

Review of the Past Year in Signaling

Discussion of Changes in Practice, Developments in Apparatus and Conditions in the Industry

The outstanding feature of the year 1915 in the transportation industry is the extreme depression which prevailed for the greater part of the 12 months. Every department felt the necessity for drastic economies and almost complete cessation of new work resulted in some lines. The outlook at the close of the year, however, is more favorable than at any time during its course. Prosperity has apparently returned with startling suddenness, and, in addition, there is abundant evidence that public opinion is slowly but surely veering around from the radical anti-railway position, which it has too often assumed. This change is reflected directly by the more friendly tone of newspaper and magazine articles and the decrease in adverse legislation on railway matters, and, indirectly, by the action of the Interstate Commerce Commission in allowing certain limited increases in freight rates and general advances in passenger rates. With the growing demand for safety and economy in train operation, and with a return of prosperity, enabling improvements to be financed, the signal departments of American railroads should experience the best year in their history during 1916.

WORK COMPLETED IN 1915

The accompanying tables, showing the installations of block signals and interlocking plants placed in service during the past year, indicate very plainly the condition that has existed. The totals of 1,296 mi. of automatic signals and 117 interlocking plants are far below the normal volume of new work installed in recent years, although it is difficult to secure accurate comparisons with previous years. The brief summary of signaling completed in 1914, which was published in *The Signal Engineer* for January, 1915, showed about 2,930 mi. of automatic signals and 91 interlocking plants, although this was known to be far less than the complete total figures for that year. The Interstate Commerce Commission report for January 1, 1915, showed an increase in mileage protected by automatic signals of 3,294 mi., as compared with the previous year, and the number of interlocking plants reported was 121 greater. The figures compiled by the *Railway Signal Engineer* and by the Interstate Commerce Commission are not strictly comparable, however, because, in the first place, we include work handled by Canadian roads; in the second place, the Interstate Commerce Commission shows only additional mileage protected by block signals, thus eliminating heavy replacement work, such as the changing of d. c. automatic installations to a. c. on account of electrification; and in the third place, the I. C. C. figures for interlocking include the reports from all roads interested in the operation of an interlocking plant, which means that many of them are reported more than once.

While no claim is made for absolute completeness in the tables presented herewith, every effort has been made to secure authentic information from the signal departments of all roads that have installed either block signals or interlocking plants during the past year.

The recent depression affected electric railways even more than steam railways, so that the installation of protective devices on such lines was given a serious check. The total mileage of signals on electric roads reported is 53.17, of which 6.17 is of the trolley contact type. Three electric roads installed a total of 7 interlocking plants. The Canadian roads were also very seriously handicapped by the financial depression, the trouble in their case being exaggerated by the direct interest of Canada in the European war. The figures given us show only 4.2 mi. of automatic block signals installed in Canada during the year, 2 mi.

of line protected by the staff system, and 17 interlocking plants.

According to these statistics, the mileage of single and double track automatic signals installed are in practically the same proportion as the total mileage on single and double track in service. The figures are 553 mi. of single-track and 743 mi. of double track. The largest mileage of automatic signals installed on a single road during the year was 235.1 mi. completed by the Illinois Central, including the Yazoo & Mississippi Valley. The Southern was next with 175.05 mi., and the Chicago, Milwaukee & St. Paul third, with 124 mi. The Toledo & Ohio Central and the Zanesville & Western, which have a common signal department, put in service more non-automatic block signals than any other road reporting, the total mileage amounting to 332. The Chicago, St. Paul, Minneapolis & Omaha was second, with 165.52.

The interlocking plants installed are classified between the various types as follows: Mechanical, 67 plants with 1,083 levers; electro-mechanical, 12 plants with 328 levers; electric, 32 plants with 1,247 levers; electro-pneumatic, 6 plants with 572 levers. Only 4 plants with more than 100 levers are reported, the largest being that on the New York Central at Utica with 224 levers. Next in order come the Tower A plant of the Central Railroad of New Jersey at the Jersey City terminal, with 179 levers, the Clearing Yard plant of the Belt Railway of Chicago with 144 push buttons, and the San Francisco Terminal plant of the Southern Pacific, with 107 levers. The Utica plant is electric, the Central of New Jersey and the Southern Pacific plants, electro-pneumatic, and the Belt Railway plant, electro-pneumatic with push-button control. The Canadian Pacific ranks first in the number of plants installed, having 8. The Southern, the Delaware, Lackawanna & Western and the Pennsylvania each put in 7.

In addition to the new work listed in the tables, the signal departments of many of the roads have handled important reconstruction work, and miscellaneous installations of various types.

PROSPECTS FOR THE COMING YEAR

The fact that the revival in signal business has already started is evidenced by the fact that 1,014 mi. of automatic signals and 52 interlocking plants are reported under construction at the present time. The tables showing work contemplated for next year are somewhat misleading, since in reality they represent very little more than work for which definite authority has been received at present. In most cases, it is impossible to foretell accurately the amount of work that will be undertaken until a definite decision is reached and the authority granted. On many roads not shown here, the budgets now under consideration include a large amount of work, and there is every reason to believe that much of this will soon be authorized. The figures for contemplated work show 906 mi. of automatic signaling and 42 interlocking plants.

While it is probable that if the roads are prosperous during the coming year, the volume of signaling authorized will not be materially curtailed by any normal development in the markets for raw materials used in signaling material and appliances, it is nevertheless interesting to consider the trend of conditions in these markets during the past 12 months, and the outlook for the future. It is obvious that no such opportunity for saving in the first cost of signal installations exists at present as prevailed during the early part of 1915, and it is not likely that the coming year will

see any similar condition. On account of the heavy export business that has developed as a result of the European war, the prices on metals and other commodities used in the manufacture of signal appliances have risen materially. Steel, for example, is quoted at present at a figure practically double its corresponding value one year ago. This

AUTOMATIC BLOCK SIGNALS.

COMPLETED DURING PAST YEAR.

Road.	Mileage of Line	Between	and	Single or Double Track	No. of Signals	Type of Signals	Control System	Remarks
A. T. & S. F.	2.0	Los Angeles, Cal.	Redondo Jct., Cal.	Double	5	3-pos. A. C. U. Q. Style "S" U. S. & S.	3-pos. wireless.	
	3.5	Joliet, Ill.	Plaines, Ill.	Double	5	3-pos. D. C. U. Q. Style "S" U. S. & S.	3-pos. Line and Track	1 outlying switchlock Completed but not placed in service.
A. C. L.	3.06	James River	"CY" tower	Double	76	Union Style "B"	D. C.	
	61.88	Selma, N. C.	Parkton	Double				
	3.86	Lanes, S. C.	Santee Bluff	Double				
B. & M.	40.4	White River Jct., Vt.	Wells River	Single				
B. & O.	6.0	Weverton, Md.	Engles	Double	18	U. S. & S. Style "T"	Normal Clear Line Circuit	
	2.90	Evitts Creek	William Street, Cumberland	Double	11	U. S. & S. Style "T"	Normal Clear. Polarized Circuit.	
	.86	Port Ivory, N. Y.	Arlington	Double	8	Hall Disc.	Normal clear.	
	6.1	Hansrote, W. Va.	Magnolia	Single	8	G. E.	Normal clear. Polarized circuits.	
	1.3	Illinois State Line.	Calumet River Draw	Double	4	U. S. & S. Style "T"	Line Circuit.	
Boston Elevated	.2	Park Street	Washington Station	Double	6	Normal clear, light, 4-indication	Double rail A. C.	In Dorchester Tunnel
C. P. R. (East)	2.2	Parkdale	West Toronto	Double	6	Semaphore	Track circuit.	
Cent. New Eng.	3.5	Loyd, N. Y.	Highland	Double	5	U. S. & S. Style "B"	Polarized track.	
C. & N. W.	3.15	Otis, Iowa	Cedar Rapids	Double	8	3-pos. U. Q. Semaphore	Track relay and line control	
C. B. & Q.	27	Savanna, Ill.	Portage	Double	72	L. Q. 60 deg.		
C. M. & St. P.	39.2	Elberon, Iowa	Capron	Double	43	Semaphore, Normal clear, 3-pos.	D. C.	Replaced Manual Block Signals
	61.0	Perry, Iowa	Manilla	Double	79			
	22.1	Hopkins, Minn.	Cologne	Double	25			
	1.7	N. P. Crossing, Spokane, Wash.	Center St., Spokane	Double	7			
C. H. & D.	7.5	Hamilton, O.	"AX" cabin	Double	16	U. S. & S. Style "T-2"	Normal clear.	
D. & H.	22.74	Plattsburg, N. Y.	Rouses Point	Single	46	Hall Style "K" top post, U. Q. 3-pos. Normal danger.		
D. L. & W.	39.43	Clark's Summit, Pa.	Hallstead	Double	101	U. S. & S. Style "B"	Polarized Track Circuit	
E. P. & S. W.	33	Tecolote, N. Mex.	Carrizozo	Single	64	Hall Style "K"	U. Q. 2-pos. overlap	
	56	Vail, Ariz.	Lewis Springs	Single	107	Hall Style "K"	U. Q. 2-pos. overlap	
Empire United Rys.	.75	Oswego City	Chapman	Single	4	G. R. S.	Trolley	
Ft. Wayne & Nor. Ind.	25.0	Logansport, Ind.	Delphi	Single	16	G. R. S.	A. P. B.	
G. T.	20.4	Thornton Jct., Ill.	C. & W. I. Jct.	Double	37	G. R. S. 2A, 3-pos., U. Q. A. C.		
	2.0	St. Davids, Ont.	Niagara Falls	Double	4	D. C. 3-pos.		U. S. & S. Style "B".
	2.0	Fenton, Mich.	Egypt	Single	2	D. C. 2-pos.		U. S. & S. Style "B".
G. N.	Abt. 1.5	Near Kingston, Mont.		Single	8			Gauntlet bridge protection.
I. C.	7.4	DeWitt, Ill.	Birkbeck	Single	12	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	13.7	Marine, Ill.	Glen Carbon	Single	28	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	2.1	Parkway, Ill.	Broadview	Double	10	U. S. & S. "B" 2-pos. L. Q.	Clear.	
	11.5	Coleman, Ill.	Plato Center	Single	20	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	6.4	La Salle, Ill.	Oglesby	Single	12	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	10.7	Mona Siding, Iowa.	Benson	Single	20	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	.2	Fort Dodge, Iowa.	(Yard)	Single	2	Hall disc.	Clear.	
	10.9	Tip Top, Ky.	Dugan	Single	23	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	10.4	Cecilia, Ky.	Eastview	Single	22	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	27.7	Leitchfield, Ky.	Horse Branch	Single	46	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	10.5	Rockport, Ky.	Beaver Dam	Single	23	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	12.4	Mercer, Ky.	Graham	Single	26	Hall "K" 3-pos. U. Q.	Clear-T. D. S.	
	17.5	Gibbs, Tenn.	Trimble	Double	28	Hall "K" 2-pos. L. Q.	Clear.	
	15.9	Dyersburg, Tenn.	Curve	Double	26	Hall "K" 2-pos. L. Q.	Clear.	
K. C. Term.	0.34	So. West Blvd.	28th St.	Double	2	A. C. 110-V, 60-cycle.	Polarized track.	
L. V.	1.09	Penn Haven	Hazelton	Double	4	Normal Danger 3-pos. U. Q.	Line.	
	0.78	Ashmore	Tannery	Double	2			
	2.00	Ashmore	Eckley Jct.	Double	6			
L. & N.	97.0	Cincinnati, O.	Winchester, Ky.	Double				
Mo Pac.	2.00	Crickett, Ark.		Single	4	L. Q.		Tunnel protection.
	1.92	Crest, Ark.		Single	4	L. Q.		Tunnel protection.
	2.09	Reeds Spring, Mo.		Single	4	L. Q.		Tunnel protection.
N. Y. C. (East)	13	Barrytown, N. Y.	Linlithgo	Two and four	32	Hall style "K"	Line	Power charging line.
	8	Storm King, N. Y.	Chelsea	Double	24	Hall style "K"	Line	
N. Y. O. & W.	1.42	Fallsburgh, N. Y.	Centerville	Double	1	U. S. & S. style "B" 2-arm.		
	.77	Fair Oaks, N. Y.	Winterton	Double	1	L. Q.	Polarized	Additional signals.
	.65	Mamakating, N. Y.	Summitville	Double	1			
	1.78	Oxford, N. Y.	Norwich	Single	2	G. R. S. style "2-A" U. Q. Top post mech.	Polarized	New signals replacing banner signals.
N. & W.	24.6	Dwight, Va.	Webb	Double	66	3-pos. U. Q.	Pol. Tr. Cir.	A. C.
	9.5	Church Road, Va.	Hebron	Double	24	3-pos. U. Q.	Pol. Tr. Cir.	A. C.
	31.8	Burkeville, Va.	Elam	Single	68	3-pos. U. Q.	T. D. B.	A. C.
	4.7	Dry Branch, Va.	Eggleston	Single	6	3-pos. U. Q.	T. D. B.	D. C.
	7.1	Ripplemead, Va.	Pearisburg	Single	16	3-pos. U. Q.	T. D. B.	D. C.
O. S. L.	1.0	Pocatello, Idaho		Double	11	L. Q. Semaphore 2-arm, U. S. & S.	Polarized	
O. W. R. & N.	21.2	Hooper, Wash.	Ayer Jct.	Single	37	Electric 60 deg., L. Q.	D. C.	
	1.3	Monroe St., Spokane	Hangman Creek Bridge	Double	10	Electric 60 deg., L. Q.	D. C.	
P. & L. E.	19.7	Coyote Jct., Ore.	Hinkle Jct.	Single	43	Electric 60 deg., L. Q.	D. C.	
	2	New Castle, Pa.	New Castle Jct.	Double	8	U. S. & S. style "T-2", 3-pos., U. Q.	A. C. 110-V from 2200 v. line.	
P. R. R.	3.2	Eldorado, Pa.	New Portage Jct.	Single	5	Low voltage D. C. motor		Lock and block with autos for following movements.
	20.0	Philadelphia, Pa.	Paoli	Four	117 (379 units)	Position light. 110 V. A. C. Single Phase Lights 6-11 Volts		Superseded 2-pos. Home and Dist. L. Q. Elec. Pneu. signals.
P. M.	1.8	Holland, Mich.	Waverly	Single	2	3-pos.	D. C.	
	4.0	Grand Ledge, Mich.		Single	4	3-pos.	D. C.	
	1.0	Steiner, Mich.		Double	1	2-pos.	D. C.	
	1.0	Grand Jct., Mich.		Single	2	3-pos.	D. C.	
Q. & C.	8.5	M. P. 218.5	M. P. 227	Double	18	Semaphore	Automatic	
	1.62	On Belt Ry., Chattanooga, Tenn.		Double	3	Semaphore	A. C. track controlled	

AUTOMATIC BLOCK SIGNALS.
COMPLETED DURING PAST YEAR—Continued

Road.	Mileage of Line	Between	and	Single or Double Track	No. of Signals	Type of Signals	Control System	Remarks
Rhode Island Co.	1.80	Delaine Mill, T. O.	Fruit Hill Ave.	Single	3	Chapman	Trolley contact	
	.30	Double Iron	Cooper's T. O.	Single	1	Chapman	Trolley contact	
	.61	Cor. Admiral and Charles Sts.	Hawkins' T. O.	Single	1	Chapman	Trolley contact	
	29	Cor. Chalk and Academy Ave.	Chalkstone and Mt. Pleasant Aves.	Single	1	Chapman	Trolley contact	
	.43	Cor. Brook and Wickenden Sts.	George St. T. O.	Single	1	Chapman	Trolley contact	
	1.99	Banningan T. O.	Swan Point T. O.	Single	3	Chapman	Trolley contact	
	17	Warwick Ave.	Buttonwoods	Double	117	U. S. & S.	Track circuit	
	1.0	Elmwood Ave.	Duby's Grove	Single	4	U. S. & S.	Track circuit	
	2.0	Grants Sta.	Rocky Point	Double	9	U. S. & S.	Track circuit	
	6.2	Winslow Tunnel.		Single	2	2-pos. U. Q., Normal clear style S.	Line control	
St. L. & S. F.		Newburg Yards.		Single	2	2-pos. U. Q., Normal clear, Motor dwarf.	Line control	
		Monett Yards.		Single	5	1-2 pos. U. Q. Motor dwarf; 4-3 pos. U. Q. style S.	Line control	
Southern Ry.	57.5	Amherst, Va.	Whittle	Double 52.7	83	A. C. U. Q.	Polarized	
	47.0	Danville, Va.	Denim, N. C.	Single 4.8		60	A. C. U. Q.	Polarized
	54.30	Gainesville, Ga.	Atlanta	Double 48.05	75	A. C. U. Q.	Polarized	
	13.25	Ooltewah, Tenn.	Citico	Single 6.25		25	D. C. U. Q.	Wire Line
T. & O. C.	3.00	Roseland, Ga.	Constitution	Double	8	D. C. U. Q.	Wire Line	
Wabash	1.04	So. Columbus, O.	Steelton	Double	2	D. C. Motor, 3-pos., U. Q.	Polarized track	
W. M.	7.0	Danville, Ill.	State Line	Double	12	3-pos. L. Q.	Polarized line	
	27.0	Thurmont, Md.	Hagerstown	Single	62	Union style "S"	A. P. B.	
	13.0	Kemps, Md.	Big Pool	Single	24	U. S. & S. style "S"	A. P. B.	
Wilkes-Barre Connecting	6.65	Hudson, Pa.	Buttonwoods	Double	14	Hall style "K", top post, U. Q. 3-pos.	D. C. Normal danger	
Y. & M. V.	77.8	Baton Rouge, La.	Kenner Jet	Single	148	Hall style "K" 3-pos. U. Q.	Clear, T. D. S.	

UNDER CONSTRUCTION.

A. T. & S. F.	20.0	Claremont, Cal.	Arcadia	Single	42	3-pos. style "S", U. S. & S. U. Q. A. C.	Line and track	
	10.1	Le Loup, Kan.	H. U. Tower	Double	11	3-pos. style "S", U. S. & S. U. Q. D. C.	Line and track	
A. C. L.	68.0			Double				
B. & O.	5.8	Engle, W. Va.	Hobbs	3	74	U. S. & S. style "T"		Stationary type battery, line charged.
	7.3	Hobbs, W. Va.	Opequon	3				
	4.2	Opequon, W. Va.	Fawvers	4				
	2.8	Fawvers, W. Va.	Cumbo	Double				
Boston Elevated	.5	Cambridge Street	Devonshire Street	Double	30	Normal clear light, 3-indication.	Single rail, A. C.	This mileage in East Boston Tunnel.
	1.30	Devonshire Street	Maverick Square	Double	42	Normal clear light, 3-indication.	Single rail, A. C.	This mileage in East Boston Tunnel.
C. M. & St. P.	35.9	Piedmont, Mont.	Butte Yard	Single	57	Light signals, normal clear, 3-light, color indication.	A. C.	Between Piedmont and Butte Yard, and Lenep and Three Forks, light signals replace D. C. Semaphore. Account electrification of line.
	78.5	Lenep, Mont.	Three Forks	Single	124			
	16.1	Butte Yard, Mont.	Finlen	Single	26			
C. R. I. & P.	2.0	63rd St., Chicago, Ill.	83rd St.	Double	7	U. S. & S. style "B", A. C.	Line	
	2.5	Gresham, Ill.	South Chicago	Double	8	G. R. S. Model 2-A, A. C.	Line	
	0.5	Gresham, Ill.	Brainerd Jet	Double	6	G. R. S. Model 2-A, A. C.	Line	
	1.0	Rock Island, Ill.	Davenport, Iowa.	Double	5	U. S. & S. Light Signal	Line A. C.	In connection with interlocking protection.
D. L. & W.	9.0	New Milford Summit					Polarized track circuit	
G. T. P.	3.0	Melville, Sask.						
I. C.	89.7	Gilman, Ill.	Mattoon	Double	149	Hall "K" 3-pos., U. Q.	Clear	
	8.0	Dugan, Ky.	Cecilia	Single	14	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	14.0	East View, Ky.	Leitchfield	Single	27	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	12.0	Horse Branch, Ky.	Beaver Dam	Single	20	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	12.0	Rockport, Ky.	Mercer	Single	21	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	34.5	Eddyville, Ky.	Paducah	Single	59	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	8.1	Woodstock, Tenn.	Nor. Yd., Memphis	Single	16	Hall "K" 3-pos., U. Q.	Clear—T. D. S.	
	2.0	Branch Jet, Ill.	Centralia	Double	11	Hall "K" 2-pos., L. Q.	Clear	
	110.0	LaFollette, Tenn.	Etowah	Single			G. R. S.-A. P. B.	
	65.0	Calera, Ala.	Montgomery	Single			G. R. S.-A. P. B.	
M. & St. L.		Minneapolis Yard.			5	Light		
N. Y. Mun. Rys.	103	New York City				Cab signals and speed control system.		
N. Y. N. H. & H.	2.75	Stamford, Conn.	Riverside	4	1-arm 10' Dwarf	Semaphore		
N. & W.	10.1	Poe, Va.	Jack	Single	22	2-pos., L. Q.	T. D. B.	D. C.
	8.1	Jack, Va.	Church Road	Double	18	3-pos., U. Q.	Pol. Track Circuit	A. C.
P. R. R.	2.43	Sunbury, Pa.		Double	5	Not finally decided		
P. M.	22.9	Vine, Mich.	New Buffalo	Single	23	3-pos.	D. C.	
	2.0	Benton Harbor, Mich.	St. Joseph	Double	2		D. C.	
Pub. Serv. N. J.	Abt. 0.5	In Newark Terminal and Subway Approach		Double	20	3-pos. light	A. C. track circuit	
Q. & C.	4.4	Woodward, Ala.	Burstall	Double		A. C.		In connection with double tracking.
San. Fran.-Oak. Term.	2.0	New Pier Line, Oakland, Cal.		Double	52	31 U. S. & S. T-2 U. Q., 3-pos., 110 V., 25 cycle, A. C. with stop arm attachment.	Full block overlap, 3-pos. track circuits.	Trestle being replaced by solid fill and new trestle. Track is signaled for 45 seconds headway.
						21 G. R. S. 2-A, U. Q., 3-pos., 55 V., 25 cycle, A. C. with stop arm attachment.	Full block overlap, 2-pos., track circuits.	
Southern	74.0	Orange, Va.	Amherst	Double	94	A. C., U. Q.	Polarized	
	21.5	Whittle, Va.	Danville	Double	28	A. C., U. Q.	Polarized	
Wabash	33.0	State Line, Ind.	LaFayette	Single	36	3-pos., L. Q.	Polarized line	
W. M.	38	Glyndon, Md.	Thurmont	Single	84	Union style "S"	A. P. B.	
	66	Colmar, Pa.	Connellsville	Single	113	Union style "S"	A. P. B.	

AUTOMATIC SIGNALS
CONTEMPLATED FOR COMING YEAR.

Road	Mileage of Line	Between	And	Single or Double Track	No. of Signals	Type of Signals	Control System	Remarks
A. T. & S. F.	6.6	Standish, Mo.	Carrollton	Double	12	3-pos., U. Q., style "S". U. S. & S. D. C.	Line and track	
Boston Elevated	.2	Washington Station	South Station	Double	4	Normal clear light, 4-indication	Double rail, A. C.	In Dorchester Tunnel.
C. & O.	8			Double				
C. I. & L.	21			Single				
C. H. & D.	40	McDoel, Ind.	Orleans	Single		G. R. S.	A. P. B.	
C. C. C. & St. L.	21.0	"A" Cabin	Miamisburg, Ohio	Double	30	U. S. & S. style "T-2" or	T. D. B.	
Cum. Valley	106.8	Bellefontaine, Ohio	Anderson, Ind.	Single				
E. P. & S. W.	6.0	Near Berkley, W. Va.		Single				
Erie	25.0	Lee, Ariz.	Moore's Spur	Single	46	Union style "S"	U. Q. 2-pos., overlap	
	15.7	Solon, Ohio	Cleveland	Double				
	27.0	Kent, Ohio	Leavittsburg	Double				
	31.9	Buchanan Jct., Pa.	Pymatuning	26.4 Single 5.5 Double		3-pos., U. Q., U. S. & S. Style "S"		
G. N.	9.2	Columbus, Pa.	Niobe Jct.	Single				
I. R. T.	30			Single				
L. I.	200	Oakdale, N. Y.	Sayville	Double	5	U. S. & S. style "B", L. Q.	D. C., track circuit, line control.	
Monongahela	2.4							
N. Y. N. H. & H.	33.0	So. Brownsville, Pa.	W. Va. line	Single		A. C.		
	18.54	Riverside, Conn.	Woodlawn, N. Y.	4	2-arm 65 1-arm 50 Dwarf 48	Semaphore		
N. Y. S. & W.	14			Double				To replace manual block.
N. & W.	38.9	Burkeville, Va.	Pamplin	Single	86	3-pos. U. Q.	T. D. B.	A. C.
	3.8	Pepper, Va.	Belspring	Double	8	3-pos. U. Q.	Pol. Tr. Cir.	D. C.
	3.1	Pembroke, Va.	Ripplemead	Double	8	3-pos. U. Q.	Pol. Tr. Cir.	D. C.
Pacific Electric	3.0	Edendale, Cal.	Tropico	Double	7	3-pos., light	A. C. double-rail return	
P. & R.	36	Newberry Jct., Pa.	Lewisburg	Double				
Rhode Island Co.	10blocks			Single		Chapman	Trolley contact	
S. P. L. A. & S. L.	57.5	Los Angeles, Cal.	Riverside	Single				
Southern	58.0	Spartanburg, S. C.	Central	Double	76	A. C. U. Q.	Polarized	
	25.0	Cornelia, Ga.	Gainesville	Double	32	A. C. U. Q.	Polarized	
Union Traction of Ind.	15.08	Broad Ripple, Ind.	Noblesville	Single	15	Absolute-permissive	Continuous track circuit	
	4.76	Summitville, 8th St.	Fairmount	Single	7	Absolute-permissive	Continuous track circuit	
	4.01	Fairmount	Jonesboro	Single	4	Absolute-permissive	Continuous track circuit	
Wabash	43.0	LaFayette, Ind.	Peru	Single	41	3-pos.	Polarized line	

rise in price was gradual and uniform until about two months ago, when the returning demand from domestic sources, added to the export business, pushed the price up very rapidly to its present mark. In some lines of special steels, it is extremely difficult to secure any supply at all, and the Steel Corporation and large independent manufacturers are unable to promise definite delivery on any steel orders for the coming year. The most spectacular increase in price during the past year was in the spelter market. This commodity, which normally sells for about 5 cents a pound, started a gradual and continuous increase in price from the beginning of the year, reaching 13 cents late in April, and then by rapid jumps and with wild flurries, went up to 26-28 cents early in June. Since that time the price has declined somewhat, ranging from 13 to 19 cents. The price of copper also increased greatly, the sheet copper of which a great deal is used in signal work, having advanced from about 16

to 23 cents. All indications point to a continuation of high prices with probable increases during the coming year.

DEVELOPMENTS IN SIGNALING AND INTERLOCKING

A review of the year's work indicates plainly that manufacturers in general have taken advantage of the lull in business to develop new apparatus and improve existing models. Probably the most important development of the year was the completion of the first installation of position-light signals on the Pennsylvania. The development of this new type of indication was fully described in *The Signal Engineer* for August and September. The advantages of the new signal include the elimination of moving parts, the insuring of an indication which is distinctive and which changes almost instantaneously, and the possibility of securing a greater number of indications with a given number of arms than is the case where semaphores are used. Color light signals have also been improved in a number of re-

NON-AUTOMATIC BLOCK SIGNALS.

COMPLETED DURING PAST YEAR.

Road	Mileage of Line	Between	And	Single or Double Track	Manual, Controlled Manual or Staff	Remarks
C. P. R. (East)	1.99	Montreal (West)	St. Luc. Jct.	Single	Staff	
C. St. P. M. & O.	119.02	Sioux City, Iowa	Omaha	Single	Manual	
	46.50	Emerson, Neb.	Norfolk	Single	Manual	
C. C. C. & St. L.	85.8	Springfield, Ohio	Berwick	Single	Manual	
Erie	9.0	West Hawly, Pa.	Honedale	Single	Manual	
L. I.	28.2	Spasset, N. Y.	Port Jefferson	Single	Controlled manual	1-arm U. Q., mechanical, 2-pos. 0 to 90 deg.
P. & R.	9.18	Tremont, Pa.	Westwood	Single	Manual	
	5.09	Shenandoah, Pa.	Kohinoor	Single	Manual	
Q. & C.	6.4	M. P. 212 I.	M. P. 218 5.	Single	Controlled Manual	
T. & O. C.	143.7	Stanley, Ohio	Thurston	Single	Manual	
	58.8	St. Mary, O.	Peoria	Single	Manual	
	61.1	Steelton, Ohio	Corning	Single	Manual	
Z. & W.	36.5	Thurston, Ohio	Spangler	Single	Manual	
	31.9	Fultonham, Ohio	Shawnee	Single	Manual	

CONTEMPLATED FOR COMING YEAR.

L. I.	17.5	Patchogue, N. Y.	Speonk	Single	Controlled manual	
	40.9	Farmingdale, N. Y.	Manorville	Single	Controlled manual	
		Manorville, N. Y.	Eastport	Single	Controlled manual	

INTERLOCKING PLANTS.
COMPLETED DURING PAST YEAR.

Road	Location	Layout—Crossing, Junction Terminal, etc.	Number of Levers		Type—Mechanical, Electrical, etc.	Special Features
			Frame	Working		
A. T. & S. F.	Erie, Kans	Crossing M. K. & T.	28	25	Mechanical	
	Oakland, Cal.	Crossing So. Pac. and Key route	40	30	All-electric	Full approach and detector locking.
	Sibley, Mo.	D. T. Cross-over and Gauntlet track Bridge	4 Elec. 16 Mech.	16	Electro-Mech.	Full approach and detector locking.
A. C. L.	Altamaha River	Draw Bridge	8	8	Electro-Mech.	
	Jakin, Ga.	Lumber road crossing	4	4	Mechanical	Door-locked Interlocking.
	Parkton, N. C.	Junction	15	8	Electro-Mech.	
B. & O.	Stillwater Junction	Crossing	28	18	Mech. Imp. S. & F.	Joint with P. C. C. & St. L.
	Calumet River	Drawbridge	31	15	U. S. & S. Type "F" Elec.	
Belt Ry. of Chicago	Clearing, Ill.	Hump yard	144	128	Electro-pneumatic push-button	A. C. track circuits for section locking. D. C. for switch and signal circuits.
B. & M.	So. Lawrence, Mass.	Junction	39	38	Electrical Type "F"	
C. N.	Westside, Man.	Crossing Winnipeg Electric	12	10	Mechanical with one electrical lever	Three A. C. Signals. A. C. track circuit. A. C. Switch.
	Bienfait, Sask.	Crossing Can. Pac.	4	3	Signal only. Lever for Door Lock and Time Lock.	
C. P. R. (East)	Estevan, Sask.	Crossing Can. Pac.	16	13	Mechanical	Time lock
	Lachine Canal, Ont.	D. T. Swing Bridge	16	16	Mechanical	Automatic signal territory.
	Simcoe, Ont.	Crossing	20	17	Mechanical	
	Farnham	Crossing	9	9	Mechanical	
	St. Leonards, N. B.	Crossing	28	22	Mechanical	
	St. John, N. B.	Crossing	4	4	Electrical	2 Crossings.
	Cornwall, Ont.	Crossing	28	23	Mechanical	
	Galt, Ont.	Crossing	20	17	Mechanical	
	Brantford, Ont.	Crossing	4	4	Mechanical	
Cent. of Ga.	Macon, Ga.	Class. Yard	20	22	Mechanical	
C. R. R. of N. J.	Jersey City, N. J., Tower A	Terminal	179	145	Elec.-Pneu. Push-Button	
	Jersey City, N. J., Tower B	Terminal	47	40	Elec.-Pneu.	
	Jersey City, N. J., Tower C	Terminal	71	64	Elec.-Pneu.	
C. & O.	Richmond, Va.	End of double track	12	9	Mechanical	Time locks.
	Milton, W. Va.	Double No. 16 Cross-overs	7 Elec. 6 Mech.		Electro-Mech.	Approach, time, route and detector locking. Signals arranged for running in both directions on double track.
C. & N. W.	Kinnickinnic, near Milwaukee, Wis.	Drawbridge	48	33	G. R. S. Electric	
	Milwaukee River (near Milwaukee, Wis.)	Drawbridge	46	44	G. R. S. Electric	
C. M. & St. P.	Chehalis, Wash.	Crossing N. P. and P.S. & W.H.	12	9	Mechanical	Time and normal indication locking.
	Dryad, Wash.	Crossing N. P. and P.S. & W.H.	12	11	Mechanical	Time and normal indication locking.
	McGuire, Idaho	I. & W. N. Crossing S. & I. E.	16	14	Mechanical	Time and normal indication locking.
	Rockdale, Wash.	Junction	8	8	Mechanical	Time and normal indication locking.
	Hopkins, Minn.	Crossing M. & St. L.	12 Added		Mechanical	Addition made account of second main track.
C. R. I. & P.	River Junction	Yard and end of double track	6 Added		Mechanical	
	Peoria, Ill.	Crossing and Drawbridge protection	24	19	G. R. S. Model 2 unit type	
C. H. & D.	Leipsic, Ohio	Crossing D. T. & I. and Ohio Electric	32	25	Imp. S. & F.	Semi-automatic distant signal.
C. C. C. & St. L.	East Linndale, Cleveland, Ohio	Junction W. & L. E.	40	32	Elec.-Mech.	
Cumb. Valley	Chambersburg, Pa.	W. J. Tower	25	17	Type "F", U. S. & S. Elec.	
	Nokomis, Ill.		32	30	Elec.	
D. L. & W.	Clarks Summit, Pa.	Yard tracks	36	29	Mechanical	Detector circuits. Approach locking
	Nicholson Tunnel, Pa.	Beginning third track	28	22	Mechanical	Detector circuits. Approach locking
	West Kingsbury, Pa.	Lap Sidings	24	16	Mechanical	Detector circuits. Approach locking
	Alford, Pa.	Junction	40	32	Mechanical	Detector circuits. Approach locking
	New Milford Summit, Pa.	Beginning third and fourth tracks	24	16	Mechanical	Detector circuits. Approach locking
	West Hallstead, Pa.	Junction	24	20	Mechanical	Detector circuits. Approach locking
	South Orange, N. J.	Yard tracks	52	50	Mechanical	Detector circuits. Approach locking
G. H. & S. A.	Flatomia, Tex.	Crossing of S. A. & A. P.	3 Added	3 Added	Mechanical	Approach and detector locking on G. H. & S. A.
G. R. & I.	Front St., Grand Rapids, Mich.	Mich. Ry. double track crossing. Three tracks of G. R. & I.	36	23	Mechanical	30 cycle single phase alternating current used for operating one distant signal, three track circuits, route locking, tower indicators and tower lighting.
G. T.	Abbotsford, Que.	Crossing			Mechanical	
	Berlin, Ont.	Crossing	4	3	Mechanical	
	Bay City, Mich.	Swing Bridge	2	2	Electrical	
G. N.	Duluth, Minn.	Junction	17	17	Mechanical	
	Duluth, Minn.	Junction	16	14	Mechanical	
H. & T. C.	Eureka, Tex.	Crossing of M. K. & T.	16 Added		G. R. S. Electric	Detector locking.
Ill. Tract	Dallas, Tex.	Crossing of G. C. & S. F.	2 Added	2 Added	Electric	
	Benid, Ill.	C. & N. W. Crossing	8	5	Mechanical	
	Stanton, Ill.	Wabash Crossing	8	5	Mechanical	
	Mt. Olive, Ill.	Wabash Crossing	8	5	Mechanical	
L. V.	Ashmore	Junction	56	47	Electric	
L. & N.	Lexington, Ky.	Junction—L. & N. and C. & O.	40	32	Mechanical	
	Paris, Ky.	Junction—Divisions	40	36	Mechanical	
	Maplewood, Tenn.	Junction—Divisions	28	26	Elec.-Mech.	
	Athens, Ala.	Junction—Divisions	56	51	Electrical	
M. C.	Detroit	Crossing and junction	23 Added		Model 2, G. R. S. Electric	D. C. route locking installed without detector bars.
M. K. & T.	Erie, Kan.		28	25	Mech.	D. C. track circuits. D. C. signal circuits. Route and approach locking.
Mo. Pac.	Leavenworth Jct., Kan.	Junction	8	6	Mechanical	
N. Y. C. (East)	Tivoli	Cross-overs	56	29	Elec.-Mech.	Route and approach locking. Electric lighted signals.
	Beacon	Cross-overs	72	57	Elec.-Mech.	Route and approach locking. Electric lighted signals.
	Utica, N. Y.	Station terminal	224	172	Electric	Route and approach locking. Electric lighted signals. Concrete trunking. Lever lights.
N. Y. C. (West)	Brookline, Ill.	Junction	72	44	Electric	
	South Chicago, Ill.	Calumet River Lift Bridge	64	46	Electric	
N. Y. N. H. & H.	Middleboro Junction		16	16	Mechanical	
N. & W.	Pearisburg, Va.	End double track	8	8	Mechanical	
N. P.	Pokegama, Wis.	Crossing	20	16	Mechanical	Semi-automatic Distant signals. Semi-automatic home signals on N. P. Electric route locking. Torpedo placers at home signals. Track indicators. Annunciator. Mechanical time lock.
	Steilacoom, Wash.	Drawbridge	12	10	Mechanical	
O. S. L.	Idaho Junction	Junction	11	8	Electrical	
O. W. R. & N.	Spokane, Wash.	Crossing and Junction	12 Added		Electric	Plant remodeled and rewired.
	Portland, Ore.	Terminal	56	49	Electric	A. C. track circuits.

INTERLOCKING PLANTS.
COMPLETED DURING PAST YEAR—Continued

Road	Location	Layout—Crossing, Junction Terminal, etc.	Number of Levers		Type—Mechanical, Electrical, etc.	Special Features
			Frame	Working		
Pac. Elec.	Rialto Ave., San Bernardino, Cal.	Crossing P. E. and A. T. & S. F.	12	9	G. R. S. all-electric	A. C. detector circuits P. E. and Santa Fe.
	First and I Streets, San Bernardino, Cal.	Crossing and passing track, P. E. and A. T. & S. F.	16	10	G. R. S. all-electric	A. C. detector circuits P. E. and Santa Fe.
	May, Cal.	Crossing and passing tracks P. E. and A. T. & S. F.	12	10	G. R. S. all-electric	A. C. approach and detector locking. P. E. and A. T. & S. F. 3-pos. U. Q. signals, S. F.
P. R. R.	Corry, Pa.	Junction with Erie	24	13	Union Elec.-Mech. P-4	General revision.
	Paoli, Pa.	Terminus, Electric Zone	56	50	Mechanical.	General revision account electrification.
	Bryn Mawr, Pa.		23	18	All-Elec. Union Type "F"	General revision account electrification.
	Corry, Pa.	Junction with Erie	24	13	U. S. & S., Elec-Mech. P-4	General revision.
P. M.	Franktown		16	11	G. R. S. Elec-Mech.	
	Zoo Garden	Divisional Junction point	55	43	Elec. U. S. & S. Type "F"	
	Reed	End of Passing Siding	8	6	Mechanical.	
	Saginaw, Mich.	Crossing Grand Trunk	8	6	Mechanical.	
	Grand Rapids, Mich.	Division Street Crossing Grand Rapids Ry. Co.	12	11	Elec.-Mech.	
Pub. Serv. N. J.	Grand Rapids, Mich.	Madison Avenue Crossing Grand Rapids Ry. Co.	8	8	Mechanical.	
	Linden Twp., N. J.	Crossing	6	6	Mechanical.	Home signals electric, semi-automatic.
Q. & C.	McLean Ave., Cincinnati, O.	Terminal	28	17	All-Electric	
	Third and Front St., Cincinnati, O.	B. & O. Crossing	32	18	All-Electric	
	R. O. Tower, Robbins, Tenn.	Double track junction	20	19	S. & F. Mech.	
	H. F. Tower, Tunnel No. 16	Double track junction	8	6	S. & F. Mech.	
	East End Ave., Chattanooga, Tenn.	Jct. of Belt Ry. and C. N. O. & T. P.	76	50	G. R. S. All Elec.	
S. L. & S. F.	Shipp's Yards, Chattanooga, Tenn.	Terminal of double main tracks of Belt Ry.	24	16	G. R. S. All-Elec.	
	29th Street, Kansas City, Mo.	Connection for New Union Station with K. C. Term. Ry.		10 Added	Mech. with power. High signals	Originally installed in May, 1909 with 30 working levers. Rebuilt in present year.
Southern.	Empire, Ga.	Crossing	24	17	Mechanical.	
	Vantine, N. C.	Lap Siding	4	4	Mechanical.	
	Archdale, N. C.	Lap Siding	4	4	Mechanical.	
	Gaffney, S. C.	Lap Siding	4	4	Mechanical.	
	Mt. Zion, S. C.	Lap Siding	4	4	Mechanical.	
	Fair Forest, S. C.	Lap Siding	4	4	Mechanical.	
	Taylor, S. C.	Lap Siding	4	4	Mechanical.	
So. Pac.	Davis, Cal.	Junction	80	52	Electric	Electric lighted. A. C. track circuits. D. C. signal circuits. Route and approach locking and detector circuits.
	Bloomington, Cal.	Crossing	24	18	Electric	Electric lighted. A. C. track circuits. D. C. signal circuits. Route and approach locking and detector circuits.
	San Francisco, Cal. (4th St. terminal)	Terminal	107	67	Electro-pneumatic	Electric lighted. D. C. track circuits. D. C. signal circuits. Route and approach locking and detector circuits.
S. P. & S.	South Houlton		12	12	Mechanical.	Route locking.
T. & N. O.	Beaumont, Tex.	Crossing of T. & Ft. S.	12	11	S. & F. Mech.	Route normally set for T. & Ft. S.
	Houston, Tex.	Crossing of H. B. & T.	4 Added	4 Added	S. & F. Mech.	Added 1 switch, 2 signals and 1 derail.
T. H. & B.	Dunnville, Ont.	Crossing	16	15	Mechanical.	
	Diltz, Ont.	Crossing	16	12	Mechanical.	
	Clatskanie	Crossing	12	10	Mechanical.	Route locking.
Wilkes-Barre Connecting.	Plains Junction, Wilkes-Barre, Pa.	Crossing D. L. & W. Mine Track Junction Wilkes-Barre & Eastern and Gauntlet over Susquehanna river bridge	32	29	Mechanical. High speed signals. Hall style "K"	Approach and route locking D. C., Gauntlet over bridge.

UNDER CONSTRUCTION.

A. C. L.	New Southern, Conn.	Connection	44	41	Mechanical.	
B. & M.	Newburyport, Mass.	Yard	20	15	Elec.-Mech.	
	West Lynn, Mass.	Junction	28	21 (7 Elec.)	S-7 Elec.-Mech.	A. C. control.
C. N.	Yorkton, Sask.	Crossing G. T. P.	16	13 (15 Elec.)	S-7	One lever for time lock.
	Yorkton, Sask.	Crossing C. P. R.	16	13	Mechanical.	One lever for time lock.
	Ft. Williams, Ont.	Half interlocking with Gates.	6	5	Mechanical Derails. A. C. signals	
C. P. R. (East)	Three Rivers	Crossing	4	2	Mechanical.	
	Guelph	Crossing	16	14	Mechanical.	
C. & A.	Pontiac, Ill.	Crossing	80		Electrical.	
C. & N. W.	Deering, Ill.	Drawbridge over Chicago river	44	37	G. R. S. Electric	
C. I. & L.	Haskells, Ind.	Crossing with G. T.	24	19	Mechanical.	Power distant signals on C. I. & L. and power home and distant and semi-automatic on the G. T.
C. R. I. & P.	Thompson, Neb.	Crossing	16	12	S. & F. Mech.	Power distant signals.
	Government drawbridge between Rock Island, Ill., and Davenport, Iowa	Drawbridge protection	6	4	Special type combination interlocked circuit controllers	Used in connection with special automatic features.
D. L. & W.	Buffalo River Drawbridge, Buffalo, N. Y.	Drawbridge	31	24	Electro-Pneumatic	
	Bailey Ave., Buffalo, N. Y.	Crossing	40 Added	38 Added	Electro-Mechanical	Electric levers added to 40 lever mech. machine.
	Liberty Street, Binghamton, N. Y.	Crossing	16 Added		G. R. S. Elec.	Detector circuits.
H. & T. C.	Bridge 60, Scranton, Pa.	Junction	39	38	Electro-Pneumatic	Detector circuits. Approach locking.
	Bellaire Jct., Tex.	Crossing of S. A. & A. P.	21	13	S. & F. Mech.	Approach and detector locking.
Int. Rap. Trans.	155th St., New York	Terminus elevated line			Elec.-Pneu.	
	Duluth, Minn.	Crossing	20	10	Mechanical.	
K. C. Term.	Duluth, Minn.	Crossing	20	10	Mechanical.	
	Rock Creek, Kansas City, Mo.	Junction	59	32	Electro-pneumatic	
L. V.	Buffalo, N. Y.	Crossing	16	12	Electric	Crossing Gates Interlocked.
L. & N.	Binghampton, Tenn.	Crossing Steam & Elec. Ry.	16	14	Mechanical.	
	Caborn, Ind.	Crossing Steam and Elec. Ry.	12	9	Mechanical.	
	Lexington, Ky.	Terminals	32	31	Mechanical.	

INTERLOCKING PLANTS
UNDER CONSTRUCTION—Continued

Road	Location	Layout—Crossing, Junction Terminal, etc.	Number of Levers		Type—Mechanical, Electrical, etc.	Special Features
			Frame	Working		
M. C.	Bay City	D. & M. Crossing	8	4	Half interlocking mechanical. S. & F. improved	Signals and derails on M. C. and signals on D. & M. operated by trainmen and door of cabin interlocked so that route must be restored to normal before operator can get out of cabin.
N. Y. N. H. & H.	Westport		16	16 Mech. 12 Elec.	Electro-Mech	A. C.
	Greens Farms		16 Mech. 32 Elec.	12 Mech. 23 Elec.	Electro-Mech	A. C.
	Stamford		53	46	All Electric	U. S. & S. type "F", A. C.
	Cos Cob		16 Mech. 12 Elec.	14 Mech. 12 Elec.	Electro-Mech	A. C.
	Rye		16 Mech. 32 Elec.	12 Mech. 23 Elec.	Electro-Mech	A. C.
	Greenwich		16 Mech. 32 Elec.	10 Mech. 21 Elec.	Electro-Mech	A. C.
N. C. & St. L.	Rockledge, Tenn.	Passing and runaway track	12	12	Electro-Mech	4 low-volt. sw. machines.
	No. End Craven's Yard	Chattanooga Yard	32	32	Electro-Mech	D. C. track circuits.
N. & W.	Burkeville, Va.	Junction	19	15	Electric	A. C.
Pac. Elec.	Magnolia Ave., Riverside, Cal.	Crossing and passing tracks, P. E. and S. P. L. A. & S. L.	24	18	Electric	D. C. approach and detector locking S. P. L. A. & S. L. A. C. approach and detector locking, P. E.
P. R. R.	Bailey Ave., Buffalo	D. L. & W. Crossing	40	36	Mechanical	General revision.
	17th St., Altoona		27	26	Elec.-Pneu	General revision.
	Penna. Ave., Baltimore	Temporary interlocking	12	10	Mechanical	General revision.
Pub. Serv. N. J.	Kiskiminetas Jct.	Junction point	16	12	Mechanical	General revision.
	Newark, N. J.	Terminal (Three Towers)	4, 6, 13	23	Electric and Electro-pneumatic	Signals, electric-light type. Switches, electro-pneumatic.
Q. & C.	M. P. 282.2	Double track junction	8	8	S. & F. Mech	
	M. P. 288.9	Double track junction	8	8	S. & F. Mech	
St. L. & S. F.	Nichols, Mo.	Crossing of Eastern and Northern Divs.	16	16	Elec.-Mech	
	South Eastern Junction, Mo.	Junction of Eastern and River and Cape Divisions	16	16	Elec.-Mech	
San Francisco-Oakland Term.	Oakland, Cal.	Pier terminal	16 Added	15 Added	Present, Mechanical, Ultimate, Electro-Mech	Track circuits throughout, route and detector locking replacing detector bars. Signals equipped with automatic stop arms.
S. P.	Coos Bay, North Bend, Ore.	Drawbridge	8	6	Mechanical S. & F.	Low voltage movements on derails.
	Suislaw River, Ore.	Drawbridge	8	6	Mechanical S. & F.	Low voltage movements on derails.
	Umpqua River, Ore.	Drawbridge	8	6	Mechanical S. & F.	Low voltage movements on derails.
Union Term. of Dallas, Tex.	North Junction	Terminal	103	82	Elec.-Pneu	
	South Junction	Terminal	71	53	Elec.-Pneu	

CONTEMPLATED FOR COMING YEAR.

A. T. & S. F.	Arcadia, Cal.	Crossing, S. P.	36	7	Electric	A. C. track circuits.
	Los Angeles, Cal. (Mission St.)	Crossing, S. P. L. A. & S. L. and S. P.	80	65	Electric	D. C. track circuits.
	Dallas, Tex.	Crossing, M. K. & T. and H. & T. C.	24	18	Electric	Full approach and detector locking.
A. C. L.	Loughman, Fla.	Everglade Cypress Co. Crossing	8	6	Mechanical	Door-locked Interlocking.
C. & O.	Dun Loup, W. Va.	Crossing			Cabin Door plant	
C. & N. W.	Washington St., Allis, Wis.	Crossing with C. M. & St. P.	132	100	Electric	
C. M. & St. P.	Bay View (Milwaukee, Wis.)	C. & N. W. Crossing	8 Added		Mechanical	Addition account track changes.
G. H. & S. A.	San Antonio, Tex.	Crossing of I. G. & N.	16	16	S. & F. Mech	Approach and detector locking
G. N.	Aberdeen, S. D.	Crossing	22			
	Calumet, Minn.	Crossing	9			
I. R. T.	Nine Locations		Total 291		Elec. Pneu	
L. V.	Port Reading Jct.	Crossing and Junction	36 Elec. 36 Mech.	29 Elec. 32 Mech.	Electro-Mechanical	
L. I.	Fresh Pond Junction, L. I.	Montauk and Manhattan Beach Divisions	36	25	S. & F. Mech	D. C. track detector and approach locking circuits, top arms slotted, route locking.
	Hollis, L. I.	Main Line and entrance to Horton Yard	32	28	Johnson Mech	A. C. track, detector and approach locking, route locking.
M. C.	Rochester, Main St.	Crossing M. C. and D. U. R.	24	17	Mechanical	
N. C. & St. L.	Bridgeport, Ala.	Draw bridge and end of double track	24	18	Electro-Mechanical	1 Low voltage switch machine.
	Chattanooga, Tenn.	Yard and junction	48	35	Electric	Dwarf signals throughout.
	Wauhatchie, Tenn.	Junction	56	33	Electric	A. C. track circuits.
	Sherwood, Tenn.	End double track	24	24	Electro-Mechanical	1 Low voltage switch machine to be operated two miles distant.
N. Y. C. (East)	Utica	Station terminal	180	142	Electric	Route and approach locking. Electric lighted signals.
	Poughkeepsie	Crossover	56	45	Electro-Mechanical	Route and approach locking. Electric lighted signals.
N. Y. N. H. & H.	South Norwalk					To be constructed in connection with rebuilding entire system.
	Mamaroneck					
	New Rochelle Jct.					
N. & W.	South Mt. Vernon					
	Pamplin, Va.	Junction	43	33	Electric	A. C.
	Jack, Va.	Junction	23	19	Electric	A. C.
	Low Grade Tunnel, Va.	Single track tunnel	32	26	Electric	D. C.
	City Point Jct., Va.	Junction	12 Mech. 12 Elec.	11 Mech. 6 Elec.	Electro-Mechanical	
Pac. Elec.	Orange, Cal.	Crossing P. E. and Santa Fe	12	10		
	Los Nietos, Cal.	Crossing P. E. and Santa Fe	16	12		
	Lamanda Park	Crossing P. E. and Santa Fe	16	12		
Southern	Charlottesville, Va.	Crossing	48	44	Mechanical	A. C. approach and detector locking, A. T. & S. F. and P. E.
	Danville, Va.	Junction	40	34	Mechanical	

spects during the past year, and one important installation is being made on a steam road, the Chicago, Milwaukee & St. Paul in Montana, while the Chicago, Rock Island & Pacific is using this type of signal to a limited extent.

The increasing use of alternating current in signal installations is noteworthy. In addition to the Pennsylvania

and the Norfolk & Western, on which important a. c. installations have been made on account of a change from steam to electric traction, and the Chicago, Milwaukee & St. Paul, which is at present engaged in making such an installation, this system has been used extensively on the Southern for steam-operated lines, and the Grand Trunk

has also put in service an important installation, described elsewhere in this issue.

In connection with the signaling of heavy electric traction lines such as the Norfolk & Western and the Pennsylvania, a number of developments have been made. The introduction of a "booster" system in connection with the alternating current propulsion circuit has made necessary a development of relays and special apparatus, notably the resonant shunt described in the September issue in connection with the Pennsylvania work.

While the semi-enclosed type of air-cooled transformer has been used to some extent for several years, it has been more generally applied to signaling during the past year and bears evidence of still wider adoption in the future for track circuit work. An important development on d. c. lines has been the application of caustic soda battery to track circuits in a great many cases on account of the greatly increased cost of gravity battery renewals.

In the field of interlocking the most important development is the increasing use of the electro-mechanical system by which, under certain conditions, the advantages of a mechanical and electric plant can be combined. A general recognition of the merits of this system is indicated by the fact that the 12 plants reported in the accompanying table were installed on 8 different roads. While the Interstate Commerce Commission figures show that practically 80 per cent of all interlocking plants in the country are mechanical, the number of this type completed during the past year, as indicated in the table, was only a little over half the total. While this may indicate to a certain extent an increasing tendency to use power, it should be pointed out that the actual discrepancy is probably considerably less on account of the fact that there is undoubtedly a larger number of omissions of mechanical plants than power, since many of the former are very small and are built by roads having no organized signal department.

A tendency to replace plunger facing-point locks with switch-and-lock movements at mechanical plants has developed, on the ground that when such movements are used in connection with a system of electric indication to insure their proper functioning, they are fully as satisfactory as the switch-and-lock movements used for power-operated switches and, all things considered, are more desirable than facing-point locks.

MISCELLANEOUS DEVELOPMENTS

One of the important developments of the year is the increasing use of low voltage switch machines. While the first installation of this type was made on the Northern Pacific during the latter part of 1914, it has been demonstrating its value throughout the past year and a number of other roads have adopted this means of operating outlying switches without the necessity of stopping trains.

The year just closed has seen a marked development in highway crossing protective devices. The possibilities for giving arrestive indications by moving arms or discs, bells, gongs and lamps seem to have been almost exhausted and material improvement has also been made in the economy of operation of such signals without decreasing their arrestive qualities.

Some progress has been made during the past year in the development of automatic train control systems by a number of companies. The Miller train control, which has been in actual service on the Chicago & Eastern Illinois from one to two years and has been operated on 107 miles of main line by the railway company since November 17, 1914, has been improved during the past year by the design of a new valve, known as model No. 4, standard valve. The New York Municipal Railway has contracted for the installation of the Simmen train control system on 103 mi. of line, although only limited progress has been made.

The Interstate Commerce Commission has published re-

ports covering tests of two automatic train control systems during the year. One of these, the Gray-Thurber, was installed on the Pennsylvania Lines West, and the other, the Jones, was on the Maryland & Pennsylvania. In addition to the above, a number of other companies have made experimental installations or have carried out additional tests on installations previously made. Among these companies may be mentioned the Julian-Beggs Signal Company, which installed and demonstrated an installation of 18 mi. on the Queen & Crescent between Erlanger, Ky., and Crittenden; the National Safety Appliance Company, which has made a service installation of cab signals and train control on 5 mi. of single-track line and 20 locomotives of the Western Pacific; the Gollos Railway Signal Company, which has installed and demonstrated a 6-mi. installation on the Chicago, Burlington & Quincy, between Sugar Grove, Ill., and Big Rock; the Wooding Railway Warning Device Company, which has made a number of test demonstrations on an installation on the Delaware, Lackawanna & Western, and the Buell Signal & Train Control Company, which has conducted numerous tests on a passenger locomotive on the Cincinnati, New Orleans & Texas Pacific.

THE PERSONNEL OF THE SIGNAL FIELD

The absence of activity in the signal field in the past year is clearly reflected in the small number of important changes that have been made among higher officers of signal departments. Only three signal engineers have changed positions, G. E. Ellis having left the Kansas City Terminal to go with the Interstate Commerce Commission, W. H. Fenley having left the Panama Railroad to enter the supply field, and F. G. White, having resigned from the Chicago Great Western at the time of the consolidation of the signal and telegraph departments.

There have been no deaths among the ranks of the signal engineers during the past year, but two supervisors have passed away, Marvin J. Brundige of the Buffalo, Rochester & Pittsburgh and A. J. Seifert of the Pennsylvania Lines West. Two well-known supply men have also been taken by death during the year—B. C. Rowell, who was prominent as an automatic stop advocate, and H. S. Hawley, president of the Railroad Supply Company.

A number of changes in the organization of signal departments have been made during the year, the Boston & Maine and the Nashville, Chattanooga & St. Louis adopting the divisional form for the maintenance of signals, and the Cincinnati, Hamilton & Dayton, the Chicago Great Western and the Toledo & Ohio Central having combined the supervision of the signal and telegraph departments. The Chicago Great Western has gone one step further and combined all maintenance forces in these two departments on one division as mentioned elsewhere in this issue. The trend is decidedly in favor of a combination of this kind in preference to one with the track department, the latter plan having failed of further adoption and having been condemned during the year by the report of Committee I of the R. S. A. and Committee X of the A. R. E. A.

A number of roads have added to their organization a force for handling the valuation of signal and interlocking material in connection with the federal valuation of railway property now being conducted.

No review of the year's activities in signaling would be complete without reference to the work of the Railway Signal Association. This organization is continually strengthening its position in the railway field and is making its influence felt to an increasing degree on the railways of the entire country. The past year has been no exception and the coming year promises to be the best in the Association's history. There has been a steady improvement in the quality of the work of the standing committees and the development of the regional committees has proved to be of considerable value.