

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51

New York, Saturday, April 6, 1918

Number 14

Opening the Discussion on Track Spiral Standardization

THERE is a disconcerting range in the practice of way departments in connection with the use of the transition or easement curve, commonly called the spiral. A similar condition exists in the practice of the several special-work manufacturers. Each railway company and each manufacturer has a standard spiral or system of spirals, with the result that the manufacturer is required to maintain a large stock of costly patterns and templates, and the purchasers of special work must pay the cost not only of their own patterns but also those of many other companies. Truly the way of the spiral seems to have about as many deviations as the paths of the whirling dervishes of the East, and there has heretofore been no common ground upon which to reconcile conflicting views, thus leading to the adoption and use of a uniform or standard system of spirals.

The work of the way committee of the American Electric Railway Engineering Association in standardizing special work specifications has shown that the state of affairs in regard to the adoption of standard spirals is not so difficult but that the seemingly insurmountable obstacles can be overcome. This was indicated by the committee in the proceedings of the Association for 1916, in which it was reported that the adoption of a standard spiral was desirable and that the manufacturers would be glad to accept such a standard provided the railways could agree upon one. Some interest in the subject was also displayed in the American Association question box in August and September, 1916. This gave evidence that the majority of those participating in the discussion believed that a standard system of spirals was both practicable and desirable.

The 1917 committee on way matters took up the matter again, but progress has been delayed through war conditions which have hindered active committee work generally. With the importance of the subject in mind and in order that it may have the wide discussion which is so desirable in matters of this character, the editors have placed the columns of this paper at the disposal of the committee, and in another part of this issue we print an important article by E. M. T. Ryder dealing with a proposed uniform system of spirals. This comprises a report prepared for the way committee.

It is our opinion that there is no reason why a standard system of spirals cannot be evolved to satisfy fully 90 per cent of the controlling conditions throughout the country. The various factors of street widths,

car dimensions, track centers and other details which influence the selection of spirals do not differ so widely but that a system of spirals of reasonable flexibility and range can be made. From this standard component parts can be selected and assembled to meet almost any particular difficulty, such as dodging sewer manholes, water gates and elevated columns. Moreover, a standard system of spirals has been adopted by the American Railway Engineering Association for steam-road use and, although electric railway conditions prevent the use of the same spirals, the action of that association shows what can be done. Incidentally it is suggested that the system of notation used by that association should be used in conjunction with any system of spirals which may be adopted for electric railway use in order to secure uniformity of engineering data.

This is an era in which every possible step should be taken which will result in economical maintenance of tracks, and we believe there is no subject of greater importance to way engineers. We believe further that the adoption of a standard system of spirals by the American Electric Railway Engineering Association will lead to many economies both in first cost and in maintenance of special track work. Mr. Ryder's article represents a great deal of hard work and deserves to be carefully read. We hope that way engineers and managers will give it more than casual study with a view to bringing out profitable discussion and constructive criticism through the columns of this paper.

Don't Blame It

All On the Boss

THERE are two tendencies with which many workers have to contend, both in themselves and in their subordinates—namely, to “knock” the management and to “soldier” on the job. These two faults go together, but our present purpose is to urge the “knockers” either to quit or co-operate. Our belief is that a man with the right spirit can work effectively and happily under any kind of a superior if he believes that superior to be able, well-intentioned and reasonable. With this confidence he can well afford to accommodate himself to the particular plans which are laid out for him, remembering that his first duty is to satisfy the man to whom he directly reports. If he cannot co-operate with his superior through lack of confidence or on account of general “cussedness,” he ought to get out.

The late Fred W. Taylor, who did so much through systemization to improve working conditions in this country and elsewhere, put this whole matter in a nut-

shell. He said that as a worker he early learned that success comes through knowing what one's superior wants done and doing it in his way. He learned this only after some hard knocks, however.

Of course, it is immoral to do anything to please the "boss" if he wants something done that is not right, but granted that he meets the specifications outlined earlier, his wishes should be scrupulously met and every effort should be made to please him with good work. Loyalty, the opposite of "knocking," is essential to progress. Many of the conditions of which the worker is apt to complain are due to his own faults rather than to those of his employer.

Daylight Saving and Staggered Hour Crowd Out Rush Hour

THE immortal, and always practical, Franklin once calculated how many millions of costly candles were wasted annually through retiring and rising late. In this essay we have a forerunner of the saving-daylight agitation. As a matter of fact, daylight saving simply means that the inside worker is led to do by a doctored clock what the farmer is led to do by the sun, namely, to take maximum advantage of daylight. That, reform being established, we can well consider another.

Staggered Hour is younger brother to Saving Daylight. He, too, deserves to come into his own. His face is not new to the public. In fact, he is exactly as old as Rush Hour, alias Peak Load, who has always been the black sheep of the Time family. We have heard the virtues of the one and the vices of the other discussed by railway men these many years. Rush Hour was in power, and none could displace him. But the war which is to unseat so many tyrants now is after this one. He has been attacked courageously in many quarters, particularly at Rochester. Now comes the Beeler report, abstracted elsewhere in this issue, which threatens his sway in Washington. Should he be defeated there, his deposition in other communities is certain because if he can be driven out of the government department trenches he can be beaten everywhere!

Whether or not the Washington recommendations are adopted in full or in part, the lines of approach and analysis used in their preparation are worthy the consideration of him who wishes to unburden himself of the rush hour in his community. Mr. Beeler did not sit down in his office to evolve a theoretical chart of changes of comings and goings for the people of Washington. His men visited each large group—be it government department, store or office in turn—to determine what the travel actually was regardless of the supposed hours. They made it their business to find out how many people rode, how many walked and why. They determined if the necessary co-ordination of different departments really demanded non-overlapping hours. They did not ignore the fact that there is a relation between the hour of breakfast, the delivery of newspapers, milk and groceries and the prejudices of the domestic servant. They sought the counsel and co-operation of every group concerned, and finally, the consulting engineer did not come forward publicly with the schedule of changes until every objection raised in conference had been answered. Thus was worked out an approximation to the public's ideal of "A seat for

every passenger" and the railway's ideal (so happily phrased by R. W. Perkins, the newly elected president of the New England Street Railway Club) of "A passenger for every seat."

Let us pray that the American people who have been progressive enough to appreciate Saving Daylight will extend the same cordial welcome to Staggered Hour and banish the extravagant, indecent Rush Hour forever!

The Value of the Report on Stresses in Track to Electric Railway Engineers

IN OUR issue for March 30 we gave a very brief summary report of the progress report of the special committee on stresses in railroad track. The subject of this report is one of the greatest importance not only to steam railroad engineers but also to those who are interested in electric railway tracks, whether on private right-of-way or in paved streets. It is quite well known that railroad track is a structure which has been evolved from previous practice and experience rather than from study and experimental data along scientific lines. It has remained for this committee to earn the enduring regard of the engineering profession through its demonstration that track is subject to known laws and scientific treatment in common with other engineering structures. The proof that track is an elastic structure acting in accordance with Hooke's law is of itself a material contribution to the sum of engineering knowledge.

The committee has yet to report upon the results of its investigations into the action of the tie and on the transmission of pressure through ballast and roadway. When it shall have presented the data on these two details of the subject we may be sure that information of the utmost value will be available for use in extending the study of the subject of proper foundation for tracks in paved streets by the committee on way matters of the American Electric Railway Engineering Association. The latter committee was virtually forced to discontinue its studies on foundation matters for lack of just the sort of information which the committee on track stresses is developing in connection with the action of ties and transmission of pressures through ballast and roadway.

Meanwhile the progress report gives much information of practical value, and one of the important principles is to the effect that rigidity is of first importance as one of the qualities which good track should possess. It must, however, be remembered that the report covers open track conditions, and it will be of interest to note that the rigidity referred to has to do with tracks laid on various forms of ballast such as broken stone, cinders or gravel rather than the rigid form of construction common to tracks in streets where a form of concrete slab is depended upon to give the rigidity and transmit the load to the roadbed. In view of the different set of conditions created by the latter form of construction about which there is a dearth of scientific data as to its action, it seems in order to suggest that the Railway Engineering Association secure the co-operation of the American Railway Engineering Association in an investigation of the stresses in track in paved streets.

Back Up the Commissions by Persistent Publicity

PUBLIC service commissioners are only human, and electric railway companies, making an appeal for increased rates, cannot afford to make the mistake of expecting the commissioners to invite upon themselves torrents of popular—even if misinformed—abuse, if they can avoid it.

Commissions can grant higher fares, but it is no part of their duty to convince the public of the fairness of their decisions—at any rate, beyond such conviction as naturally follows with the few reasonable ones who read such decisions with care.

The task of educating the general public is strictly up to the companies—not because public service commissions, generally, lack moral courage to disregard hostile newspapers, adroit demagogues or unreasonable popular clamor, but because such people do not hesitate to threaten to go to the legislature for political relief and for commissioners' heads.

Without hearing the evidence in the case of the Public Service Corporation, whose appeal for increased fares is now before the commission, the Trenton (N. J.) *Times* has already denounced the appeal as an attempted robbery. And in the issue of Tuesday, March 26, the day the hearing opened, the *Times* brandished the editorial war club, under the significant caption "On Trial," in the following words:

There may be a demand that the commission be abolished in order that the people may have restored to them rights that appear to be gradually slipping away. The near future will probably enable them to decide whether they desire to retain the board.

In Oregon the decision by the Public Service Commission that the Portland Railway, Light & Power Company should be allowed to charge a 6-cent fare, has resulted in the introduction by the trolley car baiters of an "initiative" bill, to repeal the act establishing the commission. It comes to a vote next November.

The first thing to be accepted is the fact that you are talking to a hostile audience, if not a "packed jury." The educative process can never be speedy. The inertia of human conviction is too great. The company that waits until it wants something, before it speaks to the public, is suspected right from the start. Every argument is received coldly and with incredulity.

Electric railway men themselves were pretty slow in learning their own business. For example, it took them years to learn that depreciation must be provided for from current earnings. They cannot expect the public to learn even the basic facts of as complicated a thing as the electric railway business and to understand the true relationship between public and public utility in a minute, or a week, or a month. But until the public has that understanding and sympathetic attitude, it is perfectly hopeless to expect anything but opposition to fare increases.

And the issue is of an importance that cannot be overestimated. The *Saturday Evening Post* well says in its issue of March 31:

If the American experiment of private ownership and public regulation fails, because regulating bodies have not the courage to face criticism, or because they are animated by hostility to capital, the only alternative is government ownership—to the great satisfaction of Tammany Hall and every like organization.

The experiment will fail unless, on the whole, regulating bodies discover a more courageous and liberal temper.

And the publicity necessary to show the general public, upon whose will the public service commissions themselves exist, the true facts and their true interest cannot come from the commissions. It must come from the companies.

Co-ordinated Control for Any Properties Needed by Government

UNDER the act passed in August, 1916, the President has power to take over electric railways if he thinks such action necessary to the prosecution of the war. He is also empowered, under Senate bill No. 3388, introduced by Senator Fletcher, to take over any street or electric interurban railway which is considered by the government essential to the transportation of employees of shipyards or other work connected with the present ship construction policy of the government. While we believe that the electric railway companies of the country are not desirous of having their properties taken over by the government, they are prepared to accept such action if, in the opinion of the President, conditions arise which would make the control by the government of these properties either desirable or necessary. Railway men feel that if the electric railway facilities of this country are necessary to the winning of the war and can be put to more effective service by passing under the control of the government, they are ready to accept that condition.

A bill is now before Congress, however, which provides for quite a different arrangement and one out of accord with the better general plan of the co-ordination of our transportation resources. This bill was introduced in the House on Feb. 26 by Mr. Clark of Florida and was reported out on Feb. 28 from the committee on public buildings and grounds. Its main object is to provide for the housing of industrial workers who are engaged in industries connected with or essential to the national defense during the continuation of the war and as much authorizes the Secretary of Labor to acquire lands and build houses as he may determine necessary for such purpose. But coupled with this the bill gives to the Secretary of Labor the power to acquire by purchase or otherwise such local transportation and other community facilities or parts thereof as in his judgment may become necessary for the proper execution of the trust thus created.

The purpose of the bill, that of providing proper facilities for the housing of war workers, is commendable, but we think that it would be unfortunate if the authority for taking over urban and interurban trolley lines should be vested in various heads of departments according to their judgment. It would not only place the industry in a constant position of uncertainty, but it would lead or might lead to a great deal of confusion in case one department sought to take over a line for its use while the line might be serving a more important governmental function in the handling of troops, supplies, mail, etc., either as a local movement or in connection with through traffic. Again, it would result in different railways, possibly even different parts of the same railway, being administered under entirely different policies and methods. Centralized responsibility and direction, such as would follow the assumption of this control by the President or the Director of Railroads, would be much better.

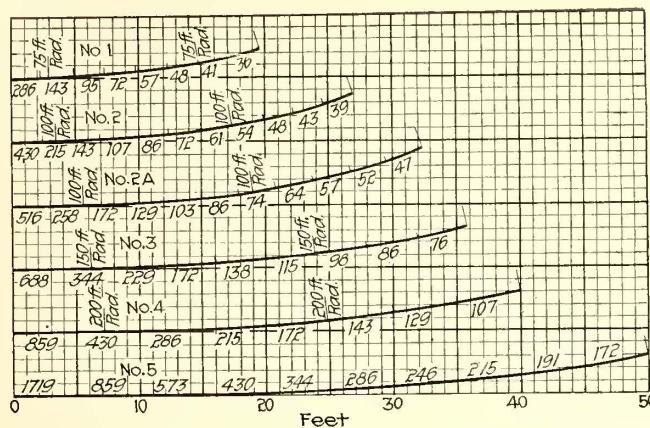


Fig. 1—Spiral standards of Lorain Steel Company (inner rail)

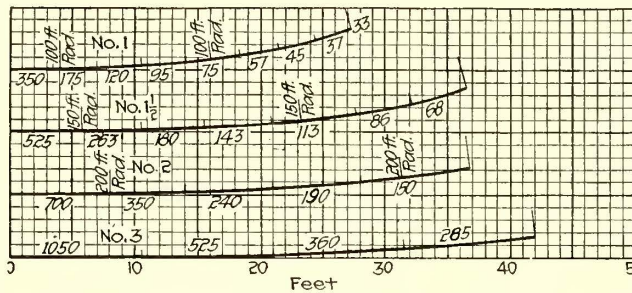


Fig. 2—Spiral standards of William Wharton, Jr., & Company (inner rail)

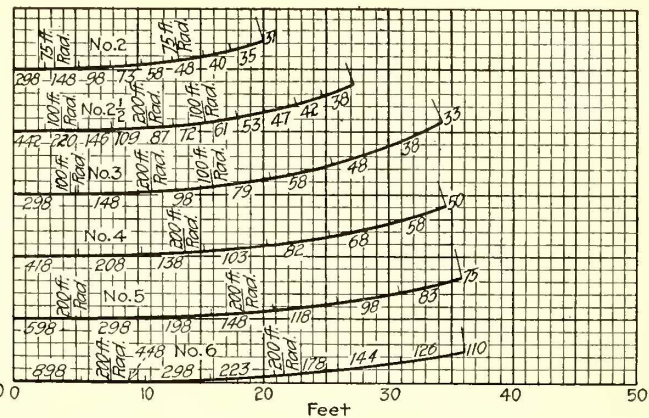


Fig. 3—Spiral standards of Pennsylvania Steel Company (inner rail)

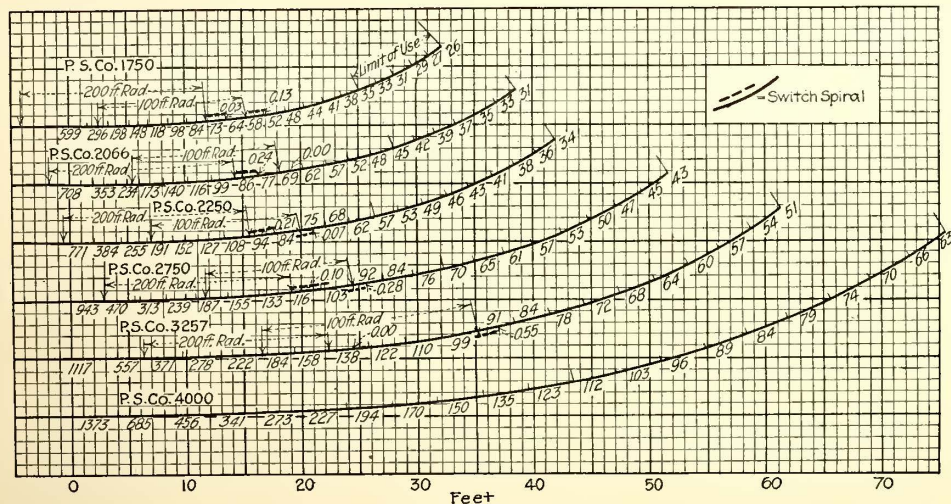


Fig. 4—Pennsylvania Steel Company's spirals proposed for standards in 1910 (inner rail)

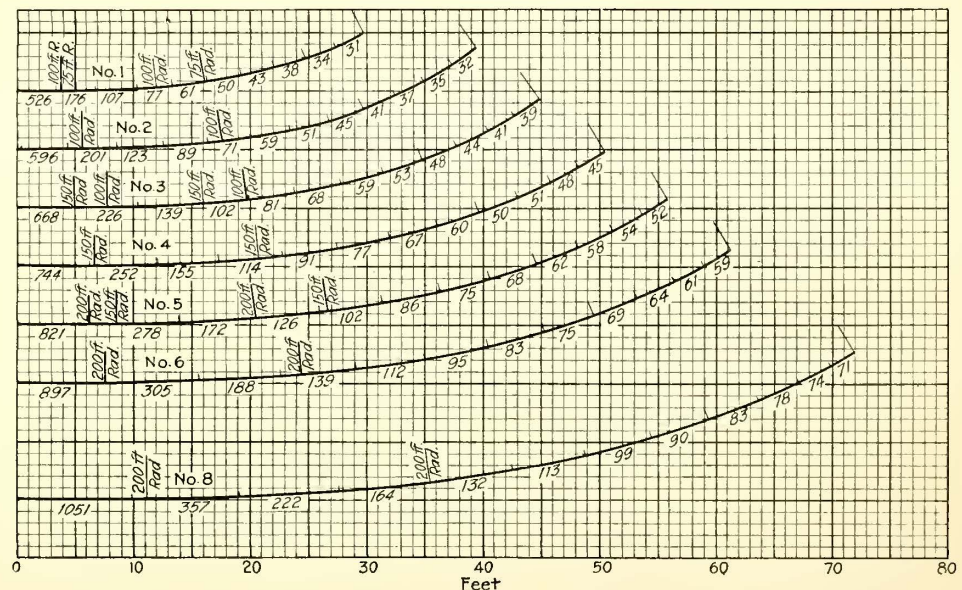


Fig. 5—William Wharton, Jr., & Company's spirals proposed for standards in 1910 (inner rail)

Present and Proposed Track Spirals of Several Manufacturers

(Each small space equals 1 ft. square)

Greater Uniformity in Track Spirals Will Conduce to Economy

The Author Shows that Co-operation Among
Manufacturers and Users Could Bring About Great
Simplification in This Element of Special Work

BY E. M. T. RYDER

Engineer Maintenance of Way Third Avenue Railway, New York City

THE following article comprises a report by the author to the committee on way matters of the American Electric Railway Engineering Association. It is desirable to obtain all possible discussion on this most important subject, and as the war has caused a temporary cessation of committee activity in the association, it was thought advisable to give the article desirable publicity through the columns of this paper.

At the January, 1917, meeting of the way committee the writer submitted two drawings on the subject of uniform track spirals, blue-prints of which were furnished to each member of the committee. Drawing No. 1 showed a set of five spirals which were suggested as a possible basis for spiral standards to be adopted by the association. Drawing No. 2 showed the existing spirals of the Lorain, Wharton and Bethlehem companies. Since this meeting criticisms of the proposed spirals have been received from five members of the committee and from one former member. In four of the six cases blue-prints were submitted showing the spirals in use by the critic, with an argument to show their superiority over those suggested by the writer. It would have been interesting to know whether the other members were similarly minded and, if so, why they hid their light under a bushel.

Incidentally it may be noted that of the four schemes suggested one calls for a single spiral, one for twenty-two spirals, one for no spiral at all, but suggests using two simple sets of compound curves, and one for a special, long-radius approach curve, the data at hand being incomplete as to the corresponding switch curves.

DESIRABILITY OF STANDARDS

This marked difference in practice is in itself one of many good arguments for the necessity of having standards—and the difficulty of getting them. All way engineers, of course, know that the largest three manufacturers of special work use entirely different sets of spirals. It may not be so well known that some years ago they attempted to "bury the hatchet" and agree on new standards, but no common ground was found at that time. The present time is, for several reasons, a good one in which to attempt to establish standards for the entire trade. Practically none of the existing spirals is long enough to accommodate the A.E.R.E.A. standard switch pieces. Also, present business conditions are likely to result in curtailment of orders for special work, and therefore policies of co-operation, economy and efficiency are everywhere the order of the day.

The writer has been interested in working up the

proposed uniform spirals in a little more detail and in comparing them with the standards of the various steel companies and of the railway companies whose engineers kindly furnished data of their own. Thirteen drawings are reproduced herewith, showing this information. The positions of cut-in points for switches have not been figured out for the proposed uniform spirals and, therefore, cannot be definitely assumed where shown. All comparisons shown on the accompanying drawings are based on curves for inside rail.

PROPOSED SPIRALS BASED ON STEAM RAILROAD STANDARDS

The proposed uniform spirals are based on Searle's spirals, commonly used by steam railroads, the fundamental principle of which is that the rate of curvature increases uniformly by a fixed amount per chord from zero to the curvature of the circular part of the curve. In steam railroad work the number of chords is generally kept constant and the length of the chord varied. In these proposed spirals the chord length is held uniformly at 5 ft. and the rate of curvature per chord is varied. Each spiral may be used with curves of various center radii by dropping off the appropriate number of chords from the sharp end of the spiral.

The proposed spirals can be laid out on the ground by transit if desired, the deflection angles to all points being given in the data in the accompanying table. This is chiefly of value in locating new lines, as correct stationing can be carried around all curves, thus preserving profile distances, etc.

The data for inside and outside rails have not been calculated, but they can be worked up later should the proposed spirals be considered worthy of further study. Co-ordinates for the center line are given in the table for convenience in plotting for comparison with other spirals. These figures were obtained by scaling from layouts plotted on a scale of 1 in. = 1 ft. by deflection angles and chords. The precise radii of these spirals can probably be modified slightly to advantage, as stated below, but the writer believes that the general scheme submitted deserves careful consideration both as to the fundamental basis of the individual spirals and their group relationship.

All the spirals are suitable for easements for plain curves and their number and relative proportions allow considerable variation to suit local conditions. In all cases circular arcs of the standard switch radii shown can be cut in without any change in the spiral and of sufficient length to take switch pieces of A. E. R. E. A. standard length.

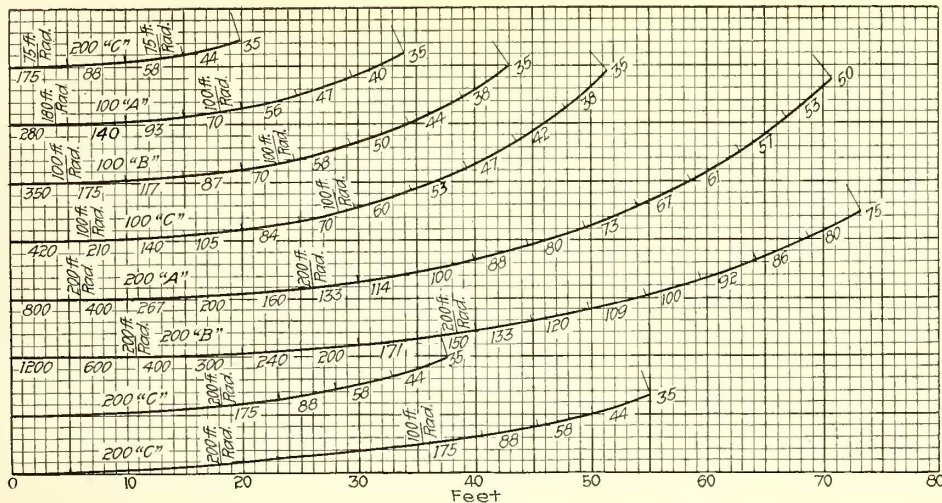


Fig. 6—Proposed uniform standard spirals (plotted for center line. For data see table)

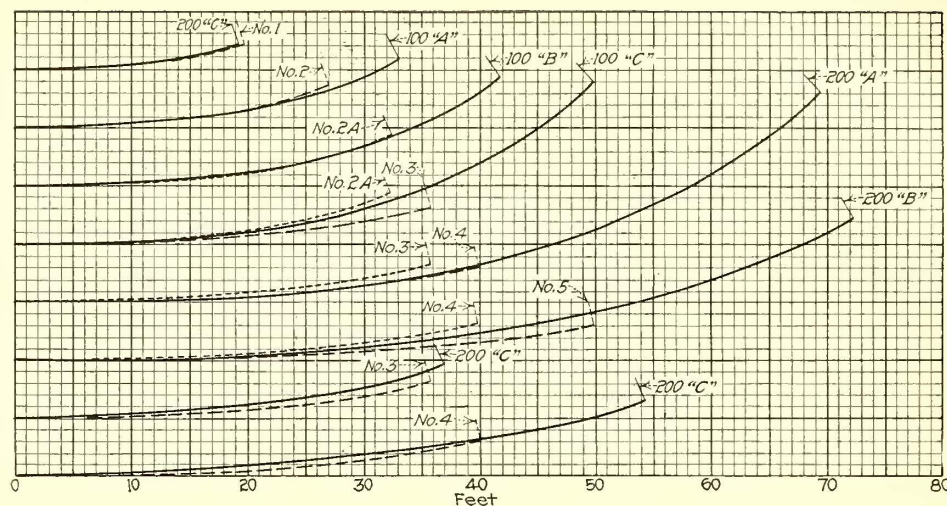


Fig. 7—Comparison of Lorain Steel Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dash line No. 1 to No. 5 inclusive; dotted line as above and No. 2-A.

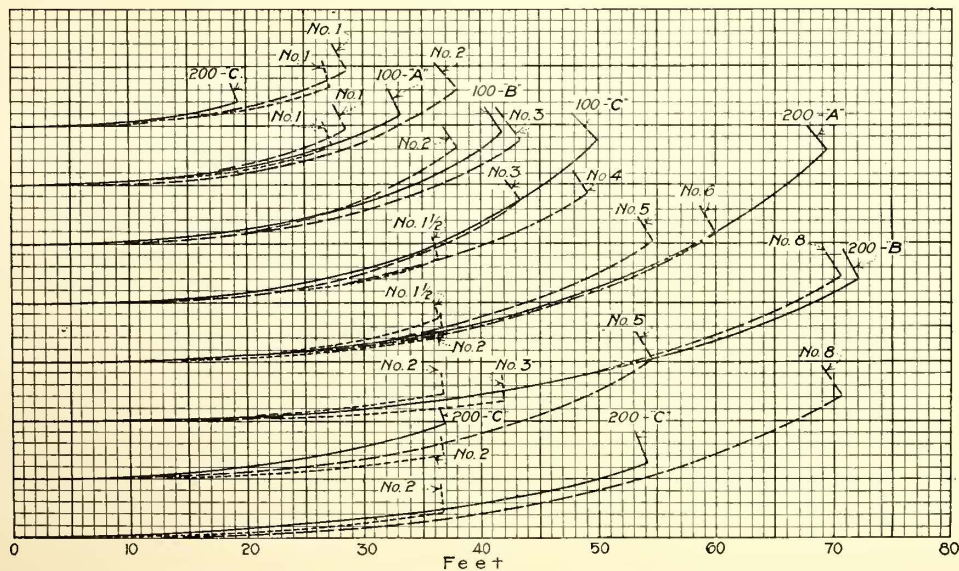


Fig. 8—Comparison of William Wharton, Jr., & Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-C inclusive; dash line No. 1 to No. 8 inclusive.

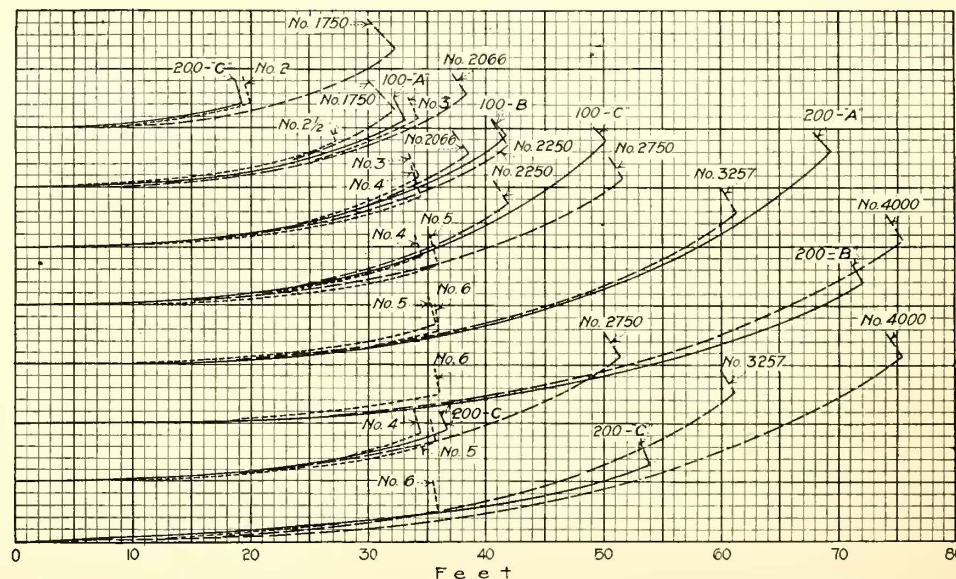


Fig. 9—Comparison of Pennsylvania Steel Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-C inclusive; dash line No. 1750 to No. 4000 inclusive; dotted line No. 2 to No. 6 inclusive.

Proposed A. E. R. E. A. Standard Spirals and Comparisons with Present Manufacturers' Standards

(Each small space equals 1 ft. square)

The proposed standards provide three spirals into which 100-ft. switches can be cut, two into which 200-ft. switches can be cut, and one spiral which can be used as an easement for a clearance curve for 200-ft. switches or as a short spiral into which a 75-ft. switch can be cut.

Spiral 100-A is intended to be the shortest spiral of the given type which will allow the cutting-in of a standard A. E. R. E. A. 100-ft. radius switch. As shown, it is a little longer than absolutely necessary and the radii can be figured down accordingly if desired. Spiral 100-B is of 25 per cent greater radius and spiral 100-C

is of 50 per cent greater radius. The latter two can be used when local conditions permit or require. All designers who have tried to make special work layouts dodging sewer heads, water-gates and elevated columns, etc., know that a certain amount of flexibility is necessary if the engineers are to avoid insanity.

Spiral 200-A is intended to be the shortest spiral of the given type which will allow the cutting-in of a standard A. E. R. E. A. 200-ft. radius switch. This spiral, like 100-A, is a little longer than absolutely necessary, and the radii can be figured down in the same manner. Spiral 200-B is of 50 per cent greater radius. Spiral 200-C is intended to be used in combination with a 200-ft. radius plain branch-off curve of the necessary

ENGINEERING DATA FOR PROPOSED UNIFORM SPIRALS

SPIRAL 200 "C"							SPIRAL 100 "A"						
N=4. L=20. R=35. D=4° 6'. Co-ordinates.							N=7. L=35. R=35. D=4° 6'. Co-ordinates.						
P	R	Dp	Cp	Lp	X	Y	P	R	Dp	Cp	Lp	X	Y
0		0° 00'	0° 00'	0	0.0	0.00	0	280	0° 00'	0° 00'	0	0.0	0.0
1	175	0° 49'	1° 38'	5	0.1	5.00	1	140	0° 31'	1° 02'	5	0.1	5.0
2	88	2° 03'	4° 55'	10	0.4	10.0	2	93	1° 17'	3° 05'	10	0.2	10.0
3	58	3° 50'	9° 50'	15	1.0	14.9	3	70	2° 24'	6° 09'	15	0.6	15.0
4	44	6° 09'	16° 24'	20	2.2	19.8	4	56	3° 51'	10° 15'	20	1.3	19.9
	35						5	47	5° 38'	15° 23'	25	2.4	24.8
							6	40	7° 46'	21° 32'	30	4.0	29.6
							7	35	10° 15'	28° 42'	35	6.2	34.1

SPIRAL 100 "B" N=9. L=45. R=35. D=4° 6'. Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0		0° 00'	0° 00'	0	0.0	0.0
1	350	0° 25'	0° 49'	5	0.0	5.0
2	175	1° 02'	2° 28'	10	0.2	10.0
3	117	1° 55'	4° 55'	15	0.5	15.0
4	87	3° 05'	8° 12'	20	1.1	20.0
5	70	4° 21'	12° 18'	25	2.0	24.9
6	58	6° 13'	17° 13'	30	3.3	29.8
7	50	8° 12'	22° 58'	35	5.0	34.4
8	44	10° 27'	28° 31'	40	7.2	38.9
9	35	12° 59'	36° 54'	45	9.9	43.2

SPIRAL 100 "C" N=11. L=55. R=35. D=4° 6'. Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0		0° 00'	0° 00'	0	0.0	0.0
1	420	0° 20'	0° 41'	5	0.0	5.0
2	210	0° 51'	2° 03'	10	0.1	10.0
3	140	1° 36'	4° 06'	15	0.4	15.0
4	105	2° 34'	6° 50'	20	0.9	20.0
5	84	3° 46'	10° 15'	25	1.6	24.9
6	70	5° 11'	14° 21'	30	2.7	29.8
7	60	6° 50'	19° 08'	35	4.2	34.6
8	53	8° 43'	24° 36'	40	6.1	39.3
9	47	10° 49'	30° 45'	45	8.4	43.7
10	42	13° 09'	37° 35'	50	11.2	47.8
11	38	15° 43'	45° 06'	55	14.5	51.5

SPIRAL 200 "A" N=15. L=75. R=50. D=2° 52'. Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0		0° 00'	0° 00'	0	0.0	0.0
1	800	0° 11'	0° 22'	5	0.0	5.0
2	400	0° 27'	1° 05'	10	0.1	10.0
3	267	0° 50'	2° 09'	15	0.2	15.0
4	200	1° 20'	3° 35'	20	0.4	20.0
5	160	1° 58'	5° 23'	25	0.8	25.0
6	133	2° 43'	7° 31'	30	1.4	30.0
7	114	3° 35'	10° 02'	35	2.2	34.9
8	100	4° 34'	12° 54'	40	3.2	39.8
9	88	5° 40'	16° 08'	45	4.5	44.7
10	80	6° 54'	19° 43'	50	6.0	49.5
11	73	8° 15'	23° 39'	55	7.8	54.1
12	67	9° 43'	27° 57'	60	10.0	58.7
13	61	11° 18'	32° 37'	65	12.5	63.0
14	57	13° 00'	37° 38'	70	15.4	67.0
15	53	14° 49'	43° 00'	75	18.7	70.8

SPIRAL 200 "B" N=15. L=75. R=75. D=1° 53'. Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0		0° 00'	0° 00'	0	0.0	0.0
1	1200	0° 14'	0° 14'	5	0.0	5.0
2	600	0° 28'	0° 42'	10	0.1	10.0
3	400	0° 42'	1° 25'	15	0.2	15.0
4	300	0° 57'	2° 21'	20	0.3	20.0
5	240	1° 11'	3° 32'	25	0.6	25.0
6	200	1° 25'	4° 57'	30	1.0	30.0
7	171	1° 39'	6° 36'	35	1.5	35.0
8	150	1° 53'	8° 29'	40	2.2	39.9
9	133	2° 07'	10° 36'	45	3.0	44.9
10	120	2° 21'	12° 57'	50	4.0	49.8
11	109	2° 35'	15° 32'	55	5.2	54.6
12	100	2° 50'	18° 22'	60	6.6	59.4
13	92	3° 04'	21° 25'	65	8.3	64.1
14	86	3° 18'	24° 43'	70	10.2	68.7
15	80	3° 32'	28° 15'	75	12.4	73.2

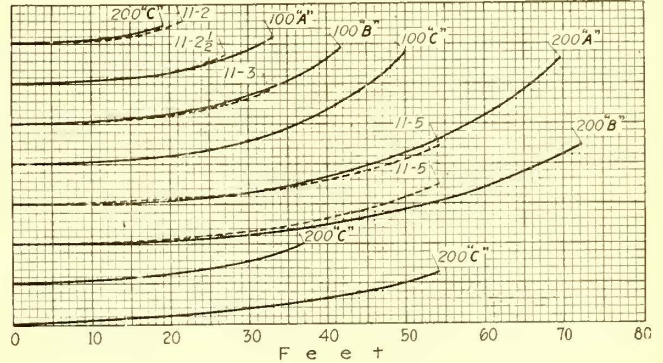


Fig. 10—Comparison of Cleveland Frog & Crossing Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dotted line 11-2 to 11-5 inclusive.

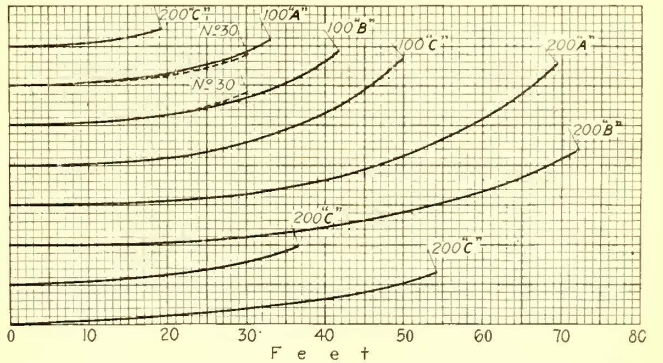


Fig. 11—Comparison of Montreal Tramways spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive.

COMPARISONS OF PROPOSED STANDARDS WITH STANDARDS OF ONE MANUFACTURER AND ONE RAILWAY COMPANY
(Each small space equals 1 ft. square)

length to allow for the A. E. R. E. A. standard switch before reaching the spiral.

To obtain car clearance it will generally be necessary to cut in a piece of long-radius plain curve between the switch and the spiral. As meeting ordinary conditions of distance between track and car dimensions, the writer suggests using 1 deg. of 1000-ft. radius as a standard. The chief use for the 200-ft. radius switch is in the inside curve of a double track branch-off where the above type of layout is generally essential in order to get car clearance. True spirals like 200-A and 200-B can be used for single-track branch-offs in wide streets or in acute-angle layouts.

Spiral 200-C can also be used in places where there is no room for standard 100-ft. switches, for 75-ft. switches must be used sometimes if we are to get out of the trenches.

PROPOSED UNIFORM SPIRALS

Spirals are similar to "Searles Spirals." Rate of increase of curvature per chord is constant and equals deflection angle for first chord.
All chords 5 ft. long on Center Line of track (as plotted).
Dc=Deflection angle for circular part of curve.
Dp=Deflection angle to any point on spiral.
Cp=Central angle to any point on spiral.
S=Central angle, total for spiral.
R=Radius circular part of curve in feet.
N=Number of chords in spiral.
L=Length of spiral=5 N feet.
P=Number giving position of chord on spiral.

$D_p = \frac{a}{b} D_c$. Where $a = 2P^2 + 3P + 1$.

And $b = 6(N + 1)$.

Central angles of chords of spirals form series $\frac{2 D_c}{N+1} (1+2+3+\dots+N)$. Sum= $S=N$

Radii of arcs of spiral form, approx. series (assuming angles proportionate to sine)

$(N+1)R (1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\dots+\frac{1}{N})$

The spirals proposed by the various manufacturers in 1910 differed materially from each other in principles and in details, but they showed a desire to increase the available range to choose from and to provide more adequately for plain ends. It is intended to cover this same field with the proposed uniform spirals presented herewith. No doubt other types and combinations could be designed and, if any simpler and more practicable ones can be found, so much the better.

COMPARISONS

Comparative sheets have been worked up for the spirals of four of the large manufacturing companies and three of the electric railway systems. Brooklyn and, of course, other of the large systems use the spirals of certain of the manufacturers shown. If de-

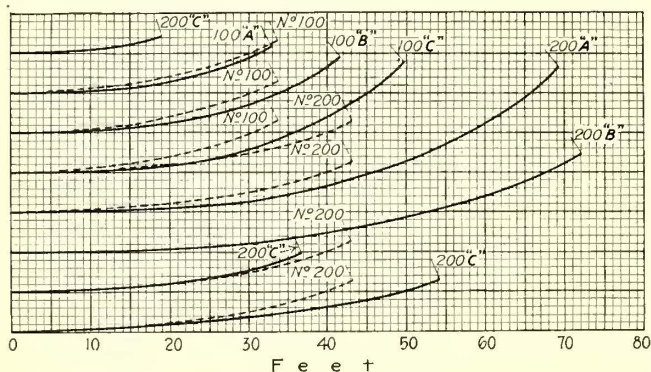


Fig. 12—Comparison of New York State Railways spirals with proposed uniform spirals (inner rail). Solid lines 200-C to 200-B inclusive.

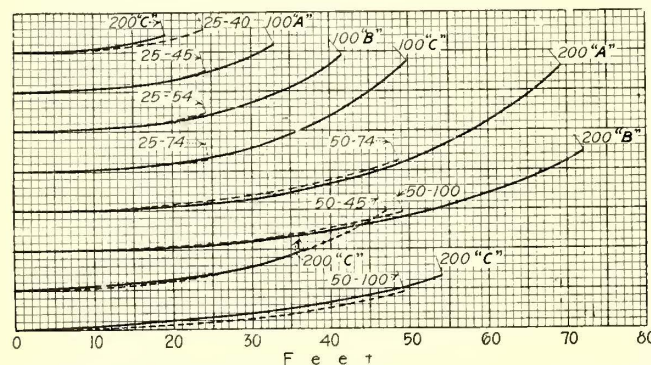


Fig. 13—Comparison of Connecticut Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dotted line 25-40 to 50-100 inclusive.

COMPARISON OF PROPOSED STANDARDS WITH STANDARDS OF ONE MANUFACTURER AND SEVERAL RAILWAY COMPANIES

(Each small space equals 1 ft. square)

sirable the comparative studies can be extended to cover any other systems. The writer hopes that these comparisons will be studied very carefully. They seem to him to indicate that the proposed uniform spirals come astonishingly near to being a satisfactory substitute for the various spirals in common use. There are very many instances where the variations from the proposed spirals are less than 6 in. throughout the whole length, and the range from sharp to easy curves is pretty well covered. In the reproductions the curves have been plotted on a scale such that the distances from the base lines can be read to one-fifth of a foot.

The advice and suggestions of experts are needed to make these studies of value, and criticism will be thor-

oughly appreciated. The good points, if any, should also be pointed out, for an adoption of such standards should only be made in case they are such a marked advance over the old that the majority of manufacturers and customers will fall in step.

Electrification Progress in Scandinavia

IN A LECTURE recently delivered before the Royal Institute of Engineers, Holland, A. Groothoff reviewed the present electrification situation in Sweden and Norway. A summary of some of the points made by him are given in the following paragraphs. The weights mentioned are in metric tons.

The first electrification on a large scale in Sweden was the Kiruna-Riksgränsen line with its tonnage of iron ore of more than 3,000,000 per year, and this within the Arctic Circle. The line is 93 miles long. Single-phase current at 80,000 volts is sent from Porjus to four transformer stations along the line, of which the first is 87 miles and the last 160 miles distant from Porjus. The voltage is stepped down to 15,000, at which tension power is supplied to the contact device.

The freight locomotives weigh about 100 tons and the passenger locomotives 70 tons. A normal freight train consists of two electric locomotives and 40 ore cars of 46 tons each, the total weight being from 2000 to 2100 tons. Normal speed for freight is 18½ m.p.h., the maximum speed being 31 m.p.h. The maximum speed for passenger trains is 62½ m.p.h.

In the first year this road transported 1,104,000 tons of ore, which is barely one-third of its normal capacity. Despite this low traffic it showed a saving over steam operation, due partly to the high price of coal.

The continuation of the road southward to Svartön on the Baltic coast has been decided upon, and the cost of the extension, 143 miles long, has been figured at \$7,800,000. With an annual ore transportation of 3,000,000 tons, electric traction can compare favorably with steam traction when coal is \$6.70 per ton. The current for the whole road is to come from Porjus. Whether or not other State railroads in Sweden will be electrified is still an open question. The question is not an easy one, for while electrification would increase the capacity of the roads it cannot do very much because most Swedish railroads are single track. This limits the total traffic regardless of motive power.

In 1917 Norway had a total of 1970 miles of railroad track, of which 44½ miles were electrified. Plans are under way for the electrification of several short lines owned by the State. A comprehensive plan for the complete electrification of all the State railways has also been worked out, involving the expenditure of \$14,000,000 for the power stations alone.

The New York *Evening Post* published its fifth annual "Public Utilities and Engineering Review" on March 30. Among those who contributed articles to the special issue were W. H. Dodge, of H. M. Byllesby & Company; O. B. Willcox, vice-president of Bonbright & Company, Inc.; E. G. Connette, president of the United Gas & Electric Corporation, W. B. Jackson, of the bond department of H. L. Doherty & Company, and Harlow C. Clark, of the American Electric Railway Association staff in New York.

Martial Note Dominates Banquet

Work of Electric Railway War Board and Other War Activities Described at Annual Meeting of New England Street Railway Club

LOYALTY to the cause of liberty, support of our allies, and a determination to see the war through to a victorious conclusion were voiced by the speakers and by 562 members and guests of the New England Street Railway Club at the eighteenth annual banquet of the organization in Boston on March 28. Appropriately in view of the war conditions the banquet was the most informal in the history of the club, the decorations being confined to the display of the national colors of the United States, Great Britain and France behind the speakers' dais. Patriotic themes were discussed by A. H. Ford of Portland, Me., retiring president of the club; R. W. Perkins of Norwich, Conn., president-elect; Hon. Guy A. Ham, Boston, Mass., toastmaster; Hon. John W. Weeks, United States Senator from Massachusetts; Hon. Andrew J. Peters, Mayor of Boston; Lucius S. Storrs, New Haven, Conn., of the Electric Railway War Board; and Major Guy C. Boyer, Twenty-second Battalion, Canadian Expeditionary Forces, who was received with tremendous enthusiasm.

PROBLEMS OF THE INDUSTRY AND WORK OF ELECTRIC RAILWAY WAR BOARD

Mr. Storrs pointed out that never in their history have electric railways been confronted with such acute conditions as at present. Rising costs have practically wiped out surplus. Some lines have been abandoned, others forced into receivership; others are tottering on the verge. Nearly all properties are nearly bankrupt. This condition is not confined to any local territory, but is nation-wide, and for that reason all the more readily understood.

The public as well as the public utility commissions are realizing the extreme needs and the publicity that has been given to the exchange of letters between President Wilson and Secretary McAdoo is having wide effect. The public has been taken into the confidence of the electric railways, and the slogan now is "Allow us to earn a fair return upon the value of the property which we have been invited to maintain for the public convenience," not that the industry may make large profits but in order that it may be an efficient agency in the successful conduct of the war. A hearing on the matter of increased rates is now orderly investigation and not the inquisition of former days. It is helpful to the community, to the commission and to the corporation.

"We are too apt to think of our problem," said Mr. Storrs, "our property and the public each of us serves in terms of local interest. Of course, we would not be worth-while employees if we did not have the interest of our particular corporation at heart, but we must realize that the little local problem with which we happen to be confronted is but one unit of the big problem, for the plight in which we each find ourselves is national in its scope. The average person never stops to think that if the services of the public utilities should stop throughout the country the whole war program would immediately collapse. It follows that in so far

as the efficiency of the public utilities is impaired, the war program is proportionately delayed.

"The conditions with which this industry is confronted have gravely affected the efficiency of all, and collapse has been imminent. It was the full realization of this that led President Wilson to say, 'It is essential that these utilities should be maintained at their maximum efficiency and that everything reasonably possible should be done with that end in view.' Briefly there is an investment of \$11,350,000,000 in the public utility business, with gross earnings of \$1,500,000,000 a year and a coal consumption of 51,500,000 tons annually. There are maturing obligations during 1918 of \$232,000,000 and during 1919 of \$265,000,000. It is estimated that the 1918 earnings will increase by \$228,000,000. Operating costs will increase \$290,000,000, resulting in an income decrease of \$62,000,000, coupled with which there is the need for an estimated increase in investment to meet the actual requirements of these times of \$650,000,000. Certainly this is a dangerous condition and one requiring immediate relief from all sources."

Mr Storrs then described the organization of the Electric Railway War Board, with offices in Washington.

When the War Board began its work the problem seemed to be largely one of affording the various companies relief from some of the annoying restrictions placed upon certain branches of their work and of aiding in the delivery of materials, fuel and supplies. While fuel distribution will now be decentralized, there still remains the problem of obtaining shipments from contractors and this can only be handled through the National Fuel organization. The War Board has been successful in straightening out conflicting rulings of various collectors of the Internal Revenue Department. The board's traffic department is also doing what it can to co-operate with the Ordnance Department of the Army and other branches of the military and naval service to render electric railway transportation available.

SOME WAR BOARD ACCOMPLISHMENTS

There have been appearances before committees in an effort to have the war finance corporation bill so framed as to enable the industry to obtain assistance in financial matters. The board has secured the elimination of the electric railways from these so-called "short-line" provisions of the railroad bill. An effort has been made to amend the bill now pending which would give the Secretary of Labor power to take over electric lines. Misstatements regarding electric railways made before Congressional committees which would work to the detriment of the industry have been corrected. A large amount of work is on hand at present. Public opinion has changed and there is a greater realization of the co-partnership existing between the utility and the community than ever before. Maximum efficiency on the part of the War Board and of the recently organized conference committee of all the public utilities requires the active co-operation of each of the individuals in the industry with full interchange of suggestions and action thereon so far as feasible in the interest of the public welfare and the companies.

New Zones Authorized

Maine Public Utilities Commission Grants New Rate Schedule to Lewiston, Augusta & Waterville Street Railway

THE Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine, on March 1 put into effect a new rate schedule between Lewiston and Bath, in accordance with a recent decision of the Public Utilities Commission. This schedule supersedes that filed on July 1, 1917, but grants the same total fare of 50 cents for the entire distance of 28.28 miles. There are, however, some features of the decision which are of special interest.

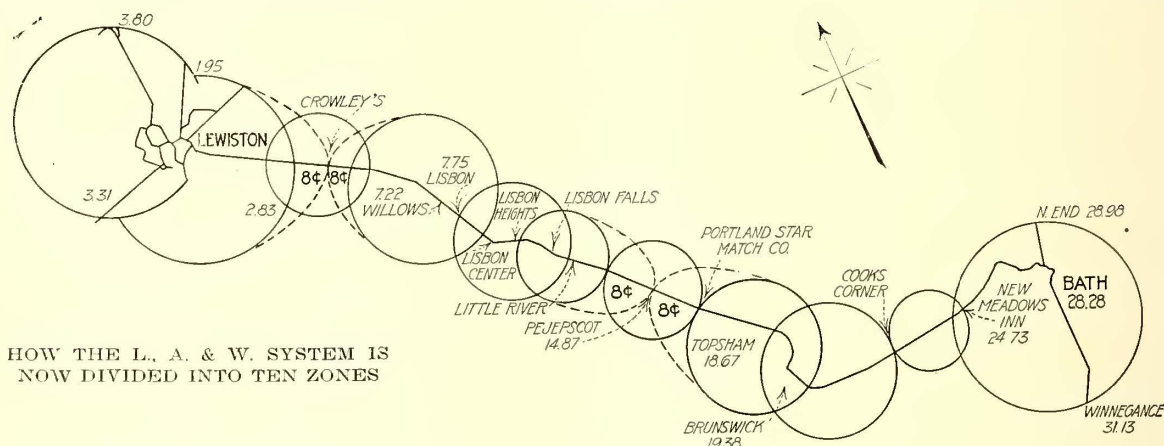
The fare was originally 1¼ cents per mile for through travel, and much less than 1 cent per mile for some of the zones. This fare had been in effect since the line was built in 1898, with the same number of zones and only minor changes in their limits. The revised schedule was filed by the company because the old zones were not properly arranged, some being much longer than others without adequate reason.

In commenting on the situation the commission said: "The zone system of fixing electric railway fares is, at best, a compromise, and not absolutely equal in its

those now charged persons going to and from Pejepscot, in either direction. While we find, and we do not understand that complainants seriously deny, that the proposed increase of fare from 35 to 50 cents is not more than just, we are satisfied that situations exist in both of these communities which demand special attention.

"Overlaps are confusing and should be avoided when possible, but so long as the zone system of fares is adhered to they will have to be tolerated where there is an otherwise irreconcilable clash between a reasonably exact division of distances and local conditions. We shall resort to this practice to remedy what otherwise would be an injustice to the travel between Lisbon Falls and Lisbon Village, and to remove minor hardships created by the new schedule at Lisbon Heights and at New Meadows Boat Landing."

Under the plan finally approved, shown in the accompanying diagram, ten 5-cent zones, some of which overlap, are required for the entire distance, the length of these zones varying from 2.45 to 3.70 miles. They provide an average rate of 1.765 cents per mile. To meet the special local conditions at Crowley's Junction, a suburban point near Lewiston, and at Pejepscot where a large pulp mill is located, special 3-cent zones



HOW THE L. A. & W. SYSTEM IS NOW DIVIDED INTO TEN ZONES

results. Some persons must live just over the line, wherever it falls, and pay an extra fare for a short ride. Since this cannot be avoided, it is a strong argument for making the base fare as low as practicable, and is one of the considerations which has deterred us from retaining the original number of zones and making a corresponding increase per zone.

"There is now a tendency among electric railways toward the adoption of the copper zone system, which is practically a mileage rate, starting with a reasonably long zone at the usual base rate, and adding 2 cents, or whatever the rate may be, for each mile, or fraction thereof, in addition. Even this is only another step in reducing the base fare; it still recognizes the zone principle. It is preferable in theory, but we are not convinced that it is now practicable to apply this practice anywhere on respondent's system until it can be worked out for the entire system, and one of the attorneys for the complainants frankly so admitted, although he at first asked for it.

"The principal complaints were directed at the rates in what formerly constituted the Lewiston zone and

are created. The extended zones, one of which is on each side of each of the above points, cover the 5-cent zone on which they are based but extend to the center of the next adjoining 5-cent zone, where they meet. This arrangement gives these two points, Crowley's Junction and Pejepscot, the advantage of a single 8-cent zone, in either direction.

Cars with Small Wheels for Cleveland

SEVERAL of the twenty-five all-steel cars ordered a year ago from the Cincinnati Car Company by the Cleveland (Ohio) Railway are now in operation. The new cars are of the Peter Witt type but differ from the original ones of this type in being mounted on smaller wheels and having motors of but 25 hp. instead of 40 hp. These cars weigh 32,000 lb. each, or 12,000 lb. less than the combination steel and wood cars. In these cars the roof is of steel with white enamel interior finish, and the seats are covered with leatherette. The floor is slightly ramped. A street sign is placed above the front vestibule and a side roof sign above the center exit.

Staggered Hours for 88,000 Washington Employees

**Present Tremendous Crush in Capital City Due to General 9 O'Clock Opening Hour—
John A. Beeler Proposes New Hours for 45,000 Employees—All Business
Interests and Car Riders Will Be Benefited**

THE latest report of John A. Beeler on the electric railway situation in Washington, D. C., submitted to the Public Utilities Commission on March 22, covers the subject of staggered hours for business. Mr. Beeler finds that with the continuance of the present hours the electric railway service will continue to suffer more or less from congestion, delays and overcrowding, especially during the morning rush hour. With the hours changed as he proposes, however, the service can be materially improved at once, and a foundation will be established upon which can be operated ultimately a system of urban transportation worthy of the capital city of America.

Washington is in no sense a usual city. Primarily it is governmental in character. On Jan. 1, 1918, the total number of government employees was close to 70,000; it has since increased by several thousands. The city is not a manufacturing center. Apart from the Washington Steel & Ordnance Company, located in the extreme southern corner of the District of Columbia, the few small factories are a negligible quantity as far as the transportation problem is concerned. The commercial enterprises which care for the local needs of the population, including department stores, offices and retail business of various sorts, while ample, are completely overshadowed by the great governmental activities.

The population in the older sections, as compared with the suburbs, is distributed in a remarkably even way. The result is that most of the people walk to and from their work, and many prefer to live within easy walking distance of their places of employment. At present others do so because of the electric railway congestion. Where the population extends farthest out, the greatest car congestion prevails. With the rapid and extensive growth brought about by the war, more people are forced to live in the outlying territory, thus accentuating the problem.

The primary cause of Washington's congested traffic situation, Mr. Beeler states, is the present hours of work, particularly the opening hour at 9 a.m., which is almost universally observed by the government, the private offices, schools and the big stores. The federal government years ago fixed the opening of most of the

departments at this hour, and on account of the climatic conditions and the generally confining nature of the work created an apparently short day by establishing 4 p.m. as the closing hour. Private offices generally open at 9 a.m. and close between 5 and 5.30 p.m. The latter, however, usually allow an hour or more for lunch, while the government departments allow but thirty minutes. The schools also open at 9 a.m., but close earlier than the departments. The large stores open at 9 a.m. and close from 5.30 to 6 p.m.

Within the last few months, in an effort to alleviate existing conditions, the Departments of Commerce and the Interior have changed their opening hours from 9 a.m. to 8.30 and 8.45 a.m. While this has aided to a certain degree, the number of employees involved is insufficient to make any great change in the general situation.

The three industrial offices, the Bureau of Engraving, the Government Printing Office and the Navy Yard, for years have had hours from 8 a.m. to 4 p.m. Recently it has been found necessary to put on additional help in two shifts—the first from 4 p.m. to midnight, and the second from midnight to 8 a.m.

Washington as a whole, Mr. Beeler says, goes to work promptly at 9 a.m. The result is that there is a tremendous demand for transportation to land the people at their places of business at this time. Counts of pedestrians were made at eight points far enough from the business section to secure those going to and from their work. The observations were made in January, when the weather was not particularly favorable for walking, so that few were doing it for pleasure.

The result of combining the counts of incoming pedestrians in the morning is shown in Fig. 1. This shows that the maximum peak was reached at 8.37 a.m., which would on an average permit the walkers to reach the downtown section at or before 9 a.m. This clearly indicates that the walkers' peak downtown is at this hour.

The results in the afternoon, on the other hand, do not indicate any marked peak. The government offices close fairly early. Many employees prefer to shop before going home, while others proceed homeward immediately. The transients especially remain down-

They Cannot All Be Carried at Once

When it is remembered that the function of an electric railway system is to provide regularity and continuity of service at all reasonable hours for the regular and normal as well as the abnormal movements, for those outbound as well as those inbound, for the occasional rider, the stranger, and the entire community generally, the magnitude of the task of attempting to bring a large proportion of the population down town for a universal 9 a.m. opening hour is apparent. This task, long established by custom, has now unconsciously grown to proportions under which the community as well as the companies stagger.

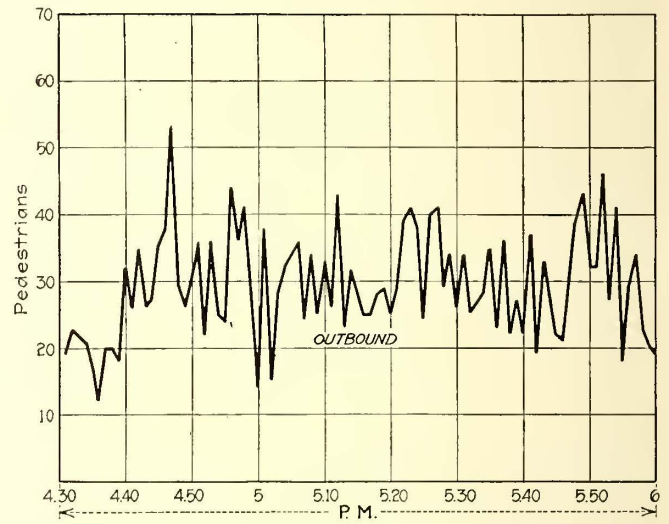
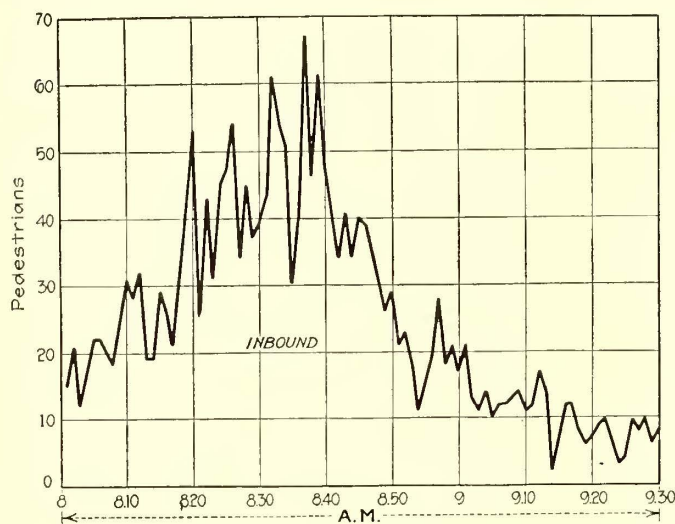
—JOHN A. BEELER.

town for some time. Fig. 2, which is a summary of the evening counts outbound, indicates a nearly even distribution of walking from 4.30 to 6 p.m.

In addition to the walkers passing from the outer sections into that included within the eight count points, there are approximately 100,000 persons living in the territory inclosed within these limits. Most of these usually walk. Some of them would undoubtedly prefer to ride, especially if residing on one side of this area and working on the other, but on many lines they find the cars so packed at this hour that it is almost essential to cultivate the walking habit.

57,000 PEOPLE RUSH TO WORK AT ONCE

To determine the exact number of employees involved, a questionnaire was sent out by the Public Utilities Commission. The returns were summarized to show the



FIGS. 1 AND 2—PEDESTRIANS ENTERING AND LEAVING DOWNTOWN DISTRICT IN WASHINGTON DURING MORNING AND AFTERNOON RUSH

number of employees and their hours of work for practically all the government employees, and for typical private organizations. The number of people and the hours at which they are due to commence and end their work are illustrated graphically in Fig. 3. Each block represents 1000 people.

At 9 a.m., Mr. Beeler states, the blocks are stacked too high in comparison with other hours. The government employees furnish 37,652 or considerably more than enough without the addition of about 20,000 going to private offices and stores at the same time.

The enforcement of such an hour has proved impracticable, and any close observer will note that this stack of blocks has literally toppled over. A considerable number come early; many others are late. Many who desire to ride are forced to walk through sheer inability to get on board the cars at this hour in the morning.

In the afternoon the problem is decidedly less acute. The blocks are stacked at various hours, and none of the piles is nearly so high.

COUNTS AT BUILDINGS PROVE CONGESTION

The times of arrival and departure of employees follow quite closely the regular opening and closing hours for the various buildings. To test this, counts were

made of all the principal government and other offices. The employees of some departments are quite prompt in arriving; those of other departments, and in all cases many individuals, come away ahead of time. Some departments show clearly defined times for opening and closing, while others do not. Quite a number work late, especially in the departments vitally concerned in the conduct of the war.

The character of the demand on the city's transportation facilities is shown in Fig. 4 and Fig. 5. These show the number of persons entering and leaving the buildings within a radius of three-fourths of a mile from Fourteenth and G Streets. This includes nineteen of the most important places of business in the city. The maximum minute in the morning was that from 8.52 to 8.53, in which time 672 persons entered the buildings counted. In the afternoon the peak came from 4.31 to

4.32, when 689 persons were counted leaving these buildings. A secondary peak occurred in the afternoon from 5.03 to 5.04, with 472 persons counted.

WASHINGTON HAS PECULIAR RAILWAY PEAKS

Counts made of the number of street car passengers, summarized in the curve in Fig. 6, show the morning peak inbound to be more than 25 per cent higher than the evening peak. It reaches its pinnacle with the cars due downtown slightly prior to 9 a.m., or in time for passengers to reach their offices at this time.

On the other hand, the afternoon peak of street car traffic is very different and much less severe. The peaks shown in Fig. 5 for persons leaving the buildings do not reappear in Fig. 6 for street car traffic. In the latter there is no sharp pinnacle. This is because the people do not all go home at once. The same is true of those who walk home after work, as may be seen in the chart of pedestrians leaving the downtown district (Fig. 2).

These peak loads, Mr. Beeler remarks, are different from those found in most other cities. Usually the morning peak occurs earlier and is not so sharp as in the evening. In Washington the reverse is true. It is much easier to care for a high evening peak, as the hours of the conductors and motormen can be so ar-

ranged as to permit the day runs to overlap the evening runs. With the high morning peak no such opportunity exists.

In order to provide for the tremendous morning load, the electric railway systems have found it necessary to work their resources to the limit. Were all the people shown in Fig. 3 to ride, the morning-peak problem would be even worse than it is. Each block of 1000 people would require about twelve street cars, each carrying eighty persons. To carry the entire load would therefore mean the operation of the cars so that 720 would arrive downtown just prior to 9 a.m. This is clearly an impossibility. If but half this number desired to ride, 360 cars would be required.

The greatest number of cars now arriving downtown in the morning by fifteen-minute periods is recorded between 8.30 and 8.45 a.m., when 161 cars are due. The normal number of cars required during the non-rush hour is at present less than eighty for each fifteen-minute period of the daily operation of the companies.

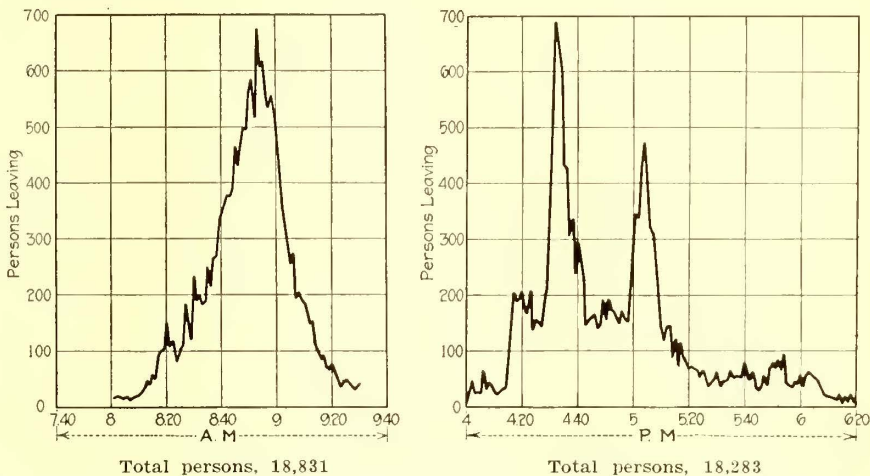
Even with the lower and flatter evening peak both companies in Washington run more cars then, than during the morning peak. The maximum number of cars scheduled to operate during the rush hours are as follows:

	Cars Scheduled	
	A.M. Rush Hour	P.M. Rush Hour
Washington Railway & Electric Company...	298	354
Capital Traction Company.....	217	231
Total.....	515	585

These figures represent the schedule requirements, but frequently both companies fall below in the actual number of cars operated, the reason being the shortage

not all desire transportation at once. If the sharp morning peak could be modified, it appeared certain that the afternoon peak would be similarly changed. There would be little likelihood of congestion arising from any reasonable hour of closing the various offices, unless too great a number were set to close at a later hour.

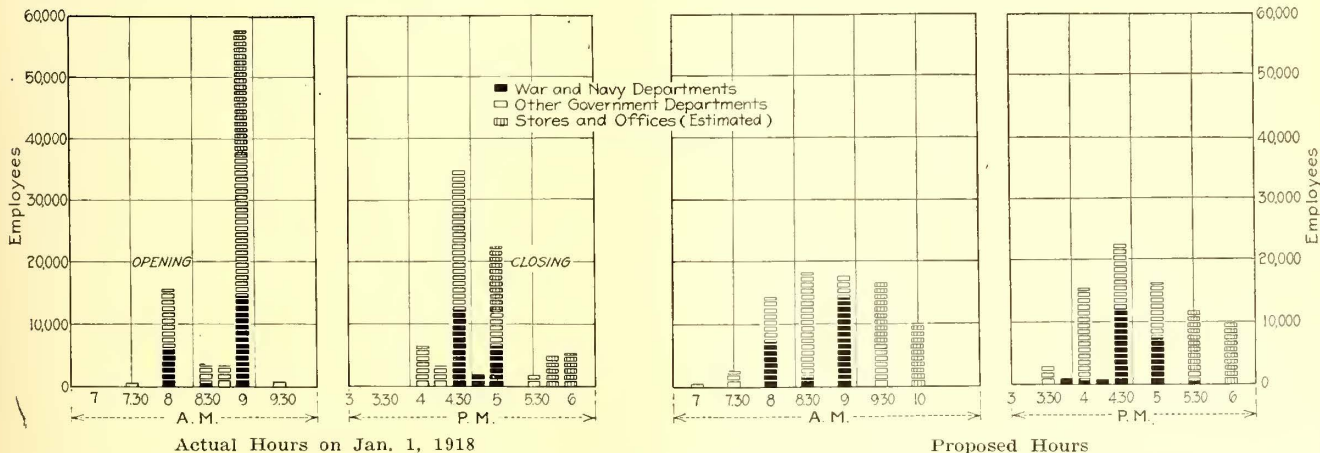
Another point kept in mind was the fact that the hours of various buildings in the same territory must



FIGS. 4 AND 5—COMPOSITE COUNT OF PERSONS ENTERING EIGHTEEN AND LEAVING NINETEEN PLACES OF EMPLOYMENT IN CONGESTED DISTRICT

be changed so that the loads on the cars do not coincide. Otherwise the hours might be changed so that the totals would appear well balanced, while in reality the congestion at certain localities might be worse than before. These factors in a large measure dictated the proposed hours of opening.

Furthermore, it was realized that groups of offices having business in common should be accorded the same working hours as far as possible. For this reason it was not considered generally desirable to split the hours for the employees in a single building. Finally, since changes generally are disapproved by those with firmly established habits, the modifications in hours proposed



FIGS. 3 AND 7—OPENING AND CLOSING HOURS IN GOVERNMENT DEPARTMENTS, STORES AND OFFICES

of men. During the winter this has been occasioned largely on account of sickness.

In order to alleviate existing conditions Mr. Beeler made a study to determine to what extent the usefulness of the electric railway facilities could be enlarged and employed to better advantage by a change of the hours of opening various offices, so that the employees would

were reduced to a minimum consistent with the purpose of obtaining the maximum degree of good service from the transportation system for the car rider.

In arranging the various proposed changes in opening hours, Mr. Beeler considered first the needs of the Army and the Navy. The United States is in the midst of the greatest war activity ever known. The Army and

the Navy Departments have in hand all they should do without having any new problems raised for their consideration. For the present, at least, Mr. Beeler says, there need be no change in their hours, which are in fact already staggered to a greater extent than those of the other departments.

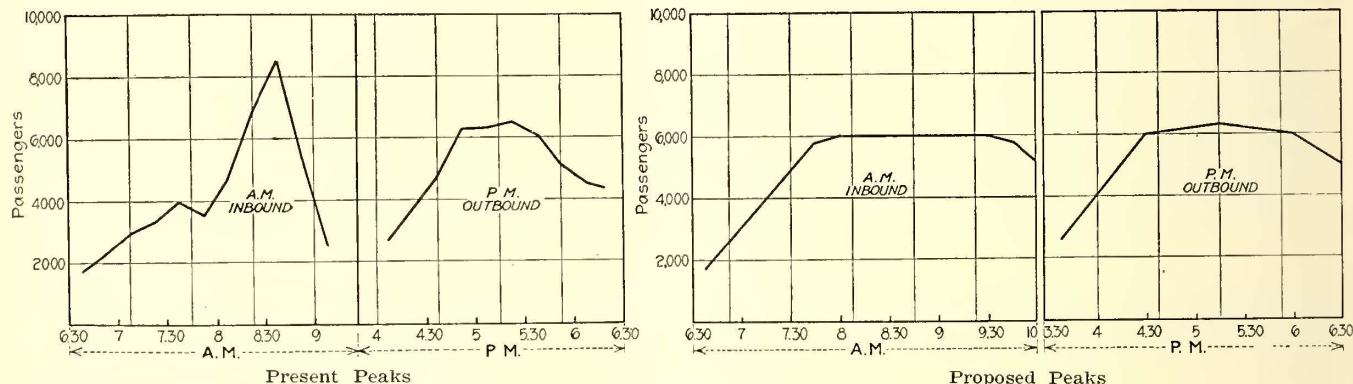
Since Washington is essentially a governmental city, other government business should rank second in importance. After the provision of a clear right-of-way for the Army and the Navy, the other departments should have their hours arranged so as to fit into the general scheme to permit a more even distribution of the opening and the closing hours, both the number of the employees and the locality of the buildings being considered. Some employees would be required to come earlier and some later than at present.

The private interests in Washington would be of third importance in fixing new opening hours. In Mr. Beeler's opinion, the private offices could readily open at 9.30 a.m. In fact, many of them are now opening after 9 a.m., and the change should not work hardship on anyone. All stores, including department stores (except

The hours proposed for each of the government offices are shown in Mr. Beeler's report in detailed exhibits, which give respectively the times for opening and closing each office, and the number of employees involved. In general, the hour of opening has been advanced from thirty minutes to one hour, and the closing hour similarly changed. A brief summary of the new opening hours is as follows:

Government offices, non-war activities.....	8.00-8.30 a.m. and 9.30 a.m.
Government offices, war activities.....	9.00 a.m.
Private offices.....	9.30 a.m.
High schools.....	9.30 a.m.
Stores (except those now opening prior to 8.30 a.m.).....	10.00 a.m.

A summary of the recommended changes in hours for the various government departments is shown in Table I, and the percentages of the employees affected are presented in Table II. The latter table shows that out of a total of 68,107 government employees, 42,870 or 63 per cent have their hours unchanged. Of the remaining 25,237, 4.4 per cent have their hours placed fifteen minutes ahead and 21.4 per cent thirty minutes



FIGS. 6 AND 8—ELECTRIC RAILWAY LOAD CURVES UNDER PRESENT CONDITIONS AND UNDER PROPOSED CHANGES IN OPENING HOURS OF BUSINESS

those now opening at 8 a.m. or before), should be opened at 10 a.m. and closed at 6 p.m. This would enable the employees to ride both ways when there is plenty of room on the cars. It would give the employees a slightly shorter working day, and they in turn should become more efficient. For some people there might be less time for shopping, but there would be ample time for buying. Keeping the stores open until 6 p.m. would enable the government employees to do their shopping after hours and in more comfort than at present, as the time is quite limited.

At present little or no business is transacted in the stores prior to 10 a.m. The change in hours would undoubtedly prove beneficial to the proprietors, employees and the public. The big stores, Mr. Beeler says, have expressed a willingness to co-operate and have shown a most commendable spirit to further the efforts of the Public Utilities Commission in every way in the solution of this problem.

The high schools, which open at 9 a.m., add a considerable burden to the transportation system. They could be set back to 9.30 without difficulty, as the day is comparatively short, and the students are home before the evening rush begins. Other educational institutions do not in any considerable degree affect the morning peak.

earlier. Only 2.2 per cent have their working day as much as one hour earlier. The number whose hours are thirty minutes later is 9 per cent of the total.

The private offices being set back thirty minutes will take 10,000 persons off the 9 a.m. peak, and the stores similarly being changed to 10 a.m. will remove an additional 10,000 from the rush hour. The high schools, while contributing a relatively small number, do add considerably to the overloading and can materially aid the situation and benefit themselves by changing the opening hour to 9.30 a.m.

BETTER SERVICE AND LESS DYSPEPSIA

These proposed changes in working hours, Mr. Beeler believes, will result in a material improvement in the appearance of the load curves. Fig. 7 indicates how the load will be spread out provided these changes are adopted and become effective. The blocks are here stacked in several piles, and the danger of falling over is greatly lessened.

The probable resulting load that will come to the traction lines is forecast in Fig. 8. It is readily seen that the companies should not only be enabled to handle in comfort thousands who are now compelled to walk, but that seats will be available through both the morning and the evening rush hours for a much greater

TABLE I.—SUMMARY OF RECOMMENDED CHANGES IN GOVERNMENT OPENING HOURS IN WASHINGTON

Department	Opening From	Changed To	Number of Minutes		Number of Employees
			Ad- vanced	Put Back	
Agriculture.....	9.00	8.30	30	..	3,143
Civil Service Commission.....	9.00	8.30	30	..	450
Commerce.....	8.45	8.30	15	..	600
District Building.....	9.00	8.30	30	..	1,000
Engraving, Bureau of.....	8.00	7.30	30	..	2,500
Food Administration.....	9.00	8.30	30	..	1,100
Fuel Administration.....	9.00	9.30	..	30	450
Interstate Commerce Commis- sion.....	9.00	9.30	..	30	830
Interior.....	8.45	8.30	15	..	2,328
Labor.....	9.00	8.00	60	..	450
National War Savings Com- mission.....	9.00	9.30	..	30	120
National Defense, Council of.....	9.00	9.30	..	30	1,000
Patent Office.....	9.00	8.30	30	..	984
Pensions, Bureau of.....	9.00	9.30	..	30	963
Post Office Department.....	9.00	8.30	30	..	1,833
Public Information, Commis- sion.....	9.00	9.30	..	30	150
Reclamation Service.....	8.45	8.30	15	..	81
Red Cross, American.....	9.00	8.30	30	..	711
State.....	9.00	8.30	30	..	300
Trade Commission, Federal.....	9.00	8.30	30	..	400
Treasury.....	9.00	9.30	..	30	2,672
War Department, Army Medi- cal Museum.....	9.00	8.30	30	..	140
War Department, Auditor.....	9.00	8.30	30	..	350
War Risk Insurance.....	9.00	8.00	60	..	1,050
War Risk Insurance.....	9.00	8.30	30	..	500
War Trade Board.....	9.00	8.30	30	..	1,100
Weather Bureau.....	9.00	8.30	30	..	32

proportion of the total passengers than ever before possible. There will be less danger of delay to the service, and hence less need for tardiness.

The spread in hours has been made sufficient for the cars to take down one load, return to the outer terminals and take down another. This can be repeated a number of times on practically all of the city lines. Short-line cars, or those which only run a portion of the way to the outer terminal, can also be used to better advantage. With the faster schedules possible by the use of the skip stop, the same number of cars now used will give a much improved service.

The time-tables will, of course, have to be readjusted to fit the new conditions. It should be possible, it is said, to rearrange the hours of work for the conductors and motormen so that they, too, will share in the benefit of the change in office hours. Since the cars will be in service longer during the rush hour, there should be fewer "trippers" and "split runs." This will remove one of the sources of complaint of the men.

An incidental advantage of the staggering of hours will be a more uniform distribution of the load on the power plants, which will permit more economical use of coal. The line voltage will be maintained more readily, which should insure an even operating speed throughout all periods of the day.

Suburbanites should be especially benefited by the improved car service. A regularity of headway on the long lines will be especially helpful instead of the flocks of cars which are now run in an effort to care for the excessive peak. This should result in opening up

suburban territory to a larger number of workers, including those who are boarding, and so relieve the congestion of the downtown districts.

The noon hour for lunch should be moved ahead or back to correspond with the opening hour. This will tend to spread out the peak load in the restaurants, so that conditions of crowding should not be so serious as at present. This should result in better service, less dyspepsia, and hence more efficient work for the government.

In short, Mr. Beeler avers, this staggering of the hours should be of great advantage to all business interests and the car riders themselves. The present tremendous crush that now occurs daily, due to nearly everyone in the city trying to observe the same hours, affects the entire commercial life of the community more or less. There is no really valid reason why anyone should insist on its continuance except that it is a long-established custom and difficult to change.

NEW OFFICE BUILDINGS SHOULD BE OUTSIDE

In conclusion Mr. Beeler mentioned the fact that the government is now building in Potomac Park two office buildings which will hold 15,000 employees. An extensive rerouting of the lines of both companies in Washington may be necessary to provide satisfactory transportation to this section. The hours for opening and closing for the new employees will also have considerable bearing upon the subject. This tremendous new development presents an acute problem which will be made the subject of a future section of this report.

If still further additions to the government offices are made, however, Mr. Beeler thinks that it would be well to consider locations near the outer ends of some of the existing car lines now operating a good, heavy service. This would at once render available a large amount of transportation facilities now idle, both during the opening and the closing hours. The cars are only very lightly loaded in the reverse direction of travel both morning and evening. This new traffic, being in the reverse direction, would make possible the utilization of the available capacity which is now wasted.

U. S. Chamber of Commerce Backs Peak-Flattening Movement

IN A BULLETIN issued recently by the Chamber of Commerce of the United States communities in which shipyards are located are urged to co-operate with the local electric railways in getting the shipbuilders to and from their work. The bulletin states:

"Of capital importance also is the question of carrying workmen to and from their work. The car lines in many communities are unable to meet the extra load which the influx of thousands of workers has put upon them. Some communities have had to solve the problem by changing the local business schedules by opening stores and offices a half hour later in order to have two peak loads and so give the workmen a rush hour of their own each morning."

Another very practical suggestion is that representative men of the communities "sit in" with the shipbuilders once a week and actually go over the problems of the latter to find out just how help can be given and then to give that help most urgently needed.

TABLE II.—PERCENTAGE OF WASHINGTON EMPLOYERS AFFECTED BY PROPOSED OPENING HOURS

	Number	Per Cent
Government employees with hours unchanged.....	42,870	62.9
Government employees with hours advanced fifteen min- utes.....	3,009	4.4
Government employees with hours advanced thirty min- utes.....	14,543	21.4
Government employees with hours advanced sixty min- utes.....	1,500	2.2
Government employees with hours set back thirty min- utes.....	6,185	9.1
Total of government employees with changed hours..	25,237	37.1
Total government employees.....	68,107	100.0
Private offices set back thirty minutes.....	10,000
Private stores set back thirty minutes.....	10,000
Total employees considered.....	88,107

Boston Elevated Maintenance Practice Discussed by Officials

At Hearings Before Massachusetts Public Service Commission M. C. Brush, John Lindall and H. B. Potter Explain the Difficulties Involved in the Upkeep of Equipment Under Present Conditions

AN EXTENDED discussion of the operating and maintenance practices of the Boston Elevated Railway was recently begun before the Massachusetts Public Service Commission, which is reviewing the report of John A. Beeler to the board upon the company's methods, submitted in November, 1917. Before the hearings are concluded the commission expects to make a thorough inquiry into the possibility of effecting increased economies in operation, service improvements, etc., along the lines recommended in the report. The hearings are being attended by President M. C. Brush and department heads of the company.

POSSIBLE PAINTING SCHEDULE WILL NOT MEET REQUIREMENTS

The painting of semi-convertible cars was the first topic discussed. President Brush conceded that these cars have been insufficiently painted, but pointed out that they are in practically constant service and that the company lacks funds with which to paint rolling stock at the desirable intervals. From 40 to 50 per cent of these cars are stored out of doors, as the carhouses are not, in general, suitable to accommodate cars of these sizes. The posts and columns are usually suited to 25-ft. body cars of the type formerly standard on the system. Some rebuilding has been done, but at great expense.

The facilities for painting are limited, also, space being available for but forty-eight cars in the several paint shops at any one time. The cars are now being painted on an average of once in three years, taking the road as a whole. Mr. Brush favored an annual painting, where possible. In the East Boston tunnel the severe grades impose heavy use of brakeshoes, and the dust covers the outsides of the bodies to such an extent that after a month or six weeks, the cars do not show the benefits of painting. It has been necessary to paint the roofs of steel elevated cars yearly on account of the thin material used. The demand for rolling stock has been so great on the system that painting has had to be postponed in many instances, wholly apart from the physical needs of the cars. In addition to all of this, experienced painters have been extremely difficult to obtain, under the present labor conditions.

John Lindall, superintendent of rolling stock and shops, testified that the time required to paint a car averages from seventeen to twenty days, depending upon the condition of the seat mechanism and other body repairs which are undertaken during withdrawal from service for painting.

Mr. Brush said that detailed plans have been made by Mr. Lindall for a centralized modern repair shop plant in the Everett district, to supersede the existing scattered repair shops and to permit the work to be

done at maximum efficiency. The raising of the money for the shops, however, is a problem. The company purchased a suitable site in connection with its right-of-way for the Everett elevated extension. All surface car and rapid transit line rolling stock repairs would be concentrated at this point.

Regarding the failure of cars in the recent extremely cold period. Mr. Brush said that the Boston company was in exactly the same position as other roads. It was impossible to get armatures fast enough to replace those which went out of commission. Seventy-four additional winders were employed at the Albany Street shops and the output was increased from a normal of seventy armatures wound per week to 166. The centralized shops would permit the simultaneous overhauling of bodies, motors and trucks, which is not at present feasible in view of the separation of shops for different classes of work at Boston. Mr. Brush said it is impossible to estimate accurately the amount which will be required for maintenance and reconstruction in any particular year because of the uncertainties which arise in railroading. Thus, in track and roadway, the sudden decision of a municipality to perform work on streets may throw a heavy and unexpected burden upon the operating company in connection with maintenance.

Mr. Lindall said that thorough inspection is done upon the semi-convertible surface cars on a basis of 800 miles operation. The mileage system of inspection has been in vogue at Boston since 1905. The company has made arrangements with the General Electric Company for the replacement of 100 GE-202 motors which have proved expensive to maintain; and has been delayed in spite of priority orders in securing the new type of motors expected under the replacement order. Most of the semi-convertible cars of the company are operated eighteen hours a day and every day in the year except Sundays.

MR. BRUSH DOES NOT FAVOR PUTTING MOTORS ON PRESENT TRAILERS

Regarding Mr. Beeler's recommendation that the company's 175 stepless, center-entrance trailers be modified and equipped as motor cars for all-day service, Mr. Brush said that this would be impracticable. These cars cost between \$3,000 and \$3,500, according to Mr. Lindall's recollection, and to equip them with motors would be very expensive. The trailers were designed for lightweight service during rush hours, and it is believed that the cars are the lightest per seat in the country. The company needs more trailers, in Mr. Brush's opinion. With their operation the public has been greatly pleased. New trucks would be required if the trailers were motorized, with new air-brake equipment, new control, reinforced underframing, changes in the hand-

brake rigging, lining of the underside of the car with metal, construction of a cab on each end, with respacing of seats, rewiring, repiping and other changes which would cost \$5,000 or \$6,000.

These trailers, if equipped with motors, would not be strong enough to pull another trailer, while to make this change would take at least eighteen months. They are useful as trailers because 13 per cent of the company's traffic is handled between 7 and 9 a.m., and 26 per cent between 4.30 and 6.30 p.m. The additional weight of the equipment with motor-car service would undoubtedly shorten the life of the car, the weight increase being estimated at 9 tons, from a present weight of 13 tons. Mr. Brush said that if he had the funds for new equipment he would appeal to the Electric Railway War Board for priority deliveries, and expected that he would receive them in view of the recently expressed opinions of President Wilson and Secretary McAdoo upon the essentiality of public utilities. Mr. Lindall stated at this point that deliveries are now nine to twelve months on trail cars and eighteen to twenty-four months on motor cars.

NEW EQUIPMENT BEST FOR TRAIN OPERATION

Mr. Brush said that the company is paying 50 to 100 per cent more on practically all supplies and equipment than a few years ago. Brakeshoes have advanced 263 per cent. The estimated cost of equipping present semi-convertible cars for multiple-unit operation is from \$2,500 to \$3,000. Mr. Brush disapproved of the utilizing of the semi-convertible car in train service, running a two-entrance car with one man.

H. B. Potter, assistant to President Brush, said that he knew of no case where in two-car train operation the conductor of the forward car controls the operation of the rear door of the forward car and the front door of the second car. In general, the company favors the purchase of complete new equipment for train operation rather than the attempt to operate older types of semi-convertible cars in trains. In view of motor difficulties on the company's No. 3 semi-convertible cars, it had been suggested that the gear ratio be changed to reduce the maximum speed and reduce thereby the burden upon the motors, but the replacement of older-type motors with more modern equipment appears the better solution.

Mr. Potter said that the company's policy is in the direction of increasing the maximum speed of cars rather than the reverse, in order to render better service. The cost of changing the gear ratio might run from \$250 per car against from \$2,500 to \$3,000 per car for new four-motor equipment, but the improved service of the later motors justifies the greater outlay. The company feels that it is cheaper to buy 100 new motors than to maintain the old ones (GE-202's). The manufacturers make an allowance per motor in the case of these older units which entered service about ten years ago, at the beginning of interpole motor design.

CARS INSPECTED EVERY 1000 MILES OR LESS

Cars on the rapid transit lines are divided into six lists for inspection, making a weekly inspection of such rolling stock. An investigation of the mileage of cars between inspections showed that the average was 707 miles per week; sixty-two cars averaged 850 miles each;

thirty-one cars 950 miles; fourteen cars 1050 miles; three cars 1150 miles. It appeared doubtful if any cars ran as high as 2000 miles between inspections. An investigation was also made of pull-ins for defects which exceeded the average mileage, and it was found that cars pulled in were not in every respect cars which had been simply out a longer time than the others. A casual inspection is made of every car nightly. Inspection on a mileage basis is less practicable on the rapid-transit lines on account of the frequent shifting of cars in train make-ups, and temporary and special movements. The surface cars are inspected on a mileage basis, this being more easily arranged in view of the close control of car units there practised, including restricted schedules of service. The daily inspection includes an examination of equipment for condition of brakes, loose parts, condition of doors, seats, etc.

Wisconsin Convention Discusses Operating Problems

Metal Electrode Welding, Increasing Hydroelectric Plant Efficiency and Solution of War Problems Are Leading Topics—New Officers Elected

THE program of the first day's session of the convention of the Wisconsin Electrical Association at Milwaukee, held on March 27 and 28, included papers devoted mainly to rates and rate increases. The "War Convention Banquet" was held on the evening of the 27th and, aside from the menu, was devoted entirely to subjects concerning the great world conflict. The attendance at both the convention and the banquet was approximately that of previous years.

On the second day all papers except that of M. C. Ewing of Wausau dealt with operating problems. Dean Treat, manager of the Wisconsin Light & Power Company, LaCrosse, Wis., read a paper on "Metal Electrode Welding." Mr. Treat pointed out the many advantages and savings made possible by the use of electric welding both in track work and in the shop. Following this paper was a general discussion of railway problems during which the various speakers expressed themselves as being in favor of one-man operation, a charge for transfer and a reduction in taxes rather than a 6-cent fare. An abstract of Mr. Treat's paper appears elsewhere in this issue.

An illustrated talk on "Increasing the Efficiency of Hydroelectric Plants" was made by Daniel W. Mead, consulting engineer of Madison. George E. Wagner, superintendent of plant, Madison Gas & Electric Company, Madison, Wis., then gave an illustrated talk on "Three-Phase Four-Wire Distribution," pointing out the advantages of this system as compared with the ordinary 2300-volt delta-connected system.

M. C. Ewing, secretary-treasurer of the Wisconsin Valley Electric Company, Wausau, then delivered a paper on "Utilities and the War." He pointed out that the war found the railways bound by such laws that their rates could not be increased like those of private industrial companies, that economies could no longer provide the necessary revenue and that increases were essential. Emphasis was placed upon the need of closer co-operation between electric railway employers and employees and upon the fact that extensions should

Preventing Spontaneous Combustion of Coal in Storage

Knowledge of Fundamental Principles Is Necessary If Waste in the Pile Is To Be Prevented
— Facts to Keep in Mind

AS MANY electric railways are planning to store as much coal this summer as they can obtain some suggestions just issued by the United States Bureau of Mines on the subject of spontaneous combustion of coal will be of immediate value. The bureau confines attention to the technical aspects of the problem, believing that the wisdom of establishing large storage piles is a matter to be determined from the facts in each case.

It is recommended that coal be stored in small quantities as near to the point of consumption as possible so as to avoid rehandling, extra transportation and the degradation of size which follows each rehandling.

If large storage piles are necessary these facts should be kept in mind: (1) The generation of heat is the result of slow oxidation of the coal surface. (2) This oxidation is much more rapid from freshly mined coal or from freshly broken surfaces. (3) The oxidation rate increases rapidly with increased temperature. (4) Different coals have different oxidizing rates.

LOW OXIDIZING RATES DESIRABLE

Where there is a choice of coal the bureau recommends that coal of the lowest oxidizing rates should be chosen, if known. Between two coals, that which is least friable should be selected and it should be so handled as to produce the least freshly broken surface. The coal should be as cool as possible when piled, it should be kept away from extraneous source of heat, and alternate wetting and drying during piling should be avoided.

As it is the fine coal or slack that furnishes the largest coal surface in the pile, lump coal should be piled where possible, the fine coal being removed and used immediately. Although there is a difference of opinion as to the effect on spontaneous combustion of the sulphur content in coal and of the piling of dissimilar coals together, it will be safer to use a low sulphur coal where possible and put only one kind of coal in a pile. In addition to these precautions the ground on which a coal pile is built should be dry.

(Concluded from page 661)

wait, but that maintenance must be kept at its highest efficiency.

L. M. Burch, president of the Electrical Supply Company, Madison, presented an explanation of the aims and purposes of the new association of Wisconsin electrical and contractors and dealers and solicited the co-operation of the electric utility executives in carrying out the plan. The committee on resolutions passed a resolution supporting President Wilson and the country at war.

The officers elected for the ensuing year were: President, John St. John, Madison; first vice-president, Raymond H. Smith, Oshkosh; second vice-president, W. C. Lownsberry; third vice-president, B. O. Watertown; secretary, A. P. Pulliam, Green Bay.

Other suggestions made by the bureau are these: Coal piles should be well ventilated and the surfaces of the piles should be exposed to allow them to cool. If the latter is impossible air circulation within the pile should be restricted. Where good ventilation, such as is provided by piling lump coal, is not to be obtained, it is desirable to approximate the condition which would exist in airtight bins. For this purpose, in making a coal pile of mixed sizes, the coal should be so handled as to make a homogeneous pile and prevent the segregation of coarse and fine coal. It is common practice to limit the height of coal piles, first because the lower layers are crushed in a very high pile, second, because the larger the pile the smaller proportionately is the area of the heat dissipating surface. Twelve feet is a common limit of height.

RECOMMENDATIONS FOR TEMPERATURE CONTROL

Whatever precautions are taken in piling coal provision should be made for keeping track of temperature rise and for rapid rehandling of portions of a pile in case of excessive heating. The bureau recommends that half-inch iron pipes be driven vertically into the pile 15 or 20 ft. apart. Into these pipes a maximum thermometer can be lowered to different depths to indicate the temperature of the pile opposite the thermometer.

A survey of the pile and of the temperature of all parts of the pile should be made twice each week during the first three months after the pile is made, and once a week thereafter until it evidently has ceased to heat. As soon as any portion reaches a temperature of 150 deg. Fahr. provision should be made for removing that portion, but actual removal need not begin until the temperature has reached 180 deg. The object of rehandling the coal is to allow it to cool below a dangerous temperature. Any method of rehandling which does not allow of cooling will always transfer the difficulty from the old pile to the new one, and it is generally useless to employ water in any attempt to cool a coal pile.

Trainmen's Poster Revised

THE United Railways & Electric Company of Baltimore has rearranged the "Motorman and Conductor" poster, issued by the National Fuel Administration.

<p>MOTORMEN and CONDUCTORS</p> <p>OUR COUNTRY</p> <p>NEEDS YOUR HELP</p> <p>UNCLE SAM HAS PUT IT UP TO THE ELECTRIC RAILWAYS TO SAVE A MILLION TONS OF COAL DURING 1918. TO MAKE GOOD WE MUST EXERCISE THE STRICTEST ECONOMY EVERYWHERE. BY CAREFUL USE OF POWER WE OUGHT TO BE ABLE TO SAVE EVEN MORE THAN THIS.</p>	<p>HOW YOU CAN HELP</p> <ol style="list-style-type: none"> 1. Get up to speed as fast and smoothly as safety and comfort of passengers will permit. 2. Coasting saves coal. Shut off controller and coast as far as possible before applying brakes. 3. It is seldom necessary to use current on down grades. 4. Bring car to a stop as quickly and smoothly as comfort of passengers will allow. With air brakes best results are usually had by making but one sufficiently strong application of air and then easing off. 5. Use judgment, when a vehicle is just ahead, and let car roll instead of feeding up controller. 6. Avoid skidding wheels. Avoid lanning air. Heavier air applications can be used at high speeds than at low speeds. 7. Save coal by economizing on light and heat. 8. The conductor's co-operation with the motorman in handling belt cord and passengers will mean getting the cars over the road with the least consumption of current. <p><small>APPROVED BY UNITED STATES FUEL ADMINISTRATION, WASHINGTON.</small></p>
--	---

TRAINMEN'S POSTER USED IN BALTIMORE

The revised form, which is on a card 6 in. high by 12 in. wide, is reproduced herewith. It is thought that the modifications improve the wording. The card is printed in red and blue inks and is designed for being posted in the motorman's cab.

Springfield (Mass.) to Have Zone Fares

Massachusetts Commission Recommends Two Five-cent Zones for Springfield, with Lower Fares When Tickets Are Purchased—Copper Zone System for Palmer and Westfield Districts

THE Massachusetts Public Service Commission on March 30 approved the establishment of a zone system on the Springfield Street Railway, modified, however, from the plan proposed by the company. The commission held that the company's zone plan provided for too abrupt an increase in placing the fare at 5 cents in the central urban area and at 10 cents to the adjoining zone points, without any intermediate gradations. For this reason it suggested special reduced-rate tickets for travel in the two zones. The company's application was noted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 4, 1917.

The commission recommended that the company take the following steps for the Springfield division:

1. Establish an inner zone, with the limits proposed in the schedule filed by the company.
2. Provide for a uniform cash fare of 5 cents in the inner zone, with free transfer privileges, and for a similar cash fare of 5 cents in the outer zone.
3. Provide for the sale of six tickets for 40 cents, or at the rate of 6 $\frac{2}{3}$ cents each, good between any point in the inner zone and any point in the outer zone which is not more than 5 miles by rail from Court Square, Springfield. This will take in most of the city of Chicopee and Chicopee Falls, East Longmeadow, Longmeadow and Agawam, and the major portion of West Springfield, which is not within the inner zone. The limit for these tickets on each line need not be fixed at precisely the 5-mile mark, but may be placed, with the commission's approval, at any natural point of division which approximates that distance. Adjustment should be made on the lines to Chicopee Falls, which reach the same destination by routes of varying length, so that the fares to the common point shall in all cases be on the 6 $\frac{2}{3}$ -cent basis.
4. Provide for the sale of six tickets for 50 cents, or at the rate of 8 $\frac{1}{3}$ cents each, good between any point in the inner zone and any point in the outer zone which is beyond the approximate 5-mile limit in which the 6 $\frac{2}{3}$ -cent tickets can be used.

For the Westfield and the Palmer divisions, the commission recommended the establishment of the copper-zone system upon the basis of a straight rate of 2 cents a mile, with a minimum charge of 6 cents for any ride covering not more than three zones and a uniform local fare of 6 cents in the heart of Westfield.

The company was organized as a horse railway in 1868. In the early days the cash fare was 8 cents, sixteen tickets being sold for \$1. With the beginning of electrical operation in 1890 the fare was cut to 5 cents, with no reduced rate tickets. The company now owns and operates 187.5 miles of city, interurban and rural track. The Springfield division includes all of that city and the adjacent area within the present 5-cent fare limits, including the lines in the city of Chicopee. The Westfield division connects at West Springfield, its main line extending through Westfield and Russell into Huntington, and including the local lines in Westfield. The Palmer division connects on the east at Indian Orchard and takes in the local lines in Palmer, Monson and Ware, its main line extending through Wilbraham and Palmer into Brimfield. The distance by rail from the eastern to the western limits of the system is about 50 miles. In-

terurban service is also shared with other companies to and from the cities of Holyoke and Worcester, Mass., and Hartford, Conn.

The old 5-cent fare area (Springfield division) totaled 61.5 square miles, the longest direct ride being 8.37 miles. The company proposed to divide this 5-cent area into two separate zones. The limits of the inner zone were fixed at points varying from 2.3 to 3.6 miles from Court Square, and the included area of the inner zone was 18.6 square miles. The following table shows the distance in miles from Court Square to the various outlying points, and the portions of the distance to be included, in each case, within the inner and the outer zones:

Route from Court Square to:	Miles in Inner Zone	Miles in Outer Zone	Total
Chicopee Junction via Brightwood.....	2.309	1.953	4.262
Market Square, Chicopee, via Glenwood	2.807	1.328	4.135
Chicopee Falls via Liberty Street.....	3.155	1.440	4.595
Chicopee Falls via East Springfield.....	3.653	2.016	5.669
Ludlow	3.201	5.170	8.371
Wilbraham Town Line.....	3.201	4.314	7.515
East Longmeadow.....	3.155	1.926	5.081
Longmeadow	2.874	3.262	6.136
Agawam-Connecticut State Line.....	3.416	4.343	7.759
Agawam-Feeding Hills.....	3.416	4.378	7.794
Westfield Town Line.....	3.324	2.911	6.235
Holyoke City Line.....	3.504	2.758	6.262

Under the company's plan the limits of the outer zone would in all cases coincide with the present 5-cent fare limits, except on the Westfield line, where 1.3 miles would be added by extending the limit in West Springfield from Tatham to the Westfield boundary. On the lines to Chicopee, tickets would have been sold at the rate of 8 cents each, good to and from points in the inner zone in lieu of a 10-cent cash fare; but no similar privilege would have been given, under the new schedule as filed, on any of the other lines.

In the Palmer division there were twenty-two overlapping zones, varying from 7.42 miles to 1.70 miles in length and averaging 5.09 miles, in each of which the fare was 5 cents. The company proposed to eliminate all overlaps and introduce two new limits in Palmer, so that there would be thirteen separate zones, varying from 6.54 to 1.70 miles and averaging 3.82 miles in length, in each of which the fare would be 6 cents.

In the Westfield division, to disregard certain short local lines in the thickly-settled portion of Westfield, there were thirteen zones, varying from 9.09 miles to 1.05 miles in length and averaging 4.14 miles, in each of which the fare was 5 cents. The company proposed to eliminate certain overlaps and to reduce the length of the first zone out of Westfield on the line to Springfield, so that there would be ten zones, varying from 7.79 to 1.05 miles and averaging 3.78 miles in length, in each of which a 6-cent fare would be charged.

In the opinion of the commission, the abolition of the overlaps in the Westfield and Palmer divisions would have undesirable results. In a few cases the fare would rise from 5 to 18 cents; in others, from 5 to

12 cents. Such increases, the board said, would be greatly resented by the population served and would lead to much walking or possible jitney patronage.

The commission concluded that the copper-zone system is far better adapted to these divisions. While such a system is still in the experimental stage, the outlook is promising. The commission stated that it could not determine the effects upon revenue, but suggested that new tariffs based upon 2 cents per mile be adopted. The average charge per mile for through traffic on the interurban line between Springfield and Brimfield would then be higher than the 1.74 cents proposed by the company, and on the Westfield-Huntington line there would also be some increase. On the other hand, the mileage plan would reduce the charge for many local rides, especially in Palmer, but less falling off in riding should be expected.

The commission held, however, that the town of Westfield is large enough to receive a uniform fare with free transfer privileges in a reasonably limited territory. It would be difficult to apply a mileage plan to the short local lines within the town. The commission recommended, therefore, that Westfield be given a uniform local fare of 6 cents, covering all short lines in the thickly settled district. Provision should be made in the tariff so that, in journeys between points in the Springfield division or the Westfield 6-cent zone and points in mileage territory, the minimum fare should not apply in the latter. Thus, in riding from a point in the center of Westfield to a point in the first mileage zone on the Huntington line, the fare should be 8 cents, instead of 6 cents plus the minimum mileage fare of 6 cents.

EASIEST FARE SYSTEM NOT ALWAYS THE BEST

In discussing the company's proposed inner and outer 5-cent zones for the Springfield division, the commission mentioned the argument of protestants that the suburban territory had been built up under the uniform fare system, with the understanding that this system was not likely to be disturbed, and that a departure from this system would be unjust and prejudicial to the inhabitants and especially to the owners of real estate. The fear that a zone system would have any substantial influence upon land values in these districts is not, the commission said, well-founded. But even if it should have such an effect, it is no doubt a fact that the extension of electric railway lines into this territory materially increased these values in the past, and that land owners enjoyed and profited by this unearned increment. If they should be deprived of some slight measure of this increment by an attempt to apportion the mounting cost of electric railway service more nearly in accordance with the service furnished, they would have no reasonable ground of complaint. There has, in this instance, been no contract that fares would continue for any period of time upon the uniform basis, such as has existed in the Boston district.

The substitution of a 6-cent fare for the present 5-cent fare in the Springfield division would undoubtedly be the easiest and simplest method of dealing with the situation, and it is quite possible that it might meet with less open and immediate criticism than any other. It is also true that there are difficulties in the application of a zone system, and that no practicable

system of fares can be devised which will be entirely free from inconsistencies or minor discriminations. The easiest way is not always the best, and experience has shown clearly that there are serious objections to a straight increase in fare in urban territory, such as is included within the Springfield division.

Continuing, the commission said:

"Experience has seemed to demonstrate, and electric railway managers are very generally of the opinion, that an increase from 5 to 6 cents discourages short-haul riding, encourages competition and appreciably diminishes the kind of traffic which it is particularly desirable to attract. The importance to the public, as well as to the company, of doing everything that can be done to hold and increase this short-haul business is obvious. The best means of developing it is, clearly, to retain a low minimum fare. If a straight raise to 6 cents were made, and results did not prove satisfactory, the next step would be a 7-cent fare, which would have an even more unfavorable effect upon short-haul traffic. On the other hand, a 5-cent fare is convenient and popular, encourages riding and is an excellent weapon with which to meet jitney competition.

"The short-haul rider has been discriminated against, up to the present. A 5-cent fare is ample, in urban territory, to cover the cost of service, and if a readjustment should be made which would retain that fare for the shorter distances and require the long-haul rider to pay a charge more nearly proportional to the cost of carrying him, certainly no injustice would be done. Under the circumstances the commission is of the present opinion that some form of 'zone system' will, on the whole, produce better results for the community than the adoption of a uniform 6-cent fare. We realize the practical difficulties in the application and the operation of such a system. Experience as yet is so limited that no one can positively affirm that expectations will be realized. The theoretical advantages, however, warrant us in feeling that the experiments should be tried."

GRADATION OF FARES NEEDED BETWEEN ZONES

The plan contained in the schedule filed by the company was considered objectionable, however, for two reasons. In the first place, if the estimate of the company is correct, its plan would produce substantially more revenue than the amount shown to be reasonably required. The estimate is \$477,762, and this was based on the traffic in the year ended June 30, 1916. For the calendar year 1917, the amount is increased to nearly \$520,000—to be secured from the Springfield division. The commission's estimate of additional revenue required is \$400,000 for the entire system. Of that \$60,000 can be obtained from the outlying divisions. This makes the amount assessable against the Springfield division about \$340,000.

In the second place, the board said, the zone plan proposed is not well considered. The fare jumps abruptly from 5 cents to 10 cents, without any intermediate gradations, creating the same undesirable conditions which led to the development of the overlapping zones in the Palmer and Westfield sections.

On the whole, the commission was not disposed, for the present, to disturb the inner zone limits as fixed by the company. Actual experience might develop valid reasons for making some adjustments in certain in-

Metal Electrode Welding*

How the Electric Welder Helped One Property to Keep Its Equipment in Repair

BY DEAN TREAT

Manager Wisconsin Railway, Light & Power Company,
La Crosse, Wis.

THREE important points in favor of this kind of welding are: (1) Direct current is easily available to railway operators; (2) only simple apparatus is used, and (3) various types of work are possible at a comparatively low cost. The type of machine selected by us consists of a four-wheeled hand-drawn set of resistors with circuit-breaker cables sufficient to secure proper electrical contacts. It can be operated by an ordinary track man without a great deal of instruction. The average time to weld 1 lb. of electrode is about fifteen minutes; the average cost of the current used, based on 1 cent per kilowatt-hour, is 15 cents, and of labor, based on 30 cents an hour is 7½ cents. This makes a total cost of 22½ cents per pound of melting.

Our first test made was the welding of plates on 80-lb. T-rail that was slightly battered at the joints due to working which had partially destroyed the concealed type of bonds. The plates were put on in the fall as a test and proved entirely satisfactory. The cost was about \$4.50 per joint.

We have installed 230 pairs of these plates and after two winters not a joint failure has been found. Battered edges were built up and ground for a span of 9 in. on each side of the joint. On one stretch of track, 4000 ft. of 66-lb. rail had to be built up at practically every joint, ½ in. of metal being added in some cases. The special work in all parts of the city and badly worn railroad crossings were built up successfully, the former without removal or disturbing the paving, and apparently can be kept up until such time as defects develop that cannot be repaired by the electric welder. At one town on our system in 1916, electric welded plates were installed on a 70-lb. T-rail for about 3500 ft. during a concrete paving job, and they have proved entirely satisfactory, showing no breakage. We have

* Abstract of paper presented at meeting of Wisconsin Electrical Association, March 28, 1918.

(Concluded from page 664)

stances, it said, and the matter will be regarded as open for future consideration, without prejudice, after such experience has been secured.

In the case of the outer zone there are two different methods by which a gradation of fares can be established between the minimum and the maximum. Provision can be made for successive concentric sections, in each of which a small additional cash fare of 1 or 2 cents would be charged, or provision can be made for intermediate steps through the sale of tickets. The latter plan, which the commission recommended, has the advantage that it simplifies fare collections by eliminating the handling of pennies, and any person who rides with any frequency can easily obtain the advantage of the reduced rate. Those who ride very infrequently may prefer to pay the full cash fare rather than to invest in tickets. To the commission's mind, however, it is not unfair that riders of this class should

also used the welder for repairing cupped joints and special work, car seat frames, gear and pinion seats, skids used during broken axle trouble, drawbar heads, motor casing breaks and gear cases. It has also been used for filling in worn-out holes in brake rigging and when plugging and redrilling axle bearings.

On two paving jobs welded plates on over a mile of single track were installed when the temperature was about 90 deg. Fahr. During this winter as low as 26 deg. below zero was recorded, giving a range of 116 deg. Fahr., yet not a single failure occurred at the joints or elsewhere in the rail section. From tests, over 150 per cent conductivity has been found at the joints and the joints are located with difficulty either with the eye or when riding over them in the cars.

Our costs for the welding of plates to serve as angle bars and bonds on 73-lb. T-rail were \$4.73 per joint. On cupped joints the cost was from 25 cents to 75 cents per joint, although a very unsatisfactory hand grinder was used. On shop work repairs the cost was from 1 to 9 per cent of value of the article repaired.

In conjunction with the electric welder it is essential to have a satisfactory grinder to smooth the work and give it an even surface. The grinder first used by us did not prove entirely satisfactory due to the unequal hardness of the rail and the weld. There was a tendency for the adjoining portions of the rail to be worn away more than the weld. The experiment of grinding out the cup to make a gradual depression rather than of trying to build it up was tried and proved quite successful for a temporary arrangement.

A few tests have been made on 45-lb. T-rail in which the bolts were first tightened up, then the angle bars were welded to some of the bolts and also along the lower edge of the angle bar to the rail base. The cup at the joints was then built up and ground smooth. This work has passed through the winter entirely satisfactorily which would indicate that this rail can be kept in use until permanent paving is laid.

The sum of about 30 cents per day will pay for the overhead expense of an electric welder, and one railroad crossing saved will more than offset the expense of the machine for one year. Electrode welding has been rightly, though not completely, named "first aid to injured track and shop equipment."

be charged a higher rate, and by so doing the ticket rate can be kept lower than otherwise possible.

Operating economies, the commission thought, would be possible along certain lines, such as the prohibition of automobile parking in the congested territory; provision of safety zones and multiple-berth stops (the latter are now in use); increased street inspection, fewer stopping places, improved handling of cars, operation of turn-back cars, use of limited-stop cars, reduction of damages through improved operation, transfer changes and use of one-man car on some lines. The commission did not approve the suggestion of John P. Fox, the city's expert, that existing cars be quite generally operated by one man, by closing up the rear door and making other minor changes. In general, the commission favored the improved practises recommended by Prof. Albert S. Richey, Worcester, Mass., whose report was abstracted in the ELECTRIC RAILWAY JOURNAL of June 2, 1917.

LETTERS TO THE EDITOR

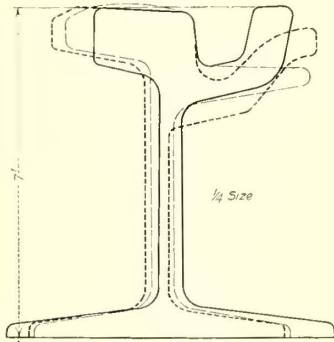
British and American Rail Sections

EDGAR ALLEN & COMPANY, LTD.
SHEFFIELD, ENGLAND, Feb. 20, 1918.

To the Editors:

I was much interested in the article in your issue of Dec. 1, 1917, by Mr. Schreiber upon tramway rails and have since read the comments by American way engineers on page 1126 of your issue of Dec. 22. These have also been summarized in the February issue of the *Electric Railway & Tramway Journal*.

The conditions under which tramways work in this country are, of course, widely different to the lines in the United States, and our Board of Trade would not permit the use in paved streets of any of the four rails mentioned by Mr. Schreiber. The use of only a grooved or Trilby rail, more severe than your Trilby, would be permitted. It is only of late years that wider grooves have been permitted. I inclose a compound section showing the British standard rails in combination with



COMPOUND SECTION SHOWING BRITISH STANDARD 4C RAIL WITH TWO POPULAR AMERICAN SECTIONS

Lorain Steel Company's sections 116/434 and 101/486.

Personally, I do not like any of the four sections Mr. Schreiber selects, and I do not agree with the arguments put forward. I fail to follow how street vehicles can either cross or turn out of the tracks laid with what you call a tram head without damage to their axles, let alone damage of the permanent way which is admitted, and even if all vehicles had pneumatic tires, both tires and axles must deteriorate from this cause. That, however, is looking at the matter from an English point of view which, after all, is the only view to take under English regulations. Furthermore, the Lorain grooved section 116/434 could not be used here for reasons already given, and you will note that our standard sections have a narrower and, we consider, a more perfect groove. Consequently the objections to the Trilby section would be greatly increased from the American aspect.

There are, no doubt, advantages which can be claimed by all the sections in accordance with conditions under which they are used; for example, an easier gage and easier running for the car wheels with your tram rail as against the English grooved rail. However, I do not admit the "greater noise" or increased derailments even through "special work." If the track is properly laid such derailments should be very few.

Speaking as a manufacturer, I do not think that British tramway engineers, even if permitted, would willingly change their present type of rail for the American types.

FRED BLAND, M. I. Mech. E.
Member Engineering Standards Committee.

Malleable Iron Overhead Fittings

EAST PITTSBURGH, PA., March 28, 1918.

To the Editors:

In regard to the article by Charles Rufus Harte, on "Overhead Line Economies," as published in your March 16 issue, your readers may be interested in the following comments of our engineers:

The Westinghouse Electric & Manufacturing Company has manufactured and recommends the use of malleable iron trolley frogs, section insulators, crossings, and mechanical ears, for the last six or seven years, and the material installed in each case has given satisfactory service.

Very few of the large electric railway systems are to-day using bronze trolley frogs and crossings. Malleable iron wears better, is no more liable to arc than bronze, and, if an arc is formed on the malleable iron frog, the injury to it would not be so great as it would be if the frog were of bronze.

Bronze approaches, of course, are used generally as the greatest wear is at the approach, and where a flexible removable approach is installed, unusually long life of the frog and crossing proper is obtained.

M. C. TURPIN,
Assistant to Manager, Department of Publicity.

Better Salaries for Technical Men

BOSTON, MASS., March 30, 1918.

To the Editors:

By way of introduction of such a subject, it is wise to start by giving a working definition of the phrase—technical men. All those who adapt the truths of science to the uses of industry may be included under this head.

Why do not engineers and chemists receive better compensation? The captains of industry immediately reply that supply and demand regulate the wage. The market is glutted with technical graduates who know nothing of adapting the truths of science to industry. They are mere possibilities of the future and need many years of experience. Our industrial captains few of whom have much acquaintance with technical subjects, allow these fledgling engineers and chemists to invade fields of endeavors at such low salaries as to drive out technical men of whose services the country is now in dire need.

That is the much mooted law of supply and demand. Much is thought of quantity but little of quality. The direct use of engineering brains is considered a necessary evil. It does not produce any immediate money return, as does the energy of a salesman. In Germany from thirty to one hundred times as many technical men are employed in industry as in this country. The press is full of the wonderful efficiency of the German "kultur." Much of it is due to the co-ordination of the financial and technical groups.

Heretofore, the truth-seeking ideal of the technical man has made him a class-less individual. There is a glimmering light of hope on the horizon—the rise of class consciousness. The power of the labor unions has undoubtedly helped the engineer, for many of the increases granted to technical men have been caused by the increased wages of labor.

TECHNICAL MAN.

Tremendous Demand for Motormen's Power-Saving Books

NEW HAVEN, CONN., April 1, 1918.

To the Editors:

The influence exerted by your journal in the electric railway field has recently been brought home to me in a very striking way. About a month ago you published a short note referring to the Connecticut Company's power-saving campaign, and mentioned that a small handbook on power saving, written specially for motormen and conductors and used by me in this campaign, could be had at cost by other companies for use on their own properties. The result of this brief mention has been astonishing. From all over the country, from the Atlantic to the Pacific and including Canada, has come a flood of requests for copies. Frequently our mail would contain requests from the widest possible diversity of ranks, *i.e.*, from motormen, chief motormen, shopmen, master mechanics, superintendents, managers, and railway presidents. I have had temporarily to engage additional help to take care of the added work.

In a great many cases, and following receipt of the sample copy sent, orders for additional copies varying from fifty to several thousand at a time were received, depending upon the size of the road.

Noting the interest aroused and the kind reception which has been accorded the handbook, I followed up the matter by sending a complimentary copy to the chief executive on every electric railway operating more than twenty cars. A further rain of orders followed, and with each mail they are still pouring in.

From present indications it looks as though most of the platform men in the country will soon have been supplied with copies of these books.

WILLIAM ARTHUR.

Investigation to Devise Means for Increasing Coal Output

The percentage of total available coal recovered in the process of mining is a factor of increasing importance under the present conditions when the demand for fuel is so abnormally high. Under the belief that the percentage of extraction at present is too low, especially in the mining of bituminous coal, the Engineering Experiment Station of the University of Illinois, in co-operation with the Illinois State Geological Survey and the United States Bureau of Mines, has undertaken an investigation of the subject. The results have just been published by the university and show that there is an excellent opportunity to improve conditions in the Middle West field by more systematic methods of mining.

On March 30 United States Fuel Administrator Garfield signed formal orders instituting the zone system of distribution for bituminous coal. Twelve general orders, imposing upon the movement of coal the limitations arranged by the Fuel Administrator and the Director General of Railroads were issued. They will be communicated at once to those charged with the enforcement of the zone system distribution plan.

AMERICAN ASSOCIATION NEWS

War Board Deprecates Making of Unnecessary Improvements

ON APRIL 2 the Electric Railway War Board sent out its fourteenth bulletin, devoted to the subject of "Unnecessary Improvements." The purpose of this was to call the attention of electric railways to a resolution of the recently organized War Industries Board, setting forth the necessity for the limitation of capital expenditures for either public or private undertakings not essential to, and not contributing either directly or indirectly toward, the winning of the war.

The Electric Railway War Board prefaces the resolution with a statement that "This imposes upon the management of railway lines a double patriotic obligation: (a) to forego for the duration of the war all expenditures which the management may have contemplated, no matter how advantageous they may seem for the company, unless the expenditures will directly help the government in the prosecution of the war; (b) to direct the attention of the proper local authorities to the position taken by the representatives of the national government to the end that the local authorities be induced to co-operate with the national government by foregoing, for the present, all public improvements which will not be helpful in the prosecution of the war, or which are not at this time absolutely essential to the welfare of the communities. This applies as forcefully to expenditures not connected with railway matters as to those affecting railway interests."

National Committee Sends Out Pamphlets

THE national committee on public utilities, of which the American Electric Railway Association is a member, has issued in pamphlet form a copy of an address made by P. H. Gadsden, president Charleston Consolidated Railway & Lighting Company, before the City Council of Charleston on March 11, on the question of higher rates. The reasons which oblige the electric railway companies at this time to ask for higher rates are put forward by Mr. Gadsden, and it is thought that the pamphlet will be of general interest to utilities as a whole.

Air Brakes Discussed at Portland

THE Cumberland County Power & Light Company section held its regular meeting on March 26, preceded by a supper. The principal speaker was George H. Martin, Westinghouse Traction Brake Company, who explained the operation of air brakes, particularly those of the type installed on one of the railway company's lines. The section orchestra played during the evening, and there was a patriotic talk on the income tax and the Liberty Loan by a local speaker. A commendable feature of the meeting was the discussion following Mr. Martin's talk. Numerous practical questions were to put the speaker, who in answering them was able to give just the information desired by his audience.

Eliminating Unnecessary Lighting and Heating in the Carhouse

Fire Risk and Energy Waste Are Considerably Reduced by Cutting Off the Power Supply from Stored Cars

BY T. F. MULLANEY

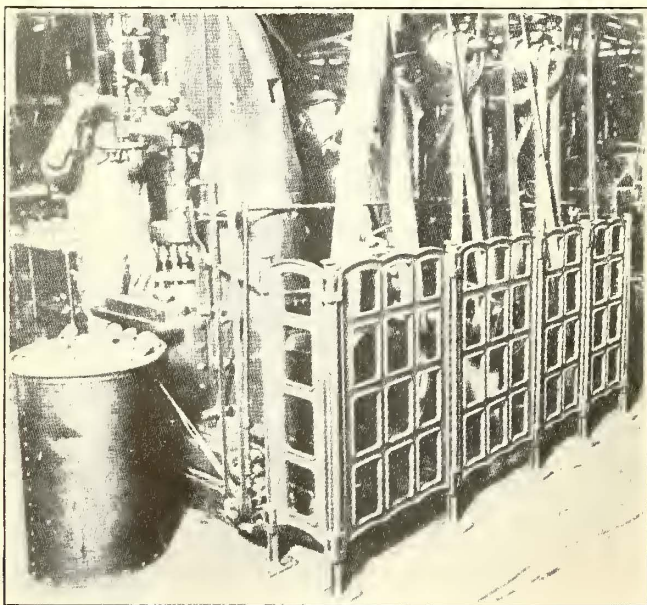
Former Chief Engineer Third Avenue Railway System,
New York City

WE HAVE HAD a great awakening lately in regard to the waste of energy in the operation of cars over the line. Little thought has been given, however, to the waste of lighting and heating energy in cars standing in the carhouse. Crews are ordered, naturally, to cut off all power; but human beings are so forgetful or indifferent that thousands and thousands of tons of coal are burned up to no one's good except that of the coal dealer.

This subject was brought vividly to my attention some years ago in connection with the insurance of rehabilitated carhouses of the Third Avenue Railway System. The insurance companies wanted the fire risk reduced to a minimum, and this could be done only by cutting off power from the cars the moment they were stored. To meet this condition I invented an automatic time-limit circuit-breaker equipment, adjustable over a range of two to twenty minutes, now used by the New York Railways as well as the Third Avenue Railway System. The following figures give

Sectional Guards for the Shop

THE subject of the National Safety Council Service Series No. 594 is "Guard Rails" for shop use. The guard advocated is sectional, as shown in the accompanying photograph, and is said to be the cheapest and most efficient known. The posts are fastened to the floor with screws and the sections are hooked into the posts in the same manner that a bed is put together. The sectional guard is especially desirable where changes are frequent, and once the patterns are made the cost is said to be very low.



GUARD FOR USE AT DANGER POINTS IN THE SHOP

some idea of the power waste in the needless heating and lighting of stored cars.

It is assumed that cars stored between the hours of 6 p. m. and 6 a. m. have twenty 23-watt tungsten lamps per car burning during these hours. It is also assumed that cars stored during the day time or the night time will be consuming power in their heaters during such storage hours.

The number of points of heat used would vary, of course, with the temperature as follows: From 32 deg. Fahr. to 40 deg. Fahr., one point of heat, equivalent to 2.7 kw.-hr. per hour. From 25 deg. Fahr. to 32 deg. Fahr., two points of heat, equivalent to 4.2 kw.-hr. per hour. Less than 25 deg. Fahr., three points of heat, equivalent to 6.9 kw.-hr. per hour.

An investigation of the Weather Bureau reports at New York City, for the year 1914, disclosed the following facts: Number of days when one point of heat would be required, fifty-two; number of days when two points of heat would be required, forty-nine; number of days when three points of heat would be required, fifty-five.

An investigation of the operating reports of one of the large railways of New York City also disclosed the following: Between the hours of 6 a. m. and 6 p. m., the average car in regularly scheduled service is stored for 4.08 hours. Between the hours of 6 p. m. and 6 a. m. it is stored for 7.36 hours. Therefore the total storage time per car in each twenty-four hours is 11.44 hours.

Accordingly the yearly power consumption in lamps and heaters for each scheduled car in storage and not including any cars in dead storage or in the repair shop, is as follows:

The energy consumed in lights for one average car is $20 \times 23 \text{ (watt)} \times 7.36 \text{ (hours)} \times 365 \text{ (days)} = 1236 \text{ kw.-hr.}$

The energy consumed in the heaters is as follows:

One point of heat, 52 (days) \times 11.44 (hours) \times 2.7 (kw.-hr.) =	1606.18 kw.-hr.
Two points of heat, 49 (days) \times 11.44 (hours) \times 4.2 (kw.-hr.) =	2354.35 kw.-hr.
Three points of heat, 55 (days) \times 11.44 (hours) \times 6.9 (kw.-hr.) =	4341.48 kw.-hr.

Total 8302.01 kw.-hr.

The total energy for lights and heaters for each car per annum equals 9538 kw.-hr. At $\frac{1}{2}$ cent per kilowatt-hour, the cost of this energy is \$47.69. This represents the amount which can be saved for energy alone where the proper devices are used for rendering dead the track circuits in the carhouses. Further, there is a substantial saving in lamp renewals where such devices are used, as follows:

The total number hours of burning per annum per car while it is stored in the carhouse between 6 p. m. and 6 a. m. is $7.36 \text{ (hours)} \times 365 \text{ (days)}$, or 2686 hours per annum.

On the basis of an average life per lamp of 1200 hours, this figure would represent a saving in renewals per car per annum of

$$20 \text{ lamps} \times \frac{2686}{1200} = 44.76 \text{ lamps.}$$

The saving in the cost of such renewals, based on a lamp cost of 18 cents each, would be

44.76 × 18 cents =	\$8.06
Energy saving, as above	47.69
Total	\$55.75

The total saving in cost of energy and lamp renewals of \$55.75 per car per annum is surely one saving worth striving for in such times as these.

Center Entrance and Exit, Pay-as-You-Pass Trailers for Dayton

People's Railway Handles Rush-Hour Travel with Light-weight Trailers Operated in Two or Three-Car Trains—Special Signaling Features

THE People's Railway, Dayton, Ohio, operated by the American Railways, Philadelphia, has recently received from the Cincinnati Car Company ten new trail cars for city service. These weigh, light, about 22,000 lb. and are serving admirably in two-car trains for carrying workers to and from the various factories during rush hours. The company has some heavy double-truck cars equipped with four GE-80, 40-hp. motors, which, by changing the air brakes and installing signals and automatic couplers, have been made quite suitable for handling a train of two or three of these new trailers.

The cars have Heywood-Wakefield rattan-covered seats to accommodate fifty-five persons. These extend across both ends and along both sides, except at the double entrance and exit door opening in the center of one side. The doors are of the sliding type, 2 ft. 6 in. wide, operated manually by the conductor. He must stand to operate them, but may remain seated at all other times. Fares are recorded on Ohmer registers, but no fare boxes are used. The car is both pay-as-you-enter and pay-as-you-leave, depending on whether the passenger goes to the front or rear of the car. The passengers enter at the left door and pay when they pass the conductor either to go to the front end of the car or to leave. Thus when the rear half of the car is not filled, it becomes a loading platform for large crowds



FIG. 3—DAYTON TRAIL CAR WITH CENTER ENTRANCE AND EXIT DOORS

and the fares are paid later. A horizontal wooden hand rail extends the full length of the car on both sides.

Steel construction is used throughout, with stiffening on the dummy side furnished by two pier panels placed opposite the door posts. Between the sheet-steel roof and its canvas covering and below the window rails is a 1-in. layer of cork, which serves as a heat insulator. Four Peerless ventilators are provided on each side. There are Westinghouse automatic air brakes and Cincinnati arch-bar trucks with a 5-ft. wheelbase, the distance between truck centers being 21 ft. 8 in. Cast-iron wheels 24 in. in diameter, made by the National Car Wheel Company, are used, making the height of the step 16½ in. The step up to the car floor is 11½ in., with a 1-in. ramp in the entrance well.

An outstanding feature of these cars is the provision for signaling. The air and electrical connections, the latter including heating, lighting and signal circuits, are made by a Tomlinson automatic coupler, furnished by the Ohio Brass Company. There are three separate signal circuits, one to give the motorman a clear indication when all doors are closed, another to signal the motorman direct from the passenger's buzzers and a third, with buttons inaccessible to the passengers, to permit the members of the crew to signal each other.

The lighting system consists of three circuits of 20-watt lamps, and there are twenty-four 500-watt electric heaters per car, with Gold thermostatic control. The heating equipment and passenger buzzers were furnished by the Consolidated Car-Heating Company.

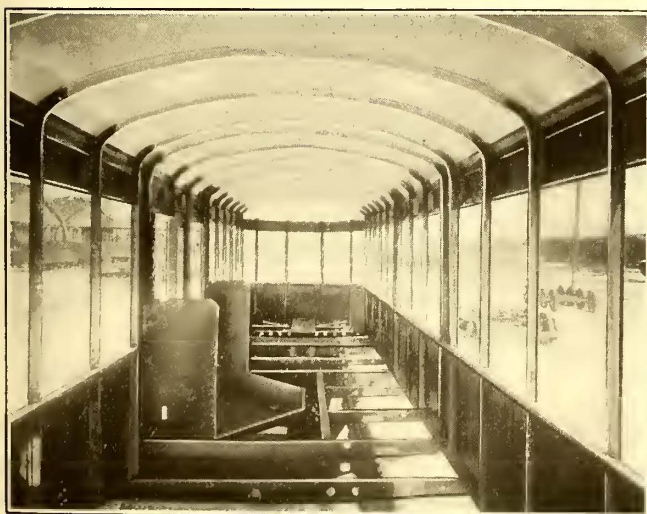


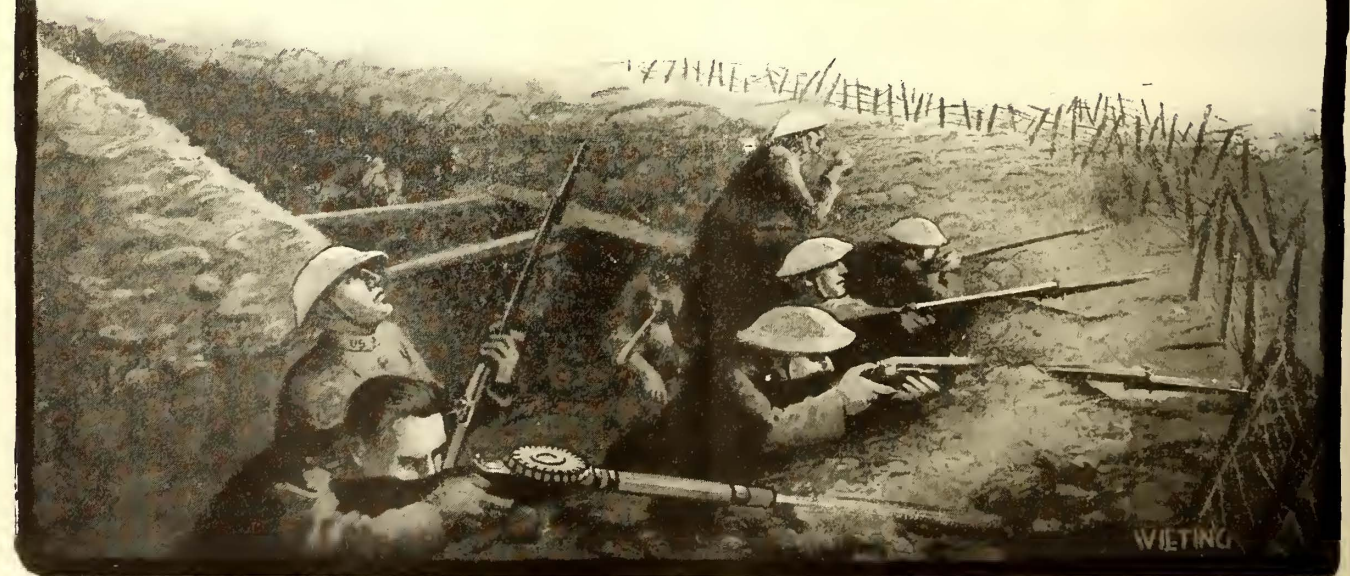
FIG. 1—STEEL FRAMEWORK OF THE NEW TRAIL CAR OPERATED IN DAYTON



FIG. 2—INTERIOR OF TRAIL CAR SHOWING CONDUCTOR'S POSITION



**The Buying Line
OVER HERE
Helps the Firing Line
OVER THERE**



Recent Happenings in Great Britain

Latest News Again Emphasizes Striking Similarity Between War Problems Affecting English and American Companies —Tramways Divided into Nine Areas

(From Our Regular Correspondent)

Conferences have been held recently between representatives of the tramway undertakings of the country and the tramways committee of the Board of Trade appointed to consider the difficulties of the various systems and to devise means to facilitate the continuance of tramway undertakings regarded as essential to the prosecution of the war. The committee has divided the country into nine areas, which have been placed in four groups under sub-committees, termed "area sub-committees." The nine areas are as follows: (1) Metropolitan and east coast; (2) Southeast and south to Bournemouth; (3) Southwest and south, excluding Bournemouth; (4) Midlands; (5) Lancashire, Cheshire and Wales (north); (6) Yorkshire and Lincolnshire; (7) Northern; (8) Scotland; (9) Wales (south). To assist the area sub-committees in carrying out their investigations there will be local advisory committees composed of representatives of the tramway undertakings in each area, who will consult with the area sub-committees.

When presiding at the conferences which have been held in the various areas, James Devonshire, chairman of the Board of Trade committee, said it was not the intention of the Board of Trade to control tramway undertakings, but to relieve them of as many of their difficulties and perplexities as possible. Each of the areas was to be in charge of an advisory committee elected by the undertakings themselves, and to have supervision over such questions as labor, rails, permanent way, rolling stock and car equipment, and priority for material.

On the question of more efficient car service, Mr. Devonshire suggested that local authorities should endeavor to arrange to have large employers of labor open at varying times, say, one at 6 a.m., another at 6.10, another at 6.20, and another at 6.30, instead of four at 6 o'clock. That system had been adopted around London with very good results.

Another way in which relief might be obtained was to ask ladies to do their shopping at times when the cars were not used by the workers. The chairman also dealt with the question of increased fares, rates for the conveyance of parcels and goods, the better utilization of cars in the distribution of food, the labor problem, and the transference of material and equipment.

He said it was possible that the Board of Trade would have to determine which undertakings should be wholly or partly discontinued in order that material might be transferred to other undertakings of greater importance. In regard to non-essential

routes the Ministry of Munitions had already made a complete survey of the tramways of the country, and if it became necessary to declare any non-essential he hoped the tramways owners would render assistance so as to avoid waste of time.

One of the functions of the advisory committee will be to advise as to the amount of compensation payable in respect of loss of revenue involved by reduction of service or closing of routes. For the advisory committee, he suggested the appointment of one member, perhaps the manager, of each tramway concern in the area.

For some time now the tube railways associated with the Underground Electric Railways, London, and the London General Omnibus Company, have been working together, and their receipts less working expenses, prior charges, reserves and other items, are pooled, and distributed in certain proportions. The five companies concerned are the Metropolitan District Railway, the Central London Railway, the City & South London Railway, the London Electric Railway, and the London General Omnibus Company.

HOW LONDON RAILWAY POOL WORKS

The gross receipts of the five undertakings were £6,661,000 for the past year, an increase of £623,000 over 1916. As the revenue liabilities were £610,000 higher, the increase in the common fund to be divided was £13,000, the amount of that fund being £520,337. Of this sum of £520,337 the London General Omnibus Company receives £166,508, the Central London £104,067, the Metropolitan District £62,440, the London Electric Railway £156,101, and the City & South London £31,220.

At the annual meeting of the London Electric Railway the chairman said the difficulties which the war had caused in connection with the operation of the railway had increased during the year. The amount of business done and the number of passengers carried by all of the underground railways had increased, due mainly to the limitation and alteration of services by the tramways and omnibus undertakings, particularly the latter, and to the abnormal conditions of London. Nearly one-half of the increase of £610,000 in the expenses of the common fund companies had been due to increased war bonus to the staff. The increase in gross receipts, while due mainly to the increase of passengers booked, had also been affected to some extent by the increased rates of fare put in effect on increased rates of fare put in effect in August, 1917.

The board in control of the London

Over the Top to the Third Line
Trenches!

properties did not believe in high fares for an urban transportation service, such as that supplied by this group of companies, nor did it believe under ordinary circumstances that the way to increase revenue was to increase fares. The present conditions, however, were so abnormal and the purchasing power of money so reduced that the effect to the company had been the same as if the rates of fare had actually been decreased. On this account it was very probable that further increases of fare would have to be made. There was no intention, however, of increasing the rates above the level which might be necessary to maintain the position of the undertakings and to provide for the maintenance of the property, but in so far as required for this purpose fares would be readjusted.

EDINBURGH HAS TRYING YEAR

At the annual meeting of the Edinburgh & District Tramways the chairman said that in many respects the past year had been by far the most trying through which the company had gone. Never had the company been beset with such constant trouble through shortage of materials, government restrictions and difficulties in finding suitable employees. Until well on in the year, the company was in a serious condition, as the system was being operated at a loss. The company was forced to approach the Corporation of Edinburgh to assist it by reducing the rent, pointing out that the only alternative was an increase of fares. The corporation could not see its way to meet this request, and immediate steps were taken to abolish the 1½d. and 2½d. fares.

The chairman thought that the agreement entered into by the company with the corporation after protracted negotiations was the fairest that could have been arranged. It was quite impossible with the depleted staff to give adequate service on all routes. The increase of fares had produced satisfactory results, and the number of passengers carried showed a steady increase. During the year the company carried a total of 70,687,146 passengers, which meant, assuming the population of the city to be 320,000, that the lines had carried the entire population 220.9 times throughout the year.

The general manager of the Edinburgh & District Tramways has drawn attention to the difficulties with which the company is at present contending, and has given warning of the possibilities of serious interruption of the tramway service. He has pointed out that the company cannot get new cables, and that the limited quantity for which it has priority terms from the Ministry of Munitions is insufficient to keep the system going. In normal times the company had spare cables, but now it had none, and those in use had been so patched and spliced that they were not reliable. Representation of the urgent need for maintaining the efficiency of the tramway service will be made to the ministry. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Electricity to Chestnut Hill

Service on Another Branch of Pennsylvania Railroad Established on April 1

Electric operation of the Germantown and Chestnut Hill Branch of the Pennsylvania Railroad from Broad Street Station, Philadelphia, to Chestnut Hill station, on the outskirts of the city, was commenced on April 1. This followed the electrification of the main-line suburban section from Philadelphia to Paoli two years ago.

Electrification of the Chestnut Hill branch was authorized by the directors of the company in 1913. The estimated cost at that time was \$1,250,000. Owing to war conditions, the commencement of the work was delayed until the fall of 1915, and many subsequent delays have been experienced through inability to obtain material and labor. The actual cost has been approximately \$1,500,000.

The first experimental train was operated on March 22. It consisted of three multiple-unit cars. The party that made the trip was composed of R. L. O'Donnel, assistant general manager, members of his staff and other operating and traffic officials.

Twenty-two multiple-unit cars are required in the operation of the service on the Germantown and Chestnut Hill branch, which carries a very heavy commutation traffic. The cars are of the standard suburban type adopted by the Pennsylvania Railroad, are of solid steel construction, and were built in the Pennsylvania Railroad shops at Altoona, Pa. They are equipped with Westinghouse motors, electrical apparatus and air brakes. Twenty-four trains are operated daily in each direction between Broad Street station and Chestnut Hill on weekdays and sixteen

on Sundays. There are ten stations on the branch, in addition to Broad Street station, West Philadelphia and North Philadelphia, which are main-line stations. The branch proper begins at North Philadelphia station.

In electrifying the Germantown and Chestnut Hill branch, 150 miles of wire was used, 232 poles were erected and twenty automatic block signal bridges constructed. At present trains are being operated on the steam schedule in use at the time the change was made. It is expected that ultimately the running time under electrical operation can be slightly reduced in both directions.

New Cincinnati Lease Likely

Members of the Rapid Transit Commission of Cincinnati, Ohio, and the committee on street railroads of the Council met with Mayor Galvin on March 29 to discuss the reopening of

Back those Bayonets with Bonds

negotiations with the Cincinnati Traction Company for a new rapid transit loop lease ordinance. This was made necessary by the fact that the Supreme Court of Ohio recently held that the provision in the original lease relating to the distribution of earnings was illegal.

Should the city and the company be able to agree upon the embodiment of the valid sections of the old ordinance into a new instrument, the disposition of the earnings will be the only question to determine. A 5-cent fare and universal transfers were provided in the original agreement. Mayor Galvin said that neither an increase in the rate of fare nor a departure from the custom of collecting a franchise tax would appeal to him.

Senate Passes Railway Bill

Measure to Insure Transit to Shipbuilding Sites Amended and Sent to the House

The Senate has passed a measure introduced by Mr. Fletcher of the commerce committee, to amend the emergency shipping fund provisions of the present urgent deficiency act, the result of which is to empower the President and his designated agents—in this case the Shipping Board—to take over, if necessary or desirable, transportation systems for the transformation of shipyards and plant employees. The bill "empowers," but does not "require."

The amendment to the deficiency act makes Paragraph F read as follows:

To take possession of lease, or assume control of any street railroad, interurban railroad, or part thereof wherever operated, and all cars, appurtenances, and franchises or parts thereof commonly used in connection with the operation thereof necessary for the transfer and transportation of employees of shipyards or plants engaged or that may be hereafter engaged in the construction of ships or equipment therefor for the United States.

Section 3 of Paragraph F of the act was amended as follows:

Sec. 3. That upon taking possession of such property, or leasing or assuming control thereof, just compensation shall be made therefor to be determined by the President, and if the amount thereof so determined by the President is unsatisfactory to the person entitled to receive the same, such person shall be paid 75 per cent of the amount so determined by the President and shall be entitled to sue the United States of America to recover such further sums as added to 75 per cent will make up such amount as will be just compensation therefor, in the manner provided for by section 24, paragraph 20, and section 145 of the Judicial Code.

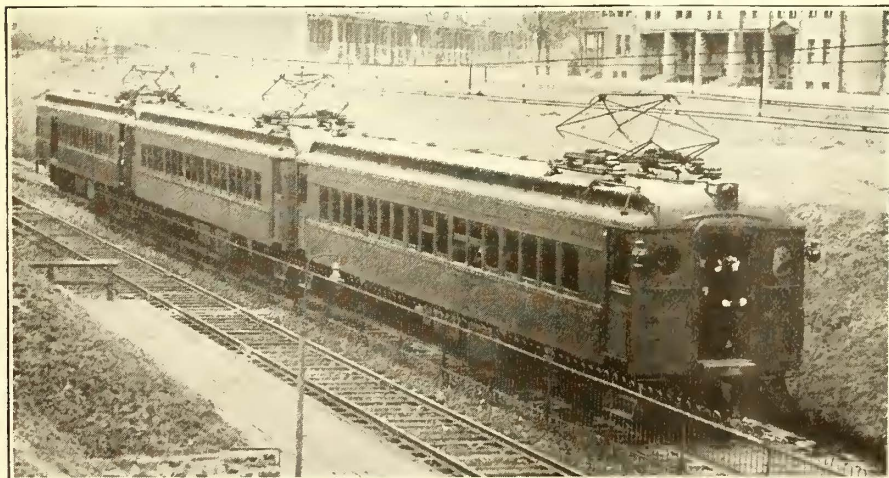
The President may exercise the power and authority hereby vested in him through the several departments of the government, and through such agency or agencies as he shall determine from time to time.

Senator Calder, who objected to the measure some weeks ago, said:

"The one danger, Mr. President, is that in case the Shipping Board are not exceedingly careful, they may have imposed upon them worthless railways at an exorbitant figure. I have had some doubt of the wisdom of the measure, but I do know that something must be done to relieve the situation in some of the out-of-the-way shipyards, which have been constructed during the past year or so. I have talked with the Shipping Board officials about the matter, and have expressed the hope to them that they will exercise the greatest possible care to avoid the danger of the government being imposed upon."

Senator Fletcher read a telegram from Admiral Bowles, for the Emergency Fleet Corporation, urging the passage of the bill.

The proposed amendments will now be laid before the House of Representatives.



FIRST ELECTRIC TRAIN TO CHESTNUT HILL

National Labor Policy Recommended

National Board to Act in All Labor Disputes Where Production Necessary to Conduct of War Is Concerned—Principles that Govern Relations Between Workers and Employers

The War Labor Conference Board appointed at the suggestion of Secretary of Labor Wilson to aid in the formation of a national labor program for the period of the war has made a report. The committee, whose appointment was mentioned in the *ELECTRIC RAILWAY JOURNAL* for Feb. 23, page 381, was made up of five employers, five labor men and two representatives of the public. L. A. Osborne and L. F. Loree, New York, were in the first group and Ex-President William H. Taft was one of the representatives of the public. The board recommends, among other things:

WAR LABOR BOARD TO BE CREATED

"That there be created, for the period of the war, a National War Labor Board of the same number and to be selected in the same manner and by the same agencies as the commission making this recommendation:

"That the functions and powers of the National Board shall be as follows:

"1. To bring about a settlement, by mediation and conciliation, of every controversy arising between employers and workers in the field of production necessary for the effective conduct of the war.

"2. To do the same thing in similar controversies in other fields of national activity, delays and observations which may, in the opinion of the National Board, detrimentally affect such production.

"3. To provide such machinery by direct appointment, or otherwise, for selection of committees or boards to sit in various parts of the country where controversies arise, to secure settlement by local mediation and conciliation.

"4. To summon the parties to the controversy for hearing and action by the National Board in case of failure to secure settlement by local mediation and conciliation.

"If the sincere and determined effort of the National Board shall fail to bring about a voluntary settlement, and the members of the board shall be unable unanimously to agree upon a decision, then and in that case and only as a last resort, an umpire appointed in the manner provided in the next paragraph shall hear and finally decide the controversy under simple rules of procedure prescribed by the National Board.

"The members of the National Board shall choose the umpire by unanimous vote. Failing such choice, the name of the umpire shall be drawn by lot from a list of ten suitable and disinterested persons to be nominated for the purpose by the President of the United States.

"The National Board shall refuse to take cognizance of a controversy between employer and workers in any field of industrial or other activity where

there is by agreement or federal law a means of settlement which has not been invoked.

"The action of the National Board may be invoked in respect to controversies within its jurisdiction, by the Secretary of Labor or by either side in a controversy or its duly authorized representative. The board, after summary consideration, may refuse further hearing if the case is not of such character or importance to justify it.

PRINCIPLES AND POLICIES TO GOVERN

"The Board in its mediating and conciliatory action, and the umpire in his consideration of a controversy, shall be governed by the following principles:

THERE SHOULD BE NO STRIKES OR LOCK-OUTS DURING THE WAR

Right to Organize

"1. The right of workers to organize in trade unions and to bargain collectively, through chosen representatives, is recognized and affirmed. This right shall not be denied, abridged or interfered with by the employers in any manner whatsoever.

"2. The right of employers to organize in associations of groups and to bargain collectively, through chosen representatives, is recognized and affirmed. This right shall not be denied, abridged or interfered with by the workers in any manner whatsoever.

"3. Employers should not discharge workers for membership in trade unions, nor for legitimate trade union activities.

"4. The workers, in the exercise of their right to organize, shall not use coercive measures of any kind to induce persons to join their organizations, nor to induce employers to bargain or deal therewith.

Existing Conditions

"1. In establishments where the union shop exists the same shall continue and the union standards as to wages, hours of labor and other conditions of employment shall be maintained.

"2. In establishments where union and non-union men and women now work together, and the employer meets only with employees or representatives engaged in said establishments, the continuance of such condition shall not be deemed a grievance. This declaration, however, is not intended in any manner to deny the right, or discourage the practice of the formation of labor unions, or the joining of the same by the workers in said establishments, as guaranteed in the last paragraph, nor to prevent the War Labor Board from urging, or any umpire from granting, under the machinery herein provided, improvement of their situation in the matter of wages, hours of labor, or other conditions, as shall be found desirable from time to time.

"3. Established safeguards and regulations for the protection of the health and safety of workers shall not be relaxed.

Women in Industry

"If it shall become necessary to employ women on work ordinarily performed by men, they must be allowed equal pay for equal work and must not be allotted tasks disproportionate to their strength.

Hours of Labor

"The basic eight-hour day is recognized as applying in all cases in which existing law requires it. In all other cases the question of hours of labor shall be settled with due regard to governmental necessities and the welfare, health and proper comfort of the workers.

Maximum Production

"The maximum production of all war industries should be maintained and methods of work and operation on the part of employers or workers which operate to delay or limit production, or which have a tendency to increase the cost thereof artificially, should be discouraged.

Mobilization of Labor

"For the purpose of mobilizing the labor supply with a view to its rapid and effective distribution, a permanent list of the number of skilled and other workers available in different parts of the nation shall be kept on file by the Department of Labor, the information to be constantly furnished: (1) By the trade unions; (2) by state employment bureaus and federal agencies of like character; (3) by the managers and operators of industrial establishments throughout the country. These agencies should be given opportunity to aid in the distribution of labor, as necessity demands.

Custom of Localities

"In fixing wages, hours and conditions of labor regard should always be had to the labor standards, wage scales, and other conditions, prevailing in the localities affected.

The Living Wage

"1. The right of all workers, including common laborers, to a living wage is hereby declared.

"2. In fixing wages, minimum rates of pay shall be established which will insure the subsistence of the worker and his family in health and reasonable comfort."

Final Philadelphia Hearing

The Public Service Commission of Pennsylvania on March 27 opened the hearing on the proposed lease of the Philadelphia high-speed transit facilities to the Philadelphia Rapid Transit Company. Mayor Smith representing the city was the first to take the stand. He presented the proposed contract and stated that he believed the agreement represented as fair and equitable a

business understanding as is possible to draft.

The Mayor was succeeded by William Draper Lewis, his counsel, representing the transit department of the city, who proceeded to discuss for the commission the meaning and intent of the contract, article by article.

The present hearing before the commission is the last move looking toward the validation of the agreement. Both branches of Councils passed the ordinance some time ago and it was promptly signed by the Mayor. The agreement was then approved by the stockholders and the directors of the company.

When Is Steel Not Steel?

Chairman Straus of the New York Public Service Commission Answers: "When It Is Agasote"

New York's new Mayor, John F. Hylan, continues on his discovery-making way. First he discovered the Brooklyn Rapid Transit; then he discovered the Public Service Commission, including Commissioners Straus and Whitney, with whom he had an animated correspondence; then he discovered Palm Beach and Mr. Hearst; then he came back to New York and discovered that the municipal employees, who of course couldn't go to Palm Beach, could loaf pretty near as well in New York, and now he has discovered the use of pasteboard trimmings in some supposedly all-steel cars in the Fourth Avenue Subway. Anent his latest discovery the Mayor wrote to Chairman Straus of the Public Service Commission:

"I wish you would examine the inclosed strip of interior finish and decoration of the steel cars of the Fourth Avenue Subway and let me know what you have to say about these cars being partly made of paper or pasteboard and not all steel, as the public are led to believe they are. The inclosure may be a new species of Public Service steel which I am not familiar with."

Said Mr. Straus to the Mayor:

"The term 'all-steel car' or 'car of all steel construction' as understood by all those who know anything about the subject, does not imply that all the materials in the car are of steel. To-day 85 per cent of the steel cars operating on the trunk lines in the United States are either partially or wholly lined with heat insulating material of the same or similar manufacture as the sample you have sent me.

"This particular material is known as 'Agasote,' and is not used as an interior lining for the purpose of reinforcing or adding strength to the car structure. The strength of the car is obtained by the steel frame, wall and roof, thus constituting an all-steel car from a construction standpoint, and the car is then lined with a material such as above stated, and which renders it less pervious to moisture, etc. I am sure you can find confirmation of these facts by consulting any expert upon 'all-steel car construction.'"

Kansas City Strike Settled

Sympathetic Strike That Set the Whole Nation to Talking Extended to Kansas City Railways, but Service Was Quickly Restored Under Protection

The Kansas City (Mo.) Railways had to suspend service on March 28 although the employees of the company, who are members of the union, had voted not to join the sympathetic strike in progress in that city. It was understood also that instructions had come from the headquarters of the national organization that the Kansas City men should not join the sympathetic movement.

The sympathetic strike was settled on the night of April 2. The workers returned to work under the former contracts. Many of those engaged in the building trades, however, were still out at that time, pending the adjustment of questions that were under discussion previous to the general strike. The order of the Kansas City Railways that the men should not display the union buttons caused a delay of an hour on April 3 in the full resumption of service, but the new agreement permits the men to wear the buttons, the union agreeing not to discriminate against trainmen without buttons. The agreement also provides that all differences shall be submitted to arbitration and that even at the renewal of the annual agreement, which expires in August, there shall be no strike. W. D. Mahon, international president of the Amalgamated Association, signed for the carmen.

At noon on March 28, despite the previous announcements of the president of the local car men's union that the men would not quit work, persons claiming to represent the sympathetic strikers announced that the cars would be stopped. During the afternoon the cars were brought into the carhouses and by evening no cars were running in Kansas City, Mo. Cars ran between Kansas City, Kan., and the downtown district of Kansas City, Mo., until eight o'clock.

Mr. Kealy the afternoon of March 28 issued a statement to employees which was published in display space on Friday morning. In this statement Mr. Kealy said:

"Those of you who are willing to return to your work are asked to report at once. You will be protected. You will earn the thanks of a public outraged by this blow at a service so necessary to its comfort and convenience. You have been forced out of work and your contract broken by these men. Isn't it time to stand for ourselves and our city against outside interference? We urge all to return to work."

President Kealy also sent to W. D. Mahon, international president of the Amalgamated Association of Street & Electric Railway Employees, a telegram

You Don't Need a Bank Account to Buy LIBERTY BONDS

notifying him that the Kansas City local had broken its contract.

Very few of the trainmen seemed to know when the orders to quit had come. They merely knew that their committee men had transmitted the order to them.

Meanwhile the police had taken a more vigorous hold of the situation and arrangements were made for the guard to help in the protection of street railway property and for policemen to ride on cars with the trainmen. On the afternoon of March 29 twenty-five cars, the maximum for which police guards were provided, started out. On the morning of March 30 the National Guard provided more help, and with an increased number of policemen, the railway was enabled during the day to operate about half of its normal number of cars.

The union employees who returned to run the cars continued to wear their union buttons. The number of men who returned was about equally divided between members of the union and non-members.

Last fall, when the men on the railway struck, an agreement was reached under which differences between the company and men were to be settled by arbitration. This agreement was between the company and an accredited committee of employees; the agreement itself made no mention of unions, or of the Amalgamated Association of Street & Electric Railway Employees. It was signed by E. F. Michael and several other employees. After its signing, a representative of the national order is said to have expressed his appreciation of the manner in which the company had met the men, and declared that he wanted to indicate the willingness of the national union to back up the agreement of the employees. At his request, therefore, he was allowed to indorse the agreement.

As stated previously the attention of President Mahon of the Amalgamated was called to the fact that this contract had been broken. He responded that this was true, but that the situation was peculiar. He was not ready to order the men back to work, alleging, it is said, that by so doing he would cause the railway men to abandon their fellow union workers in the midst of battle.

Toledo Results on April 10

At a meeting in the office of Mayor Cornell Schreiber on April 10, Federal Mediator Faulkner will announce the results of the examination of the books of the Toledo Railways & Light Company and the Toledo Traction, Light & Power Company, Toledo, Ohio, and explain their relation to the demand of the car men and electrical workers in the employ of the company for an increase in wages.

St. Louis Measure Passed

Ordinance for Settlement of Differences Between City and United Railways Before Mayor for Signature

The Board of Aldermen of St. Louis, Mo., on March 22 adopted the amendments suggested by the Board of Public Service to the proposed United Railways settlement ordinance.

SUMMARY OF PROVISION OF MEASURE

The adoption of the amendments means that:

1. The mill tax and franchise tax will be eliminated, and the United Railways will be required to pay to the city, in lieu thereof, one-half of 1 per cent of its gross receipts annually. This tax later may be increased not to exceed 3 per cent of the company's gross annual receipts.

2. The franchises of the United Railways subsidiaries will be validated and extended until 1948.

3. The United Railways will be permitted to earn for the present not to exceed 6 per cent annually on a valuation of \$60,000,000, and 7 per cent on money put into the property hereafter.

4. The temporary valuation of \$60,000,000 is fixed on the company's holdings as a basis of its earning power, with a proviso that the physical valuation of the properties made by the Missouri Public Service Commission within two years shall be substituted for the temporary valuation.

5. The company will be permitted to pay the accrued mill tax of \$2,300,000 to the city in ten annual installments, without interest.

6. The fare must remain at 5 cents, and universal transfers must be given, until the jurisdiction of the Missouri Public Service Commission to make a change is established and the commission has legally ordered a change.

7. The company must reorganize and accept the terms of the ordinance within twelve months, or within six months after peace is declared in the European war.

Two amendments submitted by President Aloe of the Aldermen were adopted. They require the United Railways to install a bookkeeping system in accordance with the orders of the Missouri Public Service Commission, and authorize the Judges of the Circuit Court to appoint the third member of the Board of Control to settle mooted problems if the St. Louis Court of Appeals fails to do so.

MEASURE UP TO MAYOR AND COMPANY

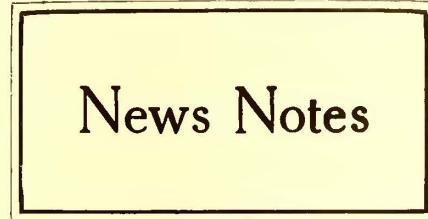
Subsequently the Board of Public Service approved the settlement ordinance as amended by the Board of Aldermen and adopted a report recommending its passage.

On March 29 the Board of Aldermen passed the settlement bill and Mayor Kiel may affix his signature after ten days or by April 8.

Liberty Bonds Speak Louder than Words

The Mayor has said that he will sign the measure, as he has studied its terms as the ordinance was developed and approves it.

The ordinance will not become effective, however, unless the United Railways accepts it and formally notifies the city of such acceptance within twelve months, or in the event the war with Germany continues beyond that, within six months after the war is over.



News Notes

Minneapolis Investigation Continued.

—Congressman C. C. Vandyke, labor leader, is investigating the labor situation on the lines of the Twin City Rapid Transit Company, Minneapolis, Minn., but has not yet reported. He is said to represent President Wilson in a further consideration of the railway company's attitude toward taking back former strikers.

Wage Advance in Sherman.—The Texas Electric Railway on April 1 advanced the wages of trainmen employed on the local lines in Sherman and the men on the interurban lines out of that city. Hereafter the wages will be from 24 cents to 30 cents an hour, depending on the length of service. This is an advance of 2 cents an hour over the former schedule.

Local Transportation Bill Passed by House.

—The bill authorizing the expenditure of \$50,000,000 through the Secretary of Labor for the purpose of providing housing, local transportation and other facilities for war needs, known as the Clark bill, has been passed by the House. An editorial discussing some features of this bill and put to press before its passage by the House appears elsewhere in this issue. This measure was also referred to in the ELECTRIC RAILWAY JOURNAL for March 9, page 471.

Programs of Meetings

National Lumber Manufacturers' Association

The postponement to a date in May of the sixteenth annual meeting of the National Lumber Manufacturers' Association, originally scheduled for April 8-9, has been announced. Last week in Washington, prominent lumbermen were asked to return to that city for a conference early in April on an important government matter. As there was a conflict in dates the executive committee of the National Association felt there was only one thing to do, and hence the annual meeting will be held some time in May, the exact dates to be announced.

United States Chamber of Commerce

On April 10, 11 and 12 the sixth annual meeting of the United States Chamber of Commerce will be held at the Auditorium, Chicago. There will be four chief objective points: (1) financing the war; (2) railroads and highway transportation; (3) ships and shipping; (4) organized control of industry. Prominent among those who will deliver addresses are: The Earl of Reading; Secretary of the Navy Daniels; Secretary of the Interior Lane; Alva B. Johnson, president of the Baldwin Locomotive Works; John F. Wallace, chairman of the Chicago Terminal Commission; T. N. Vail, president of the American Telephone & Telegraph Company, New York; Thomas N. McCarter, president of the Public Service Corporation, Newark, N. J., and Philip H. Gadsden, who is in charge of the work of the War Board of the American Electric Railway Association.

Although the annual meeting will not open until Wednesday morning, a number of committee reports will be read on Tuesday afternoon at the meeting of the National Councillors in the Congress Hotel. At the meeting on Wednesday morning the delegates will be welcomed, President Rhett will address those in attendance and the committees will be announced. In the afternoon high government officials will outline the government's position in regard to (1) government organization in relation to war; (2) railroads; (3) finance; (4) shipping. The National Chamber's activities in relation to the foregoing will also be presented in ten-minute addresses by different speakers.

On Thursday discussions will be held in group sessions on the subjects suggested in Wednesday afternoon and evening. One group will discuss government organization in relation to business in war. Finance will be taken up by the group under the leadership of Charles A. Hinsch, president of the American Bankers' Association. The discussion will be divided between trade acceptances and the effect of government financing on industry. Thomas N. McCarter and David Forgan, president of the National City Bank, Chicago, Ill., will be the speakers on the effect of government financing on industry. The group discussion of railroads and highway transportation will be under the leadership of Harry A. Wheeler. President Johnson of the Baldwin Locomotive Works will speak on motor power, and John F. Wallace will discuss terminals. Mr. Gadsden will outline some of the difficulties which confront the electric railways as a result of the war. On Friday morning, following the election of officers and a report of the committee on resolutions, there will be a general discussion leading to action upon the resolutions presented.

A Better Investment Than a Liberty Bond—Two Liberty Bonds

Financial and Corporate

Piedmont Earnings Gain

1916 Returns of Piedmont & Northern Line Show Net Increase of 30 Per Cent

According to the 1916 report of the Piedmont & Northern Railway, Charlotte, N. C., just now available, the company during that calendar year showed marked increases in operating results. The operating revenues,

The property will most likely be bought in by a reorganization committee formed by the bondholders. This committee plans to organize a new company to be bonded for approximately \$5,500,000, of which some \$2,000,000 will bear interest from July 1, 1917, \$950,000 from July 1, 1919, \$1,275,000 from July 1, 1922, and \$1,275,000 from July 1, 1927.

In 1915 gross earnings were \$801,478;

INCOME STATEMENT OF PIEDMONT & NORTHERN RAILWAY

	1916		1915	
	Amount	Per Cent.	Amount	Per Cent.
Passenger revenue.....	\$401,293	32.8	\$341,877	33.8
Freight revenue.....	750,988	61.3	610,803	60.4
Miscellaneous revenue.....	71,878	5.9	57,868	5.8
Total operating revenue.....	\$1,224,159	100.0	\$1,010,547	100.0
Way and structures.....	\$76,344	6.2	\$66,434	6.6
Equipment.....	58,658	4.8	50,985	5.0
Power.....	129,047	10.5	129,049	12.8
Transportation.....	170,722	13.9	158,320	15.7
Traffic.....	28,811	2.4	22,711	2.2
General.....	193,135	15.8	147,374	14.6
Total operating expenses.....	\$656,717	53.6	\$574,873	56.9
Net operating revenue.....	\$567,442	46.4	\$435,674	43.1
Taxes.....	48,847	3.9	37,388	3.7
Operating income.....	\$518,595	42.5	\$398,287	39.4
Non-operating income.....	9,653	0.8	11,073	1.1
Gross income.....	\$528,248	43.3	\$409,360	40.5
Interest on funded debt.....	\$316,746	25.9	\$316,710	31.3
Other interest.....	27,901	2.3	28,860	2.9
Miscellaneous debts.....	1,376	0.1	1,179	0.1
Total deductions.....	\$346,023	28.3	\$346,749	34.3
Net income.....	\$182,224	15.0	\$62,611	6.2

as shown in the accompanying table, increased \$213,612 or 21 per cent. The operating expenses rose \$81,844 or 14 per cent, with the result that the net operating revenue showed a gain of \$131,768 or 30 per cent. The net income for the year was \$182,224 as compared to \$62,611 in 1915.

in 1916 they were \$870,492, and in 1917 they were \$1,000,792. The net earnings in 1915 were approximately \$150,000; in 1916, \$170,000, and in 1917, \$200,000. Earnings for 1918 to date show a substantial increase over 1917.

It was shown during the foreclosure proceedings that the Northern Elec-

Calendar Years	Gross Revenue	Operating Income	Operating Ratio (Taxes Included)	Average Miles Operated	Gross Revenue per Mile of Road	Operating Expense per Mile of Road	Operating Income per Mile of Road
1916.....	\$1,224,159	\$518,595	57.6	127.4	\$9,608	\$5,538	\$4,070
1915.....	1,010,547	398,287	60.6	124.7	8,103	4,909	\$3,193
1914.....	949,914	324,344	65.8	121.0	7,850	5,170	2,680
1913.....	659,552	257,384	60.9	95.5	6,906	4,211	2,695
1912.....	160,345	53,596	53.6	42.9	3,737	2,488	1,249

The total number of passengers carried was 1,467,358 in 1916, as compared to 1,221,284 in 1915. The revenue tons of freight in 1916 totaled 717,296 and in 1915 572,809. The gross revenue per mile of road was \$9,609 in 1916 and \$8,104 in 1915. Further comparative statistics are reproduced above.

Northern Electric Ordered Sold

The Northern Electric Railway, which operates in the Sacramento Valley in California, between Chico and Woodland, has been ordered sold in foreclosure proceedings in the United States District Court, San Francisco. The date of sale will probably be fixed between May 15 and June 1.

tric System represented a book investment in excess of \$12,000,000, and that the California Railroad Commission had fixed its reproduction cost, less depreciation, at approximately \$10,000,000.

The system, which includes a belt freight line around the city of Sacramento, is 215 miles in length, is operated by a third-rail, and has connecting tracks at various points with the Southern Pacific and Western Pacific Railroads, and through the Central California Traction Company and Oakland, Antioch & Eastern Railway with the Santa Fé System. Its principal freight business is in grain, rice, beans, fruit and other farm products.

Since Oct. 5, 1914, the system has

been operated by John P. Coghlan, a San Francisco attorney, as receiver. The receiver has put all the earnings back into the property and now reports that he is prepared to turn the system over to the reorganized company in excellent condition. Betterments made under the receiver include a number of grain, rice and bean warehouses, spurs into new industries, new freight equipment, and additions to the motive power.

In 1917 the Western Pacific Railroad made an offer of \$3,682,000 for the system. This was refused by the reorganization committee. That this offer had been made was disclosed during the foreclosure proceedings.

Agree on War Finance Bill

The conference agreement on the war finance corporation bill as presented to Congress was adopted in the Senate on April 1. This is regarded as representing the bill as it will finally pass Congress, for the House is expected to agree to the conference report.

According to the report, the corporation, as soon as the bill becomes a law, will be allowed to issue a total of \$3,000,000,000 in bonds instead of the \$4,000,000,000 provided for in the Senate bill and instead of the \$2,000,000,000 provided for in the House bill.

The conference report provides that the security to be required for advances shall be 125 per cent, the adequacy of the 125 per cent security on the loan to be determined by the capital issues committee. The conferees agreed that the capital issues committee shall be composed of seven members to be appointed by the President, by and with the advice and consent of the Senate. The conferees refused to agree to the House idea that not more than four members of the same political party shall be members of the capital issues committee.

\$500,000 of Bonds Authorized

The California Railroad Commission has authorized the Tidewater Southern Railway, Stockton, Cal., to issue \$500,000 of first mortgage 5 per cent bonds, payable in 1942, to be sold at not less than 80 per cent of face value, and the proceeds to pay in part for the completion of its present operated line of railroad from Stockton to Turlock and Hilmar, to finish a branch from a station on its main line at Small to Manteca, and to extend its main line from Hilmar to Stevenson.

The company is operating from Stockton to Modesto by way of Escalon, about 33 miles, a branch line from Small, 8 miles; from Stockton to Manteca, 3½ miles, and also the main line from Modesto to Hilmar, a distance of 17 miles, and a branch from Hatch to Turlock, 6 miles. The work still to be done consists of grading, ballasting, fencing, laying rails, etc.

The Western Pacific Railroad controls the Tidewater company through stock ownership. It has agreed to buy the \$500,000 of bonds at 80 per cent.

Tax Question Up Soon

Chairman of House Ways and Means Committee Says Congress Must Consider Further Taxation

Representative Kitchin, chairman of the House ways and means committee, during a debate in the House of Representatives, announced that Congress must soon consider whether further taxes are to be imposed in the near future or heavy taxation and big bond issues resorted to for several years after the war to produce revenue.

The ways and means committee is charged by statute with the duty of initiating revenue producing legislation, and Mr. Kitchin was asked by members of the House when Congress will begin to tax those who are making profits out of the war and arrange to impose less taxation upon the next generation. Mr. Kitchin said he believed taxes should be increased 25 per cent, and that in any case heavy taxation and big bond issues may be expected for several years after the war, as was the case after the Civil War.

Revenue officials in Washington are stating informally that they believe the income taxes and the excess profits taxes will greatly exceed the estimated

We're in It—Let's Win It BUY LIBERTY BONDS

figures of return. These estimates are as follows: From excess profits \$1,226,000,000; from corporation incomes, \$535,000,000; and from individual incomes, \$666,000,000.

Northern Texas Earnings in 1917

The report of the Northern Texas Traction Company for the calendar year 1917 has been filed with the City Commission of Dallas, Tex., and has been formally approved by that body. The report shows a gross income of \$2,389,242 and expenditures of \$1,802,730, leaving a net of \$586,512. The revenue from passengers amounted to the sum of \$2,245,901.

Frontier Purchase Allowed

The Public Service Commission for the Second District of New York has granted the petition of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad to acquire jointly the capital stock of the Frontier Electric Railway. The order granted provides that the companies shall acquire the outstanding capital stock, \$25,000 at par, with the provision that the two roads shall not ask for an increase in the capital stock or issue any bonds of the Frontier company under the authority conferred in an order entered on Dec. 5, 1906, and that the companies shall submit to authority of the commission as to any issue of stock or bonds which may hereafter be required for construction. The companies are to comply with the provisions of the company's order within thirty days.

The Frontier company was incorporated in August, 1906, to operate an electric road from Buffalo to Niagara Falls, a distance of 75 miles. The periods within which the company was required to begin and complete construction have been extended several

BUY LIBERTY BONDS Buy—BUY—BUY—till it hurts!

times by statute and by the force of such statutes have not yet expired. The company is alive and has the requisite legal capacity to carry out the purpose of its incorporation. Financially the company has never yet been able to fulfill the object of its existence.

Selma Road Sold Under Foreclosure

The property of the Selma Street & Suburban Railway, Selma, Ala., has been sold under foreclosure by L. L. Gerould, trustee, to S. G. Adams, and by him has been reconveyed to the Selma Traction Company, a new company organized for the purpose of operating the property. The purchase price was \$50,000, the amount of the first mortgage bonds, which are owned by Mrs. F. M. Abbott, wife of Colonel F. M. Abbott, founder of the road, and Mrs. C. L. Waters, his sister.

The majority of the stock of the Selma Traction Company is owned by J. D. Woodard, Warren, Pa. The new company will issue first mortgage bonds for \$50,000 which will be taken and held by Mrs. Abbott and Mrs. Waters. Hugh Mallory, attorney for the company, made the following statement after the sale:

"Mr. Woodard has had considerable experience in the railway business. He will extend the lines toward the property of the Selma Manufacturing Company. Another improvement which he fully expects to make, and which, with the proper co-operation on the part of the public, he will undoubtedly make is to extend the line to the Municipal swimming pool."

New Tax for Jersey Railways

Under a bill which has just been signed by Governor Edge of New Jersey, a tax at the average rate of the State on the gross receipts of electric railways, gas and electric utilities is

Lend Him a Hand—BUY LIBERTY BONDS

substituted for the personal property tax on the property of such corporations. The new tax does not affect the franchise tax or the tax on real property.

Under the existing law every electric railway of New Jersey is now subject to a franchise tax of 5 per cent on the gross receipts. The new law provides that in addition to this fran-

chise tax there shall be placed on the gross receipts an annual tax at the average rate of taxation in the State as computed by the State Board of Taxes and Assessments. This additional tax is to be levied upon the same gross receipts upon which the franchise tax is levied, and it is to be imposed in lieu of all State, county, school and local taxation of personal property, including machinery, apparatus and equipment held by the corporations. The act takes effect on Oct. 1, 1918, but it is provided that its clauses shall not be applicable to taxes which are assessed for 1918.

Washington Unification

Committees Appointed from Two Local Railway Companies at Capital to Consider Closer Co-operation

The movement toward the unification of the railway systems in the District of Columbia has been accelerated by the appointment of committees from both the Washington Railway & Electric Company and the Capital Traction Company to confer with a view of devising a plan of closer co-operation or unified or single management to be submitted to the Public Utilities Com-

Money means Munitions—BUY LIBERTY BONDS

mission of the District and to the boards of directors of the respective companies as promptly as possible. The committee for the Washington Railway & Electric Company is composed of directors M. E. Ailes, George Truesdell and W. F. Ham, and that for the Capital Traction Company of directors George E. Hamilton, John H. Hanna and Benjamin W. Guy.

The resolution of the directors of the Washington Railway & Electric Company appointing the committee expresses the opinion that more efficient service could be rendered the public by the company if, with the approval of the Public Utilities Commission of the District, some plan of close co-operation, unified operation or single management could be effected between that company and the Capital Traction Company. The resolution of the Capital Traction Company is along the same general lines.

This effort by the companies toward unified operation is an indirect outcome of the inquiry of the Public Utilities Commission into the railway service in Washington. At one of the recent hearings before the commission, representatives of the Washington Railway & Electric Company said that the proper development of the public utility facilities of the District depended upon two things: first, the authorization by Congress of a comprehensive and reasonable plan of financing, and, second, the consolidation of the two principal electric railway systems operating in the District. Officers of the company also said that to the above should also be added a higher rate of fare.

Financial News Notes

Mr. Bernd a Director.—At the annual meeting of the Des Moines (Ia.) City Railway and the Inter Urban Railway, held on March 20, O. G. Bernd, auditor, was elected to the directorates of these companies. Mr. Bernd succeeds E. P. Smith.

Receiver's Certificates Authorized.—W. E. Glasscock, receiver of the Morgantown & Wheeling Railway, Morgantown, W. Va., has been authorized by the court to issue 60,000 of receiver's certificates on account of repairs and betterments.

Sale Under Foreclosure Postponed.—The sale of the property of the St. Joseph Valley Railway, Elkhart, Ind., under foreclosure, which was set for March 20, has been postponed until April 8. The company operates 8 miles of line.

Short Iowa Road Would Quit.—The Sioux City, Crystal Lake & Home Electric Railway, Sioux City, Iowa, has applied to the Railroad Commission of Iowa for permission to abandon its 4 miles of line between South Sioux City and the park on Crystal Lake.

Extra Common Dividend.—The directors of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., have declared an extra dividend of 2 per cent on the common stock, payable on April 15 to stock of record of March 30.

Will Not Abandon Operation.—The Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., brands as erroneous the statement made in the daily press recently to the effect that the company is to abandon its right-of-way and junk the property.

No Common Stock Dividend.—In view of the increased operating costs of the past winter and in order to conserve cash resources in the interest of essential construction, the board of directors of the Northern States Power Company, Chicago, Ill., has decided not to declare a dividend on the common stock at this time. Dividends have been paid on the common stock since July, 1916. The regular quarterly dividend of 1 1/4 per cent has been declared on the preferred stock, payable on April 20. Dividends on the preferred stock have been paid continuously since the organization of the company in 1910. The net earnings after the payment of fixed charges for the year 1917 were 1.83 times the preferred stock dividend requirements.

Action to Collect Seattle Tax.—The city of Seattle, Wash., on March 23 brought suit in the King County Superior Court to recover from the Puget Sound Traction, Light & Power Company the sum of \$72,443, representing 2 per cent of the gross earnings of the company in 1917, which the company is obligated to pay the city under the terms of its franchises. More than two years ago, the company petitioned the Public Service Commission to be relieved of this obligation, and the matter is now in the Supreme Court awaiting final decision. The city obtained a judgment of \$64,387, representing 2 per cent of the earnings for 1916. The company appealed to the Supreme

Court, where the case will be argued in the near future.

Sale at Auction on April 22.—The property of the Ware & Brookfield Street Railway, Ware, Mass., will be offered for sale at foreclosure on April 22 by the American Trust Company, Boston, Mass., trustee, under a mortgage securing \$135,000 of 5 per cent bonds authorized in 1901 by the Hampshire & Worcester Street Railway. The Ware & Brookfield Street Railway abandoned operation on Feb. 3. The road was organized in 1900 as the Hampshire & Worcester Street Railway. It went into the hands of a receiver in 1905 and was sold under the decree of the court to the present owners. No dividends have ever been paid and the bond interest has not been met since the reorganization. The affairs of the company were reviewed briefly in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 336.

Confirmation of Sale Put Off.—Action in regard to confirming the sale under foreclosure of part of the Dan Patch line, the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn., has been postponed in the federal court to April 6. A reorganization is being attempted to save the line from Auto Junction to the Luce or Electric Short Line Junction from being scrapped. For this purpose protective association has been formed among the citizens along the line and they have agreed to indemnify the present owners against any loss that may be caused to them by the delay in case the attempt fails that is now being made by the local interests to reclaim the road. The part of the road previously mentioned was sold on Dec. 18 to representatives of the committee acting for the bondholders.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.						INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.					
Period	Revenue Operating	Expenses Operating	Income Operating	Charges Fixed	Income Net	Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	\$77,776	*\$50,169	\$27,607	\$19,659	\$7,948	1m., Feb., '18	\$3,256,310	*\$1,812,533	\$1,443,777	\$1,171,141	\$262,676
1m., Jan., '17	74,684	*42,912	31,772	18,725	13,047	1m., Feb., '17	3,240,154	*1,645,070	1,595,084	1,006,995	\$588,089
12m., Jan., '18	889,212	*509,310	379,902	229,376	150,526	8m., Feb., '18	26,494,347	*14,871,566	11,622,781	8,823,332	\$2,800,449
12m., Jan., '17	838,388	*469,141	369,247	215,924	153,323	8m., Feb., '17	25,893,871	*12,530,598	13,363,273	7,985,983	\$5,377,290
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.						LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.					
1m., Jan., '18	\$133,002	*\$110,805	\$22,197	30,698	†\$8,501	1m., Jan., '18	\$47,120	*\$73,004	†\$25,884	\$15,911	†\$41,795
1m., Jan., '17	107,049	*75,444	31,605	32,660	†1,055	1m., Jan., '17	61,703	*54,188	7,515	15,308	†7,993
12m., Jan., '18	1,384,980	*1,174,262	210,718	360,510	†149,792	12m., Jan., '18	883,790	*702,500	181,290	187,292	†6,002
12m., Jan., '17	1,241,252	*835,578	405,674	360,129	45,545	12m., Jan., '17	812,480	*567,134	245,346	187,118	58,228
COLUMBUS RAILWAY POWER & LIGHT COMPANY, COLUMBUS, OHIO						NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1m., Jan., '18	\$367,662	*\$301,949	\$65,713	\$52,744	\$12,969	1m., Jan., '18	\$204,521	*\$131,562	\$72,959	\$41,037	\$31,922
1m., Jan., '17	337,571	*228,524	109,047	44,269	64,778	1m., Jan., '17	209,869	*133,275	76,594	41,238	35,356
12m., Jan., '18	4,054,277	*3,017,355	1,036,922	567,063	469,859	12m., Jan., '18	2,452,973	*1,587,706	865,267	489,869	375,398
12m., Jan., '17	3,577,554	*2,160,729	1,416,825	519,521	897,304	12m., Jan., '17	2,396,326	*1,470,109	926,217	507,127	419,090
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.						NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., Jan., '18	\$1,700,470	*\$1,310,849	\$389,621	\$475,933	†\$86,312	1m., Feb., '18	\$526,542	\$356,184	\$170,358	\$92,282	\$78,076
1m., Jan., '17	1,617,719	*931,056	686,663	430,359	256,304	1m., Feb., '17	477,004	297,208	179,796	82,680	97,116
12m., Jan., '18	19,806,488	*12,664,798	7,141,690	5,334,681	1,807,009	2m., Feb., '18	1,068,843	727,043	341,801	186,947	154,854
12m., Jan., '17	17,172,773	*9,480,594	7,692,179	5,053,816	2,638,363	2m., Feb., '17	967,385	580,050	387,334	166,687	220,646
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.						NEW YORK (N. Y.) RAILWAYS					
1m., Jan., '18	\$299,688	*\$263,009	\$36,679	\$65,730	†\$29,051	1m., Jan., '18	\$865,377	*\$720,601	\$144,776	287,627	†\$129,933
1m., Jan., '17	292,607	*194,800	97,807	64,065	33,742	1m., Jan., '17	997,075	*\$79,132	117,943	281,846	†\$118,821
12m., Jan., '18	3,699,552	*2,549,728	1,149,824	787,047	362,777	7m., Jan., '18	7,171,482	*\$5,418,664	1,752,818	1,978,796	†\$132,634
12m., Jan., '17	3,090,938	*1,877,592	1,213,346	757,245	456,101	7m., Jan., '17	6,390,636	*\$5,065,026	1,325,610	1,971,945	†\$354,671
GRAND RAPIDS (MICH.) RAILWAY						PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., Jan., '18	\$107,648	*\$79,155	\$28,493	\$20,444	\$8,049	1m., Dec., '17	\$594,020	*\$339,178	\$254,842	\$179,036	\$75,806
1m., Jan., '17	113,108	*74,464	38,644	18,051	20,593	1m., Dec., '16	512,594	*\$257,702	254,892	\$183,084	71,808
12m., Jan., '18	1,298,400	*\$914,867	383,533	220,608	162,925	12m., Dec., '17	6,023,510	*\$3,576,593	2,446,917	2,152,052	294,865
12m., Jan., '17	1,304,878	*\$837,827	467,051	190,436	276,615	12m., Dec., '16	5,483,110	*\$3,038,254	2,444,856	2,178,258	266,598

* Includes taxes. † Deficit. ‡ Includes non-operating income. b Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

New Bay State Fares

Rate Has Been Filed Calling for Short Six-Cent Initial Zone with Eight Cents Outside

A new schedule of fares has been filed with the Public Service Commission of Massachusetts by Receiver Wallace B. Donham of the Bay State Railway, covering city and suburban fares, and linking up the cities and country on the zone system. This schedule will go into effect on April 26. City patrons will pay 6 cents within a new city zone, which covers about a 3-mile area in the middle of each city. For those riding beyond the city zone into the fringe adjacent the fare will be 7½ cents, in tickets of six for 45 cents, and beyond this territory, in the country section, will be from 2 cents to 3 cents a mile, depending on the density of traffic. Mr. Donham says:

"The financial condition which brought about the receivership is even worse now than it was when the receiver was appointed.

"The amount of money paid to the men has recently been increased substantially and, under the contract, will be increased again on May 1. The plan for co-operative savings, in which I have great confidence, is of course only

**Count that day lost—whose low descending sun
Sees in your hand no Liberty Bond or Gun
Fight—or BUY BONDS**

just starting, so that at present, under the 2-cent an hour guaranty, we are paying substantially increased amounts.

"The probable cost of coal for the system for the calendar year 1918 will be approximately \$1,000,000 more than for the year before the war, and, in the meantime, the cost of everything else has gone up.

"The result of all these things is that at the present time the Bay State Street Railway is not earning its operating expenses, to say nothing of earning any return on the investment, and our estimate for the year, on the basis of present rates of fare, indicates that we would just break even on the operating costs, even including summer business.

"In order to straighten things out we need something over \$2,000,000 more revenue, and we have to-day (March 28) filed a schedule of fares which, with the other schedules that are now pending before the commission, will, we estimate, result in an increase in income about this amount.

"In nearly every city we are making an inner 'city zone,' which in general is 3 miles across. The fare under this new schedule will be 6 cents, without tickets. Then we are separating the

balance of the city from the country district as accurately as we can, and we are going on a basis of 7½-cent fares within the city for the area outside the so-called 'city zone' or 3-mile area, which I have just mentioned. In order to collect this 7½-cent fare we will sell tickets at the rate of six for 45 cents, and anyone not having a ticket will be charged 8 cents. Outside these two zones in the cities the whole country district is being zoned, under the schedules which were filed some months ago, so that all the system outside of the cities will be on the basis of 2, 2½ or 3 cents a mile, depending on the traffic density of the different lines.

"Workingmen's tickets are continued on the basis of 70 per cent of the regular fare wherever workingmen's tickets or transfers are now in force."

City Fights Fare Increase

Mr. Connette Fixes Present Value of Third Avenue System at \$56,000,000 on Five-Year Average Prices

The Third Avenue Railway fare increase hearing on March 26 before the Public Service Commission for the First District, New York, N. Y., was featured by another move on the part of Assistant Corporation Counsel John P. O'Brien to secure a ruling in regard to the jurisdiction of the commission. Mr. O'Brien made an argument for the dismissal of the application for a 2-cent transfer charge upon the ground that the commission has no power to authorize such an increase in view of 5-cent fare franchises granted by the city. He asked that the commission rule upon this point immediately, in order that in the event of an adverse opinion the city might take the matter to court and have the point finally settled before going to the expense of fighting the rate case further. The commission reserved decision and instructed the company to proceed with its case.

On April 1 the company presented appraisal figures for its entire property actually in public service on July 1, 1917. The appraisal was made by E. G. Connette, president United Gas & Electric Engineering Corporation, New York, N. Y., who was once on the staff of the commission and in 1909 made an appraisal of seven of the fifteen parts of the company's system.

Mr. Connette based his appraisal figures on the average unit prices prevailing in the last five, the last eight and the last ten years as to materials which would be utilized in reproducing the properties of the system. He fixed the net value of the property, after including development charges and current assets, and deducting depreciation, obsolescence and inadequacy as follows: Five years' average, \$56,364,852; eight

years' average, \$53,465,703; ten years' average, \$52,520,885.

Mr. Connette found the total appraisal value on the basis of the five years' average unit prices to be \$66,449,051, from which he subtracted \$10,084,199 estimated for depreciation, obsolescence and inadequacy. On the eight years' average unit prices he found a total value of \$62,920,599, from which he subtracted an estimate for depreciation, obsolescence and inadequacy, amounting to \$9,454,856. On an average of ten years' prices, he found the total value to be \$61,749,715. He made a subtraction of \$9,228,830 from this item for estimated depreciation, obsolescence and inadequacy.

Six-Cent Fare for Providence

Committee Now Recommends Relief for Rhode Island Company by Flat Fare Instead of Zone System

The special legislative committee considering the Rhode Island Company situation voted on April 2 to recommend a 6-cent fare with eighteen tickets for \$1 to be in effect until one year after the signing a treaty of peace in the present war.

By vote of five to one the committee defeated a resolution to report in favor of State ownership and by a vote

**A Good Return on your Money
A Quick Return for our Men
BUY LIBERTY BONDS**

of five to two the committee defeated a motion to report in favor of the zone system as recommended by the special commission in its report presented a month ago.

The resolution as provided by the committee by vote of four to three is as follows:

"Resolved, that this committee recommend that temporary relief be granted the Rhode Island Company by increasing the flat 5-cent fare to 6 cents with the issue of tickets at the rate of eighteen for \$1, such relief to be effective May 1, 1918, and to continue in operation during the present war and one year from the date of signing the treaty of peace."

On April 3 the report of the special committee, together with the minority reports, was presented to the Legislature. At the same time an act was introduced in the House authorizing the Public Utilities Commission to carry into effect the recommendations in the majority report. It will be considered April 10.

Some time ago a special commission appointed by the Legislature early in 1917, ordered the adoption of a system of 5-cent central areas, with 2-cent intermediate zones, and recommended taxation and franchise reforms as measures of relief for the company. The Legislature prevented the Public Utilities Commission from putting these changes into effect. It then began the inquiry which has now resulted in the recommendation of the 6-cent fare.

Fare Dispute in Cleveland

Much Heralded Low-Fare City a Victim of High-Cost Epidemic —City Replies to Fare Request With an Injunction

Common Pleas Judge Pearson, in a decision rendered on the afternoon of March 30, granted an injunction to the city of Cleveland, Ohio, restraining the Cleveland Railway from raising the fare, as had been planned. The suit was filed in the forenoon of the same day by City Law Director FitzGerald. Notice of appeal was given by the company's attorneys.

On April 2 the Court of Appeals reversed the decision of Common Pleas Judge Pearson and the company put into operation the next higher rate the following day. This is 4 cents cash or seven tickets for a quarter, with a charge of 1 cent for transfers which is rebated. The city gave notice of an appeal to the Supreme Court and attorneys for both sides will appear before that tribunal on April 16.

The Tayler grant, under which the railway operates, provides for an automatic increase in the rate of fare whenever the interest fund falls below \$300,000. This point was passed some time ago and the fare was advanced to three tickets for 10 cents with a charge of 1 cent for transfers with no rebate. The next higher rate provided in the Tayler franchise is 4 cents cash fare and seven tickets for 25 cents.

At the hearing before Judge Pearson City Law Director FitzGerald argued that the present rate of fare in force since Dec. 26, 1917, had not received a trial sufficient to determine whether it will replenish the interest fund. Attorney Harry Crawford, representing the company, said that the condition of the interest fund was now such that the city owed the company \$380,000.

Felder Sanders, Street Railway Commissioner, said that the failure of the present rate of fare to increase the interest fund was due to the unusual weather conditions in January and to the fact that the number of patrons decreased 1,200,000. He concluded that the \$380,000 could be made up at the present rate of fare under operating conditions such as existed in 1916. It would require five years to accomplish this under present conditions.

In a letter to John J. Stanley, president of the company, on March 28 Mr. Sanders suggested that the question of rate of fare be submitted to arbitration. On the following day Mr. Sanders received a reply in which Mr. Stanley said he could see nothing to arbitrate. Among other things Mr. Stanley said:

PAY AS YOU GO

"The rate of fare ought to have been raised to the maximum last year, as you well know. I know the present rate of fare will not bring enough to restore the interest fund while wages and prices continue as high as they are now and while the city requires of the company the present service. So do you.

"You can reduce the service; we can

put up the fare. One thing or the other must be done and done now. Present cost of operation ought to be paid by present car riders, not by their sons.

"Neither you nor any Councilman should hesitate to assent to the increase in fare. Nor should any attempt be made by Republicans to shift the duty to Democrats or by Democrats to force it upon Republicans.

"You say that on the figures for January and February the city is of the opinion that the present rate of fare has not had a fair trial. What is your own opinion?

"Weather conditions were certainly bad in January. But they were much better in February. Yet the interest fund decreased \$49,413 in that short month. It will continue to decrease so long as the present service is furnished at the present rate of fare.

"If you prefer to reduce the service so that the present fare will give us a surplus every month until the interest fund climbs to \$700,000, send us new schedules and we will put them into effect."

Mr. Sanders claims that the right of arbitration of the necessity of raising the rate of fare is not excluded by the Tayler franchise and that the public must be considered. He did not reply to Mr. Stanley's letter, but instead proceeded with the injunction case.

Platformmen in the employ of the company have decided to demand an increase of 25 cents an hour on May 1. This would make the maximum hourly wage 60 cents. In addition they will ask that 40 per cent of all runs be completed in eleven hours, 40 per cent in twelve hours and 20 per cent in thirteen hours, with a minimum work-day of eight hours. The minimum day for some time past has been five hours.

Officers of the company say that if these demands were granted a straight 7-cent rate of fare would be necessary.

Public Service Hearings Continued

Other Witnesses Follow President McCarter in Explaining Need of Higher Fares for New Jersey System

During the past week the Public Service Railway, Newark, N. J., continued to present its case for increased fares before the Board of Public Utility Commissioners of New Jersey. The general statement of the situation made by President T. N. McCarter, as noted in the *ELECTRIC RAILWAY JOURNAL* of March 30, has been supplemented by the testimony of others in regard to various phases of the company's need.

At a hearing on March 27 the chief witnesses were F. H. Sillick, comptroller of the Hudson & Manhattan Railroad, New York, N. Y.; Prof. Albert S. Richey, of the Worcester (Mass.) Polytechnic Institute; and Joseph K. Choate, vice-president of the J. G. White Management Corporation, New York, N. Y. Other witnesses were half a dozen employees from various parts of the State, called to explain the wage situation to-day and the need of an increase in pay.

Mr. Sillick expressed the opinion that the increase to 7 cents desired by the company would result in an increased revenue of about 15 per cent. His opinion was based on the experience of his company following the increase in the tube rate to uptown points in New York City. Professor Richey expressed a similar opinion. In regard to a zone system, the latter witness stated that such a system would require several months of preparation. Theoretically it was worthy of consideration, but the difficulty of fare collection, especially in densely populated territories, was an obstacle to practical application.

Mr. Choate explained to the commission how the electric railways of the whole country have approached the point where a 5-cent fare is insufficient.

As to the desirability of a zone system, Mr. Choate said that in theory the distance tariff or zone system as adopted in Europe is a correct one, but in this country it is almost an impossibility in city service.

On March 28 Prof. Roswell McCrea, Columbia University, New York, N. Y., showed how labor costs have increased in the last few years. In his opinion there will be a further increase, owing to the scarcity of workers, increased living costs and the growing "competitive power" of workers.

R. E. Danforth, vice-president and general manager of the company, gave the detailed figures of increased operating costs in 1917. He said that tales of high wages in other industries were attracting men away from the railway, and other employees are necessary.

At a hearing on April 1 Dr. Thomas Conway, Jr., University of Pennsylvania, Philadelphia, Pa., testified in regard to how electric railways have been carrying passengers for less than the cost of service. In his opinion, these utilities have suffered more than other public service companies from the present increased cost, because their expenses are more largely composed of the cost of labor.

Various associated municipalities of New Jersey, which are opposing the company's application for financial relief, have retained the services of Delos F. Wilcox, New York, and Peter Witt, Cleveland, Ohio. Mr. Wilcox has charge of the preparation of the proof to be submitted on behalf of the municipalities. The municipalities contend that the 5-cent fare has afforded more than a reasonable return upon the actual investment and is still sufficient to afford such a return.

Portland Appeals Fare Case

The city of Portland, Ore., has filed notice of appeal to the State Supreme Court from the decision of the six circuit judges of Multnomah County, who, after hearing arguments *en banc*, decreed that the Public Service Commission had legal authority to increase fares for the Portland Railway, Light & Power Company from 5 cents to 6 cents. The appeal is directed against both the commission and the company. The city has filed a bond guaranteeing to pay whatever costs may be assessed against it in the higher court. The decision of the court in this case was reviewed in the *ELECTRIC RAILWAY JOURNAL* for March 30, page 617.

New Transfer System in Trenton

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has put into effect a new transfer system designed to prevent the abuses of the transfer privilege which grew up under the system previously in force. This change is in line with the suggestion made by Peter Witt, Cleveland, in his study of traffic conditions in Trenton. Mr. Witt's recommendations were reviewed in the *ELECTRIC RAILWAY JOURNAL* of Jan. 19, page 138.

Transportation News Notes

Fare Complaint Withdrawn.—The complaint filed last July by the Commuters' Association against the Philadelphia & Western Railway, upper Darby, Pa., operating between Sixty-ninth Street, Philadelphia, and Norristown, has been withdrawn.

Suggest Higher Fares in Newport.—W. W. Freeman, president, and Polk Laffoon, secretary of the South Covington & Cincinnati Street Railway, on March 25 suggested to the city officials of Newport, Ky., an increase in the rate of fare from 5 cents to 6 cents.

Railway Will Run Three Buses.—The Winnipeg (Man.) Electric Railway proposes to install a service of three buses in connection with a section of the city not now served by its electric railway lines. There will be an exchange of transfer privileges between the railway and the buses.

Trans-Bay Fare Cases Put Over.—The hearing of the Southern Pacific Company and Key Route trans-bay fare cases, which was set for April 1, has been changed to April 17. The postponement was made necessary owing to the inability of the Railroad Commission to finish by April 1 the hearing on the Spring Valley Water case.

Automobiles Cause Half the Injuries.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.,

Don't put off till to-morrow the Bond you can buy to-day

reports that in 1917 automobile accidents were responsible for more than one-half of all injuries. In 1917 there were 1088 injuries as compared to 1063 in 1916. A total of 121 persons were injured while getting on and off cars.

One-Man Cars and Fare Boxes for Houston.—The Houston (Tex.) Electric Company has received ten new one-man cars which have been put into service as an experiment on some of the most congested lines of the city. The company has also received a shipment of fare boxes. All cars will be equipped with the boxes as soon as they are received.

Seven-Cent Fare in Keene.—The Keene (N. H.) Electric Railway has increased its fares under authority of the Public Service Commission of New Hampshire from 6 cents to 7 cents. The appeal of the company to the commission was noted in the *ELECTRIC RAILWAY JOURNAL* of March 23, page 591. The commission held no hearing as no objection was made to the new rate.

Six-Cent Fare for Oklahoma Road.—The Corporation Commission of Oklahoma has issued an order authorizing the Chickasha (Okla.) Street Railway to charge a regular passenger fare of 6 cents in that city. Campbell Russell, a member of the commission, said that electric railways in cities and towns of 10,000 to 15,000 population will continue to experience great difficulty in meeting expenses.

Skip Stops for New Jersey.—The Public Service Railway, Newark, N. J., will adopt the skip-stop on its Essex division on April 8. The territory affected comprises Essex County and the West Hudson towns. Stops will average about eight to the mile, except in the business section, where they will be more frequent. Stopping places will be designated by white bands on the trolley poles.

Cleveland & Eastern Wins Fare Case.—On March 19 the Supreme Court of Ohio dismissed an appeal from a decision of the Public Utilities Commission made by the Commissioners of Cuyahoga County in the case of the Cleveland & Eastern Traction Company. The commission had granted the company authority to increase its rate of fare between Cleveland and South Euclid from 5 to 10 cents.

New Jitney Measure Proposed.—The proposed jitney ordinance filed recently with the City Council of Portland, Ore., has been approved by a committee of jitney men. The ordinance provides that drivers of jitneys shall furnish a bond of \$1,000 instead of \$2,500 as now required. The Council has been requested to pass the measure, and then refer it to the voters for consideration at the special city election to be held May 17.

Hoboken Wants Action.—The Board of Public Utility Commissioners of

New Jersey has been requested by Corporation Counsel John J. Fallon of Hoboken, to hand down a decision on Hoboken's application for a 3-cent fare over the lines of the Public Service Railway in that city prior to the decision of the board on the 7-cent fare asked by the company. Three years ago the city of Hoboken applied for a 3-cent fare. The claim was made that Hoboken was only a mile square in size and that the company should charge only 3 cents in that city.

"For Humanity's Sake."—An appeal to automobilists for safety, with this title, has been published by J. H. Handlon, claims agent United Railroads of San Francisco. It is a pamphlet of forty-eight pages, showing on each right-hand page a different kind of automobile accident. The accident is illustrated by a picture diagram, and a brief description is given to explain how the accident might have been avoided. The general principle or moral is then stated in epigrammatic form. On each left-hand page is a quotation or maxim on the necessity for care.

Walla Walla Feels the War Pinch.—According to E. G. Miller, traffic manager of the Walla Walla (Wash.) Valley Railway, the deficit of the company is about \$40,000. The company has announced in a bulletin to the public that it will abandon the East Walla Walla line, 1½ line long; that city fares must be raised to 7 cents; and, interurban fares must be advanced to a basis of 2½ cents a mile. The company also asks the elimination of the franchise tax, protection from jitney competition and relief from paving assessments.

Winnipeg to Issue Paper.—The Winnipeg (Man.) Electric Railway has established a publicity department which will be under the direction of H. C. Howard, formerly on the staff of the *Winnipeg Free Press*. In connection with the publicity department it is the intention of the company to issue a publication which will take the form of a pamphlet to be distributed regularly on the cars. In it matters of public interest will be discussed in frank talks from time to time, with the hope that a greater degree of confidence and goodwill may be attained between the company, its employees, and the public.

Indiana Interurban Seeks Increase.—A petition for an increase in passenger rates has been filed by the Winona Interurban Railway, Warsaw, Ind., through its receiver, with the Public Service Commission of Indiana. The petition asks that the company be allowed to change its rates from 2 cents per mile to a rate basis of 2½ cents per mile, with a minimum charge of 10 cents. The petition states that operating expenses have increased so abnormally during the past few years that in order to continue operations relief is necessary. The date for the hearing has not yet been set by the commission.

Personal Mention

W. C. Twomey, formerly auditor of the Chicago & West Towns Railway, Oak Park, Ill., has joined the army.

J. E. Lawless, former master mechanic of the Paducah (Ky.) Traction Company, has been transferred to Fort Worth, Tex.

W. H. Bennett, formerly master mechanic of the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., is now connected with the Brown Show Company, Dixon.

H. C. Howard, formerly of the staff of the Winnipeg *Free Press* has been placed in charge of the publicity department of the Winnipeg (Man.) Electric Railway, which has been established by the company in its desire to promote better relations with the public.

Neal Funk has been appointed to succeed his father, the late J. T. Funk, as head of the claim department of the Louisville (Ky.) Railway. Neal Funk has been with the company for a number of years and for some time past had been assistant to his father.

M. Skouden, who has been connected with the Union Traction Company, Anderson, Ind., for seventeen years in various capacities, has been appointed superintendent of motive power to succeed R. N. Hemming, whose appointment to the Fort Wayne & Northern Indiana Traction Company is noted elsewhere in this department.

Lee J. Wells has been appointed acting superintendent of the St. Petersburg & Gulf Railway, St. Petersburg, Fla., to succeed Edward Morton, Jr., who has become connected with the Philadelphia Iron & Steel Company. Mr. Wells worked as a conductor for many years for the company and in 1915 was promoted to dispatcher.

Joseph H. Alexander, formerly assistant to the president of the Cleveland (Ohio) Railway, has been promoted to the rank of colonel in the quartermaster's department. He was called to Washington last fall and given the rank of major. Colonel Alexander is engaged in the cantonment and construction division.

P. W. Gerhardt has been appointed railway superintendent of the Savannah (Ga.) Electric Company. Mr. Gerhardt was for many years superintendent of transportation of the Dallas Consolidated Electric Street Railway, the Metropolitan Electric Street Railway and the Rapid Transit Railway, Dallas, all included now in the Dallas Railway, under the service-at-cost franchise. Before going to Dallas Mr. Gerhardt was connected with the Twin City Rapid Transit Company, Minneapolis, Minn.

J. Frank Johnson, railway engineer, who was in charge of the publicity campaign of the Dunham (N. C.) Traction Company in connection with its request to the city for a 6-cent fare, has

been transferred to the Bartlesville (Okla.) Interurban Railway in a similar capacity. The conduct of the campaign at Durham was referred to in the *ELECTRIC RAILWAY JOURNAL* for March 30, page 635.

R. N. Hemming has resigned as superintendent of motive power of the Union Traction Company of Indiana, Anderson, Ind., to become connected with the Fort Wayne & Northern Indiana Traction Company as superintendent of transportation, with headquarters at Fort Wayne. Mr. Hemming has been connected with the Union Traction Company of Indiana as superintendent of motive power since Oct. 1, 1911. Prior to his employment with that company he was with the diversi-



R. N. HEMMING

fed holdings of the Dr. S. B. Hartman interests for seven years as chief engineer. In 1907 Mr. Hemming built and managed the Ohio & Southern Traction Company. Three years prior to that he was electrical engineer for the Buckeye Steel Castings Company, Columbus, Ohio. He was also chief electrician for the municipal light plant at Columbus, Ohio. Mr. Hemming has served on the standardization committee of the Central Electric Railway Association for seven years and for three years was chairman of that committee. He also served on the equipment committee and other joint and sub-committees of the American Electric Railway Association for three years and was co-chairman of the committee on transportation appointed by that association.

M. E. Foley, attorney for the Indianapolis Traction & Terminal Company, Indianapolis, Ind., has been appointed by Governor Goodrich as chairman of the State Council of Defense of Indiana.

Arthur Preger, assistant treasurer of the Springfield Railway & Light Com-

pany and the Springfield (Mo.) Traction Company, has been appointed manager of the Albuquerque Electric Light & Power Company, Albuquerque, N. M., to succeed W. P. Southard, made general manager of the Trinidad Electric Transmission, Railway & Gas Company. Both properties are controlled by the Federal Light & Traction Company.

Winthrop M. Daniels has been elected chairman of the Interstate Commerce Commission for one year dating from March 17, to succeed Henry C. Hall. The election of Mr. Daniels as chairman is in pursuance of the policy adopted in 1911, that the term of office of the chairman of the commission shall be for one year, and that the office shall be filled from year to year in the order of seniority of service.

E. H. Thomas, a former newspaper man of Seattle and Bellingham, Wash., has been appointed to the position of publicity agent of the Puget Sound Traction, Light & Power Company, Seattle, Wash., created in the executive offices. He will co-operate with the publicity agents of the local companies of Seattle, Tacoma, Everett and Bellingham in standardizing advertising and publicity in which the several companies are interested.

Harry H. Reigel has resigned as purchasing agent of the Reading Transit & Light Company and Metropolitan Edison Company, Reading, Pa., after seventeen years of continuous service. He has held positions of authority and trust during almost the entire period of his service with the company, having been transitman, timekeeper, paymaster, cashier, chief clerk and treasurer until the retirement some time ago of John A. Rigg, former president of the company.

Joseph F. Elward has been appointed assistant master mechanic of the Indianapolis Traction & Terminal and Terre Haute, Indianapolis & Eastern Traction Companies, in charge of the West Washington Street Shops, Indianapolis, Ind., during the absence of L. M. Clark, who is serving with the colors as major in the ordnance department. Mr. Elward entered the service of the Indianapolis Traction & Terminal Company as car inspector in 1902, and was promoted to carhouse foreman in 1905. On May 1, 1910, he was appointed to the position of chief car inspector.

W. L. Davis, until recently a traveling auditor on the staff of the American Power & Light Company, New York, N. Y., has been appointed auditor of the Lehigh Valley Transit Company, Lehigh Valley Light & Power Company and affiliated companies, at Allentown, Pa. Mr. Davis was formerly connected with the firm of Ernst & Ernst, certified public accountants, Cincinnati, Ohio. Mr. Davis began his work in the railway field in 1906 with the Ohio Electric Railway and was appointed statistician of the company in 1909, serving in this work until 1912,

A. Merritt Taylor to Go to Washington

Will Be Manager of Passenger Transportation for Emergency Fleet Corporation and Shipping Board—Was Transit Commissioner of Philadelphia

when he joined the organization of the Texas Power & Light Company, Dallas, Tex., first as traveling auditor and later as assistant secretary-treasurer. From 1914 to 1915 Mr. Davis was auditor for the Southern Traction Company and the Texas Traction Company, both of Dallas.

W. P. Southard, manager of the Albuquerque Electric Light & Power Company, Albuquerque, N. M., and the City Electric Company for three years, will be transferred to Trinidad, Col., to become general manager of the Trinidad Electric Transmission, Railway & Gas Company. Previously Mr. Southard was manager of the Las Vegas Light & Power Company, Las Vegas, N. M., and the Las Vegas Transit Company. Mr. Southard succeeds at Trinidad E. C. Deal, who, as noted in the *ELECTRIC RAILWAY JOURNAL* for March 30, has been transferred to Springfield, Mo., as manager of the Springfield Railway & Light Company and the Springfield Traction Company. All of the properties are controlled by the Federal Light & Traction Company.

Sam W. Greenland, general manager of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been selected to supervise the construction of a government power plant at Baltimore, Md., to be used in connection with a munition factory. This task will require at least six months before it is completed, and Mr. Greenland will remove with his family to Baltimore, remaining there until the job is finished when he will return to Fort Wayne. Since the beginning of the war Mr. Greenland has taken an active part in patriotic work. In the Liberty Loan drives, Red Cross campaigns, Y. M. C. A., and boys working reserve activities, he has been very prominent. During his absence in Baltimore, Mr. Greenland's duties as general manager will be carried on by other department heads.

D. P. Falconer has resigned as engineer of maintenance of way of the New York State Railways, Rochester lines, to manage the sales and develop a market for magnesium, a new metal, for the Shawinigan Electro-Metals Company, and has opened an office for the company at Cleveland, Ohio. Mr. Falconer's first railroad work was done for the Pennsylvania Railroad, by which he was employed in various capacities in the maintenance of way department of the lines west of Pittsburgh. He entered electric railway work with the New York State Railways in April, 1919, as assistant engineer of maintenance of way, and in 1912 was promoted to engineer of maintenance of way of the company. Since that time Mr. Falconer has had charge of track, pavement, bridge and similar work for the lines in Rochester and the Rochester & Eastern Railway. His activities have covered the construction, maintenance and design of work done by the maintenance of way department.

Charles Piez, vice-president and general manager of the Emergency Fleet Corporation, announced in Washington on April 2 the appointment and acceptance of A. Merritt Taylor as manager of passenger transportation for the corporation and the Shipping Board, with offices at Washington. The creation of this position means a new division of work in the shipbuilding scheme of the government, as the new branch will not be a part of the housing division, which has heretofore had charge of transportation problems. The work of passenger transportation is one of the most important of the government, when it is considered that the building of ships is dependent upon the arrangements made to transport shipyard workers to and from the yards.

Mr. Taylor has arrived in Washington and has entered upon his work. In

Born in 1874 near Burlington, N. J., Mr. Taylor, at the age of fifteen, became an indentured apprentice in the machine shops of William Sellers & Company, of Philadelphia. After reaching his twenty-first year he engaged in the handling of investment securities, largely real estate mortgages, railway stocks and bonds, and during this time he became interested in the Philadelphia & West Chester Traction Company. He was elected president of this company in January 1899 at the age of twenty-four years, in which office he has since continuously served. Under his administration the company has been developed from a struggling organization, operating only about 8 miles of track, to its present prosperous condition with about 50 miles of track, most up-to-date equipment and method of operation. In 1902 he became interested in the company operating the old Fort Lee Ferry from 130th Street, New York, to Edgewater, N. J., and the electric railway from Edgewater to Englewood. In that year he and his associates incorporated the New Jersey & Hudson River Railway & Ferry Company, which acquired these properties, and Mr. Taylor was elected president. Under the new management modern double-deck ferryboats were put into service, a new commodious ferry-house was constructed on the New York City side, and the railway was extended through Hackensack and on to Paterson, N. J. An additional line was also acquired, extending from Hackensack to Newark. The company prospered from the outset. After the sale of this property to the Public Service Corporation Mr. Taylor resigned as president.

BECOMES TRANSIT COMMISSIONER

In May, 1912, Mr. Taylor was appointed by the Mayor of Philadelphia transit commissioner to investigate the problems of improved transit facilities in Philadelphia. Within thirteen months Mr. Taylor completed his report, which was a most exhaustive analysis of the problems involved. He then advised with eminent counsel as to what legislation was needed to establish and finance this system and appeared before the Legislature at Harrisburg urging the passage of the necessary bills, all of which passed, and later accepted by the people of Philadelphia by an overwhelming vote. In performing this important work Mr. Taylor declined to accept pecuniary compensation for his services. Mr. Taylor was then appointed by the Mayor director of the newly created Department of City Transit. He held office until January, 1916, and during this time had the satisfaction of seeing actual construction begun on the city's new subway and elevated lines according to the "Taylor Plan."



A. M. TAYLOR

discussing his plans with the Washington representative of the *ELECTRIC RAILWAY JOURNAL*, he said he hoped to bring to Washington a number of engineers to assist in the work, as there are 145 shipyards on the Atlantic, Pacific and Gulf coasts, and in many of them transportation questions will have to be solved.

APPOINTS A STAFF

Mr. Piez said he welcomed the opportunity to work in conjunction with Mr. Taylor, and that the latter is now selecting his own staff of engineers. Among the appointments so far made of assistants by Mr. Taylor are the following: A. B. Maine, formerly chief clerk in the Department of City Transit, Philadelphia; Charles C. Cooke, Jr., member of the firm of Kelly, Cooke & Company, engineers, Philadelphia; Howard S. Hipwell, John A. Renshaw and Walter C. Solly, who were formerly assistant engineers in the Department of City Transit, Philadelphia. Mr. Solly was recently with the New Chester Water Company, Chester, Pa.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporations

***Cumberland Power Company, Wilmington, Del.**—The Cumberland Power Company has filed its certificate of incorporation with the Secretary of State of Tennessee. This concern is incorporated under the laws of Delaware, with its principal office at Wilmington. The purposes of the company are to purchase or otherwise acquire, construct, and operate electric railways and power plants. Capital stock, \$100,000. Incorporators: F. D. Buck, M. L. Horthy, and K. E. Longfield.

Chatham County Traction Company, Savannah, Ga.—Application for a charter will be made by the Chatham County Traction Company for the construction of an electric line from the intersection of Augusta Avenue with Lathrop Avenue, Savannah, to Port Wentworth, about 6 miles. The company also desires to own and operate electric plants and furnish electric light and power. Capital stock, \$150,000. Among the incorporators are H. C. Foss, secretary of the Savannah Electric Company; W. W. Osborne, A. A. Lawrence, David S. Atkinson and Edmund H. Abrahams, all of Savannah. [March 9, '18.]

***St. Clair Central Railway, Belleville, Ill.**—Incorporated to construct a line from East St. Louis to Benton. Capital stock, \$5,000. Incorporators: John T. Taylor, Belleville, Ill.; John Henderson, St. Louis, Mo.; L. E. Fischer, St. Louis, Mo., and W. C. Wolf and P. K. Johnson, Belleville, Ill.

Franchises

Coronado, Cal.—The San Diego, South Eastern Railway has received a franchise from the City Council for an extension on First Street to K Avenue, thence over private property to Fourth Street and the shore of Spanish Bight, where a bridge is being erected by the government.

Los Angeles, Cal.—The Pacific Electric Railway has been denied authority by the California Railroad Commission to build a line from Anaheim through Tustin to the town of Irvine, a distance of about 11 miles, and also a line from Glendora to Lone Hill, about 4 miles.

New York, N. Y.—The Public Service Commission for the First District of New York has granted the application

of the Union Railway for permission to construct an extension of its Fordham Road-207th Street Crosstown Line, so as to provide street car access to and from the Dyckman Street Ferry. The Board of Estimate & Apportionment has already granted a franchise for this extension.

Marietta, Ohio—The Kanawha Traction & Electric Company will ask the City Council of Marietta for a new franchise. As a number of improvements in their lines and service are being planned by the company, the new franchise is sought to secure them against loss. The franchise under which they are now operating, expires within about three years.

Track and Roadway

Alabama Interurban Railway, Birmingham, Ala.—The proposed line of the Alabama Interurban Railway will extend from Birmingham to Lock No. 17 on the Warrior River, about 20 miles, with branches to Patton Ferry, 5 miles, and to Shoal Creek, 15 miles. Another branch to Taylor's Ferry and an extension to Lock No. 16 and Davis Creek are contemplated. Thomas L. Cannon, Birmingham, president. [March 16, '18.]

Pacific Electric Railway, Los Angeles, Cal.—Los Angeles County and the Pacific Electric Railway plan to erect a steel and concrete bridge over Vergugo Wash on Brand Boulevard, North Glendale. The cost is estimated at \$50,000.

Municipal Railway, San Francisco, Cal.—Plans are being made to extend the Municipal Railway beyond the Twin Peaks tunnel. At a recent conference in the Mayor's office a resolution was adopted by the Public Utilities Committee directing the Board of Works to prepare plans and specifications for the construction of two extensions and appropriating \$10,000 for this work.

Tampa (Fla.) Electric Company.—This company will construct an extension on Twenty-second Street and also on Chapin Street.

Orleans-Kenner Traction Company, New Orleans, La.—The Orleans-Kenner Electric Railway has been reorganized under the name of the Orleans-Kenner Traction Company. The property of the company was recently sold under foreclosure to J. Blanc Moore for \$225,000.

***Eastern Maine Railroad, Bangor, Me.**—A report from George W. Maxfield, president of the Eastern Maine Railroad, states that the company proposes to construct either a steam or electric railway from Bangor, crossing

the Penobscot River to Brewer, thence in an easterly direction through the vast timber-lands of eastern Maine through to Holton, a distance of 112 miles. Right-of-way has been purchased for about 32 miles. The company will reach amusement parks and will be able to furnish power for lighting. No contracts have as yet been awarded for the construction of the line. The officers of the company are: George W. Maxfield, Bangor, president and general manager, and Charles L. Andrews, Augusta, secretary and treasurer.

Minneapolis (Minn.) Street Railway.—Mayor Thomas Van Lear of Minneapolis has asked the City Council to compel the Minneapolis Street Railway to construct seven extensions in outlying districts as ordered eleven months ago.

Hudson & Manhattan Railroad, New York, N. Y.—The Hudson & Manhattan Railroad will extend its rapid transit system from its terminal in Newark to the Newark Bay section to provide better transportation facilities for the 250,000 workers to be employed in the shipyards filling the contracts of the United States Emergency Fleet Corporation. The plans have been approved by the shipping board.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Public Service Commission for the First District of New York on April 17, for laying tracks and for materials for finishing the Eastern Parkway and Nostrand Avenue subway extensions of the Interborough Rapid Transit Company in Brooklyn. At the same time bids will be opened for completing the Brighton Beach connection between the Brighton Beach line and the Fourth Avenue subway.

Long Island Electric Railway, New York, N. Y.—After an inquiry lasting several years, the Public Service Commission for the First District of New York has ordered the Long Island Electric Railway to abandon a part of its present route between Rockaway Road and Grant Avenue, Queens, and to build a double-track line in Liberty Avenue.

Cincinnati (Ohio) Traction Company.—C. W. Culkins, director of street railroads, will ask the City Planning Commission to approve the construction of a loop on Warner Street to provide a turning point for cars operating on a new line to be known as the Fairview line, running between Fairview Heights and Fountain Square. Mr. Culkins is also considering the extension of one of the city lines to the village of California and the extension of the Madison Road line to Delta Avenue.

Mansfield Railway, Light & Power Company, Mansfield, Ohio.—It is reported that Henry L. Doherty & Company, who operate the Mansfield Railway, Light & Power Company, plan extensive improvements and changes in Casino Park.

*Miami, Okla.—It is reported that business interests have subscribed \$200,000 toward the construction of the proposed electric railway from Miami to Picher and other towns in the mineral district. H. B. Cobban, president Miami Business Men's League, may be able to give information.

Portland, Ore.—A survey of all streets in the city of Portland has been ordered by Commissioner Barbur of the Department of Public Works, to determine the extent of the maintenance and repair work necessary, with particular attention to the condition of the tracks of the Portland Railway, Light & Power Company, which are in bad condition on many lines. It is expected an expenditure of \$500,000 will be required.

Valley Railways, Lemoyne, Pa.—It is reported that if the government quartermaster depot is placed at Marsh Run the Valley Railways will construct an extension from New Cumberland to New Market.

Carbon Transit Company, Mauch Chunk, Pa.—Plans are being considered by the Carbon Transit Company for the construction of an extension from Packertown to Jamestown, about 1 mile.

Philadelphia (Pa.) Railways.—Negotiations are under way between the Emergency Fleet Corporation and the Philadelphia Railways for the rehabilitation of its line and an extension of double-track service over the Penrose Ferry Road to the shipyard at Hog Island.

Philadelphia (Pa.) Rapid Transit Company.—Negotiations have been completed by the Philadelphia Rapid Transit Company with the Emergency Fleet Corporation, and the railway will soon begin the extension of its line on Island Avenue at Eastwick to the shipbuilding works of the American International Company at Hog Island.

Pittsburgh (Pa.) Railways.—The Public Service Commission of Pennsylvania has issued an order to the Pittsburgh Railways to construct a new line on Wheatland Street.

***Grand'Mere, Que.**—Plans are being considered by business men of Grand'Mere and Shawinigan Falls for the construction of an electric railway, costing approximately \$100,000, from Grand'Mere to Shawinigan Falls.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—It is reported that the Charleston Consolidated Railway & Lighting Company is considering the construction of some track extensions.

Virginia Railway & Power Company, Richmond, Va.—A new roller coaster will be erected by the Virginia Railway & Power Company at Forest Hill Park at a cost of \$6,000.

Seattle (Wash.) Municipal Railway.—City Engineer A. H. Dimock, Seattle, has submitted to Councilman Oliver T. Erickson, chairman of the city utilities committee, tentative plans for an ele-

vated railway on Washington Street, extending from the Seattle & Rainier Valley Railway's line at Fourth Avenue South to the city's proposed elevated line at First Avenue South, with a terminal station on Third Avenue South, between Washington Street and Yesler Way. The cost is estimated at \$85,770, exclusive of any condemnation judgments that may be awarded as damage to property along Washington Street and Third Avenue South. By extending the elevated line in Third Avenue South from Washington Street to Yesler Way, it is stated a terminal can be made from which twenty street car lines can be reached within half a dozen blocks.

Puget Sound Electric Railway, Tacoma, Wash.—Louis H. Bean, president of the Puget Sound Electric Railway, recently conferred with the Pierce County Commissioners in an effort to reach an understanding as to improvements for the company's short line bridge over the Puyallup River, which was wrecked in December by floods. W. J. Roberts, engineer of the Inter-County River Commission, which is in charge of river improvements, will go over the proposed plans with one of the company's engineers and report to the commission. Mr. Bean agrees that the bridge should have two spans, one 200 ft. in length and the other 100 ft. over the river, but wants to pay only one-fourth of the cost of a 600-ft. jetty that must be built to protect the piers.

Morgantown & Wheeling Railway, Morgantown, W. Va.—This company has been authorized by the court to issue \$60,000 of receiver's certificates for repairs and betterments on its line.

Wheeling (W. Va.) Traction Company.—Negotiations are being carried on between the Wheeling Traction Company and the County Court of Marshall County for improving the "Narrows" road south of McMechen, between the McMechen carhouse and Glendale. At a recent meeting of Marshall County Court, officials of the company fully discussed the situation and submitted plans whereby the highway can be made much safer with the erection of guard rails.

Shops and Buildings

Peoples Traction Company, Galesburg, Ill.—The old carhouse of the Peoples Traction Company located in the southwest outskirts of the city was recently totally destroyed by fire. The loss is estimated at about \$10,000.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of station finish on seven stations of the Nostrand Avenue branch of the Eastern Parkway subway in Brooklyn. The lowest bidder was A. W. King, New York, at \$249,639.

Lehigh Traction Company, Hazleton, Pa.—Plans are being made by the Lehigh Traction Company for the remodeling of its old carhouse and sheds back of its terminal at Wyoming and Spruce Streets into a big amusement hall for dances, basket ball, roller skating and public meetings. The cost is estimated at about \$7,000.

Power Houses and Substations

Fort Smith Light & Traction Company, Fort Smith, Ark.—A 33,000-volt transmission line from Fort Smith to serve Alma and a number of other communities, has been completed and the Citizens' Service Company, which distributes electricity in Alma and other communities, is now receiving its electrical energy supply from the Fort Smith Light & Traction Company. The Citizen's Service Company is completing a line from Alma to Ozark, the electrical requirements of which will also be served by the Fort Smith Company. With the completion of these transmission lines the Fort Smith Company will serve all the electrical requirements for a distance of 45 miles west and south of the city.

Pacific Electric Railway, Los Angeles, Cal.—For the purpose of increasing its supply of power for the traffic on the Long Beach—San Pedro and San Pedro—Los Angeles lines, the Pacific Electric Railway has begun the construction of a concrete and brick substation at East Wilmington.

Decatur Railway & Light Company, Decatur, Ill.—The Illinois Public Utilities Commission has granted permission to the Decatur Railway & Light Company to operate an electric lighting plant at Dawson and to take over the plant of the Consolidated Light Company of that town.

Interborough Rapid Transit Company, New York, N. Y.—Plans are being made by the Interborough Rapid Transit Company for the construction of a new one and three-story transformer station on Seventy-fourth Street near Avenue A, to cost about \$12,000.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Work will be begun at once by the Mahoning & Shenango Railway & Light Company on the erection of a transmission line from Lowellville to McDonald. The line will furnish power to the Youngstown & Niles Railway, a subsidiary company now under construction.

Reading Transit & Light Company, Reading, Pa.—The power station of the Reading Transit & Light Company at Collegeville has been dismantled, and the property will be converted into a substation. The best of the machinery and equipment is being utilized elsewhere and the remainder has been sold.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Differential Basis on Copper Wire Products

Reason Why Manufacturers with Accumulated Copper Stock Are Quoting Lower Prices

Lower prices have been looked for by the trade on all copper-wire products for some time. This belief was founded on the quotations for base, which have been gradually receding, to present quotations of 27 to 30 cents. When a large wire manufacturer was asked why the price was growing lower in the face of the government or officially established selling figures of 23.50 cents for car lots and 27.67½ cents for less than car load—prices which still prevail and have been extended by the War Industries Board to June 1—he said that the causes were various.

First, quite a stock of copper had been accumulating in the hands of primary buyers, and the market was therefore softening. Then commercial manufacturers who had a stock of high-price copper on hand had gradually worked it off. Conditions had been about equalized. Therefore it was possible on special business to sell wire on a 27-cent base.

Small sizes of wire and cable were still figured and sold on a 30-cent base. Where 27 cents was quoted it was either to meet competition or because of a desire to secure business. In transactions of this kind the credit standing of the customer is the principal factor. On some contracts taken at 27 cents base it is a matter of discounts. Orders at this figure have been accepted at 60 per cent; others at 60 and 5, and again still others at 60 and 10 to large buyers. Orders for more than \$10,000 are figured from cost and a margin of profit ranging from 10 to 25 per cent. Purchasers of large quantities of signal wire, like the prominent railroads, buy on a 23-cent base.

The general average, however, to quote this and other authorities, is a 30-cent base. This figure is quoted to jobbers buying from manufacturers, with a discount of 60 per cent. On orders under \$2,500 the usual discount is 50 per cent. It depends very much upon the commercial rating of the buyer. Sometimes an additional profit may be added for carrying the customer. Rubber-covered, lead, varnish, cambric and paper-insulated materials are sold on a cost basis plus a profit, which, of course, varies with the customer. There is no regular or hard and fast rule. Weatherproof is selling on an established pound basis, which is

now 27 cents. One manufacturer states that all list prices are based on lengths of 250 ft. of one size and kind. For shorter lengths add to list price 20 per cent on lengths up to 100 ft., 10 per cent on 100 ft. to 250 ft.

Large sizes of wire are now selling almost to the exclusion of the small sizes. The sale of the latter has fallen off on account of the almost total suspension of building operations. The government is taking the greater portion of every manufacturer's output. Originally these purchases were made by the wire cable committee of the Committee of National Defense. Within the last five months the shipyards have been buying direct on a competitive basis. They are now the most important outlet for wire products.

Changes in Carnegie Sales Organization

Colonel Bope Resigns—He Is Succeeded by William Clyde—Other Changes

Effective as of April 1, 1918, Col. Henry P. Bope has resigned his position as vice-president and general manager of sales with Carnegie Steel Company to devote his time to private interests. Colonel Bope became connected with Carnegie Brothers & Company in November, 1879, and has remained continuously in the sales work of that company and its successors up to the present time.

He has been succeeded in his office with Carnegie Steel Company by William G. Clyde, whose connection with the United States Steel Corporation and its subsidiaries dates from 1894, when he became superintendent of the plate mills of the Illinois Steel Company at South Chicago. Later Mr. Clyde became connected with the sales organization of the American Steel Hoop Company as salesman for that company in Chicago, and after the merger of that company with Carnegie Steel Company was traveling salesman for the latter company at Cleveland for three years. In September, 1905, he was made assistant general manager of sales at Pittsburgh in charge of the Bureau of Bars and Hoops, which office he retained until his present promotion. Charles L. Wood, long assistant to Mr. Clyde, has been promoted to be assistant general manager of sales in charge of the Bureau of Bars and Hoops.

H. W. Johns-Manville Company announces that its Memphis, Tenn., office has been moved to new quarters at 804-805 Exchange Building.

Track Materials Prices

Why Tie Plates and Other Specialties Are Quoted on Another Scale Than Government List

When the table in this department of the ELECTRIC RAILWAY JOURNAL is consulted for prices on "Railway Materials," it will be noted that on tie plates, (flat type) and tie plates (brace type) the quotation given is 3¼ cents a pound which is the official or government fixed scale. The same quotations apply to fish plates, angle plates and angle bars. The purchasing agent, however, when coming into the market for tie plates will find a difference in price. According to one of the principal manufacturers these goods are nearly if not quite all special, and instead of being quoted a flat 3¼ cents a pound the figures will be higher for this grade and finish of steel (carbon and hot pressed), being around 3.40 cents a pound in lots of 25 gross tons or more; 4.40 cents a pound for less than 25 gross tons. Higher prices also apply to specifications covering different sizes and lengths as well as the finish. These quotations are f.o.b. mill.

On tie rods and screw spikes, with 8 cents a pound Pittsburgh base, the average price quotations ranging from 6 to 10 cents a pound will be made, according to size and weight. One large mill states it has a heavy stock of rail spikes, on which it is quoting 6 cents a pound. Rail bolts and nuts while on a 4.90 cents per pound, Pittsburgh base, vary in price also as to size, weight and special purpose. Miscellaneous sizes, 5 to 6 cents a pound is named; 7 to 8 cents a pound for short and 8 and 9 cents a pound for special size. High T-rails (Shanghai) and girder rail (grooved) are manufactured by only two steel companies, and while quoted at 4¼ cents a pound are reported as being out of the market.

So far there is less call for rails this year than in 1917. In other words the requirements for 1918 are already provided for and traction companies are asking quotations and making reservations, when possible, for the first and second quarters of 1919. On stock shipments \$70 to \$80 a ton is being quoted, the average being \$75 for T-rails (A. S. C. E. standard). For what is known as Russian rails, made up by the Bethlehem Steel Products Company, Carnegie Steel Company, Lackawanna Steel Company and the United States Steel Corporation, and not deliverable, \$60 a ton is figured. Present deliveries are fifteen months, and the consignee is obliged to obtain a priority order for transportation facilities.

Acute Tin Shortage May Cause Higher Prices

**Manufacturers of Apparatus, Wire and Cable Express Uneasiness—
Cost of the Metal Advancing**

A sharp shortage of tin is not only freely acknowledged now but it has been in evidence for several months. The supply at the present time is less than ever. Prices have been climbing in harmony with the depleted stocks of the metal in this market. A number of manufacturers were waited upon by the *ELECTRIC RAILWAY JOURNAL* to ascertain the true state of affairs in so far as tin and its various alloys and amalgams affected the output and prices on electric railway products. At the office of one prominent concern the acute curtailment in tin stocks was frankly admitted and it was stated that the condition of the market is giving rise to a feeling of uneasiness.

Reserve supplies of tin in the hands of manufacturers of electrical apparatus, wire, cable, dry batteries and other lines are not large. One wire and cable producer said his company had recently bought 5000 lb. of Straits tin at 84 cents, or approximately four times the pre-war normal price.

Tin plays a very important part in the electrical and allied supplies market. Condensers are either coated with tin or they are made of an amalgam of tin and copper. Boiler tubes are also tin-lined, and if a substitute equally good were not made this would cause a serious predicament for central stations. All copper wire to be rubber-covered is first coated with pure tin. If this metal continues to be scarce and high, an early advance in the price of rubber-covered wire must naturally follow, in the opinion of a prominent manufacturer. At present, to use the statement of the same authority, the extra cost to the producers is from 3 to 5 per cent.

Were tin to become still more expensive or to be unattainable, a coat of pure Para rubber, said an expert, could be used on the copper wire, but this process would increase the price of rubber-covered fully 50 per cent. As yet that branch of the industry has not been called upon to meet this emergency. The concern in question supplies a majority of the rubber-covering factories with tinned wire. For lack of sufficient tinned stock a number of these plants have already been obliged to close down. Tin is also extensively used in certain grades of trolley wire. For weatherproof wire employed in the neighborhood of acid or other factories, where the presence of sulphur fumes corrodes and destroys the insulation, the core is likewise submitted to a tinning bath.

Wherever solder is utilized tin is an important element. The metal is also employed in everything of brass, bronze, phosphor-bronze, babbitt metal for journal bearings, and in other alloys known to power-house plants and in the traction railway activities trade. It is the general belief, therefore, among producers of merchandise in

which tin is a factor that, while current prices have not yet been revised on account of the shortage, discussion along these lines is arousing unusual interest and serious attention.

Transportation Checks Pole Deliveries

Shortage in East of 35-ft. Size—Advance Reported on Pins and Brackets

Reports this week on the market condition of wood poles and crossarms reveal marked differences in different parts of the country.

In the East sizes of about 35 ft., which is the popular length, of chestnut are difficult to obtain. The demand is steady but shipments are checked by embargoes. Utilities are in the market for their spring requirements in replacement and maintenance work.

From the Pacific Coast, however, there is a different report. There the pole business is reported to be in a most abnormal and unsettled state, suffering from the rather unusual combination of slack demand and difficult deliveries. This situation may be explained by the shortage of available power and the present high cost of construction material. On the other hand, the pole yards are situated in the Pacific Northwest, where a great deal of government lumber is requisitioned. Cars and boats are difficult to get and labor is almost impossible to secure, and then only at high wages. One of the large pole companies states that when it is fortunate enough to secure a boat for deliveries along the Pacific Coast it is customary to load it with everything available, instead of proportioned stocks, and thus pole stocks are spotty and poorly distributed. Crossarms, of course, are affected by the conditions noted above, with the addition that the forests in which they are cut contain lumber that is valuable for governmental purposes and demands the attention of all available labor, making slow deliveries.

An advance of about 10 per cent on pins and brackets, it is reported from the Middle West, has been scheduled. Shortage of material is given as the cause for the increase.

Steel As Related to Galvanizing

The Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued a report on a "Metallurgical Study of the Steel Base as related to Galvanizing," by G. A. White, metallurgical engineer. Some of the conclusions reached by this treatise are that steels containing a large amount of oxide and high in manganese or manganese sulphide will galvanize with a large number of small spangles, whereas steels high in manganese, manganese sul-

phide, sulphur and phosphorus but free from dissolved gases and oxides will galvanize with bright spangles; also that the factors active in the production of small granular spangles have their origin in the open-hearth process and these causes can be eliminated only when sufficient care is taken to produce a steel substantially free from oxide. The steel on which Mr. White's tests were made was from three of a total of twenty heats, on each case the heat was tapped into two ladles, the steel in one ladle being treated with ferro-carbon-titanium, while the other received the standard open-hearth process.

New Iron and Steel Prices

Dating from April 1 the new iron and steel prices, established by the War Industries Board, with the approval of the President, went into effect. The changes to miners in force for three months, were comparatively few, now making basic pig iron \$32 per ton and \$32.50 for Bessemer. Foundry is left at \$33, while malleable remains at \$33.50. A reduction of \$1 a gross ton is made on all prices of scrap, both base grade and differentials. Heavy steel melting scrap is thus quoted at \$29.

Rolling Stock

Brooklyn (N. Y.) Rapid Transit Company, which intended opening bids for 50 new center-entrance train cars on April 1, as referred to in the *ELECTRIC RAILWAY JOURNAL* of March 23, has postponed action until April 11.

Monroe (La.) Street Railway, municipally owned, is reported as about to buy four rebuilt cars from the Shreveport (La.) Railways. They are of the one man type, with two seating twenty-eight passengers, offered at \$3,000 each, and two of thirty-two seating capacity at \$3,500 each. It is stated that new cars of this kind will now cost \$6,250.

Trenton & Mercer County Traction Corporation, Trenton, N. J., is having expert mechanics from the J. G. Brill Company rebuild the cars damaged by fire on Dec. 15 last, as mentioned in the *ELECTRIC RAILWAY JOURNAL* at the time. They will soon be ready for service. The company has scrapped and sold several of its old cars.

Hudson & Manhattan Railroad, New York, N. Y., operating the Hudson River tubes and connecting systems, according to advices from Washington appearing in the daily newspapers, will extend its lines to the Port Newark Terminal, N. J. Plans to that end were announced on Tuesday by A. L. Drum, transportation engineer of the United States Shipping Board. The cost of the work is estimated at \$3,500,000, and it will begin at once and be seeped up so that trains will be running within three months. Specifications for sixty new all-steel cars are in the hands of the company.

Trade Notes

Westinghouse Air Brake Company this week posted a notice at its Swissvale and Wilmerding plants that an increase of 12½ per cent. has been given the employees.

Gurney Ball Bearing Company, Jamestown, N. Y., is equipping the entire rolling stock of the Third Avenue Railway, New York, N. Y., with its ball-bearing car journal boxes. The work is now under way.

American Chamber of Commerce, City of Mexico, Mexico, has issued the first number of the Journal of the American Chamber of Commerce. It is illustrated and contains information of interest to manufacturers desiring to market their products or better their trade connections in Mexico.

Vulcan Soot Cleaner Sales Company, Chicago, Ill., has transferred to Dubois, Pa., its general sales office, with G. L. Simonds in charge. This is only a change in location to bring the sales, factories and engineers in immediate touch, with the idea of giving better service to all; the personnel remains as before.

W. O. Duntley, president of the Chicago, (Ill.) Pneumatic Tool Company, announced his resignation on March 29, to take place the same date. Mr. Duntley gave as a reason for his resignation a desire to be relieved of the work of actively managing the concern and to devote more time to private business.

Homestead (Pa.) Valve Manufacturing Company has opened a branch office at 1 Franklin Street, New York City.

Charles Remilius has become connected with R. R. Nelson & Co., Newark, N. J., as consulting engineer for them on electric railway equipment and railway properties. Mr. Remilius has had an extended experience with operating properties in Brooklyn and other cities.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis., to insure service and every possible assistance to the various departments of the United States government, has arranged to station H. W. Knowles of its New York office permanently in Washington for the period of the war. The Washington branch will be at the Bradford, Eighteenth and K Streets.

National Conduit & Cable Company, New York, N. Y., at a meeting of the directors recently elected George J. Jackson president, to succeed Edward S. Perot, and Norton A. Howard, formerly secretary, was chosen vice-president, to take the place of Edward S. Perot, Jr. H. J. Pritchard, formerly treasurer, was elected secretary and treasurer to succeed Mr. Howard.

Economy Electric Devices Company of Chicago has received from the Chicago, North Shore & Milwaukee Railroad an order for Sangamo Economy railway meters with which to equip all of its motor cars. This railway property, which operates a high-speed double-track line between Milwaukee and the north limits of Chicago, is controlled by the officials of the Chicago Elevated Railways.

New Advertising Literature

W. N. Matthews & Brother, Inc., St. Louis, Mo.: One-page circular entitled "Labor Conservation." The circular explains the use and shows illustrations of the Matthews wire and cable clamps.

General Electric Company, Schenectady, N. Y.: Index to the company's descriptive bulletins and sheets, also a separate index to supply part bulletins brought up to Jan. 1, 1918. Both of these publications deal with railway equipment, machinery, apparatus and specialties.

C. H. Wheeler Manufacturing Company, Philadelphia, Pa.: Booklet entitled the "Radojet Air Pump." The bulletin is well illustrated, giving the outside views of various size injector-type pumps and showing the application of the so-called air "pump" in a power plant. The general arrangement of the piping system for air removal from condenser, etc., is also shown. Steam tables are included.

Joseph Dixon Crucible Company, Jersey City, N. J.: "Brushes for Your Motor," a new electrical booklet, which tells the story of graphite brushes. The two center pages are devoted to an arrangement of prices and sizes so that the cost of any size brush may be found in a minute. There are also rules as to how to order graphite brushes. Other graphite electrical specialties such as resistance rods and lubricating rods are shown and described.

NEW YORK METAL MARKET PRICES

	March 27	April 3
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26½ to 26¾	26½ to 26¾
Lead, cents per lb	7½	7.20
Nickel, cents per lb	50	50
Spelter, cents per lb	7½	7½
Tin, Straits, cents per lb	*85	*85
Aluminum, 98 to 99 per cent., cents per lb	*32.10	*32.10

* Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	March 27	April 3
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6.375	6½
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	42.41	42.41
Old carwheels, Chicago, per gross ton	30.00	30.00
Steel rails (serap), Chicago, per gross ton	35.00	35.00
Steel rails (relaying), Chicago, gross ton	60.00	60.00
Machine shop turnings, Chicago, net ton	17.00	17.00

ELECTRIC RAILWAY MATERIAL PRICES

	March 27	April 3	March 27	April 3
Rubber-covered wire Base, New York, cents per lb	27 to 30	27 to 30		
Weatherproof wire (100 lb. lots), cents per lb, New York	28½ to 34½	28½ to 34½		
Weatherproof wire (100 lb. lots), cents per lb, Chicago	33.42 to 38.35	33.42 to 38.35		
T rails (A. S. C. E. Standard), per gross ton	\$70.00 to \$80.00	\$70.00 to \$80.00		
T-rails, high (Shanghai), cents per lb	4½	4½		
Rails, girder (ground), cents per lb	4½	4½		
Wire nails, Pittsburgh, cents per lb	3½	3½		
Railroad spikes, drive, Pittsburgh, base cents per lb	4½	4½		
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8		
Tie plates (flat type), cents per lb	*3½	*3½		
Tie plates (brace type), cents per lb	*3½	*3½		
Tie rods, Pittsburgh base, cents per lb	8	8		
Fish plates, cents per lb	*3½	*3½		
Angle plates, cents per lb	*3½	*3½		
Angle bars, cents per lb	*3½	*3½		
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90		
Steel bars, Pittsburgh, cents per lb	5	5		
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90		
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80		
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35		
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95		
Car window glass (single strength), first three brackets, A quality, New York, discount	80% to 82-3%	80% to 82-3%		
Car window glass (single strength), first three brackets, B quality, New York, discount	79%	79%		
Car window glass (double strength, all sizes AA quality), New York discount	80%	80%		
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22		
Waste, cotton (100 lb. bale), cents per lb	12½ to 13	12½ to 13		
Asphalt, hot (150 tons minimum), per ton delivered	\$38	\$38		
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Warner, N. J.), per ton	\$42	\$42		
Asphalt, filler, per ton	\$45	\$45		
Cement (carload lots), New York, per bbl.	\$2.65	\$2.65		
Cement (carload lots), Chicago, per bbl.	\$2.71	\$2.71		
Cement (carload lots), Seattle, per bbl.	\$3.05	\$3.05		
Linseed oil (raw, 5 bbl. lots), New York, per gal	\$1.57	\$1.59		
Linseed oil (boiled, 5 bbl. lots), New York, per gal	\$1.59	\$1.60		
White lead (100 lb. keg), New York, cents per lb	10	10		
Turpentine (bbl. lots), New York, cents per gal	44½	42½		

* Government price.