Electric Railway Journal

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THE NEW ORLEANS MODEL CAR

The new car for New Orleans which is described on another page of this issue stands unique, if such a term can be applied to conservative design, as a combination of practically everything that has fully demonstrated its worth in modern car construction. Naturally, the most prominent feature is the invasion of the South—that stronghold of the wooden car—by an all-steel design. Next in interest is, perhaps, the fact that the weight, 36,100 lb. for a 47-ft. 8-in. car, is one of the lowest that has been recorded. However, that the low weight was not attained by skimping the structure is manifest from the published sizes of the members as well as from the illustrations, which show constructions that remind one almost of steam railroad practice rather than the usages common to city surface cars. One innovation of special importance for electric railways, but which may not be particularly obvious, is the absolute elimination of ornamental painting on the car body—something from which it is well rid. Of course, the painting schemes of recent years have been vastly less objectionable than the "moving van" styles of the earliest days. Yet there has seemed to be no tendency to give up the principle of arraying surface cars in all the colors of the rainbow supplemented with enough perfectly useless information in gilt letters to supply a correspondence school. The start that has been made by New Orleans toward plain, and therefore sensible, painting is most acceptable. In conclusion, the use of end platforms on such a model car may, perhaps, require comment, and it is only fair to the center-entrance principle to say that the "Jim Crow" law of New Orleans practically prohibited its consideration. On the other hand, of course, this is no proof that otherwise the center-entrance would have been used.

AN UNUSUAL "FLYWHEEL EFFECT"

Some years ago when the three-phase locomotive was attracting considerable attention on account of its extensive adoption on the Italian State Railways and elsewhere, quite a little stress was laid upon the way in which stored energy distributes itself in that system. If there are a number of three-phase trains in motion their energy is available to assist the power plant in starting another train. The draft of power by the accelerating train has a tendency to slow down the whole system, reducing the frequency, and for a time the moving trains draw less power and thus relieve the power station. That the same phenomenon appears in the single-phase system and must for the same reason appear also in heavy d.c. systems is indicated by the recent experience of the New Haven road, as described by W. S. Murray. When the heavy extra loads were imposed on the system by the electrification from Stamford to New Haven the peaks of power-plant load which were to be expected in view of the enormous freight trains handled did not materialize. In fact the form of the power-plant load line was improved. This resulted from the lowering of voltage due to heavy draft of current, the voltage dropping suddenly and leaving the operating trains moving at speeds higher than those corresponding to the reduced voltage. Their loads were thus taken off the power station and relieved it to that extent while they were coasting. In this way from different immediate causes, but fundamentally on the same general principle, railway systems employing constant-speed and variable-speed motors act like huge flywheels.

CONFERENCES WITH COMMISSIONS

It is difficult to understand why the Public Service Commission for the First District of New York has been subjected to suspicious criticisms during the last week because Secretary Whitney testified that conferences are often held between the individual commissioners and officers of the public utilities in the district. Perhaps these criticisms can be explained, but not excused, by reference to the dust-covered idea that public service commissions are grand juries to hear testimony against the utilities without permitting them to enter replies. The true function of regulating bodies, as now generally stated, is to act as a mediator between the public and the corporations and not to serve as an *ex parte* tribunal in either direction. It is absurd to suppose that corporation officials have not the same right of presentment of data that is bestowed upon public complainants. Wherein, then, lies the wrong—that the conferences are not public and that some complaints are dropped thereafter? In truth, such objections would betray a most lamentable lack of a proper understanding of commission work—such an understanding as led the engineer of one of the Western commissions recently to say that the informal complaints settled by any commission measure much of the real service being rendered by it. Sixty per cent of the complaints received by this commission are settled by informal conferences with the utilities, and it is stated that the ideal condition would exist if 90 per cent of the work were handled in this way. The saving in time, cost and temper secured by the settling of as many complaints as possible in an informal manner makes the method highly desirable, and the charge or even the suspicion of star-chamber proceedings under this practice betrays ignorance and nothing more.

SPIRIT OF MID-YEAR MEETING

It is but a few days since the American Electric Railway Association met at Washington to count among its speakers two leading members of the House of Representatives, one member of the Senate and the President of the United States; yet, viewed even in the short perspective of a week, it seems clear that this meeting marks a definite step toward a better understanding between regulators and regulated. When the American Electric Railway Association adopted as a body the now-famous Code of Principles it cast off to the last vestige the slough of foolish secrecy with which it had been so long encumbered. It was just as necessary that the chosen representatives of the people should declare themselves with like directness. It was the spirit of publicity and co-operation which prompted the selection of Washington as the meeting place, and it was this spirit which animated the entire convention. It is true that neither the address of the President nor the speeches of Senator Weeks and Congressmen Sherley and Montague bore directly on the specific problems of the electric railway industry. But all of them expressed the spirit of aid instead of enmity, of future co-operation for past antagonism. Each party has cried *Peccavi* and each party has promised hereafter to seek the other's good instead of the other's ill. And what is the panacea? Is it publicity alone, full and frank as that may be? No, the stronger medicine of common honesty, of square dealing, of recognition of mutual obligations is needed as a purge to cleanse both our public and private bodies of the toxins with which they have been too long poisoned. The American Electric Railway Association through its Code of Principles has put itself clearly on record for a clean life in a clean body. May those who have promised to help the business men of the United States show in future a due respect for this declaration by imposing an equally high standard of conduct on the part of the political men of the United States.

NON-UNIONISM A BASIS OF EMPLOYMENT

In clearly establishing the fact that the renunciation of union affiliations may be demanded as a condition of employment, the decision of the United States Supreme Court last week in the Kansas Coercion Statute case has cleared this phase of the labor question in a way that should be of interest to all electric railway officials. The law in question declared that it was unlawful, as a condition for obtaining or continuing employment, to coerce or influence a person to enter into an agreement not to join or remain a member of a labor organization. The downfall of this law now carries with it similar laws in California, Colorado, Connecticut, Indiana, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Oklahoma, Oregon, Pennsylvania and Wisconsin. The abolition of such laws in these states should bring the fact home to all that labor contracts are not wholly one-sided instruments. The trades union theory has always been that the employees had a right to control the acts of the employer but that the employer had no right to place equal or even similar restrictions upon the employees. Justice Pitney declares, however, that just as labor organizations have the inherent and constitutional right to deny membership to any man who will not agree that during such membership he will not accept or retain employment in a company with non-union men, and just as a union man has the constitutional right to decline proffered employment unless the employer will agree not to employ any non-union men, so the employer has the constitutional right to insist that his employees shall refrain from union affiliations during their term of employment. It will undoubtedly come as a surprise to labor advocates that employers have any constitutional rights at all along this line, for they have always been obstinately oblivious of the adage that what is sauce for the goose is sauce for the gander.

FAMILIARITY MAY BREED CONTEMPT

An experienced transportation superintendent recently brought up a point in the matter of discipline which is worth some sober thought by all who are concerned with the direct handling of men. This official found, on taking charge of the platform men on another property, that obedience to orders had become a purely optional affair with them under the late administration. In fact, when the new superintendent demanded obedience as his right, they were astonished. Some very convincing arguments in the form of direct dismissal were required to bring the survivors to their senses. Yet the men themselves had been more sinned against than sinning. The rod of discipline had been wielded so little as to seem a barbarous if not an obsolete instrument.

The trouble was that the previous superintendent had gone too far in fraternizing with the men. He was not content to be with them at an occasional smoker or picnic, but had been "one of the boys" evening after evening at a bowling alley behind a local saloon. Once he had established this intimate acquaintance the men knew his foibles far better than he knew theirs, and when he ventured to issue a disagreeable order he was simply mocked.

We are told that to make Asiatic peoples believe their kings were gods and not mere men, the commonalty were never permitted to see their king eat or drink. The disciplinary officer who wants to keep the respect of his men must also surround himself with just enough mystery to seem more than an ordinary man. The fact that he administers discipline directly makes it undesirable for him to be as familiar as the higher officers may on occasions, as they are not in close daily contact with the men. A reasonable degree of aloofness is not at all incompatible with square dealing. The separate mess for the officers of a ship is not so much a matter of snobbishness as a recognition of the fact that the officers cannot afford to display their frailties before their subordinates. To a certain degree the operating officer of a railway must follow this example, for he, too, is in an organization where implicit obedience means relatively just as much for good service as it does in the army or navy.

THE "BUY IT NOW" MOVEMENT

A prominent steam railroad official, in commenting on the business situation, said recently that if a line was drawn north and south through Chicago for a distance of 200 miles on each side of that city, and each end of the line was then extended west for a distance of 700 miles and the ends of these lines were joined so as to form a parallelogram, it would contain the most prosperous section of the world to-day.

There is no doubt that the farms of the Central West, with a wheat crop of enormous volume and selling at high war-time prices, are in a very strong financial position. This lends interest to the "Buy It Now" movement, launched from Omaha recently through the Associated Press. The campaign has extended to other cities and has attracted very favorable attention from public officials as well as from commercial organizations. The plan is well described by President Wilson, who said in his recent speech at Indianapolis: "I understand that your Chamber of Commerce in Indianapolis is working now upon the motto, 'if you are going to buy it, buy it now.' This is a perfectly safe maxim to act upon. It is just as safe to buy it now as it ever will be, and if you start buying there will be no end to it and you will be a seller as well as a buyer." Governor Capper of Kansas, in referring to the abundant crops in the Central West and the industrial depression in the East, said: "Every dollar wisely spent now tends to enliven business, to start the wheels of idle factories, to give employment to idle men and to feed the hungry. The farmer can not only buy now to better advantage than later, but he can perform a patriotic duty by paying every indebtedness promptly and by purchasing his spring supplies at the earliest possible moment, 'Buy It Now.'" Governor Hammond of Minnesota, another prosperous state, in a recent interview spoke along similar lines.

But the movement is not confined to the agricultural sections of the country. The Baltimore & Ohio Railroad has expressed itself as in full sympathy with such a movement and is showing it by placing an order for 2000 new freight cars, the first order for equipment that has been placed by the company in more than a year. In its official statement it says in part: "We have already purchased $385,000 worth of material in anticipation of our requirements for the next six months and are just about to enter into contracts for $200,000 worth of additional material covering the year's requirements. We suppose this is the most practical way in which we can aid your movement. We are heartily in accord with the work you have in hand."

Each industry and each company must decide for itself how far it can co-operate in a movement of this kind, but if there is to be a revival of industrial activity in this country it will necessarily mean larger gross receipts for the electric railway companies. We realize that each company has many local problems to solve, of which in most cases the best method of increasing fares is the most important, but the old rule should not be forgotten that the best time to make purchases is toward the end of a business depression, because prices are then nearly always lower than can be secured later.

MAKING THE NICKEL GO FARTHER

While the costs of all other elements of railway service have gone up that of electrical energy has gone down. More efficient engines, boilers, generators and distribution systems have effected savings in fuel, floor space, labor and incidentals, off-setting to some extent at least, increases in wages and cost of materials. It has thus been possible to make the cost of the energy for operating a car a small and decreasing proportion of total operating cost, occupying the order of approximately one-seventh of the total. Small as it is, however, it offers one opportunity at present for saving or, as suggested above, for making the nickel go farther in other directions, preferably at present in the line of better dividends.

The unit cost of electrical energy is now about as low as we can reasonably expect to get it, and it is probable that future improvements will take care of increasing unit costs, but not much more. We must then look for further economies in the use of energy rather than in its production. Here is a fertile field as one realizes when he calculates the difference between the energy necessary in overcoming friction in moving a car between two points and that drawn from the trolley. Figures quoted on page 231 of last week's issue showed that rolling friction in freight trains at slow speeds may be as low as 26 watt-hours per ton-mile. On the other hand, an electric street car may often use 150 watt-hours. The difference between these figures is worthy of careful study. It does not all represent waste, however, for a considerable part is incidental to maintaining a reasonable schedule speed with frequent stops.

An energy consumption of 150 watt-hours per ton-mile would occur only in high-speed city service with frequent stops. It might be roughly divided thus: Absorbed by all friction except in brakes and motor losses except resistance, 63 watt-hours, or 42 per cent; absorbed in brakes, 60 watt-hours, or 40 per cent; loss in starting grids, 25 watt-hours, or 16 2/3 per cent, and motor-resistance loss, 2 watt-hours, or 1 1/3 per cent. In heavier service with less frequent stops the energy consumption might be 100 watt-hours per ton-mile, of which friction (including air resistance) might absorb 78 watt-hours; brakes, 15 watt-hours; resistance grids, 5 watt-hours, and motor resistance, 2 watt-hours. These figures, which are approximate only, indicate at a glance the possible lines of improvement. In operation more coasting gives lower speed at brake application and less braking loss, which is roughly proportional to the square of the speed at the instant of application. Quicker acceleration permits the same schedule to be made with more coasting and is thus conducive to saving unless carried to the extreme. This is relatively more important in service with frequent stops. In such service, also, field control of motors is successful in reducing grid losses and permitting more rapid accel-

eration owing to the strong field used in starting. After all, the most tempting opportunity for saving is probably in the line of weight reduction which produces a cumulative effect. When this opportunity has been exhausted there is still scope for ingenuity in cutting down friction.

In this issue of the Electric Railway Journal we print an abstract of a paper on energy saving read a few days ago in Chicago by N. W. Storer. In this he gives data which are of great interest in the light of facts such as those outlined above.

IS PLATFORM WORK "SKILLED LABOR"?

In the Bay State Street Railway arbitration of wages now proceeding at Boston, Mass., perhaps the most important point thus far discussed is whether platform work on a car should be considered skilled labor, in the usual sense of the term. Counsel for the employees' union has devoted many hours to the effort to secure admissions from the company's officials that uniformed men in the car service should properly be classed as skilled laborers, but no such admission is likely to be made for the excellent reason that the duties performed by motormen and conductors, while calling for the exercise of proficiency in the handling of equipment and in relations with the public, do not justify the classification advocated by the union.

Granted that the duties of the motorman call for quickness of perception, intelligence, facility in manipulation, the use of judgment, and some degree of mechanical apprehension, it is none the less true that the rudiments of his occupation can be learned within a comparatively few days and that these duties are, while varied as to time combination, essentially repetitive. As experience is gained, most motormen increase in proficiency up to a point which cannot be predicted as yet for the individual, but which is approximated in sliding scales of wages at from roughly five years to ten years of service, generally speaking. Much is made of responsibility by those who contend that motormen should be classed as skilled laborers, but there is no logical connection between responsibility and skill in craftsmanship, except that the latter may be a help in meeting the former. What is true of the motorman applies to the conductor also, to a corresponding degree. The latter improves with practice, but the acquisition of sufficient knowledge and proficiency to take charge of a car is a matter of a very limited time in comparison with the many months required to learn a trade sufficiently well to be of substantial value as an apprentice, and to become a first-class workman is a question of years compared with the time demanded to become an excellent conductor.

None of these comments is intended to belittle a class of men whose faithfulness to duty, forbearance under trying conditions, adaptability to a service which constantly changes in volume if not in form, and whose patient, helpful work meets a need of the world which calls for ability, physical strength and intelligence in all sorts of weathers and in the face of many obstacles. But there is no blinking the fact that the occupation of a uniformed man on a modern street railway is one which can be passably well performed after a period of training which is one of the shortest required of intelligent workers in modern industry; not as well performed, of course, as after extended experience, but still acceptable enough to warrant putting a man on a car in charge of its passengers or its equipment surprisingly soon after his acceptance as an employee. Counsel for such employees are fond of referring to an electric car as a "highly complex locomotive" operated on the public highways, but while the complexity of the equipment may be admitted, the fact that the motorman's relations to it are almost entirely manipulative tells its own story. We may go so far as to grant that the quality of skill may be attained in the work of both motorman and conductor—skill increasing with time—but the officials of the Bay State company are fundamentally right in refusing to class the work of uniformed men with that of cabinet makers, machinists, masons, plumbers, printers, or other wage earners whose duties require for successful performance long and arduous preparation and whose compensation corresponds to the superior degree of skill of mind and hand demanded by their vocations.

CHANGE COLOR AND SAVE MONEY

A prominent superintendent of car equipment recently stated in conversation that if he was permitted to make an unrestricted choice of the shades of color with which his cars were painted he could save $5 per car at each painting without changing the quality of the work. The point is an interesting one. Of course, the economy is somewhat petty, but during the present lean years in electric railway affairs it can hardly be neglected on this score.

As a matter of fact, on any railway it is quite possible that a change in color might even appeal to the taste of the public more than a retention of the old hues. Indeed, it seems off-hand that there is no known color, except perhaps pink, that is not used for the street cars in at least one of the many cities in the country. Greens and reds, of course, predominate, but blues and browns and yellows have many supporters, and if any certain color can be accepted by the people of one city it is hardly reasonable to suppose that those of another community cannot stand a change to the same color.

In general, the selection of the color scheme for electric cars seems to be one of the few duties that railway presidents are absolutely unwilling to transfer to the shoulders of their less gifted subordinates, but when the president has made a decision regarding a color scheme, the time and effort that have been devoted to it are worth, from an artistic standpoint, exactly nothing. Any other color, if well maintained, would impress the riding public just as favorably, and the impression on the public is, so far as we can see, the only reason for painting cars with anything better than the rough but cheerful red made familiar through its universal use on barns and box cars.

Naturally, this should not be construed as an argument in favor of such a grade of paint for street cars. Electric railways owe it to the communities they serve to provide neat-looking equipment, and to this end the so-called "coach colors" are no doubt necessary because of their body and susceptibility to high finish. On the other hand, the railways are not obligated to make their cars look like the proverbial Joseph's coat. Therefore the cheapest and most durable of the coach colors would be the most satisfactory from the railways' standpoint, and it ought to be as uniformly used for street railway service as is box-car red for freight trains or "Pullman color" for sleeping cars. The opportunity for economy is definite enough, because the prices of the numerous coach colors in general use vary through a range of several hundred per cent, and the steps upward from the undefineable greenish-brown that is known as "Pullman color" through the dull yellows, the greens, the blues and the light reds are sufficient to make the latter prohibitively costly in comparison with the former.

It has been said by one of our correspondents that nothing that a manufacturer could do would cause a railroad, either steam or electric, to make a change from its standard color scheme. This would probably be true if the use of a new color could not be made to show an advantage either in lasting quality or in cost, but when a tangible result can be attained the difficulty of overcoming the railroads' conservatism ought not to be insurmountable. What is needed is that the manufacturers' specialists in color-mixing shall be called upon to point the way toward the least expensive combinations and not be told, as they are now, to make quotations upon colors that are arbitrarily selected without regard for cost or durabiilty.

TREND OF ELECTRIC RAILWAY EARNINGS

In our issue of Jan. 23 we published an abstract of the report just given out by the bureau of fare research on the subject of electric railway statistics for June, July, August and September of 1914. The data submitted only serve to confirm the evident fact that the year 1914, with its accumulating gloom of business and financial depression and the European War, was not conducive to electric railway prosperity. That electric carriers did not suffer more than they did was entirely owing to the necessary character of the commodity furnished by such carriers and the careful administration by their officials.

It may be recalled that this paper, in its issue of Nov. 28, page 1217, compiled the earnings of all companies making public reports for September, 1914 and 1913, and that the result showed a total decrease in gross earnings of 1.4 per cent and in net earnings of 2.24 per cent, or, if Western returns were eliminated on account of meagerness, 0.87 per cent for gross earnings and 1.24 per cent for net earnings. These figures were static, in a sense—that is, the month of September in both 1914 and 1913 was lifted away from the remainder of the months and an analysis made as of those two particular months. The data, however, compiled by the bureau of fare research for the four months of 1914 are in running form. They lack the feature of comparison with the preceding year's results, but they are of value in indicating the trend of gross earnings and operating expenses that led up to the condition in September as analyzed by this paper.

With the returns for June, 1914, as a basis, it can be seen from the bureau's figures that the gross earnings, after a slight expansion with the heavy traffic of July, gradually fell until in September they were only 96.24 per cent of the June amount. Similarly, the operating expenses, after a slight rise in July, by September dropped to 95.11 per cent of the June total. A considerable portion of the decreases was undoubtedly caused by the seasonal variations in traffic. Yet if, as the bureau points out, the earnings for June and July from year to year are substantially equal to those of August and September, the two middle months being most affected by these seasonal variations, then it seems that in this section of 1914 certain depressing influences were at work, for the returns of the last two months failed to keep up to the stated standard of the first two months. This is not at all surprising, however, for the increasing tightness of business and finance, the closing down of industrial plants and the cutting off of employee traffic that followed the outbreak of the European War in August may justly be considered to have retarded the seasonal traffic that might logically have been expected in August and September.

What, then, do the data really show? Simply that the static condition given by this paper for the month of September was mostly a result of influences which, beyond the control of the electric railways, accumulated the decreases in gross and net earnings over a period of at least four but particularly two months. Incidentally, too, it may be remarked that the statistics bring out the effect upon net earnings caused by slight reductions in gross earnings. Under normal conditions an increase in gross earnings is a greater financial advantage than a proportionate decrease in operating expenses. The reason for this is that a large part of the operating cost is fixed and does not fluctuate in accordance with the amount of business done, so that a greater net return is caused by an extension of the revenue-producing power than by a reduction in expenses. It follows, therefore, that a decrease in gross earnings is more detrimental to a carrier than a decrease in operating expenses; for the latter cannot as a rule be decreased to the same extent and may be simply deferred, with the result that the small margin of profit on which the company is operated and its rate of return may be seriously impaired. This state of affairs is mentioned in the bureau's report, but, as before, we find solace in the fact that the causes are external and not likely to be permanent. It will undoubtedly require time for electric railways to be restored to their former basis of prosperity, but individuals in all sections of the country who are keeping their fingers on the pulse of business are predicting a general revival, from which electric railways, of course, will secure their share of benefit.

New Cars for New Orleans

These Cars Combine All of the Most Modern Developments in Design, Having Fully-Inclosed Platforms, Arched Roofs with Ventilators, All-Steel Construction Except for Wooden Sheathing on Roof and Floor, and a Novel Form of Pressed-Steel Carline Which Fits into the Hollow Side Post

The New Orleans Railway & Light Company has just placed in service a lot of fifty cars of a type which may become standard for this property. The new design constitutes a radical departure from the practice that has heretofore been the rule in Southern cities, as the frame construction is all-steel, only the roof sheathing and floor being of wood. In addition, plain-arched roofs equipped with ventilators have been adopted as well as fully-inclosed platforms without bulkheads. Altogether, the design constitutes an excellent example of the most modern developments in surface-car construction.

As shown in the accompanying reproductions of progress photographs, the construction gives the impression of being much more substantial than usual for standard city service. The desire of the designers to reduce maintenance to a minimum is, in fact, manifest throughout, and the utmost simplicity of construction has been made the rule, filler blocks and other parts that form no essential part of the structure having been rigidly eliminated. The desire to reduce maintenance expense has even resulted in the adoption of two-motor equipments with 55-65-hp motors and 30-in. wheels in preference to four of the so-called baby motors with 24-in. wheels, notwithstanding the fact that the advantages of a low floor were fully recognized by the designers. In this case the cost of up-keep for two large motors was considered to be enough less than that for four small ones to offset the saving in weight and floor height effected by using the latter.

The combination of substantial construction and ease of maintenance at which the designers aimed is exemplified by the post and carline design. Both posts and carlines have been made of pressed-steel members, the carlines fitting into the tops of the posts and being rigidly riveted to them. In consequence the posts and carlines form a series of continuous members extending around the superstructure from one side sill to the other, a construction that has heretofore been used only in connection with light, continuous T-bars.

Notwithstanding this substantial construction, however, the elimination of unnecessary parts and the general utilization of the full strength of the various members has resulted in a total weight of only 36,100 lb. This weight does not include heaters which are not needed in the mild climate of New Orleans, and in comparisons with the weights of other cars an allowance should be made for this. Nevertheless, that the car is of large size for the unusually light weight is shown by the following table of general dimensions:

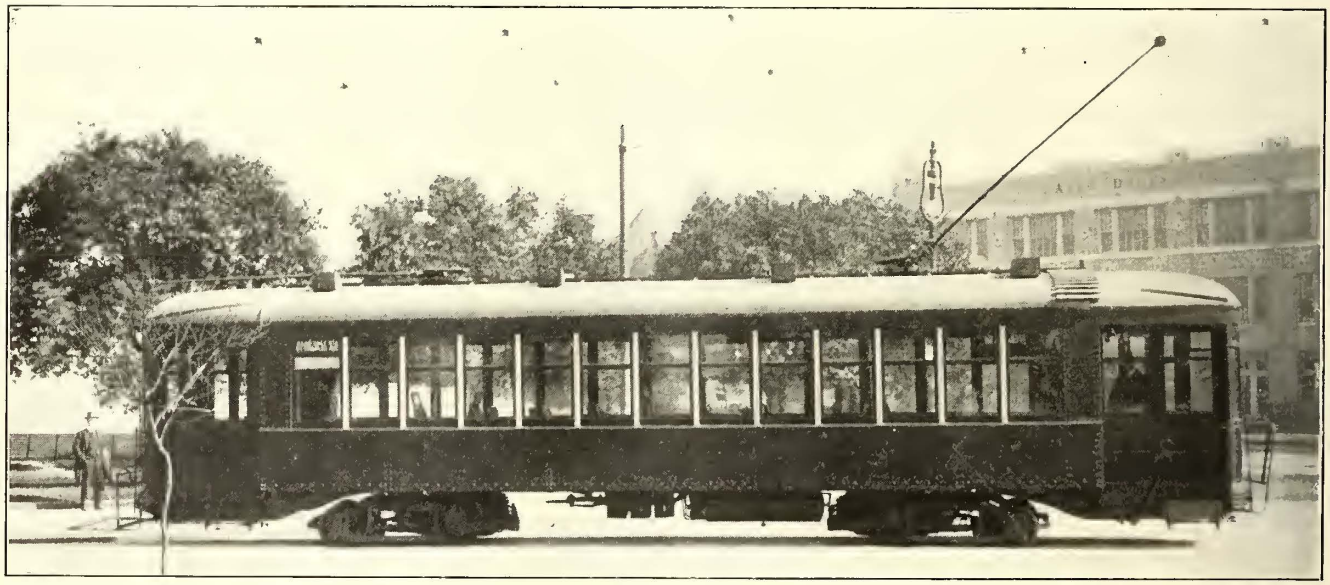
Length over corner posts	34 ft. 8 in.
Length over bumpers	47 ft. 8 in.
Width over all at window rail	8 ft. 7 in.
Width over eave mold	8 ft. 5¾ in.
Height from top of rail to top of trolley board	11 ft. 3⅝ in.
Truck centers	23 ft. 5¼ in.
Wheelbase of truck	4 ft. 10 in.

General Arrangement

The car is provided with eighteen cross-seats of the Walkover type, and there are four stationary longitudinal seats at the ends of the car, each holding four seated passengers, giving a total seating capacity of fifty-two.

To provide accessibility the body has been hung as low as possible over the 30-in. wheels. The first step is 13⅝ in. from the rail level and the second step to the level of the platform is 11 in. A 7¾-in. step brings the passenger to the car floor at the end sill, and a ramp of 3¼ in. extends from this point to the bolster, making the total height of the floor 35⅝ in. above the rail, without passenger load.

The inclosed platforms at both ends of the car are 6 ft. 2 in. long from front of vestibule dash to corner posts, and 7 ft. 3 in. wide over vestibule corner posts. No bulkheads are installed, and the longitudinal seats at the ends of the body provide large floor spaces adjoining the platforms. Three seats on each side of each end of the car are fitted with brass sockets in the seat backs for the reception of the race-division, or "Jim Crow," signs. This arrangement gives flexibility and convenience in allotting the space allowed for colored patrons, who are assigned to the rear of the car re-

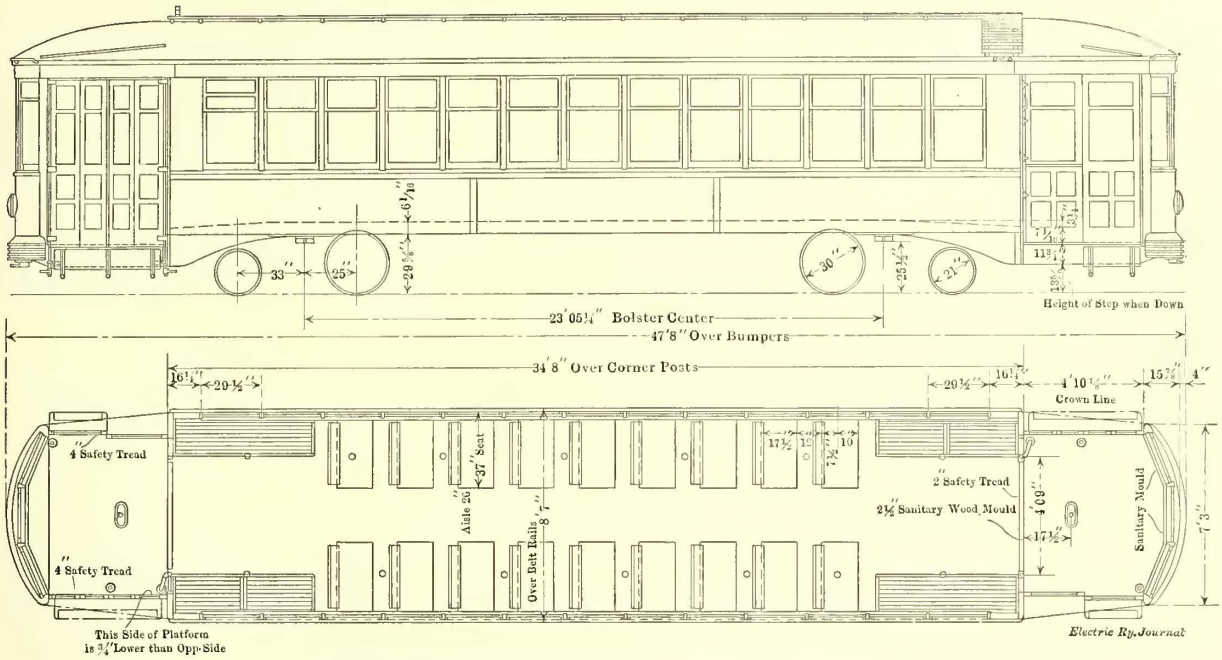


NEW ORLEANS CAR—GENERAL VIEW OF CAR, SHOWING ELIMINATION OF ORNAMENTAL PAINTING

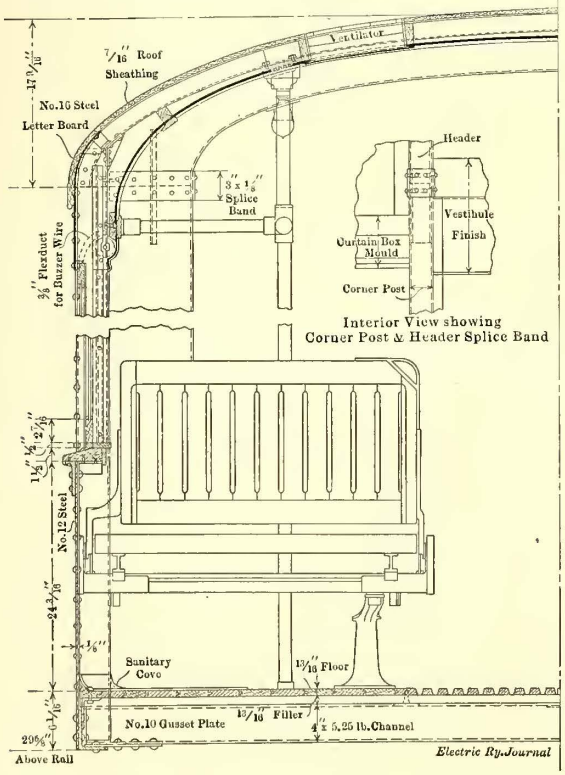
gardless of its direction. The main aisle is 26 in. wide between seat ends and 29 in. wide between seat backs. The aisle space at the longitudinal seats is 57 in.

Each platform is provided with double folding doors on the entrance side and a single sliding door on the exit side. All doors are inter-connected with their respective steps so that upon closure of the door its step is folded simultaneously, Burdette-Rountree mechanisms being used. The entrance or folding doors give a clear opening of 54 in., this opening being divided into entrance and exit portions by the installation of a vertical, white-enameled stanchion approximately in the center of the space. The door operating stand is located on the center line of the car and 11½ in. from the end sill, leaving room for the conductor to stand between it and the end sill. Portable and adjustable seats are furnished for both conductor and motorman.

Enameled stanchions are provided at the entrance archway at the usual bulkhead location and also at the entrance and exit doors. The latter stanchions are so placed as to encourage passengers to take the proper hand hold in boarding and in alighting, and thus accidents arising from this source are minimized. Instead of hand straps in the body of the car, white-enameled tubing is arranged over the longitudinal seats in a horizontal position and in a convenient location for hand holds. The enameled hand-holds and stanchions are coated with a glass-hard material that is baked on at high temperature, these having been furnished by the Ellcon Company.



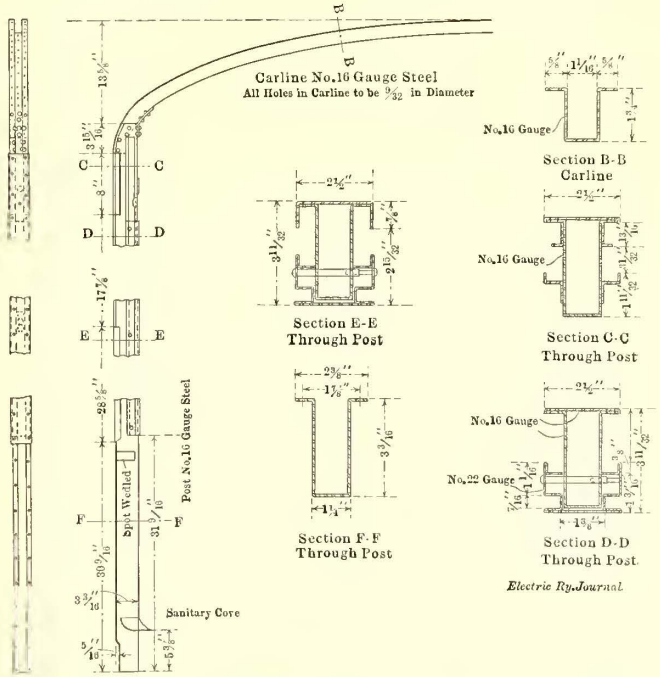
NEW ORLEANS CAR—GENERAL PLAN AND ELEVATION



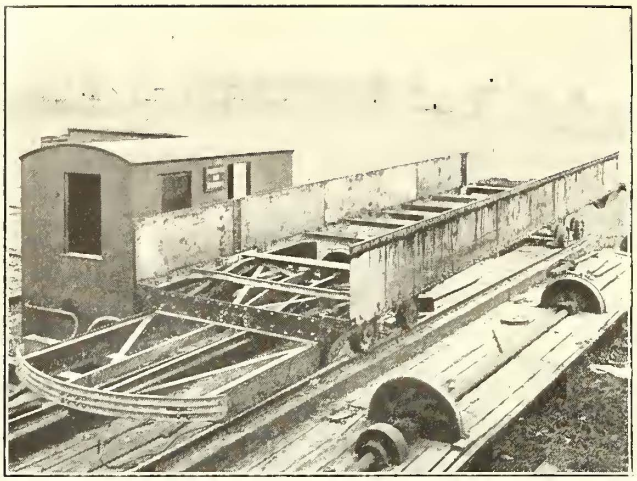
NEW ORLEANS CAR—CROSS-SECTION, SHOWING DETAILS OF SIDE CONSTRUCTION

STEEL CONSTRUCTION

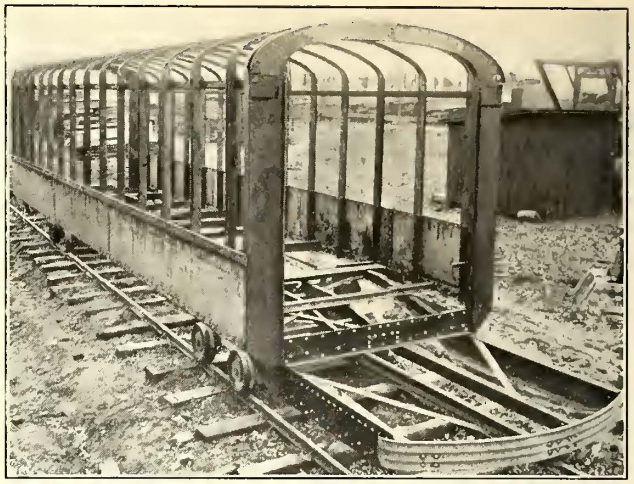
With the exception of floor and roof, the car is built of steel throughout. The underframe consists of two



NEW ORLEANS CAR—DETAILS OF SIDE POST AND CARLINE CONSTRUCTION



NEW ORLEANS CAR—SIDE GIRDERS AND FLOOR FRAMING BEFORE INSTALLATION OF POSTS



NEW ORLEANS CAR—SUPERSTRUCTURE FRAMING, INCLUDING PANELS AND HEADER AT END OF BODY

side-girders made up of No. 12 gage steel plates, which are 30-in. wide and 34 ft. 8 in. long when assembled. The top member of this girder is a 3½-in. x 1-in. x ⅜-in. dropper bar, and the bottom member is a 4-in. x 3-in. x 5/16-in. angle. Two splice plates are introduced in the length of each girder, and reinforcement against buckling is provided at the bolsters by means of 4-in. x 5-in. x ⅜-in. angle and a 4½-in. x 3-in. x ⅜-in. vertical tee, securely riveted to the girder web. The bottom member at the side of each girder is bent inward at the end sill and the two members meet at the center line of the car, where they are spliced together to form the end sills. In addition, a 3/16-in. x 9½-in. plate is securely riveted to the above-mentioned angles and this is reinforced on the bottom with a 3½-in. x 2½-in. x ¼-in. angle.

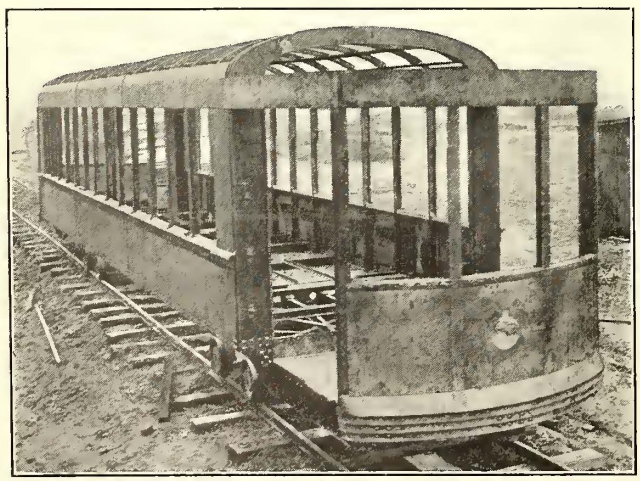
Frequent crossings composed of 4-in., 5.25-lb. channels fasten the two girders together and provide a support for the flooring, and the underframe is further stiffened by the use of diagonal members consisting of 2½-in. x ¼-in. steel bars. Generous gusset plates also are fastened to bottom angle and crossing channels. The top angle of the girder is covered with an oak window rail which also furnishes an arm rest on the inside of car.

The main platform knees are made up of a flat plate of No. 10 gage steel cut in a concave-wedge shape and reinforced on one side by means of 2½-in. x 2½-in. x ¼-in. and 3½-in. x 2½-in. x ¼-in. angles. These platform knees are securely riveted to the end sills and to the cast-steel body bolster, no bolts being used, and the outer ends are riveted to a 7-in. section of channel-shaped Hedley anti-climber which serves in place of the usual crown pieces. The auxiliary platform knees consist of 4-in. channels bent to the proper shape and riveted to the end sill and bolsters.

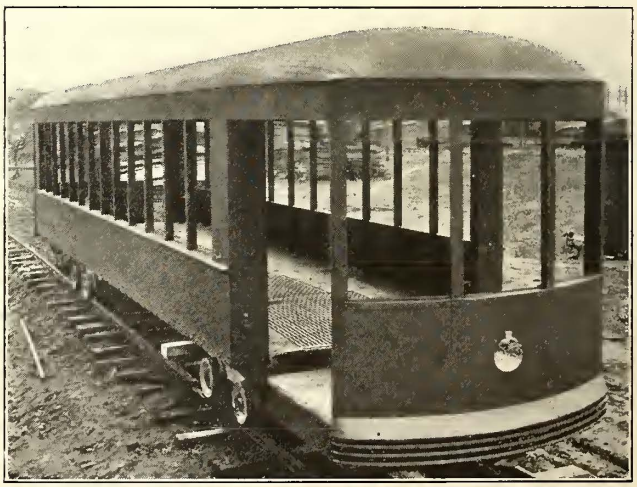
The car posts are unique. They are made of No. 16 gage steel plate which is pressed into a "U"-shape, the flanges of this being securely riveted to the side girder. The outside of each post above the side girder is covered with a No. 16 gage plate that is riveted to the flanges of the "U." The inside of the post is covered with No. 18 gage sheet steel that is molded into proper form to take the rack for the window fasteners and to provide runways for the curtain fixtures. This molding is fastened to the post by means of hollow screws.

The carlines also are composed of pressed "U" shaped sections and they are securely riveted and bolted to the tops of the posts, the carlines fitting inside of the posts and thus forming a practically continuous member extending from one side of the car to the other. The end headers and corner posts consist of pressed steel sections of a deep "U"-shape. These are riveted together at the spring line of the arch of the header and are further riveted to the pier panel which extends between each corner post and nearest side post. The headers are covered with wooden furring strips and the roof boards are through-bolted to these furring strips and to the flanges of the carlines.

The vestibule posts are all of pressed steel, the two



NEW ORLEANS CAR—STEEL FRAMING COMPLETE, INCLUDING LETTERBOARD AND VESTIBULE SHEATHING



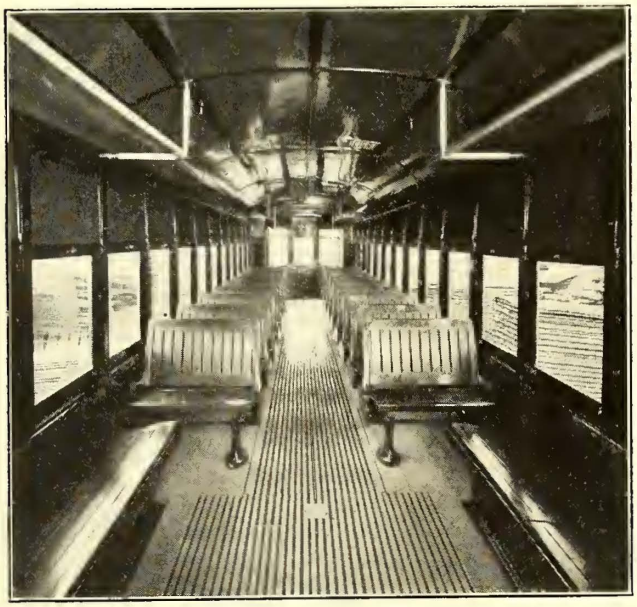
NEW ORLEANS CAR—CAR STRUCTURE COMPLETE WITH FLOOR AND ROOF SHEATHING APPLIED

center posts being made in one section of No. 16 gage steel and the corner vestibule posts in two sections of No. 12 gage steel securely riveted together. These posts are bolted to an angle-iron sprung to the proper radius and fastened to the crown piece. The vestibule is made of No. 16 gage sheets bolted to the outside of the vestibule posts, and there is also a lining plate on the inside of the vestibule posts, which provides pockets into which the sash may lower. The outside of the vestibule is provided with the usual bumper shield.

The letterboard is continuous throughout the whole length of the car body, and it is reinforced between posts with a ¾-in. x ¾-in. x ⅛-in. angle. It is 16 in. wide and is not only riveted to the posts but is bent over onto the arch of the roof and riveted to the carlines to stiffen the roof framing transversely. The vestibule top plates consists of a 2½-in. x 1½-in. x ¼-in. angle continuous from body corner post to body corner post.

Finish and Interior Fittings

The floor consists of tongued-and-grooved yellow pine, laid lengthwise of the car and depressed at the aisle section so that the top of the floor-mat is level



NEW ORLEANS CAR—INTERIOR VIEW

with the top of the floor at the side seats. The floor mats consist of narrow strips of maple screwed to the flooring. The roof consists of ½-in. tongued-and-grooved poplar through-bolted to the carlines and covered with No. 8 canvas duck.

The drip rail is made up of wood and bolted to the letterboard. The canvas of the roof comes down over the upper part of this drip rail and is tacked to it with copper tacks, following steam railroad practice. This drip rail is continuous around vestibules. The curtain box is formed of No. 22 gage steel that is divided into sections each covering one curtain and arranged for ready removal for access to curtains and fixtures.

Headlining has been installed notwithstanding the wooden roof sheathing because of the extreme heat of the summer sun in New Orleans. It consists of 3/16-in. agasote separated into convenient sections, the joints being covered with light cherry molding, and this molding matches the molding which carries the lighting wires through the body of the car. The usual space is, of course, allowed for advertising cards. The bottom sash is arranged to raise so as to give a clear opening of 27½ in. but the top sash is stationary and is fastened to the post caps with screws installed from the outside of car.

The interior finish is dark cherry color throughout, but the headlining is painted light green. The interior of the car has been rubbed down to a dull finish after varnishing and it presents a very neat and attractive appearance, the finish of the steel making a very good match with the woodwork of the seats and moldings. The outside of the car is painted a light olive green, and, as will be noticed in the accompanying illustration, all unnecessary ornamentation has been rigidly eliminated. The only striping or lettering appears on the dash, and this consists of the car number and an aluminum stripe around the edge of the dash plates.

Ventilation is provided by means of eight Railway-Utility suction ventilators. The seats are of the standard Hale & Kilburn No. 300 type, fitted with wooden cushions and backs. A Consolidated push-button system is installed for signaling the motorman. The side curtains are of pantasote fitted with Forsyth Rex type rollers and No. 88 ring fixtures. Motorman's curtains are also installed. Keystone signs are located in the center vestibule sash at each and in the rear side window, the boxes for these signs being made of steel in all cases. Crouse-Hinds headlights and Earle trolley catchers are also provided. A double-fare International register is located at one end of the car and this is operated from either end by means of a register rod installed in the center of the car close to the headlining. The bell cord to the motorman's signal bell is run in conduit above the headlining.

The lighting layout provides four circuits of five lights each, giving a total of twenty 23-watt tungsten lamps. A very neat and convenient arrangement for the light switches is provided by the installation of a switch cabinet in the pier panel of the No. 1 end of the car. The door of this cabinet is flush with the interior trim and it contains all the switches except those for the compressor, the latter being located on the dash convenient to the motorman. The compressor switches are wired in parallel so that passengers on the rear platform cannot inadvertently cut off the compressor circuit.

Weights and Propulsion Equipment

The service conditions under which these cars operate are as follows: Schedule speed 10.8 m.p.h.; average stops per mile, 7.25; average duration of stops, 4.5 seconds; average line potential, 510 volts; rate of accelerating and braking, 1.5 m.p.h.p.s.; average passenger load, 4500 lb. The total weight of the car, fully equipped and ready to run, is 36,100 lb., or 694 lb. per seat. This weight is made up as follows:

Two maximum traction trucks complete with wheels, axles, frame, boxes and brake rigging	10,700 lb.
Electrical equipment on trucks consisting of motors, gears and gear case	5,800 lb.
Electrical equipment on car body, including controllers, cables, circuit breakers, trolley bases, poles, etc	1,400 lb.
Air and hand-brake rigging	1,800 lb.
Car body complete, including all accessories	16,400 lb.

The trucks are of the Brill 39-E, maximum-traction type. They are fitted with 30-in. driving wheels and 21-in. pony wheels, and have a wheelbase of 4 ft. 10 in. The driving axles are heat-treated, association standard, E. B. type, while the trailer axles are of 4-in. diameter and are made in accordance with Pennsylvania Railroad standard. The wheels have the association standard, *B*, tread with ⅝-in. flange and 2½-in. tread. The wheels are of the single plate type and are made of cast iron. The truck bolster is provided with an auxiliary spring placed between it and the elliptical side spring which provides easy riding under conditions of partial load. The journal boxes are of the Brill type and are made of semi-steel.

The car is equipped with two General-Electric 201-I motors of 55-65 hp, the gear ratio being 15-71. The controllers are GE standard K-36-J. All power wiring is carried in conduit. Grade "M" solid gears and pinions are used, the face of gears being 5-in. These are pressed on the axles at approximately 60-tons pressure.

Two electrolytic lightning arresters are provided in connection with the usual kicking coils. Type MR circuit breakers, RG rheostats, U. S. No. 13 trolley bases and GE trolley poles, harps and steel-sided, copper-centered trolley wheels complete the electrical equipment.

The car is fitted with complete straight-air brake equipment consisting of a Westinghouse DIH 16-ft. air compressor, a 16-in. x 60-in. reservoir, a 10-in. x 12-in. brake cylinder and a Type E automatic slack adjuster. The body and truck-brake levers are so arranged as to give a braking pressure of 75 per cent of the load on the pony wheels and 85 per cent of the load on the motor wheels, these pressures being considered to meet the service conditions at New Orleans satisfactorily. Hand brakes arranged with double floating levers and Dayton ratchet-type brake handles are also installed.

Design and Construction

The general features of the new car's design were planned by a committee composed of B. F. Wood, vice-president and chief engineer, United Gas & Electric Engineering Corporation, engineers for the railway; L. C. Datz of the same company, J. S. Pevear, president New Orleans Railway & Light Company, and M. S. Sloan, general manager. The cars were built by the Southern Car Company at High Point, N. C., under the supervision of Bronson A. Smith, engineer for the United Gas & Electric Engineering Corporation.

Northern White Cedar Association

Twenty firms producing white-cedar lumber and poles were represented at the nineteenth convention of the Northern White Cedar Association held at Minneapolis, Minn., on Jan. 26 and 27. L. A. Page, Jr., president of the association, stated in his official address that general business conditions during the last twelve months had worked a severe strain on the white-cedar industry, and that the stagnation produced by the European war will continue to hold up business in all lines for some time to come. A gradual awakening of business is, however, in sight, but when this comes the short pole and post trades would be affected first. A study of pole stocks now on hand indicates an ample supply to take care of the probable demand.

The committee on publicity, of which H. S. Gilkey is chairman, reported that during the year just closed the association has carried on a campaign to interest and instruct users of white cedar. The practice of making exhibits will be extended during the next year to include conventions and local fairs. The report of the secretary, which followed, referred to extensions of freight rates and exchange of credit information among the association members.

The report of the committee on "war on substitutes" for white cedar suggested means of securing closer co-operation between pole producers, distributers and users. The importance of shipping to customers only first-class stock, thereby establishing a standard of excellence for white-cedar products, was emphasized by several speakers. The railroad committee stated that the matter of increasing the allowance for stakes used on open cars was soon to be brought before the Interstate Commerce Commission for a formal hearing.

At the close of the convention the following officers were elected for 1915: President, L. A. Page, Jr., Minneapolis, Minn.; vice-president, H. F. Partridge, Minneapolis, Minn.; treasurer, H. B. Thomas, Manistique, Mich.; secretary, N. E. Boucher, 743 Lumber Exchange Building, Minneapolis, Minn. Directors: J. E. Gerich, Milwaukee, Wis.; M. J. Bell, Minneapolis, Minn.; William Patch, Menominee, Mich., and L. A. Furlong, Minneapolis, Minn.

German 1500-Volt D.C. Line with Regeneration and Battery

The Wendelstein Railway is a mountain line of Bavaria only 9.3 miles long but notable as Germany's first 1500-volt d.c. railway. Of even greater interest is the circumstance that regeneration was adopted in connection with a storage battery, because the output of available hydroelectric power alone falls below the regular energy requirements.

The plant contains one 184-kw and one 330-kw Pelton turbo-set. The larger unit drives a 100-kw, three-phase machine which generates energy at 5000 volts for industrial purposes; it also drives a 200-kw machine which delivers 1500 volts direct current for traction. The smaller or reserve unit may be used as a motor in emergencies, at which time it is operated from another distribution system to drive a second pair of three-phase and d.c. generators. A Pirani set is also used with the storage batteries to smooth out variations in voltage and assist in returning regenerated energy.

The 721-cell storage battery furnished by the Akkumulatoren Fabrik A.G., Hagen, Germany, is of 100 amp-hr. capacity and is the first in Germany to deliver 1500 volts. This battery is divided in two parts, one section being on the ground floor and the remainder on the floor above. The lower section is grounded in the negative circuit of the railway, which gives it a difference of potential of 750 volts against ground. This voltage is easily cared for by the standard insulation of the accumulators. The cells of the other half, however, are doubly insulated against the floor, the walkways also have double insulation, and a stockade of wooden laths extends all the way around the room to prevent contact with the metal trim of windows and walls.

The rolling stock comprises one locomotive and two trailers, accommodating a total of 100 passengers. The two 750-volt motors on the locomotive are of shunt type to permit regeneration and are connected in series. The drive is arranged for both adhesive and rack rail traction. Special resistances are used to absorb regenerated energy should connection with the overhead line be temporarily interrupted. On each motor shaft is mounted a spring brake which may be manually released from the motorman's cab. Air brakes are also used. A regulator automatically applies the brakes and opens the circuit when the desired maximum speed is exceeded. Lighting is furnished at 110 volts from a motor-generator set.

The overhead line is carried at a height of 13 ft. to 16 ft. 4 in., with duplicate vulcanite and porcelain insulators. The line is not carried from either the ordinary bracket or span construction but from a wooden imitation of bridge construction. In other words, an H is formed by three poles, the horizontal member of which is braced by a diagonal connection with each vertical pole. Feeder capacity is furnished by a second trolley wire. Although no catenary suspension is used, tension take-up devices are installed every 980 ft.

The track is of meter gage and is 9.3 miles long. The train starts at Brannenburg 1548 ft. above sea level, and within one hour climbs to a height of 5650 ft. at a point only 262 ft. below the peak of the Wendelstein. Despite tunnels and retaining walls it was necessary to build part of the rock rail sections on a grade of 23.5 per cent.

The President, the Newspapers and the Association

Mr. Wilson's Address Before the Mid-Year Meeting Treated by the Press as an Important Political Message—Verbatim Report of Address with Comments from Leading Newspapers in Different Parts of the Country

The ELECTRIC RAILWAY JOURNAL for Jan. 30 carried an extended report of the 1915 mid-year meeting of the American Electric Railway Association. However, the fact that the meeting was held on Friday, Jan. 29, made it impracticable to publish in full President Woodrow Wilson's address. It was therefore decided to publish this address verbatim in the succeeding issue of this paper. But the remarkably large amount of comment from the daily newspapers also make it worth while to quote in whole or in part a few of the editorials elicited by the President's statement of administration policy. The editorials received to date include newspapers as far west as St. Louis. However, as the full text of the address was distributed by the Associated Press there is every reason to believe that the same degree of publicity was secured in the Farthest West as in the Nearest East.

THE PRESIDENT'S SPEECH

"Mr. President, Ladies, and Gentlemen: It is a real pleasure for me to be here and to look this company in the face. I know how important the interests that you represent are. I know that they represent some of the chief channels through which the vigor and activity of the nation flow. I am also very glad, indeed, to have you come and look at some portion, at any rate, of the government of the United States. Many things are reported and supposed about that government, and it is thoroughly worth your while to come and see for yourselves.

"I have always maintained that the only way in which men could understand one another was by meeting one another. If I believed all that I read in the newspapers, I would not understand anybody. I have met many men whose horns dropped away the moment I was permitted to examine their characters.

"For, after all, in a vast country like this the most difficult thing is a common understanding. We are constantly forming get-together associations, and I sometimes think that we make the mistake of confining those associations in their membership to those who are interested only in some particular group of the various industries of the country.

"The important thing is for the different enterprises of the country to understand one another, and the most important thing of all is for us to comprehend our life as a nation and understand each other as fellow-citizens.

"It seems to me that I can say with a good deal of confidence that we are upon the eve of a new era of enterprise and of prosperity. Enterprise has been checked in this country for almost twenty years, because men were moving among a maze of interrogation points. They did not know what was going to happen to them. All sorts of regulation were proposed, and it was a matter of uncertainty what sort of regulation was going to be adopted.

"All sorts of charges were made against business, as if business were at default, when most men knew that the great majority of business men were honest, were public-spirited, were intending the right thing, and the many were made afraid because the few did not do what was right.

MUST PULL TOGETHER

"The most necessary thing, therefore, was for us to agree, as we did by slow stages agree, upon the main particulars of what ought not to be done and then to put our laws in such shape as to correspond with that general judgment. That, I say, was a necessary preliminary, not only to a common understanding, but also to a universal co-operation. The great forces of a country like this cannot pull separately; they have got to pull together. And, except upon a basis of common understanding as to the law and as to the proprieties of conduct, it is impossible to pull together.

"I, for one, have never doubted that all America was of one principle. I have never doubted that all America believed in doing what was fair and honorable and of good report.

"But the method of control by law against the small minority, which was recalcitrant against these principles, was a thing that it was difficult to determine upon. And it was a very great burden, let me say, to fall upon a particular administration of this government to have to undertake practically the whole business of final definition. That is what has been attempted by the Congress now about to come to a close. It has attempted the definitions for which the country had been getting ready, or trying to get ready, for nearly half a generation. It will require a period of test to determine whether they have successfully defined them or not, but no one needs to have it proved to him that it was necessary to define them and remove the uncertainties, and that, the uncertainties being removed, common understandings are possible and a universal co-operation.

WHAT HURTS ONE HURTS ALL

"You, gentlemen, representing these arteries of which I have spoken, that serve to release the forces of the communities and serve also to bind community with community, are surely in a better position than the men, perhaps, of any other profession, to understand how communities constitute units—and even a nation constitutes a unit—and what is detrimental and hurtful to a part, you above all men, ought to know is detrimental to all and that you cannot demoralize some of the forces of a community without being in danger of demoralizing all the forces of a community.

"Your interest is not in the congestion of life, but in the release of life. Your interest is not in isolation, but in union—the union of parts of this great country, so that every energy in those parts will flow freely and with full force from county to county throughout the whole nation.

"What I have come to speak of this afternoon is this unity of our interest, and I want to make some—I will not say 'predictions,' but to use a less dangerous, though bigger, word—prognostications. I understand that there is among the medical profession diagnosis and prognosis. I dare say the prognosis is more difficult

than the diagnosis, since it has to come first, and not being a physician I have all the greater courage in the prognosis.

"I have noticed all my life that I could speak with the greatest freedom about those things that I did not understand, but there are some things that a man is bound to try to think out, whether he fully comprehends them or not. The thought of no single man can comprehend the life of a great nation like this, and yet men in public life upon whom the burden of a certain degree of guidance is laid must attempt to comprehend as much of it as they can. Their strength will be in taking counsel of as many informed persons as possible in each department with which they have to deal; but some time or other the point will come when they have to make a decision based upon a prognosis.

"We have had to do that in attempting the definitions in law which have been attempted by this Congress, and now it is necessary for us, in order to go forward with the great spirit with which I believe we can go forward, to look ahead and see the things that are likely to happen.

Peers Into the Future

"In the first place, I feel that the mists and miasmic airs of suspicion that have filled the business world have now been blown away. I believe that we have passed the era of suspicion and have come now into the era of confidence. Knowing the elements we have to deal with, we can deal with them; and with that confidence of knowledge we can have confidence of enterprise.

"And that enterprise is going to mean this: Nobody is henceforth going to be afraid of or suspicious of any business merely because it is big. If my judgment is correct nobody has been suspicious of any business merely because it was big, but they have been suspicious whenever they thought that the bigness was being used to take an unfair advantage.

"We shall have to admit that it is easier for a big fellow to take advantage of you than for a little fellow to take advantage of you; therefore, we instinctively watch the big fellow with a little closer scrutiny than we watch the little fellow. But bond having been given for the big fellow, we can sleep o'nights. Bond having been given that he will keep the peace, we do not have to spend our time and waste our energy watching him.

"The conditions of confidence being established, nobody need think that if he is taller than the rest anybody is going to throw a stone at him simply because he is a favorable target—always provided there is fair dealing and real service.

"Because the characteristic of modern business, gentlemen, is this: The number of cases in which men do business on their own individual, private capital is relatively small in our day. Almost all the greater enterprises are done on what is, so far as the managers of that business are concerned, other people's money. That is what a joint-stock company means. It means, 'Won't you lend us your resources to conduct this business and trust us, a little group of managers, to see that you get honest and proper returns for your money?' And no man who manages a joint-stock company can know for many days together, without fresh inquiry, who his partners are, because the stock is constantly changing hands and the partners are seldom the same people for long periods together, which amounts to saying that, inasmuch as you are using the money of everybody who chooses to come in, your responsibility is to everybody who has come in or who may come in.

"That is simply another way of saying that your business is a public business, and you owe it to the public to take them into your confidence in regard to the way in which it is conducted. The era of private business in the sense of business conducted with the money of the partners—I mean of the managing partners—is practically passed, not only in this country but almost everywhere. Therefore, almost all business has this direct responsibility to the public in general. We owe a constant report to the public whose money we are constantly asking for in order to conduct the business itself. Therefore, we have got to trade not only on our efficiency, not only on the service that we render, but on the confidence that we cultivate.

A New Atmosphere for Business

"There is a new atmosphere for business. The oxygen that the lungs of modern business takes in is the oxygen of the public confidence, and if you have not got that your business is essentially paralyzed and asphyxiated.

"I take it that we are in a position now to come to a common understanding, knowing that only a common understanding will be the stable basis of business, and that what we want for business hereafter is the same kind of liberty that we want for the individual. The liberty of the individual is limited with the greatest sharpness where his actions come into collision with the interests of the community he lives in.

"My liberty consists in a sort of parole. Society says to me. 'You may do what you please until you do something that is in violation of the common understanding of the public interest; then your parole is forfeited. We will take you into custody. We will limit your activities. We will penalize you if you use this thing that you call your liberty against our interest.'

"Business does not want, and ought not to ask for, more liberty than the individual has; and I have always summed up for myself individual liberty and business liberty and every other kind of liberty in the phrase that is common in the sporting world—'a free field and no favor.'

"There have been times—I will not specify them, but there have been times—when the field looked free, but when there were favors received from the managers of the course, when there were advantages given, inside tracks accorded, practices which block the other runner, rules which would exclude the amateur who wanted to get in. That may be a free field, but there is favor, there is partiality, there is preference, there is covert advantage taken of somebody, and while it looks very well from the grandstand, there are men whom you can find who were not allowed to get into the track and test their powers against the other men who were racing for the honors of the day.

What New Liberty Means

"I think it is a serviceable figure. It means this, that you are not going to be barred from the contest because you are big and strong and you are not going to be penalized because you are big and strong, but you are going to be made to observe the rules of the track, and not get in anybody's way except as you can keep out of his way by having more vigor and skill than he has.

"When we get that understanding, that we are all sports and that we are not going to ask for, not only, but we are not going to condescend to take advantage of anything that does not belong to us, why then the atmosphere will clear so that it will seem as if the sun had never shone as it does that day. It is the spirit of true sportsmanship that ought to get into everything, and men who when they get beaten that way squeal do not deserve our pity.

"Some men are going to get beaten because they have not the brains; they have not the initiative, they have not the skill, they have not the knowledge; they have not the same capacity that other men have. They will have

to be employees; they will have to be used where they can be used.

"We do not need to conceal from ourselves that there are varieties of capacity in the world. Some men have heads, but they are not particularly furnished. I overheard two men one day talking about a third man, and one of them referred to his head. 'Head?' the other said, 'head? That isn't a head; that's just a knot. The Almighty put that there to keep him from raveling out.'

"And we have to admit that there are such persons. Now, liberty does not consist in framing laws to put such men at the front and say they have got to be allowed to keep pace with the rest, because that would hold the whole process of civilization back. But it does consist in saying no matter how featherweight the other man is you must not arbitrarily interfere with him; that there must be an absolutely free field and no favor to anybody.

The Rules of the Game

"There are, therefore, I suppose, certain rules of the game. I will mention what seem to me some of them. I have already mentioned one of them by way of illustration. First of all is the rule of publicity, not doing anything under cover, letting the public know what you are doing and judge of it according as it is. There are a great many businesses in this country that have fallen under suspicion because they were so secretive, when there was nothing to secrete that was dishonorable.

"The minute I keep everything in my pocket and will not show anybody what is there, they conjecture what may be in my pocket; whereas, if I turn my pockets inside out, the conjecture is, at any rate, dissipated. There is no use inviting suspicion by secretiveness. If a business is being honorably done and successfully done, you ought to be pleased to turn it inside out and let the people whom you are inviting to invest in it see exactly how it is done and with what results.

"Publicity, which is required in sport, is required in business. Let us see how you are running the game.

"Then in the second place, there is a full equivalent for money you receive. The full equivalent in service, not trying to skimp in the service in order to increase profits above a reasonable return, but trying to make the profits proportioned to the satisfaction of the people that you serve. There isn't any more solid foundation for business than that.

"If you thoroughly satisfy the people you are serving you are welcome to their money. They are not going to grudge it because they will feel that they are getting a quid pro quo—they are getting something such as was promised them when their money was asked of them.

Need of Conscience

"Then, in the third place, this game requires something more than ordinary sports. It requires a certain kind of conscience in business, a certain feeling that we are, after all, in this world because we are expected to make good according to the standards of the people we live with. That, after all, gentlemen, is the chief compulsion that is laid on all of us.

"I am not aware of being afraid of jail. I do not feel uneasy when I pass a penitentiary, but I would feel extremely uneasy if I knew I had done something which some fine, honorable friend of mine would condemn if I passed before him. I would look carefully at his eyes to see if he suspected anything, and I would feel unhappy until I had made a clean breast of it with him. That is what we are afraid of, and that is what we ought to be afraid of.

"We are sustained by the moral judgment of honorable men, and there isn't anything else in this world that I know of that is worth while. How honors must hurt a man if he feels that they have been achieved dishonorably. They then are an arrow in his heart, not a quickening or tonic to his spirit in any respect. If he feels that he has cheated the people that trusted him then no matter what fortune he piles up, they never can contribute to his peace of mind for a moment. So I say that the conscience in business is the motive spring of the whole thing; the pride of doing the thing as it ought to be done.

"I ask every man in this room who employs other men if he would not pay the best salary he has if he could be assured that the man he employed was of that quality? You know that is the sort of men you want—the men who will take a pride in doing the thing right and have a clean conscience toward you who employ them. Now all of us are employees of the public. It doesn't make any difference what our business is or how small it is, we are, so far as we get money for it, employees of the public, and our clear, clean consciences toward our employers are the basis of our success, and it goes without saying, the basis of our happiness.

The Spirit of Service

"Then, the fourth rule, as it seems to me, is the rule of having the spirit of service. I know a lot of cant is talked about that, and I get very sick of the cant, as I dare say you do, but when I talk about the spirit of service I am not meaning a sentiment. I am not meaning a state of mind; I am meaning something very concrete—that you want to see to it that the thing that you do for the public and get money for is the best thing of that kind that can be done. That is what I mean by the spirit of service.

"I have known many a man who gave up profit for mental satisfaction. I know men in this city—there are men in the scientific bureaus of this government whom I could cite—who could make very big salaries, but who prefer the satisfaction of doing things that will serve the whole community, and doing them just as well as they possibly can be done.

"I for one am proud of the scientific bureaus of this government. There are men in it of the most self-sacrificing spirit and of the highest scientific efficiency who do things on a petty salary which some other men would not do at all, because if you have to pay a man a salary to produce the best product of his brain, then he scales the product down to the salary. Here are men who scale the product up to the highest standards of scientific ideals.

"They have hitched their wagons to a star, and the star is about to lift their names above the names of the rest of us. So I say that if your earning capacity is the capacity to earn the public confidence, you can go about your business like free men. Nobody is going to molest you and everybody is going to say, 'If you earn big profits; if you have treated the people from whom you are making your profits as they ought to be treated; if you treat the employees whom you use in earning those profits as they ought to be treated; if your methods of competition are clear and above reproach; why, then, you can pile these profits as high as the Rockies and nobody will be jealous of it.' Because you will have earned them in a sense that is the handsomest sense of all.

Definition of Government

"It is in this spirit that we all ought to regard the laws, that we all ought to criticise the laws, and that all ought to co-operate in the enforcement of the laws. Government, gentlemen, is merely an attempt to express the conscience of everybody, the average conscience of

the nation, in the rules that everybody is commanded to obey. That is all they are.

"If the government is going faster than the public conscience, it will presently have to pull up; if it is not going as fast as the public conscience, it will presently have to be whipped up. Because the public conscience is going to say, 'We want our laws to express our character,' and our character must have this kind of solidity underneath it, the moral judgment of right and wrong.

"The only reason we quarrel with reformers sometimes is because they are, or suppose they are, a little more enlightened than the rest of us, and they want us all of a sudden to be just as enlightened as they are, and we cannot stand the pace. That is all that makes us uneasy about reformers. If we could get our second wind, if we could keep up the pace as long as they do, we might be able to run as fast as they do, but we are more heavily weighted with clay than they are. We cannot go as fast. And we like companionship. We want to wait for the rest of them. We do not want to be in a lonely advance climbing some heights of perfection where there is no good inn at which to stop overnight.

"Put Up, or Shut Up"

"That, gentlemen, is the homely and, I dare say, obvious lesson which I have meant to give utterance to this afternoon. I think that I understand what you are after. I hope that you understand what we are after. All I ask is that if anything is being done that ought not to be done, the fault in it be conclusively pointed out and the way to correct the mistake be explicitly shown. There is an old rule that ought to obtain in politics as in everything else and it is aptly expressed in a very homely way. It is the old rule of 'put up or shut up.'

"Some one said, 'If you wish me to consider you witty I must really trouble you to make a joke.' If you wish me to consider you wise I must really trouble you to show the goods: To show how the thing can be done; to show how it can be better done. Because nobody is fool enough to suppose that the way he has determined that the thing ought to be done is necessarily the best way to do it; but it is the best way to do it until you show a better way. That is a perfectly obvious rule. So again I say it is the rule of 'put up or shut up.' And I do not mean that in any sort of disrespect.

"The market for ideas is a highly competitive market and the rules of competition are necessarily fair. There is only one test for an idea and that is 'Is it good?' You may for the time being dress it with such rhetoric that it will look good and the best thing that is characteristic of countries like our own is that every man who has an idea is constantly invited to the platform. And there is nothing better for an idea by way of test than exposure to the atmosphere. If you let enough people hear it stated often enough it will certainly seek its proper level.

"That is the reason I believe in free speech. I have been subjected to free speech myself and it is hard to endure sometimes, because the office of the President seems to be the clearing house for original ideas. I am brought more original ideas per diem, I dare say, than any other person in the country, and, therefore, pay the penalty of freedom of speech.

"Perhaps my mind does not register original ideas readily enough, because some of them do not register at all. I am perfectly willing to admit that that is the fault of the register, not the fault of the idea. All I have to say is that if you have ideas, the register is entirely at your service."

Comments of the Press

Many Shades of Assent and Dissent Apparent in the Editorial Expressions of Leading Newspapers

The following paragraphs are extracts from the newspaper editorials on President Wilson's speech before the American Electric Railway Association from New York papers or forwarded by staff correspondents in time for use in this issue.

Philadelphia Ledger, Jan. 30—President Wilson's address to the members of the American Electric Railway Association in Washington is a reflection of one phase of his personality with which the American public have not heretofore had many opportunities to become familiar. He spoke as a man among men, and he employed the language and the similes of sport to emphasize his thought. In effect, the President told his hearers, and through them the business world, that it was up to them to play the game and play it fairly; that the process of restraint and regulation, to the formulation of which the congress has laboriously devoted itself, has come to an end; that the recent laws have furnished definitions of business ethics which represent the desire of the country, and that it is now up to business men to test those definitions fairly and to enter upon the era of prosperity which we are facing with new confidence and with an honest purpose to enter upon "a free field and no favor." With the spirit of the President's remarks there will be general agreement, but whether there has been that specific definition by law of what ought to be done and what ought not to be done in big business is a trifle doubtful. That a great deal of constructive work has been done no one will deny; the tariff has been revised, the banking system reorganized and new machinery created, and a trades commission provided for. But beyond the definition of "restraint of trade" already given by the courts it cannot be said that the new laws add anything on that point, while the trades commission is yet to begin its activities. It is some comfort to know that business is not going to be molested solely because it may make big profits.

New York Times Annalist, Feb. 1—The responsibility of the managers of a great corporation is to the public at large rather than to the group of individuals who at any given time constitute the body of its stockholders. That is true even of corporations which perform no quasi-public function. . . . The placing of the stock of a corporation upon a public market through listing it on the Stock Exchange or otherwise is in effect an invitation to the public at large to become stockholders. It thus becomes the duty of the corporation to inform regarding its affairs not only the public which has bought, but likewise the public which has not yet bought, but which may.

New York Times, Jan. 31—In his speech to the American Electric Railway Association the President told his audience that: ". . . nobody is henceforth going to be afraid or suspicious of any business merely because it is big." It has not been so during the last twenty years, particularly during the last ten years. Bigness has been a crime, the only crime proved, and the persistent attempts to punish it savagely have disturbed the industrial peace of the country, with disastrous results, in so much that the accruing loss may be fairly compared with the cost of a great war. A few months ago the President discovered that there was a new temper of the people. The new temper meant that the people had got tired of seeing corporations crucified every day, that they had found out that these endless prosecutions were really directed against themselves, that the hurt was theirs, that when business was

alarmed and capital made timid they, all the people, were the chief sufferers. It was not a new temper at all, it was a very old state of mind. Now the President calls it a new atmosphere. It is the same thing by another name. If it means anything at all, it means that the politicians have discovered that harassing the corporations is not a profitable business for them.

New York Sun, Jan. 31—In his speech to the American Electric Railway Association at Washington President Wilson said: "It seems to me that I can say with a good deal of confidence that we are upon the eve of a new era of enterprise and of prosperity." The President has been saying this for more than a year. Indeed, he has gone much further; he said that the era of prosperity had arrived and that the blindness to it was purely psychological. Apparently he was mistaken in his former utterances. The President holds that the present regime at Washington has resolved the doubts and removed the checks. It has discovered and formulated the "rules of the business game" which appear to be excellent examples of Delphic wisdom. It has given to business a liberty which "consists in a sort of parole." If business can understand the rules and apply them with exactly the same minds as the government monitors, it is as free as a babe in leading strings. It is its duty and its privilege to grow under the new tutelage, which is the new freedom. The paternal administration is determined to regulate it into the prophesied prosperity. Mr. Wilson ends by imposing in homely phrase a motto upon business, "Put up or shut up." Perhaps business may be inspired to make it reciprocal.

New York World, Jan. 30—The true American attitude toward business was admirably defined by President Wilson in a single paragraph of his speech to the American Electric Railway Association: "You are not going to be barred from the contest because you are big and strong, and you are not going to be penalized because you are big and strong, but you are going to observe the rules of the track and not get in anybody's way, except as you can keep out of his way by having more vigor and skill than he has." This is the sum and substance of the Sherman anti-trust law and of the Clayton amendment. Every business man who has any conscience at all knows whether or not he is following the rules of the game. So far as business is concerned the period of uncertainty is over, as the President has said. The rules of the game have been defined, and these rules are an expression of the general public conscience. For years the managers of big business have insisted that they could adapt themselves to any conditions if they only knew what those conditions were. This was a just complaint, but it has been met. There is no manager of a great industry in the country who does not know in a general way what is expected of him, or who does not know that nothing unjust or unreasonable is expected of him.

Indianapolis Star, Feb. 1—Business has been pilled and potioned, inspected and dissected, expurgated and objurgated, fletcherized and exorcised, drawn and quartered—literally quartered. Now it is lectured. Like an incorrigibly naughty boy it is led by the ear to a front seat where, fidgety and forlorn, it must await the privacy of after-school hours when teacher will inflict a personally conducted course in deportment. For the precepts business must pretend to be thankful and duly exalted. It must receive them with submissive head and not a sign that it has done better by the President's code of morals than he has himself. He exalts the virtue of publicity for business, but business dare not make reply that while it has never sought other than publicity, a Democratic national administration has made secrecy its rule of conduct in caucuses, in legislation, in the violation of civil service, in Mexico, in foreign affairs and everywhere. No historian, not even Woodrow Wilson, records a more striking absence of publicity in government than has existed at Washington since March 4, 1913.

Indianapolis News, Jan. 30—In his address before the American Electric Railway Association the President spoke of what had been done by Congress to clear the business situation, and undoubtedly progress has been made. The trouble had, he thought, been due to the fact that men for the last twenty years had been "moving amongst a maze of interrogation points." They have not, however, as yet got wholly out of the maze, though we believe they are making progress. One interrogation point it is within the power of the President to sweep from the path, and that is an extra session of Congress. That is something which business and the people generally do not want. . . . The temper of the speech is excellent, and there is much in it that can be heartily commended.

St. Louis Globe-Democrat, Jan. 31—Many portions of President Wilson's speech to the convention of the American Electric Railway Association are subject to criticism, but his statement that he has met many men whose horns dropped away the moment he was permitted to examine their character is filled with truth. Most of the prejudices of the world are based on misunderstanding. Knowledge is the greatest dehorner extant. If our people might meet each other oftener in friendly intercourse there would be a better mutual understanding. Railway travel and our mail service have done much to remove sectional prejudices. The meeting of our representatives in Congress has had the same effect. The country has often marveled at how the fiery utterances of Senators have been tempered by a brief association with the men whom they once held up to obloquy and shame.

Buffalo News, Jan. 30—In his speech yesterday before the American Electric Railway Association the President said that henceforth nobody is going to be suspicious of any business just because it is big. It is evident that the President has moved a long way since he came into office, whether his party has done so or not, because the chief aim in life of the party in power for the last two years has seemed to be the prodding of big business.

Louisville Evening Post, Jan. 30—President Wilson yesterday, in a public address, said, among other interesting things, "that since practically all business concerns were no longer private but were owned by a number of people, there should be full publicity about their affairs." We do not know where this theory of universal inquisition into the affairs of other people arose, but whatever its source, it is indefensible, and utterly mischievous. The only businesses which have not this right of privacy are, first, governmental business, which nevertheless is largely conducted in secret by secret devices, full knowledge being kept from the owners of the business; second, the business of common carriers of passengers, freight and intelligence, which business is public business, conducted by corporations which are accepted as substitutes for governmental agencies and are given place on governmental highways, with other governmental powers and privileges; third, public utilities in cities, which are also arms of the government; fourth, banking, insurance and related interests, requiring some form of a government guarantee, based on governmental inspection.

Address of C. Loomis Allen at Mid-Year Dinner

Spirit of Full and Frank Publicity Becoming Universal—New Committee on Public Relations

The toastmaster at the dinner of the American Electric Railway Association and the American Electric Railway Manufacturers' Association was C. Loomis Allen, president of the parent organization. As Mr. Allen's remarks were somewhat broader than those usually given by a toastmaster it has been deemed of interest to print in this issue the more significant passages of his opening statement, as follows:

The meeting of to-day and this dinner of to-night are, I am firmly convinced, typical of the present state of mind of our association, and a bright augury of future prospects. They have their keynote in a frankness which is a reflection of Article X in the code of principles adopted by your association at Atlantic City in October, 1914.

If the association, in behalf of the industry, is to achieve the results at which it aims, the beliefs expressed in this article cannot be too often emphasized. I call it to your particular attention again to-night because I believe that of all the declarations which the code contains it is the most important, as directly reflecting the spirit in which we must proceed in order to secure that which is vitally necessary, if public utilities are to continue in their present form.

"Full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public." So the article reads.

It will be remembered that although submitted in advance to the member companies for their criticism and emendation, the code of principles was adopted by the convention without a dissenting voice. We can, therefore, safely assume that the full meaning of the several planks was realized by those companies who subscribed by their assent to its far-reaching declarations. Article X means, in consequence, that the electric railways of the country, as represented in this association, are prepared to submit with the greatest frankness their affairs to the scrutiny of patrons.

If in the past there was reason for the policy of secrecy which seemed to envelop corporation matters, that reason has disappeared. Our cards are thrown face upward upon the table, and in the spirit of co-operation and mutual helpfulness we appeal to the people of the communities which we serve in the firm belief that the reason and the justice of our plea will lead to that co-operation which ultimately will give a solution of the problems which have confronted this industry during the last decade.

Publicity, gentlemen, is not a new thing to the electric railway industry. For years we have had publicity thrust upon us unsought. Our sins have been magnified by the lenses of demagogy. Our good deeds have been hid in the shadows cast by the searchlight of the muckraker. No public service company ever has or ever can escape publicity. It is for this association and the industry to say, however, what shall be its character. Shall it be the publicity which comes from *ex parte* investigations inspired by the self-exploiter, seeking political advancement at the expense of our interests? By the fantasies of the half-baked theorist? By the malicious activities of those whose delight it is to attack all prosperity? Or shall it be the publicity that comes from our belief that of all tribunals, the tribunal of a public properly informed, and with a full knowledge of all facts, is in the end the fairest of all?

Business ethics, like all things else in this world, are subject to evolution. The structure of business in the United States to-day is vastly different from that which existed in the days of our fathers. Economic development has been rapid. The individualism which was responsible in the first instance for the development of our resources is, to a large extent, disappearing and a spirit of co-operation in all lines is taking its place.

The $150,000,000 invested in the traction business in 1882 has increased to $4,500,000,000. The 35,000 employees of that year have multiplied until to-day there are more than 300,000, and the 3000 miles of track have expanded until now nearly 41,000 miles of track cover city and country. Not one force at work in this country since 1888, when in the near-by city of Richmond the first complete electric city system was inaugurated, has contributed so much to the prosperity and growth of the cities of the United States as has the electric railway. It has bound together the town and country. It has done away with the necessity of congestion in our large urban communities. It is conserving health, and it has brought prosperity in its wake.

It would indeed be surprising if in the course of this development, if during these full years, when the genius of the inventor, the energy of the executive and the vision of the promotor were all feverishly at work in the creation of the magnificent system of local transportation which exists to-day throughout the country, errors had not occurred, if indeed sins of omission and commission were not an accompaniment, if perfection in method or in practice had been arrived at.

For one I am ready to admit the errors; I am even ready to admit in some degree the sins; and I make no claim for perfection. I do say, however, that the development of the electric railway industry has been accomplished with no greater degree of error, with no greater taint of sin, than the development of any of the other marvelous industries which have made the United States what it is to-day.

I maintain that the good which the industry has done so far overbalances the evils, that we, as its representatives, may appear before the people of this country with our heads erect and with no apology in our speech and ask of the public fair treatment, to the end that the development so splendidly begun shall be carried to its full conclusion, and the people of our urban and rural United States receive the best possible service at the least possible cost.

Under our theory of government it is in the end the people who must decide. In some form or other our case will go to the public for a final decision. It is for us, the organized representatives of this industry, to say in what form that shall be.

On Monday night Jan. 25 your committee on public relations, consisting of representatives from members of your Manufacturers' Association and your Railway Association, held a meeting in New York, at which the machinery for reaching the people with our case was assembled. Three sub-committees were appointed to have charge of various channels by which the sources of public information can be kept in touch with our ideas and our ideals. This is but a beginning, but it is a start in the right direction.

With your assistance and with your co-operation, this committee and its subdivisions can give to the electric railways that which they have for so long looked, and which is so necessary for their welfare, a voice. We have been inarticulate too long. It is time that we had our day in that court of public opinion the attention of which has been far too long monopolized by our enemies. With your assistance we will have it, and I bespeak in behalf of Mr. McCarter and confrères on the committee of public relations, your whole-hearted co-operation and help.

The Brady Medal Award

Below Is Given an Abstract of Parts of the Report of the Committee on Award Outlining Safety Methods of the Companies Honored—Awards Will be Officially Made in New York on Feb. 10

In last week's issue a brief note regarding the award of the Anthony N. Brady medals was printed, with a statement of the fact that copies of the report of the award committee were distributed. Below are given some extracts from the report. Information regarding the individuals honored in the award, including details of their work in the safety movement, together with their portraits, appear elsewhere in this issue. Mr. Sears was a pioneer in safety work and originated much of the activity described below. His campaigns to reduce infant accidents and drunkenness and other nuisances on cars have been effective. His expert knowledge of workmen's compensation acts in general has enabled him to administer the Massachusetts act with extreme fairness and justice. Mr. Neal has been active on the shop committees, combining enthusiasm with ripe experience. He has compiled many instructive briefs, regarding the treatment of common ailments, which are discussed at safety meetings. At present he investigates all accidents which occur at the Albany Street shops of the Boston Elevated Railway. He was for two years chairman of the shop safety committee.

The medals will be officially awarded at the annual meeting of the American Museum of Safety, which occurs on Feb. 10 at the United Engineering Societies' Building in New York.

Some Facts Regarding the Boston Elevated Railway System

The Boston Elevated Railway controls and operates practically all of the passenger transportation lines in the city of Boston and the surrounding cities of Cambridge, Everett, Malden, Medford, Somerville and the towns of Belmont, Watertown, Brookline and Arlington, and also operates to a more limited extent in the cities of Chelsea and Newton. The municipal area of Boston contains a population of about 700,000, but its true transportation area is made up of a number of separate municipal units containing together in excess of 1,200,000 population. The business district of the city is comprised within a very narrow area, through some part of which practically all of the 1600 cars and the 150,000 daily trips made by these cars pass. The narrowest and most involved streets of the city are within the same area. The longest stretch of straight track in the congested district is 1050 feet, and this is on Washington Street, the principal and most congested street in the city, the width of this street from curb to curb in the widest part being but 31 ft.

Applicants for employment on the rapid transit lines are limited to the positions of gatemen, brakemen on these lines obtaining their positions only after having worked as gatemen, guards only after having worked as brakemen, and motormen only after they have served in all three of the lesser positions. As a result it takes about seven years of service to become a motorman on the rapid transit line. The company is also considering a plan to require physical examination of applicants for positions in the maintenance department. Prospective trainmen are instructed in a special school and later are under the direction of an instructor while in car service. In connection with the matter of examination of prospective employees the company cooperated with Prof. Hugo Münsterberg, head of the department of psychology at Harvard University, in making psychological tests upon trainmen, designed to yield data of use in accident prevention. Every year all motormen and conductors on the surface lines and all motormen, guards and brakemen on the rapid transit lines are required to pass an eyesight test.

During the past year strenuous effort has been made to increase the supervision of car men by inspectors. As the result of the practice of keeping detailed reports of all cases in which inspectors have called matters to the attention of car man or superintendent, there has been an increase of over 100 per cent in the number of reports made in a year. The records of a certain number of employees are reviewed every week, so that the record of every employee in the service is carefully scrutinized at least once in six months. In the effort to impress upon employees the effects of the infraction of rules the legal department maintains a corps of accident clerks. Their duty is to observe the conditions which are conducive to accidents and to point out the ways in which accidents can be averted. Accident charts posted in the carhouses and revised daily have been found useful. Letters regarding the safety problem have also been mailed to the men at their homes and these have been appreciated.

The company not only makes total abstinence from the use of intoxicating liquors a condition of employment, but enforces strictly its rule making intoxication in uniform a reason for discharge, and in many cases has even discharged men who have become intoxicated when not in uniform and off duty.

During the year ending June 30, 1914, the company has succeeded in reducing the number of blue-uniformed men leaving the service from 2362 to 1166 or 50.5 per cent as compared with the year ending March 31, 1912, this being the most recent one for which the figures for comparison were obtainable, and has reduced the number of blue-uniformed men entering the service from 2380 to 1145, or 52 per cent.

The company has conducted a campaign for the prevention of accidents to school children, which was begun in the fall of 1909. In October, 1913, a circular was prepared with the title, "Safety Work with School Children," which has had a very wide circulation. In June, 1914, the Boston Chamber of Commerce was induced to give its sanction and name to a general "safety first" campaign. The first step of this consisted of an active and strenuous circularizing of the schools in metropolitan Boston during the last two weeks before vacation. About 200,000 bulletins over the signature of the Boston Chamber of Commerce, calling attention of fathers and mothers to the seriousness of accidents and inviting their co-operation, were distributed. About 7000 special circulars were sent to the teachers of the schools containing outlines of talks to be given by them to the children before the summer vacation. In this movement the school officials and teachers cooperated heartily.

In the campaign the police and the fire commissioners, the Amalgamated Association of Street and Electric Railway Employees of America, the New York, New Haven & Hartford Railroad and the employees of the company, all co-operated with the Chamber of Commerce.

For the month of July, 1914, in which special account was kept, there was a total reduction of 25.3 per cent in the number of accidents reported as compared with July, 1913, and this in spite of an increase of 9.9 per

cent in the number of passengers carried and an increase of 6.8 per cent in the number of trips run.

Safety committees were instituted throughout the entire system on July 1, 1913, the total number of local committees being thirty-seven. These committees represent all grades of work in the company's service, every division of the operating bureau being represented by one or more. The work centers in a general safety committee, composed of executive officers and heads of departments, whose duty it is to take final action upon all recommendations which have not been approved by the head of the bureau. A general secretary, appointed by the general safety committee, devotes his entire time to attending meetings of local committees, making records of suggestions and following the course of suggestions until they are either adopted or rejected. During the first year 371 men served on the various safety committees and 532 suggestions were received.

Some Facts Regarding the Public Service Railway and Railroad Systems of New Jersey

The Public Service Railway and Public Service Railroad operate over practically the entire State of New Jersey, and serve twenty-one cities and 119 towns and municipalities with a population, according to the 1910 census, of 1,898,559. The greater part of the system is purely urban, but some of the lines operate in rural districts.

Employees are trained in a school of instruction, after passing the physical examination, and are there thoroughly prepared for their future responsibilities. After a day in the school, where they are drilled on instruction cars and instructed in the rules, those who pass the required examinations are put on the road under competent men and receive training under actual road conditions. After a period of from seven to ten days they are recalled to the school and again examined before being placed in charge of their cars. For any infractions of the rules after being placed on a car employees are sent back to the school on their own time to be drilled on those rules which have been infringed. One instructor, specially qualified, drills all students in accident prevention and the method of procedure after an accident has occurred. Lectures, illustrated with lantern slides and moving pictures, are delivered to all conductors, motormen and inspectors at all of the carhouses twice during the year.

During the past year a committee on safety, consisting of the heads of the various departments, with the general claim agent as chairman, was organized. This committee meets monthly and is open to suggestions from all employees regarding conditions of roadway, equipment and operation from a safety standpoint.

For the past three and a half years a welfare plan for the payment of insurance, sick benefits and pensions to employees, their relatives and dependents, has been in operation. The employees receive these benefits without cost. The work, upon which the company expended nearly $54,000 last year, is under the direction of a welfare department.

In alleviating the effect of accidents first aid is applied to all injured persons, and during the past year the services of more than fifty physicians, regularly engaged for the work, were at the command of those needing emergency treatment. All power houses, shops, substations, line wagons, etc., are equipped with first-aid cabinets, and in each carhouse and substation hangs a chart illustrating the Schaefer or prone-pressure method of manual resuscitation, and each employee is required to familiarize himself with it. Employees are also trained by a practical man, who spends much of his time in going from place to place giving lectures and illustrating manual resuscitation.

On Jan. 1, 1914, a filing system was installed in the claim department by which every accident is indexed under six headings, as follows: Car number, conductor's number and name, motorman's number and name, car line and carhouse, nature of accident and place of accident. By means of this system the company is enabled quickly to note repetitions of any kind of accident and to notify the heads of departments immediately so that further repetition may be prevented.

As part of the educational equipment special reels of safety films have been made in co-operation with the Edison Company, and these are now being exhibited throughout the country. The campaign has also been extended to include wagon owners and drivers, who have been reached by visits, lectures and the distribution of large safety posters.

In conclusion it may be noted that, during the past eight years, the percentage of expenditure for accidents in comparison with gross earnings have been reduced from 8.64 per cent to 4.16 per cent by almost exactly equal steps.

Some Facts Regarding the Northern Ohio Traction and Light Company

The Northern Ohio Traction & Light Company operates interurban railroads from Cleveland to Uhrichsville, Ohio, and from Wadsworth to Ravenna, Ohio, in six different counties. It also operates the Akron, Canton and Massillon city lines. In addition it does a lighting business in Akron and a number of other municipalities. The railway system is the third largest in the State of Ohio.

The safety organization of the company is under the general jurisdiction of the supervisor of safety, who is also general claim agent. There are five safety committees, comprising sixty-five employees, selected from all departments of the organization. The line and shop departments have additional committees. The members of the safety committee are elected by the men of the different divisions by secret ballot. Very good men have thus been secured. There is also a general committee made up of the heads of departments. The local safety committees made weekly reports on the suggestions which have been received, and these are acted upon promptly.

Among the successful plans devised by the supervisor is the sending of an accident letter every two weeks to all employees. This contains suggestions as to how accidents can be eliminated, and calls their attention to the accidents that have occurred just previously and suggests how they could have been prevented.

The general passenger agent of the company publishes a bulletin twice a month. In this a certain amount of space is always given to safety matters. This bulletin is distributed free of charge on the cars of the company.

Quarterly Pamphlet by New York Up-State Commission

The Public Service Commission for the Second District of New York has just issued its regular quarterly pamphlet containing abstracts of the quarterly reports made to it by the operating steam and electric railroads of the State. The current pamphlets contain condensed balance sheets for each company as of Sept. 30, 1914, with corresponding figures for June 30, 1914, and condensed income statements showing revenue and expenses, fixed charges, etc., as reported for the three months ending Sept. 30, 1914. They also contain certain statistical data throwing light on operations during the quarter, such as the amount of freight and the number of passengers carried, ton-miles, passenger-miles, car-miles, etc.

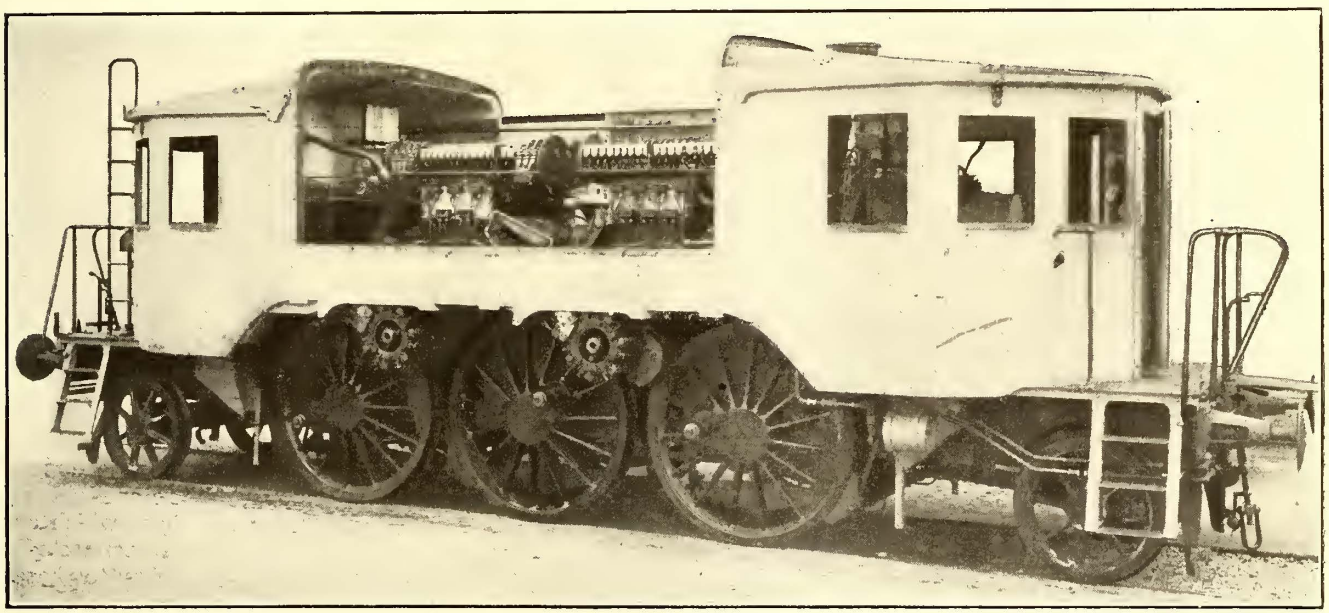
Three-Phase Italian Passenger Locomotives

These Additional Locomotives, Weighing 73 Metric Tons and Carrying Two 1300-hp Motors Each, Are for Passenger Service on the Giovi Subsidiary and Monza-Lecco Lines

BY G. PONTECORVO, EAST PITTSBURGH, PA.

The Società Italiana Westinghouse is now delivering to the Italian State Railway sixteen three-phase locomotives. These new machines have two 3300-volt, 16.7-cycle induction motors of 1300 hp each, of the slip-ring type. The stator windings are designed so that the coils can be grouped either for two-phase, six poles, or three-phase eight poles. Similarly the rotor has a special winding which can be connected for either two-phase, six poles, or three-phase, eight poles. Only seven slip rings are required. A group of three or a group of four of the seven slip rings can be connected to the stator of the second motor when a three-phase, eight-pole, or two-phase six-pole cascade is required. Otherwise they can be short-circuited through the water rheostat when a jet of water against the resistance plates to prevent concentration of heat at the surface of the water, but all the water assumes an even temperature.

The automatic regulator is designed so as to regulate for constant watts instead of constant current, as was the case in the older type of rheostat. The regulator consists of a laminated core with a two-pole winding connected in series on the ground phase of the motor and constituting the stator, and of a double T-shaped rotor with a winding inserted between the other two phases. The torque exerted between stator and rotor is counterbalanced by a spring, and the tension of this spring can be regulated by the starting controller operated by the motorman so as to predetermine the amount



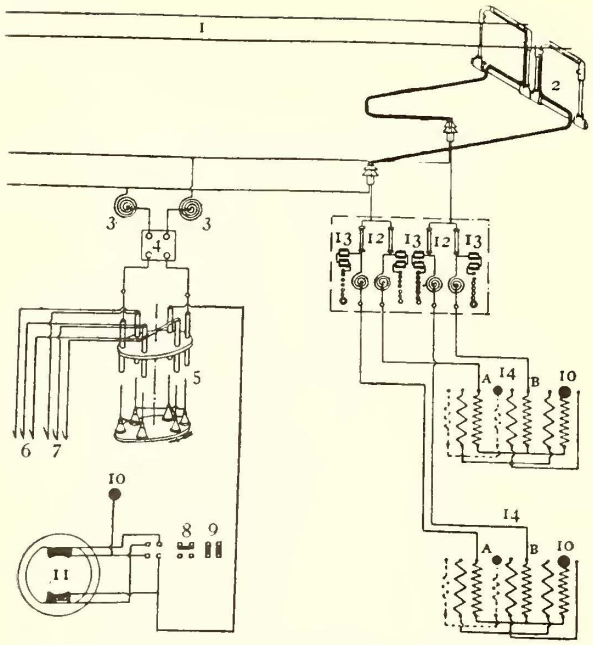
THREE-PHASE ITALIAN PASSENGER LOCOMOTIVES—FIG. 1—THE LOCOMOTIVE WITH PANTOGRAPH SECTION AND DRIVING MECHANISM REMOVED, SHOWING THE RELATIVE LOCATION OF MOTORS AND CONTROLLERS TO THE DRIVERS

the motors are connected in parallel to the line. The two motors, of course, are connected mechanically.

By connecting the motors in parallel on the line (connected either for two-phase, six poles, or three-phase, eight poles), or connecting them in cascade, a four-speed combination can be obtained which at 16.7 cycles with a wheel diameter of 1.63 m (= 64.2 in.) gives four running speeds of 23.3, 31, 46.6 and 62 m.p.h. These are fully sufficient for passenger service locomotives, not only on level lines, but also on fairly high grades.

The change of the motor connections from parallel to cascade, and also from six to eight poles, two or three-phase, is made by a drum type controller operated through electropneumatic relays by a master controller. The method of starting the wound-rotor induction motor is by means of a liquid rheostat with an automatic regulation feature which increases or decreases automatically the amount of resistance inserted in the rotor, so as to keep the power absorbed from the line fixed at a predetermined value. It is also supplied with a motor-driven centrifugal pump which is inserted in the line as soon as the rheostat is in operation. This pump throws of power to be absorbed from the line by the motors. When the power absorbed by the motor exceeds a predetermined value, the regulator tends to rotate in one direction, thereby increasing the resistance inserted in the rotor which in its turn decreases the power absorbed; vice versa, when the power absorbed tends to decrease, the regulator rotates in the other direction, thus keeping the amount of power taken by the motor at a constant value. Besides the controller and liquid rheostat, the locomotive is equipped with the usual auxiliary apparatus and instruments. There is, however, in addition, a small transformer to change the power supply from three to two-phase.

Fig. 2 shows the connection between the overhead line and the primary switch through the trolley, impedance coils, and oil switch; also the circuit supplying the auxiliary apparatus with fuses, lightning arresters, and transformers. The three phases consist of two overhead wires and the rails or ground phase. There are, as already mentioned, four connections of windings and motors to obtain the four running speeds. Two connections are shown in Fig. 3; that is, the three-



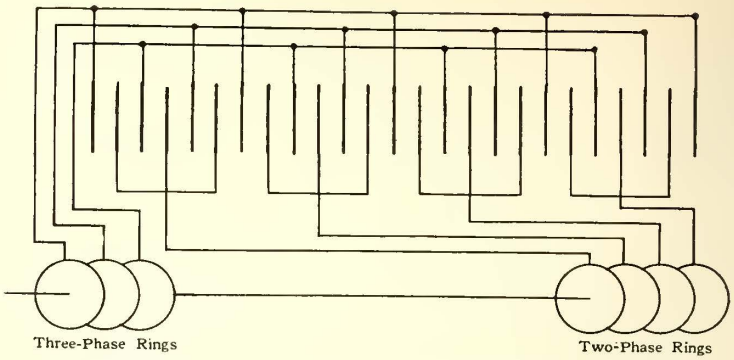
THREE-PHASE ITALIAN PASSENGER LOCOMOTIVES—FIG. 2—WIRING DIAGRAM SHOWING CONNECTIONS FROM THE TROLLEY TO THE MOTOR SWITCH AND AUXILIARY APPARATUS

1. Contact wires; 2, trolley; 3, inductance coils; 4, automatic circuit breaker; 5, primary switch; 6 and 7, to motor primaries; 8 and 9, connections of automatic regulator for cascade and parallel connection, respectively; 10, ground connections; 11, stationary part of automatic regulator; 12, fuses; 13, lightning arresters; 14, transformers with primary and secondary, *A* and *B*, respectively.

phase, eight-pole cascade and the two-phase six-pole parallel. All of these connections are made by the controllers, which are never operated under load. The connections from the slip rings to the water rheostat are shown in Fig. 4. The water level, rising in the rheostat, fills the space between the plates, thus short-circuiting the rotor windings, which are connected to the plates as shown. The controller, the trolley and the liquid rheostat, are operated by compressed air supplied by a small three-phase motor and compressor, which also supplies the air for the two air brakes (the automatic and straight air brakes).

The motors are well ventilated with air circulation through stator iron and winding. The stator end connections are dipped in an insulating compound and then covered with a brass plate to prevent damage. Experience has shown that this construction has done away with insulation break-downs due to moisture and vibration caused by heavy currents at starting.

This locomotive has five axles, and is of the 2-6-2 type, that is to say, two axles are supporting axles and the other three are driving. The two supporting axles are



THREE-PHASE ITALIAN PASSENGER LOCOMOTIVES—FIG. 4—LINE DIAGRAM OF LIQUID RHEOSTAT CONNECTIONS FROM THE MOTOR SLIP RINGS

placed one at each end of the locomotive, and each is connected to the driving axle next to it so as to form a kind of truck. All three driving axles have a transverse play for easy operation on curves. The slip rings are outside the wheelbase and easily accessible.

The weight of the locomotive, complete, is 73 metric tons, of which 45 to 51 tons is adhesive weight. The weight on the drivers can be changed within these figures by an arrangement which shifts the weight from the drivers to the supporting axles. The weight and dimensions of the locomotive are given in Table I.

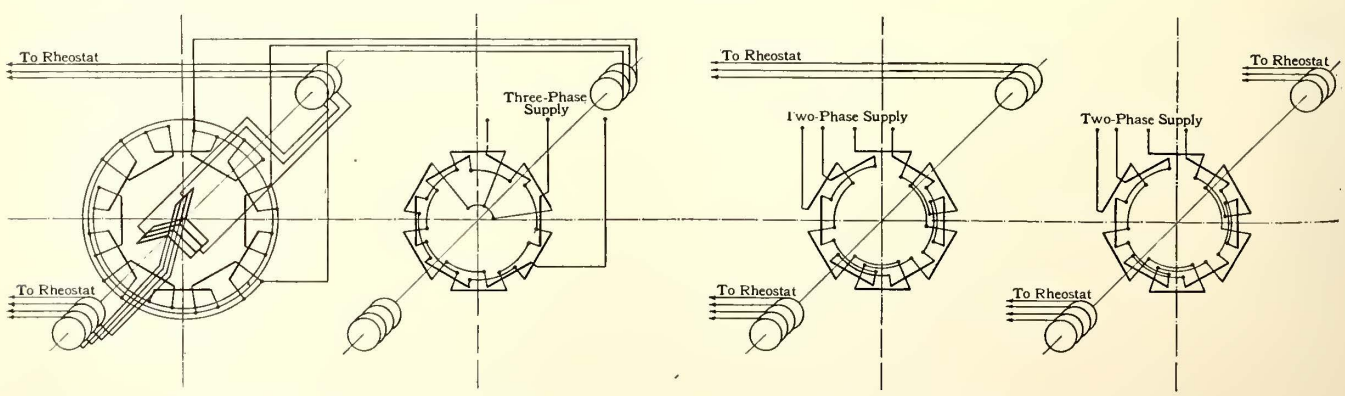
TABLE I—WEIGHTS AND DIMENSIONS

Items	Weights Kg.	Weights Lb.
Mechanical equipment	30,650	67,500
Motor equipment	27,270	60,000
Control equipment	12,700	28,000
Air-brake equipment	2,300	5,050

Items	Dimensions Meters	Dimensions In.
Maximum width	3.05	120
Maximum length	11.00	434
Diameter of driving wheels	1.63	64
Diameter of pony truck wheels	0.93	37.8

The motors are mounted on the frame in such a way that the air gap of the motor can be kept as small as electrical considerations will permit. This is done by making the bearings which support the rotor rigid with the stator frame, and independent of those which support the revolving shaft. The motors are connected to the driving wheels by a Scotch yoke similar to that of the Giovi locomotive.

These locomotives are designed for the Giovi subsidiary line and for the Monza-Lecco line, which connects Milan to the Lake of Como and the Valtellina lines which were electrified in 1901 with the same system. The Monza line is level single-track, while the Giovi subsidiary is double-track and has fairly high grades, reaching 1.6 per cent in the open and 1.16 in a 5.2-mile tunnel.



THREE-PHASE ITALIAN PASSENGER LOCOMOTIVES—FIG. 3—TYPICAL MOTOR CONNECTIONS

Showing the method of connecting the two motors for three-phase, eight-pole, cascade (left) and for two-phase, six-pole parallel.

Operating Results

Some figures regarding the performance and tests of this type of locomotive may be interesting. The normal rating of the two motors is 2600 hp at three-phase, 16 2/3 cycles, 3300 volts and is such that the locomotive can develop for one hour continuously the drawbar pulls given in Table II with a motor temperature rise not exceeding 75 deg. Cent.

Table II—Relations Between Drawbar Pull and Speed

Drawbar Pull		Speed	
Kg.	Lb.	Km.p.h.	M.p.h.
9,000	19,800	37.5	23.3
9,000	19,800	50	31
9,500	20,900	75	46.6
6,000	13,200	100	62

This locomotive can start a train of 350 tons (exclusive of locomotive) and bring it up to 75 kw p.h. (= 46.6 m.p.h.) speed on a straight line having a grade of 1.2 per cent with an acceleration of 0.15 km (= 0.093 mile) per hour per second; the tractive effort at starting is such as to utilize fully the adhesion between zero and 75 km (= 46.6 miles) per hour speed.

Of these locomotives the Italiana Westinghouse Company has already built sixteen and their operation is very satisfactory. They are run regenerating on the down grades, in this way greatly reducing the operating expenses. Their cost compares favorably with the cost of electric locomotives in the United States; however, the ratio of horse-power to weight, or 2600:73, is considerably higher.

These locomotives are rapidly solving the problems of high speed freight and passenger service on the lines on which they have been installed. Some doubts were expressed some time ago as regards the overhead line having two wires. However, no trouble has been experienced, although the overhead construction, with sliding pantograph construction, would be considered rather light in this country for such service.

Change in Car-Wiring Code Recommended

At the tenth annual convention of the Western Association of Electrical Inspectors held at the Hotel Radisson, Minneapolis, Minn., on Jan. 26-28, the report of the committee on electric traction systems recommended a change in the car wiring and equipment code as now used by the National Board of Fire Underwriters. These recommendations were approved by the association and will be submitted to the electrical committee of the National Fire Protection Association at its next meeting. The existing code appears in the 1913 edition of the National Electrical Code, which contains the rules of the National Board of Fire Underwriters.

Some of the more important amendments to the code include recommendations for self-closing doors in cabinets and for watertight conduit joints with drain holes provided at points where moisture is liable to collect. Also the combustible underside of car bodies should be protected with a fire-resisting material over all electrical apparatus. Rheostats which are at all times energized by trolley current should be surrounded by a grounded No. 8 wire netting guard having a 1-in. mesh. Wires for circuits controlling contactors, unit switches and cut-outs should not be run in the same cable, channel or conduit with power wires. Transformers or compensators should have their cases or shells thoroughly grounded. Arresters, choke coils and their connections should be installed ahead of all other electrical devices and metal conduit.

Included under the topic of electrical heaters were a number of revisions requiring that heaters should have metal inclosures which were thoroughly grounded and which should prevent inflammable material from collecting around or inside of heater casings. Panel heaters should be so mounted that there will be 4 in. between the heating element and any combustible material. Heaters should be so mounted that the heat cannot vent into the area back of the heater. Cross-seat heaters either should be mounted at least 4 in. below the under side of seats, or else the under side of the seat should be protected by not less than ¼ in. of fire-resisting insulating material. All conductors should have a rubber insulation surrounded by an outer flame-proof covering, and all circuits should be in approved metal conduit or molding installed according to rules. Switches meeting with the underwriters' requirements are to be provided and inclosed in a metal cabinet.

In order to put before the association some suggestions regarding changes in the carhouse wiring rules and instructions as included in the underwriters' code, J. S. Mahan, Chicago, chairman of the committee that is investigating this subject, reported a tentative set of revised rules. No action was taken on these suggestions, the committee being at liberty to proceed with the work of revising the rules. It is the plan of this committee to submit copies of the proposed rules to various master mechanics and superintendents of motive power of electric railways throughout the country for their criticisms and suggestions before submitting them to the association in final form. Copies of the proposed carhouse rules may be obtained by addressing F. R. Daniel, chairman of the electric traction system committee, Insurance Exchange Building, Chicago. Like the revised car-wiring rules it is intended to bring the carhouse-wiring rules, as well as the arrangement, up to date, so that they will be more readily available to those interested in using them.

Burton McCollum of the United States bureau of standards presented an exhaustive discussion on the subject of electrolysis. He recommended primarily a proper definition of the responsibilities of both railways and the pipe-owning companies in the prevention of electrolytic damage, but advocated co-operation in all cases. Where rules governing electrolysis mitigation are necessary, they should preferably be erected and administered by state authority, under which the necessary administrative machinery is available. In their absence, however, the cities in which the utilities operate should take the initiative. The federal government, while competent to carry out, as it is now doing, engineering investigations bearing on the problem, should not, and in fact cannot, undertake to prescribe or administer regulations. Where state public utilities commissions are in existence, they are the most logical authority. Such state commissions not only are able to deal with the subject in a more comprehensive way than the majority of local bodies, especially in smaller cities, but their freedom from local political influence will often enable them to deal more wisely with all interests involved.

It is most desirable that regulations be made as few and as simple as possible, to the end that the utilities concerned may enjoy the greatest freedom of action consistent with safety to the underground structures. The present apparent necessity for regulation is due to the lack of co-operation in the past between the railways and the owners of underground utilities. If the interests concerned, particularly the railways, would show a greater disposition to meet the issue squarely, and if, instead of practically ignoring the subject as has been too often done they would treat the matter as one of the engineering problems connected with the operation of street railways, the need for stringent regulation would be largely eliminated. In the absence of such a policy, however, compulsory and perhaps burdensome regulations will be inevitable.

Saving Energy in Car Propulsion

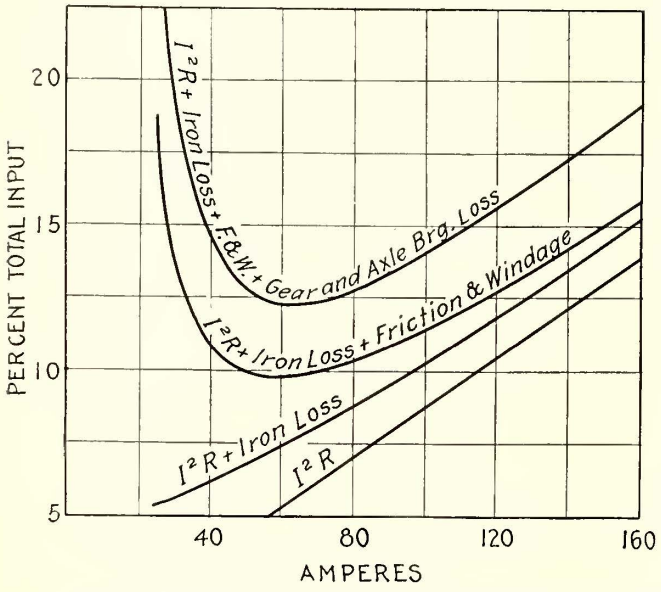
W. N. Storer Analyzed the Possibilities of Energy Saving by Improved Methods of Car Design and Operation at a Joint Engineering Meeting in Chicago on Jan. 25.

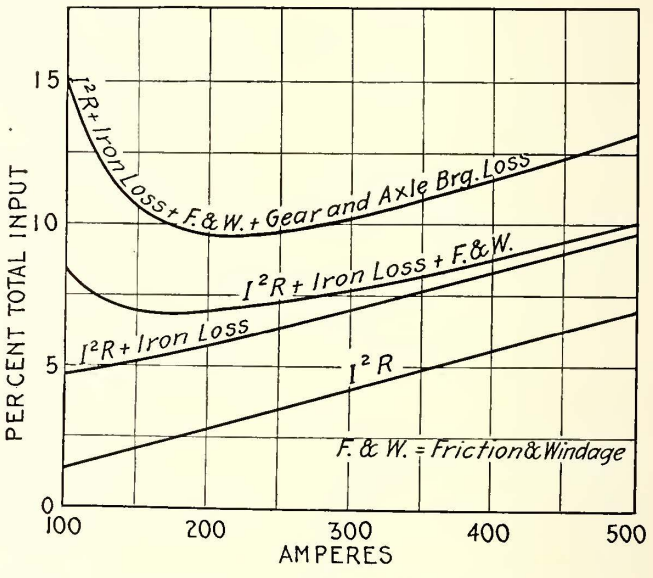
On Jan. 25, at a joint meeting of the electrical section of the Western Society of Engineers and the Chicago branch of the A. I. E. E., W. N. Storer, general engineer railway department Westinghouse Electric & Manufacturing Company, delivered a paper under the title "Economy of Power Consumption on Electric Railways." The purpose of the paper was to show how economy in energy consumption can be secured and the limitations imposed in the application of the different methods. He called attention to Samuel Insull's, April, 1912, A. I. E. E. paper, in which the statement was made that not far from 1,000,000 tons of coal would be burned in Chicago in that year to furnish power for electric railways. In Mr. Insull's opinion not less than 40 per cent and possibly 50 per cent of the coal consumption could have been saved by the use of all possible economies. Mr. Storer discussed the subject of loss reduction under these heads.

Train Resistance

The train resistance of a street car varies between 10 lb. and 20 lb. per ton, corresponding to about 25 to 50 watt-hours per ton-mile. As the total power consumption usually varies from 120 to 180 watt-hours per ton-mile, probably not more than 25 per cent of the total energy is used in overcoming resistance. The proportion is larger in elevated and subway service, where runs are longer and many curves are encountered, especially where the speed becomes so high as to give a high air resistance.

Train resistance can be reduced in the following ways: Journal friction, which is probably not more than





SAVING ENERGY IN CAR PROPULSION—MOTOR LOSSES—FIG. 1, 500-VOLT, 50-HP MOTOR—FIG. 2, 550-VOLT, 210-HP MOTOR

Storer stated that, since that time, cars have been installed on the Chicago Surface Lines which have cut the power consumption per car-mile to less than 67 per cent of that of older cars of the same capacity.

A large part of the energy now consumed is unnecessarily wasted, but on account of the large investment in existing equipment the waste must continue until the older cars and equipment are worn out. Even in the most modern equipment considerable power is wasted. The waste can be reduced by reduction of weight to be handled and by increase in the efficiency of the equipment used in handling it.

Reduction in weight has been secured by the use of two-motor equipment with maximum traction trucks instead of four-motor equipment, by the reduction in motor capacity made possible by the weight reduction, and by the use of motors weighing less per horse-power. Along with these reductions has gone the lightening of car bodies and trucks.

The energy consumed by electric cars is practically all dissipated in overcoming train resistance, in ascending grades, in motor losses, in gears and motor axle bearings, in rheostats, in auxiliaries and in brakes. Mr. 6 lb. per ton in average service, can be practically eliminated by the use of ball or roller bearings, resulting in an energy saving of from 6 to 15 watt-hours per ton-mile and possibly more. In high-speed railroading air resistance, which at a speed of 60 m.p.h. may amount to 800 lb. or 1000 lb. and may require from 110 kw to 150 kw to overcome it, can be reduced by eliminating projections which cause eddies in the atmosphere. Flange friction can be reduced by eliminating bad curves, by effective tramming of trucks, by removing inequalities in wheel diameter and other causes tending to make the wheels hug one rail.

Grade Resistance and Motor Losses

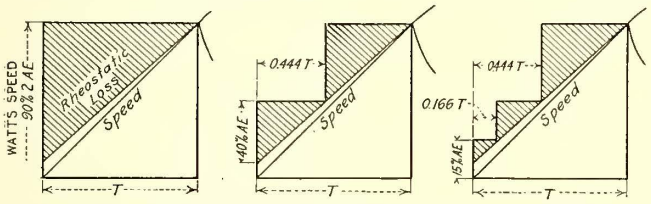
Power required in ascending grades can be decreased only by reducing weight, although it is sometimes possible to use the energy stored in a train in descending one grade to help it up the next. This is seldom done in street car work, but is quite common on lines where long runs are made. Short grades of 1 per cent or 2 per cent on interurban or elevated lines add very little to the power consumption.

The efficiency of a railway motor varies from 80 per

cent to 90 per cent, small motors ordinarily used in city service having a maximum efficiency, including gears and axle bearings, of 85 per cent to 86 per cent, while large motors run 2 per cent or 3 per cent higher. The nature of the losses in typical commutating-pole motors is illustrated in Figs. 1 and 2. An increase in efficiency is sure to be accomplished by the production of a heavier and more expensive motor, as, other things being equal, the capacity of a given size of motor is practically dependent on its efficiency. It is, therefore, fairly certain that the efficiency of railroad motors is as high as the state of the art will permit with present commercial conditions.

Mr. Storer took for illustration the losses due to friction and windage, which he translated into terms of train resistance. He stated that a motor of from 40-hp to 50-hp capacity should have approximately 400 watts friction loss with a car speed of 10 m.p.h., corresponding to about a 20-lb. train resistance. With a two-motor car, weighing 20 tons, armature friction and windage amounts to 2 lb. per ton. The axle-bearing losses would probably be about one-half as much. There are few data available from which gear and axle-bearing losses can be determined, but it is hoped that in the near future further tests will be made which will enable the standardization committee of the A. I. E. E. to give more definite figures for the efficiency of axle bearings and gears.

It is possible to use some form of frictionless bearing for armatures, but such bearings as yet have not



SAVING ENERGY IN CAR PROPULSION—RHEOSTATIC LOSSES DURING ACCELERATION

Fig. 3, parallel control; Fig. 4, series-parallel control; Fig. 5, series, series-parallel, parallel control. Shaded areas show rheostatic losses.

had sufficient tests under heavy service conditions to justify their adoption, especially as the cost is considerably higher than the ordinary sleeve bearing.

Rheostatic Losses

In the matter of rheostatic losses, it is impossible to avoid such losses altogether, but they can be reduced to a much lower amount than has ordinarily been the practice. Figs. 3, 4 and 5 show the relative rheostatic losses in straight parallel control, standard series-parallel control, and control using full series, series-parallel and full parallel, respectively. In these diagrams the shaded areas represent rheostatic losses. If two motors are assumed to accelerate with a current to give 10 per cent voltage drop in the internal resistance of each motor, then, as shown in Fig. 3, 90 per cent of the voltage will be lost in the rheostat at the instant of starting and an average of 45 per cent during the time the rheostat is in circuit. During the entire time of acceleration, double motor current will be taken from the line. As shown in Fig. 4, with series-parallel control, the rheostatic power loss at starting will be 80 per cent of the line voltage with single motor current, or an average of 40 per cent of the line voltage multiplied by single motor current during the time the car is accelerating in series. The total time will be divided between series and parallel in the ratios of the counter emfs after the resistance is cut out. In this case it will be in the ratio of 40 to 90, or 44.4 per cent of the time will be spent in series and 55.6 per cent in parallel up to the time the motor curve is reached. When the motors are connected in parallel the voltage applied to the motor terminals is only 50 per cent of the line voltage, consequently the remainder of the line voltage, or 50 per cent, is lost in the rheostat. The average drop in the rheostat will be 24 per cent for 55.6 per cent of the time. If A is the current for one motor, T the time to reach the motor curve and E the line voltage, then, in rheostatic control, the loss is

$$W = 2\,A \times 0.45\,E \times T = 0.9\,A\,E\,T$$

The total energy taken from the line during this acceleration is $2\,A\,E\,T$, and 45 per cent is lost in the rheostat.

In series-parallel control the rheostatic loss is

$$W = A \times 0.4\,E \times 0.444\,T + 2\,A \times 0.25\,E \times 0.556\,T = 0.456\,A\,E\,T$$

The total energy from the line in this case is

$$W = A\,E \times 0.444\,T + 2\,A\,E \times 0.556\,T = 1.556\,A\,E\,T$$

The rheostatic loss is thus cut almost in half by using series-parallel control instead of parallel control, and the total energy during acceleration on resistance is reduced more than 22 per cent.

The use of four-motor equipment makes it possible to go still further, as is illustrated in Fig. 5. The rheostatic loss in this case is the same as in the case shown in Fig. 4, except for the area of the rectangle cut out by full series operation, the area of which is $0.083\,A\,E\,T$. The total rheostatic loss is thus

$$W = (0.456 - 0.083)\,A\,E\,T = 0.373\,A\,E\,T,$$

a decrease of 18.3 per cent below that of series-parallel control. The energy taken from the line during the time on rheostat is $(1.556 - 0.083)\,A\,E = 1.473\,A\,E\,T$, a reduction of 53 per cent. Since the rheostatic loss in ordinary city service is only 12 per cent to 20 per cent of the total energy used, the saving resulting from starting with four motors in series can scarcely exceed 1 per cent of the total, unless there is a great deal of operation at extremely low speeds.

A recently exploited system combines the operation of four motors connected successively in series, series parallel, and parallel, with intermediate steps using three motors and a limited amount of rheostatic operation. A portion of the rheostatic losses is eliminated through unequal loading of the motors, due to doubling the voltage on one motor at a time, thus heavily overloading it without a serious surge in the acceleration. A saving of from 8 per cent to 10 per cent in power is effected.

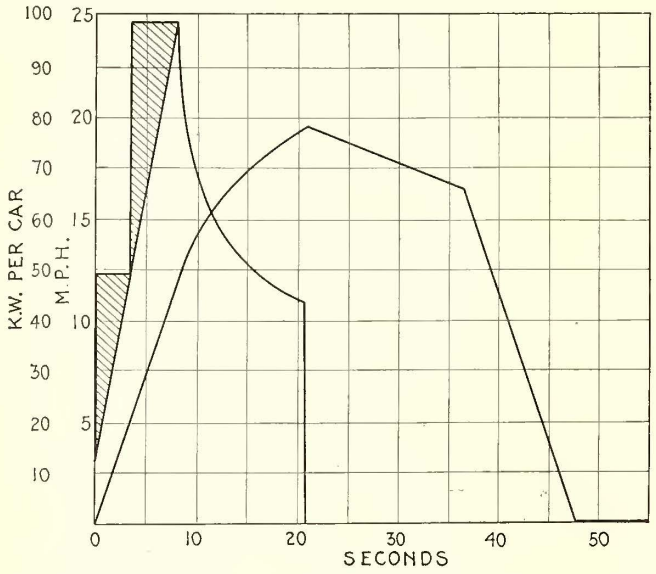
Other things being equal, the rheostatic loss varies as the square of the speed at which the motor curve is reached in acceleration. The characteristics of the motor and the rate of acceleration have, therefore, a great deal to do with the rheostatic loss. For example, a motor with a steep speed characteristic, geared for a certain schedule speed, will reach the motor curve at a lower speed than one with a flat speed curve which is geared to the same speed, and will thus have less rheostatic loss. A higher rate of acceleration will enable the motor curve to be reached at a lower speed, especially with a non-saturated motor. The rheostatic losses are thus reduced in the same way.

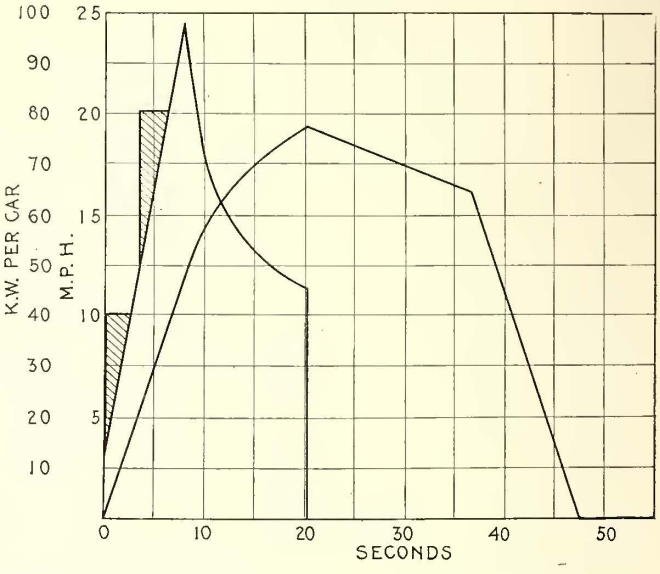
The shape of the speed curve has been too often left out of consideration because the unsaturated motor, the one with the steep speed curve, is usually slightly heavier than the saturated motor of the same rating and armature speed.

Field Control

After the series-parallel control and the single reduction motor were introduced, the control of the field as a

means of affecting economical speed variation and reduction of rheostatic losses was dropped because of the trouble from poor commutation and overloading of motors. The use of the commutating-pole motor and a better understanding of the application of railway motors to given service have led to a revival of field control which is now used in all classes of service, usually effecting a saving of from 10 per cent to 20 per cent in power consumption. To get the best results the motor should be geared to give the highest speed desired with a short or permanent field. The full-field speed curve should be 20 per cent to 25 per cent or more if possible, lower than this short field speed curve at the accelerating tractive effort. Referring to Fig. 4 and assuming that the full speed of the motor at the accelerating tractive effort is 20 per cent below that of the short field and, as the same rate of acceleration is maintained, a field control equipment would perform the same service with approximately one-half the rheostatic loss. Where the balancing speed on short field is higher than that of the non-field controlling equipment, a still further saving in power consumption results on account of the more rapid acceleration on the motor curve, permitting a longer coasting period and consequently a lower speed at the time the brakes are applied and less loss in that period. Where stops are frequent the use of field control effects a very substantial saving. Typical speed-time graphs are shown side by side in Figs. 6 and 7, Fig. 6 showing a typical run with standard motors without field control and Fig. 7 the same run under identical conditions of load and speed, but with field control. The difference in rheostatic losses is shown by the shaded areas.



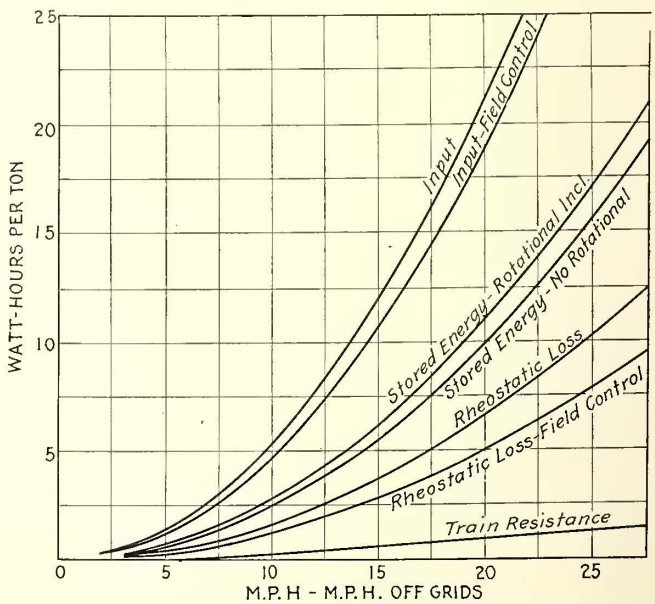


SAVING ENERGY IN CAR PROPULSION—RHEOSTATIC LOSSES—FIG. 6, SERIES-PARALLEL CONTROL; FIG. 7, SAME WITH FIELD CONTROL. SHADED AREAS SHOW RHEOSTATIC LOSSES

Data: Weight of loaded car, 20 tons; two 50-hp, 500-volt motors; 33-in. wheels, gear ratio, 16:68 (Fig. 6), 15.69 (Fig. 7); rate of acceleration and braking, 1½ m.p.h.p.s.; stops per mile, 6; duration of stop, 7 sec.; schedule speed, 11 m.p.h.; watt-hours per ton-mile, (Fig. 6) 112.8, (Fig. 7) 103.8.

Fig. 8 shows a set of general curves which may be applied to almost any condition of acceleration. They are intended primarily to exhibit the rheostatic losses entailed in accelerating 1 ton under certain conditions of motor efficiency, train resistance and rate of acceleration, with and without field control. With these curves are included others showing watt-hour input, rheostatic losses with and without field control, and energy losses in overcoming train resistance, all plotted in terms of speed at which the motor curve is reached.

To show how these curves may be used, take the speed-time curve shown in Fig. 6. The energy stored in the train at the time the brakes were applied is all lost either in the brakes or in overcoming train resistance during braking. In this case the brakes were applied at 16.3 m.p.h., and reference to the stored energy curves shows that at this speed 7½ watt-hours per ton are stored. Part of this (4 watt-hours) is stored while accelerating on resistance at an efficiency of approximately 56 per cent; the remainder (3½ watt-hours) with motors accelerating on the motor curve at an efficiency of about 83 per cent. The first portion,



SAVING ENERGY IN CAR PROPULSION—FIG. 8—ANALYSIS OF POWER CONSUMPTION IN STRAIGHT-LINE ACCELERATION

Data: Weight, 1 ton; acceleration, 1.7 m.p.h.p.s.; acceleration force, 185 lb.; control, series-parallel, with and without field control; motor efficiency at full voltage, 85 per cent.

4 watt-hours at 56 per cent efficiency, takes 7.15 watt-hours from the line; the section portion, 3½ watt-hours at 83 per cent efficiency, takes 4.22 watt-hours from the line, a total of 11.37 watt-hours for each stop or 68.22 watt-hours per ton-mile. A train resistance of 20 lb. per ton would normally require, with an average effi-

ciency of 80 per cent, 50 watt-hours per ton-mile, but since the braking period has already been included, a deficit of 13.5 per cent must be deducted, leaving 43¼ watt-hours. The total per ton-mile is then 111.47 watt-hours. This compares with 112.8 watt-hours, as given in the figures.

The ratio of the sum of the curves of stored energy and friction to the curve of input is the efficiency of the equipment during acceleration to the motor curve. With the conditions of motor efficiency, train resistance, etc., assumed, this efficiency is found to be approximately 56 per cent. It will hold approximately constant regardless of the time of acceleration or whether on level or grade. The rheostatic loss with a given tractive effort is inversely proportional to the rate of acceleration; in other words, if the car were starting on a grade that would cut the rate of acceleration in half, the time on the rheostat would be doubled and the rheostatic loss double that shown on the curve. This curve is a good check on the speed-time curve.

Other Possible Means for Saving Energy

Among the other means for saving rheostatic losses there is notably one in which the voltage on the motors is varied by means of a motor-generator set. Such a system is in operation in Paris and is reported to be giving very economical results. It is understood that this equipment is also operated to vary the voltage applied to the motor during the braking period so as to regenerate the stored energy of the train and return it to the line. Such a system must require a relatively large capacity of motor-generator set on the car and the cost of this set and the extra cost of motors and control would be considerable, while the additional weight to be carried around and the losses in the motor-generator set would go a long way toward absorbing any savings that might be made.

In conclusion, Mr. Storer discussed the possibilities of regenerative systems of control and prophesied that some plan will be developed to prevent the present enormous destruction of energy, which costs a great deal simply to destroy. He considered the proposition of elevating station tracks above those between stations for the purpose of changing the kinetic energy of the moving train into the potential energy of the train on an elevation. Theoretically, this is the most efficient method, but as a matter of fact the elevation which it would be necessary to climb is so great that its use would greatly increase the cost of any construction, the elevated railway stations would be so high as to require elevators to take passengers to and from the streets, and it could be used only with very short trains. Induction motors lend themselves to regenerative control readily and in many of the cases where it has been applied the saving in wear and tear on the brakes and the reduction in danger of accidents are more important than the savings.

With direct current motors regeneration has been accomplished by the use of shunt motors, but these have been used only to a very limited extent.* In Mr. Storer's opinion the essential of an equipment for regenerative braking with d.c. motors is the use of the standard series-wound motor with a control equipment that will add but little weight and complication to that used without regeneration, since every bit of additional weight and complication would mean additional first cost, additional cost of maintenance, and additional power to carry it around. The point would soon be reached where the extra cost balances the saving.

Mr. Storer called attention to the fact that he had said nothing directly concerning the importance of correct gear ratio, or the correct operation of equipment so as to take advantage of the benefits of rapid acceleration, long coasting, quick braking and short stops. He did not touch upon the saving resulting from the use of high efficiency lamps and the best distribution of light, nor of the use of the latest methods of car heating. He did not discuss line loss and its relation to the reduction in peak load by means of field control and proper gear ratio. He stated that these points have all been fully discussed. The reduction of dead weight per passenger, the adoption of frictionless bearings and the widest use of field control with motors of steep speed characteristics, and efficient handling of cars will alone be sufficient to save more than 40 per cent of the power now used on a great many roads. Any saving that can be accomplished by the development of a successful scheme for regenerating the power now lost in brakes would be so much clear gain.

Discussion

Mr. Storer's paper was discussed by H. H. Adams, Chicago Surface Lines, who stated that 33 1/3 per cent reduction in current consumption had been obtained on this road, on the cars equipped with field control motors. This reduction in energy consumption had made possible a reduction from 4 kw-hr. to 2½ kw-hr. per ton-mile. H. A. Johnson, of the Chicago Elevated Railways, suggested that many interurban railways could profitably undertake a careful study of their equipment with a view to eliminating useless weight. He believed that a large percentage of light-weight cars could be used in interurban service without entailing operating difficulties or reducing the comfort to passengers. Wray Thorn, equipment engineer of the Board of Supervising Engineers, Chicago Traction, called attention to the fact that the savings made possible by improved motor designs would represent a 25 per cent increase in the net earnings per car per year when the gross was assumed as 30 cents. In obtaining this result Mr. Thorn assumed that the total expense of operation per car-mile was 26 cents, of which 3½ cents per car-mile was chargeable for power. Power cost represents about 13.5 per cent of the total cost of operation, and the purchase of new equipment had permitted a 4 per cent reduction of this item. E. J. Blair, of the Chicago Elevated Railways, and W. B. Jackson also took part in the discussion.

*[NOTE—An account of a recent installation of this type, that of the Wendelstein Railway in Bavaria, is given on page 274 of this issue.—EDS.]

I. C. C. Report on Steam Railroads in 1913

The division of statistics of the Interstate Commerce Commission has issued the preliminary abstract of its twenty-sixth annual report, covering steam railroads for the fiscal year ended June 30, 1913. During this year the mileage of single track operated increased 1.67 per cent, whereas the total mileage of all tracks operated increased 2.39 per cent. The total of railroad capital on June 30, 1913, was $19,796,125,712, the increase over last year being divided $131,723,168 for funded debt and $116,763,035 for stock. The average receipts per passenger per mile were 2.008 cents, the corresponding figures for the previous year being 1.985 cents, an increase of 0.023 cent. The average receipts per ton per mile for the year were 0.729 cent, which was smaller than the corresponding average for 1912 and 1911. The rail operating revenues increased $298,177,432 during the year and the operating expenses $210,874,266, giving an increase in net operating revenue of $87,303,166. The total revenue, including that from outside operations, increased $88,290,224. Taxes during the year increased nearly 8 per cent. Dividends declared from surplus were $85,706,629, as compared to $100,435,589 for the preceding year.

COMMUNICATIONS

The President's Address

Interborough Rapid Transit Company
New York, Feb. 5, 1915.

To the Editors:

While I was not able to reach the Washington meeting of the Railway Association in time to hear President Wilson's address, as a railway operator I appreciate the importance and significance of the occasion. The association is to be congratulated upon the fact that the President took this opportunity to express through the association to the country his ideas on some fundamental business questions.

I agree with the President that nothing is so helpful to a better understanding among people as to meet and discuss their problems together. He set an example of this last week at the meeting of our association, an example which was followed by other prominent representatives of the federal government at the meeting and the banquet. This plan could well be followed not only at formal gatherings of railway men but whenever, during the year, differences of opinion arise or seem to arise in regard to the conduct of electric railway matters. Indeed, this is an advantage of commission regulation, that the public utility interests and the public, as represented by the authorities, can meet face to face to consider their mutual problems, and in this way each side can learn the attitude and opinions of the other.

Theodore P. Shonts, President.

Brooklyn Rapid Transit Company
Brooklyn, N. Y., Feb. 2, 1915.

To the Editors:

In response to your inquiry regarding my impression of President Wilson's Washington speech I would say that it was full of good ideas and was hopeful in tone. I should have liked it better if it had amplified the necessity on the part of the government, in its dealings with corporations and in its own administration accounting, of recognizing and following the same high standard of honesty and fair dealing which it seeks to establish in private and corporate business.

T. S. Williams, President.

Elevated Railroads of Chicago
Chicago, Ill., Feb. 4, 1915.

To the Editors:

From President Wilson's address, the impression was gained that he is of the opinion that the large business interests of the country could now look forward with confidence to a period of prosperity, and that business properly and lawfully conducted need not fear attacks indiscriminately by various governmental bodies, as has been the practice for several years past. The President evidently realizes that the business of the country is in need of encouragement, and it is welcome to hear this note sounded by the Chief Executive of the nation.

If a spirit of friendly co-operation with the business interests of the country permeated the national, state and municipal governments, there would be no lack of capital and few unemployed men in the United States. However, for business men to believe that governmental bodies will cease to harass business is expecting too much at the present time. The era of restored confidence which President Wilson believes is now upon us, will not come until the people fully realize what serious injury is being done, and has been done, to their interests for years, by self-seeking politicians and irresponsible reformers. Indications, however, point to a change not far distant, when the public will comprehend the true relation between their own welfare and properly conducted business, and the arguments and wiles of the politician and reformer will not meet with the easy conquests they have in the past.

When the people elect to public office men who will aid legitimate business, whether big or little, in every possible way, and work for the commercial supremacy of the United States, then and then only, will prosperity be assured. In England and Germany business is not only fostered but is also successfully governed, and the business man is honored and his counsel sought. In our country it has been quite the reverse.

The American Electric Railway Association is working along the right line in its endeavors to bring about a better understanding on the part of the public. The publicity program and high ideals set forth by Mr. Kingsbury in his able paper, will bring results not only desirable in the railway industry but equally applicable to the various business interests of the country.

Britton I. Budd, President.

General Electric Company
New York, Feb. 5, 1915.

To the Editors:

I want to express my thorough appreciation of the address delivered by President Wilson before the American Electric Railway Association on Jan. 29, and especially of the latter portion thereof in which he invites those connected with the electric railway industry, and others, to present their ideas on important public questions.

Seemingly our association could make no more fitting response to this invitation than to transmit to the President our recently adopted Code of Principles, which can hardly fail to receive his full endorsement.

William J. Clark.

McGuire-Cummings Manufacturing Company
Chicago, Ill., Feb. 2, 1915.

To the Editors:

The impressive statements made in President Wilson's talk last Friday before the American Electric Railway Association, lead us all to hope for better business. His administration came into existence pledged to accomplish the correction of abuses in business life and to a constructive work which would build to a greater and sounder prosperity.

Some of the abuses he was pledged to correct have been corrected. I believe he has a comprehensive appreciation of commercial conditions as they exist to-day, and is going to do all he can, in a constructive way, to bring to us all, large and small, a revised code of business principles, and to do his best, notwithstanding adverse world conditions to bring us material prosperity.

John J. Cummings.

Terminology for Steel Construction

The American Railways Company
Philadelphia, Pa., Feb. 1, 1915.

To the Editors:

In the article on the Cleveland Railway's new repair shops in your issue of Jan. 23, we notice that these buildings are described as being entirely fireproof. We notice, however, that in the interior view, the steelwork is shown as being entirely exposed. This condition would not, therefore, be considered by us as entirely fireproof but as non-inflammable. It has been our practice and it appears to be the practice of the Cleveland Railway to use the money that would be needed to protect the steel work completely for the installation of a sprinkling system. This would give protection not only to the building but to its contents.

While we are on the question of descriptive termi-

nology we might call your attention to a recent statement in your JOURNAL that cars which have steel underframes, steel sides and steel posts should be considered to be "all-steel." This may be slightly misleading, as we are building cars of this general description having outside steel sheathing up to the window sill and steel posts, and carlines are one continuous piece but having the trim, floors, roof, sash and doors of wood. We have been considering these cars as semi-steel and think this is the general practice.

C. G. KEEN, Engineer Way and Structures.

[NOTE—Our correspondent's first point is undoubtedly well taken. It is well known that exposed steelwork, in general, has less ability to resist the damaging effect of fire than wooden beams so that the buildings in question should have been classed as non-inflammable rather than fireproof.

The definition for all-steel cars to which our correspondent refers was developed arbitrarily to avoid confusion in our statistics as published Jan. 2. Under it, cars with the continuous post-and-carline construction would be classed as all-steel only if they had steel letterboards. Also, cars with all-steel framing and agasote roof sheathing would be classed as all-steel, the point being that the material used for roof sheathing is largely incidental. Of course, since this definition (like every other definition that could be used) is arbitrary, it is subject to difference of opinion, and we would be glad to receive other communications which might aid in the establishment of a definite and universally used terminology for the different types of car construction.—EDS.]

Stress Analysis of the Chicago Steel Car

CORNELL UNIVERSITY
ITHACA, N. Y., Jan. 4, 1915.

To the Editors:

We have been very much interested in the article entitled "Analysis of Stresses in the Chicago Elevated Steel Car" published in your issue of Dec. 12, 1914, page 1299. It occurred to us that it would be interesting to see how the "principle of least work" applied to an analysis of the stresses in this car would result. In consequence, we have worked out the problem as shown below and have obtained results which differ somewhat from those obtained by Mr. Johnson. The construction, as outlined by him, is undoubtedly entirely safe, but the application of the principle of least work seems to us to give a somewhat more exact, or at any rate, more logical method of analysis than the method employed by him.

As the truss form described is an indeterminate one, it could not, of course, be solved by the ordinary methods. The method employed by us also takes care of the forces in the truss due to the loads outside the bolsters which were probably also considered by Mr. Johnson, although the published solution does not indicate the way in which this was done.

The following is our solution of the problem: The lower part of the car frame, consisting of the channel, belt rail and sheeting, forms a plate girder of which the sheeting is the web and the window posts are stiffeners. This girder is 36.5 in. high. Let F equal the total sectional area of plate girder, or 7.30 sq. in.; y equal the coordinate of the center of gravity from top, or 19.75 in.; and I equal the moment of inertia of section with respect to its gravity axis, or 1352 in.⁴

Consider the left half of the truss. This includes the central door post, corner post and four window posts. Since the four window posts are slender and easily bent, their stress effect upon the upper chord cannot be much more than 200 lb. If required, their action could be considered, as is indicated later in this discussion. For simplicity, however, we will for the present neglect them, and represent the frame as shown in Fig. 3.

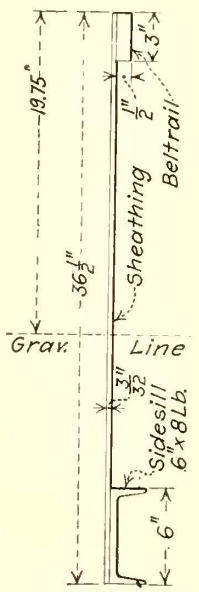
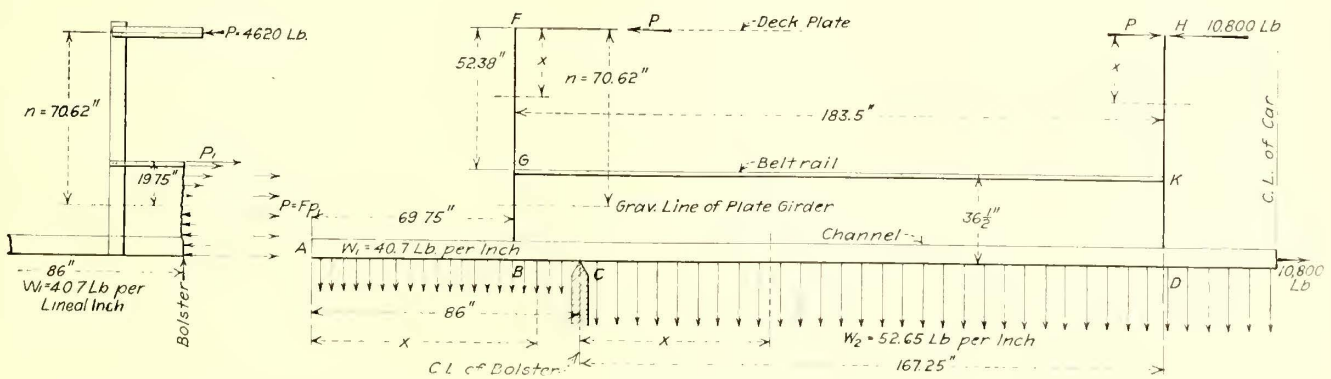


FIG. 1—SECTION OF SIDE GIRDER

Here GF, FH, and HK are the center lines of the corner post, upper chord and door posts respectively. The lower part GD is to be considered as a plate girder. The required dimensions, as far as they could be obtained, are given in the figure. With the loading uniformly distributed, the load outside the bolsters comes to 40.7 lb. per linear inch, while inside the bolsters it is 52.65 lb. per linear inch. The reaction of the bolster equals 14,150 lb. Also let I equal the moment of inertia of plate girder, or 1352 in.⁴; I_1 equal the moment of inertia of end post FG, or 169 in.⁴; I_2 equal moment of inertia of center post HK, or 327 in.⁴; F equal the area of section of plate girder, or 7.30 sq. in.; F_3 equal the area of section of deck plate, or 1.44 sq. in.

It is evident that Fig. 3 is an illustration of an indeterminate truss. The unknown stress in the upper chord is represented by P. The problem now is to find the value of P. This cannot be found by simple statics, but by using integral calculus the "Principle of Least Work" can be applied.

According to the principle of least work, of all the values that P might have, only that one is admissible which will make the total internal work done by the members a minimum. Let W represent the total internal work; then the true value of P that will make W a minimum is found by writing $\frac{dW}{dP} = O$. The ex-



STRESS ANALYSIS—FIG. 2, STRESS IN SECTION OVER BOLSTER; FIG. 3, DIAGRAM SHOWING FORCES THAT ACT ON CAR FRAMING

pression for W consists of a number of terms. Since we differentiate with respect to P we need to consider only those terms that will involve P. Any term that does not contain P will drop out in the differentiated expression. The work of shear need not be considered since the shear in the plate girder is not a function of P. This gives the following equation:

$$\frac{dW}{dP} = \int_B^C M \frac{dM}{dP} \cdot \frac{ds}{EI} + \int_C^D M \frac{dM}{dP} \cdot \frac{ds}{EI} +$$

$$\int_F^G M \frac{dM}{dP} \cdot \frac{ds}{EI_1} + \int_H^K M \frac{dM}{dP} \cdot \frac{ds}{EI_2} + \frac{Pl}{EF_3} + \frac{Pl}{EF} = O$$

The first term gives the internal work done between B and C due to the bending of the girder, and, omitting the details of integration, this equals $\frac{105{,}400 + 60P}{E}$. The second term is the work done between C and D due to bending of girder, and this equals $\frac{617P - 4{,}332{,}000}{E}$. The third term is work due to bending of end post FG, equalling $\frac{283.5P}{E}$. The fourth term is work due to bending of door post HK, and this equals $\frac{-1{,}583{,}000 + 146.5P}{E}$. The fifth term is work due to compression in member FH, or $\frac{127.5P}{E}$ and the sixth term is work due to tension in girder, or $\frac{25.2\,P}{E}$.

If these values are substituted in the equation and this equation is simplified, we will obtain, since the factor E divides out, $1259.7P = 5{,}809{,}600$, or $P = 4620$ lb.

The value is considerably larger than that given by Mr. Johnson. As stated above, the influence of the window posts was neglected, since this influence is small. If this influence is considered it will increase the value of P a little. If desirable, the effect of the window posts can be included. In that case we will have five unknowns, and can obtain five equations similar to the equation above, and involving these five unknowns. The solution of these equations gives us the required five quantities. This involves considerable labor and it seems hardly necessary.

It may be of interest to determine the stresses in a section over the bolster. To do so, pass a section through the truss over the bolster and represent the forces as shown in Fig. 2. The forces acting on the girder consist of a shear (not represented), a system of forces forming a couple, M, equal to $\frac{p_2 I}{19.75}$ (where p_2 equals stress in outer fiber due to bending), and a uniformly distributed force, P, $= p_1 F$. If now moments are taken about the neutral axis of the girder $\frac{p_2 I}{19.75} = 4620 \times 70.62 + W_1\, 86^2/2 = 477{,}800$ in. lb. and $p_2 = 6980$ lb. per square inch. Also $p_1 = \frac{4620}{7.30} = 633$ lb. per square inch.

The total unit stress in outer fiber then equals $p_1 + p_2 = 7513$ lb. per square inch. The belt rail has a sectional area of 1.5 sq. in. The approximate stress in the belt rail then is $1.5 \times 7513 = 11{,}250$ lb.

It is not intended by this article to question the sizes of members in Mr. Johnson's design, but merely to show how the stresses might be found by another method. One advantage is that it can be used even if there is more than one redundant member in the truss, such as the deck plate in this case. The above calculations are based on a live load uniformly distributed over the whole car. If we had assumed the platforms empty, the stress in the upper chord would have been about 4000 lb., according to Mr. Johnson's method, and about 30 per cent higher according to the method here given.

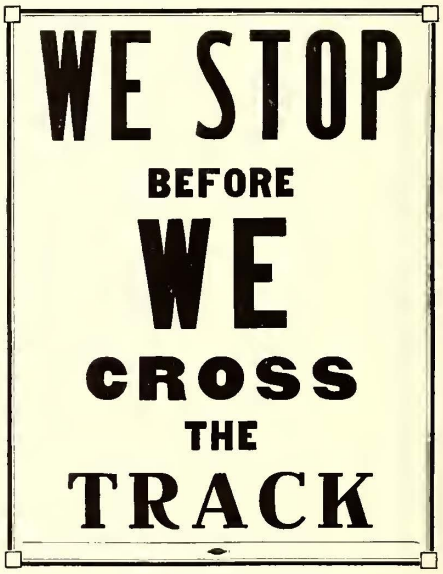
E. W. RETTGER and S. G. GEORGE,
Assistant Professors Applied Mechanics.

The "WE" Slogan Sign

KENTUCKY TRACTION & TERMINAL COMPANY
LEXINGTON, KY., Jan. 27, 1915.

To the Editors:

I think that you may be interested in our "WE" slogan sign, which I am forwarding you. These signs we have been giving to the truckmen, merchants, conveyances of any and all character, and automobiles, with the request that they be carried on the conveyance and in this manner enlist them in the campaign. This sign, as you will



"WE" SLOGAN SIGN

note particularly, is not directory but implies that the initiative is being taken by the truckmen and is not fostered by the railroad interest.

Stop to consider the number of accidents, steam and electric, which have come under your direct attention, and probably many of which may be acquaintances, and you will realize the value of this slogan, which we feel is the most forcible thing we have brought forward in our "safety first" campaign.

F. W. BACON, Vice-President.

Commission Report on Electric Interurban Lines of Iowa

According to the thirty-sixth annual report of the Board of Railroad Commissioners of Iowa, for the year ended Dec. 1, 1913, the gross earnings from operation for the electric interurban lines of the State amounted to $2,330,385, as compared with $1,823,191 for the year previous. The operating expenses increased from $1,272,340 in 1912 to $1,453,624 in 1913, while the net earnings from operation increased from $550,851 in 1912 to $876,761 in 1913. The net earnings per mile in 1912 were $1,607 and in 1913 $2,224. The interurban mileage (single track) increased from 342.74 miles in 1912 to 394.23 miles in 1913. The outstanding capitalization per mile in 1913 was $39,832 for stock and $38,333 for bonds, as compared to $40,443 and $33,356 in 1912, respectively.

ANNUAL CONVENTION SAN FRANCISCO OCTOBER 4 TO 8, 1915

American Association News

ANNUAL CONVENTION SAN FRANCISCO OCTOBER 4 TO 8, 1915

Committee Activities Continue as Middle of Association Year Approaches—Claims Association Selects Subjects for Convention Program—Block Signal Committee Especially Busy

JOINT COMMITTEE ON BLOCK SIGNALS

Meetings of sub-committees on block signal details were held at association headquarters on Jan. 26 and 27. Members of the committee in attendance were: J. M. Waldron, New York; J. W. Brown, Newark, N. J., and G. N. Brown, Syracuse, N. Y. Others in attendance by invitation were C. L. Cadle, Rochester, N. Y.; R. V. Collins, United States Signal Company; S. N. Day, General Railway Signal Company, and H. W. Griffin, Union Switch & Signal Company, who gives the committee valuable suggestions. The important matter taken up on Tuesday was the preparation of a form of statistical blank for the recording of signal maintenance cost reports. This will be submitted to the convention next October. A suggested list of requirements for trolley-contact signal operation was presented by Mr. Collins and this was discussed in detail, being accepted for further consideration by the committee.

At the meeting on Wednesday the discussion on the data sheet was continued, and, as an aid to simplifying this and providing for uniformity in the replies, a complete classification of signal operations was prepared. This provided tentative plans for expressing signal efficiency which would serve as a basis for comparing the data that would be obtained through the use of the proposed data-sheet. A proposed outline of information that should be supplied when requesting quotations upon new signal installations for interurban lines was also discussed, and changes were made in the standard clearance diagram for semaphore signals that had been submitted at the 1914 convention and referred back to the committee.

CLAIMS ASSOCIATION EXECUTIVE COMMITTEE

A meeting of the executive committee of the Claims association was held in Washington on Jan. 29. Those present were: W. Tichenor, Indianapolis, Ind., president; R. E. MacDougall, Rochester, N. Y., vice-president; S. B. Hare, Altoona, Pa., vice-president; B. B. Davis, Columbus, Ohio, secretary-treasurer; P. C. Nickel, New York, N. Y., and Wallace Muir, Lexington, Ky. A list of subjects for the 1915 meeting was prepared as follows: A card index and what it means; safety and its relation to conservation; motor vehicles (details to be announced); standard classification of accidents. The committee on the last-named subject consists of Messrs. Nickel, H. K. Bennett and H. V. Drown, of whom Mr. Drown is a recent addition. The authors of papers are to be selected by the president and the secretary.

POWER DISTRIBUTION

The sub-committee of the committee on power distribution, to which had been assigned the preparation of standard specifications for overhead line material, met in New York on Jan. 28. There were present C. R. Harte, New Haven, chairman; C. L. Cadle, Rochester; C. F. Woods, Boston, and G. W. Palmer, Boston. The sub-committee discussed in detail the possible schemes for grouping the different specifications for various parts of overhead construction so that they might be most easily available for use in permanent form, and a schedule covering the scope of the work was prepared. Tentative general specifications for material had been prepared by Mr. Harte and these were considered in detail by the sub-committee as a whole and approved with certain modifications. Detailed specifications for wrought iron and steel were then taken up, together with requirements for such parts of the usual types of overhead construction as are made wholly of these materials and which, in consequence, fall naturally under this general heading. This subject was extended into an evening session without being completed and it was decided to hold another meeting of the sub-committee on Feb. 25, the meeting to be carried over to the following day if necessary.

COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS

A meeting of the committee on a standard classification of accounts of the American Electric Railway Accountants' Association was held in Washington on Jan. 27 and 28. Those in attendance were: H. L. Wilson, Boston; W. F. Ham, Washington, D. C.; R. N. Wallis, Fitchburg, Mass., and W. H. Forse, Jr., Anderson, Ind., representing the Accountants' Association, and F. W. Sweeney and George Geekie, representing the Interstate Commerce Commission. These gentlemen spent two days in preparing the manuscript of a case book, based on the new classification. This book will publish all of the questions in the old case book and will apply them to the new classification. There will also be some two hundred additional questions in regard to the classification of accounts, which will be answered according to the basis of the new classifications. The case book will carry a complete index both of subjects and case numbers. The manuscript of this book was completed at the meeting of the committee in Washington and it will be issued by the government as soon as it can be printed at the Government Printing Office.

DENVER TRAMWAY SECTION

The January meeting of the Denver Tramway Company Section was held on Jan. 28, having been postponed from Jan. 21, the regular meeting date. The subject for the meeting was "Snow Work and Equipment," the principal paper being presented by W. H. McAloney, superintendent of rolling stock. This was discussed by J. M. Tierney, W. L. Whitlock, A. M. Evans, J. J. Foster, A. J. Krick and R. L. Baker. Mr. McAloney used a large number of lantern slides to illustrate his talk, in which the audience of 200 was intensely interested. Preceding the formal part of the program the Central Tramway Glee Club gave a brief entertainment.

COMING COMMITTEE MEETINGS

Feb. 11, New York, 10 a. m., standards committee of the Transportation & Traffic Association, L. H. Palmer, Harrison Williams Company, New York, chairman.

Feb. 11, New York, 10 a. m., rules committee of the Transportation & Traffic Association, W. H. Collins, general manager Johnstown & Gloversville Railroad Company, Gloversville, N. Y., chairman.

A meeting of the committee on way matters of the Engineering Association, C. S. Kimball, engineer maintenance of way Washington Railway & Electric Company, Washington, D. C., chairman, will probably be held in New York before the end of February.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

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

Electrolysis Develops Defects in But Three Out of 1500 Concrete Poles

BY H. G. THROOP, SUPERINTENDENT LINE AND BUILDINGS NEW YORK STATE RAILWAYS, UTICA-SYRACUSE LINES

Several articles have been published dealing with the effect of stray electric current upon concrete poles. A recital of our experiences in this line may be of some benefit to users of this type of pole.

Out of a total installation of some 1500 reinforced concrete poles placed during the last five years, three poles have developed defects, which, upon investigation, proved to be directly traceable to the flow of current through the reinforcing rods to the ground.

The first case was indicated by a vertical crack extending from the top of the pole to the ground line, from one of the corner reinforcing rods to the surface of the concrete. This pole was one of the first built and was installed in the spring of 1911 and removed in December, 1914. Evidently there had been a leakage of current into this pole for some time, due to a defective strain insulator in the span wire, the current flowing from the eyebolt into one of the corner reinforcing rods, thence to ground. When the concrete was removed from the reinforcement of this pole, the rod in contact with the eyebolt was badly oxidized, and below the ground line some 2 ft. of this rod was entirely eaten away. Within the portion of the pole which was buried in the ground the current had communicated through the damp concrete to the other rods, which were all badly oxidized. The concrete above the ground line had been so loosened from the oxidized rod that this concrete would in time have fallen away from the rod.

The second case was that of an extra heavy 8-in. top corner pole, into which there had been a gradual leakage of current. This leakage resulted in the spalling of the concrete below the ground line to such an extent that the grip of the concrete on the reinforcement was badly weakened. Due to its weakened condition this pole had been pulled 1 ft. out of line by the trolley pole of a passing car catching into the attached curve.

The third case showed spalling of the concrete below the ground line, but had not resulted in failure when the pole was removed for other reasons.

CONCLUSIONS

All of the foregoing cases of failure were due to leakage of 600-volt trolley current through defective hangers and strain insulators.

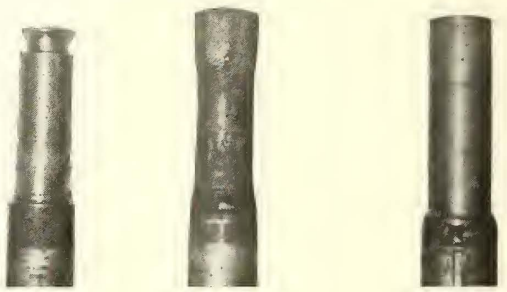
The evident remedy for the conditions cited is to insulate the pole completely by placing in the spans the proper strain insulators. Poles removed for other causes than defects have been knocked to pieces and all of their rods have been found to be in perfect condition.

In favor of this type of pole it may be stated that in all of the foregoing cases ample warning was given by the gradual spalling and cracking of the concrete, and all of the poles mentioned would have supported their load in safety for some time after the defects were detected.

Case-Hardened Collar and Welding Reclaim Worn Button-End Axles

BY A. R. JOHNSON, ASSISTANT TO SUPERINTENDENT OF EQUIPMENT THIRD AVENUE RAILWAY SYSTEM, NEW YORK

Some two or three years ago the Third Avenue Railway System had much trouble from broken check plates on the No. 22-E trucks used on lines in the outlying districts. This trouble was entirely overcome by substituting a check plate made of manganese bronze, but



No. 1 No. 2 No. 3

FIG. 1—WORN, WELDED AND FINISHED AXLES OF THIRD AVENUE RAILWAY SYSTEM

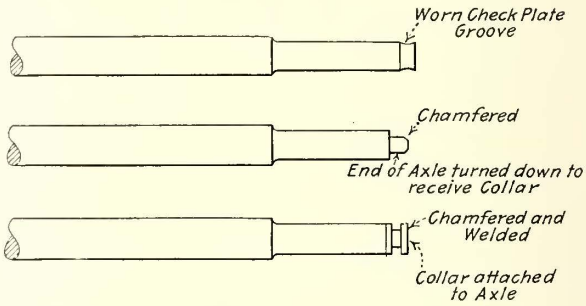


FIG. 2—STEPS IN APPLICATION OF CASE-HARDENED COLLAR TO A WELD-REPAIRED AXLE

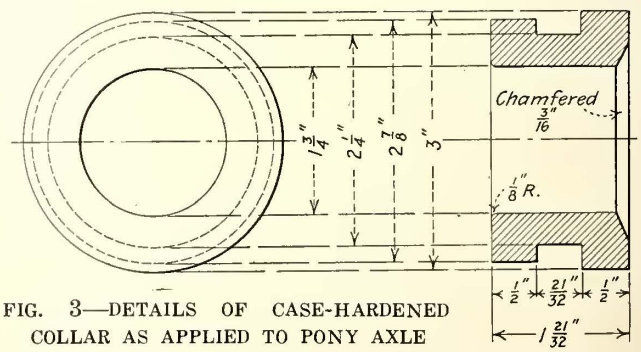


FIG. 3—DETAILS OF CASE-HARDENED COLLAR AS APPLIED TO PONY AXLE

it was then found that the hard wearing qualities of that material caused much wear in the check plate grooves on the axles. In fact, a number of them wore to a knife edge, as shown in No. 1 of the accompanying half-tone, Fig. 1.

To save the axles from the scrap pile we used our electric welding plant to fill in the grooves, as indicated by No. 2 of Fig. 1, and then turned the axles down, as

shown by No. 3 of Fig. 1. While this treatment added to the life of the axles, the welded material also wore off in time. The question of reclaiming these axles, therefore, came up a second time with the result that we decided to try the scheme of attaching a case-hardened collar on the end of the axles, as shown in Figs. 2 and 3. This collar consists of a piece of steel which is case-hardened to a depth of 1/16 in. in the grooved part only. The axle is turned down at the end for a distance of $1\frac{3}{32}$ in. and chamfered for 3/16 in. at the extreme end. The collar is arranged for a driving fit. The outer end of the collar, as shown in Fig. 3, is also chamfered to permit filling in the welding material to insure rigidity and to prevent the collar from turning on the axle.

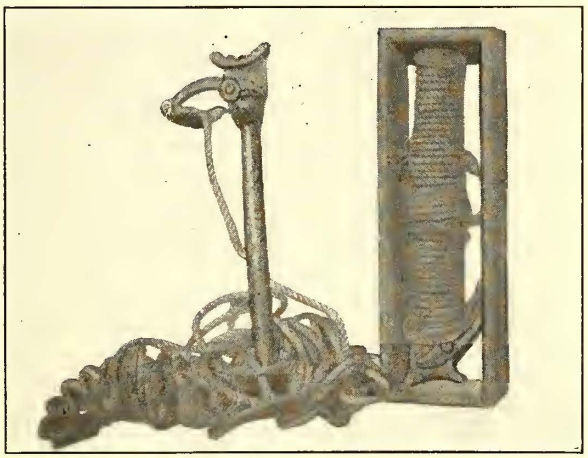
Up to the present time the practice described has been in an experimental stage, but the results so far obtained have proved very satisfactory. One car on which this collar was applied to the axle had made more than 3000 miles in hard service up to Feb. 1 of the current year and still showed no sign of wear or other possible defects.

Trolley Wire Pick-Up

BY HARRY BRANSON, SUPERINTENDENT OF EQUIPMENT LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

All cars of the Lehigh Valley Transit Company are now being equipped with trolley wire pick-ups designed to handle dropped trolley wires without danger. The accompanying halftone shows this device in its case on the right, while on the left it is shown ready for use in an emergency.

The instrument consists of a well-seasoned staff of ash about 18 in. long and 1½ in. thick with a casting mounted on one end to which a lever is pivoted, as shown. On the long end of this lever is fastened about 50 ft. of ⅜-in. rope which passes through a slanting hole in the center of the rod. The top of the casting, which is made with a corrugated curved groove, is inserted under the



TROLLEY WIRE PICK-UP READY FOR USE AND PACKED IN BOX FOR INSTALLATION IN CAR

wire. A pull on the rope will then exert through the lever a firm grip on the wire. The loose end of the rope is thrown over the limb of a tree or other support, the wire is drawn up from the ground and the rope fastened. The car may then continue its run without waiting for repairs to be made to the overhead line.

The pick-up is stored in a pine box fitted with a glass cover. This box is mounted either under a seat in the car or near the roof in one of the vestibules. The glass must be broken to get hold of the pick-up just as in the case of axes for emergency use.

Pine Ties Reused by Street Railway After Twenty-One Years' Service

BY R. C. CRAM, ASSISTANT ENGINEER WAY AND STRUCTURE BROOKLYN RAPID TRANSIT SYSTEM

The average life of the several kinds of untreated ties generally used in steam railroad track structures is now quite well determined. On the other hand, information concerning the life of ties in electric railway service in paved streets is somewhat meager. The conditions governing the two forms of service differ so much that those obtaining in steam railroad service cannot be taken as a guide for electric railway service in streets, and even, to some extent, in private right-of-way.

The ties in steam railroad service are constantly exposed to alternate variable wet and dry conditions; they are subject to very heavy stresses due to the great weight of the steam railroad equipment; they are subject to mechanical injury from more or less constant tamping. On the other hand, those in the street railway service are usually in a comparatively uniform state with respect to variation in moisture content, owing to the protection from evaporation afforded by the paving; they are subject to much lighter loads, and are seldom retamped after their installation. It is conceded that the life of tie timber is greatly increased under the latter conditions.

The character of the soils in streets may affect the life of the ties to a considerable extent, but the increasing use of concrete in the track structure undoubtedly helps to preserve ties against decay, providing fungi or fermentation are not present at the time of installation, and should offset variable soil action and add materially to the ultimate life obtained.

Fred G. Simmons, then superintendent of construction, The Milwaukee Electric Railway & Light Company, stated at the 1906 convention of the American Street & Interurban Railway Engineering Association that he had taken up tracks laid with red-cedar ties which were from sixteen to eighteen years old and that he was putting back between 40 per cent and 60 per cent of them into the tracks, surrounding them with concrete.

Tie Life in Brooklyn

The reconstruction of surface tracks carried out in Brooklyn during the past season afforded an opportunity to investigate this subject. Observation was made covering nine different streets in widely separated territory involving altogether about 15 miles of single track.

The tracks removed were constructed almost uniformly with 9-in. tram girder rail, having a base 5½ in. wide, spiked to 6 in. x 8 in. x 7 ft. sawed long-leaf yellow pine ties spaced 2 ft. 6 in. on centers, with brace tieplates spaced from 6 ft. to 8 ft. apart. In every case the tracks were paved and had been since construction, mostly with 8-in. deep granite blocks laid on sand, with sand joints. In three of the streets the original pavement had been replaced within the last six or seven years with an improved type, involving the use of the same blocks laid with grouted joints on cinder concrete.

No attempt was made to count the old ties removed, but careful check was made on the average spacing. The estimated number of ties removed was found to be about 33,000. Upon arrival at the storage yard the ties were counted and selected for use as second-hand stock, being later reissued and used, in some cases, in rehabilitated tracks where old rails were left in place and new grouted pavement was being installed.

The count at the yard showed that there was an average loss of about 24 per cent of the estimated number of ties between the street and the yard. In one or two instances the losses were so high that, considering the neighborhoods, they could only be accounted for as being due to their being appropriated for firewood. It is also patent that a fair number were destroyed in removal and went direct to dumps in the clean-up.

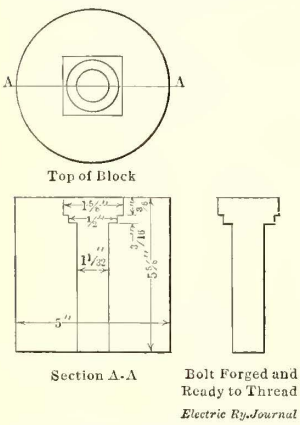
However, the interesting features are that the average age of the ties taken into stock was 18.6 years; that 72 per cent of the ties which were sorted were taken into stock, representing 54 per cent of the estimated total number removed from the street; that the ages ranged from sixteen to twenty-one years; and that in one case 94 per cent of ties sixteen years old which were sorted went into stock, or 82 per cent of the estimated original number in that street.

When all the features are considered it seems reasonably safe to assume that at least 60 per cent of the total number of ties would have been fit for stock if all of them could have been recovered. It was also observed that as a rule there was comparatively little damage to the ties due to rail cutting, especially when the 5½-in. base and old tie spacing are borne in mind.

Handy Forming Blocks for GE-57 Motors

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD & INTERURBAN RAILWAY, ROCKFORD, ILL.

During the cold weather we have had much trouble from the breakage of steel motor bolts. Such failures allow the motor case to drop and, worse than that, the armature occasionally will fall on the pole pieces. To overcome this we had lately been making these bolts from 1⅝-in. square Swedish or Farnley iron, both of which brands are very costly. Further, with the usual methods of operation much material was lost in turning these bolts from the square iron and much time was required, thus making the bolts very expensive.



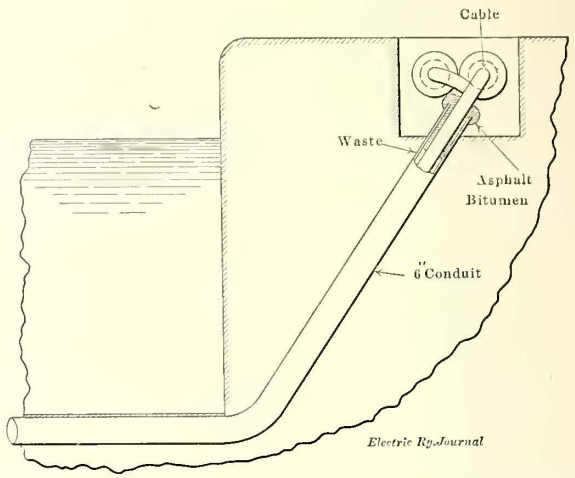
FORMING BLOCK FOR GE-57 MOTOR BOLTS

To make such bolts at a lower cost we now use a block made from a piece of an old steel axle in which the bolts can be forged from round bars of the tough steels named at a big saving in material and time. The block, as illustrated, is easily made as follows: First cut off a piece of an old axle a little longer than the length of the bolt over the head, then face off both ends in a lathe to the exact length of the bolt over the head. Next allow the block to remain in the lathe for a 1 1/32-in. drilling of its full length. After drilling the block counterbore for the round shoulder on the head of the bolt. Then take the block from the lathe and chisel it out to receive the square part of the bolt head. The block is then ready for use. Place it on an anvil or forming block, heat one end of the 1-in. round iron of which the bolt is to be made, drop it in the block with the cool end down, sledge the hot end down to form the head of the bolt, drive the bolt out of the block as soon as it is formed and allow it to cool slowly. Never cool in water. When cool the bolt is ready for threading.

Preventing Condensation in Under-Water Conduit

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, MICH.

The accompanying illustration shows a 6-in. cast-iron power cable conduit which is laid under a canal. It was found that a large amount of water had accumulated in this conduit from the condensation of entering air. This water does no damage so long as the lead



UNDER-WATER CONDUIT SEALED WITH ASPHALT-BITUMEN TO AVOID CONDENSATION

covering of the cable stays in good shape, but if the lead sheathing is damaged a little, as when the cable is pulled through the conduit, water becomes very troublesome.

To stop condensation we now seal the conduit ends with asphalt-bitumen. About 12 in. from the end of the conduit we insert a piece of clean waste to keep the bitumen from running too far down the conduit. The material is hot-poured and the end of the conduit is sealed neatly to make a good-looking job.

Accident Reduction on the Third Avenue Railway System

The following table shows a number of boarding and alighting accidents and settlements for same for 1913 and 1914 for the Third Avenue division of the Third Avenue Railway. This includes the Third Avenue road proper, 125th Street line and the Kingsbridge line.

TABLE SHOWING ACCIDENTS AND SETTLEMENTS ON THIRD AVENUE DIVISION

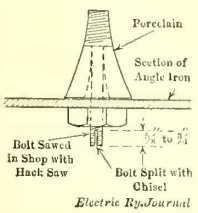
	1913. Old Style Cars				1914. New Type Cars			
	Boarding		Alighting		Boarding		Alighting	
	Accidents	Settlements	Accidents	Settlements	Accidents	Settlements	Accidents	Settlements
Sept.	70	$1,245	33	$892	14	$235	30	$360
Oct.	100	1,790	34	1,335	14	75	41	375
Nov.	72	2,412	47	1,300	17	80	31	235
Dec.	97	1,370	48	2,140	19	61	38	140
Totals	339	$6,817	162	$5,667	64	$451	140	$1,110
Increase								
Decrease					275	$6,366	22	$4,557

The division mentioned was equipped throughout with the folding door and step device of the Prepayment Car Sales Company in August, 1914, and the railway company attributes the reduction in the number and serious character of the boarding and alighting accidents entirely to this improvement. It will be noticed the number of boarding accidents decreased 275 and the alighting accidents 22, the whole reduction in settlements being $10,923, or about 88 per cent.

Experience with Malleable Iron Cross-Arms on Wooden Poles

Late in the year 1908 the New York State Railways-Rochester Lines, on what was then known as the Rochester & Sodus Bay Railway, superseded the long-leaf yellow pine cross-arms with steel-iron arms. The first installations were made on lines up to 13,000 volts, but since then the same construction has been applied to transmission lines as high as 20,000 volts. In all cases the lines are carried on cedar, chestnut or concrete poles.

The wooden cross-arms cost only 35 cents each, but as their life did not extend beyond five years it was necessary to replace them at a cost of $1 per arm for labor alone. To eliminate this maintenance cost for good, C. L. Cadle, electrical engineer of the company, decided to try steel-iron cross-arms. While these arms cost 76 cents each as compared with 35 cents for wood, they are far cheaper in the end because they will last as long as the pole. Thus, for a pole life of fifteen years the cost of wooden arms is $4.05 and that of steel $1.76. These angle-iron arms are purchased under a specification which calls for hot galvanizing after the holes have been drilled, thus avoiding the possibility of rust. The company buys the arms in the open market, but quite a portion of those now in service came from the Archbold-Brady Company, Syracuse, N. Y. Two constructions of this character, one for single-line 13,000-volt and one for double-line 20,000-volt service, are shown in accompanying drawings. It should be understood that the braces and other fittings used with the steel arms do not differ to any degree in character or price from those which were used with wooden arms.



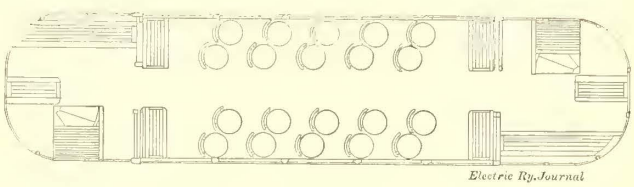
SAWED AND SPLIT BOLT

The only point of importance which came up after the first change-overs were made was how to prevent the nuts from working off of the pins. First, the company tried a spring washer at the bottom of the nut, but the nut would back off from the washer. Next a cotter key was tried, but in this construction the nut eventually wore the key in two. Finally, about three years ago, the following scheme, which has cured the trouble entirely, was devised:

Before the bolts are taken to the field, they are hack-sawed for $\frac{5}{8}$ in. to $\frac{3}{4}$ in. on that portion which will come below the nut. Then after the nuts have been applied on the job the sawed portion is split with a cold chisel just enough to prevent the bolt from losing its spring while assuring enough expansion to give the effect of a locknut. In fact, while the nut cannot work off of its own accord, it can readily be unscrewed by the lineman for use somewhere else, and of course there is no other part to remove first, as would be necessary in cotter-key fastenings.

Front Exit Glasgow Double-Deck Car With Folding Step

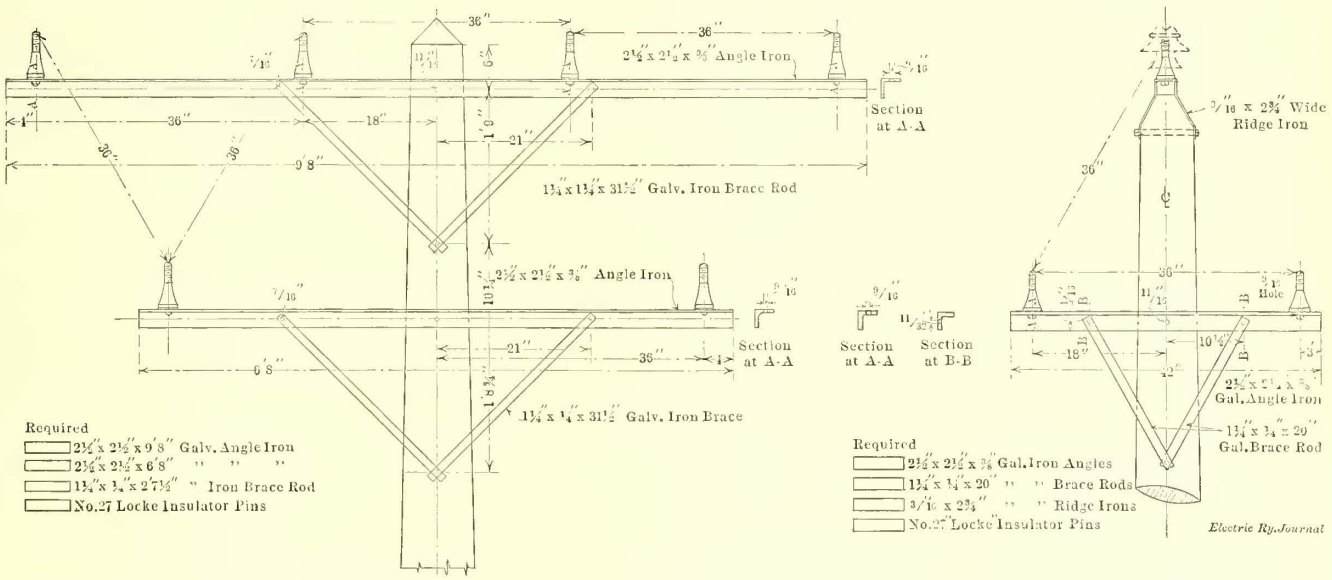
The Glasgow Corporation Tramways has recently added to its rolling stock a double-deck car, the chief features of which are a front exit for inside passengers and a new design and arrangement of the upper-deck seats. The car body and platform are built to the standard design adopted by the tramways committee many years ago. The length of the car body is 17 ft. and the length of each platform is 6 ft.



PLAN OF UPPER DECK OF CAR, SHOWING REVOLVING SEATS

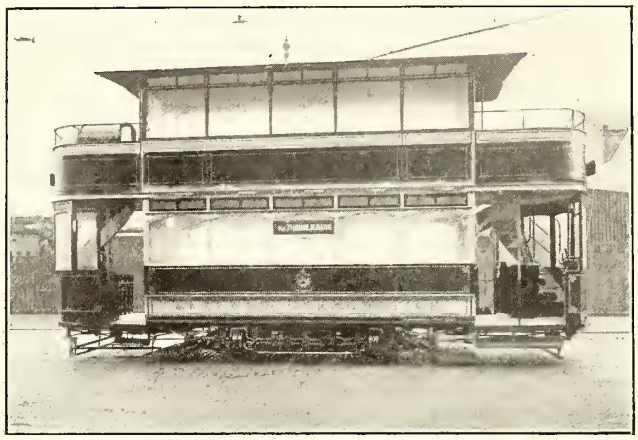
In the original design the top of the stair is fitted hard against the car body, leaving accommodation at the foot of the stair for placing the controller close up to the dashboard. In the new design, the stair is moved away from the body of the car, in order to provide the necessary headroom between itself and the car body, free access being obtained at the foot of the stair by moving the controller about 20 in. away from the dashboard. The hand-brake staff is placed at the extreme end of the platform, and a vertical wheel with suitable bevel gearing and folding handle has been introduced in place of the ordinary spindle brake.

The hinged exit gate is geared to the folding step in such a manner that when the gate is open the step is lowered, and when the gate is closed the step is raised.



STANDARD FIXTURE LAYOUTS FOR DOUBLE LINES UP TO 20,000 VOLTS AND FOR SINGLE LINES UP TO 13,000 VOLTS

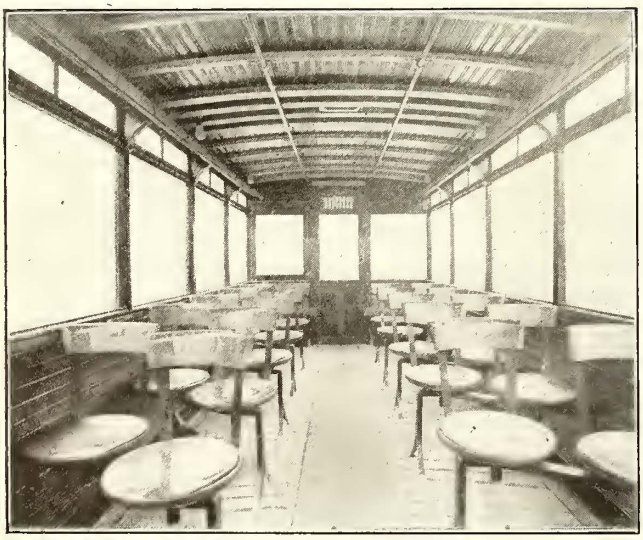
The arrangement of the top seats, as shown on the plan, was introduced in order to increase the passageway up the center of the car and at the same time to provide a more comfortable seat. By this arrangement, each passenger is provided with an independent chair, with a back rest, mounted on a pivot, so that the chairs



GLASGOW DOUBLE-DECK CAR WITH HINGED EXIT GATE AND FOLDING STEP

can be turned to suit the direction in which the car is traveling. Each pair of seats is set at such an angle that the shoulder of one passenger overlaps the shoulder of the passenger occupying the next seat.

On account of the new position of the stair, it was necessary to increase the length of the upper dashboard



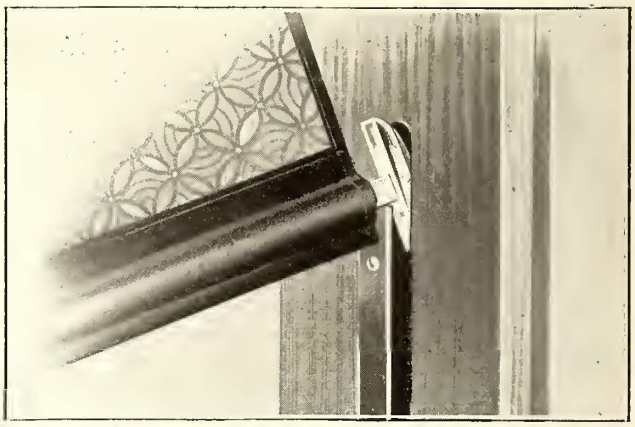
PAIRS OF PIVOTED SEATS ON UPPER DECK OF GLASGOW CAR; NOTE ALSO ABSENCE OF HEADLINING

or wind screen, the effect of which has been to increase the seating capacity under the canopy at each end of the car by one passenger. The seating capacity of the original type of car is sixty-two and in the new car sixty-four.

Local and interurban railways in Cleveland found operation difficult on Feb. 1, because of sleet on the trolley wires and tracks and numerous broken wires. Reports from Toledo indicate that similar difficulty was encountered on Feb. 1 and 2. Because of broken trolley wires power was shut off at the plant of the Lake Shore Electric Railway at Fremont and for a time operation of cars between that point and Toledo was suspended.

Curtain Fixtures Without Pinch Handles

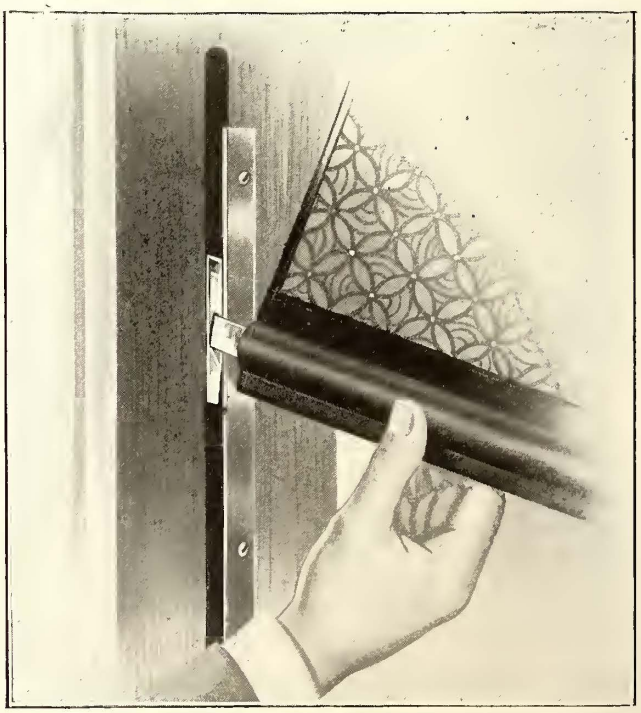
The Dayton Manufacturing Company, Dayton, Ohio, has recently brought out an improved car curtain fixture in which friction shoes bearing in the curtain grooves hold the curtain absolutely at any position. These shoes are pivoted at the ends of spring-pressed plungers, and they will not bind in the curtain grooves, even if the lower edge of the curtain is slanted at an unusual angle.



SHOE EASILY REMOVED FROM GROOVE WHEN NECESSARY

The bottom rod may be grasped at any point with either hand and the curtain raised or lowered smoothly and easily. No pinch handles are necessary.

It is asserted that no matter how rapidly or how roughly the curtain may be operated, the tips cannot be jerked from the grooves, as a metal retaining strip, fastened to the window casing along the edge of each groove, effectually prevents the accidental displacement

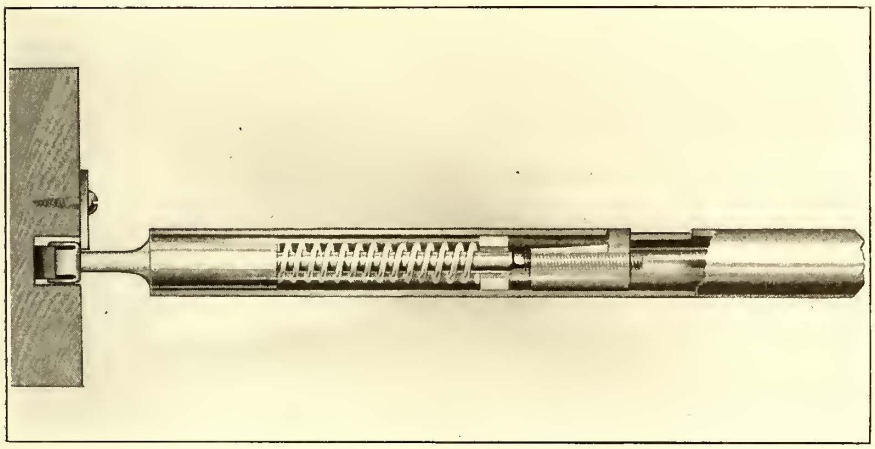


RETAINING STRIP PREVENTS ACCIDENTAL MISPLACEMENT

of the shoes. The tendency of the tips of other types of curtain to leave the grooves if the finger pieces are pressed too strongly, or if the curtain is raised or lowered too rapidly, is a source of much annoyance to passengers and what is more apparent, of considerable damage to the curtain and the finish of the window casing.

The retaining strips, while keeping the shoes in the grooves under all conditions of operation, do not interfere with the ready removal of the curtain when necessary. Each strip terminates 1¼ in. below the upper end of its groove and the friction shoe may be tilted and withdrawn through this opening. However, the shoe is nearly twice as long as this opening and it will not slide out under use. The removal of the curtain must be intentional, in which case it is easily and quickly effected.

The simplicity of this curtain fixture is apparent from the accompanying sectional view. The lower edge of the curtain is formed by a steel tube, in either end of which slides a brass plunger with its shoe. Adjustment of the spring tension and for different widths of window is obtained by screwing this plunger in or out as required, the threaded end of the plunger engaging a long bronze nut, as shown. As the shoes do not extend far below the lower edge of the tube, a long apron is not required and this feature adds greatly to the durability of the fabric.



DETAILS OF CURTAIN FIXTURE EXPOSED IN PART

The "Dayton" fixture does not require a special size of groove as it will operate equally well in the standard size groove, as also in the deeper, wider grooves required by certain other types. This is of importance when fixtures are being specified for the remodeling of old cars.

The retaining strips may be enameled to suit the color of the woodwork or they may be finished to match the other bronze trimmings of the car.

This company's curtains will be regularly made from "Fabrikoid," a durable curtain material, which can be supplied in all shades, and in a wide variety of patterns, or to match any curtain material now in use. All curtains are fitted with metal rollers.

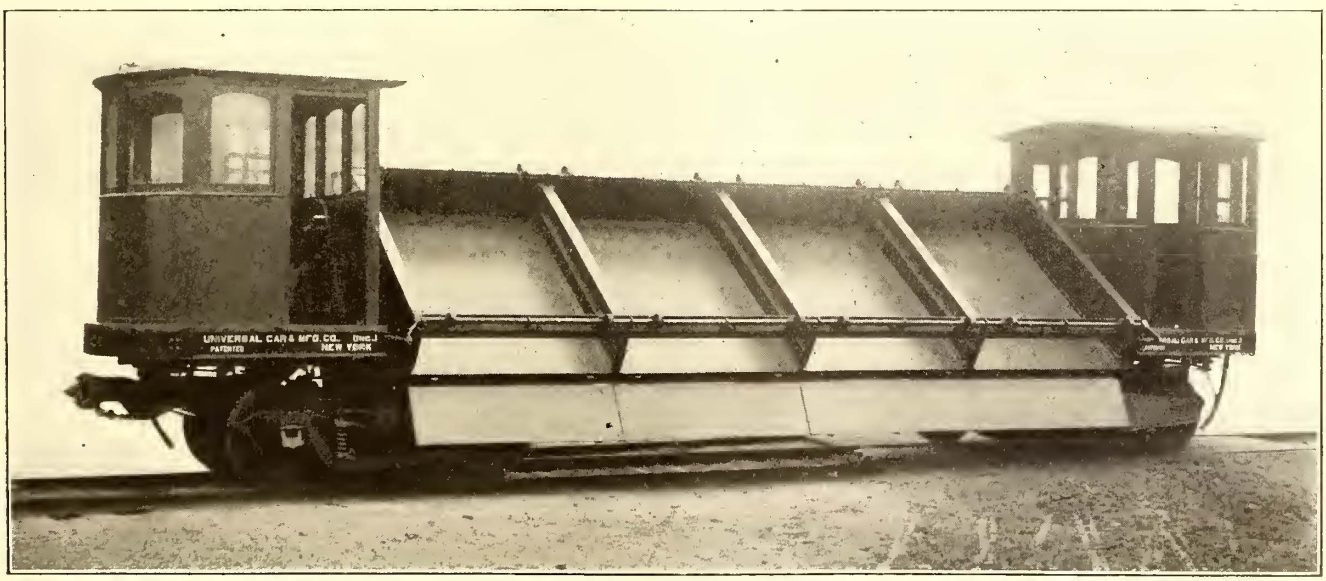
Two-Way Dump Cars

The "Universal" is the name of the modern two-way dump car built by the Universal Car & Manufacturing Company (Inc.), New York. With the exception of the cabs this car is constructed of rolled-steel sections and plates throughout, and it may be used either as a motor car or as a trailer. In trailer cars the cabs are usually omitted. The car dumps to either side and is operated entirely by hand power. As it is mounted on the underframe by means of cast-steel rockers the car comes to its full angle with little or no shock, and it is easily righted when the load is discharged. The entire dumping and righting operation is performed within two minutes.

The doors open automatically when the car is dumping and, as illustrated, form an apron for the lading to pass over, thus throwing the load entirely free of the track. A spreader is also attached to the rear truck as a further aid in pushing the material away from the track. The car may be dumped in an empty position and then loaded by hand and righted. This is a decided advantage as the lift from the roadway to the top side of the car is only 4 ft., which is easy for men using shovels.

The car has four compartments, each of which may be dumped separately if so desired. The car may also be dumped in normal running position without tilting the body. When partitions are not wanted the company substitutes a diaphragm only 4 in. high, thus allowing long material to be hauled. Any type of couplers may be used and, if desired, air brakes may be added. The body may also be mounted on the railway's standard trucks.

Cars of this type are used on several of the largest electric railways in the United States, such as the Connecticut Company, the Boston Elevated Railway, Cleve-



TWO-WAY DUMP CAR OF STEEL CONSTRUCTION EXCEPT CABS, AND MADE FOR MOTOR OR TRAILER USE

land Railway, Bangor Railway & Electric Company and the Public Service Railway. Charles H. Clark, engineer maintenance of way Cleveland Railway, estimates the earning power of one of these cars to his company as $100 a day. Since this car requires only the motorman and conductor for unloading, its superiority to the old-time hand-loaded flat car is manifest. For example, it costs one Eastern system about $2 to unload one flat car.

The principal data on a typical two-way dump car follow:

Cubic capacity level full	15 cu. yd.
Length over end sills	50 ft.
Length inside box	25 ft.
Width inside	8 ft.
Height from top of rail to top of floor	5 ft. ⅜ in.
Height from top of rail to top of side	6 ft. 1⅜ in.
Truck centers	25 ft. 6½ in.
Height inside	25 in.
Weight (without electrical equipment)	33,000 lb.

Sand-Spreading Wagon for Slippery Pavement

Officials of the Louisville, Ky., Railway have been watching the efforts of the Board of Public Works to improve the condition of the streets in the business section by means of a sand-spreading wagon. This wagon, which is made by the Havass Company, New York, N. Y., feeds sand through a revolving disk under the wagon bed. It can be adjusted to throw sand at any desired rate. It has been put to work on wood block and certain asphalted streets, the surface of which has been made very slippery by the continued cold weather.

In the sections where this wagon has been put into service the railway has double tracks, which, of course, are affected by the same conditions that make the streets slippery. If the sand distributed by the city is of the right quality, dry and sharp, it will lessen the railway's own requirements for sand; if it is a low grade of sand, the railway's "slick rail" troubles probably would be increased. However, the city is now using a sharp, clear river sand similar to that used by the railway, if for no other reason than that clayey, wet sand would not run through the new machine.

Direct-Current Generator Capacity

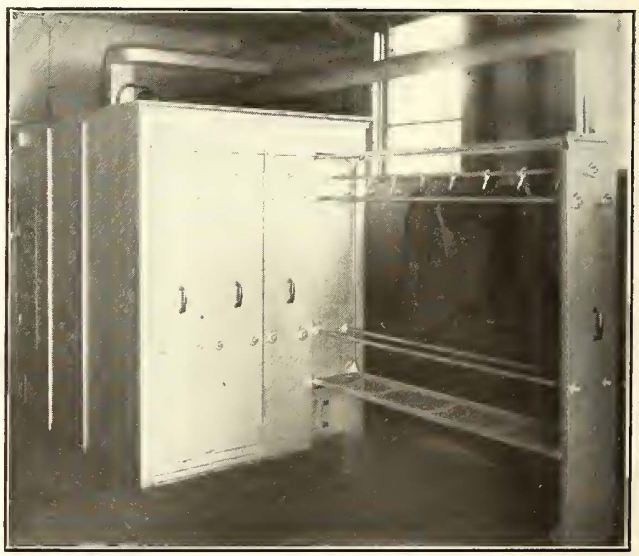
In an article in the *Electric Journal*, B. G. Lamme, chief engineer Westinghouse Electric & Manufacturing Company, commented on direct-current generators as follows: The engine-type machine in its prime was a magnificent piece of apparatus. On account of its low speed, it was of comparatively large dimensions for a given output. In the largest capacity, low-speed engine-type generators, over-all dimensions of from 25 ft. to 27 ft. were attained. However, these machines were midgets, both in size and capacity, alongside some of the a.c. engine-type generators at their maximum. The latter were constructed up to capacities of from 5000 kw to 6000 kw compared with 3000 kw for direct current, while the engine-type alternators attained over-all diameters as high as 42 ft. Incidentally, as regards capacity alone, the race between alternators and d.c. machines has been very much one-sided, almost since the polyphase system became thoroughly commercial. The earliest Niagara generators (constructed in 1893), of 3750 kw were practically of as large capacity as the largest d.c. machine ever built; while in later polyphase work, generators of the usual multipolar construction have been built up to 17,000 kw and turbo-generators up to 30,000 and 35,000 kw. Obviously, as regards maximum capacity, the d.c. generator makes but a poor comparison, but this should in no way detract from the appreciation of this machine as an energizing accomplishment.

Electric Garment Dryer Conserves Health and Schedules

For many years the Brooklyn Rapid Transit System has provided employees' clubrooms in which, among other conveniences, lockers and shower baths are installed. Through its benefit association and medical inspection service, however, the company found that these facilities were insufficient to ward off the illnesses that follow when men stay in wet clothing after coming in from a storm. Very few platform men would be likely to keep an extra suit of clothing at the clubrooms, nor is it convenient for them to go home between runs for that purpose.

To better this condition the company tried out nearly two years ago, an electric garment dryer of the style shown in the accompanying illustration. This device thoroughly dries wet clothing in the time that a man requires for a bath. The results in keeping men from becoming ill and so missing their runs, to say nothing of the comfort afforded, were so satisfactory that seven more dryers have now been installed by the company at different stations.

The dryers are made to fit any desired location. Their racks pull out individually, traveling on the floor, either



ELECTRIC GARMENT DRYER IN SERVICE, ONE RACK DRAWN OUT TO SHOW HANGER

inside or outside of the dryer. The construction is such, that each rack when pulled out its full length, closes the aperture, retaining the heat within the dryer and giving constant drying efficiency to the garments inside, while other racks are being loaded or removed.

While the dryers are ordinarily 7 ft. long and about 7 ft. 6 in. high, their dimensions may be varied to contain the necessary numbers of racks for the sizes of the crews, etc. Each rack is 16¼ in. wide, with a hanging capacity of five complete suits of underwear, linen and uniforms. The dryers have a double casing, insulated to prevent radiation of heat. In addition to the natural ventilation provided, added drying efficiency is obtained by forced draft circulation from a fan motor.

The first use of these dryers in the connection described is to be credited to the Brooklyn Rapid Transit System, although different types have been in use for some years in various municipal fire and police department houses. They are available as conditions demand for heating by electricity, coal, gas or steam. These dryers are made by the Shannon Manufacturing Company, New York, N. Y.

LONDON LETTER

P. A. Y. E. Cars Successful in Aberdeen—Last of London Horse Tramways to Give Way to Electrified Lines

(From Our Regular Correspondent)

The annual return regarding tramways and light railways and trackless trolley undertakings issued by the Local Government Board shows that since 1878 the route length of tramways and light railways on public roads open for traffic in the United Kingdom has increased from 269 to 2703 miles, the capital expenditure from £4,207,350 to £80,977,838, the number of passengers carried from 146,000,000 to 3,426,000,000, and the net receipts from £230,956 to £5,628,321. Of the total of 1848 miles of line owned by local authorities, 1640 miles are worked by those authorities themselves, or, in a few cases, by other local authorities leasing from them, and the remaining 208 miles by leasing companies. Last year the route mileage worked by electric traction was 2546 miles out of a total of 2662. This year it is 2595 miles out of 2703. Of the 279 undertakings, 171 belong to local authorities and 108 to companies or other parties. The net receipts of local authorities who work tramway undertakings belonging to them, or leased from other local authorities, amounted to £4,071,610. On the year's traffic £1,218,299 was required to pay interest or dividends on capital, and £120,039 for rent of leased lines. The sum of £1,371,263 was applied towards the reduction of tramway debt, and £589,886 for relief of rates, while £711,217 was carried to reserve and renewal funds. As regards the length of line open for public traffic, the London County Council system comes first with 146 1/6 miles, then Glasgow with 103¾ (including depot connections), while Manchester is credited with 78¾ and Liverpool with 64½. Among company undertakings the London United heads the list with 53¾ miles.

The Halifax Town Council has decided to promote a bill in Parliament giving it power to spend about £120,000 on new tramway works. It is proposed to extend the tramways from Brighouse to the Huddersfield border via Rastrick, from Halifax and Elland, from West Vale to Stainland, and from Triangle to Ripponden; to run trolley vehicles and motor buses and to secure extension of the periods during which the corporation will have possession of the tramways it has constructed in the areas of other local authorities. The Halifax Corporation is also seeking powers to run trail cars and to deal with road maintenance in connection with the running of motor buses. The clause regarding the buses follows what has now become standard practice, namely, the corporation will pay to the road authority during the first three years ⅜d. per car-mile run by the buses in the outside area. After three years, and at the end of every subsequent three years, the extra cost of road maintenance caused by the running of the buses is to be ascertained, of which the corporation will pay half, but in no case will this contribution exceed ⅜d. per car-mile run. Any grant made by the Imperial Exchequer is to be taken into account.

Mr. Pilcher, the manager of the Aberdeen Corporation Tramways, has issued a report to the members of the tramways committee to refute the criticisms on P. A. Y. E. cars. He states that the cars have been in operation on the Woodside route for twenty months, Beach route ten months, Torry route seven months, and Mannofield route four months—practically half the system now being operated. Generally speaking, he found that there was a considerable amount of criticism at first. From an administrative and operating point of view they have been an unqualified success. The number of accidents to persons attempting to board or alight from the ordinary cars while in motion, for twelve months ended Dec. 1, 1914, was 87, all of which platform accidents would either have been prevented or greatly minimized on P. A. Y. E. cars. Most of these occurred while the conductor was engaged inside or on top collecting fares. It very rarely happens that a serious platform accident occurs on a P. A. Y. E. car, as the conductor is always present to prevent it. It is interesting to note also that nearly all the conductors and motormen are in favor of the P. A. Y. E. cars.

For a considerable period the London County Council and the Stepney Borough Council have been at variance over the system on which the tramway between South Hackney and the Docks (by way of Grove Road and Burdett Road) should be electrified. The County Council wanted to install the overhead system; the Stepney Council insisted upon the conduit. The result has been that the old horse cars have ceased to run, and this important route is now without trams, though not without motor buses. Recently the need for reconstructing the tramway became urgent, and the County Council undertook to reconstruct the existing tramways for horse traction, but in such a way that they would be suitable for electrification at some future date, on the overhead trolley system. Against this the Stepney Council entered a protest. Now it has been asked by the Board of Trade if it has any further observations to offer on the plans furnished by the London County Council. At the same time, the board states that it is not prepared to withhold consent from the proposals of the County Council on the ground that that authority does not propose to renew the lines in such a way as to facilitate their equipment for electric traction on the overhead trolley system. The board transmitted copy of a communication from the Poplar Borough Council, showing that the Borough Councils of Poplar, Bethnal Green and Hackney have agreed to the overhead system and are anxious that the Stepney Council should withdraw its opposition. The works committee of the Stepney Borough Council has now replied to the Board of Trade that it has no further observations to offer except that it is doubtful whether any appurtenances purely germane to the overhead trolley system can be provided by the London County Council in the absence of the consent of the Borough Council. In other words, the deadlock continues.

The last of the horse tramways in London are shortly to be removed as the London County Council has sanctioned the expenditure of £22,000 for the widening of certain roads preparatory to electrifying the horse tramway at present running from Tower Bridge Road to Rotherhithe. The total cost of electrifying this route, which is about 27 miles in length, will be £74,700, apart from the cost of street widenings, the track work alone costing £62,500. The new tramways will be constructed on the conduit system, thus enabling through service in connection with the other routes linking up with both ends of this branch. The reconstruction of this route has been before the London County Council and the Bermondsey Borough Council for several years, the difficulty being that the London County Council favored the overhead system, while the Bermondsey authority refused to consider any other than the conduit system. After several interviews between representatives of the two bodies concerned, the London County Council yielded.

London is to have a second bill promoted in Parliament at the next session with a view to supplying electrical energy in an area comprising the Administrative County of London and adjacent areas. It will be in substitution for the London County Council bill, a few particulars of which were published last month. This second bill is promoted by a few of the London electric lighting companies, and the preamble states that electrical energy is now supplied to the County of London by a number of companies and local authorities, and that the existing conditions are unfavorable for the best economy. It states also that electrical energy can be supplied more effectively and economically from one combined undertaking, and that the existing undertakings in the area should be consolidated. The bill, therefore, proposes to incorporate a company with a share capital of £6,000,000 and a loan capital of £2,000,000 "for the purpose of consolidating, unifying and improving the generation and distribution of electrical energy for all purposes in the area of supply as defined by the act, and of utilizing to the best economical advantage all existing means of generation and distribution of electrical energy within the area, with a view to the ultimate provision within the area of one system of supply of electrical energy with concentrated generation and standardized distribution." The companies proposed to be transferred to the new statutory company are the Charing Cross, West End & City Electricity Supply Company, Ltd., the Brompton & Kensington Electricity Supply Company, Ltd., the Central Electric Supply Company, Ltd., the Chelsea Electricity Supply Company, Ltd., the Kensington & Knightsbridge Electric Lighting Company, Ltd., the London Electric Supply Corporation, Ltd., the Metropolitan Electric Supply Company, Ltd., the Notting Hill Electric Lighting Company, Ltd., the St. James & Pall Mall Electric Company, Ltd., and the Westminster Electric Supply Corporation, Ltd.

A. C. S.

News of Electric Railways

BUFFALO-NIAGARA FALLS LINE

Project Involving Expenditure of Several Million Dollars Approved by Commission

The Public Service Commission of the Second District of New York has granted the International Railway permission to build its proposed high-speed electric line between Buffalo and Niagara Falls over private right-of-way, and has authorized an issue of the company's 3 per cent fifty-year refunding and improvement mortgage bonds to the amount of $2,395,000, to be sold at not less than 87, netting a little more than $2,000,000 to pay for the new line.

The new line will start on Main Street, Buffalo, at the intersection with the Buffalo & Lockport line of the International Railway, and run northwesterly out of Buffalo to Tonawanda, through Tonawanda over the old Buffalo, Thousand Islands & Portland Railroad line, through North Tonawanda, the town of Wheatfield, village of La Salle and into the city of Niagara Falls to Portage Road and over Portage Road to Niagara Street.

Included in the cost of the new line is provision for the purchase of sixteen new 52-ft. steel underframe interurban cars, substations at Payne Avenue and Niagara Falls, a carhouse at Niagara Falls, stations at La Salle, Division Street and Tonawanda, waiting rooms at Main and Erie Streets and at Payne Avenue, and a shelter house at Ward's Road. It is provided that the new line shall cross the New York Central tracks by an overhead bridge, and bridges are provided for over Mill Creek, Ellicott Creek, State Ditch, Tonawanda Creek, Cayuga Creek, Gill Creek and the Gratwick Trestle.

The right-of-way and real estate are to cost $800,000, as detailed in the report of H. F. Riesinger; bridges and culverts, $240,500; substation equipment, $78,700; buildings, $109,850; rolling stock, $160,000; track line and grading, etc., $127,837.

PUBLIC SERVICE COMMISSION INQUIRY

New York Legislative Committee Begins Inquiry into Practices of First District Commission—Secretary Whitney Testifies

The taking of testimony by the legislative committee appointed to inquire into the workings of the Public Service Commissions of New York was begun in New York City on Jan. 30. Travis H. Whitney, secretary of the commission for the first district since its creation in 1907, explained the routine of the organization. Starting with 403 employees with salaries of $724,216 in 1907, the commission last year had 2097 employees, with salaries of $2,903,321 and expenses of $2,971,000. The increase was attributed to the building of the new subway system. The commission had twelve lawyers on its staff, but spent $57,825 for special counsel since 1907. Some of the questions were directed toward ascertaining the qualification for office of Joseph Johnson, head of the transit inspection bureau of the commission, former fire commissioner of New York and campaign manager for Judge McCall, chairman of the commission, when the latter ran for Mayor.

The history of the now famous wheel-guard case in connection with which William R. Willcox, former chairman of the commission, was held in contempt of court, was reviewed. Mr. Whitney said that the policy of the commission in regard to pressing suits to require compliance with its orders had been influenced very largely by the outcome of several of the early actions brought by the commission. In one of them the commission was awarded only $1 damages and it did not appeal, while in another action by the commission to compel respect for its orders the judge dismissed the complaint.

At the hearing on Feb. 1 it was brought out that correspondence in regard to informal complaints amounted to some twenty or thirty letters a day and that this was cared for by Mr. Whitney and George S. Daggett, the chief clerk. The complaints addressed to individual members of the commission went to such members. In the case of informal complaints no hearings were held and no orders issued. Citizens who made complaints usually wished to have them treated as informal ones, in order to obviate the necessity of having to testify at public hearings. Asked what supervision the commission exerted over this correspondence, Mr. Whitney said that Commissioner Woods, since taking office, had been applying to him for copies of complaints. Mr. Whitney said that it was the regular practice to hold conferences between the individual commissioners and officers of the public service corporations, but denied that informal complaints were often modified after such conferences.

Mr. Daggett, who followed Mr. Whitney on the stand, was asked if some of the commissioners had not been displeased with his letters to some of the public service companies, and if such displeasure had not been shown after the commissioners had consulted with officials of the companies. He replied that it might have been. Required by Mr. Haywood, counsel of the committee, to answer specifically, Mr. Daggett said, "On one or two occasions, yes."

Mr. Haywood expressed himself on Feb. 2 as being well satisfied with the progress so far made in connection with the investigation. He said, however, that if the committee was to conclude its labors by Feb. 17 it would not be possible to go thoroughly into all phases of the commission's work. Up to Feb. 2 no plans had been made for the investigation of the commission for the second district.

BRITISH TRAMWAYS AND THE WAR

General Managers of Manchester and Glasgow Companies Report Effect of War Upon Finances and Number of Employees

Mr. McElroy, the general manager of the Manchester Corporation Tramways, has submitted a report as to the effect of the war upon the finances of the department. Since the first four months of the war there has been a large decrease in the receipts, as compared with the previous year, and it is anticipated that at the end of the financial year the income will be £900,000, or £50,000 below the estimate. Notwithstanding the increased expenditure owing to allowances to the men who have joined the colors, and the engaging and training of a new staff, and the reduced revenue, Mr. McElroy considers that the tramways committee will, at the end of the year, be in a position to pay £100,000 in relief of the rates and place £50,000 to renewals, etc., fund, instead of the estimated £102,000. The report continues:

"The number of men from the tramways department who up to this date have joined the colors is about one in 200, and the amount now allowed to them or their dependents is at the rate of £44,876 per annum. Our men are still leaving us daily to enlist. In addition to supplying so many men from our own department, we have assisted in the general recruiting campaign in Manchester by displaying striking posters in the tramcars, which, we are told, have had a good effect. The department has made an energetic effort to raise funds by means of collections in the tramcars. The weekly collections since the commencement have amounted to £5,827. The various bills and posters which have been placed in the cars in connection with these collections have cost the department up to the present about £150, which equals 2½ per cent on the amount collected. Free riding on the tramcars has been granted to those recruits who have joined the city battalions and are not housed at the places where their training is taking place, and have therefore to travel daily to and from their homes. The free traveling facilities are provided by granting supplies of tokens to the commanding officers, who undertake to distribute the tokens and to see that the privilege is not abused. The value of the tokens distributed up to the present has been £2,057, which equals nearly 500,000 1d. fares."

A communication to the ELECTRIC RAILWAY JOURNAL from James Dalrymple, general manager Glasgow Corporation Tramways, states that the company is at the present time recruiting an additional 300 men as a reserve company for the tramway battalion, and later will probably be asked to

procure another 300. The men of the "First Glasgow" H. L. I., comfortably housed at Gailes, are now equipped and almost ready for the front. The company has prepared leaflets describing its troops and is having its female staff distribute these in the cars.

As to the new conductors, Mr. Dalrymple says that, although practically all new men with but very little training, they are doing quite well. The revenues of the company are showing a slight increase over last year. The fiscal year does not end until May 31, but if conditions continue as at present, the revenues should about equal those of last year.

RAPID TRANSIT IN CINCINNATI

Representatives of a number of civic organizations attended the meeting of the Rapid Transit Commission of Cincinnati at the Business Men's Club on Jan. 29. President Edwards of the commission explained the four plans presented by the engineers recently and then said that if the east and west sides of the loop in scheme No. 4 were built, all the interurban lines with one exception would have entrance to the business section of the city. He said that this line could be brought in over one of the surface tracks until the remainder of the loop is completed. The cost of constructing the two sections would be about $3,000,000 less than for the entire loop. A suggestion from another speaker that only one side of the loop be constructed at first met with disfavor.

The east side of the loop extends from the business district to Forest, while the west side extends to Crawford. The third side connects these two points and passes through Mitchell, St. Bernard, Paddock and Montgomery. Rapid transit service could not be furnished these places until the city is able to build the third section, if the plans suggested are carried out, but it was said at the meeting that they do not form a portion of the city and there is no obligation to furnish their residents with the new service at once.

W. W. Freeman, president of the Union Gas & Electric Company, sent a communication to the commission in which he stated that his company would do everything possible to aid in the improvement and that power might be furnished from its plants for the operation of the road on a more economical basis than if generated in stations built by the city. The commission promised to give this matter serious consideration.

Walter M. Schoenle, city solicitor, told the commission that he had prepared a bill for introduction in the Legislature that would, if passed, result in relinquishing the city from paying a rental of $32,000 a year for the use of the canal bed for the rapid transit line. The commission delayed any expression of opinion on the matter until the bill has received careful consideration.

INDIANA LEGISLATURE

The following bills have been introduced in the Indiana House: A bill providing that incorporated towns of 500 or more inhabitants may by order of the Town Board compel the stationing of flagmen or installation of signal systems at dangerous railroad or interurban crossings within the towns; a bill amending the tax laws to place the power of evaluating all public utilities in the hands of the State board of tax commissioners; a bill amending the old railroad commission act (now thrown under the Public Service Commission) providing that the commission shall have six months instead of thirty days to take action on railroad tariffs; a bill amending the present 2-cent fare law, and fixing the maximum fare at 2½ cents a mile.

In introducing the last measure, Mr. Waltz called the attention of the General Assembly to the fact that the Interstate Commerce Commission has recommended a 2½-cent rate in interstate business and that the various states enact laws to make such a rate legal within the confines of the several states.

The "anti-lobby" bill has passed the Indiana House, and has been amended and passed by the Senate. One of the Senate amendments provides that if any newspaper receives compensation for printing any article advocating or opposing any measure before the Legislature, it shall print the amount of the compensation received for such article and at whose instance it was printed. The amended bill has been approved and passed by the House, and will probably be signed by the Governor.

The nine-hour day bill, covering substation or switchboard operators who control or report train movements of electric railways, has been killed in the House.

SECURITY SELLING COMPANY UNDER INVESTIGATION

At the instance of the Interborough-Metropolitan Company, New York, N. Y., District Attorney Perkins has under investigation the Interborough-Metropolitan Investing & Security Company, which has recently been selling to Italian subway laborers for $24 a share Interborough-Metropolitan Company common stock quoted at $11 and $12 a share. The security selling company, which of course has no connection with the railway, induced the Italians to purchase these shares through advertising in Italian newspapers. The advertisement featured the great "opportunity" that accompanied the sale of the stock at $24, but carefully refrained from making any direct promises or statements that might give grounds to action for fraud. The railway has notified August Belmont & Company, transfer agents, not to transfer any of the stock to the Italian buyers and altogether about 300 shares of stock have been refused for transfer. It is reported that suit will be brought against the Interborough-Metropolitan Company by one of the New York Stock Exchange brokerage houses that have been dragged into the affair, to recover damages for the holding up of its stock transfers. The railway, however, in order to protect its Italian workers, is willing to allow the courts to decide the legality of its stand. The security selling company, which is said to be headed by Roberto Parodi, was formed to deal only in Interborough-Metropolitan stock and has been in existence for little more than two weeks. According to latest advices, Mr. Parodi has been arrested on the charge of grand larceny in the second degree.

BAY STATE ARBITRATION HEARINGS

Hearings by the Bay State Street Railway wages arbitration board were suspended during the week ended Jan. 30 on account of other engagements of counsel. At the later sessions various division superintendents located at important points north and south of Boston testified that the policy of the company was one of leniency toward mistakes of an unintentional character and that there was no difficulty in securing a plentiful supply of new men at the prevailing rate of wages. Representatives of the union admitted that in conferences last fall the company had offered to put into effect a daily guarantee of five hours' pay for all transportation employees, but that the offer was refused by the union, which desired a seven-hour guarantee. P. F. Sullivan, president of the company, also offered to increase the wages of blue uniformed men 0.5 cent an hour for two successive years, pointing out at the conferences that the company's finances would not justify a further advance. Extended testimony was offered by employees to the effect that the cost of living has risen materially in the last five years and that the present maximum of 28 cents an hour should be increased to 35 cents. The employees' union contends that new men should be paid 30 cents an hour and that at the end of the first year the maximum should be attained. The company's side of the case has not yet been presented. Prof. Irving Fisher of Yale University testified on behalf of the employees' union that the cost of living has risen about 50 per cent in the last eighteen years. The rise in prices is the resultant of five different factors: amount of money in circulation, amount of deposits subject to check, the velocity of circulation, activity of bank accounts and the volume of trade. Professor Fisher contended that $16 a week is the minimum wage upon which a family of five can subsist.

COUNCIL MEETINGS IN CLEVELAND

The plan to have the Cleveland (Ohio) Railway purchase the North Randall line at $146,000 was defeated at a meeting of the City Council on Feb. 1, although Peter Witt, street railway commissioner, favored the idea.

The street railway committee has presented an adverse report on Councilman Gahn's proposed ordinance requiring the Cleveland Railway to furnish derailer operators at all grade crossings.

In reply to an inquiry from Councilman Dittrick, on

Feb. 1, Mr. Witt said that the $2,500,000 which the company had agreed to expend in extensions and betterments under the Tayler agreement has been exhausted. Proposals for the expenditure of funds for this purpose must now be made by the company. Council has a right to veto the plans, however. The money has been used for the construction of division carhouses and buildings, track and rolling stock.

Virgil J. Terrill has undertaken to relieve certain cities of the necessity of seeking consents from the owners of property abutting on proposed street railway lines by introducing a bill in the Legislature making this unnecessary in cities that operate under a charter adopted in accordance with the State constitution. This is meant to apply to Cleveland and especially to open the way to building tracks on Euclid Avenue between East Twenty-second and Fortieth Streets, otherwise known as "Millionaires' Row." The city wants this section of road built the coming spring and summer.

The Council asked the company to operate its motor buses on East Thirtieth Street to test the need for a crosstown line at that point. The income from the bus operated on Noble Road at a 5-cent fare, for December, 1914, was 6.03 cents per car-mile, while the cost of operation was in excess of 20 cents, it is said. During the same month the bus on Pearl Road earned only 4.68 cents per car-mile, with the cost of operation about the same. These routes are outside the city limits.

TRACKLESS TROLLEY BILL IN PENNSYLVANIA

Representative Gans of Philadelphia has introduced a bill in the Legislature at Harrisburg that would overcome the objections of the Public Service Commission to granting charters to "trackless trolley" companies. Recently application was made to the commission for a certificate of public convenience by the Perkiomen Electric Transit Company, which proposed to run a trackless trolley through the Perkiomen Valley. The commission refused the application on the ground that under the general corporation act of 1874 no provision was made for the granting of charters for such a company, as noted in the Electric Railway Journal of Jan. 16. The bill of Mr. Gans amends the act of 1874 governing the incorporation of motorbus and omnibus lines by providing regulations for corporations drawing power from overhead wires. It is understood that the Perkiomen company, should the bill become a law, will apply again to the commission for a charter.

DETROIT PURCHASE NEGOTIATIONS

James Couzens, president of the Detroit street railway commission, announced in an interview in Detroit newspapers that negotiations for the purchase of the property of the Detroit United Railway within the one-fare zone would be undertaken shortly by the commission on the basis of the appraisal of $21,000,000 made for the commission by Prof. E. W. Bemis. He intimated that the city had a club to force a reasonable price in the 3-cent fare ordinance which was dropped at the time the day-to-day agreement establishing seven-for-a-quarter tickets was reached. He also stated that if the people rejected the price as agreed upon by the commission and the company the commission would then know whether the electors wanted municipal ownership and what plan to follow thereafter. Professor Bemis, in his supplementary report to the commission, fixed the franchise values of the Detroit city lines at approximately $2,500,000, making the total appraisal about $21,000,000 up to July 1, 1914. Prof. David Friday, of the University of Michigan, who appraised the franchises for the company, set the value at $7,500,000.

CLEVELAND FARE MATTER

Members of the Council of Cleveland, Ohio, are threatening the Cleveland Railway with an invasion of auto bus service. Interviews with Councilman William Stolte have appeared in the local papers suggesting bus operation. Councilmen W. J. Reynolds and J. J. McGinty, however, have seconded his ideas to a large extent. They will try to have the company operate its three auto buses on East Thirtieth Street, where the next crosstown line is to be built, and test the extent to which a bus service can compete with the electric railway. These vehicles are now in operation on Noble Road.

Councilman Dittrick in an interview on Jan. 28 stated that the amount paid out in accident claims will never be less so long as the cars are speeded up and the present schedules are maintained. He believes that people will have to be satisfied with a few minutes added to the running time of the cars if they wish to retain the low fare.

Several councilmen favor the plan of J. J. Stanley, president of the company, extending the Prospect Avenue line from Fortieth Street to Fifty-fifth Street and linking up one of the West Side lines with it, in order to relieve the congestion at the Public Square by running cars through. Within a short time it is thought that the Euclid line will run through on Euclid and not around on Prospect, as at present.

Bill in Kansas Legislature.—A bill has been introduced in the Kansas Senate providing that at all railway crossings in Kansas where a hedge fence approaches the crossing the fence must be kept cut down to a height not exceeding 5 ft. for a distance of eight rods from the highway.

Local Control of Milwaukee Utilities.—By a vote of twenty-five to eleven, the Common Council of Milwaukee on Jan. 18 approved a bill to be presented to the State Legislature asking that the Wisconsin Railroad Commission be relieved of all jurisdiction over the public utilities in Milwaukee, and that the control of these utilities be placed within the jurisdiction of the Council.

Legislation on Working Conditions.—A bill has been introduced in the Ohio House which will require that street and interurban railways have motormen and conductors instructed in their work for fifteen days prior to taking charge of cars; that nine hours shall constitute a work day, which is to be completed within eleven hours, and that motormen and conductors shall have thirteen consecutive hours of rest.

Saskatoon Railway Results.—The City Council of Saskatoon, Sask., on Jan. 7, in passing the street railway estimates for this year, desired to have the commissioners bring in a detailed report on the public utilities, of which the municipal railway shows a loss. A telegraphic dispatch from Saskatoon states that notice of a motion has been given for an early meeting of the Council, to consider the sale of the municipal railway.

Report on Montreal Franchises.—The Board of Control of Montreal, Que., on Jan. 4, in accordance with a resolution passed on Dec. 30, began a systematic study of the Montreal Tramway's twenty-three separate franchises, granted by the various municipalities now forming the city of Montreal, and the numerous engineering and statistical reports on the system. At the discussion on Jan. 9, the city attorney was asked for an opinion as to the various franchises, the rights comprised in them, etc.

Passaic Gas Rate Case Reopened.—The New Jersey Court of Errors and Appeals on Jan. 27 granted a rehearing of the Passaic 90-cent gas rate case. This court, as noted in the Electric Railway Journal of Dec. 19, page 1331, reversed the decision of the Public Utilities Commission reducing the gas rate to 90 cents, on the ground that the franchise values of the gas subsidiary of the Public Service Corporation of New Jersey had not been considered in determining the basis for a fair return. No date has yet been set for the rehearing.

Brooklyn Rapid Transit Assessment Lowered.—The assessments made by the State Tax Commissioners against the Brooklyn Rapid Transit System for the 1915 special franchise tax have been lowered $3,000,000. In 1913 the component companies were assessed at sums aggregating $47,130,835, this amount being voluntarily cut by the State Board of Equalization in 1914 to $34,356,263. Corporation Counsel Polk has protested against the cut on the ground that the cost of pavement should be included in the cost of reproducing the tangible property in the streets.

Legislation in Tennessee.—Three measures of much importance to the electric railways of Tennessee have just been introduced in the State Legislature. One would give

city railways the right to acquire and operate interurban lines. Another would make it unlawful for passengers to sell or give away transfers and provide penalties for violation of the law, while the third would require that all damage suits to persons or property be tried in counties where the accidents out of which they grew occurred, except when service of process may not be had in such counties.

Delay on New York Subway.—Drippings of water and collections of dust from an opening near the Seventy-second Street station of the New York subway caused a short-circuit on the third-rail on one of the uptown express tracks near that point on the morning of Feb. 2. The matter would have been remedied in about ten minutes by the switching of the uptown express trains to the uptown local tracks and the removal of the defective insulator by a repair gang, but someone rang a fire alarm signal and the fire department insisted upon stopping all traffic and making the passengers leave all trains while it investigated the trouble. The result was a delay of an hour or more during the height of the rush-hour traffic.

Ontario Hydro-Electric Railways.—The question of building an electric railway from the Niagara frontier, via Hamilton, to the Georgian Bay, is under consideration of the Hydro-Electric Power Commission of Ontario. Comptroller Morris, Hamilton, stated on Jan. 4 that F. A. Gaby, chief engineer of the commission, had shown him plans for a line from Queenston and Dunnville, through Hamilton, to Georgian Bay, and that the surveys had been completed for this and connecting lines from Dunnville to Beamsville, from Queenston to Beamsville, and from Guelph to Toronto; that preliminary surveys had been made on other sections of the district to be served, and that the surveys would be resumed almost immediately. The construction of the line would depend entirely on the action Hamilton was prepared to take.

Bills Introduced into the New York Legislature.—The following measures have recently been introduced into the Legislature of New York: To amend the public service commission law, in relation to the free transportation of chiefs of police of the municipalities of the State; to amend the code of criminal procedure, in relation to the payment of expenses and prosecution of crimes committed on railway trains; to amend the railroad law, in relation to the names of railroad stations; to make an appropriation for the elimination of certain grade crossings; to validate the consolidation of the Susquehanna Valley Electric Traction Company as a New York State corporation, with the Waverly, Sayre & Athens Electric Traction Company, a Pennsylvania corporation, by which the Waverly, Sayre & Athens Traction Company was formed; to amend the workmen's compensation law in relation to abolishing self-insurance.

Disposition of Chicago's Traction Fund Explained.—Mayor Harrison of Chicago has issued a statement in reply to numerous criticisms regarding the loose handling of the $14,000,000 traction fund. More than $2,500,000 of the fund is kept in Chicago banks. The records of authorization for distributing the remainder, filed in the city comptroller's office, show that the city has been taking out cash for the last four years by substituting tax anticipation warrants. These warrants are said to be a first lien against the city's taxes, being retired as rapidly as taxes are received. They are permitted to be issued in an amount equal to only 75 per cent of the total of the city's share in the taxes. For the amount loaned the city has been paying the banking rate of 3 per cent. The City Council has taken no action on the Mayor's proposal to contribute a portion of the fund to a pension fund for railway employees. It was assailed by the employees' association as a subterfuge for securing votes.

Merger Measure in Washington.—Ben Johnson, chairman of the district committee of the House, has referred to the District Commissioners the Page bill, which would authorize connecting or intersecting street railways of the District of Columbia to be operated under joint management. The district committee will take no action on the bill until the commissioners have handed in their recommendations. The Page bill, in short, authorizes any street railway in the District to acquire, by lease or purchase, connecting or intersecting lines, provided the holders of a majority of the stock of the two lines vote for consolidation or joint management. It is stipulated, however, that lines which so consolidate shall charge only a single fare for a continuous ride within the District over all of the lines affected by the consolidation. It is also stipulated that the aggregate capital stock of the purchasing company shall not exceed the combined capital stocks of the contracting companies.

Massachusetts Legislation.—Among the measures introduced into the Massachusetts Legislature is a bill providing that the rate of fare on street railways transporting passengers from one town to another shall not exceed 5 cents where the distance involved is not more than 5 miles. The bill is particularly aimed at the 6-cent fare unit established on the Middlesex & Boston Street Railway by recent decision of the Public Service Commission and also seeks to restrict interurban fares to the 1-cent per mile basis indicated above, within the 5-mile limit. A bill has been introduced into the House establishing a 2.5-cent fare by rebate check for passengers unable to obtain seats on street cars, and another bill provides that all street railways shall equip their cars with steps not more than 8 in. above the ground and with a maximum rise of 7 in. on steps leading to the car platform from the lowest tread. A bill is also before the House requiring all street railways to meet the expense of oiling sections of the public highways covered by their franchises, where the rest of the traveled way has already been oiled by the local authorities.

Suits Against Chicago Railways for Ordinance Violations.—In accordance with the general policy recently adopted by the Chicago city administration of entering suits against railways for violation of city ordinances, more than 100 suits have been begun in the Municipal Court on account of the failure to post copies of the traction ordinances in the cars. Another suit involves the right of passengers to demand and receive transfers at all intersecting points, some of which were specifically excluded by provisions in the 1913 merger ordinance. Still other suits charge the Chicago City Railway with posting only one copy of transfer regulations in the cars instead of two, as required by the ordinance. Action on suits previously brought has resulted in the fact that the Surface Lines have been fined in the Municipal Court for violating the ordinances requiring signs on cars clearly to designate both the route and destination. The company was fined $25 in each of sixty cases. Twenty-one more sign cases have just been submitted to the court and a fine of $50 each was assessed for violating the city ordinance.

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Association

The program for the annual meeting of the Central Electric Railway Association, to be held at the Hotel Severn, Indianapolis, Ind., on Feb. 25 and 26, will include addresses by Samuel Ralston, Governor of Indiana; Judge Thomas Duncan, chairman of the Indiana Public Service Commission; C. Loomis Allen, president of the American Electric Railway Association, and C. E. Peirce, vice-president of the Manufacturers' Association.

A. I. E. E. Mid-Winter Convention

The third New York mid-winter convention of the American Institute of Electrical Engineers will be held at institute headquarters, in New York, on Feb. 17, 18 and 19. The program will be of a general nature. Two sessions will be under the auspices of the transmission committee; one of these will be devoted to the discussion of impact testing of high-tension insulators; the other to miscellaneous subjects connected with high tension work. Another session will be devoted to papers provided by the electrophysics, electric lighting and mining committees. The last technical session of the convention will be devoted to the subject of application of electric motors, and a number of prepared discussions will be presented giving the characteristics of each type of motor which govern its application to various kinds of work. The session on the evening of Feb. 17 will include addresses by a number of prominent engineers on the general subject of the status of the engineer. On the evening of Feb. 18 a dinner-dance will be held at the Hotel Astor. The afternoon of Feb. 19 will be devoted to inspection trips to points of engineering interest.

Financial and Corporate

BANK HOLDINGS OF PUBLIC UTILITY BONDS

According to the report of the Comptroller of the Currency for the year ended June 30, 1914, the holdings of public utility bonds by the 26,765 banks of all kinds in the United States on that date were less by $137,500,000 than on the corresponding date in 1913. At the same time holdings of railroad bonds by these banks increased $145,100,000.

This decrease in public utility holdings and increase in holdings of railroad bonds were caused by changes in the investments of trust companies and savings banks. The national banks took the opposite course in increasing their holdings of public utility bonds and decreasing their holdings of railroad bonds.

The holdings of these classes of bonds over a three-year period are as follows:

	1914	1913	1912
Public Utility Bonds			
National banks	$218,200,000	$197,400,000	$195,700,000
Trust companies	224,700,000	334,300,000	208,700,000
State banks	50,800,000	52,900,000	53,600,000
Savings banks	88,500,000	135,300,000	143,500,000
	$583,900,000	$721,400,000	$603,500,000
Railroad Bonds			
National banks	$341,700,000	$345,200,000	$384,300,000
Trust companies	395,300,000	297,200,000	380,200,000
State banks	76,600,000	65,500,000	71,500,000
Savings banks	859,600,000	821,500,000	794,100,000
	$1,675,300,000	$1,530,200,000	$1,631,600,000

The 7525 national banks reporting, increased their holdings of public utility bonds $20,800,000 in the period from June, 1913, to July, 1914, while at the same time their investments in railroad bonds decreased $3,500,000. The 1564 trust companies in this period increased their investments in railroad bonds by $98,100,000 and decreased their holdings of public utility bonds by $109,600,000. The 14,512 state banks decreased their public utility holdings by $2,100,000 and increased their investment in railroad bonds by $11,100,000. The 2100 mutual and stock savings banks increased their investments in railroad bonds by $38,100,000 and decreased their public utility bond holdings by $46,800,000.

The aggregate amount of holdings by all banks on June 30, 1914, was $5,584,900,000, of which 10.43 per cent was in public utility bonds. The proportion of public utility bonds to the total holdings by each class of banks was as follows: State banks, 13.70 per cent; mutual savings banks, 4.50 per cent; stock savings banks, 0.427 per cent; private banks, 10.43 per cent; trust companies, 17.82 per cent; national banks, 11.40 per cent.

CAPITALIZATION REPORT OF NEW YORK COMMISSION

The division of capitalization of the Public Service Commission for the Second District of New York reports that the net amount of new securities authorized during the calendar year 1914 was $178,722,277. Since 1907 the commission has authorized nearly a billion dollars' worth of securities. A large part of the increase in 1914 was probably due to refunding operations and a number of purchases where securities were merely exchanged. During the year only ninety-four applications were made for authority to issue new securities, as compared to 126 in 1913 and 111 in 1912. For the first time since it was created, the division began the new year with practically a clean slate. Commenting on the acquisition of one property by another, H. C. Hopson, chief of the division, says that in many cases the purchasing corporation is obliged to pay a price in excess of the original cost of the physical property acquired. The commission allows the increased purchase price but insists upon its amortization over a reasonable number of years. This practice results in a conservative statement of the property accounts of the acquiring company, and at the same time makes it possible to put into effect immediately the savings resulting from the cutting down of competition and the instituting of centralized management. Mr. Hopson also emphasizes the fact that corporations should take better care of the filing of their vouchers and also make better explanations for entries in their capital accounts.

ANNUAL REPORT

Lehigh Valley Transit Company

The statement of income, profit and loss of the Lehigh Valley Transit Company, Allentown, Pa., for the year ended Nov. 30, 1914, follows:

Operating revenues:	
Revenue from transportation:	
Passenger revenue	$1,446,694
Other transportation revenue	78,075
Total	$1,524,769
Revenue from other railway operations: Power sales, etc.	344,236
Total operating revenue	$1,869,005
Operating expenses	1,052,693
Net operating revenue	$816,312
Taxes	97,961
Operating income	$718,351
Non-operating income:	
Dividend income	$107,963
Interest on notes, bank balances, etc	14,985
Total	$122,948
Gross income	$841,299
Deductions from gross income:	
Interest on funded debt	$530,894
Rent for leased roads	53,341
Interest on unfunded debt	17,915
Amortization of discount on funded debt	20,432
Miscellaneous debits: Legal expenses, etc	10,596
Total	$633,178
Net income	$208,121

In spite of the widespread business depression and the unusually severe winter, the gross earnings of the company increased slightly more than 1 per cent during the year. The report states that the company maintained its property at its usual standard and also continued to carry out its original program of improvements. An amount of 22 per cent of the gross earnings was allowed for maintenance and depreciation. The company now operates 167 miles of railway, of which 146.38 miles are owned and 20.62 miles are leased. Its rolling stock consists of 113 closed cars, forty-one open cars, eleven freight cars and thirty service cars, making a total of 195 cars.

During the year the company acquired all the outstanding stock of the Easton Consolidated Electric Company. This company, in addition to the ownership of the Edison Illuminating Company of Easton, owns and controls 54 miles of railway from Easton to the Bethlehem district. It is stated that the through service established between Easton and Allentown has produced a large increase in the receipts of this line over the previous year, to the profit of both companies. The surplus earnings of the controlled company for the year ended Dec. 31, 1914 (December estimated), were stated to be $87,163. The interest charges on the collateral trust bonds now outstanding amount to $55,446, thus leaving a profit of $51,717 for the Lehigh Valley Transit Company on its investment.

In regard to its freight and express service, the report says that an efficient service of this character is operated from all points on the Lehigh Valley Transit Company to Philadelphia in connection with the freight department of the Philadelphia Rapid Transit Company. Arrangements were completed to include the Lansdale-Morristown territory on Jan. 2, 1915. The company rents a portion of the new transfer station erected by the Philadelphia Rapid Transit Company at Chestnut Hill, the transfer point. During the year the surplus from the freight department increased 25 per cent in the face of the prevailing adverse business conditions. Moreover, the surplus from the Adams Express Company business was 80 per cent more than during the previous year.

In summarizing the year's work, special attention was called to new track in Allentown, on the Bethlehem Pike, and in New Jersey; the installation of automatic signals on the Slatington Division; the removal of dangerous curves and steep grades; the building of new equipment in the company's shops; the purchase of nine new prepayment cars and the increased patronage of the company's high-speed limited service.

AMERICAN CITIES COMPANY PROSPECTS

Member of Visiting Board of Directors Describes Conditions Existing in Company's Subsidiaries

The board of directors of the American Cities Company, New York, recently made a week's tour of the properties of the constituent companies at Houston, Tex.; Little Rock, Ark.; Memphis, Tenn.; Knoxville, Tenn., and Birmingham, Ala. One of the directors, Frank B. Hayne, New Orleans, in describing the unanimous conclusions of the board, states that a thorough inspection was made of all the properties, including power houses, car shops, trackage and gas works, and the physical property of each subsidiary was found to be modern, up to date and competently handled. The properties are fully rounded out to serve each community adequately, and the existing facilities are in advance of requirements. The important question now is to develop fully the available business for which the systems have been so adequately equipped.

Continuing, Mr. Hayne says:

"A most gratifying spirit of co-operation on the part of the citizens was exhibited toward the public utilities in each city visited. It was very pleasing to hear one Mayor refer to the American Cities Company as the greatest factor in helping to build up his city. In each city we were met by representative men who spent the full day not only in going around the properties with us, but also in explaining the advantages and constant development of their cities. It was most encouraging to note the progressive development of these communities, and to know of the enthusiasm of each with respect to its future growth.

"Of equal weight with this spirit of co-operation was the outspoken recognition on the part of the leading citizens that the encouragement of outside capital was of the highest importance, that the most successful way to draw additional outside capital to their cities was through a broad distribution of the local company's securities, placed in the hands of satisfied investors, and that to attack outside capital invested in their cities was the most certain way to deprive their communities of additional outside funds. This attitude toward the investment of capital in public utility companies is most encouraging."

THIRD AVENUE DIVIDEND RECOMMENDED

After Investigation, Stockholders' Committee Asks for Quarterly Dividend of 1 Per Cent

The committee of stockholders of the Third Avenue Railway, New York, N. Y., appointed by President Frederick W. Whitridge at the last annual meeting to investigate the affairs of the company, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 21, 1914, submitted a report on Feb. 1, in which it recommended that a quarterly dividend of 1 per cent be declared shortly after the beginning of the next fiscal year, to be paid not later than Oct. 1, 1915. The committee stated that with dividends paid at such a rate, there was no reason why the assets of the company should not continue to increase, why the conservative management of the company should suffer interference, or why the company should not be able to keep up its budget requirements besides adding to its surplus.

In reaching its conclusions, the committee said: "The special reserve for depreciation and contingencies from the statement ended June 30, 1914, has reached a total amount of $1,152,750. This amount was clearly a part of the net earnings of the property and should be considered as a part of the surplus earned since the company's organization, Jan. 1, 1912, which would increase the net income from $2,050,173 to $3,202,923. In 1914 the surplus earnings were $626,306 plus the reserve created for depreciation and contingencies, or $511,250—total, $1,137,556. These figures show that the net earnings of the company for 1914 were the equivalent of approximately 8 per cent on the stock, exclusive of the high maintenance charges, which were themselves a very liberal offset against depreciation."

The report gave the present management a clean bill of health and found that the physical property of the company is in commendable condition. In regard to the control exercised by the board of directors, however, the committee reported as follows:

"The records show that the company's directors, collectively, have at no time owned more than 113 shares of the total outstanding stock. The directorate is justly criticised as representing the bondholders and not the stockholders. A more general representation of the latter's interests is desirable as a matter of propriety as well as public policy."

The committee also stated that the annual report of the company should be in the hands of stockholders thirty days before the annual meeting. In a letter to the board of directors, President Whitridge agrees to this recommendation, but he states that the committee is in error in considering the depreciation reserve as earnings. Regarding the representative character of the board, he says:

"The committee is mistaken in supposing that the present board represents only 113 shares of stock. One director is the representative of a company which has 6025 shares of stock in its name, and two directors are members of firms which at the time of the stockholders' meeting held 2722 shares and 2015 shares, respectively. Besides this, I believe that the present directors represent many thousands of shares in addition."

British Columbia Electric Railway, Ltd., Vancouver, B. C.—It is announced that a dividend of 5 per cent per year has been declared on the preferred ordinary stock of the British Columbia Electric Railway for the half year, payable on Feb. 1. Last year a dividend of 6 per cent was paid.

Brooklyn (N. Y.) Rapid Transit Company.—In regard to the gross and net earnings of the Brooklyn Rapid Transit Company, which are published in this issue in the Table of Monthly Earnings, the company says that the abnormal gain in the operating revenue over the six months in 1913, $972,225, or 7.69 per cent, was caused by the operation this year of a part of the system of lines of the Coney Island & Brooklyn Railroad. The large increase in operating expenses, $801,834, was caused by the same factor. The decrease in fixed charges, $117,567, was brought about by the conversion of refunding 4 per cent bonds into preferred stock. At the recent annual meeting of the company, Eugene N. Foss, Boston, was added to the board of directors to fill the vacancy caused by the resignation of George F. Porter. At the present time the company has 8406 stockholders, compared to 6319 on June 9, 1914, and 3709 on June 9, 1913.

Chicago City & Connecting Railways, Chicago, Ill.—The financial statement of the Chicago City & Connecting Railways, formed as a collateral trust in 1910 to hold securities of the Chicago City Railway and various connecting railways serving outlying districts, shows that the gross income for the year ended Dec. 31, 1914, was $2,052,026, consisting of $1,964,771 from dividends and $87,255 from interest. Disbursements during the year required the following sums: Bond interest, $1,100,000; general expense, $45,081, and interest on bills payable, $16,033, a total of $1,161,114. The net income, therefore, was $890,912, which after a deduction of $875,000 for dividends on participation shares gave a surplus of $15,912.

Cleveland, Youngstown & Eastern Railway, Cleveland, Ohio.—On Jan. 30 Judge Pearson of the Cuyahoga County Common Pleas Court gave the Citizens' Savings & Trust Company, trustee for the bondholders, a judgment for $53,560 against the Cleveland, Youngstown & Eastern Railway on mortgages covering the portion of its line in Geauga and Portage Counties. Receiver Robert Beatty, whose appointment was noted in the ELECTRIC RAILWAY JOURNAL of Jan. 2, was ordered to sell that portion of the property within ten days, unless the mortgage is satisfied within the period. Bondholders charge that the line has been allowed to deteriorate.

Columbus Railway, Power & Light Company, Columbus, Ohio.—The stockholders of the Columbus Railway, Power & Light Company on Jan. 26 approved the proposition to purchase the Columbus Light, Heat & Power Company. Previous references to this purchase were made in the ELECTRIC RAILWAY JOURNAL of Nov. 7, Nov. 14, and Nov. 28, 1914, and Jan. 9 and Jan. 23, 1915.

Electric Bond & Share Company, New York, N. Y.—The directors of the Electric Bond & Share Company have called a special meeting of stockholders on Feb. 17 after the regular annual meeting for the purpose of authorizing an increase in the company's capitalization from $10,000,000 to $16,000,000 through adding $3,000,000 of 6 per cent preferred stock and $3,000,000 of common stock.

Gary & Interurban Railroad, Gary, Ind.—It has just been announced that the payment of coupons due on Sept. 1, 1914, on the $350,000 of 6 per cent convertible notes of the Gary & Interurban Railroad, which payment was for a time deferred, was made on Nov. 29, 1914.

Long Island Railroad, New York, N. Y.—Dick Brothers & Company, New York, are asking for proxies to be used at the annual meeting of the Long Island Railroad on April 13. It is asserted by the bankers that during the fourteen years when the Pennsylvania Railroad has operated this property the debts have increased more than $50,000,000, and the net earnings have been reduced from a substantial surplus to a deficit in 1915 of almost $1,000,000. According to a statement issued by President Ralph Peters, the Pennsylvania Railroad acquired its interest in the stock of the Long Island Railroad in 1901. At that time the Long Island Railroad was not paying dividends and had not paid any for five years. The property needed rehabilitation to eliminate grade crossings and electrify its road. This work, which is approaching completion, has involved an outlay of about $50,000,000, and has been accomplished largely through the co-operation of the Pennsylvania Railroad and by the use of that company's credit, without any assistance from the other stockholders. Mr. Peters mentioned several improvements which have been to the advantage of the Long Island Railroad, but which have been paid for by the Pennsylvania Railroad. In his opinion the charges made for the use of the Pennsylvania Terminal and the East River Tunnels are moderate, and the result through their aid has been a large increase in passenger traffic.

Mexico Tramways, Mexico City, Mexico.—It is reported that the Mexico Tramways has deferred the interest due on Jan. 1 on $6,083,333 of 6 per cent mortgage second issue bonds. The company has interest due on March 1 on $10,298,000 of first consolidated bonds, and it is probable this will also be defaulted, as conditions in Mexico are not improving.

Michigan Railway, Kalamazoo, Mich.—E. W. Clark & Company, Philadelphia, are offering to yield about 6.5 per cent the unsold portion of an issue of $5,000,000 of first lien 6 per cent five-year gold notes of the Michigan Railway. The notes are dated June 1, 1914, and mature on June 1, 1919. The payment of principal and interest is guaranteed by the controlling company, the Commonwealth Power, Railway & Light Company. A full description of this issue was given in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, in connection with the original offer of the notes.

Monterey & Pacific Grove Railway, Monterey, Cal.—At a recent meeting of the bondholders of the Monterey & Pacific Grove Railway, a protective committee, consisting of Carver Pomeroy, W. F. Williamson and R. H. Cross, was appointed. The interest default on the first mortgage 6 per cent bonds of this company was noted in the ELECTRIC RAILWAY JOURNAL of Jan 23. "Jitney" bus competition was stated to be the cause of the default. This company is controlled by the Coast Valleys Gas & Electric Company, a subsidiary of the California Railway & Power Company.

New England Investment & Security Company, Springfield, Mass—The *Boston News Bureau* of Jan. 27 says: "On April 1 the $13,709,000 of New England Investment & Security Company debentures would, under their indenture, be entitled to a 2 per cent interest payment, or one-half of 1 per cent more than the semi-annual rate during the first five years of their fifteen-year term. According to the last New Haven report, these debentures were owned by the New England Navigation Company and carried by it at a book value of almost par, although appraised at only $9,000,000 as collateral behind the $20,000,000 of short-term notes of the New England Navigation Company. An understanding has recently been reached with the New Haven interests by which the latter will on April 1 receive but 1 per cent on these notes and be afterwards allotted the full interest rate only if earned. Without such a reduction in charges, the income of the New England Investment Company for the last six months would have been considerably short of the 2 per cent semi-annual disbursement made on Jan. 1 on its 40,000 preferred shares. Holders of about 34,000 shares of preferred stock who last autumn contributed $10 per share toward the purchase of the company's 1000 shares of common stock, are likely to receive back from the protective committee which has closed that transaction not far from $1.75 per share. This means that Sanderson & Porter received about $275,000 for the common stock, as compared to the $200,000 which they paid for it."

New York State Railways, Rochester, N. Y.—Harris, Forbes & Company, New York; N. W. Harris & Company, Inc., Boston, and the Harris Trust & Savings Bank, Chicago, are offering for sale fifty-year first consolidated mortgage 4½ per cent gold bonds of the New York State Railways. These bonds are dated 1912 and due Nov. 1, 1962, but are callable at 105 and interest on any interest date. The purchase of these bonds through J. P. Morgan & Company for a banking syndicate was noted in the ELECTRIC RAILWAY JOURNAL of Jan. 30. An amount of $6,925,000 of this issue is already listed on the New York Stock Exchange, and application will be made to list the remainder.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The committee appointed on Dec. 11 by the security holders of the Oakland, Antioch & Eastern Railway to look into the affairs of the company, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 19, has reported unfavorably upon the plan of the management for the financing of the company during the next three years. The main finding of the committee is that the plan is unfair to the bondholders, in that it would increase the liabilities of the company by creating new debts through the issuance of new notes and the pledging of new bonds. After the report was submitted the security holders authorized the appointment of a new committee of seven members, three to be appointed by the security holders, three by the directors and the seventh member by the two foregoing groups. It is reported that the time for the payment of the assessment of $1.50 per share on the stock of this company and of $3 per share on the stock of the Oakland & Antioch Railway, called for Jan. 15, has been extended to Feb. 13.

Ohio Traction Company, Cincinnati, Ohio.—On Jan. 25 the Ohio Public Utilities Commission authorized the Ohio Traction Company to issue $1,500,000 of 6 per cent gold coupon notes to be sold for the highest price obtainable but for not less than 95. These notes mature as follows: Sept. 1, 1916, $200,000; Sept. 1, 1917, and Sept. 1, 1918, $300,000, and Sept. 1, 1919, and Sept. 1, 1920, $350,000. This issue has been authorized to take the place of $750,000 of 5 per cent preferred stock authorized in 1912 to be sold at 90, and $300,000 authorized in 1913, which the company has been unable to market on the terms prescribed by the commission. The proceeds from this note issue, just as in the original authorization of the stock, are to be used to reimburse the company for expenditures made on capital account.

Quebec Railway, Light, Heat & Power Company, Quebec, Can.—The Quebec-Jacques Cartier Electric Company, a subsidiary of the Quebec Railway, Light, Heat & Power Company, has defaulted interest on its first mortgage 5 per cent bonds due on Dec. 1, 1914, and a protective committee has been formed with the Bankers Trust Company, New York, as depository. It is reported that the subsidiary is simply taking advantage of the ninety-day period of grace allowed by the indenture and that arrangements will be made by March 1, when foreclosure proceedings would be possible, to pay the interest.

Republic Railway & Light Company, New York, N. Y.—White, Weld & Company and Montgomery, Clothier & Tyler, both of New York, are offering for sale at 98¾ and interest, to yield 6¼ per cent, 5 per cent secured gold notes of the Republic Railway & Light Company, dated April 1, 1912, and due on Jan. 1, 1916. These notes are redeemable at 100 and interest at thirty days' notice. They are secured by deposit with the trustee of 98.5 per cent of the stock of

the Mahoning & Shenango Railway & Light Company, and are also a first lien, through deposit of first mortgage bonds, on new power house and other physical property costing more than $1,720,000.

San Francisco-Oakland Terminal Railways, San Francisco, Cal.—The California Railroad Commission has issued a notice to the effect that it will conduct on its own initiative an investigation as to the value of the property of the San Francisco-Oakland Terminal Railways. A public hearing in the matter has been set for Feb. 23 in San Francisco before Commissioner Phelen.

Twin City Rapid Transit Company, Minneapolis, Minn.—Donald Goodrich, who is a son of C. G. Goodrich, president Twin City Rapid Transit Company, has been elected a director to succeed Sir Henry M. Pellatt. It is reported that a proposition to reduce the membership of the board from twelve to eleven will be taken under consideration at a later date.

United Light & Railways Company, Grand Rapids, Mich.—N. W. Halsey & Company, New York, are placing on a 6¾ per cent basis $1,500,000 of 6 per cent gold coupon notes of the United Light & Railways Company. These notes are dated Jan. 1, 1915, and are due Jan. 1, 1918, and Jan. 1, 1920, but are callable, all or in part, upon four weeks' notice at 100 and interest and 101 and interest, respectively. The proceeds of these notes will be used to complete payments on property heretofore acquired and to reimburse the treasury for improvements to subsidiary properties. The notes will be secured by deposit with the New York Trust Company, as trustee, of $2,000,000 of first and refunding mortgage 5 per cent bonds, due in 1932. The authorized note issue is $3,000,000, but in addition to the present $1,500,000, more notes may be issued only as additional bonds are pledged and only in an amount not to exceed 75 per cent of their par value.

DIVIDENDS DECLARED

Boston (Mass.) Elevated Railway, quarterly, 1½ per cent.

Illinois Traction System, Peoria, Ill., quarterly, 3 per cent, common.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Ohio Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Dec., '14	$467,973	.....	.....	.....	.....
1 " " '13	462,149	.....	.....	.....	.....
6 " " '14	2,866,770	.....	.....	.....	.....
6 " " '13	2,872,839	.....	.....	.....	.....

ATLANTIC SHORE RAILWAY, SANFORD, MAINE

1m., Dec., '14	$23,722	*$22,873	$849	.....	.....
1 " " '13	24,608	*21,377	3,231	.....	.....

BROOKLYN (N. Y.) RAPID TRANSIT COMPANY

6m., Dec.,'14	$13,607,760	$7,521,934	$6,085,826	$2,350,593	†$3,096,993
6 " " '13	12,635,535	6,720,100	5,915,435	2,733,794	†2,733,793

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.

1m., Dec., '14	$96,900	$62,470	$34,430	$30,791	$3,639
1 " " '13	105,365	62,807	42,557	33,087	9,470
12 " " '14	1,255,283	757,020	498,262	386,725	111,537
12 " " '13	1,255,235	759,387	495,848	381,930	133,918

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m., Dec., '14	$3,000,365	$1,365,197	$1,635,168	$913,036	‡$776,416
1 " " '13	3,035,729	1,332,748	1,702,981	913,149	‡843,904
6 " " '14	16,270,705	7,404,178	8,866,527	7,209,819	‡3,689,954
6 " " '13	15,999,453	8,866,527	7,132,926	7,209,819	‡3,272,574

MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.

12m., Dec., '14	$968,389	$415,724	$552,665	$308,642	$244,023
12 " " '13	960,262	346,712	613,549	298,048	315,501

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Dec., '14	$2,074,523	$1,202,654	$871,869	$807,016	$64,853
1 " " '13	2,141,522	1,248,860	892,662	808,663	83,999
6 " " '14	11,945,123	6,898,721	5,046,402	4,847,955	198,447
6 " " '13	12,239,537	7,136,034	5,103,503	4,796,161	307,342

*Includes taxes. †Includes adjustments. ‡Includes other income.

Traffic and Transportation

THE "JITNEY" BUS

Thirty-nine Cities Have at the Present Time Been Invaded by the Fare Snipers

Among the cities in which "jitney" bus services have been installed are Los Angeles, Oakland, Pasadena, Fresno, San Diego, San Francisco, Portland, Seattle, Tacoma, Vancouver, El Paso, Houston, Galveston, Ft. Worth, Dallas, Austin, San Antonio, Beaumont, Wichita, Lawrence, Topeka, Emporia, Kansas City, Joplin, St. Joseph, St. Louis, Ogden, Birmingham, Des Moines, Fort Smith, Oklahoma City, Tulsa, Denver, Baltimore, Sterling, Ill.; Pittsburg, Kan.; Omaha, New Orleans and Detroit.

"Jitney" owners in Kansas City have been besieging the casualty companies for liability insurance, but without success. A slight accident, when a small car, heavily loaded, overturned at a curve, injuring three persons, has brought to the attention of the drivers and owners the question of responsibility for damages. One insurance agent said: "We are very careful in writing liability on automobiles, and it is unlikely that any cars in the service have previously been covered. The car must be paid for or be backed by substantial assets before we write it. Such cars are not going into the 'jitney' business."

No action has been taken at Kansas City so far to cancel liability insurance on automobiles that are put into "jitney" service, but such procedure was intimated. Liability companies seem uncertain as to whether the usual double indemnity for injury while riding in a public conveyance would be collectible by the holder of a personal accident policy.

The Kansas City *Times* is carrying a column headed "Kansas City's 'Jitney' Service," under which the bus routes so far established are enumerated and number of cars and leaving times given wherever possible, and also the name of the person operating the route.

So significant does the San Antonio *Express* consider the bus situation that in its issue of Jan. 20 it reproduced under a heading from San Diego, Cal., the entire letter of William Clayton, managing director of the San Diego Electric Railway, addressed to the Common Council of that city. This communication had been published in abstract in the ELECTRIC RAILWAY JOURNAL.

The chief engineer of the Public Service Commission of the State of Washington has reported to Chairman Charles Reynolds of the commission in regard to the operation of the "jitney" buses in Seattle. He recommends that immediate action be taken to remedy the situation. According to the engineer the Seattle Electric Company is losing $2,450 in revenues daily, while the bus drivers are making an average net profit or wage of $2.33 a day. The report says that the 518 buses in that city are carrying 49,000 passengers daily who formerly rode on the electric street railways.

Councilman Allen Dale, of Seattle, is fathering a bill to compel bus owners to come under identical regulation with the street railways in the matter of handling passengers, gross earning tax, construction of bridges and maintenance of paved streets. Councilman Hesketh seeks to have the capacity of every vehicle operated for hire limited to its seating capacity. A third ordinance is in course of preparation to settle definite routes of travel through the downtown streets for buses. "Jitney" bus drivers will, however, come under the provisions of the ordinance recently passed by the City Council requiring all drivers of motor vehicles for hire to pass not only a medical examination but one as to proficiency in handling cars on crowded thoroughfares. This ordinance becomes effective on Feb. 7.

Objection to the operation of buses has taken a new turn at North Yakima, Wash. In that city the Electrical Workers' Union has gone on record as being opposed to the buses on the ground that they are jeopardizing the street railway service with the result that many street railway

men, among them electrical workers, will be thrown out of employment.

The "jitney" bus has made its appearance in Detroit, one car operating on Woodward Avenue the early part of the week ended Jan. 30. Newspaper announcements state that others are to be placed in service. It has also been announced that a company is to be organized to run the buses along systematic lines.

Interviewed by the Oklahoma *News* in regard to the "jitney" bus, George W. Knox, general manager of the Oklahoma Railway, said in part:

"I am not at all downhearted about the little pest that has, I am sure it will prove, temporarily infested itself upon us. It is only another example of one of the characteristic spasms of the American people to try something new, and the scheme will have to run its course, regardless of the economic features involved; that is, duplicating an already adequate service means someone is squandering or losing resources and the fiddler will have to be paid finally, and it is inevitable that the public will have to foot the bill.

"Anyone who owns an automobile, if he will take just a few moments of his time and will be honest with himself, will be able to demonstrate that by this system it is not possible to transport passengers for 5 cents, even short distances, at a profit. Taking a few concrete examples, here is a case where under most favorable conditions the 'jitney' service has been applied with the following results:

Average hours per day of cars in service	15
Average speed in miles, per hour	14
Average earnings per car, per hour, in cents	70
Average earning per car, per mile, in cents	5
Operating costs, in cents:	
Oil and gasoline, per mile	1
Tires and tubes, per mile	1
Maintenance, per mile	1½
Depreciation, per mile	1
Wages of operators, per mile	2
Total cost of operation per mile	6½

"The cars used in the above mentioned instance were the best type of light efficient machines made. If larger capacity cars are used, the cost of operation will be nearly doubled. As further evidence of the failure of the plan, it is known that a well-organized and equipped auto bus concern on the Pacific coast has had to go into the hands of a receiver and has quit business.

"I have always found the people of Oklahoma fair, and in fact, the great strides made in its wonderful development are due to the spirit of fairness manifested, one business toward the other, so it will be in this matter, further than this—ish ka bibble."

The State Board of Equalization of California, in its report, says:

"The Pacific Electric Railway, which has made careful observation of automobile competition with its lines, reports to this board that the company alone is losing $20,000 a month or $240,000 per annum from this cause. The State tax on that alone would have been $11,400. One company alone carried 122,686 passengers in a period of thirteen days with an estimated revenue of nearly $24,000. It is probable the State loss from this source is at least $200,000 per annum.

"In addition to the big double-deck buses and other large motors that ply over more or less regular routes and on a more or less definite time schedule, there are many smaller vehicles plying for hire on less regular schedules, all doing the same kind of business which comes under the purview of the State tax system. It would appear that the State tax system ought to be extended to cover these carriers, both to protect the State revenues and in justice to the taxed transportation companies."

The Denver Tramway Company has issued a modern fable, entitled "The Landlord," written by John A. Beeler, vice-president and general manager. In this fable the municipality represents the landlord; and the premises, the city streets. The moral is that the taxes and sums paid for city improvements by the tramway are of more importance to the landlord than the insignificant license fees paid by "jitney" bus operators. In addition to the franchise and general tax aggregating more than $200,000 per year, the tramway company pays interest on about $2,000,000 of bonds that have been issued for street paving, grading and other public improvements, which at 6 per cent amounts to about $120,000 per year. Repairs to paving and the removal of snow and ice average about $50,000 per year. These items total $370,000, all of which goes to the public good. On the contrary, however, if the proposed sixty-six "jitney" buses were permitted to operate under the ordinary $25 annual motor license, as they desire to do, they would pay $1,650 yearly, and their operation would undoubtedly involve the city in tremendous police expense for handling the traffic.

It is said that nearly 85 per cent of the expenditures of the tramway company for combined construction and operation are made locally for home products, materials, fuel and wages. Exactly the opposite, however, is true of the "jitney" buses, for fully 85 per cent of their expenditures are made abroad for autos, tires, gasoline and repair parts. As regards accidents, too, the "jitney" buses are reported to be leaving behind them a trail of killed, maimed and injured in the Pacific coast cities, and the congestion in the streets there has become dangerous and alarming. In summing up the case, Mr. Beeler states that the success of the "jitney" bus depends upon their escaping the responsibility of paying for franchise rentals, street paving, grading, viaducts and other public burdens that have fallen upon the street car companies, and upon their stealing the cream of the transportation business. If such buses want to compete with electric railways, they should be required to do so on equal terms and under equal conditions.

THE COPPER ZONE SYSTEM

New Fare Collection System of Union Traction Company of Indiana Working Satisfactorily

Officials of the Union Traction Company of Indiana, which on Jan. 1 adopted the copper zone system for passenger fares, approved by the Public Service Commission of Indiana, state that the new system is working out very satisfactorily. With the introduction of the new zone plan a system of cash fare receipts was inaugurated to take the place of the recording fare registers which have been in use on the interurban cars of the company, and the fare registers have been removed from the cars. The fare receipts are in duplicate, passenger's fare receipt and auditor's stub, numbered consecutively and bound in pads. At the end of each run the conductor turns in the duplicate receipts in an envelope, and each day the stubs in the conductor's book and the cash fares for the day are audited at the principal offices of the company at Anderson.

The management of the company believes that the new system of fare receipts is proving most satisfactory in obtaining an accurate accounting of all fares collected from passengers on the cars. Since the new copper zone system went into effect an increase has been shown in the number of passengers who purchase tickets before boarding the cars. In fact, it is estimated that more than 85 per cent of the passengers are now purchasing tickets at the stations. Under the new copper zone system the company filed tariffs which put into effect on its lines in Indiana rates which approximated 2 cents a mile for the actual distance traveled, with a minimum of 5 cents. Commutation tickets are sold in books of twenty round trips at the rate of 1¼ cents a mile, and the sale of round-trip tickets at an amount less than two full one-way fares was discontinued. Many inequalities in the old nickel zone system have been eliminated by the adoption of the new system.

TICKET SALES AT BOOTHS IN KANSAS CITY

The middle of January the Metropolitan Street Railway, Kansas City, Mo., built a booth at the corner curb line where passengers for and from the new union station are handled. General agents of the company, as they are called, occupy this booth from the first regular car in the morning until midnight, chiefly to answer questions as to destinations and routes, and to look after the running of the cars. Incidentally, tickets are sold at 5 cents each—no reduction for quantities—at the booth. There was some doubt as to how extensively the opportunity to buy single-ride tickets would be taken advantage of, but the feature has proved very

popular. Half-fare tickets are also sold at the booth. Heretofore the full-fare tickets have been purchased at the company's offices, chiefly by firms which provide their employees with transportation. Conductors sell half-fare tickets only.

No Reduction in Traffic in Washington.—The Washington Railway & Electric Company has been informed by the Public Utilities Commission of the District of Columbia that observations made by its inspectors show that the service now in force is demanded by traffic conditions and must be continued.

Chicago to Issue Official Booklet of Traffic Facts.—It was decided at a recent meeting of the committee on local transportation of the City Council of Chicago, Ill., to authorize R. F. Kelker, Jr., traction supervisor, to prepare a booklet of facts not generally known to the public regarding street railway service in the city.

Brooklyn Inquiry Concluded.—The inquiry being conducted by the Public Service Commission of the First District of New York into the adequacy of the service of the surface lines of the Brooklyn Rapid Transit Company was concluded on Feb. 1. The principal witness was Slaughter W. Huff, vice-president of the company.

Louisville-Indianapolis Hearing.—The Louisville Board of Trade has received notification of indefinite postponement of the hearing before the Interstate Commerce Commission in connection with the reopened case against the Indianapolis, Columbus & Southern Traction Company and other lines connecting with Indianapolis. The hearing was to have been held on Jan. 29.

New Freight Rates.—The Mahoning & Shenango Railway & Light Company has filed a revision of its freight rates with the Interstate Commerce Commission and the Ohio and Pennsylvania commissions, to become effective on Feb. 15. The new tariff provides for through rates over all lines of the system based on the distance freight is carried. A small increase is made in the rates for milk.

New Indianapolis Traffic Ordinance.—The City Council of Indianapolis recently passed an ordinance, which is now being put into effect, requiring that all cars shall stop on signal on the far side as well as the near side of certain street intersections in the downtown district, where the distance over the crossing is very considerable on account of the intersection of wide north and south streets with diagonal avenues.

Decision in Atlanta Service Case.—In its decision upon the petition of the Georgia Railway & Power Company, Atlanta, Ga., to curtail its service on fourteen lines in Atlanta, the State Railroad Commission has granted in full the prayer of the company for curtailments on two routes and granted in part or conditionally the company's petition regarding five other lines. The other seven lines were not allowed to be changed.

New Street Rule in Detroit.—A new stopping ordinance has been passed recently in Detroit, Mich., which permits the driver of a vehicle to pass between the running board or lower step of a car headed in the same direction, when stopping to discharge or take on passengers, provided there is a 6-ft. clearance between the car step and the vehicle. If it is not possible to allow this clearance the vehicle is required to stop at least 6 ft. from the rear end of the car.

Change in Zone System Denied.—The Public Service Commission of Maryland has rendered a decision in the case of F. L. Hawley versus the City & Suburban Railway, Washington, D. C. The question at issue was the division of the line for the boundary of the District of Columbia to Laurel into five zones with a cash fare of 5 cents for each. The complainant desired four zones with the same fare, but the commission decided that the Interstate Commerce Commission under the Shreveport decision had the final authority in the matter, and it, in establishing six zones between Laurel and Washington, had already provided five between Laurel and the district boundary.

Fares in Edmonton.—The following fares were put into effect on the Edmonton (Alta.) Municipal Electric Railway on Dec. 15: Regular fare, 5 cents cash; tickets (lilac), five for 25 cents, good at all hours; tickets (brown), six for 25 cents, good from 6 a. m. to 8 a. m., 12 noon to 2 p. m., 5 p. m. to 7 p. m., not good on Sundays or public holidays; children's tickets (green) from five to fourteen years, ten for 25 cents. Two children are permitted to travel on 5 cents cash or one regular ticket. A double fare is charged after midnight, payable in cash or tickets. Tickets intended for use by persons on city's business are sold at the rate of twenty-five for $1.

Answer to Albany Suit.—Ledyard P. Hale, counsel to the Public Service Commission for the Second District of New York, has filed an answer to the writ of certiorari obtained by the United Traction Company, Albany, for a review of the commission's order requiring better service from the company in Albany. In the answer Mr. Hale denies that the commission's order is illegal or erroneous and states that a hearing is the proper method of offering any additional facts by the company and that a rehearing of the case is not necessary. The papers in the case will be printed immediately and an argument had before the Appellate Division in the first week of the term beginning March 2.

Traffic Survey in New Orleans.—D. D. Curran, president of the New Orleans Railway & Light Company, New Orleans, La., has presented to the Mayor of that city a summary of a traffic survey of most of the lines of the company for the period from Dec. 7 to Dec. 12, inclusive. In its communication to the Mayor the company says that since making the check it has added twenty-one cars to the various lines of its system and at the present time is operating a total of 443 cars daily, as compared with 422 for the same period of last year. In addition to this, the company has replaced fourteen large cars seating fifty-two persons each on the St. Charles and the Tulane Belt lines for fourteen smaller cars with a seating capacity of twenty-eight each. A traffic bureau has been organized to check traffic on all the lines of its system.

Highway Accidents in New York and New Jersey.—One-third fewer deaths in January in the streets of New York than a year ago are reported by the National Highways Protective Society, which estimates that the traffic on the streets has fallen off 30 per cent, 10 per cent of which is commercial traffic. During January, 1915, sixteen children lost their lives, fourteen being killed by automobiles, one by electric railway and one by wagon. The total number of persons killed was thirty-one, of which number automobiles killed twenty-three, electric railways four and wagons four. The number of persons killed on the streets and highways of New York State, outside of New York City, during the past month was eleven. Automobiles caused the death of seven and electric railways four, as compared with five by automobiles, five by electric railways and one by wagon in January, 1914. In New Jersey thirteen persons were killed by automobiles, as compared with eight during the month of January, 1914. Nine persons were killed at railroad grade crossings in New York and six in New Jersey during January.

Fare Order Respite.—Under the stipulation reached recently by the officers and patrons of the Seattle-Everett Interurban Railway the order of the State Public Service Commission of Washington of Dec. 24, reducing the rate charged by the company from 3 cents to 2 cents per mile has been deferred for a period of six months. The stipulation will ask the commission to validate the old schedule of rates, except that the company will issue a twenty-five ride book from the city limits to Seattle, as follows: To Lake Ballinger and intermediate points at the rate of 2 cents a mile; to Esperance, at the rate of 2.1 cents a mile; to Seattle Heights, at the rate of 2.2 cents a mile; to Cedar Valley substation, at the rate of 2.3 cents a mile; to Alderwood Manor, at the rate of 2.4 cents a mile; from the city limits of Everett to Silver Lake and intermediate points, at the rate of 2 cents a mile; the minimum fare in the case of a twenty-five ride ticket book to be 5 cents, the coupons to be good for transportation when presented with the book. The twenty-five ride ticket book, if continued beyond the term of six months' trial period, is to be good for one year from the date of sale. Pending a six months' trial of this experiment, no action will be taken upon the commission's order or the company's petition for rehearing.

Personal Mention

Mr. C. W. Colvin has been appointed transmission engineer of the British Columbia Electric Railway, Vancouver, B. C.

Mr. C. A. Hoag, who has been the assistant secretary and assistant treasurer of the Hagerstown & Frederick Railway, Hagerstown, Md., has resigned.

Mr. Alexander Armstrong, Jr., was elected assistant treasurer of the Hagerstown & Frederick Railway, Frederick, Md., to succeed Mr. C. A. Hoag, resigned.

Mr. J. L. Baird, heretofore assistant secretary and treasurer of the Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont., has been appointed auditor.

Mr. Carl D. Jackson, Oshkosh, has been confirmed by the Wisconsin Senate as the successor to Mr. John H. Roemer on the Railroad Commission of that State.

Mr. C. Loop, who has been acting roadmaster of the Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont., for the last year, has been appointed roadmaster.

Mr. A. R. Keele, heretofore assistant dispatcher of the Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont., has been appointed chief dispatcher of the company.

Mr. C. D. Flanigan, vice-president and general manager of the Athens Railway & Electric Company, Athens, Ga., has been elected president of the Athens Chamber of Commerce.

Mr. George Bullock has been elected chairman of the board of directors of the United Gas & Electric Engineering Corporation, New York, N. Y. He was formerly president of that company.

Mr. W. L. Palmer has resigned as claim agent for the Illinois Northern Utilities Company, at Dixon, Ill., to become claim agent for the Terra Haute division of the Terra Haute, Indianapolis & Eastern Traction Company.

Mr. A. Baltzer, heretofore shop foreman of the Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont., has been appointed master mechanic of the company in charge of shops and all work in connection therewith.

Mr. S. J. Dill, vice-president of the United Gas & Electric Engineering Corporation, New York, N. Y., has been placed in charge of the work of that company in the South, with headquarters at 201 Baronne Street, New Orleans, La.

Mr. Charles C. Mumford, one of the trustees of the Rhode Island Company, Providence, R. I., appointed by the Federal Department of Justice, has been elected president of the leased Providence & Danielson Railway to succeed Mr. D. F. Sherman.

Mr. C. P. Cooper has been appointed superintendent of the Windsor, Essex & Lake Shore Rapid Railway, Windsor, Ont., in charge of general operation. He has been with the company in various capacities from its construction days, and has been chief dispatcher for four years.

Mr. S. H. Bennett, general auditor Hagerstown & Frederick Railway, Frederick, Md., was elected assistant secretary of the company at the recent annual meeting, to succeed Mr. C. A. Hoag, resigned. Mr. Bennett will, in addition to this office, continue to hold that of general auditor.

Mr. J. S. Pevear, formerly president of the New Orleans Railway & Light Company, New Orleans, La., has been elected president of the United Gas & Electric Engineering Corporation, New York, N. Y., to succeed Mr. George Bullock, who has been elected chairman of the board of directors.

Mr. F. Howard Warfield, trust officer of the Fidelity Trust Company, Baltimore, Md., was elected vice-president of the Hagerstown & Frederick Railway, Frederick, Md., at the recent annual meeting of the railway. This office is a new one in addition to the vice-presidency held by Mr. Henry Holzapfel, who was re-elected.

Mr. F. S. Barnard, Victoria, B. C., who has been appointed Lieutenant-Governor of British Columbia, was born at Toronto, Ont., on May 16, 1856, and has been associated with the British Columbia Electric Railway for many years, acting recently as local adviser to the directors, most of whom reside in London, England.

Mr. Beecher W. Waltermire, an attorney of Findlay, has been appointed by Governor Willis to succeed Mr. E. W. Doty as a member of the Ohio Public Utilities Commission. Mr. Doty's term expired on Feb. 1. Mr. Waltermire was a candidate for lieutenant-governor in 1912 and has been successful on the lecture platform. He took part in the campaign for Governor Willis.

Mr. Pope Y. White, who has been appointed editor of the United Railways *Bulletin*, published in the interest of the employees of the United Railways, St. Louis, Mo., was engaged in daily newspaper work for fourteen years, advancing from reporter to telegraph editor, make-up editor, news editor and finally city editor, which place on the St. Louis *Times* he resigned to become connected with the United Railways.

Mr. Walter Alexander, Milwaukee, has been nominated as a member of the Railroad Commission of Wisconsin to succeed Mr. David Harlowe. For the last five years Mr. Alexander has been district master mechanic for the Chicago, Milwaukee & St. Paul Railway with headquarters at Milwaukee. Previous to this time he served on the faculties of the University of Wisconsin, Armour Institute and the University of Missouri.

Mr. Hugh McCloskey has resigned as chairman of the board of directors of the New Orleans Railway & Light Company, New Orleans, La. Mr. McCloskey was elected chairman of the board of the company and president of the American Cities Company in October, 1913. He first became identified with railway work in New Orleans as a member of the board of directors of one of the subsidiary companies under the New Orleans Railway & Light Company.

Mr. Russell A. Sears, to whom was awarded the silver replica of the Anthony N. Brady safety medal, was born in New York in 1869, but was educated in the Boston public schools. He was admitted to the Massachusetts Bar in 1890 and for fifteen years was associated in law practice with Samuel L. Powers. He resides at Quincy, Mass., of which he was Mayor in 1898 and city solicitor in 1900 and 1901. He had early association with various street railways now comprising the Middlesex & Boston Street Railway before its consolidation with some of the street railways now included in the Bay State Street Railway. He has been associated with the Boston Elevated Railway as general attorney since October, 1902. In addition to his Boston Elevated activities, Mr. Sears is a director of the Massachusetts Employees' Insurance Association, the Granite Trust Company and the Citizens' Gas Light Company. Mr. Sears was nominated by his company to receive the safety award because he has taken a leading part in accident reduction. In addition to the activities mentioned elsewhere in this issue he has developed the machinery of his department to promote safe operation. For example, the department diligently prosecutes in the criminal courts all persons who make traveling upon the cars unpleasant and dangerous. Again, in connection with the department, accident clerks are appointed to spend their time in carhouses and lobbies instructing employees on safety matters. Mr. Sears supervises the work of the general secretary of safety committees. He has also organized a number of public campaigns, among them being one against the stealing of rides and the jumping on and off cars. Another was one to stimulate the writing of safety verses in the schools by means of a prize contest. A special campaign against drunkenness upon street cars gave excellent results.

R. A. SEARS

Mr. William W. Chisholm, who has been appointed electrical engineer of the Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont., was born at Caradoc, Ont., on Oct. 17, 1876. He entered railway service in June, 1896, and to April, 1897, was switchman on the Michigan Central Railroad, St. Thomas, Ont. From April, 1897, to March, 1898, he was yard conductor and assistant yardmaster of the Toronto, Hamilton & Buffalo Railway, Hamilton, Ont. From March, 1898, to June, 1903, he was brakeman of the Michigan Central Railroad, St. Thomas, Ont. In May, 1905, he became assistant chief engineer of the city pumping station at St. Thomas, Ont., and since November, 1907, he has been chief engineer of the power plant of the Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.

Mr. Henry V. Neal, to whom was recently awarded the bronze replica of the Anthony N. Brady medal, is sixty-six years of age. He has been in the employ of the Boston Elevated Railway for twenty-one years and is at present a mechanic in the Albany Street shops. Before coming to the Boston Elevated Railway, he was in the employ of the Hinckley Locomotive Works for thirteen years and the Boston & Albany Railroad for nine years, and was actively interested in the emergency work of the latter company. Mr. Neal for many years has been deeply interested in medical matters. In the early eighties, while with the Hinckley Company he took a course of emergency lectures, and later helped to organize an emergency class while with the Boston & Albany Railroad. In connection with this work he acted as assistant demonstrator during another lecture course. All of this preparation has well fitted Mr. Neal to take up his present activities, which are mentioned in connection with the digest of the Brady medal committee report elsewhere in this issue.

H. V. NEAL

OBITUARY

James D. Parker, one of the promoters of the Sandusky, Milan & Norwalk Electric Railway, now included in the system of the Lake Shore Electric Railway, Cleveland, Ohio, is dead.

John C. Brewster, superintendent of construction during the building of the Muskegon (Mich.) Street Railway, now included in the system of the Muskegon Traction & Light Company, is dead. Mr. Brewster was born on June 5, 1829, in New York. He located in Muskegon in 1869 as a civil engineer. He was interested in the construction of the Chicago & Michigan Railroad and the Grarnd Rapids & Indiana Railway.

John Wesley Richardson, general superintendent of the Kansas City-Western Railway, Kansas City, Kan., is dead. Mr. Richardson was born at Freeman, Mo., on March 25, 1867. When seventeen years old he entered the employ of Holmes Brothers with the local railway lines in Kansas City. Later he became superintendent of one of the divisions of the Metropolitan Street Railway in Kansas City, and in June, 1905, was made general superintendent of the Kansas City-Western Railway.

John M. Mack, financier and contractor, who took a prominent part in the organization of the Philadelphia (Pa.) Rapid Transit Company, is dead. Mr. Mack was born in Philadelphia on Aug. 15, 1852. He was educated in the public schools there and in 1872 began business as a contractor. He was largely responsible for organizing the Asphalt Company of America. He was formerly president and a director of the Barber Asphalt Paving Company, the General Asphalt Company, the Mack Paving & Construction Company, the Norwich Compressed-Air Power Company, the Hamburg Vitrified Brick Company, the Railways Company General, and was president of the Manhattan Trap Rock Company. Mr. Mack retired some time ago from active business.

Construction News

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

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

RECENT INCORPORATIONS

***McConnellsburg & Fort London Railway, McConnellsburg, Pa.**—Application for a charter has been made by this company in Pennsylvania to build an electric railway between McConnellsburg, Pa., and Fort London in Peters Township, Pa. Incorporators: Edward J. Post, D. H. Patterson, Herbert A. Duffy, George A. Harris and B. C. Lamberson.

Portland, Vancouver & Northern Railway, Vancouver, Wash.—Chartered in Washington to build an electric railway between Portland, Ore., and Vancouver, Wash. Capital stock, $300,000. Henry Crass, 511 United States Bank Building, Vancouver, Wash., president, and G. W. Ford, Vancouver, secretary. [E. R. J., Jan. 19, '15.]

FRANCHISES

Fresno, Cal.—The Fresno Interurban Railway has asked the Council for a franchise over certain streets in Fresno.

Los Angeles, Cal.—Upon being informed that the Los Angeles Railway corporation is desirous of removing certain tracks on Thirty-ninth Street, which is to form an entrance to Exposition Park, the Park Commission has approved new plans for the street approach to the park in question.

Riverside, Cal.—Floyd Brown and associates have asked the Board of Supervisors for a fifty-year franchise to build an electric railway along the county highway in Riverside, and by motion it was decided to advertise for bids on the franchise to be opened March 3.

***Santa Barbara, Cal.**—Application has been made to the City Council by Richard Hamilton Gaud for a franchise granting the right to construct an electric railway upon certain streets in Santa Barbara until March 15, 1957. The Council will receive sealed bids up to Feb. 18 for the franchise.

Murphysboro, Ill.—The Murphysboro & Southern Illinois Railway will ask the Mayor and City Council for a franchise in Murphysboro on Feb. 9.

Albany, N. Y.—The International Railway has received permission by the Public Service Commission in Albany to construct its high-speed electric line between Buffalo and Niagara Falls. Permission was also given the railway to issue 3 per cent fifty-year refunding and improvement mortgage bonds for $2,395,000 to be sold at not less than 87. The new line is to start in Buffalo at the intersection of the Buffalo & Lockport line and run out Main Street through Tonawanda over the old Buffalo, Thousand Islands & Portland Railroad line, through North Tonawanda, Wheatfield, La Salle into Niagara Falls.

Buffalo, N. Y.—The Frontier Electric Railway has received a franchise to extend its lines across Kenmore Avenue, Main Street and intervening streets in Buffalo.

Buffalo, N. Y.—The International Railway has accepted the franchise recently granted it by the Tonawanda Common Council giving it the right to build a double-track line from Buffalo to Niagara Falls. In the acceptance, the company placed a clause giving it the right to cancel the grant at any time before the building of the new line is begun. The company will also accept the North Tonawanda franchise on the same condition.

***Clymer, N. Y.**—The Columbus & Mayville Railroad has asked the Council for a franchise in Clymer. This is part of a plan to build an electric railway between Jamestown and Clymer.

New Rochelle, N. Y.—The trolley committee of the City Club of New Rochelle has asked the Council to grant the Westchester Electric Railway a franchise to build a new electric line from Mount Vernon through Winyah Avenue, to connect the end of the line in North Pelham with North Avenue, and to extend these cars to Hudson Park and double-track Franklin Avenue.

East Linden, Ohio.—On Jan. 27 the commissioners of Franklin County granted the East Linden Electric Railway a franchise for a line between the Leonard Avenue viaduct in Columbus and East Linden. Work must be begun within two years and the fare is to be 5 cents until the net income exceeds 6 per cent on the investment, when it is to be reduced to the rate of six tickets for 25 cents. Further decrease of the fare is provided as the income increases.

Toronto, Ont.—The City Council has authorized the issue of debentures to the amount of $455,961 for civic lines in Toronto. The City Council authorized the issue of debentures, amounting to $66,418, for acquiring the portion of the Scarboro division of the Toronto & York Radial Railway within the city limits.

McConnellsburg, Pa.—The McConnellsburg & Fort London Railway has received a fifty-year franchise from the Council in McConnellsburg. This is part of a plan to build an electric line between McConnellsburg and Fort London.

***Knoxville, Tenn.**—M. K. Bell has asked the County Court for a franchise for an electric interurban railway from Knoxville to Bristol and Newport.

Seattle, Wash.—The City Council of Seattle has voted to submit at the March election the ordinance of Councilman Erickson to extend Division A of the municipal electric railway into Ballard.

TRACK AND ROADWAY

Gadsden, Ala.—Application for a charter will soon be made by Louis Hart to build an electric railway from Gadsden to Centre. It is expected the capital stock will be at least $250,000, although the preliminary organization of the company may be effected on a smaller amount. Property holders of Centre are greatly interested in the project and will give material assistance. Power will be purchased from the Alabama Power Company. [E. R. J., Jan. 30, '15.]

Mobile Light & Railroad Company, Mobile, Ala.—This company has in contemplation extensive improvements of its lines provided the franchise rights are secured. The company has been considering these improvements for some time, and it is expected that if the proper negotiations are completed the work will begin in the near future.

Tramways Company, Ltd., Edmonton, Alta.—The agreement between the Edmonton City Council and this company has been ratified by the ratepayers. The directors are: A. E. Farncomb, president; H. Stutchbury, S. D. Hogan, G. G. Reedwell, S. Carson, W. Golley and S. H. Smith. It is reported that the company has already graded several miles from the city limits and has bought right-of-way from the landholders along the side of the road allowance.

San Jose & Almaden Railway, San Jose, Cal.—The project to build a 12-mile electric line between Almaden, San Jose and Hacienda has been abandoned. [E. R. J., Sept. 28, '12.]

Jacksonville, Fla.—The new interurban electric railway from Jacksonville to Middleburg, on which construction was recently begun, in addition to being in shape to go ahead with its building for the first 10 miles, has the co-operation of every land owner along the line. These have contracted to give time, labor and ties, in addition to offering to take stock in the company as soon as the organization is completed.

Miami (Fla.) Traction Company.—Work has been resumed by this company on its line in Miami. It is planned to have 2 miles of track laid by March 1. B. B. Tatum, Miami, president. [E. R. J., Nov. 21, '14.]

Tarpon Springs, Fla.—Plans to build an interurban railway from Tarpon Springs to St. Petersburg are under consideration. The line will be 12 miles long and will be operated with gasoline motive power. M. L. Waggoner, Third Avenue, South, St. Petersburg, is interested. [E. R. J., April 25, '14.]

Macon Railway & Light Company, Macon, Ga.—The work of relocating the track on College Street, removing it from the lower edge of Tattnall Square and placing it in the center of the street, will be begun at once by this company.

Union Traction Company, Coffeyville, Kan.—This company has placed in operation its extension to Nowata. Other extensions are contemplated.

Manhattan, Kan.—Municipal bonds to the amount of $20,000, voted in 1910 as a bonus to the Manhattan City & Interurban Railway when it should complete a line to Fort Riley, were turned over to the traction company on Jan. 23, the line having been placed in operation three months ago.

Arkansas Valley Interurban Railway, Wichita, Kan.—Plans are being considered to build soon the extension to Hutchinson. Extensions to Great Bend, Larned and other western towns are also being considered and plans are also contemplated for extensions northward, probably to McPherson and Salina.

Kentucky Traction & Terminal Company, Lexington, Ky.—Orders have been placed by this company with the Hardwick Lumber Company, Winchester, for 30,000 crossties, which are for use in the reconstruction of the railway.

Louisville & Interurban Railway, Louisville, Ky.—Plans are being made by this company for a 7-mile extension from Fern Creek to Mount Washington.

Louisville (Ky.) Railway.—There will be no extension of the Walnut Street line in Louisville from the present terminal in Parkland to the State Fair grounds at the present time. The board of directors of the company so decided at their regular January meeting recently.

Southwestern Traction & Power Company, New Iberia, La.—Plans are being made for the construction of an electric railroad from New Iberia, La., to St. Martinville, a distance of 10.5 miles, also from Jeanerette, La., through Franklin, Baldwin and Patterson, to Berwich, a distance of 50 miles. No contracts have been let, but it is expected that work will soon be begun. W. S. Henning, New Iberia, La., is chief engineer.

***New Orleans, La.**—Plans are being made to build a double-track electric railway for the section of the city below Canal Street. Among those interested are: Charles Torreogrossa and Joseph F. Ebert, New Orleans.

Orleans-Kenner Electric Railway, New Orleans, La.—Work has been begun by this company on the construction of the Metairie Ridge loop line in New Orleans. [E. R. J., Jan. 9, '15.]

Shreveport (La.) Traction Company.—Plans are being made to build an extension from Waverly to South Highlands, about 1½ miles, in Shreveport.

Asbury Park, N. J.—Harry W. Smock, retiring president of the Chamber of Commerce, is reported as stating that the recently talked of Trenton to Asbury Park electric railway is now assured. He announces that the line will run through Allentown, Lakewood, Farmingdale and Hamilton and thus into Asbury Park with a spur from Lakewood to Point Pleasant. The project will go through, he assured chamber members, without local financial aid.

Trenton & Mercer County Traction Company, Trenton, N. J.—Wilbur residents are agitating the extension of the Hamilton Avenue line into East Trenton. The present terminus of this branch is Olden Avenue and State Street. The plan is to have the tracks extended to the corner of Clinton Avenue and Olden Avenue.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—This company has been asked to buy the Buffalo-Susquehanna Railway extending between Buffalo and Wellsville. The proposition is to electrify the Buffalo-Susquehanna Railway which would provide an outlet into Buffalo. It is understood the Chamber of Commerce of Olean and the towns of Friendship, Franklinville, Wellsville and others would aid such an undertaking.

Goldsboro, N. C.—The House of Representatives at Raleigh, N. C., has passed on third reading the bill authorizing the city of Goldsboro to issue bonds for municipal street railway purposes.

Pictou County Electric Company, Ltd., Stellarton, N. S.—This company has under consideration the construction of an extension from Potiers Bridge to Pardale, N. S., ½ mile. L. T. Flaherty, New Glasgow, N. S., manager.

Youngstown & Southern Railway, Youngstown, Ohio.—David Tod, receiver for this railway, has announced that the line will be double tracked from Youngstown to Southern Park, where the racetrack is located. He will soon ask the Council for a franchise for this work.

Toronto (Ont.) Eastern Railway.—This company has an application before the Dominion Parliament asking for an extension of time for completing the line authorized to be built from Toronto easterly to Cobourg, Ont., with branches as follows: From Cobourg or Port Hope northerly to Peterborough; from Scarborough to Markham, Stouffville or Uxbridge; from Oshawa northerly via Lake Scugog to Lindsay; from Oshawa southerly to Lake Ontario.

Niagara, Welland & Lake Erie Railway, Welland, Ont.—This company has an application before the Ontario Legislature for the confirmation of an agreement granting the right to the company to operate a railway in Welland, and the confirmation of a second agreement fixing the assessment of the company's property there at specific sums for five-year periods, terminating in 1934.

Portland & Oregon City Railway, Portland, Ore.—This railway will be completed and in operation to Baker's Bridge, 16 miles from Portland end, early this spring,

Lancaster & Berks Electric Railway, Lancaster, Pa.—Plans are being contemplated by this company to change its route to Womelsdorf for the proposed spur line that was to have been laid from Kleinfeltersville to Womelsdorf. It has been stated that the line will now be constructed along an altogether different route, passing through Reistville, Richland and Stricklerstown. It is said that the reason for abandoning the original project is that the right-of-way could not be secured at a nominal cost. The new spur would connect with the Ephrata & Lebanon lines.

Montreal (Que.) Tramways Company.—The Quebec Legislature is being asked by the town of Mount Royal for an extension of time within which it may make arrangements with this company and the Montreal Public Service Corporation for the building of electric railways, etc.

Columbia Railway, Gas & Electric Company, Columbia, S. C.—In advance of the paving of Elmwood Avenue by the city, this company will lay a new track down Elmwood Avenue and erect concrete poles. The company will soon replace the wooden poles on Lady Street with iron poles.

Brenham, Tex.—Washington will join in the project to build an interurban electric railway from Brenham via William Penn and Independence, thence through the Brazos section. This will add 6 miles more to the route already surveyed. Outside capital is very much interested in the construction of this interurban line. L. M. Hewitt, Bryan, is interested. [E. R. J., Jan. 30, '15.]

El Paso Electric Belt Line, El Paso, Tex.—No definite plans have yet been formulated by this company for the construction of its proposed electric railway from the center of El Paso through suburbs to Woodlawn addition, east of El Paso. Thomas P. Ruddy, Kansas City, is interested. [E. R. J., Nov. 14, '14.]

San Angelo (Tex.) Street Railway.—Plans are being considered by this company to extend its lines in San Angelo to Austin, a distance of about 75 miles.

Lynchburg Traction & Light Company, Lynchburg, Va.—This company contemplates the construction of an extension to Madison Heights over the proposed viaduct from Seventh Street and Commerce Street across the James River in Lynchburg.

***Radford, Va.**—Plans for the construction of an electric railway from Willis, in Floyd County, to Radford, Va., 28 miles, are being considered by residents of that county and the Radford Board of Trade. It is understood that Floyd County people will subscribe about $100,000 to the stock of a company which may be formed to build the railway, and that they will pay for it in crossties and labor. A. J. McClung, secretary of the Radford Board of Trade, may be able to give further information.

Tacoma (Wash.) Municipal Railway.—The first line of this railway has been placed in operation in Tacoma. It will be known as the Tide Flats line and will operate from Pacific Avenue and Eleventh Street to the shops of the Chicago, Milwaukee & St. Paul Railway. The line will be operated under lease by the Stone & Webster Corporation.

West Virginia Traction & Electric Company, Wheeling, W. Va.—It has been officially stated that this company is contemplating many improvements of its lines in Wheeling during 1915.

SHOPS AND BUILDINGS

Kankakee & Urbana Traction Company, Urbana, Ill.—T. W. Shelton, superintendent of this company, has just completed the plans for a new station for the company at Rantoul. It will be on the site of the present structure. Work will be begun as soon as the weather will permit. The new structure will be of brick, 20 ft. x 50 ft., and so arranged that 100 ft. more can be added to it when necessary. The front will be used as a waiting room for passengers, and in the center will be the ticket office. The rear part will be used as a freight room, switches being run to it to make loading and unloading easy.

Berkshire Street Railway, Pittsfield, Mass.—This company has opened a new passenger station in Pittsfield.

Piedmont & Northern Railway, Charlotte, N. C.—The offices of this company have been moved from the former place on Main Street to the new office on Washington Street over the new depot.

Cleveland (Ohio) Railway.—Plans are being made by this company to ask the City Council for permission to purchase 19 acres of land near the Big Four Railroad at Denison Avenue and Ridge Avenue in Cleveland on which the company plans to build new carhouses. The land will cost $60,000.

Texas Traction Company, Dallas, Tex.—Negotiations are now being conducted between the Southern Traction Company and Texas Traction Company, of Dallas, and the Dallas Interurban Terminal Association for the right of the cars of the lines mentioned to use the shed and station privileges of the new interurban terminal station which the association will erect. This is one of the most important details of the erection of the new interurban terminal station by the Stone & Webster interests. It was the former purpose of the Strickland-Goodwin Managerial Association, controlling the operation of the Texas and Southern Traction companies, to build a station of their own out of the present Santa Fé depot at Commerce and Murphy Streets. They bought control of this property some months ago. If the new contract is made, their plans will probably be changed. The Southern Traction and Texas Traction Companies hold franchises on Commerce Street at the present time, so that no changes would have to be made in order to reach the new stations. The franchise on the streets entering the station itself is a blanket franchise, issued to the association, covering all lines.

POWER HOUSES AND SUBSTATIONS

United Railroads of San Francisco, San Francisco, Cal.—Work will shortly be begun by this company on the construction of a new substation on Eighth Avenue, near Geary Street, in San Francisco. This substation is designed to handle all cars operated in the Richmond district. The ultimate capacity of the new substation will be 6000-kw, equivalent to approximately 10,000 hp.

Rockingham Light & Power Company, Portsmouth, N. H.—The electric machinery, formerly in use at the power house of the Portsmouth & Exeter Street Railway, now abandoned, at Stratham, is being moved by the Rockingham Light & Power Company to Portsmouth, where it will be installed at the Daniel Street plant and connected up with the power lines. The lot includes a rotary converter, transformers, switchboards and other equipment.

Toronto (Ont.) Suburban Street Railway.—Contracts have been awarded by this company for three substations on its Toronto to Guelph line, at Islington, Georgetown and Guelph, Ont. The latter will have 1000-kw. capacity, in two 500-kw units, while each of the other two will have a single 500-kw unit, with provisions for the addition of a similar unit in the future. Power will be received at 25,000 volts, alternating current, three-phase, twenty-five-cycle, and will be stepped down and passed through 500-kw rotary converters, which will deliver to the line at 1500 volts direct current. The Georgetown and Guelph stations will contain waiting, baggage and express rooms and dispatching offices, providing railway station facilities.

San Angelo (Tex.) Street Railway.—Plans are being considered by this company to build a new power house in San Angelo.

Manufactures and Supplies

ROLLING STOCK

Reading (Pa.) Transit & Light Company is contemplating the purchase of a few cars.

Iowa Railway & Light Company, Boone, Ia., is reported as expecting to buy four cars.

International Railway, Buffalo, N. Y., is reported as figuring on buying twenty-five cars.

Sioux City (Ia.) Service Company is reported as expecting possibly to rebuild five city cars.

Oakwood Street Railway, Dayton, Ohio, is reported as expecting to rebuild cars in its own shops.

Columbia (S. C.) Railway, Gas & Electric Company is reported as expecting to purchase new cars.

Dayton & Troy Electric Railway, Dayton, Ohio, is reported as expecting to buy three interurban cars.

Birmingham & Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., during 1915 will purchase four passenger cars.

Somerset Traction Company, Skowhegan, Me., expects to purchase one semi-convertible combination passenger and baggage car.

Columbus Railway & Light Company, Columbus, Ohio, is rumored as considering the possible purchase of twenty-five or fifteen city cars.

Hagerstown & Frederick Electric Railway, Frederick, Md., has ordered two electric freight locomotives of 25 tons each from the General Electric Company.

Arkansas Valley Interurban Railway, Wichita, Kan., noted in the ELECTRIC RAILWAY JOURNAL of Jan. 30, 1915, as expecting to purchase one car, has ordered this equipment from the Cincinnati Car Company.

Tampa & Gulf Coast Railway, Tampa, Fla., contemplates either electric storage-battery or gasoline motor car operation on its recently completed line between Tampa and St. Petersburg, Fla. Other cars will be purchased for similar service between Tarpon Springs and Port Richey.

Union Electric Company, Dubuque, Ia., which operates all the electric utilities in that city, placed in service during 1914 two electric buses which run on a twenty-minute schedule between Dubuque, Ia., and East Dubuque, Ill. This service, which could not be furnished in any other manner, has proved so popular that an order has recently been placed with the General Vehicle Company, Long Island City, N. Y., for a third bus.

Shore Line Electric Railway, Norwich, Conn., has specified the following details for the ten semi-convertible cars recently ordered from the Wason Manufacturing Company:

Date of delivery, during May	Control .....West. H. L.
Seating capacity 52	Couplers .....West C-I
Weight of car body, 20,000 lb.	Curtain fixtures.....National
Bolster centers.....24 ft.	Curtain material...Pantasote
Length of body over corner posts .....36 ft.	Gongs .....Dedenda
Length over vestibule, 45 ft. 5 in.	Hand brakes, Peacock, no staff
Height, rail to floor..40½ in.	Heaters .....Consol.
Height, floor to trolley board, 8 ft. 4½ in.	Headlights ....Golden Glow
Width over sills...8 ft. 2 in.	Motors.....four, inside hung
Width over all....8 ft. 4 in.	Registers ....No. 5 Sterling
Body .....metal	Sanders .....Sterling
Interior trim.....mahogany	Sash fixtures.....Brill
Headlining .....Agasote	Seating material.....rattan
Roof .....arch	Springs .....Brill
Underframe .....metal	Steps .....Stanwood
Air brakes....West. S. M. E.	Trolley Catchers..Earll No. 7
	Trolley base....U. S. No. 15
	Trucks...Brill No. 27 MCB 1
	Ventilators .....Brill
	Wheels.....Midvale, 34 in.

Metropolitan Street Railway Company, Kansas City, Mo., has advised through the board of control that it will let a contract on Feb. 8 for fifty new cars to be delivered April 15. Specifications call for single-end, double-truck cars with an inclosed rear door and folding step with motorman's red light signal for starting the car. White enamel decorating is to be used and 50 per cent more heaters will be provided than have been in use on the Metropolitan's cars. The wheel height is to be reduced from 33 in. to 30 in. in order to save space and facilitate boarding and alighting.

TRADE NOTES

Lorain Steel Company, Johnstown, Pa., has just received an order from the International Railway, Buffalo, N. Y., for 5300 tons of 9-in. girder rail, No. 124—432.

Electric Controller & Manufacturing Company, Cleveland, Ohio, announces that the O. H. Davidson Equipment Company, Ideal Building, Denver, Colo., will act as its representative in Colorado, Utah, Montana, Wyoming, South Dakota, New Mexico and Arizona.

H. Bortin, formerly engineer in charge of valuation department of Union Pacific Railroad for four years, and member of its valuation committee; lately assistant to general secretary of Presidents' Conference Committee on Federal Valuation of the Railroads, announces his entry into private practice as consulting valuation engineer, with office at 149 Broadway, New York City.

Guy E. Marion, secretary-treasurer of the Special Libraries Association, has resigned from Arthur D. Little, Inc., chemists, engineers and managers, 93 Broad Street, Boston, Mass., where he has been located for the last five years in charge of its information department. Mr. Marion will devote himself to the organization and development of special libraries, or information departments, in business houses, industrial plants, etc.

American Manufacturing Company, Chattanooga, Tenn., of which J. B. Robinson is president, manufacturer of hardware specialties, such as electrically welded wire oven racks, etc., has recently purchased the plant and equipment of the Owensboro Shovel & Tool Company, Owensboro, Ky., of which J. W. McCulloch was president. The equipment has been installed in the Chattanooga manufacturer's plant and will be ready for operation in a few weeks.

Edison Storage Battery Company, Orange, N. J., has appointed Charles E. Poyer as assistant general sales manager. Mr. Poyer has been with the Edison interests for about four years, having served first on the personal engineering staff of Mr. Edison in the development of special application of the alkaline battery, and later as assistant advertising manager. For the past two years he has been manager of the house lighting department.

British Westinghouse Eectric & Manufacturing Company, Ltd., Manchester, England, will purchase the Société Anonyme Westinghouse, Havre, France, and the Societa Italiana Westinghouse, Genoa, Italy. The English company, it is reported, will take over the Continental companies purely as a matter of business policy, and not as an expedient under which to furnish war materials for the Allies. The American company, by virtue of its stock control of the English company, will still control the English company, and through it the French and Italian concerns. The plants in France and Italy will continue to be run separately.

E. P. Roberts, who, since 1912, has been Commissioner of Smoke Abatement at Cleveland, has reopened his office as consulting engineer at Cleveland with temporary headquarters at 2053 East Ninety-sixth Street. Mr. Roberts has had an extended experience as consulting engineer for public service and industrial properties. In the circular which accompanies the announcement in regard to the opening of his office, it is stated that the total amount involved in properties for which Mr. Roberts has been engineer, or for which he has prepared reports, is approximately $175,000,000; the properties for which he has been engineer cost from a few thousand dollars up to $3,500,000, and the properties existing or proposed which he investigated or reported on would cost from a few thousand dollars up to $8,500,000.

ADVERTISING LITERATURE

Eclipse Railway Supply Company, Cleveland, Ohio, has issued a folder describing its trolley retriever.

Ohmer Fare Register Company, Dayton, Ohio, has issued a card which reproduces an editorial which appeared in the Dayton *Daily News* of Dec. 23, 1914, commenting upon the proper relationship between manager and conductor.