) IF PURCHASER IS TO MAKE INSPECTION AT POINT OF PRODUCTION IT SHALL BE SO STATED.
9. TESTS.
(a) TESTS MAY BE MADE AT POINT OF PRODUCTION, OR ON SAMPLES SUBMITTED, AND MAY ALSO BE MADE AT DESTINATION.
(b) CONTRACTOR SHALL GIVE THE PURCHASER SUFFICIENT NOTICE OF TIME WHEN MATERIAL WILL BE READY FOR TESTING.
(c) CONTRACTOR SHALL PROVIDE, AT POINT OF PRODUCTION, APPARATUS AND LABOR FOR MAKING REQUIRED TESTS UNDER SUPERVISION OF THE PURCHASER.
(d) IF TESTS ARE TO BE MADE AT POINT OF PRODUCTION, THE PURCHASER SHALL SO STATE AND ALSO INDICATE WHICH OF THE TESTS HEREIN SPECIFIED ARE TO BE MADE AND WHAT PORTION OF THE MATERIAL SHALL BE TESTED.
(e) THE FOLLOWING TESTS SHALL BE MADE:
1. ABILITY TO RESIST CORROSION.
2. INTEGRITY OF SEALING.
(b) IMMERSION TEST.
(b) HYDRAULIC PRESSURE.

- (f) SAMPLING.
1. ONE HUNDRED REFLECTOR UNITS WILL BE SELECTED BY THE PURCHASER AT RANDOM FROM A LOT OF AT LEAST 2500.
2. FROM THE GROUP OF 100 UNITS, 25 WILL BE SELECTED AT RANDOM FOR TESTS.
10. DESCRIPTION OF TESTS.
(a) SALT-WATER SPRAY (CORROSION TEST).
1. THE COMPLETE REFLECTOR UNITS AS USED IN THE SIGN SHALL BE SUBJECTED WITH A 20 PER CENT SALT-WATER SOLUTION FOR 48 HOURS. REFLECTOR UNITS SHALL THEN BE EXAMINED FOR EVIDENCE OF CORROSION; IF ANY APPEAR THE LOT REPRESENTED BY THE SAMPLES SHALL BE REJECTED.
(b) IF THE REFLECTOR UNIT IS OF THE DOUBLE REFRACTION TYPE:
1. THE REFLECTOR UNIT SHALL BE ALTERNATELY IMMERSUED FOR TEN MINUTES IN TWO BATHS OF COLORED WATER, ONE AT A TEMPERATURE APPROXIMATELY 33 DEG. F., THE OTHER 170 DEG. F. REPEAT THIS ALTERNATE IMMERSION TEN TIMES, AFTER WHICH THE REFLECTOR UNITS SHALL BE EXAMINED FOR LEAKAGE. IF LEAKAGE HAS OCCURRED THE LOT REPRESENTED BY THE SAMPLES SHALL BE REJECTED.
2. THE SEALING BETWEEN THE LENS AND THE CAP OF THE REFLECTOR UNIT SHALL BE SUCH AS TO BE WATER-TIGHT UNDER A HYDRAULIC PRESSURE OF 10 LB. PER SQUARE INCH IN COLORED WATER FOR A PERIOD OF 1 MINUTE. AFTER THE REFLECTOR UNITS HAVE BEEN SUBJECTED TO THIS TEST THEY SHALL BE EXAMINED FOR LEAKAGE. IF LEAKAGE HAS OCCURRED THE LOT REPRESENTED BY THE SAMPLES SHALL BE REJECTED.
(c) IF THE REFLECTOR UNIT IS OF THE SINGLE REFRACTION TYPE:
1. THE BACKING SHALL NOT BE AFFECTED BY EITHER 20 PER CENT SALT-WATER SOLUTION AT ROOM TEMPERATURE, FRESH WATER AT 170 DEG. F., OR A DRY TEMPERATURE OF 170 DEG. F. THE BACKING SHALL BE SUBJECTED TO THE SALT WATER FOR A PERIOD OF 24 HOURS AND TO THE FRESH WATER FOR A PERIOD OF 4 HOURS IMMEDIATELY FOLLOWING THE SALT-WATER IMMERSION AND THEN KEPT AT A DRY TEMPERATURE OF 170 DEG. F. FOR 4 HOURS. THE PROTECTIVE COATING SHALL BE OF SUCH MATERIAL AND SO APPLIED AS NOT TO BE READILY RUBBED OFF AFTER THE ABOVE TESTS HAVE BEEN MADE CONSECUTIVELY. IF GLASS HAS CRACKED DURING THE TEST OR IF REFLECTIVE BACKING HAS BEEN DAMAGED OR IF PROTECTIVE COATING IS READILY RUBBED OFF, THE LOT REPRESENTED BY THE SAMPLES SHALL BE REJECTED.

11. PACKING.
(a) MATERIAL SHALL BE SO PREPARED AS TO PERMIT CONVENIENT HANDLING AND TO PROTECT AGAINST LOSS OR DAMAGE DURING SHIPMENT.
12. MARKING.
(a) PURCHASER'S ORDER, REQUISITION AND PACKAGE NUMBER, NAME OF CONSIGNOR, AND NAME AND ADDRESS OF CONSIGNEE, SHALL BE PLAINLY MARKED ON OUTSIDE OF PACKAGE.
13. WARRANTY.
(a) 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 MAKING, AT POINT OF PRODUCTION, ANY PART OR PARTS TO REPLACE THOSE WHICH SHALL BE FOUND DEFECTIVE WITHIN TWO YEARS AFTER SHIPMENT TO 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 JUDGEMENT, ITS PROPER FUNCTIONING OR RELIABILITY, OR WHICH HAS BEEN SUBJECT TO MISUSE, NEGLIGENCE OR ACCIDENT.

SPECIFICATION FOR REFLECTOR SIGNS.
(A. R. A. SIGNAL SECTION SPECIFICATION 155-33.)

1. PURPOSE.
(a) THE PURPOSE OF THIS SPECIFICATION IS TO PROVIDE SIGNS OF VARIOUS DESIGNS FOR RAILROAD HIGHWAY GRADE CROSSING PROTECTION.
2. TENDER.
(a) THE TENDER SHALL BE FOR APPARATUS MEETING THE REQUIREMENTS OF THIS SPECIFICATION. IF THE CONTRACTOR WISHES TO VARY FROM THE SPECIFICATION, A TENDER MAY BE SUBMITTED COVERING THE APPARATUS HE DESIRES TO FURNISH. THIS TENDER SHALL BE ACCOMPANIED BY FULL INFORMATION SHOWING WHEREIN THE REQUIREMENTS OF THIS SPECIFICATION ARE NOT MET.
3. MATERIAL AND WORKMANSHIP.
(a) MATERIAL AND WORKMANSHIP SHALL BE FIRST-CLASS IN EVERY RESPECT.
4. SHEET STEEL.
(a) SHEET STEEL SHALL BE CORROSION RESISTING. THE TOTAL AMOUNT OF CARBON, MANGANESE, PHOSPHORUS, SULPHUR AND SILICON SHALL NOT EXCEED 0.70 PER CENT. IF THE TOTAL AMOUNT OF THESE FIVE ELEMENTS EQUALS OR EXCEEDS 0.20 PER CENT THE METAL SHALL CONTAIN NOT LESS THAN 0.17 PER CENT COPPER AND NOT MORE THAN 0.04 PER CENT SULPHUR. IF THE TOTAL OF THESE FIVE ELEMENTS IS LESS THAN 0.20 PER CENT AND SULPHUR IS NOT GREATER THAN 0.04 PER CENT THE PRESENCE OF COPPER IS OPTIONAL.
(b) THE BASE METAL SHALL BE UNIFORMLY COATED WITH A GOOD QUALITY OF ZINC AND THE SURFACE OF THE COATED METAL SHALL BE OF SUCH NATURE THAT THE PRIMER SPECIFIED WILL ADHERE FIRMLY. THE ZINC COATING SHALL BE APPLIED BY THE HOT DIP PROCESS AND HEAT-TREATED IN SUCH A MANNER AS TO GIVE A TIGHT DULL COAT WHICH WILL NOT PEEL NOR FLAKE ON THE OUTSIDE OF A BEND WHEN BENT DOWN FLAT. THE DULL COATED SURFACE OF THE SHEET SHALL HAVE THE CHARACTERISTICS OF A MATTE AND SHALL BE FREE FROM BRIGHT OR GLOSSY SPANGLS.
5. REFLECTOR UNITS.
(a) REFLECTOR UNITS SHALL CONFORM TO SPECIFICATION SHOWN ON THIS SHEET.
(b) REFLECTOR UNITS, ASSEMBLED IN SIGNS WHICH CARRY A LEGEND, SHALL BE COLORLESS.
(c) REFLECTOR UNITS, ASSEMBLED IN MARKER SIGN WHICH CARRIES NO LEGEND, SHALL BE CANARY YELLOW.
(d) REFLECTOR UNITS HAVING AN EXPOSED DIAMETER OF 0.40 TO 0.50 IN. SHALL BE USED IN LETTERS 4 INCHES IN HEIGHT. REFLECTOR UNITS HAVING AN EXPOSED DIAMETER OF 0.590 TO 0.684 IN. SHALL BE USED IN LETTERS AND NUMERALS 5 1/2 INCHES IN HEIGHT AND ALSO IN MARKER SIGN.
(e) REFLECTOR UNITS SHALL BE HELD IN A FIXED RELATION TO THE APERTURE WITH THEIR AXES NORMAL TO THE FACE OF SIGN.
(f) REFLECTOR UNITS SHALL BE HELD IN POSITION IN FRONT PLATE BY MEANS OF AN INTERMEDIATE PLATE. THE INTERMEDIATE PLATE SHALL BE READILY REMOVABLE AND REPLACEABLE WITHOUT THE USE OF TOOLS AND WHEN REMOVED SHALL RELEASE REFLECTOR UNITS.
(g) REFLECTOR UNITS SHALL PROJECT NOT MORE THAN 1/4 IN. OUTSIDE OF APERTURE.
(h) A DURABLE WATERPROOFING BASKET OF NON-CORROSIVE MATERIAL SHALL BE USED BETWEEN REFLECTOR UNITS AND FRONT PLATE.
6. DESIGN, SHEET STEEL SIGNS.
(a) THE FRONT, BACK, AND INTERMEDIATE PLATES SHALL BE NO. 16 U.S. STANDARD GAUGE (0.0625 IN.).
(b) REINFORCING METAL PARTS OR SUPPORTING PLATES USED IN BACK OF SIGNS SHALL BE 1/4 INCH IN THICKNESS.
(c) THE EDGES OF THE SIGN SHALL BE FLANGED TO A DEPTH OF NOT LESS THAN 3/16 IN.
(d) FLANGES SHALL BE WELDED AT CORNERS.
(e) THE FRONT PLATE SHALL BE SLIGHTLY LARGER THAN THE BACK PLATE SO THAT IT WILL FREELY TELESCOPE OVER THE FLANGES OF THE BACK PLATE.
(f) THE FRONT PLATE SHALL HAVE THE LEGEND OF THE SIGN EMBOSSED UPON IT. THE EMBOSSED NUMERALS AND LETTERS SHALL BE RAISED NOT LESS THAN 0.085 IN. NOR MORE THAN 0.125 IN.
(g) THE DIMENSION, INSIDE, BETWEEN THE FRONT AND BACK PLATES SHALL BE SUCH AS IS NECESSARY TO MEET THE REQUIREMENTS OF THIS SPECIFICATION AND THE PARTICULAR REFLECTOR UNIT ASSEMBLED IN THE SIGN.
(h) THE FRONT PLATE SHALL BE ATTACHED TO THE BACK PLATE BY BRONZE SCREWS OF SPECIAL DESIGN WHICH CANNOT BE REMOVED WITH AN ORDINARY SCREW DRIVER. IF NUTS ARE USED THEY SHALL BE SO DESIGNED THAT THEY CANNOT BE REMOVED WITH ORDINARY PLIERS, WRENCH, OR SCREW DRIVER.
7. ENAMELING, SHEET STEEL SIGNS.
(a) METAL SHALL BE THOROUGHLY CLEANED IN ORDER TO SECURE A PERFECT SURFACE FOR PAINTING.
(b) ONE COAT OF SUITABLE IRON OXIDE PRIMER OF THE LONG OIL TYPE SHALL BE APPLIED TO ALL SURFACES.
(c) SUBSEQUENT TO THE PRIMING COAT ON SIGNS BEARING A LEGEND, ALL SURFACES SHALL BE GIVEN THREE COATS OF BLACK EGG-SHELL FINISH HIGH GRADE SYNTHETIC ENAMEL.
(d) SUBSEQUENT TO THE PRIMING COAT ON MARKER SIGN BEARING NO LEGEND, ALL SURFACES SHALL BE GIVEN THREE COATS OF SEMI-GLOSS PERMANENT LEMON YELLOW HIGH GRADE SYNTHETIC ENAMEL.
(e) THREE COATS OF SEMI-GLASS PERMANENT WHITE HIGH GRADE SYNTHETIC ENAMEL SHALL BE APPLIED TO THE EMBOSSED PORTION OF THE SIGN.
(f) MATERIALS USED IN THE ENAMEL SHALL BE SUCH THAT PREMATURE CHALKING WILL NOT TAKE PLACE. EACH COAT SHALL BE THOROUGHLY DRY BEFORE SUBSEQUENT COAT IS APPLIED.
(g) THE FINISHED DESIGN SHALL BE CLEAR CUT AND SHARP AND THE LINES EVEN AND TRUE.
(h) THE FINISH PRODUCED ON THE SIGNS SHALL BE A TOUGH FLEXIBLE COATING, FREE FROM CRACKS, SHRINKAGE, WRINKLES, BLISTERS, OR OTHER BLEMISHES AND SHALL WITHSTAND THE FOLLOWING TESTS:
1. THE FINISH SHALL NOT CHIP NOR FLAKE WHEN TESTED WITH THE POINT OF A KNIFE.
2. THE FINISH SHALL WITHSTAND A GASOLINE TEST MADE BY RUBBING WITH A CLEAN WHITE RAG SOAKED IN GASOLINE.
3. THE FINISH SHALL POSSESS SUCH ELASTICITY AND ADHERING QUALITIES THAT IT WILL NOT CRACK NOR SEPARATE FROM THE SIGN WHEN STRUCK A LIGHT BLOW WITH A HAMMER.
8. IDENTIFICATION.
(a) INSIDE OF SIGN SHALL BE PLAINLY MARKED WITH NAME OF MANUFACTURER.
9. INSPECTION.
(a) PURCHASER MAY INSPECT MATERIAL AT ALL STAGES OF MANUFACTURE.
(b) PURCHASER MAY INSPECT THE COMPLETED PRODUCT TO DETERMINE THAT THE REQUIREMENTS OF THIS SPECIFICATION HAVE BEEN MET.
(c) IF MATERIAL HAS NOT BEEN ACCEPTED AT POINT OF PRODUCTION AND, UPON ARRIVAL AT DESTINATION, IT DOES NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION, IT MAY BE REJECTED, AND THE CONTRACTOR, UPON REQUEST, SHALL ADVISE THE PURCHASER WHAT DISPOSITION IS TO BE MADE OF THE DEFECTIVE MATERIAL. CONTRACTOR SHALL PAY ALL FREIGHT CHARGES.
(d) IF PURCHASER IS TO MAKE INSPECTION AT POINT OF PRODUCTION IT SHALL BE SO STATED.
10. TESTS.
(a) TESTS MAY BE MADE AT POINT OF PRODUCTION, OR ON SAMPLES SUBMITTED, AND MAY ALSO BE MADE AT DESTINATION.
(b) CONTRACTOR SHALL GIVE THE PURCHASER SUFFICIENT NOTICE OF TIME WHEN

MATERIAL WILL BE READY FOR TESTING.
(c) CONTRACTOR SHALL PROVIDE, AT POINT OF PRODUCTION, APPARATUS AND LABOR FOR MAKING REQUIRED TESTS UNDER SUPERVISION OF THE PURCHASER.
(d) IF TESTS ARE TO BE MADE AT POINT OF PRODUCTION, THE PURCHASER SHALL SO STATE AND ALSO INDICATE WHICH OF THE TESTS HEREIN SPECIFIED ARE TO BE MADE AND WHAT PORTION OF THE MATERIAL SHALL BE TESTED.

11. PACKING.
(a) MATERIAL SHALL BE SO PREPARED AS TO PERMIT CONVENIENT HANDLING AND TO PROTECT AGAINST LOSS OR DAMAGE DURING SHIPMENT.
12. MARKING.
(a) PURCHASER'S ORDER, REQUISITION AND PACKAGE NUMBER, NAME OF CONSIGNOR, AND NAME AND ADDRESS OF CONSIGNEE, SHALL BE PLAINLY MARKED ON OUTSIDE OF PACKAGE.
(b) DETAIL LIST OF LOOSE PIECES, CONTAINERS AND THEIR CONTENTS SHALL BE FURNISHED FOR EACH SHIPMENT.
13. WARRANTY.
(a) 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 MAKING, AT POINT OF PRODUCTION, ANY PART OR PARTS TO REPLACE THOSE WHICH SHALL BE FOUND DEFECTIVE WITHIN TWO YEARS AFTER SHIPMENT TO 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 JUDGEMENT, ITS PROPER FUNCTIONING OR RELIABILITY, OR WHICH HAS BEEN SUBJECT TO MISUSE, NEGLIGENCE OR ACCIDENT.

A. R. A. MANUAL MAY 1933

REVISIONS

S-467-A

1 SHEET



THE PENNSYLVANIA RAILROAD
STANDARD
SPECIFICATIONS

FOR REFLECTOR SIGNS AND REFLECTOR UNITS.

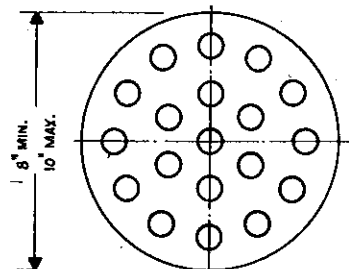
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCTOBER 31, 1933.

Approved

Chief Signal Engineer

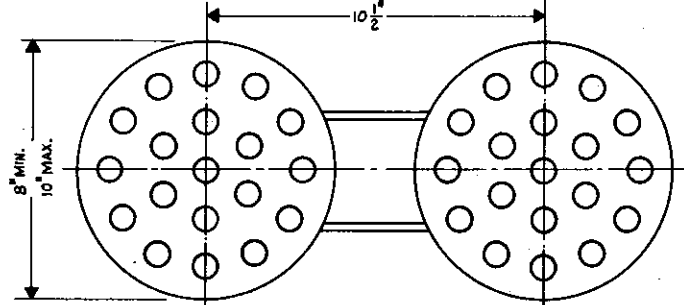
Approved

Chief Engineer



4681 MARKER FOR SEMAPHORE SIGNALS.
RED REFLECTOR UNITS, RED FACE PLATE.
STORES CAT. REF. NO. 2A-1417

4682 MARKER FOR SEMAPHORE SIGNALS.
YELLOW REFLECTOR UNITS, YELLOW FACE PLATE.
STORES CAT. REF. NO. 2A-1930.

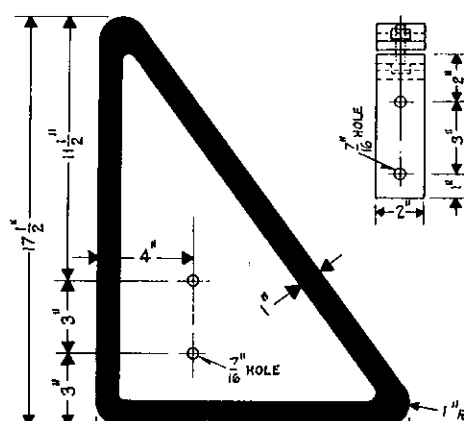


4683 MARKER FOR SEMAPHORE SIGNALS.
RED REFLECTOR UNITS, RED FACE PLATE.
STORES CAT. REF. NO. 2A-1419.

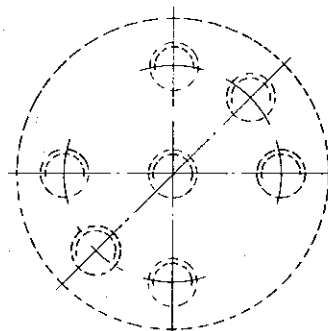
ATTACHMENT TO LAMP BRACKET SHALL BE SO THAT THE CENTER OF THE LEFT HAND MARKER (4683) WILL BE $11\frac{1}{16}$ INCHES FROM CENTER LINE OF SIGNAL MAST.

SPECIFICATION FOR MARKERS (SEMAPHORE SIGNALS)

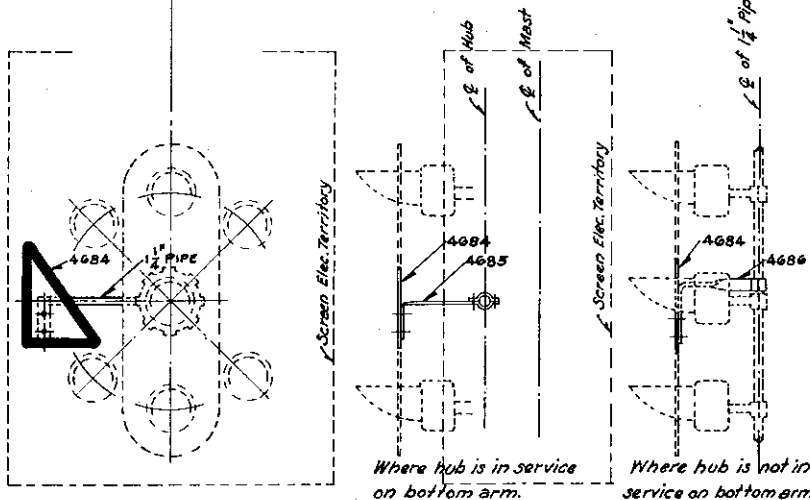
1. **PURPOSE:**
(a) THE PURPOSE OF THIS SPECIFICATION IS TO PROVIDE SINGLE AND DOUBLE MARKER UNITS OF THE REFLECTOR TYPE FOR SEMAPHORE SIGNALS.
2. **TENDER:**
(a) THE TENDER SHALL BE FOR APPARATUS MEETING THE REQUIREMENTS OF THIS SPECIFICATION. IF THE CONTRACTOR WISHES TO VARY FROM THE SPECIFICATION, A TENDER MAY BE SUBMITTED COVERING THE APPARATUS HE DESIRES TO FURNISH.
3. **MATERIAL AND WORKMANSHIP:**
(a) MATERIAL AND WORKMANSHIP SHALL BE FIRST-CLASS IN EVERY RESPECT.
4. **GENERAL REQUIREMENTS:**
(a) MARKERS SHALL BE FURNISHED COMPLETE WITH ALL NECESSARY PARTS FOR SECURING TO LAMP BRACKET AS SHOWN ON A.A.R. SIGNAL SECTION DRAWING 1049-A.
(b) MARKERS SHALL BE CIRCULAR IN SHAPE AND SHALL HAVE NOT LESS THAN 19 REFLECTOR UNITS.
(c) THE DIAMETER OF EACH MARKER SHALL BE 8 INCHES MINIMUM, 10 INCHES MAXIMUM.
(d) DOUBLE MARKERS SHALL BE SPACED HORIZONTALLY $10\frac{1}{2}$ INCHES, FROM CENTER TO CENTER.
5. **COLOR:**
(a) THE COLOR OF THE REFLECTOR UNITS AND FACE PLATE SHALL BE THE SAME.
(b) EDGES AND BACK OF THE HOUSING SHALL BE BLACK.
6. **REFLECTOR UNIT HOUSING:**
(a) THE REFLECTOR UNIT HOUSING SHALL BE IN ACCORDANCE WITH SIGNAL SECTION SPECIFICATION 185-42 FOR RAILROAD HIGHWAY GRADE CROSSING SIGNS AS FAR AS APPLICABLE. THE FINISH SHALL BE ACID RESISTING VITREOUS ENAMEL.
7. **REFLECTOR UNITS:**
(a) THE REFLECTOR UNITS SHALL BE IN ACCORDANCE WITH A.A.R. SIGNAL SECTION SPECIFICATION 185-40 FOR REFLECTOR UNIT. $\frac{7}{8}$ INCH DIAMETER REFLECTOR UNITS MAY BE FURNISHED.



4684 MARKER
#12 U.S. STD. GAUGE (.109") ENAMELING STEEL.
STORES CAT. REF. NO. 2A-5200



APPLICATIONS OF MARKER 4684.



4685 BRACKET O. H. S.
STORES CAT. REF. NO. 2A-5201

4686 BRACKET O. H. S.
STORES CAT. REF. NO. 2A-5202

FURNISH 2- $\frac{3}{4}$ X 1" CADMIUM PLATED ROUND HEAD MACHINE SCREWS WITH 1-LEAD WASHER AND 1- SPRING LOCK WASHER WITH EACH BRACKET 4685 AND 4686.

SPECIFICATION FOR MARKER 4684.

1. MARKER 4684 IS FOR USE IN CONJUNCTION WITH HOME AND DISTANT SIGNALS PERMITTING TRAINS TO MAKE DIVERTING MOVES AT 45 MILES PER HOUR.
2. MATERIAL SHALL BE IN ACCORDANCE WITH A. A. R. SIGNAL SECTION SPECIFICATION NO. 185-42
3. MARKER 4684 SHALL BE COATED WITH ACID-RESISTING VITREOUS ENAMEL (SEMI-GLOSS FINISH) IN ACCORDANCE WITH A. A. R. SIGNAL SECTION SPECIFICATION NO. 185-42. THE FACE OF THE MARKER SHALL BE ENAMELED MEDIUM-CHROME YELLOW WITH THE EDGES AND BACK ENAMELED BLACK.
4. ALL PARTS OF BRACKETS 4685 AND 4686 SHALL BE THOROUGHLY CLEANED, THEN GIVEN A PRIMARY COAT OF RED LEAD AND A FINISH COAT OF FIRST CLASS BLACK PAINT.

REVISIONS

REDRAWN FROM APPROVED PLAN S-468-A, DATED SEPT. 28, 1927. MARKER 4684 AND BRACKETS 4685 AND 4686 ADDED.

1 SHEET



S-468-B

THE PENNSYLVANIA RAILROAD

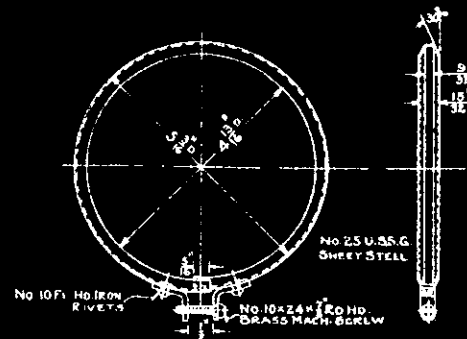
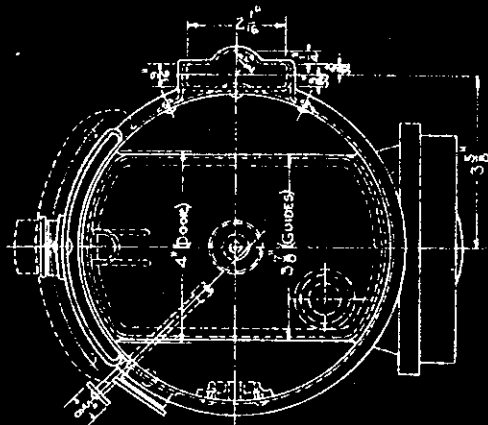
STANDARD

MARKERS

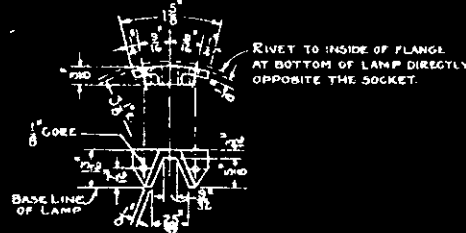
OFFICE OF CHIEF ENGINEER, PHILA., PA. AUG. 25, 1944.

Approved *H. C. Stanton*
Assistant Chief Engineer-Signals

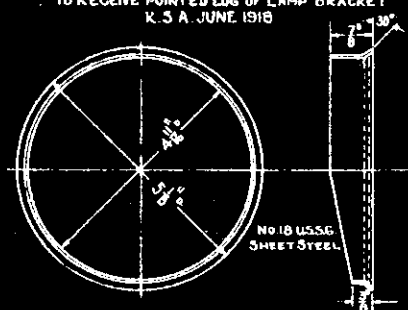
Approved *W. H. H. H.*
Chief Engineer



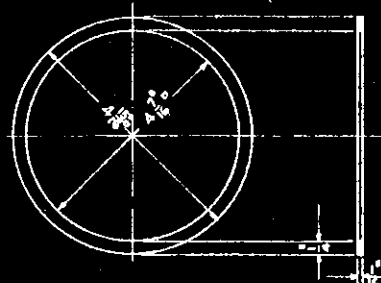
4775-LENS COUPLING RING
R.S.A. MAR. 1920



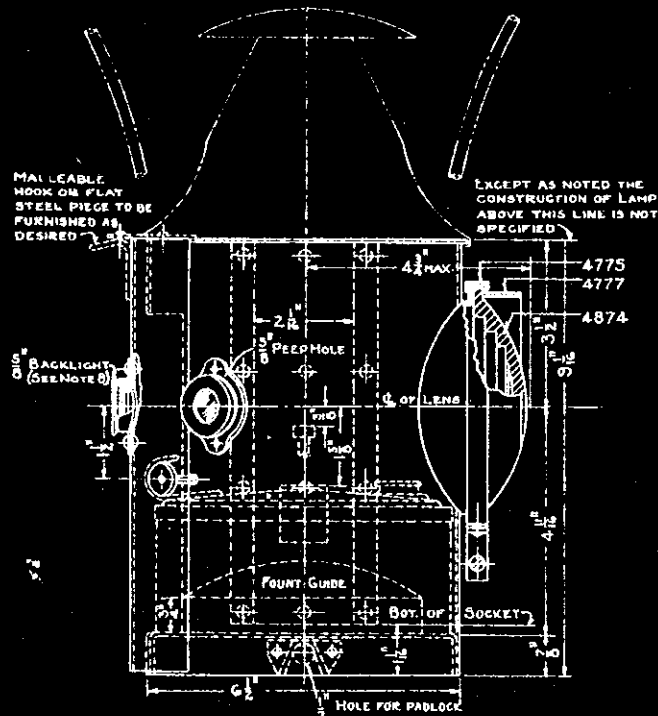
4776-MALLEABLE POCKET
To RECEIVE POINTED LUG OF LAMP BRACKET
R.S.A. JUNE 1918



4777-LENS HOOD
R.S.A. MAR. 1920



4778- GASKET
RED SHEET PACKING



4771-LAMP COMPLETE WITH WHITE LENS
4772-LAMP COMPLETE WITH RED LENS
4773-LAMP COMPLETE WITH YELLOW LENS
4774-LAMP BODY WITHOUT LENS

SPECIFICATION

1. Body of lamp shall be made of No. 18 sheet steel, tinned.
2. Rivets shall be used in the construction of the body of the lamp, for holding the parts together.
3. Handle of lamp shall be No. 4 B. W. G. steel wire.
4. Door shall have watershed so arranged as to prevent rain entering the lamp, and door shall be high enough to make the opening six and five-eighths (5 5/8) inches.
5. Lamp shall have top draft ventilation. (Ventilation will be tested, when required, at the factory as follows: (A) Wind velocity equivalent to eighty (80) m. p. h., for two (2) minutes. (B) Still air temperature, one hundred and ten (110) degrees Fahr. for two (2) hours. If either of the above tests extinguishes flame, lamp will be rejected.)
6. Lens shall be five (5) inches in diameter, with three and one-half (3 1/2) inch focus.
7. Lens Coupling Ring shall be arranged so that lens can be easily removed and shall completely enclose the lens.
8. Backlight and peep-hole glasses shall be held in place by screw retaining rings. Backlight glass shall be covered with a metal disc placed between the glass and retaining ring.

REVISIONS

REDRAWN FROM APPROVED PWS 477-A
DATED AUG. 2, 1920 AND REVISED.

1 SHEET

S-477-B

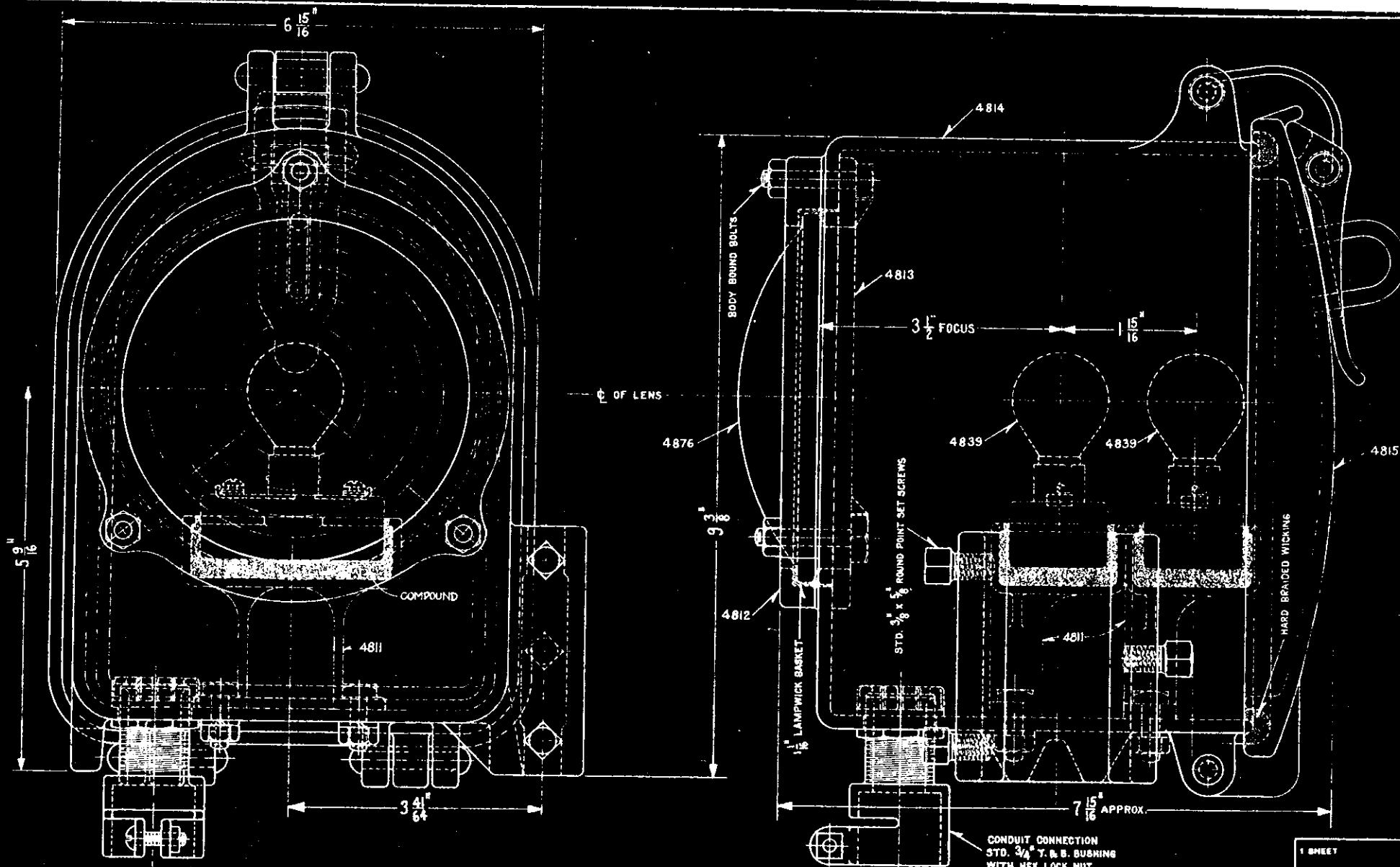


PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAMP
OIL LIGHTED SIGNAL

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCT. 17, 1922.

Approved
C. H. Reed
Chief Signal Engineer

Approved
[Signature]
Chief Engineer



4781	LAMP CASE	COMPLETE WITH CLEAR LENS.
4782	"	" " " " RED "
4783	"	" " " " YELLOW "
4784	"	" " " " WITHOUT LENS.

NOTE:
LAMPS 4839 SHALL BE FURNISHED SEPARATELY.
PAINT OUTSIDE BLACK, INSIDE WHITE ENAMEL.

REVISIONS
SUPERSEDES APPROVED PLAN NO. S-478-B, DATED AUGUST 2, 1920.
LAST REVISED JANUARY 24, 1925.

S-478-C



THE PENNSYLVANIA RAILROAD
STANDARD
ELECTRIC LAMP
FOR SEMAPHORE SIGNALS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., SEPTEMBER 7, 1925

Approved

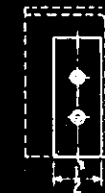
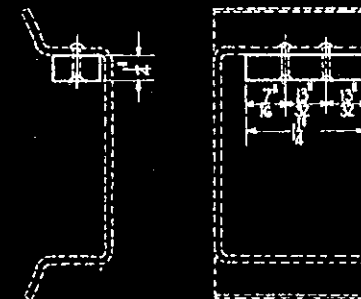
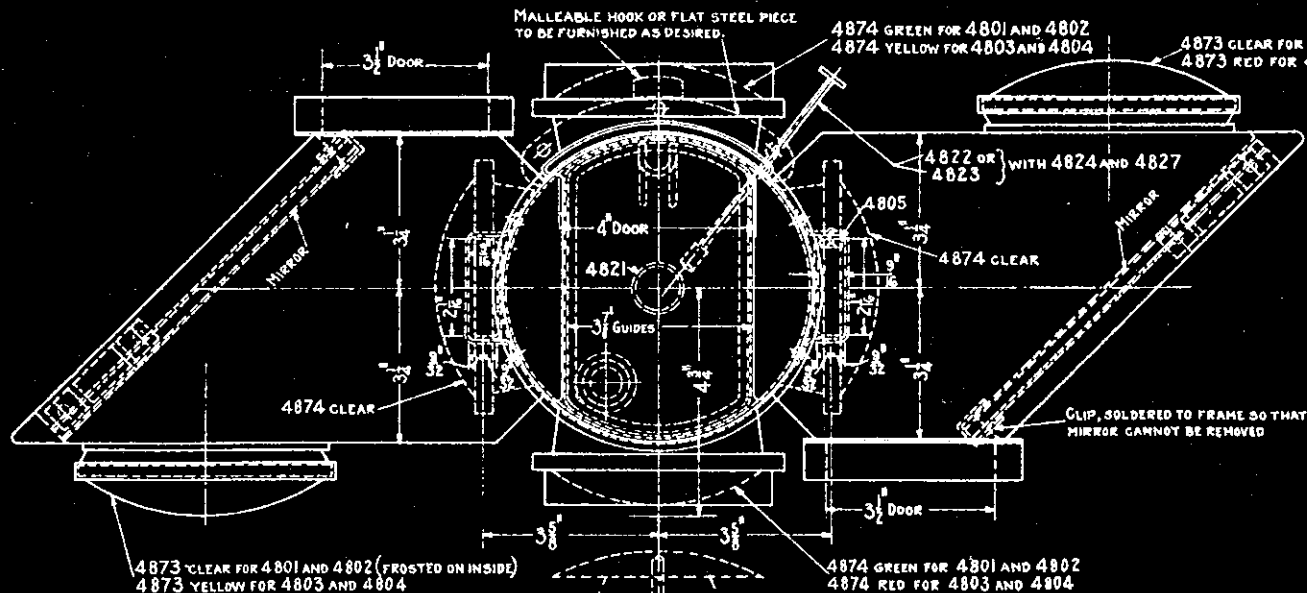
Arthur

Chief Signal Engineer

Approved

William

Chief Engineer



4805-FILLER
O.H.S.

NOTE:-

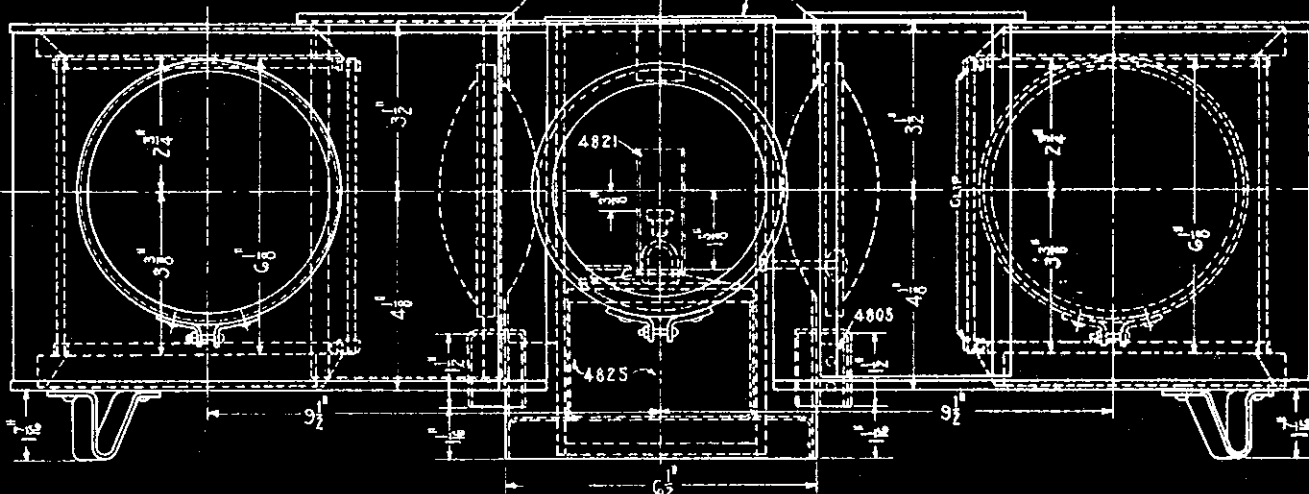
LENSES AND ROUNDLS SHALL BE IN ACCORDANCE WITH PENNSYLVANIA RAILROAD SYSTEM PLAN AND SPECIFICATIONS FOR LENSES AND ROUNDLS.

WHEN NO DETAIL PLAN REFERENCE IS SHOWN, THE MANUFACTURER'S STANDARD APPARATUS, IF APPROVED BY THE PURCHASER, SHALL BE FURNISHED.

LAMP TOP MUST OPEN PARALLEL TO SIGNAL CASTING.

4801 AND 4802 FOR TWO-WAY FLAG STATION SIGNAL.

4803 AND 4804 FOR UNATTENDED BLOCK STATION SIGNAL.



4801-LAMP COMPLETE WITHOUT 4805.

4802- " ONLY " 4805.

4803- " COMPLETE WITH 4805.

4804- " ONLY " 4805.

NOTE:- FURNISH BURNER, FOUNT AND CHIMNEY WITH 4801 AND 4803.

REVISIONS

REDRAWN FROM APPROVED PLANS 4801
DATED 2-7-21, LAST REVISED 4-2-21,
AND REVISED

1 SHEET

S-480-G

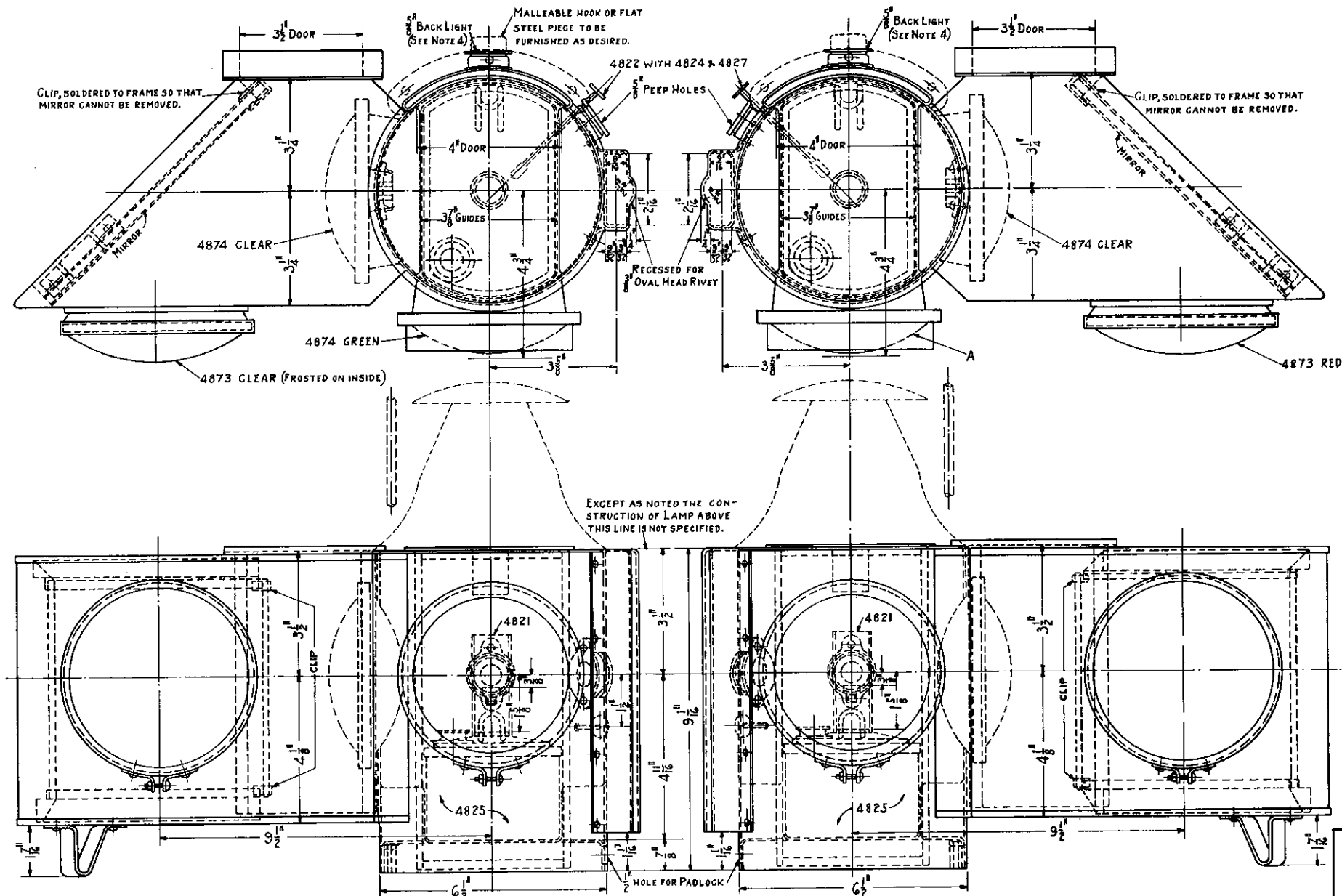

PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAMP

FOR FLAG STATION AND
UNATTENDED BLOCK STATION SIGNALS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA. PA., JULY 25, 1924.

Approved 
Chief Signal Engineer

Approved 
Chief Engineer



- NOTE:-
1. LENSES AND ROUNDLS SHALL BE IN ACCORDANCE WITH PENNSYLVANIA RAILROAD SYSTEM PLAN AND SPECIFICATIONS FOR LENSES AND ROUNDLS.
 2. WHEN NO DETAIL PLAN REFERENCE IS SHOWN, THE MANUFACTURERS STANDARD APPARATUS, IF APPROVED BY THE PURCHASER, SHALL BE FURNISHED.
 3. LAMP TOP MUST OPEN PARALLEL TO SIGNAL CASTING.
 4. BACK-LIGHT AND PEEP-HOLE GLASSES SHALL BE HELD IN PLACE BY SCREW RETAINING RINGS. BACK-LIGHT GLASS SHALL BE COVERED WITH A METAL DISC PLACED BETWEEN THE GLASS AND THE RETAINING RING.

REVISIONS.
REDRAWN FROM APPROVED PLANS 4790
DATED 2-7-21, LAST REVISED 4-2-21,
AND REVISED.

ONE-WAY FLAG STATION LAMP

ORDER NO.	NAME	ORDERING REFERENCE	REQUIRED
4791	LAMP COMPLETE	AS SHOWN	
4792	LAMP ONLY	WITHOUT 4821-4822-4824-4825-4827	

BLOCK SIGNAL MARKER LAMP

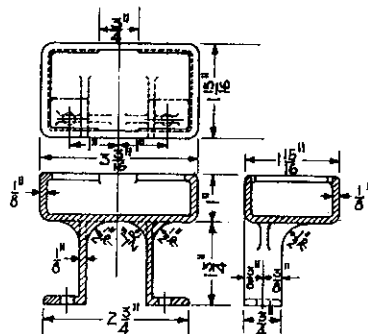
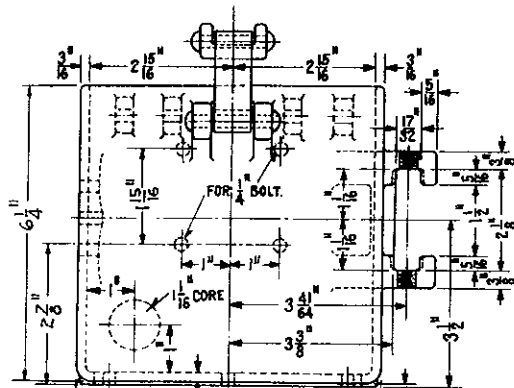
ORDER NO.	NAME	ORDERING REFERENCE	REQUIRED
4793	LAMP COMPLETE	AS SHOWN	
4794	LAMP ONLY	WITHOUT 4821-4822-4824-4825-4827	
4795	LAMP COMPLETE	AS SHOWN	
4796	LAMP ONLY	WITHOUT 4821-4822-4824-4825-4827	

1 SHEET

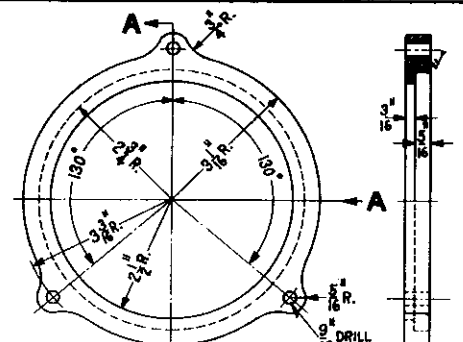
S-479-C

PENNSYLVANIA RAILROAD SYSTEM
STANDARD
LAMPS

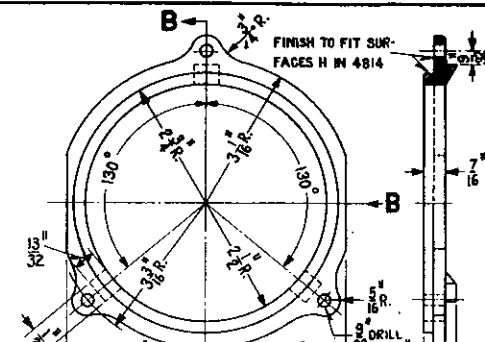
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., JAN. 20, 1925
Approved *Chief Signal Engineer* Approved *Chief Engineer*



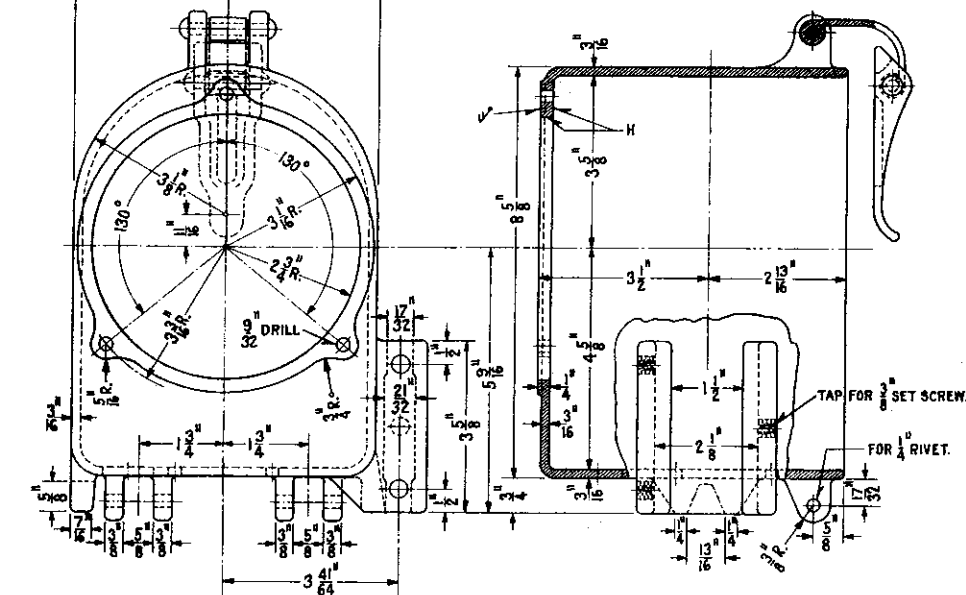
4811-BRACKET.
CAST IRON



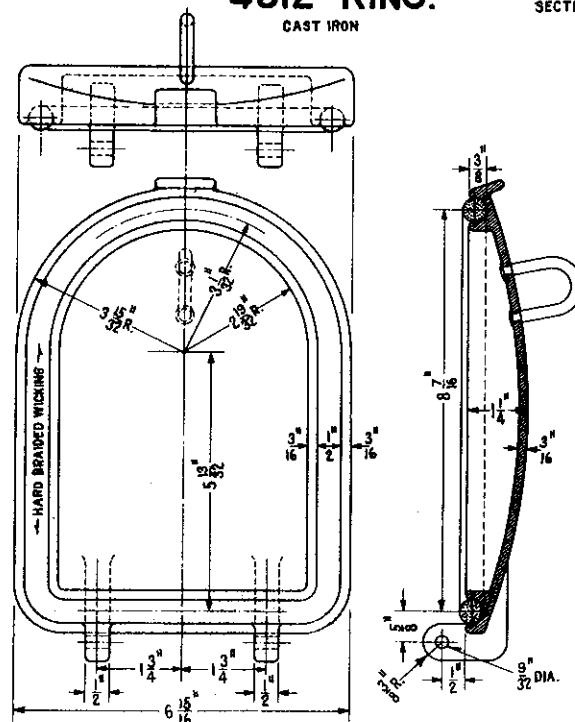
4812-RING.
CAST IRON



4813-RING.
CAST IRON



4814-CASE.
CAST IRON



4815-DOOR.
CAST IRON

REVISIONS

1 SHEET

S-481-A



THE PENNSYLVANIA RAILROAD
STANDARD

ELECTRIC LAMP PARTS

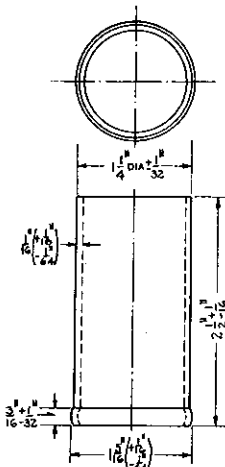
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., SEPTEMBER 7, 1920

Approved
Art. Paul

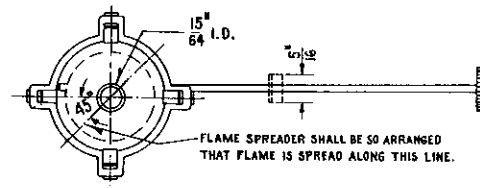
Chief Signal Engineer

Approved
W. H. Sullivan

Chief Engineer

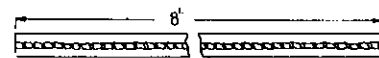


4821-CHIMNEY

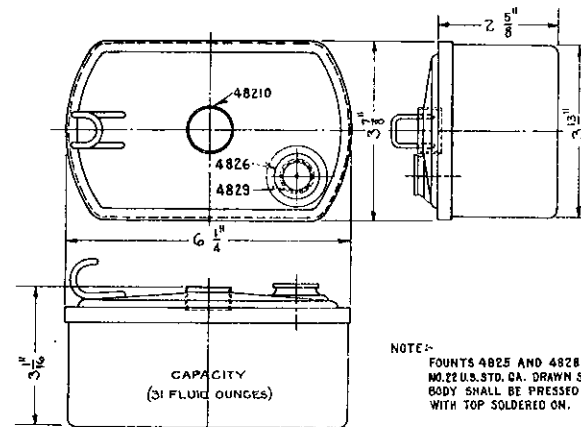


4822-BURNER A-4"

4823-BURNER B-1 7/8"

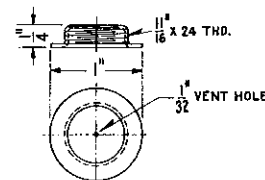


4824-WICK
(CENTER CORE FELT)



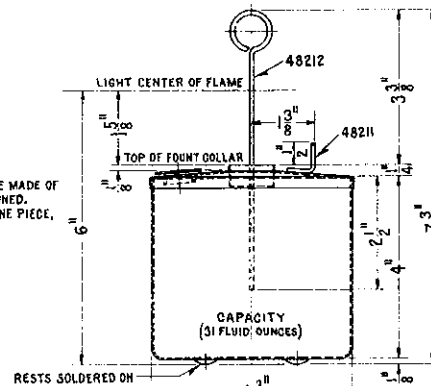
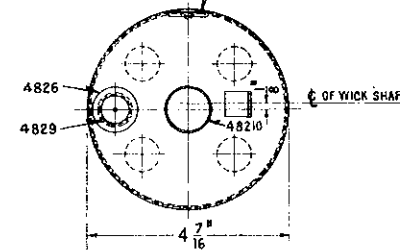
4825-FOUNT

K.S.A. APR. 1914

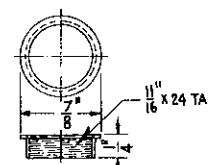


4826-FEEDER CAP
NO. 20 A.W.G. BRASS

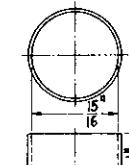
HANDLE, WHEN SOLDERED IN PLACE SHALL NOT EXTEND BEYOND DIAMETER OF BODY.



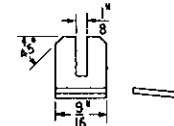
4828-FOUNT



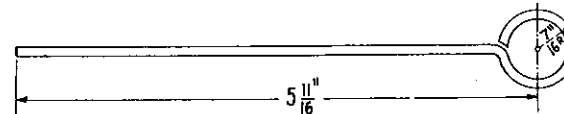
4829-FEEDER COLLAR
NO. 20 A.W.G. BRASS



48210-FOUNT COLLAR
NO. 20 A.W.G. BRASS TUBING



48211-WICK SHAFT LOCK



48212-HANDLE
NO. 12 B.W.G. STEEL WIRE

SPECIFICATIONS FOR CHIMNEYS

1. GENERAL DESCRIPTION:
This specification covers Long Time Burner Chimneys.
2. KIND OF GLASS:
Chimneys shall be made of LOW EXPANSION HEAT RESISTING GLASS.
3. ORDERING:
As far as possible Chimneys shall be ordered in multiples of standard package quantities.
4. BOILING WATER TESTS:
Chimneys shall stand immersion in boiling water (distilled) for two (2) hours without showing any disintegration.
5. CHILLING TESTS:
(a) In making this test the Chimney is placed on a suitable Burner and the flame is turned up as far as possible without smoking. The lamp is then tilted to an angle of forty-five (45) degrees, in a direction parallel to the slot in the Burner, and allowed to remain in this position for five (5) minutes. During this period the flame shall be regulated, if necessary, so that a strip not to exceed three-eighths (3/8) of an inch wide running the length of the Chimney and parallel to its axis is smoked. The Chimney is then removed from the Burner, and immediately dropped, top downward, into a vessel of ice water, maintained at a temperature of between forty-three (43) and fifty (50) degrees Fahr., care being taken that the Chimney does not strike the ice.
(b) Chimneys tested as described in 5a shall not show breakage in excess of three (3) in twenty-four (24) tested.
(c) If the first twenty-four (24) samples fail to pass the Chilling test, an additional twenty-four (24) samples shall be taken for a second test, and if the average of breakage of the two (2) tests does not exceed twelve and one-half (12 1/2) per cent, the material is acceptable.
6. PERMISSIVE VARIATIONS:
Chimneys shall conform to approved drawings.
7. MARKING:
Chimneys shall show the Manufacturer's Trade Mark.
8. PACKING:
Chimneys shall be carefully packed, each package containing twelve (12) dozen Chimneys, in suitable containers, marked to show quantity, requisition number, order number, and, name and address of Consignee.
9. WORKMANSHIP:
Chimneys shall be clear, of smooth surface, and have both ends finished without sharp edges.
10. REHEARING:
When tests are made at the Purchaser's laboratory, samples of rejected material will be held for one month from the date of test report. In case the Manufacturer is dissatisfied with results of test, he may make claim for rehearing within that time. Failure to raise a question within one month, will be construed as evidence of satisfaction with results of test. The samples will be scrapped and claim for a rehearing will not be considered.
11. FREIGHT CHARGES:
Rejected material will be returned to the Manufacturer, who shall pay freight charges both ways.

REVISIONS

B- JANUARY 7, 1926
APPROVED: *Arthur*
C- JUNE 23, 1937, c.p.
APPROVED: *H. C. Schuch*

1 SHEET

S-482-C



THE PENNSYLVANIA RAILROAD

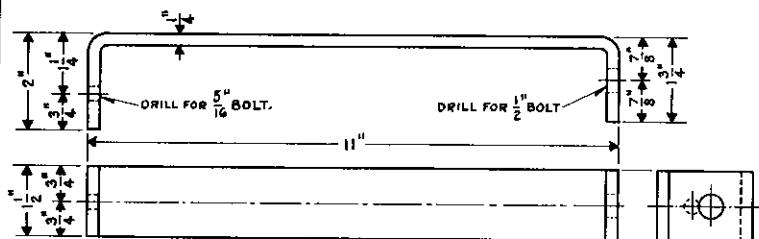
STANDARD

LAMP DETAILS

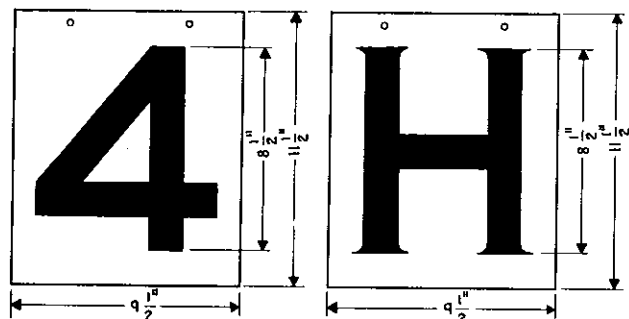
FOR OIL LIGHTED SWITCH AND SIGNAL LAMPS

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., OCT. 4, 1923.

Approved: *Arthur* Chief Signal Engineer
Approved: *H. C. Schuch* Engr. of Standards
Approved: *John* Chief Engineer



4891 SUPPORT
O. H. STEEL



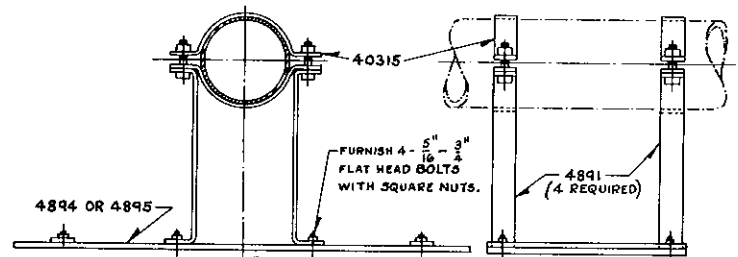
4892 PLATE

16 U.S. STD. GAUGE ENAMELING STEEL.

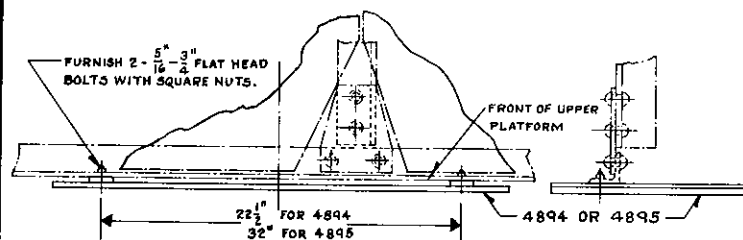
4893 PLATE

16 U.S. STD. GAUGE ENAMELING STEEL.

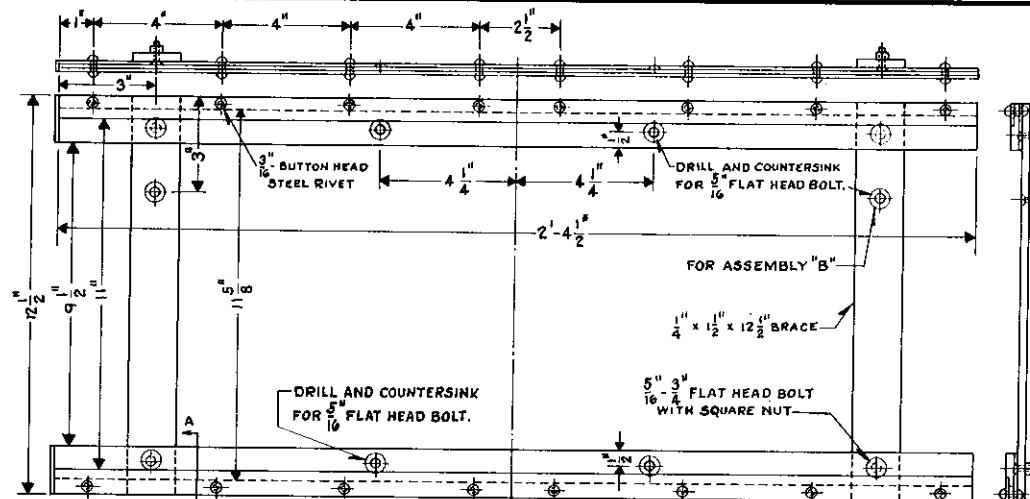
IF NECESSARY, TWO SMALL HOLES MAY BE PROVIDED IN EACH LETTER OR NUMERAL PLATE FOR USE DURING THE PROCESS OF VITREOUS ENAMELING.



ASSEMBLY "A" FOR DIAGRAMS B & C.

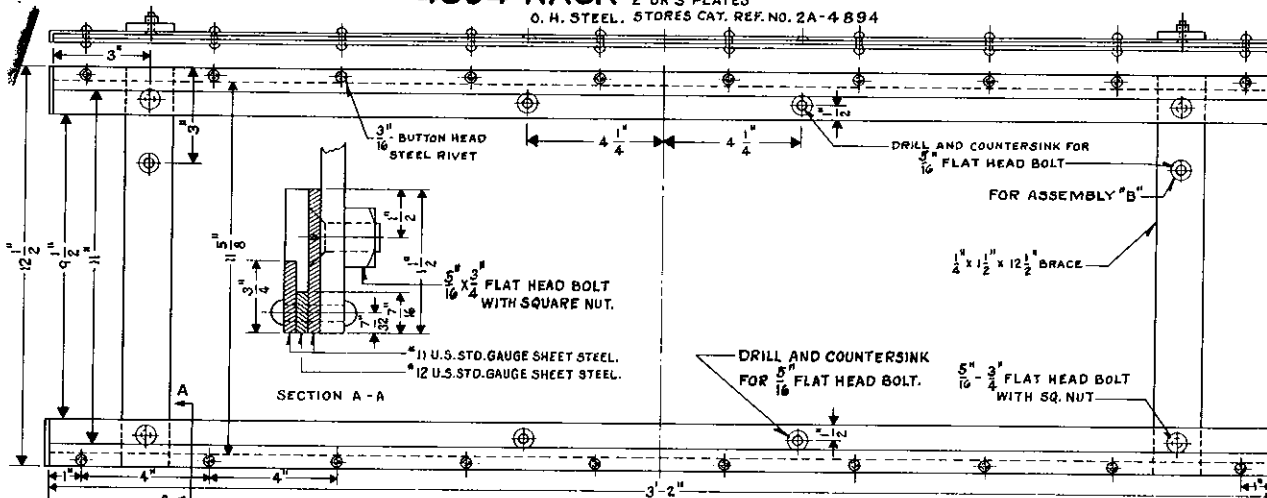


ASSEMBLY "B" FOR DIAGRAM A.



4894 RACK 2 OR 3 PLATES

O. H. STEEL. STORES CAT. REF. NO. 2A-4894

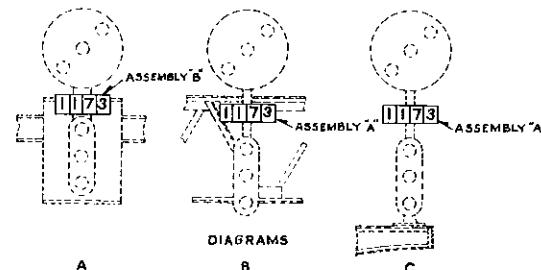


4895 RACK 4 PLATES

O. H. STEEL
STORES CAT. REF. NO. 2A-4895

ORDERING REFERENCE FOR BRACKETS COMPLETE

ORDER NUMBER	STORES CAT. REF. NUMBER	BRACKET ONLY FOR	ASSEMBLY
4896	2A-4896	2 OR 3 PLATES	"A" DIAGRAM B OR C
4897	2A-4897	4 PLATES	"A" DIAGRAM B OR C
4898	2A-4898	2 OR 3 PLATES	"B" DIAGRAM A
4899	2A-4899	4 PLATES	"B" DIAGRAM A



A APPLIED TO SIGNAL ON BEAM TYPE SIGNAL BRIDGE.
B APPLIED TO SIGNAL ON STANDARD TYPE SIGNAL BRIDGE.
C APPLIED TO SIGNAL ON CANTILEVER.

NOTE:-

1. FRONT AND BACK OF ALL PLATES SHALL BE BLACK ACID RESISTING VITREOUS ENAMELED WITH NUMERALS AND LETTERS WHITE ACID RESISTING VITREOUS ENAMELED.
2. NUMERALS AND LETTERS SHALL BE PROPORTIONED IN ACCORDANCE WITH STANDARD M.W. PLAN BASIC NUMBER 78000.
3. WHEN ORDERING SPECIFY NUMERALS OR LETTERS DESIRED.
4. POSITION LIGHT SIGNALS WHOSE MOST RESTRICTIVE INDICATION IS MORE FAVORABLE THAN STOP, SHALL BE NUMBERED.
5. ALL PARTS OF RACKS AND CLAMPS SHALL BE THOROUGHLY CLEANED, GIVEN A PRIMARY COAT OF RED LEAD AND A FINISHING COAT OF FIRST CLASS BLACK PAINT.
6. IN ACCORDANCE WITH C.E. 58-A, A LETTER MAY BE PREFIXED TO THE SIGNAL NUMBER FOR DESIGNATING BRANCH LINE SIGNALS.
7. FOR NUMERALS AND LETTERS APPLIED TO GROUND MASTS, SEE PLAN NO. 5-490.

REVISIONS

REDRAWN FROM APPROVED PLAN S-489-E, DATED JUNE 27, 1924, LAST REVISED FEB. 18, 1935 AND REVISED AS FOLLOWS:- VERTICAL NUMBER RACK ELIMINATED. ENAMELING OF PLATES MADE VITREOUS ENAMEL. NOTE 7 & STORES CAT. REF. NUMBERS ADDED. CLAMP CHANGED AND SUPPORT 4891 ADDED.

G REVISED JANUARY 23, 1944. ALL 5/16 BOLTS FORMERLY 3/16. NOTE 1 CHANGED.

APPROVED: *N. C. Stanton*

1 SHEET



S-489-G

THE PENNSYLVANIA RAILROAD

STANDARD

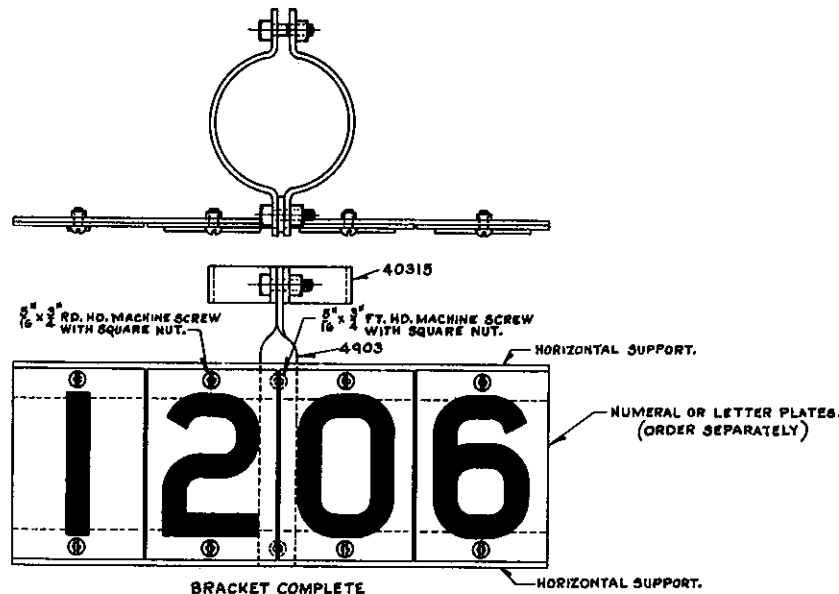
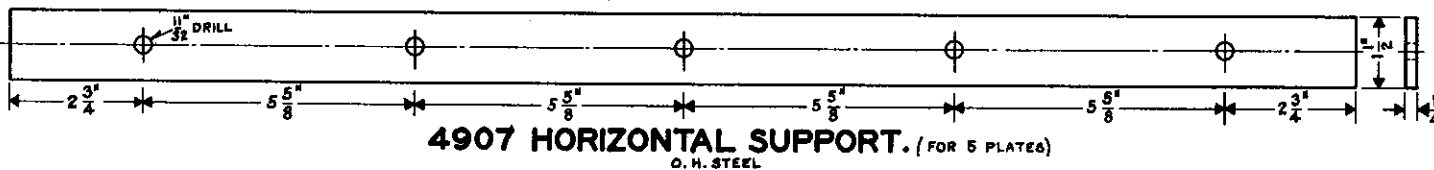
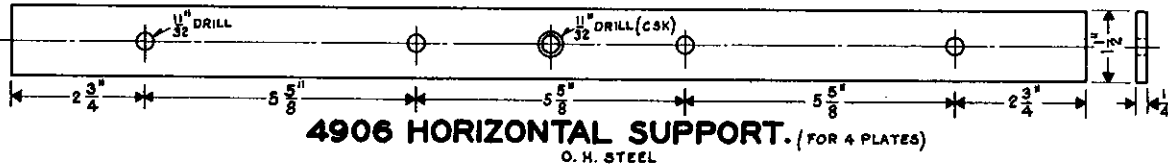
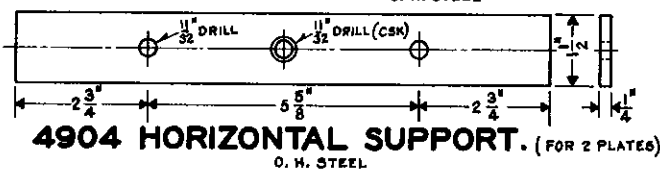
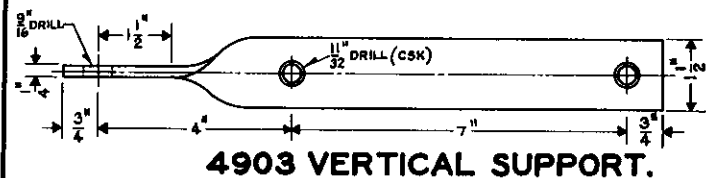
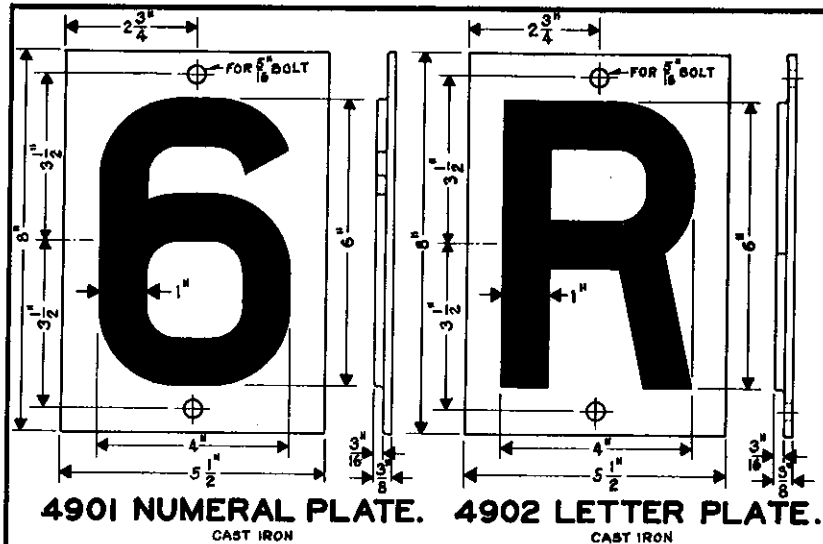
NUMERALS & LETTERS

ENAMELED

FOR SIGNAL NUMBERING
OFFICE OF CHIEF ENGINEER, PHILA., PA., NOV. 27, 1942.

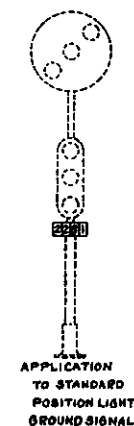
Approved *N. C. Stanton*
Assistant Chief Engineer-Signals

Approved *W. J. Seeger*
Chief Engineer



ORDERING REFERENCE FOR BRACKETS COMPLETE.

ORDER NUMBER	STORES CAT. REF. NUMBER	BRACKET ONLY FOR	FURNISH
4908	2A-4908	2 PLATES	1-40315, 1-4903, 2-4904, 2-5/16 x 3/4 FT. HD. MACH. SCREWS WITH SQ. NUTS AND 4-5/16 x 1/2 RD. HD. MACH. SCREWS WITH SQ. NUTS.
4909	2A-4909	3 PLATES	1-40315, 1-4903, 2-4905, AND 6-5/16 x 3/4 RD. HD. MACH. SCREWS WITH SQ. NUTS.
49010	2A-49010	4 PLATES	1-40315, 1-4903, 2-4906, 2-5/16 x 3/4 FT. HD. MACH. SCREWS WITH SQ. NUTS AND 6-5/16 x 1/2 RD. HD. MACH. SCREWS WITH SQ. NUTS.
49011	2A-49011	5 PLATES	1-40315, 1-4903, 2-4907, AND 10-5/16 x 3/4 RD. HD. MACH. SCREWS WITH SQ. NUTS.



- NOTE:-
1. FRONT, BACK AND EDGES OF PLATES 4901 & 4902 SHALL BE PAINTED BLACK. PAINT LETTER OR NUMERAL WHITE.
 2. PLATES 4901 AND 4902 SHALL BE ORDERED SEPARATELY, SPECIFYING NUMERALS OR LETTERS DESIRED.
 3. ALL PARTS OF BRACKETS SHALL BE THOROUGHLY CLEANED, THEN GIVEN A PRIMARY COAT OF RED LEAD AND A FINISHING COAT OF FIRST CLASS BLACK PAINT.
 4. PLATES 4901 AND 4902 SHALL BE IN ACCORDANCE WITH A.A.R. SPECIFICATION FOR GRAY IRON CASTINGS.
 5. POSITION LIGHT SIGNALS WHOSE MOST RESTRICTIVE INDICATION IS MORE FAVORABLE THAN STOP, SHALL BE NUMBERED.
 6. IN ACCORDANCE WITH C.E. 58-A, A LETTER MAY BE PREFIXED TO THE SIGNAL NUMBER FOR DESIGNATING BRANCH LINE SIGNALS.
 7. FOR NUMERALS AND LETTERS APPLIED TO BRIDGE MASTS, SEE PLAN NO. S-489.

A. A. R. SIG. SEC. MAN.-1926

REVISIONS

REDRAWN FROM APPROVED PLAN S-490-A, DATED MAY 2, 1927, AND REVISED AS FOLLOWS:-
VERTICAL NUMBER RACK ELIMINATED.
MINOR CHANGES MADE TO AGREE WITH A.A.R. PLAN. NOTES 4, 6, 7 & STORES CAT. REF. NUMBERS ADDED.

1 SHEET



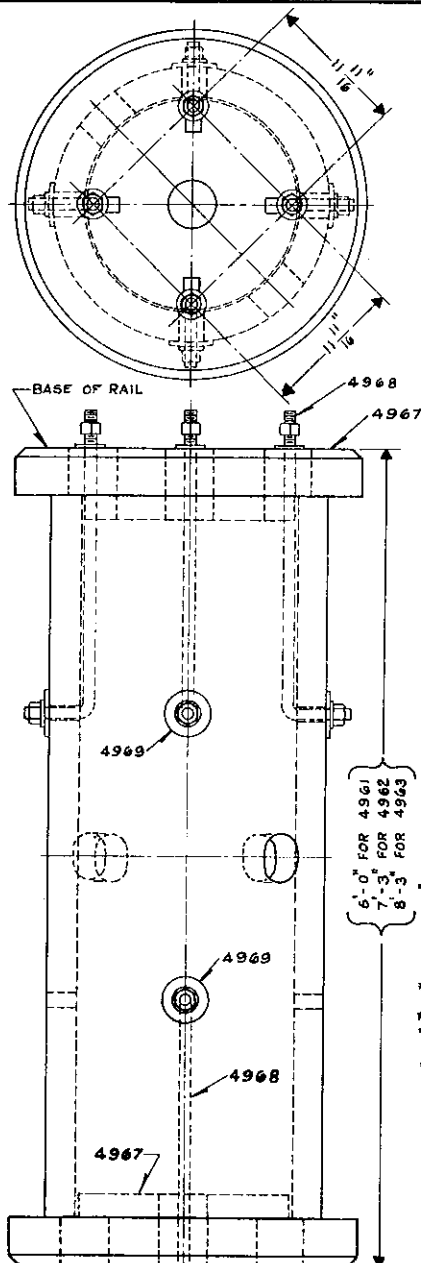
S-490-B

THE PENNSYLVANIA RAILROAD
STANDARD
NUMERALS & LETTERS

CAST IRON
FOR SIGNAL NUMBERING
OFFICE OF CHIEF ENGINEER, PHILA., PA., NOV. 27, 1942.

Approved
N. L. Stanton
Assistant Chief Engineer-Signals

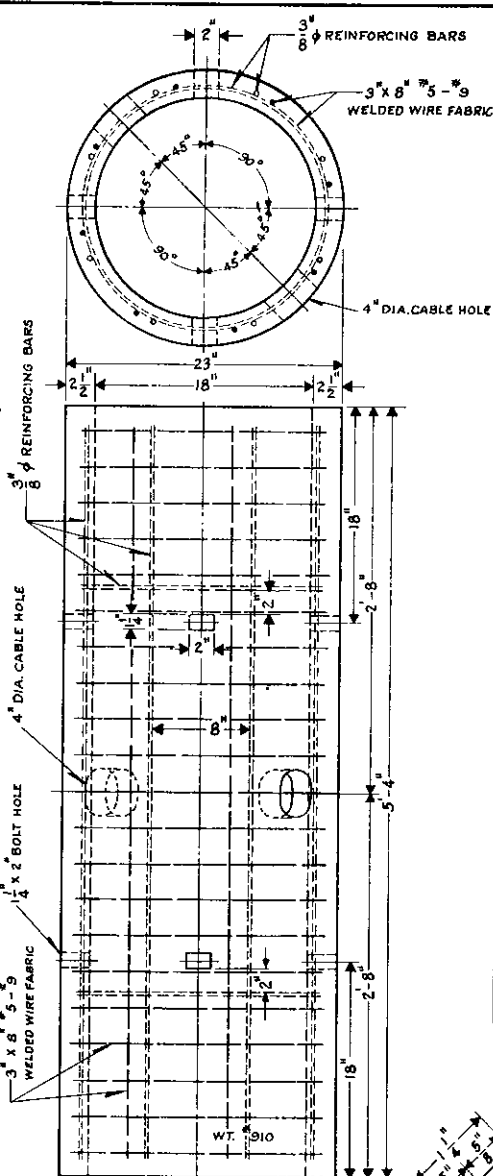
Approved
Mr. [Signature]
Chief Engineer



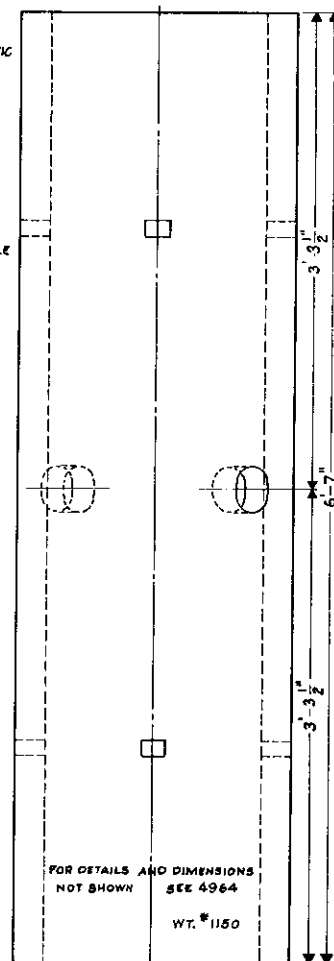
4961 FOUNDATION COMPLETE AS SHOWN
USING BODY 4964.
STORES CAT. REF. NO. 2A-4506

4962 FOUNDATION COMPLETE AS SHOWN
USING BODY 4965.
STORES CAT. REF. NO. 2A-4962

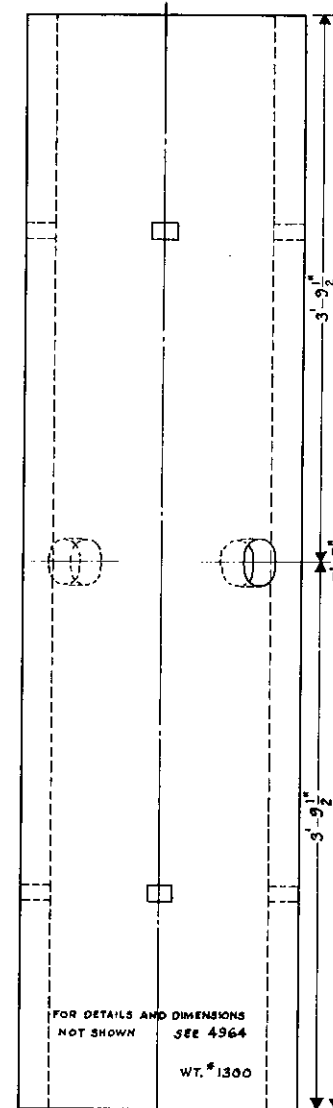
4963 FOUNDATION COMPLETE AS SHOWN
USING BODY 4966.
STORES CAT. REF. NO. 2A-4963



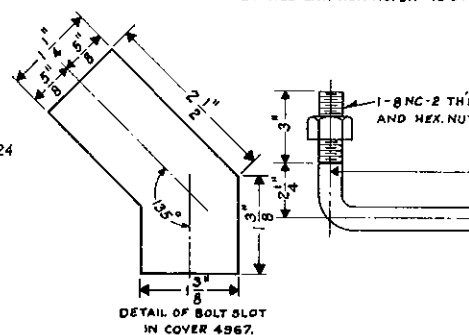
4964 BODY
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-5124



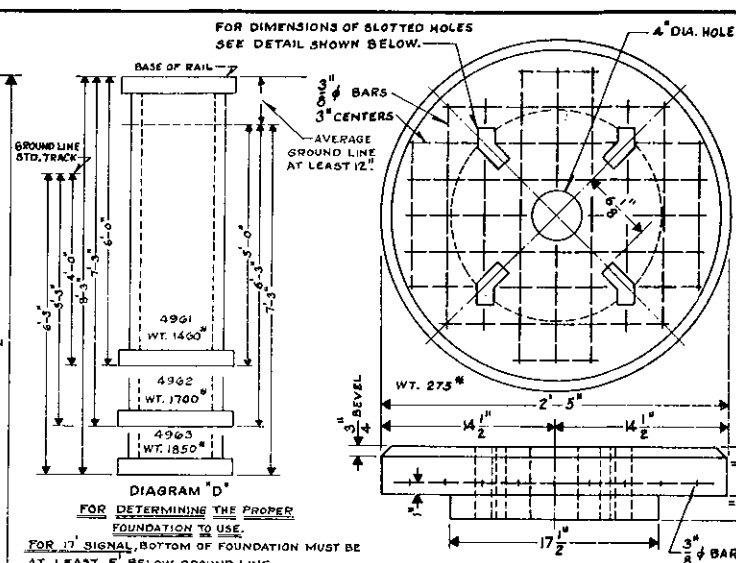
4965 BODY
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-4965



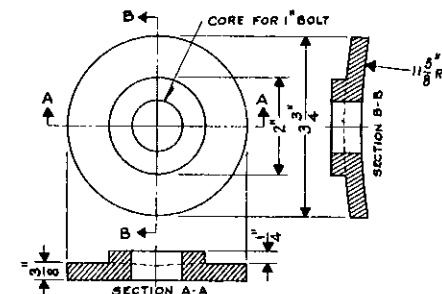
4966 BODY
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-4966



4968 BOLT COMPLETE AS SHOWN.
D. H. S.
STORES CAT. REF. NO. 2A-4968
(FURNISH 6)



4967 COVER
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-5125



4969 WASHER CAST IRON.
STORES CAT. REF. NO. 2A-5127
(FURNISH 6)

FOR NOTES SEE SHEET 2.

SHEET 1 OF 2 SHEETS.



S-496-D

THE PENNSYLVANIA RAILROAD

STANDARD

FOUNDATIONS

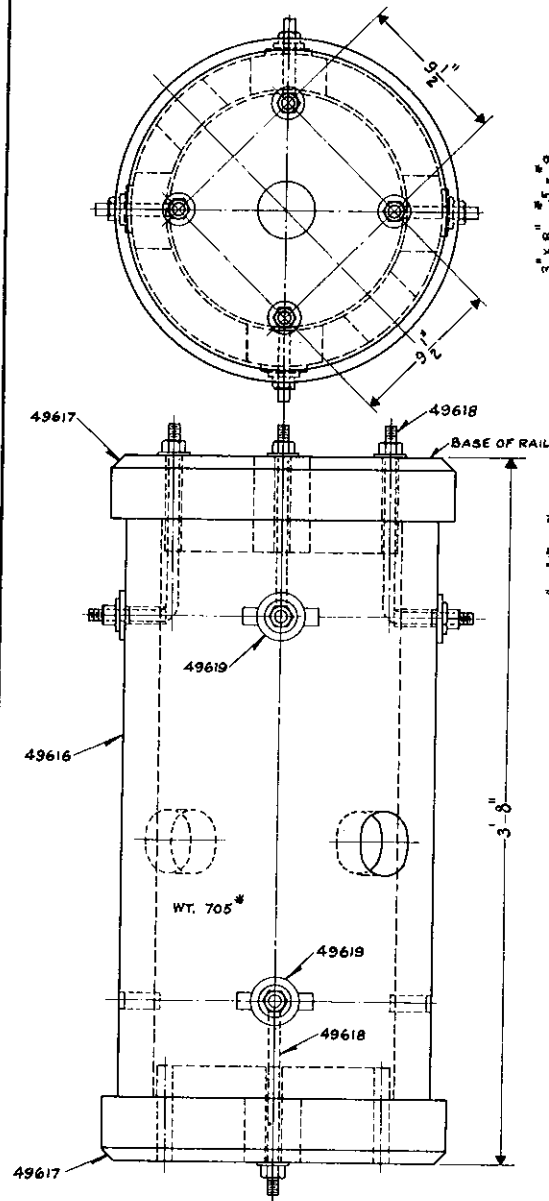
PRE-CAST CONCRETE
FOR POSITION LIGHT SIGNALS

OFFICE OF CHIEF ENGINEER, PHILA., PA.

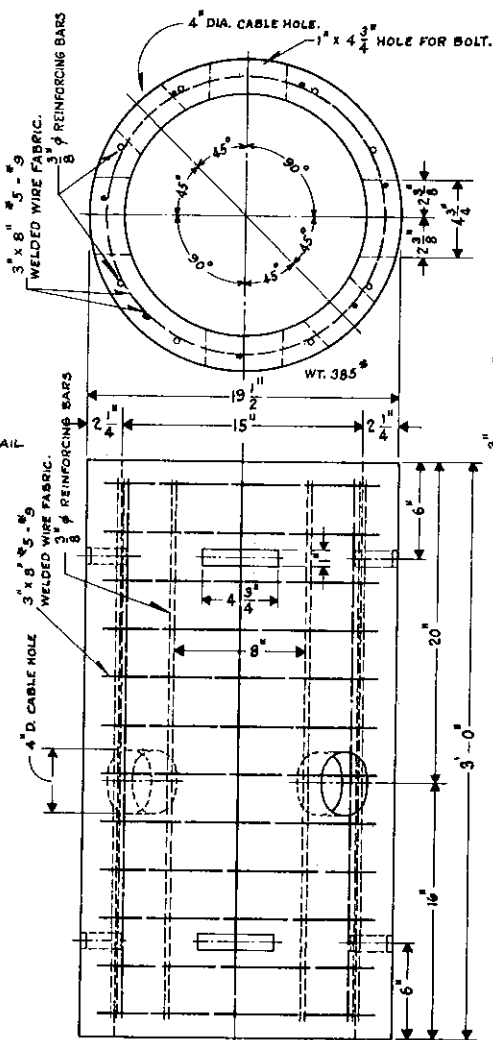
JUNE 26, 1944.

Approved
N. L. Stanton
Assistant Chief Engineer-Signals

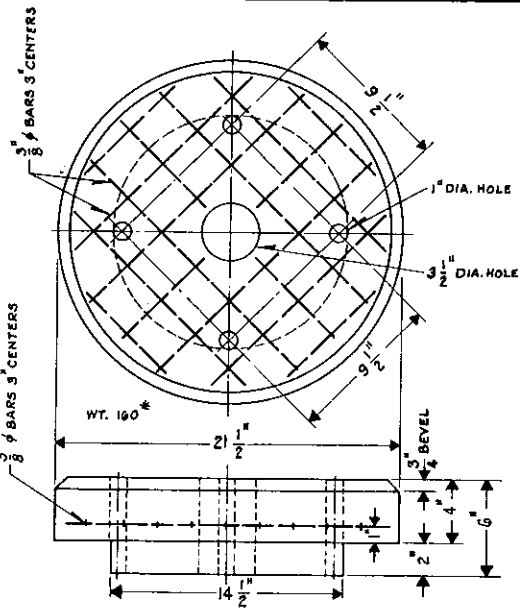
Approved
W. H. ...
Chief Engineer



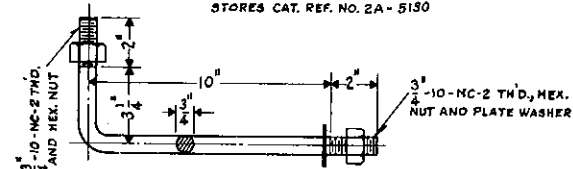
49615 FOUNDATION COMPLETE
AS SHOWN.
STORES CAT. REF. NO. 2A-4529



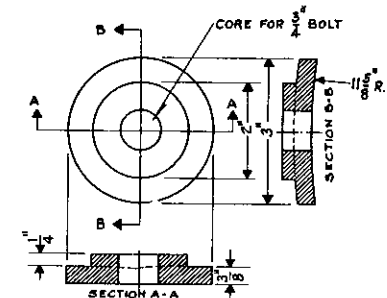
49616 BODY
REINFORCED CONCRETE
STORES CAT. REF. NO. 2A-5129



49617 COVER
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-5130



49618 BOLT COMPLETE
AS SHOWN.
O. M. S.
STORES CAT. REF. NO. 2A-5131
(FURNISH 6)



49619 WASHER CAST IRON
STORES CAT. REF. NO. 2A-5132
(FURNISH 6)

- NOTES:-
1. FOUNDATIONS SHOWN ON SHEETS 1 AND 2 OF THIS DRAWING, S-496 (CURRENT ISSUE), SHALL BE MANUFACTURED IN ACCORD WITH A.S.T.M. SPECIFICATIONS C76-41. CONCRETE SHALL TEST 4500 POUNDS PER SQUARE INCH IN 28 DAYS, AND EACH UNIT SHALL BE PLAINLY MARKED WITH THE MANUFACTURER'S NAME.
 2. ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
 3. THE REINFORCING IN BODIES 49614, 49615, 49616 AND 49618 SHALL BE 3" X 8", #5 GAUGE X #9 GAUGE WELDED WIRE FABRIC FORMED INTO A CAGE, WITH THE #5 GAUGE WIRES PLACED IN THE ANNULAR POSITION, THE #9 WIRES LAPPED AT LEAST 6" AND SECURELY TIED TOGETHER. IN ADDITION 3" LONGITUDINAL BARS, & 3" ANNULAR BARS IN 49614, SHALL BE IMBEDDED AS SHOWN.
 4. THE REINFORCING IN COVERS 49617 AND 49618 SHALL BE 3" BARS, SPACED 3" CENTERS EACH WAY AND SECURELY TIED TOGETHER.
 5. FOUNDATIONS 4961, 4962, 4963 AND 49615 SHALL BE SHIPPED KNOCKED-DOWN, WITH ALL BOLTS, WASHERS, ETC. FOR ASSEMBLING IN THE FIELD.
 6. FOUNDATION 49615 IS FOR USE WITH SIGNAL 4102 DRAWING S-410. FOR APPLICATION OF FOUNDATIONS 4961, 4962, & 4963 SEE DIAGRAM 'D' SHEET NO. 1 LOCATING CENTER OF MAST 10'-0" FROM GAUGE LINE OF NEAREST RAIL OF TRACK GOVERNED BY LOCAL CONDITIONS. IN ALL CASES DRAINAGE SHALL NOT BE OBSTRUCTED.
 7. PRE-CAST CONCRETE FOUNDATIONS SHALL BE AS SHOWN ON DRAWING, SHEETS 1 & 2, OR SIMILAR IN CONSTRUCTION IF APPROVED BY THE ASSISTANT CHIEF ENGINEER-SIGNALS.
 8. INSPECTION OF PRE-CAST CONCRETE FOUNDATIONS SHALL COVER THE MANUFACTURER'S PLANT TO DETERMINE IF PROPER FACILITIES ARE AVAILABLE TO MANUFACTURE THE PRODUCTS IN ACCORDANCE WITH THE DRAWING AND THAT HE UNDERSTANDS WHAT IS REQUIRED. THIS INSPECTION SHALL BE MADE DURING THE PROCESS OF CONSTRUCTION TO INSURE THAT THE PROPER QUALITY AND QUANTITY OF CONCRETE IS BEING USED, AND THAT THE LOCATIONS AND DETAILS OF THE REINFORCEMENT ETC. ARE IN ACCORDANCE WITH THE DRAWING.

FOR REVISION NOTES SEE SHEET NO. 1.

SHEET 2 OF 2 SHEETS

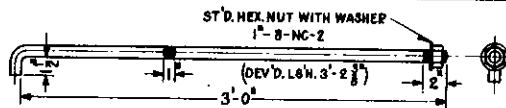
S-496-D

THE PENNSYLVANIA RAILROAD
STANDARD
FOUNDATIONS
PRE-CAST CONCRETE
FOR POSITION LIGHT SIGNALS

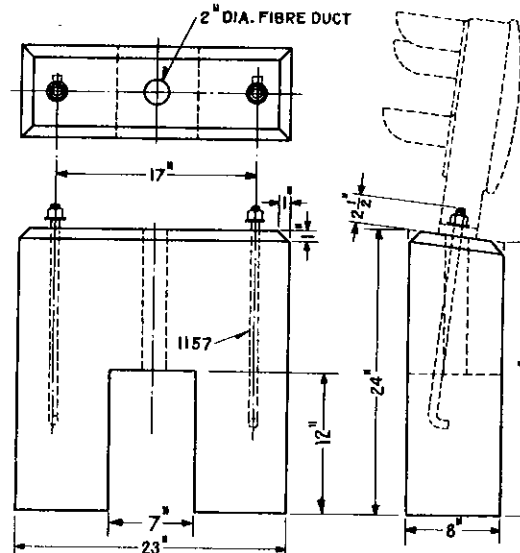
OFFICE OF CHIEF ENGINEER, PHILA., PA. JUNE 26, 1944.

Approved *N. L. Stanton* Assistant Chief Engineer-Signals

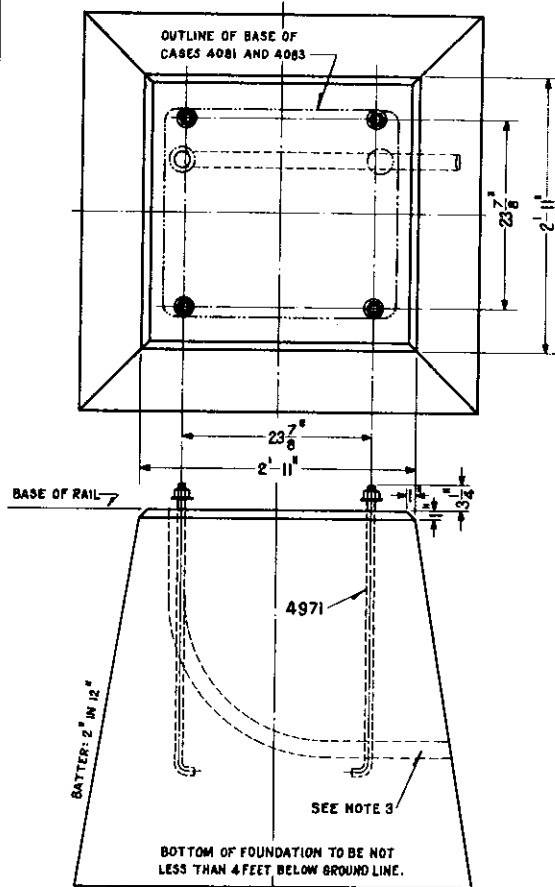
Approved *[Signature]* Chief Engineer



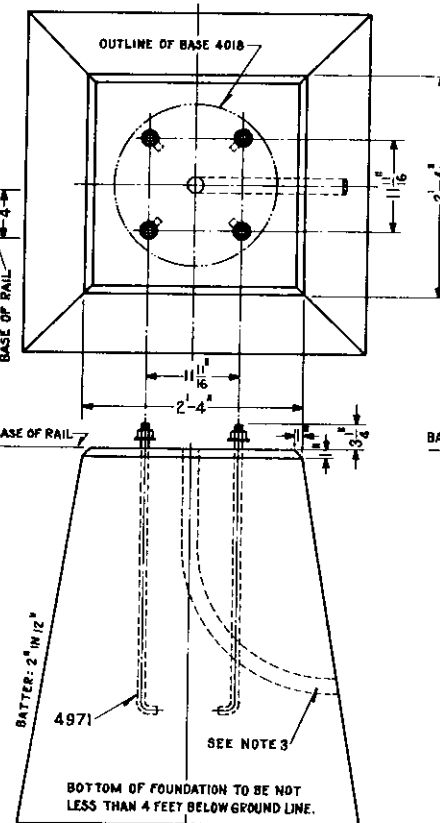
4971 HOOK BOLT O.H.S.
A. R. A. MAN. 1924



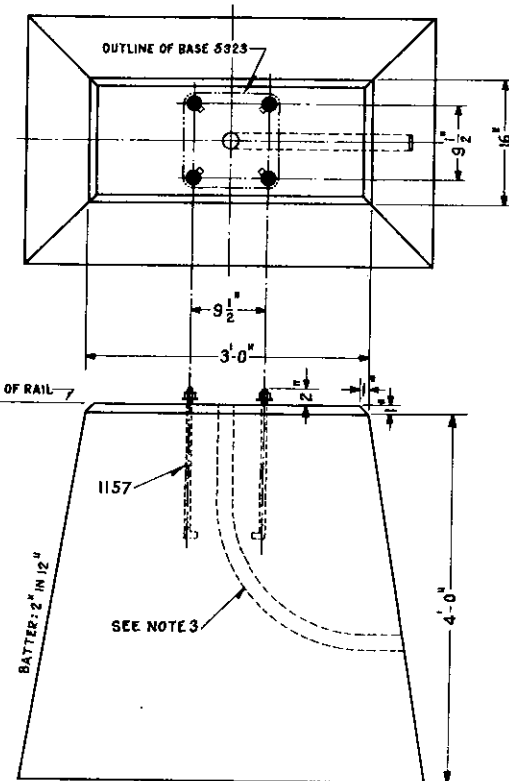
4973 FOUNDATION



4972 FOUNDATION



4974 FOUNDATION



4975 FOUNDATION

FOUNDATION	FOR USE WITH
4972	SIGNALS 4062, 4063 INSTRUMENT CASES 4081, 4083
4973	SIGNAL 4101
4974	SIGNALS 4001, 4061
4975	SIGNAL 4102

NOTE:-

1. CENTER OF FOUNDATIONS 4972, 4974 AND 4975 SHALL BE 7 FEET 6 INCHES MIN. FROM GAUGE LINE OF RIGHT HAND RAIL OF TRACK GOVERNED.
2. CENTER OF FOUNDATION 4973, WHEN BETWEEN TRACKS, SHALL BE LOCATED ON THE CENTER-LINE OF INTER-TRACK SPACE; WHEN OUTSIDE OF TRACK NOT LESS THAN 4 FEET 3 INCHES FROM GAUGE LINE OF RIGHT HAND RAIL OF TRACK GOVERNED.
3. 2 INCH DIA. FIBRE DUCT WITH 18 INCH RAD. BEND. THE LOCATION OF DUCT MAY BE CHANGED TO SUIT LOCAL CONDITIONS.
4. CONCRETE SHALL BE IN ACCORDANCE WITH A.R.A. SIGNAL SECTION SPECIFICATION NO. 1111.

REVISIONS
REDRAWN FROM APPROVED PLAN S-497-C, DATED JAN. 28, 1927 AND REVISED.
E JULY 20, 1934.
APPROVED <i>Arthur</i>

1 SHEET

S-497-E

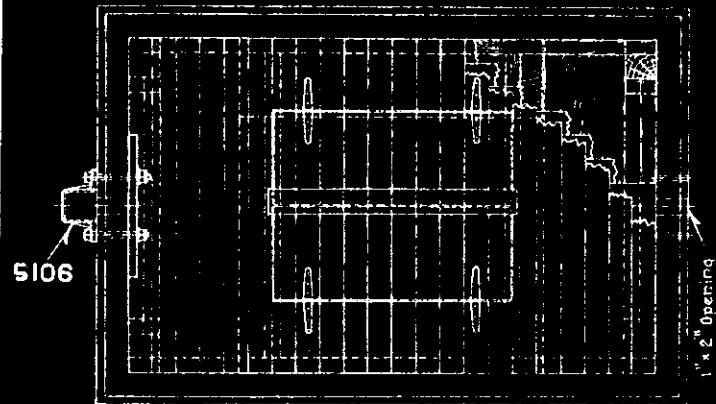


THE PENNSYLVANIA RAILROAD
STANDARD
FOUNDATIONS

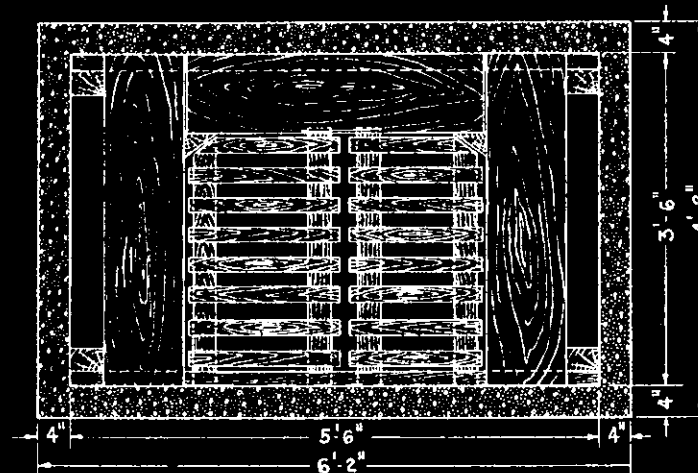
FOR POSITION LIGHT SIGNALS AND INSTRUMENT CASES
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., FEB. 18, 1934

Approved *Arthur*
Chief Signal Engineer

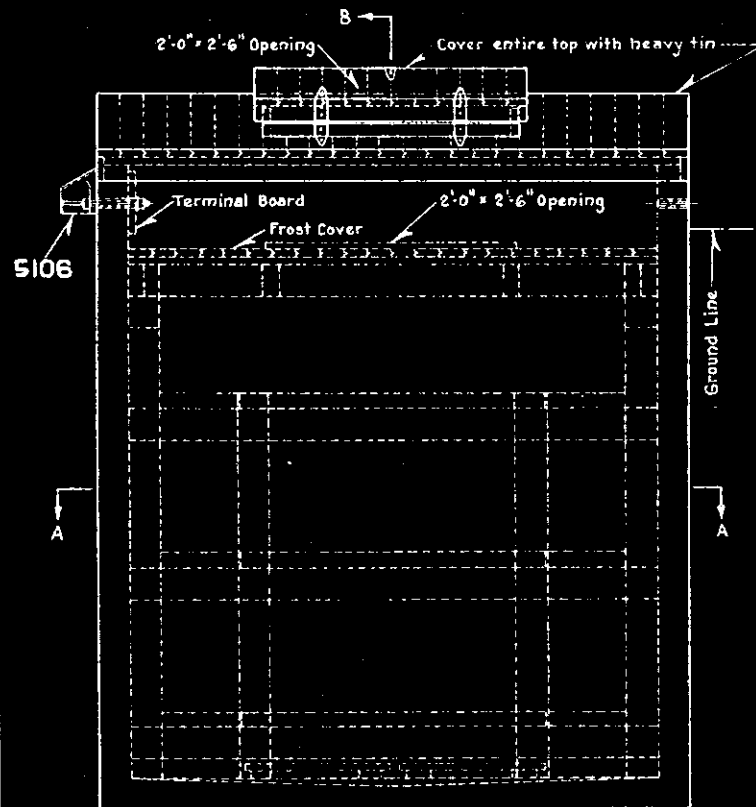
Approved *Arthur*
Chief Engineer



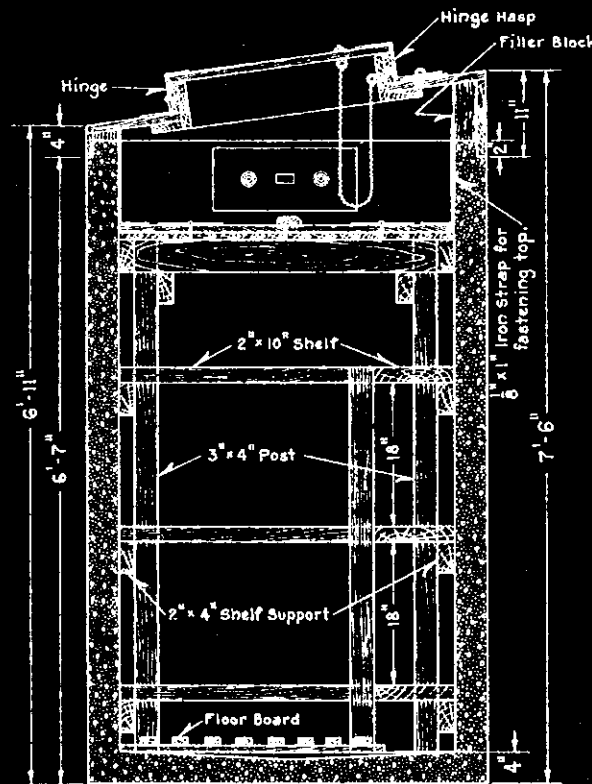
PLAN SHOWING FROST COVER



SECTION A-A



FRONT ELEVATION



SECTION B-B

Note:
Well shall be constructed in place.
Well shall be placed so that door opens
away from Main Tracks.



REVISIONS

1 SHEET

S-508-A

PENNSYLVANIA SYSTEM

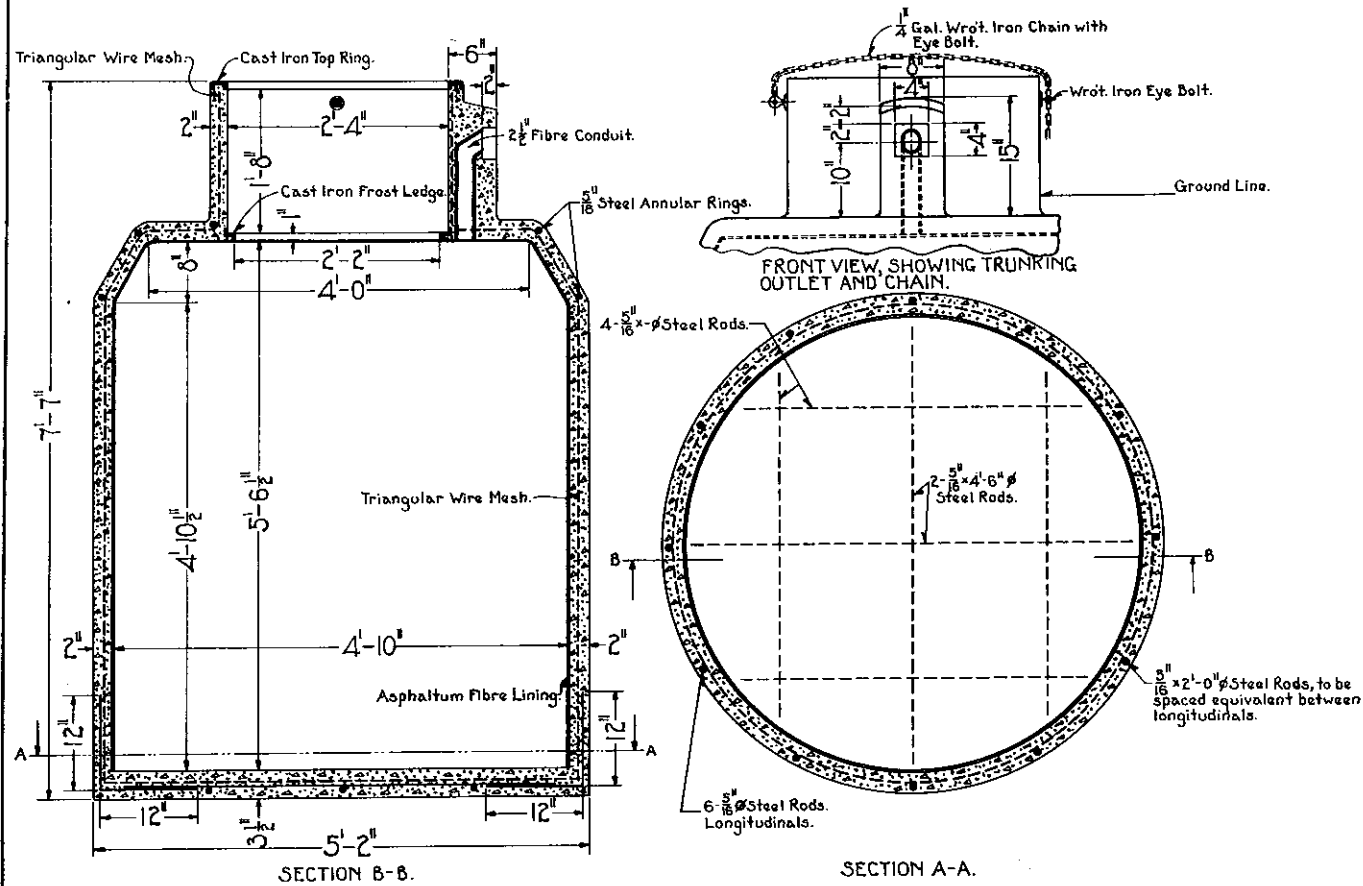
STANDARD

BATTERY WELL

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., MARCH 6, 1922

Correct *Arthur* Chief Signal Engineer

Approved *W. H. Mumery* Chief Engineer



5091-WELL. Max. capacity { 48 Cells 500 A.H. / 42 " 1000 "

ASSEMBLAGE.	
No. Req.	NAME.
1	Well Body.
1	Pressed Steel Cover.
1	Eye Bolt with 1-Sq. nut and 2 washers.
1	Chain with Eye Bolt with 1-Sq. nut and 2 washers.
1	Frost Cover.
1	Ladder.
18	Shelf Segments.
18	" Blocks.
18	" Strips.
12	" Uprights.
1	Slab Floor.

Note:-
Battery Well 5091 shall be provided with three complete circular shelves with 1" clearance between them, and slab flooring.

REVISIONS
B- JUNE 12, 1936.
Approved: *at Paul*

1 SHEET S-509-B

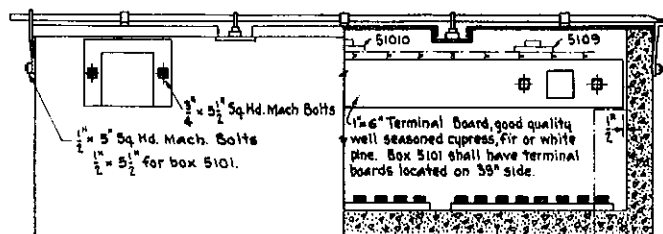
PENNSYLVANIA SYSTEM

STANDARD BATTERY WELL

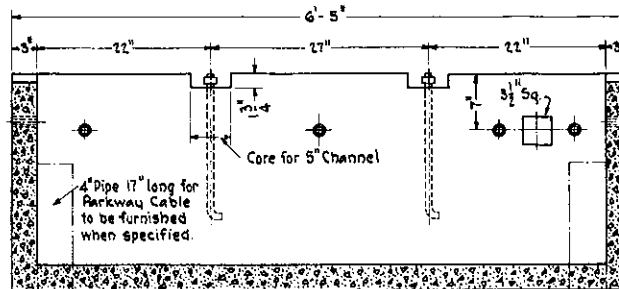
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., SEPT 2, 1921.

Correct *at Paul* Chief Signal Engineer.

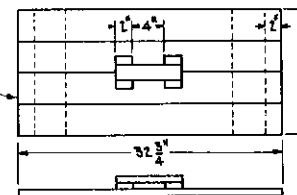
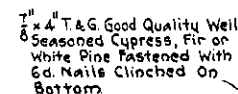
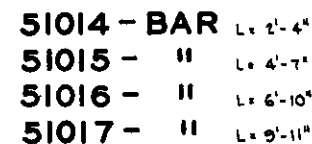
Approved *at Paul* Chief Engineer.



Quarter Section of Complete Battery Box



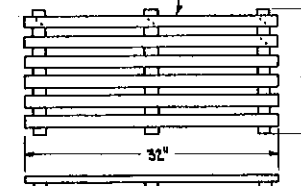
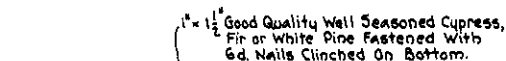
Half Section of Battery Box With Dimensions



5108 - FROST BOARD L. 16 3/4"

5109- " " L 21 7 11

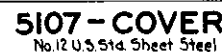
51010- 11 11 L: 22nd



51011-SLAT FLOOR Lx 16'

51012- " " L = 19 1/2

51013- " " L = 16'



2. One piece of thirty five mesh copper screen, the size of the outlet cover, shall be provided for one outlet of each box housing lead tube battery.
2. The entire surface and top edges of box and all surfaces of terminal boards, silt floor and frost boards shall be given two coats of asphaltum paint before installation.
3. Iron work shall be thoroughly cleaned and given a priming brush or dipping coat of red oxide or graphite paint and two coats of light gray paint.
4. Interior iron work in boxes shall be protected with acid proof compound.

5. Box shall be made of Portland cement concrete in accordance with Association of American Railroads Specification.
6. Coarse aggregate shall consist of 3/4 inch maximum size stone or gravel.
7. Not less than 7 sacks of cement shall be used per cu. yd. of concrete.
8. Water cement ratio to produce a compressive strength of 3000 pounds per square inch after 18 days shall be used.



A.A.R. Manual - Mar. 1936.

1 Sheet

5-510-B



BATTERY BOX

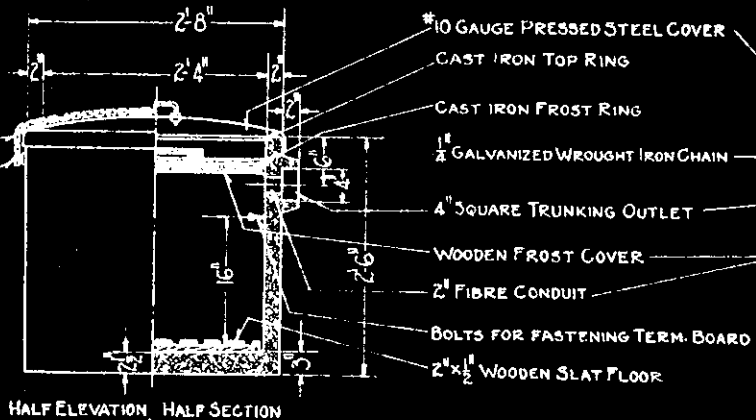
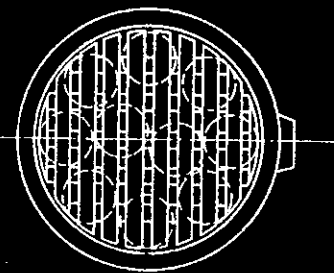
Office of Chief Signal Engineer, Phila., Pa., June 10, 1936.

Approved:

Approved:

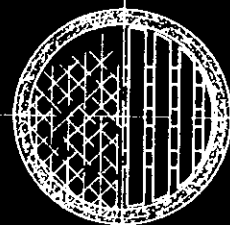
A. H. Hurd
Chief Signal Engineer

W. Higgins
Acting Chief Engineer

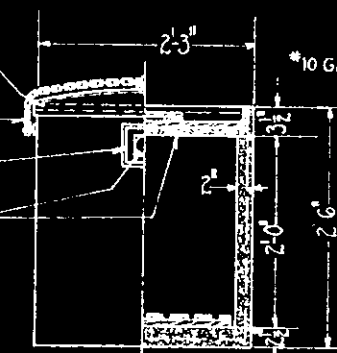


HALF ELEVATION HALF SECTION

5111-BOX REINF. CONCRETE
CAP. 10 CELLS 500 A.H.
CAP. 7 CELLS 1000 A.H.

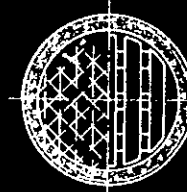


HALF SECTION SHOWING REINF. IN BOTTOM
HALF SECTION SHOWING SLATS IN FLOOR

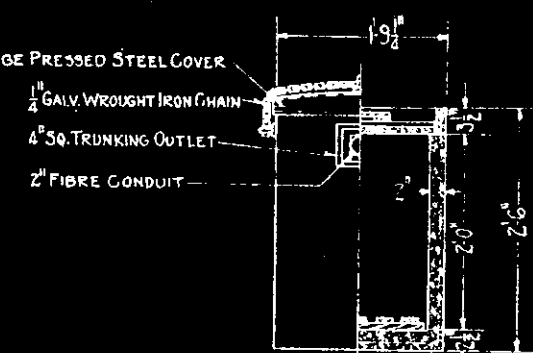


HALF ELEVATION HALF SECTION

5112-BOX REINF. CONCRETE
CAP. 6 CELLS 500 A.H.
CAP. 4 CELLS 1000 A.H.



HALF SECTION SHOWING REINF. IN BOTTOM
HALF SECTION SHOWING SLATS IN FLOOR



HALF ELEVATION HALF SECTION

5113-BOX REINF. CONCRETE
CAP. 3 CELLS 500 A.H.
CAP. 2 CELLS 1000 A.H.

REVISIONS

1 SHEET

S-511-A



PENNSYLVANIA RAILROAD SYSTEM
STANDARD

BATTERY BOXES

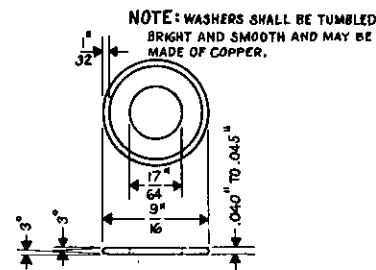
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA. PA., JUNE 22, 1924.

Approved

Anthony
Chief Signal Engineer

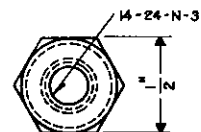
Approved

[Signature]
Chief Engineer



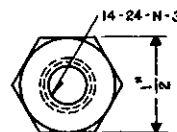
5134 WASHER.

A.A.R. SIG. SEC. M-1936.
STORES CAT. REF. NO. 2-A-2965



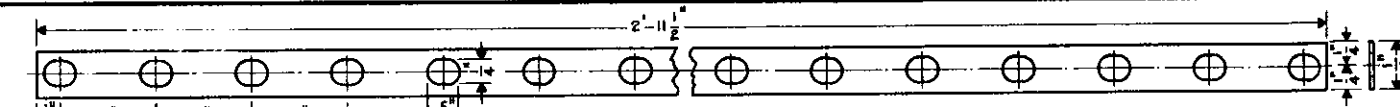
5136 BINDING NUT.

A.A.R. SIG. SEC. M-1936.
STORES CAT. REF. NO. 2-A-1598.



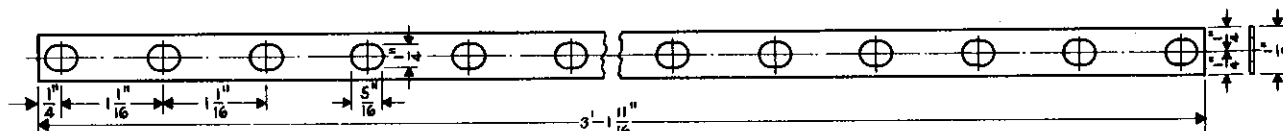
5137 CLAMP NUT.

A.A.R. SIG. SEC. M-1936.
STORES CAT. REF. NO. 2-A-1589.



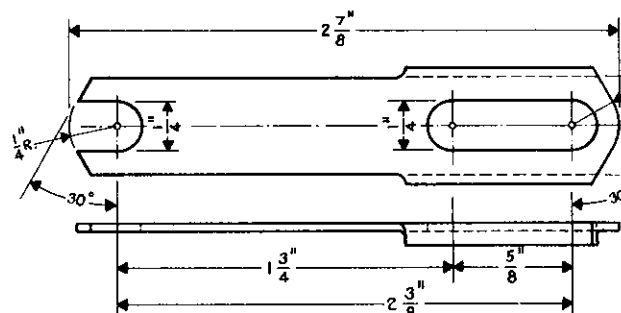
51312 CONNECTOR BUS. FOR 36 TERMINALS

HALF-HARD COPPER NO. 18 A.W.G. (NICKEL OR CHROMIUM PLATED)
A.A.R. SIG. SEC. MAR. 1939.
STORES CAT. REF. NO. 2-A-2694.



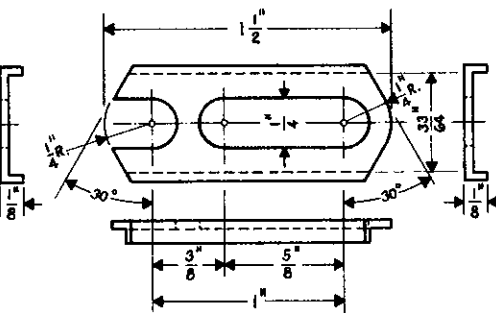
51313 CONNECTOR BUS. FOR 36 TERMINALS

HALF-HARD COPPER NO. 18 A.W.G. (NICKEL OR CHROMIUM PLATED)
STORES CAT. REF. NO. 2-A-4111



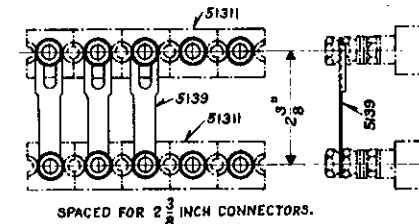
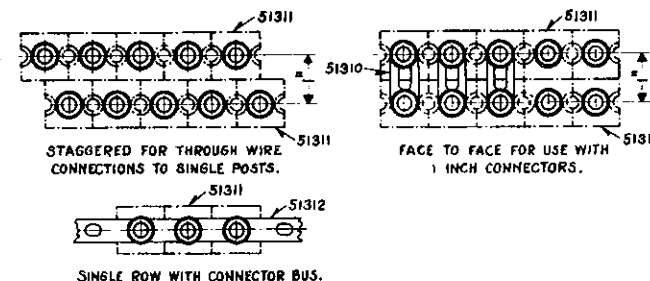
5139 CONNECTOR.

HALF-HARD COPPER NO. 18 A.W.G. (NICKEL OR CHROMIUM PLATED)
A.A.R. SIG. SEC. MAR. 1939.
STORES CAT. REF. NO. 2-A-688.



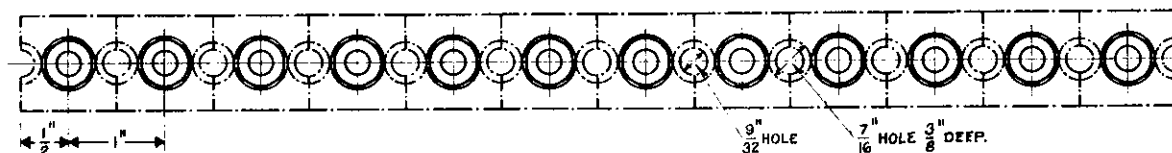
51310 CONNECTOR.

HALF-HARD COPPER NO. 18 A.W.G. (NICKEL OR CHROMIUM PLATED)
A.A.R. SIG. SEC. MAR. 1939.
STORES CAT. REF. NO. 2-A-689.



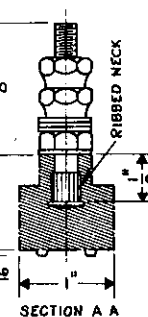
NOTE:

1. MATERIAL FOR TERMINAL BLOCKS, WASHERS, NUTS AND BINDING POSTS SHALL BE IN ACCORDANCE WITH A.A.R. SIG. SEC. SPECIFICATIONS NO. 159 AND NO. 183.



51311 MULTIPLE UNIT TERMINAL BLOCK. COMPLETE

A.A.R. SIG. SEC. OCT. 1940
STORES CAT. REF. NO. 2-A-4110



SECTION A A

REVISIONS

REDRAWN FROM APPROVED PLAN
S-513-E, DATED AUG. 4, 1920, LAST
REVISED OCT. 23, 1934 AND REVISED.

1 SHEET



S-513-F

THE PENNSYLVANIA RAILROAD

STANDARD

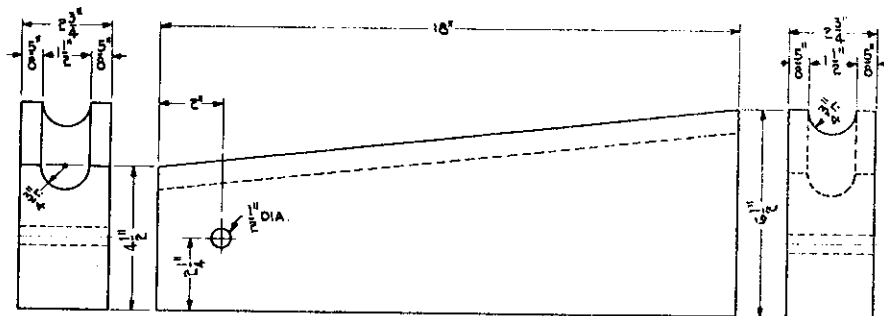
TERMINAL BLOCKS

MULTIPLE UNIT

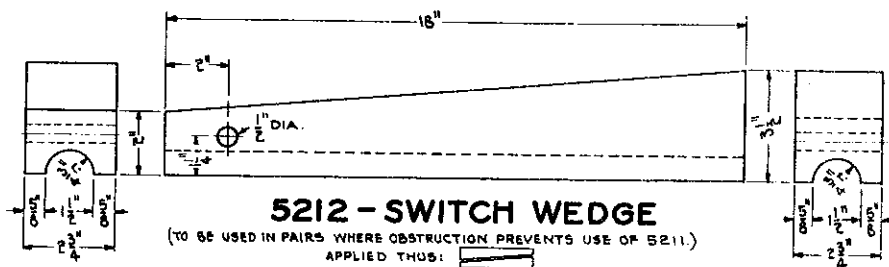
OFFICE OF CHIEF ENGINEER, PHILA., PA. MAY 14, 1940.

Approved
H. C. Smith
Assistant Chief Engineer-Signals

Approved
W. J. Higgins
Chief Engineer



5211 - SWITCH WEDGE



5212 - SWITCH WEDGE

(TO BE USED IN PAIRS WHERE OBSTRUCTION PREVENTS USE OF 5211.)
APPLIED THUS: [Diagram showing two wedges applied to a rail joint]

- SPECIFICATION -

MATERIAL: SWEET BIRCH, DOGWOOD, HORNBEAM, LOCUST, HARD MAPLE, OAK (EXCEPT SO-CALLED SWAMP OR WATER OAKS).
PHYSICAL REQUIREMENTS: SWITCH WEDGES SHALL BE FREE FROM DECAY, HOLES, KNOTS, SPLIT, WANE, GRAIN WITH SLANT GREATER THAN ONE IN TWENTY AND MOISTURE IN EXCESS OF 20%.
DESIGN: SWITCH WEDGES SHALL CONFORM TO THE SHAPES AND SIZES SPECIFIED. ALL DIMENSIONS SHOWN ARE MINIMA.
MANUFACTURE: SWITCH WEDGES SHALL BE STRAIGHT, CUT SQUARE AT THE ENDS, HAVE SMOOTH GROOVE, AND BE SURFACED ON ALL PLANES.

- FIELD NOTES -

WHERE SWITCH POINT OPENING IS SUCH THAT WEDGE 5211 CANNOT BE DRIVEN BETWEEN STOCK RAIL AND SWITCH POINT A SUFFICIENT DISTANCE TO INSURE A SAFE WEDGE, THAT SURFACE OF WEDGE WHICH IS PLACED AGAINST STOCK RAIL MAY BE CUT BACK TO OBTAIN THE DESIRED RESULTS.

WHERE UNUSUAL OBSTRUCTIONS, SUCH AS BOLT HEADS, ETC, PREVENT THE APPLICATION OF WEDGE 5212 AS INTENDED, THE LENGTH MAY BE REDUCED TO NOT LESS THAN NINE INCHES, BY SAWING OFF THE ENDS, TO MEET LOCAL CONDITIONS.

PRECAUTIONS MUST BE TAKEN TO INSURE WEDGES ALTERED TO MEET AN UNUSUAL CONDITION, SUCH AS OUTLINED ABOVE, ARE NOT USED WHERE STANDARD WEDGES 5211 OR 5212 CAN BE APPLIED.

REVISIONS

1 SHEET

5-521-A



THE PENNSYLVANIA RAILROAD
STANDARD
SWITCH WEDGES

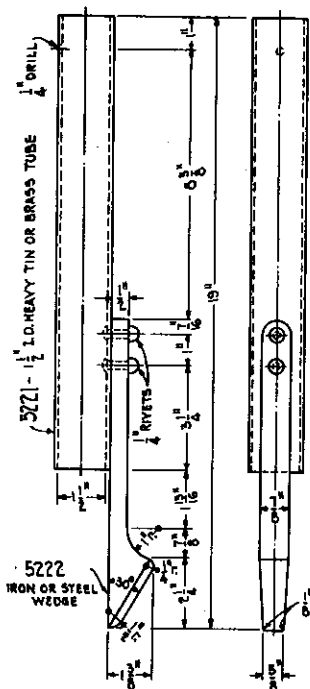
Office of Chief Signal Engineer, Phila., Pa., July 10, 1935

Approved:

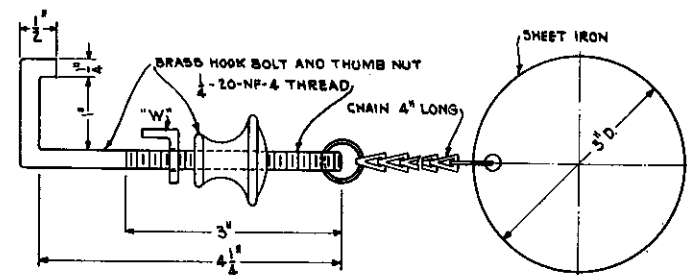
Approved:

A. S. Knab
Chief Signal Engineer

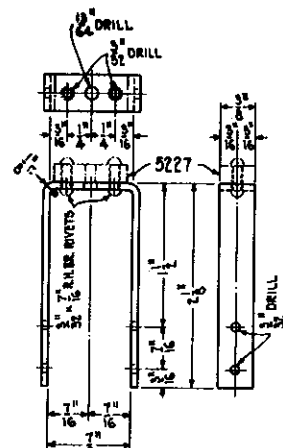
W. S. Suggs
Actg. Chief Engineer



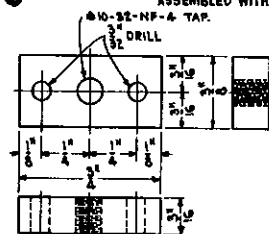
5221-TUBE ONLY.
5222-WEDGE ONLY.
5223-BLOCK COMPLETE.
 FOR MECHANICAL MACHINE.



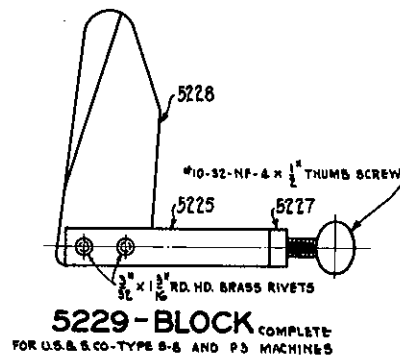
5224-BLOCK
 FOR G.R.S. MODEL 2 UNIT LEVER TYPE ELECTRIC MACH.



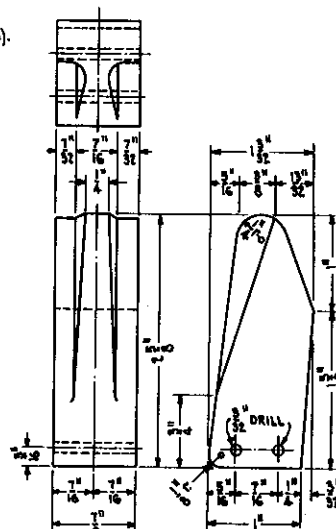
5225-'U' STRAP ONLY (NO. 14 AWG BRASS).
5226 ASSEMBLED WITH 5227.



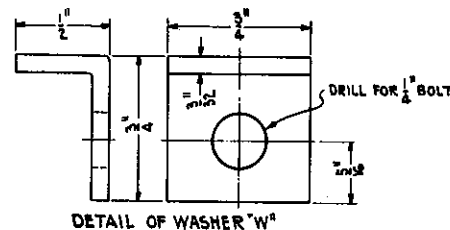
5227-BLOCK (BRASS)



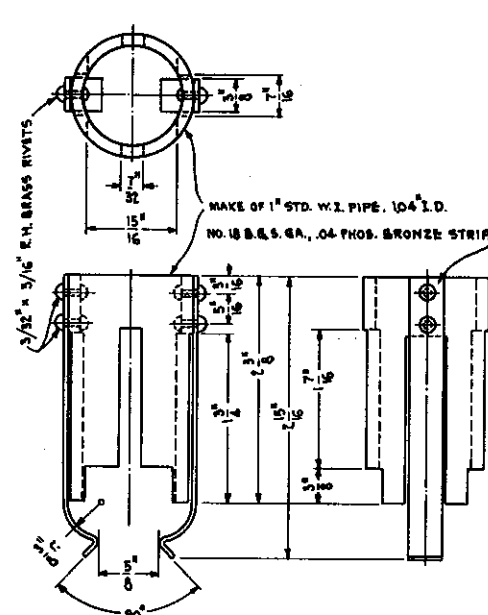
5228-BLOCK COMPLETE
 FOR U.S. & CO. TYPE S-S AND P3 MACHINES



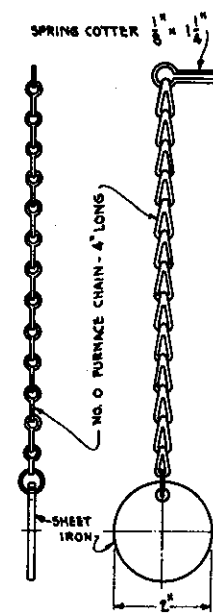
5228-BLOCK (HARDWOOD)



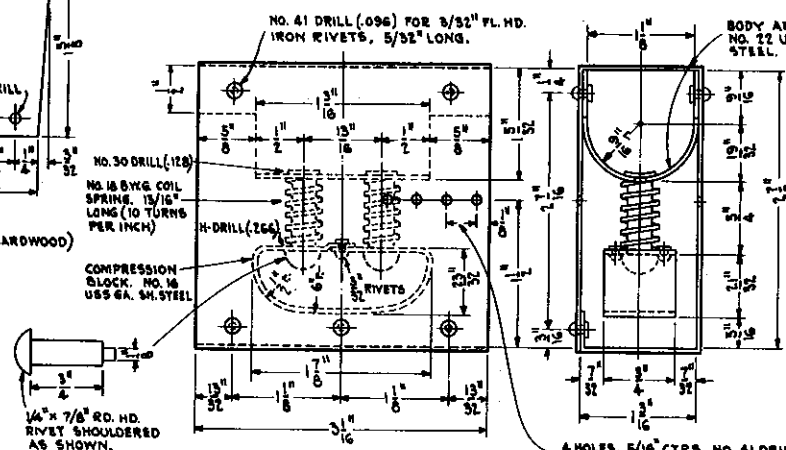
DETAIL OF WASHER "W"



52210-BLOCK
 FOR U.S. & S. CO. POWER MACHINES.



52211-BLOCK
 FOR ELECTRICALLY LOCKED SEMAPHORE
 INDICATOR AND CIRCUIT CONTROLLER.



52212-BLOCK
 FOR G.R.S. MODEL 2 ELECTRIC MACHINE.

ALL EXPOSED PORTIONS, EXCEPT THREADED PARTS, ENAMELED VERMILION.

1 SHEET

REVISIONS

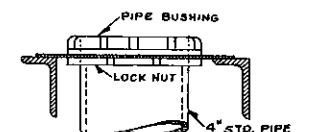
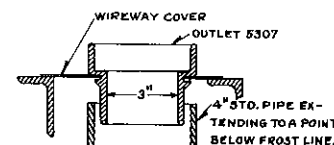
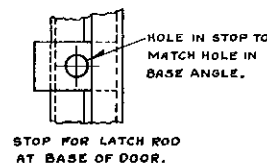
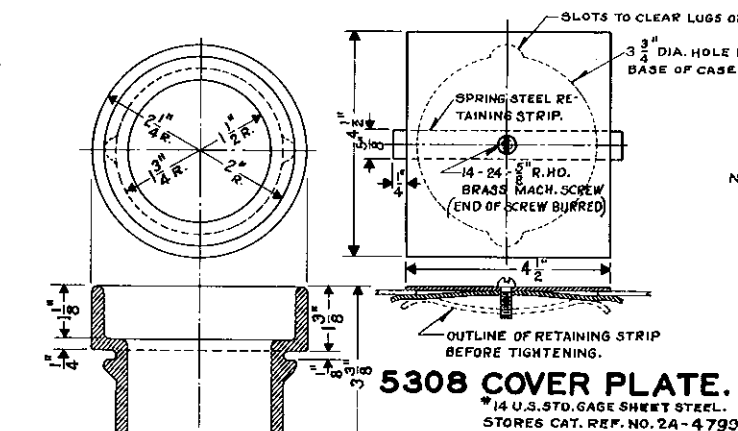
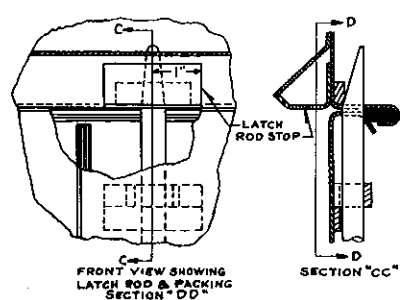
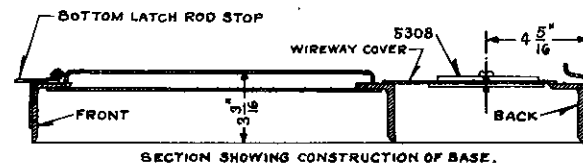
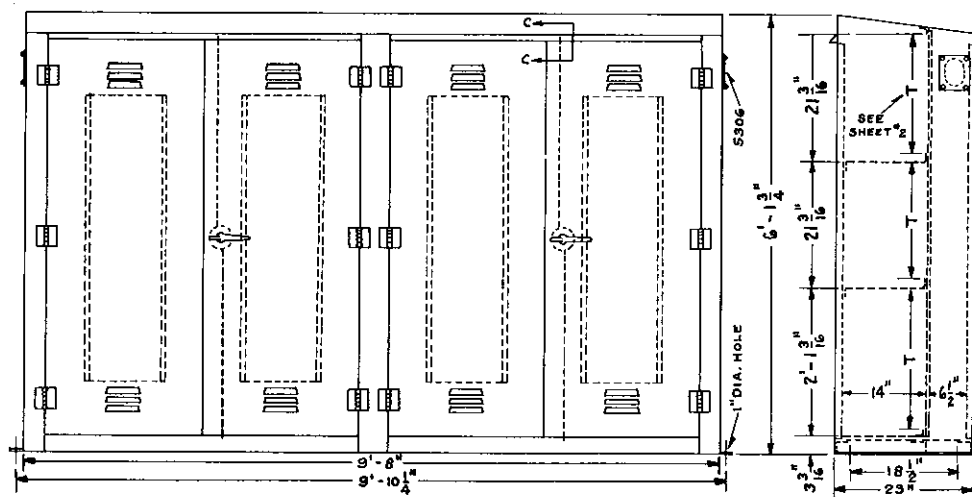
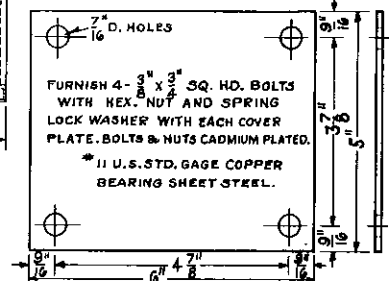
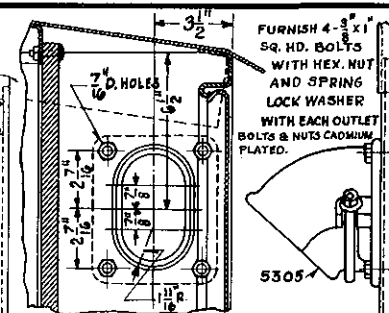
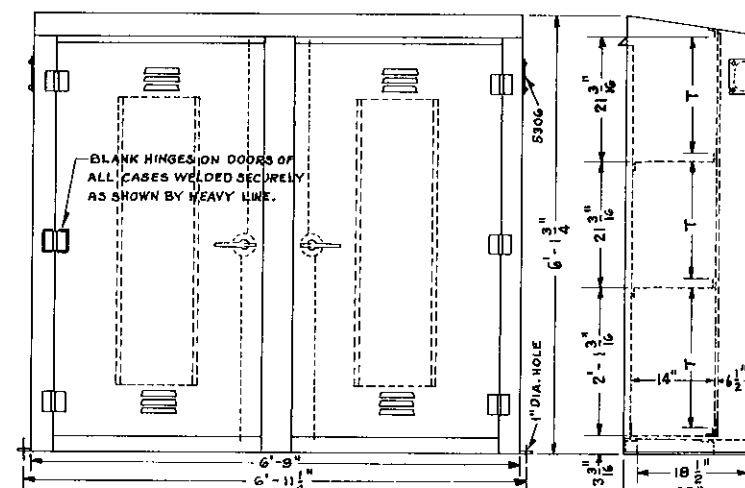
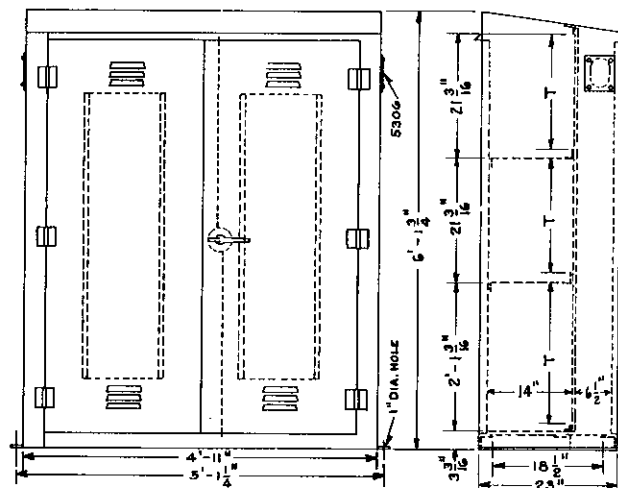
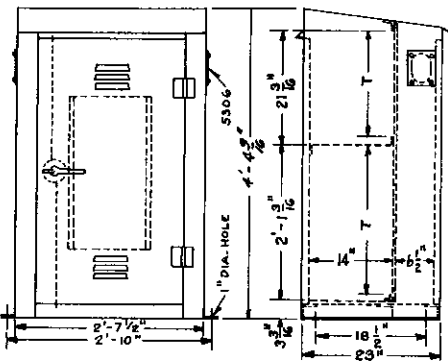
REDRAWN FROM APPD. PLAN S-522-F
 DATED 9-12-22, LAST REVISED
 7-16-24, AND REVISED.

S-522-F

THE PENNSYLVANIA RAILROAD
 STANDARD
BLOCKING DEVICES
 FOR INTERLOCKING MACHINE LEVERS

Office of Chief Signal Engr., Phila., Pa., January 10, 1935
 Approved *A.H. Hurd* Chief Signal Engineer
 Approved *[Signature]* Chief Engineer

J. H. Henshaw
Chief Engineer



- NOTE :-
1. INSTRUMENT CASES WILL BE FURNISHED WITH CABLE OPENINGS EQUIPPED WITH COVER PLATES AS SHOWN.
 2. CABLE OUTLETS 5305 AND 5307 SHALL BE ORDERED SEPARATELY. (NOT WITH CASE)

REVISIONS

REDRAWN FROM APPROVED
PLAN 9-530-F, DATED JANUARY
23, 1933 AND REVISED AS
FOLLOWS--CASES 5301 AND 5302
STORES CAT. REF.'S, CONSTRUCTION
DETAILS, AND 5308, 5306, 5307,
5308 ADDED. SPECIFICATIONS
SHOWN ON A SECOND SHEET. SLIGHT
CHANGES IN SPECIFICATIONS TO
AGREE WITH MANUFACTURERS
PRACTICES, AND P.R.R. REQUIRE-
MENTS. VARIOUS SKETCHES SHOW-
ING APPLICATION OF OUTLETS,
COVER PLATES, ETC. ADDED.

FOR SPECIFICATIONS AND OTHER
DETAILS SEE SHEET NO.2.

SHEET 1 OF 2

S-530-G

THE PENNSYLVANIA RAILROAD

STANDARD INSTRUMENT CASES

OFFICE OF CHIEF ENGINEER, PHILA., PA., NOVEMBER 18, 1942.

Approved A
N. C. Stanton
 Assistant Chief Engineer-Signals

Approved _____

 Chief Engineer

SPECIFICATIONS

1. GENERAL:

- (a) INSTRUMENT CASES UNDER THESE SPECIFICATIONS SHALL BE MADE IN FOUR SIZES. THE OVERALL LENGTH, WIDTH AND HEIGHT AND THE FOUNDATION BOLT HOLE SPACING SHALL BE AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER.
- (b) INSIDE OF EACH CASE SHALL BE ARRANGED AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER SO THAT WITH THE ROOF FORMED IN ACCORDANCE WITH SECTION 4 OF THESE SPECIFICATIONS, TERMINAL WALL SHALL HAVE A CLEAR SPACE "T", FREE OF METAL BETWEEN SHELVES, AND EXTENDING THE ENTIRE LENGTH OF THE CASE.
- (c) A CLEAR SPACE APPROXIMATELY 6 1/2 INCHES WIDE EXTENDING THE FULL LENGTH OF CASE SHALL BE PROVIDED BETWEEN THE TERMINAL WALL AND REAR PANELS.
- (d) EACH CASE SHALL BE PROVIDED WITH SHELVES AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER, THE FULL INSIDE LENGTH OF CASE AND EXTENDING BACK TO THE TERMINAL WALL.
- (e) ALL SHEET METAL PARTS SHALL BE MADE OF COPPER BEARING STEEL, PATENT LEVELED AND RESQUARED. ROOF AND WEATHER EXPOSED WALLS SHALL BE MADE OF #14 U.S. GAGE. SHELVES, TERMINAL WALL SUPPORTS ETC. SHALL BE MADE OF #16 U.S. GAGE. MATERIAL FOR BASE FRAME SHALL BE AS SPECIFIED UNDER SECTION 2.
- (f) THE DESIGN AND CONSTRUCTION OF CASE WHICH MANUFACTURER PROPOSES TO FURNISH SHALL MEET THE APPROVAL OF THE ASSISTANT CHIEF ENGINEER-SIGNALS.

2. BASE FRAME:

- (a) BASE FRAME SHALL BE CONSTRUCTED OF O.H. STEEL ANGLES WITH CROSS TIES IF NECESSARY TO PROVIDE A FRAME OF PROPER RIGIDITY.
- (b) THE ENTIRE BASE FRAME SHALL BE FIRMLY WELDED TOGETHER.
- (c) EACH BASE SHALL BE PROVIDED WITH CABLE ENTRANCE OPENINGS COVERED WITH PLATE 5308, THE NUMBER OF OPENINGS FOR EACH CASE SHALL BE AS SHOWN ON PLAN S-530 SHEET NO. 2 BASIC NUMBER.

3. UPRIGHTS:

- (a) THE END UPRIGHTS SHALL BE OF ONE PIECE, IN CHANNEL SECTION, OF A SIZE SUFFICIENT TO FORM END OF CASE AND SIDE OF FRAME FOR DOORS AND BACK PANELS. THEY SHALL BE MOUNTED AGAINST OUTSIDE OF BASE FRAME AND SUBSTANTIALLY WELDED TO IT.
- (b) IN CENTER OF FRONT AND REAR OF CASES 5303 AND 5304 SHALL BE FORMED CHANNEL-SECTION UPRIGHTS. THE FRONT CHANNEL SHALL FORM A PART OF DOOR FRAME, THE REAR CHANNEL SHALL FORM A PART OF BACK FRAME TO HELP SUPPORT BACK PANELS AND TO SERVE AS A STIFFENER. BOTH CHANNELS SHALL BE SECURELY WELDED TO TOP RAIL AND BASE FRAME.
- (c) THE END UPRIGHTS SHALL BE PROVIDED WITH CABLE OPENING AND PLATE 5306 BOLTED TO END WALL WITH NUTS AND LOCK WASHERS INSIDE OF CASE.

4. ROOF:

- (a) ROOF, WATERSHED OVER DOORS, AND REAR PANELS SHALL BE FORMED FROM ONE PIECE OF SHEET METAL WITH A ROOF SLOPE DOWNWARD TO THE REAR, OF 1 1/2 INCHES TO THE FOOT.
- (b) ENDS AND FRONT SHALL BE STRUCK DOWN VERTICALLY AND SECURELY WELDED TO VERTICAL WALL WITH FILLET WELDS 1 1/2 INCHES LONG, ON 10 3/4 INCH CENTERS.
- (c) BACK OF ROOF SHALL BE STRUCK DOWN AT AN ANGLE, AS INDICATED ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER TO A POINT 1 1/4 INCHES FROM CASE TO PRODUCE A SUBSTANTIAL WATERSHED.
- (d) FRONT OF ROOF SHALL BE FORMED DIRECTLY OVER DOORS WITH A SLOPE OF 45 DEGREES AS SHOWN AND EXTEND TO A POINT NOT LESS THAN 1 INCH FROM CASE, TO PRODUCE A SUBSTANTIAL WATERSHED.
- (e) CORNERS OF ROOF SHALL BE WELDED TO PRODUCE A WATERPROOF SEAM.

5. DOOR AND PANEL FRAMES:

- (a) SUITABLY FORMED HORIZONTAL ANGULAR SHAPES, FORMING DOOR AND PANEL FRAME, SHALL BE SECURELY WELDED TO BASE FRAME, ROOF AND UPRIGHTS, FRONT AND BACK.
- (b) ALL PERMANENT JOINTS AT THE JUNCTION OF SHAPES, FORMING DOOR AND PANEL FRAMES SHALL BE SEAM-WELDED TO PRODUCE A ONE-PIECE WATERPROOF FRAME.

6. DOORS:

- (a) EACH DOOR SHALL BE FORMED INTO A CHANNEL SECTION FROM ONE PIECE, WITH CORNERS SEAM-WELDED, AND SHALL BE REINFORCED WITH A CHANNEL BRACE 12 INCHES WIDE, BETWEEN THE LOUVRES, WELDED TO INSIDE OF DOOR.
- (b) EACH DOOR SHALL BE PROVIDED WITH 2 THREE-LOUVRE VENTILATORS AND SLIDING REMOVABLE BRASS SCREENS (0.0135 INCH WIRE, 24 WIRES PER INCH) AS INDICATED ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER. LOUVRES SHALL BE PUNCHED 1 INCH HIGH AND 6 INCHES WIDE ON APPROXIMATELY 1 1/2 INCH CENTERS.
- (c) EACH DOOR SHALL BE SUPPORTED BY SUITABLE HEAVY BLANK HINGES, SECURELY WELDED TO DOOR AND FRAME AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER.
- (d) EACH PAIR OF DOORS, OR SINGLE DOOR SHALL BE EQUIPPED WITH A SUBSTANTIAL THREE POINT LOCKING DEVICE, LOCKING AT TOP, BOTTOM AND CENTER OF DOOR. A STOP TO PREVENT LOCKING DEVICE BEING LOCKED BEFORE DOOR IS FULLY CLOSED SHALL BE WELDED TO FRAME DIRECTLY OVER TOP OF DOOR AND ON BASE UNDER BOTTOM OF DOOR.
- (e) EACH DOOR SHALL BE EQUIPPED WITH A DEVICE FOR SECURING IT IN THE OPEN POSITION.
- (f) HANDLE, OPERATING LOCKING DEVICE, SHALL BE SO MADE AND ASSOCIATED WITH AN ANGLE PLATE OR EQUIVALENT, WELDED TO THE DOOR, THAT A PADLOCK HAVING A 3/4 INCH BAIL MAY BE APPLIED.
- (g) EACH DOOR SHALL BE SO CONSTRUCTED THAT WHEN IT IS CLOSED AGAINST A SUITABLE FABRICATED PACKING SECURELY MOUNTED TO DOOR FRAME, IT SHALL BE PRACTICALLY WATERPROOF.

7. PANELS:

- (a) BACK OF CASE EXCEPT FRAME SHALL BE REMOVABLE AND SHALL CONSIST OF SUITABLE VERTICAL PANELS, EACH FORMED IN CHANNEL SECTION FROM ONE PIECE WITH CORNERS WELDED. EACH CASE SHALL HAVE THE SAME NUMBER OF PANELS AS DOORS.
- (b) EACH REAR DOOR PANEL SHALL BE HELD IN ITS VERTICAL POSITION BY ONE SUPPORT WELDED TO THE CENTER OF THE LOWER INSIDE OF THE DOOR SO THE END OF SUPPORT WILL REST ON THE DOOR PACKING GROOVE. THE DOOR PANEL IS TO BE SECURED TO THE CASE WITH 3/4 INCH CHP SCREWS, LOCATED ONE ON EACH SIDE, APPROXIMATELY 10 INCHES FROM THE BOTTOM OF THE DOOR. THE TWO CHP SCREWS ARRANGED SO THAT THEY CANNOT BE REMOVED FROM DOOR.

8. SHELVES:

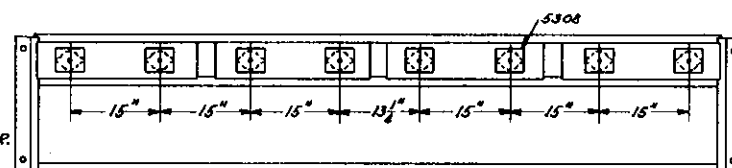
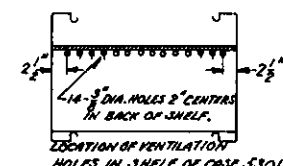
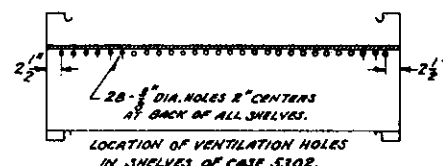
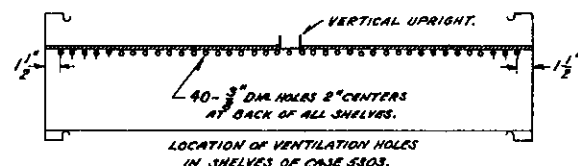
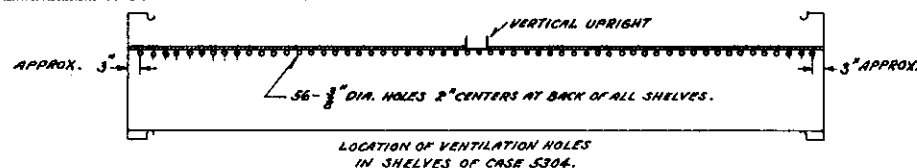
- (a) SHELVES 14 INCHES WIDE (TOLERANCE 1/4 INCH) SHALL BE FORMED WITH 1 1/2 INCH FLANGE BENT DOWN IN FRONT AND BENT UP IN BACK AND WELDED IN PLACE. THE ENDS OF SHELVES SHALL BE WELDED TO END WALLS.
- (b) BACK FLANGE SHALL BE PROVIDED WITH SUITABLE HOLES FOR 1/4 INCH STOVE BOLTS PROPERLY SPACED FOR SUPPORTING THE TERMINAL WALL, AS SHOWN IN SKETCH "A" PLAN S-530 SHEET NO. 2. BASIC NUMBER.
- (c) ALL SHELVES, EXCEPT BOTTOM OF CASE, SHALL BE PROVIDED WITH VENTILATION OPENINGS AS SHOWN ON PLAN S-530 SHEET NO. 2.

9. TERMINAL WALL:

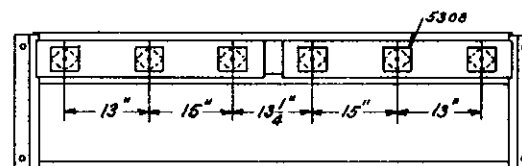
- (a) TERMINAL WALL SHALL CONSIST OF 1/2 INCH THICK HARD ASBESTOS BOARD OR EQUIVALENT (IF APPROVED BY THE ASSISTANT CHIEF ENGINEER-SIGNALS) THE FULL LENGTH AND HEIGHT OF CASE AS INDICATED ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER. THE SECTIONS OF ASBESTOS BOARD SHALL RUN HORIZONTALLY, JOINING THE SECTIONS AT BACK OF EACH SHELF, AND SHALL BE SECURELY BOLTED TO BACK OF SHELVES, ALSO TOP AND BOTTOM HORIZONTAL SHAPES, WITH 1/2 INCH ROUND HEAD STOVE BOLTS IN ACCORDANCE WITH SKETCH "A" PLAN S-530 SHEET NO. 2, EXCEPT CASES 5303 & 5304 ARE PROVIDED WITH A VERTICAL UPRIGHT 3 1/2 INCHES WIDE MOUNTED DIRECTLY AGAINST BACK OF SHELVES MIDWAY BETWEEN END WALLS. THE ASBESTOS BOARDS FOR THESE TWO CASES BUTT AGAINST THIS UPRIGHT.
- (b) THE ENTIRE CASE SHALL BE THOROUGHLY CLEANED BEFORE PAINTING.
- (c) ALL METAL PARTS, INSIDE AND OUTSIDE, SHALL BE GIVEN ONE COAT OF RED LEAD OR EQUAL, THEN TWO COATS OF A HIGH GRADE ALUMINUM PAINT INSIDE, AND TWO COATS OF A HIGH GRADE BLACK PAINT OUTSIDE. (UNLESS OTHERWISE APPROVED BY THE ASSISTANT CHIEF ENGINEER-SIGNALS)
- (d) A FINAL COAT OF CLEAR VARNISH SHALL BE GIVEN TO THE INSIDE OF CASE OVER THE LAST COAT OF ALUMINUM PAINT.
- (e) TERMINAL WALL SHALL NOT BE PAINTED.

10. FINISH:

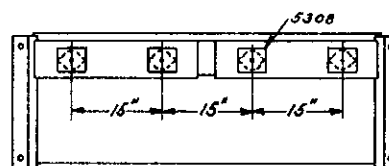
- (a) THE ENTIRE CASE SHALL BE THOROUGHLY CLEANED BEFORE PAINTING.
 - (b) ALL METAL PARTS, INSIDE AND OUTSIDE, SHALL BE GIVEN ONE COAT OF RED LEAD OR EQUAL, THEN TWO COATS OF A HIGH GRADE ALUMINUM PAINT INSIDE, AND TWO COATS OF A HIGH GRADE BLACK PAINT OUTSIDE. (UNLESS OTHERWISE APPROVED BY THE ASSISTANT CHIEF ENGINEER-SIGNALS)
 - (c) A FINAL COAT OF CLEAR VARNISH SHALL BE GIVEN TO THE INSIDE OF CASE OVER THE LAST COAT OF ALUMINUM PAINT.
 - (d) TERMINAL WALL SHALL NOT BE PAINTED.
- ## 11. SHIPMENT:
- (a) ALL CASES SHALL BE SHIPPED INTACT MOUNTED ON TWO 2 INCH x 4 INCH WOOD SKIDS.
 - (b) TWO 1 1/2 INCH x 2 INCH WOOD SKIDS SHALL EXTEND THE FULL LENGTH OF CASE AT TOP, ONE IN BACK AND ONE IN FRONT, AND SHALL BE SECURELY WIRED IN PLACE AS A PROTECTION TO THE TOP OF CASE.



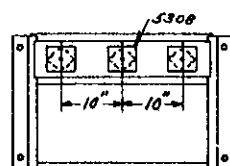
PLAN VIEW OF BASE OF CASE 5304 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



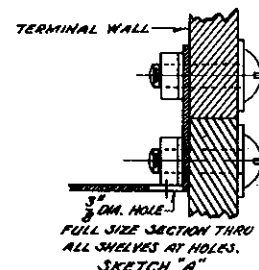
PLAN VIEW OF BASE OF CASE 5303 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



PLAN VIEW OF BASE OF CASE 5302 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



PLAN VIEW OF BASE OF CASE 5301 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



FOR ORDERING REFERENCES AND OTHER DETAILS SEE SHEET NO. 1.

SHEET 2 OF 2



S-530-G

THE PENNSYLVANIA RAILROAD STANDARD INSTRUMENT CASES

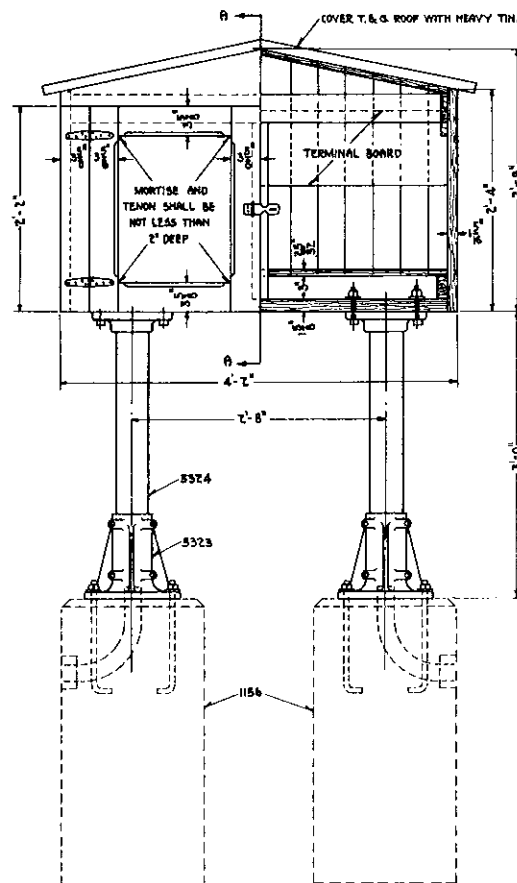
SPECIFICATIONS AND DETAILS

OFFICE OF CHIEF ENGINEER, PHILA., PA., NOVEMBER 18, 1942.
Approved

N. C. Stanton
Assistant Chief Engineer-Signals

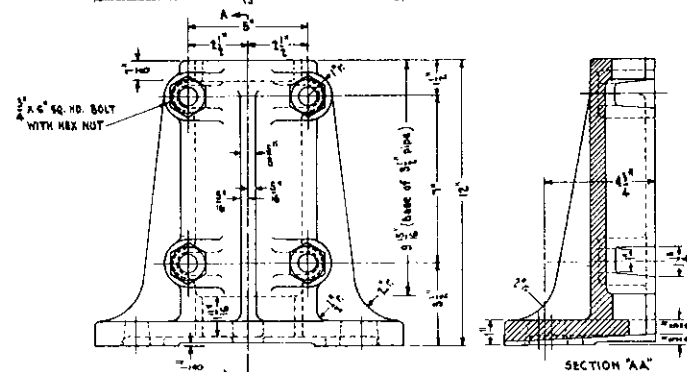
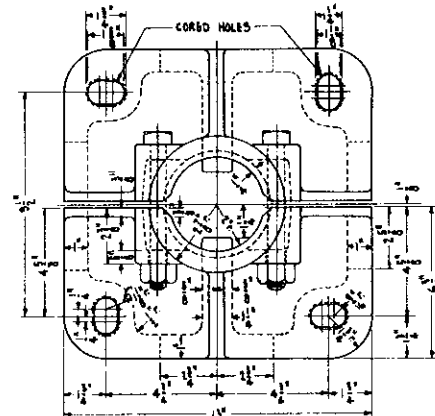
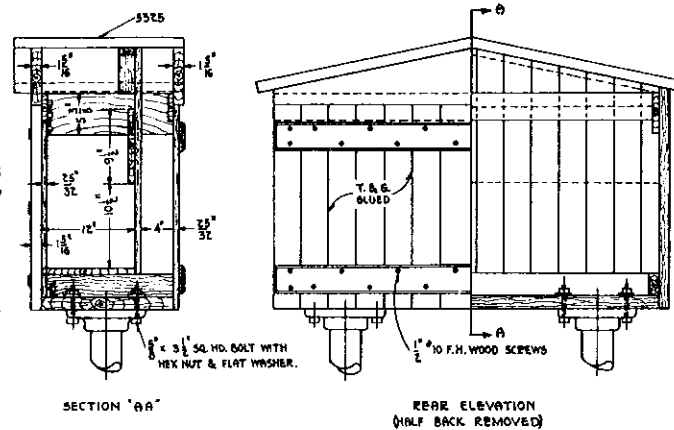
Approved

W. Skirvin
Chief Engineer

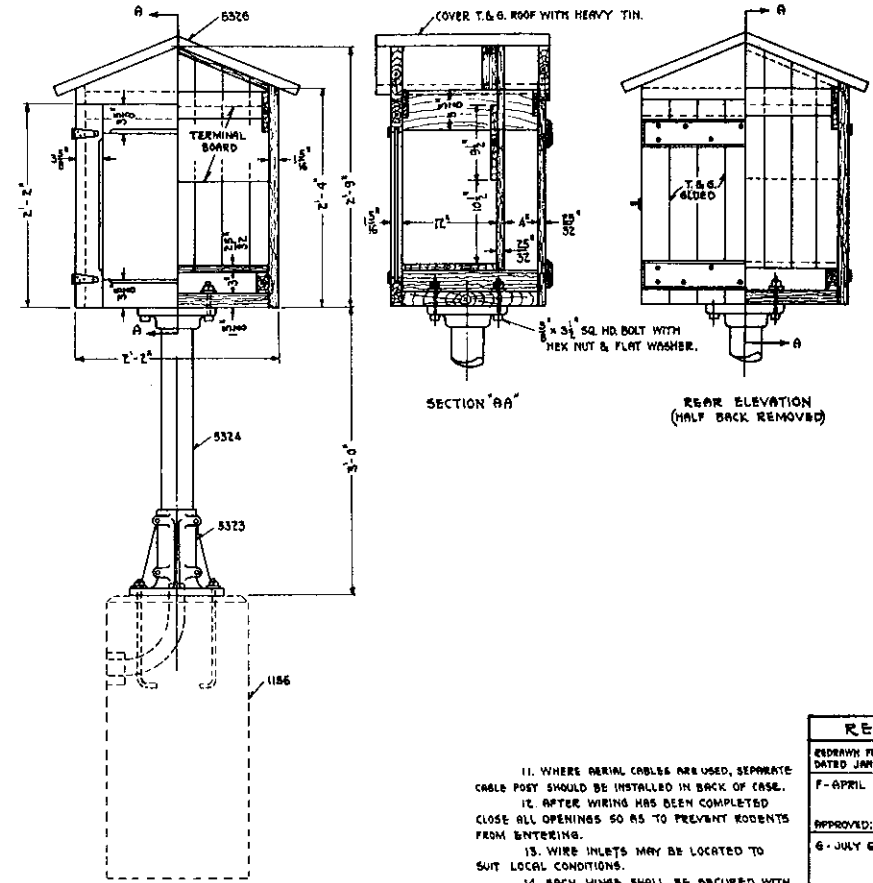


FRONT ELEVATION
(HALF FRONT REMOVED)
5321-CASE

ORDERING REFERENCE	
ORD. NO.	REMARKS
5321	CASE 5325 WITH 2-5323 AND 2-5324.
5322	5324 1-5323 1-5324.
5323	BASE COMPLETE.
5324	STD. 3 1/2" PIPE, 2'-10" LONG, WITH FLANGE AND BOLTS AS SHOWN.
5325	CASE ONLY.
5326	



5323-BASE C.I.



FRONT ELEVATION
(HALF FRONT REMOVED)
5322-CASE

- NOTE:-
1. CASING SHALL BE MADE OF NORTHERN WHITE PINE, CEDAR, CYPRESS OR REDWOOD.
 2. TERMINAL BOARDS SHALL BE MADE OF CEDAR, CYPRESS, WHITE PINE (IDAHO, NORTHERN OR SUGAR), PONDOSO PINE, SPRUCE (EASTERN OR SITKA) OR REDWOOD, SURFACED TO 25/32, SHALLED (2 COATS) AND VARNISHED.
 3. TERMINAL BOARDS SHALL BE GRADE B AND BETTER, FREE OF KNOTS.
 4. ALL BOARDS AND STRIPS, OTHER THAN TERMINAL BOARDS, SHALL BE GRADE B AND BETTER, FREE OF SAPWOOD.
 5. TERMINAL BOARDS SHALL BE SURFACED FOUR SIDES (64S).
 6. CASING SHALL BE SURFACED TWO SIDES (52S) AND TONGUE AND GROOVE (CM OR SM).
 7. ALL GRADES, SIZES AND WORKING SHALL BE IN ACCORDANCE WITH AMERICAN LUMBER STANDARDS.
 8. ALL JOINTS EXPOSED TO THE WEATHER SHALL BE ELUED.
 9. INSIDE OF CASE, EXCEPT TERMINAL BOARDS, SHALL BE GIVEN TWO COATS OF SLATE COLORED FIRE RETARDING PAINT APPROVED BY THE CHIEF SIGNAL ENGINEER.
 10. PAINT OUTSIDE OF CASE BLACK.

11. WHERE AERIAL CABLES ARE USED, SEPARATE CABLE POST SHOULD BE INSTALLED IN BACK OF CASE.
12. AFTER WIRING HAS BEEN COMPLETED CLOSE ALL OPENINGS SO AS TO PREVENT RODENTS FROM ENTERING.
13. WIRE INLETS MAY BE LOCATED TO SUIT LOCAL CONDITIONS.
14. EACH HINGE SHALL BE OCEURED WITH BOLTS AND SCREWS, USING NO LESS THAN FOUR BOLTS.

REVISIONS.	
REDRAWN FROM APPROVED PLAN S-532-E, DATED JAN. 10, 1928.	
APPROVED: <i>A.H. Rood</i>	
6-JULY-6, 1934.	
APPROVED: <i>A.H. Rood</i>	

1 SHEET

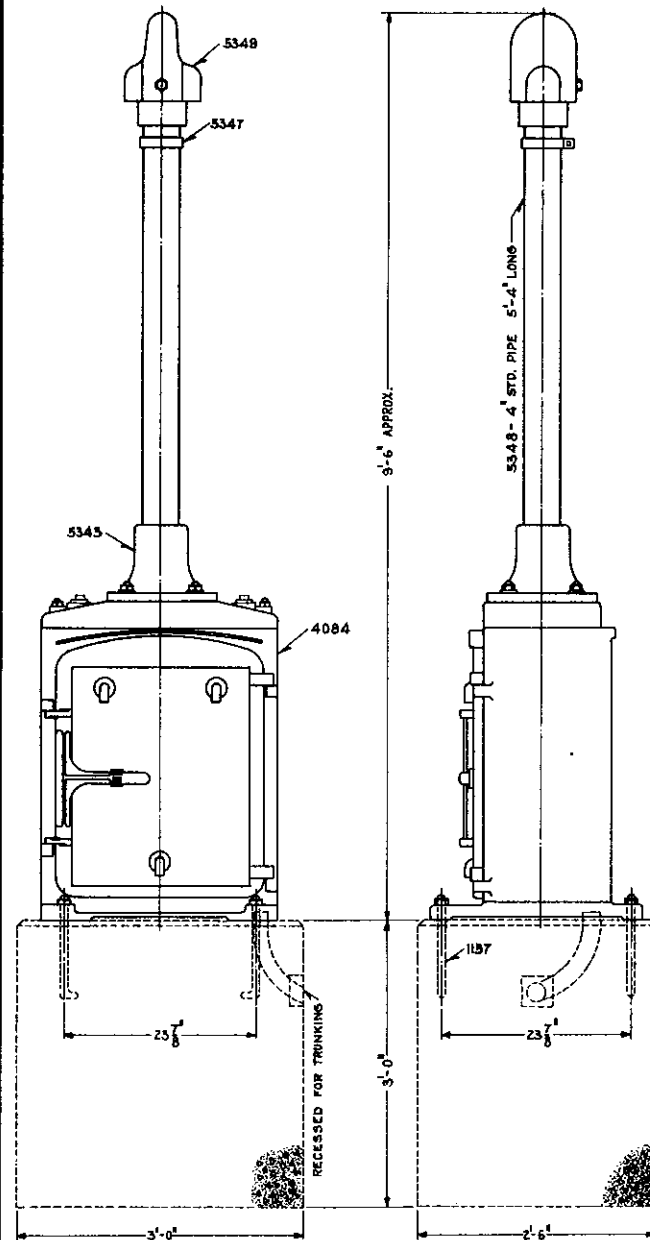
S-532-G

**THE PENNSYLVANIA RAILROAD
STANDARD
INSTRUMENT CASES**

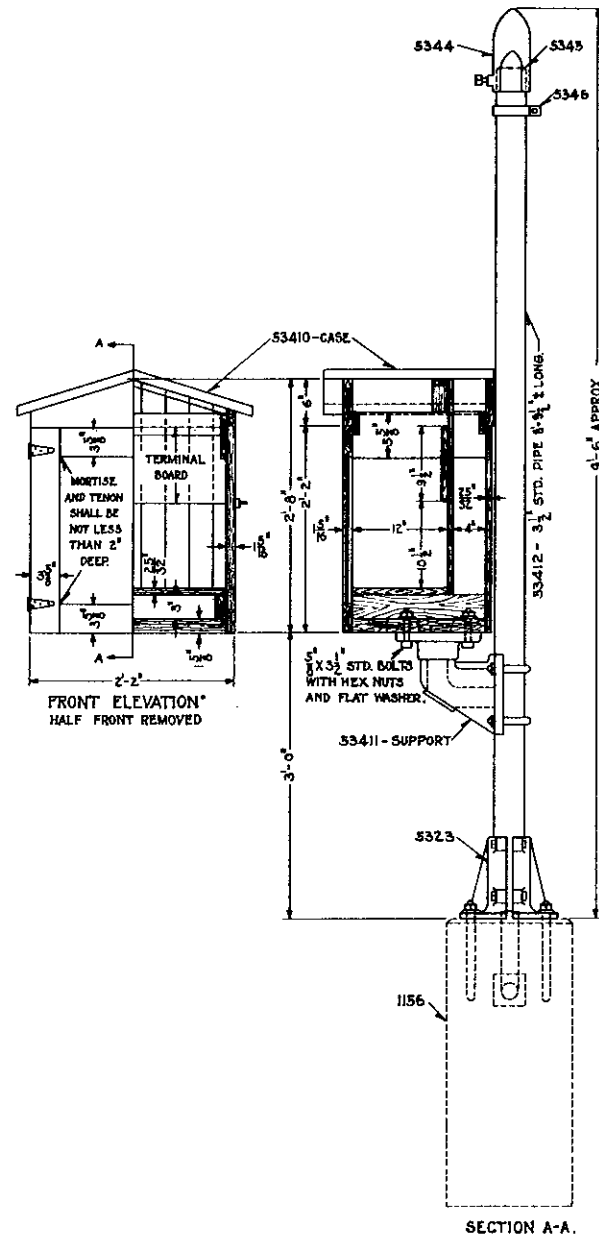
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA., JANUARY 10, 1928.

Approved *A.H. Rood*
Chief Signal Engineer

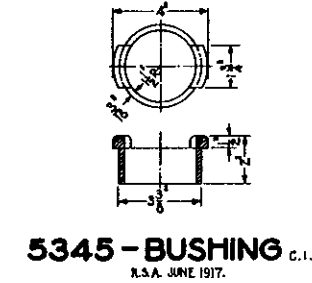
Approved *J. H. Rood*
Chief Engineer



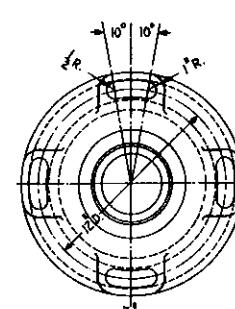
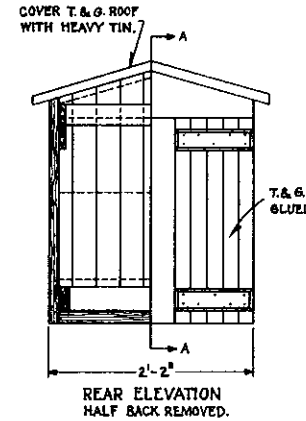
5341 - INSTRUMENT CASE



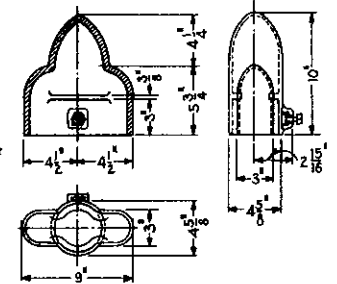
5342 - INSTRUMENT CASE



5345 - BUSHING C.I.
R.S.A. JUNE 1917.



5346 - CLAMP R=2'
5347 - " R=2 1/4"
O.H.G.
R.S.A. JUNE 1917.



5344 - CAP C.I.
R.S.A. JUNE 1917.

NOTE:-

1. CASING FOR 53410 SHALL BE MADE OF NORTHERN WHITE PINE, CEDAR, CYPRESS OR REDWOOD.
2. TERMINAL BOARDS SHALL BE MADE OF CEDAR, CYPRESS, WHITE PINE (IDAHO, NORTHERN OR SUGAR), PONDOSO PINE, SPRUCE (EASTERN OR SITKA) OR REDWOOD, SURFACED TO 25/32", SHELLACED (2 COATS) AND VARNISHED.
3. TERMINAL BOARDS SHALL BE GRADE B AND BETTER, FREE OF KNOTS.
4. ALL BOARDS AND STRIPS, OTHER THAN TERMINAL BOARDS, SHALL BE GRADE B AND BETTER, FREE OF SAPWOOD.
5. TERMINAL BOARDS SHALL BE SURFACED FOUR SIDES (545).
6. CASING FOR 53410 SHALL BE SURFACED TWO SIDES (825) AND TONGUE AND GROOVE (C.M. OR S.M.).
7. ALL GRADES, SIZES AND WORKINGS SHALL BE IN ACCORDANCE WITH AMERICAN LUMBER STANDARDS.
8. ALL JOINTS EXPOSED TO THE WEATHER SHALL BE GLUED.
9. INSIDE OF CASE, EXCEPT TERMINAL BOARDS, SHALL BE GIVEN TWO COATS OF SLATE COLORED FIRE RETARDING PAINT APPROVED BY THE CHIEF SIGNAL ENGINEER.
10. PAINT OUTSIDE OF CASE BLACK.
11. EACH HINGE SHALL BE SECURED WITH BOLTS AND SCREWS, USING NOT LESS THAN FOUR BOLTS.
12. CONCRETE SHALL BE IN ACCORDANCE WITH SPECIFICATION C.E. 78, PROPORTION 5.
13. FOUNDATIONS SHALL BE NOT LESS THAN TWO FEET UNDERGROUND.
14. AFTER WIRING HAS BEEN COMPLETED, CLOSE ALL OPENINGS 50 AS TO PREVENT RODENTS FROM ENTERING.
15. WIRE INLETS MAY BE LOCATED TO SUIT LOCAL CONDITIONS.

REVISIONS

REDRAWN FROM APPROVED PLAN
S-534-C, DATED 5-2-22, LAST
REVISED 8-31-26, AND REVISED
E - JULY 6, 1934.

APPROVED:- *A.H. Ridd*

1 SHEET

S-534-E



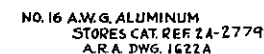
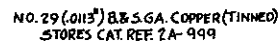
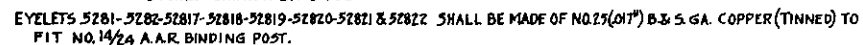
THE PENNSYLVANIA RAILROAD
STANDARD

CABLE POST AND INSTRUMENT CASES

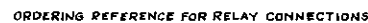
OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. MARCH 14, 1934.

Approved *A.H. Ridd*
Chief Signal Engineer

Approved *[Signature]*
Chief Engineer



CONNECTORS SHALL BE STAMPED OR OTHERWISE MARKED TO INDICATE SIZES OF WIRES CONNECTED



STORES CAT. REFERENCE	ORDER NUMBER	LENGTH L
2A-669	5287	20"
2A-4893	5289	*2" TO 10"
2A-4740	52827	14"
2A-4741	52828	16"
2A-4742	52829	18"
2A-4743	52830	22"
2A-4744	52831	24"
2A-4745	52832	26"

* SPECIFY LENGTH ON ORDER.



NOTES:

EYELET 5281, AS SHOWN, FOR USE ON NO.14& NO.16 STRANDED OR FLEXIBLE WIRE

52817 SIMILAR TO 5281 EXCEPT FOR USE ON NO. 12 " " " "
" 52818 " " " " " " " " NO. 9 " " " "
" 52819 " " " " " " " " NO. 6 " " " "
" 5282, AS SHOWN, FOR USE ON NO. 14 & NO. 16 SOLID WIRE
" 52820 SIMILAR TO 5282 EXCEPT FOR USE ON NO. 12 SOLID WIRE
" 52821 " " " " " " " " NO. 9 " " " "
" 52822 " " " " " " " " NO. 6 " " " "
" 5283 FOR USE ON MACHINE COMBINATION WIRES
TAG 5284 FOR INSIDE USE-INSTRUMENT HOUSE, CASE AND TOWERS
5285 " " " " " " " " " " " "
" 5286 FOR OUTSIDE USE-WHERE IT IS SUBJECT TO WEATHER CONDITIONS
" 52875 FOR USE ON MACHINE COMBINATION WIRING
" 52826 " " AS MARKING TAG FOR PN-50 RELAY WIRING
USE FLAT NOSED PLIERS, SIMILAR TO RACO NO. 178-9 FOR
SETTING EYELETS.

ORDERING REFERENCE FOR TWIN GRIP CONNECTORS				
STORES CAT. REFERENCE	ORDER NUMBER	CONNECTS LINE TAP P.S. GA. INCHES	LENGTH L	
2A-587	52811	4-6-8	9	2 5/16"
2A-5406	52812	2-4-8	9	"
2A-564	52813	2-4-6	6	"
2A-5407	52814	2-4	4	"
2A-566	52815	2-4	6	"
2A-567	52816	9-10	14	1 5/16"

REVISIONS

REDRAWN FROM APPROVED
DRAWING 5-528-6 DATED 6-16-1921
LAST REVISED 9-21-1933 REVISED.
EYELETS 52818 & 52822 CHANGED
TO AGREE WITH LATEST DESIGN.
EYELETS 52817-52818-52819-
52820-52821-52822 ADDED.
TAGS 52827 & 52826 ADDED.
STORES CAT. REF NOS. ADDED.

1 SHEET



S-528-H

THE PENNSYLVANIA RAILROAD
STANDARD
EYELETS, TAGS & CONNECTORS

OFFICE OF CHIEF ENGINEER, PHILA., PA., MAY 7, 1945.

Approved:

H.C. Griffiths
Assistant Chief Engineer - T. C. & S.

Approved

J. H. Hunsitt
Chief Engineer

SPECIFICATIONS

1. GENERAL:

(a) INSTRUMENT CASES UNDER THESE SPECIFICATIONS SHALL BE MADE IN FOUR SIZES. THE OVERALL LENGTH, WIDTH AND HEIGHT AND THE FOUNDATION BOLT HOLE SPACING SHALL BE AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER.

(b) INSIDE OF EACH CASE SHALL BE ARRANGED AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER SO THAT WITH THE ROOF FORMED IN ACCORDANCE WITH SECTION 4 OF THESE SPECIFICATIONS, TERMINAL WALL SHALL HAVE A CLEAR SPACE "T", FREE OF METAL BETWEEN SHELVES, AND EXTENDING THE ENTIRE LENGTH OF THE CASE.

(c) A CLEAR SPACE APPROXIMATELY 6 1/2 INCHES WIDE EXTENDING THE FULL LENGTH OF CASE SHALL BE PROVIDED BETWEEN THE TERMINAL WALL AND REAR PANELS.

(d) EACH CASE SHALL BE PROVIDED WITH SHELVES AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER, THE FULL INSIDE LENGTH OF CASE AND EXTENDING BACK TO THE TERMINAL WALL.

(e) ALL SHEET METAL PARTS SHALL BE MADE OF COPPER BEARING STEEL, PATENT LEVELED. ROOF AND WEATHER EXPOSED WALLS SHALL BE MADE OF 14 U.S. STD. GAGE. SHELVES, TERMINAL WALL SUPPORTS ETC. SHALL BE MADE OF 16 U.S. STD. GAGE. MATERIAL FOR BASE SHALL BE AS SPECIFIED UNDER SECTION 2 OF THIS SPECIFICATION.

(f) THE DESIGN AND CONSTRUCTION OF CASE WHICH MANUFACTURER PROPOSES TO FURNISH SHALL MEET THE APPROVAL OF THE ASSISTANT CHIEF ENGINEER-T. C. & S.

2. BASE:

(a) THE BASE SHALL BE FORMED TO SPECIAL CHANNEL CROSS SECTION BY BENDING AS INDICATED BY SECTION B SHOWN ON SHEET 1 OF THIS PLAN.

(b) THE REQUIRED END PLATES AND CROSS RIBS ARE TO BE ASSEMBLED WITH THE LONGEST RECTANGULAR SECTION IN A VERTICAL POSITION WITH RESPECT TO THE FOUNDATION AND SUITABLY WELDED IN PLACE TO PROVIDE THE NECESSARY STRENGTH AND RIGIDITY.

(c) EACH BASE SHALL BE PROVIDED WITH CABLE ENTRANCE OPENINGS COVERED WITH PLATE 5308, THE NUMBER OF OPENINGS FOR EACH CASE SHALL BE AS SHOWN ON PLAN S-530 SHEET NO. 2 BASIC NUMBER.

3. UPRIGHTS AND WALLS:

(a) THE END WALLS SHALL EACH BE OF ONE PIECE, OF CHANNEL-SECTION, OF A SIZE SUFFICIENT TO FORM END OF CASE AND SIDE OF FRAME FOR DOORS AND BACK PANELS. THEY SHALL BE MOUNTED AGAINST OUTSIDE OF BASE SUBSTANTIALLY ATTACHED BY WELDING.

(b) UPRIGHT SUPPORTS OF FORMED CHANNEL-SECTION ARE TO BE ASSEMBLED IN FRONT AND REAR OF CASES 5303 AND 5304 AT CENTER TO FORM A PART OF DOOR AND PANEL FRAMES, AND TO PROVIDE THE NECESSARY RIGIDITY OF CASE. UPRIGHT SUPPORTS SHALL BE SECURELY WELDED TO ROOF AND BASE.

(c) EACH END WALL SHALL BE PROVIDED WITH A CABLE OPENING APPROX. 13 SQ. INCHES AREA. A COVER PLATE 5306 SHALL BE ASSEMBLED WITH SUITABLE SEALING COMPOUND BETWEEN THE PLATE AND WALL, AND HELD IN PLACE BY FOUR 3/8" x 1" HEX. HEAD CAD. PLATED TAP BOLTS ASSEMBLED WITH THE NUT INSIDE THE CASE.

4. ROOF:

(a) ROOF, WATERSHED OVER DOORS, AND REAR PANELS SHALL BE FORMED FROM ONE PIECE OF SHEET METAL WITH A ROOF SLOPE DOWNWARD TO THE REAR, OF 1 1/2 INCHES TO THE FOOT.

(b) ENDS AND FRONT SHALL BE STRUCK DOWN VERTICALLY AND SECURELY WELDED TO WALL WITH FILLET WELDS 1/2" LONG, ON 10 3/4" CENTERS.

(c) BACK OF ROOF SHALL BE STRUCK DOWN AT AN ANGLE, AS INDICATED ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER TO A POINT 1 1/4 INCHES FROM CASE TO PRODUCE A SUBSTANTIAL WATERSHED.

(d) FRONT OF ROOF SHALL BE FORMED DIRECTLY OVER DOORS WITH A SLOPE OF 45 DEGREES AS SHOWN AND EXTEND TO A POINT NOT LESS THAN 1 INCH FROM CASE, TO PRODUCE A SUBSTANTIAL WATERSHED.

(e) CORNERS OF ROOF SHALL BE WELDED TO PRODUCE A WATERPROOF SEAM.

5. DOOR AND PANEL FRAMES:

(a) SUITABLY FORMED HORIZONTAL ANGULAR SHAPES, FORMING DOOR AND PANEL FRAME, SHALL BE SECURELY WELDED TO BASE, ROOF AND UPRIGHTS, FRONT AND BACK.

(b) ALL JOINTS AT THE JUNCTION OF SHAPES, FORMING DOOR AND PANEL FRAMES SHALL BE SEAM-WELDED TO PRODUCE A ONE-PIECE WATERPROOF JOINT.

6. DOORS:

(a) EACH DOOR SHALL BE FORMED TO A CHANNEL SECTION FROM ONE PIECE WITH CORNERS WELDED. SATISFACTORY RIGIDITY OF THE DOOR SHALL BE PROVIDED WITH A SUITABLE DESIGN OF X-BRACE WELDED TO THE CHANNEL-FORMED SECTION.

(b) EACH DOOR SHALL BE PROVIDED WITH 2 THREE-LOUVER VENTILATORS AND SLIDING REMOVABLE BRASS SCREENS (0.0185 INCH WIRE, 24 WIRES PER INCH) AS INDICATED ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER. LOUVRES SHALL BE PUNCHED 1 INCH HIGH AND 6 INCHES WIDE ON APPROXIMATELY 1 1/2 INCH CENTERS.

(c) EACH DOOR SHALL BE SUPPORTED BY SUITABLE HEAVY BLANK HINGES, SECURELY WELDED TO DOOR AND FRAME AS SHOWN ON DRAWING S-530 SHEET NO. 1 BASIC NUMBER.

(d) EACH PAIR OF DOORS FOR CASES 5302 AND 5304 AND EACH DOOR FOR CASE 5303 SHALL BE PROVIDED WITH A SUBSTANTIAL THREE POINT LOCKING DEVICE, LOCKING AT TOP, BOTTOM AND CENTER OF DOOR. DOOR FOR CASE 5301 SHALL BE PROVIDED WITH A SUBSTANTIAL TWO POINT LOCKING DEVICE.

(e) EACH DOOR SHALL BE EQUIPPED WITH A DEVICE FOR SECURING IT IN THE OPEN POSITION. DEVICE SHALL BE APPROVED BY THE ASST. CHIEF ENGR. T. C. & S.

(f) HANDLE, OPERATING LOCKING DEVICE, SHALL BE SO MADE AND ASSOCIATED WITH AN ANGLE PLATE OR EQUIVALENT, WELDED TO THE DOOR, THAT A PADLOCK HAVING A 3/4 INCH BAIL MAY BE APPLIED.

(h) EACH DOOR SHALL BE SO CONSTRUCTED THAT WHEN IT IS CLOSED AGAINST A SUITABLE FABRICATED PACKING SECURELY MOUNTED TO DOOR FRAME, IT SHALL BE PRACTICALLY WATERPROOF.

7. PANELS:

(a) BACK OF CASE SHALL BE PROVIDED WITH REMOVABLE PANELS, EACH FORMED TO CHANNEL-SECTION FROM ONE PIECE WITH CORNERS WELDED. EACH CASE SHALL HAVE THE SAME NUMBER OF PANELS AS DOORS.

(b) EACH REAR PANEL SHALL BE POSITIONED VERTICALLY BY ONE SUPPORT WELDED TO THE LOWER INSIDE OF THE PANEL AT THE CENTER TO LOCATE THE PANEL VERTICALLY FOR ALIGNMENT OF ATTACHMENT SCREWS. EACH PANEL SHALL BE SECURED TO THE CASE WITH FOUR 3/8" CAP SCREWS, ONE LOCATED ON EACH SIDE APPROX. 10" FROM THE TOP, AND ONE ON EACH SIDE APPROX. 10" FROM THE BOTTOM OF THE PANEL. CAP SCREWS ARE TO HAVE NUTS ASSEMBLED INSIDE THE PANEL, SECURED AGAINST LOOSENING SO THE CAP SCREWS WILL BE RETAINED AS A PART OF THE PANEL ASSEMBLY.

8. SHELVES:

(a) SHELVES 14" WIDE ± 1/4" SHALL BE FORMED TO HAVE 1 1/2" TURN-DOWN IN FRONT AND 1 1/2" TURN-UP IN BACK, AND ARE TO BE SECURELY WELDED TO END WALLS AND UPRIGHTS.

(b) BACK TURN-UP SHALL BE PROVIDED WITH SUITABLE HOLES FOR 1/2" STOVE BOLTS PROPERLY SPACED FOR SUPPORTING THE TERMINAL WALL, AS SHOWN IN SKETCH "A" ON THIS PLAN.

(c) ALL SHELVES, EXCEPT BOTTOM OF CASE, SHALL BE PROVIDED WITH VENTILATION OPENINGS AS SHOWN ON THIS PLAN.

9. TERMINAL WALL:

(a) TERMINAL WALL SHALL CONSIST OF 1/2" THICK TRANSITE ASBESTOS BOARD OR EQUIVALENT (IF APPROVED BY ASST. CHIEF ENGR. T. C. & S.) THE FULL LENGTH AND HEIGHT OF CASE AS INDICATED ON SHEET NO. 1 OF THIS PLAN. THE SECTIONS OF ASBESTOS BOARD SHALL RUN HORIZONTALLY, JOINING THE SECTIONS AT BACK OF EACH SHELF, AND SHALL BE SECURELY BOLTED TO BACK OF SHELVES, ALSO TOP AND BOTTOM HORIZONTAL SHAPES, WITH 1/2" ROUND HEAD STOVE BOLTS IN ACCORDANCE WITH SKETCH "A" SHOWN ON THIS PLAN, EXCEPT CASES 5303 & 5304 ARE PROVIDED WITH A VERTICAL UPRIGHT 3 1/2" WIDE MOUNTED DIRECTLY AGAINST BACK OF SHELVES MIDWAY BETWEEN END WALLS. THE ASBESTOS BOARDS FOR THESE TWO CASES BUTT AGAINST THIS UPRIGHT.

10. PAINTING:

(a) THE ENTIRE CASE SHALL BE THOROUGHLY CLEANED BEFORE PAINTING.

(b) ALL METAL PARTS SHALL BE PRIMED WITH ONE COAT OF RED LEAD OR EQUAL BEFORE ASSEMBLING. AFTER ASSEMBLY, ALL WELDED AND BURNED AREAS SHALL BE THOROUGHLY CLEANED OF SCALE, AND GIVEN ONE COAT OF RUST-INHIBITOR SUCH AS "PARCOLITE B" AND THE WELDED AND BURNED AREAS REPRIMED; THEN APPLY TWO COATS OF A HIGH-GRADE ALUMINUM PAINT INSIDE AND TWO COATS OF A HIGH-GRADE BLACK PAINT OUTSIDE (UNLESS OTHERWISE APPROVED BY THE ASST. CHIEF ENGR. T. C. & S.).

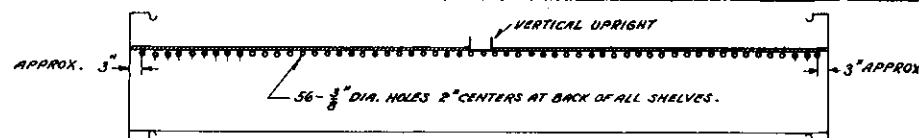
(c) A FINAL COAT OF CLEAR VARNISH SHALL BE GIVEN TO THE INSIDE OF CASE OVER THE LAST COAT OF ALUMINUM PAINT.

(d) TERMINAL WALL SHALL NOT BE PAINTED.

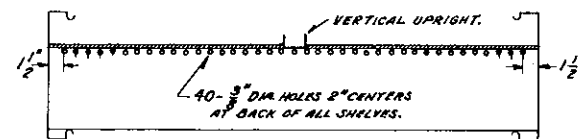
11. SHIPMENT:

(a) ALL CASES SHALL BE SHIPPED MOUNTED ON TWO 2" x 4" WOOD SKIDS.

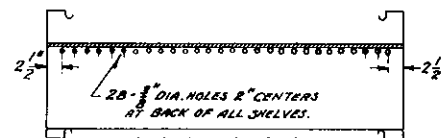
(b) TWO 1 1/2" x 2" WOOD SKIDS SHALL EXTEND THE FULL LENGTH OF CASE AT TOP, ONE IN BACK AND ONE IN FRONT, AND SHALL BE SECURELY WIRED IN PLACED AS A PROTECTION TO THE TOP OF CASE.



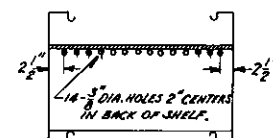
LOCATION OF VENTILATION HOLES IN SHELVES OF CASE 5304.



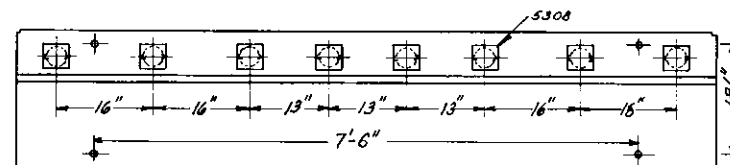
LOCATION OF VENTILATION HOLES IN SHELVES OF CASE 5303.



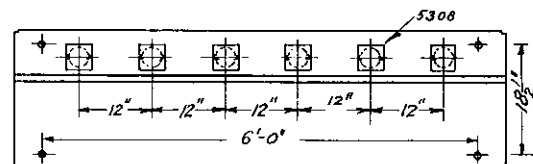
LOCATION OF VENTILATION HOLES IN SHELVES OF CASE 5302.



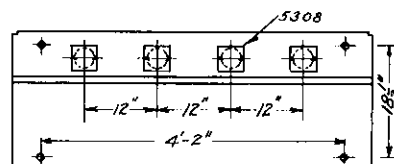
LOCATION OF VENTILATION HOLES IN SHELF OF CASE 5301.



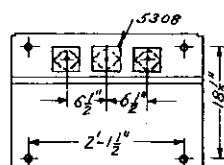
PLAN VIEW OF BASE OF CASE 5304 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



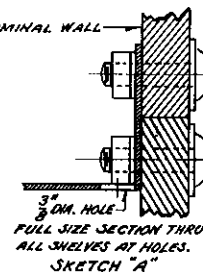
PLAN VIEW OF BASE OF CASE 5303 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



PLAN VIEW OF BASE OF CASE 5302 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



PLAN VIEW OF BASE OF CASE 5301 SHOWING LOCATION OF HOLES FOR CABLE ENTRANCE.



FOR ORDERING REFERENCES AND OTHER DETAILS SEE SHEET NO. 1.

SHEET 2 OF 2



S-530-H

THE PENNSYLVANIA RAILROAD
STANDARD
INSTRUMENT CASES

SPECIFICATIONS AND DETAILS

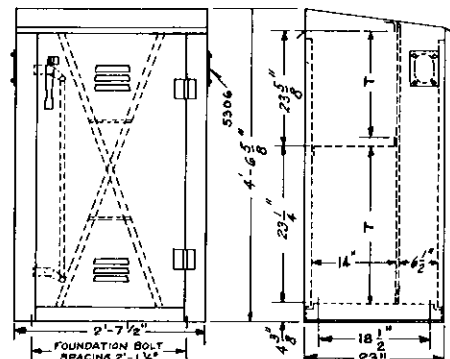
OFFICE OF CHIEF ENGINEER, PHILA., PA., NOVEMBER 18, 1942.

Approved

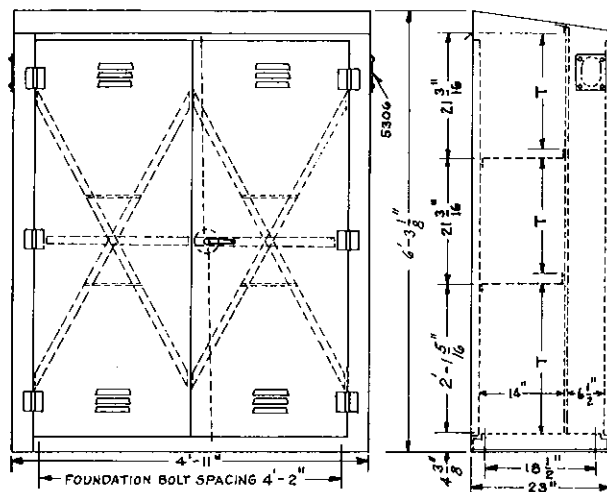
Approved

H. L. Stanton
Assistant Chief Engineer - Signals

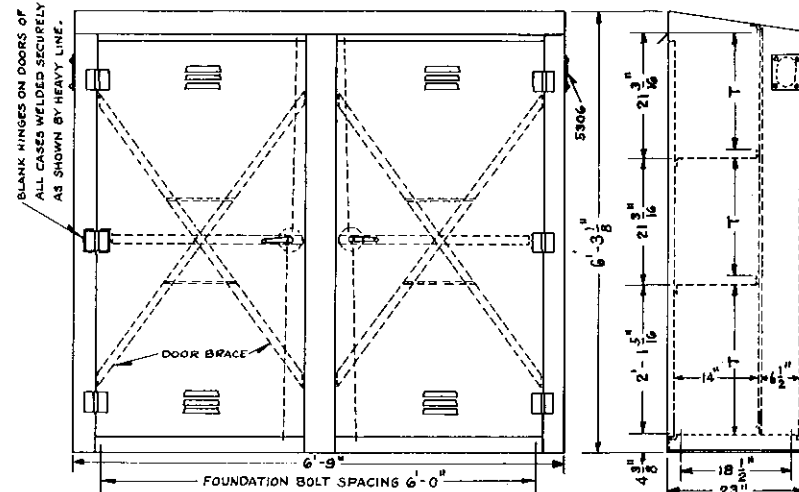
W. J. ...
Chief Engineer



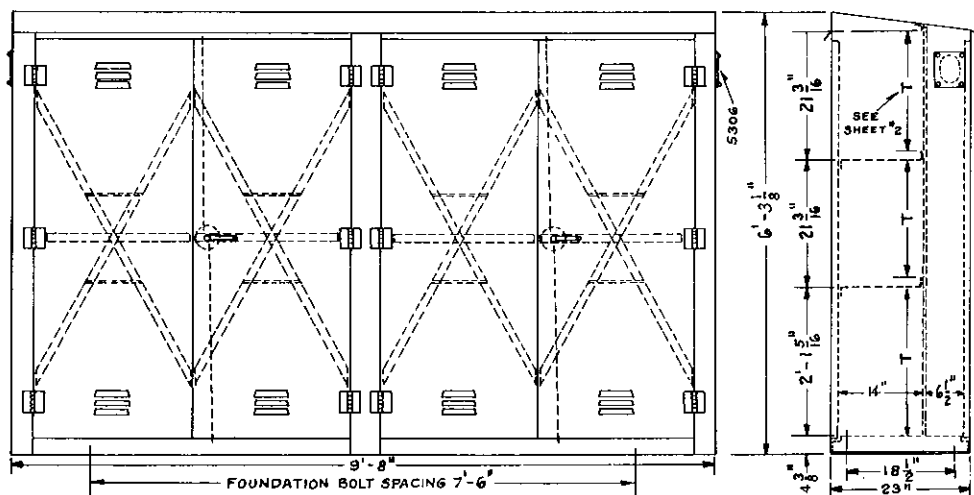
5301 CASE. STORES CAT. REF. NO. 2A-4177.



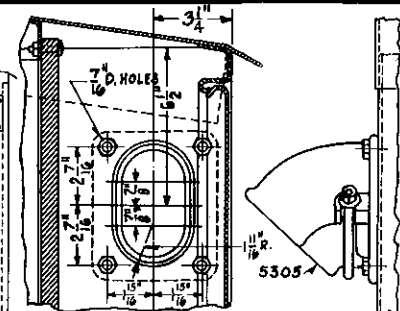
5302 CASE. STORES CAT. REF. NO. 2A-531.



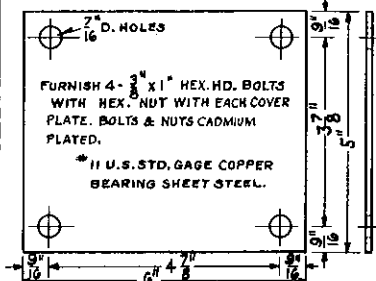
5303 CASE. STORES CAT. REF. NO. 2A-4702.



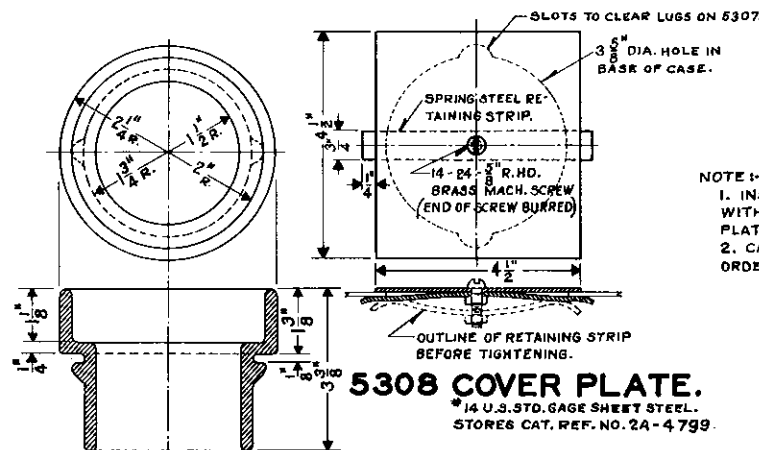
5304 CASE. STORES CAT. REF. NO. 2A-530.



5305 CABLE OUTLET.
STORES CAT. REF. NO. 2A-1389



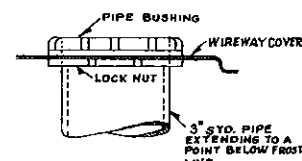
5306 COVER PLATE.
STORES CAT. REF. NO. 2A-4797.



5307 CABLE OUTLET.
CAST IRON.
STORES CAT. REF. NO. 2A-4798.

5308 COVER PLATE.
* 14 U.S. STD. GAGE SHEET STEEL.
STORES CAT. REF. NO. 2A-4799.

- NOTE 1-
1. INSTRUMENT CASES WILL BE FURNISHED WITH CABLE OPENINGS EQUIPPED WITH COVER PLATES AS SHOWN.
2. CABLE OUTLETS 5305 AND 5307 SHALL BE ORDERED SEPARATELY, (NOT WITH CASE)



THIS METHOD MAY BE USED WHERE THERE IS NO PROBABILITY OF GROUND SINKING AND PULLING DOWNWARD ON PIPE.

FOR SPECIFICATIONS AND OTHER DETAILS SEE SHEET NO. 2.

SHEET 1 OF 2



S-530-H

THE PENNSYLVANIA RAILROAD
STANDARD
INSTRUMENT CASES

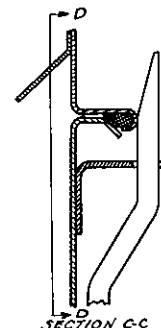
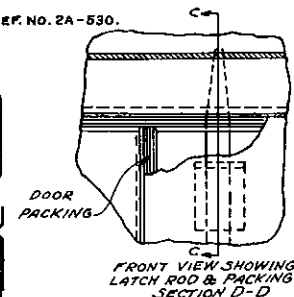
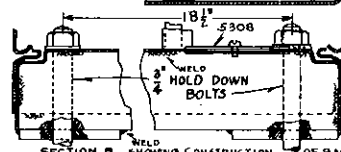
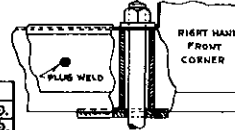
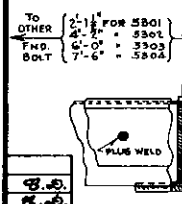
OFFICE OF CHIEF ENGINEER, PHILA., PA., NOVEMBER 18, 1942.

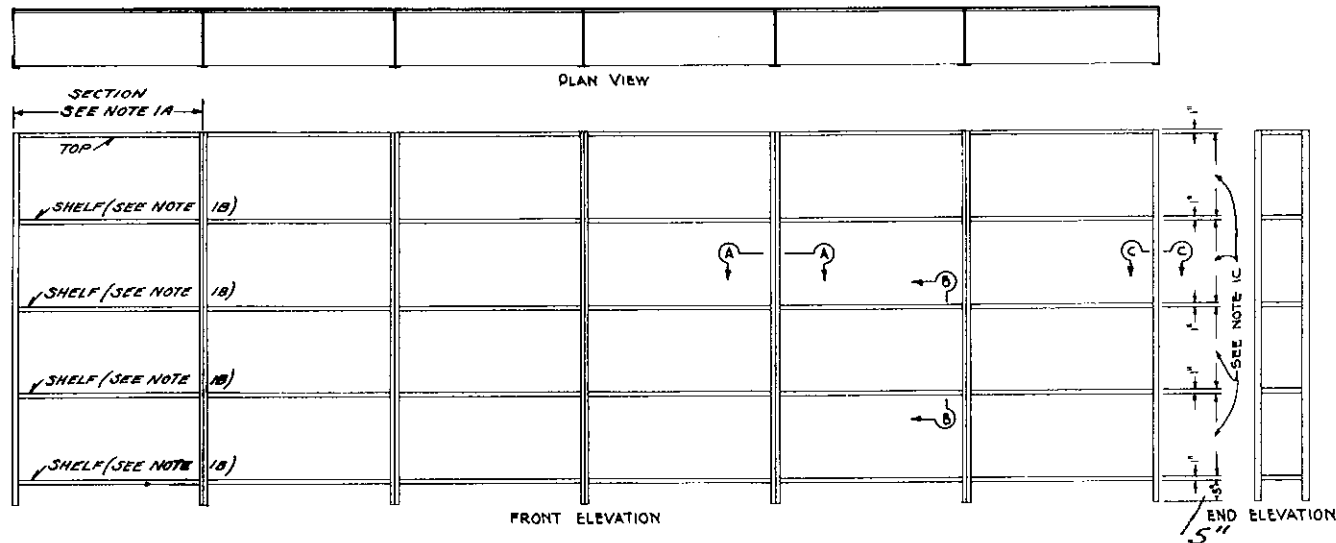
Approved

H. C. Stetson
Assistant Chief Engineer-Signals

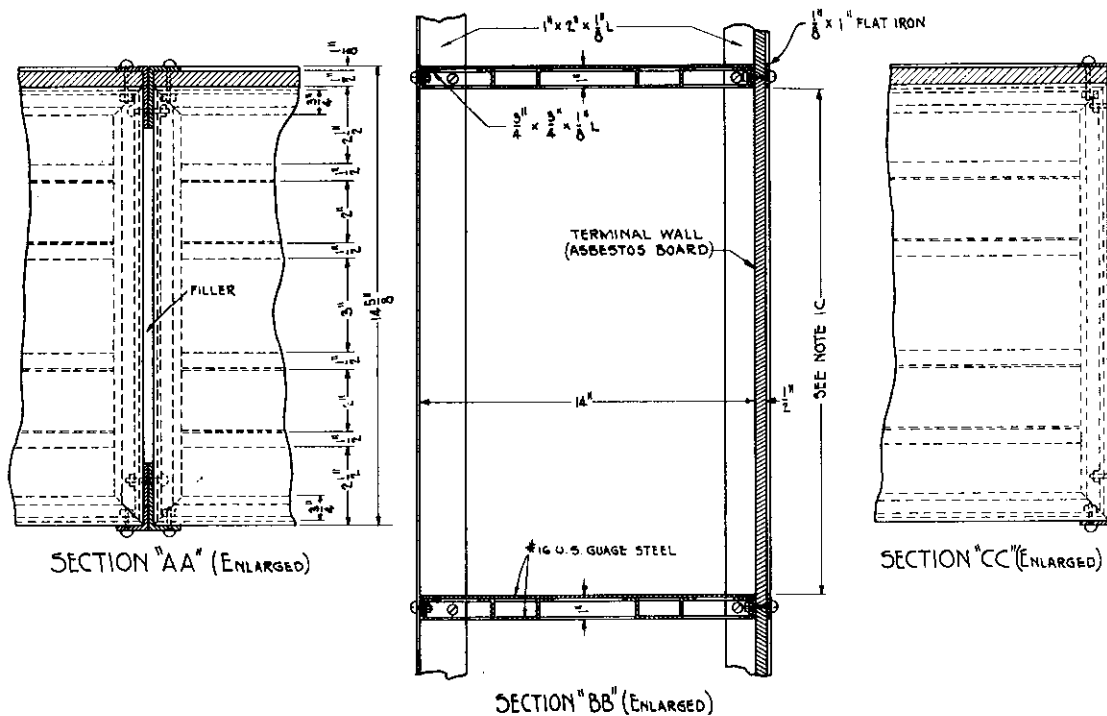
Approved

M. J. Stetson
Chief Engineer





SPECIFICATIONS:-
 INSTRUMENT RACKS SHALL BE BUILT IN SECTIONS OF 3 OR 4 FT. UNLESS OTHERWISE SPECIFIED.
 PROVISION SHALL BE MADE AT ENDS OF SECTION FOR SECURELY BOLTING TO ADJOINING SECTIONS. WHERE SECTIONS ARE BOLTED TOGETHER FILLER SHALL BE PROVIDED FOR ANY OPENING AT JUNCTION OF SHELVES TO PREVENT SMALL OBJECTS FALLING THROUGH.
 THE ENTIRE BACK SHALL CONSIST OF ONE-HALF INCH HARD ASBESTOS BOARD SECURED DIRECTLY AGAINST SHELVES. SPLICES IN ASBESTOS SHALL BE MADE IN BACK OF SHELVES.
 ALL METAL SURFACES SHALL BE GIVEN ONE COAT OF RED OXIDE AND TWO COATS OF OLIVE GREEN PAINT. ASBESTOS SHALL NOT BE PAINTED.
 WORKMANSHIP SHALL BE OF THE BEST, ALL SHELVES, ETC BEING PROPERLY IN ALIGNMENT AND RIGIDLY FIXED IN PLACE.



NOTE:-
 1. REQUISITIONS FOR INSTRUMENT RACKS SHALL STATE:-
 (A) THE NUMBER AND LENGTH OF SECTIONS.
 (B) THE NUMBER OF SHELVES IN EACH. (TOP NOT CONSIDERED A SHELF)
 (C) THE DISTANCE BETWEEN SHELVES. (18" OR 24")
 (D) WHETHER OR NOT THE RACKS ARE TO BE ERECTED ON THE GROUND BY THE MANUFACTURER OR SHIPPED KNOCKED DOWN TO BE ASSEMBLED BY P.R.R. FORCES. WHERE ERECTED BY MANUFACTURER STARTING AND COMPLETION DATES SHALL BE GIVEN.

2. WHERE CONDITIONS ARE SUCH THAT STANDARD LENGTH SECTIONS CANNOT CONVENIENTLY BE USED A SKETCH SHALL BE ATTACHED TO EACH COPY OF REQUISITION SHOWING THE DESIRED ARRANGEMENT.

REVISIONS
B - Feb. 5, 1937.
Approved: <i>A.H. Pugh</i>
C - JAN. 13, 1938. c.d.
APPROVED <i>N.L. Stanton</i>

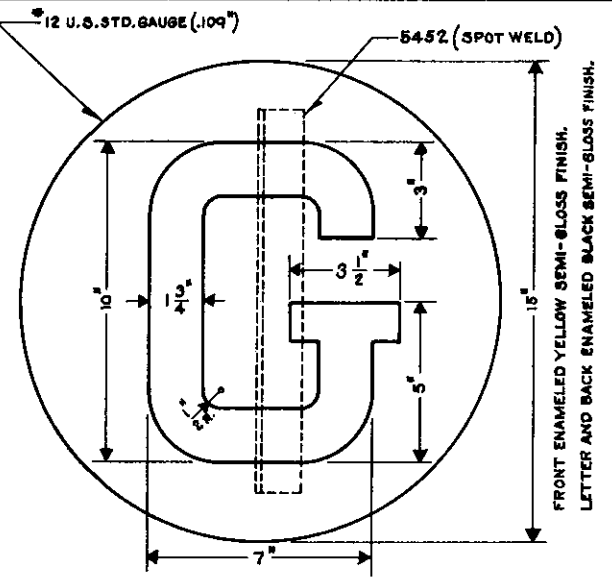
1 SHEET

5-540-C

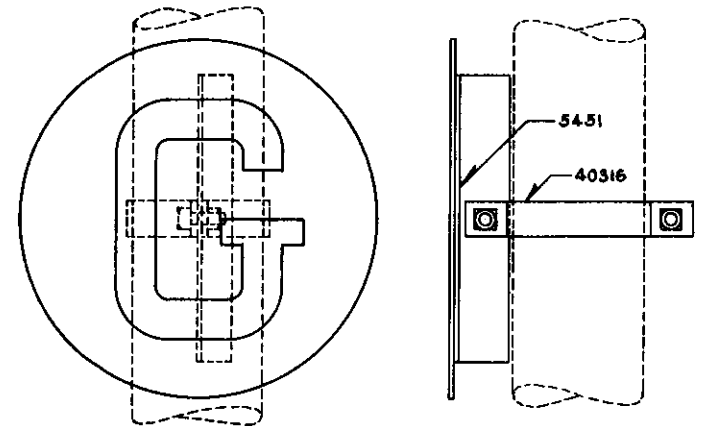
THE PENNSYLVANIA RAILROAD
 STANDARD
 INSTRUMENT RACKS
 (FOR INTERLOCKING STATIONS)
 Office of Chief Signal Engineer, Phila., Pa., June 25, 1934

Approved *A.H. Pugh*
 Chief Signal Engineer

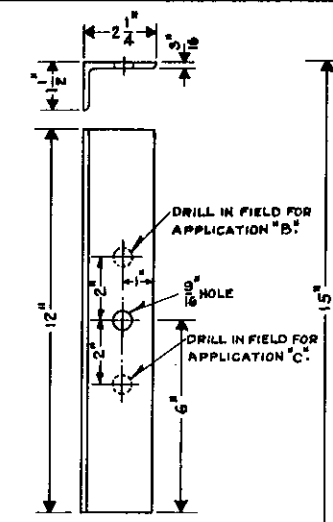
Approved *N.L. Stanton*
 Chief Engineer



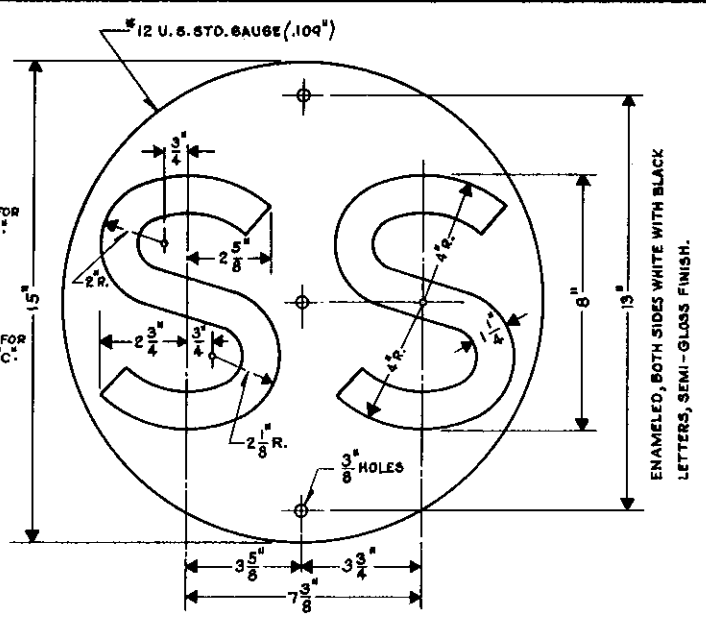
5451 GRADE SIGNAL MARKER ONLY.
A. A. R. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2A-5451.



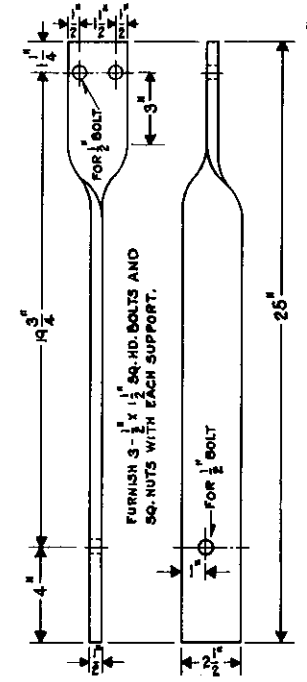
5453 GRADE SIGNAL MARKER COMPLETE.
A. A. R. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2A-5453.



5452 ANGLE.
O. H. STEEL



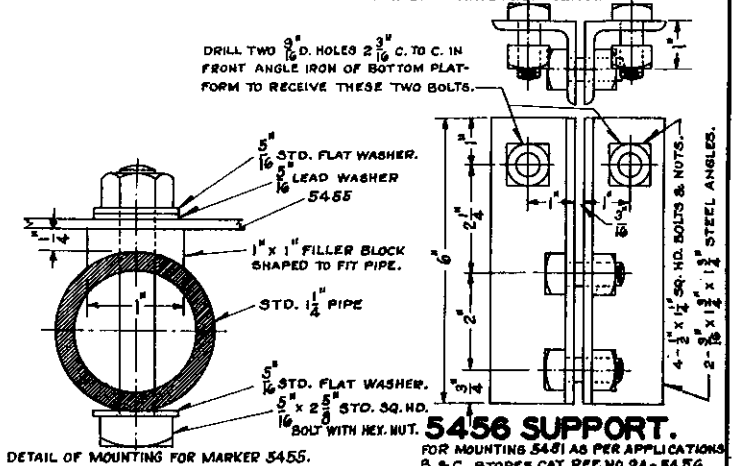
5455 SPRING SWITCH MARKER.
A. A. R. SIG. SEC. M-1934.
STORES CAT. REF. NO. 2A-5455.



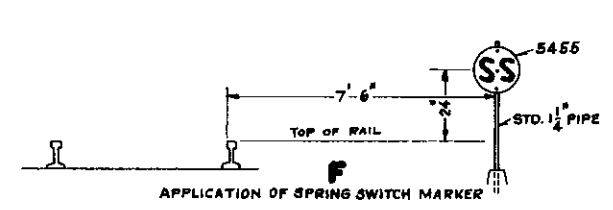
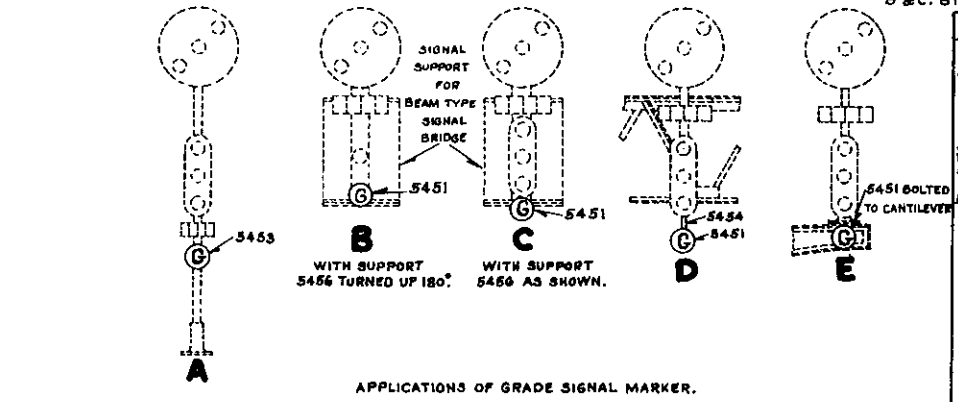
5454 SUPPORT.
O. H. STEEL
STORES CAT. REF. NO. 2A-5454.
(FOR APPLICATION D)

- NOTE:-
1. MARKERS 5451 AND 5455 SHALL BE VITREOUS ENAMELED IN ACCORDANCE WITH A.A.R. SIG. SEC. SPECIFICATION 155-41.
 2. SUPPORT 5454 SHALL BE THOROUGHLY CLEANED, GIVEN A COAT OF RED OXIDE PRIMER AND ONE COAT OF A GOOD GRADE BLACK PAINT.
 3. MATERIAL SHALL BE IN ACCORDANCE WITH A.A.R. SIG. SEC. SPECIFICATION 155-41. (THICKNESS OF METAL AS SHOWN HEREON).
 4. IN SPECIAL LOCATIONS MARKER 5455 MAY BE MOUNTED ON SWITCH STAND AT PROPER CLEARANCE FROM TRACK.

DRILL TWO 3/8" DIA. HOLES 2 3/8" C. TO C. IN FRONT ANGLE IRON OF BOTTOM PLAT- FORM TO RECEIVE THESE TWO BOLTS.



5456 SUPPORT.
FOR MOUNTING 5451 AS PER APPLICATIONS B & C. STORES CAT. REF. NO. 2A-5456.



REVISIONS

REDRAWN FROM APPROVED PLAN S-545-F, DATED AUG. 28, 1927, LAST REVISED JULY 31, 1935 AND REVISED TO SHOW - 5451 FORMERLY 5456 & CHANGED TO AGREE WITH A.A.R. FORMER PLAN INCLUDED A 24" DIA. 90° MARKER CLAMP 40316 INDICATED IN 5453 FORMERLY 4502. SUPPORT 5454 FORMERLY 5457 WHICH WAS WITHOUT THIST. CLAMP 5456 AND APPLICATION F ADDED. APPLICATIONS OF MARKERS RE-ARRANGED. NOTES CHANGED.

1 SHEET

S-545-G

THE PENNSYLVANIA RAILROAD

STANDARD

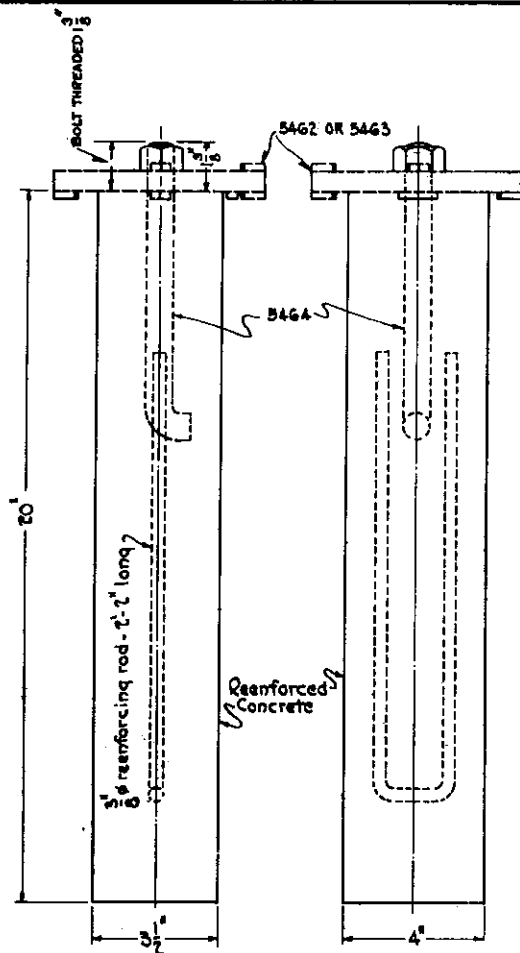
MARKERS

FOR GRADE SIGNAL AND SPRING SWITCH.

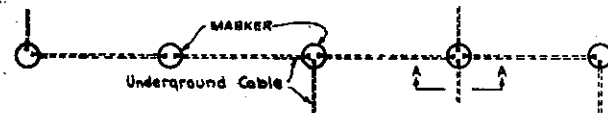
OFFICE OF CHIEF ENGINEER, PHILA., PA., JULY 8, 1942.

Approved *H. S. Stanton* Assistant Chief Engineer-Signals

Approved *M. J. Higgins* Chief Engineer

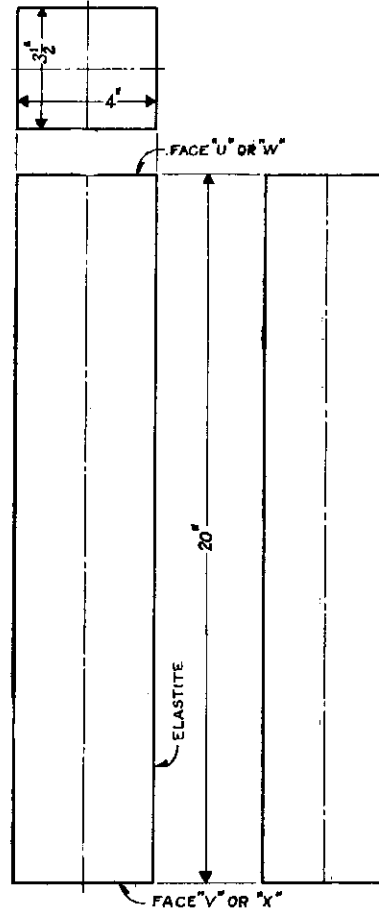


5461-MARKER COMPLETE WITHOUT PLATE.
REINFORCED CONCRETE.
STORES CAT. REF. NO. 2A-1515

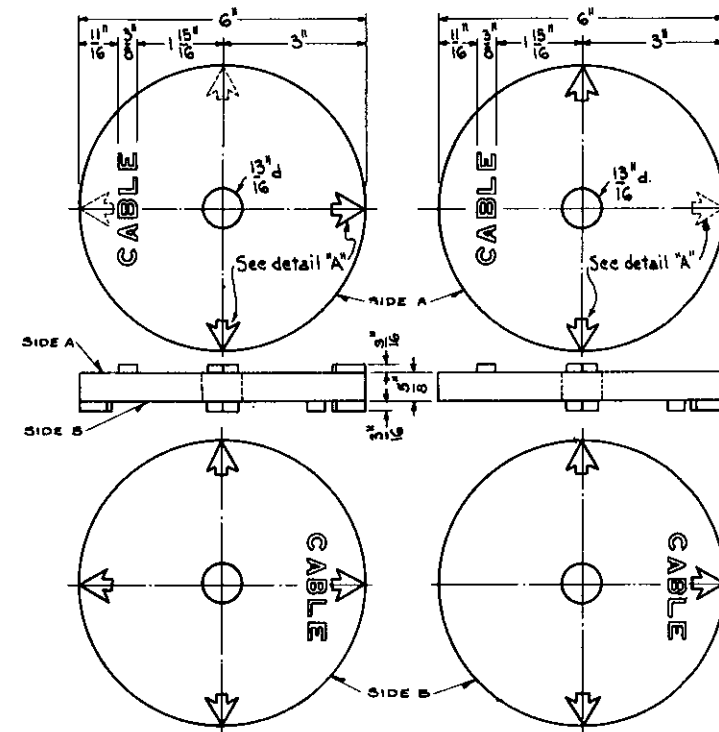
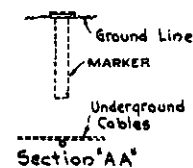


- METHOD OF INSTALLATION

Markers to be arranged to show direction of cable runs as indicated in sketch above.
Maximum distance between markers shall not exceed two hundred feet.
After placing in service, all exposed metal surfaces shall be given a coat of good grade black paint.



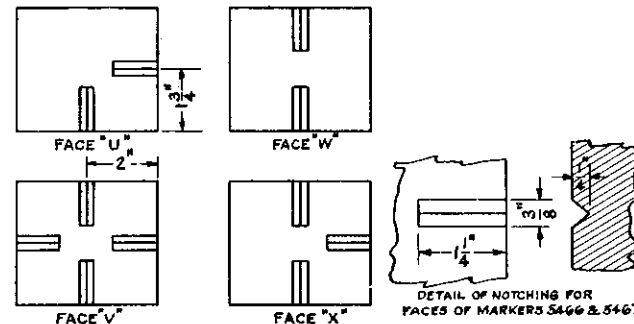
5466-MARKER FACES "U" & "V".
STORES CAT. REF. NO. 2A-1418
5467-MARKER FACES "W" & "X".
STORES CAT. REF. NO. 2A-1423
ELASTITE.



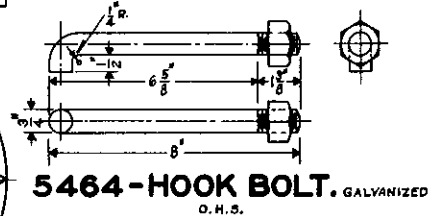
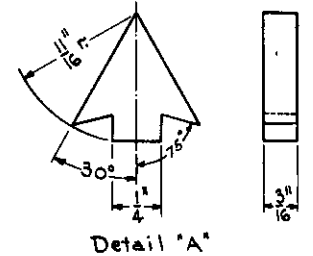
5462-PLATE CAST IRON
STORES CAT. REF. NO. 2A-1743.

5463-PLATE CAST IRON
STORES CAT. REF. NO. 2A-1744.

NOTE:-
1. ORDER 5461, 5462 AND 5463 SEPARATELY.
2. PLATES 5462 AND 5463 SHALL BE GIVEN ONE COAT OF RED OXIDE, THEN ONE COAT OF GOOD GRADE BLACK PAINT.



FACING OF TOP AND BOTTOM
FOR MARKERS 5466 & 5467.



5464-HOOK BOLT. GALVANIZED
O.H.S.

Revisions	
B	SEPTEMBER 8, 1942
APPROVED <i>N. C. Stanton</i>	
C. APRIL 14, 1945. MARKER 5461 FORMERLY SHOWN MADE OF ELASTITE OR CONCRETE. ELASTITE MARKER REDESIGNED AND NUMBERED 5466 & 5467. STORES CAT. REF. NOS. ADDED.	
APPROVED <i>N. C. Stanton</i>	

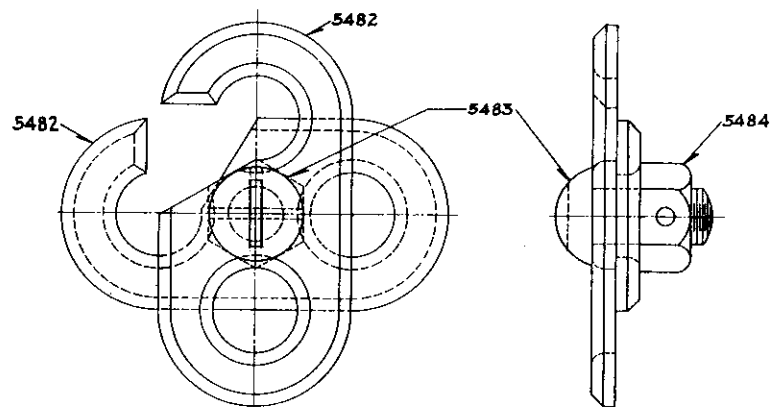
1 Sheet

5-546-B

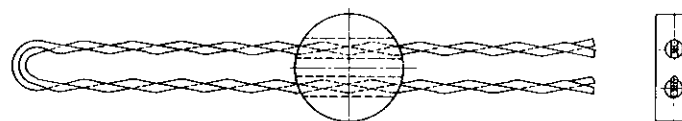
THE PENNSYLVANIA RAILROAD
STANDARD
CABLE MARKER
FOR UNDERGROUND CABLES

Office of Chief Signal Engineer, Phila., Pa., Nov. 11, 1935.

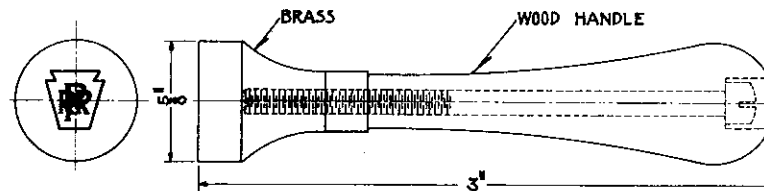
Approved: *A. H. Dickey* Chief Signal Engineer
Approved: *W. J. Huggins* Actg. Chief Engineer



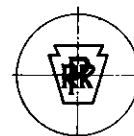
5481-LOCKING AND SEALING DEVICE



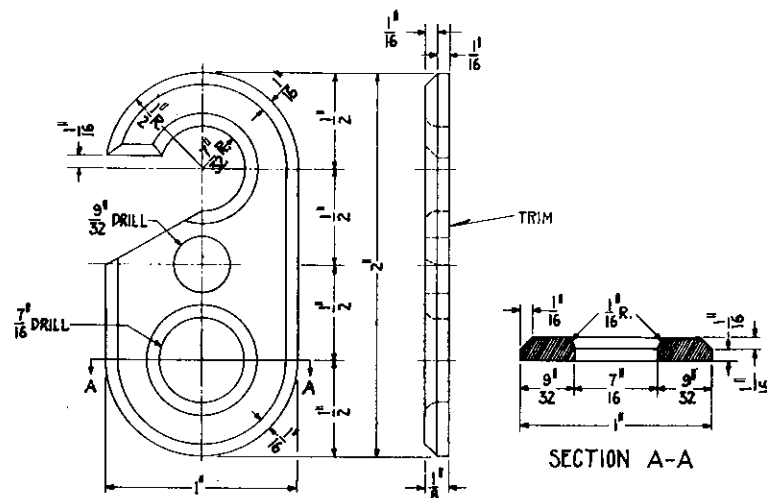
5485 - LEAD SEAL AND WIRE
(SEE NOTES)



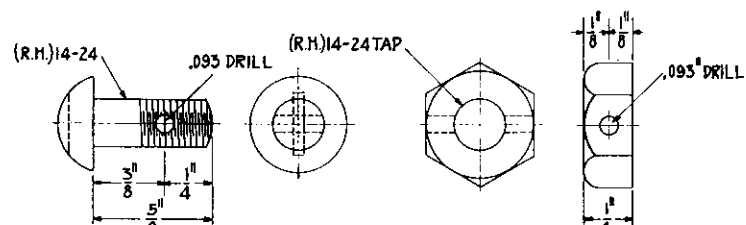
5486-RELAY SEAL
(SEE NOTES)



5487-DIE
(SEE NOTES)

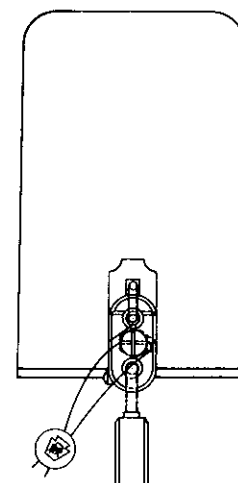


5482-LOCK PLATE
CAST BRASS.



5483- MACH. SCREW
BRASS.

5484 -NUT
BRASS.



APPLICATION OF 5481.

- NOTES:-
1. 5485 SHALL BE SIMILAR TO #0 PAGE 48 AND 5487 SHALL BE USED IN SEAL PRESS SIMILAR TO #3 PAGE 48, CAT. #28, S.H. QUINT'S SONS CO., 15 S. 4TH. ST., PHILA., PA.
 2. MONOGRAM FOR 5486 AND 5487 SHALL BE IN ACCORDANCE WITH 5473 PLAN S-547.

REVISIONS

1 SHEET

S-548-A



THE PENNSYLVANIA RAILROAD
STANDARD

LOCKING AND SEALING DEVICES

OFFICE OF CHIEF SIGNAL ENGINEER, PHILA., PA. JUNE 20 TH. 1927

Approved

A.H. Reed
Chief Signal Engineer

Approved

V. Sullivan
Chief Engineer

RULE	INDICATION	NAME	FIGURE					
			A	B	C	D	E	F
280	PROCEED; MANUAL BLOCK CLEAR.	CLEAR - BLOCK						
281	PROCEED.	CLEAR						
282	PROCEED APPROACHING NEXT SIGNAL AT MEDIUM SPEED. NOTE - TRAINS MAY PROCEED APPROACHING NEXT SIGNAL AT NOT EXCEEDING 45 MILES PER HOUR AT SIGNALS DISPLAYING A YELLOW TRIANGLE OUTLINED IN BLACK.	APPROACH - MEDIUM						
283	PROCEED; MEDIUM SPEED WITHIN INTERLOCKING LIMITS. NOTE - TRAINS MAY PROCEED AT NOT EXCEEDING 45 MILES PER HOUR AT SIGNALS DISPLAYING A YELLOW TRIANGLE OUTLINED IN BLACK.	MEDIUM - CLEAR						
285	PROCEED PREPARED TO STOP AT NEXT SIGNAL. TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED.	APPROACH						
285 A	TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED. WHERE A FACING SWITCH IS CONNECTED WITH THE SIGNAL, APPROACH THAT SWITCH PREPARED TO STOP. APPROACH NEXT SIGNAL PREPARED TO STOP.	CAUTION						
287	PROCEED; SLOW SPEED WITHIN INTERLOCKING LIMITS.	SLOW - CLEAR						
288	PROCEED PREPARED TO STOP AT NEXT SIGNAL. SLOW SPEED WITHIN INTERLOCKING LIMITS.	SLOW - APPROACH						
289	BLOCK OCCUPIED; FOR PASSENGER TRAINS, STOP; FOR TRAINS OTHER THAN PASSENGER TRAINS, PROCEED PREPARED TO STOP SHORT OF A TRAIN OR OBSTRUCTION, BUT NOT EXCEEDING 15 MILES PER HOUR.	PERMISSIVE - BLOCK						
290	PROCEED AT RESTRICTED SPEED.	RESTRICTING						
291	STOP; THEN PROCEED AT RESTRICTED SPEED. NOTE - FREIGHT TRAINS OF 90 OR MORE CARS OR HAVING TONNAGE OF 80% OR MORE OF THE PRESCRIBED ENGINE RATING MAY PROCEED AT RESTRICTED SPEED WITHOUT STOPPING AT SIGNALS DISPLAYING A YELLOW DISK ON WHICH IS SHOWN THE LETTER 'G' IN BLACK.	STOP - AND - PROCEED						
292	STOP.	STOP - SIGNAL						
293	LIMIT OF THE BLOCK. NOTE - FIG. A - YELLOW LIGHT TO BE PLACED NEXT TO TRACK GOVERNED.	BLOCK - LIMIT						
293 A	PROCEED PREPARED TO STOP AT NEXT BLOCK - LIMIT SIGNAL. TRAIN EXCEEDING MEDIUM SPEED MUST AT ONCE REDUCE TO THAT SPEED. NOTE - WILL NOT APPLY TO TRAINS AUTHORIZED TO PASS THE BLOCK - LIMIT STATION AS THOUGH CLEAR - BLOCK SIGNAL WERE DISPLAYED.	APPROACH BLOCK - LIMIT						
294	ORDERS. NOTE - FIG. A - TO APPLY TO TRAINS GOVERNED BY FIXED SIGNAL WITH WHICH CONNECTED. NOTE - FIG. B - BY DAY THE YELLOW LAMP IS NOT DISPLAYED.	TRAIN - ORDER						

NOTE:-

IN THE ILLUSTRATION OF TYPICAL ASPECTS, RULES 280 TO 294, INCLUSIVE:

R - RED
P - PURPLE
Y - YELLOW
G - GREEN

SPEEDS

MEDIUM SPEED - NOT EXCEEDING ONE-HALF THE SPEED AUTHORIZED FOR PASSENGER TRAINS BUT NOT EXCEEDING 30 MILES PER HOUR.

REDUCED SPEED - PREPARED TO STOP SHORT OF TRAIN OR OBSTRUCTION.

SLOW SPEED - NOT EXCEEDING 15 MILES PER HOUR.

RESTRICTED SPEED - NOT EXCEEDING 15 MILES PER HOUR PREPARED TO STOP SHORT OF TRAIN, OBSTRUCTION OR SWITCH NOT PROPERLY LINED AND TO LOOK OUT FOR BROKEN RAIL.

REVISIONS

REDRAWN FROM APPROVED PLAN S-602-F, DATED JANUARY 5, 1938 AND REVISED.
H. SEPTEMBER 10, 1942. INDICATION FOR RULE 284 MODIFIED. APPROVED N. L. Stanton
I. JUNE 7, 1944. RULE 293 A ADDED. APPROVED N. L. Stanton
J. AUGUST 29, 1944. RULES 282 & 283 CHANGED. NOTE ADDED - EFFECTIVE 3-15-44. APPROVED N. L. Stanton
K. MARCH 14, 1945. NOTE FOR RULE 283 CORRECTED. APPROVED N. L. Stanton
L. SEPTEMBER 20, 1948. RULE 289 CHANGED AND RULE 294 REARRANGED. APPROVED H. C. Griffith

1 SHEET



S-602-L

THE PENNSYLVANIA RAILROAD STANDARD SIGNAL ASPECTS

OFFICE OF CHIEF ENGINEER, PHILA., PA., JULY 12, 1941.

Approved
N. L. Stanton
Assistant Chief Engineer - Signals

Approved
W. J. J. J.
Chief Engineer

