

# Electric Railway Journal

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## THE PASSING OF THE SNOW MENACE

Elsewhere in this issue is described a new form of snow-sweeper that has just been successfully tried out by the New York Railways. Its principle is simple, involving merely the use of an out-board broom to clear a passageway beside the rails for the wagons and trucks which otherwise could not be forced off the tracks during snow storms. Notwithstanding the almost obvious nature of the underlying idea, its importance to the industry is much more likely to be under- than over-estimated. In fact, the surface railways have become so inured to the losses occasioned by snow storms that these have come to be accepted as a regular risk of the business, and great reductions in gross earnings for periods of two weeks or more, such as were reported in New York City last winter, are looked upon with calmness if not with equanimity. Manifestly, the major part of the loss from snow is traceable directly to reduced car movement. No one cares to pay even a nickel for a ride when walking is quicker and much more reliable, and just as long as the street-railway track offers the only pathway through a snow-covered street the speed of the cars will be measured by that of the slowest wagon upon it. Of course, it is easy to say that the municipality ought to clear the streets promptly, but on the other hand, practical experience shows that this is not going to be done. There remains only the alternative for the street railways to do the work. But if they do it themselves, the hypothesis that a snow storm in a large city means an immediate reduction in schedule speed to 3 m.p.h. need no longer be accepted.

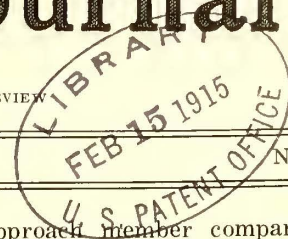
## THE EMPLOYER'S OPPORTUNITY.

The educational committee of the American Electric Railway Association has announced the inauguration of the correspondence courses for employees engaged in construction, maintenance and operating work. For this purpose arrangements were made with a well-known correspondence school. Students are enrolling, and a number have already passed sections of the courses very creditably. The committee, of course, had the sanction of the association in adopting these arrangements, which were made only after the former had demonstrated to the satisfaction of all interested persons that it was impracticable to conduct correspondence courses by the association itself. While cooperation with a commercial concern is not entirely without precedent in the association, such an alliance must be guarded most carefully if the results are to be permanently satisfactory. The correspondence schools are responsible for the results of their work, but as

they have authority to approach member companies with the backing of the association, the very considerable influence of the latter will cause many persons to enroll as students who would not otherwise have done so. The association must see to it that these especially, but also all others who follow the courses conscientiously, are not disappointed. To this end it is the manifest duty of every employer to take an active interest in the work of students in his employ and promptly to notify the association officers of any weaknesses or defects which are discovered in the courses. The use of special correspondence courses by large industrial concerns is on the increase, and the officers take a lively interest in the progress of their young men. In the association courses the same principle applies, but the industry is so enormous that greater effort must be made to keep track of this movement which, in its inception, will properly be inconspicuous.

## STARTING RESISTANCES FOR RAILWAY MOTORS

In the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 26 we printed and commented upon an interesting article on this subject by Mr. Castiglioni. As a result of this publication J. W. Corning of the Boston Elevated Railway sent us an account of an experience of that company which bore testimony to the importance of the subject, and this was printed last week. Since then Prof. A. M. Buck has contributed the article printed elsewhere in this issue. We are pleased to print these articles for their reference value and because they contain information not readily accessible. Calculating resistances is a mathematical rather than a controversial problem. There can be only one correct result of the application of different methods of solution. The interest seems to us, therefore, to center in the method rather than in the result. Mr. Corning puts an ammeter on the car and records the current and thus obtains data for the readjustment of resistance steps. Mr. Castiglioni, by methods necessarily laborious, works out sets of curves which when completed are applicable to all cases and for all time. Professor Buck replots the torque-current curve of the motor in terms of current and torque per ampere, and by applying to it a simple geometrical device makes it possible to calculate the starting resistances for a given equipment very quickly. For a manufacturer who has to make these calculations by wholesale Mr. Castiglioni's method appears to possess advantages as a time saver. For purposes of instruction, which naturally impelled the development of Professor Buck's plan, it is probable that his method is better in impressing fundamental principles more graphically.





### ABOLITION OF SELF-INSURANCE

A pending bill in the New York Assembly contains a serious threat at one of the good features of the workman's compensation law passed at the last session. Whether it was inspired by the casualty companies or by one of those persons who actually believe that the government can do everything better than the individual or private corporation, we do not know, but its purpose is to remove the provision permitting employers, upon deposit of proper security with the compensation commission, to carry their own risks for compensation to injured workmen. The fact that all of the large electric railway companies in New York City early adopted the self-insurance plan after the law went into effect last July shows to what an extent electric railways would be affected by such a prohibition.

The alacrity with which these companies took advantage of the self-insurance provision is ample evidence of the fact that this method of insurance is considered by railways with large organizations and extensive resources better than insurance in the State fund or with casualty companies. Not only can these railways follow the mandates of the workman's compensation law most easily and cheaply in this way, but the self-insurance method more fully safeguards the interests of the employees. For years the large electric railways in the State had been paying compensation to their employees, even where no legal liability existed, as part of their systems of welfare work, and in the necessary investigation of passenger injuries and claims they had developed departments that were able with the utmost facility to handle the clerical and medical work necessitated under the new law. Thus, not only did the existing departments make it possible to adopt the self-insurance method without the piling-up of high administrative costs and overhead charges, but there was also an absence of the "loading" charges so inseparable from State fund and casualty insurance operations. In other words, each company was not compelled to make contributions to any general fund, made up by averaging good and bad risks, whereby the more stable companies have to pay the losses incurred by bad risks. Lastly, under this method, each self-insuring company was made more than ever the guardian of its own workmen, for aside from humanitarian reasons the fact that it alone had to meet all its compensation expenses gave it the most powerful incentive to minimize injuries by improving the physical conditions of its plant and providing safety appliances for operation.

The adoption of the self-insurance method, however, meant no lack of protection to the employees, for the self-insuring companies were required to prove to the compensation commission that they were financially responsible and had to file with the commission, to insure the faithful discharge of their duties, high-class securities in an amount equal to the semi-annual premium in the State fund, less 10 per cent. This latter amount had to be deposited in cash with the commission for use in the case of any immediate call for compensation payments. In the event of any death resulting in com-

penation payments, the self-insurers were required to deposit immediately the full amount estimated to be necessary to cover the risk involved to its full maturity.

In the light of these facts, it is difficult to see wherein lies the justice or economy of abolishing self-insurance. Insurance experts are at loggerheads on the question of whether or not the State fund is operating successfully. Governor Whitman in a special message on the subject expresses his sincere hope that the compensation commission may be so reorganized as to reduce its expenses and states that the results so far indicate that "the attempt by the State to do the business of its citizens must inevitably cause enormous expense to the Government, besides the inconvenience and disorganization of private business and injury to private interests, whether of capital or labor." He accordingly desires the work of the commission to be relieved somewhat by making the commission a supervisory party in compensation settlements between employers and employees instead of the settling party itself. If the cutting of expenses is so much needed, why abolish the very method of insurance that large electric railways have chosen for its cheapness and ease of administration? Small companies of all sorts must find strength in union through the State fund, casualty companies or mutual associations, but the expenses resulting therefrom and the cost of insurance to self-insurers need not be increased under cover of politics and the delusion that state operation is necessary for compensation insurance success.

### THE RAINBOW-CHASING JITNEY

The more we learn about the cost of operation of the motor-bus in city transportation the more apparent it becomes that this "menace" is likely to take care of itself by the simple process of self-elimination. In many large cities there may be special circumstances in particular localities which will enable a bus line over a short route to exist on a 5-cent fare. But that the bus can be extensively profitable and in a large sense therefore a serious menace to the surface car, is not at all apparent. Several companies and many individuals have rushed into motor-bus operation to their sorrow. They knew nothing about cost of operation and maintenance, and there was little or nothing that could be found out about these costs had the information been sought. On paper the jitney-bus is a gold mine. At the end of a few months the cost of tires, repairs, accidents and operation of almost empty buses for five or six hours a day usually changes the golden glow to a dark blue.

Even when second-hand automobiles of the five-passenger touring-car type are used instead of the bus the same condition will obtain, whether these cars are operated by a number of individual owners or by a single company. A second-hand touring car represents, of course, a much smaller investment than an automobile bus, but its carrying capacity is proportionately less and the per cent of maintenance on its cost should certainly be no less. The rate of depreciation obviously is higher.



There is no more reason for believing that a fleet of second-hand passenger automobiles can be operated at a lower rate per passenger than the automobile bus than that the same number of second-hand carriages, when horses were used as motive power, could compete in cheapness per passenger with a regular horse-drawn bus. The jitney-bus competition which has been felt so keenly on the Pacific Coast and elsewhere in this country as described in recent issues of this paper has been largely from cars of this nondescript character, that is to say, while there have been a few buses, most of the competing vehicles have been old automobiles of practically every type, make and condition.

While there are many owners of private automobiles who can testify as to the cost of operation and maintenance of their own cars there are comparatively few reliable data on the cost of motor bus operation. The London figures, for reasons which have already been published in these pages, are not of very great assistance because the transportation conditions in that city differ so greatly from those prevailing in American cities. The latest and almost the only reliable information we have is that of the Fifth Avenue Coach Company in New York, and we present in this issue a discussion of these figures by the president of the company, supplemented by other data, including a very clear analysis of the situation in San Francisco by Charles N. Black.

The Fifth Avenue Coach Company gets a 10-cent fare and gives 10-cent service, both as to quality and quantity. Few cities can or will pay for such a service, but in the comparatively rare occasions where buses can be operated the electric railway company might well consider motor-bus operation as a supplement to its own service, if there is a genuine demand for it, rather than to leave it to others. But in support of the claim that for general city transportation the automobile can compete on at all equal terms with the electric car, not one scintilla of evidence can be adduced.

In addition to the information we now have in regard to New York and San Francisco, there may be cited the experience of Wilkes-Barre and Pittsburgh, Pa., and Washington, D. C. In the Pennsylvania cities bus operation has not been a financial success, and in Pittsburgh it has been abandoned. In Washington the bus company has a 3-mile route through the heart of the best residence district, reaching the business and shopping centers, the theaters and several government departments, yet the six-for-a-quarter fare barely earns operating expenses, and in the two years of its life the company has been unable to charge off a dollar for depreciation. It has carried a large number of passengers per bus mile run, but the expense of upkeep has absorbed the revenue as fast as it came, or faster. Any railway man who has been losing sleep over the inroads of the motor-bus, and those who are contemplating the operation of these vehicles as a short road to wealth, should study Washington's experience. The railway man will save his sleep and the other man will save his money.

There still remains the question of the best way in

which the electric railways can protect their short haul business in large cities from jitney competition. So long as second-hand automobiles can be purchased at a low price there will remain the temptation for individual chauffeurs and perhaps garage owners to operate one or more of these cars, when these cars cannot make more money elsewhere and until they break down, in a 5-cent fare service along certain profitable routes. This is a matter where the municipality can fairly interfere, as indeed it has been done in a number of western cities. Mr. Black has shown that under parallel conditions an electric railway can transport passengers more cheaply than they can be carried in an automobile, and if the company should abandon its long unprofitable lines or charge a higher fare on them it could carry passengers on the more profitable lines for less than 5 cents.

However, the interests of the public as a whole have always been felt to lie in the American system of a uniform fare. This was what the authorities in both New York and Chicago fought for and obtained in the recent negotiations with their transportation lines. The railways of the country have been willing to haul some passengers long distances for 5 cents because they also had the short haul business, but they would be unwilling to take the unprofitable business without the part which shows a profit.

But the financial side is not the only one to consider, as Mr. Black clearly points out. There is the increased danger on the streets to pedestrians from an added number of automobiles, driven in most cases by irresponsible drivers, as well as the physical limitations of space on the streets. Then again, there is the question of taxes, street paving and other contributions to the welfare of the city in which the electric railway takes a large part. The income derived by the city from the electric railway companies from these sources is considerable, and it is only by the neglect of equivalent obligations that the jitney can thrive even temporarily. All in all, there is every reason why the city should favor the electric railway rather than the automobile pirate. Regulation can be and, in many cases, has been applied, and from any standard of equity it should be applied. There should be no difficulty in getting communities to pass such measures. But in so doing it would be well for them to realize that, if they do not reserve the right to control the routes of the jitneys, and the railways lose business on their only profitable lines, it is inevitable that all of the existing lines that now run at a loss will have to be abandoned. This may be a serious matter for many cities.

It may be that some vehicle more economical of operation than those now available will be developed. Until then the electric car can easily undersell the motor-bus and give better as well as cheaper service. The mobility (it may almost be regarded as gregariousness) of the motor-bus is an undeniable advantage, but this will usually mean merely that it can run where there is not enough traffic to support electric car lines, and it can therefore take proportionately little from the electric railway company's revenue.



# A Solution for the Snow Problem

The New York Railways Company Has Tested Successfully a New Form of Snow Sweeper with An Out-board Broom Which Clears a 12-Ft. Path Beside the Rails, Thus Eliminating Restriction of the Service During Snow Storms Through Vehicular Congestion on the Tracks

For every really large city in the United States east of the Rockies and north of the thirty-eighth parallel a heavy snow-storm constitutes a disaster that is quite comparable to a cyclone in its costliness. The spectacular features of the cyclone, of course, are lacking, but should the snow be allowed to lie where it fell the orderly course of the city's domestic economy would be rudely interrupted. The alternative is snow removal, and this involves an expense which may reach a figure, as it has in New York, of more than \$2,000,000 per annum. Only an extraordinary visitation of nature in a malignant mood could inflict damage to this extent.

Ethically speaking, the responsibilities of the electric railways in such emergencies are limited to keeping their tracks sufficiently clear of snow so that cars can move, and to that end, elaborately equipped organizations have been developed for the sole purpose of fighting snow. Yet, thus far, these have generally failed in the complete accomplishment of their purpose for the very reason that, when the railway tracks are clean and the rest of the street is piled with snow, every truck and wagon gravitates naturally to the pathway thus afforded, and the electric cars are almost as effectively blocked as if the tracks had not been swept at all.

From the practical standpoint this condition is unavoidable. The economic life of the city demands continuous movement for goods as well as for persons, and an interruption of the facilities for communication means almost immediate privation and even danger to the citizens. Regardless of orders or ordinances, trucks, fire-engines and ambulances are bound to use the tracks if these provide the only passage through a snow-covered street, and, obviously, the one method of keeping them off is the provision of a clear space outside the rails which may be occupied by the irregularly-moving vehicles.

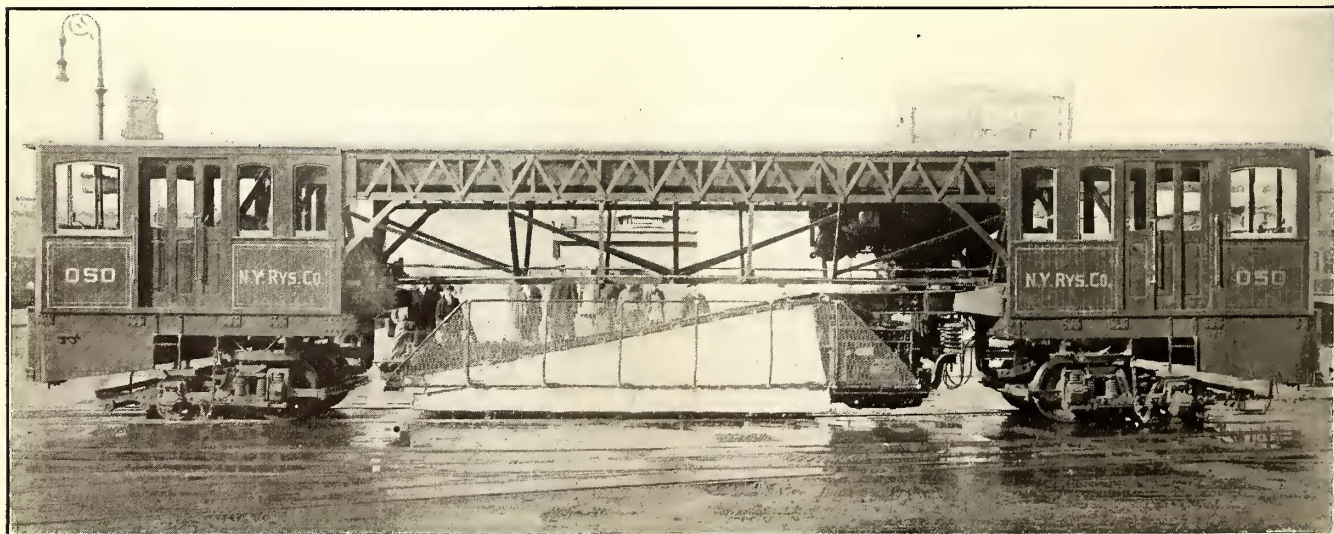
## OPERATING RESULTS WITH NEW SWEEPERS

It is this phase of the snow problem that has been attacked, with apparently complete success, by the New York Railways. A new form of sweeper with a 16-ft.

out-board rotary broom has been developed by J. S. Doyle, superintendent of equipment, and the equipment engineering department of that company, under the direction of Frank Hedley, general manager, and during last week's storm in New York City this sweeper was operated with most satisfactory results. The machine is designed to clear a path 12 ft. wide alongside of the track, and the actual experiences in its first test under the most severe conditions showed that it was fully capable of doing this work.

The results were found to be largely dependent upon the relative peripheral speed of the broom as compared with its forward movement. When the sweeper-car moved slowly, the moderately rapid rotation of 300 r.p.m. for the broom was sufficient to clear even packed snow from a paving surface composed either of wood or granite block. When the car was stationary sleet or freezing rain could be removed. This is ascribed partly to the heat of friction developed at the line of contact between the broom and the pavement and partly to the minute chipping action of each of the numerous rattan stems forming the broom filling. On asphalt, however, presumably on account of the smoothness and greater heat-absorbing ability, the broom failed to remove packed snow except when the sweeper-car was practically stationary.

It is, of course, of the utmost importance (if it really is a physical possibility to remove sleet as well as packed snow) that the sweeper should be able to clean the street surface on asphalt as well as on wood pavement because there is much of the former in use in New York and because a sleet storm is quite as effective as a fall of snow in sending trucks upon the car tracks. Consequently, the designers plan to increase the broom speed from 300 r.p.m. (as it is at present) to 800 r.p.m., with the expectation that the increased speed will permit the complete cleaning of all kinds of pavement. If necessary to enable the sweeper to maintain the normal speed of the passenger cars, and still clean sleet from the pavement, the broom will be direct-connected to its motor and run at 1300 r.p.m.



NEW YORK SNOW-SWEEPER—VIEW SHOWING BROOM SWUNG IN-BOARD INTO CLEAR POSITION AND WITH FENDER RAISED



One of the most remarkable features of the test in last week's storm of freezing rain followed by snow was the fact that when the relative speeds of broom and car were properly adjusted the pavement was left not only clear of sleet but actually dry. What this means from a humanitarian standpoint, as well as in the saving of expense and loss of time for the owners of horse-drawn vehicles, is obvious.

Another feature of the test on the new machine was the discovery that even with light snow there was a proper speed of car for every broom speed. When the sweeper-car moved faster than the speed to which it should have been limited by the broom speed, the snow was invariably left across the broom's path in a series of windrows instead of being swept completely out beyond the end of the broom.

#### PLAN OF OPERATION

The custom followed by the New York Railways in snow-fighting at the present time with standard sweep-

ers that pass or are passed by the sweeper as it moves forward. Arrangement has also been made so that the direction of movement of the sweeper car can be reversed and the broom can be extended on either side and at any angle. This has involved the use of two cabs, one at each end of the sweeper body, between which is a bridge structure which carries the broom and which permits it to be swung out-board on either side.

The broom is rotated by an independent motor mounted on the broom carriage and another motor provides power for swinging the carriage out board at the desired angle. In operation, these two motors are controlled by a man stationed in the forward cab who swings the broom in-board whenever a vehicle is passed and who also varies the broom speed and pressure to suit conditions. The motorman who runs the sweeper car is, of course, located in the front cab and his duties are confined to this work alone. A mechanic is also carried in accordance with the standard practice of the New York Railways, to care for the sweeper mechanism. At



NEW YORK SNOW-SWEEPER—REAR VIEW SHOWING ARRANGEMENT OF WARNING LIGHTS AND BELL AT END OF BROOM

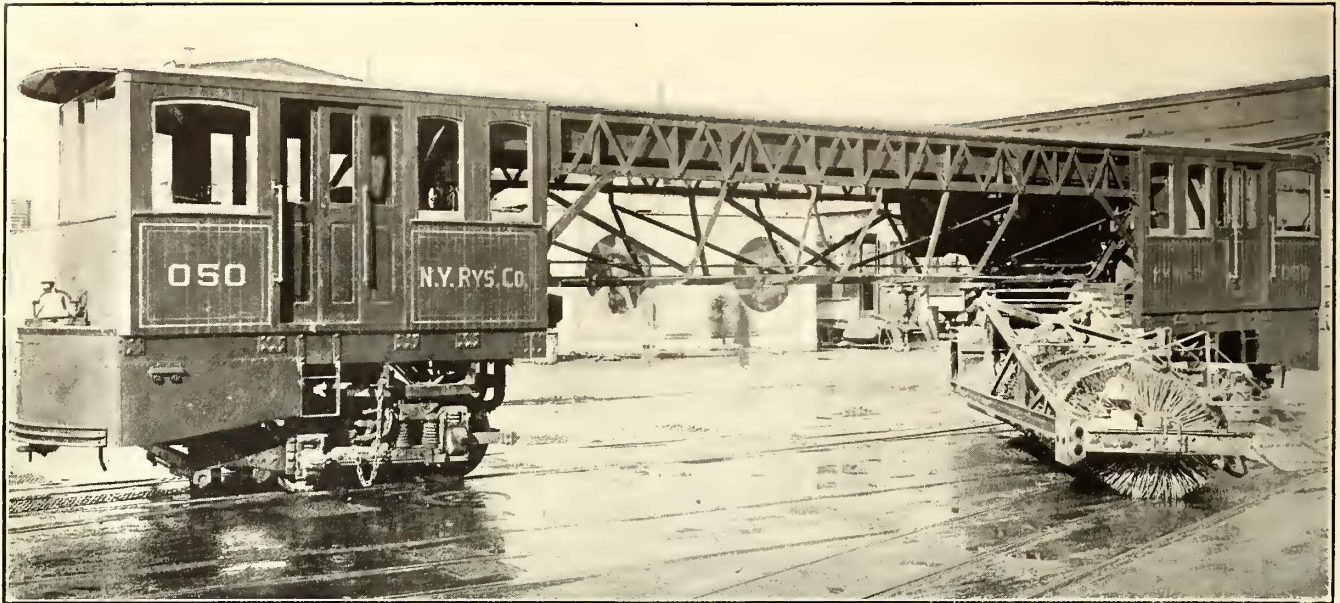
ers is to put out all equipment as rapidly as possible whenever threatening snow begins to fall. Sweepers are sandwiched in between the regular equipment in service, at intervals averaging roughly ten cars. The sweepers are kept continuously at work on the line until the snow stops, and as the best of electrical equipments is used for the snow-fighting facilities, the company's lines have not been actually tied up on account of snow for several years past, although the speed is so much reduced by vehicular congestion that for several days after a severe storm receipts fall off very materially.

The new type of sweeper is designed for a similar scheme of operation, and consequently, as it will have to be used during hours when vehicular traffic is heavy, provision has been made whereby the out-board broom can be swung at will inside of the tracks to clear vehicles

switch backs or at the stub ends of lines the broom is swung to the opposite side of the sweeper-car and the broom carriage is moved to the opposite end of the open structure between the cabs so that the in-board end of the broom is in advance of the out-board end. This operation has been made possible by mounting the supporting mechanism of the broom carriage on what is called a mast-carriage, or trolley, that runs on an overhead track supported by the open structure between cabs, a small motor being provided to move the mast-carriage as desired.

As the plan of operation involves the sandwiching of sweepers in between the passenger cars, frequent sweepings will be the rule. A snow fall, therefore, will not be permitted to pile up, and no sweeper will be called upon to handle snow that has a depth greater than say  $\frac{1}{4}$  in. This scheme of eliminating the necessity





NEW YORK SNOW-SWEEPER—VIEW SHOWING BROOM SWUNG OUT-BOARD READY FOR OPERATION

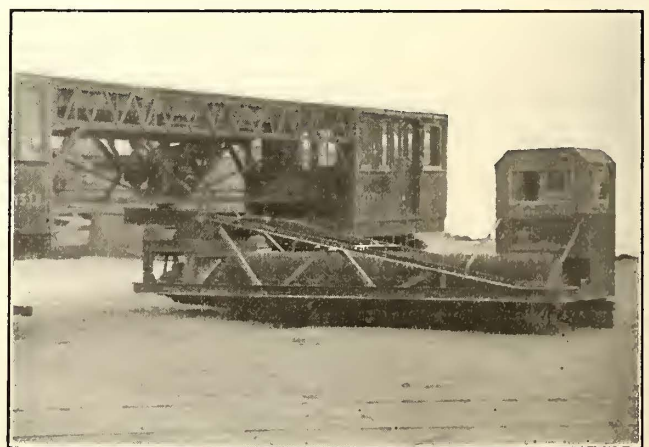
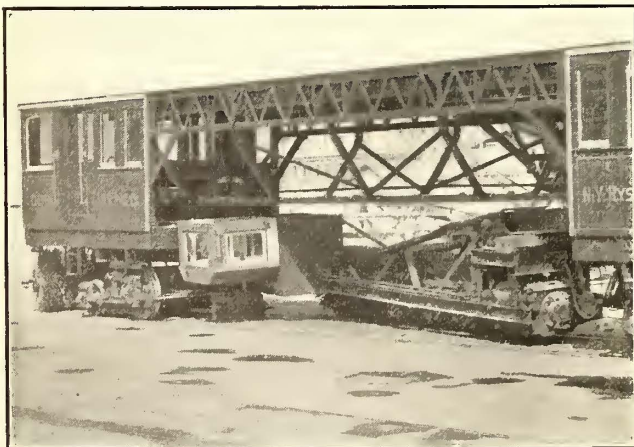
for "plowing" snow is to some extent a new one, and, naturally, it provides against strangulation, even for short periods, of the electric car service because of teams on the tracks. The anticipated result will be to permit practically normal schedule speed for cars even during snow storms. As the speed under present snow-storm conditions is sometimes reduced to the vicinity of 3 m. p. h., and as the effectiveness of the present sweepers is reduced in proportion to their speed, it is believed that a sweeper of the new type will do about twice as much work as one of the old ones because of its higher speed. On the New York Railways the present snow-fighting equipment, which is known to be ample, consists of one sweeper for every 2 miles of single track, so that the capacity of one of the new machines under New York conditions is estimated roughly at 4 track miles. The cost of the new machines, it may be said, is roughly estimated at 50 per cent more than that of a standard double truck sweeper so that, considering the increased capacity, equipment of the new type will really cost less than the old. However, as expressed by Mr. Doyle, the cost is almost immaterial if equipment can be provided to prevent the recurrence of such conditions as existed in New York last winter, when two heavy falls of snow in close succession practically paralyzed transportation for more than a week,

resulted in great privation, cut heavily into railway receipts, and even left the city open to disastrous conflagration through the inability of the fire department to respond promptly to calls.

#### DETAILS OF CONSTRUCTION

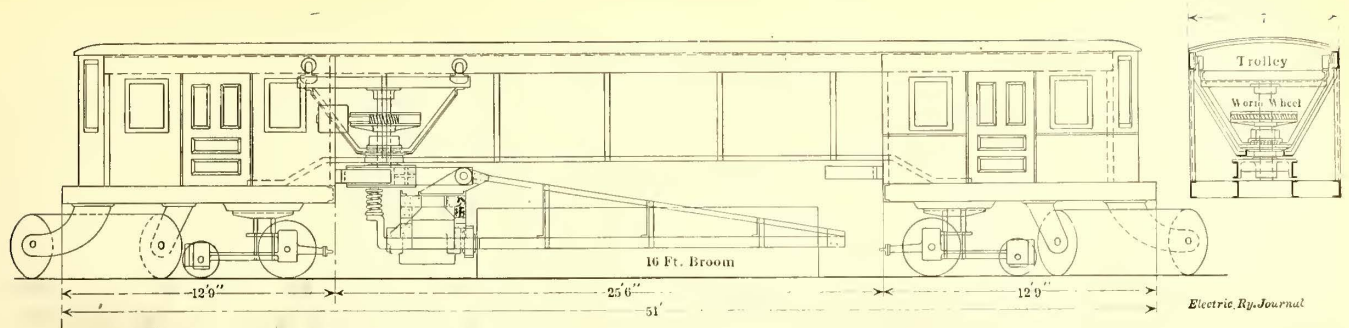
As shown in the accompanying illustrations, the new sweeper-car consists of two cabs mounted on standard trucks and connected by an open bridging. Close under the roof of this central portion are a pair of rails that carry the mast-carriage, which may be moved from one end of the bridging to the other by means of a small motor geared to the wheels. In bearings at the center of the mast-carriage a 7-in. shaft, or mast, is carried, and upon this shaft between the upper and lower bearing in the dropped-frame of the carriage is keyed a heavy worm-wheel, 48 in. in diameter. The worm that meshes with the wheel is driven by a 5-hp motor mounted on the carriage frame so that as the motor is rotated the shaft turns and the broom carriage, which is keyed solidly to the shaft and is in fact supported solely by it, is swung either to the right or to the left according to the direction of rotation of the motor.

It may be of interest to state that the force which is exerted by the broom as it drags forward on the street surface has been found by dynamometer test to be



NEW YORK SNOW-SWEEPER—VIEWS SHOWING ORIGINAL ARRANGEMENT OF OPERATOR'S CABIN WITH HINGED ROOF AT END OF BROOM. THIS LOCATION FOR OPERATOR WAS GIVEN UP BECAUSE OF THE FLYING SNOW THROWN BY THE BROOM





NEW YORK SNOW-SWEEPER—ELEVATION SHOWING GENERAL CONSTRUCTION

equivalent to a force of 3180 lb. applied at the broom end. As this point is 21 ft. from the mast the thrust on the worm amounts to 66,800 lb., allowing 100 per cent for suddenly applied loads. This enormous thrust has necessitated special bearings for the worm shaft and, indeed, special design throughout.

The broom carriage is composed of two main parts, one of which may be called the supporting frame and includes the center casting to which the 7-in. shaft is fastened. This section has a semi-circular end which fits into a concave casting mounted on each end-cab, thus providing a stop for the movement of the mast-carriage and also a bearing to resist the horizontal thrust from the unbalanced weight of the out-board broom. The broom frame proper is hung from the supporting frame by means of a shaft acting as a fulcrum at the side opposite the semi-circular end-bearing, and this permits the outer end of the broom to tilt up and down in accordance with the crown of the street pavement. The broom itself, which is 16 ft. long and 36 in. in diameter, is carried in bearings at the ends of a simple frame work upon which is also mounted the 35-hp motor which drives the broom.

In the present machine the tilting is reduced by springs at the inner end of the broom frame. However, the matter of broom pressure has been found to be of considerable importance, and contrary to expectations difficulty has been experienced in getting sufficient pressure at the out-board end of the broom. For this reason the springs shown in the illustrations are to be replaced by air cylinders working in the opposite direction so that pressure can be applied as desired to pull up the in-board end of the broom and thus force down the out-board end.

The fender that is shown attached to the broom was considered necessary to prevent possible injuries to pedestrians who might be struck because they fail to notice that the broom occupies a considerable space outside of the rails. For the same purpose, the out-board end of the broom has been equipped with red lights and a locomotive bell which is actuated mechanically by the rotation of the broom. Another locomotive bell is placed at each end of the sweeper-car instead of the usual gong, the object of this being to provide a distinctive warning upon the approach of the machine.

It may be of interest to note that the original plan provided at the out-board end of the broom a small cabin for the broom operator. This arrangement is shown in two of the illustrations, one of which shows the hinged roof that was provided on the cabin so that the broom could be passed under the bridge structure from one side to the other. The out-board location for the operator, however, was given up for the previously mentioned location in the front cab of the sweeper because of the unbalanced weight on the broom frame and because of the difficulty of vision on account of flying snow thrown by the broom.

It should be noted that the machine shown in the

illustrations was planned as an experiment only and that, in consequence, the usual track brooms at each end of the car as indicated in the line cut were not actually installed. In its final form, which has now been definitely decided, the new sweeper will sweep the track, as well as a space at one side, and will also be provided with a slot scraper for the third-rail conduit used almost universally on the lines of the New York Railways. This is required to make the machine complete from the snow-fighting standpoint, as accumulations of snow in the conduit sometimes constitute a serious cause of trouble.

### Mid-Winter Meeting of Southwestern Electrical & Gas Association

The first mid-winter meeting of the Southwestern Electrical & Gas Association was held in the Westbrook Hotel, Fort Worth, on Friday, Jan. 15, and it proved to be a decided success. A report from the accounting committee, outlining a system of accounts suitable for the smaller public utilities, brought forth considerable discussion, and the sense of the meeting was that the committee should, at the next annual convention in May, prepare a modification of the various national systems of accounting that could be used by the smallest public utility without prohibitive expense and labor.

A lengthy discussion also took place on the subject of the legally uncontrolled and unrestricted competition of the "jitney bus." The president appointed a committee of six street railway members to deal with this subject, this committee being empowered to take any action that it might consider desirable and to report fully of its action at the next annual convention.

David Daly, manager Houston Electric Company, and D. A. Hegarty, general manager Houston Lighting & Power Company, were elected as second vice-president and member of executive committee respectively to fill the vacancies caused by the resignation of C. W. Kellogg, who has left the State of Texas. Also, T. R. T. Orth, general manager Wichita Falls Traction Company, and J. C. Kennedy, secretary, Brenham Compress Oil & Manufacturing Company, were elected to the advisory committee to fill vacancies in that body.

The sixth annual report on the statistics of express companies in the United States, compiled by the Interstate Commerce Commission for the year ended June 30, 1913, shows that the total express mileage increased from 283,303.57 miles in 1912 to 301,621.63 in 1913, or 18,318.06. This increase was made up of 3,197.47 miles on steam railroads, 776.81 miles on electric lines, 13,892.53 miles on steamboat lines and 451.25 miles on stage lines. The total electric line mileage in 1913 was 8,468.68 miles as compared to 7,691.87 miles in 1912. The increased mileage was mostly on lines covered by the larger express companies.



# The Jitney-Bus Competition

R. W. Meade, Charles N. Black and Others Analyze Economic Problems Raised by This New Means of Conveyance—Various Regulative Measures to Control This Competition Compared

Nowhere in the history of transportation can there be found anything comparable to the recent mushroom growth of the "jitney-bus"—a term which has been coined off-hand and applied indiscriminately either to auto-buses or to itinerant automobiles carrying passengers for a 5-cent fare upon any temporary route that seems likely to produce profits. The expression "jitney" is said to be the side-show barker's slang for a 5-cent piece. Three months ago the name was hardly known outside of its place of origin, Los Angeles. To-day the movement is likened by some alarmists to the death-knell of the electric railway industry, and it must be admitted that, notwithstanding the mushroom character of the new competition, it may temporarily do a great deal of damage if it is permitted to continue along the utterly reckless lines of its beginning.

Of course, the fact that the automobile is inherently a more expensive means of conveyance than the electric car insures the ultimate end of any competition between the two, but the opportunity of the unregulated auto-bus to compete only on those streets whose highly profitable

pany was organized with a flourish of trumpets and a capitalization of \$500,000, the announcement being made that it would place 100 double-deck buses in operation between Los Angeles and Venice, Long Beach, Pasadena, San Pedro and other nearby points. Thirty-three of these cars were actually delivered and commenced operation in July, and news notes published in the Los Angeles papers of that time indicated that the company was doing an enormous business in competition with the Pacific Electric Railway. Passengers were carried between Los Angeles and Venice—a distance of about 10 miles—for 40 cents a round trip, while the fare on the railroad was 50 cents. Later the round-trip fare was reduced to 25 cents, and pictures taken in the Los Angeles streets show the buses being mobbed by enormous crowds.

During November, 1914, stories began to appear that the owners of small cars—principally Fords—had noted with greedy eyes the business that was being done by the buses and had begun to take passengers at a 5-cent fare in certain city districts. Reports stated that the business was booming, and that some 200 buses were running on a dozen different streets, each taking in as much as \$10 or \$12 every day. Within a month of the time when these stories appeared the Pacific Motor Coach Company was in the hands of a receiver, and its buses, which had been bought on a deferred payment plan, were taken over by the mortgagee and recently have been transferred to San Francisco, where they are being operated on the jitney plan.

The term "jitney-bus" covers a number of types of vehicle ranging in size from the large double-deck omnibus down to the ordinary two-seated touring car familiar to everyone. The jitney-bus is distinctive, however, in that it is usually driven by its owner who picks up fares wherever they may be had. Naturally, the idea has achieved its greatest popularity in Los Angeles, San Francisco, Seattle and other cities on the Pacific Coast, but even during the past month it has spread like a malignant growth as far south as Texas and as far east as Detroit and Toledo.

When shown telegraphic dispatches appearing in the newspapers to the effect that trolley line extensions in several western cities had been stopped as a direct result of jitney-bus competition, R. W. Meade, president Fifth Avenue Coach Company, New York, said that the municipal authorities in many American cities were making a serious blunder in permitting the development of the jitney-bus. "The danger in the situation," he said, "is that the busmen, the city authorities and all others concerned, are apparently plunging ahead without giving much thought to consequences. The surface cars in these cities are subject to rigid regulation on the part of city and state commissions, they pay heavy sums into city and state treasuries in the way of taxes and license fees, and as responsible corporate bodies they can be held to account for claims for damages. This item always cuts heavily into the earnings of a traction company, as everyone knows.

"But your jitney busman, as a rule, carries none of these financial burdens. His taxes are trifling. He pays practically nothing in the way of license fees, he snaps his fingers at damage suits, and being financially irresponsible, he cannot be brought to book. Do you wonder at the complaints of the operators of the electric railway?



JITNEY-BUS—TYPICAL MACHINE USED FOR JITNEY SERVICE

short-haul railway traffic pays the expense of operating unprofitable suburban lines may involve losses that are really serious. Since the wave of jitney-buses began to sweep over the country hardly a month ago, one vital fact has become apparent. This is that regulation by law can be and must be applied, and the experiences and views of a number of those who have already dealt with the problem are given in the following paragraphs to the end that those upon whom it may soon be thrust will be prepared to meet it. A series of articles on the progress of the jitney-bus has appeared during the past four or five issues in the department of Traffic and Transportation of this paper. The purpose of this article, therefore, is not to trace the growth of the movement so much as to record the opinions of those who have had a chance to analyze it.

## ORIGIN OF THE JITNEY-BUS

The first "jitney-bus" service was commenced as a result of attempted competition with the apparently highly profitable business of the Pacific Motor Coach Company in Los Angeles, Cal. In April, 1914, this com-



## TEN-CENT FARE HARDLY SUFFICIENT IN NEW YORK

"However, the great danger in the situation lies deeper. If what I have outlined were all the factors in the situation, the outlook for some of the traction companies might be rather blue, but the real menace may be shown by citing the experience of the Fifth Avenue Coach Company. This company is no infant as passenger-carrying companies go. As far back as nearly thirty years ago it was operating horse-drawn stages on Fifth Avenue. Later it tried out the storage-battery type of bus, and about eight years ago it adopted the gasoline-driven type of vehicle. Now, in this history of over a quarter of a century, the company, before it became self supporting, lost something like a million dollars, but it learned a great many actual first-hand facts about bus operation. For one thing, it learned that if all fundamental factors are taken into consideration, the motor-bus costs more to operate in America

were poor, if it could ignore the regulations of the authorities and all responsibility for damage claims, and if it was able to forget the morrow and cut down its reserves for maintenance and depreciation, in a word, if it was able to operate anywhere and everywhere without regard to schedule and other restrictions, the company could no doubt make a highly favorable financial showing for a few seasons. What might happen after that is another matter.

"The situation among the jitney busmen is quite like this. Few of them understand the real facts of the situation. Probably not one in a hundred of them is setting aside the proper reserves required for the successful continuance of his business. Of course there will be a reckoning some time in the future, but in the meanwhile no little havoc is being played in the traction situation as it concerns some localities. There is another phase in the situation worth noting. Much capital is being coaxed from the public by promoters interested in



JITNEY-BUS—STREET SCENE IN LOS ANGELES, THE BIRTH-PLACE OF THE JITNEY, DURING THE BRIEF LIFE OF THE LOCAL BUS COMPANY

than the surface car. There isn't the least doubt of this.

The surface car operators, bear in mind, are complaining, not because the jitney busmen are cutting into their earnings, but because they are doing so under wholly artificial conditions.

"The Fifth Avenue Coach Company is to-day moderately successful, but it charges a 10-cent fare, runs over a limited and favorable stretch of territory, is backed by many years' experience, has an investment of \$2,000,000 in plant and equipment and is managed with scrupulous care by an operating staff that has been many years in process of development. In spite of these advantages the company spends 9 cents out of each dime on its service, that is, in providing for operating expenses, maintenance and depreciation, reserves for damage suits, taxes, interest on capital, etc. If the company was able to keep back for its own uses the \$60,000 and more that it pays each year to city and state, if it was able to send out its buses when the harvest was good and take them in when the pickings

highly speculative bus companies, and often the basis of their claims is the showing made by the jitney busmen. This is unfortunate. The bus has a future in America, but it is not along these lines. Bus operations in London and Paris are likewise wholly misleading. The higher level of labor costs in America alone would make a comparison valueless if there were no other fundamental differences."

## BUS CANNOT DISPLACE THE RAILWAY CAR

Charles N. Black, vice-president United Railroads of San Francisco, in a recent address before the City Club of Berkeley discussed the economics of the jitney-bus in detail. He said that if the jitney-bus is a real advance in transportation service, existing street and interurban railways will have to be discarded, but unless it can perform all the functions of an electric car as efficiently and as economically it will unquestionably fail.

The greatest and most serious problem confronting every street railway in this country is handling the



people during the rush-hours. In San Francisco on Market Street over 15,000 people are transported per hour in each direction, which means a car on both inbound and outbound tracks every twenty-five seconds. Is it possible to conceive of any development of the jitney which will handle this number of people at this rate, unless the entire street is given up to their use? Even then the congestion would be impossible.

In London double-deck auto-buses are in use. In Paris they were formerly used but have been abandoned as it was found that the accidents resulting from the people attempting to reach the upper deck were very serious, and further, because the loading and unloading time required was excessive. From the experience of both of these cities one may safely conclude that any auto-bus, such as has been developed abroad, would not be a satisfactory substitute for our existing street cars. A bus that will seat from twelve to fifteen people, which is a compromise between the bus in use abroad and the jitney in use here, would be, approximately, 17 ft. or 18 ft. in length by from 6 ft. or 7 ft. in width. At least eight of such buses would be required to equal one modern street car, and eight of such buses would take up as much space in the streets as at least three electric cars. A city can ill-afford to permit any system of transportation to develop which is not economical of space in

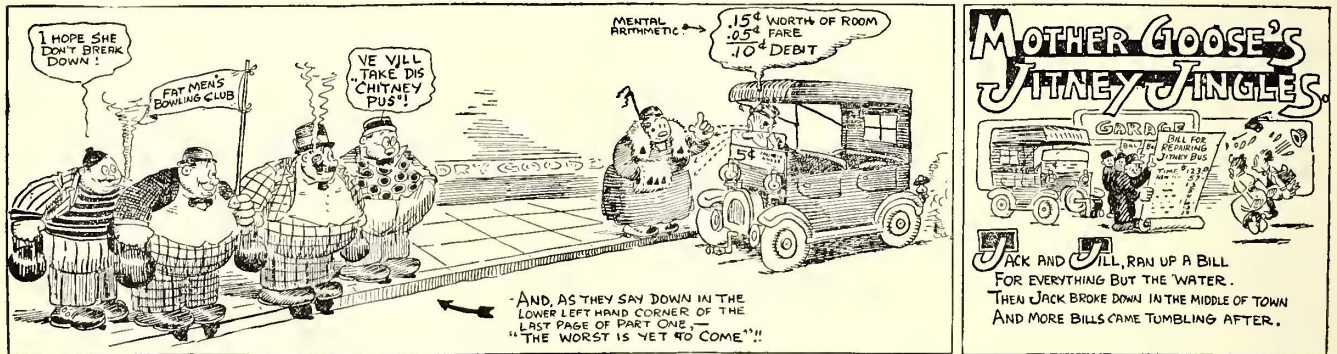
the driver 3 cents per mile. A résumé of the above is as follows:

Depreciation .....	1 cent per mile
Tires .....	1 " "
Gasoline .....	.6 " "
Oil .....	.4 " "
Miscellaneous, including repairs, storage, etc. ....	1 " "
Driver .....	3 " "

Total operating costs..... 7 cents per mile

In this estimate extraordinary expenses resulting from accidents have not been taken into consideration, nor has there been any allowance made for injuries to persons and property, which are bound to occur. It would appear, therefore, that the total operating costs as given above, viz., 7 cents per mile, are certainly as low as can be hoped for under the existing conditions of the art. Dividing this 7 cents by the passenger seating capacity, or four, gives a cost per seat mile of  $1\frac{3}{4}$  cents.

The cost of a seat mile on the San Francisco railways, including a reasonable return on the investment, is, approximately, 0.7 cent. In other words, the cost of a seat mile in the jitney service is at least two and a half times the cost of a seat mile of an electric car. If the comparison was based on the total carrying capacity of the two types of vehicle, a considerably larger discrepancy would be found to exist. As a matter of fact, the



JITNEY-BUS—RECENT CARTOON IN DAILY "TIMES" OF LOS ANGELES, WHERE JITNEYS HAVE OPERATED SINCE NOVEMBER

its streets, and, in fact, in large cities every effort is being made to divert as much of the traffic as possible to underground railways. Apparently, therefore, the jitney in this respect is not a step in advance, and if there were no other objections this would be sufficient absolutely to condemn it.

But the economic condition is even more difficult to meet. Out of 261 automobiles which were actually in operation in San Francisco on Jan. 26, eighty-nine were Ford machines, or practically 30 per cent of the total number, the next largest being Overlands, of which there were thirty-five. The present price of a Ford machine, capable of seating four persons in addition to the driver, is \$565. Assuming that it can operate 56,500 miles before being relegated to the scrap pile, makes the proper depreciation charge 1 cent per mile.

The cost of a set of tires is within a few cents of \$40. Assuming a life of 4000 miles, the equivalent is 1 cent per mile. Twenty miles per gallon of gasoline on the basis of 12 cents per gallon, makes the cost 0.6 cent per mile.

Lubricating oil at 20 cents per quart, and allowing 2 quarts per 100 miles, gives the equivalent of 0.4 cent per mile. Miscellaneous supplies, housing, cleaning and minor repairs to the car will, on a most conservative basis, average at least 1 cent per mile.

Assuming the car can make an average of 100 miles per day in actual service and that \$3 per day is a reasonable wage to allow the driver, makes the cost for

gross earnings per seat mile of the street cars now operating in San Francisco are less than the actual operating costs per seat mile of a jitney-bus exclusive of any allowance for the driver's wage.

#### EFFECT OF LACK OF REGULATION IN 'FRISCO

Mr. Black added that under similar requirements of service, it would appear that the street car had absolutely nothing to fear from the competition of the jitney-bus. But unfortunately for the street car, it has been compelled up to the present time to compete with an absolutely unregulated service and under handicaps which are most inequitable.

In the first place the burdens of taxation are far heavier. Directly and indirectly, the street railways of California pay on the average taxes amounting to at least 12 per cent of their gross receipts. Assuming the earnings of a jitney bus are simply equal to the minimum operating expenses, including a living wage to the driver, the total taxes which it pays to state, city and county, including all licenses, only amount to approximately  $1\frac{1}{4}$  per cent.

In the second place, the jitney-bus is not required to adhere to any specified route. It furnishes no transfers but confines itself entirely to the short-haul travel, or what might be termed the cream of the business. Governmental authorities, recognizing that a transportation system in any city is a natural monopoly, have required street railways to furnish transfers within the corporate



limits upon the payment of a 5-cent fare. This means that the street railway actually loses money on a considerable number of passengers, and this sum has to be made up from the profit of the short-haul travel.

No one factor in the development of American cities has had more influence than the system of a flat street car fare. It has enabled the working man to acquire a home in the suburbs at reasonable cost and has eliminated the congestion so common to the cities of the old world, where the transportation systems have been developed on the so-called zone system. If the American people decide to forego the present advantages derived from the flat fare and permit the street railroads to establish zone systems, charging the passenger a rate in proportion to the distance traveled, competition from the auto-bus will soon be eliminated.

To illustrate, a passenger can be transported on the street cars in San Francisco from the Ferry to Eighteenth and Castro Streets, to which point the largest number of the jitney-buses are at present operating, at the rate of 2½ cents, and still earn a reasonable return on the investment. But under such conditions the fare to the outlying districts would have to be considerably in excess of 5 cents, and the operation of many of the existing lines entirely abandoned.

Mr. Black added in his address that there was just one other matter to which he desired to refer, namely, the increased hazard to life and limb to everyone using the streets of a city where the jitney bus is operating. In London, during the year 1912, the deaths caused by motor buses exceeded in number the deaths caused by all vehicular travel of every description during the year 1905.

The record of the traffic squad of San Francisco's Police Department shows that during the month of November, 1914, there were five automobile accidents in the policed district with but one person injured. During the month of December, 1914, also, there were five automobile accidents in the same area and one person injured. But during the month of January, 1915, up to and including Jan. 26, there were eighteen automobile accidents, with eleven persons injured, one of whom did not survive. It is, perhaps, needless to add that prior to Jan. 1 there were practically no jitneys in operation in San Francisco.

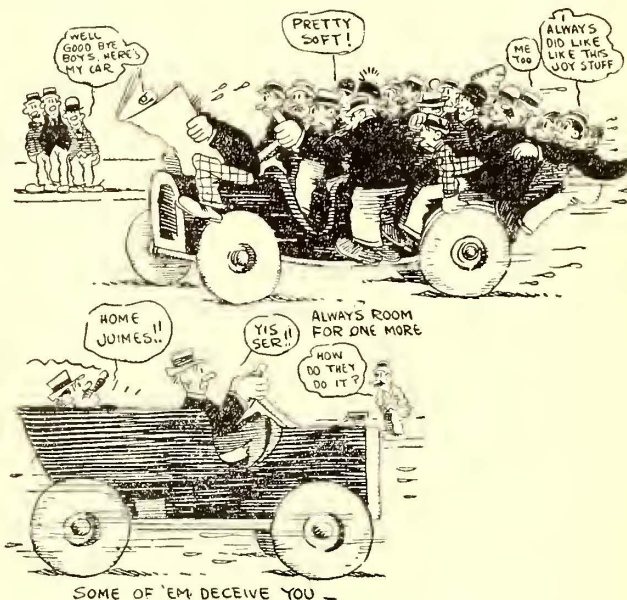
The electric railroads, both urban and interurban, do not ask for any privileges or advantages withheld from their automobile competitors, but they do demand that the same conditions of service, the same burdens of taxation, and the same protection to the traveling public be demanded of their competitors as they are required to operate under. Under equal conditions the cost of service will unquestionably be the controlling factor, and the road to Tipperary for the jitney bus is still a very long one.

THE JITNEY-BUS IN SMALLER CITIES

Mr. Black's consideration of the jitney-bus as outlined above, applies particularly to its influence upon a large city system where the discrepancy between the costs of short hauls in congested districts and long hauls to outlying suburbs is at a maximum. In smaller cities, of course, the opportunity for the jitney-bus to pick out only the highly profitable traffic is considerably lessened, with the result that the economic disadvantage against the new conveyance is more marked. However, that this has not deterred the extension of the jitney-bus idea is shown by the following outline of the views expressed last week by A. H. Rogers, president Southwest Missouri Railroad, shortly after the machines began operating in Joplin, Mo., and the nearby cities.

Mr. Rogers is quoted in part as follows: "If the motor bus people have discovered a better, more thor-

oughly satisfactory service than the electric railway companies can offer, the jitneys have come to stay. Electric cars will be relegated to history, just as prairie schooners, canal boats and mule cars were pushed aside by improved methods of transportation. The public demands and deserves nothing short of the best. But an accident that has just occurred in Joplin, when a prominent business man and his wife were struck by a jitney bus and narrowly escaped death, ought to be ample proof for the most enthusiastic ballyhooper for the new service that special regulations and requirements are needed, and the remark of one victim is fraught with significance: 'There are just two classes of people downtown nowadays, the quick and the dead.' The need for regulation is obvious, but with fair requirements to effect the control of its operation the jitney-bus will be entitled to fight it out with the street cars on a strictly competitive basis. In the end if the jitneys



JITNEY-BUS—TYPICAL CARTOON FROM THE ATLANTA "GEORGIAN"

are preferred by the public, the electric railway operators will be forced to admit defeat and retire, saving as much out of the wreck as they can with which to enter the jitney-bus business themselves."

Franklin P. Griffith, president Portland (Ore.) Railway, Light & Power Company, has also emphasized the necessity for common equity in case the competition of the jitney is to be permitted. He said recently: "The electric railway system of Portland pays to the public every year in direct taxes, bridge tolls, paving costs and franchise charges about one dollar in every five it receives from passenger revenue. The company thus pays about 6 per cent of the taxes of the city, and these charges are fixed and required, so that a loss of revenue does not stop this heavy overhead charge of 20 per cent of gross revenue. If the jitney is the coming means of transportation and can carry the load, if it is to be permanent, adequate and can bear the load of traffic efficiently, and the just tax load as well, then the jitney is the thing for the public. But that cannot be proven until the jitney is put on a business basis and made to carry the burdens the public forces present transportation corporations to assume when serving it."

In Oklahoma City, the menace of the jitney-bus was recognized with extraordinary promptness by the citizens themselves. Jitney service made its appearance in the community about Jan. 25, and on Feb. 2 an ordinance to control it was passed by the city commis-



sioners. This action was influenced by the business men of the city, who went before the commission to the number of more than 100 and demanded that legal regulation be provided. This has resulted in the practical withdrawal of the jitney service, which in practice as well as theory appears to be unable to survive reasonable regulation. Altogether the brief experience in Oklahoma City has been anything but unfortunate, as it is reported that even during the few days when the jitneys ran they got very little patronage, the citizens almost to a man refusing to use them.

#### REGULATING JITNEY SERVICE

The foregoing paragraphs show the economic waste of the jitney-bus as well as the danger to which communities are exposed where there is absence of restrictions on their use. Several cities, notably Denver, Oak-

land and Oklahoma City are purely regulative in character and display a certain similarity of detail. Each commences with a definition of the scope of the ordinance. This broadly includes all vehicles engaged in the business of carrying passengers for hire, as announced by sign, voice or other device, over a specified route or between specified termini. Taxicabs, hotel buses, automobile livery cars, sight-seeing buses and the like are excluded. Oklahoma City includes horse-drawn vehicles, while Oakland does not. A yearly license fee of \$60, which covers any number of vehicles owned by the licensee, is required in Oakland, while in Oklahoma there is no charge for the license (which nevertheless must be obtained), but there is an annual tax for each vehicle ranging from \$50 to \$150, according to size.

In both ordinances the licensee must file complete data about his automobile, proposed schedule, hours of operation, termini and route. In Oakland the City Council must pass on the application for a license and has the power to change the proposed route or deny the license altogether. In Oklahoma City the license must, apparently, be issued as requested, provided the applicant meets with the various requirements as to fees and indemnity bond.

Both ordinances specify that each person engaging in the business of bus operation must file a bond of \$10,000 for the protection of passengers or other persons who have established damage claims against the operator of the machine on account of his negligence, sums due to the city, and the like.

With regard to identification marks the Oakland ordinance requires the use of a front sign which is visible at a distance of 100 ft. and which shows the route of the automobile, the termini and the fare charged. The operator is also required to wear a metal badge and carry an identification card issued by the Police Department. This is to prevent the operation of cars by unlicensed drivers. In Oklahoma City the ordinance requires only the display on the car of a sign giving the name of the owner of the automobile, the license number, the route and destination.

It is unlawful under both ordinances to permit passengers to stand either on the running board or in the space in front of the front seat, to sit upon fenders or dash or doors of the car or to carry extra passengers outside the body of the car. Only one person is permitted to ride with the driver.

The sections in both ordinances with regard to loading of passengers differ materially. In Oakland the only restriction is that when passengers are boarding the automobile it must be at least 2 ft. away from the right hand curb of the street. In Oklahoma City, stops for passengers must be made at the rear side of the crossing and alongside of the curb. Machines must not stand more than two minutes at any one point. Both ordinances require that the interior of the tonneau of the machine shall be lighted at night when the top is up. Unloading must be done from the right-hand side of the machines in Oakland except in the case of passengers on the front seat. In Oklahoma City the rule is only that passengers must not alight while the car is in motion.

In Oakland a violation of the terms of the ordinance is considered a misdemeanor and is subject to a fine not to exceed \$100, or imprisonment for a period not exceeding six months, or both. In Oklahoma City the penalty for the violation of the terms of the ordinance is a fine not exceeding \$100, or imprisonment not exceeding thirty days, or both. Both ordinances, it may be said, were classed as emergency provisions, to take effect at once.

## Relief for Street Car Strap-Hangers NO SEAT--NO FARE

Beginning next Sunday, you can ride down town and return to your home in a comfortable, modern automobile for the SAME FARE that you are now paying on street cars—5 cents.

A few far-sighted and practical business men of this city have organized an enterprise that will furnish a far superior and more comfortable passenger service than has ever been thought possible.

The success of this venture is entirely dependent on your support, which is confidently expected.

**On Sunday, January 31st, Beginning at 6:30 A.M.**

### The Feitel Jitnymobile Company

will operate a line of Automobiles on the following routes for a 5 Cent Fare:

**JACKSON CAR: RED SIGN.** From Canal and Baronne St., up Baronne to Howard Ave., out Howard Ave. to St. Charles Ave., up St. Charles Ave. to Jackson Ave., returning by the same route to Canal St. FARE, EITHER WAY, 5 CENTS.

**LOUISIANA AVE. CAR: BLUE SIGN;** same route as above up to Louisiana Ave., 5c Fare.

**NAPOLEON AVE. CAR: GREEN SIGN;** same route as above up to Napoleon Ave., 5c Fare.

**CANAL ST. CARS:** will operate from the corner of Canal and Camp to the CEMETERIES for a 5c Fare each way.

There will be a **BROAD STREET CAR—RED SIGN.**

**HAGAN AVE. CAR—GREEN SIGN.**

**CEMETERIES CAR—BLUE SIGN.**

Every passenger is assured a SEAT for his FARE. Drivers will not take on more passengers than a car can seat. Passengers enter from and alight on sidewalk. Cars receive and discharge at any street corner along their route.

Within a few weeks, all cars of this company will be of a uniform color: **BROADWAY—yellow with red gear.** (which render them readily distinguishable).

The St. Charles St. route will be extended to Carrollton Ave. as soon as equipment, already ordered, arrives, and other lines to all parts of the city inaugurated shortly.

The number of cars on each line will be increased as rapidly as possible. Cars will be operated daily from 6:30 a. m. to 8 p. m.

A red pennant will be shown when cars are full.

#### JITNEY-BUS—ADVERTISEMENT USED IN NEW ORLEANS PAPERS

land and Oklahoma, have already passed such restrictive acts. An analysis and comparison of these follow:

The Denver ordinance, briefly speaking, is directly restrictive. It requires vehicles "operating for the purpose of affording a means of transportation similar to that afforded by street railways" to obtain a franchise. The penalty for violation is not less than \$100 fine and not more than \$300 and ninety days imprisonment, each trip or part thereof constituting a separate offense. This ordinance clearly eliminates jitney operation, as no city council would be likely to grant a franchise to a single irresponsible driver. However, the way is left open for regularly organized companies to operate auto-bus lines under such regulation as may be deemed necessary in case any body of responsible men is willing to invest in such an unprofitable enterprise. The Denver Tramway Company, immediately after the passage of this ordinance, issued a pamphlet analyzing the new



The Oklahoma City ordinance contains two apparently important clauses which are not included in the Oakland ordinance. One of these requires that jitney-buses shall not be operated upon streets where street cars are operated for distances of more than two blocks and then only when within the city fire limits, where this is necessary in the crossing of such fire limits. There is also a section devoted to speed limits, 8 m.p.h. being specified within fire limits and 15 m.p.h. outside of fire limits, but in all cases and at all times speed must be reasonable. A clause is also inserted regarding the general regulations for vehicular traffic which are to apply to the jitney-buses the same as other vehicles.

On the other hand, the Oakland ordinance contains a number of sections which do not appear in the Oklahoma City ordinance, such as the requirement of non-skidding devices, a minimum age limit of eighteen years for drivers and provisions for forfeiture and restoration of the license by the City Council. In addition, special trips also may be made in Oakland to public schools, excursion trains and to public assemblages for a period not to exceed one hour before and one hour after the assemblage is being held. In making such special trips the signs on the jitney-bus must be changed. These special trips can only be made upon alternate days. That is to



JITNEY-BUS—GETTING A RIDE FOR LESS THAN COST—THIS BUS LINE FAILED AFTER SIX-MONTHS OPERATION

say, machines with odd license numbers may make special trips every other day and machines with even license numbers may make them on the days when the odd-numbered machines are prohibited. In this way half of the jitney-buses in the city must be operating upon their regular routes. This regulation regarding the special trips upon alternate days only does not, however, apply to the trips to public schools, which may be made every day.

In Oakland, also, it is unlawful for jitney-buses to refuse passengers who apply for transportation, except when all seats in the vehicle are occupied, or when the person who proposes to ride is in an intoxicated condition or boisterous or profane. Within the Oakland city limits jitney-buses must not charge more than a 5-cent fare for a full trip or refuse to make the full trip when passengers are being carried, although one bus may transfer its passengers to another bus under permission of the council. Diverging routes are permitted to the extent that machines may turn into side streets to deliver passengers therein, but the buses must return to the original route after delivering such passengers.

The smoking of tobacco "or other mixture" and drink-

ing of intoxicating liquors by operators while "engaged in the service of transporting passengers" is prohibited. Oakland also prohibits jitney-buses from crossing either steam or electric railway tracks unless the machine comes to a stop at the intersection with the railroad track. An exception, however, is made where traffic officers or flagmen are located.

### Reducing the Fire Risk

Some interesting facts in regard to fire insurance premiums are contained in a paper recently presented by N. H. Daniels of the Stone & Webster organization before the Boston Society of Civil Engineers. An electric generating station built according to the best ideas of the insurance companies commands a yearly rate of only 19 cents per \$100 of insurance, subject to an exposure charge if near other hazards; while a frame shingle-roofed building, with unprotected openings to the basement, poor wiring and slovenly management plus zero protective apparatus is likely to run as high as \$3, if indeed, any company can be found to take the risk in view of its combined external and internal conditions.

Between these limits is a large range of rates varying with what might be called the personal equation of each station. Changes in construction which might seem relatively unimportant to an engineer throw the insurance rates up or down to an extent which justifies close attention to these points. For example, if the oil-insulated transformers in a plant are not installed in a fireproof compartment, the rate goes up 3 cents per \$100, representing an increased yearly premium of \$300 in a 10,000-kw plant. This means that about \$6,000 more might be expended at a 5 per cent interest charge to house the transformers in the safest manner, without materially increasing the expense burden of the station, and in a concrete case may justify putting a transformer house outside the main building, even in a hydroelectric plant, whose fire hazards are not ordinarily looked upon as of much importance by the layman. Far beyond the amount of the insurance premium is the valuation to be set upon continuous service.

Even in a plant well designed from the fire prevention point of view, there is no small responsibility laid upon the operating staff to avoid increasing the hazards. A not uncommon practice is the storage of planking among roof trusses during construction periods, which gives also favorable opportunities for the careless disposal of boxes, crates, excelsior, gasoline torches and other supplies. The columns supporting the roof at its intermediate portion are danger points where they pass downward through the basement, and the accumulation of combustible material around footings should be prohibited. A lot of loose wiring goes into service during many repair periods, and the use of poor joints in such circuits is a fertile source of trouble. Where temporary walls of corrugated iron are used in stations, it is highly desirable that outside these flimsy partitions platforms of fireproof material shall supersede wooden structures, that oil storehouses shall be decently separated from the partitions and that a more permanent form of construction shall be settled upon as early as possible. Without listing the variety of hazards which determine the rate on an operating plant, it is none the less essential to point out the desirability of giving them frequent study, for high standards of service are only maintained by constant vigilance.

Application has been made to the Ontario Railway & Municipal Board by the Toronto Suburban Railway for the privilege of operating cars on its various lines on Sundays.



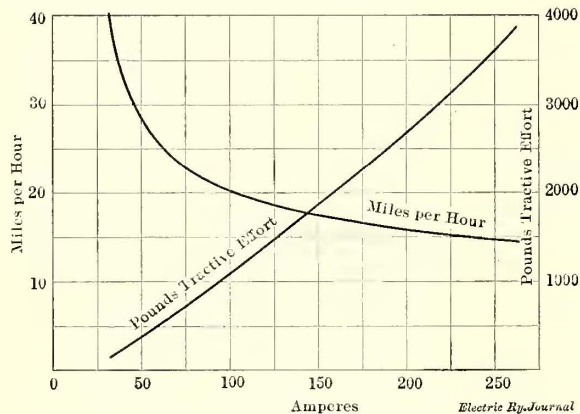
# Proportioning of Railway Motor Resistances

A Simple Graphical Method of Calculating Starting Resistances Differing in Detail from that Described in the Issue for Dec. 26 Is Given and Illustrated

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In any of the methods so far devised for the control of direct current series motors, it is not sufficient to reduce the potential at the motor terminals by the use of different combinations of motors. To prevent an excessive flow of current, and to keep the torque within rather narrow limits, it is necessary to introduce a certain amount of resistance into the motor circuit in series with the motors. The amount of resistance should be just sufficient to reduce the starting current and the torque to the desired limiting values allowable for the equipment. As the motors gain speed the amount of resistance must be reduced until it is all removed from the circuit. This may constitute the entire control, or it may be done in conjunction with changes in the arrangement of the motors, such as connections in series and in parallel.

At standstill, the current flowing through the motors is limited only by the resistance of the windings of the machines connected in series, unless sufficient external resistance be inserted to cut the current down to some specified value.



MOTOR STARTING RESISTANCE—FIG. 1—CHARACTERISTIC CURVES FOR 75-HP MOTOR

As an example, take the 75-hp railway motor, curves for which are shown in Fig. 1. It is desired to accelerate a certain car by using a pair of such motors with series-parallel control at such a rate that the current will vary between the limits of 200 amp and 150 amp while resistance is included in the circuit. The actual determination of the limiting values of current depends on the weight of the car, the desired acceleration, and the allowable current through the motors. The difference between the maximum and minimum values of current is determined by the allowable number of steps on the controller, which in its turn depends on the allowable variation from the mean acceleration.

At standstill the current will be the maximum value, and the necessary resistance to be used will be found by Ohm's law:

$$I' = \frac{E}{R_1 + 2r} \quad (1)$$

where  $I'$  is the maximum current,  $E$  is the line emf,  $R_1$  the external resistance, and  $r$  the motor resistance. In the example cited,  $r = 0.232$  ohm, hence

$$200 = \frac{500}{R_1 + 2 \times 0.232'}$$

whence  $R_1 = 2.036$  ohm. This represents the total resistance which must be added to the motor circuit to keep the first rush of current down to the desired limit.

With current passing through the motors a torque will be developed, which will cause the car to accelerate. As the car gains speed the motors develop a counter-emf, the production of which causes a reduction in the motor current, and hence in the tractive effort and the acceleration. In order to keep the tractive effort within the limits desired the resistance should be reduced when the current has fallen to the minimum value decided on.

When the current has fallen to some value  $I''$ , the counter-emf developed by the two motors in series,  $2E_c$ , will be

$$2E_c = E - I''(R_1 + 2r) \quad (2)$$

It is then necessary to determine the new value of external resistance ( $R_2$ ) which will cause the current through the motors to increase to the maximum value  $I'$ . The change in resistance will be made instantaneously, so that there will be no opportunity for the speed to change during the operation of the controller from one notch to the next. If the field flux remained constant with changes in armature current, as in a shunt motor, the counter-emf would be the same after the resistance had been reduced, except for the small change in  $IR$  drop in the motor windings. But with the series motor, an increase in armature current carries with it an increase in field flux, so that the counter-emf will also be increased. In order to find the amount of this increase in counter-emf, the saturation curve of the motor may be used, and the two values of flux, corresponding to the currents  $I'$  and  $I''$  determined from it. Unfortunately, the railway engineer does not usually have a saturation curve of the motor available. A good substitute can be found from the tractive effort curve, as follows:

The torque developed by an electric motor depends on the fact that a conductor carrying an electric current tends to be pushed sidewise out of any magnetic field in which it is situated. The value of this push varies directly with the current in the conductor, with the flux density of the magnetic field, and with the length of the conductors, and their number and arrangement. For any particular motor the conductors on the armature are permanently arranged, so that we have

$$D = k\Phi I \quad (3)$$

where  $D$  is the torque produced by the motor,  $k$  a constant depending on the windings,  $\Phi$  the field flux, and  $I$  the current in the armature. It may be seen at once that for a given value of current the torque of the series motor is fixed, since the armature current also flows through the field coils and determines the field strength. Changes in potential have no effect on the torque characteristic of the series motor and serve only to vary the speed at which any torque is produced.\*

Equation (3) gives the relation between torque, flux and current. If the torque and current are known (as,

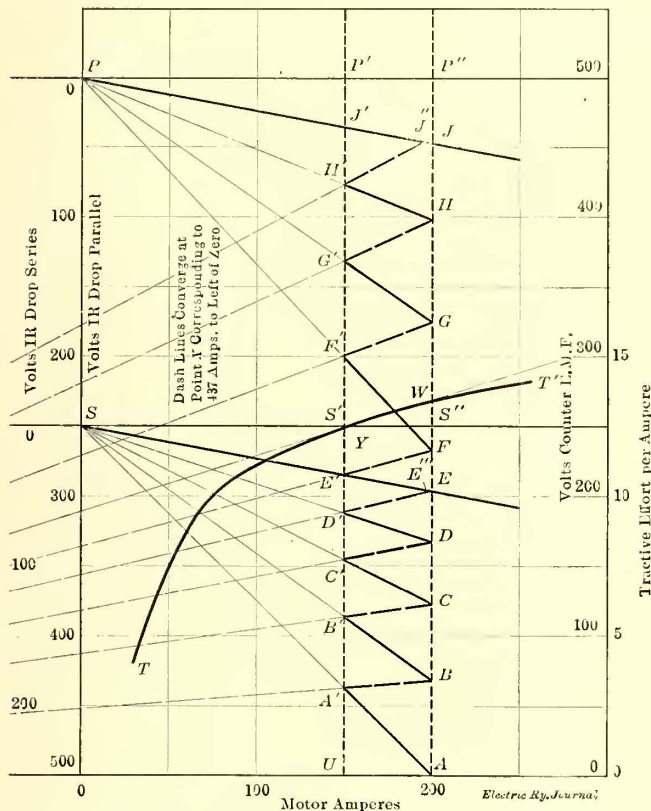
\*A small change in the losses and in the magnetic relations will cause a slight difference in the torque produced under different conditions, but the changes are so small as to have very little effect on the general form and value of the torque characteristic.



for example, from the characteristic curves in Fig. 1) a value may be obtained proportional to the flux:

$$\frac{D}{I} = k\Phi \quad (4)$$

Since tractive effort and torque only differ by the constant ratios of gearing and wheel diameter, the former may be used equally well in equation (4), merely changing the value of the constant  $k$ . A curve plotted between tractive effort per ampere and motor amperes, as  $TYWT'$  in Fig. 2 will then represent the variation in flux with magnetizing current. This relation holds true only in the case of motors whose field current varies directly with the load current.



MOTOR STARTING RESISTANCE—FIG. 2—DIAGRAM FOR CALCULATING RESISTANCES

In finding the increase of counter-emf when the resistance is reduced so that the current increases from  $I''$  amp to  $I'$  amp, it is only necessary to determine the values of tractive effort per ampere for the two values of current. That is,

$$\frac{E_{c_1}}{E_{c_2}} = \frac{D'/I'}{D''/I''} \quad (5)$$

where  $E_{c_1}$  and  $E_{c_2}$  are the counter-emfs corresponding to currents  $I'$  and  $I''$  respectively, and  $D'$  and  $D''$  the values of tractive effort for those currents. The value of  $E_{c_1}$  having been found already by equation (2), the value of  $E_{c_2}$  can be determined from equation (5). The new value of resistance will have to be such as to give the counter-emf  $E_{c_2}$  when a current  $I'$  flows through the circuit, which will satisfy the equation

$$I' = \frac{E - 2E_{c_2}}{R_2 + 2r} \quad (6)$$

This equation is similar in form to equation (1), but takes account of any value of counter-emf which may exist at the moment.

Applying these equations to the example cited, we have from equation (2),

$$2E_{c_1} = 500 - 150(2.036 + 2 \times 0.232) = 125 \text{ volts.}$$

This is the counter-emf existing the instant before the resistance is reduced. The instant after the resistance has been reduced, this becomes

$$2E_{c_2} = 125 \times \frac{13.43}{12.40} = 135 \text{ volts.}$$

The necessary value of resistance is found from the relation

$$200 = \frac{500 - 135}{R_2 + 2 \times 0.232}$$

from which  $R_2$  is found to be 1.361 ohms.

The same reduction in torque as the speed of the motor increases will be noted, and, when the current has fallen to 150 amp, the counter-emf may be calculated by equation (2) as before. A new value of resistance may then be found by the use of equations (5) and (6). This process will be continued until all the resistance is cut out, and the motors are connected in series directly across the line.

To obtain further acceleration it is necessary to reconnect the motors in parallel. The counter-emf per motor will be the same; but when the connections are changed to parallel the two emfs will not add. Equation (2) will have to be rewritten as follows:

$$E_{c_1} = E - 2I'' \left( R + \frac{r}{2} \right) \quad (7)$$

Having found the new value for  $E_{c_1}$ , the value of  $E_{c_2}$  may be found by equation (5). By this method all the values for the parallel resistances may be determined. The table shows these values as determined for the problem outlined. In the columns for counter-emf, the upper values are for each motor ( $E_c$ ), and the lower for the two motors when they are in series. In the columns for resistance, the upper values are per motor and the lower for two motors in parallel.

It may be seen that on points 5 and 9, on which all resistance has been cut out, the current will not rise to quite 200 amp. This is unavoidable with the assumptions made.

This method of calculation lends itself very readily to a graphical solution. Referring to Fig. 2, a diagram has been plotted between motor amperes and motor volts. If the line emf is 500 volts, then when the two motors are in series, each will be taking 250 volts, less what is consumed in the resistance. The lines  $SE$  and  $PJ$  have been drawn at an angle such that the ordinate, as  $S'E'$  or  $P'J'$ , represents the  $IR$  drop in one motor at any current  $I$ . The line  $SA$  has been drawn to represent the  $IR$  drop per motor for any value of current, when the resistance is so chosen as to bring the motor to a standstill at 200 amp. When the current has fallen to 150 amp, the total  $IR$  drop is represented by the ordinate  $S'A'$ , and the drop in external resistance by  $E'A'$ . If the resistance is then reduced so as to increase the current to 200 amp, the counter-emf will be increased by the ratio given in equation (5). The curve  $TYWT'$  between tractive effort and current has been plotted to the same base, although, if the current limits are to be those decided on, the points  $Y$  and  $W$  are all that need to be located. The straight line  $WYX$  is then drawn through  $Y$  and  $W$ , intersecting the current axis prolonged at  $X$ . It will be seen at once, from similar triangles, that any line drawn through  $X$  will produce intersections on the lines  $UP'$  and  $AP''$  that are proportional. That is,

$$\frac{UA'}{AB} = \frac{UY}{AW}$$

and so on, for any possible line drawn through  $X$ . If then the line  $XA'B$  is drawn through  $X$  and  $A'$ , intersecting  $AP''$  at  $B$ , the ordinate  $AB$  will represent the counter-emf developed when the current has been in-



creased from 150 amp to 200 amp without changing the speed. The ordinate *S'B* gives the total *IR* drop, and *EB*, the drop external to the motor; this latter, divided by the current, determines the new value of resistance. The *IR* drop will then decrease along the line *BB'* as the current falls off, until, at point *B'*, the current must be increased again. The same construction is repeated until the two motors are in series without resistance. The current which will be obtained when the last point of resistance is cut out may be readily determined, since the *IR* drop in the motor alone is plotted as *SE*. When the last line radiating from *X* is drawn it will intersect this line at some point as *E''*. The abscissa determines the current.

In changing to parallel it is only necessary to move the axis of reference for *IR* drop to the proper point, in this case the ordinate for 500 volts, and continue the construction from that point. The construction is otherwise exactly the same as before.

As shown, the diagram is theoretically correct, and a comparison of the values found graphically for resistances with those calculated and tabulated as below

Points on Controller	Speed		Counter emf		<i>IR</i> Drop		Resistance		
	200 amp	150 amp	200 amp	150 amp	200 amp	150 amp	Total	Motor	External
	1	0.0	2.35	0.0	62.5	500.0	375.0	2.5	0.464
2	2.35	4.26	67.5	113.0					
3	4.26	5.82	135.0	226.0	365.0	274.0	1.825	0.464	1.361
4	5.82	7.06	122.2	154.5	255.6	191.0	1.278	0.464	0.814
5	7.06*	8.09	241.4	309.0	166.0	123.0	0.830	0.464	0.366
6	8.09	11.24	167.0	188.5					
7	11.24	13.8	334.0	377.0	166.0	123.0	0.830	0.464	0.366
8	13.8	15.8	203.6*	215.2					
9	15.8*	....	407.2*	430.4	92.8	69.6	0.464	0.464	0.0
			232.0	299.0	268.0	201.0	1.340	0.232	1.108
			322.5	366.7	177.5	133.3	0.670	0.116	0.554
			395.0	421.0	105.0	79.0	0.887	0.232	0.655
			453.6*	....	46.4	....	0.443	0.116	0.327
							0.525	0.232	0.293
							0.262	0.116	0.146
							0.232	0.232	0.0

\*At 196 amperes.

shows how closely they agree. Further, the diagram may be used for any value of line potential without any further change than shifting the origin for the *IR* drop. For different current limits it is necessary to take new points on the tractive effort per ampere curve, thus getting a new location for *X*. The shape of the curve, as drawn on the diagram, shows that a small variation may be made without relocating this point, and the error will not be great.

In general, as the resistors must be used both for the series and the parallel connections, a certain amount of adjustment must be made of the values found for definite current limits. The method of doing this is to continue the *IR* drop line corresponding to the actual resistance until it intersects the corresponding dash line. The current values will then, of course, not be those selected at the outset as the limiting ones.

The great advantage in the use of this diagram for determining motor resistances lies in its extreme simplicity. All that is needed is the tractive effort curve of the motor, and the motor resistance. The accuracy depends on the care with which the diagram is drawn, and makes no use of assumed constants, so that it can be used with any type of series motor.

According to *Railway and Locomotive Engineering* painful accidents have sometimes been caused by molten lead exploding while being poured, and many workmen have had their patience sorely tried when pouring melted lead around a wet joint to find the lead explode, blow out or scatter from the effect of the steam generated by the heat of the metal. The whole trouble may be stopped by putting a piece of rosin about the size of a hickory nut into the ladle before pouring.

## Northern Ohio Traction & Light Company "Safety First" Work

During the past year the number of accidents of all kinds on this property was 34 per cent smaller than that for 1913, and there were 45 per cent fewer fatalities from all causes. The number of persons injured in getting on or off cars was reduced by 35 per cent and the number of collisions with vehicles by 43 per cent. This company operated during the past year a total track mileage of 233.2; the number of car-miles run was 8,810,466.

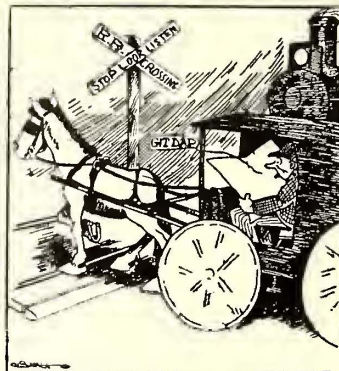


ILLUSTRATION FROM THE COMPANY'S BULLETIN

The safety work of the company is carefully organized in the department of the general claim agent, who has also the title of supervisor of safety. He is assisted by a large safety committee carefully chosen by the men. One of the effective features of the work is *The Traction Bulletin*, published twice a month for distribution on the cars. The *Bulletin* contains information regarding the operation of the company, time-tables and useful general information, not omitting a few jokes. An illustration used in a recent issue is the one taken from *The Philadelphia Times*, shown herewith. It was reproduced with editorial comment. E. H. Clinedinst is supervisor of safety of the company.

## Sources of Creosote Used in the United States

The increasing demand for coal-tar creosote in the United States and the apprehension regarding the supply because of the European war, makes the question of our sources of supply a pertinent one. In a recent issue of the *Wood Preservers' Bulletin* it is stated that the consumption of coal-tar creosote in the United States during 1913 amounted to 109,373,359 gal., which was the largest on record. Of this amount less than 40 per cent was produced in this country, while that imported totaled more than 69,800,000 gal., or 64.4 per cent of the total consumption. Practically all of the coal-tar creosote imported came from countries now at war, although as stated in the proceedings of the American Wood Preservers Association's last annual convention, shipments are still being made from all these countries except Germany. According to the information furnished by the United States Department of Foreign Commerce, the sources of supply and their growth in 1912 and 1913 were as follows:

### IMPORTS OF CREOSOTE

Imported from	1912		1913	
	Gallons		Gallons	
Europe:				
Belgium .....	396,652	\$19,103	7,675,174	\$326,925
France .....				
Germany .....	15,602,683	611,454	17,947,501	704,802
Netherlands .....	3,638,793	161,700	7,062,248	412,003
Sweden .....	9,588	1,124	3,600	618
United Kingdom—				
England .....	21,380,832	1,064,143	22,383,966	1,268,988
Scotland .....	9,596,183	428,298	13,581,965	930,954
Ireland .....	635	40	.....	.....
Total Europe .....	50,625,366	\$2,285,862	68,654,454	\$3,644,290
North America .....	1,672,836	95,724	1,151,224	67,050
Total imports .....	52,298,202	\$2,381,586	69,805,678	\$3,711,340



# Higher Fares Restored in Milwaukee

Commission Rescinds Low Fare Order—Says Interest of Greatest Number Best Promoted by Rates High Enough to Cover Cost of Reasonably Adequate Service

An order has been issued by the Railroad Commission of Wisconsin rescinding the decision of Aug. 23, 1912, which required the Milwaukee Electric Railway & Light Company to discontinue the ticket rate of twenty-five tickets for \$1 and substitute therefor a ticket rate of thirteen for 50 cents. The decision of the commission, dated Jan. 30, 1913, is signed by John H. Roemer, who has just retired as chairman, and Halford Erickson. David Harlowe, the third member of the commission, who has also retired, did not sign the decision.

The order was issued after a hearing on a petition of Christ Woehsner, Mayor of Cudahy, Wis. He expressed his belief that the order of Aug. 23, 1912, was unreasonable and unjust in preventing the Milwaukee Electric Railway & Light Company from getting a fair return. He asked that the order be so modified that the earnings of the suburban railway system owned by the Milwaukee Light, Heat & Traction Company and the earnings of the city system of The Milwaukee Electric Railway & Light Company should be combined and considered as a whole.

Counsel for the city of Milwaukee objected that the complaint should be dismissed on the ground that under the railroad commission law an individual does not have the right to complain as to the amount of earnings made by a corporation under an order of a commission; that the proper method to test orders is through the right of appeal provided in the statutes. Counsel for the city also felt that the Milwaukee Light, Heat & Traction Company had no franchise to do business within the city limits of Milwaukee.

The Milwaukee Electric Railway & Light Company declared that by the modifying order issued Oct. 28, 1914, the commission unjustly and improperly extended fare limits and reduced rates of fare of the company and the Milwaukee Light, Heat & Traction Company. On Dec. 5, 1914, the Milwaukee Light, Heat & Traction Company instituted an action in the Circuit Court of Dane County against the Railroad Commission alleging that the order of Oct. 28, 1914, did not provide a fair and equitable return upon the property. The company also declared that the ordinance of Jan. 2, 1900, and other franchises constitute contracts. The company alleged that the return on the street railway system for many years has been and is now less than 5 per cent per annum, whether based on the proper investment therein or on the fair value of the property used and useful in the conduct of the railway, and that the rate of return which would be earned under the rates of fare existing prior to the order of Aug. 23, 1912, has been at all times and would be less than 6 per cent per annum, whether based on the investment in the street railway property or on the fair value thereof, and that the order of Aug. 23, 1912, requires reductions in the fares which will diminish the revenues and return more than \$170,000 per year.

The Milwaukee Light, Heat & Traction Company in an answer to the petition alleged that the return which it is now earning and has earned for many years on its railway system is less than 5 per cent per annum, whether based upon the proper investment or the fair value of the property used and useful for railway purposes.

## PHYSICAL PROPERTY CHANGES LARGE

In taking up the changes which have occurred since Dec. 31, 1911, and their effect upon the future, the de-

cision first considers physical property. By far the most significant of the factors which have contributed to the changed conditions existing at present have been the additions to physical property. During the four years ending Jan. 1, 1915, the additions aggregated \$4,691,843, resulting in a total cost new of \$15,206,044 or an increase of 44.6 per cent over the property on Jan. 1, 1911. In round numbers the physical property used for railway purposes by the company in Milwaukee increased from approximately \$10,000,000 in 1910 to \$15,000,000 at the beginning of 1915, or 50 per cent. In 1910 the revenues amounted to \$3,787,323, producing an investment ratio of 38.1 per cent. For 1911 the revenues of \$3,969,072 resulted in the slightly lower ratio of 37.7 per cent, while for 1914, with property at \$15,000,000 and revenues of \$4,110,717, the ratio is 27.35 per cent, or a decrease of more than 10 per cent.

"In other words," adds the commission, "in 1911 there existed \$2.65 of property for every \$1 of revenue, which increased to \$3.66 of property for every \$1 of revenue in 1914. To place the year 1914 upon the same profitable basis as that of 1911 it is significant to show that the revenues should have totaled \$5,665,186, or a necessary increase in 1914 over 1911, assuming the same operating ratio, of \$1,702,114, or 43 per cent. This last figure, compared with the actual increase in revenues of 1914 over 1911, \$147,645, or 3.7 per cent, brings out the differences in conditions admirably. It may be contended that this comparison would be effected by the depressed business conditions during the latter half of 1914, but the maximum revenues collected by the company during its entire history occurred in 1913 and were only greater by \$110,592 than those of 1914."

In analyzing the expenditures for additions the commission called attention to paving as an important item contributing to the decrease in net earnings. The expenditure for four years was \$593,871, or 14.5 per cent of the total other additions to property.

## MAINTENANCE COSTS HIGHER

Maintenance at present requires higher relative charges than those prevailing during the period covered by the 3-cent fare case. This is due to several reasons. There was an element of deferred maintenance in 1908 to 1911, inclusive. The new physical property installed since 1911 has caused additional maintenance to cover new property and has caused the maintenance per unit to increase and, finally, the nation-wide increases in prices of materials and wages have affected the urban transportation business very materially.

In the service case the commission concluded that at least 1.8 cents per car-mile would be required to keep equipment in proper repair. The company contended for and still contends for 2.006 cents per car-mile as an adequate allowance for maintenance of equipment. The final necessary cost, the commission declares, is certain to be from 0.5 cent to 0.7 cent per car-mile higher than the average prevailing during 1908 to 1911. The final average of 1.8 cents per car-mile or higher indicates the amount of additional maintenance which will be required to cover pay-as-you-enter mechanism, air brakes, sign and signal systems, etc., added to the old equipment.

If no appreciable increases have appeared in maintenance due to other new property there is no doubt that these will occur within several years when the newness of the additions has worn off.



OPERATION

Certain increases in wages of labor, expense of supervision and general overhead charges have been due to larger power plant and repair-shop capacity, additional crosstown lines, single-fare extensions, additional car-house accommodations and other developments. Trainmen's wages per car-hour in 1911 cost 49 cents, in 1912 49.8 cents, in 1913 51.5 cents and in 1914 53.8 cents. During 1914 an increase of \$83,400 took place over 1911, of which about \$24,000 was traceable to the spread of duty and minimum wage policy, \$2,700 to fare-box collectors placed at important intersections where heavy loading occurs during the rush hour periods, and \$58,000 to wage increases.

REVENUES

In 1909 operating revenues increased 7.6 per cent over the preceding year, in 1910 9.2 per cent, in 1911 4.7 per cent, in 1912 4.3 per cent and in 1913 2.2 per cent, while in 1914 there was a decrease of 2.6 per cent.

In 1908 operating expenses, taxes and depreciation were approximately 65 per cent of revenues. In 1913 the percentage was 75, and in 1914, 78.

Rides per capita increased from about 100 in 1897 to 250 in 1913. Recent indications point to the tendency that the present growth in rides per capita is not keeping pace with the former growth nor with the population curve. Revenues per capita increased from \$5.39 in 1897 to \$10.43 in 1913. The situation seems to be that the riding habit is approaching a more complete saturation than ever before in the history of the company of eighteen years.

Another factor is the decreasing average revenue per revenue passenger. The proportion of passengers paying cash fares has decreased to 15.68 per cent in 1914. The cash-fare passengers were 84 per cent of the total revenue passengers in 1900. The average fare has reached as low as 4.163 cents for 1914, whereas prior to 1900 it was approximately 5 cents.

Another important cause is the extended use of transfers. The per cent of revenue passengers using transfers increased from 25.52 in 1897 to 36.94 in 1913 and 39.66 per cent in 1914. Revenue passengers decreased from 100,073,659 in 1913 to 97,874,919 in 1914, or a difference of 2,198,740, while transfer passengers increased from 37,402,570 in 1913 to 39,263,919 in 1914, or a difference of 1,861,349. The most important causes were the installation of crosstown lines and extended transfer privileges. A conservative estimate of the annual loss occasioned by the use of these privileges is \$80,000 for 1914 alone.

Among other causes which are affecting revenues adversely are automobiles, cycle cars and motorcycles.

Another more tangible cause is the order of the commission. The probable full effect of the issue of the tickets under the reduction order would be to reduce the revenues for 1912 by an additional amount of \$116,000, and those for 1913 and 1914 by additional amounts of respectively \$58,000 and \$63,000.

Finally the general trend of industrial and financial conditions has increased materially the prices of material, labor and capital and altered economic conditions considerably in many ways. During the past eighteen years prices on commodities generally appear to have increased not far from 50 per cent, while labor in practically all lines also commands much higher prices.

The commission reached the conclusion that no encouragement can be found that for a considerable time to come the revenues can recoup their own losses, due to both permanent and temporary causes, and also make up the relative differences which now exist in the investment and operating ratios due to the large addi-

tions to physical property with the attendant outlays, to the increased costs in maintenance charges and operation and to the constantly increasing demands upon revenues on account of public requirement.

INCOME ACCOUNT

No allowances were made for working capital or going value, as it was not deemed essential for the general conclusions reached in this decision to determine a final value.

SUMMARY OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY—INCOME ACCOUNTS, 1912-14

	1912	1913*	1914
Cash investment .....	\$16,563,559	\$17,508,284	\$19,246,548
Per cent return .....	6.377	5.906	3.634
Commission's earning value.	\$12,502,836	\$13,862,874	\$15,441,000
Per cent return .....	8.448	7.460	4.530
Tax commission's value....	\$18,191,000	\$18,700,000	\$20,235,104
Per cent return .....	5.806	5.530	3.457

NOTE—Values under 1912 and 1913, as of Jan. 1. Values under 1914 as of June 30.

SUMMARY OF THE MILWAUKEE LIGHT, HEAT & TRACTION COMPANY—INCOME ACCOUNTS, 1912-14

	1912	1913*	1914*
Cash investment .....	\$7,781,305	\$7,590,635	\$8,124,627
Per cent return .....	2.800	2.907	3.739
Commission's earning value..	\$6,184,929	\$6,195,208	\$6,274,889
Per cent return .....	3.523	3.702	4.841
Tax commission's value.....	\$5,780,000	\$6,900,000	\$7,084,000
Per cent return .....	3.769	3.324	4.289

\*Year ending June 30.

NOTE—Values as of Jan. 1.

Percentage returns upon the cost of reproduction for the city company as of Jan. 1, 1912, 1913 and 1914, respectively, were 9.87, 7.29 and 5.45. For the traction company the returns for these years were 2.16, 3.77, 2.28. Taking the two companies combined the percentage returns were 7.29, 6.14 and 4.47. The income account of the city company, which was used as the basis for these calculations, does not reflect the actual condition of the finances. The amount of revenue deducted on the basis of the coupon redemption reserve fund has not equalled the probable reduction in revenues when the thirteen-for-50-cents tickets should be sold as ordered originally. To place the income account for the three years subject to the estimated effect would require a reduction of \$116,000 in 1912, \$58,000 in 1913 and \$63,000 in 1914, resulting in a per cent return on the cost new for the years named of 8.92, 6.86 and 4.79. It has been estimated that an additional amount for the improvement of service will no doubt aggregate approximately \$100,000. When this allowance is incorporated in the income account together with an allowance for reduction in revenues on the basis of the full effect of thirteen-for-50-cents tickets, the per cent returns are reduced to 8.10 for the year 1912, 6.12 for 1913 and 3.7 for 1914. Another burden upon the city company is the deficits in suburban territory. It falls upon the city system income account to produce sufficient net earnings to provide something like fair returns upon the suburban plant values. When these plant values are included in the income account of the city company together with the allowance for the additional reduction to the thirteen-for-50-cents tickets and for service requirements the per cent returns foot up to 7.38 in 1912, 5.61 in 1913 and 3.48 in 1914. "Any adjustments that can possibly be made," the commission adds, "will not prevent the conclusion that during the last two calendar years the revenues have not been sufficient to cover all legitimate demands for the adequate transportation of passengers in the city of Milwaukee and the adjacent suburban territory."

Income accounts in the accompanying table, although not accepted by the commission in their entirety, "contain certain merits which warrant a summary representation in this decision."



## CONCLUSION

"The increases in the operating expenses and fixed charges of the companies and the failure of their gross and net revenues to maintain their ordinary annual growth during the past few years are due to causes that are wholly beyond the control of the companies," the commission says in conclusion. "The net earnings of the respondent now are and for some time have been considerably lower on the investment than the rates or costs at which it is well known new capital for similar undertakings can in the long run be had. The conditions in this respect are also considerably aggravated by the fact that in this case, as in nearly all large and growing cities, there is a constantly growing demand for improvements in and extensions to the local street railway service.

"The tendencies and changes in the expenses and earnings in question were seen when the order complained of was made, but it was not then thought that they were permanent but rather temporary in their nature. Had the nature of these changes then been better understood it is very certain that the order would not have been made. Justice and the law demand that the rates charged by public utilities for the services they render shall be reasonable to the utilities as well as to their patrons. The best interest of the greatest number in matters of this kind can as a rule be best promoted by allowing rates that are high enough to cover the cost of reasonably adequate service. As the rates provided by the order complained of fall short of this, we are in fairness to the petitioner and in the interest of patrons compelled to find that this order is unreasonable and that it should be repealed or abrogated."

## COMMENT OF MR. MORTIMER ON THE DECISION

Commenting on the decision of the Railroad Commission of Wisconsin, James D. Mortimer, president of the Milwaukee Electric Railway & Light Company, said to the *ELECTRIC RAILWAY JOURNAL*:

"The order of the commission restoring the franchise rates of fare prevailing prior to the previous order of Aug. 23, 1912, was determined upon after a most thorough examination of the facts and the finances of the railway department of the Milwaukee Electric Railway & Light Company. The original order of 1912 was predicated upon a relation between earnings and value of property which was the maximum ever attained in the history of the company. During 1911 and 1912, the company was engaged in a large amount of construction work which added very materially to its property account. The original decision contained no adequate recognition of this large additional investment then in process of completion or the further investment that would be required during the remainder of 1912 and during the year 1913. This additional investment, together with expenses arising out of higher wages, greater expense on account of injuries and damages, and additional burdens imposed by virtue of the police powers of the municipality, such as sprinkling streets, replacing pavement not apparently contemplated under the franchise, and raising and lowering tracks to conform to new grades, all contributed to bring about the low ratio between net earnings and value of physical property, upon which the commission based its recent rescinding order.

"The commission has indicated its breadth of view and strength of character in frankly admitting that the order of 1912 was in error and was issued without sufficiently complete recognition of the then current tendencies of the costs of street railway operation.

"The facts would have justified a rate of fare higher than 6 tickets for 25 cents and 25 tickets for \$1, but in view of these long established commutation rates, any

departure therefrom would probably not be in line with sound public policy. Even with rates of fare lower than the standard nickel, the same aggregate return may be attained by shortening the length of haul for a single fare. There are opportunities for this treatment on a number of our suburban lines."

## COMMUNICATIONS

## Mr. Murray's Franklin Institute Paper

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY  
EAST PITTSBURGH, PA., Feb. 5, 1915.

To the Editors:

In your issue of Jan. 30 you give an abstract of a paper by W. S. Murray, which was presented at Philadelphia on Jan. 20. This last paper on the New Haven electrification, giving as it does costs of operation, is of the greatest interest, as, in fact, are all of Mr. Murray's papers. The costs given speak for themselves and need no comment. It may not be amiss, however, to discuss some of the statements in the remainder of the paper. The pause in the onward march of the electrification of steam railways, due to financial depression, is not an unmixed evil. It is of great value not only to the railways themselves but to the manufacturing companies. It offers an opportunity for a study of ways and means, of necessity and cost, of advantages and disadvantages of electrification, and for planning the work which it is recognized must come sooner or later, so that it can be done in the most economical manner and at the same time secure the maximum of advantage. The writer is very much opposed to legislation designed to force the electrification of steam railways. Electrification under such conditions will inevitably cost a great deal more than necessary and the city securing electrification by such means will lose a great part of the advantage which it should have. The work would have to be done under pressure, and plans which really require years of study would have to be rushed through in a few months. The examples of electrification which are now in progress are in places where an actual financial saving will result from them, and this is what every thorough electrical engineer expects will ultimately be the case on a great many of the roads in this country. The problem is so vast, however, that it must not be forced or there will be a heavy loss instead of a financial gain.

Another subject which is touched upon in Mr. Murray's paper is the administration in electrical operation. Manufacturers of electric locomotives are familiar with the expression "That is railroading," which has come to mean that the operating men expect a locomotive to stand any amount of abuse that can be heaped upon it no matter whether it is injured or not; that it will be expected to haul continuously any load that it can start. This method of operation is usually sufficient to eliminate entirely any possibility of financial profit from the investment in electrification, and reduces the matter simply to a question of how much more it is going to cost the company to operate electrically than by steam. Fortunately, as Mr. Murray says, this attitude has changed to a great extent on railroads where the operating men are coming to understand that electrical apparatus has limitations and that it costs vastly more to maintain it if it is abused than if it is treated as any valuable piece of machinery should be treated—namely, with some degree of intelligence and respect. There is nothing in Mr. Murray's paper that is any truer than this statement: "Successful electrification, therefore, requires that there be in the admin-



istrative forces men trained to the necessity of a different viewpoint from that which has been developed in eighty years of steam service."

The writer would, however, take issue with Mr. Murray as to the disadvantage of the employment of steam locomotive engineers for operating electric locomotives. He believes that such men, if properly educated as to the capabilities and limitations of these locomotives, will operate them as well as new men specially trained. They must, however, be given a proper point of view by men who are thoroughly familiar with electric locomotives and have authority to enforce their instructions.

One thing that would be of the greatest advantage on a railroad is a more thorough co-operation between the motive power department and the transportation department than is usually found on trunk-line railways. Both departments should have a voice in the selection of apparatus for the operation of the railway. The transportation department should state the service requirements before the capacity, speeds, etc., of locomotives are decided upon. The equipment should be purchased upon this basis if it is approved by the management of the railway, and, after it has been installed, the transportation department should be required to adhere as closely as possible to these specifications and not be permitted to take the equipment and see how much more can be done with it. Such methods always result in financial loss to the company and dissatisfaction with the apparatus if it has been designed with the ordinary factor of safety.

N. W. STORER.

## Calculation of Starting Resistances for Railway Motors

NEW YORK, Feb. 2, 1915.

To the Editors:

In recent issues of the *ELECTRIC RAILWAY JOURNAL* several communications have appeared commenting upon the method which I proposed in the issue of Dec. 26, 1914, for calculating starting resistance. Allow me to take up some of the points raised by Professor Harding, Mr. Cameron and Mr. Simmon.

If Professor Harding recognizes that the proposed method and the calculation in itself are of interest to the manufacturer who is studying a new proposition based on certain data, it is difficult to see why, in case the data have to be changed or the existence of some trouble suggests the desirability of investigating the matter, the same procedure shall not be useful to anyone else who wishes, with little time and effort, to determine the correct arrangement of the grids.

Referring to Mr. Cameron's communication, I am of the opinion that problems regarding traction can be studied better on paper than by tests because, if the variables entering the problem are numerous we can, on paper at least, make use of reasonable averages and have some basis for comparisons, while in actual operation there are many causes of difference in addition to the variables under study. Hence it is difficult to obtain two runs with all conditions but the one in question absolutely identical. This is especially true in the problem of starting a train where the sudden "jerks" of the current corresponding to the controller operation are not easily and precisely followed by means of an ordinary ammeter, and are given in an uncertain manner and on a small scale by recording instruments. To the uncertainty of these tests are added others due to the manner of operating the controller which, with very slight variations, can produce remarkable differences in the current peaks, as the motors are operated at starting on the flat part of the torque-current curve.

Primarily the difference in ideas as to the best method of determining the proper resistance is this: By the theoretical method, as described in my plan, the work can be done on paper, accurately and in an hour's time at a cost of, say, 50 cents. By the practical method a car has to be prepared for test, the results must be plotted, the resistors must be readjusted and the car again tested, etc. This process must be continued without the operator in the end being sure that any final good results are due to a better arrangement of steps or rather than to changes in some of the variables not under the control.

In making calculations by my method it is not necessary to make arbitrary assumptions, such as that there is no line drop, that resistance grids run cold in city service or red hot in interurban service. To take care of such matters only good engineering judgment is required in assuming reasonable average data, and then the theoretical study will yield satisfactory average results.

Mr. Simmons hints at some of the difficulties of the starting resistance problem, such as the necessity for correcting the resistance on the first step. I need simply note that as the method which I outlined is based on simple and rapid calculations it permits allowance to be made for such matters without great effort.

In conclusion, it should be understood that the proposed solution does not pretend to eliminate the "cut and try" inherent to the problem, but only to hint how to "cut" and to make the "trying" less discouraging. These two operations might be irksome to the man who has not the experience of the specialist and the free use of the accumulated data of a manufacturing company.

F. CASTIGLIONI.

Efforts will be made to bring about repeal of the full crew laws in Pennsylvania and New Jersey at the present sessions of the Legislatures in these States. Thirteen railroads operating in the two States have joined to make a public appeal to the people for their support in accomplishing this object. These railroads have organized a committee to take charge of the work. R. L. O'Donnell, general superintendent of the Pennsylvania Railroad, is chairman of the committee. The other members are: C. H. Ewing, general superintendent of the Philadelphia & Reading Railway; F. Hartenstein, assistant to general manager of the Lehigh Valley Railroad; Robert Finney, general agent of the Baltimore & Ohio Railroad; J. S. Fisher, solicitor of the New York Central & Hudson River Railroad. This executive committee represents the committee which in turn represents the Pennsylvania Railroad, Baltimore & Ohio Railroad, Philadelphia & Reading Railway, Lehigh Valley Railroad, Erie Railroad, Lackawanna Railroad, New York Central Railroad, Delaware & Hudson Railroad, Buffalo, Rochester & Pittsburgh Railway, Pittsburgh, Summerville & Clarion and Cumberland Valley Railroad.

The Public Service Commission of Missouri has issued its first volume of reports for the period from April 16, 1913, to Sept. 24, 1914. Besides the complete reports of all cases decided during this period, the volume contains a table of the cases reported, a table of the cases cited, an index of cases by localities and also an index-digest of findings for all the cases with cross references.

Arrangements have been completed for handling mail at Junction City, Kan., over the Interurban Railway from Manhattan, and contracts have been sent to the Post-Office Department at Washington for approval. It is planned to serve Fort Riley and Ogden in the same manner if the Junction City contracts are approved in Washington.



ANNUAL CONVENTION  
SAN FRANCISCO  
OCTOBER 4 TO 8, 1915

# American Association News

ANNUAL CONVENTION  
SAN FRANCISCO  
OCTOBER 4 TO 8, 1915

Association Activity Invades Phillipine Islands—Public Service Section Announces Comprehensive Program—  
Company Section Committee Expending Literary Effort to Enlist Interest

## MANILA ELECTRIC RAILROAD & LIGHT COMPANY SECTION

The organization meeting of joint company section No. 5 of the American Electric Railway Association and the National Electric Light Association was held in Manila, P. I., on Dec. 15. The following officers were elected: President, Oscar Keese, superintendent of transportation; vice-president, Arthur J. Grant, superintendent of lighting installation; secretary, Walter E. Smith, purchasing agent; treasurer, E. A. Barretto, cashier; directors (1 year) H. P. L. Jollye, assistant auditor; (2 years) B. Solano, chief clerk accounting department; (3 years) Roman Lopez, superintendent of electrical distribution. J. B. Russell, auditor, was designated by the company as the director ex-officio.

J. B. Russell addressed the meeting on the aims and objects of a company section, the character and scope of its work, its advantages and benefits, and on the necessity of each individual member doing his share in furthering the interest of the section. He dwelt with special emphasis upon the advantage of a company section in Manila because of its geographical location, far removed from the headquarters of the parent associations. As this isolation makes it difficult for employees of the company to attend the annual conventions of the associations, they can profit to an unusual extent from the local association.

C. N. Duffy, vice-president and general manager, called particular attention to the gold medals awarded annually by the Railway Association and the Electric Light Association respectively for the best papers read before company sections, and urged the members to be competitors for these medals. As an extra inducement Mr. Duffy announced that he would personally give the sum of \$100 to the winner of either medal and that he hoped that the Manila company section would win both medals in 1915.

Before the election of officers the constitution of the joint company section was acted upon section by section. This has since been printed in convenient pamphlet form. It provides for two classes of membership; active, consisting of officers or employees of the Manila Electric Railroad & Light Company or its affiliated companies, who are members of the American Electric Railway Association or Class D members of the National Electric Light Association; and associate, any persons interested in the objects of the section and members of either of the national associations. Associate members have all privileges of active members except the right to vote, to hold office and to attend the meetings of the executive council.

There are no membership dues other than those required for membership in these associations.

The officers of the section are a president, a vice-president, a secretary, a treasurer and four directors. Three directors are elected, one each year, and the fourth is a member of the official staff of the company and designated by it. There are two standing committees, one on program and the other on membership. The latter is to consist of not less than one member from each department of the company represented in the section. This committee is to report to the executive council, consisting of the officers and directors, twice annually.

## PUBLIC SERVICE COMPANY SECTION

The following program has been announced for the meetings of the Public Service Railway company section for this season and next. The program was inaugurated with the January meeting when the topics considered were: Historical review of the development of transportation, with particular reference to the organization of the Public Service Railway; discussion of a chart giving various constituent companies of the system, and dates of organization; and analytical review of cost of operation and maintenance for 1914, with suggestions for 1915.

February: Organization and financing of a street railway company. Explanation of stock and bond issues of an electric railway and the reasons for increasing them at various times.

March: Legal steps and obstacles in the formation of the organization. Procedure to be followed in securing franchise rights, property owners' consents, right of way, etc. Tribulations of the promoter.

April: Engineering work in surveying, preparation of plans and estimates, etc. Preparation of roadbed and construction of track and bridges.

May: Design and construction of power house and substation. Construction of line and distribution systems.

June: Design and construction of carhouses and shops. Equipment of shops and construction of rolling stock.

September: Determining the rate of fare, showing limits of profitable haul per unit fare.

October: Cost of operation, including platform expenses, superintendence, power, etc. Increased cost per passenger mile during commission hours. Cost of running extra car. Operating costs.

November: Maintenance of tracks and bridges. Maintenance of distribution system.

December: Social.

January, 1916: Maintenance of powerhouses and substations. Maintenance of equipment.

February: Claim Department. Welfare work. Costs of accidents. Costs of welfare work.

March: Overhead charges, general expenses, interest, taxes, etc.

April: What constitutes the value of a service corporation?

The above will be followed by six lectures on rates of return, valuation, regulation, franchise life, etc.

## TRAINING OF TRANSPORTATION EMPLOYEES

The Transportation & Traffic Association committee on this subject, C. S. Ching, Boston, Mass., chairman, has just sent out data sheet No. 127 calling for information as follows: Rules and regulations of public service or railroad commissions and city ordinances relating to or affecting the employment of men on street railways; practice regarding the issuing of letters or the posting of notices of commendation in cases where employees may have been commended by the public or may have performed meritorious acts; practice regarding the publication of company magazines to which employees contribute, and the issuing of pamphlets on general topics, such as courtesy, etc.; opinions and experience regard-



ing employees' meetings and programs therefore; probation periods and discipline; watch inspection and standards, and bonding conductors.

#### COMMITTEE ON COMPANY SECTIONS AND INDIVIDUAL MEMBERSHIP

The chairman of this committee, Martin Schreiber, engineer maintenance of way Public Service Railway Company, Newark, N. J., is preparing an instructive pamphlet on the advantages of company sections. The committee hopes to assist in the formation of several company sections this year. One of the most promising prospects is the Chicago Elevated Railways which has a thriving "Chicago Elevated Railway Club." The Chicago club has a membership of more than a hundred and definitely expects to enroll as a company section of the American Electric Railway Association, probably this year. It gives every indication of having a membership of 150 before the end of the year.

#### JOINT COMMITTEE ON OVERHEAD AND UNDERGROUND LINE CONSTRUCTION

A largely attended meeting of this committee was held at the New York Railroad Club rooms, 30 Church street, New York, on Jan. 27. The discussion was of a general nature.

#### COMING COMMITTEE MEETING

Feb. 19, and 20 (if necessary), 10:00 a. m., New York, committee on way matters of the Engineering Association, C. S. Kimball, engineer maintenance of way Washington Railway & Electric Company, Washington, D. C., chairman.

### Annual Meeting U. S. Chamber of Commerce

The third annual meeting of the Chamber of Commerce of the United States was held in Washington, D. C., on Feb. 3, 4 and 5. At a meeting of the national council before the convention on Feb. 2, Harvey S. Chase, Boston, spoke in advocacy of a national budget in order to give citizens a more intelligent understanding of the financing of the government. At the opening meeting of the chamber on Feb. 3, President John H. Fahey, Boston, described the progress of the Chamber of Commerce into its present position as the largest, most representative and most democratic organization of its kind in the world. He told how the Chamber was performing its functions of crystallizing the business opinion of the country in legislative matters and of bringing into closer co-operation the business men and the government.

At the afternoon session on Feb. 3, William Jennings Bryan, Secretary of State, discussed the factors that enter into the extension of American trade in foreign lands, the advantages of the administration shipping bill and the work of the Department of State in establishing amity and good-will between foreign nations and this country. Following Mr. Bryan, Samuel McRoberts, vice-president National City Bank, New York, outlined government co-operation with business through consular channels and diplomatic intervention, and said that a campaign of education and publicity regarding foreign trade and enterprises was necessary. At the evening session the feature was an address by President Wilson. The most serious reference made was that the anti-trust laws should be amended so as to make it possible for American business houses, particularly the small firms, to band together for common action in the export trade, provided they did not form combinations to exclude any manufacturer or exporter.

In discussing trade expansion and the European war on Feb. 5, Edward A. Filene, Boston, recommended that business men should begin a national discussion of peace terms as a means of helping to end the European war, that banks should do more pioneer work for trade expansion, that foreign trade contracts should be protected by insurance and indemnity provisions and that the Chamber of Commerce should adopt a quality stamp for the goods of its members. Other papers and reports were of less interest to electric railways.

### Presentation of Brady Medals

The ceremony in connection with the presentation of the Anthony N. Brady memorial medals for safety work on electric railways occurred at the annual meeting of the American Museum of Safety, Feb. 10. This meeting was held in the auditorium of the United Engineering Societies' Building, New York, and four other medals were presented and addresses were made on the work of the museum during the year. President Wilson sent a message to those at the meeting saying that he was very much interested in the effort made to conserve life and safeguard health by the museum. The dies for the medals are now being cut according to the accepted artist's sketch published on page 239 of the issue of Jan. 30, and the medals will be delivered in due course.

The speech in connection with the presentation of the medals was made by Prof. F. R. Hutton, chairman, jury of award of museum medals. The gold medal was awarded to the Boston Elevated Railway, and the speech of acceptance was made by Gen. William A. Bancroft, who said that he realized the honor conferred by the award and expressed the appreciation of the company for it. Russell A. Sears of the legal department and Henry V. Neal of the mechanical department of the company, to whom were respectively awarded the silver and bronze replicas, were also present. In his presentation speech Prof. Hutton referred to the fact that the jury of awards had made honorable mention in its report of the Public Service Railway of New Jersey and the Northern Ohio Traction & Light Company. E. W. Heilig of the former company and E. A. Clinedinst of the latter company were the representatives of those companies in attendance.

At the same meeting the E. H. Harriman memorial medal, which is awarded to the steam railroads each year under very similar conditions to those covering the Brady medal and the electric railways, was presented to the New York Central Railroad. A. H. Smith, president of the company, received the medal for the company. Mrs. Anthony N. Brady and Mrs. E. H. Harriman were among those seated on the platform.

### Berlin Stadtbahn Will Test High-Tension Direct Current

In the *Elektrotechnische Zeitschrift* for Dec. 24, 1914, Dr. Zehme states that the Prussian State Railways have decided to test high-tension d.c. motor car third-rail operation as well as single-phase equipment in connection with the Berlin Stadtbahn electrification. The sum of \$6,250,000 has already been granted by the Prussian Diet for this electrification. This change in plans is the result of the government's study of recent progress made in high-tension d.c. operation.

The experiments will be conducted on the Wannsee-Stahnsdorf branch of the State Railways with a 1600-volt third rail, four motor cars and six trailers. Dr. Zehme suggests that the experimental section, which later would form a part of the electrified network, be so equipped that the third-rail voltage could be raised later to, say, 3000.



# Equipment and Its Maintenance

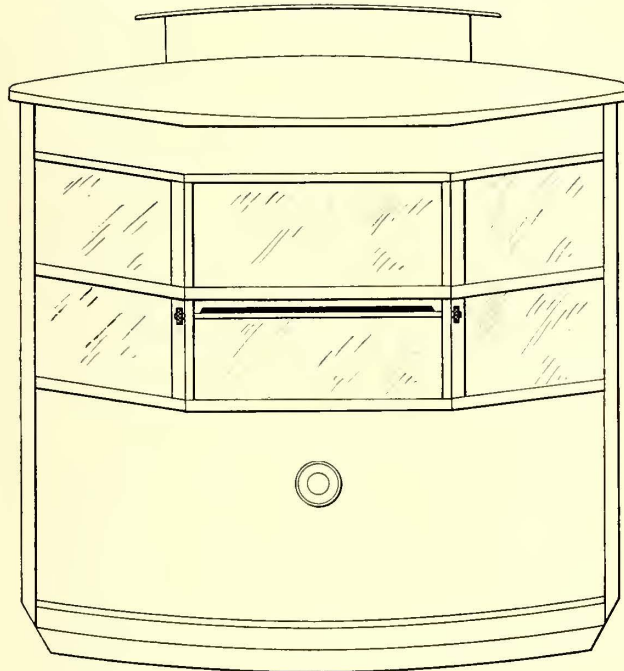
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

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

## Fixed Squeegee for Vestibuled Cars

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

In remodeling about 630 convertible cars to the pay-within type the Third Avenue Railway System, New York, realized that the removal of the bulkheads necessitated some means of keeping the vestibule sash free of rain, snow and ice with the least discomfort to the pas-



FIXED SQUEEGEE FOR VESTIBULED CARS

sengers and also of avoiding accidents from clouded sash. To attain this end a fixed window cleaner or squeegee was devised. This cleaner consists of two pieces of 1/8-in. x 3/4-in. strap iron with a strip of rubber clamped between them, the straps being bolted to the

two center vestibule posts. Where the straps project beyond the posts they are twisted, their ends being secured by means of two thumbscrews. Furthermore, springs are set between the straps and the posts to allow clearance between the sash and the straps, while permitting close contact of the sash and rubber. The squeegee extends across the bottom vestibule sash which is stationary, and close to the upper stile of the same in order to be out of the way. As the top center sash is lowered and then raised by the motor man, the outer side of the pane is swept by the rubber tongue so effectually that rain streaks and snow are readily cleaned off.

## Recording Progress in Construction of Cars and Assembly of Equipment

BY NORMAN LITCHFIELD, M. E.

The modern electric multiple-unit motor car is a highly complex machine requiring in its construction the completion of a number of processes at the works of the car body and truck builders, and also necessitating for its full equipment the assembling of multitudinous detail parts after the main body and truck structures are completed. It is often advantageous for the railway company to purchase various specialties such as doors, seats, etc., directly from the manufacturers instead of from the car builders, and if this course be followed then it is essential that these parts be delivered to the car builders at a sufficiently early date to permit the prompt construction of the cars to proceed without interruption from lack of material.

It is often impossible to place the order for these parts at an earlier date than that of the order for the car bodies themselves, and it becomes, therefore, a difficult matter to keep track of the various items and to be able to ascertain quickly just what material is coming forward properly and what needs attention to insure its arrival in time.

In the same manner parts may be bought separately for the trucks, such as wheels, axles, springs, etc., and

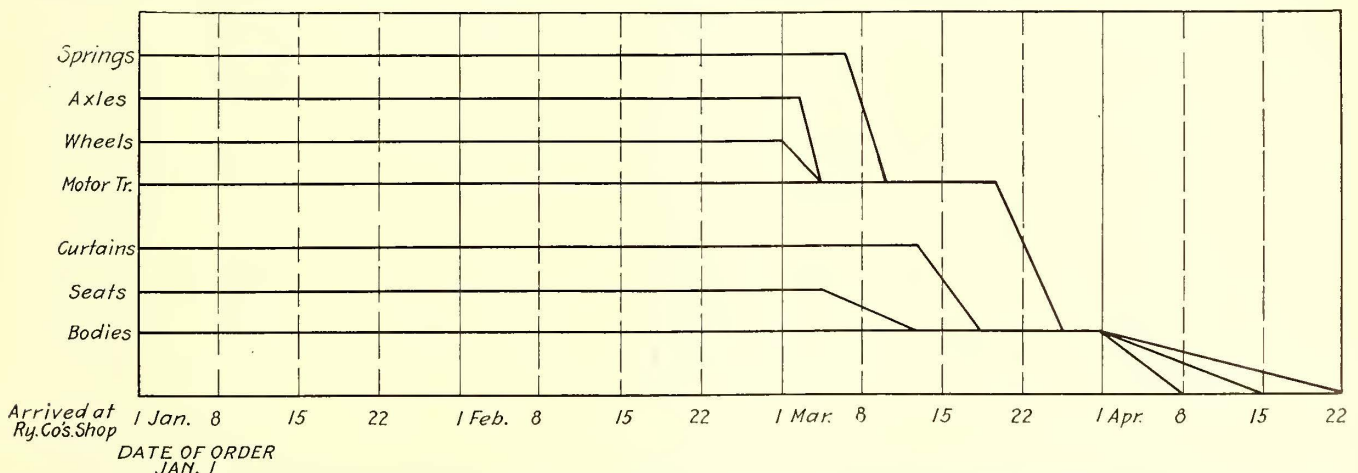


FIG. 1—CO-ORDINATION OF PARTS DELIVERED FOR ASSEMBLY AT TRUCK AND CAR-BODY BUILDERS AND THEN SHIPPED TO RAILWAY. THE DIAGONAL LINES INDICATE THE TIME THAT THE MATERIAL IS IN TRANSIT



they must reach the truck builders at specified dates. Furthermore, if the trucks are built by contractors other than the body builders and it is desired that the cars be shipped on their own wheels, then it must be seen to that they arrive at the car builders' works at the proper time.

All of these matters involve considerable accounting, and numerous methods have been devised to prevent the tangles that arise when shipments of materials fail to meet the progress in construction. The problem becomes more complicated when, as is often the case, the contract for the bodies and trucks is divided among several firms for reasons of economy, convenience and quick delivery.

Some railroads permit the car builders not only to build the body and truck structure but also to assemble the electrical and brake equipment on the car. Other roads prefer to send a force of their own men to the car builders' works and do that work themselves. Still others have the car builders do only a very limited amount of strict equipping work and wait until the cars arrive at the railroad's own shops before applying the equipment. The deliveries of material to the company's own shops then have to match with the progress in the construction of the cars at the builders and also with the progress obtained in the equipment of the cars at the home point.

As in all other matters, an orderly procedure, well and definitely recorded, has proved not only convenient but economical in this work, and the following method has proved its worth in a series of construction jobs of considerable magnitude.

As soon as arrangements have been definitely completed with the car-body builders, and an agreement has been reached in regard to the promised rate of delivery, a chart is made up as shown in Fig. 1. This chart gives a list of the parts to be furnished to the car and truck builder, and the approximate dates at which they should be delivered. This form, with the aid of the diagonal lines, shows at a glance at what date the wheels, etc., must be delivered to the truck builders in order that the trucks may be completed to be shipped in their turn to the body builders in time to meet their requirements. Requisitions are then made in manifold, giving the number of each article required for the complete job, a description of the material and reference to the detail blueprint number and specification number, and date of desired delivery. In addition to the copies forwarded to the purchasing and storekeeping departments, copies are furnished to the material clerk of the car equipment department, the engineer's office, the construction foreman and the inspector at the works of the car builder.

From these requisitions, file cards are made out and handled by the material clerk in a regular card index system, with the usual follow-up methods. The value of the card index for this work is very great, but on account of the great number of detail parts, each varying in the number required per car, and made by numerous different manufacturers, it is very difficult, almost impossible to be sure that some items have not fallen behind in their delivery and will cause a serious delay by their non-appearance. In other words, a comprehensive, lucid picture is lacking.

For this purpose the charts shown in Figs. 2 and 3 have been devised. These charts have been in successful use for some years. Fig. 2 is a chart of progress at the works of the car and truck builders. This chart, made on tracing cloth, is held at the railroad company's home office, and its chief value lies in the fact that the unit used throughout is that of the complete car, and not the detail itself, i.e., if twenty 1/2-in. x 3 1/2-in. machine bolts are required per car and up to date 200 have been delivered, then they are shown on the chart, not

SPECIFIC ACTION NO.	DATE BROS SENT IN	NO. PER CAR	REQUISITION NO.	DATE OF ORDER	MANUFACTURER	ITEM	5	10	15	20
					A	Cars Complete				
						" in Trimming Dept.				
						" with Roof & Iron Painted				
						" " 3rd Coat Varnish				
						" " 2nd " "				
						" " 1st " "				
						" Lettered				
						" 2nd Coat Color				
						" 1st " "				
						" Rubdown				
						" Staining				
						" 3rd Coat-Surface No.3				
						" 2nd " " "				
						" 1st " " "				
						" Putty				
						" with Coat-Surface No.2				
						" " " Metallic Primer				
						" " Brake Rigging Applied				
						" " Cement Floor Laid				
						" " Inside Finish Applied				
						" in Finishing Dept.				
						" Sand Blasted				
						" Side & Roof Sheeting Riveted				
						" Super Structured				
						" Underframe				
508-A	7-16-12	12	84	3-1-13	B	Seats				
80	"	20	80	"		Curtains & Fixtures				
507	"	2	"	2-1-13		Air Reservoir				
507-A	7-26-12	2	"	"		Air Brake Cylinders				
	8-30-12	2-Sets	103	"		Door Hanger overhead Truck				
					C	Motor Trucks Complete				
						80%				
						60%				
						40%				
						20%				
						10%				
48-B	7-16-12	2	81	8-9-12		Wheels				
11-E	"	1	"	8-8-12		Axles				
	3-15-13	1	215	3-20-13		Gears				
511-E	9-18-1	2	116	4-25-12		Elliptic Springs				
"	"	2	116	9-25-12		Double Coil Springs				
	11-11-12	2	144	11-25-12		Journal Boxes				
					D	Trailer Trucks Complete				
48-B	7-16-12	2	81	10-24-12		Wheels				
48-B	"	1	90	8-8-12		Axles				
511-B	9-18-12	2	116	9-19-12		Single Coil Springs				
	11-11-12	2	144	11-25-12		Journal Boxes				

ORDER NO.	NO. PER CAR	REQUISITION NO.	DATE OF ORDER	MANUFACTURER	ITEM	5	10	15
		344		A	Cars Completed			
		"			" 80%			
		"			" 60%			
		"			" 40%			
		"			" 20%			
		"			" 10%			
		"			" arrived at Ry. Shops			
	2	244	1-9-13		Motors			
	2	"	"		Master Control			
	1	"	"		Reverse Handles			
	1	"	"		Line Switches			
	1	"	"		Motor Resistances			
	2	"	"		Fuse Blocks & Fuses			
	2	"	"		Main Fuses & Boxes			
	1	"	"		Control Junction Boxes			
	1	"	"		Limit Switches			
	2	"	"		Plow Sockets			
	2	"	"		Plow Socket Plugs			
	6	"	"		Control Circuits & Fuses			
	1	233	3-6-13	B	Cut-out Cocks			
	1	"	"		Compressors			
	1	"	"		Suction Strainers			
	1	"	"		Pump Gov.			
	1	"	"		Safety Valves			
	2	"	"		Brake Valves			
	1	"	"		Brake Valve Handles			
	2	"	"		Air Gages			
	2	"	"		Exhaust Mufflers			
	3	"	"		Drain Cocks			
	2	82	4-12-13		Cab Heaters			
	8	"	"		Truss Plank Heaters			
	12	"	"		Seat Heaters			
	2	103	2-1-13		Pneu. Cylinders			
	2	"	"		Plunger with rolled Pins			
	2	"	"		Trip Bars Complete			
	8	"	"		Movable Brackets			
	16	"	"		Pivots for Supp. Angles			
	4	"	"		Door Shoe Cams			
	1	"	"		Ratchet Foot Switches			
11901	4	367	8-29-13		Red Seal Batteries			
8585	2	180	4-26-13		Collapsible Shoes R.H.			
"	2	"	"		" " L.H.			
4332	2	"	3-13-13		Headlight Frames			
8464	2	202	5-17-13		Coin Register & Fare Boxes			
9920	2	283	5-17-13		Wheel Guards			
9902	2	211	5-16-13		" " Hoods			
8645	2	216	4-5-13		Motor Support Spring			
"	2	"	"		" " "			
8726	2	"	"		" " Spring Bolt			
	1	215	3-20-13		Pinions			
9161	2	216	4-5-13		Washer No.1			
"	4	"	"		Washer No.2			

FIG. 2—PROGRESS OF CARS, TRUCKS AND PAINTING; FIG. 3 PROGRESS IN DELIVERY TO HOME SHOPS



as 200 bolts but as twenty cars. Each day the reports of the inspector at the car builders' works as to the progress in the construction of the cars are noted on this chart and in conjunction therewith the progress in delivery of material. For material which has been shipped but not yet arrived the chart is cross-hatched, and for material delivered and found O. K. it is filled in solid.

Fig. 3 shows a similar chart for material delivered to the company's own shops and the rate of progress in turning out the cars complete for service.

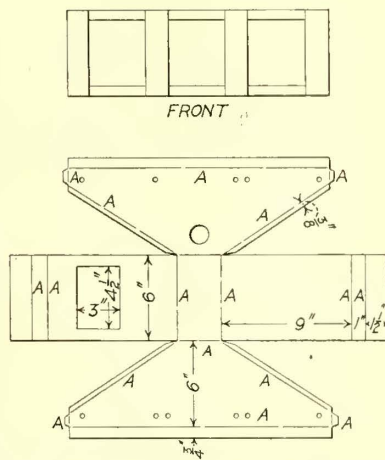
These charts permit the executive to see at a glance whether any items are falling behind. Thus in Fig. 3 it is evident that the delivery of heaters and batteries must be pushed if work is to proceed at the desired rate.

The charts give a ready picture of the status of the work from the placing of the order for the car bodies to the placing of the complete cars in service. Together with an index card file system they have furnished a satisfactory solution of the equipment problem.

### Illuminated Train Number Box

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD & INTER-URBAN RAILWAY, ROCKFORD, ILL.

The accompanying sketch of our train number box shows one that is very easily made in any railway shop. The body of the box is cut from a single piece of tin or light galvanized iron. If cut according to measurements no trouble will be experienced. All lines marked A must be turned at a clean sharp angle, a machinist's vise being used for the purpose. After the bends are made the box is ready to solder together. The divisions that separate the numbers are made of two strips of tin 1½ in. x 6 in. in size, soldered to the front of the box as shown in the sketch. The round hole shown is for an ordinary sign socket, preferably of Federal type. The rectangular hole, 3 in. x 4½ in. in size,



PATTERN FOR CUTTING OUT TRAIN NUMBER BOX

is for the door on the outside of the box. Two U-shaped slides are soldered to the box to hold the door in place. This door is made from a piece of tin or iron and has a small loop soldered thereto for convenient removal. The door gives access to the box when it is necessary to replace the lamp.

The number strips are made of painter's white muslin placed against a black background. These numbers run from 1 to 9 and 0. One strip is furnished with an E to designate extra trains. All strips are also provided with a black blank to be used when fewer than three numbers are needed. These number strips are glued at the ends to ½-in. x 6-in. wooden rolls. These rolls have a ¼-in. hole through the center through which the operating rod passes. For such operating rods we use trip rods from GE ML-2 circuit-breakers. However, a piece of ¼-in. round iron will answer the purpose if provided with some sort of a knob with which to turn it. The rods pass through the small holes shown in the sketch and through the hole in the

wooden rolls. They are held firmly in the rolls by friction.

The boxes are placed in the center front window of the car and are supported by iron or brass brackets



TRAIN NUMBER BOX

screwed to the sash. In wiring, enough slack is left so that the motorman can lift the box out of the brackets while changing the numbers. The light can be wired either in series with one of the car circuits or with the marker and classification light circuit.

### Voltmeter Measurements of Direct Current

BY G. H. MCKELWAY, DISTRIBUTION ENGINEER BROOKLYN RAPID TRANSIT SYSTEM

Practically all engineers are familiar with the use of a voltmeter for determining current in a wire from voltage drop, but few of them have tables that will give them quickly and easily a statement of the amount of current in the wire causing the drop found. Generally, after the measurement has been made, it is necessary to look up in a table the resistance per 1000 ft. of the size of wire upon which the measurements have been taken and then calculate from that the amount of current.

Much time will be saved by using tables which give the number of amperes in each size of wire corresponding with a drop of 1 millivolt over any specified length. A table such as the following is a great help.

AMPERES PER MILLIVOLT

Size of Copper Wire	Number of Feet				
	1	2	3	4	5
5,000,000 circ. mils. ....	476.0	268.0	158.6	134.0	95.2
2,500,000 circ. mils. ....	238.0	134.0	79.3	67.0	47.6
2,000,000 circ. mils. ....	190.4	95.2	63.4	47.6	38.0
1,500,000 circ. mils. ....	142.7	71.4	47.6	35.7	28.5
1,000,000 circ. mils. ....	95.2	47.6	31.7	23.8	19.0
500,000 circ. mils. ....	47.6	23.8	15.9	11.9	9.5
No. 0000.....	20.1	10.0	6.7	5.0	4.0
No. 000.....	16.0	8.0	5.3	4.0	3.2
No. 00.....	12.7	6.4	4.2	3.2	2.5
No. 0.....	10.1	5.0	3.4	2.5	2.0
No. 1.....	7.9	4.0	2.7	2.0	1.6
No. 2.....	6.3	3.2	2.1	1.6	1.3
No. 3.....	5.0	2.5	1.7	1.2	1.0
No. 4.....	4.0	2.0	1.3	1.0	0.8
No. 6.....	2.5	1.2	0.8	0.6	0.5
No. 8.....	1.6	0.8	0.5	0.4	0.3
No. 10.....	1.0	0.5	0.3	0.25	0.2

An even quicker method is to measure off different lengths on different sizes of wire and so arrange these lengths that the current in the wire can be read off either directly from the indications of the millivoltmeter or with a constant of 100, 10, 1 or 0.1. This will avoid all figuring after the meter reading has been obtained.

LENGTH OF WIRE

Size of Copper Wire	Constant			
	100 Ft. In.	10 Ft. In.	1 Ft. In.	0.1 Ft. In.
5,000,000 circ. mils. ....	4 9	47 7	.. ..	.. ..
2,500,000 circ. mils. ....	2 4½	23 9½	.. ..	.. ..
2,000,000 circ. mils. ....	1 11	19 9½	.. ..	.. ..
1,500,000 circ. mils. ....	1 6	14 3¼	.. ..	.. ..
1,000,000 circ. mils. ....	.. ..	9 6½	95 3	.. ..
500,000 circ. mils. ....	.. ..	4 9	47 7¼	.. ..
No. 0000.....	.. ..	2 0	20 1	.. ..
No. 000.....	.. ..	1 7	16 0	.. ..
No. 00.....	.. ..	1 7	16 0	.. ..
No. 0.....	.. ..	1 3¼	12 8½	.. ..
No. 1.....	.. ..	.. ..	7 11	79 0
No. 2.....	.. ..	.. ..	6 3½	63 0
No. 3.....	.. ..	.. ..	5 0	50 0
No. 4.....	.. ..	.. ..	4 0	40 0
No. 6.....	.. ..	.. ..	2 6	25 0
No. 8.....	.. ..	.. ..	1 7¼	16 0
No. 10.....	.. ..	.. ..	1 0	10 0





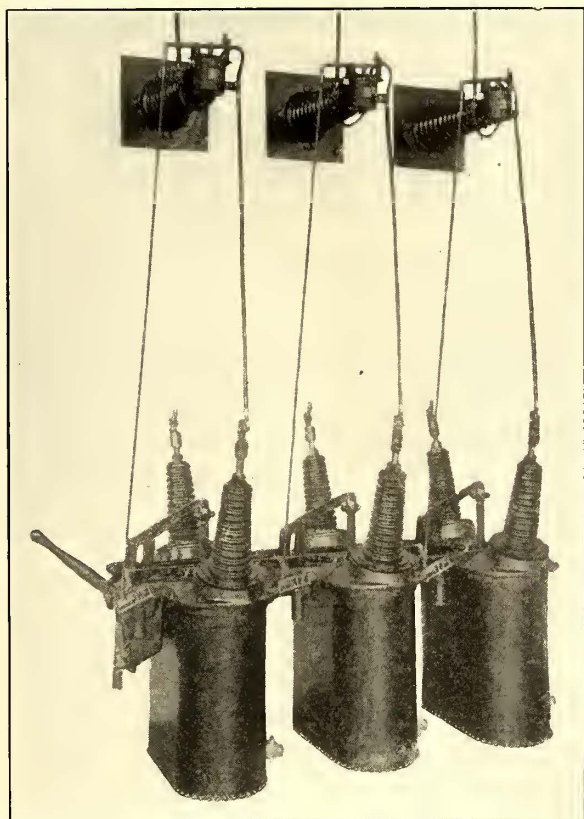


is required for lubrication. The representative for the inventor in this country is Joseph Gelbert, who is in the way and structure department of the Brooklyn Rapid Transit System.

### Series Trip for High-Voltage Oil Switches

Low-voltage current is usually employed to trip high-voltage automatic oil switches on the occurrence of abnormal conditions against which the automatic features are intended to guard. Electrically-operated switches are usually tripped by direct current; and for tripping hand-operated switches, alternating current is generally used. In many cases, however, neither low voltage direct current nor alternating current is conveniently or cheaply available; and then, automatic protection is secured by the aid of a high-voltage series trip.

For this service, the General Electric Company has developed an arrangement representing considerable



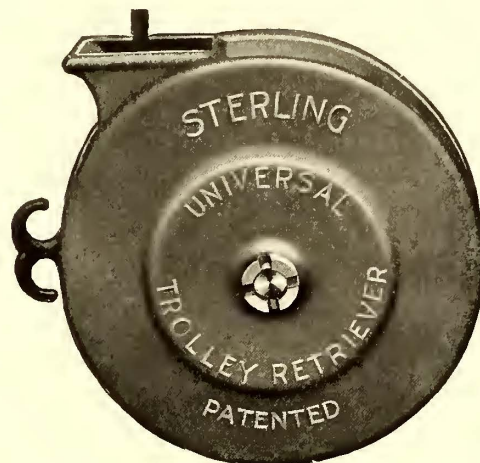
TRIPLE-POLE SINGLE-THROW 45,000-VOLT OIL SWITCH WITH TRIPLE-POLE TIME-LIMIT SERIES TRIP

improvement on types of high-voltage series tripping devices heretofore in use. The new features are: accessibility of the working parts for inspection; cleaning or adjustment while in service without danger; calibration at the oil switch itself, and not at the insulator supporting the series tripping solenoid; and the use of a new type of solenoid, which consists of but a few simple and rugged parts that need practically no attention whatever after installation.

The solenoid plunger is connected to the tripping mechanism of the oil switch by a wooden rod. Calibration, namely, change in current tripping values, is accomplished by a movable weight located near to the operating mechanism of the switch at a considerable distance from the high voltage current. This type of series trip is furnished for instantaneous or inverse time-limit operation. Time delay is obtained by means of a dashpot mounted on the tripping mechanism at the switch.

### New Trolley Retrievers and Catches

The New Haven Trolley Supply Company, New Haven, Conn., is just placing on the market the "Sterling Universal" trolley retriever, and the "Sterling" trolley catcher. These devices contain a number of novel features. For example, only one weight retrieving spring is used in the trolley retriever. This spring

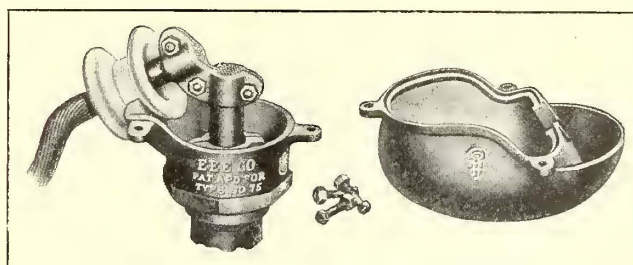


EXTERIOR VIEW OF TROLLEY RETRIEVER

can be adjusted to meet any tension of trolley pole desired, thereby making it unnecessary to carry in stock various sizes of retrieving springs. Action of the retrieving spring does not affect the service spring. It is asserted that these machines positively will prevent skipping or "walking up" of the pole after it leaves the wire. They contain very little mechanism, and the few parts are strong and simple. Repairs can be made without the use of tools other than a wrench with which to remove the case. The company absolutely guarantees for a period of five years all parts except springs. The springs, nevertheless, are said to be the best obtainable, and were designed specially for the characters of service required. Where desired, the company can supply machines that are interchangeable with present equipment.

### Third-Rail Cable End Bell

A cable end bell for use in connection with feeders supplying third rails has recently been developed and placed on the market by the Electrical Engineers Equipment Company, Chicago, Ill. The desire for more adequate protection for this class of feeders by a large



THIRD-RAIL CABLE END BELL

electric railway in the West prompted the development. The bell is so constructed that it can be mounted upon any size of iron pipe or fiber conduit, which is used in conducting the feeder cable. In case a lead-covered cable is used for the feeder, the lead sheath is cut away for a short distance from the end. The lead is then belled out so as to make a tight fit into the patented grounding clamp with which all of this company's end



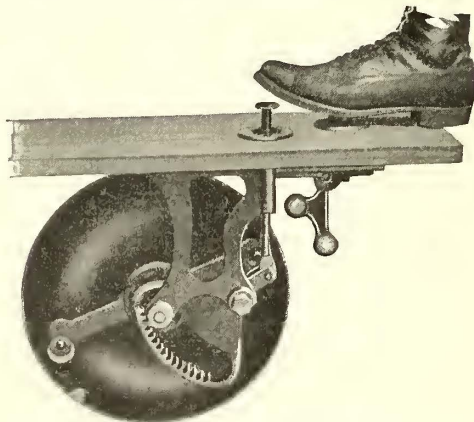
bells are equipped. The cable insulation is also cut away a few inches, depending upon the size, and a split tinned copper sleeve is slipped over the bare end. A similar sleeve is placed over the bare end of the rail cable which is introduced into the bell through a porcelain bushing. The two cables are then bolted rigidly together by means of a copper angle connector which fits over the copper sleeves. The bell can be used in connection with braided as well as lead-covered cables. This construction is shown in the accompanying cuts.

The lower portion of the bell is then filled with a compound completely sealing the cable, and the cover is put in place. This cover has been designed with an extension over the porcelain bushing to form a watershed which prevents moisture from entering the bell. By removing the cover and loosening the angle connectors the bell is readily made detachable. The completed bell forms a safe, simple and efficient means of protecting this class of feeders.

While designed originally to meet the specifications of one railway a number of other third-rail systems are now using the same equipment.

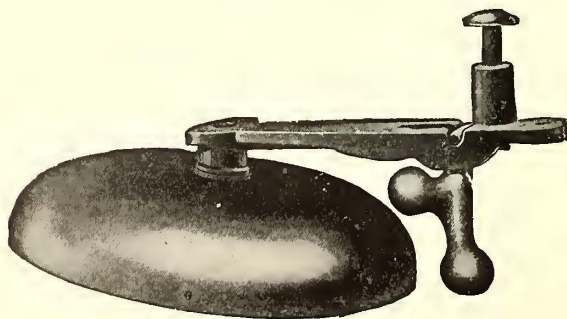
### Modern Gongs

One of the two accompanying cuts shows a combination rotary multiple ringing and single stroke foot gong made by G. C. Reiter, Canton, Ohio. This gong gives forth a loud, clear ring which can be varied from a single



COMBINATION ROTARY MULTIPLE RINGING AND SINGLE-STROKE FOOT GONG

tap to a continuous alarm. No springs are used. The gong itself is made of a most resonant bell steel, the hanger and knocker wheel are of cast iron and the lugs,



SINGLE-TAP FOOT GONG

which are electrically welded to the gong, are of steel. The mechanism inside the gong includes a centrifugal internal gear connected to a pinion whose ratchets engage with teeth on the rocker arm. A black japan finish is usually employed to prevent oxidation, etc. Mr. Reiter also supplies gongs of simpler form, such as single-

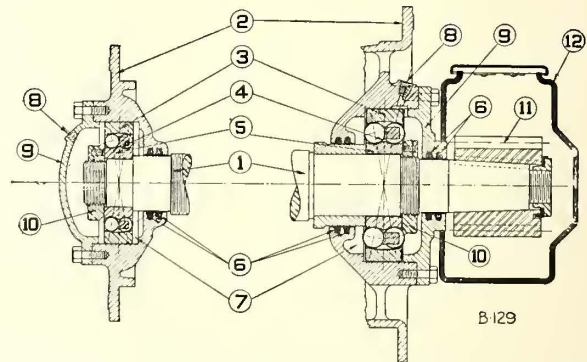
stroke foot or hood gongs and single-tap inside striking gongs. Although it is not generally known, this manufacturer not only makes gongs for every purpose but supplies a large number of those sold by the leading supply houses and car builders. These gongs are also used in large numbers by foreign tramways.

### Ball-Bearings on Storage-Battery Cars

Arthur V. Farr, M. E., who is with the S. K. F. Ball Bearing Company, New York, has recently prepared the following summary of the value of ball bearings in electric railway service:

The necessity for extreme accuracy in energy consumption has made the builders of storage-battery cars lead in the use of anti-friction bearings for journal boxes and motors. Every tie-up required for charging or boosting and every percentage increase in the coefficient of friction of the bearings limits directly the application of this type of car.

A storage battery of given ampere-hour capacity is able to take the car over a definite schedule. The amount of the starting and tractive efforts determines, among other factors, the limitations of this schedule. The use of ball bearings has reduced the starting effort upward of 50 per cent, which makes possible either quicker acceleration, using the same size motor, or greater mileage on the one charge, using a smaller



BALL-BEARING HEADS FOR A 65-HP RAILWAY MOTOR

- |                           |                                |
|---------------------------|--------------------------------|
| 1—Motor shaft             | 7—Lubricant chamber            |
| 2—Bearing head            | 8—Tap for lubricant supply     |
| 3—Outer ball race         | 9—Housing cap                  |
| 4—Balls and ball retainer | 10—Lock-nut to hold inner race |
| 5—Inner ball race         | 11—Driving pinion              |
| 6—Oil retaining grooves   | 12—Pinion casing               |

motor. Ball bearings in this way increase the sphere of application of accumulator cars, improving the running schedule and decreasing the number and duration of charging periods.

The reduced starting effort directly affects the battery characteristics. Battery efficiencies vary widely, depending upon the rate at which the battery is charged and discharged, and the extent to which the discharge has been carried when the charge is begun. High rates of discharge lower the efficiency, consequently types of axle bearings which necessitate heavy starting effort put a severe handicap on the storage-battery car.

Ball bearings, besides decreasing the starting effort, permit the car to coast farther than where plain bearings are used. This coasting feature is so noticeable that it is possible to take advantage of even the slightest inclines. On the whole, actual tests have shown that an increase of 10 per cent in mileage may be expected from the use of ball bearings.

Almost, if not quite, as important to the car maintenance department is the saving in upkeep and inspection which results from the use of ball bearings. The saving in maintenance charges due to the freedom from hot journals, frequent lubricant renewals, repairs, etc.,



is held to be from 35 per cent to 70 per cent. This significant saving is due to the fact that where ball bearings are properly mounted they do not require adjustment or repairs and are free from the intrusion of dirt and grit.

The saving in the lubricant used on the car journals is about 85 per cent. The ball-bearing journals can be sealed so that there is no leakage out of the journal box, and it is not necessary to lubricate the bearings more often than once in three months.

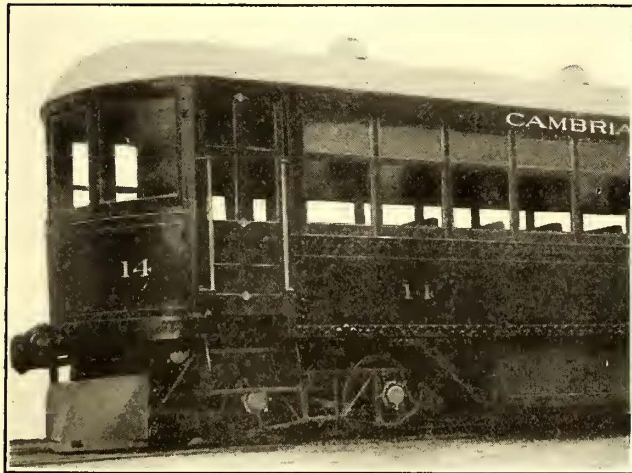
The reason for the reduced friction of ball bearings is that they substitute rolling action for the rubbing



BALL-BEARING JOURNAL BOX FOR STANDARD 0-50 TRUCK—  
RADIAL LOAD ON EACH JOURNAL 6500 LB.

friction of plain bearings. With bearings that are self-aligning, binding or wedging action of the balls is impossible. Also, bearings with the double row of balls permit the use of twice as many balls per bearing to carry the load and consequently reduce the load carried by each ball.

Ball bearings on the driving motors increase the life of the driving gears by maintaining the gear center



CAMBRIA & INDIANA RAILROAD BALL-BEARING AXLES—  
CAR WEIGHT 59,100 LB. TRUCKS, BRILL 69-E

distances. To prevent rapid wear, gears must mesh properly. When plain motor bearings wear or the armature shaft wears, the entire driving strain is taken by the inside corners of the driving teeth, and rapid wear with frequent failure of teeth results. Ball bearings minimize bearing wear and eliminate shaft wear, keeping the gears properly in mesh.

The substitution of the rolling of ball bearings for the rubbing action of plain bearings reduces the bearing wear to an amount that is so small that it cannot be measured and consequently the armature air gap is

maintained constant. This eliminates the danger of the armature falling on to the pole pieces and causing costly repairs. In fact, a prime cause of motor repairs is thus eliminated. Cars in the repair shop for motor trouble are generally there because of worn bearings, worn-out armatures, burnt-out armatures, etc., due directly to the fact that the plain bearings have worn down.

### Editor Eichel on Conditions in Germany

In a personal letter to a member of the editorial staff of the *ELECTRIC RAILWAY JOURNAL*, Eugen Eichel, editor of *Elektrische Kraftbetriebe und Bahnen* has some interesting things to say on conditions in Germany at this time, particularly with regard to railway and electrical affairs.

Mr. Eichel says that the war has led to a relaxation in the police rules governing passengers standing in electric railway cars, so that it is now quite common to see a car carrying as many passengers as it will hold. Consequently, the railways are operating at a lower service cost than in times of peace.

A number of autobuses and automobiles are still running in Berlin with the consent of the war department, although rubber tires and gasoline are extremely costly. In many cases a mixture of gasoline and wood alcohol is used, as the latter is abundant in Germany. Gasoline is also manufactured largely in Germany as a by-product of the coal-tar industry, and as both tar and coal are at hand in large quantities the question of fuel is not a pressing one.

Naturally the war offers a very favorable opportunity for the exploitation of electric lighting and electric vehicles, since both gasoline and petroleum have risen in price very much. The military authorities who first installed petroleum lighting for barracks, military hospitals, encampments and prisoners' quarters prefer electricity wherever it is possible to make connections with existing central stations or transmission systems. The use of electricity is particularly valuable for prison camps because the wiring and lamps can be so arranged that the turn of a switch will flood any suspicious area with light. In connection with the prison camps, Mr. Eichel writes that large numbers of illiterate Russian prisoners are being taught to read and write.

The large electrical companies of Germany have done praiseworthy service in fitting out military hospitals with electrical apparatus for sterilizing, cooking, x-ray and electro-therapeutical purposes. The Siemens-Schuckert Company, in particular, has equipped part of its new main building as a hospital with 400 to 500 cots, including an all-electric kitchen.

### War Affects Buenos Aires Underground

The Compagnie Générale de Tramways de Buenos Aires of Brussels reports that the first section of the Anglo-Argentine Tramways in Buenos Aires was opened for traffic in December, 1913, the length being 4.2 miles. During the first nine months of operation the average receipts, if applied to a whole year, would amount to about \$368,000 per mile per annum, as compared with \$249,600 in Paris, \$179,200 in London and \$377,600 per mile in New York. As a consequence of the financial crisis in Argentina the construction of the second underground section has been indefinitely postponed, although the hope is expressed that an extension of time will be granted by the authorities. The European war has reacted unfavorably on Argentina and a reduction in the operation of the tramways is held in prospect.



# News of Electric Railways

## NEW YORK COMMISSION INVESTIGATION

### Summary of Testimony of Commissioners McCall and Wood Before Legislative Committee

Edward E. McCall, chairman of the Public Service Commission of the First District of New York, was the witness before the legislative investigating committee on Feb. 4. He was examined first as to the methods and scope of the commission. Mr. McCall explained that he took the position because he believed a crisis had arisen in the subway contract situation. The commission was divided two to two over the dual system now well under way. He cast the deciding vote, after considering the matter five weeks. Five commissioners were necessary to the work of the commission. Colonel Hayward, counsel for the committee, recited the record of work outside of the commission on which Mr. McCall had been engaged during his early connection with the commission, to show that Mr. McCall had spent fifty-seven days in court or sitting as a referee and had missed nine stated meetings of the commission. Mr. McCall expressed the opinion that the jurisdiction of the commission should be extended so as to take in more of the Long Island Railroad and all Westchester County. He favored the first district commission looking after the New York telephones. He did not believe that any of the transit managers were disregarding the people's interests. He did not favor turning over the supervision of the construction of the new rapid transit lines to the Board of Estimate.

At the hearing on Feb. 5 Mr. McCall said that he was familiar with the conditions at the Brooklyn Bridge in rush hours and that he often used the subway. The fleet of automobiles of the commission consisted of five autos and two trucks. Colonel Hayward read into the record the chauffeur's slips. Mr. McCall explained that he was accustomed after his work at the office to ride in the commission's car toward his country home until he was met by his own and could transfer to it. All the rides were taken for the public service. His experience showed that a commissioner could not possibly practice law. He found that if he tried to do so he would break down. Mr. McCall considered that the civil remedies were adequate for the commission's purpose. He did not believe it was ever intended that the commissioners should seek an indictment for misdemeanor because a train was five minutes late or twenty-five people were standing in one place for ten minutes. He referred the committee to Commissioners Maltbie and Williams when the question of security issues was brought up.

Robert Colgate Wood, the member of the Public Service Commission appointed from the Bronx about eight months ago by Governor Glynn, was the witness on Feb. 6. He had been solicited to take the appointment. He was not a lawyer and had had no administrative experience except as a corporation director and in contract work. His lack of exact knowledge of the commission law he attributed to his short term of service with the commission. He consulted counsel for the commission in regard to all matters concerning the law. He had been active in public service corporation work only with the New York City Interborough Company and the Lincoln Gas Company, but retired from the former seven years ago. This experience had been valuable to him in his commission work. The property of the New York City Interborough Company was now included in the system of the Third Avenue Railroad. Mr. Wood had two telephones to his office in the commission, one connected through the local switchboard in the commissioner's office and one, a personal wire, connected with the telephone central at headquarters. Mr. Wood did not know whether other commissioners had similar unlisted wires. He understood, however, that there had always been two wires connecting his office. In this connection Senator Foley, the Tammany member of the investigating committee, explained that everybody in public service had a private wire. The testimony showed that Mr. Wood had paid personally for his private wire.

The hearings were resumed on Feb. 10.

In consequence of the attention that the legislative com-

mittee has devoted to the regulatory side of the commission's functions as apart from its work in providing for the dual subway system, the commission has caused to be issued a statement of what it has accomplished in the way of regulating public utilities since its creation on July 1, 1907.

## BAY STATE ARBITRATION HEARINGS

Testimony by Prof. Irving Fisher of Yale University in regard to the cost of living was the feature of the Bay State Street Railway arbitration at Boston during the week. In general Professor Fisher's evidence dealt with the relation between the cost of living and the shrinking value of the dollar, which topic is discussed at length in Professor Fisher's book, "Why the Dollar Is Shrinking," reviewed in the *ELECTRIC RAILWAY JOURNAL* of Jan. 30, 1915, page 264. Under cross-examination by Attorney James M. Swift, counsel of the company, Professor Fisher said that the expense of increasing the wages of employees should be laid upon the passengers. He said in conclusion: "It seems to me that the true solution for this difficulty into which the world is put by the rising cost of living and the shrinkage of the dollar, is for the railroads to raise their rates. That course was granted to a limited degree for the steam railroads against opposition with which I have no sympathy. I think it may well be true that the electric roads will come to the same necessity of raising their rates over the fixed 5-cent fare, to a 6-cent or a 7-cent fare, or a fare that changes from time to time like other prices in the community. This depreciation of gold necessitates the raising of all prices to correspond."

Professor Fisher held that almost all the large public problems of the day were due to the fact that the prices of commodities, labor, and of public service do not move together. He advanced the opinion that in reality the adjustment was not taken out of the passenger, because he got higher wages and income himself. In response to an inquiry by Chairman Pelletier, the witness said that the company should increase wages first and then apply to the Public Service Commission for permission to establish higher rates of fare, along the lines followed in the Middlesex & Boston Street Railway case, which offered an excellent precedent.

## FRANCHISE UPHELD

### Supreme Court of Minnesota Decides in Favor of the Duluth Street Railway

An important decision concerning the validity of the franchises of the Duluth (Minn.) Street Railway was rendered recently by the Supreme Court of Minnesota. The case was brought before the court on quo warranto proceedings by the Attorney-General of the State and was tried first in the District Court, where a decision was rendered in favor of the company on May 23, 1914. The contention of the State was that the original franchise of the company, granted in 1881, provided that the company should build 1 mile of street railway within one year of the date of the grant; that while the company did lay such a mile of track, the line was not equipped and put in operation until some months later after it had been reconstructed; that consequently the terms of the franchise had not been complied with, and since then the company had been operating on the street merely on sufferance and not by virtue of its contract. The company's claim was briefly that the State and the city, after thirty years' acquiescence and recognition of the franchise, was now estopped from raising any question on its validity.

In the trial in the lower court it was brought out that since the railway had been in operation, various actions had been brought against the company by the city and State on taxation and other matters, and that during this time there had been no claim, with one exception, which was not material, that the company was not occupying the streets by virtue of its franchise, and that the city had levied taxes on the company in which the franchise was assessed at a large sum. It was also shown that the company had sold securities to



the public, based on the validity of the franchise, that these securities had been purchased in good faith and that the company had been encouraged to do this because the city during this long period of time had never disputed the validity of the franchise. In view of these facts the court held that even had there been any failure to meet the terms of the franchise, action now was barred by the statute of limitations.

The court did not deny that a statute may create a self-executing forfeiture, but it held that none of the cases cited where such self-execution was held to have occurred contained facts especially like the case in question. The court held that the intent of the Legislature in the original grant was to have a railway built, but that the terms on which it should be built were largely of local concern. This was shown by the fact that the city could require extensions. Moreover, the city in 1882 had consented by formal resolution to a postponement of operation, and the railway was in operation within the time fixed by this last resolution.

The court finally held that as the franchises of the company were granted in 1881 for a period of fifty years, they would not terminate until 1931.

#### LEGISLATION IN INTEREST OF TORONTO

The Council of Toronto, Ont., has decided to oppose the application of the Metropolitan Radial Railway for power to lay double tracks on Yonge Street within the city limits; to apply to the Legislature for a declaratory act restoring the order of the Ontario courts declaring the Toronto Suburban Railway was liable to restore pavements as well as to repair, and to give the same definition to the word "tracks" as given by the courts; to seek an order for the cancellation of the company's franchise within the city limits for having refused to carry out the provisions of the agreement, and to give the city power to take over the system on similar terms to which it took over the Mimico & Scarborough divisions of the York Radial. A special committee has been appointed to confer with representatives of the Harbor Board and the Provincial Hydro-Electric Power Commission and consider and report upon a plan for a rapid transit system for the city and for the entrance of the radial lines. It was also decided to apply for an act declaring that the agreement between the city and the Toronto Railway means that the company is compelled to extend its tracks and to operate a service within the limits of the city as they may exist at any time, and not solely within the old limits of the city; for the confirmation of the Barnes report suggesting the company spend \$2,950,000 on new cars and extensions; for an amendment to the assessment act to provide for the assessment of railway rolling stock, and for the imposition of a percentage tax on capital stock of the railway companies. The Mayor's proposal that application be made to the Ontario Railway Board for an order compelling the Metropolitan Railway to reduce its fares within the city limits was referred back to the Board of Control, as was his suggestion that power should be sought to enable the city to purchase and operate a system of motor busses.

At a joint meeting of the members of the City Council of Toronto, the Harbor Commissioners and Sir Adam Beck, representing the Hydro-Electric Power Commission of Ontario, on Feb. 4, it was decided that the engineers and legal advisers of the three bodies should confer on the legal and engineering aspects of the transportation situation and that the engineers should prepare a general scheme for a rapid transit system for the city and suburbs, embracing a common entrance for the radial lines on the north, west and east of the city. Sir Adam Beck said the Government intended to oppose the granting of new franchises to electric companies and refuse an extension of time for construction to those who had obtained franchises in the past. The Provincial Hydro-Electric contemplated the construction of 1600 miles of radials in the province, and the success of the system depended upon being able to obtain an entrance into Toronto, the hub of the system. As soon as the engineers have prepared the general scheme for the radial railways it will be submitted to the conference, the object being to advance the project so that it may be submitted to the people at the next municipal elections.

#### INDIANA LEGISLATURE

The following new bills have been introduced in the House: a bill providing that the officers of all incorporated companies in the State shall send annually to the stockholders a report of the business transacted; a bill providing that newspapers may contract with railroads for advertising, taking mileage or transportation in payment for the same; a bill providing for the regulation of labor for hire, for the adjustment of all controversies arising therefrom by arbitration, and that all labor for hire shall be "compensated on a truly competitive basis."

The following bills have been killed in the House: House bill 554 of the 1913 session, which was vetoed by the Governor after the Legislature adjourned in March, 1913, providing that railroad engineers be permitted to run their trains across electric railway tracks without stopping; bill for amendment providing that towns of 500 population can order the installation of protective signal devices or flagmen at railroad crossings; bill providing for installation of suitable signs at railroad crossings, cost to be borne between township and companies; bill providing that electric railways shall pave between the tracks with the same material that is used for the remainder of the street.

A bill has been passed by the House providing that steam and electric railways shall maintain station flagmen or automatic signal devices at all crossings where the view is obstructed, provided a petition for such man or device is presented by five freeholders.

The following new bills have been introduced in the Senate: a bill providing certain regulations for the ventilation of street and interurban cars and passenger stations; a bill providing that where a public utility does an interstate business the rates charged in Indiana shall be no greater than the rates charged by the utility in another State; a bill providing for a uniform bill of lading to be used by all shippers; a bill making uniform the law in regard to transfer of stocks of corporations; a bill making it unlawful for a public service corporation to supply service to another State unless a schedule of rates charged in the foreign State shall first have been filed with the Public Service Commission of Indiana; a bill prohibiting the payment of dividends by corporations unless the dividends have been actually earned; a bill prohibiting any person from acting as a director in any corporation unless he is a bona fide stockholder in such corporation; a bill giving the Public Service Commission power to order the separation of grade crossings in cities of 20,000 population or less.

The bill to prevent public utilities from diverting funds or assets after an examination of the property of the company has been ordered by the Public Service Commission has passed the Senate.

#### STORM IN ONTARIO

The whole Province of Ontario was in the grip of the storm king on Feb. 2. In one of the worst gales which has swept over the province during the past decade, Toronto was cut off entirely from railway communication for more than eight hours. The storm paralyzed radial traffic in and out of Toronto. During the morning all traffic was practically at a standstill, and only the snowplows were able to make headway against the gale. These were of little practical use, however, as the wind swept the drifts over the tracks again. The Toronto Railway ran cars without any attempt to keep to the schedule, and residents of the eastern and western sections were without service for more than three hours. About noon, however, the street railway officials succeeded in bringing about the opening of all lines in the city.

The Galt, Preston & Hespeler Railway ran sweepers all night in Galt so as to keep the line open. The service was irregular. Street railway service in Guelph has practically been out of business since Jan. 30. The electric railway service between Woodstock and Ingersoll was completely tied up. The Hamilton Street Railway operated cars all night in order to keep the system open. In Kingston steam and electric railway service was demoralized and business was practically at a standstill, and in St. Thomas the street railway system was tied up all day and the electric line from St. Thomas to London and Port Stanley was blocked.



CLEVELAND MATTERS

The opinion prevails in Cleveland that the Council will not authorize the Cleveland Railway to purchase some additional auto busses to determine their adaptability for passenger business. John J. Stanley, president of the company, said recently that a dozen busses in addition to the two now in use would be necessary to test their work on East Thirtieth Street, as is proposed in the Stolte resolution now before Council. He is not in favor of the plan.

City engineers have reported that the plan to build a subway under the Cuyahoga River, in connection with the elimination of a dangerous bend near the site of the proposed Lorain-Huron bridge, is feasible. Councilman Moylan requested the investigation in the belief that a tube could be built in connection with the construction of the bridge and that it could be used by a rapid transit line in the Walworth Run valley.

At a recent meeting of the Lakewood Chamber of Commerce it developed that Lakewood is willing to grant the Cleveland Railway an extension of franchise in return for the extension of the West Madison line from West 117th Street to Riverside Avenue, Lakewood. The company desires the franchise to expire with that of the Tayler grant in 1934. The plan would give the Lakewood people 3-cent fare within their own city.

ONTARIO RAILWAYS UNDER COMPENSATION ACT

The steam and electric railways of the Province of Ontario learned through their representatives on Jan. 15 what the Workmen's Compensation Commission expects of them under the operation of the compensation act. Lawyers representing the different companies called upon the commission and went fully into the subject of their responsibilities and duties under the act. The board pointed out the procedure established. The railways are in Schedule 1 of the act, which means that while they are under the general provisions of the measure they are not brought within the grouping system, each company being held individually liable for the compensation due a workman or his dependents in case of injury or death. According to the board's plans, when a workman is injured or killed, the company must at once notify the commission, supplying a physician's report and other data. The commission passes upon the case, fixes the compensation due the workman and notifies the company. A check for the amount fixed must then be forwarded to the commission, which places it upon record and sends it on to the workman. In every respect the employee of a railway receives the same protection and compensation as the worker under the general scheme, the only difference being that he gets his compensation from his employer instead of from a general fund. The board has met one objection to the individual liability system advanced by the men by arranging that the worker need not go to the employer to claim his rights. This is designed to protect the timid workman against relinquishment of his compensation or a part of it, especially in case of slight injury, owing to the fear that the pressing of his claim may prejudice his situation.

DEVELOPMENTS IN CINCINNATI.

The Rapid Transit Commission of Cincinnati has been asked by the Central Avenue Improvement Association to have the subway, necessary to the proposed rapid transit road, run down Central Avenue instead of Plum Street, no matter which of the four schemes under consideration may be adopted.

On Feb. 5 the People's Power League filed a petition with the city auditor, with 10,632 signatures, asking that a referendum vote on the franchise granted the Cincinnati, Newport & Covington Street Railway be taken at the regular election in November. The auditor has asked the city solicitor's opinion as to whether two elections will be necessary, one at the regular date in the fall, in compliance with this petition, and a special election on March 9, as asked in a petition filed by the business men of the city previously. The latter contained 30,000 names. While City Solicitor Schoenle had given no opinion early in the week, it is believed that the special election will be held. This company has informed the city that it will use some other streets

than those designated in its franchise, if its plan should interfere with the rapid transit road that is now under consideration.

I. C. C. ACCIDENT BULLETIN FOR YEAR

The Interstate Commerce Commission has issued accident bulletin No. 52, covering the three months ended June 30, 1914, and the year ended June 30, 1914. The table of collisions and derailments on electric railways for the year contained in the bulletin follows:

No.	Classes	Number	Number of Persons		Damage to Road and Equipment and Cost of Clearing Wrecks
			Killed	Injured	
<b>Collisions:</b>					
1	Rear .....	69	18	675	\$24,793
2	Butting .....	32	4	143	51,906
4	Miscellaneous .....	53	1	208	17,473
	<b>Total .....</b>	<b>154</b>	<b>23</b>	<b>1,026</b>	<b>\$94,172</b>
<b>Derailments due to:</b>					
5	Defects of roadway....	18	1	38	\$11,032
6	Defects of equipment..	16	..	37	8,033
7	Negligence of trainmen, signalmen, etc. ....	8	..	9	1,173
8.	Unforeseen obstruction of track, etc.....	14	1	38	5,750
9	Malicious obstruction of track, etc. ....	3	..	7	395
10	Miscellaneous causes....	19	2	134	11,003
	<b>Total .....</b>	<b>78</b>	<b>4</b>	<b>263</b>	<b>\$37,386</b>
	<b>Total collisions and derailments .....</b>	<b>232</b>	<b>27</b>	<b>1,289</b>	<b>\$131,558</b>
<b>Total for year:</b>					
	1913 .....	275	29	1,401	211,777
	1912 .....	261	21	1,605	117,865
	1911 .....	255	92	1,291	110,466

The summaries of casualties to persons on the electric railways for the years ended June 30, 1914, and 1913 follow:

No.	Item	1914		1913	
		Killed	Injured	Killed	Injured
<b>Passengers:</b>					
1	In train accidents.....	18	1,182	10	1,252
2	Other causes .....	40	2,047	26	1,789
	<b>Total .....</b>	<b>58</b>	<b>3,229</b>	<b>36</b>	<b>3,041</b>
<b>Employees on duty:</b>					
3	In train accidents.....	9	100	18	154
4	In coupling accidents.....	2	25	1	19
5	Overhead obstructions, etc....	2	28	6	34
6	Falling from cars, etc.....	8	126	8	138
7	Other causes .....	25	289	17	203
	<b>Total .....</b>	<b>46</b>	<b>568</b>	<b>50</b>	<b>548</b>
<b>Total passengers and employees on duty.....</b>					
	<b>104</b>	<b>3,797</b>	<b>86</b>	<b>3,589</b>	
<b>Employees not on duty:</b>					
8	In train accidents.....	..	16	..	5
9	In coupling accidents.....	..	..	..	..
10	Overhead obstruction, etc....	..	..	..	..
11	Falling from cars, etc.....	1	13	1	19
12	Other causes .....	2	5	2	4
	<b>Total .....</b>	<b>3</b>	<b>34</b>	<b>3</b>	<b>28</b>
<b>Other persons not trespassing:</b>					
13	In train accidents.....	1	4	1	8
14	Other causes .....	247	1,081	196	860
	<b>Total .....</b>	<b>248</b>	<b>1,085</b>	<b>197</b>	<b>868</b>
<b>Trespassers:</b>					
15	In train accidents.....	..	..	..	..
16	Other causes .....	168	139	117	123
	<b>Total .....</b>	<b>168</b>	<b>139</b>	<b>117</b>	<b>123</b>
<b>Total accidents involving train operation .....</b>					
	<b>523</b>	<b>5,005</b>	<b>403</b>	<b>4,608</b>	
17	Industrial accidents .....	28	1,053	19	798
	<b>Grand total .....</b>	<b>551</b>	<b>6,108</b>	<b>422</b>	<b>5,406</b>

CHICAGO TRACTION FUND FOR AUTO BUSES

According to an opinion handed down by the corporation counsel of Chicago, the City Council is at liberty to use the traction fund, which represents the city's share of the net earnings of the surface lines, for the purchase and operation of a municipal bus system. In brief the opinion states that the city may, upon the passage of an appropriate ordinance, use the traction fund to acquire these buses and other property necessary for the operation of the bus line. The city may also acquire and own a bus system and lease it to a corporation for operation. Before an ordinance for acquiring and conducting the system would be legal, however, it must



have the approval of the voters, and they must also approve the plan for operating the system. This opinion was based upon the fact that although the traction ordinances provide that the city traction fund shall be used for the purchase and construction of street railways, the Supreme Court held that subways come under this provision. Furthermore, it was claimed that the 1907 City Council had no right to bind the succeeding councils on the purpose for which the traction fund should be used, providing the city's contractual relations were not molested.

**Ohio Legislation.**—A bill has been introduced in the Legislature to require all interurban and street cars to be equipped with a particular style of air brake and a particular sander.

**Utah Commission Bill Opposed.**—The Evans bill to create a public utilities commission in Utah was opposed by the representatives of the railroads and the public utilities on Feb. 5 as being unfair and unduly burdensome. The hearing was continued by the Senate committee to Feb. 9.

**Kansas City Enabling Act.**—A bill has been introduced in the Legislature of Missouri authorizing Kansas City to put aside the percentage it receives under the new franchise granted the Metropolitan Street Railway until sufficient money has accumulated to purchase the system.

**Transfer of Ferry Service Sought.**—Mayor Malone, of Chelsea, Mass., will shortly confer with the Boston Chamber of Commerce on behalf of turning over the ferry service between Chelsea and Boston to the Boston Elevated Railway and Bay State Street Railway in case the consolidation of the two companies is approved by the Legislature.

**Toledo Prize Awards.**—In the contest for the best criticism of the first franchise draft prepared by Henry L. Doherty and his associates in the Toledo Railways & Light Company awards were announced on Feb. 2. Judge John A. Doyle received the first prize, \$100; Orville S. Brumbach, second, \$75; William C. Clark, third, \$50, and S. P. Bowles, fourth, \$25.

**Recent New York Bills.**—Among the bills introduced recently in the New York Legislature are the following: to amend the public service commissions law in relation to quotation of rates by common carriers; to amend the railroad law in relation to the minimum number of employees to be employed in the operation of certain trains; to amend the railroad law in relation to the length of trains.

**Extension Question in Toronto.**—The suggestion of Mayor Church, of Toronto, Ont., that application be made to the Ontario Legislature for the passing of an act compelling the Toronto Railway and the Toronto Suburban Railway to extend their lines and improve their services and equipment forthwith was adopted by the Board of Control on Jan. 29. The matter was expected to come before the Council on Feb. 1.

**Subway Report in Los Angeles.**—The Council of Los Angeles, Cal., by a unanimous vote, has adopted a resolution instructing the Board of Public Utilities to make a careful study of the traffic situation between Temple Street on the north, Tenth Street on the south, Main Street on the east, Hill Street on the West, and submit a report showing the results of such investigations and estimates of cost covering the construction of a subway system.

**Rehearing Denied in Mill-Tax Case.**—The Supreme Court of Missouri has denied the application of the United Railways, St. Louis, Mo., for permission to file a motion for a rehearing in the mill-tax case. The case will be appealed to the Supreme Court of the United States. The company will contend in presenting the case to the United States Supreme Court that the Missouri Supreme Court misinterprets a former decision of the United States Supreme Court.

**Important Question Before Ohio Commission.**—Walter M. Schoenle, city solicitor of Cincinnati, and Lawrence Maxwell and Ellis G. Kinkad, attorneys for the company, requested the Public Utilities Commission of Ohio on Jan. 25 to state the extent to which the Cincinnati Traction Company will be allowed credit in its reproduction value for the money spent in paving between its tracks. The opinion of the commission is desired as a guide in the consideration of the questions that have come up with regard to the road.

**Illinois Public Utilities Commission Closes First Year.**—The State Public Utilities Commission of Illinois has closed its first year of work and reports receipts of \$510,173 and expenditures of \$180,000, including all salaries and the fitting up of offices in Springfield and Chicago. More than 3000 cases were considered during the year, and of approximately 500 formal cases heard eighteen appeals were taken from the decision of the commission. Nine of these appeals were heard in the circuit court of Sangamon County at Springfield and in no case was the decision of the commission reversed.

**Bills Introduced in Maine.**—Two workmen's compensation measures known respectively as the Swift bill and the Cole bill, have been introduced into the Legislature of Maine. A bill regarded as the most drastic bill by far presented at the present session has just made its appearance in the Senate. This measure would create the People's Water Rates & Power Commission. Under it all water powers now privately owned would be taken over by the commission, rented for the benefit of the State and the entire question of the control of water powers taken from the jurisdiction of the Public Utilities Commission.

**Key Route Must Build Interlocker.**—The Railroad Commission of California has rendered a decision in which it finds that the interlocking plant at Lowell Street and Stanford Avenue in the city of Oakland is inadequate and unsafe. This tower protects the tracks of the San Francisco-Oakland Terminal Railways, the Southern Pacific Company and the Atchison, Topeka & Santa Fé Railway. These carriers are directed to replace the present tower with a first-class, standard, interlocking plant within six months from the date of the commission's order. The first-named company will have to bear the greater portion of the expense.

**Proposed Consolidation of Utilities and Tax Commissions.**—There has been talk in Ohio, in connection with the Governor's program of economy, of consolidating the State Public Utilities and the State Tax Commissions. James Boyle and J. H. McGiffert have been nominated as members of the Tax Commission to succeed Frank E. Munn and Christian Pabst. Mr. Boyle served as private secretary of the late William McKinley when he was Governor and as consul to Liverpool during Mr. McKinley's administration as president. Mr. McGiffert was connected with the State Auditor's office under Walter D. Guilbert and E. M. Fullington and afterwards was transferred to the State Tax Commission in charge of the collection of the excise tax on corporations.

**Los Angeles Railway Purchase Considered by City.**—The City Council of Los Angeles, Cal., is considering what policy it shall follow in handling expiring street railway franchises. The acquisition of the street railways by the city under the charter provision whereby the city may issue bonds against a revenue-producing utility is being urged. At a recent executive conference of the Council, George A. Damon, associate of Bion J. Arnold, Chicago, who made the transportation study for the city several years ago, said that the city could take over the railways by paying a portion of the equity value of the railways, and issuing bonds against the railways themselves for the balance. The Council as a committee of the whole has referred the matter to the board of utilities.

**Philadelphia Councils Desire Rapid Transit Details.**—Councils, in both chambers, on Feb. 4, adopted a resolution requesting Transit Director A. Merritt Taylor to present to Councils, if possible by Feb. 18, a complete list and full description of the subway, elevated and surface lines contemplated to be constructed under his rapid transit improvement plans. Robert S. Dripps, reform floor leader in Common Council, declared that Mr. Taylor had made a full report to Councils on his plans last summer and that the resolution was aimed to prevent the people expressing their views at the proposed special election next month on the Taylor plans by vote at the polls on the \$30,000,000 permanent loan for carrying on the work. Mr. Taylor said: "All the information required by the resolution has been worked out in detail and is on file in the Department of City Transit. I am very glad to have the opportunity of furnishing this information to the City Councils in the specific form requested, with every detail which is relevant thereto."



# Financial and Corporate

## MR. BYLLESBY ON BUSINESS

### This Public Utility Operator Looks Forward to a Recurring Period of Reasonable Expansion of Utility Business

H. M. Byllesby, speaking in a recent interview particularly about electric light, power and gas properties, stated that these seem to be enjoying a greatly increased popular standing on account of the stability which they have shown during the last few years of legislative attacks and generally depressed business conditions.

In regard to the general business conditions, Mr. Byllesby said:

"From one end of the country to the other there is a growing confidence in a revival of general business, and there is no enterprise which responds more quickly to such a revival than the public utilities. The corollary naturally follows that with a revival in the activity of the utilities, a corresponding increase is immediately felt in the operation of the vast industries whose business is the manufacture of wire, pipe, structural material, electrical machinery, boilers and various adjuncts for utility operation.

"Within the last few years there has been a very pronounced curtailment of the development of all classes of utilities on account of a variety of reasons, principal among which have been the extreme difficulty of providing capital for their further development and the disinclination of the operators of such properties to engage in further development risks in the face of the drastic attitude of the public and regulatory bodies and the uncertain business conditions. Believing that both of these conditions have materially changed for the better within the last few months, however, I have reason to expect a recurring of reasonable expansion of the utility business."

## MR. FARRELL SEES BUSINESS BOOM

### Head of Steel Corporation Sees Unprecedented Opportunities at Hand in the United States

President Farrell of the United States Steel Corporation, in a recent address before the Engineers' Society of Western Pennsylvania, stated that the financial tide in the United States has turned and that the country now has before it a period of unprecedented prosperity. In his opinion, every day now records a marked improvement in the general situation.

Continuing Mr. Farrell said:

"Our foreign trade balance for January will approximate \$150,000,000, a figure never before approached in our history. Eminent authorities have calculated that this may easily reach \$1,000,000,000 for 1915. This is important, for the years of greatest prosperity have been when the balances were largely in our favor.

"We are furnishing Canada with capital and we have made a beginning in extending investment to South and Central America. Moreover, the United States is to-day the chief granary of Europe. The prices received should insure for our farming population and therefore for the general population an unprecedented measure of prosperity.

"The steel trade is improving and the outlook is encouraging. The lumber industry is showing similar results. Large orders from belligerents and neutrals in Europe are keeping various lines of industry quite busy. Building has been quiet, but investors are coming to realize that money can be saved by starting operations now, material being available at unusually attractive prices. There is evidence of increasing merchandise traffic on the railroads, of opportunity to earn more money to establish credit and make expenditures for materials and equipment—which all mean activity in manufacturing lines dependent upon railroads for orders."

Mr. Farrell, in closing his address, announced the resumption of new construction work by the United States Steel Corporation. He said that last year the company had suspended all operations of new construction in the Pittsburgh district, but as evidence of its faith in the immediate future it had decided to proceed with work at once in order that it might be prepared for greater things.

## ANNUAL REPORTS

### Cleveland Railway

The statement of income, profit and loss of the Cleveland (Ohio) Railway for the year ended Dec. 31, 1914, follows:

BASED ON ORDINANCE ALLOWANCES		Cents Per Car Mile
Operating revenues:		
Revenue from transportation.....	\$7,610,592	
Revenue from operations other than transportation .....	81,751	
Total operating revenues.....	\$7,692,343	23.80
Expense allowances:		
Maintenance allowance .....	\$1,602,398	4.96
Operating expense allowance.....	3,910,934	12.10
Total expense allowances.....	\$5,513,332	17.06
Operating income .....	\$2,179,011	6.74
Non-operating income .....	43,334	0.13
Gross income .....	\$2,222,345	6.87
Taxes .....	466,996	1.44
Net income .....	\$1,755,349	5.43
Interest .....	1,702,259	5.27
Surplus .....	\$53,090	0.16
Special allowances .....	180,000	.055
Deficit .....	\$126,910	0.39

BASED ON DISBURSEMENTS		Cents Per Car Mile
Operating revenues .....	\$7,692,343	23.80
Actual expenses:		
Maintenance of way and structures.....	\$1,158,683	3.58
Maintenance of equipment—except power plant .....	649,898	2.02
Maintenance of power plant.....	119,677	0.37
Power .....	728,227	2.25
Conducting transportation .....	2,406,999	7.45
Traffic .....	899	0.00
General and miscellaneous.....	815,113	2.52
Total maintenance and operating expenses.....	\$5,879,676	18.19
Operating income .....	\$1,812,667	5.61
Non-operating income .....	43,334	0.13
Gross income .....	\$1,856,001	5.74
Taxes .....	466,996	1.44
Net income .....	\$1,389,005	4.30
Interest .....	1,702,259	5.27
Deficit .....	\$313,254	0.97
Obsolete equipment .....	120,000	0.37
Total deficit .....	\$433,254	1.34

The increase in passenger revenue during the year, exclusive of transfers, amounted to \$299,616 or 4.31 per cent, while the increase in passenger revenue, including transfers, was \$532,336 or 7.66 per cent. Gross income increased \$554,911 or 7.58 per cent. The increase in maintenance allowance was \$99,267 or 6.6 per cent, and the increase of maintenance expenses was \$235,427 or 13.91 per cent. The operating allowance increased \$216,111 or 5.85 per cent, while the operating expenses increased \$246,953 or 6.66 per cent. Taxes increased \$32,323 or 7.3 per cent, and interest \$130,688 or 8.31 per cent. The total increase in operating expenses, taxes and interest amounted to \$409,965 or 7.18 per cent, and the increase in maintenance and operating expenses, taxes and interest was \$645,392 or 8.72 per cent. The year showed the following increases in transportation statistics: Fares, 9,638,017 or 4.37 per cent; transfers, 5,056,031 or 5.77 per cent; rides, 14,349,271 or 4.61 per cent; ordinance car-miles, 1,965,425 or 6.52 per cent, and actual car-miles, 2,605,760 or 8.43 per cent.

The report states that the most important development during the year, in its effect upon the finances of the company, was the increase in the rate of fare. In July the net balance in the interest fund fell below \$300,000 and on Sept. 1 the company began to retain the 1 cent charge per transfer instead of returning it. The effect of this on the passenger revenue was an increase of 8.97 per cent for September, 11.21 per cent for October, 16.06 per cent for November, and 9.07 per cent for December as compared to the corresponding months of 1913. The first eight months of 1914 showed an increase in passenger revenue of 5.84 per cent and the last four months an increase of 11.21 per cent, or an average for the twelve months of 7.66 per cent.



The receipts for transfers in the last four months amounted to \$232,719. Omitting these transfer receipts, the report shows that the increase for the last four months dropped to 1.32 per cent, which was made up of increases as follows: September, 0.87 per cent; October, 1.24 per cent; November, 5.75 per cent and December, 0.42 per cent. The receipts for November, 1913, was less by about \$40,000 than they would have been but for the great storm of that month. If this amount were added to this month's revenues to bring them up to normal, the increase in November, 1914, would be changed to a decrease. The last four months of the year would then show a decrease of 0.375 per cent instead of an increase of 1.32 per cent. The serious drop in earnings came in August. On the basis of actual earnings the passenger revenue for the first seven months increased 6.59 per cent and for the last five months 1.27 per cent. On the basis of the revised figures for November, 1913, the passenger revenue during the last five months decreased 0.07 per cent, giving an average of 3.71 per cent as compared to 4.31 per cent under the preceding calculation. The increase in the rate of fare, which was intended to make up the depletion in the interest fund, was therefore but little more than enough in the four months to take the place of the reduction in earnings in the last five months caused by the change in general business conditions.

The charges to expense during the year for repairs of the physical property and for such renewals as were properly chargeable to expense, amounted to \$1,928,437 or 5.97 cents per revenue car mile. The total amount allowed for these purposes and for depreciation was \$1,602,398. The expenditures, therefore, exceeded the ordinance allowance by \$326,039, and the maintenance, renewal and depreciation reserve at the end of the year was over-expended to the extent of \$490,687. During the ten months ended Dec. 31 the company deducted from gross receipts and credited to the reserve \$120,000 for abandoned property, whose reproduction value is set at \$705,348. The company is also charging gross receipts and crediting to the reserve \$6,000 per month from March until \$217,444 has been paid in, this sum being the amount of over-expenditures in the maintenance, depreciation, and renewal reserve on March 1, 1913.

The operating expenses for the year were 12.22 cents per car mile, or 0.12 cents in excess of the operating expense allowance. The report states that it may be necessary, therefore, to make an application to the City Council before the end of the ordinance year for at least a temporary increase in the allowance. It is stated that there was an increase in revenue car miles in the year as a whole, but that the service was reduced in August and figures for the last four months show a decrease of about 305,000 miles. If this reduction in service had not been made, the operating expense allowance would have been \$37,000 greater, but the actual expenses would have been increased only about half of this amount. Furthermore, the earnings of the entire road per car mile were 23.32 cents, but the earnings of new crosstown lines varied from 10.09 cents to 20.75 cents and their total cost of operation, including maintenance, operating expenses, taxes and interest, was 25.27 cents. There was also an increase of expenditures in the accident department, due to causes beyond the control of the management, from 1.02 cents to 1.27 cents per car mile.

One hundred and sixty new cars were added to the company's rolling stock during the year, and sixty-nine cars were retired. On the basis of numbers only, the net increase in the year was 8 per cent. On Dec. 31 the company had 1373 revenue cars and 183 service cars. Its single track mileage was 344,746 miles. Betterment expenditures during the year amounted to \$2,577,867.

The total number of stockholders of the company is 4262, with average holdings of thirty-nine shares. The stockholders residing in Ohio, 3813 or 89.5 per cent, own 88 per cent of the outstanding stock. Of these stockholders, 2979 with an average holding of sixty-six shares, reside in Cleveland and Cuyahoga County.

In March the stockholders were allowed to purchase additional capital stock to the amount of 10 per cent of their holdings. Of the \$2,141,000 offered, \$2,137,400 was so sold. In September an additional offering of \$2,382,000 was made, of which \$1,914,800 had been issued up to Jan. 20. On Dec. 31 the total amount of capital stock outstanding was \$25,221,200.

## KANSAS CITY REORGANIZATION PLAN

### No Assessment on Stock Issues of Kansas City Railway & Light Company—New Bonds Proposed—\$3,400,000 of Working Capital Needed

Chairman Dunham of the reorganization committee of the Kansas City Railway & Light Company, Kansas City, Mo., on Feb. 8 announced the details of the proposed plan of reorganization for the company. The \$9,407,500 of preferred stock and \$9,543,080 of common stock of the Kansas City Railway & Light Company outstanding in the hands of the public will remain undisturbed, and no assessments will be levied.

The secured indebtedness of the company, amounting to \$28,700,000, is to be cared for in the following ways: To pay off \$24,920,000 of overdue securities (including \$10,200,000 of Kansas City Railway & Light Company first lien refunding mortgage 5's, \$5,478,000 of Kansas City Railway & Light Company Series A and Series B 6 per cent notes, \$7,242,000 of Metropolitan Street Railway consolidated mortgage 5's and \$2,000,000 of Central Electric Railway first mortgage 5's), to provide for additions and to pay debts, there will be a new issue of twenty-five-year 5 per cent first mortgage bonds exclusively upon the street railway property of the Kansas City Railways, the successor to the Metropolitan Street Railway, and also an issue of new twenty-five-year 6 per cent first lien collateral mortgage notes of the Kansas City Railway & Light Company. The collateral for this second new issue will be the stock of both the street railway and the lighting properties. The electric light company will be left without a direct lien on its property, and will have power to mortgage it for future extensions, provided the stockholders under commission approval raise \$150 for every \$850 raised by bonds.

In changing the old overdue issues into these two new issues, the Metropolitan Street Railway consolidated mortgage 5's and the Kansas City Railway & Light Company first lien refunding mortgage 5's are to be exchangeable at 107 for the new Kansas City Railway bonds. Provision is made, however, that the Metropolitan bonds may be changed at par into a separate issue of three-year 5½ per cent notes of the Kansas City Railway & Light Company. The matured Series A and Series B notes of the Kansas City Railway & Light Company are to be exchanged at 105 for the new Kansas City Railway & Light Company first lien collateral mortgage 6 per cent notes. The \$2,000,000 of Central Electric Railway first mortgage 5's are also to be exchanged for these first lien notes at 105.

Thus far all the outstanding issues except \$680,000 of Corrigan Consolidated and East Side bonds and railway and light 5 per cent notes to banks, and except \$3,100,000 of Kansas City Elevated Railway and Kansas City & Westport Belt Railway first mortgage bonds have been covered. The first named group will be paid in cash, while the bonds of the second group, maturing in 1922 and 1926, will be left lying on their respective properties. An amount of \$3,410,000 of the new Kansas City Railways bonds, however, is set aside to acquire these unmaturing bonds or obtain a clear title to the property securing them. Portions not so used are to be cancelled.

To insure the success of this reorganization plan it is necessary to raise working capital estimated at \$3,400,000. For this purpose an arrangement has been made to underwrite at 85 \$4,000,000 of an authorized issue of \$15,000,000 of new twenty-five-year 6 per cent second lien Kansas City Railway & Light Company notes. The stockholders are offered the option of taking their proportionate share of these notes at the same figure. Chairman Dunham states that it is hoped to have the plan in operation by July 1. It must be approved by the Federal Court, the Mayor and City Counselor and the Public Service Commission.

Auburn & Syracuse Electric Railroad, Syracuse, N. Y.—The Public Service Commission for the Second District of New York has authorized an issue of \$150,000 of eighteen-months 6 per cent notes and \$43,400 of 6 per cent equipment trust certificates of the Auburn & Syracuse Electric Railroad. The notes are dated Feb. 1, 1915, and due on Aug. 1, 1916, and are to be sold at not less than 99½. The net proceeds, or \$149,250, are to be applied toward the pay-



ment of outstanding notes payable and bills payable and also part of the company's \$300,000 of notes heretofore authorized. The equipment trust certificates, issued in connection with the Guaranty Trust Company, New York, are to be accompanied by a cash payment of \$10,580 and are to be paid in four installments with interest on the deferred payments at 6 per cent. The proceeds are to be used to purchase twelve new enclosed body electric passenger cars.

**Bryan & Central Texas Interurban Railroad, Bryan, Tex.**—It is reported that J. A. Turner was on Jan. 26 appointed receiver of the Bryan & Central Texas Interurban Railroad. The appointment was made at Houston by the United States District Court on the application of A. C. Price, New York, trustee.

**Columbus Railway, Power & Light Company, Columbus, Ohio.**—The Ohio Public Utilities Commission has authorized the Columbus Railway, Power & Light Company to issue and deliver to the holders of a like amount of the preferred and common stocks of the Columbus Light & Power Company, an amount of \$516,300 of the preferred stock, series A, and \$210,500 of the preferred stock, series B, of the Columbus Railway, Power & Light Company, in full and final payment for the property of the Columbus Light, Heat & Power Company. These amounts constitute an amendment to the original order of consolidation of April 22, 1913, and show the basis for the purchase of the lighting and heating company, which was authorized by the stockholders of the railway company on Jan. 26, as noted in the *ELECTRIC RAILWAY JOURNAL* of Feb. 6.

**Jersey Central Traction Company, Keyport, N. J.**—The Board of Public Utility Commissioners of New Jersey has issued a certificate approving an issue of bonds to the amount of \$1,754,000 by the Jersey Central Traction Company.

**Lincoln Railway & Heating Company, Lincoln, Ill.**—The Lincoln Railway & Heating Company has been granted a certificate of incorporation by the Secretary of State of Illinois. The company's capital stock is stated to be \$15,000. The incorporators are J. R. Patton, John A. Hoblit and Frank S. Bevan. This company succeeds the Lincoln Railway & Light Company, which was sold at public auction on Jan. 14 to J. R. Patton, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 23.

**New York State Railways, Rochester, N. Y.**—Harris, Forbes & Company, New York, announce that practically all of the first consolidated mortgage fifty-year 4½ per cent gold bonds of the New York State Railways recently offered by this company and N. W. Harris & Company, Inc., Boston, and the Harris Trust & Savings Bank, Chicago, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 30 and Feb. 6, have already been sold.

**Oakland, Antioch & Eastern Railway, Oakland, Cal.**—The Sacramento Valley Electric Company has leased its 12-mile line, connecting the town of Dixon with the Oakland, Antioch & Eastern Railway's tracks, to the latter company for a period of six months, with the privilege of then renewing the lease. The lessee plans to operate the Dixon line as a feeder for the main system. The Railway Commission of California has authorized the Oakland, Antioch & Eastern Railway to issue two notes in the sum of \$58,000 to replace two other notes previously issued without the consent of the commission. The company is further granted authority to mortgage certain real estate in the city of Sacramento now used for terminal purposes, as security for the notes. The amount of these notes was by a misprint stated to be \$68,000 in the *ELECTRIC RAILWAY JOURNAL* of Jan. 30.

**Oklahoma Union Traction Company, Tulsa, Okla.**—The Oklahoma Union Traction Company was sold on Feb. 5 at receiver's sale for \$53,500 to A. J. Biddleston, who represented interests of the Colonial Trust Company. This company has 5 miles of track completed and 15 miles under construction.

**Ottumwa Railway & Light Company, Ottumwa, Iowa.**—H. M. Byllesby & Company reports that the gross earnings and miscellaneous income of the Ottumwa Railway & Light Company for the twelve months ended Dec. 31, 1914, were \$324,928, as compared to \$320,684 in 1913. The expenses

and taxes in the two years amounted to \$179,126 and \$175,172, leaving net earnings of \$145,802 and \$145,512. The interest charges were \$66,918 and \$66,786, and the preferred stock dividends in each year \$31,493, so that the balance was \$47,390 for 1914 and \$47,233 for 1913.

**Peoria Railway, Peoria, Ill.**—The Peoria Railway has been granted authority by the Illinois Pacific Utilities Commission to issue \$570,000 of first and refunding mortgage bonds, dated June 20, 1906, and secured by a mortgage to the Chicago Title & Trust Company, trustee.

**Public Service Railway, Newark, N. J.**—The Board of Public Utilities Commissioners of New Jersey has granted permission to the Public Service Railway for the thirty-year extension at 5 per cent of the payment date for \$100,000 of 5 per cent bonds of the North Hudson County Railway, due on Feb. 1.

**Puget Sound Traction, Light & Traction Company, Seattle, Wash.**—Lee, Higginson & Company, Boston, and Harris, Forbes & Company, New York, are offering at 100½ and interest, to yield about 5.85 per cent, an additional \$557,000 of five-year 6 per cent mortgage gold bonds of the Puget Sound Traction, Light & Power Company. These bonds are dated Jan. 15, 1914, and are due on Feb. 1, 1919. This issue will make \$8,067,000 outstanding of the \$15,000,000 issue.

**San Francisco (Cal.) Municipal Railways.**—The December net earnings of the San Francisco municipal railway system amounted to \$42,136, according to a report filed on Jan. 29 with the Board of Works. The city's cars are unharmed by the "jitney" busses, the report stated, as the new carriers have not come into competition with the city except for the short distance on Market street. The total receipts for December were \$110,483, less United Railroad transfer reductions, and the expenses totaled \$68,347.

**San Francisco-Oakland Terminal Railways, Oakland, Cal.**—The Railroad Commission of California has issued a supplemental order amending a previous decision in which the San Francisco-Oakland Terminal Railways was allowed to use \$75,000 of a promissory note issue for the purchase of new cars, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 2. Under the terms of the new order, the company receives permission to expend \$60,000 of this \$75,000 in reimbursing its treasury for moneys expended from income, provided after such reimbursement the money is used for the payment of taxes falling due on Feb. 1, 1915.

**Seattle, Renton & Southern Railway, Seattle, Wash.**—In a recent decision holding the Illinois law declaring interest rates higher than 7 per cent to usury applied, Judge A. W. Frater of the King County Superior Court awarded Peabody, Houghtaling & Company, Chicago, only \$270,000 of its \$300,000 claim against the Seattle, Renton & Southern Railway on collateral trust notes of this electric line held by the banking firm. The amount allowed was the principal of the notes, the court holding that \$30,000 of interest and discount, amounting to 8 per cent, was invalid because in excess of the interest allowed by Illinois law. Judge Frater, however, decided that a bond issue of \$125,000 made by the railway, bought by the banking house and resold to small investors, was valid, inasmuch as the combined interest and discount did not exceed 6.8 per cent.

**Southern Pacific Company, San Francisco, Cal.**—According to a statement issued in the West, the Southern Pacific Company is preparing to take over various lines which it owns in Oregon and Washington. These include the electrically-operated Portland, Eugene & Eastern Railway. The statement says that the Southern Pacific Company owns the capital stocks of these companies, and their purchase is merely in accordance with the stock ownership. It is largely a bookkeeping matter and does not affect the public interest.

**Southern Public Utilities Company, Charlotte, N. C.**—The Southern Public Utilities Company has sold \$2,600,000 of first and refunding mortgage 5 per cent gold bonds, due on July 1, 1943, to William Morris Imbrie & Company. This banking house has been appointed the fiscal agent of the company. The Southern Public Utilities Company owns and operates various electric power and lighting plants, gas plants and water works in the Piedmont section of North



and South Carolina. It also owns the property of the former Winston-Salem Railway & Electric Company.

**United Traction Company, Pittsburgh, Pa.**—No action has been taken upon the declaration of a dividend on the preferred stock of the United Traction Company, and the committee representing the preferred stockholders has called for deposits with the Philadelphia Trust, State Deposit & Insurance Company. Previous references to the dividend situation with this company were made in the *ELECTRIC RAILWAY JOURNAL* of Jan. 9 and Jan. 16.

**Waverly, Sayre & Athens Traction Company, Waverly, N. Y.**—A bill has been filed in the New York State Senate to validate the consolidation of the Susquehanna Valley Electric Traction Company, a New York State railway corporation, with the Waverly, Sayre & Athens Electric Traction Company, a Pennsylvania railway corporation, by which the Waverly, Sayre & Athens Traction Company was formed in 1894. The bill requires the certification of the Public Service Commission for the Second District of New York that the consolidation was made with the consent of the holders of more than two-thirds of the capital stock of each of the constituent companies and that all of the stockholders have acquiesced therein.

**West Jersey & Seashore Railroad, Camden, N. J.**—The stockholders of the West Jersey & Seashore Railroad voted on Feb. 4 to increase the common capital stock of the company by \$3,000,000 and to execute a mortgage to secure not to exceed \$6,000,000 of general and refunding bonds. Preliminary mention of these changes was made in the *ELECTRIC RAILWAY JOURNAL* on Jan. 2.

**DIVIDENDS DECLARED**

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1 3/4 per cent, preferred.

Connecticut Valley Street Railway, Greenfield, Mass., quarterly, three-fourths of 1 per cent, common.

Detroit (Mich.) United Railway, quarterly, 1 1/2 per cent.

Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1 3/8 per cent, preferred.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1 1/2 per cent, first preferred; quarterly, 1 1/2 per cent, original preferred.

Philadelphia Company, Pittsburgh, Pa., 2 1/2 per cent, preferred.

**ELECTRIC RAILWAY MONTHLY EARNINGS**

**BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.**

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Dec., '14	\$76,639	\$67,046	\$9,593	\$17,385	†\$7,697
1 " " '13	76,164	*71,253	4,911	15,523	†10,528
6 " " '14	524,025	*466,938	57,087	103,306	†45,304
6 " " '13	541,338	*450,954	90,384	90,881	†43,691

**CONNECTICUT COMPANY, NEW HAVEN, CONN.**

1m., Dec., '14	\$630,642	*\$446,564	\$184,078	\$97,462	†\$108,479
1 " " '13	631,963	*472,854	159,109	88,274	†93,076
6 " " '14	4,192,386	*3,097,200	1,095,186	589,707	†635,637
6 " " '13	4,282,333	*3,113,432	1,168,902	537,153	†762,728

**NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.**

1m., Dec., '14	\$24,466	*\$23,590	\$876	\$7,876	†\$6,980
1 " " '13	24,879	*23,759	1,120	7,726	†6,580
6 " " '14	214,808	*161,924	52,884	47,254	†5,902
6 " " '13	210,133	*155,594	54,538	46,092	†8,733

**NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.**

1m., Dec., '14	\$38,043	*\$45,618	†\$7,575	\$6,878	†\$14,383
1 " " '13	34,173	*47,705	†13,532	4,976	†18,073
6 " " '14	225,116	*261,352	†36,236	36,886	†72,886
6 " " '13	205,185	*296,005	†90,820	31,550	†119,763

**RHODE ISLAND COMPANY, PROVIDENCE, R. I.**

1m., Dec., '14	\$411,509	*\$314,187	\$97,322	\$117,308	†\$18,337
1 " " '13	424,554	*327,952	96,603	107,589	†10,255
6 " " '14	2,788,017	*2,038,480	749,537	709,108	†78,440
6 " " '13	2,833,670	*2,021,454	812,217	638,467	†235,365

**WESTCHESTER STREET RAILWAY, WHITE PLAINS, N. Y.**

1m., Dec., '14	\$18,421	*\$21,922	\$3,501	\$1,312	†\$4,807
1 " " '13	19,334	*20,154	821	1,137	†1,944
6 " " '14	141,806	*138,562	3,244	7,537	†4,219
6 " " '13	137,008	*128,466	8,543	6,417	†2,273

\*Includes taxes. †Deficit. ‡Includes other income.

**Traffic and Transportation**

**THE "JITNEY" BUS**

**Failure of Original Los Angeles Company—Jitney Idea Still Spreading—Notes Regarding New Regulatory Measures and Services Discontinued**

A weird series of developments presents itself for record this week in connection with the "jitney." That the theory of the small profit and the quick turn-over in connection with the large bus has been carried to excess in one case at least is instanced by the news from Los Angeles that the Pacific Motor Coach Company of that city has filed a voluntary petition in bankruptcy in the United States Court. Insolvency proceedings had been previously instituted. The schedule of assets and liabilities shows the total indebtedness of the short-lived corporation amounts to \$86,788. This includes a claim for thirty-three double-deck motor buses and one 2-ton fuel wagon. An aggregate of \$1,729 is due employees for wages. The assets of the company are scheduled at \$3,026. This company is not to be confused with any of the "jitney" bus associations, and was, in fact, hastened into bankruptcy by the diversion of such traffic as it at first enjoyed to the more speedy "jitney."

The idea of the "jitney" is still spreading. Two of the most important cities to be invaded are Toledo and Louisville. On Feb. 2 "jitney" service was started in Toledo, in competition with the Cherry Street line of the Toledo Railways & Light Company. In an address before the Toledo Automobile Association on the day the bus was started, F. R. Coates, president of the Toledo Railways & Light Company, said that the operation of the "jitney" will teach the people that a ride is worth 5 cents and in that way benefit the local railway.

In the case of Louisville, a charter has been filed in the county court there by the Nickel Automobile Company, with an authorized capital of \$10,000. The incorporators announce that they will have lines of specially designed motor buses, each capable of hauling ten or fifteen passengers, and that they will ply between residence districts and the business section. Close on the heels of this project comes the announcement that other similar companies are in process of formation. William P. McDonough, attorney and secretary of the Louisville Retail Grocers' Association; Louis C. Heck, Jr., attorney; Stephen S. Jones, attorney, and William A. Baker, real estate man, are incorporators of the first company. J. S. Roberts, formerly with the Overland Automobile Agency, is promoting another company, while R. M. Cunningham, a lumberman with offices in the Inter-Southern Building, Louisville, is interested in organizing a third venture. It is stated the first of the Nickel Company's vehicles will be put on the streets some time in March, while it is declared by promoters of other venture that they will begin service immediately. Officials of the Louisville Railway have declined to discuss the development.

H. M. Byllesby & Company, Chicago, Ill., report that two days' operation of "jitney" buses at Fort Smith convinced an auto-livery concern of that city that such competition with the street cars would not be profitable and the buses have been discontinued. The "jitney" line was started on the principal traffic artery of the city, and a ten-minute service with 5-cent fare was announced to the public in newspaper advertisements.

It is reported from Phoenix, Ariz., that the twelve cars which were started there in "jitney" service have been ordered to suspend operations by the Mayor. The service was installed in December. The city asked a license of \$60 a year from the operators of the service and a \$2,000 bond on each car. The owners of the service were censured severely by the city officials for allowing the passengers to ride on the steps of the cars and were finally forced to suspend.

On Feb. 2 the Board of Commissioners of Oklahoma City passed an ordinance regulating the "jitneys," and on the same day the Mayor signed the measure. This measure provides among other things that all vehicles called "jitneys" must file an application with the city clerk stating the type of car, horse power, factory number, seating capacity, name of chauffeur, terminals, hours of operation, file a bond of



\$10,000, pay an annual fee of \$50 for each eight-passenger vehicle, \$75 for each vehicle seating more than eight passengers, and \$150 for each seating more than twelve passengers. Specifications are set out for signs to be carried and speed limits are fixed. It is made unlawful for "jitneys" to operate longitudinally upon any street occupied by a street car line, except that within the fire limits the vehicles may operate for not more than two blocks in one direction along such streets where necessary in crossing such fire limits.

The "jitney" did not make any large inroads on the receipts of the Oklahoma Railway. On Feb. 5 they were still plying their service, however, but there was a marked falling off in the number of vehicles running. At no time does it seem that they made anything like their expenses.

An ordinance is pending in Spokane to require "jitney" operators to file a bond of \$5,000 and in addition pay an annual tax ranging from \$25 to \$100 a year.

The ordinance enacted by the City Commissioners of Denver to regulate the "jitney" was passed by a vote of four to one. An emergency clause was attached which made it effective immediately without having to wait the usual thirty days. The ordinance provides in short that it shall be unlawful to operate an automobile or other vehicle for hire without first securing a franchise and that violations of the ordinance shall be punishable by a fine of not less than \$100 nor more than \$300 or by imprisonment for not more than ninety days, or both. Every trip is to constitute a separate offense.

On Jan. 29 the City Council of Corpus Christi, Tex., took prompt measures to regulate the operation of "jitney" cars, when under the emergency clause an ordinance was passed requiring that any person, firm or corporation operating a "jitney" line must first secure a franchise from the city. In addition the ordinance provides that the applicant shall also furnish to the city a bond in a sufficient amount to guarantee the payment of any claims that arise as a result of damages, and that "any person injured by a 'jitney' car may sue the bondsmen."

In regard to the effort to regulate the "jitney" in Birmingham the *Herald* of that city said recently: "Disagreement among the members of the city commission over the provisions of the proposed ordinance to regulate the 'jitney' auto lines of the city has temporarily at least held up the new law, and in all probability has killed it. The proposed ordinance provided for a \$2000 indemnity bond to be placed on each company operating cars and a license to be charged for each car in operation of probably \$15 or \$20. A very authentic report was to the effect that counsel for the Birmingham Railway, Light & Power Company has prepared an ordinance for the regulation of the 'jitney' autos, but which was not accepted by the commission because it was in some ways too drastic."

The City Council of Portland, Ore., has authorized Commissioner Daly to proceed at once with the formulation of legislation to govern the operation of "jitney" buses in that city. Mr. Daly hopes to report by Feb. 15.

Two hundred thousand little "missionaries" are to be sent out by the San Antonio (Tex.) Traction Company in the interest of public patronage of the street railway. The "missionaries" are in the form of "stickers" printed in blue, yellow, green and red, with this caption: "The Traction Company Has Helped Build San Antonio—Use the Street Cars." A picture of one of the modern steel cars operated by the company, as a background for a small mule car of the type used when the public carrier service first was established, is shown on the stamps. Printed under the drawing is: "1881-1915."

*Automobile Topics* seems to see the hand of the Standard Oil behind the "jitney" development. That paper says: "One of the most extensive fields of influence that the automobile industry has yet encountered lies in the 'jitney' bus. No less than a revolution has been effected in the used car market; the Standard Oil Company, seeing large increases in gasoline sales, is throwing its influence in favor of the movement; the leading tire companies are contemplating the strongest possible support for the promoters and operators of 'jitney' lines; and traction interests are concerned lest the values of their street railroad securities be impaired by traffic losses occasioned by the new competitors."

The Dallas *Dispatch*, Dallas, Tex., is offering prizes of \$2 for best jingles about the "jitney." Here are a few of the gems published by that paper:

Hush, little Ford,  
Don't you cry,  
You will be a "jitney"  
Bye and bye.

"Jitney" means a nickel,  
A nickel means a ride,  
If the "jitney" hadn't come along,  
I suppose I would 'a' died.

If the "jitneys" jar and jingle like  
The "jitney" jingles jar,  
You can't blame a single human for  
Preferring the trolley car.

The Fort Worth *Telegram* has also gone in for "jitney" jingles. There appeared in that paper recently the following:

Oh you "jitney"!  
You give me a pain;  
I rode in you once,  
But never again.

If a street car meets a "jitney"  
Coming down the lane,  
And the street car hits the "jitney,"  
I wonder who's to blame.

The trolleys are bad,  
The "jitneys" are worse;  
I always walk,  
Safety first.

#### ATLANTA SERVICE DECISION

##### Synopsis of Georgia Railroad Commission's Decision Deals Interestingly with Seating Capacity

The Georgia Railway & Power Company, Atlanta, Ga., asked the Georgia Railroad Commission recently for authority to discontinue certain tripper or extra cars among the number operated in its system during rush hours, its position being that traffic had fallen off on the lines involved to an extent justifying the withdrawal of services not needed. The commission's decision, referred to very briefly in the *ELECTRIC RAILWAY JOURNAL* of Feb. 6, was against the company in all but three counts and was partially favorable in some four others. The synopsis of the decision of the commission contains one or two interesting points, particularly that which the commission makes as to the number of passengers above seating capacity that are allowable under abnormal conditions at rush hours. The commission said in part:

"While it is reasonable and wholly probable that during December, 1914, there was a smaller volume of traffic than during rush hours in 1913, the commission is of the opinion, from many considerations, that this decrease has been relatively smaller than in non-rush hours. Granting, however, that the rush-hour traffic is reduced under 1913, the commission is not inclined to agree with the assumption that the facilities supplied during these periods in 1913 were entirely adequate on every route. On some routes we feel sure they were not, and in making this statement the commission does not base it upon the contention that every passenger on every car operated should be furnished a seat. This contention may be sound in theory. Under street car traffic conditions as they exist daily, such a theory is frequently impossible of actual operation."

"In our opinion it is the duty of the common carrier to provide seats, that is, reasonable accommodations, in its cars for such patrons as desire them, in so far as they can reasonably anticipate and measure the volume of traffic which will offer. Experience shows that there is, with fair regularity, an estimable volume of traffic during certain hours of the day. This should be provided for. But this



does not mean that if an average of forty passengers customarily board a given schedule car on a certain route upon which is operated a forty-seat car, the car is then loaded to its reasonable capacity, and that when forty-one passengers begin to ride additional facilities must be provided.

"Careful observation has shown that an appreciable percentage of regular street car patrons prefer riding on the platforms to occupying seats inside the cars. These are styled 'voluntary standees.' Again, it must be borne in mind that city street car transportation is generally for comparatively short distances. A given route we will say is 5 miles long; cars are operated regularly the entire distance of the route. At an ascertained peak point, where the load is always heaviest, a forty-seat car will customarily have on board, say, forty-eight passengers. This maximum was only reached one block back. At the next block forward the car begins to discharge its load, and within two or three blocks the load is again below the seating capacity, no one having stood for a longer distance than three or four blocks or for a longer time than five or ten minutes. This particular schedule may have been—and observation demonstrates this—the only one at all overloaded during the whole day. Conditions frequently arise in street car traffic when it is impossible to avoid overloading for short distances or for short periods of time.

"Taking into consideration such conditions some commissions have held that facilities are fairly reasonable where the peak point loads do not exceed 30 per cent of the seating capacity offered for a continuous period of thirty or forty minutes. In our opinion, an allowance of 30 per cent over the seating capacity for standees, whether voluntary or involuntary, is too large. We are rather inclined to allow only 20 per cent on this account, to be extended not longer than thirty minutes with schedules operated or not exceeding ten-minute headway. It would not be reasonable to apply this rule to only one day's travel, or even a week's. The congestion should extend over such a reasonable period as would show that it is regular and not spasmodic; that it is permanent in nature and not due to temporary conditions. It would be unreasonable to require a carrier to operate sufficient cars to provide a seat for every passenger on every schedule or every day of every year and for every distance. Moreover, it is impossible even if the public would render the absolutely necessary co-operation in distributing the loads as between the cars offering.

"We have deemed it advisable to submit the foregoing general observations in order that the public may be reminded that the carrier is only required by law to supply reasonably adequate and comfortable facilities. It is the province of the commission to compel this reasonably adequate and efficient service. If at any time or upon any route there are shown to be facilities and service in excess of the reasonable needs of the public, it is just as much our duty to allow a reasonable reduction of this excess as to order more cars when service is shown to be inadequate. In the pending application our conclusions and action are based upon such facts as we have found to exist."

## SAN FRANCISCO EXAMINATION RESULTS

### Instructing Ninety New Crews in Twenty Days on San Francisco Municipal Line

When the Panama-Pacific Exposition opens on Feb. 20, the Municipal Railways of San Francisco plans to add ninety new cars to the number now in service, and the motormen and conductors who will be employed were selected from the Civil Service Commission eligible lists in time to allow twenty days for instruction, as most of the new men are without experience. The Civil Service Commission, working in conjunction with Thomas A. Cashin, superintendent of the Municipal Railway, some months ago planned the general nature of the examination and results have been highly satisfactory, it is now reported. The examination consisted of two parts, physical and written, and applicants who failed to pass in the first were not allowed to take the second. The physical tests were considered rather severe, and although about 3000 men made applications only 711 took the written part of the examination for motormen, and 798 the written examination for conductors. Of these, 554 passed the motormen's examination and

633 the conductors' examination. Those who passed successfully were then listed in the order of the written examination percentage made, and the first ninety men in each of the two lists were employed.

**New Freight Service.**—The Pacific Electric Railway, Los Angeles, Cal., has begun a freight service between San Bernardino, Los Angeles and way stations.

**Increase in Fare.**—The Cumberland & Westernport Electric Railway, Cumberland, Md., has increased the price of books of one hundred tickets good over its lines from \$4 to \$4.50. The cash fare remains at 5 cents in each zone.

**Fare Hearing Continued.**—The hearing in connection with the fare complaint against the Public Service Railway, Newark, N. J., by representatives of Gloucester City, Woodbury and other towns will be continued before the Board of Public Utilities Commissioners on Feb. 23 at Trenton.

**Hitching Sleds to One-Man Cars.**—Instructions have been issued to the city police force of Regina, Saskatchewan, to take vigorous measures to suppress the practice indulged in by youths of the city of tying their sleds to the cars of the Regina Municipal Railway. One-man cars are operated.

**Rounding Up Deaf Teamsters.**—The Metropolitan Street Railway, Kansas City, Mo., has this order posted in the carhouses: "Conductors and motormen will obtain the names of all wagons which remain on the tracks after sounding the gongs and report the same to the division superintendents."

**Ventilation in Louisville.**—Instructions to conductors of the Louisville (Ky.) Railway provide that at all times two of the ventilators in the cars shall be kept open. This is the answer of the company to the agitation of the question of street car ventilation in which certain Louisville newspapers and the city health authorities have been indulging.

**I. T. S. Reduction in Fare.**—The Illinois Traction System, Peoria, Ill., has announced reduced passenger tariffs between Bloomington, Peoria and St. Louis, claiming a differential over steam lines. The old round-trip rate from Bloomington to St. Louis was \$5.30; the new rate is \$5; the old rate, round trip, Peoria to St. Louis, \$5.50; new rate, \$5.30; old rate, round trip, Springfield to St. Louis, \$3.10; new, \$2.80.

**E. R. Kelsey Wins in Membership Contest.**—A membership contest for the Young Men's Christian Association at Toledo, Ohio, ended on Jan. 28. Two teams were organized and christened the "Electrics" and the "Stearns." E. R. Kelsey, publicity manager of the Toledo Railways & Light Company, captained the "Electrics" and Hugh Campbell, the "Stearns." The object was to increase the membership by at least 300. Mr. Kelsey's team won with 185, while Mr. Campbell's team secured 130.

**Hearing Regarding Trailers.**—The Public Utilities Commission of the District of Columbia will hold a formal hearing on Feb. 16 to consider the application of the Capital Traction Company with respect to Section 13 of order No. 21 regulating the operation and equipment of cars in the District of Columbia. Section 13 provides that no trail car shall be operated for the purpose of carrying passengers unless a separate conductor or an employee acting as such is provided for each car of the train.

**New Fare on Schenectady Railway.**—Local round-trip tickets good until used for transportation between Stop 19, or any stop between Stop 19 and Stop 14½, inclusive, and Schenectady, or for transportation between Stop 19, or any stop between Stop 19 and Stop 22½, inclusive, and Albany, will be sold in the Schenectady and Albany terminals and at a convenient place in the vicinity of Stop 19 at 25 cents a ticket. This is a new fare established under order of the Public Service Commission in cases Nos. 4545 and 4587 and will go into effect on March 1, 1915.

**Action on "Jim Crow" Bill Postponed.**—The House by a vote of 168 to 107 has decided not to take up, for the present, the bill introduced by Representative Clark, of Florida, providing for the operation of "Jim Crow" cars on the electric railways in the District of Columbia. The Clark bill was introduced in the House on April 7, 1913. After lying dormant for almost two years, it was suddenly revived on Feb. 2, 1915, when it was ordered reported to the House. It is possible for this legislation to come up on Feb. 22, or



by a special agreement among the House leaders on some other day.

**Accident on New York Elevated.**—Nine persons were injured in an accident on the Manhattan Elevated Railway, at 8:37 a. m. on Feb. 6, when a south-bound Ninth Avenue local train crashed into the rear car of a local-express that was halted at the Fiftieth Street station. After the collision a short circuit started a fire in the wrecked rear car of the local express and the first car of the local, which had telescoped each other by the force of the collision. The immediate effect of the accident was to suspend all traffic on the Sixth Avenue elevated line, the trains of which turn into Ninth Avenue through Fifty-third Street.

**Brooklyn Transfer Order.**—The Public Service Commission for the First District of New York has rescinded an order adopted in November last and adopted three new orders, requiring the Van Brunt Street & Erie Basin Railroad to exchange transfers with the intersecting lines of the Coney Island & Brooklyn Railroad, the Brooklyn Heights Railroad and the Nassau Electric Railroad at Hamilton Avenue. The order directs the companies to agree between them as to the portion of the 5-cent fare to which each shall be entitled by Feb. 10, 1915, and to report to the commission upon Feb. 11 whether such an agreement has been reached, so that the commission may apportion the joint rate if the companies fail to agree.

**Motorman Not Entitled to Engineer's Pay.**—In the hearing before the Railroad Board of Arbitration, which is considering the demand of engineers and firemen of the Western district for an increase in wages, R. E. Hewitt, general foreman of electric car shops, Southern Pacific Company, West Alameda, Cal., stated that motormen on electrified steam roads are not entitled to the wages of the locomotive engineer. Mr. Hewitt is quoted as saying: "The only thing the motorman has to do is to lift his kit of tools into the cab and to see that he has a supply of fuses. Everything has been made ready for him before the motor leaves the shop. The employees have dubbed the motor 'the dead man's outfit,' and the motormen certainly are not entitled to an engineer's wages."

**Ambulance Chaser Fined at Boston.**—The first case to be brought at Boston, Mass., under the so-called ambulance-chaser law (Chap. 432) of 1914 has resulted in the conviction of Harry Noonan and the imposition of a fine of \$100 for soliciting a claim in a damage case against the Boston Elevated Railway. The act provides penalties for disbarred attorneys and also includes in its prohibition any person not having been admitted to the bar who represents himself as having authority in behalf of persons having claims for damages to procure settlements for such claims, or whoever, not being an attorney, solicits either for himself or for another the management and control of such claims. The maximum penalty for the first offense is a fine of \$100 or six months' imprisonment and for each subsequent offense a fine of \$500 or imprisonment of one year.

**Accident Figures for Detroit.**—During 1914 a total of 16,331 accident reports were filed with the Detroit (Mich.) United Railway as against 17,938 the year before, a reduction of 9 per cent. The records of the company show that while 4142 cars were in collision in 1913 this number was cut down to 2343 in 1914, a reduction of 43 per cent. There was a decrease of 11 per cent in derailment of cars, an increase from seventy-one to eighty reports on running into open switch points, while there was a decrease of 47 per cent in running over street and steam railroad crossings. In 1913 there were 2595 reports on passengers hurt in boarding or alighting from cars, while last year this was cut to 2143, a reduction of 17 per cent. In reports on falling from cars, mostly moving, there was a reduction from 304 in 1913 to 191 in 1914, or 37 per cent. There was an increase from 248 to 309 in reports of passengers hurt while within the body of the car. In 1913 there were 3210 automobile collisions with cars on the Detroit United Lines, mostly within the one-fare zone. In 1914 this class of accident reports increased to 4072. This is an increase of 27 per cent, with more than eleven automobiles struck every day. The worst month of all was December, when 491 automobiles were struck, an average of sixteen a day. The company says: "Let us have some 'safety first' operation among the automobile drivers."

## Personal Mention

Mr. C. E. Brown has succeeded Mr. J. H. Hornung as manager of the San Francisco, Napa & Calistoga Railway and will make his headquarters at Napa, Cal.

Mr. H. E. Blain has been appointed operating manager of the Metropolitan District Railway, London Electric Railway, City & South London Railway and Central London Railway, London, England.

Mr. Frederick L. Siddons has been appointed an associate justice of the Supreme Court of the District of Columbia and has been succeeded as a member of the Public Utilities Commission by Mr. Louis Brownlow.

Mr. J. M. Nelson has resigned as chief engineer of the power station of the Houghton County Traction Company, Houghton, Mich., to become connected with the Standard Oil Company as a traveling engineer.

Mr. Z. E. Knapp has been appointed manager of maintenance and construction of the Metropolitan District Railway, London Electric Railway, City & South London Railway and the Central London Railway, London, England.

Mr. J. P. Thomas has been appointed general superintendent to the London (England) General Omnibus Company, Ltd., and in this capacity will have charge of all the work of operation, under the general control of Mr. H. E. Blain, operating manager.

Mr. W. E. Mandelick, in addition to his office as secretary to the Metropolitan District Railway, London Electric Railway Company, City & South London Railway and the Central London Railway, London, England, has been appointed business manager of the companies.

Mr. W. E. Blake, in addition to his position as superintendent of the line to the District Railway, has been appointed superintendent of the line to the London Electric Railway, City & South London Railway and Central London Railways, in place of Mr. J. P. Thomas, who has resigned from these companies to become general superintendent of the London General Omnibus Company, Ltd.

### OBITUARY

G. Benz, director of the Gesellschaft für den Bau von Untergrundbahnen (Underground Railways Construction Company, Berlin, Germany), is reported killed in battle. Mr. Benz had previously received the iron cross for valor.

James F. McElroy, president of the Consolidated Car Heating Company, Albany, N. Y., died at Laconia, N. H., on Feb. 10. Mr. McElroy was born in Greenfield, Ohio, Nov. 25, 1852, and was graduated from Dartmouth College in 1876. For four years following Mr. McElroy was the principal teacher of the Indianapolis Institution for the Blind, and then for seven years was superintendent of the Michigan Institution for the Blind. In 1887 he organized the McElroy Car Heating Company. Two years later it was combined with the Sewall Car Heating Company.

Norman B. Ream, capitalist, died in New York on Feb. 9. Mr. Ream was born in Somerset County, Pa., on Nov. 15, 1844. At the age of fourteen he became a teacher, and in 1861 enlisted as a private in the Union army. He was wounded in a battle near Savannah and returned from the war a commissioned officer. He then clerked for awhile in Pennsylvania, but in 1866 opened a general store in Princeton, Ill. The following year he moved to Osceola, Ia., increasing the line of goods handled. In 1871 he moved to Chicago and engaged in the commission business. He prospered immensely and was a member of the famous big four which included N. S. Jones, John Cudahy and Sidney A. Kent. Mr. Ream had made his headquarters in New York for many years. He was connected with many corporations as an officer or director, among them the following: Baltimore & Ohio Railroad, Brooklyn Heights Railroad, Brooklyn Rapid Transit Company, Chicago & Erie Railroad, Chicago & Alton Railroad, Chicago, Burlington & Quincy Railroad, Erie Railroad, International Harvester Company, National Biscuit Company, New York, Susquehanna & Western Railroad, Pennsylvania Coal Company, Pullman Company, Seaboard Air Line Railway, United States Steel Corporation.



## Construction News

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

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

### RECENT INCORPORATIONS

**\*Black Mountain & Eastern Railroad, Combs, Ark.**—Chartered in Arkansas to build a 20-mile interurban railway between Combs and Cass. Capital stock, \$250,000. Edward C. Jeter, Fayetteville, Ark., director.

**\*New Britain (Conn.) Street Railway.**—Application for a charter has been made by this company in Connecticut to build an electric railway from the corner of Myrtle Street and Main Street, in New Britain, to connect with the existing electric line, westerly along Myrtle Street to Grove Street, to Broad Street, Washington Street, Farmington Avenue to Stanley Street and on the Hartford road to connect with the existing line at Elmwood. Another line would begin at Grove Street and extend along Plainville road to the center in Plainville. A third line would extend westerly from Main and Broad Streets to Washington Street and a fourth would extend from North Burritt Street to Farmington Avenue and Commonwealth Avenue where it would connect with the line first mentioned. Capital stock, \$50,000 to be increased to \$500,000. Incorporators: Mayor George A. Quigley, George M. Landers, Joseph M. Halloran, Edward O. Kilbourne, William J. Farley, George Glover, George P. Spear and Mortimer H. Camp.

**\*Lincoln Railway & Heating Company, Lincoln, Ill.**—Incorporated in Illinois, presumably as the successor to the Lincoln Railway & Light Company, the property of which was sold under foreclosure recently, and to build electric railways in Lincoln. Capital stock, \$15,000. Incorporators: J. R. Patton, John A. Hoblit and Frank S. Bevan.

**\*Marietta-Parkersburg Railway, Marietta, Ohio.**—Chartered in Ohio to build an interurban railway between Marietta and Parkersburg. Capital stock, \$10,000. Incorporators: H. H. Archer, E. Clark, Jr., and John Kaiser.

### FRANCHISES

**Phoenix, Ariz.**—The Phoenix Railway has received a franchise from the Council for an extension along Monroe Street between First Street and Second Avenue in Phoenix.

**Los Angeles, Cal.**—The Los Angeles Railway has received an extension of time on its franchise in which to complete the work of reconstruction of tracks and paving certain sections of its lines in Los Angeles.

**Los Angeles, Cal.**—The public utilities committee of the City Council decided recently to recommend the granting of a franchise for an incline railway in Griffith Park, for which Colonel Lewis Ginger has made application. The Board of Public Utilities is to outline the route and the mode of operation, and the city attorney will then prepare the notice of sale. Colonel Ginger states that he is ready to begin construction as soon as the legal phases of the subject are fulfilled and he hopes to have the line in operation within six months after it starts. [E. R. J., Dec. 26, '14.]

**Mill Valley, Cal.**—The Railroad Commission has denied the application of the Marin County Electric Railways for permission to proceed with the construction of 1 mile of new track from the Northwestern Pacific Depot, Mill Valley, to the Cascades. [E. R. J., Jan. 30, '15.]

**Riverside, Cal.**—The Pacific Electric Company has received permission from the Council to abandon portions of its second track franchise on New Magnolia Avenue in Riverside. The company will be granted a new double track franchise over the street with the understanding that if the second track is not installed within three years the city will have the power to require the company to place its tracks in the center of the street.

**San Francisco, Cal.**—The Board of Works has been directed to prepare plans and specifications and advertise for bids along the lines of Engineer O'Shaughnessy's plan No. 9 for the Church Street railway in San Francisco.

**Evansville, Ky.**—Extension of the Bell Street line of the Evansville Railway from Kentucky Avenue to the city limits is to be undertaken at once under a franchise which has just been approved by the Board of Public Works. The East End Improvement Association has subscribed a part of the money needed. Construction work will begin when the weather permits.

**Henderson, Ky.**—A thirty-year contract under which the Henderson Street Railway has been operating its lines in Henderson expires on Oct 21 and, although it is reported never to have declared a dividend the company wants to extend the contract on the same terms. There has been much agitation of the questions which have been raised in this connection and it is intimated rather definitely that the city authorities will require that certain conditions be complied with before action on extending the franchise is taken. Among these, it is said, will be extensions of the lines to outlying towns and establishment of schedule services on them before the Council votes a franchise.

**Hamilton, Ont.**—A special committee of the City Council will request the Hamilton Street Railway to build two cross town lines and also relay new tracks on several streets in Hamilton.

**Toronto, Ont.**—The Toronto & York Radial Railway will apply at the next session of the Ontario Legislature for power to construct a double track line on Yonge Street, from the Canadian Pacific Railroad to the north city limits of Toronto.

**Three Rivers, Que.**—The Three Rivers Traction Company has received a twenty-year franchise from the Council in Three Rivers.

### TRACK AND ROADWAY

**Gadsden, Ala.**—Application for a charter will soon be made to build a 30-mile line between Gadsden and Centre, Ala. Louis Hart, Gadsden, is interested. [E. R. J., Nov. 7, '14.]

**Mobile Light & Railroad Company, Mobile, Ala.**—Two new loop lines to connect with its present tracks will soon be built by this company in Mobile.

**Birmingham-Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.**—This company has completed its electric line in Tuscaloosa and will place it in operation at once.

**Montecito Railroad, Las Angeles, Cal.**—This company has placed in operation its electric railway over Montecito drive, beginning at the north end of Griffin Avenue and East Avenue Forty-seven in Los Angeles. W. L. Larrabee, president. [E. R. J., Aug. 22, '14.]

**Hartford & Springfield Street Railway, Warehouse Point, Conn.**—Plans are being made by this company for an extension from the local waiting station in Thompsonville through Main Street and across the Connecticut River, connecting at a point on Mapleton Avenue in Suffield with the present Suffield Street Railway.

**\*Washington, D. C.**—A recommendation to Congress for legislation that will permit the extension of electric lines to East Potomac Park will be made in the next annual report of the chief of engineers in Washington.

**Palm Beach & Everglades Railway, West Palm Beach, Fla.**—Offices have been opened by this company in the McGinley Building, West Palm Beach. Plans are being considered to award contracts in the near future to build this steam or electric railway from West Palm Beach westerly to a point 6 or 8 miles from the shore of Lake Okeechobee; thence south and northwesterly parallel with the shore of Lake Okeechobee to a point at or near Lake Hicopochee, the line to be about 75 miles. [E. R. J., Jan. 23, '15.]

**Georgia Railway & Power Company, Atlanta, Ga.**—Preliminary surveys have been made and plans are being considered by this company to build an extension to the site of the Oglethorpe University, about 1½ miles north of the present terminus at the DeKalb County line near the Capital City Country Club.

**Augusta-Aiken Railway & Electric Corporation, Augusta, Ga.**—Plans are being considered by this company for improving its lines in Augusta.

**Waycross Street & Suburban Railway, Waycross, Ga.**—Plans are being made by this company to build an extension through the southern section of Waycross.



**East St. Louis & Suburban Railway, East St. Louis, Ill.**—This company is asked to consider plans to build its tracks along Main Street from Broadway to Missouri Avenue in East St. Louis.

**Chicago, Peoria & Quincy Traction Company, Peoria, Ill.**—This company has decided to run its new line from Peoria to Canton on the most direct route from Hollis to Glasford and from Glasford direct to Canton. The Chapman Construction Company of Chicago is the engineer for the construction and the Woolf Company will sell the stock. A considerable amount of stock has been sold in both Peoria and Quincy. [E. R. J., Jan. 9, '15.]

**Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.**—This company is now engaged in installing automatic block signals between Huntington and Peru, Ind., a distance of 25 miles. This work is being done in pursuance of the order of the Indiana Public Service Commission.

**Union Traction Company, Coffeyville, Kan.**—It is reported that plans are being considered by this company to extend the line from Coffeyville to Collinsville. Eventually this line will be extended south from Collinsville to Tulsa.

**Arkansas Valley Interurban Railway, Wichita, Kan.**—Plans are being made by this company to build  $\frac{1}{2}$  mile of new track within the city limits of Hutchinson. It will extend through the Carey district.

**Hagerstown & Frederick Electric Railway, Frederick, Md.**—Many plans for improvements of this railway during the summer are being considered by this company. One of the extensions contemplated is a branch from Hagerstown to Security, 2 miles east of Hagerstown, where the new power house of the company is located. Straightening curves and strengthening culverts over the entire system are also planned.

**Boston, Mass.**—Bids are desired until Feb. 25 by the Boston Transit Commission, 15 Beacon Street, Boston (B. Leighton Beal, secretary), for building Section H of the Dorchester Tunnel, located in Dorchester Avenue, between Old Colony Avenue and Woodward Street and is about 2200 ft. long. The structure is to be mainly of reinforced concrete and consists of a single-span double-track tunnel, to be built by the cut and cover method. The work also includes a pump well, an emergency exit and sewer changes. Specifications and forms of contract can be obtained at 15 Beacon Street, ninth floor. The right to reject any and all bids and to award the contract as is deemed to be for the best interest of the city of Boston is reserved.

**United Railways, St. Louis, Mo.**—This company is asked to consider plans to extend its lines along Tamm Avenue in St. Louis to Art Hill, in Forest Park.

**International Railway, Buffalo, N. Y.**—As soon as the legal preliminaries in connection with the construction of this company's line between Niagara Falls and Buffalo, permission for which was granted by the Public Service Commission recently, are concluded and the \$2,395,000 bond issue floated, actual construction work will begin. This will probably be early in the spring. The company has yet to obtain permission of the State Canal Commission to bridge the Erie canal at Tonawanda, arrange with the New York Central and the Erie for crossing the tracks of the steam roads and obtain a few consents. While items for the construction of new carhouses at the Falls and stations along the line are included in the estimated cost of the line authorized by the Public Service Commission, the company has not yet definitely decided upon the exact location of these buildings. This is a matter that probably will not be decided upon until actual construction work is well under way.

**Black River Traction Company, Watertown, N. Y.**—Plans are being contemplated by this company to re-track its line on the Public Square in Watertown during the summer.

**Cleveland (Ohio) Railway.**—This company is asked to consider plans for an extension of the West Madison Avenue electric line from West 117th Street to Riverside Avenue, Lakewood. Other extensions and betterments of its lines in Cleveland are being contemplated.

**Conneaut, Kingsville & Ashtabula Railway, Kingsville, Ohio.**—Surveys have been completed by this company on its 14-mile line between Conneaut and Ashtabula. It has not

been decided when construction will be begun. W. E. Hawley, Kingsville, president. [E. R. J., Oct. 26, '12.]

**Ohio Valley Traction Company, Portsmouth, Ohio.**—Right-of-way has been received by this company through eight pieces of property in Porter. Plans are being considered by this company to build its 23-mile extension from Sciotoville to Ironton within the next few months.

**Portsmouth Street Railway & Light Company, Portsmouth, Ohio.**—Plans are being made by this company to build an extension in Portsmouth.

**Muskogee (Okla.) Electric Traction Company.**—It is reported that R. D. Long, general manager of this company, plans to build an electric railway between Muskogee and Drumright.

**Oklahoma & Interstate Railway, Oklahoma City, Okla.**—An interurban line 130 miles long and connecting Columbus and Galena in southeastern Kansas with northern and central Oklahoma and Oklahoma City, will be begun this spring, according to John R. Rose, Oklahoma, president of this company. Mr. Rose put his proposal to the commercial clubs of the cities affected at a meeting recently. The cities represented were Columbus, Galena and Baxter Springs, Kan., and Commerce and Miami, Okla. Interurban lines already extend as far south as Columbus and Galena, and the representatives of the commercial clubs expressed the belief that the cities would co-operate to obtain the right-of-way and the money that has been asked for the line.

**Sand Springs Interurban Railway, Tulsa, Okla.**—It is reported that this company plans to build an extension this summer to Owasso Lake, north of Owasso, and that the new line will enter Tulsa over the tracks of the Sand Springs Railway, which would save the construction of 10 miles of new track.

**Hamilton, Ont.**—In order to improve the present railway service in Hamilton, Mayor Walters has suggested the construction of a crosstown line from the new Burlington Street line to Barton and King Streets, the tracks to be laid on Wentworth Street in Hamilton. Mayor Walters and the Board of Control were told by representatives of the Hamilton Street Railway on Jan. 26 that no railway extensions or important improvements could be thought of until the present war was over. Industrial and financial conditions made it impossible.

**Kirkton, Ont.**—It is reported that the Hydro-Electric authorities in Kirkton have agreed to the resolutions approving of the construction of a hydro-radial line in Kirkton, and also a hydro-radial line to connect London and Stratford, via St. Mary's.

**London & Port Stanley Railway, London, Ont.**—This company has completed the reconstruction of its track and roadbed on the line between London and Port Stanley and will proceed at once with the erection of the overhead construction.

**Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.**—Work will be begun in the spring by this company on the Perth to Smith Falls section of the electric railway which is making a belt 300 miles in length in Eastern Ontario. E. Malone, chief engineer. [E. R. J., Dec. 12, '14.]

**Toronto, Ont.**—Another step was taken on Feb. 4 toward a start upon the Toronto-Port Perry Hydro Radial Railway when the Hydro-Electric Power Commission of Ontario forwarded to the Provincial Government for approval the by-laws and contracts of eleven municipalities in the radial zone which have voted in favor of the establishment of a radial service. The contracts were from Scarboro, Markham, Pickering, Stouffville, Port Perry, Whitby town and township, Uxbridge and Whitchurch. As the system now stands it will comprise 94 miles of track. Two matters of importance have yet to be dealt with before work can be begun on the line. The entrance to Toronto must be agreed upon and will be taken up in the consideration of the general transportation question in Toronto. The other matter yet to be settled is that of a Federal subsidy to aid in the construction.

**Toronto, Ont.**—Ratepayers in Rosedale will seek legislation to compel the construction of an electric railway loop around Rosedale.



**Toronto, Ont.**—The city will oppose the application to the Ontario Legislature of the Forest Hill Electric Railway for an extension of its contract. The company's original bill gave them until December, 1913, to expend \$50,000 in construction. An amendment extended the time to December, 1914, and now the company is asking until December, 1915. All that has been done up to the present is some grading work on Forest Hill Road. The bill was put through in the face of strenuous opposition by the city.

**Toronto & York Radial Railway, Toronto, Ont.**—Plans are being considered by this company to build a double track line on Yonge Street, from the company's southerly terminals to the north limits of the city of Toronto.

**\*Klamath Falls, Ore.**—An electric railway is being planned from Eureka, Cal., up the coast to Regua, and thence up the Klamath River to Klamath Falls according to an announcement recently made. D. W. Hanson, president of the Eureka Development Association, Eureka, Cal., is interested.

**\*Chambersburg, Pa.**—Application for a charter will soon be made to build an electric railway to connect McConnellsburg and Fort Loudon, a distance of 10 miles. Edward J. Post, D. H. Patterson and Herbert A. Duffy are among those interested.

**\*Monaca, Pa.**—It is reported that residents of Monaca, Pa., will organize a company to build an electric line from Monaca south to Coraopolis, about 20 miles. J. W. Reid, D. J. Mitchell, J. J. Allen and H. L. Grimmell, all of Monaca, are among those who are reported to be interested in the project.

**Joplin & Pittsburgh Railway, Pittsburgh, Pa.**—Plans are being considered by this company to build an extension of its line from Dunkirk, Kan., to Arcadia, Kan., via Hazen and other coal camps, probably within the next few months.

**Pottstown & Phoenixville Railway, Pottstown, Pa.**—This company has placed in operation its extension from Sanatoga Park to Linfield. Grading has been begun on the section between Linfield and Spring City.

**Bristol (Tenn.) Traction Company.**—This company has been asked to consider plans for an extension of its line from Big Creek into the Shady Valley section of Johnson County.

**Jonesboro, Tenn.**—In the interest of the project to connect Jonesboro and Johnson City, 7 miles distant, by an electric railway, Mayor A. S. Murray has appointed a committee composed of J. H. Epps, J. H. Anderson, R. M. May, A. L. Shipley and J. S. Pritchett to confer with representatives of Johnson City and the Tennessee Eastern Electric Company. Jonesboro has voted bonds of \$25,000 to further the project, and it is proposed that Johnson City issue an equal amount and that the electric company make up the remainder. Six miles of railway would be necessary to connect with the Johnson City line, and it is estimated that construction and equipment would cost from \$75,000 to \$100,000.

**Portland, Vancouver & Northern Railway, Vancouver, Wash.**—Surveys have been begun to determine the most practicable route for an electric line in Vancouver to extend east of Garrison, to be constructed by this company. [E R. J., Feb. 6, '15.]

**SHOPS AND BUILDINGS**

**Puget Sound Traction, Light & Power Company, Seattle, Wash.**—A lease for a term of years of the entire eighth floor of the new Stuart building at Fourth and University Streets, owned by the Metropolitan Building Company, has been made to the Puget Sound Traction, Light & Power Company, whose offices, long located in the Pioneer Building at First and Yesler Streets, will be removed to the new quarters at once.

**POWER HOUSES AND SUBSTATIONS**

**Pacific Gas & Electric Company, San Francisco, Cal.**—The contract between this company and the Great Western Power Company, whereby the latter supplies the former company with electric power, has been renewed for eighteen months.

**Holyoke (Mass.) Street Railway.**—This company is increasing the capacity of its Berkshire Street plant.

**Manufactures and Supplies**

**ROLLING STOCK**

**Warren-Bisbee Railway, Warren, Ariz.,** during 1915 will probably purchase two closed cars.

**Gary, Hobart & Eastern Traction Company, Hobart, Ind.,** will purchase two interurban and one baggage and express car during 1915.

**Charles City-Western Railway, Charles City, Ia.,** expects to purchase two interurban cars, one electric locomotive and three city cars during 1915.

**Manhattan City & Interurban Railway, Manhattan, Kan.,** expects to purchase several trailers and good single-truck motor cars during 1915.

**Charleston-Dunbar Traction Company, Charleston, W. Va.,** expects to purchase one motor express car and one electric locomotive during 1915.

**Kansas City, Clay County & St. Joseph Railway Company, Kansas City, Mo.,** has ordered five all-steel cars from the Cincinnati Car Company. The cars will have a seating capacity of 68; length over all, 59 ft.; length over body, 58 ft.; length of smoking compartment, 14 ft. 8 in.; extreme width, 9 ft.; truck centers, 37 ft.; dia. of wheels, 36 in.; wheelbase, 7 ft.; width of seats, 40 in.; width of aisle, 22 in. The specifications call for a center entrance arranged somewhat along the lines used on this company's present center-entrance equipment, except that the smoking compartment will be smaller. This is accomplished by an additional partition separating one-half of the car into smoker and passenger compartments. The equipment will include four 100-hp motors; air brakes, both automatic and straight. The seats will be of the Hale & Kilburn type with those in the passenger compartment upholstered in green plush, while those in the smoking compartment will be covered with a black fabrikoid. The interior finish of the car body will be mahogany, and all windows will be fitted with storm sashes. The ceilings of the car body are to be of steel with no covering, so that the carlines are exposed. Heat and ventilation are furnished by Peter Smith heaters and sixteen 8-in. Railway Utility ventilators.

**Interborough Rapid Transit Company, New York, N. Y.,** noted in the ELECTRIC RAILWAY JOURNAL of Jan. 9, 1915, as having ordered twelve all-steel subway cars from the Pressed Steel Car Company, has specified the following details for this equipment:

Date of delivery, about May 1	Couplers, West. automatic,
Length over body corner posts.....39 ft. 4 in.	car, air & electric
Length over draw-bars,	Curtain fixtures,
51 ft. 4 in.	Cur. Sup. Co.
Width over side sills	Curtain material...Pantastote
8 ft. 6 3/4 in.	Gears and pinions,
Width over window sills	stub-tooth, oil-tempered
8 ft. 10 1/16 in.	Hand brakes....geared type
Bolster centers, length, 36 ft.	Journal boxes.....ry. std.
Interior trim .....steel	Motors,
Roof .....monitor	Two 100 hp, field control
Air brakes,	6 equipments, West. 302-F2
Westinghouse automatic	6 equipments, G.E. 240-C
Axles...ry. std., heat treated	Seats, Hale & Kilburn, rattan
Bumpers, Hedley anti-climber	Springs...Std. Steel Works
Car trimmings...Aero metal	Trucks, Hedley cast steel
Control, 6 West., type A B F	frame type, built by Brill
6 G. E., type PC	Wheels.....solid rolled steel

**TRADE NOTES**

**Asbestos Protected Metal Company, Pittsburgh, Pa.,** has removed its head office from Beaver Falls to the First National Bank Building, Pittsburgh, Pa.

**Cambria Steel Company, Philadelphia, Pa.,** will appoint C. B. McElhany, who has been assistant general manager of sales, to the position of general manager of sales, succeeding J. Leonard Replege.

**Cement-Gun Construction Company, Chicago, Ill.,** has received a contract to encase all the structural steel work on the new power house now being erected by the Ford Motor Company at its Detroit factory.



Murphy Varnish Company, Newark, N. J., at a meeting of its board of directors on Jan. 12 created the office of chairman of the board and appointed Franklyn Murphy to that position. Franklyn Murphy, Jr., was appointed to succeed his father as president of the company. John J. Nicholson succeeds Mr. Murphy, Jr., as vice-president. The office of second vice-president was abolished.

J. Leonard Replogle, vice-president and general manager of sales of the Cambria Steel Company, with headquarters in Philadelphia, has terminated, by resignation effective March 1, 1915, a connection of twenty-six years with that company and will become vice-president and general manager of sales of the American Vanadium Company. His new headquarters will be at both New York and Pittsburgh.

Titan Storage Battery Company, Newark, N. J., owing to the existence of a battery jar marketed under the name "Titan" and the fact that any battery using these jars might appear as a Titan battery, has changed its name to the General Lead Batteries Company. No change whatever in ownership, officers or policy is involved. The change is made entirely to avoid confusion.

Industrial Works, Bay City, Mich., has added to its extensive line of locomotive and wrecking cranes, a small locomotive bucket crane operated by a gasoline engine. This crane is especially adapted for light or intermittent work, such as handling coal, ashes, etc., or for service in places where the use of steam is objectionable. A crane of this type has a further advantage in that it is always available for immediate use without waiting to get up steam. In operation it should be very economical as there is no waste of fuel when the crane is not actually working.

Union Switch & Signal Company, Swissvale, Pa., has appointed Thomas S. Grubbs, auditor and secretary of the Westinghouse Machine Company, as secretary and assistant treasurer. George F. White, of the Westinghouse Machine Company, has been appointed assistant secretary of the signal company. Mr. Grubbs has been with the machine company for twenty-seven years and was one of the oldest employees, having previously been with the Philadelphia company which was owned by the Westinghouse interests. Mr. White has been with the machine company for the past eleven years.

Edison Storage Battery Company, Orange, N. J., has had a pleasant custom for several years, in common with other Edison interests, of celebrating in a quiet but loyal way, Feb. 11, the birthday of Mr. Edison. The custom, in which all of the employees of the Edison interests as well as a number of Mr. Edison's intimate friends participate, is to wear a small ribbon or button containing Mr. Edison's portrait in the left lapel of the coat. As Mr. Edison was born in 1847, he is sixty-eight years old this year. The *esprit de corps* of the Edison organization, which is always very strong, is intensified this year by the energy which the company and its distinguished chief have exhibited in rehabilitating the works after the fire a short time ago.

Esterline Company, Indianapolis, Ind., manufacturer of "Golden Glow" headlights, reports shipments during the month of January to the following railway companies: Roanoke (Va.) Railway & Electric Company; Boston & Maine Railroad, North Adams, Mass.; Great Northern Railway, Cascade Tunnel, Wash.; Mahoning & Shenango Railway & Light Company, Youngstown, Ohio; Scranton (Pa.) Railway; Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.; New York & Long Island Traction Company, Hempstead, L. I., N. Y.; Niles Car & Manufacturing Company, for new cars of East Liverpool Traction & Light Company; Cincinnati Car Company for new cars of Corpus Christi Street & Interurban Railway; Philadelphia & Western Railway, Upper Darby, Pa.; Wausau (Wis.) Street Railroad; Jamestown (N. Y.) Street Railway; Osgood-Bradley Car Company, for new cars of Richmond Light & Railroad Company; Empire United Railways, Syracuse, N. Y.; St. Petersburg & Gulf Railway, St. Petersburg, Fla.; Muskegon (Mich.) Traction & Lighting Company; San Antonio (Tex.) Traction Company; Lincoln (Neb.) Traction Company; Texas City (Tex.) Street Railway; Central New York & Southern Railway Company, Ithaca, N. Y.; Altoona & Logan Valley Electric Railway; Des Moines (Ia.) City Railway.

Kennedy-Stroh Corporation, Pittsburgh, Pa., with a capitalization of approximately \$2,500,000, has taken over all

rights, processes and factories of the Kennedy Manufacturing & Engineering Company, New York, the Stroh Steel Hardening Process Company, the Lawrence Steel Casting Company and the Best Manufacturing Company, Pittsburgh, Pa. The corporation will operate as a main plant the factory at Oakmont, Pa., formerly operated by the Best Manufacturing Company, also the old Lawrence Steel Plant at Thirty-second Street and A. V. R. R., Pittsburgh, as the Lawrence department. The Kennedy line of mining, crushing, cement making and conveying machinery is one of the most extensive of American manufacture. The Stroh steel hardening process is a method of casting two kinds of steel in one solid casting in such a manner that the hard alloy comes on, and only on, the parts which are subjected to wear. The Lawrence Steel Casting Company, which was established in 1883, is one of the first concerns of its kind in the Pittsburgh district, and is well known. The Best Manufacturing Company has been manufacturing a line of power piping flanges, fittings and valves for thirty years and has made some of the largest piping installations in service in the United States. W. H. Schoen, formerly connected with the Schoen Pressed Steel Company, now the Pressed Steel Car Company, is president of the new corporation and will be the active business head. J. E. Kennedy, who is vice-president and chief engineer, has been well known as a designer of mining and other machinery for more than twenty years. J. L. Kendall, of the Kendall Lumber Company and allied interests, is treasurer. J. D. Hiles, who has been connected with the Best Manufacturing Company for the past fourteen years, is secretary. W. Y. Stroh of the Stroh Steel Hardening Process Company, is general manager and metallurgist.

#### ADVERTISING LITERATURE

Ohio Brass Company, Mansfield, Ohio, has issued a folder describing and illustrating its O. B. trolley retriever.

American Veneer Company, Hoboken, N. J., has issued a folder describing its three-ply laminated wood headlining for railway and street cars. The headlinings are light and substantial and are supplied ready for installing in any required curve. They are furnished in the following woods: mahogany, quartered oak, birds-eye maple, white maple, sycamore, plain oak and poplar.

Terry Steam Turbine Company, Hartford, Conn., has issued a sixty-four page bulletin on the subject of centrifugal pumps. The bulletin gives details and data on various turbo-pump applications. The principles of operation and construction of the centrifugal pump are fully explained, as are the details of the steam turbines, which have been used during the past ten years for driving them. Because of the wide latitude of speed possible with the turbine the unit occupies a much smaller space than would be required for performing the same duty but driven by a reciprocating engine. The range of conditions in this service varies from large volumes of water pumped against low heads up to high head work. Special attention is directed to the reliability of these pumping units and freedom from shutdown owing to accidents, repairs or packing renewals.

Delta-Star Electric Company, Chicago, Ill., has issued Bulletin No. 15, which describes and contains 188 illustrations of its "unit type" high-tension indoor equipment, including switches, fuses, choke coils and entrances. These insulators are said to eliminate the disadvantages and embody the good points of both pillar and post types, in that the top and bottom fittings are adjustable, detachable and occupy minimum space. The unity type insulator consists of a corrugated pillar, each end having a socket, into which is "key cemented" a threaded malleable iron thimble. By means of standard bolts any desired fitting can be secured to an insulator unit. "Key cementing" thimbles into the insulator ends to receive fittings rather than clamping fittings around the outside maintains a maximum creepage distance between live parts and ground. The voltage ratings conform to the standard commercial pressure of 6600, 13,200 and 22,000 volts. At the end of the bulletin is a technical data section, containing a number of useful tables essential for reference in dealing with busbar operation. This company has also issued Bulletin No. 20, which describes its high-capacity outdoor substation high-voltage equipment, including pole-top air-brake switches and S. & C. lightning arresters.