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Retrospect and Prospect

LARGER gross and net earnings, accompanied by rising taxes and other expenses; new cars purchased and built a third more than in 1915, with new track a third less; receivership and foreclosure rates about normal; companies giving signs of more intensified traffic development; public showing greater appreciation of railway operating problems and financial burdens; these facts form partly the history of 1916. A glance forward indicates that the recuperative strength shown during the past year will produce encouraging results under the more favorable conditions promised for 1917.

THE ELECTRIC RAILWAY JOURNAL IN 1916 AND 1917

Probably the most striking developments during 1916 in the electric railways of the country were of an economic character, growing directly out of the tremendous industrial revival which marked this past year. This activity brought more traffic to the railways, but greatly increased the cost of their materials and labor. Properly to report the changed conditions in the material market, this paper last April considerably enlarged its department of industrial news, now known as "Manufactures and Markets." Here have appeared interviews on trade conditions with important men in the manufacturing field, articles on prices by purchasing agents, discussions on questions of delivery and other live industrial news. Another phase of the economic development of the year, already mentioned, is that of labor, brought about by the enormous demand for help in manufacturing enterprises. This condition encouraged the activities of electric railway labor agitators, and resulted in a number of strikes, of which the most important was the September strike in New York. Here also this paper not only reported at length the negotiations between the contending parties and before the commissions, but followed up the most interesting single feature of the New York situation, the adoption of the individual contract, by describing its early history in Indianapolis and the experience with it there. From an engineering point of view, the most important development has been the continued improvement in the passenger car, especially in the direction of providing for more rapid passenger interchange. This development was signaled in the Convention Number issued on Sept. 30, 1916, and devoted to "The Development of the Modern Car." The events in the American Electric Railway Association have been reported in the Association News department which is now a feature of each issue of the paper. In

this number we present our usual statistics for the year which has just passed. We also publish editorial reviews of progress in the leading branches of the industry, with a survey of its existing economic condition.

The service which we expect to give during 1917 will be even better, we hope, than that given to the industry in the past. While it is impossible in any newspaper to foretell just how each important event of the year will be handled, as the events themselves are shrouded in the future, we can say concretely that we have already arranged for one or more articles on three important topics by well-known authorities. One of these topics is the labor situation, another is public relations and publicity, and the third is the economic future of interurban railways.

ADVERTISING IN COMPANY PUBLICATIONS

An important point in the ethics of public service corporations was raised in a paper on "Railway Publicity," read recently before the Canadian Railway Club by Walter S. Thompson, press representative Grand Trunk Railway, and published in this paper last week. The author was discussing company publications, and while he spoke highly of their value in producing an *esprit de corps* among the employees, he condemned, and properly, the inclusion in such papers of advertisements of supply houses and other firms doing business with the company. We are aware that some electric railway publications carry such advertisements as well as some local advertising directed particularly to the men, but believe that where the practice of soliciting advertisements from concerns which do business only with the company is followed, it has been begun without any particular thought of the merits of the case. Nevertheless, as Mr. Thompson says, there are obvious objections to a railway seeking to gain this form of revenue from any publication which it issues.

The primary objection to the plan is that it involves the acceptance of money by the company without the giving of an equivalent. Those to whom the company publication goes and by whom it is attentively read are not potential buyers of the turbines, motors or other apparatus which are sometimes advertised in its columns or are purchasers in only very small proportion. Hence the circulation which such a publication gives to advertisements of this kind is largely wasted. Manufacturers who are large advertisers recognize this fact, but experience has shown that many of them prefer to submit to petty graft of this kind rather than to run the risk of offending the person making the request, if he occupies a responsible position on the property. This may be cowardice on the part of the manufacturer, but the blame lies primarily with the railway which makes the request directly or through one of its officers.

ADVERTISING AS A BUSINESS FORCE Advertising ceased long ago to be an indefinite science. If it was, it would be impossible to justify

the large sums of money which are spent annually by many large advertisers. The fact is that the principles underlying and controlling advertising are just as definite as those underlying and controlling the flow of

electric current in a circuit of known resistance, and investments can be made and results predicated therefrom with practically the same certainty. One of the foundation principles of the expenditures thus made is that in the commercial world advertising is a business force, as necessary in the sale of goods as men, credit, transportation or money. It is not to be confused with charity, with contributions to religious, political or commercial causes or with any other service or thing. Another fundamental principle is that good advertising mediums do not "happen." They are made by service, just as the value of a public utility to a community is made by service, and by painstaking adaptation of means to ends. Mr. Thompson calls the advertising placed by supply houses in railway company publications "policy advertising," by which he undoubtedly means that the manufacturers are afraid not so to spend their money, but this is a reason which is not creditable to the railway company soliciting the business. We are glad to learn from the paper before the Canadian Railway Club that the steam railroads are coming to the view that these publications, when properly conducted, are worth to the companies the price which they cost and that support from outside advertisers can be dispensed with.

Publicity and Good Public Relations

We expressed the opinion recently that the maintenance of good public relations was the most important subject now before electric railway companies. For this reason we have devoted a considerable part of this issue to a symposium on the subject from men who have in charge the work of publicity and public relations on a number of railway properties. This symposium might be considered as a continuation of the series of editorial talks and cartoons which was concluded in our issue of Dec. 23. They discussed the general principles of publicity and the type of man required as a publicity agent. The present symposium opens with a summary by Ivy L. Lee, who dignifies this official with the title "publicity engineer." Mr. Lee tells, among other things, who the publicity engineer should be, how he should be treated by his employer, and how he should perform his functions. In the other articles in the symposium the writers show the application of the fundamental principles and tell what is being done in the way of publicity on different railway properties and how it is being done.

It is possible that there may be some electric railway managers who have the idea that publicity is being urged upon the industry as a specific for a peculiar condition. This is not so. Publicity is as broad as human activity. It is no recent discovery. Its efficacy and the wisdom of its application are unique nowhere. It pertains to electric railways no more than to all other public service corporations. It is not restricted even to corporations. It is pertinent to the prosperity and peaceful conduct of all affairs, governmental or civic, big or little, public or private, corporate or individual,

with which any large element of population is concerned. It is the same everywhere and rests on the same basic foundation. Its other name is Mutual Understanding.

There are certain essentials for success with publicity. These are honesty of deed, sincerity of purpose and frankness of method on the part of those in whose behalf it is undertaken; ability and integrity on the part of him who applies it to that behalf, and ultimate fairness on the part of the people who are the jury. The third essential is present always.

There is only one point of possible difference between the publicity practice of utility corporations and that of other interests. This difference lies in the fact that the utility companies are under more critical surveillance and, in consequence, that their adherence to the canons must be absolute and unswerving. For instance, a public utility that lacks in any appreciable measure its share of the essentials mentioned above would be wise not to tamper with publicity.

Again, if any corporation possessed all the essentials it would be compromising its opportunities if it entrusted its publicity to the direction of a man whose own measure falls short of the proper standard. It is undoubtedly true that the spirit of publicity must radiate throughout the whole corporation, and it is only when the entire organization is being ruled by it and living up to it that publicity is accomplishing its maximum efforts. But the one man whose specialty this is must be as big as his work, or the work itself suffers. Then, if the cause is worthy and the manner of its presentation appropriate, publicity is sure of eventual success. It is dangerous, indeed, if misused, but if

directed wisely and courageously it is a mighty and beneficent force.

It is the exception in these days to find a public service corporation which cannot stand the limelight of publicity. But it is also true that those companies which sincerely and consistently invite it still appear to be the exception. We might just as well be frank and admit that the old ideas hang on tenaciously. Many public service corporations have not yet shaken off the archaic reluctance to talk publicly and for publication. They cling to the old error of baffling silence when the public is intent to catch a whisper, of vicarious refusal to discuss topics which they regard as none of the public's business. Everything that has to do with utilities

is the business of the public, because the public itself has so decreed, and the public is not going to tolerate indefinitely on the part of any corporation that policy which denies this right.

But it is not alone sufficient that a company should admit the desirability of a policy of publicity. A person might give full assent to the statement that to learn how to swim is good, but that belief alone would not help him much if he got beyond his depth in the water. So with publicity—considered in its broadest sense of making corporation matters public. Professions of willingness to treat the public fairly but without action avail little. But there is ample testimony to the fact that the right kind of publicity pays.

The Organized Safety Movement

The youth of the movement designed to mobilize interest in safety work and to stimulate further development is indicated by the fact that during 1916 the fifth annual convention of the National Safety Council and the second of the Safety First Federation of America were held. The former association started in the industrial field and has had a remarkable growth. The Federation represents especially the public safety movement. The fields of the two organizations overlap in all cases where industries and public are both involved, as they are in public utility operation and particularly electric railway operation. The electric railways are therefore interested in the work of both, and they have taken an active part in them up to the present time.

It is greatly to be regretted that the very promising movement under way during the past year in the direction of organic affiliation of the two safety societies has not yet accomplished its aim. That it will do so soon is to be expected because there is no room in this field for competition or duplication. The accident hazards connected with daily life are increasing so rapidly that every effort must be made to control them. The two organizations have no doubt had great influence so far. United this influence will be far more potent.

The electric railways have rallied to the support of the National Safety Council during the past year and at the Detroit convention, held in October, the electric railway section was conspicuous. The membership in this section is now large enough to make it an important medium of co-operation. It is only as the railways use the section in this way that it can perform its natural and proper function. The council has little to give to the railways but the machinery for co-operation, and if it does not produce the desired results it will be because its function is not understood. The principal work of last year was to get the railways together. Now they must utilize the opportunity thus afforded.

The Safety Federation is so new that the electric railways have hardly as yet had an opportunity to utilize it. However, it does furnish a medium through which municipal and other officials can work with the transportation men in making the streets more useful and safer. It has an active electric railway committee.

Electric railways are preeminent in the safety movement as are few if any other industries. In the first place, they are obliged to entrust the inherently dangerous operation of electric cars to a very uncertain class of labor. The increase in the number of motor vehicles, the recklessness of drivers and pedestrians, and the severity with which courts of justice administer the law of negligence, all combine to render car operation difficult and expensive. Again, as far as employees are concerned, the railway incurs many risks incident to manufacturing, while as a power producer and distributor it has safety problems like those of the electrical power industry. It is appropriate, therefore, that the railways, through the national safety organizations and through their own associations, should push the safety movement. That they are doing so is indicated by the amount of space which has been required in the *ELECTRIC RAILWAY JOURNAL* during the past year to record the new things which are being done. While the Hudson & Manhattan Railroad and the Union Traction Company of Indiana occupied the limelight through the respective awards to them of the Travelers' and the Brady safety medals, many other roads have made very creditable records.

Among the tangible evidences of safety efforts in the railway field there are two classes of exhibits. One consists of warning signs and bulletins, which are now found everywhere. These are good so far as they go, but better are the safeguards actually placed around danger spots. In the shop we find belting and gearing inclosed with frames and screens, floors kept clear of debris, goggles provided for use in eye-jeopardizing operations, etc. In the power plant the switchboard is made foolproof as far as possible, stairways are used in place of ladders, walkways over boilers and piping are provided, and in some cases even railings are installed to protect window washers.

There is, of course, some danger that safety work may become a fad; that talk will be considered a substitute for deeds and that workmen will not take seriously the efforts made in their behalf. However, we are convinced that the movement is meeting a real need, that if followed sanely it will produce good results and that the results of recent progress can be conserved and applied through concerted effort.

The Year in Heavy Electric Traction

Insofar as new installations in the electrification of steam railroads are concerned, the year 1916 has been somewhat barren of results. In Europe, it is true, there has been the adoption of single-phase electric power for the Swiss Federal Railways and the electrification with high-tension direct current on a freight line of the North Eastern Railway in England, as well as a rather "dinky" suburban line out of Manchester. On this continent we have had only the placing in service of the third engine division of the epoch-making Chicago, Milwaukee & St. Paul installation over the Rockies, the interest in which, however, has been largely discounted by the great extent of the work that was done on this project in 1915.

The year, nevertheless, has been exceptionally productive in the way of operating experience. On the two spectacular installations of 1915—the Norfolk & Western and the Chicago, Milwaukee & St. Paul electrifications—the results have been extraordinary in their success. This has been due, obviously, to the fact that both lines undertook, for the first time in the history of electrification, to handle freight on a large scale. The dominant feature of both has been the displacement of somewhat more than three steam locomotives by each electric machine. In both cases train loads have been increased very materially, and train speeds have been practically doubled.

Here we have, at last, something definite upon which to base conclusions as to the future of electric operation of trunk line railroads, and every conclusion that can be drawn points to a great extension of electrified track within the near future. At the present time a great number of projects and rumors of projects are in evidence, and it is unquestionably the fact that much of the electrification work now being considered as a possibility has been due directly to the records made available during the past year.

Of the definite new projects the two most ambitious are that of the New York Central, including the west-side tracks in New York City, and that of the Illinois

Central, including its lake front terminal in Chicago. Neither one offers anything in route mileage that approaches the Milwaukee's electrification across the Rockies, but at that both will be remarkable for the density of the traffic that will have to be handled. In addition it is practically a foregone conclusion that the New York Central's electrification, which will involve handling all the road's heavy freight trains over some thirty miles of the main line, will end in the extension of the electric zone to Albany, about 100 miles farther north. On this division the traffic is so dense and so continuous that it is actually feasible to use 1200-volt current. At present trains of great length are being handled by steam in remarkable time, the entire division being on the flat grade of the Hudson River, and this serves to cut down the margin between the effectiveness of steam and electric motive power. Nevertheless, there is a good possibility of the service being electrified solely on the grounds of operating economy.

Other than this, the projects now in the air are generally those which involve heavy grades, where the electric locomotive has the special advantages of unlimited power and superior tractive efficiency, both tending toward the establishment on the mountain divisions of train loads that are equal to the tonnages handled on level divisions as well as to the maintenance of reasonably high train speeds. On mountain divisions also the element of regenerative braking affords another advantage to the electric locomotive, the year's experience having shown that this method of handling trains is thoroughly practical from an operating standpoint, although as yet no basis is available for estimating the extent to which it increases maintenance costs.

In conclusion it may, perhaps, be said that the past year has been one of watchful waiting in electrification. The outlook for 1917 is more than promising as regards new projects, mainly for the reason that many doubts on the ability of electric traction to produce results have been set at rest through the record of definite accomplishment.

How Earnings Have Held Up

Just as in periods of panic or depression one finds in electric railway and other utility earnings a marked stability, so in the days of rapidly expanding prosperity one does not expect to find utility earnings so inflated as those of many other companies, particularly industrials. For this reason, the unparalleled earnings records that were made by many manufacturers in the United States during 1916 had no counterpart in the electric railway industry during this period, although appreciable advances appear to have been made in the latter field. Electric railways as a whole are still far from being inclined toward prompt co-operation in the matter of furnishing earnings statistics, but from figures thus far obtained by the information bureau of the American Electric Railway Association it may be

possible to give some indication of the trend of their earnings.

For the fiscal year ended June 30, 1916, as compared to the similar preceding period, the operating revenues for about 8700 miles of line out of approximately 30,000 miles showed an increase in gross operating revenues of 3.47 per cent, in operating expenses 2.40 per cent, and in net operating revenues 5.15 per cent. During the first six months of the calendar year 1916, as compared to 1915, this showing seemed much improved, for companies operating about 7450 miles of line increased their gross operating revenues 8.08 per cent, and their net operating revenues 12.10 per cent, operating expenses rising 5.68 per cent. To bring the record as far as possible up to date, the results for the first nine

months of 1916 indicate that the gross operating revenues for about 7400 miles of line rose 6.26 per cent, the operating expenses 5.13 per cent, and the net operating revenues 8.06 per cent.

Comparisons between the foregoing figures must naturally be somewhat elastic on account of the diverse mileage involved, but it seems to be assured that the earnings for 1916 will show up much better than those in 1915—probably to the extent of 7 per cent in gross and 9 per cent in net. During the year the Eastern and the Southern districts in the main continued to report improvement, and in the last reported quarter, July-September, an encouraging gain was also noticeable in the Western district, where the jitney competition on the Coast and the peculiarly persistent business depression in the Northwest had been such disturbing factors. With such general improvement the showing for the whole of 1916 would probably have followed closely that for the first half if it had not been for the losses incurred in the third quarter in connection with the New York strikes. According to the public service commission reports, the operating revenues of the metropolitan surface lines concerned fell off 50 per cent in September, 1916, as compared to September, 1915, while the operating expenses decreased only 30 per cent. These decreases had a considerable effect upon the general totals for the third quarter, and without doubt account for most if not all of the poorer results for the first nine months of 1916 than for the first half of the year.

While general increases in gross and net were thus secured in 1916, this result is not ground for unlimited optimism, for it was obtained only after a most strenuous struggle with the rising costs of labor and materials, as indicated by the above stated increases in operating expenses. That was not all, however, for the gain in

net operating revenues was accompanied by added tax burdens to the extent of 3.04 per cent for 7700 miles of line in the last fiscal year, 6.58 per cent for 6400 miles in the first half of 1916 and 7.05 per cent for 6400 miles in the first three quarters of 1916. For neither of these groups is there much hope of immediate betterment. Such relief in labor costs is not possible, and while some materials whose high cost has been based largely on war usage will relapse sharply with peace, the general high prices of materials will probably not soon be forced down to the pre-war levels. Nor does it appear that there is any widely growing recognition of the fallacy of lessening the effectiveness of transportation systems to make them tax gatherers or any more serious study of the proper incidence of taxation.

Because of these facts, although the possibilities arising from the settlement of the European war present no terrors to electric railways and other utilities as compared to industrials, the future could well be much brighter for electric railway earnings. The point of the whole matter is that the companies cannot long continue to meet rising expenses with a practically fixed income; many of them are seriously pinched now. A greater traffic development will help some lines, particularly interurbans, but for the industry as a whole, in the absence of a cataclysm that would sweep away high operating costs, the fare unit must be increased or some fare system adopted that will give more adequate recompense for the service rendered. In the last three calendar years forty-nine electric railways secured fare increases of various sorts, but this is only a drop in the bucket. Many more increases are needed, and the sooner electric railway officials try in concert to show the fallacy of a sacrosanct 5-cent fare, the better it will be for the industry.

Converging Aims in Car Design

The close of the year 1916 is a particularly fitting time for consideration of the immediate goal toward which recent developments in electric railway surface cars are leading the industry. During the year certain definite ideas seem to have become common to practically all who are interested in the design of cars for city service, and although the revolutionary changes that began some four years ago are still going on, there is no question but that sentiment has reached a well-defined state of crystallization in regard to a number of features of marked importance. This, we believe, can only mean that the first step is being taken toward standard city cars—something which practically every one favors in the abstract, but which as a concrete matter is opposed because of supposititious difficulties of establishment. Insofar as interurban cars are concerned, there is no doubt that many of the same factors apply, but it is in the case of the city car that they are most strongly emphasized, thus making the latter the better basis for consideration.

During the past year the record of new construction

for city service, confirming the indications exhibited in 1915, has shown very definitely that the open car is dead. With it has gone the fully-convertible car, leaving for future general types only the closed car and the semi-convertible car, which differ from each other merely in trifling detail. The year has seen, also, a practical settlement of the question of all-steel versus semi-steel construction, since the rapid growth in popularity of steel side posts and carlines demonstrates beyond a doubt that the use of wood, except for floor and roof sheathing, will very shortly disappear altogether.

With regard to less general or more detailed features of the car body, the record of the past year has shown that the arched roof is thoroughly established, because the original opposition to it on the ground of ventilation has been finally dissipated, the largest company that retains the monitor deck having actually adopted the plan of closing up the deck sash and installing half a dozen automatic ventilators in their place. The use of interior bulkheads is also very much on the wane, in view of the rising popularity of the fully-inclosed,

pay-within car, which in addition has produced a tendency toward uniformity in platform design for end-entrance cars, including door width and radius of crownpieces. A practical standardization has already taken place in regard to the use of a transverse seating arrangement with longitudinal seats at the doors, and at the same time has come the adoption of a seat spacing (coinciding in all recent cars with the distance between side posts) that now falls, without exception, within a range of less than 2 per cent from the mean.

Here, indeed, are the elements of a standard car, provided the two questions of general dimensions and door arrangement could be settled. Of these the latter appears to be most formidable, because the center-door principle has received another lease of life through the new front-and-center-door designs, and in case these fulfill their present promise, they will constitute formidable and permanent rivals of the end-entrance design. It seems, in fact, impossible to consider the standardization of door arrangement at the present time. This does not, however, stand in the way of establishing a standard end-entrance car which, regardless of any reasonable growth of the modified center-door idea, could undoubtedly be used for many years to come, nor does it even stand in the way of the demand for "this year's model," mentioned by W. H. Heulings in his recent able article on standard cars. "This year's model" does not have to be a freak. In fact, experience has shown that radical changes in design are never acceptable to the electric railway industry, and that the novelties which go to make up a new model are invariably subordinate in character.

ARE STANDARD DIMENSIONS POSSIBLE?

If, then, the question of door arrangement may be left aside to be settled by future years of experience, there remains no very serious obstacle to standardization of car bodies, at least from the user's standpoint. As we have mentioned in previous issues, an overall length of 45 ft. might be arbitrarily adopted as standard for double-truck city cars without being more than 5 per cent away from the dimension now used in practically any one of the important cities in this country. Expressed in terms of capacity, this means four seats, and it would require considerable hardihood, even for supporters of the "local conditions" theory, to argue that such a small change could make a vital difference in operating results.

In the same way a width of 8 ft. 4 in. would be suitable for practically every large city, and, to go a step further, as Mr. Heulings has done in his article, a width of 8 ft. 2 in. would be suitable, with rare exceptions, for any community, large or small. For a city where an 8-ft. 6-in. width is permitted, the suggestion of using a narrower car doubtless would not be welcomed, yet it is safe to say that the great majority of city railways whose clearance lines permit such ample widths are not, to-day, making the most of their opportunities. Thirty-five-inch seats with, say, a 25-in. aisle give about all the space that any city car really needs, and these dimensions may be attained with an

overall width of 8 ft. 2 in. When greater overall widths have been provided, it is quite the rule to find no wider seats or aisles than those just mentioned—the extra space in nine cases out of ten is wasted in unduly wide side walls which, instead of being confined to the easily attainable dimension of 1 in. in thickness, frequently run up to 3 in. or even more for no explicable reason.

In the case of the double-truck car, therefore, the question of standard overall dimensions is no longer a serious matter. Nor is it any more serious in the case of the single-truck car, which has a definite place in small cities where travel is light. For such equipments a length of 33 ft. has become so nearly a universal rule that it would already constitute a standard except for the incomprehensible and unnecessary variations of a few inches over or under that appear in recent cars. This, of course, excludes consideration of the one-man car whose length may be very much less than 33 ft., but here is, of necessity, a novel and little-understood type of equipment that cannot well be included, at least for the present, in any discussion of standardization. It is, as a matter of fact, a distinctly separate development that gives every indication of running its own course absolutely without regard to the older types of design.

NEXT STEP TOWARD STANDARDIZATION

From the user's standpoint, then, it has now become possible to establish a standard car by arbitrarily assigning average overall dimensions and by following the most commonly-used designs for vestibules, roof contour and seat spacing. This, it would seem, is all that the user is really interested in, since the details of construction are primarily the affair of the manufacturer, and are not likely to be improved upon by those who are operators rather than builders of equipment. Indeed, we believe that much of the existing chaos in car design has been due to the interference of railway maintenance departments with construction details—something that might far better be left to the specialists in construction. Even so, there is sufficient divergence in the ideas of the many different builders of car bodies to offer a wide choice in structural details to the purchaser of a car that had standard overall dimensions and standard general features. What the purchaser wants is a car of minimum weight and price, and of maximum durability, and a distraction of his attention to such petty complications as variations of a few inches in length, or differences in roof contour, or the relative advantages of continuous or independent side-posts and carlines can only obscure the final object.

Granting this, as well as the possibility of bringing a respectable number of railways to use a standard car, it seems to us that the next step should be a definite estimate as to the actual, tangible advantages accruing to the user through standardization. If the gain is found to be of considerable importance, there is little doubt but that the industry could be induced to indicate general dimensions and outlines which would be acceptable as standard at least for a large number of com-

panies, but which, of course, would not have to be used by all. For the ensuing year, therefore, we would commend this question of economy effected through the use of a standard design to the car builders. From no

other source could any kind of an answer be obtained, and without an answer it might well be that the present ripe opportunity for establishing a standard car would be lost altogether.

Keeping Track Costs Down

In the way departments of electric railways, the year 1916 will be remembered as one marked by a great scarcity of labor and consequent high wages, delayed deliveries and almost prohibitive prices of materials. As a result much necessary track work was postponed until conditions will have adjusted themselves. In many cities the authorized work could not be completed because sufficient labor could not be had, and in others material deliveries were responsible for incompleting programs. To counteract this labor situation much attention was directed toward increasing efficiency in the handling of materials. Many engineers turned to power tools to speed up their work. Pavement rooters in several instances supplanted the pick in the hands of a laborer. Steam shovels, dump cars and auto trucks were substituted for hand shoveling and teams. Derrick cars were quite generally used for handling the heavier track materials, and concrete mixing plants of various kinds and capacities greatly reduced the forces necessary to place this material in the track. Pneumatic tamping outfits, drills and spike drivers—all had a prominent place in track work, and each played an important part in supplanting labor.

Despite the critical situation that existed in 1916, the end does not yet appear in sight. Rail prices were advanced \$10 per ton during the year and prices for special work and other steel products were also increased in the same or greater proportion. In fact, abnormal advances in prices were recorded all along the line, and indications are that further advances will be made. How much more the electric railway companies can stand and continue construction and rehabilitation programs is problematical. It is true that earnings showed substantial gains, but these were needed to make up for the losses of past years. On the other hand, the period of retrenchment on many properties had been prolonged until renewals and reconstruction were absolutely necessary. Hence, it was not surprising to find that this class of track work rather than that for extensions predominated.

SPECIAL WORK AND BETTER CONSTRUCTION

In the special-work specifications which were submitted in final form by the 1916 way committee and adopted as standard by the American Electric Railway Engineering Association, a valuable contribution to the industry was completed. Special-work manufacturers co-operated in the preparation of these, and they are anxious that the specifications should be used generally because they insure a common bidding basis. Undoubtedly these specifications will be amended to meet new conditions as they arise, but in their present form they are as complete and satisfactory as most thorough consideration could make them. In connection with special-work purchases during the past year it is interesting to

find that machined-bearing insert settings and flange bearings were very generally specified, and all manufacturers are now prepared to supply this demand. We feel that our efforts in this direction were largely responsible for this change and are not only gratified but sure that it will be of great benefit to the industry.

Another development has been the general drifting toward higher standards of track construction. There was a marked increase in the mileage of track laid on concrete foundations. Where natural drainage conditions were good this change was not so marked, but elsewhere the increased bearing to be had with concrete track foundations insured greater permanence to track line and surface. Moreover, the advantages of the principle adopted by the Board of Supervising Engineers Chicago Traction at the beginning of the extensive track rehabilitation program in that city have been accepted by many other companies, and a track substructure on which rails could be renewed has been growing in favor. In an industry such as the electric railway, where the margin of profit is small, permanence in the physical property is vitally important. Undoubtedly the findings of the comprehensive study of rail corrugation made in Chicago to determine the relative merits of concrete and ballasted track in this respect will influence other companies to adopt concrete track foundations in their future programs. In this study it was shown that rail corrugation was as prevalent on one type as the other and that the phenomenon was not a respecter of age or conditions.

RAIL HEADS AND RAIL CORRUGATION

Incident to the rail corrugation problem and more closely related to the rate of rail wear has been the introduction of curved head rails. Chicago's study of rail wear pointed to the advantage of a change from the ordinarily used flat-head rail to a curved head. The curved-head rail has been used successfully in England for a number of years and a few years' experience with it in this country indicates that by its use the rate of wear on wheels and rails will be greatly retarded. During the coming year the way committee will consider the question of designing a curved-head grooved-girder rail section. To facilitate this work and insure perfect harmony the equipment committee has been asked to co-operate in so far as such a head will affect the wheel tread and flange. It appears that the curve of the rail head should conform to that of an average worn wheel. The problem before these committees is to determine whether the average contour of worn wheels is sufficiently close on all properties to permit the adoption of a standard rail head section, or whether this section must be prescribed for each company. It appears reasonable to expect that where different rail

sections and wheel contours are used the form of wear will vary: In some rail purchases a 20-in. curvature has been specified, while in others a 12-in. radius curve was used. Inclined curved head rails are limited to the grooved-girder sections, but this has not prevented the users of plain girder and standard-section rails from taking advantage of the full-line-of-contact principle. The first tilted or "cocked" rail track was built in Cleveland, Ohio, in 1915. Considerable of this type of construction has been added in the past year, as several other companies purchased steel ties designed to hold the rails in this tilted position and built track of this type. The cocked ties incline the rail so that its head conforms to the slope of the wheel tread and thus provides a full line of contact. In connection with rail tendencies it is also interesting to note the increasing popularity of the 7-in. sections as a substitute for the 6-in. and 9-in. rail in both the plain and grooved-girder sections.

Rail corrugation, as usual, received its share of attention during the year. Several old causative theories were exploded and new ones advanced. It was pretty clearly brought out that curved head rails are not a cure but do postpone the appearance of rail corrugation. A microscopic analysis of the mechanical properties of corrugated rail conducted by H. M. Sayers, revealed nothing new in the way of a remedy. Perhaps the vibration theory is still held by the largest number of people, but the remedies based upon this theory, where they have been used, have failed to cure the disease. According to this theory, ballasted track should offer a cure, yet the study in Chicago revealed corrugations on both types. It may be, of course, that the ballasted track was not sufficiently flexible to eliminate corrugation, but it is hard to see how greater flexibility could be introduced in track in paved streets without introducing greater complications. It has been repeatedly shown that rigid track construction is absolutely necessary to permanent line and surface—both vital requisites to minimum pavement maintenance. Where pavement maintenance costs are practically the same as track maintenance costs, it ill becomes any engineer to change his type of construction so as to increase the cost of the former. In other words, until a remedy is found which is less damaging than the disease, it appears advisable to follow the practice of the past and remove rail corrugations by grinding.

THE JOINT PROBLEM

Welded, riveted and drive-fit or high-elastic-limit bolted joints are being almost exclusively used by the

progressive companies for their track in paved streets. It is useless to argue that the old-style mechanical joint will "stay put." The bolt and joint fit clearances are too great to provide absolute security, and the substitution of the drive-fit, high-elastic-limit bolt is a logical change and will unquestionably obviate many of the difficulties of the past. The electric welder and the thermit weld have brought the welded joint within the reach of all companies, and the ease of repairing isolated joint failures commends them. Both of these processes are not limited to use at the joints but have permitted the introduction of innumerable economies in making repairs to steel of all kinds in electric railway operation. The cast-welded joint and the Lorain type electric-welded joint are equally efficient with the other types of welded joints, but one requires an expensive plant and the other may only be bought under contract for the installation of a large number of joints. Finally, it is folly to use the same type of joint in expensive track in paved streets as in open construction, simply because they are uneconomical. For a time during the past year the prohibitive war prices of spelter and thermit greatly curtailed the use of the Nichols and thermit joints, but this situation has practically readjusted itself.

COST ANALYSIS ACCOUNTS NECESSARY

Whether track materials and labor are being purchased at war prices or not, it behooves electric railway engineers to analyze all their costs in order to introduce economies. It has been particularly evident during the year just past that more and more attention is being directed to unit costs. Most of those published, however, were construction costs. While it is important to keep down construction costs, it is of more importance, to our mind, to minimize maintenance costs. The efficiency of various types of track and materials can only be determined by a comparative analysis of maintenance costs. Whether this be done on one property or as between different properties is unessential so long as an analysis is made. It is but natural that engineers should delight in construction and dislike maintenance, but it is the latter phase of their work where the real savings may be made for their companies. It is only through maintenance experience and analysis that economical improvements can be made in construction. Whether the interest and depreciation on expensive track more than offset the higher maintenance of cheaper construction is a question all way engineers must be prepared to answer in the course of the next few years.

THE problems of electric railways are the problems of the communities served, and in increasing measure as these problems become more complex it is essential that the community vision be clarified if the interests of both parties are to be properly served.—JAMES H. MCGRAW.

Equipment of the Power Plant

In reviewing power plant progress it is convenient to consider separately the boiler room and turbine room of the steam plant, with their respective auxiliaries, and other general matters which relate to steam and other plants as a whole. This year we shall confine attention to the steam plant, although this does not imply that progress has not been made in water power, gas power, and oil power plants as well. For the electric railway operator, however, it seems that the most significant progress has been made in the steam plant.

THE BOILER PLANT IS IMPROVING

There is no doubt that after a long period of comparative neglect the boiler room is now getting its proper share of attention. This is in part due to the demand for higher pressure caused by steam turbine development and also to the objectionable bulk of the boiler compared with the turbine for which it furnishes steam. In partial explanation of the slowness of boiler improvement it may be said that the opportunity, and hence the incentive, for saving was less here than in the engine room. At present, further reduction in steam consumption in the turbine depends largely upon the ability of the boiler to produce higher pressure. At the recent A. S. M. E. meeting in New York a speaker claimed for a certain boiler plant, not in electric railway service, a sustained efficiency of 90 per cent. In view of the numerous although individually small sources of loss a performance like this cannot be expected under ordinary circumstances. The present excessive cost of steam coal, however, should stimulate boiler operators to get along with a minimum quantity of this precious mineral and to provide ample storage facilities in future.

In going to higher boiler pressures there is evidence that the makers are prepared to furnish what is demanded. There are practical limitations, however, set by first cost and maintenance cost, heat losses and leakage, as well as hesitation in departing from standard practice. An example of a high-pressure plant is one installed this year by the Public Service Company of Northern Illinois in which the pressure is 350 lb. per square inch and the superheat 225 deg., Fahr. It is to be expected that pressures will be increased gradually as design and construction are perfected. The standard boiler code of the A. S. M. E., adopted last year, will no doubt exert its influence in steering design along conservative lines.

Aside from the matter of pressure, there is no doubt a tendency also toward improvement in increasing heating surface. With one notable exception, in the main plant of the Detroit Edison Company, the popular size of boiler has contained 6000 sq. ft. of heating surface or less, producing roughly 600 (so-called) boiler horsepower or less. There is no reason for not going to larger sizes excepting the natural desire for standardization, but this cannot, of course, be controlling. At any rate, the demand henceforth is going to be for more

heating surface per unit. The amount of steam which can be produced on this surface is determined almost entirely by the furnace.

THE FURNACE IS A SEPARATE PROPOSITION

In the line of furnaces there is a steady demand for all three general types of stoker, the underfeed for use with forced draft, the inclined overfeed for natural draft and the chain grate. In spite of the more spectacular results obtained with the first-named type, which is eminently adapted for peak load work, natural draft is still relied upon in many plants. The use of oil in furnaces has not been forgotten either, but in general this fuel cannot compete with coal on a cost basis. Although oil as a fuel is attractive from the standpoint of convenience and cleanliness, these advantages are becoming less important each year as the apparatus for handling coal and ashes is perfected. In a modern plant the labor element in the boiler room cost has become entirely reasonable.

It is to be regretted that little progress has as yet been made in popularizing a substitute for the unit known as the boiler horsepower. All engineers recognize the inconsistency of the present practice, particularly as output depends to so great an extent upon the furnace, but they seem not to be able to get together in the matter. The good work should be kept up, however, in the interest of consistency. Electric railway engineers can exert considerable influence to this end.

WHERE WILL THE TURBINE STOP?

At the moment the situation in the metal market is affecting deliveries of steam turbines, but great progress is being made in the turbine room as well as the boiler room. The most remarkable thing is the scale upon which large turbines are being purchased, speaking in general terms of the past year or so. Remodelings like that of the Virginia Railway & Power Company's plant, described in a recent issue of this paper, are going on everywhere. That the power plant is able to stand the expense involved in the development period of a new prime mover like the steam turbine and at the same time produce its output at less cost is highly creditable to the engineer.

There seems to be no limit to the size of the turbine, large or small. In large units there are some under construction to produce outputs of 70,000 kw. in three cylinders, and a single-flow turbine recently ordered will deliver 45,000 kw. from a single cylinder and generator. In small units the turbine is increasingly appreciated for driving auxiliaries, as it is compact and rugged. As its exhaust is used for feed water heating the water rate is not a prime consideration. Geared turbines, particularly for direct-current generator drive, are also being called for more and more. The types of turbines now in use between the extremes in size mentioned comprise tandem-compound turbines with one generator and cross-compound with two generators. The three-cylinder turbines referred to, designed for

the Interborough Rapid Transit Company, are of the two-stage type and drive three generators each.

THE CONDENSER IS MAKING NOTABLE PROGRESS

Condensers have been improved to keep pace with the turbines which they serve, as is evidenced by the fact that surface condensers of as high as 56,000 sq. ft. condensing surface are being built and a jet condenser for a 45,000 kw. turbine is on order. The preference is for surface condensers, but the business in jet condensers continues to be good. Barometric condensers are being constantly improved. In surface condensers the problem is to produce straight line flow of steam to eliminate friction loss.

In auxiliaries the steam turbine furnishes a popular drive for circulating and air pumps, although the reciprocating vacuum pump and slow-speed circulating pump are still preferred in some cases. A so-called "heat balance condenser" has also been developed in which the pump load on a jet condenser is divided between a turbine and an electric motor. This permits the turbine to furnish just the amount of steam required for heating the feed water.

A NEW APPLICATION OF THE PHASE CONVERTER

The electrical end of the turbo-generator unit has, of course, been improved with the steam end. This has

been accomplished through refinement in design. Temperature rise, allowable and actual, has had even more than usual attention, and an effort has been made to interest users in keeping track of internal temperature rises through the use of suitable instruments. Power plant operators concerned with the furnishing of single-phase power particularly for railways have been much interested in the application of the phase balancer or phase converter by the Philadelphia Electric Company, which supplies power for the Philadelphia-Paoli electrification. This apparatus applies the principle of the revolving field somewhat as was done in the phase converter used on the Norfolk & Western locomotives, where single-phase power is drawn from the line and is converted to three-phase for the motors. By an ingenious adaptation this principle has been applied in a machine which can be placed away from the power plant on the three-phase line and will automatically transfer load from a heavily loaded phase to the others.

It would be unfair to an important movement to close this brief review without a reference to the commendable zeal of power plant operators in safeguarding dangerous machines, circuits and other sources of possible accident. New plants are being designed with this element conspicuously in mind and the older plants are being brought up to date rapidly, as is explained more in detail in another editorial.

Protecting the Overhead System

In the power distribution field the work of the year has been in the way of an intensive study of existing apparatus and methods with view to increasing the reliability and safety of service and to securing economy in operation rather than the development of new apparatus and radically different systems of distribution. As reflected by published articles and the work of technical society committees, state commissions and federal bureaus, the leading thought of the year seems to have been protection. The term "protection" as here used covers two categories; protection of service and protection of employees and others from the hazards incident to the rendering of that service.

INCREASING RELIABILITY OF TRANSMISSION LINES

The increased attention on the part of the railway companies to the matter of power sales work, the large energy supplies required for industrial purposes, and the heavier railway traffic all have tended to increase the demand for a service which shall be without interruption. It is not surprising, therefore, that at the present time engineers are giving much time and thought to minimizing the number of interruptions of service and the time per interruption. Devices, such as arc suppressors, electrolytic lightning arresters, current-limiting reactances, isolating transformers, better insulators and motor emergency trucks, which assist in accomplishing these ends are gaining rapidly in favor. As illustrative of what may be accomplished by paying careful attention to the matter of lightning protection may be cited the experience of the Common-

wealth Edison Company, as described by D. W. Roper in papers presented at the annual conventions of the American Institute of Electrical Engineers and the National Electric Light Association. This company, by the use of improved methods of protection, has been able to eliminate 90 per cent of the troubles caused by lightning. Along the same line may be noted the experience of the Beaver Valley Traction Company, described in the *ELECTRIC RAILWAY JOURNAL*, Jan. 8, 1916, page 89. By the use of carefully wired electrolytic arresters on their cars this company has been able to reduce its motor trouble caused by lightning to an almost negligible amount.

So important is the matter of good transmission line insulation from the standpoint of continuity of service that there is a feeling, in some quarters at least, that it is better engineering either to weed out defective insulators or to reinsulate a line than to provide a duplicate line. Tests for detecting faulty insulators on both dead and live lines have been more fully developed during the year, and, while still not infallible, a large percentage of the bad insulators on a line may be located by their use. Methods for replacing defective insulators on high-voltage lines with the line in service have also been developed.

THE PROBLEM OF INTERCONNECTING TRANSMISSION LINES

The interconnection of the transmission systems of electric railway and power companies seems to be a growing practice and one that is highly commendable.

If properly carried out it prevents absolute shutdown, reduces the amount of reserve equipment necessary and promotes economy in operation. Broadly considered, a transmission system is a transportation system just as much as is a railway system. In the early days each railway formed a separate little unit and the present interconnection of systems has been a gradual development. Such connections, however, have so facilitated transportation that their severance would be, as we look at it now, little less than a national calamity. It seems reasonable that the facilities for the transportation of electrical energy should be just as flexible and as well interconnected as are the facilities, say, for the transportation of coal. The problem of interconnection is one, therefore, that we feel should receive in the future even more attention than is now being bestowed upon it. The interconnected system of railway and power companies centering at East St. Louis, described in the *ELECTRIC RAILWAY JOURNAL*, Jan. 22, 1916, page 156, is a good example of what might be done with profit by many companies in other sections of the country.

The second phase of protective work, namely, the minimization of life hazards, has received an unusual amount of attention this year. Not only have individual companies been paying particular attention to their safety work, but the labors of the Bureau of Standards in connection with the National Electrical Safety Code have tended particularly to emphasize this phase of protective work. Objections to the code have been well aired before technical societies and in the engineering press, and, therefore, will not be reviewed here. Whatever its faults are as a code, however, it cannot but be admitted that it has had considerable educational value and that the many joint meetings held over the country for the purpose of discussing its various features have tended to develop a get-together spirit which should hasten the general standardization of many of the minor details of line construction.

THE WORK OF THE ENGINEERING ASSOCIATION

The American Electric Railway Engineering Association committee on power distribution faced a large number of problem assignments when it began its year's work; too many one would think on first sight. Nevertheless, the committee's record is one of much valuable work accomplished. The consideration of standards of other societies relative to overhead work with the view of weeding out inconsistencies, the review and revision of the existing association standards on the subject and the work on joint committees were among the important features of the year's work. An exceptionally well prepared technical discussion of the theory of concrete poles was contained in the committee report, as was also a rather exhaustive study of the various third rail constructions now in use. A number of new sections were added to the recommended specifications for overhead line material and information relative to high voltage direct current and catenary trolley construction preparatory to the formulation of standard specifications for such constructions was gathered. The

formulation of the specifications is one of the important tasks set for the succeeding committee.

DEVELOPMENT WORK IN POWER TRANSMISSION

The study of the effect of altitude on apparatus ratings and the use of the grounded neutral constituted the bulk of the work of the American Institute of Electrical Engineers committee on transmission and distribution. No attempt was made by the committee to determine an altitude correction factor, but a consensus of the opinions gathered from operating engineers seemed to indicate that altitude should be given some consideration at least in loading apparatus of standard ratings. The question of the grounded neutral versus the ungrounded one is largely a matter of protection of service and apparatus. As one might expect, what would be best for one system might not be best for another, but as a result of its work the committee seemed to feel that the grounded neutral offered most advantages when the line voltage was above 60,000.

THE RETURN CIRCUIT

The work of several national joint committees, commented on in our review of last year, has been continued, although as far as reports are concerned the committees have been marking time pending final action on the National Electrical Safety Code. It is expected that the report of the national joint committee on electrolysis will be published shortly. As its work will represent the combined efforts of a number of associations represented by eminent engineers, this report will constitute a high authority on the subject. The notable series of electrolysis investigations by the Bureau of Standards have been continued and several valuable technical papers bearing on the subject have been published. Among other things, the investigations of the bureau have shown that corrosion is practically negligible where the cycles of current reversal are shorter than one minute. The conclusion is that, in the so-called neutral zones of railway networks, where the currents in underground structures are continually reversing, the damage chargeable to electrolysis is less than would be expected from a consideration of the arithmetical average of the current discharged to earth from the structure. The three-wire system as a means of electrolysis mitigation is being installed at Springfield, Mass., under the directions of the Bureau of Standards experts. Such a system has been in service on 125 miles of track in Los Angeles for nearly two years. The experience there seems to be that under favorable conditions, where there is a sufficient number of feeders, such a system costs less and has lower losses than the better known insulated return feeder system.

The problem of maintaining the return circuit is very closely related to that of electrolysis. The elimination of electrolysis and poor bonding are certainly incompatible, and the problem of bond maintenance seems to be largely that of joint maintenance. In city service welded joints are being used more than ever before. The same may be said of the welded type of

bond, and it is of interest to note that several of the new bond welding devices are of such nature as to permit the work of bonding to go ahead without interrupting service.

ELECTRIC RAILWAYS ARE CONSIDERING SUBSTITUTES FOR COPPER

The high cost of copper and aluminum in this country during the past year has focussed the attention of American engineers on the conducting problem. Considerable information relative to the electrical characteristics of iron and steel wire and cables has been published and, where climatic conditions are not adverse, there seems to be a growing tendency to use such conducting materials on lightly loaded distributing circuits. The use of specially-spiralled cables for railway feeders

has been suggested, and in this connection it has been pointed out that the higher inductance of the magnetic conducting material would increase the protection of substation apparatus. While this is true as far as substation apparatus is concerned, experience with third-rail systems would seem to indicate that, upon the interruption of a short circuit or other heavy current, the discharge of the energy stored in the magnetic field in the feeder itself and the surrounding air would increase the duty imposed upon the control and motor equipment of the cars. As illustrative of the greater possibilities in the use of iron or steel may be mentioned the return circuit construction used on the recently electrified section of the Lancashire & Yorkshire Railway, where a fourth rail is used for the return circuit.

A Complex Year for the Manufacturers

The manufacturer of electric railway supplies during 1916 experienced conditions that may safely be defined as chaotic. Material and labor conditions have never been more complex than they were last year, but out of the complication has come a stronger group of manufacturers, more willing and more able to serve the electric railway industry.

To summarize the problems which have confronted the manufacturers during the past year is difficult, because conditions have changed so rapidly. For instance, a year ago that manufacturer whose income was largely derived from sales to electric railways found himself in very serious circumstances. For three or four years the roads had not been buying in substantial quantities, each year the buying was growing less and the cost of manufacturing and selling was increasing. In the face of rising costs and a diminishing market, the year 1916 bid fair to be a lean year. Until late spring there was little prospect for sustenance on the part of those whose bread and butter came largely from sales to electric railways. Then the roads in the eastern industrial districts began to buy. Later on traffic increases for the roads in the Central States prompted buying activity there. Then the rush began.

Having deferred purchases so long because of lack of money and because of high prices, the electric railways, when they did begin to buy, really needed prompt deliveries. Most of the buying was to meet deferred maintenance. But other industries had begun to buy earlier, and the material and labor situations were so tense that the electric railways had to wait their turn. And in most instances it was a long wait. Only within the last few weeks have manufacturers been able safely to make promises of deliveries.

PRODUCTION CONDITIONS STILL UNSATISFACTORY

Production conditions are now far from what the manufacturers would wish, but they are on the mend. The larger concerns have finally established sources of

supply for most raw materials so that delivery of finished product is now more nearly determined by the speed of factory production. Of course there will always be special jobs offered, which, if accepted, would interrupt factory procedure. But this year the manufacturer, backed up by good orders for his standard products, is in a strong position to turn down orders for special material and special designs. It has required great courage at times to make decisions which would clear the involved manufacturing situation. Sales effort has had to be curtailed and good salesmen diverted from their regular work to go scouting for raw materials and for labor to man the shops. But now the lines of supply of materials have become better established, and production is going forward at a rate probably never before approached by the manufacturers in the electrical industry.

In setting down the reasons which caused and sustained the highly involved manufacturing conditions of 1916, lack of labor should be put first, and lack of raw material second. Capital for carrying on the work was not lacking, and the freight problem was a natural sequel to the labor and material shortage.

Consider the labor situation first. All the industries of the country are busy, and raw material producers are sold so far ahead that they have little concern about next year's market conditions. They need men. Nearly 500,000 men are engaged in munition supply work. And, in consequence of labor shortage and high living costs, wages for day labor have exceeded all previous limits.

The steel and textile industries, two of the greatest employers of labor, have granted a 10 per cent increase in wages for the third time since Jan. 1, 1916. Wage advances in many lines of manufacturing have been more than 50 per cent. Yet, notwithstanding the abnormally high wages paid, it has been practically impossible for manufacturers to hire all the men needed during the past seven or eight months. The reason for this has largely been the competition for labor among

the manufacturers. This is particularly true with regard to the high grade skilled employees and the low grade common laborers, the two extremes. And the natural consequence of this shortage of labor has been one of lower efficiency in the manufacturing operations. Men by the thousands, who two years ago had never seen the inside of a large machine shop, are now employed at machine work and drawing the pay of first-class machinists. Many a "skilled mechanic" of to-day never served an apprenticeship. Labor never cost so much and earned so little.

The material problem of the manufacturer can probably best be expressed to the railway reader by the statement that during the last year so far as embarrassment from slow delivery of material has been concerned, the manufacturer has suffered more than the railway. Most manufacturers at the beginning of 1916 had on hand some surplus stocks, supplies or extra parts ready for manufacturing their products. Many had built up reserve stocks during the lean years. They were thus able to sell to the roads and protect them against emergencies. In contrast, however, the manufacturer found his avenues for buying even more restricted. The producers had little surplus stock on which to draw and were inclined to listen only to the big buyers.

Manufacturers have put enormous pressure on the producers of raw materials and have gone to the extra expense of having materials expressed into their factories in order to be in position to accelerate deliveries of finished products to the railways. Raw materials must be paid for now at top-notch prices, and these conditions have existed for several months.

THE METAL MARKET IS STILL UNSETTLED

In the manufacture of electric railway materials copper plays a most important part, and the dearth of this material and its steadily rising price has been a bugaboo for many manufacturers. Since 1908 copper had ranged from 11 to 22 cents, until 1916 when it began its phenomenal climb. At the opening of the year 1916, the New York carload price for Lake copper was 20 cents per pound, and an epoch in the history of copper prices developed on Nov. 20, when for the first time all deliveries up to one year were quoted at 30 cents per pound or more. Bulk copper was then 34 cents. It should be remembered that the prices for lead, tin and zinc have followed the same general trend as those of copper, but toward the end of the year these materials were not quite so strong as was copper.

The copper question, so far as the manufacturer in the electric railway industry is concerned, is a delicate one. Should he stock up with copper at 35 to 40 cents per pound and use this to manufacture his devices for sale two or three months hence? Or should he buy just sufficient copper to fill existing orders and take chances on the future? In either case he is speculating—in one case with materials and in the other case with his prestige with his customers. There still exists a wide divergence of opinion as to the future trend of copper prices. Thus the manufacturer must busy himself

with matching prices and widely fluctuating material costs in an endeavor to obtain for himself a margin of profit. From the railroad standpoint, of course, purchasing of copper and copper products at present prices means a largely increased permanent investment, on which there is a possibility of considerable drop. Hence the restraint in buying except for maintenance requirements.

What has been said about copper also applies very closely to the conditions in the steel and iron market, and uncertainty regarding steel prices and deliveries has caused the manufacturer no end of worry during 1916. The girder-rail manufacturers early in the year gave their old customers opportunity to buy their regular requirements. Having done this, the manufacturers felt themselves free to contract for all their other capacity. Electric railways purchased less girder rail in 1916 than for many years previous, except 1915. Even at these increased prices there is little prospect of very much girder rail being available for purchasers during 1917.

BUYING IRREGULAR BUT MARKET CONDITIONS BETTER

Notwithstanding the present orders in hand and in prospect, market conditions in the electric railway industry are not as satisfactory as the manufacturers might desire. The general buying is extremely irregular. This no doubt is due to the fact that the field has largely ceased to expand. Comparatively little new street or interurban line has been built in the last five years. The average additional trackage growth per state is less than 15 miles per year, and that means that buying for the industry is based largely on maintenance and renewal requirements.

In turn, of course, this has benefited those manufacturers who are interested in other fields and yet are strongly entrenched in this one. It means that they are not now subject to the hazardous competition of earlier years. Then, when things were going fast, there was a market which stimulated competition by the very reason of its activity. New devices, new tools and new labor and money-saving methods were promoted in large numbers. But of late the field has not offered the inspiration for new things that it did in earlier years. Consequently most manufacturers have built up interests in allied fields of industry, and their problems have become those of production and sale of recognized products, rather than of design and development. This is tending toward standardization, and if the roads will adopt standards and buy accordingly, the saving to them will no doubt offset the loss due to the lack of the former highly competitive selling stimulus.

The manufacturers of cars, motors, trucks, rails and other large elements of an electric railway would extend every co-operation to any group or association that would standardize its requirements. Much has already been said on this subject. The manufacturers have always been ready to act, but even though associations have "adopted" standards, the railroads don't accept them for purchase. Standardization is a manu-

facturer's problem which the roads have a primary interest in solving at once.

The possibilities for next year's business are now a live topic. Prospects seem very bright just now for a busy year. Slack buying for four years, increasing

traffic and much equipment that has outlived its natural life, would seem to warrant the prediction that the electric roads during 1917 will require more new materials and supplies than they have bought during several years past.

Developing Traffic

A new order of things presents itself in practically every phase of the electric railway industry as compared with practices, opportunities, restrictions, liabilities and public sentiment prevalent ten, five, and even two years ago. In the character of traffic and the possibilities of its development, especially, has there been noticeable change. For instance, the interurban service which we now assume as a potent factor of the whole transportation scheme of the nation has been almost wholly a unique factor in the field of electric common carriers. They had to create a field for themselves and carry people who previously did not travel. Now, however, this pioneer work is largely completed, use of the electric railways has become habitual, and there is not great room for expansion in this class of transportation, future growth of passenger travel being largely dependent on population growth. Yet this approach to saturation is what was expected in the original estimates as the means of profitable return to the investors, and the reason that the railways are now in hard straits is because the greatly increased operating costs were not anticipated.

Herein, then, lies the incentive and the necessity to go beyond the plans of the original promoters and include in the business of the electric lines, transportation which will offset the grossly enlarged operating costs, bring the lucrative return which was expected and is on the majority of roads impossible from the passenger business alone, and present a field where real endeavor may show big increases in total traffic and net profit.

As the various railways recognize this necessity to broaden the scope of their business, the immediate possibility for expansion in the transportation of freight is obvious. One prominent official even goes so far as to say that there is no electric line which accepts freight that does not have more traffic offered to it than it can possibly handle. We have repeatedly pointed out during several years past that the possibilities for important revenue from freight service were great, that the physical inadequacies were the principal limitations and that this was the answer to the question of future growth.

Hence, it is with interest that we see each year a few more properties engaging in this business. Thus, during the past year, to mention a few: the Terre Haute, Indianapolis & Eastern Traction Company; the Chicago, Lake Shore & South Bend Railway; the Cleveland, Southwestern & Columbus Railway, the Scioto Valley Traction Company and the Chicago, North Shore & Milwaukee Railroad, among others, have begun physical preparations for entering into the freight

business in a large way. The Illinois Traction System, the Detroit United Railway, the Michigan Railway, the Pacific Electric Railway and others, already well established in this class of traffic, are making extensive additions to their facilities for handling carload and less-than-carload freight, including terminal facilities costing amounts approaching millions on individual properties. And so the dawn of another day in the traction field is bright.

MEANS TO ENCOURAGE CAR LOAD FREIGHT

Ways and means to create freight traffic, once it is begun, are numerous, but much depends on the personal element in the straight solicitation of business, for much educational work is still necessary to show the shippers that the electric line really has advantages to offer. Hence, the solicitation must be tactful and convincing. Then the matter of service—fast, frequent, reliable schedules—is the foremost requisite for development of any class of traffic, and too much emphasis cannot be given to this consideration. Terminal facilities with arrangement and capacity for releasing teams and trucks with minimum delay are important business getters, for a merchant or manufacturer would much rather send his freight over a line that will get his team or truck away from the terminal without standing in line two or three hours than to use any line where he must make this expensive sacrifice. For every four trucks or teams that have to stand in idleness for two hours a day regularly, he must add another unit to his haulage equipment, with the added labor, upkeep and overhead it entails. This is a big item that the shipper sees and feels, and the road that can save him time and money here has a big advantage in attracting his patronage.

The carload freight traffic is coupled very closely in its possibilities with the interchange arrangements with other lines. Some difficulty is experienced in securing these traffic agreements with the steam lines, but this is gradually being overcome and must soon give way before the importance the electric lines can assume as tributaries to the flow of freight on the long haul lines. Following these arrangements, industries must be developed on the electric lines. Grain elevators are one of the common adjuncts in this connection. One merchant who was induced to build three elevators on a mid-western line has also put in large stocks of lumber, building material and coal at these points. The advantage of this combination is very significant. It not only permits all-year business for both the merchant and the railway, but makes it possible for the latter to handle cars under load both ways.

It is possible to develop some remunerative carload traffic by encouraging the installation of side tracks for lumber and coal yards at points adjacent to thickly settled communities. Connection with sand pits, cinder pits, stone quarries, etc., for distribution of their products, and unloading these materials at points close to the work under way with a charge for the actual cost of this unloading, will encourage preferential movements over electric lines. Attention to the hauling of brick, paving blocks and sand and cement for paving roads and city streets, especially where solicitation can include the ability to deliver close to the spot they are to be used, will create a goodly traffic in the course of a year. Keeping closely in touch with contemplated public and private improvements in towns along the line and co-operating with the concerns selling the materials necessary for this work will bring good returns. In fact, it is possible to make the railway traffic department a sort of information bureau for people located along the line, to direct as to the best place to secure almost all kinds of commodities. This is profitable when it stimulates shipments of carload lots or even steady shipments of less than carload quantities.

In many localities within 100 miles of our numerous sugar factories, beet culture is a profitable industry for the railways and the farmers. Beet dumps or receiving stations may be secured at the expense of the sugar company where, within a radius of 3 or 4 miles, farmers have 500 acres of beets, raise beets averaging 14 tons to the acre and haul them to the receiving station. At these stations the sugar company takes the beets, furnishes scales for weighing and pays the freight to the sugar factory.

POSSIBILITIES IN LESS-THAN-CARLOAD FREIGHT

In the development of the less-than-carload and package freight traffic, the growth is more than ever dependent on "better service" and will increase almost in proportion to the class of service maintained. Some electric railways are making a practice of accepting shipments up to fifteen minutes before scheduled departure of trains, and by use of the Manibill system, make four copies of the waybills at once and place the destination station in a position to effect delivery in a few minutes after the arrival of trains. A liberal policy in discharging freight at points along the line where there are no depots is also a business producer for the distributor and a time saver for the receiver, and it makes friends for the company. These and other efforts at highest service are effective in competing with the motor truck, which is now offering keen competition for the short haul package freight. It is advisable in some cases to utilize motor trucks as feeders for the railway and to make street address deliveries in restricted areas where competition is particularly keen.

Working in conjunction with Chambers of Commerce and civic organizations for the development of truck farms and dairies, arranging convenient schedules for movement of these supplies to market, and co-operating to create a market, will often bring a very profitable return in traffic, though opposition from the commis-

sion men is often encountered. Another plan is direct co-operation with creameries and merchants along the line. One creamery company on a western road has for next year a plan of loaning money at a nominal rate of interest to any farmer who will invest it in milch cows, a plan which has great possibilities. In the handling of milk, of course, good results have been obtained by providing special milk trains.

Another very important field of traffic in which the rapid service of the electric line may be made an important inducement is in handling perishable freight. Meat, berries and other high class shipments, which otherwise move under ice, may be handled without icing by virtue of prompt service, thus saving the expense of icing to the shipper and to the road.

Then there is the carrying of freight on passenger cars, or "traction express" as it is often misnamed, an important item in the sum total business on the interurban line. Advantage is not taken of this plan by a great many roads, which seems rather surprising, for we are familiar with the income which has been realized from this source on several roads with practically no additional expense to handle the business and little solicitation to get it. It is a real service to the small town merchant to be able to telephone in early in the morning to his wholesale house 20 or 30 miles away and give his order for merchandise to be placed on the "8 o'clock car" and receive it at 9 o'clock.

FREIGHT FRANCHISES OF BENEFIT TO PUBLIC

Of course, many of the possibilities for expansion of the interurban freight service depend on the attitude of the municipalities through which the lines pass. Unfortunately there has been a short-sighted prejudice thrown around the handling of freight through the city streets, but this limitation is gradually lifting. The electric lines could bring about a large saving in the cost to the consumer of bringing produce, dairy products, etc., into the cities and moving building materials and freight generally, over the city streets to their point of local distribution or ultimate consumption. This movement could be made at night when the aesthetic sense of the citizens need be little disturbed, in tight, clean cars which would be much less obnoxious in every sense than the garbage and other filthy loads which are now hauled through our streets in the day time in leaky, unsightly wagons. Then, too, the matter of street congestion is assuming constantly greater importance, yet the most efficient means of transportation is used scarcely at all during one-fourth of the time. We are glad to note, however, that there is evidence here and there of a change in public sentiment as communities realize the savings and advantages secured by the movement of electric freight through the streets. And with the present high living cost, the savings in particular take on added public interest. Hence, this may be the opportune year for electric railways to press their case for freight franchise rights through the streets. Certainly no more commendable effort from the viewpoint of service to the community or profit to the company, could be made.

The Technique of Publicity

By Ivy L. Lee

FRANKNESS in Dealing with the Public Through the Newspapers, Faith in Its Fairness if Facts Are Presented Simply and Truthfully, as Well as Methods for Securing Publicity Are Advocated in This Article.

PUBLICITY in the running of public service corporations is as important in its way as motive power itself. Electric railway managers have not had time to think about publicity. They are busy men. Their whole aim has been to please both the public and investors.

Years ago street railway managers were busy running their cars with horses and mules. That was a big problem in its time, and it was just as hard then—if not indeed harder—to satisfy both the public and investors. Then came a new and vital adjunct to the running of street railways—electricity. Railway managers had not thought much about its use to them. It came as something from the outside, but it came with a universal demand for its use.

The railway managers could not ignore this new force. First they employed experts to assist in adapting this new power to their service; then they made a careful study of it themselves. True, they were very busy, but this new thing was too important to leave to subordinates. Upon its successful use depended the whole future of the business.

Running railway properties to-day without taking the public into one's confidence, without using every legitimate means of publicity, is about as obsolete as operating street railways with horses and mules. Through publicity the railway manager of to-day brings to his aid those vital forces which come from support of the public. Without these, indeed, the business itself cannot live.

TAKING THE PUBLIC INTO ONE'S CONFIDENCE

Why is this thing, "Publicity," so important? It is so intangible and the direct value of it is so difficult to appraise that the practical mind is prone to regard it as an evanescent product of an age of newspaper hysterics, and not as a supremely vital and substantial force in business management. But even the most unimaginative business man has come to realize the power of public opinion. The public not only has power, but it has come to know that it has it. Public service corporations are beset on every side by laws and regulations. These, indeed, are very real things demanded by a democracy which refuses to be denied.

I am one of those who believe that the American people are fair; and that when they really understand the facts, they will see to it that justice is done. They have no objections to success as such, no matter how large, if only it is honestly and fairly attained. If this is correct, and if the railway manager feels that the ultimate success of his business hangs upon the fairness and justness of law and regulation, must we not see to it that the public which is back of law and regulation knows all the facts so that its judgments may be sound and constructive?

NOT ALL THE FAULT IS WITH THE POLITICIANS

One so often hears it said that politicians are at the bottom of all our troubles; that if they would only stop their meddling all would be well. Those who make



IVY L. LEE

such a statement mistake the effect for the cause. The demagoguery of politicians is not solely responsible for the troubles of public service corporations. The misunderstandings of the public, due generally to lack of information on the facts or full information on a bad state of things, have led to an attitude of mind exceedingly open to the influence of the politician.

When public service corporations are run with primary regard for their public obligations, and when they have made the public know that this is true, the politicians will be prompt to trim their sails to other winds.

"Yes," you may say, "this is all very well, but let's get down to a practical basis. How does this all apply to the daily life of my company? What can I do to avail myself of this new power that in modern days, you say, is just as important as electricity itself in the conduct of my business?"

THE WRONG WAY OF DEALING WITH NEWSPAPERS

The most important medium through which to deal with the public is the press. Newspapers are more delicately adjusted to sense the feeling of the people than any other institution. H. G. Wells says that the newspapers are the windows through which we look at the world. The street railroad man must, therefore, take the newspapers into his confidence, not as newspapers, but as representing the public which the newspapers inform.

Many people believe that successful publicity consists in the cultivation of pleasant personal relations with newspaper writers, and that if "the newspaper boys" are made to feel good all will be well. Such a theory is fundamentally unsound.

Of course, every man, be he newspaper man or otherwise, should be treated with courtesy, and the newspaper man should receive all facilities for obtaining facts to which the public is entitled. But to rely upon friendly interpretation of one's acts in any large way by the newspapers simply because of one's personal friendship is just as false a procedure as to seek a favorable judgment from a court because of one's pleasant personal relations with the judge.

A newspaper which bestows favors because of the personal friendships of its writers is sure to lose its influence; and a corporation which does not look beyond the newspaper and direct its policy with reference to satisfying that paper's readers is sure to be disappointed.

WHEN AND HOW TO USE PUBLICITY

Publicity is of no use whatever, unless the fundamental policy of the company itself is honest and sincere. Even if a company's policy is honest and sincere, it must not be taken for granted that the people fully

realize its character. Publicity for that policy is absolutely necessary.

People are thinking of their own affairs, and if a company's service is fairly satisfactory they are not likely to give it much thought until trouble arises. Then they think not so much of the generally good service as of the trouble. That becomes magnified. Continuous publicity of good work would have softened a public irritation in the day of trouble.

No public service corporation can satisfy everybody. The majority of people are indeed fair, but there are always some who consider that a public service company should be run for their particular benefit, instead of for the greatest good of the greatest number. In order that the criticism of such people be not given undue weight it is important that a company keep the public informed day by day and make itself understood.

THE VALUE OF A PUBLICITY ENGINEER

Every company which can do so should employ a publicity engineer—preferably an experienced newspaper man—to advise with its officers and to act with them in all matters of public relationship and in the cultivation of general good will. Such a man should know what the public is interested in. There are many facts in the operation of public service corporations which are interesting and important. If the local newspapers knew about them they would gladly send members of their staff to get material for their columns.

The publicity man will know what the newspapers would send for if only they had the suggestion. He will write the matter the way the papers want it. In cases of accidents such a man is promptly on hand to see that the newspapers get those facts which the public is properly entitled to.

Of course, no one wants to co-operate with the "ambulance chaser," and neither the newspapers nor the public have any great interest in trivial accidents, however regrettable they may be from the point-of-view of the victims. On the other hand nothing irritates either the newspapers or the public more, when a serious accident occurs, than trouble in getting accurate information promptly.

This adviser in public relations—for such a man should be far more than a mere publicity agent—should constantly study the temper of the public mind. He should know criticisms of his company which are being made; he should know of improvements to its service which a company might effect with popular approval.

Some people seem to think that the functions of a publicity man are to "hush things up," and to "put things over." On the contrary, his work, in a word, will be to interpret his company to an enlightened public opinion and to interpret an enlightened public opinion to his company.

WRITE IN LANGUAGE THAT ALL CAN UNDERSTAND

It so often happens that when in matters of policy it is desired to make a statement to the local public the railway manager thinks it the wise thing to have a lawyer prepare the document. That is another fundamental mistake. Lawyer's functions are with the courts and commissions, in the conduct of negotiations, in the

preparation of contracts, and in other purely legal activities.

When the man of legalistic mind attempts to speak to the public he usually encumbers his utterances with a mass of irrelevant facts or unintelligible jargon which makes the whole document vague and unreadable to the average man.

In the preparation of statements to the public, directness and terseness, even colloquialism, are of the utmost importance. The reason Billy Sunday is so effective is because he speaks the language of the people. The clergyman in the gown may use more elegant English, but if his real purpose is to reach the heart of man, he must realize how infinitely more effective is the homely straightforwardness of Billy Sunday.

Therefore, let the railroad manager accept the counsel of his adviser in public relations in the preparation of statements to the public, whether they concern either matters of routine operation or corporate policy—that is, assuming that he wants the people to know exactly what he means.

STAND BACK OF EVERY STATEMENT

And right here let it be urged that every statement from a public service corporation should be authoritative, issued preferably on stationery bearing the name of the company and the name of the

president. Every newspaper, in fact every person, receiving such a statement should know whence it comes and who stands sponsor for it.

Nothing is more futile than any devious or indirect method of publicity. It may be that a company can at times induce the newspaper to publish as its own something which the corporation wants to have said. But unless the statement is in every detail truthful and embodies the honest policy of the newspaper itself no such effort on the part of a corporation can be successful. This leads to a discussion of advertising.

A public service corporation should take all of the advertising space it can afford to pay for. It should constantly inform the local public concerning its policy and daily work. Unless these are matters of current moment a newspaper cannot regard them as news. But it is none the less important that the public be constantly informed concerning them.

One of the greatest merchants in the world is H. Gordon Selfridge, an American, who runs a large department store in London. Mr. Selfridge has a big advertisement in the London morning papers every day telling of his prices, bargains and other strictly mercantile data.

SELFRIDGE TELLS ALSO OF HIS POLICIES AND IDEALS

But in the afternoon papers he pays for a column of space in which to tell of the general policies, the ideals, the principles of the House of Selfridge.

I question very much whether this advertisement in the afternoon papers does not contribute vastly more, in the long run, to the success of the firm than the purely commercial advertising. It is human nature for people to do business with those whom they trust, those in whose ideals they believe. Such advertising of one's ideals creates just that atmosphere of confidence.

It follows that, if a railroad corporation wishes the extension of a franchise, if it seeks relief from burden-

The functions of a publicity man are not to "hush things up," and "put things over," but to interpret his company to an enlightened public opinion and to interpret an enlightened public opinion to his company.

In this era of a tremendous outpouring of literature of all kinds the man or company who can arouse curiosity has made a real step forward.

A central bureau of advice on public relations would serve as a power house of publicity assistance, but the local company must always turn on the power.

“EVERY company which can do so should employ a publicity engineer—preferably an experienced newspaper man—to advise with its officers and to act with them in all matters of public relationship and in the cultivation of general goodwill. Such a man should know what the public is interested in. There are many facts in the operation of public service corporations which are interesting and important. * * *

“The publicity man will know what the newspapers would send for if only they had the suggestion. He will write the matter the way the papers want it.”—IVY L. LEE.

some taxation, or if it appeals for public support in any controversy, its appeals will fall upon receptive or deaf ears just in the proportion that the company enjoys the confidence, the real confidence, of the people whom it serves. And this confidence will be based upon actual observation of its service and such interpretation of its service as the company may, by appropriate publicity, truthfully make.

Experience has proved that the quickest way to get the company's story to the greatest number of readers is through advertising columns, where the company can write its own headlines and use type in the way best calculated to claim attention.

OTHER OPPORTUNITIES FOR PUBLICITY

Newspapers are not the only media of communicating with the public. Every railroad corporation has in its stations and cars an opportunity to create a medium of communication of its own, through cards and posters. Car cards are read first because they are short; and second because people cannot help seeing them. As in a movie theater, so here there is only one thing to look at.

Every electric railway company should avail itself of this medium to the utmost. To do so it is necessary to make the cards interesting, make them pertinent, make them newsy. They should never be allowed to become an old story. Such cards should be appropriately illustrated, if possible, but they should most certainly be changed frequently.

But neither the newspapers nor the car cards can convey to all constituents of a company all of the data which people should have in order to interpret the company's acts. Those companies which have tried it have found it profitable to issue publications of their own. Such publications arouse the interest of employees; they form the basis for information for editorial comment by newspapers; they are media of communication with city officials, taxpayers' organizations and the like.

Such publications should be brief, very brief. My own experience has shown that it is much better to issue such publications irregularly—only when one has something important to say—rather than at stated intervals.

If issued at irregular intervals, those receiving such a publication are likely to wonder as to the occasion for its issuance at the time. It arouses curiosity. And in this era of a tremendous outpouring of literature of all kinds, the man or the company who can arouse curiosity has made a real step forward.

AROUSE CURIOSITY FIRST

Someone has said that advertising is the roadway to a man's mind. The way to make people read advertisements is first to arouse curiosity.

Both the railway manager and his adviser in public relations should give unusual attention to public bodies of all kinds, not with a view to exerting any but proper influences, but with a view to insuring that the members of such bodies are well informed concerning the policies of the company.

If the head of the company or if his adviser in public relations is a good speaker, the company has an exceptionally valuable asset. The community always likes to hear at first hand of the affairs of its public service corporations.

WHAT A CENTRAL BUREAU CAN DO

The problem of the public service corporation will have to be solved separately according to the conditions in each local community. Especially is this true of electric railways. Any effective bureau of publicity to conduct wholesale the public relations of all electric railway companies is an impossibility.

But the fact remains that there are certain general problems which do concern all electric railways. Of these, the problem most fundamental is that of the fixed five-cent fare and its relation to the fact that the costs of operation and the amount of service expected for that fare are constantly increasing.

A central bureau can be of tremendous use in making a study of the service given for five cents in different cities and the conditions surrounding that service, and in supplying the results of the study to each company for interpretation and comparison.

The jitney problem concerns nearly all companies. The way it is being met in different communities and the methods used to cultivate sound public opinion with reference to it could very well be studied by a central bureau and the results placed at the disposal of each company for use.

So with reference to questions of paving, taxation, franchise permits, and service requirements by regulating commissions—all of these questions are of universal interest.

Likewise, local problems are constantly arising in the affairs of every company, concerning which information of the experience of other companies can be furnished by a central organization.

The American Electric Railway Association is an admirable organization for this. Under the direction of its committee on social relations a bureau could be created to be placed in contact with companies throughout the country needing its help.

ACTUAL THINGS A PUBLIC RELATIONS BUREAU COULD WELL DO

Such a bureau could give specific advice to railway companies in connection with the establishment of publicity departments, and criticism and suggestions could be given concerning material to be issued to local communities. Publications could be edited on the basis of material supplied by the companies; car cards could be prepared, and other matters could be handled for use in each community concerning such problems as all companies have to meet.

Such a central bureau should work entirely through local companies and should not assume itself to conduct any campaign of education with reference to the general problems. Any effort, however, to avoid treatment of local problems by the local company is likely to prove wasted.

A central bureau of advice on public relations as outlined would serve as a sort of power house of publicity assistance, to which the wires of any company could be attached at will. But the local company must always turn on the power, and guide the machine.

Advertising the Twin City Lines

By A. W. Warnock

General Passenger Agent Twin City Lines, Minneapolis and St. Paul

AN ANALYSIS of the Policies Behind the Publicity of the Minneapolis and St. Paul Companies—Some Examples of Advertisements Produced to Inform the Public of Causes of Delays and Changes in Routes.

NOT so many years ago street railway companies generally took little or no interest in the broad subject of Publicity—a term we seem to have substituted to-day for the good old-fashioned word Advertising. True, we were always glad to have the press speak well of us if it felt so disposed, and conversely we were always pained to hear ill things said of us. Aside from an occasional paid “story” of our properties on some special occasion, however, no company really and truly adopted advertising as a strong aid to its success. It is to be doubted, indeed, whether we ever spent any money in advertising except under duress or protest—never, I suppose, because it was the sensible, business-like thing to do so.

The past ten years have seen street railway companies everywhere undertake practical, continuous advertising campaigns, and from the good widespread results that we all know have followed, it is now a foregone conclusion that the day has gone when the right of advertising to a permanent place on the payroll of every progressive company will be questioned.

Great care should be employed in the management of a street railway company’s advertising expenditures. In a day of “pitiless publicity” when every business,



A. W. WARNOCK

some permanent form for their educational value to us all.

THE ADVERTISING DEPARTMENT STARTED IN 1906

In view of the request of the ELECTRIC RAILWAY JOURNAL for an explanation of the simple working methods of the advertising policies of Twin City Lines, it may be of interest to say that exactly eleven years ago we organized an advertising department in connection with the General Passenger De-

partment, and, like the patent-medicine testimonial, we can honestly say, “We wouldn’t be without it in the house since buying our first bottle.”

Prior to 1906, our company, like all electric or steam companies, was on the old-fashioned trading basis with the newspapers in our territory. We issued perhaps \$8,000 worth of free tickets every year to the papers and carried their bundles of papers free, while they in turn gave us such “kindly mention” from time to time as they thought proper. The opening of a new extension, the purchase or building of some new cars, the installation of a new power house—these were all subjects for news stories regarding our property. One hand washed another, and the balance, if there was any, no matter in whose favor, automatically wiped itself out at the end of each year.

Just at this time the air all over the country was beginning to be surcharged with sentiment against free transportation of all kinds, and the days of the trading plan were numbered. In February, 1906, nearly one year before the Interstate Commerce Commission put a stop to the wholesale issuance of transportation in general and advertising transportation in particular, we put our relations with our newspapers on a strictly business basis—as much to their gratification and satisfaction as our own. All free transportation to newspapers was cancelled, and a charge of one-quarter cent a pound was made for the carriage of their bundles to local city points and one-half cent a pound to interurban points. Then it was we got down to a brass-tack basis of making definite advertising contracts for such space as we thought we needed. The papers thus received no favors from us, and we received none from them. I do not know whether newspapers in other cities are differently constituted than ours, but eleven years of such a business-like policy has taught us how just and fair the papers are in their attitude to a public service enterprise such as ours. If we are faulty in service, if we need reproof—in fine, if we are guilty of errors either of omission or commission, we hear from the papers promptly in big black type, to our discomfiture, perhaps. But if we do the decent thing by the communities we serve and give evidence of such purpose,



profession and calling seems to employ a press agent who is screaming at the top of his voice, and when puffs and notices are seen so frequently in the columns of our papers delicately extolling the merits of men, wine, women, songs and other commodities, perhaps we might give pause and see that our advertising is properly done, so that it may ring true and make the proper impression on the reader.

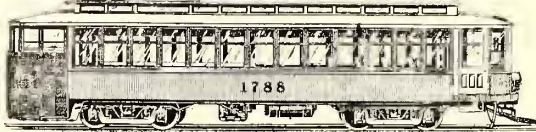
There is danger, a great danger, that lack of care in such endeavor may work greater harm than good for us, and pessimistically we may ask ourselves the question, “Tell me, does it pay?” in the same way as the hopeless man shown in a recent cartoon which we reproduce herewith simply to show how very hopeless that is. This cartoon suggests the splendid series of publicity cartoons and talks which have been appearing in the ELECTRIC RAILWAY JOURNAL for some weeks past. Those talks and cartoons have expressed so clearly and aptly so many wholesome ideas on the subject that it is hoped the JOURNAL will republish them in

Best Way To See The Twin Cities



Their Beautiful Lakes, Rivers, Parks and Interesting Public Institutions Most Quickly, Comfortably, Inexpensively IS ON ELECTRIC CARS

You can obtain a good idea of Twin City geography and enjoy much interesting sightseeing, by traveling back and forth between Minneapolis and St. Paul on the four Interurban lines, each with its own distinctive attractions—the Minneapolis & St. Paul, the Como-Harriet, the Selby Lake and the Snelling-Minnepaha. The fare from city to city is 10 cents, collected in fares of 5 cents in each city, entitling the passenger to transfer



at either end to any local line desired. Any point of interest can be reached from either Minneapolis or St. Paul as starting point. For instance, if you start from Minneapolis to Stillwater, go to St. Paul by any interurban line and a conductor for transfer to Stillwater. On return trip ask conductor on Stillwater train for transfer to any Interurban line to Minneapolis.

MINNEAPOLIS TRIPS

WHERE TO GO	HOW TO GO	FARE
LAKE MINNETONKA. To see Lake Minnetonka most delightfully and economically get aboard a safe, swift, comfortable "Twin City" Steamboat. You can enjoy splendid trips of 1, 2, 3, 4 or 5 hours at a cost of from 20 to 50 cents by boarding Steamboats either at Excelsior or Wildhurst. Get a Lake Minnetonka Map Time Table for complete Steamboat information.	TO CONNECT WITH LAKE MINNETONKA FAST STEAMBOATS—Lake Minnetonka Cars leave Sixth Street Station (17 N. 6th St.) for Excelsior every half hour from 6 A. M. until 6 P. M. Tonka Bay Cars leave for Wildhurst every hour from 6 A. M. until 6 P. M.	25c
THE CHAIN OF LAKES Park Board Launches leave Lake St. Landing for interesting pleasure cruises over the three beautiful urban bodies of water: LAKE CALHOUN, LAKE OF THE ISLES and CEDAR LAKE at 7, 8, 8:30, 9:30, 10, 11:30 A. M., 12:30, 1, 2, 2:30, 3:15, 3:30, 4, 4:15, 4:45, 5, 5:30, 5:45, 6:15, 6:30, 7, 7:15, 7:45, 8, 8:30, 8:45, 9:15, 9:30, 10, 10:15 P. M. Round Trip—11 Miles—50 Minutes—25 cents.	Take a St. Louis Park or Calhoun Beach Car to Lake Street Landing. Or take any Lake St. or Lake Harriet Car to Hennepin Ave. and Lake St. and walk along Lake St. a short distance to Lake St. Landing.	5c
CALHOUN BATHS AND BEACH Bothing under the finest possible conditions. Excellent refectory.	Take a St. Louis Park or Calhoun Beach Car.	5c
LAKE HARRIET Picnic grounds and boating. Excellent refectory. Evening band concerts on attractive roof garden. Park Board Launch leaves Main Dock at 8, 8:30, 9, 10, 11 A. M., 12, 1, 2, 3, 4, 4:30, 5, 5:30, 6, 6:30, 7, 7:30, 8, 8:30, 9, 9:30, 10, 10:30, 11, 11:30 P. M. Round Trip—2.5 Miles—25 Minutes—10 cents.	Take a Lake Harriet, Oak & Harriet, Oak & Verross, Como-Harriet or Hopkins Car.	5c
MINNEHAHA FALLS AND PARK A great scenic playground of 142 acres, a delight to everybody. The immortal Falls and Park, picnic grounds, flower gardens, deer, elk and bear reserve. Excellent refectory.	Take a Minnehaha Falls or Snelling-Minnepaha Car.	5c
MINNESOTA SOLDIERS' HOME Attractive buildings and grounds, with superb river views.		
LONGFELLOW ZOO GARDENS Trained and wild animals and birds.		
GLENWOOD PARK Picnic grounds, public golf links and bathing. A wonderful park of 586 acres.	Take a Glenwood Park Car.	5c
MINNESOTA STATE UNIVERSITY A group of splendid educational buildings adorning a splendid campus.	Take an Oak & Harriet, Como-Harriet, or St. Paul & Minneapolis Car.	5c
MINNESOTA STATE FARM A most interesting "Model Farm" well worth visiting.	Take a Como-Harriet Car from either Minneapolis or St. Paul. Same fare.	5c
MINNESOTA STATE FAIR A composite and pictorial exposition of the State's resources on Sept. 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.	Take a Como-Harriet or Fair Grounds Car from either Minneapolis or St. Paul. Same fare.	5c
FORT SNELLING Scenic, historic and picturesque.	Take a Snelling-Minnepaha Car from either Minneapolis or St. Paul. Same fare.	5c
MINNEAPOLIS ART MUSEUM An unusual collection of paintings, sculpture and art treasures. Open on Sundays and Mondays from 1 to 5 P. M. On other days from 10 A. M. to 5 P. M.	Take any Car on Marquette, Nicollet or 4th Ave. S. to 24th St. and walk along 24th St. a short distance to 3rd Ave. S.	5c
FLOUR MILLS AND FALLS Best seen from Tenth Avenue South Bridge.	Take a Car to Washington and 10th Aves. S.	5c
BEST MISSISSIPPI RIVER VIEWS	Take a Selby-Lake or Snelling-Minnepaha Car from either Minneapolis or St. Paul. Same fare.	5c

ST. PAUL TRIPS

CITY OF STILLWATER "Park City" on St. Croix River. Get a St. Paul and Stillwater Map Time Table for information about Stillwater, State Prison, Wildwood Park and White Bear Lake Resorts.	St. Paul & Stillwater Cars leave Seven Corners Terminal at 17 and 57 Minutes past each hour.	30c
MINNESOTA STATE PRISON "The Finest Prison in the World." Open every day except Sundays and Holidays from 8 to 11 A. M. and from 12:30 to 4:30 P. M.	Take a St. Paul & Stillwater Car from St. Paul and Transfer in Stillwater to a South Stillwater Car.	30c
WILDWOOD PARK On picturesque White Bear Lake. "The Twin Cities' Ideal Picnic Resort," offers fine restaurant, dancing, bathing, bowling, boating, picnic groves, playgrounds, roller coaster, water sports and other amusements. Sunday orchestral concerts.	Take a St. Paul & Stillwater, Hazel Park & Wildwood, Hazel Park & White Bear, or Hazel Park & Malthorned Car.	15c
WHITE BEAR TOWN	Take a Hazel Park & White Bear Car.	20c
COMO PARK AND COMO LAKE A glorious park of 425 acres of charming waterways, flower gardens, picnic grounds, woods, boulevards. Excellent refectory. Motor bus trip around and through the park, 25 cents. Evening band concerts, except on front of beautiful Casino.	Take a Como Harriet or Como Park Car.	5c
HARRIET ISLAND PUBLIC BATHS A most attractive Municipal resort on the Mississippi River. Excellent refectory.	Take a Mississippi & Cherokee Heights or Jackson & Stryker Car.	5c
INDIAN MOUNDS PARK Offering wonderful wide-aweping views of the Mississippi River.	Take a Rondo & Maria Car.	5c
MINNESOTA STATE CAPITOL One of the most magnificent public buildings in the world. Open every day except Sundays and Holidays from 9 A. M. to 5 P. M. On Saturdays from 9 A. M. to noon.	Take a Car to Wabasha Street and Central Ave.	5c
ST. PAUL'S FAMOUS SUMMIT AVENUE Handsome residential street in America.	Take a Car to Selby and Nina Aves.	5c
SOUTH ST. PAUL STOCKYARDS Fifth largest livestock market in the country.	Take a South St. Paul Car.	5c
PHALEN PARK AND LAKES An enchanting park of 485 acres of beautiful "linked" waterways, picnic groves, woods, boulevards. Bathing and boating. Excellent refectory. Evening band concerts, except Mondays.	Take a Phalen Park Car.	5c

Send Your Address and 6 Cents in Stamps Today For a Copy of the New Picture Map Folder "The Twin Cities—1916"

Handsome booklet of information published about Minneapolis and St. Paul. Printed in four colors, on finest paper, in highest art. Tells how to see and enjoy all the above interesting places in and about Minnesota's Two Great Cities. Contains new information and pictures as well as seven splendid colored maps of Twin City interest.

A. W. Warnock, General Passenger Agent. Telephone—Main 4589—Center 3134.

we are backed up by the papers and given equal credit. Could anything be fairer?

We have six large daily newspapers in the Twin Cities and we treat them all exactly alike as to volume of space purchased. We play no favorites at any time or under any circumstances. Line for line, each paper receives exactly the same number each year. Our first contracts, made in 1906, were for 14,000 agate lines of space in each paper, and from time to time, as our necessities have required we have raised that amount, until our contracts for 1916 were for 42,000 agate lines for each paper. That is the principle followed for the large dailies. Such city weeklies as we use receive contracts based on their character, influence and circulation. In small towns and villages served by our interurban lines, we give each weekly paper the same amount of money for the insertion of a 5-in., single-column time-table advertisement for the entire year. Some of the small-town papers figure such a service at \$10 or \$15 less than is asked by the largest paper, but we believe that each paper in its own town is as important as any other, and so the general standard highest figure is adopted by us as the basis for all. A good, clean, well-edited weekly paper is a big asset for any little town, and should be treated liberally.

The space purchased, comes now the logical question what do we put into it?

KINDS OF ADVERTISEMENTS PUBLISHED

Strange as it may seem, we devote only a part, a very small part, of our space to what might be termed the solicitation of new business. From May 15 until Sept. 30 we operate a fleet of seven passenger and excursion steamboats on Lake Minnetonka in connection with our two interurban lines from Minneapolis, and that service offers material for limited exploitation for the short period of three months, June, July and August. From Memorial Day to Labor Day we also operate Wildwood Park, a resort on White Bear Lake, reached by another of our interurban lines from St. Paul, and some space is used for that. Of all our advertising efforts we can say honestly that we have found the best general advertisement to have been a three-column announcement, giving in table form the list of places of interest reached by our lines, a few words concerning each place, the cars to take to reach them and the rates of fare. During the summer season we constantly use such a standard bid for new traffic, and from the expressions of many strangers and home people alike, we believe it gives just the street-car information people want.

But the bulk of our contracted space, the large bulk, is used simply and primarily to keep the public of the communities we serve informed of our general service.

"Why was my car late coming along to take me to my work this morning?" "Why was I delayed getting home from my work last night?" "What is the reason for rerouting such a line?" "When will such a line be opened?" "What are my transfer privileges?" "What is the reason for this and that and the other thing?"

These are some of the many subjects we discuss in our announcements from time to time. Take the matter of delays. How exasperating it is never to know what delayed your car going to or from your work, to find your line rerouted arbitrarily without advance notice, not to be advised of new transfer privileges, or not given reasons for changes in service which you as a patron are justly entitled to receive!

For several years we have printed from day to day, as occasion requires, a Street Car Delay advertisement in all our daily papers. The purpose is to answer the many delay questions which naturally arise in the car patron's mind. A specimen advertisement is submitted.

12637

No delay is announced unless it has been for ten minutes or more, and all delays, whether our own fault or that of others, are recorded. If defective equipment was the cause, we report it as readily as though some drayman's wagon broke down on our tracks, although we never mention the drayman's name. We do not say "The Peerless Draying Company's wagon, broken down on our track, delayed the Hennepin Ave. Line," but "A wagon broken down," etc. The fairness of such a rule is obvious. These delays are reported to our office by the general superintendent by 11 a. m. each day, and at 11:45 a. m. they are in six newspaper offices ready for afternoon editions. Thus the patron reads about the cause of his morning delay on his way home or at his fireside in the evening. We have received from our patrons literally hundreds of favorable comments on

Street Car Delays

WEDNESDAY, NOV. 15.

The following delays occurred at the railroad crossing at Franklin and Cedar Aves; from 12:45 A. M. 10 minutes; from 6:02 A. M. 12 minutes; from 4:40 P. M. 11 minutes.

A vehicle broken down on the track at Plymouth Ave. and 6th St. held the Plymouth & Bloomington Line 10 minutes from 12:05 P. M.

A Car off the track at University Ave. and Oak St. delayed the Oak & Harriet Line 34 minutes from 6:55 P. M. Extra Cars were sent out from East Hennepin Ave. and 4th St. so that there was little delay from that point West.

A broken trolley wire at Hennepin and Douglas Aves. delayed the West-bound Hennepin Ave. and Monroe & Bryant Lines, Southbound, for 15 minutes from 7:20 A. M.

On account of a fire on Fremont Ave. the Chicago & Fremont Line was delayed, Southbound, for 22 minutes from 3:50 P. M., although extra Cars were filled in the line from Washington and 20th Aves. N. making the delay in the Loop only 8 minutes.

A horse fallen down on the slippery pavement at 2nd Ave. St. and 5th St. blocked the St. Paul & Minneapolis and Minnehaha Falls Lines for 18 minutes from 9:54 A. M. necessitating a rerouting of those Cars through the Loop District.

On account of the burning out of a transmission cable, there was no power and all lines were delayed 10 minutes from 2:15 P. M.



Complaints and Suggestions Always Receive Prompt, Courteous Attention.

A. W. Warnock, General Passenger Agent, Hennepin Ave. and 11th St.

Telephone—N. W. Main 4580—T. S. 33154.

ADVERTISEMENT ANNOUNCING CAUSES OF DELAYS

a "two-page spread" (two pages opposite each other) to tell of important work done or of several new lines to be opened. There was such a case two years ago, when we explained the amount of improvements undertaken during the unusually heavy summer season of 1914. The advertisement went into the details as to the building of 45.72 miles of new track in 1914, which meant 23.27 miles of new lines and 22.43 miles of old lines rebuilt, also 165,963 square yards of new paving laid and 100 new cars built, as well as all the news details of the opening of the new lines for service.

This information had a strong news value, and the newspapers would have been glad to have printed it at length, but we preferred to take a large amount of space to tell the story in our own way and at our own time. That naturally suggests the idea that we do not offer news stories to newspapers, unless we are asked

to do so, or unless we know it is real out-and-out news such as they would ask for if they knew of its existence with us. City and managing editors have grown to look with cold eyes on the Greek bearing gifts in the guise of professional "press agents" with "hot rews stories." Why should papers print anything about the building of your wonderful new smoke stack, or any of your other doings? If the smoke stack should fall down in the course of erection, that's news, but not otherwise. Be ready to give the news that is asked, and to tell the real damage the smoke stack did in falling. Nowadays, very properly, it seems to be bad form to work a willing press for free "puffs" and "send-offs." An over-enthusiastic, over-zealous press agent, measuring his results by the number of inches of free space he gets in the papers for "the pieces" he writes, is likely to be a dangerous person to have access to a public-service corporation's closest confidences. So much depends upon the horse sense of the man acting as the megaphone for your property!

It is regrettable that in too many companies in the past the idea of publicity was to tell only what the management wanted to tell, not what the public had a right to know and what it should have been told. There have been instances where it was the vogue to hand out a plate of carefully selected scraps of news at the back

door to reporters, under the mistaken notion that the giver was bestowing priceless gifts on the receiver.

Our papers like to print our monthly financial statement, and on the same day that such a statement is released in New York, copies are sent to all the papers in Minneapolis and St. Paul. Usually telephone inquiries from the papers follow the receipt of these statements, asking for the cause of the decrease or increase of earnings shown. Last month one city editor called us up and asked to what we attributed such heavy earnings for a month. We explained that it was because of the natural good times prevalent in the Twin Cities, everybody at work and so many folks riding. That was all right as far as it went, but he wanted further explanation.

"It's the same prosperity reason that accounts for the fact that your paper last night had 48 pages with 100 per cent more advertising at 25 per. cent higher rates than a while ago when you had only 16 pages."

"I'm on," the editor laughingly replied. "I guess ours is a good deal better game than yours."

Reporters readily can see anybody they want to see in our offices, and if they prefer to see the president or any other officer than our publicity department they are always welcome. Doors leading to executive offices with "PRIVATE" in neat gilt letters fortunately are passing out of vogue. People with grievances or proper inquiries in their minds should not be met with rebuffs or obstacles at the start when they visit public servants—which we all are. Accessibility breeds friends. "WELCOME" looks decidedly better on a door than "NO ADMITTANCE."

We have taken as much as

*Complaints and Suggestions
Always Receive
Prompt and Courteous Attention*

TWIN CITY ADVERTISING—SLOGAN PUT ON ALL ADVERTISEMENTS OF THE TWIN CITY LINES

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We have a slogan which we put at the bottom of every advertisement we print, whether a newspaper an-

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nouncement, car window card or any other form of publicity. It is a true and tried friend, and we always try to back up the promise contained in it with kindly and cheerful performance on our part. This slogan is shown on page 21.

We have explained as fully as seems desirable our advertising as applied to newspapers. There are still some other forms of publicity we have used for some years with most satisfactory results.

OTHER FORMS OF PUBLICITY

At an early date in 1917 we will issue our twelfth annual folder entitled, "The Twin Cities To-day." The purpose of this folder is primarily to exploit the Twin Cities and their attractive surroundings, and secondarily and indirectly to advertise the Twin City Lines and the service they offer. This folder has been an annual feature with this company, as stated, for eleven years, and it is issued in improved form each year, although the shape is never changed. The folder consists of 64 pages 4 in. x 9 in. when folded and opening up to 9 in. x 32 in., printed in four colors and illustrated with a large number of fine maps and halftones, on the best paper obtainable. This folder is offered in the daily papers in the Twin Cities and throughout the State of Minnesota and elsewhere in a small advertisement from May until September. A copy is mailed upon receipt of six cents in stamps, although it costs nearly double that amount. On the average, seventy-five letters requesting copies are received daily from all over the country from persons who intend to visit the Twin Cities for a vacation, to stop over on their way west, or to move to the Twin Cities to reside. The nine steam railroads running into the Twin Cities distribute this folder over the counters of their city ticket offices in the Twin Cities as well as in all their leading offices throughout America. It is not an uncommon experience to receive a letter from a man in New York or Chicago asking about the advantages of the Twin Cities before he starts on a journey to the Coast. This folder is also found in hotel time-table racks everywhere in the Twin Cities, and it is on all the passenger steamships plying between Duluth and Buffalo on the Great Lakes, as well as on the large river boats running on the Mississippi River between St. Paul and St. Louis. It is used in the Twin City schools as a text book for Twin City geography. Civic associations in Minneapolis and St. Paul use it as an aid in influencing desirable people to come to our cities to live.

This folder is also distributed in the information bureaus of all the large department stores in the Twin Cities, in the public libraries, and in all other places where strangers are likely to visit. The leading hotel of St. Paul and the leading hotel of Minneapolis make it a rule to put a folder in each room on the arrival of a new guest. The first thing that a guest to either of these hotels sees is one of the Twin City folders with its collection of street railway maps and information for his benefit. We got that pleasant idea from a hotel in Heidelberg, Germany.

Possibly the reason why the folder is acceptable in so many places is because of its character, for while we do not waste money on its preparation, nevertheless from a mechanical point of view, it is prepared with all the skill and taste that the best artists, mapmakers and printers can summon to their aid. It has been our constant aim to make it so distinctive as to be in a class by itself. The good these annual folders have done for us has been immeasurable.

Right here may we suggest that the reason why so much printed matter, regardless of how "clever" it may be, does not always do its greatest good is because no

intelligent carefully thought-out plan is drawn up and followed for its distribution. The best folder is worthless and really represents a waste of time, paper, ink and money unless it gets into the hands of prospective riders on your cars, the people you prepare the folder for and whom you want to reach.

We carry in two upper sash windows of all our cars two six-ply car cards, measuring 14 in. x 25 in., on



To Patrons Cedar Ave. Line

On Wednesday, November 1, the new through Cedar Ave. Line running from Cedar Ave. and 42nd St. into The Loop will be put into operation.



To Patrons Bryn Mawr Line

Commencing on Wednesday, November 8, the Great Northern Ry. will begin the reconstruction of the West end of the Bryn Mawr bridge, over its tracks.



To Patrons Fremont Ave. and N. Lyndale to 51st Ave. Lines

Commencing Monday, October 30, a "No Stop" Car will be run from The Loop to Fremont and 14th Aves. N. Daily Except Sunday. This Car will display Chicago & Fremont signs.

A "No Stop" Car will also be run to Lyndale and 51st Aves. N. Daily Except Sunday carrying N. Lyndale to 51st Ave. signs.



To Patrons N. Lyndale to 51st Ave. Line

Effective Monday, November 27, the following change will be made in the plan of operation of the "No Stop" Car leaving Hennepin and Washington Avenues Northbound, at 6:00 p.m. Except Saturday and Sunday.

No stops to let off passengers will be made between The Loop and Washington and 20th Aves. N. (instead of Washington and Lowry Aves.)

As heretofore stops to take on passengers will be made at any regular stopping place and stops to let off passengers will be made at any regular stopping place between 20th Ave. North and the terminus of the line.

Complaints and Suggestions Always Receive Prompt, Courteous Attention.
A. W. Warnock, General Passenger Agent, Hennepin Ave. and 11th St.
Telephones—N.W. Main 4580—T.S. 33134.

TWIN CITY ADVERTISING—ANNOUNCEMENT OF CHANGES IN ROUTES

which is displayed general information which we believe is most essential in following up our advertising satisfactorily. These cards carry constant daily invitations and reminders to passengers to bring their grievances to us for prompt attention.

The past year we have issued pocket time-tables of each of our local lines for the information of patrons. We do not show the time where the headway is very frequent during the rush hours, but practically all cars are shown from all terminals on all lines from midnight

to midnight. The signs and routes of each line are given, and altogether a patron with one of these timetables in his pocket experiences a feeling of satisfaction in knowing just what service he has a right to expect on his line. We all know how patrons have the habit of writing for such information, and so we give it to them in neatly printed form. One folder gives the car signs and routes of all the lines of our system. How times have changed! Think of issuing a street railway time-table in the old horse-car days!

To make his advertising fulfill its mission and get results, whether the commodity he is offering be groceries, pianos or street-car service, the advertiser must do exactly what he says he will do and give exactly what he promises to give, tying up each transaction with those silken strings called courtesy and considerate service. A public-service corporation must make even greater efforts to back up its promises with civil, efficient performance. You must first believe absolutely—or, at least, most of it—is reasonable, and that good will on your part will beget good will on the public's part. You must stand ready and willing to do the right

and reasonable thing at all times as well as to receive with an open mind any complaints and suggestions, whether they be reasonable or unreasonable. You should regard the receipt of such complaints as real opportunities to make friends and to remedy defects in your service, instead of taking offense thereat, as has unfortunately been the case too many times in the past. In that way you will earn and retain the good will of your public, and there will be no question about whether your advertising "pays."

Advertising, stripped to the bone, is simply telling your "store news" honestly, clearly and sincerely, and then making good on it. That means treating the customer well and satisfying him completely from the beginning to the end of his dealings with you. In short, it is the practical application of the Golden Rule. In recent years the "wiseheimers" in the advertising line have made much talk about "psychology," "appeal to the mind," and other vague and mysterious things, whereas really to any straight-thinking business person advertising should be as simple as the first three letters of the alphabet.

A Public Relations Department

By Frank Wert

Manager Public Relations Department, Mahoning & Shenango Railway & Light Company

THE PURPOSES OF a Public Relations Department Are Explained by the Author, Also the Means Which Have Been Adopted for Improving the Relations Between the Company and Its Employees.

THE Mahoning & Shenango Railway & Light Company of Youngstown, Ohio, has had a public relations department since Sept. 1, 1914, and we look upon its field as somewhat more comprehensive than a publicity department, as its scope includes a variety of activities all bearing upon the question of improving the relations of the company with the patrons. Some of these activities have been fairly well established, while others remain to be developed to their proper degree of usefulness. Prior to its organization, matters of publicity, advertising, complaints, etc., were cared for in departments whose other duties were too pressing for them always to give proper attention to these "side issues." Hence the department was organized and these matters placed under its jurisdiction, and other duties assigned to it from time to time as occasion arose.

The field covered by the department at present may be divided about as follows:

Publicity.—Supplying ten daily and several weekly newspapers with news facts about the company, its activities, accidents, etc., and in general affording a ready means for newspapers to obtain information and acting as the company's mouthpiece. All matters pertaining to the lay press, and largely to the technical press, are handled in or through this department.

Advertising.—Both commercial and "good-will." Comparatively little of the latter has been done, but opportunity is never lost to use the advertising columns of newspapers to announce and explain changes in schedules, routes, transfer privileges, fare collections, etc. More comprehensive use of newspaper space for "good-will" advertising is contemplated, the difficulty not being the subject matter for such advertisements, but rather the opportune time for establishing the precedent so as not to create the impression that the company



FRANK WERT

"wants something," and therefore is "trying to be good." All contracts for advertising and, in a general way, all copy, especially if it touches on any question of policy, are under the jurisdiction of this department.

Bureau of Adjustments.—This is an adjunct to the department to which all patrons, railway or lighting, are invited to bring their grievances in order that the company may make reparation, may adjust or explain, as the case

warrants. It is the medium through which the company seeks to meet the individual who feels that he has not been used fairly and to right speedily any wrong that exists. It is operated upon the basis that "the customer is right" until the contrary is proved, and that no matter complained of is too trivial for thorough investigation. This bureau has been in existence for one year and has handled more than 1500 cases. Many of these, of course, have been trivial, but some of them have disclosed conditions of operation which could be changed in such manner as to lead to the satisfaction of a large number of patrons who had not voiced their dissatisfaction. Very few absolute failures to satisfy the patron have resulted, though the number of those who remained resentful but silent cannot be estimated. Letters and personal expressions of satisfaction at the courtesy and fair dealing meted out by the bureau have been fairly numerous. Of course, the great bulk of complainants are never heard from, partly because their resentment vanishes after the first outburst

and partly because a complaint adjusted becomes to them a closed incident not calling for any comment.

This bureau also handles the refunding of excess fares dropped into fare boxes, calls concerning outage of street lamps and some commercial lighting "trouble calls," and shortly it will take over the restoration to owners of articles found on the cars.

House Organ.—The *Em-an-Ess Electric News*, a monthly paper, 6 in. x 9 in., twenty-four pages and cover, is issued under the editorial direction of the manager of public relations. A part of a sample page of this little periodical is shown in the illustration below which indicates also one of the ways in which the opportunity for introducing a newcomer in the company ranks to the mass of employees is embraced by the publicity department.

The *Em-and-Ess Electric News* is distributed free to every employee and to a small number of persons outside

news from all departments. Considerable space is also devoted to articles on changes in personnel, improvements made by the company, new equipment, history of various departments, biographical sketches of old employees, etc., while the more important educational efforts are kept from being so conspicuous as to alienate the interest of the great body of employees. Too much preaching leads to resentment.

It has also appeared to us that a good means of accomplishing the purposes sought in the paper is to publish from time to time cartoons representative of some general idea upon which may be based an editorial article of instructive value. For this purpose we have utilized cartoons published in the *ELECTRIC RAILWAY JOURNAL*, and we hope to print other cartoons in the same manner, believing that cartoons are a powerful means of pointing a moral.

In the Councils of the Company.—Under the organization plan of the company the heads of the main departments, such as the railway, light and power, accounting, treasury and claims, form a sort of cabinet for the president, and meet regularly every two weeks to discuss company problems. The manager of public relations is a member of this "cabinet," and his "portfolio" is that of "advocate of the people." He is included in this group for two purposes:

1. So that he may be informed concerning all important developments, a necessity for publicity work, and
2. That he may present objections to any proposal which, from his observation, would seem to be objectionable to the people. Sometimes this may lead to a project being abandoned or postponed till conditions change. More often it leads to modification to meet the wishes of the public. Still more frequently it results in a discussion of a proposal from many viewpoints and the determination upon a plan for presentation to the people so as to reduce to a minimum their opposition by clearly showing to them the benefits to them as well as to the company.

For essentially the same reasons the manager of public relations is a member of or attends meetings of various departmental organizations, the object always being to keep him fully informed of developments in the company and to insure due consideration of the wishes and needs of the public on the part of all executive and operating officials.

Questions of donations to charities and various other incidental matters go to complete the "tour of duty" for the department, so that there are few activities of the company that do not touch to some extent or other the public relations work.

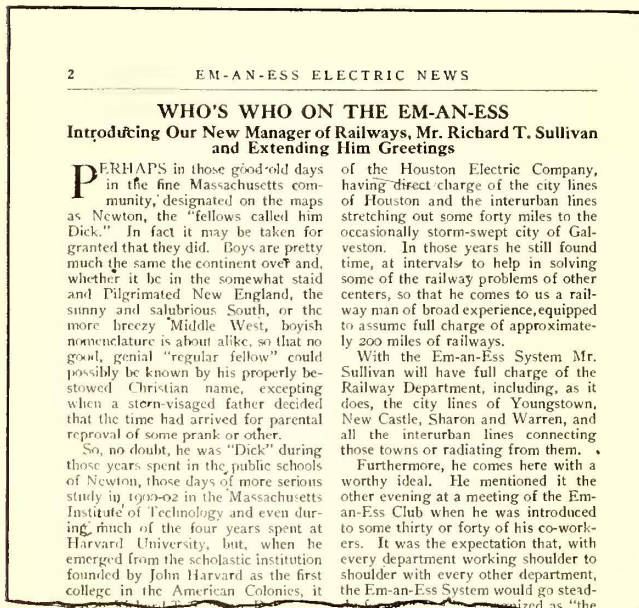
ESSENTIAL TRUTHS OF PUBLIC RELATIONS

In conclusion I might say that I have read with interest the publicity and public relations editorials published for some weeks past in the *ELECTRIC RAILWAY JOURNAL*, and consider them exceptionally forceful and thoughtful expositions of the truths which must be accepted sooner or later by all public utilities, namely:

That publicity is a necessary part of public utility work.

That publicity must be free and frank, never so slightly tinged by press agency, and must be constant, considerate and progressive, if suspicion and misunderstanding, due to the silence and, in some instances, "gum-shoe" political methods of former years, are to be replaced by confidence and appreciation.

That education is needed not solely by the public, but just as much by the rank and file of employees, and, perhaps, even more particularly by the executives, boards of directors and stockholders, whose financial interests are bound up in the welfare of utilities.



SAMPLE PAGE FROM "EM-AND-ESS ELECTRIC NEWS"

the company. Its purposes are especially to promote courtesy toward patrons, the practice of safety in operation and co-operation among the various divisions of employees and, in general, to place before all employees the problems involving electric railway and power companies with a view to the promotion of better relations with the public. That is to say, the company feels that by homeopathic doses of educational effort the large number of employees who actually come into touch with the riding and light-buying public may gradually be turned from a liability of unsympathetic ignorance concerning the company into a decided asset through:

1. A growing appreciation of what is due to patrons (courtesy).

2. Improvement in the service rendered, and therefore a removal of many causes of friction between company and public (safety and efficiency).

3. An intelligent understanding of some of the more outstanding problems of public utilities (paving burdens, excessive taxation, service requirements beyond the earning capacities of lines, etc.), so that the employees may become advocates of fair treatment of the companies instead of joining in the chorus of unthinking criticism.

To insure reading by the employees in general and to gain sympathetic interest for the publication, one-third to one-half of the paper is devoted to personal

Publicity Pays

By W. T. Waters

Publicity Manager Georgia Railway & Power Company, Atlanta, Ga.

PUBLICITY *Is Broad and Far-Visioned Advertising and Can Be of Material Assistance in Every Just Cause—The Editorials in the ELECTRIC RAILWAY JOURNAL Point the Way.*

I WONDER how many street railway bondholders and stock owners and directors and executives read those recent editorials in the *ELECTRIC RAILWAY JOURNAL* on publicity? And of those who did read them, how many soaked them in? Were they believed and taken to heart? Or were they forgotten forthwith as vain ideals, phrased by some publicity fanatic of more words than experience?

How much of their import went clear over the heads of the folks who say the yeas and nays of street railroading? That's the test. Did *they* get it? Did the series set them to thinking that perhaps after all some of this talk about the value of publicity is more than mere verbiage; that it points the way to some practical and desirable results—did they catch these truths?

If only a few of them did the *JOURNAL* has hastened measurably that day when publicity will be a real factor in electric railway affairs.

The *JOURNAL*'s editorials advanced many strong arguments. I should like to see them distilled to their epigrams and kept constantly before the men who make and break policies.

One of these was that corporation publicity is no press agent work; that the man to perform it must have "enough size and weight to make his superiors allow him to do the right thing in spite of their prejudices and previous habits." These are bold specifications, and radical—but right. Publicity under the old rules of repression would not be publicity at all.

And another was this: "The very fact that a company is trying by a frank policy of publicity to set itself right with the public inevitably leads its employees into the same attitude." This is one big result rarely included in the estimates.

"The kind of publicity that sticks its head in the sand never accomplishes very much," said another. In truth, it never accomplishes anything. It is not publicity.

"Successful publicity must concern itself with things about which the public is clamoring for information," for if it doesn't, the public will get misinformation about those same things, which is just what publicity must prevent.

"If explained as they arose, there would be few serious controversies between corporations and the public they serve." And if the explanations be started long before they arise there will be still fewer serious controversies.

"The best man to do the every-day cultivation of the newspapers is the publicity man." Because he knows just what sort of cultivating to do—which is the self-respecting sort that begs no favors and peddles no alms; and just how much—which is mighty little.

But I could keep on quoting till I reproduced the series.

A certain prolific syndicate writer who formerly was a minister has retained the wonderful faculty of discussing with an air of finality any subject under the sun. But recently he said something. He praised ad-



W. T. WATERS

vertising (which is an integral part of publicity), because in it "business becomes vocal." Industry and organization, said he, "are dumb giants until they find speech—dumb and dangerous."

"The telephone people are spending a deal of money talking to the public through the newspapers," he continued. "It is the wisest, shrewdest move a corporation ever made. Somebody in the telephone company had vision."

Then this: "Railroads, street cars, gas, electricity companies and similar forms of public utility are in a bad way. They complain that every man's hand is against them and that legislation is hostile. The cause of their plight is that they have not advertised properly. Even at this late day an intelligent program of advertising might save them. Without that, their days are numbered."

It may not be quite so bad as that; but, anyway, there's an outsider's suggestion. He happens to be an outsider whose writings are read (and believed in, to the last syllable) by a great many people in a number of cities.

Publicity ought to have become a well-marked line of activity among corporations when the early muckrakers put on paint and feathers.

But it was overlooked then, or deferred, or rejected, and therefore is all the more important now. The people have had their temporary fill of crusading and have constituted themselves into a vast jury with some growing sense of responsibilities. To win the verdict of this jury the corporation must employ publicity in all forms. And to do that effectively it must retain publicity counsel, just as it must retain legal counsel upon matters pertaining to courts of law. The public is not to be censured for the prejudiced verdict that is apt to follow if it hears nothing, either evidence or argument, from the utility's side of the court, or if what it hears from there is haltingly and weakly presented.

In the end public opinion is irresistible. It controls the legislative, administrative, executive and judicial departments of state and city. They are mere agencies and instruments of its will. Its recognition has got to be merited, and sought, and won.

The cause that is just need not fear this tribunal. True, human nature will retain its emotions, and to an extent can be swayed by them into prejudice. But, also, it will hold to its faculties of reasoning. By addressing itself to the average intelligence of the average man and woman, the utility will win that deserves to win.

Regardless of ifs and buts, however, utilities stand before the bar of public opinion whether in fear or in confidence. They're there, and they've got to make

the best of it. They've got to plead their cause. They've got to employ publicity in some form, in some degree, and while they are about it they might as well use it fully and effectively.

Perhaps some indifference toward public opinion still survives here and there among utilities. Or perhaps the flayings they suffered in bygone years have left some controlling individuals raw to the touch even of balms and unguents. It may be some were burned so often and so cruelly by publicity in hostile hands that now the very sound of its name twangs their nerves anew.

Goodness knows these unfortunate gentlemen, if such there be, will find it easy to continue so by shrinking from publicity that is in their own behalf. Of course, they organize other defensive measures. Of course, they overlook no other detail. Yet they would forego this. They have not yet realized that to resist without it is but to temporize with the final issue. They may have their assailants licked to a frazzle on points, but unless the public knows it, what's the use in the end? Unless the lawyer convinces the jury, where does he get by having a better case than his opponent?

The fact that one has been seared by publicity's hot irons does not warrant his refusal of their defense in the hands of one who knows which end to pick them up by. Then he should be after enjoying the sights that he can see. For publicity can be just as effective in defense as in aggression—much more so, in fact, if the aggression be ignoble.

The basic principles of publicity are not subject to challenge. They are cut in the stone. But their practice may be a matter of individual method. Right there the human equation enters. Different men may interpret controlling circumstances from different angles of understanding. On each must rest the responsibility of his own course.

For my part, I believe optional expediency never should govern when it compromises the principles of publicity. As to when expediency is optional and when not—there again enters the human equation. I think the situation is rare in which the honest utility can be compelled into surrender.

Voicing my own opinion still, I believe expediency is optional and that it compromises the far-seeing principles of publicity when it demands for the sake of temporary peace that some graft, polite or impolite, be countenanced. For instance, an artificial and super-imposed advertising rate is assessed against a utility by some newspaper, as though its advertising were objectionable and to be penalized with that of clairvoyants and quacks and other fakers. Though this segregation is without excuse in conscience or reason in business, the newspaper has unquestioned privilege to declare it. But it has no right to coerce the utility into buying space at the spurious rate. Again, worthless or superfluous advertising is proffered with the intimation that the utility must buy. Both of these are dishonest practices. They and similar forms of blackmail will be tolerated no longer by any company from any quarter when those who own the utilities feel the courage of their moral position.

Again, it is my opinion that the time of all times for any corporation to press the accelerator on its publicity is when it is under attack. This opinion may be confronted by that of experienced electric railway men that the better course is to lie low and let public interest pass on. But would it do that any sooner? Public interest in a given topic endures just so long and no longer. Determined defense by a utility under fire will not prolong this interest unduly, but on the contrary may dissipate it by clarifying the issue and an-

icipating discussion. Moreover, if it has the public's good opinion, the utility stands to lose too large a measure of that by remaining silent under abuse. The time to convince the public mind is while that mind is open to what you have to say. Silence emboldens the pack to yap the harder, engenders the suspicion that there really is something up the tree and brings no end to anything.

"A lot of disappointments have been caused by the hiring of reporter press agents," said one of the JOURNAL'S editorials. Care should be taken, as the JOURNAL took it, to charge those disappointments against their true cause. By no means do they demonstrate the failure of publicity as a policy.

To attract the best men and hold them, publicity must be recognized by the utilities as a worthy and technical calling and must be compensated as such. To pay for reporter press-agent service and expect something of a higher order is unreasonable.

The field of utility publicity is broadening and begins to offer those further possibilities of progress which inspire effort. The demand is for workers who realize that the day of special pleading has passed and that specious defense is worse than none at all, who can retain the viewpoint of the critical outsider and address to his understanding and acceptance the truths about public service.

But the mere securing of the right man and the mere designating of him with some entitlement—this is but the beginning of deliberate publicity. The name of the thing is not enough. The concession of the theory, the recognition of the policy accomplish little. Beyond and above these the fearless spirit of publicity has got to be there.

Publicity does pay. It is but advertising—broad and far-visited advertising. All of us advertise, whether consciously or not. We bow to good taste in personal matters. We demand creditable business stationery and presentable offices. We pay commensurate rent for locations on good business streets. We spend money to keep our cars varnished and our windows washed. All this is advertising or publicity, and every cent we put into it is well invested. Every day of our lives we adhere to the credo that publicity judiciously advanced certainly pays.

As a cold, strict, absolutely calculating business proposition publicity pays not only in more zealous loyalty among employees and in fair treatment dictated by public esteem, but also in dollars and cents that flow from that loyalty and that esteem; in increased demand for whatever we have to sell, whether it be car rides or cabbages.

The electric railway that depends for its dividends on the fortunity that if people ride in street cars they must pay it their nickels is not only foolish and pathetically myopic, it is precariously near the edge of big trouble.

A whole lot of folks have a say-so in the conduct of every corporation, be it public or private. And that's the rub. They have many conflicting opinions. The convincing of their majority that publicity offers peace to their business souls and fair wages to their commercial investments is not a task that can be lightly disposed of.

Therefore it is that I wonder how many owners and creditors and managers read the JOURNAL'S editorials and absorbed them and were moved by them to determination upon action.

How many, and who?

It is an interesting question. The answer could foretell much of the to-morrow of public service by private capital.

Special Ideas in Publicity Work

By E. B. Atchley

Publicity Agent Kansas City Railways Company

TEXT: "Whatsoever ye would have the people do unto you, do ye even so unto the people"—and it will be done.

THIS is a little sermon—a little sermon on publicity—and it covers every publicity idea under the sun. The publicity department ought to be a flood of sunlight, diverging in all directions from the heart of every public service concern, enveloping all the people served.

But the heart of the corporation must be there, and the chief executive is the heart. That publicity department is unsuccessful which does not have standing back of it the right kind of a chief executive, for he, too, needs must have as thorough an understanding of human nature as the publicity department. In this the Kansas City Railways' publicity department is most fortunate.

Secretiveness has been the curse of public service corporations because secretiveness brought only the just condemnation of an interested public—no praise. The people want to be friendly, and they will be, save for a few meddlers, if they are taken into the corporation's confidence. The public will treat you as you treat the public, and present opportunities for good publicity work enabling the department to grasp these opportunities. That is keeping *ahead* of the procession!

Recently the Common Council of Rosedale, a suburb of Kansas City, protested against the cars in use by the Kansas City Railways, and adopted a resolution prohibiting their operation.

The controversy brought bitter words, and while the break was bridged temporarily, the bad feeling was not wholly removed. In a few weeks a movement started by Rosedale women for a big playground, and the Railways' publicity department was the first to give aid in pushing the movement. Cards were carried on the cars boosting the playground, while newspaper stories urging the people to help found their way into print from this department. While this work meant no financial return to the company it did mean a better feeling, and to-day the women of Rosedale sing the praises of the Railways. The Golden Rule did it!

Knowing that all Kansas City was interested in the November election, the Railways arranged with the light company for a system of signals to announce the results as soon as the telegraph brought the news. The newspapers took up the plan, carried stories on it from day to day, and it was talked everywhere. The plan was carried out, with the result that everybody on the cars, as well as the people who remained at home, knew who had won as quickly as the people who watched the bulletin boards. Everybody was pleased.

Space has been given on the front of the cars in the last few months to promote public welfare, church, school and hospital work to show the Railways is interested and willing to aid in promoting any movement for the public good. Undoubtedly the assistance given these measures has aided the Railways materially in its efforts to relieve traffic congestion, for the organizations boosted have, in turn, fought for better traffic regulations on the part of the city. In some of this work the publicity department has gone outside its regular duties to assist in the preparation of newspaper stories,



E. B. ATCHLEY

but everything done has been productive of splendid results.

Kansas City inaugurated a "health week" early in December, holding big meetings in Convention Hall, where a "health evangelist" exhorted his hearers to live up to the health rules laid down. The railways joined in the movement, helped in the newspaper publicity work, placed cards on the front of the cars calling attention to the meetings and prepared health literature

for distribution on the cars. Every health advocate in the city talked about what the Railways was doing—and he liked it. The Railways did for the health advocate what it would like the health advocate to do for it under similar circumstances, and it naturally brought good will. Isn't this the object of a publicity department?

The safety work inaugurated by the Railways publicity department has been thoroughly "covered" in the ELECTRIC RAILWAY JOURNAL, but in the few months it has been carried on the work has developed wonderfully. Safety patrols have been established by all schools, essays are written by pupils, and the various local school publications carry articles on safety. These things followed the work of the safety director carried on in the schools, but they also indicated co-operation as a result of the publicity department having taken a part in pushing school athletics, evidencing more strongly the biblical truth.

Just one more word about building good will in a special manner. When the national encampment of the Grand Army of the Republic was held in Kansas City last August, this department issued a small daily newspaper called "The G. A. R. Edition" of *The Railwayman*, this being the title of the company's magazine for its employees, which carried all official news of the encampment and 20,000 copies of which were distributed free each day. Everybody interested in that encampment clamored for recognition in that little newspaper. It was made the official organ, and resolutions were adopted indorsing, praising and proclaiming all the other necessary good will, friendship, etc. Thousands of visitors saved every copy, many wrote back for extra copies after they went home, congratulatory letters came in by the dozen, and that paper was the talk of the town. It simply made a big hit, and the 20,000 veterans went back to their homes declaring Kansas City had the best street railway system on earth, to which every employee of the company wholly agreed. The little newspaper did it!

And now a word about newspaper publicity. Hardly a day has gone by in the last ten months since the Railways established its publicity department that the newspapers have not carried favorable mention of the

company. Of course, there has been criticism—some just, some unjust. When the criticism has been unjust it has always been regarded as an unintentional error, and so treated in discussing the matter with the newspapers, the man who wrote it never being blamed and no anger being displayed. Reporters from every paper in the city call daily at this office, being kept advised of the Railways plans, frequently a week in advance of the time of publication, and not one has violated the confidence. They are as careful not to violate a confidence as a company official. In the news submitted for publication no effort is made to boost the company, no facts are hidden. The truth is always told. In this manner the Railways' publicity department has established a feeling of confidence in the statements made. Every effort is made to be fair—and news is judged mainly from the viewpoint of the public and the newspaper man, not purely from the company's viewpoint. This, it is considered, is a vital matter in the publicity work.

If the newspaper becomes convinced the publicity man is "coloring" news, all information coming from the department is regarded as "colored." As a result of the confidence established, when an accident is reported to police headquarters involving the Railways, almost the first step of the reporter "covering" it is to call this department. If the information is not at hand the department secures it, looks into every angle of it and supplies the details. The newspapers take the statements as true. Wishing to be dealt with fairly, the Railways deals with the newspapers fairly—and the plan has proved to be right in Kansas City.

Whatsoever ye would that any or all should do unto you, do ye even so unto them, is the great fundamental law, or idea, of publicity, o'ershadowing everything, reaching even unto your enemies. Opportunities will bring forth the lesser and more special ideas, differing as to localities and dependent wholly on the brain that directs the work. The flood of sunlight will loose itself.

"Straight-Talk" Publicity

By E. E. Soules

Manager Department of Publicity, Illinois Traction System

THE AUTHOR Outlines the Policy of the Illinois Traction System, Which Is Invariably to Tell the Company's Story First Thereby Obviating the Necessity for Defensive Campaigns to Meet Popular Criticism Based on Misinformation.

IF the illustrious David Harum had given the same thought to the psychology of public utility operation that he gave to horse trading it is almost a certainty that his advice would have been to "tell the truth about yourself—and tell it first."

Actual experience has convinced the operators of American public utilities that publicity, rightly used, is a valuable factor in producing and maintaining desirable relations with the public. As to the method to be used, it has been demonstrated that this is dependent in large measure upon local conditions. It is impossible to lay down a hard and fast set of publicity commandments that will apply to all properties. There are scores of publicity mediums, and the first duty of the executive who has under his direction the outlining of the publicity policy of his property is to pick the medium that will work to best advantage in his particular territory. Then follows the selection of method of appeal to be used through this medium.

It is possible, however, to form some conclusions from the experience of others, and the results of the publicity efforts and methods pursued by a company that has pioneered in public utility publicity should be of interest to the present-day public utility operator.

The Illinois Traction System, operating some 800 miles of interurban and city railway, with gas, electric and steam-heat plants in twenty-five cities in the Central West, was perhaps one of the first companies of its kind to establish a publicity department. The innovation was worked out and put into effect by H. E. Chubbuck, vice-president executive, and since 1909 the publicity department has been a fixture with this property.

The company started its publicity work at a time when part of its property was in the development stage. This is an advantage. During this period the management has a story to tell that is welcome in the community in which it intends to operate. The ordinary reader

is interested in learning of the plans of a new enterprise. He likes to feel that he is being given advance information on a project that affects the prosperity and development of his particular neighborhood. If he is taken into the confidence of the company at the outset he is very likely to take a personal interest in the affairs of the company in years to come.

From the beginning the publicity policy of the Illinois Traction System has been based upon the use of the newspaper as a medium. For this reason the publicity department has been in charge from its inception of a man taken from the newspaper field. The original idea of co-operation between the management of the property and the newspapers has not been changed. It has been the aim of the company to constantly impress upon the mind of the publishers in its territory the idea that its publicity department is at their command at any and all times for the furnishing of any information that may be consistently given in regard to matters of public interest. It has not been the intention of the company to "work" the editorial or news rooms of the publications for free, or complimentary write-ups, nor to save on its advertising bills by "slipping in" editorial matter of an advertising nature.

However, instances of co-operation between the company and the editorial rooms of the newspapers appear in connection with accidents, wrecks, new extensions, purchasing of equipment, etc. In case of an accident it is the policy of the company to place every means for the securing of necessary information at the disposal of the newspaper man. Requests from the newspaper man for information on matters of news interest concerning the company's affairs receive immediate and careful attention. Another example of this kind of co-operation is the issuing of a "press sheet" at frequent intervals. This contains short news stories written in newspaper style so that they reach the news editor's desk in such shape that he can use a few or all of them at his own convenience and discretion. This news sheet is mimeographed and mailed to a list of all publications in the territory.

The publicity department is not used to keep the newspaper man out of the office of the executive officials.

The door of the highest official is always open to the newspaper man with a legitimate request for facts. Nor is the department used for the suppression of bad news. The policy of the company is to give the newspaper man the bad news along with the good and to ask only in return an even break on editorial comment or news "position."

When the company has a story to tell that deals with a question of public policy it buys and pays for sufficient space in the newspapers to tell it. Its policy is to place this display advertising copy with all newspapers in the territory affected, regardless of the editorial policy of the paper. It considers the avoidance of hostile

In all of the company's newspaper advertising it endeavors to place its message in words that will be understood by the average newspaper reader. It adopts the "heart-to-heart" attitude, with the human interest side of its story uppermost, at the same time maintaining the proper amount of dignity. Technical expressions are avoided, and in no instance is copy used that can be construed as antagonistic to individuals or classes. Especially is this true in cases such as a campaign against municipal ownership or some such propaganda where there is divided opinion in the public mind.

Personalities in company advertising are religiously avoided. The loss of dignity and broad-mindedness which should characterize the efforts of a public utility company is far greater from the use of personalities than any gain. The company endeavors to make statements rather than refute them. In other words, it endeavors to tell its story first, whether it be good or bad,

A Straight Talk on Street Cars

What the Automobile and General Business Conditions Did to the Peoria Railway Co. in 1915

This is not a prosperity story, neither is it a wail or a cry for relief. It is a statement of fact.

We believe the people of Peoria are interested in facts rather than glittering generalities having prosperity as a theme and we are using this space to tell you just what the year 1915 meant to us and some of the reasons we assign therefor.

The Peoria Railway Company carried 670,000 fewer pay passengers in 1915 than in 1914. Its cars carried fewer passengers in 1915 than in 1913. Here are the figures.

	1915	1914
Ticket fares	7,066,228	8,440,308
Cash fares	8,087,045	8,213,206
Transfer fares	15,992,273	16,654,214
Transfer fares	3,964,324	3,881,333

Thus, during the past year, while the number of pay passengers was approximately 670,000 less than in 1914 the number of transfer passengers, which means an increase in revenue, was 73,000 more.

This decrease in business is being noted year after year in spite of a corresponding steady growth for the city of Peoria both in population, civic health and prosperity.

There are reasons for this contradictory condition. According to our analysis the principal contributory cause is the privately owned automobile. Another cause, but not necessarily a permanent one, is the existing general business condition.

Many readers of this statement no doubt possess their own automobile. They will recall that before they invested in this convenience they rode the street car to the office or the shop in the morning and returned by street car at night. They went with their family and friends to the theater via street car. They

negotiated business trips in the same manner. On holidays they boarded a street car for a trip to the park. On Sundays they found their way to church in the same manner.

In this day these same street car patrons drive their car to the office in the morning and drive home in the evening, probably picking up several friends or neighbors on both trips. For a theater party they press the automobile into service. Business trips are made in the same manner. On holidays the car seldom has an empty seat and on Sundays it may be seen standing in front of their church.

Where formerly they were making these trips via street car at a rate of 4 cents per trip they are now using the automobile, although the saving in cost does not pay for wear on tires.

The advent of the privately owned automobile has cut big holes in the business of the street car company in Peoria as well as in every other city. True, the street car still has its rush hours, but the steady traffic which is so necessary to the profitable conduct of the local transportation company has been practically lost.

General business conditions are also big factors in the conduct of a street railway. A recession in business is rapidly recorded by a decrease in the number of street car riders. This was again demonstrated in 1915 and 1916.

On the operating side of the proposition it is a fact that cost of labor and materials has increased rapidly and constantly. This means an increase in operating expense.

Yet, in spite of this constant decrease in number of passengers carried and increase in operating expense, which means marked decrease in net revenue, the same nickel or four cent ticket that bought your ride ten years ago buys a longer, better and more comfortable ride today.

TRACTION INFORMATION

To the Editor or Publisher—The information below is submitted for use as you may see fit in the news columns of your publication. It is the desire of this company to cooperate in every way possible with the newspapers in furnishing reliable information concerning our properties on matters of news interest to your readers.

ILLINOIS TRACTION SYSTEM

Department of Publicity.

E. E. Soules, Manager

The electric railways were the first to use the telephone in dispatching cars or trains, in fact have never used any other system. The best evidence of its value has been its adoption by a number of steam railroads, among which are several of the important railway systems of this country. When it is considered that the movement of electric trains is much more frequent and constant than on a majority of steam roads the proficiency of this method of dispatching is demonstrated.

The fifth annual picnic of employees of the general shops of the Illinois Traction System at Decatur, Ills., will be held in Miller Park, Bloomington, Ills., on June 22. This event is annually participated in by several hundred employees of the Traction System and it is anticipated that Congressman W. B. McKinley, President of the Company, will attend as is his custom.

A comparison of electric railway statistics for the month of October, 1915, with figures for the corresponding month of 1914 made by the American Electric Railway Association indicates that, as a whole, the electric railway business in the United States has changed but little during that period. Data from 107 city and interurban companies reporting to the Association shows an increase in operating revenue of 1.47 per cent, in operating expense of 0.74 per cent, and in net revenue of 2.42 per cent, while data for 87 of these companies indicates an increase in taxes of 8.30 per cent.

Peoria Railway Co.

By H. E. CHUBBUCK, Vice-President Executive

ILLINOIS TRACTION SYSTEM PUBLICITY—A "STRAIGHT TALK" ABOUT THE AUTOMOBILE

newspapers as a short-sighted policy. Equal space is usually placed with all newspapers regardless of editorial opinion.

TYPICAL "STRAIGHT TALKS"

Different styles of copy have been used in different cities, the actual method of appeal depending upon local conditions. For instance, on one property a series of "Straight Talks on Street Cars" was used in which the problems of the local street car company were set forth. In another city "Plain Talks About the McKinley Company in Your City" were carried on, the copy dealing with the conditions under which the gas and electric company operated in that community. In another city the affairs of the company were set forth in opposing a municipal ownership bond issue; while in still another the advertising columns of the newspaper were used to explain reasons for and conditions under which the company intended to appeal to the proper regulative body for an increase in tariff rates.

ILLINOIS TRACTION SYSTEM PUBLICITY—NEWS SHEET FURNISHED TO EDITORS AT FREQUENT INTERVALS

rather than to spend space and money later denying or explaining statements of the opposition or the uninforming.

The company endeavors to get the thought to its patrons that it is doing the best it can in the way of furnishing adequate service. It does not claim in all cases that it is furnishing the best possible service, but that it is giving the best service possible under existing conditions. Where such conditions handicap the company an effort is made to explain them.

An example of "straight-talk" publicity used by this company is the full-page display copy which was used widely in the New Year and "Prosperity" editions of newspapers early in 1916. Where it has been customary for utility companies to patronize these "special editions" of newspapers with copy expressing the compliments of the season or pledging co-operation during the coming year, this company used copy showing what the privately owned automobile did to the local street-car company in the year previous. That this piece of copy produced results was evident from comment both from newspapers and individuals. At any rate, it is believed that it set some of its patrons thinking along constructive lines.

A typical series of "straight talks" used by this company for one of its local street railway properties at

a time when no particular point was at issue, contained the following subjects:

In some cases this copy was illustrated with diagrams or half-tone cuts, but for the most part the company depended upon the type alone for the telling of its story.

- 1—What One Car Traveling One Mile Earns in Peoria and Elsewhere.
- 2—You Can't Judge the Earning Capacity of a Street Car by the Load It Carries.
- 3—Your Nickel, and What Part of It the Street Railway Company Retains as a Profit.
- 4—The Investment of a Street Railway in City Pavement.
- 5—What a Crowded Car During the Rush Hour Does and Does Not Mean.
- 6—The High Cost of Living and Your Street Car Fare.
- 7—The Development of the Street Railway Track and What It Has Cost the Industry.

Of Interest to Street Car Patrons

The Peoria Railway Company is endeavoring to give the best possible street railway service consistent with local conditions and the size of the city.

We welcome honest criticism as to management, service and conduct of our cars in relation to the public.

We appreciate information from patrons who have complaints which should be brought to our attention and assure a conscientious investigation.

We Provide the Post Card

In order that we may properly investigate such complaints we are preparing to give distribution of a self-addressed post card which we ask patrons to use. THESE POST CARDS WILL BE FOUND IN ALL CARS, as quickly as they can be equipped with boxes.

If you have complaint to make use one of these cards, fill it in, stating your complaint in specific terms giving car number, name of line, time of day, etc.; attach signature and post.

Peoria Railway Co

FACTS ABOUT THE MCKINLEY BRIDGE AND THE ELECTRIC TERMINAL SITUATION

"A Five Year Experiment With a Five Cent Fare."
No. 1.—INTRODUCTORY

To the People of St. Louis and the Tri-Cities:

The St. Louis Electric Terminal Railway Company has for more than five years operated its suburban cars over the McKinley Bridge between Granite City, Illinois, and Twelfth and Lucas Streets in St. Louis at an actual loss.

This bridge and these terminals, linking business St. Louis with the buying public of the most productive sections of Illinois, were built upon plans and hopes which were of necessity largely experimental. After five years of efficient operation it is apparent that our heavy investment in this electric gate-way between Illinois and Missouri will be eventually consolidated under the present rate of suburban fare. A change from the present burdensome condition is absolutely necessary. Plans for relief are now under consideration.

The name "Illinois Traction Company" is popularly associated only with the 420 miles of electric railroads running into St. Louis over the McKinley bridge from Illinois points. These interurban lines represent but a smaller part of the total property of the Illinois Traction Company, and yield only about 30 per cent of the Company's gross revenues. The other 70 per cent is contributed by the large number of electric lighting and power, gas, street railway, and heating properties located in various cities in Illinois, Missouri, Iowa and Kansas. Last year out of the total gross income of the Illinois Traction Company the interurban railroads served by the McKinley Bridge, including the suburban service, earned but \$3,072,000.00. This was not profit, but was gross income.

The public utilities in other cities cannot be expected, nor are they permitted under existing state utilities commission laws, to support the bridge and terminals in St. Louis and the Tri-Cities. These latter are properly a part of the railway investment.

We believe in the policy of informing the public of the facts and conditions concerning our properties. We will present through the columns of this newspaper a series of advertisements, facts which will explain the necessity of our present concern and anxiety over the Bridge and Terminal Situation.

The next article will explain and set forth the general character of our properties in St. Louis and the Tri-Cities, ST. LOUIS ELECTRIC TERMINAL RAILWAY COMPANY.

By E. D. Bell, General Superintendent.

ILLINOIS TRACTION SYSTEM PUBLICITY—ADVERTISEMENT FOR COMPLAINT CAMPAIGN; TELLING THE COMPANY'S STORY FIRST

- 8—The Street Car You Rode in Then; the One You Ride in Now, and What Your Ride Costs.
- 9—How the Cost of Street Railway "Overhead" has Advanced with the Times.
- 10—Your Street Railway Company as an Employer of Labor.
- 11—Twenty-One Million People Rode in Safety on Peoria Street Cars Last Year.
- 12—What the Peoria Railway Company Pays for Use of the Streets.

Supplementing these general publicity campaigns are special campaigns on subjects of public interest. For example, at the outset of the jitney invasion the company presented its side of the problem through "straight talks" in newspapers in the cities principally affected by the invader. Typical pieces of copy on this subject were:

- 1—A Preliminary Chat on Street Railway Finance and the Jitney Bus.
- 2—Your Street Railway and the So-Called Jitney Bus—A Comparison.
- 3—Think of Safety When Choosing Between the Street Car and the Jitney Bus.
- 4—A Nine-Mile Street Car Ride for the Cost of a Three-Mile Jitney Bus Ride.
- 5—Jitney Comfort and Jitney Immorality—A Comparison with the Street Car.

6—What the Street Railway Company Pays for the Use of the Streets—A Comparison with the Jitney Bus.

7—The Jitney Bus Ruling and What It Really Means.

8—The Street Car, the Jitney Bus and the Working Man.

In presenting the case of the jitney bus the company did not endeavor to make the point that the jitney was all bad and the street car all good. Rather, it was held that there was, perhaps, a place for the jitney bus but that, if allowed to compete on equal footing with the street car, it should be willing to submit to equal regulation. Also, it was pointed out that the street car offered added conveniences for the same money, such as universal transfers, safety and comfort.

The company has used this style of copy on several occasions when proposed municipally owned plants threatened confiscation of its own local properties. It is in such campaigns that the difficulty of keeping away from personalities with individuals or factions is encountered. And it is especially desirable in this kind of campaign, the company has found, to tell its story first, to stay on the offensive rather than the defensive, to deal absolutely with facts and to induce the people to believe in the management. Circulars and other methods of publicity have been used in these campaigns, but the newspaper advertising campaign has been the nucleus about which all the rest has been built.

The company feels that its publicity efforts have been well rewarded in these campaigns, and in a majority of cases the vote of the people has expressed their confidence in the company and its cause.

A COMPLAINT CAMPAIGN

Appreciating the fact that the public is entitled to have personal attention given its complaints, this company inaugurated a "complaint campaign" on one of its local street railway properties which met with considerable success. Boxes placed in all city cars contained a supply of return post cards with a message from the company inviting complaints from patrons as to the management, service and conduct of trainmen and asking for suggestions. Ample space was provided for writing the complaint, and the only requirement was that the card should be signed with name and address of the complainant.

Newspaper space was liberally used in calling attention to this request for complaints, and during each of the first two or three weeks about 100 complaints and suggestions were received. Each communication as received was given attention by the local superintendent, and a personal letter of acknowledgment was written to the complainant. In many cases suggestions were adopted, and when this was the case the complainant or suggestor was courteously thanked for his interest. Where it was impossible to adopt suggestions a special effort was made to explain the reason.

After a few weeks the number of complaints gradually decreased. The patrons of the company who had suggestions stored away for several years past had evidently been satisfied by this personal attention and ceased making complaint when they learned that the company evinced a real interest and was making an honest effort to comply with the wishes of its patrons to the best of its ability.

In conclusion, it may be said that the Illinois Traction System has not solved all of its problems through use of publicity. It is still misunderstood, as are many other utility companies in many questions of public interest. Some of its efforts to present its cause have seemed to fail. But its officials believe that it enjoys much good will and has a better standing in the communities in which it operates by reason of frank and honest presentation of its side of questions of public interest.

Street Railway Advertising: When, How and Why

By Frank Putnam

The Milwaukee Electric Railway & Light Company

THE OBJECTS of Such Advertising Should Be to Secure Increased Patronage, Fair Play from City and State Regulating and Taxing Agencies, and the Friendship of the Public—Advertisements Should Appear Continuously, not Spasmodically.

THIS comment applies specifically to street railways operating under state regulation of capital, value, earnings, service, rates, accounting, etc. In part it may apply also to street railways operating under city regulation, or none. It is based upon somewhat more than twenty years' study of the business from the outside, as an active advocate of municipal ownership, and upon somewhat less than two years' study of the business from the inside, as an advocate of company ownership under state regulation.

When I advocated municipal ownership, I did so believing the surplus earnings of the business should go into the city treasuries, to support non-productive municipal services. I believed municipal ownership was the only way the public could get a fair share of its carfare spent for car service and the only way that the corrupt jobbing of franchises and the dishonest flotation of watered securities could be stopped.

To-day I advocate company ownership, under state regulation, because I have learned that under state regulation "there ain't going to be no core to this apple"—no surplus profits to be used for any other purpose, because it is apparent that State regulation is a surer and better way than city ownership to get a fair share of the carfare spent for car service, because under state regulation franchises no longer have any value except for taxing purposes, and because under state regulation the flotation of watered securities is impossible.

The public has got the results it wanted, but by another route than the one we early advocates of municipal ownership advised it to travel.

Some of my Socialist friends, who believe in the public ownership of all property because they believe in it, and some of my practical politician friends, who are able to visualize the fat pickings that would be made available under city ownership and political control of street railway payrolls, stubbornly declare state regulation of the business to be a failure. From their point of view it is a failure.

Some street railway operators, I suspect, harbor the idea that in the long run they will be able to "regulate the regulators."

They won't. They're dreaming. The state street railway regulators are on the public payroll. Here and there one of them may temporarily lean to mercy's side, so to say, but as a rule and in the long run they are going to give the public the big half of the apple.

State regulation has made good in some of the states. It will make good in all. It establishes company ownership and operation of street railways on a public service basis—the only tolerable basis from the public's viewpoint—the public through its own agencies saying what kind and amount of car service it wants and assuring the company owners a fair rental return on the cost of providing such service and not a penny more.



FRANK PUTNAM

If any street railway company is not satisfied with that prospect under state regulation, it can either sell out while the selling is good or it can encourage the gradual confiscation of its property by cultivating a chronic grouch and fighting its job.

My brief comment on street railway advertising, now to be written, is addressed to street railway investors and operators who are satisfied with that prospect.

Street railway companies should advertise to get two results chiefly: (a) Increased patronage; (b) fair play from city and state regulating and taxing agencies, and public friendship.

Advertising for increased patronage should be continuous—every day in the year—straight sales advertising. The riding habit, like any other, can be encouraged by apt suggestions, varied and repeated daily—just as the buying habit has been increased tenfold within a generation.

Public relations advertising should be used to make the public acquainted with all facts regarding the street railway service that the citizen gets as a matter of right regarding his city owned and operated services. Under state regulation the street railway company is only a group of citizens chartered to perform a public service for a going wage to the capital and labor required by that service. The public has an unquestioned right to know as much about this public service as about any other. It is to the interest of a street railway company that is conforming to the letter and spirit of state regulation to have the public know all about it. Possessing this knowledge, the public won't listen to unjust attacks upon the company. Nobody—either predatory politicians or sensational newspapers or even the Socialist agitators—will dare make unjust attacks upon the company when the public knows all the facts in the case.

If state rate regulators fix fares and hauls on a losing basis, so that the company can't earn on its officially determined earning value the fair return which state regulation generally has indicated to be necessary to maintain sound credit and give good service, the company's best recourse is an appeal straight to the public in newspaper advertisements. The American people are on the square. They don't want anybody's property confiscated. They won't have it done in their name if they know it. The exceptions to this rule nowhere form more than a noisy minority.

Street railway companies, approaching this task of establishing friendlier relations with the public by means of publicity, must bear in mind that the public

as a whole is not yet habited to the idea that state regulation has stopped stock watering, franchise jobbing and excessive dividends. The extraordinary change which state regulation has made in the relation of the utility companies to the public are but dimly understood by the average citizen. Some of the facts which every street railway company under state regulation needs to fix in the public mind are these:

1. That a franchise no longer has any earning value or any sale value; in a word, it is no longer a "special privilege"; has, in fact, no use except to serve as an excuse for levying an extra tax on street railway receipts.

2. That identical street railway service would cost at least as much—for plant, labor and interest on capital—under city as under company ownership, and that company management will invariably be more energetic and efficient, and almost invariably more economical, than political management.

3. That the company has no more interest in "playing politics" than the department stores; that it is ready and eager to provide any kind and quantity of car service the public wants, provided the public's regulating and taxing agencies will let it earn and keep, for that purpose, revenue sufficient to provide that kind and quantity of service, pay a fair rental return to its owners and maintain good wages and fair working conditions for its employees.

The public still vividly remembers its unpleasant sensations experienced during the pre-regulation period of street railway development. It is not more than dimly aware of the new status of the business under state regulation. The new generation of operators can't spend money to any better purpose than for making the new status thoroughly understood.

But if any company has any extra cards up its sleeve, if it still thinks it can "slip something over" on the public, if its hands are not clean and its closets scoured, it had better clean up before it announces the housewarming.

And as for insinuated bogus "news" publicity calculated to mislead the public, why, that's old stuff. The public is on. That gun kicks harder than it shoots. When a street railway company talks to its public to-day it should do the talking in display advertising space, preferably over the signature of a responsible official speaking for the company.

The old public prejudices against street railway companies were not established in a day or a year; they were the product of a good many years of cumulative dissatisfaction, part of it justified, part of it due to public ignorance of street railway limitations which operators didn't have the merchandising wisdom to remove, as they might have done.

These prejudices can't be wiped out in a day or a year. The public sympathizes with a repentant sinner. Indeed, there is more joy in Zion over one black sheep that has repented than over ninety and nine whose feet have never slipped. But the public naturally wants time to make sure the repentance is genuine.

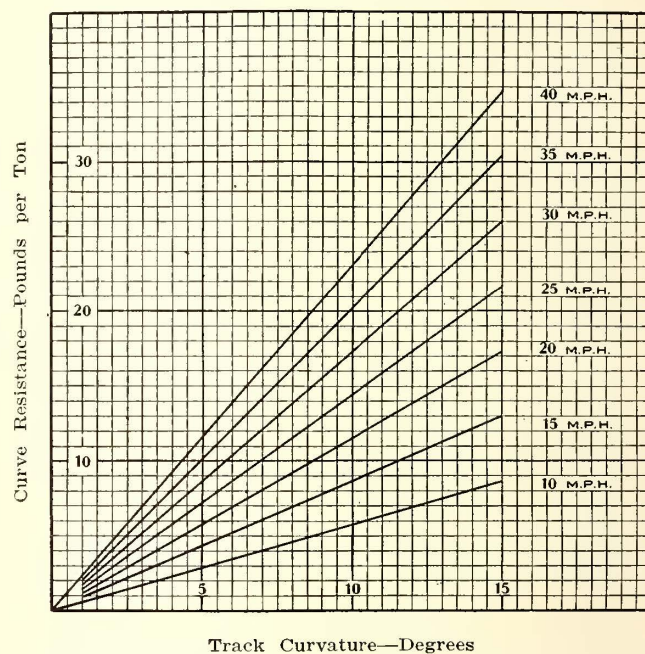
A Good Use for Safety Bulletins

The annual meeting of the Missouri Short Line safety committee was held in Liberty, Mo., on Dec. 19, 1916, fifty of the employees of the Kansas City, Clay County & St. Joseph Railway being present. Addresses were made by a pastor of the Disciples of Christ Church and a Catholic priest of Liberty, and by J. D. Bowersock, attorney for the road. R. S. Mahan, general passenger agent, who acted as toastmaster, had provided slips for each man on which had been written mottoes

and statements concerning safety practices, culled by him from bulletins and publications of the National Safety Council. Most of the men, after reading the slips that had been handed to them, made short comments, relating experiences of the past few months and drawing lessons therefrom. Both of the ministers who spoke emphasized the importance of educating the public to proper practices while getting on and off cars, while on the cars, and while crossing the tracks. Both mentioned also the necessity of educating motor-car drivers in the means of avoiding collisions. J. R. Harrigan, general manager of the road, pointedly urged the men to be watchful of their own and others' safety.

Data on Car Resistance on Curves

Edward C. Schmidt, professor of railway engineering, University of Illinois, and H. H. Dunn, assistant in railway engineering, have recently published in the form of a University of Illinois Engineering Experiment Station Bulletin, No. 92, the results of tests of tractive resistance of a 28-ton electric car on curves. This is the test car which has been owned by the university for a number of years. It has a body 45 ft.



RELATION OF CURVE RESISTANCE AND CURVATURE AT VARIOUS SPEEDS, FROM UNIVERSITY OF ILLINOIS TESTS

long, trucks with 6 1/3-ft. wheelbase placed on 23 1/4-ft. centers, and four 50-hp. motors. The tests were made on track laid with 70-lb. T-rail on ties spaced on 24-in. centers, with super-elevation of the outer rail on curves varying from 0.75 in. on a 2-deg. curve to 5.9 in. on a 14 1/2-deg. curve.

The results of the tests are expressed in the formula:

$$R_c = 0.058 S C,$$

where R_c is the curve resistance in pounds per ton, S is the speed in miles per hour, and C is the degrees curvature. The results are also shown in the report in graphical form as in the accompanying sample diagram.

Full data of the tests are given in the bulletin, which can be obtained from the experiment station at a price of 25 cents per copy. In the introduction to the bulletin the authors acknowledge the assistance of the officers of the Illinois Traction System on which road the tests were made.

New Electric Rolling Stock for 1916

The Record of New Cars Ordered or Built in Railway Companies' Shops Shows a Total Approximating 3900—This Is a Marked Increase Over the Figures for Both 1914 and 1915, Which Is Mainly Due to the Large Number of New City Cars Purchased

THE annual compilation of figures covering new cars ordered by electric railways or built in electric railway companies' shops during the past year is shown in the table below. The railways represented in the figures own 97 per cent of all cars operated in the United States and Canada. From the total of 3942 it is apparent that the year, although by no means a banner one in car building, has seen a very distinct recovery from the low figures of 1915. Taken as a whole the figures are especially encouraging because of the large number of companies ordering cars, the total of 250 being about 50 per cent more than last year.

The following summary shows the record in condensed form since the year 1907, and classifies the cars according to the various services for which they were purchased. In this summary, of course, certain arbitrary dispositions have had to be made in special cases. Subway and elevated cars are considered as city equipments, as are also all storage-battery cars. Cars intended for use on suburban lines or for operation indiscriminately in city and interurban service have been classified as interurban equipment. Express cars, electric locomotives, funeral cars, freight cars and line and work cars of all kinds have been placed in the miscellaneous column.

Year	City Cars	Interurban Cars	Freight and Misc. Cars	Total
1907	3,483	1,327	1,406	6,216
1908	2,208	727	176	3,111
1909	2,537	1,245	1,175	4,957
1910	3,571	990	820	5,381
1911	2,884	626	605	4,015
1912	4,531	783	687	6,001
1913	3,820	547	1,147	5,514
1914	2,147	384	479	3,010
1915	2,072	336	374	2,782
1916	3,046	374	522	3,942

Special features of the statistics appear in connection with the number of electric locomotives ordered, which was 31, as compared with 43 ordered in 1915. The number of cars of all classes built in company shops was 445, thus showing a sudden increase when opposed to the figures of 165 in 1915 and 228 in 1914. A decrease took place in the number of gasoline-driven cars of all kinds. On the other hand, the number of one-man cars purchased during 1916 was materially greater than in 1915, the respective totals being 187 and seventy-seven. Purchases of automobiles and automobile trucks also displayed an increase. These figures are respectively twenty-nine and ten, but they have not been included in the lists of rolling stock.

The list of passenger cars is virtually divided between semi-steel and all-steel cars, showing a remarkable growth of popularity for the latter type of construction. Trail cars, however, have definitely lost popularity, since the lists include only seventy-one interurban trailers and 128 city trailers. The same thing applies to open cars of which only 131 were purchased and even this number is affected by the large single order of 127 constructed by the Public Service Railway of New Jersey in its shops. Of semi-convertible cars there were a total of 379, an insignificant number of fully-convertible cars being included in this figure.

In the lists below, space limits have necessitated

certain arbitrary usages. All cars not specifically marked as trail cars may be considered to be equipped with motors. The classification of freight cars includes all gondola, box, flat and hopper bottom designs that are used to handle bulk freight. Cars less than 35 ft. long are marked to show one-man or two-man operation, and it is to be understood that cars longer than this are operated with two men. In connection with construction the term "all" refers to all-steel designs that have steel framing throughout, while the term "semi" applies to cars with steel carried only as high as the belt rail. Since practically none of the cars ordered during the year is of fully convertible type, the term "conv." has been used to indicate semi-convertible as well as convertible cars.

Railway	Number	Type	Overall Length	Service	Construction	One-man?
Aberdeen R. R.	2	Psr. Cl.	26	City	Semi	One
Albany Tr. Co.	1	Psr. Cl.	32	City	All	One
Alta Lt. & Ry.	2	Psr. Cl.	33	City	Wood	Two
Alton, Granite & St. L. Tr. Co.	3	Psr. Cl.	54	Int.	All	..
Altoona & Logan Valley Ry.	5	Psr. Cl.	41	City	All	..
Anaconda Copper Mining Co.	2	Psr. Cl.	53	City	Wood	..
	1	Psr. Trail	47	City	Wood	..
Appalachian Pr. Co.	1	Psr. Cl.	33	City	All	Two
Arkansas Valley Int. Ry.	1	Psr. Cl.	56	Int.	Semi	..
	1	Exp.	50	Int.	Semi	..
Asheville Pr. & Lt. Co.	6	Psr. Conv.	35	City	Wood	Two
Atholn Ry., Lt. & Pr. Co.	3	Psr. Cl.	30	City	All	One
Aurora, Elgin & Chi. R. R.	4	Psr. Cl.	42	City	Semi	..
Austin St. Ry.	4	Psr. Cl.	30	City	All	One
Bangor Ry. & Elec. Co.	3	Psr. Conv.	43	Int.	All	..
	3	Psr. Cl.	33	City	Semi	Two
Bay State St. Ry.	200	Psr. Conv.	43	City	Semi	Two
	7	Exp.	40	..	Semi	..
	5	Frt.	40	..	Wood	..
Beaumont Tr. Co.	7	Psr. Cl.	27	City	All	Two
Benton Harbor-St. Joe Ry.	2	Psr. Cl.	39	City	All	Two
Berkshire St. Ry.	4	Psr. Conv.	43	City	Semi	..
Binghamton Ry.	16	Psr. Cl.	31	City	All	Two
Boston & Maine R. R.	2	Loco. 130 ton.	..	..	..	..
Boston Elevated Ry.	42	Psr. Cl.	47	Elev.	Semi	..
	100	Psr. Cl.	49	City	Semi	..
	2	Frt.	39	..	All	..
	10	Psr. Cl.	48	City	Semi	..
	50	Psr. Trail	48	City	Semi	..
	2	Work	47	..	Semi	..
Bristol & Plainville Tr. Co.	3	Psr. Cl.	39	City	Semi	..
Buffalo & Depew Ry.	1	Work	28	..	..	..
Buffalo & Lake Erie Tr. Co.	30	Psr. Cl.	45	City	All	..
	1	Sweeper	..	..	..	..
Buffalo, Lockport & Rochester.	1	Exp.	54	Int.	All	..
Burlington County Tr. Co.	2	Psr. Conv.	41	Int.	Semi	..
Burlington Trac. Co.	1	Psr. Cl.	44	City	Semi	..
Butte, Anaconda & Pacific Ry.	6	Locos. 80 ton	..	..	..	..
Butte Elec. Ry.	4	Psr. Open	46	City	Semi	..
	5	Psr. Cl.	41	City	All	..
Centralia Trac. Co.	2	Psr. Cl.	32	Both	All	Two
Chambers'bg, G'n'sle & W'boro Ry.	2	Psr. Conv.	47	Int.	Semi	..
	1	Line	34	..	..	..
Charleston Interurban R. R.	2	Psr. Cl.	47	Int.	All	..
	1	Exp.	45	..	Semi	..
Chattanooga Trac. Co.	2	Psr. & Bagg.	46	Int.	All	..
Chicago & Interurban Tr. Co.	1	Psr. Cl.	48	Int.	..	..
Chicago, Lake Shore & So. Bend Ry.	2	Locos. 72 tons	..	..	..	..
	18	Frt. Trail	44	..	..	..
Chicago, No. Shore & Mil. R. R.	5	Psr. Cl.	54	Int.	Semi	..
	7	Psr. & Exp.	54	Int.	Semi	..
	3	Dining	54	Int.	Semi	..
Chicago, So. Bend & No. Ind. Ry.	5	Psr. Cl.	38	City	All	..
Chicago Surface Lines.	10	Psr. Cl.	48	City	Semi	..
Chicago & West Towns Ry.	5	Psr. Cl.	46	City	All	..
Cincinnati, Newport & Cov'gt'n.	25	Psr. Cl.	45	City	All	..
	2	Sweeper	28	..	..	..
Cincinnati Traction Co.	100	Psr. Cl.	44	City	Semi	..
Citizens' Ry. Co.	2	Psr. Cl.	30	City	All	One
City Elec. Co., Albuquerque, N. M.	5	Psr. Cl.	28	City	Semi	One
City Lt. & Tr. Co., Sedalia, Mo.	8	Psr. Cl.	29	City	Semi	One
City Ry., Dayton, O.	10	Psr. Cl.	43	City	All	..
Clev. All'nce & M'h'n'g V'y R. R.	2	Psr. Cl.	55	Int.	All	..
	6	Frt. Trail	50	..	Semi	..
Cleveland, Paines'le & E'st'n R. R.	1	Exp.	50	..	Wood	..
Cleveland Ry Co.	25	Psr. Cl.	51	City	Semi	..
	25	Trail	49	City	Semi	..
	1	Sweeper	..	..	..	..
Cleveland Southw'n & Col. Ry.	6	Psr. Cl.	62	Int.	All	..
Columbus Ry., Lt. & Pr. Co.	5	Psr. Cl.	36	City	Semi	One

Railway	Number	Type	Overall Length	Service	Construction	One-Man?	Railway	Number	Type	Overall Length	Service	Construction	One-Man?
Conestoga Trac. Co.	1	Ps. Cl.	43	Sub.	Semi		Macon Ry. & Lt. Co.	6	Ps. Cl.	30	City	Wood	
	3	Ps. Cl.	38	City	Semi		Madison Rys.	5	Ps. Cl.	33	City	Semi	
	1	Frt.					Mahoning & Shenango Ry.	10	Ps. Cl.	47	City	All	
Connecticut Co.	60	Ps. Conv.	49	City	Semi			10	Ps. Cl.	28	City	All	One
	30	Ps. Conv.	43	City	Semi			4	Frt.	43			
	10	Ps. Conv.	46	Both	Semi		Manhattan & Queens Tr. Co.	1	Line	43			
	1	Ps. Cl.	50	City	Wood			7	Ps. Cl.	43	City	All	
	4	Exp.	41		Wood			1	Sweeper				
	4	Frt. Trail	42		Semi		Massachusetts No'east'n Tr. Co.	12	Ps. Conv.	42	Int.	Semi	
	6	Frt. Trail	42		Wood		Memphis & Rugby Ry.	1	Ps. Cl.	27	City	Wood	
	1	Snow Plow					Miami Tr. Co.	2	St. Batt.	26	City	Wood	Two
	1	Line	42		Wood		Michigan Railway	2	Ps. Cl.	53	Int.	All	
	1	Wrecker	42		Wood			8	Ps. Trail	53	Int.	All	
Connecticut Valley Ry.	1	Work	45		Wood			2	Express				
Corning & Painted Post Ry.	4	Ps. Cl.	34	City	All	One		4	Ps. Cl.	61	Int.	All	
Cumberland County Pr. & Lt. Co.	4	Ps. Conv.	36	City	Semi			20	Ps. Cl.	40	City	Semi	
Cumberland & West'p't Elec. Ry.	5	Ps. Cl.	45	Int.	All		Michigan United Rys.	20	Ps. Cl.	41	City	Semi	
							Milwaukee Elec. Ry. & Lt. Co.	50	Ps. Cl.	50	City	All	
Dayton & Troy Ry.	6	Frt.	50	Semi				1	Sweeper				
Dayton, Springfield & Xenia Ry.	2	Ps. Cl.	44	City	All		Mississippi Valley Elect. Co.	4	Ps. Cl.	26	City	Semi	One
Des Moines City Ry.	40	Ps. Cl.	45	City	Semi		Moline, Rock Island & E'st'n Tr. Co.	1	Sweeper				
	1	Loco.	30				Monongahela Valley Tr. Co.	8	Ps. Cl.	29	City	Semi	Two
	1	Line	40		Wood		Monroe St. Ry.	3	Ps. Cl.	29	City	Semi	One
	2	Work	40				Montgomery Lt. & Tr. Co.	6	Ps. Cl.	31	City	All	Two
Detroit United Ry.	100	Trail	47	City	All		Montgomery Transit Co.	3	Ps. Cl.	35	City	All	Both
	8	Trail	54	Int.	Semi		Morris County Tr. Co.	5	Ps. Cl.	48	Int.	All	
	50	Ps. Cl.	47	City	All			1	Sweeper				
	8	Ps. Cl.	54	Int.	Semi		Municipal Ry., Alexandria, La.	2	Ps. Cl.	32	City	All	Two
	8	Ps. Cl.	58	Int.	Semi		Murphysboro Elec. Ry.	2	Ps. Cl.	43	Int.	All	
	31	Frt. Trail	50				Muskegon Tr. & Lt. Co.	4	Ps. Cl.	45	City	All	
	30	Frt. Trail	40				Nashville (Tenn.) Int. Ry.	1	Express	46		Semi	
	1	Work	48				Nashville (Tenn.) Ry. & Lt.	9	Ps. Cl.	42	City		
	3	Line	50				New Bedford & Onset St. Ry.	1	Line				
Duluth St. Ry.	8	Ps. Cl.	47	City	Wood		New Jersey & Penna. Tr. Co.	1	Baggage	23			
Durham Trac. Co.	6	Ps. Cl.	31	City	All	One	Newport News & Hampton Ry.	4	Ps. Cl.	35	City	All	Two
	3	Ps. Cl.	26	City	All	One	New York Central R. R.	12	Ps. Cl.	70	Int.	All	
								10	Locos. 100 ton				
East St. Louis & Sub'n Ry.	50	Ps. Cl.	46	City	Semi		New York Municipal Ry.	200	Ps. Cl.	67	Sbwy.	All	
	3	Ps. Cl.	54	Int.	All		New York Railways	70	St. Batt.	29	City	Semi	Two
Eastern Pennsylvania Rys	2	Ps. Conv.	47	City	Semi		New York State Rys. (Rochester)	50	Ps. Cl.	50	City	All	
Eastern Transit Co.	6	Ps. Cl.	42	Int.	All			3	Dump				
	1	Sweeper	31				New York State Rys. (Syracuse)	25	Ps. Cl.	48	City	All	
Elmira Water, Lt. & R. R.	5	Ps. Cl.	45	City	All			1	Snow Plow				
	3	Work	45				New York State Rys. (Utica)	12	Ps. Cl.	50	Int.	All	
Escanaba Trac. Co.	1	Ps. Cl.	34	City	All	One		10	Ps. Cl.	48	City	All	
Evanston Ry.	3	Ps. Cl.	42	City	Semi		Niagara Junction Ry.	1	Loco. 60 ton				
Fonda, Johnstown & Gl'v'le R. R.	2	Ps. Cl.	33	City	All	Two	North Carolina Pub. Serv. Co.	6	Ps. Conv.	27	City	Semi	One
Fort Dodge, Des Moines & S'n R. R.	2	Ps. Cl.	43	City	Semi		Northern Massachusetts St. Ry.	1	Work	30		Wood	
	2	Ps. Cl.	53	Int.	Semi			15	Ps. Cl.	53	Int.	All	
	1	Trail	50	Int.	Semi			25	Ps. Cl.	50	City	Semi	Two
Fort Wayne & Decatur Trac. Co.	3	Ps. Cl.	49	Int.	Semi			1	Express	60		Semi	
	1	Exp.	40		Wood		Northern Texas Tr. Co.	10	Ps. Cl.	28	City	Semi	One
	1	Sweeper	28				Ogden, Logan & Idaho	3	Ps. Cl.	65	Int.	All	
Fort Wayne & N. Ind. Tr. Co.	1	Exp.	50		Semi			3	Loco. 50-ton				
Fox & Illinois Union Ry.	1	Exp.	50		Semi			1	Loco. 30-ton				
Fresno Trac. Co.	6	Ps. Cl.	30	City	Wood		Oakwood St. Ry.	5	Ps. Cl.	45	City	Semi	
							Ohio Elect. Ry.	10	Frt. Trail	39		Wood	
Georgia Ry. & Pr. Co.	6	Ps. Cl.	44	City	Semi		Ohio River Pass'g'r Ry.	2	Ps. Trail	47	Int.	All	
Grand Rapids Ry.	15	Ps. Cl.	44	City	Semi		Oklahoma Ry.	4	Ps. Cl.	56	City	All	
Grand Rapids, Grand Haven & Muskegon Ry.	1	Ps. Cl.	53	Int.	Semi			6	Ps. Cl.	44	City	Semi	
	3	Exp.	50		Semi			2	Exp. Trail	42		Wood	
	3	Exp.	48		Wood			25	Ps. Cl.	42	City	Wood	
Great Falls St. Ry.	7	Ps. Cl.	40	City	All		Omaha & Council Bluffs Ry.	1	Loco.	23			
							Oshawa Ry.	1	Loco.	23			
Hagerstown & Frederick Ry.	2	Trail	30	City	Wood	Two	Oskalooza Tr. & Lt. Co.	6	Ps. Cl.	30	City	All	One
Hammond, Whiting & E. Chi. Ry.	4	Ps. Cl.	48	City	Semi		Ottumwa Ry. & Lt. Co.	5	Ps. Cl.	31	City	All	Both
Harrisburg Rys.	2	Ps. Cl.	44	Both	All			2	Ps. Cl.	31	City	All	One
	3	Ps. Cl.	37	City	Semi		Pekin Municipal St. Ry.	1	Sweeper				
Hoeking-Sunday Creek Tr. Co.	1	Ps. Cl.	48	Int.	All		Pennsylvania R. R. (Elec. Div'n)	10	Ps. Cl.	44	City	Semi	
	1	Ps. Trail	45	Int.	All		Peoples' Ry. of Dayton, O.	10	Ps. Trail	42		Semi	
	5	Ps. Cl.	42	City	Semi			10	Ps. Trail	44		All	
Holyoke St. Ry.	5	Ps. Cl.	44	City	Semi		Piedmont & Northern	1	Ps. Cl.	27	City		One
	5	Ps. Cl.	44	City	Semi		Piedmont Ry. & Elect. Co.	2	Ps. Cl.	26	City	All	One
	1	Sweeper					Pittsburgh Rys.	162	Ps. Cl.	45	City	All	
Hudson Valley Ry.	3	Ps. Cl.	51	Int.	Wood			75	Ps. Trail	45	City	All	
	1	Work	43					4	Dump				
Hutchinson Inter-Urban Co.	3	Ps. Cl.	28	City	Semi	One	Portsmouth Elect. Ry.	1	Work	34			
Hydro-Elect. Pr. Com., Toronto, Can.	3	Ps. Cl.	50	Int.	Wood		Pottstown & Phoenixville Ry.	8	Ps. Conv.	52	Int.	All	
							Princeton Power Co.	2	Ps. Cl.	43	Int.	All	
Illinois Northern Utilities Co.	1	Ps. Cl.	32	City	Semi	One	Public Service R. R., Trenton	5	Ps. Cl.	47	Int.	Semi	
Illinois Trac. System.	101	Frt. Trail	40				Public Service Ry., Newark	127	Ps. Open	49	City	Semi	
	40	Frt. Trail	42					50	Ps. Cl.	52	City	Semi	
	60	Frt. Trail	36					20	Ps. Cl.	47	Int.	Semi	
	1	Sweeper						10	Sweepers	28			
Indianapolis Trac. & Term. Co.	25	Ps. Cl.	47	City	Semi		Public Utilities Co.	10	Ps. Cl.	41	City	Semi	
International Ry.	20	Ps. Cl.	55	Int.	Semi			1	Frt.	34			
	7	Ps. Cl.	34	City	Semi		Puget Sound Tr., Lt. & Pr. Co.	1	Ps. Cl.	23	City	All	One
	2	Funeral						8	Ps. Cl.	28	City	All	One
Ironwood & Bessemer Ry.	3	Ps. Cl.	28	City	Semi	One	Quebec Ry., Lt. & Pr. Co.	4	Ps. Cl.	40	City	Semi	
Ithaca Trac. Corporation	1	Sweeper	28					1	Sweeper				
							Reading Tr. & Lt. Co.	15	Ps. Conv.	46	Int.	Semi	Both
Jackson (Miss.) Lt. & Trac. Co.	2	Ps. Cl.	26	City	All	One		13	Ps. Conv.	32	City	Semi	Both
Jackson (Tenn.) Ry. & Lt. Co.	2	Ps. Cl.	30	City	All	One		1	Dump				
Jamestown St. Ry. Co.	10	Ps. Cl.	42	City	All		Regina Municipal Ry.	1	Snow Plow	29			
Jamestown, Westfield & Nor. R. R.	3	Ps. Cl.	62	Int.	All		Rhode Island Co.	50	Ps. Cl.	42	City	Semi	
	1	Ps. Trail	62	Int.	All			7	Express	41		Wood	
Jersey Central Trac. Co.	3	Ps. Cl.	33	City	All	One	Richmond Lt. & R. R. Co.	1	Dump				
Johnstown Trac. Co.	10	Ps. Cl.	40	City	Semi		Rockland, Thomaston & Camden	1	Ps. Cl.	42	Int.	Semi	
Joplin & Pittsburgh Ry. Co.	1	Exp.	45		Wood		Rutland Ry., Lt. & Pr.	1	Ps. Cl.	29	City	All	Two
							St. Cloud Pub. Serv. Co.	2	Ps. Cl.	34	City	Semi	One
Kankakee & Urbana Trac. Co.	1	Exp.	51		Wood		Salem & Penns Grove	1	Express	28		Wood	
	7	Frt.	36		Wood		Salt Lake & Ogden Ry.	6	Ps. Trail	62	Int.	Semi	
Kankakee Elec. Ry.	2	Ps. Cl.	27	City	Semi	One	Salt Lake & Utah R. R.	6	Ps. Cl.	61	Int.	All	
Kansas City Rys.	75	Ps. Cl.	44	City	Semi			2	Locos. 50-ton				
Kansas City, Clay Co., & St. Jo. Ry.	1	Loco.					San Antonio Tr. Co.	30	Ps. Cl.	35	City	All	Both
Kansas City, Kaw Valley & W'n Ry.	2	Locos.					Sand Springs Ry.	2	Ps. Cl.	58	Int.	All	
Keokuk Elec. Co.	1	Ps. Cl.	28	City	Semi	One		3	Frt. Trail				
Lake Shore Elec. Ry.	12	Ps. Cl.	60	Int.	All		Sandwich, Windsor & Am'b'g Ry.	2	Ps. Cl.	43	Int.	All	
	2	Exp.			All			2	Ps. Cl.	34	City	Wood	
Lehigh Valley Transit Co.	12	Ps. Cl.	50	Both	All		San Francisco-Oakland Term. Ry.	20	Ps. Cl.	41	City	All	
Levis County Ry.	2	Ps. Cl.	32	City	Semi	Both		12	Ps. Cl.	51	Int.	All	

Railway	Number	Type	Overall Length	Service	Construction	One-Man?
Scranton Ry.	10	Psr. Cl.	46	City	Semi	..
Shore Line Elec. Ry.	2	Frt. Trail	44	..	..	..
Sioux City Service Co.	10	Psr. Cl.	39	City	Wood	..
Sioux Falls Tr. System	1	Psr. Cl.	30	City	Semi	Both
Slate Belt Elect. St. Ry.	1	Frt.	50	..	..	..
Southern Cambria Ry. Co.	2	Psr. Cl.	50	Int.	Wood	..
Southern Penna. Tr. Co.	3	Psr. Conv.	41	City	Semi	..
Southern Pub. Utilities Co.	6	Psr. Cl.	38	City	All	..
Southwest Missouri R. R.	5	Psr. Cl.	27	City	..	One
Southwestern Interurban Ry.	1	Psr. Cl.	44	Int.	Semi	..
Springfield & Washington Ry.	1	Psr. Cl.	28	City	All	Two
Springfield (Ill.) Consol. St. Ry.	1	Psr. Cl.	49	Int.	All	..
Springfield (Vt.) Elect. Ry. Co.	7	Psr. Cl.	45	City	Semi	..
Springfield (Mass.) St. Ry.	1	Snow Plow	..	..	..	..
Springfield (O.), Troy & Piqua Ry.	10	Psr. Conv.	43	City	Semi	..
Stark Elec. R. R.	1	Express	45	Int.	Semi	..
Staubenville & East L'pl Ry.	1	Exp. Trail	51	Int.	Semi	..
Staubenville Ry.	2	Psr. Cl.	55	Int.	All	..
Stroudsburg P's'g'r Ry.	3	Psr. Cl.	43	City	All	..
Tazewell St. Ry.	5	Psr. Trail	47	City	All	..
Third Avenue Ry.	3	Psr. Cl.	44	Int.	All	..
Tidewater Pr. Co.	1	Psr. Conv.	31	City	Wood	Two
Tiffin, Fostoria & East'n Ry.	1	Psr. Cl.	31	City	Semi	Two
Toledo, Bow'l'g Green & S'n Tr. Co.	1	Express	55	Int.	All	..
Toledo, Fostoria & F'd'l'y Ry.	2	Psr. Cl.	55	..	All	..
Toledo Rys. & Lt. Co.	1	Psr. Cl.	50	City	All	..
Toronto Civic Ry.	60	Psr. Cl.	47	City	Semi	..
Toronto Ry. Co.	13	Psr. Cl.	47	City	Semi	..
Toronto Suburban St. Ry.	25	Psr. Conv.	..	City	..	..
Towson & Cocksவில் El. Ry.	2	Psr. Cl.	50	City	Wood	..
Tri-City Rg of Illinois	1	St. Batt.	26	City	Wood	One
Tri-City Ry. of Iowa	3	Psr. Cl.	42	City	Semi	..
Twin City Rapid Tr. Co.	10	Psr. Cl.	37	City	All	..
Union Depot Bridge & Term. Co.	1	Dump	..	..	..	..
Union St. Ry., New Bedford, Mass.	63	Psr. Cl.	47	City	Semi	..
Union Tr. Co. of Coffeyville, Kan.	5	Psr. Cl.	30	City	All	One
Union Tr. Co. of Indiana	12	Psr. Cl.	44	City	All	..
United Rys. & Elect. Co.	1	Loco.	..	..	..	..
United Rys. of St. Louis	1	Sweeper	..	..	..	..
United Traction Co.	100	Psr. Cl.	44	City	Wood	..
Valley Railways	4	Sweeper	40	..	..	..
Vicksburg Lt. & Tr. Co.	4	Psr. Cl.	33	City	Semi	..
Virginia Ry. & Pr. Co.	10	Psr. Cl.	40	City	Semi	..
Visalia Electric Co.	1	Psr. Cl.	33	City	All	Both
Warren St. Ry.	1	Psr. Cl.	45	Int.	All	..
Washington & Maryland Ry.	1	Psr. Cl.	45	Int.	All	..
Waterbury & Milldale Tr'w'y.	2	Psr. Conv.	31	Int.	Semi	Two
Waverly, Sayre & Athens Tr. Co.	1	Psr. Cl.	47	City	Wood	..
West Chester St. Ry. Co.	2	Psr. Cl.	45	Int.	All	..
West Penn Rys.	6	Psr. Cl.	58	Int.	Semi	..
West Virginia Tr. Co.	1	Express	45	..	Wood	..
Western Lt. & Pr. Co.	1	Sweeper	..	..	..	..
Wheeling Tr. Co.	3	Psr. Cl.	28	City	All	Both
Wichita Falls Tr. Co.	8	Psr. Cl.	45	Int.	All	..
Wichita R. R. & Lt. Co.	5	Psr. Cl.	2	City	Semi	One
Wisconsin Ry., Lt. & Pr. Co.	15	Psr. Cl.	30	City	All	One
Worcester Consol. St. Ry.	4	Psr. Cl.	31	City	Semi	One
York Railways	7	Psr. Cl.	43	City	Semi	..
	11	Psr. Cl.	44	City	Semi	..
	3	Express	45	..	Semi	..
	3	Snow Plows	..	..	..	..
	6	Psr. Cl.	35	City	All	Two
	1	Dump	..	..	..	..

Electric Railway Statistics

Figures Are Given by States of the Miles of Track and Number of Cars Owned

THE accompanying table gives statistics of the miles of track and cars of the electric railway companies in the United States, made up from the August, 1916. *Electric Railway Directory* of the McGraw Publishing Company. The dates of the reports in this directory average about June, 1916, so that the table may be considered to represent the statistics of the industry at about that time.

A comparison of the totals given in this table with those in a somewhat similar table published in the issue of Jan. 22, 1916, will show for all states a total of 47,562 miles as compared with a total of 46,454 miles last year, and 100,476 cars as compared with 99,405 last year. A comparison by states, however, will show some decreases in both cars and miles of track, while in the case of other states, there are increases of considerable magnitude. This condition, to which attention was directed last year, may be accounted for, in part, by the seeming inevitable discrepancies which occur

when reports are made out by different officials each year, in part to differences in the methods of classifying cars, and in part to more exact information as to the portions of interstate railways which are located in two or more states.

A few other words of explanation are necessary. The electrified mileage of steam railroads is included in all cases, but under cars only the electric locomotives and the electric motor cars on such roads are given. That is to say, in such cases, trail cars and service cars have not been included. Gasoline motor passenger cars are included in the column of motor passenger cars, but in most cases the miles of track over which the gasoline motor cars operate have been omitted from the mileage column as these tracks are used very largely for steam freight trains and it has been the intention to make the table primarily one of city and interurban passenger properties. In a few cases, where a company owns a large number of service cars compared with the number of passenger cars owned, the total number of such service cars has been intentionally omitted from the table.

TABLE SHOWING STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

	Number of Companies	Miles of Track	Motor Passenger Cars	Trail Passenger Cars	Electric Locomotives	Express Motor Cars	Freight Cars	Service and Other Cars	Cable and Horse Cars
<i>New England States:</i>									
Connecticut	12	1,592	2,160	44	100	..	67	..	..
Maine	16	580	589	..	3	3	56	149	6
Massachusetts	43	3,245	7,922	236	3	23	37	1,144	..
New Hampshire	13	210	266	..	1	..	2	29	2
Rhode Island	3	438	1,051	47	..	..	..	259	..
Vermont	10	125	142	..	..	..	3	17	..
Total	97	6,190	12,130	327	107	26	98	1,665	8
<i>Eastern States:</i>									
Delaware	2	153	309	..	..	..	..	80	..
District of Columbia	7	412	1,078	..	..	..	..	433	..
Maryland	11	675	2,155	..	10	..	3	218	..
New Jersey	29	1,538	2,810	2	2	13	..	53	..
New York	110	5,477	16,559	1,124	138	11	35	2,161	203
Pennsylvania	128	4,477	8,575	16	2	6	78	602	1
Virginia	17	602	921	25	..	..	..	179	..
West Virginia	25	633	641	..	12	..	3	43	..
Total	329	13,967	33,048	1,167	164	30	119	3,769	204
<i>Central States:</i>									
Illinois	72	3,760	5,922	697	51	..	962	627	..
Indiana	44	2,304	1,923	..	1	7	3	256	..
Iowa	27	868	965	13	19	..	..	365	..
Kentucky	9	462	992	26	..	..	21	58	..
Michigan	25	1,676	2,272	8	20	102	13	473	..
Minnesota	14	715	1,250	8	8	..	..	287	..
Missouri	22	1,113	2,514	6	..	..	..	450	..
Ohio	80	4,300	5,512	76	11	6	28	1,309	2
Wisconsin	21	768	875	142	..	..	3	60	..
Total	314	15,966	22,225	976	110	115	1,030	3,894	2
<i>Southern States:</i>									
Alabama	15	365	437	34	..	..	2	210	..
Arkansas	11	134	237	..	..	..	..	54	..
Florida	9	193	248	..	..	..	..	59	..
Georgia	17	485	691	5	..	..	..	88	2
Louisiana	10	328	680	..	..	..	..	140	..
Mississippi	11	123	159	2	..	..	..	27	..
North Carolina	13	289	301	..	6	..	2	217	..
South Carolina	7	113	156	6	..	..	..	19	..
Tennessee	14	461	835	..	1	..	3	147	..
Total	107	2,491	3,744	47	7	..	9	961	2
<i>Western States:</i>									
Arizona	4	52	45	1	..	..	..	1	..
California	42	3,232	3,674	81	69	12	338	1,746	109
Colorado	13	459	414	157	..	..	..	259	2
Idaho	6	180	68	..	..	..	..	19	..
Kansas	20	527	391	3	..	..	12	112	3
Montana	9	947	110	20	35	..	..	19	..
Nebraska	6	254	538	10	1	..	..	65	..
Nevada	2	10	12	..	..	..	..	..	..
New Mexico	2	9	11	..	..	..	..	..	..
North Dakota	6	38	77	..	..	..	..	14	..
Oklahoma	15	301	242	7	..	..	..	100	..
Oregon	19	733	799	47	19	3	146	545	..
South Dakota	3	26	28	2	..	..	..	5	..
Texas	40	977	1,188	78	..	14	3	186	..
Utah	5	425	275	6	..	1	2	262	..
Washington	13	1,056	1,027	24	27	819	29	110	45
Wyoming	2	22	12	7	..	..	..	3	..
Total	198	8,948	8,911	443	151	849	530	3,449	159
Total, all States	1,045	47,562	80,058	2,960	539	1,020	1,786	13,738	375

New Electric Railway Track Built in 1916

Reports Received from the Various Electric Railway Companies of the United States and Canada Show That Approximately 700 Miles of New Track Were Constructed or Electrified During the Year—A Marked Decrease from Previous Years

THE single-track mileage of new line built or electrified and placed in operation during the year 1916 by the electric railways of the United States and Canada is tabulated in the accompanying lists. The data for these records have been compiled from reports received from practically every electric railway in the United States and Canada and represent 98 per cent of the total operated mileage.

The total new mileage for the year, amounting to 744.3, is materially less than the total of any previous year for which record has been kept. This condition is shown in the following table, which contains the statistics obtained in previous years since 1907, but note should be made of the fact that by far the greater part of the decrease has been a loss in new electric railway track, since the electrified steam railroad mileage of 388 is not an exceptional decrease from the high corresponding figure of last year. Thus it becomes increasingly evident that the two classes of electric railway mileage display wholly independent tendencies and should be considered separately.

Of the 356.3 miles of new electric railway track that has been built during the past year, about two-thirds may be classed as interurban—only a slightly larger ratio than that which existed last year. A tendency toward an evenly-distributed loss in new construction appears also in the fact that although the decrease from last year on a mileage basis is practically 50 per cent, it is only 25 per cent on the basis of states represented and a loss of only 33 per cent on the basis of the number of companies appearing in the record. In other words, the average company cut down on its new construction and relatively few gave up new work altogether. The same thing is evidenced by the fact that, in only one case was there any considerable

stretch of new track put down in any particular locality, the maximum mileage built in one State being 78.4 if the electrified steam road mileage of Montana is included.

The State in question is California, whose leading position in new track construction is due to considerable extension of four of the numerous interurban railways characteristic of the west coast. Illinois ranks second in the list, with approximately 33 miles of new track, of which 25 miles were constructed by the Chicago Surface Lines—the largest extension of strictly city tracks reported for the year. In this connection it may be said that Canada appears to have maintained track extensions to a rather surprising degree in view of the European war, since no less than ten electric railways are represented with 9 miles of new track exclusive of the 53-mile electrification of the Lake Erie & Northern.

This 53 miles of the Lake Erie & Northern is included in the total of 388 miles of electrified steam railroad track, but the major part of the steam railroad track equipped for electric operation is contributed by the Chicago, Milwaukee & St. Paul installation extending across the Rocky Mountains. This project includes four engine divisions, of which one was placed in service in 1915 and two during the past year. The remaining division will be completed early in 1917.

	New Electric Railway Track Built	Electrified Steam Line	Total New Electric Mileage
1907	.....	.....	1880.0
1908	1174.5	84.0	1258.5
1909	774.7	112.4	887.1
1910	1204.8	192.4	1397.2
1911	1105.0	86.5	1191.5
1912	869.4	80.8	950.2
1913	974.9	119.0	1093.9
1914	716.5	229.0	946.4
1915	596.0	448.2	1044.2
1916	356.3	388.0	744.3

	Miles.		Miles.
ALABAMA			
Mobile, Volanta & Pensacola R. R.	1.0	Chicago Heights St. Ry.	0.7
	1.0	Decatur Ry. & Light Co.	0.5
CALIFORNIA			
Fresno Interurban Ry.	15.0	Joliet & Eastern Trac. Co.	0.1
Oakland, Antioch & Eastern Ry.	1.4	Kankakee & Urbana Trac. Co.—Connects Ludlow and Paxton	5.0
Pacific Electric Ry.	16.3	Springfield Consolidated Ry. Co.	0.5
San Diego Electric Ry.	2.2	Tri-City Ry. Co. of Illinois	0.4
South San Francisco R. R. & Power Co.	0.5		33.2
Tide Water Southern Ry.—Modesto to Turlock	17.0	INDIANA	
Visalia Electric R. R. Co.—Exeter to Strathmore to Lindsay 21.5 miles. Southeast to Portersville 4.5 miles.	26.0	Chicago Lake Shore & South Bend Ry.	2.3
	78.4	Interstate Public Service Co.	0.5
CONNECTICUT			
Connecticut Co.	7.3		2.8
Lordship Co., Bridgeport, Conn.	0.25	IOWA	
	7.55	Des Moines City Ry.	3.1
DISTRICT OF COLUMBIA			
Capital Trac. Co.	0.1	Fort Dodge, Des Moines & Southern R. R. Co.—Swanwood Junction to Des Moines	4.5
	0.1	Fort Madison St. Ry. Co.	0.3
FLORIDA			
St. Petersburg & Gulf Ry.	1.5	Inter-Urban Ry. Co.	2.6
	1.5	Keokuk Electric Co.	0.3
GEORGIA			
Georgia Ry. & Power Co.	4.5	Tri-City Ry. Co. of Iowa	0.8
	4.5		11.6
HAWAII			
Honolulu Rapid Transit & Land Co.	0.2	KANSAS	
	0.2	Salina St. Ry. Co.	0.1
ILLINOIS			
Bloomington, Pontiac & Joliet Ry. Co.	0.5	Topeka Rys.	0.5
Centralia & Central City Trac. Co.	0.2	Hutchinson Inter-Urban Ry. Co.	1.1
Chicago Heights St. Ry.	0.75		1.7
Chicago, Ottawa & Peoria	0.3	KENTUCKY	
		Louisville Ry. Co.	4.0
		Southern Traction Co., Inc.	0.25
			4.25
		LOUISIANA	
		New Orleans Ry. & Lt. Co.	0.9
			0.9
		MARYLAND	
		United Rys. & Electric Co.	5.5
			5.5

MASSACHUSETTS		Miles.
Boston Elevated Ry. Co.....	4.5	
Springfield St. Ry. Co.....	1.5	
Union St. Ry. Co.....	0.5	
	6.5	
MICHIGAN		
Detroit United Ry. Co.....	23.9	
Escanaba Traction Co.....	0.3	
Grand Rapids Ry. Co.....	0.5	
	24.7	
MINNESOTA		
Duluth St. Ry. Co.....	5.4	
Twin-City Rapid Transit Co.....	3.0	
	8.4	
MISSOURI		
Kansas City Rys. Co.....	9.3	
United Rys. of St. Louis.....	1.1	
	10.4	
MONTANA		
Butte Electric Ry.....	2.5	
Chicago, Milwaukee & St. Paul Ry.—Electrification. Between Three Forks and Harlowton 114 miles of main track; 54.5 miles of side track and yards. Between Deer Lodge and Alberton, 111 miles of main track; 53.0 miles of side track and yards	332.5	
Missoula St. Ry. Co.....	1.5	
	336.5	
NEW JERSEY		
Public Service Ry. Co.....	1.2	
	1.2	
NEW YORK		
Brooklyn Rapid Transit Co.....	6.0	
Buffalo & Lake Erie Trac. Co.....	0.9	
International Ry. Co.....	0.5	
Manhattan & Queens Trac. Corporation.....	2.7	
New York State Rys.—Syracuse Lines.....	0.2	
Third Ave. Ry.....	1.6	
	11.9	
NORTH CAROLINA		
Goldsboro Electric Ry.....	1.5	
Piedmont & Northern Ry.....	3.5	
Southern Public Utilities Co.....	2.0	
	7.0	
OHIO		
Cleveland Ry. Co.....	3.0	
Mahoning & Shenango Ry. & Light Co.....	3.0	
Portsmouth St. R. R. & Light Co.—Between Wheelersburg and Hanging Rock.....	21.0	
Toledo Rys. & Light Co.....	0.6	
	27.6	
OKLAHOMA		
Ardmore Ry. Co.....	1.25	
Oklahoma Ry. Co.—Edmond to Guthrie.....	16.0	
Tulsa St. Ry. Co.....	1.0	
	18.25	
PENNSYLVANIA		
Allen St. Ry. Co.....	0.3	
Chester & Eddystone St. Ry. Co.....	1.9	
Eastern Pennsylvania Rys. Co.—Pottsville to St. Clair....	2.0	
Lehigh Trac. Co.....	0.3	
Northwestern Pennsylvania Ry. Co.—Venango to Cambridge Springs.....	3.6	
Philadelphia Rapid Transit Co.....	0.9	
Philadelphia & West Chester Trac. Co.....	1.0	
Pottstown & Phoenixville Ry. Co.....	4.0	
Reading Transit & Light Co.....	1.0	
Scranton & Binghamton R. R. Co.—Brooklyn to Montrose	10.0	
	25.0	
RHODE ISLAND		
Rhode Island Co.....	0.6	
	0.6	
SOUTH DAKOTA		
Sioux Falls Trac. System.....	0.5	
	0.5	
TENNESSEE		
Chattanooga Trac. Co.—Valley Junction to Red Bank, 5 miles, and C. & D. Junction to C. N. O. & H. Ry., 5 miles.....	10.0	
Jackson Ry. & Light Co.....	3.0	
	13.0	
TEXAS		
Beaumont Trac. Co.....	0.7	
	0.7	
WASHINGTON		
Lewiston-Clarkston Transit Co.....	2.0	
Walla Walla Valley Ry. Co.....	0.25	
	2.25	
WEST VIRGINIA		
Appalachian Power Co.....	1.7	
Charleston Interurban R. R. Co.—Marmet to Cabin Creek Junction.....	6.5	
Norfolk & Western Ry. Co. (Elec. Div.)—Electrification of branch line to Pocahontas, Va.....	2.5	
Princeton Power Co.—Interurban through New Hope and Billie.....	12.0	
	22.7	

WISCONSIN		Miles.
Chicago, Harvard & Geneva Lake Ry.....	0.6	
Madison Rys. Co.....	1.0	
	1.6	
WYOMING		
Cheyenne Electric Ry. Co.....	0.25	
	0.25	
CANADA		
Calgary Municipal Ry.....	3.5	
Lake Erie & Northern Ry.—Electrification from Galt to Paris, Brantford, Waterford, Simcoe and Port Dover	53.0	
London St. Ry. Co.....	0.8	
Montreal & Southern Counties Ry.—Abbotsford to City of Granby.....	8.5	
Port Arthur Civic Ry. Co.....	1.1	
Quebec Ry., Light & Power Co.....	0.5	
Regina Municipal Ry.....	1.4	
Sandwich, Windsor & Amherstburg Ry.....	0.8	
Sarnia St. Ry. Co.....	0.5	
Toronto Civic Railway.....	1.2	
Toronto Ry. Co.....	0.75	
	72.05	

AMERICAN ASSOCIATION NEWS

Boston Meeting Program

Supplementing the statement made in the issue for Dec. 16, the following brings the information regarding the mid-year meeting program up to date:

- a. General business.
- b. Report of committee on social relations:
 1. Minimum wage,
 2. Old-age pensions,
 3. Employees' thrift.
- c. Prepared discussion by E. E. Rice.
- d. Paper on "Wage Arbitration and Contracts," by Bentley Warren, Boston, Mass.
- e. Paper on "Salesmanship in the Electric Railway Business," by Robert Frothingham, New York City.

Power Distribution

The Engineering Association committee on power distribution met in Chicago, Ill., on Jan. 3, 4 and 5. The committee devoted its combined efforts to revision of the specifications for line construction and line materials. As this issue of the paper goes to press a telegram announces that Friday evening was to be spent by the committee in an inspection of one of the automatic substations of the Elgin & Belvidere Electric Railway as guests of E. S. Gillette, electrical engineer Aurora, Elgin & Chicago Railroad.

The Chicago meeting was attended by the following committee members: C. L. Cadle, Rochester, N. Y., chairman; R. H. Rice, Chicago, Ill.; E. J. Blair, Chicago, Ill.; C. R. Harte, New Haven, Conn.; E. S. Gillette, Aurora, Ill.; C. E. Fritts, Kansas City, Mo.; J. H. Libbey, Boston, Mass., and A. Schlessinger, Indianapolis, Ind. C. C. Beck, commercial engineer Ohio Brass Company, was also present by invitation, for the purpose of representing the line material section of the Associated Manufacturers of Electrical Supplies.

Training of Transportation Employees

The Transportation & Traffic Association committee on the above subject met in Chicago, Ill., on Jan. 3 and 4 and finished the task of co-ordinating the work of previous committees. In attendance were G. T. Seely, Chicago, chairman; H. B. Flower, Baltimore, Md.; C. W. Kellogg, Keokuk, Iowa; J. E. Gibson, Kansas City, Mo., and W. A. Carson, Evansville, Ind.

H. J. Kenfield has been appointed chairman of the transportation sub-committee in charge of the Illinois-Wisconsin district.

Receiverships and Foreclosure Sales

Mileage Placed in Receivers' Hands During 1916 Was Next to Smallest in Last Eight Years
—Mortality Rate Through Foreclosure About the Average

THE record of electric railway receiverships for 1916 is considerably better than that for many of the years preceding. In fact, the number of companies, or fourteen, whose finances in 1916 became involved to the point of receivership, was the smallest in the last eight years with the exception of eleven in 1910 and ten in 1914, while the mileage concerned was in the low group and the least with the exception of that in 1913. The showing made in 1916 was especially in contrast to that in 1915, the fourteen railways involved in the last year having a mileage of 351.06 and a capitalization of \$24,988,800, as compared to a mileage of 1152.10 and a capitalization of \$79,670,425 for the twenty-seven lines in 1915. The receiverships for the last eight years compare as follows:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909.....	22	558.00	\$29,962,200	\$22,325,000
1910.....	11	696.61	12,629,400	75,490,735
1911.....	19	518.90	29,533,450	38,973,293
1912.....	26	373.58	20,410,700	11,133,800
1913.....	18	342.84	31,006,900	47,272,200
1914.....	10	362.39	35,562,550	19,050,460
1915.....	27	1152.10	40,298,050	39,372,375
1916.....	14	351.06	14,264,600	10,724,200

The accompanying table gives the details of electric railway receiverships in the last calendar year. An attempt was made at all times to take the figures from the most up-to-date and most authoritative sources, and to sift out the correct data in many cases where there were a surprising number of conflicting statements in the financial manuals, particularly with reference to the smaller companies. These, it will be noted, constituted the majority of the railways placed in receivership, only three having more than 50 miles of track.

Most of the receiverships were evidently caused by accumulated financial burdens due to rising costs, operation in poor territory or inherent weakness of organization, but in a few cases there were special reasons. For example, the chief cause of the financial troubles of the Monmouth County Electric Company was the competition of jitneys. A receiver was appointed for the Cincinnati, Dayton & Toledo Traction Company to take the place of a bondholders' protective committee in collecting the rentals of its property from the lessee, the Ohio Electric Railway, which desired a second modification of the lease on account of losses thereunder.

The number of electric railways sold at foreclosure in 1916 was nineteen, the same as in the preceding year. Although the mileage was greater, owing to the resale of the Chicago & Milwaukee Electric Railroad property after the cancelled sale of 1912, the general record was not far from the average for the last eight years. The following table shows the complete comparative figures for this period:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909.....	21	488.00	\$22,265,700	\$21,174,000
1910.....	22	724.36	19,106,613	26,374,065
1911.....	25	660.72	91,354,800	115,092,750
1912.....	18	267.18	14,197,300	10,685,250
1913.....	17	302.28	15,243,700	19,094,500
1914.....	11	181.26	26,239,700	44,094,241
1915.....	19	308.31	30,508,817	16,759,997
1916.....	19	431.35	13,655,400	22,542,300

The detailed foreclosure sales are published in the accompanying table. As in preceding years, some electric railways for which receivers had been appointed or against which foreclosure suits had been brought were able to effect reorganization without public sale or have the case dismissed by the court. All the various

forms of reorganization, readjustment and change in ownership without formal foreclosure sale were omitted in compiling the table. In passing, however, it might well be noted that the 1915 receivership of the Des Moines City Railway was dissolved without sale after the settlement of the franchise question, and the 1915 receiver of the Kansas City, Clay County & St. Joseph Railway, appointed to protect a judgment for \$1,500,000 to the Interstate Railway for the taking of right-of-way on which it held options, was removed in 1916 after the perfection of a satisfactory bond pending final decision on the appeal of the damage case.

In the majority of cases the foreclosure sales in 1916 were the last step prior to the beginning of business through a reorganized company or an entirely new one. For some lines, however, such sales meant a complete cessation of operation and dismantlement. The Mount Vernon Railway, the Lima & Honeoye Light & Railroad Company, the Mountain Railway and half of the Lake Erie, Bowling Green & Napoleon Railway suffered such a fate, and according to reports the Lancaster & Southern Street Railway was destined also to be junked.

ELECTRIC RAILWAY RECEIVERSHIPS IN 1916

	Mileage	Out-standing Stock	Outstanding Funded Debt
Algiers Railway & Lighting Company.....	6.00	\$430,000	\$35,000
Boise Railroad, Ltd.....	8.00	510,400	389,000
Bristol Traction Company.....	15.30	143,800	192,500
Cape May, Delaware Bay & Sewell's Point Railroad.....	20.00	150,000	150,000
Cincinnati, Dayton & Toledo Traction Company.....	83.90	2,250,000	5,000,000
City Railway, Mt. Vernon, Ill.....	3.25	40,000	.....
Gary, Hobart & Eastern Traction Company.....	9.00	125,000	125,000
Lancaster & Southern Street Railway.....	7.35	100,000	109,000
Lancaster & York Furnace Street Railway.....	12.50	170,400	150,000
Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company.....	56.00	8,331,000	1,000,000
Monmouth County Electric Company.....	17.71	325,000	500,000
Nashville-Gallatin Interurban Railway.....	27.05	750,000	600,000
Southwestern Traction Company.....	15.00	189,000	130,000
Winona Interurban Railway.....	70.00	750,000	2,343,700
Totals.....	351.06	\$14,264,600	\$10,724,200

ELECTRIC RAILWAY FORECLOSURE SALES IN 1916

	Mileage	Out-standing Stock	Outstanding Funded Debt
Ardmore Electric Railway.....	4.70	\$200,000*	.....
Chicago & Milwaukee Electric Railroad.....	160.00	5,000,000	\$16,225,000
Choctaw Railway & Lighting Company.....	23.26	2,000,000	1,144,000
Lake Erie, Bowling Green & Napoleon Railway.....	24.50	678,400	428,500
Lancaster & Southern Street Railway.....	7.35	100,000	109,000
Lancaster & York Furnace Street Railway.....	12.50	170,400	150,000
Lima & Honeoye Light & Railroad Company.....	4.60	5,000	.....
Lykens & Williams Valley Street Railway.....	10.10	188,500	175,800
Mountain Railway.....	2.00	2,400	.....
Monmouth County Electric Company.....	17.71	325,000	500,000
Mount Vernon Railway.....	9.00	10,000	40,000
Norton & Taunton Street Railway..	21.20	297,000	296,000
Sapulpa & Interurban Railway.....	12.00	80,500	.....
Seattle, Renton & Southern Railway	25.00	1,250,000	825,000
Southeastern Ohio Railway, Light & Power Company.....	16.34	600,000	600,000
Southern Iowa Railway & Light Company.....	10.00	120,000	340,000
Syracuse & South Bay Electric Railroad.....	26.56	1,000,000	561,000
Syracuse, Watertown & St. Lawrence River Railroad.....	6.35	40,000	200,000
Youngstown & Southern Railway..	38.18	1,588,200	948,000
Totals.....	431.35	\$13,655,400	\$22,542,300

*Authorized amount; outstanding amount not ascertainable.

Short and Up-to-Date Articles on
EQUIPMENT AND ITS MAINTENANCE

Combination Snowplow for City and Interurban Lines of Spokane—Hardwood Key Blocks for Track and Pavement Work in New York—Reinstallation of Old Soldered Bonds by Sacramento Company—Economical Work by Pneumatic Tampers of Pittsburgh Railways—Mirror for Protecting Track Crossing in San Antonio, Etc.

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

A Combination Snowplow for City and Interurban Use

Washington Water Power Company Has Built a Plow Which Is Suitable for City and Interurban Snow Fighting

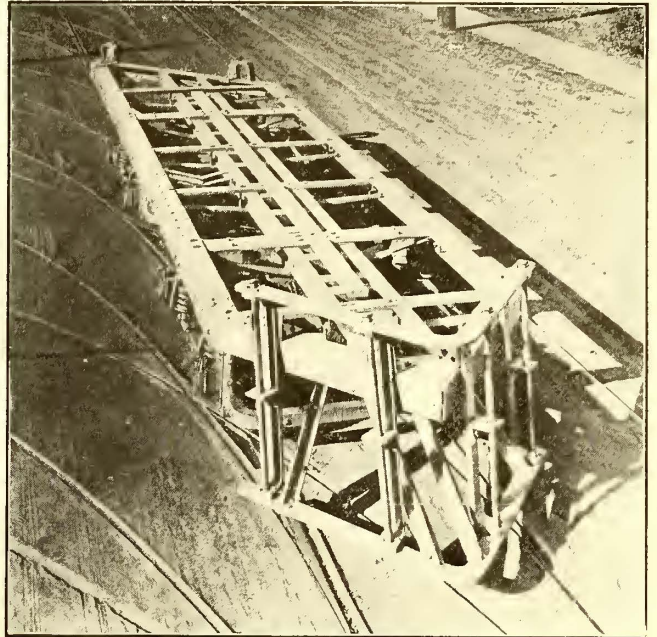
BY R. A. WILLSON

General Superintendent Washington Water Power Company, Spokane, Wash.

A snowplow to be used on the city and interurban lines of Spokane, Wash., has recently been built by the Washington Water Power Company. Inside a city, in clearing double tracks of snow it is desirable to use a shear plow which throws the snow to only one side of the car. On interurban lines, however, the snow often forms heavy drifts which the shear plow cannot clear off, and it is necessary to use a plow with a sharp nose which cuts through the snow and throws it to both sides. The plow described below combines both kinds of blade mounted on the same frame.

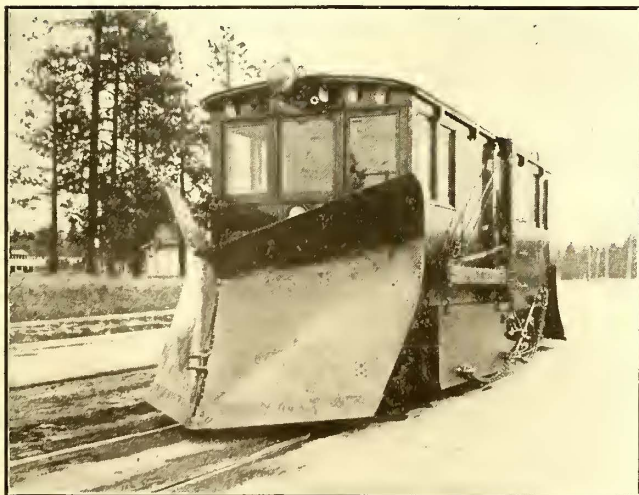
This frame is built of heavy structural steel, as may be seen from the illustration, the side sills, for example, being 8 in. x 8 in. channel bars. The width of the frame as shown is 7 ft. 10 in. and the length is 36 ft., and with the plows in position the total length is 43 ft. 3 in. The weight of the whole car and its equipment is 35 tons. Brill 27-F trucks having a 6-ft. wheelbase set with a distance of 15 ft. between centers are used, and mounted on these trucks are four 60-hp. General Electric motors which drive through gears having a ratio of 15 to 71.

The plows are of steel boiler plate mounted on heavy frames. The shear plow, as shown in the illustration, may be used in connection with the auxiliary wing which is shown swung in position at the center of the car. The shear is 12 ft. x 6 ft. and the wing is 10 ft.

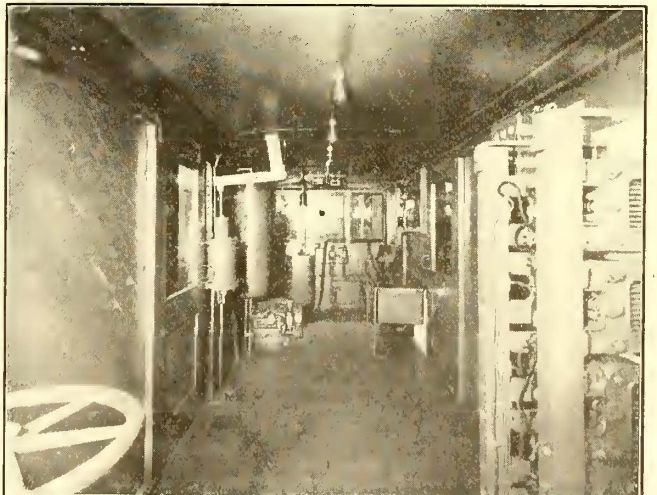


HEAVY STEEL FRAME OF COMBINATION SNOWPLOW

x 3 ft., the maximum sweep of both shear and wing being 15 ft. Another illustration shows the sharp-nosed or wedge plow which is 9 ft. 9 in. across and 7 ft. high. It splits the heavy drifts and throws the snow to both sides. Both types of plow overhang the track 20 in. on each side. Their bottom or cutting edges are riveted to the main plow face and may be replaced if injured by striking an immovable object. By means of compressed-air cylinders, the plows are raised on slid-



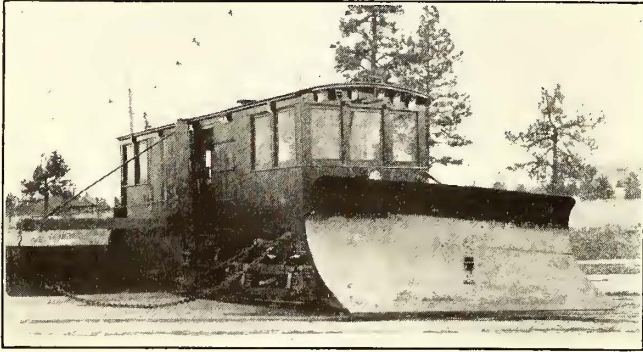
VIEW OF NOSE PLOW USED FOR CLEARING HEAVY DRIFTS FROM THE TRACK



INTERIOR OF CAR, SHOWING COMPRESSOR, RESERVOIRS, OPERATING CYLINDER FOR SIDE WING, ETC.

ing rods to a maximum height of 10 in. above the rail. In addition to the plows, the car is equipped with spring steel track scrapers. These are held against the track under pressure, which may be made as high as 70 lb. for each scraper, but when they come in contact with an immovable object they spring over it without being damaged.

The car body is built of wood reinforced with steel and it has sixteen windows of $\frac{3}{8}$ -in. plate glass set in heavy frames. A tool box is built on the outside of the car for carrying picks, snow shovels and other tools. The car is equipped with a General Electric magnetite headlight which can be moved from one end to the other,



VIEW OF SHEAR PLOW AS USED WITH SIDE WING

and stationary Golden Glow headlights on each end. There is also a row of incandescent lamps circling the car underneath the eaves for general illumination of the surroundings.

As far as possible all of the operating mechanism is placed inside the car to avoid slush and snow. A view of the car's interior given here shows (on the left-hand side of the car) the air compressor, the large reservoirs and the cylinder for operating the side wing.

The convenience and comfort of the men running the car was carefully looked after. To this end the switches which control the different apparatus were plainly marked, and a radiator for warming the entire car and a small heater for cooking coffee, as well as comfortable chairs and a table, were provided. These luxuries serve to add some pleasure to what is usually a disagreeable task.

Soldered Bonds Reinstalled at Low Cost

Old Bonds Removed from Web of Rail and Soldered to the Rail Head

BY W. H. EVANS

Electrical Engineer Northern Electric Railway, Sacramento, Cal.

The experience of the Puget Sound Traction, Light & Power Company with soldered rail bonds, as outlined in the issue of the *ELECTRIC RAILWAY JOURNAL* for Oct. 28, 1916, page 938, is of interest to those companies which still use soldered bonds, and our own experience along these lines may prove of further interest, particularly as a large number of roads have had unprofitable experiences with the soldered type of bond.

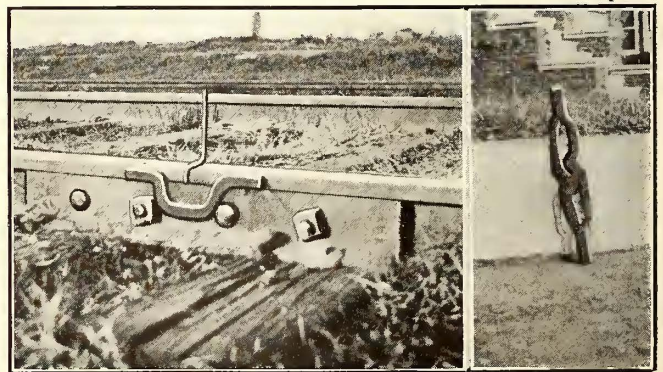
The Northern Electric Railway has some 150 miles of track, mostly on private right-of-way, of 60-lb. A. S. C. E. T-rail section on which the bonding originally consisted of two 10-in., 200,000-circ. mil. ribbon type soldered bonds soldered to the web of the rail under the angle bars at each joint. Owing to the very restricted clearance under this joint the bonds soon became pinched and either failed by coming loose at one or both terminals or the ribbons broke at the center of the

bonds. The cost of this type of bond installed was 55 cents each. The bond itself cost 27.5 cents, the other material such as solder, gasoline, etc., nine cents, and the labor, 18.5 cents. The average life of this bond was probably not in excess of six years, and a large number failed in less time.

It became imperative to rebond the line and after a consideration of various type of bonds, it was decided to install the same bond, but in a different manner. The choice was in a way influenced by the fact that we had on hand a large number of bonds of this type, and that financial considerations forbade any large outlay for new bonds.

The 10-in. bonds were placed in a frame and by means of a bulldozer were made to assume a U-shape with the ends turned out parallel to the top of the rail giving us a bond for application on the outside head of the rail. This newly-formed bond was then soldered to the head of the rail by a method which, I believe, was first developed on the Northwestern Pacific Railroad at Sausalito, Cal., and has been used by it for a number of years on soldered bonds with wonderful success.

This method as applied to our bonds consists in the formation of a substantial layer of solder between the bond terminal and the head of the rail in the following manner. The rail was first ground clean and bright, using a carborundum wheel electrically operated from the third-rail supply. Then some five or six small cuts were made vertically in the rail with hammer and chisel, the rail was then heated and tinned thoroughly, after which the bond, held in a pair of tongs, was placed against the rail and so inclined that the lower edge of the terminal touched the rail while the upper edge was about a quarter inch from the rail. Solder and heat were then applied by means of a gasoline bonding torch, care being taken not to get the rail too hot. The solder instead of running freely was puddled into the wedge-shaped space between the bond terminal and the rail. In other words, an effort was made to obtain a sort of wiped joint between the rail and the bond terminal, and while the solder was in this semi-plastic condition the terminal was pressed toward the rail leaving, however, about $\frac{1}{8}$ in. between the terminal and the rail at the top. The bond was held in position by the tongs a very short time after removing the torch, no water being



VIEWS SHOWING NEW METHOD OF SOLDERING BONDS TO HEAD OF RAIL AND AN OLD BOND REMOVED FROM WEB OF RAIL

used to cool the joint; the other terminal was then applied in a similar manner.

This process tends to cause an even distribution of solder over the faces of the bond and the rail and leaves a cushion of solder between the two. The success of this method depends upon not getting a temperature so high as to cause the solder to run too freely, as if it flows too freely it acts like drops of water on a piece of glass, gathering in spots to cover some areas of contact

and leaving others with no solder. The latter in time oxidize and reduce the contact area of the terminal and also its holding power.

The concealed joints are tested by means of a Roller-Smith bond tester with a snap switch on the test handle of the test bar wired in series with auxiliary contacts at the ends of the test bar, and a small portable box of six dry cells so that the tester can use either the power current or the current from the battery. Unless traffic is very frequent we find that the auxiliary source of current is necessary if any number of joints are to be tested in an efficient manner.

In doing the rebonding it has been found profitable to open up all joints which test over 10 ft. of rail. About 50 per cent of the bonds thus reclaimed are in such shape that they can be used over again on the head of the rail and the remaining 50 per cent are so torn that they are scrapped, their value as scrap more than compensating for the cost of opening up the joints.

While the new method of bonding consists of but one bond per joint whereas there were two originally, a completely single bonded line is obtained with no expenditure for new bonds since, as noted above, about half of the bonds removed are in suitable condition to be reinstalled. At the present price of copper this means a large saving, and at the same time we have obtained a bond which promises a life at least equal to the former type, and one much more easily maintained when it does fail.

About 30,000 soldered bonds of this type have been installed, the costs of which are shown below:

Material per Bond—	Unit	Amount	Unit Cost Cents	Total Cost Cents
200,000-circ. mil bond.....	1.0	1.0	27.5	27.50
Gasoline	gal.	0.04	11.0	0.44
Solder	lb.	0.13	19.5	2.53
Soldering salts	cans	0.0035	180.0	0.63
Carborundum wheels	each	0.001	202.0	0.20
				31.30
Store-expense, 4 per cent.....				1.25
				32.55
Labor per Bond—				Cents
Testing				0.89
Supervision				0.50
Soldermen				4.09
Torchmen				3.72
Grinding				1.87
Miscellaneous				0.93
				12.00
Use of tools, 2 per cent.....				0.24
Total Labor				12.24
Total Material				32.55
				44.79

The rates of pay per day for this work were: foreman \$3.50, soldermen \$2.75, torchmen \$2.50, grinders \$2.50, all men working a nine-hour day. The gang usually consisted of a foreman, four soldermen, four torchmen and two grinders, with an extra man at \$2.50 for part of the time to aid in painting the bonds after installation. The foreman tested all joints as well as running his gang. The men lived in an outfit car which was spotted on adjacent spurs and moved along the line as the work progressed.

It was found that the bonding men could do much better work if the connection between the tank and burner was made with about 30 in. of rubber hose instead of the iron pipe usually used. The heavy gasoline tank can then be placed on the ground at a convenient position, and the burner applied in the position most suitable for directing the flame on the rail and bond. Some experimenting has been done with the oxy-acetylene process in connection with these bonds, but the shape of the head of the bond terminal has so far prevented us from getting a good job with this process.

On the tracks in city streets we have been using for

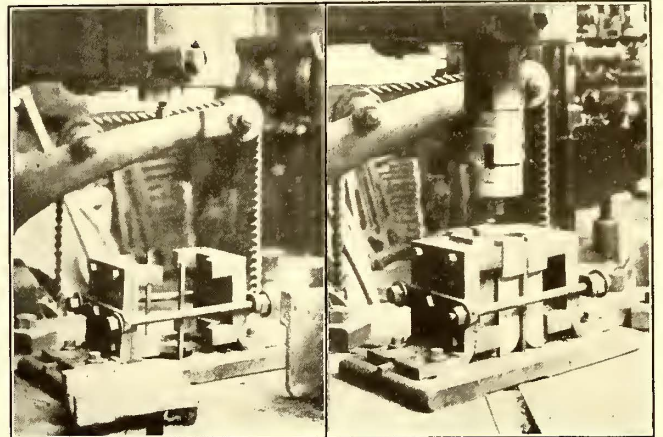
several years a flexible jumper bond, installed around the joint plates and soldered to the flange of the rail, in a manner similar to that used by the Puget Sound Traction, Light & Power Company. A large number of these came from old scrap third rail jumper cables which would have been sold for scrap but by this method are used for city bonding work, thus eliminating the necessity of purchasing new material.

Home-Made Jig for Boring Brasses

BY L. J. GOUTHRO

Foreman of Machine Shop Boston & Worcester Street Railway

At the Framingham (Mass.) shops of the Boston & Worcester Street Railway the jig shown in the accompanying illustrations is used to expedite the boring of brasses. Fig. 1 shows the jig open, ready to receive the brasses, these being bored in pairs when set up as shown in Fig. 2. The jig consists essentially of a pair of clamps mounted on an adjustable base which is

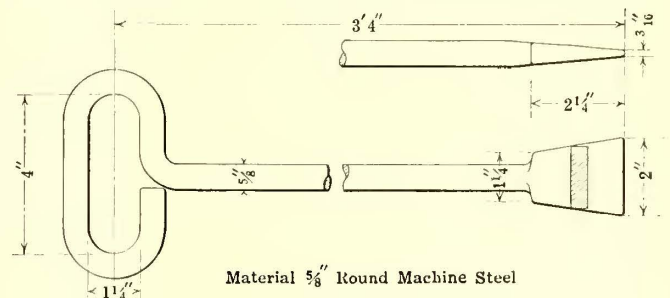


JIG FOR BORING BRASSES—FIG. 1—JIG OPEN; FIG. 2—JIG WITH BRASSES IN PLACE

attached to the bedplate of the boring machine. These clamps are brought up against the work by two 5/8-in. bolts, and the brasses are centered by two 1/4-in. x 3/8-in. vertical rods, which, when turned, give an adjustment of 1/16 in. in diameter at the brass. About 3 in. of horizontal adjustment can be had at the clamps. Two brasses of any size that the road uses can be bored out in ten minutes, whereas such an operation on a single brass would easily take twice as long on a lathe or milling machine.

Switch Iron

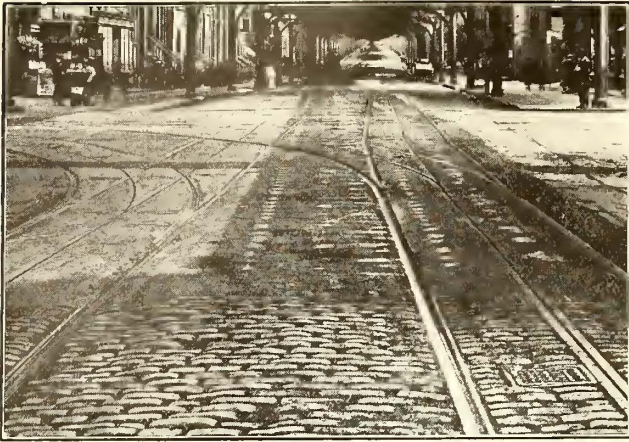
The New York State Railways, Rochester Lines, is now making switch irons according to the accompany-



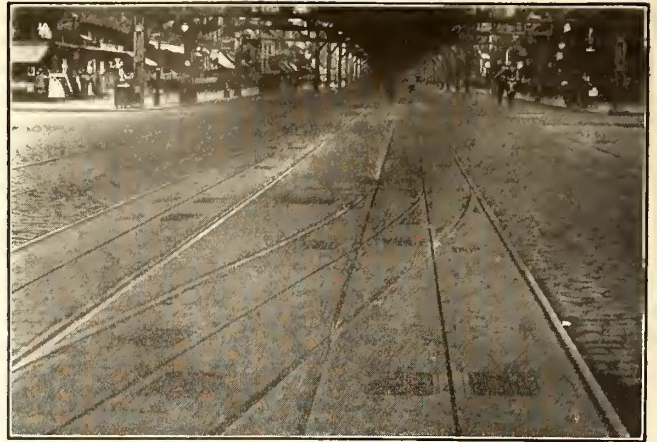
Material 5/8" Round Machine Steel

DETAILS OF NEW YORK STATE RAILWAYS SWITCH IRON

ing drawing. The print from which the cut was made was furnished by G. M. Cameron, master mechanic, and is dated Dec. 27, 1916.



WEST BROADWAY AND CANAL STREET—CONTRAST FILLER AND KEY BLOCK CONSTRUCTION WITH GRANITE IN FOREGROUND



BOWERY AND WILLIAMSBURGH BRIDGE—ONE OF NEW YORK'S HEAVIEST TRUCKING CENTERS—NOTE ORDINARY GRANITE ALONGSIDE

Rail Fillers and Key Blocks Prolong Special Work Life in New York City

Special Paving Used by the New York Railways at Street Crossings Subject to Heavy Traffic

About three years ago the New York Railways tried the experiment of lengthening the life of granite block paving and special work at Twenty-third Street and Fourth Avenue and Twenty-third Street and Sixth Avenue by installing hardwood key blocks between the granite and rail fillers along the rails. The blocks and fillers were supplied by Edward Alcott, Manassas, Va., who recommended that the key blocks be driven to such a depth that they would project, say, $\frac{1}{4}$ in. above the granite blocks on each side.

The initial jobs proved so satisfactory that the New York Railways decided to adopt this construction for practically every piece of special work on its system. At this writing more than sixty intersections have been so paved, and at some locations the plan has also been applied to the straight runs.

The actual results obtained with this method of prolonging rail life were noted in a recent inspection trip which covered some of the heaviest car and trucking streets in the world. In every instance the Alcott paving and the special work paved therewith were found to be in decidedly better condition than adjacent construction.

The inspection was made during and after a heavy rainstorm, thereby making apparent the non-slip advantages of the key block paving. As previously stated, the

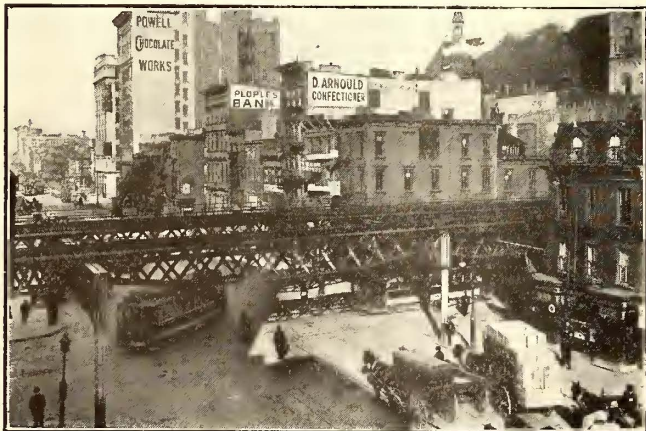
key blocks, as installed, project $\frac{1}{4}$ in. above the granite. The tendency of traffic is to drive these blocks down, thereby keeping the paving wedged tight, but still leaving it rough enough to give an excellent footing for horses and a better grip for automobile tires. Naturally, this construction is also watertight and therefore is not damaged either by rain or flushing by the street cleaning department.

As the key blocks assure a tight paving structure, movement of the special work is materially reduced at a great gain in the direction of noiselessness and in the reduction of track maintenance cost. To use one track foreman's expression, "They never loosen like granite does." Another consequence of this, noted after the storm in question, was the absence of water pockets and puddles. The latter condition elicited praise from the traffic policemen who are stationed at intersections.

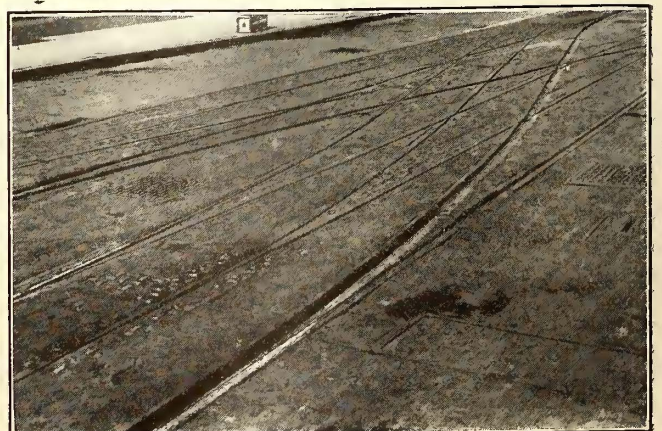
As the New York Railways installations are so numerous, it will serve to mention the following few typical cases:

Thirty-fourth Street and Eleventh Avenue. At this point the Thirty-fourth Street cars cross the New York Central freight tracks on Eleventh Avenue. On this avenue there is also extremely heavy trucking from the warehouses and river terminals. The paving has been in service one and one-half years. Other installations along Thirty-fourth Street are at Tenth, Ninth and Eighth Avenues and Cortlandt and West Streets, the last-named having been in use more than two years and nine months.

Forty-second Street, the most important crosstown thoroughfare for car and automobile travel. Alcott paving is found at Lexington, Sixth and Ninth Avenues.



WEST BROADWAY AND CANAL STREET—GENERAL VIEW OF INTERSECTION SHOWN IN DETAIL ABOVE, INDICATING CHARACTER OF TRAFFIC



CORTLANDT AND WEST STREETS—COMBINATION OF KEY BLOCKS AND RECLAIMED GRANITE—NO UPKEEP COST IN TWO YEARS AND NINE MONTHS

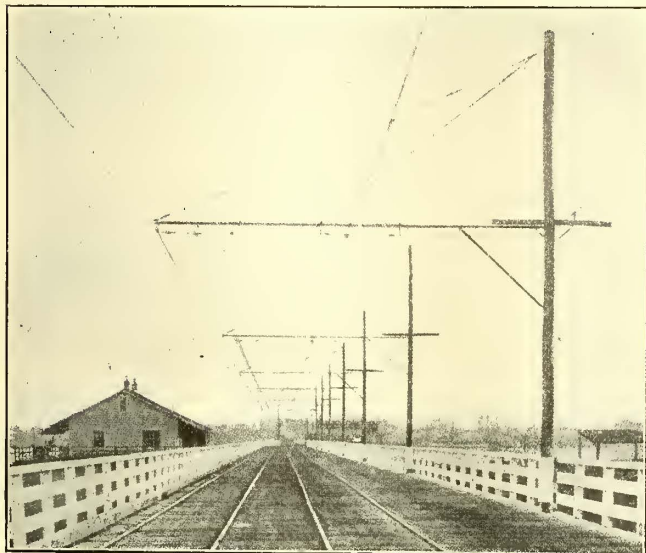
The intersection at Sixth Avenue is within two blocks of the New York Hippodrome.

West Broadway from Bleecker to Broome Streets. In this installation the blocks are used from rail to rail without any pinching of the conduit slot, showing that there is no swelling of these blocks.

Other important installations are at Twenty-third Street and Fourth Avenue, now in service three years; Canal Street and Broadway, Cortlandt and West Streets, Delancey Street approach to the East River Bridge, etc.

Long Bracket Arms for Narrow Roadway

In the issue of the *ELECTRIC RAILWAY JOURNAL* for Sept. 30, 1916, page 684, there appeared an account of an installation of unusually long bracket arms on the Brooklyn Rapid Transit System. In this case the purpose was to avoid interference between a cableway



LONG BRACKET ARMS INSTALLED BY VIRGINIA RAILWAY & POWER COMPANY AT NORFOLK, VA.

constructed by a contractor for digging a sewer in an important street and the span construction in use for supporting the trolley wire.

The Virginia Railway & Power Company has made use of a similar scheme at one location on its right-of-way where it is so narrow that it is impracticable to set poles on both sides. A wagon road runs along one side of the tracks and the brackets span this road and the two car tracks.

The pole bracket arms, which were furnished by the

Ohio Brass Company, are 23 ft. long and are made of 2-in. C-tubing. They are braced by 1½-in. C-tubing braces and in addition are supported by two rods attached to each arm. In order to protect the wooden poles from damage by wagon hubs, renewable V-shaped guards are placed at the bottom of each pole.

Pneumatic Tampers Cut Labor Cost in Half in Pittsburgh

The Tamping Outfits Also Reduce the First Cost of Welding Equipment

The Pittsburgh Railways was one of the first to use pneumatic tampers. The present equipment consists of two compressors, each of which furnishes power for a battery of six tampers. These machines have three lines, respectively 50 ft., 100 ft. and 150 ft. long and each line takes care of two tampers.

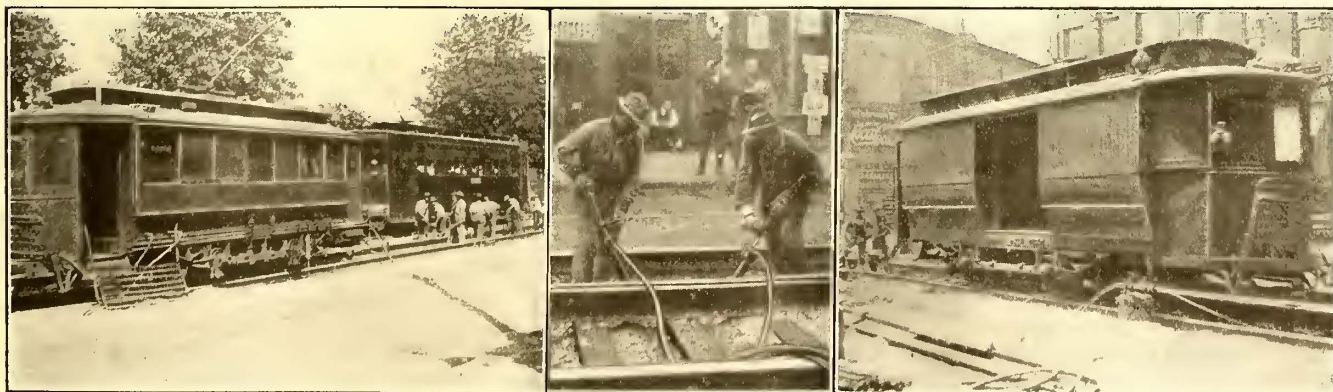
The company is also planning to purchase five portable sets, made to handle four tampers each, in order to secure the convenience of working with compressor equipment that can be kept off the tracks where traffic is being maintained upon the tracks undergoing repairs.

As in other installations, the pneumatic tampers show a decided saving in cost, the saving per foot of track being about 15 cents or one-half of the former cost. The proportionate saving in men, however, is greater, and this is an advantage, particularly as the much smaller force that is required is of a higher grade. There is only 30 per cent of the force used that would be required for hand tamping.

The ballast used in Pittsburgh is classified as "coarse," in which sizes up to 2½ in. are used, and as fine, in which 1 in. is the largest size. The machines tamp both classes of ballast much better than was customary with hand labor. Though the tamping is done as a rule with the 1-in. ballast, the rough ballast is spread, compacted and rolled to a depth of about 6 in. before the track is laid.

The company has also taken advantage of the Ingersoll-Rand tamping equipment to reduce the first cost of Thermit welding outfits. The ordinary preheater used in connection with Thermit joints includes a blower outfit which costs about \$600. The Pittsburgh Railways only find it necessary to use of this outfit the tanks and burners costing about \$35 to do the preheating in connection with reduced air pressure supplied from the compressor outfits.

A second by-product of the tamping equipment is the forthcoming use of small air drills, which are lighter than electric drills, in making joints immediately following the tamping. Also having compressed air on the job, it may be found to be useful to run air drills to break up and remove concrete.



PNEUMATIC TAMPERS AT WORK IN PITTSBURGH—SERVICE CAR WITH TAMPING OUTFIT, AND TAMPING GANG; PAIR OF TAMPERS IN ACTION; MIXER TANK AND BUNSEN BURNER REPLACING WELDING PREHEATER

Mirror Used in Safeguarding Crossing

The accompanying illustration shows how W. W. Holden, superintendent of transportation San Antonio (Tex.) Traction Company has used a mirror to do the work of a signal in protecting a crossing on his road. The route of car A is straight head while car B takes the route indicated by the dash line and arrow points. The track layout is such that before the mirror was

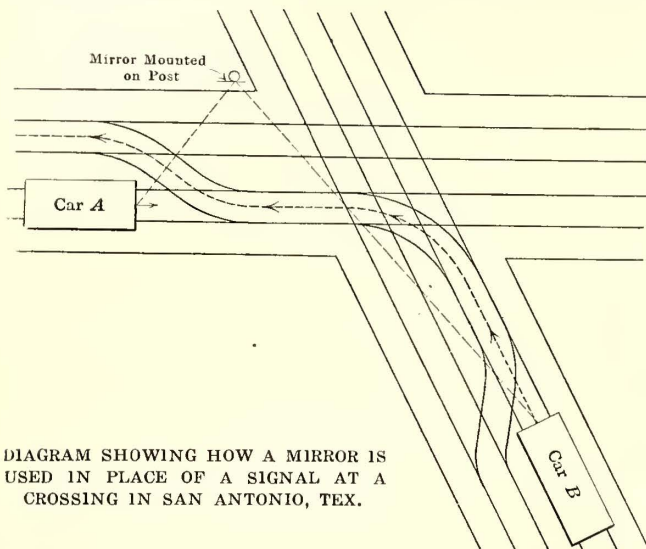


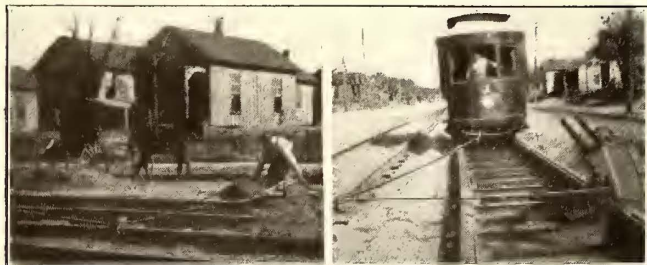
DIAGRAM SHOWING HOW A MIRROR IS USED IN PLACE OF A SIGNAL AT A CROSSING IN SAN ANTONIO, TEX.

used the motormen on the two cars could not see each other. The placing of a mirror at the point shown in the diagram brings the two cars within view of each other before they reach the crossing, and thus the danger of a collision is greatly reduced.

The mirror is 30 in. x 45 in. in size and is protected by a wire screen. It is mounted on a post using two turnbuckles to provide for easy adjustment.

Electric Shoveling

Shoveling with the motive power of a street car reduced the cost from 12 cents to 5 cents per yard on about 2200 ft. of double track in Dallas, Tex. R. G. Taber of the Stone & Webster organization, general managers of the Consolidated Electric Street Railway, was in charge of electrically welding a section of new track. As the car used for transporting the welding outfit remained idle most of the time Mr. Taber conceived the plan of putting it to work. He fastened a

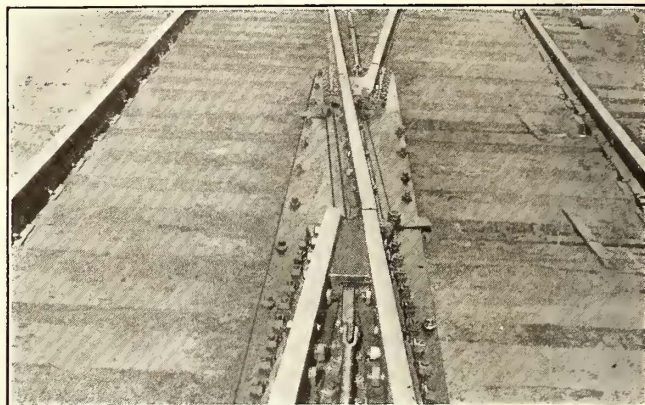


STREET CAR USED TO PULL SCRAPER IN DALLAS, TEXAS

rope to a scraper as shown in the accompanying illustrations, passed it through a pulley which was hooked over the rail and tied the other end to the car. The scraper was taken out beyond the dirt which was piled on both sides during the laying of the track. Then the car was started and the scraper was pulled in toward the track, gathering a load as it came. The cost mentioned above covered everything (including the motor-man's wages) except the power used by the car.

Frogless Switch Makes Continuous Rail for High-Speed Track

A mechanism for eliminating the break in the rail and the two pieces of guard rail necessary, and to form a continuous rail at a switch, has been developed by the Walls Frogless Switch & Manufacturing Company, a Colorado corporation of Kansas City, Mo. This consists of a section of rail which is made to take the place of the usual frog, and which is turned with the switch point to form a section of either the main-line track or the switch track. This section of swing rail is 7 ft. long and rests on a plate of steel carried on the track ties. As the section of rail is thrown with the switch point to either position, it is locked on both sides of either end to prevent it moving while a train or car



FROGLASS SWITCH INSTALLED ON SANTA FÉ RAILWAY TRACK

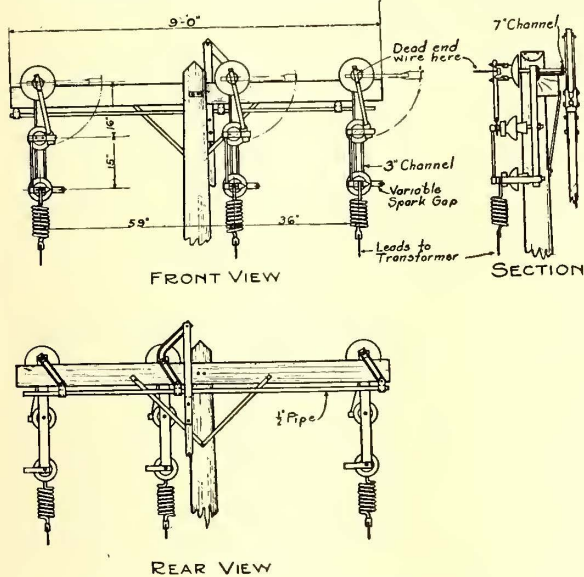
is passing over it. One of these locks at each end is affected by inserts in the bearing plate, and the other by means of a rod running parallel with the rail and contained in a housing, which inserts a bolt at either end, the combination affecting five locks in 7 ft. of rail. The steel plate under the frog is 15 ft. long, taking care of the bearing area for the 7-ft. rail section and supplying 3 ft. anchorage at either end leading onto the frog. Expansion and contraction are taken care of by mounting a short section of rail at each side of the swing section, and then as rail and bearing plate expand or contract, no difficulty is had with the rails binding.

Thermo-Couple and Potentiometer for "Hot Spot" Temperature Measurement

The importance of knowing the temperature of the hottest part in electrical machines is now well recognized. An accurate and reliable method of measuring temperature in parts inaccessible to thermometers is by means of a thermo-electric couple. The practice of building such couples into the windings of large machines at points where the highest temperatures are reached, though of comparatively recent origin, is fast becoming standard. For measuring the temperature at a point where a thermo-electric couple has been installed a potentiometer is utilized. This instrument balances the electromotive force of the couple under test against that of another couple at a known temperature. This avoids all errors due to variation in resistance of leads, etc. As all indications are on the zero-reading principle, very accurate readings can be obtained. A handy set for this purpose made by the Westinghouse Electric & Manufacturing Company combines in one case a standard couple and a potentiometer.

Pole-Top Switch

Low cost, simplicity and ruggedness are the claims of the makers. the K. P. F. Electric Company, San Francisco, for the switch shown herewith. This switch is fabricated from structural iron, and is then hot-dip galvanized. No clamps are used on the insulators, cemented caps being employed. The units are shipped from the factory in assembled form. To install them it



lowed include practically all the high-grade oils previously used in preservative specifications.

The treatment specifications state that the timber should preferably be only partly seasoned, and that green and seasoned timbers shall not be treated in the same charge. Approximately nine hours is the length of treatment required to give a uniform distribution of the oil. The need of an adequate preliminary steam treatment with proper time and temperature limits is also emphasized.

In laying the pavement sand gives too yielding a base when used as a cushion, and as a filler it allows water to get under the paving, thus causing swelling and consequent buckling. This can be prevented by the use of a bituminous filler. A new method of construction is recommended in which a coating of coal tar pitch or other suitable water-proofing paint is applied in a thin coat over a smooth base of concrete. The wood blocks are placed upon this coating within at least thirty minutes of its application. The specification as a whole has received the best thought of many authorities, and if consistently followed there is little doubt that most of the troubles charged against wood block pavement will be eliminated.

Circuit Breakers for High Voltage

The circuit-breaker illustrated herewith is one of a line recently developed by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. These breakers range in capacities from 300 to 1200 amp. at 23,000 volts, and from 1600 to 2000 amp. at 16,600 volts. All-steel construction is used, rendering them compact for their rupturing capacity. They are made up of single poles mechanically connected so as to permit spacing according to local conditions. For cell mounting, the steel base of each pole unit is held in channel irons built into the cell walls and the single pole solenoid is mounted with its mechanism on a plate and channel frame fastened on top of the cell. To enable them to break the arc quickly the breakers are provided with accelerating springs. Adjustable air-cylinder dash-pots take up the shock of the moving parts at the full open position. The moving contacts are of the laminated-brush type and they are protected by butt-type arcing contacts of considerable size.

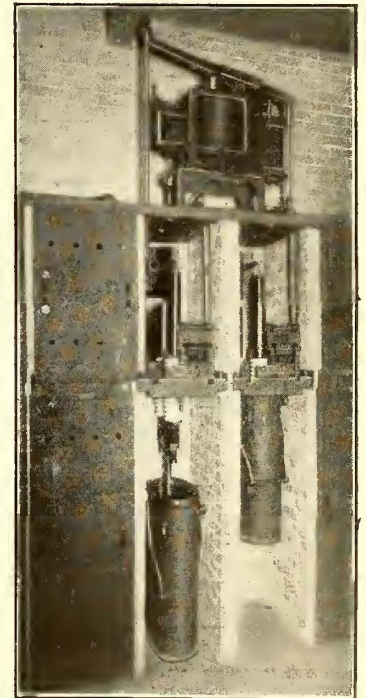
is only necessary to bolt the three units to the crossarm and attach the line wires and control rods. The channel baseplate and the channel arm supporting the insulators are riveted together, and no amount of warping of the crossarm, it is claimed, can throw the switch arms out of alignment. While the three legs of the circuit are opened and closed simultaneously by means of the rear control rod, each pole of the switch is separate from the others and is self-contained.

Creosoted Block Pavement Standardized

The chief defects of creosoted block pavement have been the occasional tendency to expand and buckle and the bleeding or exuding of oil caused by the blocks being improperly treated. While the character of the oil has frequently been held responsible for these defects, the method of treatment and the character of the timber of which the blocks are manufactured are of greater importance. The pressing need for a uniform standard for this pavement has been realized, and a specification has been adopted by the American Society of Municipal Improvements, Chicago, Ill. This specification has already been indorsed by five other leading engineering and municipal societies interested in this subject.

The vital points covered by the specifications are the timber, preservative compounds, treatment, and the method of laying the pavement. The quality of the timber is based on its density, and specific directions are given for measuring the number of rings in a definite distance and the determination of the percentage of summer wood in that region. The preservative specification allows the use of two types of oil, the first a coal tar solution consisting of a creosote oil to which a limited amount of refined coal tar is added, and the second a coal tar distillate oil the qualities of which are clearly defined. Careful descriptions are given of the methods of sampling and testing the preservative. The oils al-

lowed include practically all the high-grade oils previously used in preservative specifications. The treatment specifications state that the timber should preferably be only partly seasoned, and that green and seasoned timbers shall not be treated in the same charge. Approximately nine hours is the length of treatment required to give a uniform distribution of the oil. The need of an adequate preliminary steam treatment with proper time and temperature limits is also emphasized. In laying the pavement sand gives too yielding a base when used as a cushion, and as a filler it allows water to get under the paving, thus causing swelling and consequent buckling. This can be prevented by the use of a bituminous filler. A new method of construction is recommended in which a coating of coal tar pitch or other suitable water-proofing paint is applied in a thin coat over a smooth base of concrete. The wood blocks are placed upon this coating within at least thirty minutes of its application. The specification as a whole has received the best thought of many authorities, and if consistently followed there is little doubt that most of the troubles charged against wood block pavement will be eliminated.



Recently tests were made on one of these breakers by short-circuiting a 25,000-kva., 23,000-volt turbo-generator, five tests being made without external reactance in the circuit, five tests with 5 per cent 500-amp. reactance coils and six tests by short-circuiting the line at a sub-station 8 miles distant, the circuit including about 3 miles of cable. After the tests the breaker was opened for inspection, and there was no evidence on the arcing tips of excessive burning.

London Letter

Topics Discussed Mostly Those Growing Out of the War—Claygate Electrification Completed

(From Our Regular Correspondent.)

The Ashton-under-Lyne Corporation, in conjunction with the Waterloo and the Bardsley Parish Councils, recently took the first definite step towards acquiring the tramway system of the Oldham, Ashton & Hyde Electric Tramways, operated under private management for about twenty-five years. The Ashton Council decided to promote in the next session of Parliament a bill to make provision in respect to the purchase of the undertaking. Agreements were also confirmed with the Parish Councils of Waterloo and Bardsley for the transfer of their powers to the Corporation. The bill seeks to authorize the Corporation to construct additional tramways in the borough and to provide and run omnibuses. In the event of the bill being passed, it is hoped to establish through inter-running between Ashton and Oldham.

A bill will be promoted next session by the Nottinghamshire & Derbyshire Tramways to empower it to purchase the tramway of the Corporation of Ilkeston. The bill will confirm and carry into effect the indenture dated Nov. 5, 1916, between the Corporation and the company for the transfer of the undertaking.

The motormen of the Newcastle Corporation tramcars have made a request to the management for a cessation of work at 10.30 p. m. during the winter months. This is due to the excessive strain upon the men in driving the cars for so many hours in darkness, both morning and night. The committee is anxious to give due consideration to the men's request, and also to cause as little inconvenience as possible to the public and to the places of entertainment. The members of the tramway committee have discussed with theater managers the desirability of altering the hours of performances, with a view to meeting the changed conditions under which the tramway system is at present being worked.

The financial position of the Hull Corporation Tramway has necessitated several important changes. These will be made with the sanction of the City Council. Since the war all sailors and soldiers have had the free use of the cars, and the privilege has naturally been enjoyed to the fullest possible extent. Some time ago commissioned officers were asked to pay as ordinary passengers, and now it is proposed to charge the rank and file half-penny fares. Wounded men will still be allowed to use the cars free. In order to effect an economy in wear and tear, the tram service will be curtailed. The chairman at a recent committee meeting stated that it was estimated that for the year 1916-17 there would be a deficiency of £2,447. He also stated that there would have to be a revision of stages, and the abolition of penny through rides from extreme points of the service. Owing to the shortage of drivers, the manager had been empowered to introduce women drivers where advisable.

There is every prospect that passengers of the Liverpool Corporation Tramways will soon hear the stations announced automatically by a gramophone arrangement connected with an electro-magnetic route indicator. This ingenious contrivance is the invention of Mr. Mallins, the general manager of the tramway.

An application put forward by employees in the traffic section of the London County Council tramways for an increase of 15 per cent on all current rates of wages formed the subject of arbitration proceedings at the Chief Industrial Commissioner's Department, Westminster, recently. The claim was based on the ground of the higher cost of living, and more than 5000 workers were affected, including men and women conductors, and pointsmen. A concession of 2s. a week, in addition to the existing war bonus of 3s., and 6d. for each employee's child under fourteen years of age, was offered by the London County Council, but this offer was declined. At the close of the proceedings, which were conducted in private, it was announced that the decision of the arbitrators would be communicated to the parties interested after full consideration of the evidence laid before the tribunal.

Suggestions were made recently by local authorities that there is danger, during Zeppelin raids, from tramways and railways. The Field-Marshal Commanding-in-Chief of the Home Forces now points out that it is confidently believed that it is only necessary to assure the public that the continuance of railway and tramway traffic does not serve as a guide to hostile aircraft, and is of vital importance for the successful prosecution of the war for them to accept the decision and co-operate in carrying it out with loyalty and patriotism.

Stoppages are still taking place on the Birmingham Corporation Tramways, owing to lack of power. An endeavor is being made to give the necessary motive power for tramway purposes so as to enable a limited number of cars to be run on all routes throughout the day at times when the pressure of the factories is greatest. The matter has been referred to the Ministry of Munitions, whose local representatives are giving careful consideration to the question with the object of effecting an improvement in the supply of electricity to the tramways.

The electrification of the Claygate portion of the London & South-Western Railway's suburban lines has been completed, and a half-hourly service of electric trains between Claygate and Waterloo, covering the journey in twenty-nine minutes, has begun. There will be extra steam trains morning and evening.

One of the most interesting appointments to readers of this paper in the cabinet of ministers under the new Lloyd George Government, is that of Sir Albert Stanley to the post of president of the Board of Trade. Sir Albert has now a world-wide reputation as a most successful organizer, and for the past few years has been the managing director of the Underground Electric Railways, London. Brought to London by the absolute necessity of having a strong man to co-ordinate the services of the various underground railways and tube railways, Sir Albert has made a complete success of the whole system. Two years ago he was granted a knighthood, and now this further honor has been conferred upon him in recognition of his valuable services in connection with the transport problems of London. Sir Albert has already helped the Government in many ways connected with the transport problem at the front, and is now put in a position where his great abilities will be used to assist the whole country.

The business of the A. E. G. Electric Company, one of the three subsidiaries in England of the Allgemeine Elektrizitäts Gesellschaft of Berlin, has been sold by the controller appointed by the Board of Trade to Dick, Kerr & Company, Ltd., London and Preston. The A. E. G. Electric Company was the most important of the three subsidiaries, and had offices and works in London, Newcastle, Cardiff and Birmingham. It had undertaken large contracts, and one of the reasons advanced for the continuance of its operations after the outbreak of war is understood to have been the importance of the work it had undertaken. The contracts varied in value from £1,000 to about £40,000, and the liquid assets held in this country amounted to more than £100,000. Before the war the company employed many German mechanics, and the whole of the capital was held by the parent company in Berlin. During the war the German staff is stated to have been replaced by a British staff, and the latter is now taken over by Dick, Kerr & Company, together with a number of uncompleted contracts.

It will be remembered that a short time ago Dick, Kerr & Company also obtained the control of Willans & Robinson, Rugby, who manufacture steam turbines, pumping and condensing apparatus, etc. They have also obtained control recently of the United Electric Car Company, Preston, with which they had a working agreement for many years. All of these businesses will now be entirely in the hands of Dick, Kerr & Company, who are gradually putting themselves into a very strong position to conduct the very largest kind of enterprises in any part of the world as soon as the opportunity arises. They will be in a position to control the manufacture of almost every piece of apparatus that can be installed in connection with the most elaborate electric power, electric tramway or electric railway enterprises, and by these consolidations will become one of the most important manufacturing and contracting companies in Europe.

A. C. S.

News of Electric Railways

Traffic and Transportation

Financial and Corporate

Personal Mention

Construction News

Extension of Line Ordered

Berkshire Street Railway Ordered to Complete Intra-State Connecting Link

The Public Service Commission of Massachusetts issued an order Dec. 30, 1916, requiring the Berkshire Street Railway to complete its Lee-Huntington line for service on or before July 1, 1917. The order answers a petition of the selectmen of five towns traversed by the line which was constructed under the provisions of Chap. 601, Acts of 1910, which authorized the purchase of the Berkshire company by the New York, New Haven & Hartford Railroad and required the building of this line among others as an incidental feature of the purchase. In 1912 the then Board of Railroad Commissioners extended the time of completion of this line from Jan. 1, 1913, to Jan. 1, 1914. No further extension of time has been granted by the commission or requested by the company.

The entire line, which is 23.86 miles long, was nearly completed three years ago. In December, 1915, the commission granted a certificate of operation for a section of the line 12.54 miles long, from East Lee to Otis. Soon afterward informal complaint was made to the commission because of the failure of the company to operate the entire line. In August, 1916, the board authorized the company to operate an additional 3800-ft. section. The company stated at a hearing before the board that it desires to postpone as long as possible the completion and operation of the section of the line from Algeree Four Corners, Otis, to Blandford, and that it had no intention or desire to complete and operate the remainder of the line from Blandford to Huntington, unless ordered to do so by proper public authority.

The attitude of the company was influenced by its financial condition and by the physical condition of the line. Construction has been difficult and costly in the hilly region traversed, about \$3,000,000 having been expended. The company also claimed that the operation of the entire line would involve a financial loss which it ought not to be called upon to assume in its present financial condition.

The Berkshire company failed to pay its operating expenses and fixed charges in 1916 by more than \$87,000. After every reasonable allowance had been made for any possible inflation in the company's capitalization or floating debt, it did not appear that the company's financial status was such as to justify the commission, under ordinary conditions, in requiring the company to assume an additional financial burden through the operation of an unprofitable line. This case differed, however, in important respects from a proceeding brought under the general law to compel a street railway to build and operate an extension of its existing lines. This line had already been substantially completed at an estimated cost of about \$3,000,000. The obligation to build was definitely imposed by the Act of 1910, as one of the considerations for permitting the New Haven company, contrary to the general law and policy of the State, to acquire and hold the capital stock of a street railway. This legislation was actively sought by the New Haven company, not with any expectation that the operation of the Berkshire company would in itself prove profitable, but that the existing and projected lines of the Berkshire company would serve as feeders to the New Haven road, and would develop a large amount of long-haul business for the latter, which would be sufficiently profitable to offset any loss from the Berkshire property. The commission holds that the agreement of the two companies, evidenced by their acceptance of the act, raises what is virtually a contractual obligation to complete and operate the line.

Six of Ninety Contracts Unawarded

These Are All of the New York Contracts Unlet. Many New Lines to Open Soon

Only six general construction contracts out of ninety for the dual system of rapid transit remain to be awarded by the Public Service Commission for the First District of New York. Several important portions of the new lines will be placed in operation during the year 1917, adding materially to the present traffic facilities of New York. Several track installation contracts and station finish contracts for a number of stations remain to be awarded. These for the most part will be delivered during 1917. At the end of the year the Public Service Commission had completed or had awarded contracts for construction work on the new lines to be owned by the city of New York aggregating \$196,278,900. In addition, expenditures had already been made or authorized to the amount of nearly \$15,000,000 for real estate in connection with rapid transit work. Portions of this real estate, however, will be resold.

Exclusive of the above expenditures, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation, which will operate the new rapid transit lines, entered into contracts and agreements involving large amounts in connection with rapid transit work. While exact figures are not at hand as to the amounts involved, it is roughly estimated that the two companies had expended and were under obligation to the amount of \$35,000,000 all told for construction work upon company owned lines, making the total of construction contracts let by the city and the companies for all work about \$231,000,000. In addition, the two operating companies will contract for \$20,000,000 of equipment which they must supply.

Among the city owned lines which it is hoped may be placed in operation during the coming year are the Astoria and Corona extensions, the White Plains Road extension, the Jerome Avenue extension and a portion of the Southern Boulevard extension of the Lexington Avenue line, together with the main stem of the Lexington Avenue line, the Seventh Avenue Subway in Manhattan, and possibly a portion of the Flatbush Avenue and Eastern Parkway Subway in Brooklyn, for operation by the Interborough. The major portion of the Interborough lines will be in operation by the end of this year. Of the city-owned lines for operation by the New York Municipal Railway Corporation of Brooklyn, it is believed that a part and possibly all of the Broadway Subway in Manhattan will be in operation. Such operation will be in part a shuttle service south of Canal Street and a through service from Brooklyn by way of Manhattan Bridge and Canal Street north of Canal Street. Reports indicate that during the coming year the Second Avenue elevated line extension across the Queensboro Bridge and possibly the extension of the Ninth Avenue elevated line to a connection with the Jerome Avenue line will be placed in operation. New elevated facilities for operation by the Brooklyn company expected during the year are the third tracks on the Broadway line from Myrtle Avenue to Aberdeen Street, the Jamaica Avenue extension from Cypress Hills to Jamaica, and the third tracks on the Myrtle Avenue line between Broadway and Wyckoff Avenue.

Since the first of the year the third track on the Broadway line, Brooklyn, between Myrtle Avenue, Williamsburg, and Aberdeen Street, East New York, has been placed in operation for the use of express trains from Canarsie. Within the last few days there has also been opened for service the extension of the elevated lines on Jamaica Avenue from Crescent Street, Cypress Hills, to Grant Avenue, Woodhaven. This last extension is a section of the new elevated route from Cypress Hills over Jamaica Avenue to Jamaica.

Beaver Valley Traction Entertains

Christmas Reception Planned by Superintendent Boyce—Newspaper Participates by Sending Gifts

The sixth annual Christmas entertainment for the employees and families of the Beaver Valley Traction Company, New Brighton, Pa., was held on Dec. 20 at the pavilion at Junction Park, owned by the company. It was the biggest affair of the kind the company has held. The entertainment of the children, of whom there were more than 300, was a feature. W. H. Boyce, superintendent of the company, planned the affair and in carrying out the program he was ably assisted by Mrs. Boyce, J. E. McKirdey, advertising manager of the Pittsburgh Railways Company; Mr. Hay, president of the Pittsburgh section of the National Electric Light Association, and others. An enormous Christmas tree strung with red, white and blue electric light bulbs, red and green papier maché rope, gilt and other brilliant ornaments, stood at the lower end of the dance floor, while hundreds of lantern-effect shades were draped over the lights of the room. The entire pavilion was strung with garlands and on every hand were cards bearing the inscription "We wish you all A Merry Christmas and A Happy New Year," signed by the Beaver Valley Traction Company.

The children were entertained royally for an hour and in turn sang Christmas carols for Mr. Boyce. Each received candy, a toy and a monkey-on-a-stick. Shortly after 5 o'clock the employees of the company, their wives, families and sweethearts arrived with their friends. As they came in each employee walked up to the tree and gave his name. Miss Blanche Moore, acting as clerk to Santa Claus, had a list of all the employees and the number of the package each was to get. In addition there was candy in boxes and boxed peanuts, the latter complimentary from *The Beaver Daily Times*. For each of the men of the company there was a handsome lapel watch chain. For the women guests there were necklaces of beads and other jewelry and ornaments. C. C. Shetterley, lessee and manager of Junction Park during the past season, also presented cigars to each employee of the company. Lunch was prepared for 700 persons. Shortly after 1 a. m., the employees who had been out all night with cars began to arrive. These belated arrivals received their gifts and were entertained with music. The company hung in its cars, over its own name, a placard, 19 in. by 13 in., in colors, on which was printed this Christmas sentiment "We wish you All a Very Merry Christmas and a Happy and Prosperous New Year."

U. S. Circuit Court Dismisses Strike Injunction

The United States Circuit Court of Appeals at Chicago, Ill., on Jan. 2 reversed the ruling of the United States District Court at Indianapolis, Ind., in the case of the Indianapolis Traction & Terminal Company, and dismissed the injunction against W. D. Mahon and other officials of the Amalgamated Association and the employees of the Indianapolis Traction & Terminal Company restraining them from calling a strike against the company. The Court of Appeals ruled that the District Court had no jurisdiction in the matter because the real parties at interest were both residents of the State of Indiana, and therefore the action should have been in the state court and not in the federal court.

The suit was brought in 1914 by the Guaranty Trust & Safe Deposit Company, Philadelphia, Pa., trustee under the mortgage of the Indianapolis Traction & Terminal Company, and was a suit on contract—that of the arbitration award which ended the strike of November, 1913. In the hearing before Judge Anderson of the United States District Court at Indianapolis, the plaintiff proved that a strike in violation of the arbitration award was imminent, and the defendants, who included members of the street railway men's local union and officials of the Amalgamated Association, offered no testimony.

When the matter of the threatened strike was first brought before Judge Anderson in September, 1914, he declined to issue a temporary restraining order ex parte. He called the attorney representing the union and asked that it

guarantee that no strike would be called that night, but when the attorney refused to assure the court that the contemplated strike would be held in abeyance until a hearing, Judge Anderson then issued the restraining order. Two months later, proof of the threatened strike having been given at the hearing and no evidence being offered by the defendants, the temporary injunction was issued. An appeal was then taken by the unions to the Circuit Court of Appeals, but no decision was handed down by the Court of Appeals until Jan. 2, 1917. The court held that the bringing of the action in the name of the Guaranty Trust & Safe Deposit Company, Philadelphia, and omitting the name of the Indianapolis Traction & Terminal Company as a party plaintiff was not the proper procedure.

Town to Help Complete Railway

Massachusetts Municipality Shares Construction Cost for Completing County Street Railway

The Public Service Commission of Massachusetts has concluded an investigation of plans for completing the Plymouth & Sandwich Street Railway, under which the town of Plymouth shares in the construction cost of the road. By Chap. 95, Acts of 1911, the town was authorized to purchase securities of the road to the amount of \$50,000 to facilitate building the railway, which is to serve sparsely settled territory in the Cape Cod district. The town was not allowed to subscribe, however, until the commission had found that reasonably sufficient financial arrangements had been made to permit the completion of the line. The company now petitions the commission to enter such order as may be necessary to authorize the subscription by the town. A portion of the line 6.15 miles long, from Plymouth to Fresh Pond, has been completed, a further portion, 1.85 miles long, between Sagamore Beach and the Cape Cod Canal, has been built but not as yet operated; and there remains to be completed 9.9 miles, between Fresh Pond and Sagamore Beach and between the Cape Cod Canal and the Bourne-Sandwich line.

On Dec. 6, 1916, there remained only 1.47 miles of track construction to be done. The company has three single-truck open cars, two single-truck box cars and one double-truck box car. It now has an agreement with the Brockton & Plymouth Street Railway for the joint use of the latter's tracks to Plymouth, and expects to arrange for the use by the Brockton & Plymouth of the new track to Sagamore. At present the company has a carhouse of five-car capacity at Manomet, but plans to build a carhouse of eight- or ten-car capacity in 1917 at Sagamore. Power is purchased from the Brockton & Plymouth Street Railway, but a connection will be made with the system of the South-eastern Massachusetts Power & Electric Company near Sagamore. The assets of the company on Oct. 31, 1916, totalled \$360,651. The banking house of Hodgdon, Cushman & Company, Boston, has agreed to underwrite the construction notes of the company sufficiently to cover the contract price. In this case it has been urged that the words "reasonably sufficient financial arrangements," as shown in the statute, are equivalent to the words, "reasonably sound financial arrangements," and that the commission cannot properly issue the desired certificate if it appears that the construction of the road has been or is being financed largely by the creation of floating indebtedness and without the issue of stock sufficient in amount to insure a reasonable measure of financial stability to the enterprise. In the judgment of the board, the Legislature was endeavoring to insure, not the financial stability of the company, but the completion of a railway between Plymouth and Sandwich.

From the beginning it appears that the town of Plymouth has desired an opportunity to invest in the undertaking, not so much in the hope of securing a direct return upon the investment as to obtain the advantages of railway connection to the coastal territory lying immediately to the south, which included a region of summer-vacation popularity. The town was the petitioner for the above legislation. The commission certifies that reasonably sufficient financial arrangements have been made to permit the completion of the road.

Cleveland Power Contract Finding

Board of Arbitration Decides in Favor of Railway Purchasing Power from Illuminating Company

The board of arbitration selected two months ago to pass upon the Cleveland power contract made public its decision on Jan. 2. The board approved the power contract between the Cleveland Railway and the Cleveland Electric Illuminating Company. The plan of the railway to scrap its Cedar Avenue power house and build a substation at a cost of \$250,000 was also approved. The decision on the latter points was announced some time ago. The cost of power to the railway under this contract will be less than 6 mills per kilowatt hour, according to the estimates made by the engineers at the hearings. The board stated that it considered the Illuminating Company's bid the lower of the two and the best under the circumstances.

The report stated that the bid of the local municipal light plant had not been approved by the board of control, as required by law; that it contained statements to the effect that the proposition was tentative and to be used as a basis for a more formal contract, and that it would be necessary to agree on conditions if the bid proved satisfactory. One of the principal reasons for the rejection of the municipal plant's bid was that the question as to whether it should be accepted was not included among those upon which the board was asked to pass. Moreover, the municipal plant proposed to furnish only the power which had been generated heretofore at the Cedar Avenue power house of the railway. This amounted to about 50,000,000 kw.-hr. per annum. The contract was arranged to extend over a period of ten years.

On the other hand, the Cleveland Electric Illuminating Company agreed to furnish not only this amount of power, but to continue that already being furnished to four substations, and as much more as may be required. The contract with this company is to cover a period of eighteen years. At the end of five years, however, the railway may receive competitive bids for the remainder of the term and if any bid received is 10 per cent lower than the price paid to the Illuminating Company and so low that this company will not meet it, then the railway may abrogate the contract on a year's notice.

The report said that if the primary and secondary charges alone were considered, the bid of the municipal plant for the service heretofore furnished by the Cedar Avenue plant was probably lower than that of the Illuminating Company. The municipal plant, however, could probably not furnish this power before July 1, 1918, while the Illuminating Company can furnish it by July 1, 1917.

There was considerable discussion of the clause by which the railway agreed to pay a certain proportion of the additional cost of coal above \$2.25 per ton. The board criticized this, but said that the objections to it were not sufficient to overcome the advantages of other features of the contract. It recommended a modification of a clause relating to handling coal, and this will be made.

The reproduction value of the Cedar Avenue power house was placed at \$1,265,565, and this, less the salvage of machinery and equipment estimated at \$115,565, is to be placed in a suspense account and paid off at the rate of \$20,000 a month.

It is estimated that the saving by buying the power heretofore furnished by the Cedar Avenue power house will be about \$200,000 a year. The cost of production at the Cedar Avenue plant of the Cleveland Railway has been around 1 cent per kilowatt hour.

The report was signed by A. F. Ingersoll, chairman of the board and Warren Bicknell the member selected by the railway. Thomas L. Sidlow, the member selected by the city, brought in a minority report, in which many points of the majority report were discussed and criticized. He recommended the approval of the bid of the municipal plant as the more advantageous in every respect.

The total cost of the arbitration was \$24,053. The arbitrators were awarded \$5,000 each. Joseph Alexander, first selected by the company to represent it and afterward incapacitated by accident, received \$1,000. The fees of city witnesses amounted to \$4,665, while those of the company's witnesses were \$858. The stenographer received \$2,530.

Connecticut Company Review

Present Financial Condition Makes It Impossible for Company to Extend Service

The Connecticut Company, New Haven, Conn., in a brief which has just been filed with the Public Utilities Commission, announces that its present financial condition makes it impossible for the corporation to extend its service through Centerville, for which a petition was filed recently. The brief answers a petition for service in Hamden. The final hearing on the petition of the Hamden residents was held before the commission a few weeks ago.

The brief explains that the trustees of the Connecticut Company do not hold office in the same manner that the board of directors of street railways generally do. The men who handle the Connecticut Company affairs were appointed trustees of the property by the federal court and the tenure of office ends in 1919, giving them about two and a half years more service. The company said in part:

"Under these circumstances the trustees may very properly hesitate to make arrangements for the permanent financing of the company. The directors have followed the policy that the extraordinary expenditures be made out of current expenses, rather than permanently to finance the company and use the proceeds for the capital account. This policy has led the trustees to declare extremely small dividends during the last two years, paying last year a 1½ per cent dividend and the year previous, 1 per cent.

"It does not seem out of place at this time to mention a few of the larger expenditures which have been made during the past year, or are to be made during the present fiscal year, and the expenditures which have been recommended by officials but have not been approved by the board of directors at the present time.

"During the past year it has been necessary greatly to increase the capacity of the power houses in New Haven, Bridgeport and Hartford, upon which account is being spent the sum of \$900,000. The carhouse in Waterbury is to be extended and rebuilt, for which an authorization of \$200,000 has been granted. The building of bridges that are now under construction will result in a cost of \$250,000 this year and bridges in contemplation will add \$100,000 more to this account. For new passenger equipment it has been necessary in the last two years to form equipment trusts amounting to \$1,100,000, which must be paid within five years. Paving of streets has averaged for the last three years an expenditure of \$400,000 a year.

"Recommendations have been made by officials of the company for necessary carhouses, inspection barns, repair shops in various cities at an expenditure estimated at \$1,150,000. These latter are very necessary in order to provide accommodations for the additional equipment.

"During the last five months of this fiscal year the total operating expenses have increased 31.58 per cent over the same period of last year. The gross earnings, however, have increased only 13.74 per cent, so that the net earnings have shown a decrease of 14.30 per cent, due to the enormous increase in the cost of maintenance and labor."

Report on Dorchester Tunnel Extension

The Boston Transit Commission has filed a special report in the Legislature relative to the extension of the Dorchester tunnel from Andrew Square to Upham's Corner. At the last session the commission was ordered to report upon the cost and most feasible route, and it finds the former to be about \$2,800,000, via Boston Street, Edward Everett Square and Columbia Road, the distance being about 1 mile. An accompanying report by Chief Engineer Edmund S. Davis states that the present terminal at Andrew Square includes about 620 linear feet of two-track tunnel extending southerly from the station for cross-over facilities. The extension from this point to Upham's Corner would terminate at a station 350 ft. long with a lobby above the track level and the necessary entrances and exits. South of this station the usual cross-over facilities would be provided. The estimate takes into consideration the advanced cost of labor and material, the cost of the subway and station, including location of water pipes and sewers and land damages.

Lease Negotiations in Cincinnati

In a letter to E. W. Edwards, president of the Rapid Transit Commission of Cincinnati, Ohio, on Dec. 27, W. Kesley Schoepf, president of the Cincinnati Traction Company, expressed a willingness to enter into negotiations for the lease of the proposed rapid transit loop on the basis of a general proposition which had been presented to him. Mr. Schoepf said he would not object to a new franchise for his company, as proposed, on condition that it is so drawn as to leave no doubt as to its legality and to its practicability from a financial standpoint.

Instead of basing the returns on the net earnings of 1916, however, Mr. Schoepf made the counter-proposal that 1914, 1915 and 1916 be used for this purpose. He also said the company should deduct an amount equal to its 6 per cent franchise tax, before a division of any balance was made with the city, and he further contended that the percentage tax should not exceed the present payments. The company would agree to operate the loop as a part of a unified system, with universal transfers, entrance for all interurban lines, regulation of service and rates of fare, the city's right to order extensions and the fixing of a valuation for the purchase of the company's property by the city. Mr. Schoepf suggested that the zone of the 5-cent fare be limited to the present area. Through City Solicitor Charles A. Groom the canal lease secured by the city has been modified in such a way as to allow its use under somewhat different specifications than originally intended. It permits the city to build the rapid transit loop from 100 ft. beyond Brighton bridge to 300 ft. beyond Mitchell Avenue as an open way or on the surface instead of constructing it as a subway, as originally intended.

New Franchise Conditions in Gary

Proposed Substitute Grant Would Eliminate 3-Cent Fares and Make City a Partner

The segregation of the properties of the Gary & Interurban Railroad into its former constituent parts and a share of the net profits to the city of Gary, Ind., are provided for in a new franchise before the Council of that city. In return, the city of Gary will repeal the former fifty-year grant which exacted a 3-cent fare and grant a new thirty-year franchise. Should the company break faith with the city, the 3-cent fare will become operative again.

The segregation will restore the identity of the Valparaiso & Northern and the Chicago, Goshen & South Bend and connecting lines. The city of Gary demands that all lines east of Broadway in Gary be operated as separate companies. There is no objection to the old Gary & Interurban Railway, which also operates in Tolleston and Hammond, and the old East Chicago City Railways being one line.

Other conditions in the tentative grant provide for the addition at once of twenty modern pay-as-you-enter cars for service in Gary, all future track to be laid with 85-lb. rail, extensions of the road to new plants and to new sections of the city.

Plan to Consolidate Massachusetts Commissions

A struggle in the Legislature is forecasted by the recent action of Representative Allen of Newton, Mass., in filing a bill in the House providing for the consolidation of the Public Service Commission and the Gas & Electric Light Commission. Instead of the present boards aggregating eight members the bill provides a single body of seven members, to be appointed for terms of seven years at salaries of \$7,500 each, with the exception of the chairman, whose compensation will be \$8,000. The bill provides for the appointment by the chairman of four sub-boards of three members each, to deal respectively with steam railroads and steamships, street and elevated railways, gas and electric light companies, telephone and telegraph companies. The chairman and secretary of the commission are to be appointed by the Governor, the chairman having power

to appoint the sub-boards and to name the chairman and secretary of each. According to the bill the decision of the sub-board is to be the decision of the commission. Previous efforts to consolidate the two commissions have failed on account of the absorption of both boards in their duties and the unbroken and successful regulative history of the Gas & Electric Light Commission in its particular field of service.

President House on Indefinite Leave

After Brief Rest He Will Study and Report to the Company Methods in Use Elsewhere Than Baltimore

At a special meeting of the directors of the United Railways & Electric Company, Baltimore, Md., on Jan. 3 William A. House, president of the company, was voted an indefinite leave of absence, and Thomas A. Cross, the vice-president, was selected to perform the executive duties while Mr. House is away. The official statement issued by the board follows:

"William A. House, at his request made to the directors of the United Railways & Electric Company, has been granted a leave of absence from official duties in order that he may secure, first, complete rest, after which he will engage in an investigation of the operation of a number of street railways in other cities. During his absence Mr. House will continue as president, but his duties will be performed by the vice-president, Thomas A. Cross.

"The directors realize that with the rapid industrial expansion of our city the company will be confronted with many serious problems of operation, and it is the desire of the directors that the company be in a position not merely to meet requirements, but to lead and assist in an intelligent policy of expansion and development.

"In order that they may have before them a thorough and competent study of what has been done elsewhere in the intelligent development of facilities to meet similar situations, the directors have decided to have made a report which will embrace the work done in most of the other large centers in this country.

"In considering means of making such a survey of the work elsewhere, different engineering firms were under consideration, but it was finally decided that it would be more satisfactory to have the report made by a man familiar with the local situation. The man pre-eminently fitted to make such a report is William A. House. Mr. House has been connected with the United Railways for the past thirty-five years, during which time he has not only seen the development of the company from a comparatively small beginning to its present magnitude, but during this time has been an important factor in the development and expansion of the company.

"In order to facilitate this work, and realizing that the exacting duties of the president of the company during the past years have taxed the strength of its president to the limit, and in order that he may be prepared to make the extensive tour of the larger cities involved in making the report in question, the directors of the company have granted a leave of absence to President House.

"It is the intention of the president for the first month to take a complete rest. The directors insisted that this should be done before his new duties were assumed. After his rest he will begin the inspection and examination into the railway situation in other cities. With the assistance of the report that will be made by President House, the directors of the company expect to develop comprehensive plans looking to meeting the future requirements of the local railway situation."

Toronto Carhouse Destroyed By Fire.—A fire broke out in the east carhouse of the Toronto (Ont.) Railway on the Don River at 8.30 p. m., on Dec. 28, causing total destruction of the building and many cars which were stored in the carhouse at the time. The loss is unofficially estimated at \$500,000. R. J. Fleming, general manager of the company, refused to make any statement until the officials had made a complete examination and determined the exact loss.

Aurora Carhouse Roof Collapses.—As a result of splitting a switch upon entering the carhouse in Aurora, Ill., one of the cars of the Aurora, Elgin & Chicago Railway jumped the track and knocked down one of the columns supporting the roof, and the south half of the latter caved in. The construction was undoubtedly strong enough to support the roof under ordinary conditions without one column, but the excessive weight brought on by 8 in. of snow and ice was probably responsible for the failure. The truss rods buckled, and the roof gave way, burying five cars in the wreckage.

Arbitration of Wages on Interurban Line.—The trainmen in the employ of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., have agreed to submit their request for increased wages to a board of arbitration. The present basis of pay is 24½ cents for first-year men, the scale then ranging to a maximum of 28 cents. The company offered the men a flat increase of 2 cents an hour for the first year with an additional increase of 1 cent an hour for the other years. The trainmen asked 25 cents an hour for first-year men and 30 cents and 35 cents for the other employees. The working conditions that exist, other than the wage scale, are satisfactory.

Hearing on Jan. 15 on Relief from Franchise Conditions.—The State Public Service Commission of Washington has fixed Jan. 15 as the date for a hearing of the petition of the Tacoma Railway & Power Company, Tacoma, to be relieved of certain of its franchise obligations, which include the paving of right-of-way, and the payment of 2 per cent of its gross earnings to the city, because of impaired revenues due to jitney competition, and other reasons. The case is identical to that instituted by the Puget Sound Traction, Light and Power Company, Seattle, except that the Public Service Commission has made a valuation of the Tacoma Railway system, while it has not valued the Seattle system.

Grand Rapids Railway Raises Wages.—The third increase within a year in the wage scale of the employees of the Grand Rapids (Mich.) Railway was announced on Dec. 24 by Benjamin S. Hanchett, president, to become effective on Jan. 1. The scale is raised 4 cents an hour, bringing the new rate up to 28 cents for the first six months, 29 cents for the second six months, 31 cents for the second year, and 32 cents for the third year. The notice of the raise called attention to the fact that the earnings of the company did not justify the action at this time, but that the living expenses of the men had increased so materially that the company felt it necessary to assist in alleviating the conditions.

High Cost of Materials May Endanger Fare at Cleveland.—Fielder Sanders, street railway commissioner of Cleveland, Ohio, said that a decision of the board of arbitration in favor of the Cleveland Railway in the power contract controversy will result in a saving of \$200,000 a year to the company and that this will meet the constantly advancing cost of labor, materials and equipment. In case the company does not receive this relief, he said, the fare would almost inevitably have to be increased to 4 cents cash and three tickets for 10 cents. Mayor Harry L. Davis is quoted as saying the city is opposed to an increase in fare, but Commissioner Sanders has answered this with the assertion that there is nothing else to do but stand for it, if the interest fund falls below the limit at which the fare is to be increased automatically under the Tayler franchise provisions.

Increases in Wages in Tacoma and Seattle.—Employees of the Tacoma Railway & Power Company, Tacoma, Wash., to the number of more than 300, received a Christmas present in the form of a rearranged wage schedule providing increases in pay approximating 2 cents an hour above the old wage scale. The new scale of wages ranges from 23 cents an hour for the first six months, up to 30 cents for ten years and thereafter. Trainmen operating one-man cars receive 2 cents an hour in addition to the above rates. Gripmen on cable cars receive 1 cent an hour in addition to the regular schedule. Trainmen while breaking in students receive 2½ cents an hour in addition to the regular schedule. Seattle employees of the Puget Sound Traction, Light & Power Company, which also controls the Tacoma Railway & Power Company, also received a Christmas pres-

ent in the form of a wage increase, effective on Jan. 1, when the scale was increased 1 cent an hour above what it formerly was, to be followed by an increase of another cent on July 1, 1917. Nearly 1000 employees of the company are benefited by the Seattle increase.

Extension of Bridge Approach Underground.—At a conference of the city-planning commission of Cleveland, Ohio, recently, the matter of extending the eastern subway bridge approach on Superior Avenue to the Public Square was discussed, and it was decided to make an investigation with that end in view. Under present plans the entrance to the subway will be at West Sixth Street. Members of the commission believe that, with a moderate expenditure, the subway could be extended to the Public Square. This would relieve congestion and allow the cars greater freedom of operation. Such construction is also regarded as a first step toward subways on the various streets approaching this point and an underground terminal at the square. County Engineer Stinchcomb told President Stanley of the Cleveland Railway, Street Railway Commissioner Fielder Sanders and members of the street railway committee of the City Council that the county will not recede from its position in refusing to pay one-third of the expense of re-locating the street railway tracks in order to allow the construction of the subways to the bridge to proceed. He said the city had agreed to take care of this matter.

Programs of Association Meetings

National Foreign Trade Council

The National Foreign Trade Council has called the Fourth National Foreign Trade Convention to meet at the William Penn Hotel, Pittsburgh, Pa., on Jan. 25, 26 and 27, 1917, to consider, among others, the following questions:

Conditions in Foreign Markets After the War, and the Measures Necessary to Safeguard American Foreign Trade, as Well as the Foreign Trade Aspect of the American Tariff System.

Co-operation in Foreign Trade Development.

The American Merchant Marine.

Foreign Investment of American Capital as an Aid to Oversea Commerce.

Problems of the Smaller Manufacturer and Merchant.

All Americans engaged in, or desirous of entering, overseas commerce are invited to participate.

The proceedings will be designed to bring out the mutual interests of the chief elements in foreign trade. In addition to prepared addresses by authorities on topics mentioned, the convention will be given over largely to "group sessions," each devoted to intensive discussion of a single problem, in which all delegates are at liberty to participate. R. H. Patchin, Hanover Square, New York, is secretary of the National Foreign Trade Council.

American Wood Preservers' Association

The thirteenth annual meeting of the American Wood Preservers' Association will be held at the Hotel Astor, New York, N. Y., on Jan. 23, 24 and 25. The association will convene on Jan. 23 with an address of welcome by Mayor Mitchel of New York. In the afternoon reports of committees will be presented as follows: Publicity, Promotion and Education, by E. A. Sterling, chairman; Service Tests of Ties and Structural Timber, by C. P. Winslow, chairman; Terminology, by J. B. Card, chairman.

On Jan. 24 reports of committees will be presented as follows: Plant Operation, by A. L. Kuehn, chairman; Preservatives, by E. B. Fulks, chairman; Purchase and Preservation of Treatable Timber, by A. R. Joyce, chairman. On the same day the following papers will be presented: "The Grouping of Ties for Treatment," by C. P. Winslow, and "The Bad and the Good in the Handling of Wood," by J. H. Waterman.

On Jan. 25 reports of committees will be presented as follows: Service Tests of Wood Block Paving, by L. B. Moses, chairman; Wood Block Paving, by C. H. Teesdale, chairman.

An informal banquet will be held on the evening of Jan. 24 at 6.30 p. m. Special entertainment features will be provided for the ladies on all three days.

Financial and Corporate

Foreclosure Proceeding in San Francisco

Suit was filed in San Francisco, Cal., on Dec. 27 by the Anglo & London-Paris National Bank, the Oakland Bank of Savings, and D. A. Bulmore, as trustee, to foreclose the mortgage on the property of the Market Street Cable Railway, under which are secured \$1,800,000 of 6 per cent bonds. The defendants are the Market Street Cable Railway, the United Railroads, the Union Trust Company, which is trustee for junior mortgages, and others.

The apparent objects of the suit are to prod along the reorganization of the United Railroads, the bondholders of which are not readily responding to the plan, and to prevent the junior bondholders from pleading the statute of limitations against this issue of \$1,800,000. It was believed in the San Francisco financial district that, with the filing of this suit, it becomes imperative on the part of the holders of the \$28,854,000 of United Railroads 4 per cent blanket mortgage bonds which are junior to these underlying mortgages, to take active steps to protect themselves, either by depositing their bonds under the present plan, or formulating a plan of their own.

Annual Report

Municipal Railway of San Francisco

An advance statement of the annual report of the Municipal Railway of San Francisco, Cal., contains the following income statement for the fiscal year ended June 30, 1916:

Operating revenues	\$1,982,804	
Operating expenses	1,164,617	
Net operating revenues.....		\$818,187
Legal and clerical service.....	*\$9,182	
Depreciation (18 per cent of gross).....	352,075	
		361,257
Operating income	\$456,930	
Income from bonds owned.....	24,038	
Gross income		\$480,968
Deductions from income:		
Taxes, comparison charges required by charter	\$103,855	
Municipal franchise	59,149	
Municipal car license	2,955	
Federal income	755	
		*166,714
Balance before interest.....	\$314,254	
Interest on funded debt.....	239,486	
Net profit	\$74,768	
*Comparison charter charges as above.....	175,896	
Profit for year.....		\$250,664

According to the advance statement, presented by Superintendent Thomas A. Cashin, the system has been maintained at better than 80 per cent of its reproduction cost. He warns the city, however, that although the road has been earning a surplus, there must be a conservative policy in undertaking costly and unprofitable extensions.

Heavy drains have been made upon the earnings of the municipal system which must be borne in mind, he points out. From surplus earnings \$48,000 was expended on the Stockton Street Tunnel; about \$84,000 was used to help complete the Church Street line; \$25,000 is being appropriated for five motor buses to operate across Golden Gate Park, and the track construction through the Twin Peaks Tunnel, which will be required within a few months, will probably cost \$275,000. Thus a total of \$428,000 has been taken bodily out of the earnings of the system. The Church Street line, for which a total of \$500,000 has been spent, is not operating, and thus earnings are not accruing to defray interest on the investment. The Chestnut Street line, built to handle Exposition traffic, will not be profitable until the district is built up. Moreover, some of the cross-town lines which it is necessary to maintain are being op-

erated at present in expectation of greater development in the future.

Bond redemptions, Superintendent Cashin adds, will increase this year from \$100,000 to \$202,000 annually, and as long as the system is required to pay its own way out of earnings and at the same time maintain a high state of efficiency, projected extensions and other expenses must be carefully watched if "the garment is to be cut according to the cloth." Although the complete financial report for the year has not yet been put in shape for circulation, it is stated that the net profit of the municipal line for the year is \$74,768, after deducting state and municipal franchise, municipal car license and federal income taxes. In other words, the actual profits total \$250,664, which amount is now actually in the city treasury.

Arkansas Valley Interurban Railway, Wichita, Kan.—The Arkansas Valley Interurban Railway has been authorized by the Public Utilities Commission of Kansas to issue \$1,000,000 of first mortgage 5½ per cent gold bonds; \$600,000 of preferred stock and \$1,500,000 of common stock. The company is to retire \$1,303,000 of bonds authorized by the Railroad Commission in 1910, using for such retirement the proceeds of \$900,000 of the new bond issue and \$500,000 of the preferred stock. The proceeds of the other issues are to go for improvements.

Bartlesville (Okla.) Interurban Railway.—Edward V. Kane & Company, Philadelphia, Pa., announce that the \$250,000 of Bartlesville Interurban Railway first mortgage 6 per cent gold bonds, due July 1, 1934, which they placed in 1910, were called for redemption at 102 and interest on Jan. 1, 1917. The same firm has purchased a new issue of \$350,000 of Bartlesville Interurban Railway first mortgage sinking fund 6 per cent gold bonds, dated Jan. 1, 1917, due Jan. 1, 1947, and redeemable any time at 102 and interest. Practically all the old bonds will be exchanged for the new issue. Bonds not exchanged will be offered to the public at 100 and interest. The new bonds are a first lien on railway, light and power property in Bartlesville, having a replacement value of \$583,000 as compared with \$350,000 of outstanding bonds. All of the stock of the Bartlesville Interurban Railway is owned by the Cities Service Company.

Boise (Idaho) Railroad, Ltd.—H. E. Dalton, general manager, has been appointed receiver of the Boise Railroad, Ltd., which operates 8 miles of local lines in Boise. A sale was ordered by the court for Jan. 3, at a minimum price of \$182,000. The application for a receiver, which was made by the Germantown Trust Company, Philadelphia, trustee under a mortgage securing \$389,000 of bonds, was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 19.

Bristol (Tenn.) Traction Company.—Upon a hearing of the bill of complaint of the Munsey Trust Company, trustee, in a suit in chancery instituted against the Bristol Traction Company, Judge Roberts of the Corporation Court of Bristol, Va., on Dec. 8 appointed Fred Dulaney and Joseph A. Caldwell receivers of the company. The same action was taken in the Chancery Court in Bristol, Tenn. The deed of trust under which application for a receiver was made was executed to secure payment of thirty-year gold bonds aggregating \$300,000, but the bill recited that bonds in the total amount of only \$200,000 were ever issued, \$7,500 of which the defendant itself owns. On Sept. 1, 1916, the defendant defaulted in the payment of the semi-annual installment of interest on the outstanding bonds of \$192,500. The complainant filed as an exhibit to its bill a copy of a report which B. L. Dulaney, president, recently made to the board of directors of the company, showing that after paying taxes and interest on its bonds his company operated in both Bristols at a total loss of \$8,652 during the fiscal year ended June 30, 1916.

Chicago (Ill.) City Railway.—The First Trust & Savings Bank and the Illinois Trust & Savings Bank, Chicago, Ill., have purchased an issue of \$1,700,000 of first mortgage 5 per cent bonds of the Chicago City Railway. The proceeds from the sale of these bonds will be used to reimburse the company for improvements which have been made by it and for which the purchase price to the city is raised.

Chicago (Ill.) Elevated Railways.—Officials of the Chicago Elevated Railways have announced that the interest

on such of the \$14,000,000 of two-year 5 per cent secured gold notes of the company, dated July 1, 1914, as have not been extended under the terms of the extension agreement of June 19, 1916, will be payable at the office of the National City Bank in New York City for the six months ended Dec. 31, 1916, at the rate of 5 per cent per annum. It is stated that practically all of the notes have gone into the agreement.

Cincinnati & Columbus Traction Company, Cincinnati, Ohio.—The sale of the property of the Cincinnati & Columbus Traction Company, which was scheduled to take place on Dec. 19 at an upset price of \$850,000, failed to be carried through on account of a lack of bidders. It is expected that the court will order a revaluation, and the property will again be offered for sale. Were it not for the unsettled condition of the loop question and an interurban right-of-way into Cincinnati, it is said, the stockholders would be prepared to buy in the property at once. The railway was placed in the hands of the Union Savings & Trust Company, Cincinnati, as receiver on account of flood damage in 1913.

Gary, Hobart & Eastern Traction Company, Hobart, Ind.—The application for a receiver in the case of the Gary, Hobart & Eastern Traction Company, noted a few months ago in the *ELECTRIC RAILWAY JOURNAL*, has been granted, Judge Wildermuth receiving the appointment.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The application for a receiver for the Kansas City, Kaw Valley & Western Railway, noted in the *ELECTRIC RAILWAY JOURNAL* of March 11, 1916, was dismissed by order of the court, according to official information now available.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—Howard Abbott, master in chancery, has been ordered by Judge Wilbur F. Booth, in the United States District Court at Minneapolis, Minn., to sell the property of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company at auction on or before May 27, 1917.

Monongahela Valley Traction Company, Fairmont, W. Va.—An extra stock dividend of 6 per cent has been declared by the directors of the Monongahela Valley Traction Company on the \$6,782,037 of common stock, along with the regular quarterly dividend of 1 per cent. Both of these dividends are payable on Jan. 15 to holders of record of Jan. 5. The regular quarterly 1¼ per cent on the preferred stock of the company has also been declared, payable on Feb. 1.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—The Nashville-Gallatin Interurban Railway has been placed in a receivership upon the petition of H. H. Mayberry, the controlling stockholder in the property, whose bill filed with the court alleged that interest due on July 1, 1916, on the \$600,000 of first mortgage bonds of the road is in default. H. H. Corson and James R. West were appointed receivers, and creditors were ordered to file their claims before July 1 next. The receivers were authorized to issue \$20,000 of 6 per cent receivers' certificates to mature in six months, and to use the proceeds to pay the bond interest to prevent foreclosure. It is believed, according to the bill of complaint, that a sacrifice of the property will be thus prevented, and that the company will be able to work out of its financial difficulties. The railway is 27 miles long from Nashville to Gallatin.

Northern Ohio Electric Corporation, Akron, Ohio.—The Public Utilities Commission of Ohio on Dec. 29 authorized the Northern Ohio Traction & Light Company to issue \$1,000,000 of additional common stock, from the proceeds of which a number of improvements will be made. The new stock will be taken by the parent corporation, the Northern Ohio Electric Corporation.

Orleans-Kenner Electric Railway, New Orleans, La.—The application for a receiver for the Orleans-Kenner Electric Railway, made several months ago, was promptly thrown out of court. In connection with present advice to this effect, it is stated that the company is in fine shape and is doing well.

People's Street Railway of Nanticoke & Newport, Wana-mie, Pa.—The application for a receiver for the People's

Street Railway of Nanticoke & Newport, noted several months ago in these pages, is still formally in court, but there is said in official circles to be no reason why the property should be placed in receivership. The application was made by a few dissatisfied minority stockholders. The company is said to be in a very sound financial condition, interest on \$73,500 of outstanding bonds always having been met as required, and liberal dividends having been paid on \$100,000 of stock since 1910.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The Pittsburgh Trust Company was named on Jan. 2 as receiver of the Pittsburgh & Butler Railway. The railway defaulted in November, 1914, in the payment of interest on the \$1,500,000 of first mortgage 5 per cent gold bonds of the Pittsburgh & Butler Street Railway of which the Pittsburgh Trust Company is trustee. Subsequent interest payments were not made and a bondholders' protective committee was appointed. The Pittsburgh & Butler Railway was organized in March, 1914, as a consolidation of the Pittsburgh & Butler Street Railway and the Butler Passenger Railway.

Sapulpa & Interurban Railway, Sapulpa, Okla.—The recent newspaper report that the Midland Valley Railroad, a steam line with main offices in Philadelphia, has purchased the Sapulpa & Interurban Railway is declared to be erroneous. The property of this 12-mile electric railway was foreclosed and bought in by the bondholders on Sept. 9 and the receivership was discharged. The former receiver, R. V. Miller, however, is still in charge of the property for the new owners. There will probably be a reorganization soon, but as yet nothing has been done. As far as is known, there is no probability that the Midland Valley Railroad will acquire the property.

Southern Traction Company, Inc., Bowling Green, Ky.—The application for a receiver in the case of the Southern Traction Company, Inc., made by a director a few months ago, has been denied, according to official information now at hand.

Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio.—In a joint application filed with the Ohio Public Utilities Commission on Dec. 26, the Ohio River Power Company proposes to lease that portion of the property of the Steubenville & East Liverpool Railway & Light Company which is utilized in carrying on the electric light and power business of the Ohio River Power Company. The proposed lease is to run until Oct. 1, 1919, at a rental of \$90,000 a year, with the privilege of purchasing the property for \$1,500,000. A notice of a special meeting of the stockholders of the railway and light company to act on the lease was published in the *ELECTRIC RAILWAY JOURNAL* for Nov. 18, page 1079.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—An initial dividend of 1 per cent was paid on Dec. 21 to the holders of the common stock of the Youngstown & Ohio River Railroad of record of Dec. 16. The company also paid on Dec. 21 to holders of record of Dec. 16 a dividend of 1 per cent on the preferred stock on account of accumulations, together with the regular quarterly dividend of 1¼ per cent.

York (Pa.) Railways.—A dividend of 2½ per cent has been declared on the preferred stock of the York Railways on account of accumulations, along with the regular quarterly 1¼ per cent, both payable on Jan. 30 to holders of record of Jan. 20. The accumulations in dividends on this stock have now all been met.

Dividends Declared

Athens Railway & Electric Company, Athens, Ga., quarterly, 1¼ per cent, preferred.

Boston (Mass.) Suburban Electric Companies, 50 cents, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Citizens Traction Company, Oil City, Pa., quarterly, 1½ per cent, preferred.

Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.

Dayton & Troy Electric Railway, Dayton, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1¼ per cent, common.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common; 6 per cent on common payable in common stock.

Rome Railway & Electric Company, Rome, Ga., quarterly, 1 per cent.

Stark Electric Railroad, Alliance, Ohio, 1 per cent.

Warren & Jamestown Street Railway, Warren, Pa., 3 per cent.

Western New York & Pennsylvania Traction Company, Olean, N. Y., 3 per cent, first preferred.

Western Ohio Railway, Lima, Ohio, quarterly, 1¼ per cent, first preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.

York (Pa.) Railways, quarterly, 1¼ per cent, preferred; 2½ per cent on preferred in full of all accumulations.

Electric Railway Monthly Earnings

		BATON ROUGE (LA.) ELECTRIC COMPANY				
Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Earnings
1m., Oct.,	'16	\$18,509	*\$8,319	\$10,190	\$3,532	\$6,658
1 "	'15	18,096	*9,670	8,426	2,204	6,222
12 "	'16	208,536	*102,548	105,988	40,285	65,703
12 "	'15	187,957	*109,873	78,084	25,674	52,410
		BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.				
1m., Oct.,	'16	\$9,964	*\$9,306	\$658	\$1,128	†\$470
1 "	'15	9,405	*7,855	1,550	1,106	444
12 "	'16	121,336	*106,240	15,096	13,264	1,832
12 "	'15	115,316	*97,162	18,154	13,563	4,591
		CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, NOVA SCOTIA				
1m., Oct.,	'16	\$36,466	*\$18,205	\$18,261	6,568	\$11,693
1 "	'15	34,152	*16,891	17,261	6,606	10,655
12 "	'16	387,757	*227,251	160,506	78,470	82,036
12 "	'15	347,773	*205,637	142,136	79,289	62,847
		COLUMBUS (GA.) ELECTRIC COMPANY				
1m., Oct.,	'16	\$84,786	*\$30,405	\$54,381	\$28,572	\$25,809
1 "	'15	67,214	*28,135	39,079	28,730	10,349
12 "	'16	847,466	*343,413	504,053	343,883	160,170
12 "	'15	706,911	*324,245	382,666	344,769	37,897
		EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.				
1m., Oct.,	'16	\$72,130	*\$37,862	\$34,268	\$8,759	\$25,509
1 "	'15	71,644	*35,193	36,471	8,715	27,756
12 "	'16	817,842	*435,548	382,294	106,336	275,958
12 "	'15	694,754	*380,106	314,648	105,056	209,592
		EL PASO (TEX.) ELECTRIC COMPANY				
1m., Oct.,	'16	\$104,990	*\$55,576	\$49,414	\$5,286	\$44,128
1 "	'15	84,807	*43,932	40,875	4,202	36,673
12 "	'16	1,088,443	*633,775	454,668	56,891	397,777
12 "	'15	967,036	*515,683	451,353	50,371	400,982
		GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.				
1m., Oct.,	'16	\$171,761	*\$107,012	\$64,749	\$36,858	\$27,891
1 "	'15	174,258	*103,652	70,606	36,124	34,482
12 "	'16	1,929,671	*1,231,365	698,306	438,617	259,689
12 "	'15	1,992,280	*1,199,804	792,476	432,963	359,513
		HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.				
1m., Oct.,	'16	\$25,956	*\$15,756	\$10,200	\$5,240	\$4,960
1 "	'15	23,033	*13,053	9,980	5,522	4,458
12 "	'16	320,263	*181,911	138,352	64,478	73,874
12 "	'15	268,003	*160,261	107,742	66,681	41,061
		HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.				
1m., Nov.,	'16	\$512,904	*\$224,107	\$288,797	\$215,702	\$73,095
1 "	'15	477,687	*197,256	280,431	212,253	68,178
5 "	'16	2,397,008	*1,084,185	1,312,823	1,075,132	237,691
5 "	'15	2,246,309	*956,673	1,289,636	1,059,286	230,348
		JACKSONVILLE (FLA.) TRACTION COMPANY				
1m., Oct.,	'16	\$49,646	*\$34,930	\$14,716	\$15,437	†\$721
1 "	'15	51,338	*35,896	15,442	14,735	707
12 "	'16	619,387	*422,793	196,594	182,308	14,286
12 "	'15	617,722	*431,913	185,809	174,675	11,134
		PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.				
1m., Oct.,	'16	\$26,437	*\$17,390	\$9,047	\$7,241	\$1,806
1 "	'15	25,312	*15,336	9,975	7,511	2,464
12 "	'16	310,557	*203,471	107,086	87,075	20,011
12 "	'15	289,478	*180,484	108,994	91,595	17,399
		PENSACOLA (FLA.) ELECTRIC COMPANY				
1m., Oct.,	'16	\$21,439	*\$12,319	\$9,120	\$7,714	\$1,406
1 "	'15	22,385	*13,025	9,360	7,082	2,278
12 "	'16	279,557	*154,398	125,159	91,217	33,942
12 "	'15	249,556	*146,262	103,294	86,375	16,919
		TAMPA (FLA.) ELECTRIC COMPANY				
1m., Oct.,	'16	\$82,457	*\$43,762	\$38,695	\$4,263	\$34,432
1 "	'15	84,803	*42,938	41,865	4,212	37,653
12 "	'16	964,328	*527,078	437,250	52,269	384,981
12 "	'15	978,005	*498,264	479,741	52,503	427,238

*Includes taxes. †Deficit.

Traffic and Transportation

Decision in Grafton Fare Case

Commission Finding Contains Discussion of Economics of Country Line Transportation

The Public Service Commission of Massachusetts has reached a finding in the Grafton fare case, on the Worcester Consolidated Street Railway, to the effect that a reduction in rates is justified on this branch of the system radiating from Worcester. As the company, after conference with the commission, has agreed to furnish special tickets on the line good between the hours of 6 a. m. and 8 a. m. and 4.45 p. m. and 6.45 p. m., the petition of citizens of Grafton for lower cash fares is placed on file. The finding contains a discussion of the economics of transportation on country lines radiating from Worcester and is abstracted below.

The petitioners alleged that the fares charged by the company for the transportation of passengers through Grafton, viz., two fares of 5 cents each for passage in one direction, were excessive. The distance from Worcester City Hall to the end of the line in Grafton Center is 8.90 miles. From the City Hall a passenger can ride 4.79 miles for 5 cents, 7.47 miles for 10 cents, and 8.90 miles for 15 cents, without allowance for the transfer privilege at Worcester. The line in Grafton is 4.77 miles long and the fare is 10 cents.

The petitioners requested a reduction largely on the ground that the fares they are paying are relatively higher than those prevailing upon other and similar lines radiating from Worcester. On twelve routes out of Worcester the distance available on a 10-cent cash fare from the center of Worcester ranges from 6.04 to 10.33 miles, and on ten of these routes the distance available on a 15-cent cash fare varies from 7.98 to 13.3 miles. On the Holden route a concession is given in the form of 10-cent tickets good in the morning and afternoon rush hours between Holden and Worcester City Hall and giving a ride of 10.16 miles, by former order of the commission. There are no transfer privileges in Worcester with these tickets. Other tickets are in vogue on the Spencer and Bramanville lines. The commission held that the fact that the above inequalities existed was not conclusive evidence in favor of the petitioners. Similar apparent irregularities were to be found upon most of the Massachusetts street railways. Fares had been established strictly on a mileage basis, but had been influenced by other factors, such as the location of centers of population, municipal boundary lines and traffic density. Cost of service was by no means solely dependent upon mileage. An attempt to readjust street railway fares within the State upon a uniform mileage basis would mean revolutionary changes probably in general unsatisfactory to all concerned.

A tabular exhibit of maximum distances was likely to be misleading. Thus: if on a certain line the maximum distance for a 10-cent fare was 8 miles and for a 15-cent fare, 12 miles, the principal settlement in the 15-cent zone might be at the 9-mile point, so that very few local riders had the benefit of the maximum distance. The company contended that a situation similar to this existed on many of the routes radiating from the Worcester City Hall. On nearly all the suburban lines except the Grafton line very few persons lived in the vicinity of the 10-cent fare limit. Hence if that fare limit was extended for a considerable distance into the country on those lines, it would not materially affect the income of the company, as the through passengers would pay the fare anyway. A reduction of the fare to 10 cents in the case of the Grafton line would result in a very considerable loss for the street railway and give to persons located at the large settlement a privilege and advantage that was not accorded to any considerable number of people on any other suburban line. If the Grafton line did not end at Grafton Center, the 15-cent fare limit might be placed at a point more nearly conforming to the similar distances on the other routes without any real benefit to the people living at the Center.

The company paid dividends of 5.5 per cent on its stock in 1915 and 5 per cent in 1916. In this case no attempt

was made, either by the company or the petitioners, to segregate investment in the Grafton line and pro-rate revenues and operating expenses so that the financial results from operation might be determined with approximate accuracy. It was claimed by the petitioners, however, that the line was one of the better paying suburban routes. The company did not refute this. The commission knew of no uniform and inflexible rule to apply with general public advantage in cases where comparative street railway fares were involved. The factors that apply were so numerous and varied that each case must be determined on its own merits. The commission found that an adjustment by means of special tickets was equitable. The company has agreed to furnish tickets good during the hours above mentioned at 10 cents each for the use of regular patrons traveling between any part of Grafton and the terminus of the line at Salem Square, Worcester.

Car Capacity Measure Amended

Board of Health Order Will Not Apply Where Full Track Capacity Is Utilized

Two years ago, through the initiative of Dr. S. S. Goldwater, then Commissioner of Health of New York, an order was issued by the Board of Health against certain car lines in the boroughs of Manhattan, Brooklyn and Richmond, forbidding them to carry in any car passengers to a number exceeding one and one-half times the seating capacity of such car. The application of the order led to strong denunciation of the board's orders and to a demand for their repeal. On the other hand, the Board of Health felt that the duties imposed upon it by the charter demanded that the efforts to improve the hygienic conditions prevailing in the transportation service be continued, to the end that the health menace might be reduced to the minimum.

In order that the department might have the advice and guidance of others experienced in this field, a meeting of the advisory committee on traffic sanitation was held in the office of the commissioner of health, on Dec. 15. At this meeting, there were present the Mayor, John Puroy Mitchel, Deputy Police Commissioner Guy A. Scully, City Chamberlain Milo R. Maltbie, Commissioner of Plant and Structures F. J. H. Kracke, Public Service Commissioner Henry W. Hodge, Daniel L. Turner, engineer of the Public Service Commission; Jacob C. Klinck, president of the Brooklyn Civic Club; J. S. Doyle, of the Interborough Rapid Transit Company; R. A. Shaw of the Brooklyn Traffic Committee of One Hundred; Alexander McKinney, William J. Millard, assistant corporation counsel; Max W. Weir, for the Merchants' Association, and Dr. John Franklin Crowell, for the Chamber of Commerce.

For the information and guidance of the meeting, attention was called to Sec. 1169 of the charter, which requires the Board of Health to aid in the enforcement of and, so far as practicable, to enforce all laws of the State applicable in New York City, to the preservation of human life or to the care, promotion or protection of health. Section 1172 of the charter empowers the Board of Health to amend the sanitary code and to publish therein additional provisions for the security of life and health in the city of New York.

After considerable discussion, the committee decided that overcrowding could be prevented to a very great degree if the full track capacity of all the lines was used, as far as practicable, to meet the demand of the traveling public. It was agreed that when the operating companies were using to the full all the available facilities which the public allows them, it would be unreasonable to demand that they exclude excess passengers from their cars. The committee suggested that the Board of Health meet this situation by revoking the existing orders and adding the following section to the sanitary code:

"Sec. 306. Cars Not to be Overcrowded. The carrying of passengers on railroad cars in the city of New York shall be so regulated at all times that the number of passengers on any such car at any time shall not exceed one and one-half times the seating capacity of the car; provided, however, that the foregoing provisions of this section shall not apply when the full number of cars which

shall have been ordered by the Public Service Commission to be operated on any line or part of a line are so operated; and provided, further, that the foregoing provisions of this section shall not apply, in the absence of such an order of the Public Service Commission, when the maximum number of cars which can be practicably operated on any line or part of a line are so operated."

The recommendations of the committee were submitted to the Board of Health at a special meeting held on Dec. 16, and the orders already referred to were revoked and Sec. 306, as just cited, was adopted as part of the sanitary code, to take effect immediately.

Storm Affects Traffic

Western New York Lines Tied Up—Cause of Delays Advertised

Traffic on electric lines throughout western New York was seriously delayed for several days following the freezing rain and heavy snow fall on Dec. 23, last. The sleet storm lowered wires and covered rails with heavy ice. No efforts were made to operate cars on the Buffalo & Lake Erie Traction line between Buffalo and points west, and several cars were abandoned along the line between Buffalo and Lackawanna. The schedules of the city lines in Buffalo were only partly maintained by the International Railway and service was completely suspended on several of the Niagara Falls local lines. Interurban traffic between Buffalo and Niagara Falls and Lockport was abandoned for a short time. Neglect on the part of the city to clean up the snow in the streets of Buffalo also caused much delay in operating lines.

In an effort to acquaint the public with causes of delay on the Buffalo city lines, the International Railway printed advertisements in the daily newspapers giving the time, place and cause for each delayed car. This departure on the part of the company caused much favorable comment. E. J. Dickson, vice-president of the company, also prepared a statement for the public which was printed in the daily newspapers giving the cause for the delays on the lines. He placed much of the blame for the delays on blockades caused by motor trucks, wagons, sleighs, etc., on the tracks.

Louisville Men Discuss Salesmanship

In presentation of their activities to them in the light of "Selling Rides," officials of the Louisville (Ky.) Railway have created much new interest in their work among the trainmen. The passengers are regarded differently than they used to be and the men are talking about the proposition some weeks after the meetings at which the subject was discussed. In the current issue of *Trolley Topics*, issued by the company, Motorman O. E. Allen is represented by the following on "Selling Rides":

"This is a subject composed of two small words but has a great meaning. It is an easy matter to sell something to eat, drink or wear, but when it comes to selling rides, it takes a first-class salesman to do business. We are up against hard competitors when it comes to selling rides, for we have many automobile owners who give rides away. Think what we would be up against if we were in a business selling groceries and our next-door neighbor was giving the same articles away. Do you think we would make many sales? When we make a sale let us do all in our power to make a satisfied customer and he will bring us more. If we sell a ride to one customer and he is dissatisfied he will not buy any more from us and will not stop there but will keep others from buying from us. I have noticed on several occasions where I was in sight of a station a passenger standing there; when the car approached within 100 to 150 ft. a machine would come along, and the man would get in; sale gone, not 5 cents either, but sometimes 25 or 30 cents. (Mr. Allen is on a country line.) Dissatisfied customers or bad salesmanship may be the cause of losing sale of the ride. Now let us all devote our energy to our sales and when we make a sale let it be a satisfied sale. Use all the politeness we have, especially to the aged and infirm, and see what an improvement it will make."

Buses for Municipal Railway

Announcement has been made by the Board of Public Works of San Francisco, Cal., that sealed proposals will be received on Jan. 31 for furnishing the city with from five to fifteen buses for use in the transportation of passengers in conjunction with the Municipal Railway System. It is stipulated in the specifications that the actual seating capacity of each bus shall be nineteen passengers, with a total carrying capacity of thirty passengers.

The proposals which have been sent out also call for bids for the maintenance and upkeep of buses ordered by the city during a run of 125,000 miles. As the estimated daily run of each machine will average about 125 miles, this means that the successful bidder will be obliged to maintain the upkeep of each machine taken by the city for a period of about three years. The estimated cost of the machines is about \$5,000 each.

While the original idea was to purchase only sufficient buses to operate across Golden Gate Park into the Sunset District from the present Tenth Avenue terminal of the Municipal Railway System, the proposition advanced by the Harbor Commission that the city operate a line along the harbor front over a smooth roadway to be constructed by the State may mean the purchase by the city of the full complement of fifteen machines.

Fall River Ticket Withdrawal Postponed.—The Public Service Commission of Massachusetts has issued an order postponing the proposed withdrawal from sale by the Bay State Street Railway of strips of six tickets for 25 cents in the city of Fall River until Feb. 1, 1917.

Low Freight Damages of Louisville Interurban Line.—Losses and damage charges against the freight service of the Louisville & Interurban Railway, Louisville, Ky., are less than one-fifteenth of 1 per cent of the receipts. R. H. Wyatt, general freight agent of the company, is quoted as claiming that this record cannot be excelled by that of any other similar service.

Windows Replace Curtains in San Francisco Cars.—The curtains which have thus far been used to protect the open sections of cars of the San Francisco (Cal.) Municipal Railway, have been replaced by glass windows. This change excludes rain and has decided advantages over the fully inclosed cars, which are not so popular. The change is costing about \$40 a car.

Kansas City Rate Hearing on Feb. 15.—A hearing on suburban street railway rates on the lines of the Kansas City Railways will be held in Kansas City, Mo., on Feb. 15 by the Public Service Commission of Missouri. Because of a controversy over certain suburban rates, the company had asked the commission to take up the entire matter and establish a basis for future ratemaking on the suburban lines, possibly on the mileage plan.

Increase in Fare on New Jersey-Pennsylvania Line.—The Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., has placed a new schedule of fares in effect between Morrisville and Torresdale, Pa. The through trip fare between these two towns has been increased from 25 cents to 35 cents. The rate from Torresdale to Cornwells and Eddington remains unchanged, as does the rate from Bristol to Croyden, Eddington, Cornwells and Edgely.

Numbered Stops on Trenton Suburban Line.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has had sheet-iron tags hung from the wires at about eighty stops along its Hopewell line. Each tag is numbered, and passengers now inform the conductor at what number they want to alight from the car. The signs also show just where the cars stop to take on passengers along the country districts. A number of old stops has been eliminated.

Tulsa Service Increased.—The Tulsa (Okla.) Street Railway has increased its service by placing conductors on all its cars. When the jitneys made inroads into the company's business several months ago, the company was forced to curtail expenses, and in addition to reducing the number of cars in operation the company resorted to one-man cars. Since the City Commission of Tulsa adopted adequate legislation for the jitneys the business of the Tulsa Street Railway has more than doubled.

Sliding Gates Considered for Manhattan Elevated Lines.—The Public Service Commission for the First District, New York, is attempting to get the Interborough Rapid Transit Company to improve the type of platform gate used on its trains on the Manhattan elevated lines. At a hearing held last week, George Keegan, assistant to the vice-president and general manager, promised the commission that he would within a short time submit drawings of a type of sliding gate to be placed on the outside of the cars which the company would be willing to install upon two or three trains for the purpose of experiment. Experts of the commission testified at the hearing that the installation of folding and collapsible gate devices on Manhattan elevated lines would undoubtedly serve to improve conditions materially.

Legislating Against the Dallas Jitney.—The jitney traffic ordinance drafted by the city attorney at the instance of the Mayor and the City Commissioners of Dallas, Tex., seems likely to be finally adopted. This ordinance, which is a general traffic law, provides that each jitney in Dallas shall give an indemnity bond in the sum of \$2,500 to protect passengers and the public. The ordinance also limits the number of passengers to be carried by a jitney to its seating capacity. The demand for more stringent regulatory measures affecting jitneys arises from the numerous accidents. Since Jan. 1, 1916, two persons have been killed, forty-five persons seriously injured and 173 persons slightly injured. It is estimated that more than 100 minor accidents were not reported to or by the police. The jitney drivers declare that the ordinance will put them out of business. They maintain that the cheapest bond which will meet the city's requirements will cost them \$250 a year. The jitney driver now pays annual fees of approximately \$100. This he considers prohibitive.

Discharges Follow Inability to Sense Organization Spirit.—The Kansas City (Mo.) Railways has during the eleven months since the new organization took charge, gradually installed many features of welfare work, insurance, social intercourse, athletics, and safety, in addition to the departments that make for greater efficiency in maintenance and operation. In each case of thoughtful provision for the personal good of the employees, the response has been grateful and immediate. The ideals of the company having been pretty thoroughly disseminated, the time arrived when the problem presented itself of dealing with those who did not and could not respond to these ideals. As a first move the company in December discharged sixteen men, most of them for violation of the spirit of the safety rules. These were all cases wherein it was apparent that the men were not in sympathy with the safety policies of the company, and could not get into sympathy with them. A few of the discharges, however, were on account of deception, with respect to misstatements as to accidents. Nine collisions occurred one day, and this startling number was made the occasion for the first demonstration on a considerable scale that discipline was an essential feature of the new regime.

New Medium Between Company and Public in New York.—*Interborough Rapid Transit* is the name of a new bulletin just issued by the Interborough Rapid Transit Company, New York, N. Y. The new paper, which will be published from time to time, as constantly arising questions demand it, has long been contemplated as a medium of expression between the company and the public, while, on the other hand, the *Interborough Bulletin* and the *New York Railways Employees' Magazine* already serve as mediums of communication between the companies and their employees. The circulation of the new magazine will depend upon the subject matter handled, i. e., it will be mailed to those individuals and organizations who would seem at the time to be most interested in the subject under discussion. The front page of the first issue, dated Dec. 20, 1916, contains a graphic representation of the tremendous growth of the traveling habit in New York from 147 rides per annum per person in the horse car days of 1872, to 332 rides per person on the subway, surface and elevated lines in 1916. The paper also enumerates and describes the numerous and costly safety devices which have been installed in the subway, such as safety platforms, safety signal system, door signals, extra lighting system, electric fans and white enameled car ceilings for better lighting.

Personal Mention

Charles Ruff has been appointed master mechanic of the Lincoln (Neb.) Traction Company.

B. W. Hilliard has been appointed superintendent of transportation of the Lincoln (Neb.) Traction Company.

C. R. Phenicie, vice-president of the Wisconsin Public Service Company, Green Bay, Wis., has been elected vice-president of the Manitowoc & Northern Traction Company, Manitowoc, Wis.

Charles E. Miller, who has been bookkeeper for the Marion & Bluffton Traction Company, Bluffton, Ind., for several months, has been appointed auditor of the company. Mr. Miller entered upon his new duties on Jan. 1.

Lawrence I. Grinnell, who went to the Border in July, 1916, as a member of Troop D, Squadron A, New York National Guard, has been mustered out of active service and has resumed his position as a member of the editorial staff of the *ELECTRIC RAILWAY JOURNAL*.

J. G. Miller has been appointed local manager of the Manitowoc & Northern Traction Company, Manitowoc, Wis., to succeed Thomas Higgins, resigned. Mr. Miller was born and educated in Milwaukee, is a civil engineer by profession, and was formerly in electric railway work in San Antonio, Tex. Mr. Miller for the past year has been civil engineer for the Highway Commission in construction of roads about the city of Milwaukee. The property at Manitowoc was taken over recently by the Clement C. Smith interests.

Charles A. Drummond has been appointed assistant publicity agent of the Detroit (Mich.) United Railway and assistant editor of *Electric Railway Service*, which is published in the interest of the railway. Mr. Drummond was for many years on the editorial staff of the *Detroit Journal* and for the last year and a half was city editor of that paper. He succeeds with the Detroit United Railway A. H. Sarvis, who resigned in November to become a member of the executive staff of the Flint Varnish & Color Works.

Melodia Blackmarr Jones, widow of Capt. Joseph T. Jones, president of the Niagara Gorge Railway, Niagara Falls, N. Y., the Gulf & Ship Island Railroad, Gulfport, Miss., and the Gulfport & Mississippi Coast Traction Company, has been elected active president of the Gulf & Ship Island Railroad. It is reported Mrs. Jones will also have charge of the Gulf & Mississippi Coast Traction Company. No announcement is made as to who will assume the presidency of the Niagara Gorge Railway, of which Burt L. Jones is general manager.

T. Lee Miller, since last August assistant to the president of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has resigned to accept a position with a New York banking firm. Mr. Miller was graduated from Cornell University with the degree of mechanical engineer. Immediately after graduation he became connected with the firm of Marwick, Mitchell & Company, New York, efficiency and cost engineers. Upon leaving the last-named firm he entered the service of the Toledo Railways & Light Company, Toledo, Ohio, as assistant to F. R. Coates, president. He resigned from that company in 1915 to become New York manager of sales of the Sangamo Electric Company. It was from this company that Mr. Miller resigned to become connected with the Fort Wayne & Northern Indiana Traction Company.

Charles Currie, who retired as vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, on Dec. 31, was born in Toronto, Ont., on March 8, 1868. At the age of fourteen he entered the employ of the London (Ont.) Street Railway as an office boy. This was in the horse-car days, and, although Mr. Currie's activities were always in the office end of the business, he had an opportunity of coming in contact with very many operating and construction problems. He rose through the office ranks as clerk, cashier and auditor, after which he became sec-

retary of the company. In 1896 he was called to Lima, Ohio, as general manager of the Lima Railway. Three years later he resigned from the company at Lima to become general superintendent of the Cleveland (Ohio) Electric Railway. In this position he handled successfully a very serious strike. Mr. Currie became general manager of the Detroit & Toledo Shore Line, operating between Detroit and Toledo, in 1901, with headquarters at Detroit. He was then asked by the Everett-Moore syndicate to take the position of vice-president and general manager of the Northern Ohio Traction & Light Company, which had been organized only a short time before to take over the Akron, Bedford & Cleveland interurban line, the Akron city lines and several suburban lines. This connection continued fifteen and one-half years and witnessed the development of the property to one of the most modern and complete utilities of its kind in the United States. During Mr. Currie's administration at Akron other lines were added to those originally owned by the company, including the Canton-Akron, Canton-Massillon and Canton-New Philadelphia interurban lines and the Canton and Massillon city lines, making a consolidated property of 264 miles of track. The power developments of the company alone in the last five years involved an investment of more than \$3,000,000. The Northern Ohio Traction & Light Company was one of the first to place limited cars on interurban lines and to demonstrate the possibilities of this service. In 1913 Mr. Currie spent three months in Europe studying the electric railway developments on the continent and in the cities of England and Scotland. With this exception he was never away from his desk for any length of time in the more than fifteen years' service with the company. On the sale of the property recently to Hodenpyl, Hardy & Company and E. W. Clark & Company Mr. Currie declined a proposal that he remain in active charge, but agreed to continue with the company as a director.

Obituary

Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., died on Dec. 30 of pneumonia following an operation for appendicitis. Mr. Whitridge, who was responsible for lifting the Third Avenue system out of receivership into a paying system, and whose recent controversy with the labor unions during the car strike brought him into prominence, was born in New Bedford, Mass., on Aug. 8, 1852. He was graduated from Amherst College in 1874 and in 1877 received a master of arts degree from the same institution. Mr. Whitridge was admitted to the bar of New York in 1879; and after that time practised in New York, devoting part of his time to lecturing at Columbia University on administrative law and constitutional and political history. In 1906, on the occasion of the coronation of King Alfonso of Spain, Mr. Whitridge represented the United States as special ambassador. The work of rehabilitating the physical property of the Third Avenue Railroad, which Mr. Whitridge directed as receiver of the company until he became president in 1912, is well known through the articles which have appeared in the *ELECTRIC RAILWAY JOURNAL* from time to time. While Mr. Whitridge was receiver of the Third Avenue Railroad his frequent tilts with the Public Service Commission of the First District enlivened the proceedings before that commission and his correspondence with that body was voluminous. This correspondence Mr. Whitridge subsequently published at his own expense. Besides being an author of numerous pamphlets, Mr. Whitridge wrote several books on legal, historical and other subjects, including one on the present European war. He received a degree of LL.B. from Columbia University in 1878 and in 1909 Amherst College, his alma mater, conferred on him a degree of LL.D. Mr. Whitridge was a director of many corporations besides the Third Avenue and its subsidiary companies. His funeral was attended by some 300 employees of the Third Avenue Railway, and a number of men very prominent in public life were among those who acted as honorary pallbearers. A resolution of sympathy and regret at Mr. Whitridge's death was drawn up at a meeting of the board of directors of the Third Avenue Railway held on Jan. 3.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Berwyn, Ill.—The Chicago & West Towns Railway has received a franchise from the City Council of Berwyn to construct three new crosstown car lines on Harlem, Ogden and Ridgeland Avenues.

Taylor Springs, Ill.—The Southern Illinois Light & Power Company has received a franchise from the City Council of Taylor Springs to construct a line to the American Zinc Company's smelter.

Columbus, Ohio.—The City Council of Columbus granted a new twenty-five-year franchise to the Columbus Depot Company on Dec. 26 to cross a number of streets and erect a depot and union terminal station. The company will have until 1919 to complete the work. Town, Front, Rich, Walnut and Wall Streets are to be crossed with tracks and switches.

Miami, Okla.—The Oklahoma & Northern Traction Company has received a franchise from the City Council of Miami to construct a line on Vine Street for passenger traffic and a line on Short Street for freight traffic. F. M. Overlees and Richard Flood, Bartlesville, are interested. [Dec. 23, '16.]

***Union, S. C.**—Application has been made to the City Council for a franchise to construct an electric railway in Union. E. F. Kelly, B. F. Kennedy and A. C. Kennedy, Union, are interested.

Salt Lake City, Utah.—The Emigration Canyon Railroad has asked the Council for a franchise to construct an extension to the mouth of Big Cottonwood Canyon and thence up the canyon.

***Hampton, Va.**—H. R. Booker, Nelson D. Groome and H. H. Holt have received a franchise from the City Council to construct a line from Mallory Avenue to the city limits of Hampton.

TRACK AND ROADWAY

Montgomery Light & Traction Company, Montgomery, Ala.—A report from the Montgomery Light & Traction Company states that it will construct an extension from Pickett Springs to Wetumpka, 9 miles, during 1917.

Fort Smith Light & Traction Company, Fort Smith, Ark.—During 1917 this company will construct 1 mile of new track.

Peninsular Railway, San Jose, Cal.—Work will be begun in February by the Peninsular Railway lowering the tracks on its Alameda branch. It is estimated that the cost will be about \$100,000.

Connecticut Company, New Haven, Conn.—Work has been begun by this company laying tracks on the new Stratford Avenue bridge, at Bridgeport. A temporary track is being laid on the northerly side of the bridge, which will be replaced with permanent rails later when the bridge is in use. On the southerly side the company will lay permanent tracks, and while these are being laid the cars will use the temporary tracks.

Valdosta (Ga.) Street Railway.—A report from the Valdosta Street Railway states that the company expects to begin construction of 3 miles of track in February or March.

Caldwell (Idaho) Traction Company, Ltd.—This company reports that during 1917 it expects to electrify the line between Caldwell, Greenleaf and Wilder, 10.3 miles, leased from the Oregon Short Line and now operated with steam.

Pekin City Municipal Railway, Pekin, Ill.—A report from the Pekin City Municipal Railway states that it will construct 2 miles of new track during 1917.

Springfield (Ill.) Consolidated Railway.—A proposition for placing all overhead wires in underground conduits, to be owned by the city and to be leased to the public utility companies, has been submitted to the City Council by A. D. Mackie, general manager of the Springfield Consolidated Railway. The cost of the installation of conduit system is estimated at \$390,000.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will construct an extension during the coming spring to the plant of the Premier Motor Corporation near Brookside Park. The exact route has not been announced but will be submitted to the Board of Public Works in the near future.

Mason City & Clear Lake Railroad, Mason City, Iowa.—This company reports that it will construct 7 miles of new track during 1917.

Arkansas Valley Interurban Railway, Wichita, Kan.—This company has applied to the Public Utilities Commission of Kansas for authority to issue \$2,000,000 additional in bonds and \$900,000 additional in capital stock for the purpose of making extensions into other counties, including Sumner, Butler, Cowley, McPherson, Marion, Rice, Saline and Dickinson.

Brantford (Man.) Municipal Railway.—A report from the Brantford Municipal Railway states that an extension of about 2 miles may be built during 1917.

United Railways & Electric Company, Baltimore, Md.—The Public Service Commission of Maryland has passed an order authorizing the United Railways & Electric Company to construct a new car line out Liberty Heights Avenue to Berwyn Avenue, and has approved the company's plans for the new route. The new line will make connection with the Garrison Avenue line and another line to enable passengers to reach Howard Park and Gwynn Oak.

Boston (Mass.) Elevated Railway.—This company will construct new rails in Salem Street from the Faulkner school to Broadway.

Lawrence, Mass.—A contract has been awarded by the Lawrence Bridge Commission to Joseph Wagenbach & Son, Lawrence, at \$19,987, for the construction of 1500 lineal feet of double track on the Central Bridge across the Merrimack River in Lawrence. [Dec. 16, '16.]

Milford, Attleboro & Woonsocket Street Railway, Milford, Mass.—A contract has been awarded by the Milford, Attleboro & Woonsocket Street Railway to F. T. Ley & Company, Springfield, for the construction of a new bridge at Franklin at a cost of about \$5,000.

Berkshire Street Railway, Pittsfield, Mass.—The Public Service Commission of Massachusetts issued an order Dec. 30, 1916, requiring the Berkshire Street Railway to complete its Lee-Huntington line for service on or before July 1, 1917.

Springfield (Mass.) Street Railway.—The lines of the Springfield Street Railway west of the Connecticut River are being equipped with the sectional three-wire system in an attempt to mitigate electrolysis.

Worcester (Mass.) Street Railway.—This company has received permission from the Board of Aldermen to construct an extension in Greenwood Street, Worcester, to the Millbury line.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—It is reported that the Omaha, Lincoln & Beatrice Railway will let contract early in the spring of 1917 for the construction of an extension from Lincoln to Omaha, via Have-lock, Greenwood, Ashland, Papillion and South Omaha, about 50 miles, including the construction of pile and steel concrete bridges.

Fallon (Nev.) Electric Railroad.—This company, which is building a line from Fallon to Sand Springs, 38 miles, states that during 1917 it expects to build a line from Fallon to Stillwater, 4 miles. [Nov. 25, '16.]

Brooklyn (N. Y.) Rapid Transit Company.—Work will be begun during March by the Brooklyn Rapid Transit Company on the construction of an extension of the Metropolitan Avenue line. The line will extend from St. John's Cemetery, in Middle Village, through the Forest Hills section and thence to Jamaica Avenue, Richmond Hill.

International Railway, Buffalo, N. Y.—This company has completed its new double-track line on Bailey Avenue, between East Ferry and Genesee Streets and Broadway and William Street. One track has been laid between William and Clinton Streets and cars are now being operated over this new route, a distance of more than two miles. Tracks have been laid between Clinton and Seneca Streets, and service over the line between Broadway and Seneca Street will be started within the next few weeks.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—This company plans to lay a double track along College Avenue, from Roe Avenue north to West Thurston Street, at which point a new single-track line is to be laid along Thurston Street to Westside Avenue, where it will be united with the present tracks.

New York State Railways, Utica, N. Y.—The president, trustees and citizens of Whitesboro have filed a petition with the Public Service Commission of New York asking that the New York State Railway be required to reconstruct its tracks through the village, the present track construction being too light and inadequate.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Public Utilities Commission has authorized the Northern Ohio Traction & Light Company to issue \$1,000,000 additional stock, from the proceeds of which a number of improvements will be made.

Cleveland (Ohio) Railway.—This company plans to construct tracks on the new Detroit-Superior high-level bridge at a cost of about \$135,000.

Columbus Railway, Power & Light Company, Columbus, Ohio.—This company has proposed to build a line on Eleventh Avenue from Fourth Street into and past the State Fair Grounds to connect with its Linden line, if the city will accept \$5,000 as its proportion of the cost of eliminating the Big Four Railroad grade crossing. The Council asked the company to pay \$20,000. The Chamber of Commerce recently passed a resolution requesting the Council to accept the company's offer.

***Middlefield & Lockwood Traction Company, Middlefield, Ohio.**—The Public Utilities Commission of Ohio has authorized this company to issue \$100,000 of common stock and \$200,000 of bonds for the purpose of constructing a line between Middlefield and Lockwood, 12 miles, which will be operated by the Eastern Ohio Traction Company. This will connect Cleveland and the Youngstown district.

Sand Springs Railway, Tulsa, Okla.—It is reported that the Sand Springs Railway has awarded a contract for the double-tracking of its line from Sand Springs to Tulsa.

Tulsa (Okla.) Street Railway.—This company was stopped by an injunction issued by the District Court at Tulsa when it attempted to lay its tracks across the new \$200,000 bridge built by Tulsa County, across the Arkansas River at Tulsa. The traction company had laid 500 ft. of track on the approaches to the bridge when the injunction was granted. Tulsa County Commissioners have laid down certain rules and conditions that must be met by any traction company which desires to use the new bridge. The public authorities contended that the company was not meeting these requirements.

Tulsa (Okla.) Traction Company.—It is reported that construction has been begun by this company on its proposed extension to Sapulpa. All material for the new line has been purchased and contracts that have been let call for a completed road that will permit the operation of trains from Tulsa to Red Fork.

Montoursville (Pa.) Passenger Railway.—This company reports that in the spring it will construct 1½ miles of new track in Loyalsock Township and in Montoursville.

Philadelphia, Pa.—According to an unofficial announcement, the public hearing before the Public Service Commission of Pennsylvania on the application of Director Twining for a certificate of convenience for the Byberry trolley line will be held in Philadelphia during the week of Jan. 8. The Byberry line, for which \$1,200,000 has been appropriated, is designed to extend from Frankford and Oxford Avenues, along Oxford Avenue, Castor Road, Bustleton Avenue, Worthington Road and Southampton Road to Byberry and Beusalem Pike, in the Thirty-fifth Ward.

Dallas (Tex.) Consolidated Street Railway.—This company has announced its readiness to begin improvements on Tremont Street from Beacon Street to Fulton Street, as ordered by the City Commissioners of Dallas. The company will relay its tracks with 90-lb. T-rails, the work to be completed early in February.

Grays Harbor Railway & Light Company, Aberdeen, Wash.—Petitions asking the construction of a line between Grays Harbor and Willapa Harbor will be presented to the officials of Grays Harbor Railway & Light Company at an early date by the Grays Harbor Realty Association.

***Tacoma, Wash.**—President D. D. MacKay of Whitworth College, Tacoma, backed by business men of Spokane, is heading a committee which will petition Louis W. Hill, president of the Great Northern Railway, to construct a street railway line from Whitworth College to Spokane, to supplant the present jitney service. President MacKay states the college has an offer from one railroad company that if the college will obtain the roadbed and lay the rails, the company will take care of the operation of the line. The estimated cost of constructing the line has been placed at \$20,000.

Wisconsin Railway, Light & Power Company, La Crosse, Wis.—This company reports that during 1917 it expects to double-track and reconstruct some of its lines.

SHOPS AND BUILDINGS

Pacific Electric Company, Los Angeles, Cal.—Work has been begun on the construction of new carshops for the Pacific Electric Railway at Torrance. Fourteen buildings will be constructed at this time, these constituting the first and principal unit of a group that will eventually include thirty or more structures. As soon as the need for expansion arises, a second unit comprising six structures will be erected adjoining the first group. The new buildings, equipped, will cost over \$500,000, and all plans are made so that the plant can be doubled at any time without any impairment of efficiency while the construction work is going on. Recreation grounds, including a baseball field and tennis courts, will be provided for the employees, and the entire surroundings made as agreeable as possible.

Connecticut Company, New Haven, Conn.—This company will reconstruct and extend its carhouse at Waterbury, for which an authorization of \$200,000 has been granted.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has received bids for the construction of station finish for nine stations on the lower portion of the Seventh Avenue subway in Manhattan. The contract has already been awarded by the Commission covering several stations on the northern portion of this line. The stations included in the bids recently received were those between South Ferry and Fourteenth Street inclusive, including two express stations. The low bidder was the Seventh Avenue Construction Company, New York, at \$389,880. Bids had been received for the construction of station finish for the above stations previously. The bids were rejected, however, when question arose as to the incorporation of one of the bidders.

Piedmont & Northern Railway, Charlotte, N. C.—It is reported that plans have been prepared by the Piedmont & Northern Railway for the construction of twelve warehouses to cost about \$100,000.

POWER HOUSES AND SUBSTATIONS

Indiana Railways & Light Company, Kokomo, Ind.—This company has announced that it will enlarge its power house at Kokomo, and plans to install four new boilers of 500-hp. capacity at an estimated cost of \$48,000; a 5000-kw. turbine and necessary auxiliaries at an estimated cost of \$90,000 and additional pumps, heaters and other devices necessary to complete the enlargement of the plant at a cost of \$10,000. The installation of 250 new street lamps at an estimated cost of \$10,000 to \$12,000 is also planned.

Burlington Railway & Light Company, Burlington, Iowa.—This company has received permission from the Iowa Railroad Commission to extend its transmission lines in Louisa and Des Moines Counties.

Manufactures and Markets

Discussions of Industrial Conditions

A Department for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases

Business Announcements

Trade Literature

Steel Tie and Crossing Foundation Business Is Active

Inquiries Very Numerous from All Parts of Country
—Price Increase Probable—High Prices of
Manganese Crossings Stimulate
Crossing Foundation Inquiries

Inquiries for steel ties and for crossing foundations were never before so numerous," according to E. M. Haas, sales manager of the International Steel Tie Company. "These inquiries," he states, "originate with both electric and steam railways. They are not confined to any part of the country nor to large or small roads but are diversified as to location and size of property. One reason for the inquiries is the anticipation of an increased price in the spring and because a great many roads were sufficiently fore-handed to order rails far in advance for the 1917 construction season."

STEEL TIES SOLD AT LESS THAN MATERIAL PRICE

According to Mr. Haas the possible increase in the price of the International twin-steel track ties is due entirely to the raw material market situation. The International company now has more than \$100,000 worth of raw material in its yards, but a large part of this will be required in fulfilling tie contracts now in hand. This reserve supply of steel was purchased some time ago at 2½ cents per pound. The market is now at 4½ cents per pound, and deliveries are difficult. According to the manufacturer, twin-steel ties are now being quoted at a price below that of the present cost of the raw material, and therefore it appears that when additional material is necessary, the manufacturer will be forced to increase the selling price of the ties. "At present prices," Mr. Haas says, "the use of steel twin-ties, compared with wooden ties, will show a construction-cost saving ranging from \$2,000 to \$6,000 per mile. This proportionately large saving is derived from savings in excavation and in concrete, as well as in the cost of ties. Thus, any slight increase in the first cost of the steel tie will not greatly affect the initial and final economy.

CROSSING FOUNDATION BUSINESS DEVELOPING FAST

"The unusually high range of prices for special track work and particularly crossings in which manganese steel is used has brought about more active recognition of the value of stable crossing foundations. This condition has accelerated the sale of the International crossing structures. The roads have found, for example, that by combining an ordinary built-up crossing with the International steel crossing foundation, the life and cost of the unit, installed in situations where the life of the crossing is limited by the bolt breakage, compares favorably with that of the installation of a manganese steel crossing. The reason for the economy is the large bearing area of the International foundation. This, in combination with a built-up crossing, affords a bearing area much larger than that of a widely spread manganese steel crossing. Moreover, bolt breakages are practically eliminated by the unit support given to the composite crossing frogs."

Favorable service reports on six International crossing foundations installed by the Los Angeles Railway, where it crosses the Santa Fé Railroad tracks, have resulted in orders for the construction of other foundations which will be used by the Santa Fé for steam-over-steam crossings. It is pointed out by Mr. Haas that in this way the Santa Fé System will be able to watch the crossing foundation performance and have entire say about its maintenance. They will thus be able to determine the actual cost. The Pennsylvania Railroad also has installed six of these founda-

tions in Indiana and Ohio. Some of these have been down three years, and the results are so favorable that the engineering department of the road is said to have appointed a committee of division engineers to keep track of the performance of these crossings and to report for the benefit of the entire Pennsylvania System.

Adaptation of Compressed Air to Door and Step Control

T. W. Casey Discusses in Detail the Advances Made
in the Various Branches of This
Highly Specialized Art

In a recent interview, T. W. Casey, vice-president of the National Pneumatic Company, discussed the remarkable development during recent years of pneumatic door and step control for electric railway cars.

When the company brought out its first pneumatic engines for operating car doors, in 1905, it was already doing a large business in air operators for elevator doors. The air-operated car door was considered applicable only to heavy rapid-transit service like the New York subway, where it was obviously impracticable to operate center doors rapidly by hand when the guard was stationed on the end platform. These engines lacked a number of the features that are in use to-day, such as the cushioning feature, the releasing feature which prevents passengers from being caught in the doors, means by which doors may be opened at one rate of speed and closed at another; means by which only a practically negligible amount of air is used—as well as numerous detail improvements, such as continuous lubrication regardless of weather conditions, etc.

The use of air-operated doors in heavy rapid-transit service showed such a clear gain in reducing the standing time of the cars at station stops that progressive operators began to see its advantages for operation on surface cars. This was particularly true of applications to lines with congested traffic and short headways, where the burdens imposed upon the motorman and conductor are so great that any automatic device that enables them to handle passengers faster and more safely is worth consideration.

It would seem a very simple problem to work out air-operated doors, and steps interconnected therewith, for practically universal application. Nevertheless, almost every city has a combination of needs that calls for important variations whose successful invention and application demands the services of men who are specialists in pneumatic devices. As examples of diverse conditions one may name the Bay State Street Railway, where both left-hand and right-hand operation are required; the New York Municipal Railway, where it is necessary to operate from one to six doors; the Pontiac Interurban Division of the Detroit United Railway, where the doors must be capable of being operated from any part of the car; and the Detroit city lines, where the air consumption of the engines must be so low that it will not interfere with the storage-air-brake operation unique to Detroit.

The National Pneumatic Company's engineers have been obliged to develop not only the design but in many cases the tools for securing that exactitude of manufacture that is essential to a pneumatic device called upon to operate hundreds of times a day under very severe conditions.

It is now recognized that air-operated doors and steps not only fulfill the function of greater safety but they make possible higher schedule speeds, permit the conductors to collect fares under easier conditions, allow the mechanism to be operated with scientific uniformity and ease, and, in general, enable the car to produce more revenue car-miles a day than had been hitherto possible.

Among the cities where this company's air-operated door and step control is used may be named New York, Brooklyn, Boston, Cleveland, Detroit, Schenectady, Utica, Syracuse, Ottumwa, Indianapolis, Haverhill, Toledo, Denver and Pasadena. These installations cover practically the whole range of electric railway service. Judging from the large number of equipments ordered during 1916, Mr. Casey feels that the time is not far distant when practically all new cars and a very large proportion of existing cars will be fitted with pneumatic door and step control.

Copper Value Contends with Iron for First Place

A total of over \$100,000,000 in dividends was paid out of the mines of five Western States in the year 1916, according to a recent report of the Geological Survey to Secretary Lane, just made. "Never before," said Mr. Lane, "has so large a draft been made on the natural resources of our country as during this year, and never before have the metals been extracted from these ores with less waste or utilized to better advantage in advancing the general prosperity of the country. Even as written in the plain figures of 1916 production, the wonderful record of our mines sets forth a degree of national industrial independence only hoped for a few years ago.

"Again copper stands out as the best illustration of how American mines can meet a world demand. The output of nearly 2,000,000,000 lb. of the red metal is double that of ten years ago, and its value is twice that of the copper produced in 1915. Add to this the facts that in value copper now contends with iron for first place among the metals, and that together the amount of these two metals produced last year had a value of more than \$1,000,000,000, and we have a measure of what this country can contribute in useful metals.

"The output of zinc for domestic ores increased last year 95,000 tons, which makes a new record for that metal, the total value of spelter from United States ore being \$150,000,000. Lead also shows a large increase, the \$75,000,000 output being a gain of more than 50 per cent.

"Another mineral product which furnishes an index of business conditions is cement, the 1916 production of which is estimated to be 5,000,000 bbl. in excess of the output of the previous year, while the shipments were even greater, aggregating 94,500,000 bbl.

"These advance statements not only show that 1916 marks a new advance for the mineral industry of the country, but this remarkable increase promises to be approximately 25 per cent over the 1915 production."

Rubber Covered Wire Market a Puzzle Market Hard to Analyze—Manufacturers Crowded with Orders—No Fixed Price for Bare Wire —No Hope for Lower Prices

The market situation for rubber covered wires and cables is most difficult to analyze so far as the future is concerned, and according to manufacturers it would be unwise to hazard a guess as to how long the present condition will continue. The operation of the law of supply and demand under the present situation is influenced by many uncertain factors, and also it is generally admitted that the output of copper for the first half of 1917 is practically all under contract. Even if orders for war munitions were curtailed, that could not affect the wire and cable industry for months to come. Manufacturers' books are crowded with orders for deliveries which will run well into 1917, and these orders were taken and the copper contracted for at prevailing prices.

There is no fixed price for bare copper wire. It is altogether a matter of bargaining between buyer and seller, and the price is largely determined by the necessities of the buyer. Bare copper wire in substantial quantities for immediate delivery, or even for delivery in the near future, is not to be had. That manufacturers are paying premiums to expedite deliveries and are placing orders for shipments five

and six months hence is also true, as well as that purchasers who have in the past followed the policy of holding up requisitions in the hope of lower prices now find themselves obliged to cover their needs in a much higher market. "The Wire Message," published by Habirshaw Electric Cable Company, Inc., and the Electric Cable Company, commenting on the foregoing situation, says that it "can see nothing in the copper situation to justify the hope of lower prices in the near future. On the contrary there are many indications that point to higher values."

Electrical Production for 1916 Passes Half-Billion Mark

At no time in the history of the world has industry been carried on so tremendously as during the twelve months of the year that has just passed. The new year is ushered in to the music of a record of production difficult not only to surpass but even to equal. In this flood of business prosperity the electrical industry was swept along with the leaders. Electrical manufacturers and agents have produced and sold to the last ounce that was physically possible, and yet the market is unsatisfied. The production of electrical goods in 1916 went beyond the \$500,000,000 mark, while the unfilled orders at the beginning of 1917 were probably well over \$200,000,000. There was placed, therefore, in 1916 a volume of orders for electrical equipment of \$750,000,000, a most stupendous total for an industry that has practically grown up within the present generation.

With one or two exceptions the orders placed in 1916 were not particularly large. In the first few days of 1916 a \$1,000,000 order was placed for the electrical equipment of a steel mill, and in the last few weeks of the year a prominent holding company placed a \$1,000,000 contract for electrical equipment for its various plants. As a rule, however, the orders were not of a size to create comment.

On the other hand, there was a marked tendency toward the purchase of units larger than ordinary rating. Orders were received for a number of 15,000-hp., 12,000-hp. and 8000-hp. motors. The 15,000-hp. size is the largest ever built. Turbo generator sets passed the 60,000 hp. mark early in the year, when a 73,000-hp. set was ordered for one of the largest urban railways in the country. There have been other orders for sets in the neighborhood of 50,000 hp., which rating was unattained until a few months previous to the placing of the order for the 73,000 hp. set.

ROLLING STOCK

Toronto (Ontario) Railway, Toronto, Canada, is reported on Dec. 28 to have lost 130 cars in a fire which totally destroyed its carhouse.

International Railway, Buffalo, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, as having ordered twenty double-end center-entrance cars from the G. C. Kuhlman Car Company has specified the following details for this equipment:

Seating capacity.....63	Destination signs.....Hunter
Weight (car body only) 27,000 lb.	Fenders or wheelguards.....
Bolster centers, length 32 ft. 0 in.	Locomotive Patented
Length of body.....43 ft. 10 in.	Gears and pinions.....GE Grade M
Over vestibules.....53 ft. 7 1/4 in.	Gongs.....12 in. Dedenda
Width over sills—	Hand brakes.....National
Over all.....8 ft. 8 1/4 in.	Heaters.....Consolidated
Height, rail to sills 2 ft. 10 3/8 in.	Headlights.....GE Luminous
Sill to trolley base.....9 ft. 3 in.	Journal boxes 4 1/4 in. x 8 in. MCB
Body, wood or metal.....Semi-steel	Motors, types and number.....
Interior trim.....Mahogany	4 GE 203
Headlining.....Nevasplit	Motors, suspension.....Inside
Roof, type.....Arched	Paint.....Acme System
Underframe.....Metal	Registers.....New Haven Square
Air brakes.....Westinghouse AMM	Sanders.....Westinghouse
Axles.....5 in. and 6 in. EB.	Sash fixtures.....Brill
Bumpers.....Hedley Anti-climbers	Seats, style.....
Cables.....Flexible	Transversible head roll
Car trimmings.....Chocolate brass	Seating material.....Fabrikoid
Conduits and junction boxes.....	Springs.....Brill
Crouse-Hinds	Step treads.....Feralun Safety
Control, type.....GE, PC.	Trolley catchers or retrievers.....
Couplers.....Tomlinson	Earl No. 10
Curtain fixtures.....	Curtain Supply-Rex
Window fixtures.....	Trolley base.....US 14
Ring 1 in. roller	Trucks, type.....Brill MCB-2
Curtain material.....Pantasote	Varnish.....Valspar
Door operating mechanism.....	Ventilators.....Brill Exhaust
Consolidated	Wheels.....30 in. rolled steel, 3 in. tread 3/4 in. flanges

Toronto (Ont.) Railway, Toronto, Canada, lost 130 cars in a disastrous fire which totally destroyed the King Street carhouse on the Don River and caused a loss of about \$500,000. Of the equipment destroyed, one-third consisted of palace cars, the remainder being cars of other types. The King Street division will be operated temporarily from the Front Street carhouse and cars from the different divisions will be drawn to provide an adequate service. It is reported that the loss will be fully covered by insurance.

East St. Louis & Suburban Railway, East St. Louis, Ill., and not the Columbus (Ohio) Railway, Power & Light Company, as was noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 23, is said to be in the market for five city cars and three interurban cars. It was stated that this company was planning to rebuild forty-five cars in its own shops, but these plans have been changed. The company now plans to have new car bodies built by the American Car Company, making use of the hardware and equipment from the old cars as far as possible.

TRADE NOTES

Trolley Supply Company, Canton, Ohio, has received an order from the Boston Elevated Railway for 200 Simplex trolley bases for its 100 new cars.

Joseph A. Bower, Philadelphia, Pa., president of the Hale & Kilburn Company, has been elected a vice-president of the Liberty National Bank, New York City.

Robbins & Myers Company, Springfield, Ohio, announces that on Jan. 1, 1917, the Rochester office will be removed to 740 Ellicott Square Building, Buffalo, N. Y. L. Larsen, the present manager of the Rochester office, will have charge of the Buffalo office.

Stanley M. Tracy, until recently Western district manager in the Chicago office of the Driver Harris Wire Company, is now assistant general sales manager at the main office and works of the company, Harrison, N. J.

F. H. Poss became sales manager of the Benjamin Electric Manufacturing Company on Jan. 1. He was formerly Pacific Coast manager for the same company, having opened that office in 1905. Between 1905 and 1912 he also represented the Holophane Company.

American Conduit Manufacturing Company, Pittsburgh, Pa., announces that beginning Jan. 1, M. B. Austin & Co. of 700 Jackson Boulevard, Chicago, Ill., will be its sales agents in Chicago territory for the following products of its manufacture: "Wiremold," the new surface wiring material, and "Wireduct," a non-metallic flexible conduit.

Hensley Trolley & Manufacturing Company, Detroit, Mich., will be represented after Jan. 1 in the New England States by the Frank Ridlon Company, 261 Franklin Street, Boston, Mass. The company feels that its many customers in the New England States will be better taken care of by having a representative in this territory and for this reason they have appointed the above company as exclusive agents.

F. R. Blair & Company, Inc., 50 Church Street, New York, N. Y., announce that on Jan. 1, 1917, H. H. Gildner, who has been chief engineer for the S. K. F. Ball Bearing Company for the last three years, has joined this organization as manager of the Flexite department. Mr. Gildner will make his headquarters in New York and will devote his time to the development and sale of Flexite universal joints and couplings.

Lord Manufacturing Company, New York, N. Y., wishes to correct the announcement made in the *ELECTRIC RAILWAY JOURNAL* of Dec. 30, and advises that the entire business, together with all of the railway devices now manufactured by it, will be taken over and handled after Jan. 1, 1917, by the Horne Manufacturing Company, 50 Court Street, Brooklyn, N. Y. Under the new arrangement manufacturing facilities will be increased and the scope of the selling organization enlarged.

Lumber Prices Show Little Increase.—A recent compilation by the best authorities of the prices of 111 commodities on the New York market compared with only two years ago shows a minimum increase of 19 per cent, a maximum of 476 per cent and an average of 85 per cent, yet the official Government figures show that the lumber manufacturer in 1915 got 10 per cent less per thousand feet for his product

than in 1906. According to R. S. Kellogg, secretary National Lumber Manufacturers Association, the 1916 lumber prices will average little more than those of 1915.

ADVERTISING LITERATURE

General Electric Company, Schenectady, N. Y., has issued bulletin No. 49,300 on single, flat twin and three conductor band-steel armored cables. A number of completed installations are shown and several pages are devoted to data on the different types and grades of armored cable.

Peter Smith Heater Company, Detroit, Mich., has sent out a danger notice in the form of a post card. This card is a warning to operators of hot-water heaters, advising them to test safety valves and to know that the system is open and free to circulate before placing heaters in service.

United Hammer Company, Boston, Mass., is distributing a sixteen-page booklet on Fairbanks' hammers. The regular hammers which are manufactured in sizes of from 25 lb. to 300 lb. are described and illustrated, as are also motor-driven hammers with special treadle and hammers with self-contained countershafts.

Atlas Preservative Company of America, Inc., 95 Liberty Street, New York, N. Y., announces that the company has been reorganized and after Jan. 1, 1917, will be known as the Chipman Chemical Engineering Company, Inc. The company as reorganized will continue the weed-killing business by the Atlas "A" method, and the manufacture and sale of chemicals used in this process will be continued as in the past. Improved manufacturing facilities and additional capital will enable the company to give its customers the highest class service. The staff of the new company, of which R. W. Chipman is manager, will remain the same.

Harvey Fisk & Sons, New York, N. Y., bankers and government bond dealers, have published a 120 page pamphlet, "The Insular Possessions of the United States—The Republic of Cuba," descriptive of the island possessions of the United States, Hawaii, the Philippine Islands and Porto Rico, and of the Republic of Cuba. The book contains chapters on the area and population, products and industries, banks, commerce, finances and bonded debts, also historical notes. The book will be found valuable for reference not only by investors, but also by all persons who wish to be well informed about these island countries.

Railway Utility Company, Chicago, Ill., has issued catalog No. 600 on car ventilation and on the thermometer control of electrically heated cars. The operation of the thermometer control is explained, and wiring diagrams and illustrations of the regulator panel are also given. One section is devoted to Honeycomb and round-jet ventilators which are designed for all classes of cars and buildings. Sections through the different types of Honeycomb ventilators are shown and in addition a summary of tests showing efficiencies are tabulated. The last ten pages show illustrations of these ventilators installed on electric car equipment.

NEW PUBLICATIONS

Applied Electricity for Practical Men. Arthur J. Rowland, McGraw-Hill Book Company. 375 pages, illustrated. Price \$2.

The many books written for the purpose of imparting electrical knowledge without demanding of the reader a considerable acquaintance with mathematics generally have one of two faults. They either attempt to cover the whole range of electricity or they deal too much with principles without giving sufficient knowledge of practical applications. This volume seems well adapted for practical men who expect to make direct application of their information to their daily work with commercial circuits and machinery. It does not touch problems of apparatus design. Pure theory is avoided except as it bears directly on practical matters. The principle stated and the explanations of apparatus offered are given to show the practical application of the theory. Numerical problems are given at the end of each chapter, and these are useful both in teaching the principle and performances of apparatus and also as guides in solving particular problems that may come up in practice. The book should prove very useful for teaching applied electricity in trade and industrial schools, and for helping electrical workers of all kinds.