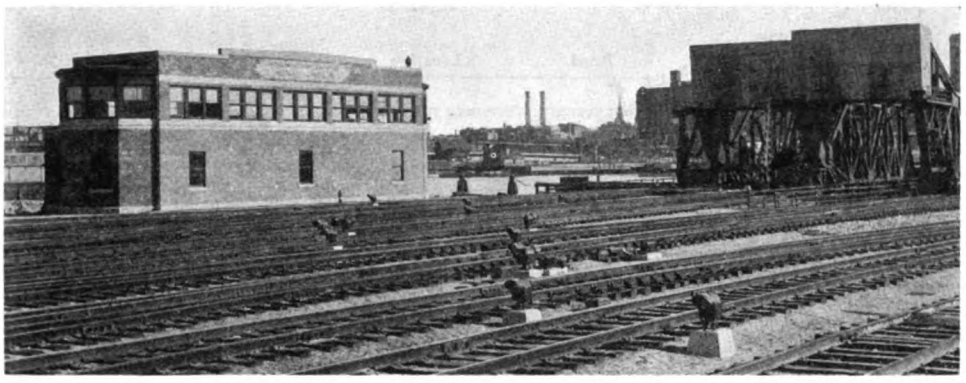
Signaling Construction During 1932



Dwarf signals are used extensively in The Boston & Maine's electro-pneumatic interlocking plant at Boston

Programs confined to projects effecting immediate savings in operating expenses—Facilities completed total only 25 per cent of those for previous year

THE volume of signaling construction on the railroads of the United States and Canada during 1932 set a low mark in comparison to past records, a total of only 2,837 units being placed in service as compared with 11,349 for the previous year and 16,343 units for the annual average for the four years prior to 1932. In this comparison one unit of value is allowed for each automatic signal, highway crossing signal, interlocking or remote control lever, power switch, car retarder, etc., as shown in the table.

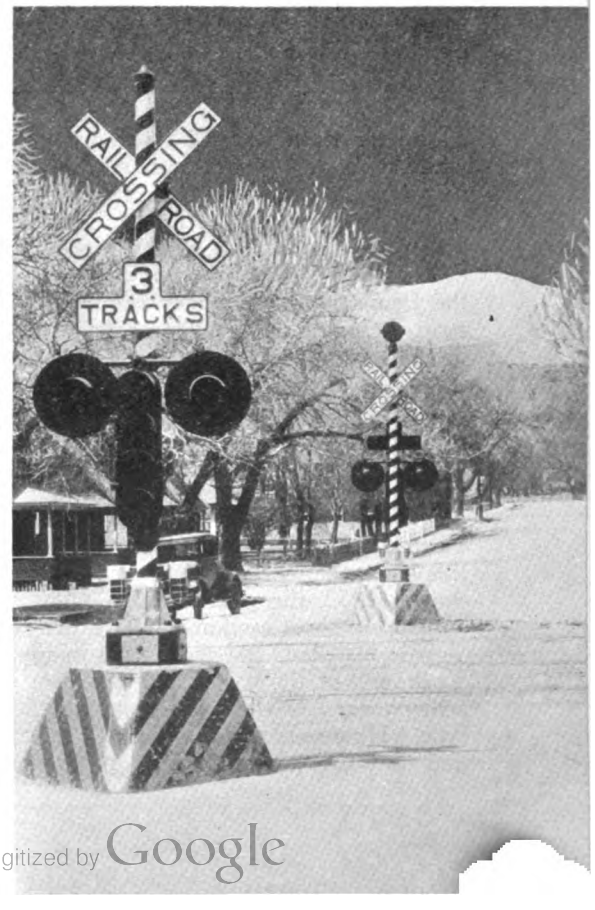
Excepting for one extended signal installation and a few large interlockings at terminals, new construction during 1932 was limited to comparatively small-sized projects which were installed because the immediate saving to be effected in operating expenses was sufficient to show a large return on the expenditures required.

Among the few bright spots of the year may be mentioned the fair-sized programs of automatic interlockings, including 26 plants, highway crossing protection involving 882 signals, remote and centralized control, including 61 switches and 139 signals, as well as 57 spring switches. However, the volume of regular interlocking, including only 27 plants, and automatic block signal construction of 190 miles for 1932, dropped to such low totals as not to be comparable with any past record since signaling became of importance on the railroads over 25 years ago. The previous low record was in 1920 when

Comparison of Annual Signaling Construction

Number of Units Completed Each Year	1928	1929	1930	1931	1932
Automatic Block Signals	5,680	8,061	7,320	3,501	617
Highway Crossing Signals	2,271	2,505	2,984	2,368	879
Levers of Interlocking	2,395	2,170	2,707	2,701	611
Levers of Remote and Centralized Control	312	584	839	653	93
Power-Operated Switches in Remote and Centralized Control	136	309	607	412	63
Signals Controlled in Remote and Centralized Control	600	1,150	1,517	883	139
Signals in Automatic Interlockings	160*	328	503	410	251
Spring Switches	153	135	152	122	57
Levers Added at Rebuilt Plants	455	403	619	162	124
Number of Retarders	53	221	98	41	3
Power Switches in Retarder Yards	86	357	153	96	.....
Total	12,301	16,223	17,499	11,349	2,837

*Liberal estimates.



Standard A.R.A. flashing-light crossing signal with automatically controlled STOP sign in service on D. & R. W. in Colorado Springs, Colo., Pike's Peak in background

546 miles of automatic block signaling was installed, which mileage was 356 in excess of the 1932 low record.

Car-retarder construction was practically at a standstill during 1932, one new installation being completed at an industrial plant involved retarders, while three retarders were added to an existing installation. No new general use of certain types of signals or systems of power supply.

The interlocking construction program for 1932 included 27 new plants, involving 711 levers as compared with 110 new plants including 2,701 levers for 1931.

Table A—Automatic Block Signals Completed During 1932

Road	Location	Miles of Road	Number of Signals	Manufacturer	Power Supply
Alton	Corwith, Ill., to Pan-Handle Xing.	1.3d	2s	G.R.S.	ACF
		.....	1c	.....	.....
A.T.& S. F.	Raton, N. Mex., to Dillon	3.0s	2s	Union	Prim.
	Jansen, Colo., to Starkville	.....	2s	Union	Prim.
			1c		
	Barstow, Cal., to Mojave	71.8s	119c	Union	ACF
	Joseph City, Ariz., to D. T. Jct.	23.5s	33c	Union	ACF
B. of T. C. of N. Y.	42nd St., New York, to Roosevelt Ave. and Nassau Ave., to Queens Ave	.....	264c	G.R.S.	AC
B. & M.	Tower H, Boston, Mass., to West Cambridge	2.5d	6c	G.R.S.	ACF
	West Cambridge, Mass., to Fresh Pond	0.8d	1c	G.R.S.	ACF
	Hill Crossing, Mass., to Waltham	4.0d	6c	G.R.S.	ACF
G. T. W.	Detroit, Mich., to Royal Oak	8.8d	12c	Union	ACF*
	Pontiac, Mich., to Pontiac	1.4d	5c	Union	ACF
C. P.	Vancouver, B. C.	1.2s	5c	G.R.S.	AC
C. & O.	Orina, Va., to Williamsburg	14.0d	19c	Union	ACF
D. L. & W.	Plymouth Jct., Pa., to West Nanticoke	5.0d	10s	Union	Prim.
	Elmira, N. Y.	1.3d	1c	Union	ACF*
Ft. W. & D. C.	Childress, Tex., to F. W. & D. Jct.	3.7s	6c	.....	ACF
	Ft. Worth, Tex., Yards	0.7s	3c	.....	ACF
	Wichita Falls, Tex., Yards	.....	1c	.....	ACF
M. P.	Belt Jct., Tex., to Gulf Coast Jct.	2.0s	5c	G.R.S.	ACF
N. Y. C.	Woodlawn, N. Y., to Mt. Vernon	1.2f	8c	G.R.S.	ACF
	Mt. St. Vincent, N. Y., to Yonkers	2.5f	10c	G.R.S.	ACF
	Dobbs Ferry, N. Y., to Tarrytown	4.7f	20c	G.R.S.	ACF
N. Y. O. & W.	Middletown, N. Y.	3.0d	8c	Union	ACF*
P. E.	Vineyard, Cal., to Beverly Hills	4.6d	1c	Union	AC
Penn.	Jersey City, N. J., to Journal Sq.	1.9d	5p	Union	AC
	Seaford, Del., to Bethel	3.1d	2s	Union	ACF
		.....	4c	.....	.....
	Clairton, Pa., to Dravosburg	6.0d	8s	.....	ACF
Reading	Shawmont, Pa., to Norristown	8.8d	22c	Union	AC
	Fishers, Pa., to Chestnut Hill	5.1d	18c	Union	AC
S. A. L.	Columbia, S. C., to Cayce	2.5s	4c	Union	ACF*
S. P.	Fresno, Cal.	1.0d	3c	Union	ACF*
		108.4s	26s		
		72.6d	322c		
		8.4f	264c		
			5p		
		189.4	617		

Legend—
In "Miles of Road" column: s = Single track. d = Double track. t = Three tracks. f = Four tracks. a = Five tracks. e = Eight tracks.
In "No. of Signals" column: s = Semaphore. c = Color-light. p = Position-light. cp = Color-position-light.
In "Power Supply" column: AC = alternating current. ACF = a-c floating and ACF* = a-c, floating with primary battery for track circuits. ACP = a-c, primary and Prim = primary.

Table B—Interlocking Plants Completed During 1932

Road	Location	Manufacturer	Lever Capacity of Frame	Working Levers: Mech.	Elec.	Elec. Pneu.	Elec.-Mech.: Mech.	Elec.-Mech.: Elec.
A. C. L.	Staton, N. C.	Union	4	4	....	....	....	....
	Columbia, S. C.	Union	4	4	....	....	....	....
B.of T.C.of N.Y.	Roosevelt Ave., N. Y.	G.R.S.	48	....	60	....	....	....
	Lexington Ave., N. Y.	G.R.S.	24	....	17	....	....	....
	Nassau Ave., N. Y.	G.R.S.	24	....	15	....	....	....
	Court Sq., N. Y.	G.R.S.	32	....	25	....	....	....
	Queens Plaza, N. Y.	G.R.S.	44	....	36	....	....	....
	36th St., N. Y.	G.R.S.	28	....	24	....	....	....
	Nor. Blvd., N. Y.	G.R.S.	12	....	8	....	....	....
B. & O.	Clifton Jct., N. Y.	G.R.S.	32	....	32	....	....	....
C. & O.	Old Point Jct., Va.*	G.R.S.	....	....	1	....	....	....
	BK Cabin, W. Va.	Union	4	4	....	....	....	....
	South Ruffner, W. Va.	Union	20	20	....	....	....	....
	Greenway, Va*	.....	....	....	1	....	....	....
C. B. & Q.	Chicago	G.R.S.	144	....	140	....	....	....
D. U. T.	Dayton, Ohio	G.R.S.	....	....	154	....	....	....
L. T. C.	Levis, Que.	G.R.S.	4	4	....	....	....	....
L. & N.	Mayton, Tenn.*	Union	19	....	....	11	....	....
	Cumberland River Draw*	G.R.S.	32	....	23	....	....	....
	Tennessee River Draw*	G.R.S.	....	....	....	....	4	2
M-K-T.	Boonville, Mo.	Union	....	....	3	....	....	....
M. P. I.-G. N.	Magnolia, Tex.	.....	2	2	....	....	....	....
H. B. & T.	Houston, Tex.*	G.R.S.	....	....	2	....	....	....
N. Y. C.	Harmon, N. Y.*	G.R.S.	128	....	9	....	....	....
B. & A.	Chatham, N. Y.*	.....	60	2	....	....	....	....
N. Y. C. & St. L.	Thornton Jct., Pa.	Union	2	....	....	....	2	2
	Gould, Ohio	Union	36	....	27	....	....	....
Penn.	Philadelphia, Pa.	Union	131	....	....	74	....	....
	Gwynn Run, Md.	Union	47	....	....	31	....	....
	Baltimore (Union Jct.), Md.*	Union	....	....	....	5	....	....
	Odenton, Md.*	Union	....	....	....	....	....	2
	Lancaster, Pa.*	Union	....	....	....	7	....	....
	Thorndale, Pa.*	Union	11	....	....	7	....	....
	Camden, N. J.*	Union	....	....	....	7	....	....
	Paoli, Pa.*	Union	....	....	....	....	6	2
	Wilmerding, Pa.*	Union	....	....	....	7	....	....
	Brownsville, Pa.*	Union	21	21	....	....	....	....
	Toledo, Ohio*	Union	....	3	....	....	....	....
P. M.	Grand Rapids, Mich.	G.R.S.	4	....	4	....	....	....
	Detroit, Mich.*	.....	....	2	....	....	....	....
S. A. L.	Parrishville, S. C.	Union	4	4	....	....	....	....
	Barrelville, S. C.	Union	4	4	....	....	....	....
	Heath, S. C.	Union	4	4	....	....	....	....
	Dupont, S. C.	Union	4	4	....	....	....	....
	West Palm Beach, Fla.	Union	4	3	....	....	....	....
Totals Levers	New			57	545	105	2	2
	Added			28	36	44	10	6

Plants	Levers
New 27	711
Rebuilt 18	124

* = Existing plant at which additional levers were added and in many cases entire plant rebuilt.

automatic train control installations have been made, while at the requests of certain roads the Interstate Commerce Commission has permitted some such installations to be removed from service. The bright spot in this picture is that several of the roads are to continue and even extend the operation of cab signaling. During 1932 the Pennsylvania extended cab signaling on 11 miles of road including 29.4 miles of track between Manhattan Transfer and Sunnyside Yards.

Automatic Block Signaling

In 1932, automatic block signals were placed in service on only 190 miles of road, as compared with 1,385 miles for the previous year. The Atchison, Topeka & Santa Fe installed automatic signals on 95 miles of single track, this being the most extensive installation placed in service during 1932, the remaining 95 miles of the total being split up in short sections on 17 other roads. Of the 617 signals installed, 264 were used in the subways in New York, and of those installed on steam roads 26 were the semaphore, 322 the color-light and 5 the position-light type. However, the volume of construction was so limited that the statistics reveal no trends as to the more

Of the new plants completed last year 11 were mechanical, 13 electric, 2 electro-pneumatic, and 1 electro-mechanical. At 18 other plants, which were rebuilt, a total of 124 new levers were added, making a total of 835 new levers of interlocking installed during 1932. In addition, a considerable number of old plants were overhauled, semaphore being replaced with light signals, electric locking being installed, etc., as a part of the improvement program.

One of the most important interlockings completed during the past year was that at the Dayton Union Terminals, this plant being of the C. T. C. type, the new interlocking with one control machine handling an entire terminal layout which formerly involved five interlock-

ings and several layouts requiring switch tenders. The arrangement of the equipment and the circuits developed for this plant were an excellent example of the results of continued effort toward simplicity and facility of operation.

Table C—Remote and Centralized Control Installations Completed During 1932

Road	Location	Miles of Road	Manufacturer	No. of Levers: Desk Type	No. of Levers: Cntld Type	No. of Levers: Power Oper. Swths.	No. of Sigls. Ctd.
A.T.& S.F.	Raton, N. M., to Dillon, N. M.	.....	Union	3	....	....	7
B.& M.	Waltham, Mass.	.....	G.R.S.	....	28	21	35
C.B.& Q.	Pacific Jct., Iowa, to Plattsmouth, Neb.	5.0s	Fed.	1	....	....	3
	Armour, Mo., to S. Iatan, Mo.	7.0s	Union	2	....	1	4
C.G.W.	Utica, Minn.	.....	Union	....	....	....	2
C.M.St.P. & P.	Techny, Ill.	.....	Union	....	6	4	10
	Bensenville, Ill.	.....	Union	....	6	4	9
D.L.& W.	Elmira, N. Y.	.....	Union	5	....	3	7
I.C.	Illinois Jct., Ill., to Ballard Jct., Ky.	.....	Union	....	2	2	8
L.V.	Potters, N. J.	.....	G.R.S.	....	4	2	7
L.& H.	Franklin, N. J.	.....	G.R.S.	4	....	....	8
M.St.P.& S.S.M.	Schiller Park, Ill., to Junction 16	1.6s	G.R.S.	1	....	1	3
M.P.	Harviell, Mo.	.....	G.R.S.	....	....	1	....
	Cliff Cave, Mo.	.....	G.R.S.	....	....	1	....
	Percival Jct., Tex.	.....	G.R.S.	2	....	....	8
	Similar installations located at various points	.....	G.R.S.	....	....	3	....
N.Y.C.& St.L.	Walbridge Park, Ohio, to Maumee	6.6d	Union	....	13	12	....
N.P.	West End, Mont., to Muir	1.0s	G.R.S	5	....	2	7
Reading	Neshaminy Falls, Pa.	1.0d	Union	2	....	3	3
S.P.	Alameda, Cal.	.....	Union	5	....	....	6
T.& N.O.	Interlocker No. 76, Tex.	.....	G.R.S.	2	....	....	8
Wabash	E. Peru, Ind.	.....	Union	....	2	1	4
	Totals	14.6s 7.6d		32	61	61	139

Table D—Automatic Interloockers Completed During 1932

Road	Location	Manufacturer	No. of Signals	No. of Smash-boards
A. T. & S. F.	Princeville, Ill.	Union	7	....
	Hope, Kan.	R.R.S	4	....
	Jacobs (Ramona), Kan.	G.R.S.	4	....
	Lathrop, Mo.	Union	4	....
	El Moro, Colo.	Union	5	....
	Sweetwater, Tex.	G.R.S.	8	....
	Midlothian	G.R.S.	10	....
Alton	Green Valley, Ill.	G.R.S.	8	....
	White Hall, Ill.	G.R.S.	8	....
B. & O.	Chicago Heights, Ill., 11th St.	.....	4	....
	17th St.	.....	4	....
	22nd St.	.....	6	....
	26th St.	.....	4	....
C. N.	Glencoe, Ont.	.....	8	....
C. P.	Regina, Sask.	Union	7	....
	Mayfair, Sask.	Union	8	....
C. B. & Q.	Ziegler Jct., Ill.	.....	9	....
	Lathrop, Mo.	.....	6	....
	Nickerson, Neb.	.....	8	....
	Northport, Neb.	.....	10	....
	Forman, Ill.	.....	10	....
C. M. St. P. & P.	Huson, Mont.	Union	4	1*
C. R. I. & P.	Peru, Ill.	.....	6	....
C. R. I. & G.	Shamrock, Tex.	.....	9	....
I. C.	Cedar Falls, Iowa	.....	6	....
M. P.	Benedict, Kan.	.....	6	....
	Toronto, Kan.	.....	5	....
N. P.	Eldridge, N. D.	G.R.S.	3	1s
P. E.	Clearwater, Cal.	Union	10	....
S. N.	Sankey, Cal.	Union	8	....
S. A. L.	Maggetts, S. C.	Union	4	....
	Center Hill, Fla.	Union	8	....
	Iris, Fla.	Union	10	....
U. P. L. A. & S. L.	South Gate, Cal.	Union	8	....
	Ontario, Cal.	.....	7	....
	Totals—35 plants		251	2

*=Movable point frog. s=Power operated switch.

In spite of, but more probably because of, hard times, the construction of automatic interlockings continued at a fairly good rate, 35 such plants being completed in 1932, as compared with 62 the previous year. These new plants placed in service during 1932 included 251 signals, 1 movable point frog and 1 power-operated switch. In most cases these automatic interlockings replaced mechanical plants, the savings effected by eliminating operators being sufficient to pay for the improvement in from one to three years.

In the field of centralized traffic control, including remote control, the construction was very limited during 1932, only 20 installations, involving 61 power switches and 139 signals, being placed in service, as compared with 64 installations involving 412 power switches and 883 signals in 1931. None of the C. T. C. installations completed in 1932 involved much mileage, the more important projects involved the consolidation of the control of two or more interlockings, such as that at Waltham, Mass., on the Boston & Maine, including 21 switches, or that at Walbridge, Ohio, on the Nickel Plate, involving 12 switches. The remaining installations of the year each involved from 1 to 4 switches at the ends of double track or junctions, the object of making the improvements in most cases being to eliminate interlockings at outlying points. In some cases the operating problem at these outlying switches was handled by the installation of a spring switch, a total of 57 such switches being made in 1932, as compared with 122 in 1931. A spring switch lock operated automatically by the train itself

Table E—Highway Grade Crossing Protection Installed in 1932

Name of Road	Number of Crossings Protected	Number of Wig-wag Signals	Number of Flashing-light Signals	Number of Rotating Stop Sign Signals with Flashing Lights	Number of Traffic Type Stop and Go Signals	Number of Electrical Operated Gates
Alton	9	....	20	.....	.....	.....
A. T. & S. F.	42	60	....	.....	.....	.....
B. & O.	9	.....	24	.....	.....	.....
B. & L. E.	2	.....	4*	.....	.....	.....
B. & M.	1	.....	1	.....	.....	.....
	2	.....	.....	.....	2	.....
C. N.	1	.....	.....	.....	.....	4
	2	3	....	.....	.....	.....
	1	*	2	.....	.....	.....
	3	5	.....	.....	.....	.....
	3	....	6*	.....	.....	....
C. P.	5	6	....	.....	.....	4
C. R. R. of N. J.	7	.....	27	.....	.....	.....
	1	.....	2*	.....	.....	.....
C. V.	1	.....	2†	.....	.....	.....
C. & O.	8	.....	20	.....	.....	.....
C. & E. I.	5	.....	11	.....	.....	.....
	....	....	4†	.....	.....	.....
C. & N. W.	3	5	....	.....	.....	.....
	8	.....	17	.....	.....	.....
	1	.....	....	.....	.....	1
C. B. & Q.	11	.....	22	.....	.....	.....
	13	1	24	.....	.....	.....
	2	1	1	.....	.....	.....
	4	.....	8	.....	.....	.....
C. G. W.	1	.....	4	.....	.....	.....
C. M. St. P. & P.	13	.....	.....	26	.....	.....
	2	3	....	.....	.....	....
C. N. S. & M.	9	.....	2	.....	.....	7
C. St. P. M. & O.	1	1	....	.....	.....	.....
C. & S.	3	.....	6	.....	.....	.....
D. L. & W.	4	.....	8†	.....	.....	.....
D. & R. G. W.	4	.....	2	.....	.....	.....
	....	....	2*	.....	.....	.....
Erie	31	3	26*	.....	.....	.....
	....	.....	44†	.....	.....	.....
C. N.	4	.....	....	8	.....	.....
I. C.	1	.....	2	.....	.....	.....
	3	.....	10†	.....	.....	.....
	....	.....	.....	.....	.....	4
L. V.	2	.....	5	.....	.....	.....
	2	.....	8†	.....	.....	.....
L. & N.	1	.....	.....	.....	.....	2
	1	.....	4	.....	.....	2
	1	.....	.....	.....	.....	2
	1	.....	4	.....	.....	.....
	2	.....	4	.....	.....	.....
	1	.....	.....	.....	.....	4
	1	.....	.....	.....	.....	4
	1	.....	6	.....	.....	.....
	1	.....	6	.....	.....	.....
	1	.....	4	.....	.....	3
Me. C.	1	....	1	.....	.....	.....
M. & St. L.	1	1	.....	.....	.....	.....
G. St. P. & S. Ste. MM.	5	8	....	.....	.....	.....
	7	.....	14	.....	.....	.....
	3	.....	.....	6	.....	.....
M-K-T.	1	.....	2*	.....	.....	.....
	1	.....	....	.....	.....	4
M. P.	9	.....	18*	.....	.....	.....
	1	.....	2†	.....	.....	.....
M-I.	2	.....	4*	.....	.....	.....
	2	.....	4†	.....	.....	.....
N. O. T. & M.	4	.....	8*	.....	.....	.....
I-G. N.	2	.....	4*	.....	.....	.....
N. C. & St. L.	12	.....	24*	.....	.....	.....

(Continued on next page)

Table E—Highway Crossing Protection

(Continued from last page)

Name of Road	Number of Crossings Protected	Number of Wig-wag Signals	Number of Flashing-light Signals	Number of Rotating Stop Sign Signals with Flashing Lights	Number of Traffic Type Stop and Go Signals	Number of Electrically Operated Gates
N. Y. C.	8	.....	18	.....	.....	.....
	2	.....	4*	.....	.....	.....
	1	.....	2†	.....	.....	.....
	2	.....	2*	.....	.....	.....
B. & A.	3	.....	3†	.....	10	.....
M. C.	3	6	.....	.....	.....	.....
	2	.....	4*	.....	.....	.....
	6	.....	12†	.....	.....	.....
P. & E.	1	.....	2	.....	.....	.....
C. C. C. & St. L.	3	.....	6	.....	.....	.....
	1	.....	2	.....	.....	.....
I. H. B.	1	.....	2*	.....	.....	.....
N. Y. C. & St. L.	6	.....	6	.....	.....	.....
	1	.....	1†	.....	.....	.....
N. Y., N. H. & H.	15	.....	15†	.....	1	.....
N. Y. O. & W.	6	.....	5	.....	.....	1
N. & W.	6	12*	.....	.....	.....	.....
P. E.	5	5	.....	.....	.....	.....
	1	.....	.....	.....	.....	.....
Penn.	23	.....	73	.....	.....	.....
	2	.....	7†	.....	.....	.....
	3	.....	11*	.....	.....	.....
	1	.....	.....	.....	.....	2
	3	.....	6*	.....	.....	.....
	1	.....	2†	.....	.....	.....
L. I.	6	.....	2	.....	.....	.....
	...	.....	4†	.....	.....	.....
P. M.	10	3	3	.....	.....	.....
	...	.....	3†	.....	.....	.....
Reading	7	.....	17	.....	.....	.....
St. L.-S. F.	1	.....	2*	.....	.....	.....
S. A. L.	6	.....	13	.....	.....	.....
S. P.	11	13	.....	3	.....	.....
T. & P.	1	.....	2*	.....	.....	.....
	3	.....	6†	.....	.....	.....
T. H. & B.	1	2*	.....	.....	.....	.....
U. P.						
L. A. & S. L.	9	18	.....	.....	.....	.....
Wabash	2	.....	6*	.....	.....	.....
W. M.	7	.....	7	.....	.....	.....
W. P.	1	.....	.....	.....	.....	.....
		14*	137*			
			135†			
	459	156	667	43	13	44

*=New A. R. A. automatically controlled illuminated STOP sign used in conjunction with regular wig-wag or flashing-light signal.
†=New A. R. A. button-type reflector sign reading "Stop on Red Signal" used in conjunction with regular wig-wag or flashing-light signal.

Table F—Spring Switches Installed During 1932

Road	Number
A. T. & S. F.	15
A. C. L.	2
B. & M.	1
C. of G.	1
C. & O.	5
C. B. & Q.	1
C. M. St. P. & P.	12
C. R. I. & P.	2
D. & R. G. W.	3
L. V.	3
L. & N.	5
M. P.	2
N. P.	1
S. A. L.	2
S. P.	2
Total	57

was developed during 1932 and is operating satisfactorily on trial installations. The use of such a lock will no doubt extend the use of spring switches for locations where speed restrictions were otherwise considered necessary in connection with spring switches.

The construction of highway crossing signals continued during 1932 at approximately 25 per cent of the schedule during the previous year, more than 879 signals and 44 gates being installed for the protection of 459 crossings as compared with 2,368 signals and 34 gates for 1,136 crossings in 1931. During 1932 several states adopted the standards of the A. R. A. Joint Committee on Highway Crossing Protection, while many roads voluntarily adopted these standards. Of the 156 wig-wags installed in 1932, 14 were equipped with the A. R. A. standard button-type reflector sign reading Stop-on-Red Signal. Likewise, of the 667 flasher-light signals installed, 137 were equipped with the Stop-on-Red Signal sign and 135 with the automatically-controlled illuminated STOP sign.

Train Control and Cab Signal Activities

Activities in the automatic train control field during 1932 have been devoted primarily to the abandonment of such facilities rather than the construction of new installations. Eight roads using the intermittent system and one road using the continuous system have petitioned the Interstate Commerce Commission for permission to discontinue the maintenance and operation of their train control. As a result the orders of the commission have been suspended in respect to three roads, the Great Northern, the Northern Pacific and the Burlington. Hearings or final action have not been completed as yet with reference to the remaining six roads. Three roads using the continuous system have requested permission to discontinue the use of automatic brake applying apparatus but to continue the cab signaling, the commission amending its orders in this respect with reference to the Union Pacific and the Pennsylvania, while action is yet to be taken on the request of the Norfolk & Western.

Table Listing Roads Which Have Petitioned for Discontinuance of Train Control

Road	Track Miles	Locomotives Equipped	Date Granted	Remarks
G. N.	256	73	Jan. 11	
N. P.	216	52	July 11	
C. B. & Q.	244	86	Dec. 5	
U. P.	450	140	July 11	Cab signals continued
Penna.	1,392	1,108	Dec. 12	Cab signals continued
T. & N. O.	160	71		Hearing held
M. P.	53	43		Hearing held
C. R. I. & P.†	243			Hearing held
D. & H.	279	161		Hearing held
B. & M.*	203	157		
C. I. & L.*	161	50		
N. & W.*	242	75		Cab signals to be continued
Totals	1,815 2,084	693 1,395		Installations to be adandoned Cab signaling only to be used

*Petition presented but hearing not yet held.
†Request is to discontinue train control on second territory from Des Moines, Iowa to Davenport first territory Davenport to Chicago to remain in service.

The petitions of the railroads were in general based on five reasons as follows:

1. That the train density on equipped track is such that automatic train control is not essential for safety.
2. That the physical characteristics of the equipped track do not warrant operation by automatic train control.
3. That increased safety of operation is indicated by the accident record.
4. That the money saved could be used to better advantage for other safety measures.
5. The desirability of eliminating all possible operating expenses, giving due regard to the question of safety.

The Bureau of Safety is continuing the periodical inspections of methods used by the carriers with respect to maintenance and operation of train control systems. The method of tabulating performance records, in use for the past three years, has been simplified.

The A. R. A. Committee on Automatic Train Control and the Bureau of Safety, in co-operation with various carriers and signal companies, are continuing the investigation of irregularities in operation and other conditions, and have developed new methods of testing that have greatly facilitated this work. Test of interchangeability, conducted by the committee on the Boston & Maine have demonstrated that the method proposed to effect interchangeable operation between General Railway Signal Company intermittent inductive equipment and Union Switch & Signal Company continuous stop or speed control devices are practicable for the purpose.