

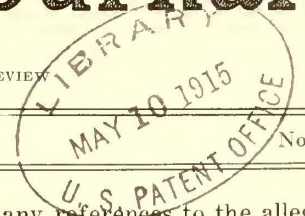
# Electric Railway Journal

Published by the McGraw Publishing Company, Inc.  
Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

Vol. XLV

NEW YORK, SATURDAY MAY 8, 1915

No. 19



## TECHNICAL EDUCATORS AND THE CONVENTION

It will be remembered that last year an incident of the Atlantic City convention of the railway association was an attempt to bring leading instructors and railway men together for mutual benefit. As far as it went the result was satisfactory, and there was manifest a desire that more should be done along the same line. While no plans for the current year have been announced it will be necessary for teachers to make their plans for attending the convention within the next few weeks before the governing boards adjourn for the summer. The date of the convention, Oct. 4 to 8, fits in well with that of the International Engineering Congress, Sept. 20 to 25, the intervening gap being available for studying the exposition exhibits. If plans are made early it should be possible to have a large delegation of teachers on hand. There are big problems with which they should become familiar and which have even more bearing on the future careers of their students than, say, the heating of a rotary converter armature coil, located  $n$  slots from a tap point, when carrying full load with 95 per cent power factor, leading current.

## INCREASED SPEED WITH LESS POWER

Certain elaboration seems to be desirable with regard to our recent comment on the vital importance of faster schedules, in which it was said that power consumption per car-mile would be reduced as schedule speed was increased. Higher speed accompanied by lower power consumption admittedly constitutes an apparent paradox because most available records on the use of energy by cars and trains deal only with factors such as rolling friction, wind resistance and the like, to the practical exclusion of the number of stops per mile. As a matter of fact the latter is of far more importance in urban service than all the other factors added together, and our statement that fewer kilowatt-hours are required with faster schedules is predicated on the condition that the increased speed was to be attained by cutting out stops. To recognize the importance of this factor it is only necessary to recollect that a free-running car at 20 m.p.h. uses less than 50 watt-hours per ton-mile, while in city service with numerous stops a schedule speed of only 10 m.p.h. involves the use of about three times as much power. Without going into details each stop necessitates an expenditure of energy of the order of 6 watt-hours per ton, or if a saving of five stops per mile is effected, the power consumption will be reduced some 20 per cent even though the speed will increase about 20 per cent at the same time.

## MOTOR-BUS COSTS IN ENGLAND

So many references to the alleged low cost of bus operation in England have appeared of late in connection with the introduction of the bus *vs.* tram controversy into this country that some startling statements to the contrary which were published recently in the proceedings of the London Institution of Civil Engineers possess considerable interest. These covered actual working costs given out by three British municipalities which had undertaken bus operation and then had discontinued it, the figures being respectively 32 cents, 25.4 cents and 28.8 cents per bus-mile—about twice the cost for tramcars in England. Authentic figures lower than these were stated not to be available, the London bus company being “loath to divulge details on account of the competition which exists.” This is most unfortunate. Rumors of low operating costs have been so frequent as to have acquired the dignity of the truth in the minds of practically everyone in this country, and statements indicating that the auto-bus may not be much cheaper to operate in London than here come as a distinct surprise. When, in addition, it is stated before the Institution that vast amounts of capital have been lost in motor-bus exploitation in England, and that still larger amounts are in contemplation “without any cost figures to which responsible parties would affix their names,” it seems that conditions on the two sides of the Atlantic are much the same after all. The main difference is that England has followed this *ignis fatuus* longer than we have and has wasted more money in doing so.

## NEW YORK CONSTITUTIONAL CONVENTION

The members of the constitutional convention now in session at Albany, N. Y., have received from a committee representing local members of several national societies and local societies of engineers copies of a pamphlet making certain well-considered but novel suggestions. Some of these were mentioned in a brief abstract of the pamphlet printed in this journal last week. The substance of the matter is that the engineers of the State, acting as a specially qualified group of citizens, after careful consideration offer a constructive program for the conducting of those parts of the State's activities which have to do with public works and public utilities. These men are by the nature of their work forced to realize keenly the shortcomings of the present system which result largely from the constant shifting of the personnel of administrative offices and regulatory bodies. They form a distinctive and highly intelligent class well qualified to speak and entitled to a respectful hearing from public servants. The

case is the same as if the physicians of the State should speak as a group on matters affecting public health, or the lawyers on its court machinery. What the engineers want to secure is competence in high places. In no other way can public works be economically constructed and maintained and public utilities secure consistent and reasonable treatment. Since the last constitutional revision twenty years ago great progress has been made in public-utility regulation and in State engineering work. Sufficient experience has been accumulated to show the necessity for removing these from direct and indirect political control. Incessant "investigations" have demonstrated the precariousness of tenure of office and have greatly reduced the attractiveness of many State posts to the class of men who would make the best public officers. The electric railways and other utilities of the State are greatly concerned in this matter as they touch State authority at many points and have a vital interest in removing these offices as far from politics as possible. Through their local delegates to the convention they can and should exert an influence commensurate with the magnitude of their concern in the outcome.

#### FINAL ARTICLE ON N. Y. M. CAR

In this issue we complete the series of articles on the new New York Municipal car of the Brooklyn Rapid Transit System, begun about a year ago. Altogether six installments have been published, descriptive respectively of the general design; body; truck, brake rigging and draft gear; motors, control, conduit and collectors; lighting, and brakes and auxiliaries, the last considered in the present article. So much progress has been made during the past few years in the design of cars, particularly for rapid transit service, that we believe this series of articles has put in form easily accessible to others a great deal of information which they will find of practical use for any study which they may make of rolling stock for their own needs. As a rule, freedom in car design is hampered by the necessity of complying with rigid limitations imposed by the track location. In this case, the clearances provided in the new subway system as well as on the existing Brooklyn elevated system were so great that the principal limitation became one of weight, and this the designers were able to attack so successfully as to secure a final weight for a motor car of only 315 lb. per passenger, based on a carrying capacity per car of 270 passengers. The operating features of the car seem to have been as carefully studied out as those of structural strength combined with minimum weight. Rapid loading and unloading is provided by three sets of double side doors under the control of one trainman, and rapid acceleration, retardation and passage over the road by the use of ventilated motors of high capacity on each car, the clasp brake and a control system which automatically keeps the speed below the maximum allowed by operating conditions at different points. Finally, the comfort of passengers is cared for by scientifically designed seats and a system of illumination based on modern principles made possible by the white enameled finish of the interior of the car.

#### BY-PATHS IN WAGES ARBITRATION

Attention has been called in these columns to the thoroughness with which the evidence of the Bay State Street Railway in the pending wages arbitration at Boston was prepared, and some hint of this was given in concrete form in the issue of April 10 in connection with the report of Professor Richey's testimony on the cost of living then published. One of the things which impresses one who scans the material presented by the company is the number of by-paths traversed in the case and the immense amount of special investigation conducted on the system in order to furnish the arbitration board with the latest and most accurate data possible. Hearsay evidence was tabooed, and the facts brought out with so much skill by the company's officials are the result of costly analysis by competent men who went straight to the source of information for their material.

Thus, the figures and plots showing the variation in the cost of living in the cities and towns of the sixteen divisions operated were derived from information secured at considerable expense by men who went personally into these places, consulted with local superintendents as to reliable merchants, and then interviewed tradesmen upon the present and former cost of foodstuffs, clothing, etc. In the compilation of data bearing on rents one of the largest real estate firms in Boston was retained to investigate these costs in territory in which railway employees could have their homes, and in this way authentic information, assembled by specialists, was brought to the hearing room.

Going still deeper into the economic conditions governing its employees, the company determined the amount of taxable property held by car service men or their wives to be more than \$1,000,000. Even though such property might in part be mortgaged, it was felt that such a total, representing 425 employees, showed that the company's service had been unduly attacked by the union representatives as deadening to ambition and tending to force the men into hopeless poverty! Relative to the enjoyments of life participated in by the men when off duty, the company introduced quotations from the union magazine to neutralize the testimony of individual employees called to the stand by the union to convince the board that pleasure and the blue uniformed man seldom met. Even a census of the number of children and the former occupations of the men was presented, and the comparisons of their wages and permanency of employment with other occupations in Massachusetts were most illuminating.

Counsel for the men naturally elaborated upon the multiplicity of duties assigned to the modern motorman and conductor, and with the detailing of these, with an immense amount of repetition, the expenses of both the men and the company were forced to wearisome limits. A very large part of the Bay State service is rendered in suburban or country districts, and to offset the contention that street railway work is as laborious on such lines as in the city, the company introduced evidence by a number of employees from other roads in Massachusetts and Maine stoutly affirm-

ing that country operation is easier even where a man runs on a single track. Evidence submitted showed that in the last five years there were fifty times as many rear-end collisions on double track as head-end collisions on single track on the Bay State system. Another new line of attack which graphically supported the justice of the graduated scale was the diagram showing the relation between reprimands, accidents and years of service. This diagram was shown in the *ELECTRIC RAILWAY JOURNAL* of April 10, page 709.

To mention one more of the by-paths which the company followed in turning its affairs inside out at the hearings, one of the nearly 500 exhibits filed described the organization of the department of maintenance of way, and that of the department of motive power and machinery, including lines, power stations, carhouses, etc., with a summary of the duties of numerous officials, both of high and subordinate ranks. Their purpose was to show that every official of these departments has specific duties of a superior character and that the company was not spending money needlessly for executive supervision. The company deserves congratulation upon its treatment of the problems involved in a way which demonstrates that electric railway practice is a profession in every sense of the word.

#### CIRCULARIZING PROPOSED RAILWAYS

We are occasionally the recipients of letters from consulting engineers, supply men and others interested in new electric railway construction, which inclose for our explanation circular literature previously addressed to proposed railways reported in the *JOURNAL*, but returned unclaimed to the sender because of incorrect or insufficient address. In most cases of this kind the address on the unclaimed letter has been simply the name and supposed local headquarters of the proposed line but not the name of the promoters interested. The letter probably failed of delivery because the line was in an embryonic state and its name was therefore unknown to the local postmaster. Some other letters, called to our attention, were addressed to individuals in large cities, without their house or street address.

While many of the notes published on proposed lines do not mention the names of the officers directly concerned, owing to lack of available information, they are often followed in later issues with details of personnel, including the name of the officer most valuable to the manufacturer—the man in charge of purchases. We suggest, therefore, that circularizers make a point of constantly keeping their "field" cards of proposed roads strictly up to date by searching the current "Construction News" columns carefully for the names of proper addressees connected with these roads but not mentioned in the preliminary scanty report. The superscription of each letter of solicitation should be based on the very latest information obtainable at that time and should, so far as possible, bear the name of the officer most likely to supervise the awarding of contracts.

If these precautions are taken we believe that solici-

tors will be repaid for their trouble by a noticeable saving in "dead" postage, stationery and stenographic labor, and above all by the transformation of many apparently chimerical railways into real prospects. More careful circularizing would also save the financial promoter of a line, who can hardly tell a motor from a controller, the nuisance of forwarding to his equipment engineer a flood of misdirected technical correspondence and advertising literature.

#### FLANGE-BEARING SPECIAL WORK

The satisfactory results obtained by the few electric railways that have installed flange-bearing special work, especially at obtuse and right-angled crossings, have led some companies to adopt this practice as standard and have caused others to give similar action serious consideration. Our observations are that there is much to be gained by the practice. In both the solid manganese and insert special work the first evidences of wear appear at the intersections of the running rails. The use of flange bearings delays the wear at these crucial points and proportionately lengthens the life of the installation. Manifestly if the impact blows struck by wheels at the intersecting flangeways could be eliminated, the life of special work would be materially increased and, in fact, would approach more nearly that of the rail.

Some engineers have been inclined to look on this practice with considerable apprehension because they believed that it affected the safety of operation. Experience in Kansas City, Mo., and elsewhere has demonstrated that even with chilled-iron wheels this belief was unwarranted. With rolled-steel wheels in the flange-bearing special work, the slight wear on the flanges certainly will not be as rapid as that on the treads which tends to make the flanges deep. Moreover no hazards are introduced as regards the safety of operation, since rolled-steel wheel flanges do not chip.

The general use of the welder in making track repairs offers a means of prolonging the life of the flange-bearing throatway floors of special work. It is quite a simple task to deposit new metal on the floor of the groove to replace that worn out by passing wheel flanges. As long as this worn-out metal may be restored in this manner, special work may be kept flange-bearing indefinitely. Added importance is given to the more general use of flange-bearing special work when one considers the relatively small investment in car wheels as compared with that in the special work installations in large cities. To our way of thinking, experience has shown that the practice is perfectly safe, and it is certainly an economic measure which should warrant more general adoption. This practice is particularly applicable to solid manganese steel frogs and crossings since no difficulty is experienced in providing gentle approaches in the grooved floors. Flange bearings may also be provided in the various types of insert special work and in these it can more easily be maintained since the materials employed lend themselves more readily to welding.

# The New York Municipal Car—Brakes and Auxiliaries

Unusually Severe Conditions Are Set for the Air Brakes, in Which the Braking Pressure Is Varied According to the Load—The Low-Voltage Coupler Greatly Simplifies Train Operation, Including Automatic Change of Marker and Tail-Lights—Pneumatically Operated Doors with Spring Shock Absorbers, Automatic Speed Control, Buzzer Train Signals and Correct Posture Seating are Other Features

In this article, which concludes the series\* on the multi-side-door car of the New York Municipal Railway Corporation, are described the braking equipment with its empty-and-load brake mechanism, the low voltage coupler, the interoperation of control, door, train light and train signal circuits, the automatic speed control, the heaters, signs and other auxiliaries.

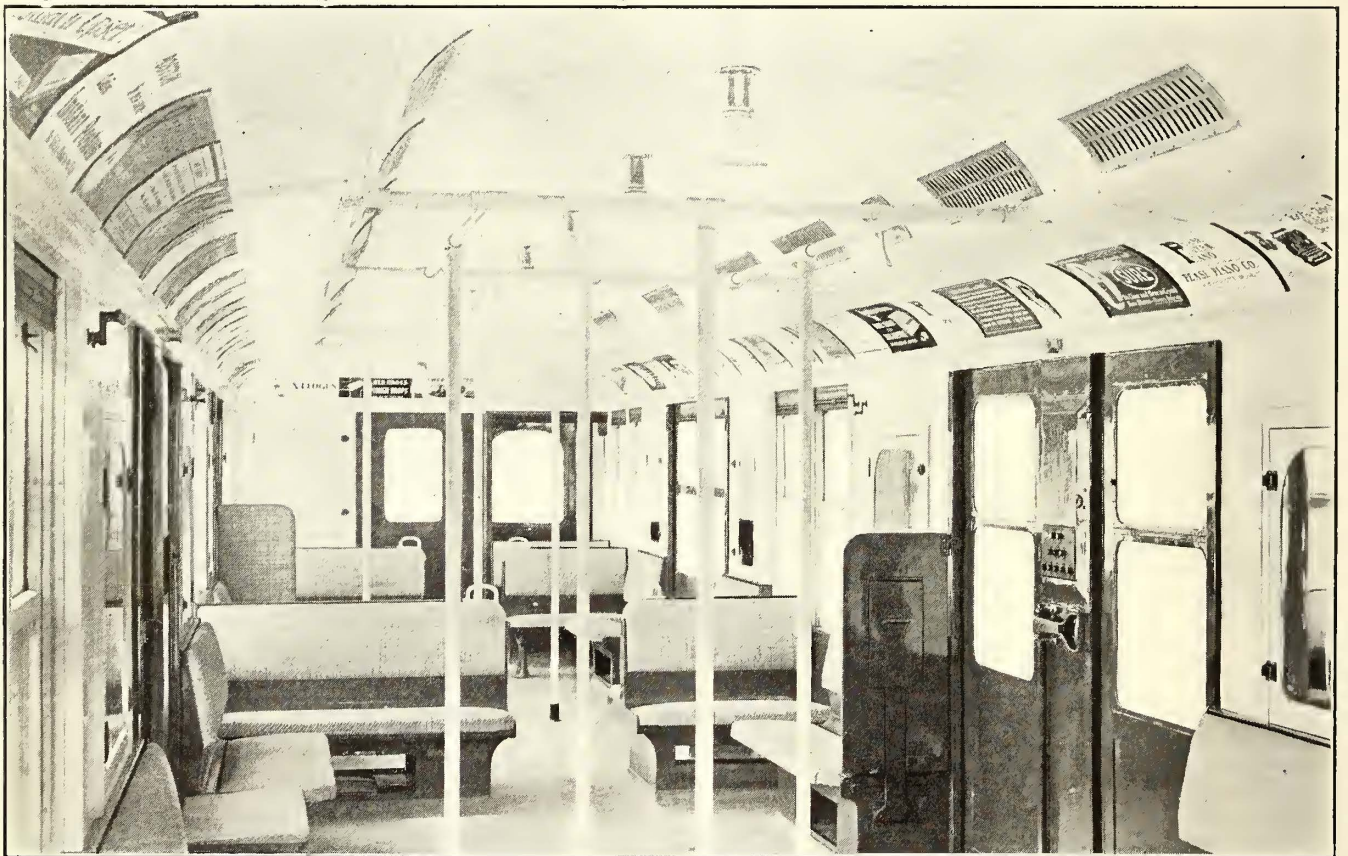
## AIR BRAKES

The air brakes are of Westinghouse automatic type A M U E with electropneumatic control and graduated release. Further, they embody the features of rapid

cylinder pressure with a fully loaded train. The electro-magnet valves of the brake system are operated from the 32-volt storage battery on each car.

As noted in the article of Dec. 26, 1914, all wheels of each truck are fitted with clasp brakes, two shoes per wheel. With 50 lb. air pressure in the brake cylinder, the foundation and truck brake rigging, which is designed for a leverage ratio of 12:1, delivers a combined pressure on each pair of brakeshoes equal to 90 per cent of the weight on each trailer wheel and 110 per cent of the weight on each motor wheel.

The air brakes are to be operated under the local and



N. Y. M. CAR—INTERIOR SHOWING THE GENERAL SEATING ARRANGEMENT AND VIEW OF SEAT FOLDED UP ALONGSIDE ONE OF THE ACTIVE DOORS; EMERGENCY LAMPS SHOWN OVER DOORS

recharge after each brake application and of auxiliary reservoir recharge without releasing the brakes. Emergency application of the brakes is obtained instantaneously and simultaneously on all of the cars of a train from the opening of the motorman's brake valve, the conductor's valve, or rapid reduction of brake-pipe pressure from any other cause. The brake-pipe pressure is 70 lb., and full service application gives 50 lb. brake-

express run conditions already detailed in the article of March 13, 1915. Broadly speaking, local trains are to make a schedule speed of 15 m.p.h. between terminals of local service and express trains are to make a schedule speed of 25 m.p.h. between terminals of express service. Some trains will operate in local service entirely and others in mixed local and express service. The trains will vary from two to eight cars, weighing 120,000 lb. each when fully loaded. The average lengths of stop for local and express service respectively will be twenty and thirty seconds. The average lay-over at terminals will be three minutes.

\*For the preceding articles in this series, see ELECTRIC RAILWAY JOURNAL as follows: "Design," June 6, 1914; "Body," June 13, 1914; "Trucks, Brake Rigging and Draft Gear," Dec. 26, 1914; "Motors, Control, Conduit and Collectors," March 13, 1915, and "Lighting," March 27, 1915.

One important requirement is that the air brake shall be capable of making full emergency application after, or superimposed upon, ten possible applications with an average interval of 430 ft. when the train is descending inclines over the East River bridges.

On straight, level, clean and dry rail with trains of two to eight cars using cast-iron brakeshoes and with a brake-cylinder pressure of 50 lb. for service and the maximum obtainable for emergencies the following rates of retardation are specified.

**Service Stop**—From an initial speed of 50 m.p.h. the average rate of retardation during a service stop must not be less than 2 m.p.h.p.s., provided the product of the efficiency of the brake rigging and the average coefficient of friction of the brakeshoes throughout the stop, expressed in percentage, is not less than 9.5 per cent. The period of retardation includes the time from the instant full service pressure is obtained in the brake cylinder to the instant of stop.

**Emergency Stop**—From an initial speed of 50 m.p.h. the guaranteed average rate of retardation during an emergency stop must not be less than 3 m.p.h.p.s., provided the product of the efficiency of the brake rigging and the average coefficient of friction of the brakeshoes throughout the stop, expressed in percentages, is not less than 9.5 per cent. Here the period of retardation includes the period from the instant the brake-valve handle is moved to emergency position to the instant of stop.

Full emergency pressure is applied automatically whenever the brake-pipe pressure is reduced below a predetermined point, whether through leakage or other causes. While possessing maximum sensitiveness to increases in brake-pipe pressure for the purpose of obtaining release, the brake is free from the tendency to "creep on" due to slight fluctuation in brake-pipe pressure. Any failure in service of the electric control of the brake system in service or emergency application results in the automatic application of the brakes, without further manipulation of the brake valve by the motorman.

#### CHARACTERISTICS OF BRAKING APPARATUS

The D-2-F motor-driven compressor has a displacement capacity of 25 cu. ft. per minute at 600 volts. Its motor will operate the compressor at a minimum line voltage of 300 and a main reservoir pressure of 100 lb., and it will also operate satisfactorily on line voltages ranging from 300 minimum to 750 maximum. The compressor was subjected to a preliminary voltage test of 3000 a.c. for one minute, between windings and ground, while the commutator had to stand a voltage test of 200 a.c. between adjacent bars for one minute.

The compressor motor has ample capacity to operate for three hours continuously with 100-lb. air pressure in the main reservoir, on an average line voltage of 550, with a maximum temperature rise in the motor windings of 65 deg. Cent. above the surrounding atmosphere. Furthermore, the compressor must be capable of supplying the  $1\frac{3}{4}$  cu. ft. of free air per car which the pneumatic door devices take at each station stop. It must also be capable of supplying the air for the chime air whistles.

One complete synchronizing system is furnished with each set of air-brake apparatus. This system is so designed that the first governor to cut in, after depletion of the main reservoir pressure, will close all compressor switches in the train simultaneously.

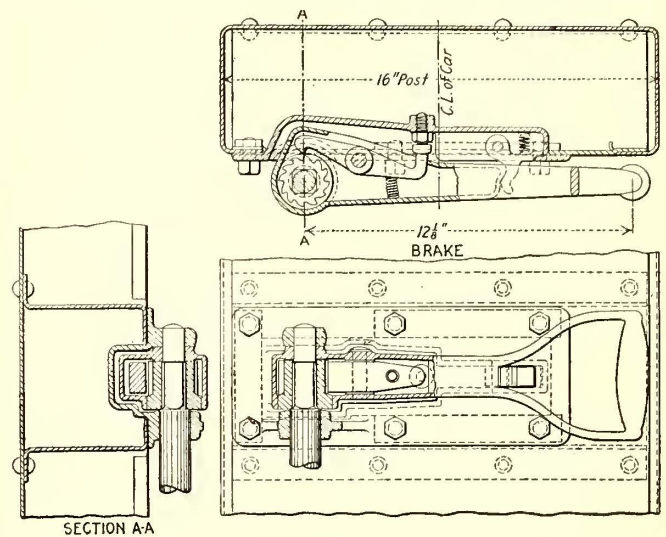
The compressor switch opens the motor circuit at a normal maximum of 750 volts, and is capable of opening, without injury, the compressor motor circuit during such current surges as may be caused by crossing gaps in the third-rail.

The governor cuts in and cuts out on a variation of 10 per cent of the main reservoir pressure, and its quick action is not influenced by a slow rate of depletion of the main reservoir pressure. Failure of any governor on the train to cut in does not affect the operation of the compressor switches on any of the cars in the train.

The emergency-valve (deadman's handle) feature in the motorman's cab has already been described in the article relating to motors and control. It is proper to add here that each car is equipped with the usual conductor's valve placed in the deck sill near the middle of the car.

Moreover the speed control equipment hereinafter described is so interconnected with the brakes that if a motorman disobeys a signal the brakes will apply automatically.

In addition to the usual gages, cocks, valves and other air-brake fittings, including American Type J automatic slack adjuster, there is installed the empty-and-load brake attachment described hereinafter.



N. Y. M. CAR—DETAILS OF HAND BRAKE

All reservoirs are made of steel plate enameled inside to prevent corrosion and oxidation. They were tested by a hydraulic pressure of 200 lb. per square inch followed by an air pressure of 160 lb. per square inch.

All pipe used in connection with the air brakes is of iron lap-welded "Sherarduct." The fittings are of malleable iron, each tested under water with air pressure of 250 lb. per square inch. All pipe joints are made with shellac cut in alcohol, and the installation, when completed, was tested with a pressure of 125 lb. per square inch, at which pressure it had to be free from leakage. All unions are of rough brass with ground joints.

An individual spiral-shaft hand brake, especially designed by the railway, is available for contingencies. The ratio of this brake is 4:1, and it is operated by means of a ratchet handle. A drawing of the brake is presented in an accompanying illustration.

#### EMPTY-AND-LOAD BRAKE ATTACHMENT

The object of the empty-and-load brake mechanism is to vary the braking power, as applied through the brakeshoes, in accordance with the variations in the live weight of the car. These variations are made when the doors are open; in other words, they occur only during the period of passenger interchange. The functions of this mechanism are carried out as follows:

When the doors of a car are opened, interlocks on the door-operating mechanism are in such position that an electropneumatic valve on the car body is energized from the storage battery. The action of this valve permits air to enter a vertical cylinder, which is mounted on the truck truss plank, and to push the piston of this cylinder outward and upward.

As the passenger load on the car increases, the movement of the elliptic springs on the truck tends to force this piston backward. This movement in turn actuates a vertical rack and pinion which are mounted on the body bolster. Any movement of the vertical rack is transmitted to a horizontal rack which in turn causes a connecting pullrod to vary the capacity of the auxiliary reservoir.

In this way the brake-cylinder pressure at full load is increased between 35 per cent to 40 per cent, with a 20-lb. reduction in the brake pipe. In case of an emer-

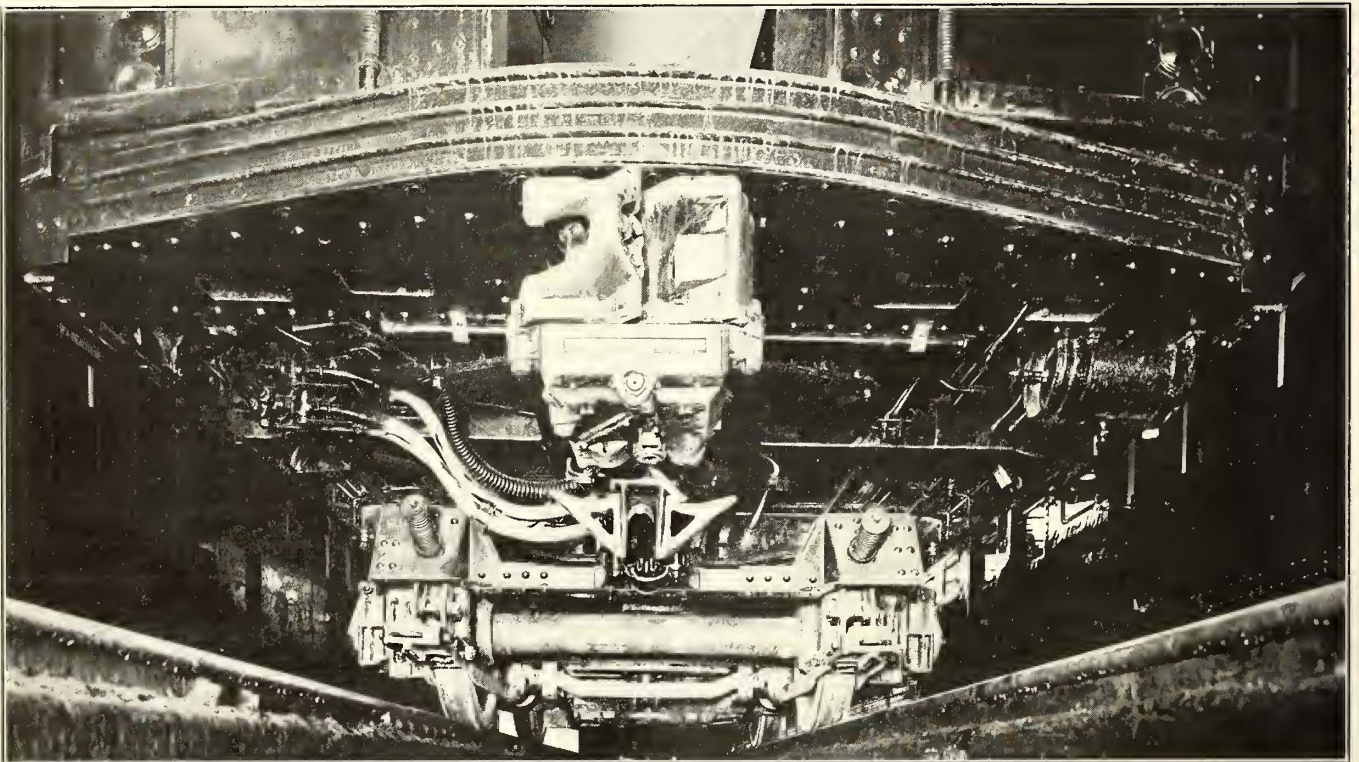
distances, irrespective of loading. The acceleration also is maintained at a uniform maximum for any given grade condition, irrespective of loading.

These important factors, together with the shorter spacing of block signals involved, permit a remarkable increase in train capacity on any rapid transit railway.

#### AUTOMATIC CAR, AIR AND ELECTRIC COUPLERS AND JUNCTION BOXES

In place of the usual loose-fitting car couplers, double sets of air hose and train-line receptacles with removable jumper connections, the Westinghouse combined car, air and electric coupler was adopted for the following reasons:

1. Less time needed to couple and uncouple the cars.
2. Less hazard in coupling cars.
3. Freedom from possible accidents due to dragging jumpers.



N. Y. M. CAR—LOW-VOLTAGE AUTOMATIC COUPLER AS INSTALLED

gency application the braking power is increased practically 42 per cent. In short, the most efficient rate of retardation is maintained for any degree of loading.

The empty-and-load brake mechanism is also tied in with the selective acceleration feature of the multiple-unit control. This is accomplished by means of an extra winding on the limit switch whose modification of current input to the motors is controlled from a switch operated in connection with the empty-and-load brake mechanism.

A full appreciation of the great value of this improvement is obtained only when one considers the effect of a 40 per cent increase in the total weight, by means of the live load, upon the stopping distance of multiple unit trains as heretofore braked. The weight of the empty train determines the maximum braking power that can then be applied to it, and under the old conditions an increase of 40 per cent in weight meant lengthening all the stopping distances obtainable with the empty train by about 40 per cent when the same train was loaded. With the empty-and-load brake attachment, all trains can be stopped in the same minimum

4. Superior contact for train-line connections.
5. Saving in the cost of coupling cars.
6. Simpler installation, because one-half of the train-line terminals are eliminated.
7. No extra provision for housing in the cars or at the terminal for detached jumpers.
8. Simple and safe automatic operation of auxiliary contacts at the end of the train for marker and signal purposes.
9. Greater facility in cutting the train line to locate trouble, thus minimizing possible delays.
10. Material reduction in cost of maintenance.
11. Because there is no wear between car coupler faces, this expense in maintenance is eliminated.

Perhaps the most important feature of the automatic electric coupler is that only one operation is required, namely, that of throwing the coupling valve in the motorman's cab. On the contrary, with the preceding jumper system fully sixteen operations were necessary and only a few of this large number were due to safety gates, chains and other non-train-line devices.

When the motorman throws the coupling valve the

main control, the speed control, the air brakes, the signal lights (including the extinguishing of marker and tail-lights between cars), the buzzers, and all other train-line auxiliary circuits are in normal service.

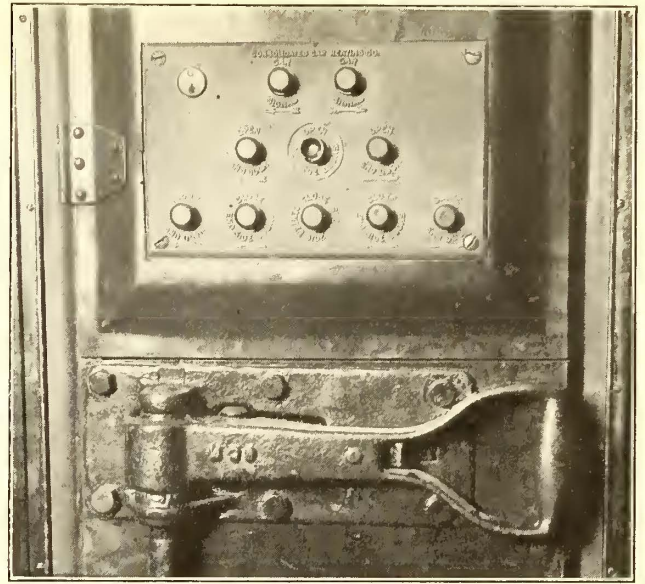
All of the foregoing advantages are made practicable by the fundamental fact that the car coupler, to which the air and electric connections are attached, is of the absolutely tight-lock type. When two of these coupler heads have been united the two parts become as one piece, so that when in service a thin coating of brake-shoe dust extends across the two, there is no crack to indicate the line of juncture.

One junction box near each end of the car and one at the center of the control box with terminal studs are provided to form the train-line connection between the automatic couplers, the master controller, the control box and the brake and auxiliary apparatus.

At the end junction boxes are outlets for all train-line wires, including the main control, speed control, brake, marker and tail-light and signal circuits. At the central junction box separate outlets are provided for the control circuits, the brake circuits and the battery supply connections. Each terminal clip is marked with the number of the wire to which it is to be connected, and the terminal board is usually marked with the train-line numbers on each stud.

#### DOOR OPERATION

As stated in the earlier articles the New York Municipal car has three pairs of sliding doors on each side and a single door at each end. One operator stationed on either side of the car midway between the two middle doors, is able, by means of the push-button board illustrated, to operate all doors on the side nearer to him, and, also to operate both end doors from the same



N. Y. M. CAR—PUSH-BUTTON BOARD FOR DOOR CONTROL; HAND BRAKE BELOW

position. He can also operate the doors on the opposite side of the car by manipulating the buttons on the opposite panel. In all, each car has fourteen door engines and eight electropneumatic valves.

All engine valves are equipped with an attachment for opening or closing their respective doors by hand from the inside of the car. The respective valves are also equipped with an attachment for opening and closing from the outside the two end doors and each pair of middle doors, by means of properly-protected push buttons outside the car.

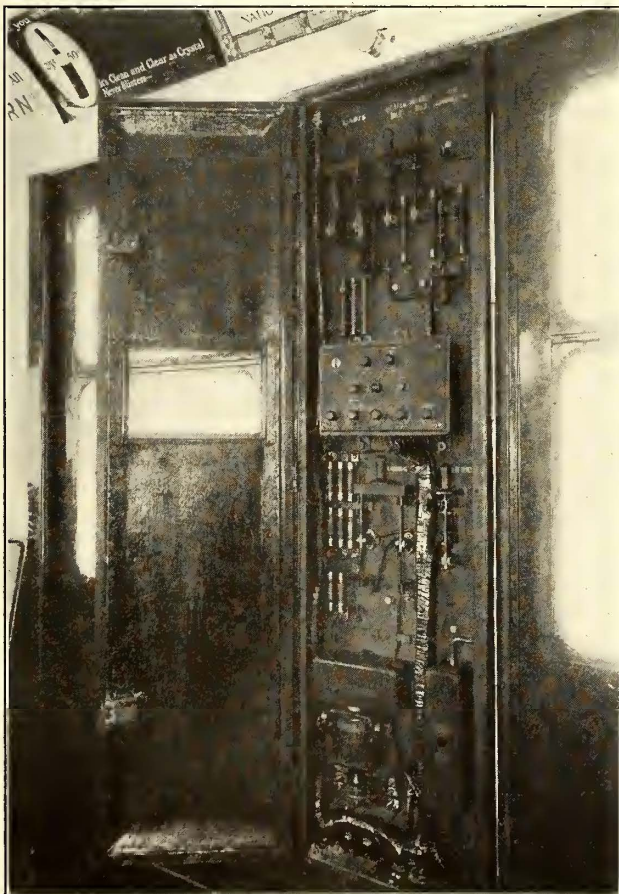
The doors will operate at main reservoir pressures of 80 lb. minimum to 100 lb. maximum. It was specified that all door mechanism must be capable of making 300,000 strokes in service between applications of lubricant. The wear of operating parts during these periods must not cause valves or piston packing to leak. The variation in the time of door opening and closing between applications of lubricant must not be more than 10 per cent with an air pressure of 100 lb. per square inch in the main reservoir with atmospheric temperature ranging from zero to 90 deg. Fahr.

The door-operating mechanism, which was built by the Consolidated Car Heating Company, embodies some valuable improvements to meet the New York Municipal requirements. Probably the most important of these requirements was that relating to the time of the door-operating cycle.

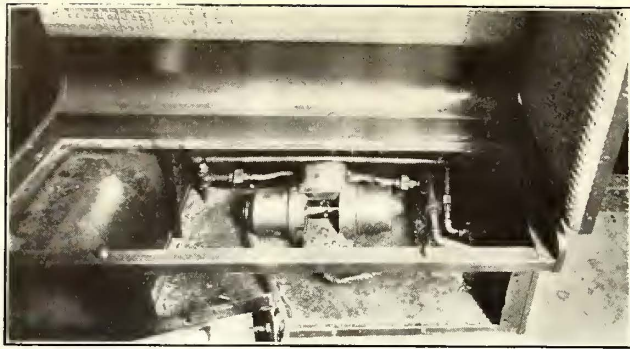
The railway company felt that in a service with the short station stops specified a rapid yet absolutely safe door mechanism was essential. It therefore specified that all door engines should be capable of opening the doors in one and one-half seconds from the time that the operator pushes the button. This speed, however, is too high for door closing; consequently the time allowed for closing is two seconds. Thus by adding one-half second to the period of closing the entering passenger is not subjected to severe shock should he come in contact with the door. Still further to insure non-injurious closing a spring has been interposed between the piston and the door whereby the door is operated with a cushioning effect in addition to employing the usual rubber cushion at the edge of the door.

On the whole, this door-operating mechanism is a notable improvement over earlier designs.

At one of each pair of side doors is a folding seat



N. Y. M. CAR—VIEW OF PANEL BOARD FOR AUXILIARY CIRCUITS



N. Y. M. CAR—DOOR-CONTROL MECHANISM UNDER SEAT

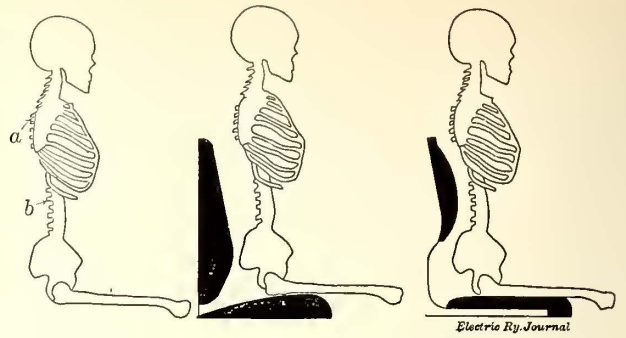
which is so connected to a three-way cock in the air feed to the door engine, that when the seat is in use the respective door engine is cut out of action. Thus it is impossible to open the door until the seat is folded up to clear the door.

**BUZZER AND DOOR-SIGNAL CIRCUITS—EMERGENCY LIGHTING**

A buzzer-signal circuit replaces the slow and obstructive bell cord. The buzzer push buttons are mounted just above and on the same panel as the door-control buttons. This signal circuit is so wired that the guard who pushes his buzzer button transmits the signal no further than to the buzzers in the forward cab of his own car and the rear cab of the car ahead. In this manner the signal is transmitted ahead from car to car. The wiring is so arranged that it is impossible to skip a car. This circuit, which is fed from the storage battery, is closed by means of interlocks mounted in the door pockets, the interlocks being operated by means of attachments on the doors themselves.

The motorman depends upon the buzzer circuit only at such times as the light signal in the operating master controller is out of order. These lights burn only when all the doors in the train are closed. The light signal consists of two lamps of 6-volt automobile type, and as but one is in use at a time the possibility of total failure is very remote. The second lamp goes automatically into circuit when the first one burns out.

The circuit for the signal lights is so connected through the reverse drum of the master controller that



N. Y. M. CAR—THE HUMAN BODY AND THE CAR SEAT

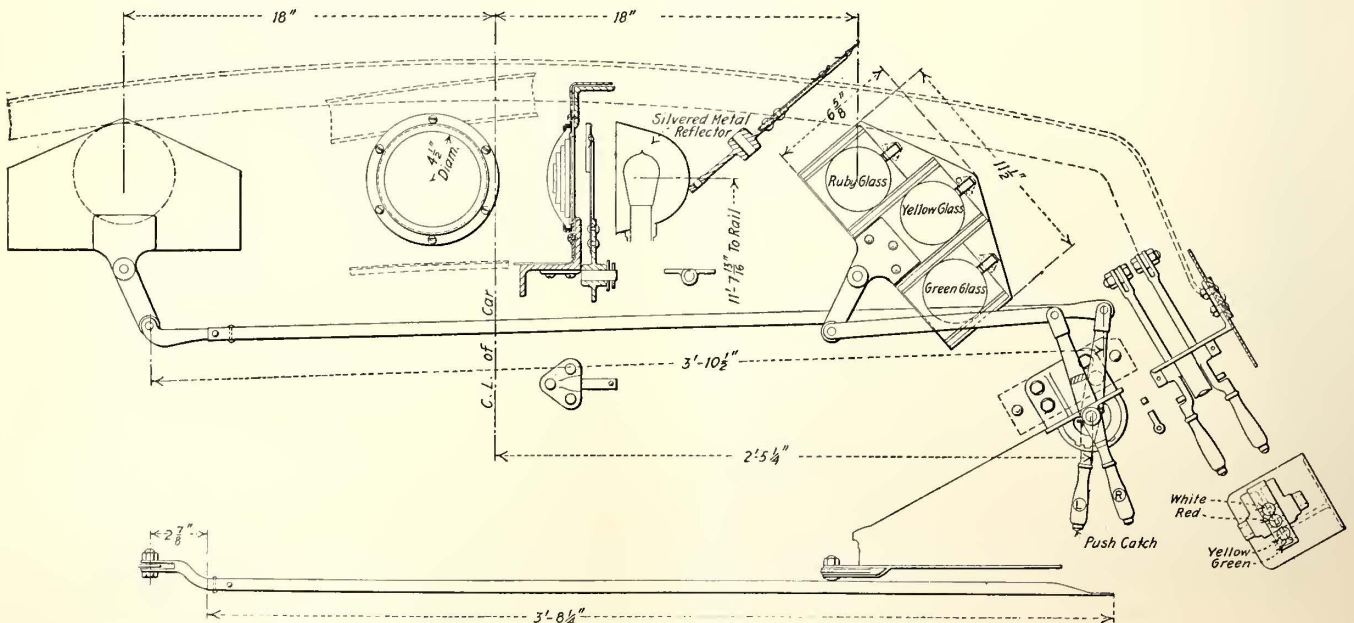
Fig. 1—The natural curve of the backbone. The proper points where a seat should give support are at the lower part of the shoulder (a) and the small of the back (b). Fig. 2—The prevailing style of street car and Pullman car seat, which, being padded at the wrong place, pushes the pelvis out and affords no support for the back. Fig. 3—The new "correct posture" seat which allows an opening for the lowest part of the back and is made to fit the natural curves of the human spine.

the signal is displayed only in that master controller which is in the operating position, thereby avoiding waste of energy and unnecessary indications.

Between each pair of doors is mounted one 10-watt, 34-volt frosted-bulb tungsten lamp. The positive circuit of these lamps is connected to one blade of a double-pole, single-throw lighting switch. The negative side is connected to contacts on the voltage relay which is always energized when power is on the line. In the energized position the relay disconnects the negative side of the emergency lighting circuit. Therefore, when normal lighting is in service the main lighting switch will be in the closed position. On any failure of the traction circuit the voltage relay drops and the negative side of the emergency lighting circuit is completed to the storage battery.

**MARKER AND TAIL-LIGHTS**

The marker and tail-lights are interconnected with the control circuit in such a way that when the motorman changes train ends his tail-lights automatically change from white to red as soon as he throws the reverse handle to the center position; vice versa, the red lights turn to white on throwing the handle to the operating position. Should the train be broken up en route in any way, the tail-lights will go red at the point of



N. Y. M. CAR—MARKER LAMP LAYOUT AND OPERATING MECHANISM



breaking. This is accomplished by combinations in the automatic coupler and control as previously stated.

The two marker lights provided in each hood of the car have stationary white semaphore lenses. Colored disks of the Railway Signal Association standard colors are arranged inside of the hood, connected so that any desired color may be placed between the lamps and lens. The marker lights on each side of the hood are operated independently.

The tail-lights consist of one white and one ruby 4-in. diameter  $2\frac{3}{4}$ -in. focal length semaphore lens as per the Railway Signal Association standard colors in each set. They are lighted from the storage battery by incandescent lamps placed behind each lens. The lenses are held permanently in place by pressed steel retainers riveted to or pressed in the end sheet with removable retainer rings.

HEATER CIRCUITS—SIGNS

The heating equipment per car totals 21 kw capacity divided among thirty heaters with two coils per heater. All coils are interchangeable. The three-point system is used, twenty coils being in series on each point. Piping and wiring connections for thermostatic control have been installed in view of the possible later use of thermostats.

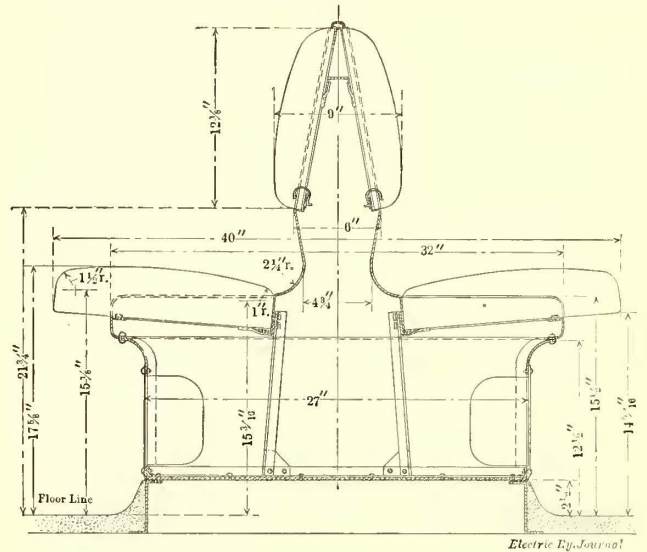
Destination signs are displayed in every car in the windows alongside the central pair of side doors. These signs are of double curtain type, as furnished by the Electric Service Supplies Company.

CORRECT POSTURE SEATING

In concluding the description of this car it is fitting to add some details on the radically different type of rattan car seating. From the first the engineers of the company had planned a seat which would not only be of the transverse type where practicable but which would also permit a more comfortable bodily position than previous designs. With the assistance of the American Posture League, an organization of experts on hygiene and anatomy, the design was improved still further by certain modifications in the angularity of the back and in the height of the seat cushion. In the seat as finally adopted, the distance from the highest

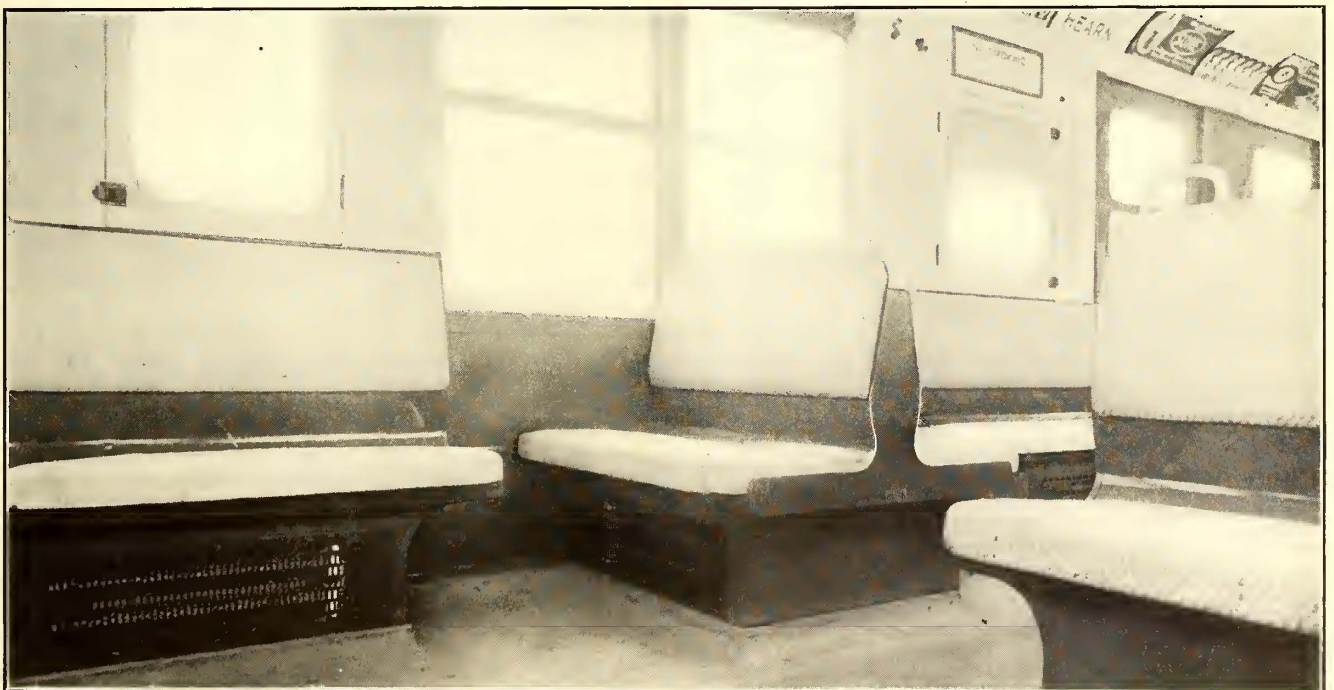
point of the unoccupied seat cushion to the floor is  $17\frac{5}{8}$  in. The league's ideal figure of  $17\frac{1}{4}$  in. is approximated when the seat is depressed by the weight of the passenger. This height, as compared with the usual one of 18 in., permits good footing for all but very small children.

A still more important feature is that the back is so shaped that the rattan section begins at a height of about 5 in. above an inwardly curved metal section which forms the base. As shown in the several accompanying halftones and drawings, this formation of the back al-

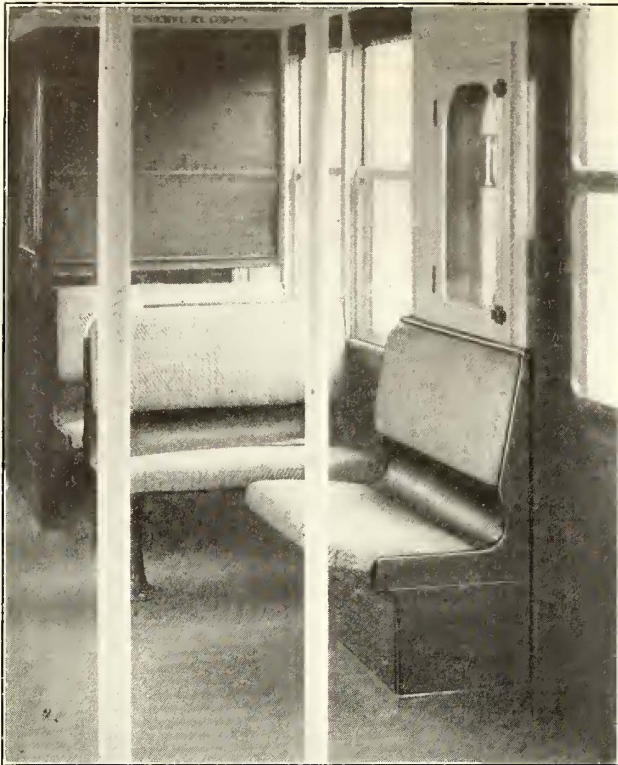


N. Y. M. CAR—DETAILED DIMENSIONS OF CORRECT POSTURE CROSS-SEAT

lows the lower part to fit the natural curve of the human spine, while the upper part gives a proper support for the back. The result is to place the passenger in the most restful position. Since his body is properly balanced he is also less likely to be disturbed by any sudden lurching of the car. The league has affixed its approval plate to the seats in the New York Municipal car, and will gladly co-operate with other railways to achieve



N. Y. M. CAR—VIEWS SHOWING CORRECT POSTURE SEATING OF DIFFERENT TYPES



N. Y. M. CAR—CORRECT POSTURE LONGITUDINAL AND CROSS-SEATS

scientific seat design. The seats are of the Hale & Kilburn Company's manufacture.

#### SPEED-CONTROL SIGNAL SYSTEM

In lieu of the usual signal system employing fixed signals and automatic stop devices placed at certain intervals along the track, each car is equipped with a cab signal system so designed as to give the motorman necessary information as to when to apply the brakes, when to resume normal speed, the permissible speed, the available braking distance, and such other information as is necessary properly to control the train. In addition to the signals, each car will be equipped with a speed-control system which automatically applies the brakes if the motorman fails to obey the cab-signal indications. Also, the system is arranged so as to enforce obedience to fixed interlocking signals by automatically applying the emergency brakes if a train should attempt to pass such signals in the stop position.

Cab signals, one of which is shown in an accompanying halftone, are located in both ends of each motor car and are so arranged that their indications are visible only in the cab from which the train is being operated and controlled. Cab-signal indications are given by two lights as follows: A green light indicating "proceed" when the next two blocks ahead are clear; and a yellow light indicating "caution" when the next block ahead is clear and the second block ahead is occupied or is governed by an interlocked signal indicating "stop," or when the train is on a down grade or curve or when it has some other fixed hazard.

The audible signal, provided in each motorman's cab, is so designed and interconnected with the speed-control mechanism, that it sounds sufficiently long in advance of the automatic speed-control application of the brakes to permit the motorman to control his train so as to avoid the automatic application of the brakes. An indication is given in each motorman's cab to show the maximum allowable speed and the distance within which, succeeding the giving of a caution signal, the

speed of the train must be reduced to the prescribed minimum to avoid the automatic application of the brakes.

The speed-control apparatus is so arranged that when a train runs into an unsignaled section of track a distinctive indication is displayed in the motorman's cab, and the cab signals and speed-control equipment are automatically put out of service and automatically return to service when the train again enters the signaled section of track.

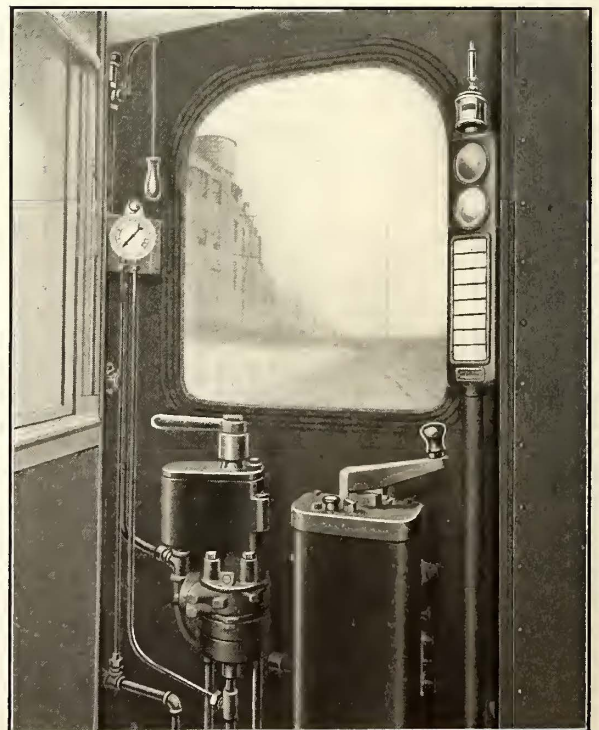
The speed-control equipment does not interfere with the operation of the train so long as the motorman runs his train according to the indications of the cab signal, but, if the motorman fails to obey the "caution" signal, the speed-control apparatus enforces obedience by automatically applying the brakes, but only when and if the speed of the train, at any point, exceeds that prescribed by the predetermined braking curve.

When a train, running at a speed not exceeding the prescribed minimum, approaches a clear block, its speed-control apparatus is, prior to entering the block, automatically reset in such a manner as to permit the train to accelerate. If a clear block is succeeded by an occupied block, the train is permitted to accelerate, slowing down should the speed thus acquired exceed that established by the predetermined braking curve. If a clear block is succeeded by another clear block, the train is permitted to attain normal speed.

Suitable means are provided whereby, in the event of its failure, the speed-control mechanism on any car can be safely cut out of service in such manner as not to interfere with the operation of the speed-control apparatus on the remaining cars of the train.

The speed-control and cab-signal equipment is actuated by means of ramps located adjacent to the tracks at such points as provide the required track capacity and facility of operation.

The cab signals are block signals and indicate the condition of the blocks in advance; at crossings, junctions, terminals, etc., fixed signals, which are of the light type, are used to indicate the route set up. The indications of interlocking signals are given by one light as follows:



N. Y. M. CAR—VIEW OF CAB SIGNAL AS INSTALLED

HOME SIGNALS

Indication	Aspect
Proceed on same track.....	One green light
Proceed on diverging light.....	One yellow light
Stop.....	One red light

The speed-control apparatus on each car is arranged so as to enforce obedience to the interlocking home signals by automatically applying the emergency brakes if a train should attempt to pass such signals in the stop position.

An accompanying drawing shows speed and braking curves for a typical block, which in this case is 1200 ft. in length. The emergency braking curve *A* represents the distance within which, succeeding an emergency application, a train is brought to stop before reaching the end of the block. The design of the speed-control system enforces obedience to this curve by automatically applying the brakes in case the speed of the train, at any point, exceeds that indicated by this curve. The automatic application of the brakes takes place at varying distances from the end of the block, depending upon the speed, this being one of the essential features of the system. The usual system employs automatic stops with an overlap, the length of which is always based on maximum speed, and failure to obey a stop indication would cause an emergency application at the same point, regardless of speed. This requires that trains must be spaced apart a distance equal to the length of the overlap, which is usually a full block or more, whereas in the speed-control system trains can close up, provided always that the speed has been reduced to a point within the braking curve. In the speed-control system greater facility is provided, owing to the fact that trains can close up instead of being spaced a full block apart.

Curve *B* is the normal braking curve and represents the retardation which results from a service application of the brakes. Curve *C* is the audible-signal curve. The audible signal is given sufficiently in advance of the service-braking curve so as to avoid an emergency application if the motorman obeys the audible indication and applies the brakes. This curve is an important factor in facilitating traffic in the case of a train entering the block at less than normal speed as follows:

If a train enters an unoccupied block at low speed it can accelerate, as shown by curve *D*, until the curve intersects audible-signal curve *C*, at which point, if the brakes are promptly applied, curve *D* merges into curve *B* and an emergency stop is avoided.

Curve *E* shows a train proceeding at less than maximum speed, in which case the audible signal is given at the intersection of the speed line and curve *C*. If the brakes are promptly applied an emergency stop is avoided as in the preceding case.

A train can enter an occupied block, as shown by curve *F*, but cannot exceed the prescribed minimum speed. Curve *G* is a continuation of curve *D* and shows the acceleration attained if the block in advance is clear.

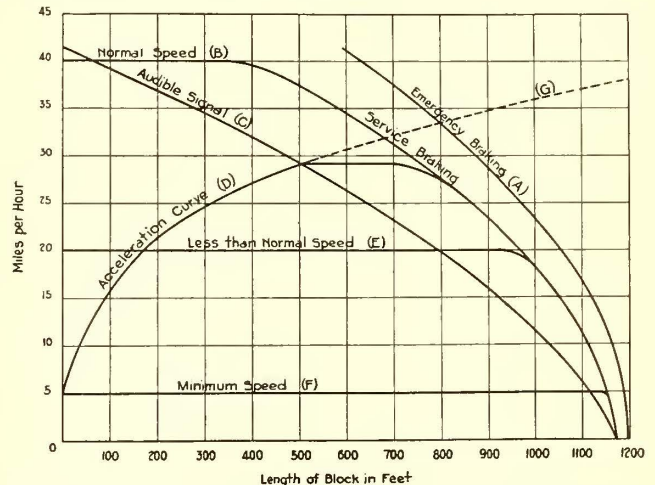
If two blocks in advance are clear, in which case the cab signal would show a green light, a train entering the block shown in the diagram mentioned could proceed at normal speed without interference from the speed-control apparatus. If the block in advance was clear but the second block in advance was occupied, the cab signal would show a yellow or "caution" indication and, if the motorman does not apply the brakes, an automatic emergency application of the brakes occurs, bringing the train to a stop before reaching the end of the block.

OPERATION OF SPEED-CONTROL SYSTEM

The diagram on page 880 shows the principles of the signal system. At one end of the track circuit

a transformer, *T*, supplies electric energy which flows through the track circuit and, when the block is unoccupied, energizes track relay *R*, and its front contact closes a circuit from battery, *B*, or some other source of electric energy. Hence when a car is at a ramp, as in this case, current flows through the ramp, through the contact shoe *S*, and then through the car relay *C*, causing its armature to pick up, and back to the common return by way of the car axle and one of the track rails. In this condition current from the battery *D* flows through and energizes the green light *G* of the cab signal, which gives the "proceed" indication. Energy from battery *D* also flows through and energizes magnet *E*.

After the train has passed an energized ramp a retaining circuit is established by way of contact *A*, so that current from the battery *D* energizes the car relay *C* and the green light or "proceed" signal continues until the next ramp is reached.



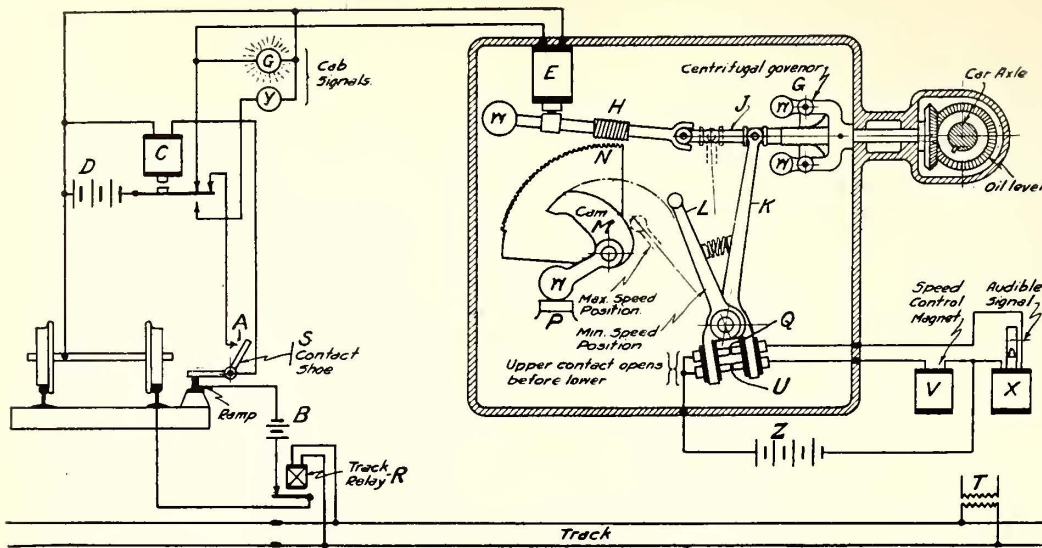
N. Y. M. CAR—TYPICAL SPEED AND BRAKING CURVES FOR SPEED CONTROL

If the track circuit was occupied, track relay *R* would be de-energized, and as a result the ramp, also the car relay *C* and the magnet *E* would be de-energized. In this condition current from the battery *D* flows through and energizes the yellow light *Y* of the cab signal to give the "caution" indication.

Magnet *E* controls the speed-control apparatus, which operates in the following manner: The rotating motion of the car wheels is transmitted by means of the bevel gears shown in the drawing, to shaft *J*, on which is mounted a centrifugal device or governor which is so arranged and connected that, as the speed increases, the arms *K* and *L* are moved to the left. The worm *H* is driven through the medium of shaft *J* and is held out of engagement with the worm sector *N* by the attraction of the magnet *E*. When the magnet *E* is de-energized, the worm *H* engages with the worm sector *N*, causing the cam *M* to move forward against the action of gravity. The shape, speed and general arrangement of cam *M* are such that if the speed of the train is not reduced, succeeding the giving of a caution indication, the surface of cam *M*, coming in contact with the lever *L*, opens the contact *Q* and the audible signal warns the motorman to apply the brakes.

If the motorman promptly applies the brakes arm *L* moves to the right, away from the cam *M*, thus preventing the opening of the contact *U* and the consequent application of the brakes. If, however, the motorman fails to obey the audible signal, the contact *U* opens and an emergency application of the brakes occur.

Upon reaching the next energized ramp the magnet *E* is energized, which disengages the worm *H* and the



N. Y. M. CAR—DIAGRAM SHOWING OPERATION OF SPEED-CONTROL SYSTEM

sector *N*, and cam *M* is restored to its normal position by the action of gravity, thus restoring the speed-control system to the normal condition which allows the train to accelerate. If the next ramp is de-energized, the train may proceed through the block only at minimum speed, which minimum speed is determined by the maximum radius of the cam.

The selector, shown at the left of the drawing below, in its proper position on the car, sets up the various "block combinations" and indicates the same to the motorman. Combinations are set up by selector ramps, in the center of the track, which lift up one or more of the tappets shown on the lower part of the selector. When lifted by the selector ramps the tappets latch up and are so held until a new combination is set up, at which time the former combination is knocked down by the center tappet. Complete information is given in the cab as to the point at which speed reduction must take place, in order that a lower speed combination may not be set up prematurely and apply the brakes. For example, if the change is to be from a combination of 50 m.p.h. and 1600 ft. braking distance to a combination of 20 m.p.h. and 400 ft. braking distance, first, a "caution" signal is given to the motorman so as to allow him to reduce speed, and, after the speed is properly reduced, the new combination becomes effective, and a "proceed" signal is given, provided that conditions in advance are proper. If the motorman fails to obey the indications shown in the cab, an automatic

application of the brakes occurs.

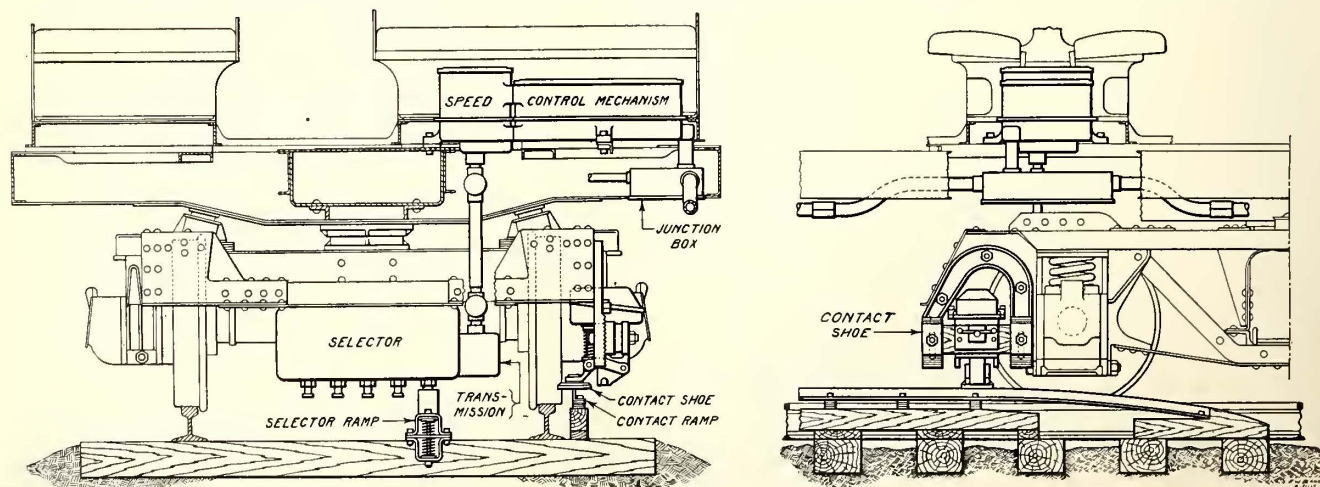
The speed-control mechanism in proper position on the car is also shown in the cut. The operation of this mechanism is described in connection with the simplified diagram. The drawing of the speed-control mechanism shows the contact shoe in the proper position on the car, also the ramp. The contact shoe is of the lifting rotary type, in which the disk contacts with a ramp. The disk, which is inexpensive and easily replaced,

travels over the ramp with a scrubbing movement which maintains a smooth contacting surface. The lifting of the contact shoe opens a circuit which de-energizes the car relay, if current is not flowing through the ramp, as described in connection with the simplified diagram.

The cab-signal and speed-control system requires comparatively a small amount of simple, substantial and efficient apparatus, and affords maximum traffic capacity consistent with safety. The system is being installed by the General Railway Signal Company, Rochester, N. Y., under the Simmen patents for speed control.

### The Jitney as a Subject for Many Writers

The jitney has been juggled on the point of many pens since its advent. Elbert Hubbard, Walt Mason, Dr. Frank Crane, William Marion Reedy, he of the bright and shining *St. Louis Mirror*, and other celebrities have had their fling at the new pirate of transportation, and a famous moving-picture scenario writer has even coupled up dear Charlie Chaplin with the jitney in "The Jitney Elopement." Now comes none other than Hugh S. Fullerton, who writes about the jitney in the *American Magazine*. Mr. Fullerton is presumably the same gentleman who got baseball into the magazines a few years ago. As an expert on the inside game he writes entertainingly about the jitney, but not quite so entertainingly as he talks about round-house curves and when to give the pitcher the gate.



N. Y. M. CAR—SPEED-CONTROL SELECTOR; CONTACT SHOE AND SPEED-CONTROL MECHANISM

# Investment Required per Passenger

Appraisals Are Expensive and Time-Consuming—New Unit Suggested as Basis for Comparison of Railway Investments—Some Examples are Given

BY D. J. M'GRATH, RESEARCH ASSISTANT MASSACHUSETTS INSTITUTE OF TECHNOLOGY

The relation of the capitalization of public utilities to the fair value of the property is one of the most vexing problems that has to be dealt with in analyses of rates and fares. Whether the problem under consideration is a specific case or a rate problem in the abstract, the doubt frequently exists as to whether the capital liabilities fairly represent the value upon which a return should be paid. In the street railway business we meet with this question as frequently, at least, as in any branch of public service enterprise.

To make a complete appraisal of a large street railway system is expensive and time-consuming. It would appear desirable, then, to have some standard method of comparison of the capitalization, cash investment in, or valuation of, street railway properties by which could quickly be formed a fair judgment as to the reasonableness of the amount of stock and bonds upon which the company is paying interest and dividends.

The two methods of comparison in most common use are based upon the "per mile of track" and the "per dollar of gross annual revenue" units.

Neither one of these two methods has been found very satisfactory. The property value per mile of track in a city system doing a moderate amount of business can scarcely be compared with the corresponding figure for another system with a higher density of traffic for the same track mileage, because the amounts of equipment required will be quite different. On the basis of "dollars investment per dollar of gross revenue," the comparison is more satisfactory, but this method fails under differences in rate of fare. The result of dividing the total investment by the gross annual revenue varies directly with the fare rate, consequently where we have, as in different cities of this country, rates varying from 3 cents to 6 cents, this method cannot be used generally.

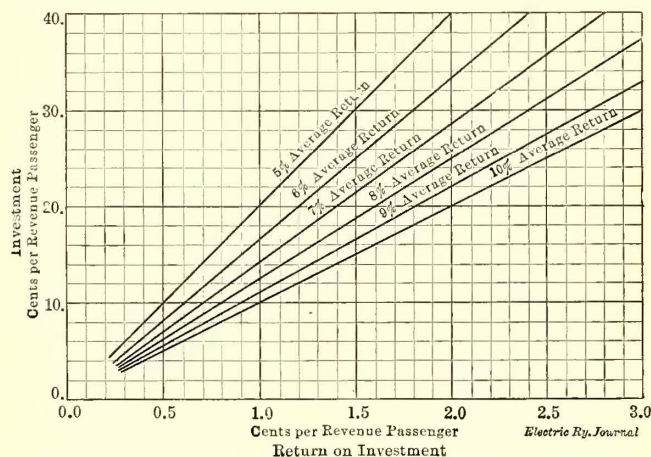
In the investigations of the Electrical Engineering Research Laboratory of the Massachusetts Institute of Technology on the street railway fare problem, appraisals being beyond the financial resources available, it has become necessary to try to establish some method of standardizing and comparing street railway investments and securities. It was desired to fix a standard, or set of standards, of investment for given kinds of service and conditions, so that the face value of securities issued by any company might be compared on a unit basis with a standard investment for a similar system. The unit "per dollar of gross revenue" was used to some extent at first, but the most satisfactory and fundamentally basic unit seems now to be the "revenue passenger."

The total investment of the standard system, or the value thereof, and the securities outstanding of the system to be compared, are divided by the respective numbers of revenue passengers carried in the corresponding year, and the quotient is expressed in cents.

Even this unit shows considerable variation for different properties, but the divergences are not so extreme as those experienced with the other forms of comparative units. It seems to be the most logical and fundamental unit for comparative purposes, and such variations as occur may be more readily explained.

It may be thought that the basis should more prop-

perly be "per total passenger," *i. e.*, dividing the investment by the sum of revenue and transfer passengers combined. However, the use of transfers is widely different in various cities and depends upon local conditions and the system of operation. By using this method, it would probably appear that the company giving the largest ratio of transfers had the lowest investment per passenger, which would certainly be misleading. The general proposition in American city street railway practice is that the operating company undertakes to transport the passenger from any given point to any other point within a certain territory for one fare, and it is not necessarily the passenger's fault that he may have to transfer one or more times to reach this point. The economical operation of the system makes it impossible to run direct cars from any given point of origination to all possible points of destination within the territory of the single fare. Therefore, the transfer system may be as essential to the company as it is convenient for the passengers, for without it every small group of people using certain odd



RETURN ON INVESTMENT PER REVENUE PASSENGER FOR VARYING INVESTMENTS AND VARIOUS RATES OF RETURN

routes would be demanding direct cars. The transfer ratio in American cities ranges all the way from nothing up to an estimated ratio of more than 60 per cent in the case of the Boston Elevated Railway. Consequently the "revenue passenger" has been chosen as the fundamental unit.

As standards of reference we may take properties which have been recently valued by competent engineers or commissions and any others where we have satisfactory reason for believing that the capitalization has been honest and conservative.

As examples of the former we have the surface systems in the city of Chicago, appraised by a special board; the Los Angeles City Railway, appraised by the Board of Public Utilities of that city; the Manchester (N. H.) Street Railway Company, appraised for the New Hampshire Public Service Commission by the firm of Sloan, Huddle, Feustel & Freeman, and many other appraisals made in past years. Properties coming under the classification of known honest and conservative capitalization are the street railways in the State of

Massachusetts, all of which have been under the supervision of the Massachusetts Railroad Commission (now the Public Service Commission) for many years. In these companies all issues of stocks and bonds must represent bona fide cash investment, their sale being permitted only after the authority of the commission has been granted. Consequently it is believed that a fair valuation of any Massachusetts street railway should compare favorably with the securities plus the premiums paid in. The only discrepancy which might be found would probably be due to a certain amount of depreciation and deterioration which may not have been provided for by reserves from earnings. Considering the difficulties which any of these companies has experienced in trying to pay a return upon their stock, it is not surprising to find that depreciation reserves have sometimes been neglected.

The accompanying table gives the results of finding the capitalization, total investment or appraised value per revenue passenger of some street railway systems which come under one or the other of the classes mentioned before. These figures are only approximate, as no useful result is accomplished by carrying them out to

SOME TYPICAL EXAMPLES OF INVESTMENT, OR VALUE, PER REVENUE PASSENGER TRANSPORTED

Name	Total Stocks and Bonds, in Cents (Approx.)	Total Cash Investment, <sup>1</sup> in Cents (Approx.)	Total Appraised Value, in Cents (Approx.)
Boston Elevated Railway Company (Massachusetts) .....	....	32 <sup>2</sup>	....
Bay State Street Railway Company, (Massachusetts) .....	....	27	....
Worcester Consolidated Street Railway Company (Massachusetts) .....	....	21	....
Springfield Street Railway Company, (Massachusetts) .....	....	17	....
Union Street Railway Company (Massachusetts) .....	....	14	....
Holyoke Street Railway Company (Massachusetts) .....	....	17	....
Chicago City Railway & Southern Street Railway .....	....	....	22 <sup>3</sup>
Chicago Railways Company .....	....	....	22 <sup>3</sup>
Manchester (N. H.) Street Railway Company .....	13 <sup>4</sup>	13	13 <sup>4</sup>
Los Angeles Railway Corporation } .....	....	....	17 <sup>5</sup>
Los Angeles City Railway Company }			

<sup>1</sup>Total cash investment for Massachusetts companies includes premiums (+) and discounts (-).

<sup>2</sup>Includes West End and other leased property, city of Boston tunnels and subways.

<sup>3</sup>Valued in 1907. Subsequent additions to property have been under Board of Supervising Engineers.

<sup>4</sup>New Hampshire Public Service Commission has recently placed value approximately equal to the capitalization. This company has no investment in power plant.

<sup>5</sup>Valued by Board of Public Utilities in 1913. Value approximately equal to bonded indebtedness. No investment in power plant.

several decimal places. Moreover, there are necessarily some variations from year to year. The data for the figures presented here are all from recent, if not the latest, public reports. The investment in roads operated under lease is included.

Of course, there is found to be considerable variation even in the results obtained by this method. But these results we believe to be more fundamental in their derivation than with either of the other methods proposed. The variations which appear in the above table are due to basic conditions which have determined the size of the investment necessary to perform the required service.

Let us take, for instance, the case of Boston with a total investment per revenue passenger of more than 30 cents. On the basis of the standard 5-cent unit of fare, the ratio of this investment to gross revenue is more than six to one. In spite of this rather high ratio, there has never been, so far as we are aware, any claim that this company has been capitalized in any way but a conservative and honest manner. Indeed, under Massachusetts laws, it is difficult to see how it could

have been guilty of over-capitalization. The large investment here is due in part to the expensive subways, tunnels and elevated lines which provide rapid transit in the more congested parts of the city and along the main lines of traffic, with unrestricted free transferring from surface to rapid transit and vice versa. Part of this investment has been borne by the city of Boston, but as the company pays a rental which covers the interest and depreciation, the financial result to the company is the same as though it had made the whole investment itself. Therefore, the total investment, both company and city, is included in the figure given above.

Although it is difficult to present absolute proof of the statement, it seems only reasonable to assume that part of the high investment in Boston is due to the long hauls given for a single 5-cent fare. From the center of the city, the lines run six to eight miles or more into the outlying suburbs, all within the one-fare limit.

Turning to the other extreme, as for instance the company operating in the city of Manchester, N. H., with its relatively low investment per revenue passenger carried, we find that it is operating within a much more restricted single fare area, and that it has no expensive construction in subways or elevated systems. Moreover, this particular company has no investment in a power plant, all its electric energy being purchased at a fixed rate per kilowatt-hour from the electric company. This expense is of course wholly charged into the operating expenses of the street railway.

Where a street railway company having characteristics similar to the examples given in the preceding table is found to possess a capitalization which figures out considerably higher than these examples on a per passenger basis, particular reasons are looked for. It may be that the company in question had heavy construction expenses due to local difficulties, existing systems may have been purchased at a high market value, a company may have built and equipped itself ahead of the actual needs of the community and the business done has not yet caught up with the plant available. The possibilities of "watered stock" or inefficient management would, of course, be considered in any such investigation.

Let us now consider the interest requirements of street railway investments, reduced to the same unit basis, the revenue passenger. It is not within the scope of this article to discuss the percentage that constitutes a fair rate of return. The courts and commissions have had more or less to say upon that subject, and the rate of return must necessarily be governed to some extent by the interest rates demanded by new capital. To leave this point perfectly open we will assume that the average rate of return on the total investment may be anywhere between 5 per cent and 10 per cent per annum.

Taking an average rate of 6 per cent as an example, if the total investment is 10 cents per revenue passenger transported, then 0.6 cent must be contributed by each passenger toward the interest and dividends on the securities. If the investment is 20 cents, 1.2 cents must be contributed from each fare; if 30 cents, 1.8 cents. It is simply a straight line function for any given average rate per cent, as shown in the diagram on the previous page.

It will be noticed that the calculations so far involved in this discussion of investment and return on investment are quite independent of the rate of fare in use. This would seem to be an important consideration when we are analyzing the factors which must be considered in determining the proper rate of fare.

Men outside of the street railway business are usually greatly surprised to find that such a large portion of each fare collected must go to pay interest and divi-

dends at a perfectly fair rate on an honest amount of capital securities. The fact that the cash investment in the property and business of a street railway company is necessarily much higher in respect to the gross annual revenue than in ordinary mercantile propositions is not yet appreciated by the general public. This point was clearly brought out by Professor Dugald C. Jackson of the Massachusetts Institute of Technology in his address at the Philadelphia convention of the National Electric Light Association, June 3, 1914, when he said:

"\* \* \* Instead of earning gross annual revenue equal to or exceeding the capital investment, a public service company must ordinarily put out and expend a sum of money in establishing its plant and business, which is not less than four or five times, and is sometimes as much as twelve times, the gross annual revenue that it may expect to receive. This at once multiplies the proportion of the revenue which must go to the investors in case a reasonable return is paid on the investment.

"\* \* \* This being the case, the average man may as a matter of his own business experience honestly believe that he is being unfairly treated by an electric utility company when such may be far from the fact, and the only way to convince him and his associates, composing the public, of the truth of the matter, is to present the facts in such a manner that the individuals may measure them by means within the reasonable scope of their own experience. \* \* \*"

When a street railway company, financed and doing business in an honest manner, desires to demonstrate to the public the necessary and reasonable return demanded by its capital investment, it would appear that the unit most easily appreciated and understood by the average man would be the "per revenue passenger" one.

## Commercial and Industrial Conditions in Canada

Consul-General John G. Foster of the United States at Ottawa has reported at length to the bureau of foreign and domestic commerce of the Department of Commerce on commercial and industrial conditions in Canada. His report was published as a supplement to *Commerce Reports* of recent date. In reviewing railroad conditions Mr. Foster said in part:

"Transportation lines have felt the effect of the general depression and of the war. The falling off in building operations affected shipments of material for building purposes, and the slackness in manufacturing had its effect in reducing shipments of coal and of raw and finished material. Lake and canal traffic was fair. Ocean transportation at the outbreak of the war practically ceased on the St. Lawrence and Atlantic, and many vessels were tied up for some time in river and ocean ports.

"Railway and transportation statistics are not yet fully available, but it is estimated that the earnings of railways will show a decrease of approximately 5 per cent as compared with those of the previous year. Statistics of traffic through the canals at Sault Ste. Marie for 1914 show the total amount of freight locked through was 55,369,934 tons in 18,717 vessels. Although twice as many vessels passed through the American lock and the American locks was about the same, 27,771,467 being carried through the latter and 27,598,467 through the Canadian route. Less coal was shipped west than in 1913.

"Electric railway track laid during 1914 was approximately 36.73 miles, compared with 164 miles in 1913."

## Ruling on Accident Reports

### The Interstate Commerce Commission Declares Reports on Accidents in City Service Need Not Be Filed

A decision in the hearing held by the Interstate Commerce Commission Dec. 18, 1914, in regard to the filing of reports on all accidents occurring on electric railways engaged in interstate commerce, has just been published. A report of this hearing was printed on page 1389 of the *ELECTRIC RAILWAY JOURNAL* for Dec. 26, 1914. The principal address for the electric railways was presented by J. T. Beasley, general counsel Terre Haute, Indianapolis & Eastern Traction Company. The conclusion reached is that railway companies which provide both street car and other intra-state service should restrict the scope of their monthly report of accidents so as to include only accidents resulting from the operation of cars engaged in interstate commerce.

In its decision the commission touches upon the history of the interurban electric railways and the class of business which they do, as developed at the hearings, particularly the Indiana lines, the Detroit system and the Bay State Street Railway, which were represented at the hearing and later filed briefs. Taking these as typical of the lines in each of these sections of the country, the decision says that it was shown that their interstate business and operations are of comparatively little importance. But the commission then quoted cases to show that to bring carriers under the interstate commerce law the extent of their participation in interstate traffic is not very material if they are regularly engaged in the transportation of interstate traffic (*Johnson vs. Southern Railway Co.*, 196 U. S., 1; *United States vs. C. & N. W. R. R. Co.*, 157 Fed., 342). The commission also held that the actual physical location of a railway line cannot be accepted as the ruling consideration; nor does it seem to be open to question that traffic crossing a state line is interstate traffic, although in the Council Bluffs case the court has held that certain traffic, though admittedly interstate, is not such as Congress intended to make subject to the interstate act.

Continuing, the commission said that almost from the beginning it had required annual reports of finances and operations or monthly reports of accidents from electric railways that were understood to be engaged in interstate commerce, as well as from steam roads similarly engaged, and it believes that electric railways engaged in interstate transportation are subject to its jurisdiction. In this connection it points out that electric lines have from time to time requested the commission to take jurisdiction over them with respect to various matters arising from the application of the interstate commerce law. The reports concludes as follows:

"The authority for the requirement of monthly reports of accidents is based on a special law separate and distinct from the one generally spoken of as the act to regulate commerce. The general application of this law to electric railways as a class naturally follows from the commission's broad interpretation of the term 'railroad,' which is found in the accident law as well as in the act to regulate commerce.

"In cases such as some of those which have been described at length in this proceeding, in which there is a clear distinction between lines operated in purely city service and those operated to a greater or lesser extent in interurban and interstate service, it does not seem necessary or proper to require reports of all accidents. A consideration of the decisions of the Supreme Court in the *Employers' Liability* cases, 207 U. S., 463, and in *B. & O. R. R. Co. vs. I. C. C.*, 221 U. S., 612, would seem

to lead to the conclusion that in such cases the filing of reports covering the accidents that occur in connection with the operation of cars, other than purely city cars, carrying interstate passengers, freight or express will answer the requirements of the accident-report law. Moreover, it does not appear that the promotion of the safety of operation of the railway lines over which interstate commerce moves or any other of the purposes of the accident law will in any degree be subverted by such a restriction, while, on the other hand, the requirement of reports of all accidents occurring on all the lines and in all the operations of carriers such as those whose cases have been here described will result in the accumulation of an enormous amount of data prepared at the expenditure of much time and money by the reporting companies, and perhaps in some cases duplicating returns made to state commissions or other more local regulating bodies, without any commensurate advantage."

### Jitney Operation in Dallas, Tex.

#### Statistics Showing Number of Cars in Operation and Average Earnings Per Car

A report dealing with the jitney bus situation as it existed in Dallas, Tex., up to March 24, 1915, has recently been compiled by the Dallas Consolidated Electric Street Railway Company and an abstract of it is given in the following paragraphs:

On Jan. 7, three jitneys began service in Dallas, the drivers being former deputy sheriffs and constables whose term of office had ceased about Dec. 1 and who were therefore without employment, although they owned Ford cars. In February the jitneys began to increase rapidly. Unemployed men and even women, boys and girls, who had second-hand automobiles, began running them in the jitney service. Other unemployed persons without automobiles rented cars or operated automobiles in jitney service on a per diem basis. Second-hand automobile dealers were quick to grasp the opportunity, advertising in the Dallas papers extensively, and buying up old automobiles not only in Dallas but in the country for miles around. Since then the jitneys have continued to increase rapidly, and up to March 24 a maximum of 292 were in service on the same day.

The following table shows the number of jitneys operating in Dallas at ten-day intervals from their inception to the latter part of March:

Date	No. of Jitneys	Date	No. of Jitneys
Jan. 1	0	Feb. 20	156
Jan. 11	3	March 2	204
Jan. 21	7	March 12	251
Jan. 31	25	March 22	259
Feb. 10	98		
Maximum day, March 13	292		

During February the street congestion became marked in the rush hours, and despite the efforts of the traffic policemen blockades began to occur. The accidents during the month rose from an average of less than one per day to slightly more than five per day.

During February the street railway inspectors reported the license numbers of 536 different automobiles in jitney service. A record was kept of the days each of these cars operated, and this record shows that 160 of them operated for only one day. While this record may not be accurate, owing to errors made by the inspectors in taking down the car numbers, undoubtedly many automobile owners, reading in the newspapers of the exaggerated reports of the earnings of some of the drivers, conceived the idea of "trying it out," but the results of one day convinced them that the jitney serv-

ice was unprofitable. To reach a conservative conclusion the 160 jitneys reported to have operated only one day may be left out of consideration. On such a basis the number of jitneys operated in February were 376, of which number 167 operated five days or less, only fifty-four operated in excess of fourteen days and only eleven operated more than twenty-one days. The 376 jitneys operated a total of 2975 days in February, an average of a little less than eight days per jitney. Since the jitney service increased rapidly between the first and last of February, these figures do not mean a great deal except in comparing the total number of jitneys operated, 376, with the maximum number operated on any one day in the month, which was 184. Observation seems also to indicate that fully 50 per cent of all the cars in service operate less than a total of four hours a day. These 50 per cent operate between 7:30 a.m. and 9 a.m. and between 5 p.m. and 7 p.m. The other 50 per cent operate anywhere from four to fifteen hours a day.

#### EARNINGS

While there were only three or four of the jitneys operating, the drivers were questioned as to their daily earnings. One man said he averaged about \$4 a day. The others said they were barely making a living and that the only reason they continued was because there was nothing else to do at the time. Several weeks later one of these men who had secured regular employment, in discussing his jitney experience, said he would much prefer a regular \$60-a-month job to operating his automobile in jitney service.

On Jan. 29 and again on Feb. 5, before the buses became so numerous, fairly complete checks were made by the street railway companies' inspectors. The results of these checks are summarized in the following tables:

Route	Jan. 29, 1915			Feb. 5, 1915		
	No. of Jitneys	No. of Trips	No. of Pass.	No. of Jitneys	No. of Trips	No. of Pass.
Ervey	6	241	769	22	858	2,261
Bryan	3	101	292	9	347	998
Fair Park	8	129	287	13	261	651
Harwood	3	72	155	4	123	346
Oak Lawn	2	2	7	9	146	411
Average number of passengers per trip				2.8		
Average number of passengers per jitney				68.7		
Average earnings per jitney				\$3.43		
				\$4.09		

Of all the jitneys operated on the two days checked, the earnings of only two exceeded \$10. From the number of trips made by these two cars it is apparent that both were operated from fifteen to eighteen hours. On Jan. 29 only seven of the drivers earned more than \$5 and on Feb. 5 only twenty-one out of fifty-seven earned in excess of \$5. Twenty-two of the fifty-seven cars operated on Feb. 5 made less than twenty single trips. In its Feb. 11 issue, the Dallas Dispatch published some figures compiled by Claude Hamilton, organizer of the Dallas Transit Association, who claimed to have received complete reports from sixty-eight of the 103 jitney drivers on the results of their operation on Feb. 10. These sixty-eight drivers, according to his figures, carried a total of 8063 passengers. The average earnings per man were \$4.88 for the day. The maximum amount reported by one man was \$11.90 and the minimum \$2.30. The weather conditions on Feb. 10 were quite pleasant and the temperature 63 deg. These figures therefore check fairly well with those obtained by the electric railways inspectors.

The Society for the Promotion of Engineering Education has announced the program of the annual meeting to be held in Ames, Iowa, from June 22 to 25. The program consists largely of committee reports dealing with all phases of educational activity in this field.



# Telephone Dispatching in City Service

The Author Describes the System Used in Rochester, N. Y., Whereby the Service Is Adjusted to Meet the Exigencies of Operation, and Outlines Numerous Cases in Which Centralized Control of Car Movements Proves to Be Advantageous

BY ELMER E. STRONG, SUPERINTENDENT OF TRANSPORTATION NEW YORK STATE RAILWAYS, ROCHESTER LINES

One of the most troublesome questions that confronts the average transportation department head is how to keep in such close touch with the operation as a whole that he may know immediately when an interruption occurs at any point, and knowing of it may be able to readjust the service quickly and with the least inconvenience to the public.

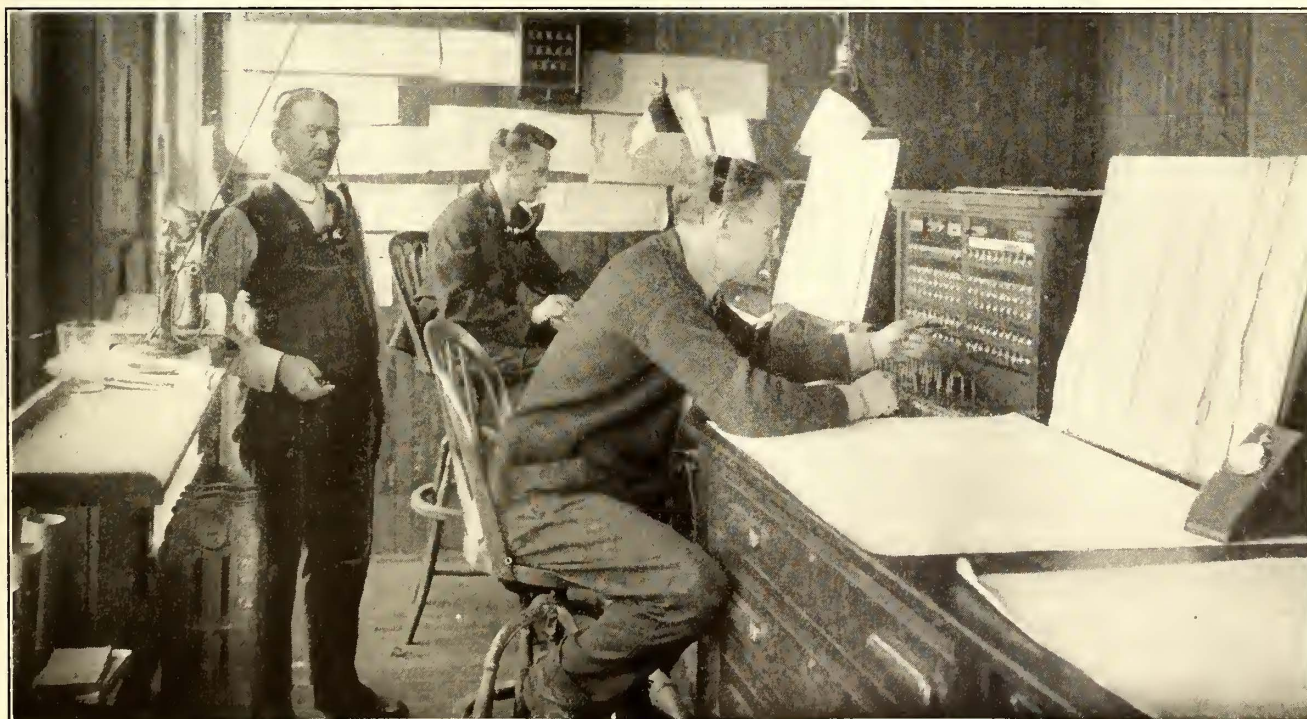
It is a safe venture to state that most superintendents desire a larger supervisory force than their companies feel able to maintain, as a thoughtful superintendent must realize how small a percentage of his trains and his men are under actual supervision at any time. The superintendent of a factory, shop or mercantile establishment may have a thousand employees performing their duties under the personal supervision of a very few foremen, but a thousand trainmen under an equal number of foremen or supervisors get but little individual attention. A supervisor or inspector cannot be more than human; he can be at only one place at a time; he cannot foretell when or where an interruption in service will occur, nor can he, after hearing of trouble at any point, instantly set himself at that point. It is rarely his good fortune to be in the immediate vicinity when a fire breaks out, a derailment occurs, a trolley wire falls, a car becomes crippled or a vehicle stalls on the track. If he is attending properly to his duties he is as likely to be at some far-distant point on the lines.

The rules require that the conductor of the first car in a blockade shall call the company's telephone operator and state the facts. It then becomes the duty of the operator to find an inspector; next the duty of the in-

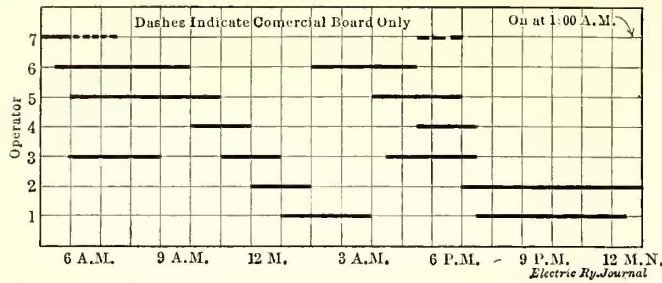
spector to reach the scene of trouble as soon as possible. In the meantime, more cars are becoming blocked and operation is coming to a standstill.

It was with a sense of dissatisfaction with this sort of procedure, and with a consciousness of how little information came to light promptly enough to be of use, together with the fact that much even of the prompt information was unusable because there was no means of reaching the crews, that the New York State Railways, Rochester Lines, sought a means whereby immediate knowledge of general operating conditions could be centralized. Organization and operation as carried on in the transportation departments of several companies were studied for the purpose of learning what had been accomplished in other cities. Among the properties visited was that of the Denver Tramways Company where a telephone dispatching system had been in use for many years, and had proved a marked success. The system there, however, had grown up with the road and there was some question as to whether such a system could be introduced on a property of equal size on which dispatching had never been used. Therefore, in order to give it a trial, arrangements were made with a local telephone company to install a small board in one of the railway offices, and pole telephones at the termini of four of the heaviest lines.

Inspectors who had previously been in charge of these lines, and who knew their peculiarities, were assigned to duty on the board. Each of these men, after a brief experience, declared that he could control the lines much better and more easily from the board than when sta-



ROCHESTER DISPATCHING—INTERIOR VIEW OF DISPATCHER'S OFFICE SHOWING SWITCHBOARD



ROCHESTER DISPATCHING—CHART SHOWING DISPATCHERS' HOURS AT SWITCHBOARD

tioned on the street. The system remained in experimental stages for nearly a year and a great deal of data were accumulated, analyzed and studied. Finally the management determined to make a permanent installation of telephones embracing all of the city and suburban lines.

The switchboard for the Rochester telephone system is 15 ft. in length and is provided with ample filing drawers for preserving dispatchers' records. It consists of three turrets, the middle one being the master turret, from which connections can be made with central lines, with the company's commercial lines, with the street phones in the center of the city, or with any of the dispatching phones at line terminals. The turret on the right is so constructed that the dispatcher operating it can take over any dispatching line by pulling out plugs under the respective jacks. By pushing in plugs, the corresponding lines are thrown over to the left turret. Thus, any combination of lines or all lines may be operated from any turret. During the day the commercial and central lines are operated from a board in a separate room in order to avoid noise and confusion, but at night these are switched over to the dispatcher's board.

On the fourteen lines in Rochester during rush hours there are in operation as many as 360 cars, twenty-five of which are trailers, so that there are no less than 330 trains. These are under the direction of three dispatchers, each of whom, during the busiest periods, receives as many as eight calls per minute. Between the morning and evening rush hours, when the number of trains does not exceed 140, two men easily handle the fourteen lines. After the morning rush, two men receive all commercial calls in addition to the dispatching, and after 12:30 a. m. only one man is on duty. The accompanying diagram shows the hours to which dispatchers are assigned.

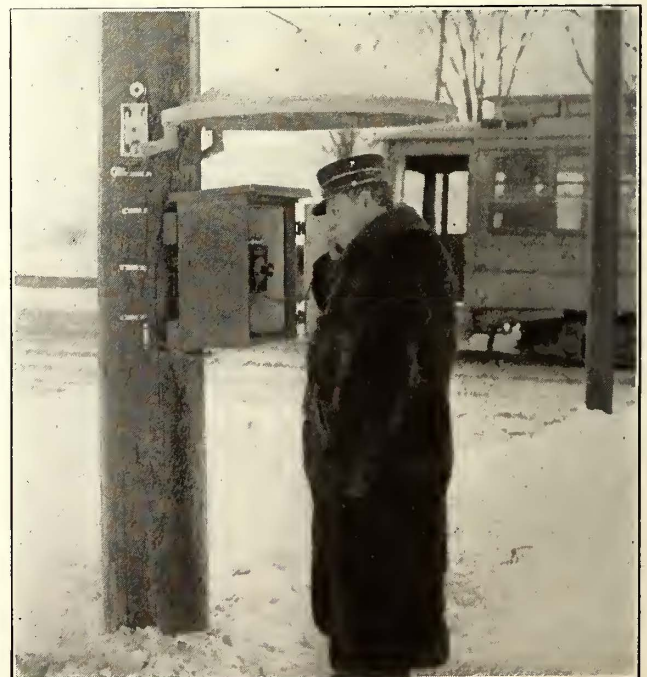
For several years all cars in operation have been known as trains, metal train number cards 4 in. x 8 in. being carried on the front and rear of all trains. The scheme of numbering trains is such that those on Lake and Monroe Avenues, for example, are numbered 100, 101, etc.; those on Main and West Streets, 200, 201, etc., and so on for the fourteen lines. The time-table shows the schedule of each train in a column by itself. Instead of using this schedule, which is prepared by the schedule department from traffic checks, the dispatcher makes a list of trains in the order in which they are due at terminals, and shows the scheduled leaving time opposite each.

Motormen are under strict orders to call the dispatcher from each terminal, giving the name of the terminal and the number of his train. The former would not be necessary on most routes as nearly all have individual lines, but a few have extensions over which only a part of the trains run. In such cases, the two phones are on the same line, hence it is necessary for the motormen to call, for example, "Lake 122," or "Charlotte 115." The dispatcher answers by giving the time of departure, which under normal conditions is the same as that

shown on the schedule posted in the station. The dispatcher makes a written record of each train as it is reported on the dispatcher's sheet. If reported at or before its scheduled time, the scheduled time is recorded; if late, the actual time of report is entered followed by — 1, — 2, etc., to indicate the number of minutes late. Hence, under ordinary conditions, the operation with the dispatching system is the same as before its inauguration, but there is the positive knowledge that trains are running according to schedule, as well as a written, detailed record of the fact for future reference.

The real value of the system reveals itself when interruptions occur from any cause. This is the very time that the former method of operation failed. When a train is several minutes late and, owing to traffic conditions, it is improbable that it will recover its place, the dispatcher calls the station and orders out an extra, or "fill-in," to run on the late train's time and the latter is turned. The turning of this train, however, does not inconvenience the public, as the crew is instructed before leaving the terminal to carry a sign indicating that the train will not run through to the opposite terminal, but that it is a "short car." Inspectors, as a rule, are inclined to remain near to the center of the city as interruptions are more likely to occur there, and if they do occur, they are of more serious consequence than elsewhere. For that reason, if a train is delayed in an outlying section, the inspector may have no knowledge of it until his trains cease to come, and it is then too late to get out cars to fill the gap. Necessarily he must turn some trains in order to put them on time. He is obliged to change a sign after the train has received passengers, and those who desire to ride beyond the turning point are irritated at having to change cars in order to reach their destination. There is some merit in a passenger's argument that if he boards a car signed for a certain destination, the car should take him to that destination unless it becomes a physical impossibility. In addition the old method allowed the gap in the service to be carried from terminal to terminal, while the new method allows it to be carried only from the initial terminal to the center of the city.

In the event of an interruption at any point, it is the duty of the motorman of the first car in the block to



ROCHESTER DISPATCHING—TYPICAL TELEPHONE AT END OF A LINE

notify the dispatcher from the nearest available telephone, thus giving the maximum time to rearrange the service. At points where interruptions are likely to occur, such as at canal lift bridges and railroad crossings, pole phones have been provided. If a train is held at a canal bridge for instance, the dispatcher, knowing the number of the delayed train, can space back its leaders. For example, assume that train No. 208 is due at terminal at 2 p. m.; 209 at 2:05 p. m.; 210 at 2:10 p. m., etc., and suppose that No. 210 is held six minutes when running toward that terminal. The dispatcher would order 208 to leave at 2:02 p. m.; 209 at 2:09 p. m., and 210 being six minutes late would leave at 2:16 p. m. The following train 211 is immediately behind so that 210 may turn without leaving the gap. It will be noted that all this has been accomplished by giving a seven-minute headway instead of a five-minute headway for a few minutes. Without the telephones there would have been five-minute headways until a gap of eleven minutes occurred. This would be plainly noticeable to patrons, while a change in the headway from five minutes to seven minutes for a few trains is not likely to be observed.

It sometimes occurs that a car is derailed near the end of a line. In such a case the dispatcher orders the conductor to go back to the nearest cross-over to alternate cars on either track from that point to the terminal, until the derailed car can be replaced on track. Frequently, when there is trouble on any one line, the dispatchers use pull-in cars from any or all other lines to keep up service until the trouble can be cleared. In like manner, pull-in cars from all lines are sent to care for extraordinary travel, such as that for a ball game or a circus.

During snow storms, or when rail conditions are such that it is impossible to make schedule time, the dispatcher may disregard his model schedule and give more running time with increased headway. This insures regularity of service at the expense of cars being less frequent, but on the whole is far more desirable.

The system proves of considerable advantage in cases of power interruptions. After a delay from this cause some motormen are able to get over the road more rapidly than others, and thus cause bunching of cars. In this event the trains are spaced on scheduled headway so that regular service is restored immediately, although no trains are on time. The latter condition, however, is of no interest at all to patrons. In order to put trains on time, different methods are used, depending upon conditions. The first of these methods is, after spacing cars as described above, to order each crew to change cars with whatever crew is running on their time. This causes some inconvenience on account of the necessity of taking register readings, removing train number cards, etc., and is not done during the busy hours of the day. Instead, all trains are allowed to run behind schedule until the rush is over, at which time pull-in cars are available to assist in getting trains on time. In fact, it is possible, when all trains on a line are, say, eight minutes late, to have one crew turn back each car, putting each one nearly on time. A method of restoring trains to schedule which is used mostly after serious interruptions, such as are caused by parades which necessitate stubbing from a point near the center of the line to the terminals, is to order alternate trains at each terminal to run to the opposite end of the line, the other trains turning so as to take their places on regular schedule. As soon as the through trains report again, they are ordered to turn, while the trains already on time make the through run. In this way all trains are running on time within about an hour, no matter how seriously they were disarranged at the beginning.

With the dispatching system the number of inspectors has been reduced so that the increase in the number of dispatchers is about offset. Although the inspection force has been curtailed, the remaining inspectors have many duties to perform, but they may give more time to that variety of inspection that makes for a better disciplined force of trainmen. Line terminals must be checked frequently for the purpose of ascertaining that each crew leaves at the designated time, as the dispatcher has no means of insuring this. An automatic headway recorder would be a valuable adjunct to the telephone.

Besides the actual operation of cars, for which the dispatching system was installed, many other uses have been discovered. Not least among these "by products," as they may be termed, is the operation of snow plows and sweepers during severe storms. With some twenty pieces of equipment, each assigned to keep definite portions of the line clear of snow, it was difficult, under old conditions, to keep all under close supervision and occasionally a plow would be disabled for some time before the fact became known, the consequence being the partial blocking of the lines assigned to that plow. The satisfaction in knowing, through frequent reports from the crew of each plow that it is progressing over its route can scarcely be estimated, and in case of any plow becoming disabled, those on other routes are dispatched to divide its territory.

Delays to traffic, caused by crippled cars, have become less frequent, for the reason that motormen report defective conditions before they become serious because of the conveniently located telephones. In like manner, reports of minor defects in track or overhead are made. The expense of changing cars is reduced by replacing defective cars with cars that would otherwise be turned in at the carhouse.

Reports of accidents are made to dispatchers as soon as a crew reaches a terminal, and if the claim department wishes to interview the crew at once, they are immediately relieved. When unforeseen conditions arise on any line, the dispatcher is immediately notified, and through him the necessary orders reach the crews. Otherwise it would be necessary to detail a man to the specific task of informing each crew as they passed him. This proves valuable in the event of broken rails, excavations near track and similar conditions.

Another use of the system has been that of locating property which passengers have left on cars. This, although not an essential point, is one which is much to the liking of patrons. On several occasions individuals have expressed surprise that lost property can be returned so promptly. It is even becoming a frequent occurrence for patrons who board cars at terminals to ask dispatchers such questions as, "At what time does the first morning car leave this point?" or "What time must I take a car here to get a train on ——— Railroad at 5:15 a. m.?"

Looking back over a year's operation with the dispatching system, it may be said not only that it has kept its promises in full but that it has given service that was not thought of in the beginning, and there is no reason to believe that all uses of the system have yet been discovered.

The national bureau of standards is preparing a circular on the subject of the standards for electric service which can be required by public service commissions or city officials from electric light and power companies. The circular covers the subject of the quality and safety of service, the accuracy of measurement by the instruments employed, and certain other public relations questions.

## The Auto-Bus in London

### Exclusive Short-Haul Privileges, Avoidance of Peak Traffic, High Fares and Low Taxes Make Local Success of Bus Operation

In the report of a discussion on motor vehicles which took place before the (London) Institution of Civil Engineers, recently published in pamphlet form, H. H. Gordon contributed some illuminating data regarding the causes of success of the auto-bus under the conditions peculiar to the city of London. He stated that, except in the central area of the city where traffic was continuous from morning to night and from which tramways were excluded, the real problem of London traffic was how to care for the peak loads which were very pronounced. At Blackfriars Bridge, for example 9000 passengers were conveyed by the tramways in the hour of busiest rush which was in the morning, but only 700 passengers were handled during the hour of least traffic. During the five hours from 11 a. m. to 4 p. m. the average was only 1000 passengers per hour. A large part of this peak load occurs before 8 o'clock in the morning or during the period when workingmen's fares, which permit a ride of about  $5\frac{1}{2}$  miles for 2 cents, are in force. The motor omnibuses, however, begin to operate each day only after the hour when this reduced rate has ceased. As the morning rush in London is 50 per cent greater than the evening rush, the motor omnibuses are thus enabled to escape the severe peak in the load.

Bus fares seem also to vary depending upon whether there is tramway competition. Thus, a passenger traveling by motor omnibus along a tramway route could travel on an average of 2 miles for 2 cents, but where there was no tramway, although it was alleged that the motor omnibus was the cheaper vehicle, a passenger could travel only  $1\frac{1}{2}$  miles for 2 cents. A passenger in the center of London traveling from Charing Cross to Oxford Circus, which is probably the most profitable traffic center in the world, could travel only 1 mile for the 2-cent minimum fare. On the longer runs a passenger on a motor omnibus traveling along a tramway route could go  $6\frac{3}{4}$  miles for 6 cents, but if he happened to be off the tramway route he could go only  $4\frac{1}{2}$  miles.

The relative public burdens borne by the London tramways and motor omnibuses constitute an important reason for the success of the London buses. It has been testified formally that the contribution made by each tramway vehicle in London toward the public funds amounts to \$1,000 per year, and also that the contribution made by the motor-omnibus company toward public burdens amounts to less than \$200 per annum per omnibus. If motor omnibuses paid taxes proportional to the tramways it would mean an additional charge on them of \$3,000,000, but inasmuch as the London General Omnibus Company's total profit for the year is only about \$1,500,000 it would not continue long to run in London if such public burdens were imposed on it.

In conclusion Mr. Gordon said it was undoubtedly true that motor omnibuses in London had been a great success, but it was equally true that they had been a great failure in every other European city. Summed up the reasons are, first of all, a monopoly of the best traffic area in the world is reserved in London for motor omnibuses. The streets are paved in a manner that is unequalled anywhere. The buses have absolute independence to run when and where and how they like. They are not restricted as to fares, and in many other ways they enjoy advantages which are not granted elsewhere. In addition the buses are relieved of a large

part of the taxation which is normally imposed on transportation utilities, notwithstanding the fact that actual experience in London has shown the effect of the heavy motor traffic to be quite as deleterious to the granite blocks used for the city paving as to macadamized roads. In fact, the life of the granite under bus traffic is no longer than the life of soft wood paving. In 1908-1909, in connection with certain reconstruction work at Putney Bridge, the whole street paving was repaired, but during 1913 it had been found necessary to reconstruct that paving entirely, and even the granite then installed is giving way at the present time under the intense traffic imposed upon it.

## Comments on Insulating Tape

### George E. Austin Outlines His Experiences in Its Manufacture, Sale and Use

At the annual convention of the Mechanical Rubber Company at Cleveland, George E. Austin presented a paper in which he outlined his experiences in the manufacture, selling and use of insulating tape. He stated that some twenty-five years ago tape sold at prices ranging between 40 cents and 75 cents per pound, and that this price gave the manufacturer a chance to produce a good article at a reasonable profit. At the present time, notwithstanding the higher average cost of the raw material, friction tape is sold as low as 15 cents a pound and rubber tape at 25 cents a pound so that it is difficult for the manufacturer to supply a really good and efficient product.

However, there is a growing tendency among large consumers to call for a higher quality of tape, especially where it is used for insulating purposes, and where the cost of replacing the tape, irrespective of the damage due to its failure, is a hundredfold more expensive than the cost of the material.

Mr. Austin opposed the use of many different grades of tape and advocated the establishment of but three or four standard qualities. He referred to the existing lack of standardization in testing methods but stated that the only really practical test was that obtained under normal working conditions. The present tendency to call for a large yardage of tape to the pound was unwise, as this was obtained only by cutting down the friction which takes away the insulating and adhesive properties.

Where the material is to be used for outdoor work such as line construction on a railway, there is need for a sticky tape and one that will not absorb moisture. For armature or interior work a dryer tape is preferable so long as the breakdown tests meet the requirements. Climatic conditions affect the efficiency of friction tape materially, as tape which is frozen in course of transit loses its adhesion until warmth is applied.

The matter of pinholes in tape is important. When the material is wrapped several times around the work so that one layer covers the other the punctures are partly eliminated, but where a single wrapping only is used, pinholes make the tape inefficient. This condition should immediately be called to the notice of the factory as it is often caused by failure properly to spread the friction on the cloth as well as by using a compound which adheres poorly and falls away from the fabric when it unrolls. It is desirable that tape should be wrapped in wax paper or tinfoil and put in cartons for shipment.

Formerly it was usual to guarantee a friction tape against drying out for one year. But in general this is an impossible requirement, although all grades of tape should retain their adhesiveness for about six months, if left in original packages and properly stored.

ANNUAL CONVENTION  
SAN FRANCISCO  
OCTOBER 4 TO 8, 1915

# American Association News

ANNUAL CONVENTION  
SAN FRANCISCO  
OCTOBER 4 TO 8, 1915

H. G. McConnaughy Expresses Optimism Regarding Convention—Washington Section Entertains National Officers—Power Distribution Committee Assembles Results of Fruitful Year's Work

## MANUFACTURERS' ASSOCIATION

E. H. Baker, president of the Manufacturers' Association, and H. G. McConnaughy, secretary, recently returned from San Francisco, where they went to arrange for convention meeting places and transportation. The results of their work will appear in circulars regarding the tours, which will be issued next week, and others regarding hotels, etc., which will follow in a few weeks.

The meetings will be held in the Inside Inn, a commodious hotel located centrally in the exposition grounds, opposite the Baker Street entrance. The hotel faces the Musical Concourse and is near the Horticultural Building. It was designed to accommodate conventions, a large ballroom providing ample space for the general sessions. The registration headquarters will also be at this hotel, but there will be no "official" hotel. Tentative plans for a reception to be held at the St. Francis Hotel on the evening of Monday, Oct. 4, were also made.

Mr. McConnaughy states that hotel prices and those of food and all other goods are normal and that there is no tendency in any direction to take advantage of the people who visit the coast. Contracts were made two years ago for hotel reservations, but it will be necessary for the committee to know well in advance who will attend. The train equipment for all special de luxe tours was fortunately secured eight months ago and will be the finest that will go across the continent this year. The tours have been planned so that the association can visit the properties of the member companies in the cities through which the several trains pass, and as it is the first opportunity that the association has had to do this, the companies are making preparations to show some real hospitality.

In response to an inquiry as to his impressions of the trip, Mr. McConnaughy said that "the exposition as a whole is the most beautiful and wonderful ever built and is worth the price and the time to see the grounds and the lighting effects alone, to say nothing of the buildings both at San Francisco and San Diego." En route he was impressed by the hydraulic power development and wonderful transmission lines, the latter being visible over the mountains for miles from the train. He also noted the special equipment and rolling stock of the railway companies of the West.

The member companies throughout the West will extend a welcome that will linger long in the memory of all those who make this trip.

## AMERICAN ASSOCIATION EDUCATIONAL COMMITTEE

The International Correspondence Schools are enrolling members in the several courses under the arrangement made with the association through its educational committee. As each student enrolls the employer and the committee are notified and the notification is acknowledged direct to the student by the committee. As each pamphlet in the course is completed, the committee is notified of the grade secured and the date of completion, and a complete record of the work of each student is kept in the association office. The students are making excellent progress in the preliminary shop calculation section of the course, a number passing the

examinations with high averages. The committee is assisting the schools in the revision of the instruction pamphlet on steam turbines so that, when students take up this work, the treatment will be up to date. At the appropriate parts of the courses students will be furnished with sections of the engineering manual so that their studies may be related to the engineering work of the association.

## COMMITTEE ON ELECTROLYSIS

The Engineering Association committee on electrolysis met in New York on April 28, those in attendance being as follows: A. S. Richey, Worcester, Mass.; G. W. Palmer, Jr., Boston, Mass., and C. B. Martin, New York, representing E. B. Katté. In accordance with the assignment made to it by the executive committee all that this committee could do was to consider the subject with reference to the forthcoming report of the national joint committee on electrolysis. This report is now in the hands of the publishing committee, of which Mr. Katté is chairman.

## COMMITTEE ON POWER DISTRIBUTION

The Engineering Association committee on power distribution met in New York on April 29 and 30. Those in attendance were A. S. Richey, Worcester, Mass., chairman; E. J. Blair, Chicago, Ill.; D. E. Crouse, Annapolis, Md.; C. R. Harte, New Haven, Conn.; G. W. Palmer, Jr., Boston, Mass.; R. H. Rice, Chicago, Ill., and Gaylord Thompson, Trenton, N. J. Condensed minutes of the meeting will be printed on this page next week. One of the most interesting reports presented was that of the sub-committee on poles, which was the result of several meetings. One was held at Rochester, N. Y., on March 26 and 27, attended by Messrs. Cadle, Thompson and Rice. Here experimental poles, made under the committee specifications and design, were tested and the results were compared with the formula published in last year's report. Samples of the standard New York State Railway poles were also tested. The results of the tests were discussed on the spot. At Cleveland on April 26 Messrs. Cadle and Rice inspected the Cleveland Railway pole, its use and manufacture. At Wheeling, W. Va., on April 27 Mr. Rice visited the plant of the Electric Railway Equipment Company and tested standard and special steel poles which had been manufactured for test purposes. At New York on April 28 Messrs. Thompson and Rice worked out a report, for presentation on the following day, based on the results of the previous meetings.

## WASHINGTON SECTION

An audience of about 100 members and guests of the Washington Railway & Electric Company section greeted C. Loomis Allen, E. B. Burritt, Charles C. Peirce, R. D. Simms and J. H. Hanna, the speakers at the April meeting.

Mr. Allen spoke on the subject of co-operation. After outlining the individualistic conditions of living in the pioneer days, he traced briefly the growth of the co-operative spirit with the opportunity for initiative and enterprise. This led naturally into the subject of public relations and the part which employees must play in them if the railway managements are to be success-

ful. Street railway employees are part of a city's life and an intelligent factor in a community. They have an opportunity to defend their employers when the latter are unjustly assailed.

Mr. Peirce, representing the Manufacturers' Association, said that the best measures of a good town are its street railways and other utilities. The criticism of these utilities is on the decrease, due to improvements made in the service even in the face of higher operating costs. Fares must be increased in view of increased overhead charges.

Mr. Burritt, representing the American Association, spoke briefly regarding his former connection with the Washington Railway & Electric Company and the pleasant friendships formed during that period. Mr. Simms, treasurer of the Capital Traction Company, complimented the motormen who had submitted papers in the competition which closed recently, and of which Mr. Hanna, of the same company, acted as judge. The latter stated that, while he had looked forward to the task as a heavy one, it turned out otherwise. He had read all of the forty papers at least twice, with pleasure and profit.

The topic of the papers referred to was "How to Prevent Accidents, Insure Comfort to Passengers, and Save Power." The prize winners were W. D. Valentine, J. N. Malloy and S. F. Frye.

### Appointment of Jury on Awards

The International Jury for the Electrical Exhibits, San Francisco Exposition, Organizes

Following are the members of the international jury of awards of the Panama-Pacific International Exposition appointed to pass on all electrical exhibits: Nominated by the chief of the department of machinery—Dr. Carl Hering, consulting engineer, Philadelphia; Prof. C. M. Jansky, University of Wisconsin, Madison; William H. Onken, Jr., *Electrical World*, New York; Cecil P. Poole, consulting engineer, Atlanta, Ga. Nominated by the chief of the department of transportation—Dean George A. Damon, Throop College of Technology, Pasadena, Cal.; A. H. Babcock, electrical engineer Southern Pacific Railroad Company, San Francisco. Nominated by the chief of the department of manufactures—Prof. V. Karapetoff, Cornell University, Ithaca, N. Y.; Prof. H. J. Ryan, Stanford University, Palo Alto, Cal.; Guy Bayley, chief of electricity Panama-Pacific International Exposition. Nominated by the chief of the department of liberal arts—A. J. Halloran, *Journal of Electricity, Power and Gas*, San Francisco; Charles A. Rolfe, president Southwest Home Telephone Company, Redlands, Cal.; Dr. Frank Wolff, bureau of standards, Washington. Electrical groups of all departments—Italy, Vite Capastini. Professor Ryan has been chosen chairman of the group, Vite Capastini vice-chairman and A. J. Halloran secretary.

The group jury has twenty days to pass on exhibits and will report to a department jury composed of the chairmen and vice-chairmen of each group jury of the respective departments. Each department jury must begin work within five days after notice by the chief of the department and will submit findings to the director of exhibits, who will certify these to the superior jury. The latter will determine finally and fully the awards to be made. This superior jury will convene on June 3, and will report within fifteen days, and as soon as practicable thereafter formal public announcement of the awards will be made. There will be six classes of diplomas—the grand prize, medal of honor, gold medal, silver medal, bronze medal and honorable mention without medal.

## COMMUNICATIONS

### Zone System of Fares

BOSTON ELEVATED RAILWAY COMPANY

BOSTON, MASS., May 3, 1915.

To the Editors:

In response to your request for an expression of opinion relative to the so-called Milwaukee zone system of fares, I am free to say that the subject is one of much importance. Any method of increasing net earnings so as to provide for requirements deserves careful study. Beyond expressing my interest in the zone system as an attempt to substitute a graduated charge for the 5-cent fare, I do not feel prepared to speak. We are naturally greatly interested in seeing how the plan works out in practice.

There are many questions to be considered before one would be warranted in concluding that this method should be adopted on a system as complex as the Boston Elevated Railway. Last year our company carried a total of about 613,000,000 passengers, but only 343,000,000 of these contributed to our revenue. More than 270,000,000 free transfer passengers were carried on the system. The extension of free transfer privileges within late years has reduced the average fare per passenger carried to less than 3 cents. Here is a source of lost revenue which may be studied with perhaps as much advantage as the application of the zone system. Increased fixed charges in one form or another and increased wages are other elements in the problem of affording capital its just return. The practical application of the zone system implies many difficulties on such a closely articulated group of rapid transit and surface lines as we have in Boston. Doubtless zone fares can be put into successful practice here if it appears that this method is acceptable to the public and desirable for the company, but at present an unqualified approval of such a plan cannot be given for a system as large and complex as this. The paper of Mr. Stearns on the application of zone fares in Milwaukee before the April 22 meeting of the New England Street Railway Club is a valuable contribution to the subject.

WILLIAM A. BANCROFT, President.

### Mating Gears and Pinions

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION  
DALLAS, TEX., April 27, 1915.

To the Editors:

Referring to the article on page 803 of your issue of April 24 in regard to "Working Ordinary and Hard Gears and Pinions Together," it would seem to the writer that there must have been other factors in the operation of this car to account for differences in the results obtained with the gearing in the two cases. While the wear of the No. 1 pinion and gear is abnormal, the lack of wear on the No. 2 pinion and gear is also abnormal for the mileage given. It would be as well, in cases of this character, if factors other than the mere difference of hardness between the gears were carefully observed. In this case, lack of proper lubrication on the gear-train of No. 1 might easily account for the abnormal wear, as also might the fact that the No. 1 motor, either in armature or fields, has had such characteristics that it did a great deal more work than the No. 2 motor. This last condition is one that may often be observed where the input of current to each motor on the same car is not frequently tested, and this last condition would account not only for the excessive wear on the No. 1 gear-train, but for the lack of normal wear on the No. 2 gear-train.

I think your readers would like to hear from Mr. McAloney further in regard to the other factors which might have caused, or partly caused, the extraordinary difference in wear between the gear-trains on the same car.

H. S. COOPER, Secretary.

R. D. NUTTALL COMPANY  
PITTSBURGH, PA., April 28, 1915.

To the Editors:

We are much interested in the experiment of Mr. McAloney on mating hard gears and soft pinions, appearing in the issue of the *ELECTRIC RAILWAY JOURNAL* of April 24. This experiment had already been brought to our attention.

The proper combinations for new equipments can be determined very readily, but when it is necessary to install new pinions with several different grades of partially worn gears, care must be exercised to select the grade of pinion that will wear most satisfactorily with the different gears or vice versa.

We can corroborate Mr. McAloney's experience, having conducted several similar tests with the same results.

In searching for an explanation of this peculiar result it is reasonable to assume that the harder surface of the gear starts to wear the face of the pinion tooth, the resultant grit mixing in the gear grease and acting as an abrasive between the teeth, and as the harder surface of the gear begins to wear this grit imbeds itself in the face of the pinion tooth, accelerating the wear. It would be interesting to know if the face of the pinion teeth were rough, which would be necessary to bear out the theory.

W. H. PHILLIPS, Metallurgist.

## Self-Ventilated Railway Motors

GENERAL ELECTRIC COMPANY  
SCHENECTADY, N. Y., May 4, 1915.

To the Editors:

The article in the issue of the *ELECTRIC RAILWAY JOURNAL* for May 1 on the subject of ventilated railway motors by R. E. Hellmund, of the Westinghouse Electric & Manufacturing Company, is full of interest, and indicates that the idea of efficient ventilation is being generally accepted for the various reasons set forth in his article. This is particularly gratifying to us as we have advocated for a number of years the general adoption of motors designed for positive self-ventilation with external air. We had faith in the scheme from the first and are pleased to say that the results of ventilation obtained with more than 15,000 motors of various sizes have been in every way satisfactory.

The general idea of ventilating a railway motor is quite old, but only in recent years has a thoroughly effective and efficient design of ventilation been worked out. The first railway motors of early days did not have inclosing magnet frames. The armature and field coils were almost completely exposed. This construction gave fairly good ventilation but also a lot of trouble from burned-out armatures and field coils and from various mechanical failures. A long step in advance was taken with the advent of the closed motor, even though ventilation was largely destroyed. Efforts to improve the ventilation of closed motors naturally followed.

As early as 1893 the General Electric Company made d.c. railway motor armatures with round, longitudinal holes and radial ventilating ducts in the core, and in 1906 a.c. motors were made with longitudinal ducts the full length of the armature, including the commutator. It was not an uncommon practice, when closed motors

ran too hot in service, to partly or wholly remove frame covers or to use special covers to allow some circulation of external air through the motor. This method of ventilation, however, was not altogether effective or generally satisfactory.

One of the early G.E. self-ventilated street car motors, with positive circulation of external air, employed the series-ventilation plan with a fan at the pinion end, and an intake pipe extending out from the motor frame on the truck as far as the side of the car. It was thought that there might be some objection to taking air adjacent to the motor on account of the dust, and that the cleaner air at the side of the car would do less damage to the motor. After operating motors for some time in this way and noting that the interior of the motors accumulated practically no dust or dirt, the intake pipes were removed and the less clean air adjacent to the motors was allowed to circulate through them. After continued operation under this condition the motors appeared to be cleaner than the old types of closed motors in which the copper and carbon dust were all deposited inside the motor.

An experiment was made of setting up such a motor out of doors and directing a stream of water onto it from a hose, the stream at times being directed into the openings through the frame and frameheads. The fan blades acted to throw the water away from the armature, and while the interior of the motor at the pinion end was wetted to some extent, absolutely no damage resulted. There could be no accumulation of water in the motor since it drained off through holes in the bottom of the frame.

Under actual service conditions we have known self-ventilated motors to operate over tracks which were flooded with from 1 ft. to 2 ft. of water without the motors being damaged in any way. In the operation of such motors nothing whatever has occurred which would indicate that exceptional trouble will be experienced from water or snow. Ventilating motors have proved fully as reliable as closed motors, if indeed they are not more reliable. With very dirty streets there may be some accumulation of dust in the motor, but this can readily be blown out with compressed air. We know of no instance where dust or dirt has accumulated sufficiently to cause trouble.

The GE-203-A self-ventilated motor which employed the series-ventilation plan was first exhibited by the General Electric Company at the electric railway convention at Atlantic City in the fall of 1911. The motor attracted a great deal of attention, but there was some skepticism, which since has almost completely disappeared, as to whether the motor could be successfully operated with openings through the magnet frame. After their years of operating closed motors it was somewhat difficult to convince operating men that it was practicable to circulate air taken from the outside of the magnet frame through the motor. The large increase in service capacity secured by such ventilation was not thoroughly appreciated.

One of the early tests which was conducted to show the value of self-ventilated motors was undertaken with four motors on the Fonda, Johnstown & Gloversville Railroad between Schenectady and Gloversville, N. Y. This road runs large heavy cars, and for a number of years the cars have been equipped with four motors which weigh about 4200 lb. each. Four self-ventilated, field-control motors weighing about 2150 lb. each were substituted in place of the heavier motors and run in regular service for about two and one-half years. After an all-day service the temperature rise of the light self-ventilated motors was approximately the same as

the temperature of the heavy motors of the non-ventilated type.

The ventilated motors were geared for the same maximum speed as the heavy motors. They were not favored in any way and performed identically the same service as the heavier motors. After operating 166,025 car-miles the motors were in splendid condition, thoroughly demonstrating that the light, self-ventilated motors would perform the service with entire success. The gear and pinion teeth showed but slight wear, the average wear in thickness for the pinions being 0.0457 in. and for the gears 0.0250 in. This is of special interest since the gears were untreated cast steel and the pinions were G.E. grade "F."

While the effectiveness of ventilation is especially pronounced in interurban service, where car speeds are high, in city service with low car speeds there is a partial offset due to the use of higher gear ratios and correspondingly higher armature speeds for a given car speed. The effectiveness of ventilation is a function of armature speed rather than car speed.

In some of the early investigations to determine the effectiveness of self-ventilation with longitudinal passages through the armature, temperature-exploring coils, wound with very fine wire, were placed in various locations in the armature windings, the rise in temperature of a particular spot being determined by the rise in resistance of the exploring coil. With motors ventilated in the ordinary way the hottest spot in the armature is usually under the windings between the armature and the commutator. With longitudinal ventilation it was found that the temperature under the lower part of the windings, between the core-head insulation and the windings, was as low as, or even lower than, the temperatures obtained directly under the head dressing, showing that the air passing through the armature was even more effective in removing heat than the air passing over the exterior surface of the armature. This was also found to be the case in that part of the coils lying in the core slots.

Longitudinal ventilation is particularly effective in the core, since with the multiplicity of air passages a large surface is exposed for radiation, and heat which is generated in the core and windings is conducted much more effectively throughout the core in a radial direction than in a transverse direction. Heat traveling in a transverse direction has to pass from one lamina to another through the insulation on the laminae and the small air spaces between them caused by unevenness of surface. Investigations have shown that the heat can be conducted radially through the laminae fully twenty-five times more effectively than in a transverse direction across the laminae.

It may be of some interest to relate developments which led up to parallel ventilation. The first motors were designed with series ventilation. To make series ventilation most effective a large diameter of fan was required. With the increased diameter of fan it was observed that the outside surface of the fan, above the armature-core diameter and adjacent to the core, although turned reasonably smooth, tended at high velocity to drive back the air entering the motor frame at the pinion end. It occurred to the writer to make a virtue of the evil by placing radial fan blades on the surface in question, thus securing parallel ventilation and a larger volume of air, with the intake at the commutator end of the motor. This gave two parallel independent cool streams of air passing over field coils and through the armature. The effectiveness of this arrangement was found to be very pronounced.

EDWARD D. PRIEST,  
Engineer Railway Motor Department.

## Recent Manganese Steel Crossings

UNITED RAILWAYS COMPANY OF ST. LOUIS  
ST. LOUIS, Mo., April 17, 1915.

To the Editors:

Referring to the article published in your April 10, 1915, issue entitled, "Recent Solid Manganese Steel Crossings," and to the other articles published during the past year in regard to solid manganese and hard center special work, I believe it is to be expected that these failures will result in improvements in design and in foundry practice which will greatly increase its life. It is but a few years since this type of special work was adopted to any great extent and comparatively a few months since the failure of the first installations.

If, in the past year or two, solid manganese special work manufacturers have succeeded in improving the quality of metal at the intersection of the running rails to such an extent that the new pieces no longer fail at this place, it is very good evidence that they have been to a certain degree successful with their changes in design or in their foundry practice. We all hope that it will be but a short time before the manufacturers of solid manganese special work find the design and method of manufacture of special work pieces which will make it more uniform and increase the maximum life. We also hope that the study of failures of hard center special work by the manufacturers will result in great improvements in that type of special work.

C. L. HAWKINS, Engineer Maintenance of Way.

NEW YORK STATE RAILWAYS  
SYRACUSE, N. Y., April 19, 1915.

To the Editors:

I was very much interested in reading the article in the April 10, 1915, issue of the ELECTRIC RAILWAY JOURNAL regarding the wear on manganese steel frogs. I have not noticed on our solid special work that the frog points are wearing much better than formerly. If the shifting of the webs farther from the frog points has a tendency to provide better metal at the points of heavy wear, it certainly is a very important step in the manufacture of manganese frogs. I believe, however, there is still a question as to whether this is so from the fact that manganese steel centers in hard center work spall off, notwithstanding that these centers have no supporting webs and are generally flat on the bottom, especially in machine bearing work. I believe that while the design of the sections used probably has considerable to do with obtaining sound metal at the points of heavy wear, the main difficulty is in the manufacture of the metal and in the heat treatment. This would seem to be borne out by the fact that special work in the same layouts, of the same design and under the same traffic, generally does not wear the same; some of the pieces spall off and some do not. It would also be interesting to note, in the frogs mentioned in the article which have been in service for three and one-half years, whether the absence of spalling at the frog points was not in a great measure due to the flange bearing, and if at the present time these frogs are still flange bearing, thus relieving the intersecting corners from the wheel blows. It would also be interesting to note, in general, under different densities of traffic, how long the solid frogs remain flange bearing. I am inclined to believe that if the flange bearing is effective for say only three years, during the fourth year when the corners get the full pound, they would probably start to spall and wear more rapidly than in the previous three years.

E. P. ROUNDEY,  
Engineer Maintenance of Way.



# 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.)

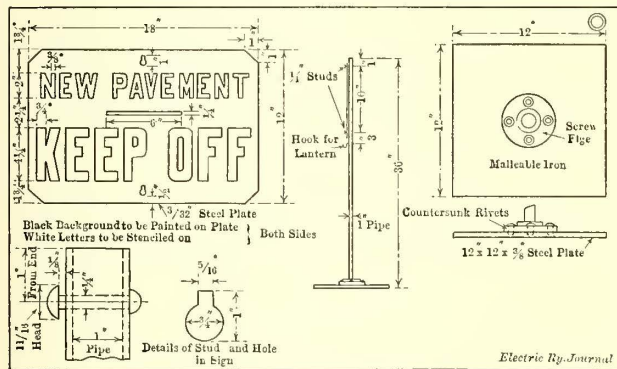
## Warning Signs to Protect Paving Work in Tracks Under Traffic

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

The protection of new pavement in tracks in congested city streets is a rather serious problem, partly because car service is usually resumed immediately following the track work and the tracks cannot be effectively barricaded against teamsters during the repavement. This is especially true where team traffic is allowed on some parts of the street at all times. Watchmen are usually provided but there is a persistent tendency upon the part of teamsters to follow the tracks and to disregard the average watchman.

As a rule, there is comparatively little trouble from teaming on fresh pavement laid in the first track completed, because this can be protected by the materials along the 2-ft. strips and the space made by the opening which need not be restored immediately. Openings can be left ahead of the new pavement also, thus quite effectually preventing teams from getting on it.

It is with the protection of the paving in the devil



ASSEMBLY AND DETAILS OF WARNING SIGN TO TEAMSTERS

strip and second track that most of the trouble is experienced. These areas are usually laid at the same time and promptly afford a place upon which teamsters can turn out in avoiding teams and cars, especially when the latter are operating on single track against traffic.

To assist in the protection of new pavements under these conditions a page has been taken from the police department traffic signs, which have the respect of teamsters. "New Pavement" signs, as shown in the accompanying figure, have been put into service with such good results, after a season's trial, that their use is to be continued. These signs are designed to be placed about 30 ft. apart in the devil strip. They will clear cars when carefully set. It will be noted that they are quite light in construction with detachable sign plates. They were made light largely to avoid possible car derailment troubles in case they came in contact with car equipment. There is no record of derailment due to the signs, although in the course of rebuilding 15 miles of single track, about twenty-seven out of fifty-five used during six months were partially

destroyed in various ways. The signs cost about \$1.10 each, exclusive of painting and lettering.

## Brightening of Blackened Solder Shows Bearing Wear

BY A. P. LEWIS, SUPERINTENDENT POWER AND SHOPS  
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY

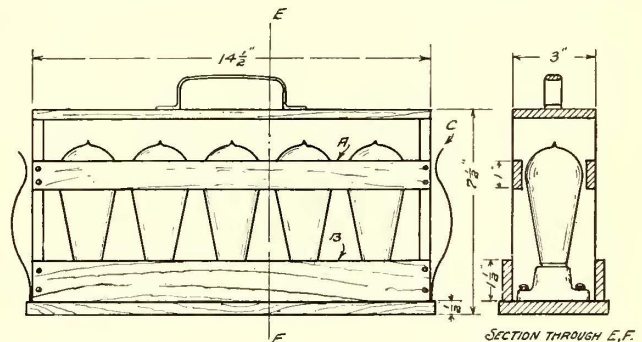
An unusual method of testing armature clearance has been adopted by the mechanical department of the Cleveland, Southwestern & Columbus Railway. At the time an armature is repaired small globules of solder are dropped on the bands at several points around its circumference. These globules project approximately 1/16 in. beyond the armature core clearance line. When the daily visual inspection of motors is made through the openings provided in the shells, the armature clearance is checked by observing the condition of the solder globules. If the clearance is scant bright spots will be noted on the projecting globules, which, of course, had left the shop blackened with insulating paint. Naturally, these indications of wear on the solder call for the early renewal of the bearings.

Since the inspection plate openings are limited, it is possible that one of these tell-tale globules will not come to view at every inspection, but it is quite certain to appear often enough to satisfy the purpose.

## Improved Portable Lamp Bank Holder

BY G. B. TANIS

The portable lamp bank generally used in the substations of electric railways consists of five lamps connected in series and mounted on a wooden board. As the lamps are exposed they are easily broken. The



PORTABLE LAMP BANK PROTECTED AGAINST BREAKAGE AND GROUNDING

positive terminal also often comes in contact with some grounded metal, thereby causing a short-circuit.

The accompanying illustration shows how these troubles have been readily overcome by placing the lamp bank in a portable wooden cage. The slat A protects the bulb from breakage and also strengthens the sides. While the slat shuts out some light the lamp bank is seldom used for lighting purposes, but rather for miscellaneous testing. The board shown at B prevents the wire and terminals from coming in contact with any

undesired object. The leads, which should be about 10 ft. long, when not in use can be wrapped around the cage and fastened under the clips C.

### Power Reel for Cars, Trucks, Etc.

BY R. H. PARSONS, ELECTRICAL FOREMAN

In many instances it is necessary to operate cars or trucks in parts of buildings or yards where power is not available; for example, on an upper floor equipped with a transfer table but without trolley wires or channel rails, or in shops where the cars are jacked up and the trucks moved elsewhere for overhauling.

The following paragraphs describe a reel whose conductor is made alive, embodying such construction that the wire can be fed out as the car or truck leaves the transfer table or elevator, and which can be wound

the source to the reel. The segments on the commutator, acting like collectors on a generator, are in contact in any fixed or moving position of the drum because both the commutator and drum turn on a common shaft. The reel and commutator are fastened to the shaft with ordinary pipe flanges, which are pinned to the shaft and held to the reel with wooden screws. The end of the shaft is finished square to permit a crank to be used for winding up the cable.

The whole outfit is set on a frame of 1/2-in. x 2 1/2-in. iron, with the bearings forged as a part of the frame. Neither the speed nor the weight of the reel demand micrometer fitting bearings, the main point being to add a little oil once in a while.

On the side of the reel from which the cable is drawn are placed two brackets (attached to the frame) and a wooden roller over which the cable runs when it is drawn out. The roller is shown connected to a transfer table, but it can be just as readily connected to the main trolley of the shop.

Connection direct to the trolley would be in order if only fully-equipped cars were used. In that case cable connections could be made to the controllers of the car, and the resistors of the car would protect the motors. However, a controller and resistors are necessary when trucks with motors only are handled, or cars on which the motors are not connected to the car wiring. By the use of a double-throw, double-pole switch the controller and resistors of the transfer table may be utilized, thus combining the feature of convenience with safety: first, by making it impossible to move the transfer table when current is supplied to the car;

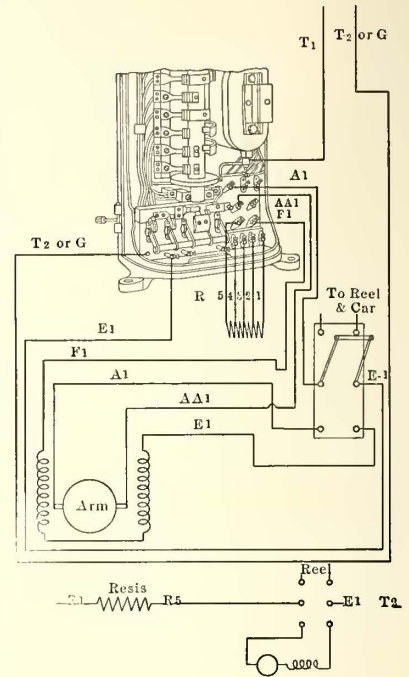


FIG. 4—WIRING CONNECTIONS TO A K-8 CONTROLLER

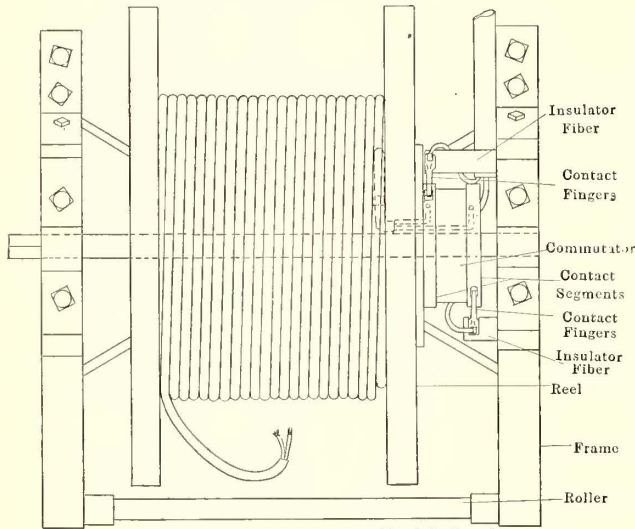
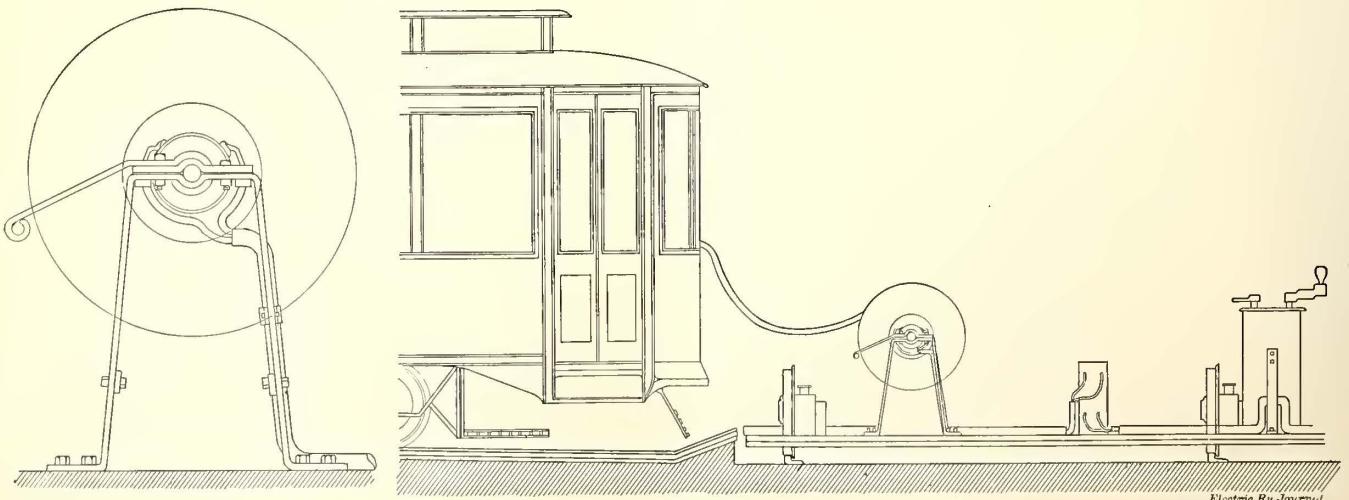


FIG. 1—TOP VIEW OF REEL

up as the vehicle is drawn in. In this way loose cable is prevented from sliding around the floor, and time is saved in handling the equipment.

The reel is a simple drum of the style furnished by wire companies to transport cable. It is fitted with a dummy commutator which is turned from dry, hard wood and fastened to the side of the reel. This commutator has two full circle segments, placed about 5 in. apart, and to these segments the wires from the inside of the drum are connected. On the segments rest two controller-like fingers which conduct the current from



FIGS. 2 AND 3—SIDE VIEW OF REEL; GENERAL ASSEMBLY WHEN TRANSFER TABLE CONNECTION IS USED

second, by making it impossible to run the car when the motor of the transfer table is energized.

The accompanying wiring diagram shows the connections, which are so arranged that with the double-throw switch in one position, the motor of the transfer table receives energy through its proper resistance steps; while in the other position of the switch the same controller and resistors are used to supply energy to the motor of the truck through the reel and cable.

As but two leads are run from the reel to the motor on the truck to be moved, it is necessary to tie an armature and a field lead of the motor together and the leads from the reel must be connected to the other armature and field leads of the motor.

In conclusion, it may be noted that as this device permits very little dragging of the cable over the floor, the liability of fire from short-circuited wires is greatly reduced.

## Track Work by Contractor or Way Department?

BY S. GAUSMANN, BROOKLYN, N. Y.

Many arguments may be advanced both for and against contract work in the laying of surface track. Some roads consider contract letting more economical, while others believe that future maintenance is appreciably increased if the track work is done by outsiders.

The principal reason usually offered in favor of contract work, and one advanced by contractors, is that a contractor can do the work cheaper because he has not so large an organization to maintain as the railway. However, in practice it will be found that in proportion to the work to be done the fixed charges of the railway are no greater and certainly no more than those of a contractor. Of course, for small roads with no efficient track organization, the laying of track by contract is economical and advisable; but this cannot be said of roads that have a competent track organization of this character, unless the head of that department is hampered in one way or another by the executive.

A railway organization which undertakes construction in addition to maintenance work is at times limited by the necessity of employing for construction work men who are not the most competent for the purpose. For example, on some properties a number of the men may be partly superannuated, being kept on the payroll for lighter service, while on others men may be retained because of political conditions. On the other hand, a contractor is freer to go out in the open market to pick the men best suited to the job in hand. Moreover, since the term of employment is indefinite he will usually pay the men a higher rate than a railway which plans to keep men on the payroll the greater part of the year.

With such restrictions it is difficult to retain a competent force, especially if the men are obliged to work with contractors' men, who often receive better wages.

Furthermore, when it would be advantageous to employ, say, fifty or more men on a job, no more than twenty-five may be available because the remainder of the force is required elsewhere. An insufficient number of men on a track job simply increases the amounts to be paid corporation inspectors, watchmen and others, to say nothing of delaying the car traffic by holding back the work.

A contractor does not have to contend with such conditions. He employs as many men as he can work on the job efficiently; he pays them such rates as they are entitled to get because of the character of the work and their ability; and he keeps them busy each day for whatever number of hours he thinks will bring the best results.

I do not mean that the head of the way department should be the sole judge of expenditures, but he should be permitted to pay rates consistent with the work the men do and to add something for long and able service. Where a system of this kind is in vogue under a capable head track work can be done for less by the company forces than by the contractor.

Many contractors who bid on track work fail to take all the conditions into consideration, although the specifications may be plain enough, with the result that their bids are less than the department estimate. Such bids give the general manager a wrong opinion of his own way organization. The proof that the bid was too low will come when the same contractors bid on a similar piece of work. Then their bids will exceed the department estimate. Even an experienced contractor seemingly may underbid an efficient way organization, but in reality he is likely to be higher because the railway is still obliged to pay for municipal inspection and also to furnish its own inspectors to check the contractor. The latter charge, of course, is absent when the company does the work itself.

Another disadvantage of letting out work, which may be overlooked because it is indeterminate, is that other jobs will cost more because nothing must be done to delay the contractor. This means that the company forces often must neglect and delay their own work to satisfy the wants of the contractor in order to forestall his demands for "extras" because of alleged delays and interference.

### NEW TRACK CONSTRUCTION BY CONTRACT

While the reconstruction of track by contract is not good policy, there are various reasons why it is advisable to employ contractors on entirely new work. The contractor, for example, has better means for disposing of excavated material and for handling paving, as mentioned later.

Many points must be watched closely where track work is done by contract, especially when a contractor realizes that he is losing money. The men selected to inspect his operations should thoroughly understand each step of the work. They should not be employed simply because they can read and apparently comprehend the specifications, as the latter are too often so finely drawn that it is not always practicable to obey them to the letter. In such cases an experienced man with sound common sense is worth more than a bookish, inexperienced one.

Inspectors should also follow closely the protection of the street, especially at night. This precaution usually receives the least attention from contractors, insufficient lights and few watchmen being the rule. While this feature might appear to be fully covered by accident and liability insurance, many cases of injuries to pedestrians, etc., will not come up until long after the contractor has been released of his obligations. Then the company will have to defend these actions or else spend money in litigation to place the responsibility where it belongs.

Another important point to cover is to make the contractor responsible for all operations instead of having a certain part cared for by company forces. For example, if a contractor is competent to do track work generally he should be competent to take care of such special operations as compromise connections to old track or special work. Exceptions usually prove unsatisfactory to all concerned and are especially costly to the company when it is obliged to shift men to meet the contractor's wants, even though its men may be on work of more importance. If the company men do not come immediately the contractor has another plausible claim for "extras."

The important operation of tamping is one generally slighted by the contractor, either intentionally or because he lacks competent men. Unless followed closely the contractor considers that "once over" is enough, and even this process is carried on an insufficient distance ahead of the concreting. This plan may be satisfactory in some soils when done thoroughly and by well-drilled men, but the contractor's tampers rarely are men of that type.

Careless tamping will sometimes develop immediately after the paving is completed. While the contractor can be obliged to remove and do the work a second time, the result even then may be a loss of cement and other materials. Matters are still worse if the poor work does not show itself within a year or two, for by that time there is no chance for redress.

#### KINDS OF WORK DONE CHEAPEST BY CONTRACT

A company that does its own work will find that a few operations usually can be done cheaper by contract, particularly the delivery of material and the disposal of refuse material and paving. Much depends, however, on the nearness of the supply yard or dump to the job, whether or not cars are available and what departmental charges are made for the use of cars.

A reasonable price for disposing of the excavated material can usually be obtained from some contractor, as he may be able to reach with wagons a near-by dump that is not accessible to cars; or else the contractor has some fill close by where he can use the material to advantage.

More definite prices also can be obtained by contract for paving work, either with or without material, for a contractor will do such work on a straight yardage basis at a cost lower than that attainable by a railway.

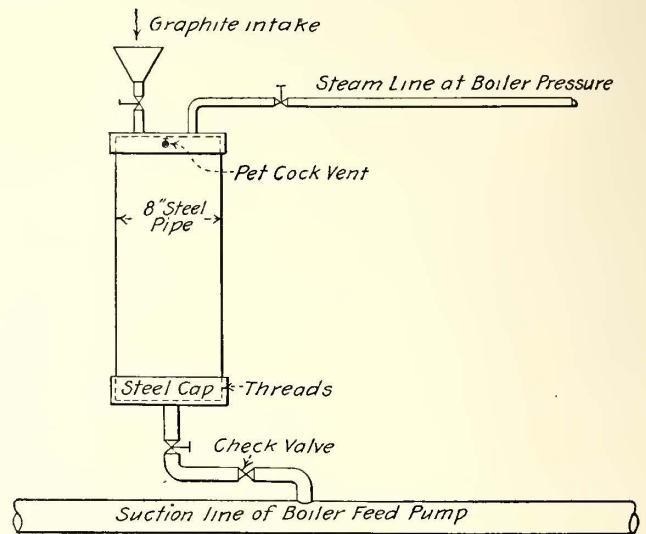
#### FALLACIES IN LOWEST BID AND PERCENTAGE BASIS

In awarding any contracts for track work the ability of the bidder rather than the amount of the bid should receive more consideration. The lowest bidder, for example, may be the one who has had no experience whatever in this line, so that his work would require much more rigid and costlier inspection. Again, under no consideration should contract work be done on a percentage basis. This is a very expensive method, unless a limit is set on the cost per foot. While the percentage contractor would do better work, his charge would exceed what the company would spend to do the same job equally well with its own forces. From a cost standpoint the most satisfactory results are obtained by fixing the price at so much "per foot of single track."

### Dispensing with the Unsightly Copper Oil Can

Cylinder lubricators on the engine-driven auxiliaries in the combination lighting and railway power plant of the Terre Haute, Indianapolis & Eastern Traction Company at Terre Haute, Ind., are all fed from a central oiling system. There are in the station seventeen duplex pumps, three single-acting pumps, four dry-vacuum pumps and four circulating pumps. On none of these units does the visitor to the station see a cylinder oil can. Instead, however, he will observe small, neatly-installed pipe lines leading from an oil header to each cylinder lubricator or sight-feed oil dropper. Tracing the oil header back to its origin, there will be found a home-made 5-gal. steel tank which, at all times except when it is being filled, is kept under 110-lb. pressure by live steam. The arrangement of the piping at the tank is shown in the

accompanying sketch. H. E. Smith, chief engineer at the plant, designed the oil system to reduce the waste of oil and the inconvenience of filling such a large number of lubricators. According to his state-

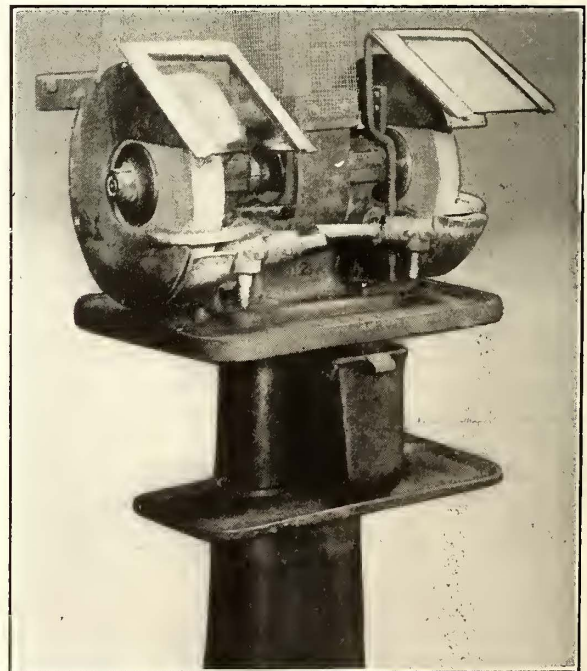


LAYOUT FOR DISPENSING WITH OIL CAN

ment, the apparatus has not only proved entirely successful from the standpoints of economy and convenience, but has aided greatly in keeping the station auxiliaries "looking spick and span."

### Goggles on the Grinder Instead of on the Man

It is one thing to give shopmen protective devices and another thing for the men to make use of them. Thus the New York State Railways, Syracuse Lines, ordered the operators at the emery wheels to wear safety goggles, but the goggles were found hanging on the wall



EMERY WHEEL GRINDER WITH PLATE-GLASS WINDOWS

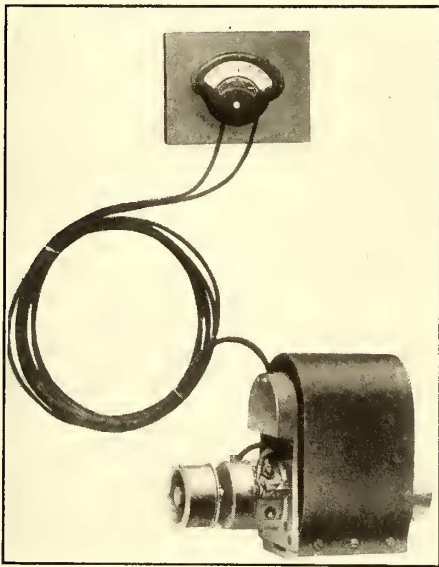
more often than on an operator's nose. Some thought was given to the matter with the result that the goggles, so to speak, were attached to the tool. These "goggles," as the accompanying halftone shows, are

nothing more than rectangular pieces of framed plate glass. These are installed on the tool in such a way that they serve as windows, through which the operator can see in safety the progress of grinding.

### An Electrical Speed Indicator

The Esterline Company, Indianapolis, Ind., has placed on the market a new electrical speed indicator, consisting of a specially-constructed magneto-type generator and a high-grade electrical indicating instrument. The generator is so constructed that the voltage developed by it is directly proportional to the speed at which the armature is driven, and a voltmeter connected to the terminals of the generator indicates, therefore, the true speed of the device to which the generator is coupled. This device has the advantage that the indicating instrument can be located a long distance from the generator and can be placed where it is not affected by vibration, heat, etc.

The generator is designed especially for speed-indicating purposes. The armature rotates on ball bearings of large size, and both bearings are fully housed



ELECTRIC SPEED-INDICATOR—BELTED FORM OF GENERATOR COMPLETE WITH LEADS AND METER

in dust-tight, oil-containing compartments, so that they will run for months without lubrication or attention. The compartment wall on the commutator end prevents oil from the bearing getting on the commutator and keeps worn particles of the commutator and brushes from getting into the bearing.

The electrical instruments have D'Arsonval movements mounted in cases that sheathe them against magnetic fields. They are absolutely dead beat, and the moving elements are purposely made light in weight so that they are not affected by vibration. Each instrument has a zero adjusting device. The instruments can be furnished calibrated to read in any one of the number of different ranges of speed, for revolutions per minute, miles per hour, etc. The makers state that tests of the instruments, extending over a period of one year, show that they are very permanent in the calibration and accurate in their indications.

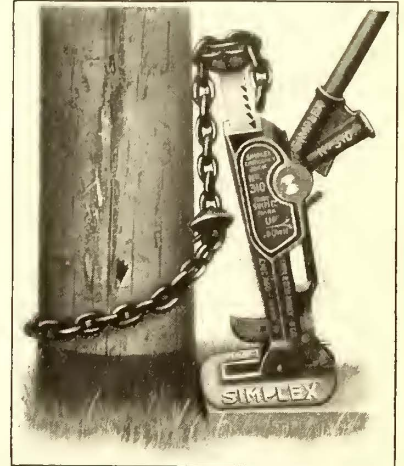
The rugged construction of the generators enables them to be mounted where there is excessive vibration, such as on steam locomotives, street railway cars, steamships, printing presses and moving machinery, and they can be driven either by direct connection to

shafts or by means of belts or silent chains. In consequence the new device is applicable to the measuring of speed of any rotating or moving body to which the generator can be applied, and it has, in fact, been successfully adapted to many industrial uses.

### A New Type of Emergency Jack

An industrial emergency jack embodying several entirely new features to give it the flexibility necessary for lifting and pushing at the various angles, has just been put on the market by Templeton Kenly & Company, Ltd., 1020 South Central Avenue, Chicago, Ill. This is known as Emergency Jack No. 310

and is shown in the accompanying illustration. It is built for 15 tons capacity but has an ample factor of safety and is so constructed that it may lift or push at any angle between 30 deg. and 90 deg. from the horizontal. By releasing the dog which normally holds the frame rigidly in a vertical position on the base, the head of the jack may be revolved to



EMERGENCY JACK

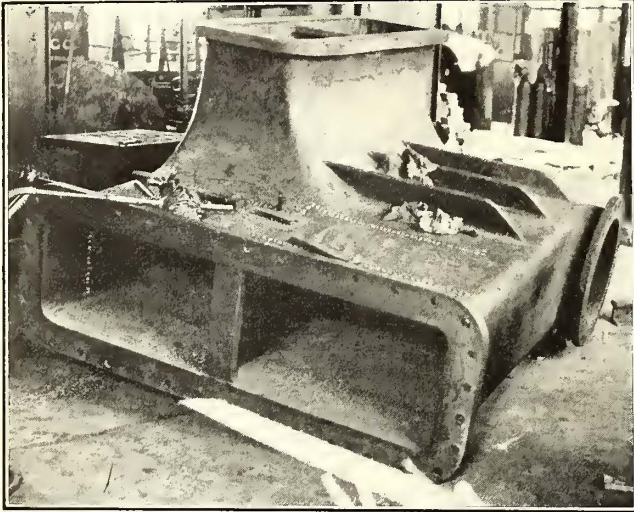
any angle within 60 deg. from the vertical. This head is pivoted on the base which has machine-fitted vertical lips so that the frame fits snugly, and the base, instead of the trunnion, takes the thrust. A cold-rolled steel pin holds the base and frame in position and serves as the pivot. To provide ease in lifting or pushing at the various angles the jack is made with two handle sockets, one to be used when the jack is in the fixed vertical position and the other in the extreme angular position. These sockets are supported on heavy trunnion bearings at the fulcrum point.

A recessed chain cap is another feature which gives the jack flexibility under various working conditions. The function of this is shown in the accompanying illustration. It provides also for a heavy detachable shoe which is employed to lift loads that cannot be handled by the cap or by the foot at the base of the rack bar. The flexibility given by the pivoted base and the recessed cap increases the jack's utility in pulling or straightening trolley poles, in wrecking, in pushing obstructions from the track, or in setting heavy machines or boilers, and, in addition, the jack may be employed as a combined crane and jack. The standard equipment includes 5 ft. of heavy chain and a 5-ft. lever bar and car mover combined. It is interesting to note that the Simplex jacks, of which this is one, recently were awarded the gold medal by the American Museum of Safety.

The chief engineer of the Public Service Commission for the First District of New York has been authorized to invite bids for the reconstruction of station platform edges in the Fourth Avenue subway, Brooklyn, so as to provide for the operation of the new steel cars purchased by the New York Municipal Railway Corporation. These cars are wider than the old subway cars, and therefore a considerable amount of reconstruction in the platform is necessary for their accommodation.

## An Unusual Oxy-Acetylene Weld

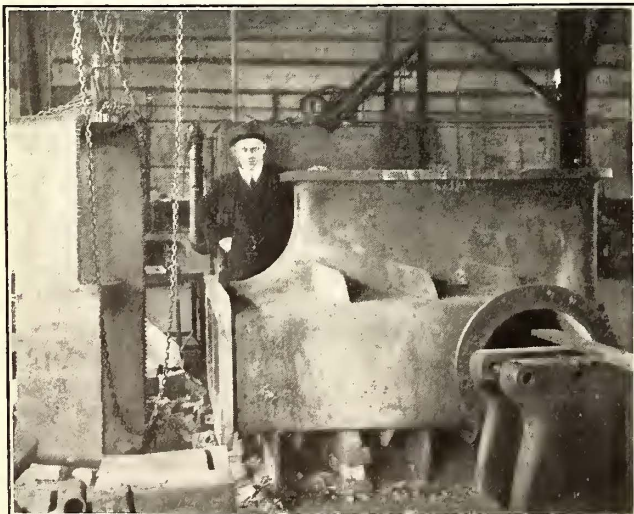
Recently the Oxweld Acetylene Company of Chicago had occasion to make a weld on a 7600-lb. casting which served as a connection between the exhaust outlet of a steam turbine and the inlet of its condenser. Owing to changes in the plant in which this was to be used it was necessary either to shorten the casting 18 in. or else to obtain an entirely new one, and it was decided to accept the former alternative by removing a section from the casting and welding the flange in place again, although



CASTING PARTIALLY CUT BY DRILLING

to make a weld on so large a casting it was necessary to ship it to the Oxweld Company's shop in Chicago.

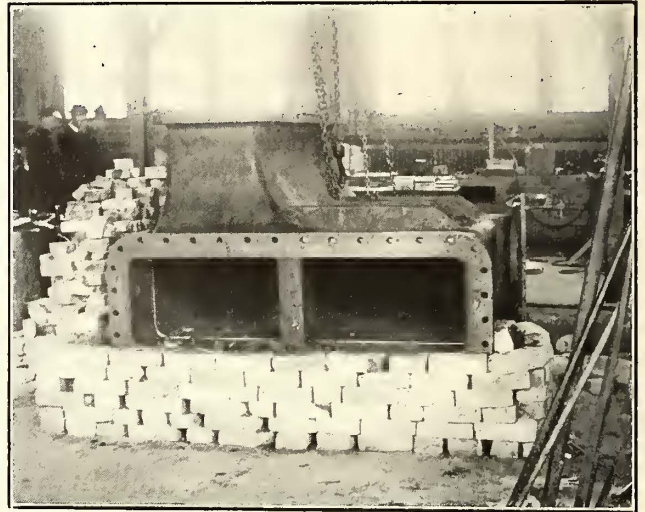
In one of the accompanying illustrations the casting is shown with the 18-in. section partially cut out by drilling. An electric hand drill was used for this operation because it is impossible to cut cast-iron with the oxy-acetylene cutting flame. After the section had been removed and the flange moved up against the main casting to close the 18-in. gap, a temporary furnace of brick was constructed partially around the casting. During the welding operation a charcoal fire was maintained in this to preheat the metal, and the heat was continued until the weld was finished. The furnace and the work were covered with asbestos sheets which were removed only to expose that portion actually being welded in order to maintain the casting at a uniform temperature.



VIEW SHOWING FINISHED WELD AND SECTION THAT WAS REMOVED

Probably the greatest difficulty experienced with a weld of this size is to overcome distortion, but this method of preheating and retaining the temperature in the casting solved the problem. Four men worked continuously at the welding process, completing it in thirty-six hours.

The success attending this job is indicated by the smoothness of the welded portion shown in the illustration of the completed weld, no attempt having been made to finish the work before it was photographed. In fact, it was practically impossible to distinguish the line of the weld around the body of the casting. It is



CASTING IN TEMPORARY REHEATING FURNACE

roughly estimated that the value of the casting was \$300, and to have procured a new one would have taken at least twenty-five days. The time actually required to cut the casting was three days. The welding took one and one-half days more, and transportation to and from the plant consumed one week.

## Minor Economies on Small Roads

Strictly speaking there are no minor economies in electric railroading, in view of the small units into which income is subdivided. Among the lesser methods of saving money on the line, in the shop and carhouse, however, are many which are the result of experience, and they all count in the net earnings. Thus one company operating about six cars normally, and twenty-one on pleasant Sundays and holidays, totaling seventeen days yearly as a maximum, generates its own electric power in a 350-kw unit in the former case, and buys extra power from an adjoining system when the peaks come. Fixed charges are much lessened in this way, and if the purchased power should cost a little more than it would if generated in the local plant, the yearly balance is in favor of this plan, for to equip a small road with a power station based on the extremes of seventeen days each year, when reliable service can be purchased without undue expense, would be unwise.

On the same road a dual system of carshop lighting is in vogue. The power station contains a 187-kw, belted generator, but even this machine would be run very inefficiently to supply the night lighting required after car service ceases. Energy is purchased, therefore, from a local central station system at a total cost of about \$2 per month, and about twenty outlets in shop and pits are wired for this service with multiple incandescent lamps, the ordinary lighting being by the usual groups of five lamps in series off the trolley circuit. The scheme is far more economical than an

attempt to supply the shop lighting from the power house of the railway. Incidentally it permits the heating of the carhouse offices by means of a luminous electric radiator in chilly weather. By locating this heater some 10 ft. below the pits, the company was able to get along without the use of steam traps in returning condensation to the boiler. Thus a carshop 150 ft. by 60 ft. in size is heated even in cold weather from a 35-hp boiler delivering steam at a pressure of a pound or two per square inch, compared with 10 lb. or 12 lb. which would have been necessary had a trap been used. The difference in coal consumption is considerable.

### Shop Kinks at Holyoke

The recently completed carhouse and repair shop of the Holyoke (Mass.) Street Railway has been provided with a number of handy equipments for saving time and labor, among them being a well-arranged bench for the repair and cleaning of electric headlights which is shown in an accompanying illustration. The work is done on a galvanized-iron shelf on top of a tool and supply cupboard 3 ft. 2 in. high, 4 ft. long, and 2 ft. 2 in. wide. A permanent resistance is mounted against the shop wall on an asbestos-covered panel, the wiring being in conduit. The positive lead for a headlight test is carried to a receptacle at the side of the bench and a plug connection is provided for the lamp undergoing inspection. The metal cover of the bench is grounded and a lower shelf at the right (not shown in the photograph) facilitates cleaning. The drawers are provided with sheet copper partitions and furnish convenient storage for coils, carbons, globes and other parts.

In the carhouse pits the lighting is supplemented by a receptacle and switch, making it unnecessary for the usual recessed lamp to be unscrewed and laid aside when the maintenance force or the car inspectors desire to use a portable lamp underneath the car body. As illustrated, each recess lighting unit consists of a 16-cp incandescent lamp, and a snap switch in series with it, a receptacle wired in conduit being connected on a

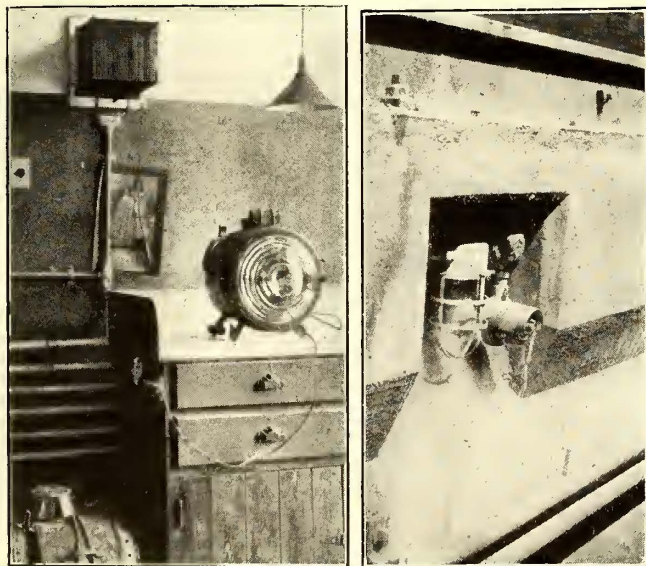
To facilitate locating early morning cars, there is provided an assignment board in the new carhouse which gives the car number, time out, the bay and track location for each run, as illustrated. Both regular and extra cars are listed, the latter with the names of conductors responsible for the starting of each trip.



BOARD FOR LOCATING ASSIGNED CARS IN CARHOUSE; CABINETS FOR SMALL STOCK

In a large carhouse with seven bays and three long tracks per bay it is a decided convenience to be able to proceed to the exact location of the car without consulting a starter as soon as a crew reports for work. The board is supported on 1 1/8-in. x 3/16-in. strap-iron brackets and is carried about 6 ft. 6 in. above the carhouse floor.

A departure from the usual stockroom facilities also is found in the provision of 549 metal drawers specially designed for the storage of small fittings. These drawers are mounted in tiers as illustrated, a standard group of eighty-one 3 1/2-in. x 6-in. x 3 3/4-in. boxes occupying a space only 3 ft. long, 4 ft. high and 6 in. deep. Each box is provided with a metal handle of 1/2-in. radius, spot-welded to the front, and a card carried in a clip rack at the front gives the title of material in each case. Each drawer also carries within a 3-in. x 5 1/2-in. stock card, on which is kept an accurate record at all times of the material received and issued, with the dates.



HEADLIGHT TEST BENCH; SWITCH FOR FIXED OR PORTABLE LAMPS IN PIT

shunt around both. When the switch is closed the fixed lamp is thrown in circuit, and when it is opened the fixed lamp is cut out, the usual series circuit then being shunted through the receptacle, plug and portable lamp. A metal guard protects the snap switch from oil and mechanical damage.

### Accident Record of the Louisville (Ky.) Railway

The accident blue-print of the Louisville (Ky.) Railway for March of this year showed the following as to miles covered per accident report on the first seven lines of the system: Oak Street, 10,969; Twelfth and Fifteenth Streets, 4554; President Street, 3320; Sixth Street, 3183; Portland and Shelby Streets, 3053; Broadway, 2740; Seventh and Brook Streets, 2553. Comparisons of the information reports on several of the lines show mileage on Oak Street increased this year from 6042 to 10,969, for each report; the Portland and Shelby line compares as 1736 to 3053. Ten lines showed improvement for March of this year over March, 1914. Eight of the lines showed less favorable records this year than last, the discrepancy in this direction being sufficient to make the average for the eighteen lines 2623 miles per information report in March, 1914, against 2465 miles for the same month this year.

## Electric Railway Legal Decisions

### CHARTERS, ORDINANCES, FRANCHISES

#### Indiana.—Crossings Over Interurban Right-of-Way.

Where a conveyance of a right-of-way to an interurban railway company required it to establish a crossing for wagons at or near a crossing at the foot of a hill, the covenant does not obligate the railway company to establish a crossing different from that which landowners are authorized to demand under Burns' Ann. St. 1914, Sec. 5711, and hence such covenant will not be specifically enforced—the statute giving the landowner a plain, adequate remedy at law in case of the railway company's refusal. (*Indiana Union Traction Co. et al. v. Seisler*, 106 *Northeastern Rep.*, 911.)

#### Iowa.—Statutory Signals at Crossings Applying to Steam Railroads Must be Given by Interurban Cars.

Under Code Sup. 1907, Sec. 2033b, the words "railway," "railway company," "railway corporation," "railroad," "railroad company" and "railroad corporation" include "interurban railways." Hence interurban cars, when approaching highway crossings, must give the statutory signals. (*Landis v. Interurban Ry. Co.*, 147 *Northwestern Rep.*, 319.)

#### Maine.—Freight Is Not Additional Servitude, but Turnout Is.

For a street railway authorized to carry freight to transport it in ordinary railroad cars imposes no additional servitude on the highway.

A street railway, though authorized to use a street for the purpose of carrying persons and property, is not authorized to construct a turnout in the street to use for switching cars, for the public rights in the street are paramount. (*Percy v. Lewiston, A. & W. St. Ry.*, 93 *Atlantic Rep.*, 43.)

#### Massachusetts.—Right of Husband to Consequential Damages.

Unless the wife herself can recover for personal injuries suffered, the husband cannot recover for his consequential damages. (*Jackson v. Boston Elevated Ry. Co.*, 105 *Northeastern Rep.*, 379.)

#### Washington.—Abandonment of Parallel Line Cannot Be Enjoined.

The abandonment of an electric railway line closely parallel to a new line adequate to handle all business could not be enjoined on the ground that persons accessible to both roads would thereby be deprived of competitive service, though there had been no legal consent to the abandonment, as the purpose of the public service commission law (Laws 1911, Chap. 117) is to require adequate and safe service at a reasonable price and without discrimination, and its whole theory is opposed to the idea that the public will be better served by two parallel lines where one road will amply suffice. (*Day et al. v. Tacoma Ry. & Power Co.*, 141 *Pacific Rep.*, 347.)

### LIABILITY FOR NEGLIGENCE.

#### Alabama.—Duty to Passengers—Degree of Care Required.

The law is correctly stated by a charge that a carrier of passengers, by street car, owes to its passengers the duty to exercise the highest degree of care, skill and diligence known to very careful, skilful and diligent persons engaged in like business, consistent with the practical operation thereof. (*Birmingham Ry., Light & Power Co. v. Scisson*, 66 *Southern Rep.*, 2.)

#### Arkansas.—Injury to Passenger Rising Before Car Stops.

Failure of a street car passenger to comply with a notice to passengers to remain seated until the car stops is insufficient to charge the passenger, injured as the result of the alleged negligent operation of the car, with contributory negligence as a matter of law, but such omission being only of fact, which, considered with other facts, should be considered in determining the issue of contributory negligence. (*Robinson v. Little Rock Ry. & Electric Co.*, 168 *Southwestern Rep.*, 1126.)

#### Kentucky.—Injury to Passenger Rising Before Car Stops.

Conductors on street cars are under a duty to exercise care to protect passengers from dangers arising from the passengers' negligence or thoughtlessness and must not knowingly permit them to be injured, if by the exercise of ordinary care they can prevent it. Where an elderly woman

passenger, after signaling for the car to stop, left her seat, and went to the rear end of the car, passing immediately by the conductor, who knew the car was in motion, it was his duty, if he knew that she intended to get off, to warn her of the danger or to try to prevent her alighting. (*Paducah Traction Co. v. Tolar*, 171 *Southwestern Rep.*, 1009.)

#### Maryland.—Look-and-Listen Rule Applicable to Automobiles—Warning Signs Not Always Necessary.

Since the development of automobiles, the look-and-listen rule is peculiarly applicable, and plaintiff, who ran his automobile at a speed of 10 m.p.h. onto a crossing of a suburban line, though he could not see approaching cars and was unable to hear them because of the noise of his own machine, is guilty of negligence barring recovery.

Though an electric railroad did not comply with Code Pub. Civ. Laws, Art. 23, Sec 280, requiring signs at crossings, a traveler injured in a collision cannot recover on that ground where he knew of the presence of the road. (*Glick v. Cumberland & W. Electric Ry. Co.*, 92 *Atlantic Rep.*, 778.)

#### Massachusetts.—Negligence May Be Imputed to Child Six Years Old.

Where plaintiff's intestate, a boy nearly six years old, started to run across a well-lighted street with a rapidly approaching street car in plain sight, well lighted, and so near that it struck him when he reached the middle of the track, resulting in his death, and there was no evidence that he looked or listened or exercised any care at all for his own safety, a directed verdict for defendant was proper, for even a boy of his age must use such care as he is capable of. (*Kyle v. Boston Elevated Ry. Co.*, 102 *Northeastern Rep.*, 310.)

#### Massachusetts.—Injuries to Passenger Stepping from Platform Into Car.

The action of the conductor in giving the starting signal when a robust, healthy woman thirty-seven years old had her left foot on the floor of the body of the car, resting her weight on it and was in the act of raising her right foot from the vestibule floor, was not actionable negligence, though he placed his hand on her back, and where the movement of the starting of the car was only the ordinary movement, she may not recover for injuries by falling. (*Saunders v. Boston Elevated Ry. Co.*, 103 *Northeastern Rep.*, 780.)

#### New York.—Passengers, Before Ejection, Must Have Opportunity to Pay Fare.

A street car passenger, offering an invalid transfer and ejected before having a reasonable opportunity to pay his fare, may recover for his ejection. (*Zuckerman v. New York Rys. Co.*, 148 *New York Sup.*, 82.)

#### Pennsylvania.—Tort by Servant.

Where one of defendant's servants, a strike breaker, was struck by a stone thrown by an unknown person, and he got off the car on which he was riding, but on which car he had not been assigned to duty, with a revolver in his hand, and fired on young men walking along the street and hit plaintiff, defendant was not liable, there being no evidence that he was in defendant's employ as a special police officer, or that the revolver had been given him by defendant. (*Christian et al. v. Philadelphia Rapid Transit Co.*, 90 *Atlantic Rep.*, 645.)

#### Pennsylvania.—Company Not Responsible for Injuries to Infant.

In an action to recover for injuries to an infant by taking hold of a copper wire charged with electricity, a non-suit is properly entered, where he had found in the street a spool of copper wire not belonging to defendant, to which he attached a stone and threw it over defendant's un-insulated feed wire and was injured by taking hold of the wire. (*Green v. West. Penn Rys. Co.*, 92 *Atlantic Rep.*, 341.)

#### South Carolina.—Reasonableness of Transfer Regulations.

A street car company whose regulations required persons holding transfers to take the next succeeding car at the point designated was justified in refusing transfers of passengers boarding the car at about 100 yards from such point and in demanding fare from them, and, on their refusal to pay, was not liable for their ejection. (*Taylor v. Spartanburg Ry., Gas & Electric Co.*, 82 *Southeastern Rep.*, 404.)



# News of Electric Railways

## THE DETROIT PURCHASE

### Negotiations Are Begun on a New Basis for Purchase of Lines by the City

Following a refusal of the Detroit (Mich.) United Railway to accept an offer from the Detroit Street Railway Commission to have the city assume bonded indebtedness of the company to the extent of \$23,285,000 in exchange for the lines of the company within the one-fare zone, a new plan for the acquisition of the property by the city is now in process of negotiation. The refusal of the commission's offer by the company followed upon the withdrawal of the first offer of the commission to assume bonds to the extent of \$24,900,000 and the substitution of a second offer that eliminated from the price \$1,715,000 of bonds now held in the company's treasury.

The plan now proposed and tentatively agreed to by both sides is that the price of the lines shall be set by the circuit judges of Wayne County sitting en banc as a court of chancery, with a right to appeal to the State Supreme Court by either party in the event of dissatisfaction with the award. To accomplish this plan the Street Railway Commission proposes the submission of the question of municipal ownership of the lines to the electors with the amount to be paid left blank on the ballot, the purchase price to be filled in later in accordance with the determination of the circuit judges. A three-fifths majority is required before this plan could go through.

J. C. Hutchins, president of the Detroit United Railway, in a letter to the commission declining the commission's second offer stated:

"The price so proposed is so much less than the value of the property involved that the board cannot recommend acceptance of such amended proposal by the stockholders. The board reaffirms its willingness to sell this property at the price offered by the Street Railway Commission in its original proposal under date of Feb. 23, 1915, namely, \$24,900,000, notwithstanding that it regards this price as inadequate."

Upon the receipt of this letter, which followed an adjourned meeting of the company's stockholders held on April 28, the commission called Mr. Hutchins and F. W. Brooks, general manager, into conference, at which the idea of having the price set by the circuit judges was proposed and tentatively accepted. It is planned to have attorneys for the city start immediately upon the draft of a contract which will be the basis of further negotiations between the company and the commission.

## CLEVELAND EXPENDITURES APPROVED

At its regular meeting on April 3 the City Council of Cleveland, Ohio, approved the following expenditures to be made by the Cleveland Railway: for an operating station at Denison Avenue and West Seventy-third Street, \$100,000; tracks and overhead work at the same point, \$80,000; shops at Harvard Avenue and East Forty-second Street, \$100,000; carhouse at Harvard Avenue and East Fifty-fifth Street, \$99,500.

At the same meeting the committee to which the matter had been referred authorized the acceptance of the franchise passed by the City Council of Lakewood recently. It is possible, however, that this ordinance may be subjected to a referendum vote.

The Cleveland Railway has asked its employees to suggest plans for collecting fares on the Detroit and Clifton Boulevard lines, passing through Lakewood, after the new ordinance goes into effect. The fare is to be 3 cents within the city of Lakewood and 5 cents between any point in Lakewood and any point in Cleveland. It is also believed by some that this ordinance is the beginning of the zone system of fares in Cleveland, as Lakewood, while it is not now a part of Cleveland, seems likely eventually to be annexed to the city. Another section within the city limits is paying 8 cents. This is the Euclid Village section, and cars must pass through East Cleveland, an independent municipality, to reach it.

## PHILADELPHIA LOAN CARRIED

The \$6,000,000 loan to be used to start construction of the high-speed rapid transit lines planned by Director of City Transit Taylor was passed at the special election held in Philadelphia, Pa., on April 29. The vote for the loan was 85,992 and against it 8772. Following the announcement of the result Mr. Taylor made public a statement in part as follows:

"The question of transit development has been placed clearly before the people of Philadelphia, and their decision with relation thereto has been rendered in such an emphatic manner that there should be no delay in starting construction. I am most grateful to all who have contributed to this splendid indorsement of the plan for transit development, and thus secured the prompt establishment of the much-needed facilities."

The ordinance of Councils authorizing a special loan election and fixing the amount of the loan specified that the money was to be used to construct a subway in Broad Street, from League Island, to Olney Avenue, with branch lines northeast and northwest from Broad Street and an elevated road from Front and Arch Streets to Rhawn Street. It remains with Councils to say which of these lines shall be started first. The Philadelphia Rapid Transit Company, under the contract entered into by it with the city, has ninety days in which to signify its attitude toward the construction and operation of the lines.

## LABOR INVESTIGATION AT SPRINGFIELD

The Massachusetts Board of Arbitration has assigned a public hearing for May 12 at Springfield for an open investigation of the points at issue between the Springfield Street Railway and the local branch of the Amalgamated Association. Numerous conferences have been held recently by the board with the officials of the company and with the union representatives, but the company has refused to reinstate the three conductors discharged for irregularities in accounts, which cases have formed the basis of contention on the part of the men. In the conferences with the board the union first proposed that the two discharged men longest in the service of the company be restored to their positions and that the third man be re-employed as a motorman. It was then proposed that the senior in service be put back as a conductor and the other two as motormen. The final suggestion was that all three men be re-employed as motormen.

The company refused to accept any of these proposals, but in view of the claim of the men that the union objected to arbitration on the score of its cost, the company offered not only to bear its half of the expense of arbitration but to pay one-third of the employees' share up to \$2,000 in case one man should be reinstated by the board, two-thirds up to \$4,000 if two men should be retained, and the entire cost of the proceedings up to \$6,000 if all three men were reinstated. The union would not agree to this proposition, but asked the company to lodge charges of larceny against the three men and to abide by the finding of the court in disposing of the matter. The company considered this proposition at length and finally rejected it on the ground that it could not consistently with its duty to the public to maintain a reasonable discipline among its employees and an efficient management of its business make the question of the right of discharge depend solely on the difficulties and uncertainties of criminal procedure. The State board has been assured that there will be no strike on the road pending the public investigation. At the hearing, which will begin on May 12, the company will be represented by its attorney, C. W. Bosworth; Vice-President C. V. Wood, General Manager H. M. Flanders and probably Traffic Manager Robert E. Cosgrove.

Commenting editorially on the labor situation in that city the Springfield *Union* said in part:

"To ask more of the company than it has already granted is unreasonable, and is so regarded by the public. If a strike ensues the blame will rest squarely on the officers and members of the association. The public knows that

between the company and the association is a binding agreement to arbitrate all differences that cannot otherwise be amicably adjusted, and that both are legally and morally bound to respect the terms of this agreement. Resorting to a strike will not establish the innocence of the conductors, but it will brand the association as a labor organization that has no regard for its solemn obligations. A strike means loss of employment and ultimate defeat for the members of the union. If the situation were reversed, if it were the company and not the association that refused to accept arbitration, refused to keep its agreement, the same condemnation would be meted out to the company as will be visited upon the men in the event of their resorting to a strike. They will do not only themselves but the whole cause of organized labor hereabout an irreparable injury should they fail to respect the terms and conditions of their contract. All their grievances, all the justice that their cause may have, will be overlooked by the jury of public opinion should they bring upon Springfield this wholly unnecessary evil."

### THE INDIVIDUAL INDIANAPOLIS CONTRACTS

#### Union Alleges Violation of Terms of Recent Arbitration Award

Following their motion to withdraw from the Federal Court the petition enjoining the Indianapolis Traction & Terminal Company from securing signatures to its individual service contract, attorneys for the union employees filed a complaint with the members of the Public Service Commission who constitute the board of arbitration, alleging that the company has violated several of the provisions of the award of the arbitration board. The complaint charges, among other things, that the company is using coercion against the union employees, is intimidating men to sign its individual contract, urging the men to deal direct with the company, etc.

On April 28 Chairman Duncan of the Public Service Commission and Commissioners Edwards and McClure began a hearing relative to the grievances filed. William Blackman and S. A. Smythe, representing the Department of Labor, who were sent from Washington at the request of the Central Labor Union of Indianapolis, were present at the hearings. W. H. Latta appeared as attorney for the company. J. J. Mahoney, superintendent of the company, testified that the employees had been requested through the carhouse foremen to sign the individual service contract, and that most of the men had reported at the office to execute the agreement. J. P. Tretton, assistant superintendent, stated that many of the non-union employees had requested that they be permitted to sign the contract in order that they might work on the Sundays they were required by the arbitration award to be off duty. A number of other car service men testified at the hearing, some stating that they had agreed to the terms proposed by the company, others that they had not. In no case was a witness able to point to any threat or intimidation used by the company against him. No evidence was offered by the attorneys for the union that any man had ever been discharged or discriminated against because he had refused to sign the individual contract.

Robert I. Todd, president and general manager of the company, denied that the Indianapolis Traction & Terminal Company was forcing any of its men to sign the contracts, but stated that he had issued orders to the effect that all the men should be afforded an opportunity to sign if they wished. Mr. Todd stated that most of the men had signed the contracts. The agreement was devised in order that the company could operate its cars on Sunday during the summer months by providing that the men waive the requirement of the arbitration award that they should be off one Sunday in each month, which requirement compelled 25 per cent of the trainmen to be off every Sunday. Chairman Duncan ruled that the question of the validity of the service contract had already been determined by Judge Anderson in the Federal Court. The Federal Court held that the contract is valid and in effect on its signers, this decision being rendered in the judgment in which the employees and labor leaders are restrained from attempting to bring about a strike on the city lines of Indianapolis.

### CHICAGO AND HOME RULE

Several hearings have been held by the committee on public utilities of the Illinois Legislature to determine the necessity of "home rule" for Chicago, as well as how it should be administered in case it was granted. At a recent hearing evidence was taken, particularly as regards home rule administration. The Insull interests opposed "home rule" in any form at this hearing. They maintained that the State Utilities Commission had done good work, and that there was no criticism of that body. It was admitted that "home rule" appealed to the pride of the public, but what was wanted most was the best regulation. If that regulation was by the State, then it should be under State jurisdiction. It was also averred that the best regulation of public utilities could not come from a body of seventy men like the Chicago City Council, but must come from a body of qualified specialists.

The home rule bill as proposed authorizes the City Council to fix the terms of office of the commissioners; in fact, practically all power is delegated to that body, but the expenses are controlled by a State board, which also, upon request, may furnish expert assistance and data. At this hearing the Chicago Surface Lines again supported Chicago's request for "home rule," but counsel advised, however, that the railways did not favor the bill as it stood, but advocated a "home rule" commission created by statute. This commission should also have the power to subpoena and swear witnesses, make rules of direct and cross-examination under oath and other powers which would remove utilities from the jurisdiction of the courts.

### RAPID TRANSIT QUESTIONS IN CINCINNATI

Walter M. Schoenle, city solicitor, of Cincinnati, Ohio, appeared before Attorney-General Turner of Ohio on April 29 and protested against the renewal of water and pipe leases from the canal in Cincinnati, as contemplated by Superintendent Miller of the State Board of Public Works. Mr. Schoenle construed the lease of the canal bed by the city as requiring the city to maintain works for supplying the users of water from the canal only until the expiration of the leases existing at the time the contract between the city and the State was made. He said that no renewal of such leases was contemplated, and intimated that the cost to the city of building a conduit to supply the six or seven concerns desiring a renewal of their leases would be about \$1,000,000 and that it would be better to forfeit the lease than to undertake this. No use of the canal has yet been made by the city and it has not been necessary to build a conduit, but the purpose of leasing it was to supply a route for a portion of the rapid transit loop and transform it into a parkway. A rental of \$32,000 a year is paid for the use of the canal. Attorney-General Turner promised to do all he could for the city, but if he decides in favor of the city his ruling will be opposed to that of former Attorney-General Hogan, who held that the leases of the water users might be renewed forever under the contract made with the city. Forfeiture of the canal lease would necessitate an entire change in the various plans suggested for the rapid transit loop.

Cincinnati friends of the Bauer rapid transit bill fear that in the few days remaining of the present session of the Legislature it will not find a place on the calendar of the House. According to present arrangements a recess will be taken on May 8 and the final adjournment will follow on May 11 or 12. Only four days will be left for passing bills. Another danger threatens it in the Jackson bill, which passed the House on April 28 and was sent to the Senate for ratification. This bill is meant to control the issue of bonds for municipal enterprises, but without amendment will probably make it impossible to finance the rapid transit loop.

One hundred citizens of Cincinnati appeared before Governor Willis on the afternoon of April 3 to urge that the Bauer bill be placed at the head of the House calendar for the following day. The Governor frankly stated to the delegation that several bills containing administration pledges to the people of the State had been delayed and that they would receive his undivided attention until they are passed. Other measures, including the Bauer bill, will then receive attention. The Governor stated that he is not opposed to the Bauer bill.

At a meeting of the City Council on April 27 the extension of the Sixth Street route was modified so that cars will run over the Hopple Street viaduct into Fairmont, but not to Cumminsville. The plan of routing College Hill and Westwood cars over the Mohawk bridge was postponed for eighteen months. The extension of the Vine Street route to Mitchell Avenue was permanently established. The ordinance requiring construction of tracks on Plum Street between Fourth and Eighth streets was repealed. Clifton and Elm lines will remain as they are. Construction of the proposed Warsaw-Elberon line was ordered, as soon as consents can be secured. The extension of the Warsaw route to Covedale was dropped as a result of this order. Legislation requiring double transfers under certain conditions was passed and several additional transfer points were established.

#### CANADIAN ELECTRIFICATION PROPOSAL

A special meeting of the City Council of Brantford, Ont., was held on April 27 to consider a proposition from Manager Todd, of the Lake Erie & Northern Railway, which is controlled by the Canadian Pacific Railway. The company suggested that if the city would hand over to it the Grand Valley Railway entrance to Galt and the entrance to Paris from the Galt end the company would connect the Lake Erie & Northern Railway with the Galt, Preston & Hespeler Railway and electrify the road through to Port Dover. The granting of the request would mean that the city would virtually have to abandon that portion of the recently acquired Grand Valley Railway between Paris and Galt, while the Canadian Pacific Railway would get an entrance to Paris. On the other hand the Grand Trunk Railway wants the city to retain the entire Grand Valley Railway and give it freight rights over the line into Paris. The Aldermen appointed the Street Railway Commissioners and representative of the Board of Trade to go fully into the matter.

#### STEINWAY TUNNEL OPERATION

The Public Service Commission for the First District of New York has adopted an agreement modifying the provisions of the dual system contract with the Interborough Rapid Transit Company to provide for the temporary operation of the Steinway tunnel. This tunnel was built by Interborough interests and is completed from a point in Forty-second Street, Manhattan, between Lexington and Third Avenue, under Forty-second Street and the East River to a point in Long Island City at Jackson and Van Alst Avenues. Under the dual system contract the tunnel was transferred to the city and made a part of the city-owned lines which will be operated by the Interborough Company. Under the direction of the commission the company has been reconstructing certain portions of the tunnel to fit it for temporary operation, which is expected to begin next month. The modifying agreement provides that it shall be operated in connection with the existing subway either by trains of cars or by single cars. Eventually the tunnel will be extended to a junction with the existing subway at Times Square, but for the present transfers will be given between the tunnel trains and those of the subway. An escalator will bring passengers to the surface of Forty-second Street, and they will have a short walk to the Grand Central station of the subway where their transfers will be good on trains going in either direction.

#### TORONTO CONSTRUCTION ORDERED

D. M. MacIntyre, chairman of the Ontario Railway & Municipal Board, issued an order on April 26 calling on the Toronto Railway to start the construction of the lines in the Ossington Avenue, Hallam and Dufferin Street district by June 1, and complete them by Aug. 1. On Nov. 6, 1914, the board issued an order instructing the company to build double tracks on Ossington Avenue, beginning at the tracks on Bloor Street, thence along Ossington to Hallam, along Hallam to Dufferin, along Dufferin to Lappin Avenue, along Lappin to Lansdowne Avenue and to a junction with the tracks on Lansdowne. The construction was to be subject to the approval of the city engineer of Toronto. The board ordered that the lines be in operation by June 1. The company made no attempt to commence construction of the lines, and the city of Toronto, through Corporation Counsel

Geary, applied recently for a further order. The company argued that it was unable to raise the necessary money for the work because of financial conditions, and claimed that the jitneys might reduce the traffic. The city held that the company should be made to obey the original order of the board calling for the completion of the new line by July 1. The board, after consideration, decided that this would hardly give the company time to finish construction, but ordered a start by June 1, and the completion of the line by Aug. 1.

#### DECISION IN NEW JERSEY LEASE CASE

The right of the Board of Public Utility Commissioners of New Jersey to withhold its approval of the lease by the Pennsylvania Railroad of the West Jersey & Seashore Railroad and its franchises for 999 years was upheld by the Court of Errors and Appeals on April 22, in an opinion handed down by Chief Justice Gummere. The West Jersey & Seashore Railroad sued out a writ of mandamus when the utility board refused to approve the lease. The board demurred to the writ, and this action was upheld by the Supreme Court, and in turn approved by the Court of Errors, which affirms the Supreme Court. It was urged for the railroad that the delegation of power by the Legislature was a violation of the constitution. The Chief Justice holds that the Legislature vested in the board specific power to fix rates to be charged by this class of corporations, to compel railroads and street railroads to establish connections for the convenience of passengers, to protect grade crossings and various other functions. The Chief Justice says that the right of the Legislature to exercise these powers is unquestionable, as is also its right to delegate them. In regard to the claim that it would be a violation of the constitution for the utility board to have this power the Chief Justice says:

"We are unable to appreciate the force of this contention. The law which empowers a railroad corporation of this State to lease its road is a general one applicable to all such corporations, no matter how created. The condition or restriction imposed by the public utilities act upon the exercise of this power by these companies is equally general, binding upon every railroad company of the State and applicable to every lease proposed to be made by any such company."

The West Jersey & Seashore Railroad is controlled by the Pennsylvania Railroad through ownership of a majority of the \$9,641,600 of common stock. The property has been operated in connection with the Pennsylvania system. The main branches of the road run from Camden to Atlantic City and Cape May. Stockholders of the West Jersey & Seashore voted to lease their road to the Pennsylvania in April, 1913, at a fixed rent sufficient to pay all fixed charges and 6 per cent on all the stock. Objection was made by the Public Utilities Commission that a perpetual lease would be tantamount to a conveyance in fee.

#### CAR CONSTRUCTION HEARINGS

According to R. J. Fleming's statement to the Ontario Railway Board on April 30, the Toronto Railway has eighteen new cars in various stages of construction, but by some mischance plans for these cars were not submitted to the board as required by the order of last November. The result is that if, after the general hearing set for May 17 to consider the type of cars to be used, an order is issued calling for a plan different from that followed, the company will perhaps face the necessity of reconstructing some of the eighteen cars. The matter came up on April 30. Mr. Fairty, for the city, asked that the hearing be continued until May 17. Mr. Fleming, for the company, stated that the company had eighteen of the fifty cars ordered by the board under way. Chairman McIntyre of the Railway Board remarked that plans had not been submitted until recently, although the order called for cars of a design approved by the board. Mr. Fleming stated that the company had adopted the most modern type. Mr. McIntyre again pointed out that the order of Nov. 7 called for the submission of designs, and told Mr. Fleming that the company, in going on with construction without approval, was doing so at its own risk. In continuing the hearing to May 17 Mr. McIntyre pointed out that if that hearing resulted in modifications of the plans the company would be bound by the order.

## THE CLEVELAND, AKRON &amp; CANTON LINE

In connection with its proposed four-track subway under East Fifty-fifth Street at Cleveland, Ohio, the Cleveland, Akron & Canton Terminal Railway, through Ohio C. Barber, has begun negotiations with the State for the purchase of the old canal bed for a private right-of-way between Cleveland and Dresden. It is said that the promoters intend to lay a four-track electric line between the two points. From Dresden by way of the Muskingum River there is a direct marine route to the Ohio River. This route does not pass through Canton, but it is the intention to run a spur to that city. Such a road would open the territory in the Tuscarawas Valley which now has very limited service. Attorneys for the company stated before a special committee of the Cleveland City Council that the engineers' estimates showed a cost of about \$1,000,000 per mile for the construction of the subway under East Fifty-fifth Street. Attorney W. W. White for the company refused to guarantee to begin construction work within two years. He insisted that there will be no unnecessary delay if the company is granted a franchise on fair terms. The committee also wants a purchase clause that will enable the city to take over the property within the city limits, if it should become desirable to do so.

**Chicago Lines Move Offices.**—The Chicago (Ill.) Surface Lines have transferred their general offices from the sixteenth floor of the First National Bank Building to the Borsland Building, Chicago. The new quarters of the company will occupy the sixth, seventh, eighth and a part of the tenth floors.

**Sea Beach Line Opened.**—The Brooklyn (N. Y.) Rapid Transit Company has put in full operation its Sea Beach line from Sixty-first Street, Brooklyn, to Coney Island. This has been entirely reconstructed in connection with the new subway system. Until the Fourth Avenue line is open, probably next month, single cars on a short headway will be run instead of trains.

**Petition for Removal of Massachusetts Commissioners.**—G. M. Nichols, Lynn, Mass., a former newspaper publisher, has filed a petition with Governor Walsh asking for the removal of Chairman F. J. McLeod and Clinton White of the Public Service Commission. The petition contends that the commissioners made no attempt to prevent violations of law by the New York, New Haven & Hartford Railroad although as members of the present board and former Railroad Commission they had knowledge of the alleged violations.

**Los Angeles Harbor Lines.**—The committee of the whole of the City Council of Los Angeles, Cal., has decided to advertise for sale two electric railway franchises along South Park Avenue. One franchise provides for a line to extend from Thirtieth and San Pedro, along San Pedro to South Park Avenue and out to Slauson. The other franchise covers practically the same route except that the terminus will be Manchester Avenue. Under the charter the franchise is not to be for longer than twenty-one years, with the city having the right to purchase at the end of five years. It was in connection with the proposed construction of these so-called harbor lines that municipal ownership and possibly also operation by the municipality were urged.

**Motorman a Carnegie Hero.**—Albert May, a motorman in the service of the Bryan-College Interurban Railway, Bryan, Tex., since its organization five years ago, is in receipt of a letter from F. M. Wilmot, manager of the Carnegie Hero Fund Commission, Pittsburgh, Pa., advising him that the commission's attention has been called to an act performed on Dec. 7, 1913, by Mr. May in which he was instrumental in saving the lives of a man, woman and child in the great flood and overflow of the Brazos River, and that in recognition of the heroism displayed on that occasion the Carnegie Commission has awarded Mr. May a silver medal and the sum of \$1,000. At the time of disastrous overflow, Mr. May was granted leave of absence by the company. Without hope of reward or even wages for his time, Mr. May, accompanied by other citizens, energetically and heroically went to the succor of those whose lives were imperiled.

## PROGRAMS OF ASSOCIATION MEETINGS

## Pennsylvania Street Railway Association

The program has been announced for the spring meeting of the Pennsylvania Street Railway Association to be held at the Fort Pitt Hotel, Pittsburgh, Pa., on May 11 and 12. The delegates will be expected to register early on the morning of May 11. At 10 a. m. there will be an excursion to the power plant of the Pittsburgh Railways. At 7:30 p. m. the dinner of the association will be held at the Fort Pitt Hotel. The regular meeting of the association will be called at 2 p. m. on May 11. The program of this session follows:

Address by President C. L. S. Tingley.

Paper, "Economies in Operating Small Cars," by J. F. Layng of the General Electric Company.

Presentation of question box problems.

Address, "Organized Safety," by Lew R. Palmer, chief inspector Department of Labor and Industry.

Address on civic opportunities or some similar topic.

The meeting on May 12 will be called to order at 9:30 a. m. Among the subjects are the following:

Report of the committee on filing schedules, rates and tariffs, by C. B. Fairchild, Jr., chairman.

Report of the committee on a uniform crossing agreement, by R. P. Stevens.

Discussion of question box, with W. A. Heindle in charge.

Address, "Legal Phase of the Workmen's Compensation Act," by D. A. Reed.

At the conclusion of the session there will be an excursion to the Westinghouse plant and other places of interest.

## Gas, Electric &amp; Street Railway Association of Oklahoma

The fourth annual convention of the Gas, Electric & Street Railway Association of Oklahoma will be held at the Lee-Huckins Hotel, Oklahoma City, Okla., on May 12, 13 and 14. Delegates will be afforded an opportunity to register between 11 a. m. and 2 p. m. on May 12. At 2 p. m. Mayor Overholser of Oklahoma City will deliver an address of welcome and George W. Knox, president of the association, will respond. Mr. Knox, who is general manager of the Oklahoma Railway, will then present his address as president of the association, after which the convention committees will be appointed. The papers to be presented on the afternoon of May 12 follow:

"The Modern Generating Station," by A. L. Mullergren, electrical engineer Benham Engineering Company, Oklahoma City.

"The So-Called jitney Service," by J. J. Johnson, assistant general manager Oklahoma Railway.

At 5 p. m. on May 12 a special car will leave the hotel for Briarwood Park on the Oklahoma City-El Reno interurban line where a barbecue will be held.

On May 13 the following papers of interest to the electric railways will be presented:

"Utility Appraisals Under Order No. 774," by George C. Saunders, of the Oklahoma Gas & Electric Company.

"Relative Values of Coal, Oil and Gas as Fuel for the Production of Electric Power," by E. E. Hunter, chief engineer Oklahoma Gas & Electric Company, and L. G. Purtee, chief engineer Oklahoma Railway.

At the session of the association on May 14 the following papers will be presented:

"Care and Sale of Supplies and Current-Consuming Devices by Public Service Companies," by Galen Crow, general purchasing agent Public Service Company of Oklahoma.

"Public Utilities—Their Customers and the Public," by Noel R. Gascho, manager Alva Light & Power Company.

The presentation of these papers will be followed by the question box and a general discussion, after which the annual reports of the standing committees, the board of directors, secretary and treasurer and the reports of the convention committee will be presented. Officers will then be elected.

On the afternoon of May 14 those in attendance at the convention will be the guests of the Oklahoma Railway and will be taken in a special car on a sight-seeing trip of the city. The annual banquet of the association will be held at the Lee-Huckins Hotel at 8 p. m. on May 13.

# Financial and Corporate

## ANNUAL REPORTS

### Georgia Railway & Power Company

The statement of income, profit and loss of the Georgia Railway & Power Company, Atlanta, Ga., for the calendar year 1914 follows:

Operating revenues .....	\$6,341,183
Operating expenses .....	3,323,726
Net operating revenue .....	\$3,017,457
Less taxes .....	434,347
	\$2,583,110
Other income:	
Dividends .....	\$ 5,718
Miscellaneous .....	160,748
Total .....	\$ 166,466
Gross income .....	\$2,749,575
Deductions:	
Interest on bonds .....	\$1,236,527
Interest on notes .....	60,111
Extinguishment of discount .....	8,465
Rental dividends .....	801,168
Total .....	\$1,606,272
Net income .....	\$ 643,303
Sinking fund contributions .....	102,933
Balance .....	\$ 540,370

The report states that on April 1 the company executed its first and refunding mortgage to secure a total authorized issue of \$30,000,000 of 5 per cent forty-year sinking fund gold bonds. An amount of \$8,865,000 of these bonds was issued and exchanged at par for a like amount of the first mortgage bonds of the Georgia Power Company, whose mortgage was then cancelled, and \$1,000,000 of the bonds were sold to cover expenditures on account of construction. It is stated that charges to construction for 1914 for additions to the property of the Georgia Railway & Power Company other than the work being done by the Northern Contracting Company totalled \$161,049.

Charges to construction for additions to the property of the Georgia Railway & Electric Company, which is leased by the Georgia Railway & Power Company, totalled \$501,522. During 1914 the Georgia Railway & Electric Company sold \$494,000 of refunding and improvement mortgage bonds to reimburse the Georgia Railway & Power Company for expenditures made in 1914 and 1913. The Georgia Railway & Electric Company also sold \$430,000 of refunding and improvement mortgage bonds and \$607,228 of common stock to repay a loan of \$665,000, the balance being applied toward the payment of construction expenditures.

The total rentals due to the Georgia Railway & Electric Company, consisting of taxes, interest, dividends and sinking fund, aggregated \$1,863,399 for 1914. On December 31 the total mileage of railway track owned or leased and controlled and operated by the Georgia Railway & Power Company was 231.888 miles, single track. During the year 5.119 miles were built and 0.218 mile was abandoned.

### Oakland, Antioch & Eastern Railway

The first annual report of the Oakland, Antioch & Eastern Railway, Oakland, Cal., for 1914 is unusually complete in the details of income statement figures by accounts and by months. The sub-accounts in the operating expense group are also published in full. The total operating revenue for the year was \$542,180. Of this \$391,524 was for passenger revenue, the balance being made up of \$117,651 for freight revenue, \$16,506 for miscellaneous transportation revenue and \$16,499 for other than transportation revenue. The total number of passengers carried during the year was 586,231, while the freight carriage amounted to 194,923 tons. Owing to completed lines and connections it is expected that during the next full year of operation the freight revenue should be materially increased. An automobile bus line between Pittsburgh and Antioch secured considerable of the Antioch passenger traffic, and similar facilities are to be installed between Molena and Rio Vista. These feeders operated in only part of 1914.

The total operating expenses of the company were \$389,459, or 72.5 per cent of the gross revenues. This total was divided as follows: Maintenance of way and structures, \$70,549; maintenance of equipment, \$30,561; power, \$68,752; conducting transportation, \$157,864; traffic, \$17,861; general and miscellaneous, \$44,878; transportation for investment (credit), \$1,007, and outside quarry operation, \$5,229. The operating income of the company for the year was \$147,491 and the gross income \$147,623. Deductions totaled \$284,986, leaving a deficit of \$137,362. The total charges to road and equipment for the year were \$896,599. The betterments included trestle and tunnel work, the installation of automatic electric block signals on the entire line and automatic electric brakes on part of the equipment and the erection of twelve stations. The total assessments on stockholders received to Jan. 31, 1914, were \$1,215,120.

In concluding his report, W. Arnstein, president, says:

"Owing to the generally depressed financial conditions, on account of which the earnings of practically all railroads have been on a subnormal basis, it has been impossible for this company to dispose of any bonds during the last year. Just prior to the outbreak of the European war, the directors had every reason to believe that a negotiation then being carried on with a large New York house would be consummated and the floating debt taken care of thereby, but the war prevented this. Notwithstanding adverse conditions and the loss caused by the abnormally high water and floods in the early part of 1914 and the loss of the ferry-boat, with the consequent increase in operating costs, the company earned during 1914 its operating expenses and about 50 per cent of the interest charge on its entire outstanding indebtedness, both funded and unfunded. With the return of normal traffic conditions and the full operation of feeder lines it is reasonable to expect that the earnings will be sufficient during the coming year to insure the success of the financial plan for paying off floating debt out of earnings."

### Atlantic Shore Railway

The total operating revenue of the Atlantic Shore Railway, Kennebunk, Maine, for the year ended Dec. 31, 1914, amounted to \$357,869. This was made up as follows: Passenger revenue, \$303,818; freight revenue, \$27,183; other revenue from transportation, \$19,555, and other operating revenue, \$7,312. The total operating expenses were \$289,235, divided in this manner: Maintenance of way and structures, \$63,812; maintenance of equipment, \$36,161; power, \$60,296; conducting transportation, \$98,773; traffic, \$1,368, and general and miscellaneous, \$28,824. The operating income was \$68,633, and miscellaneous income, \$2,271, making gross income of \$70,904. Taxes, interest and other deductions totaled \$102,217, leaving a deficit for the year of \$31,312. This combined with the debit balance on hand at the beginning of the year made a total deficit of \$74,255 as of Dec. 31, 1914.

The total revenue mileage of the company was 1,355,695 car-miles in 1914 as compared to 1,344,707 car-miles in 1913. The total passengers carried were 4,995,796 in 1914 and 5,010,342 in 1913. Other statistics compare as follows: Gross earnings per car-mile, 1914, 0.2638 cent; 1913, 0.2761 cent; gross earnings per car-hour, 1914, 3.054 cents; 1913, 3.16 cents; operating expenses and taxes per car-mile, 1914, 0.2191 cent; 1913, 0.2159 cent; and operating expenses and taxes per car-hour, 1914, 2.535 cents; 1913, 2.471 cents. The company operates 95.164 miles of track and has eighty-six cars, fifty-three with electric equipment.

### Cleveland, Painesville & Eastern Railroad

During the calendar year 1914 the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, received gross earnings of \$404,492 as compared to \$425,923 in 1913, a decrease of \$21,431. Individually, however, the passenger revenue and power revenue showed increases of \$7,199 and \$8,942, respectively. The operating expenses and taxes decreased from \$234,666 in 1913 to \$220,651 in 1914, or \$14,014, so that the net earnings of \$183,840 in 1914 were a decrease of only \$7,417 from the 1913 figure. On account of an addition of \$3,999 of miscellaneous income in 1914, the gross income for this year was \$187,840, a decrease of \$3,417

as compared to 1913. Deductions from income increased \$4,956 during 1914, so that the surplus for the year decreased by \$8,374 to \$55,567.

The average miles in operation during 1914 were 38.32. The gross earnings per mile were \$10,556, and the net earnings, \$4,797, as compared to \$11,115 and \$4,991 in 1913, respectively. The operating ratio was 54.54 per cent in 1914 and 55.09 per cent in 1913. The receipts from the lighting and power department showed a gain of 49 per cent. The United Light & Power Company, which was purchased in the preceding year, gained 31 per cent. The total expenditures in 1914 for additions and betterments amounted to \$19,536, of which the principal items were \$14,693 for lighting and power, \$2,656 for track and roadway, \$1,158 for power plant and substations and \$883 on cars and equipment.

### FINANCES IN KANSAS CITY

#### Judge Hook Authorizes Receivers' Certificates for Extensions—Interest Held Up for Two Weeks Pending Satisfactory Reorganization Plan

Judge William C. Hook on April 29 authorized the receivers of the Metropolitan Street Railway to issue \$592,500 of receivers' certificates for the purpose of constructing necessary extensions to the lines of the company in Missouri. These certificates, by order of the court, are a prior lien on the property, ahead of any bonds, notes or other obligations. The court held that the company's obligations to the city precede the claims of the bondholders.

In another ruling Judge Hook ordered the \$496,000 of interest due on May 1 and May 15 to be withheld from payment for two weeks, to see if a plan of reorganization satisfactory to all parties concerned can be worked out. In case a reorganization plan is submitted which appears probable of being successfully carried out, the court intimated that it would be inclined to pay interest then, even if it meant the issuance of receivers' certificates for the purpose. All holders of judgments against the company joined with the city in protesting against the payment of the due interest.

Judge Hook laid down pointed rules in regard to the forming of a reorganization plan that would meet with his approval. There were two important elements in the necessary conditions: (1) The Kansas City Electric Light Company must take care of a fair and equitable proportion of the indebtedness; (2) The railway company must be so bonded as to leave a margin of safety and not endanger its ability to get money in the future. Judge Hook left to the security holders the adjustment of the interrelations of the various companies, particularly the imperative separation of the electric light and the street railway properties.

The question of payment of interest came up as an incident to a petition of the receivers as to the solution of paying for improvements. A schedule has been filed, showing that \$2,427,865 must be spent in 1915 for maintenance and reconstruction and extensions, under franchises. The estimated revenues for 1915 would be \$6,447,000, and the estimated expenditures, including interest and the item of \$2,427,865, would be \$7,306,965. The expenditures therefore would be \$859,965 in excess of the revenues. The interest paid in 1914 was \$1,459,000. The showing of the figures therefore was to the effect that if the required betterments were paid for from income, there would not be half enough left to pay the interest.

Mayor Jost at the hearing before the court declared that even if reorganization were effected, the contract obligations as to betterments would have to be met—he put them at \$6,000,000—before bondholders got anything. He declared that there would be no extension of time for reorganization and acceptance of the franchise after July 7 unless there were a very strong presumption that reorganization was assured.

The court denied the request of the receivers that all the cases before it be consolidated. It is understood that the chief obstacle is the disinclination of the New York (N. Y.) Trust Company, trustee for the second mortgage bonds of the Metropolitan held by the light company, to join.

### WESTINGHOUSE CONVERSION CHANGE

#### Company Proposes Conversion Plan More Favorable to Bondholders in Return for Change in Trust Indenture

The directors of the Westinghouse Electric & Manufacturing Company elected at a special meeting on April 5 to alter the prevailing provisions for the conversion of convertible bonds into stock. The conversion price of 200 will, under the plan, be reduced to par for the remainder of the year and thereafter will be 110. At the present time the owner of a \$1,000 convertible 5 per cent bond can get only \$500 in stock in exchange. With the new plan in force \$1,000 of bonds will be equal to \$1,000 of stock until Dec. 31, 1915. Bondholders will be asked to consent to a change in the trust indenture in return for the more favorable terms of conversion proposed. The change refers to the restrictions as to the issuance of preferred stock, the distribution of stock dividends and the issuance of any stock at more than 10 per cent below the market price of similar old stock.

If the plan becomes operative, either common stock to the amount required for conversion or new bonds convertible into common stock at the reduced price will be offered to shareholders for pro rata subscription at 105. To the extent that stock or bonds are sold upon this basis, the proceeds will be used to retire the present bonds at the redemption price. There are \$19,476,000 of 5 per cent convertible bonds outstanding. The plan provides that new bonds may be exchanged for the old at par. Bonds presented for payment in cash will be paid off at 105, or the exchange may be made for both cash and new bonds.

The directors say: "The company will not require additional capital for its present volume of business or for any increase expected in the near future. It has made adequate provision without borrowing for the execution of the large orders recently received from foreign governments. On the other hand, in case of the radical increase of business which may come with good times, the company would be handicapped in securing additional capital by the restriction cited in the trust indenture."

**American Light & Traction Company, New York, N. Y.**—The earnings of the American Light & Traction Company on the stock of subsidiaries were \$3,714,959 in 1914 as compared to \$3,751,976 in 1913, while miscellaneous earnings in the two years were \$717,420 and \$714,257 respectively. The expenses amounted to \$157,292 and \$123,107, leaving net earnings of \$4,275,087 for 1914 and \$4,343,126 for 1913. With the surplus of the previous year of \$9,495,882 in 1914 and \$8,689,293 in 1913 combined with dividends of \$3,811,932 in 1914 and \$3,536,537 in 1913, the surplus balance on Dec. 31, 1914, amounted to \$9,959,038 as compared to \$9,495,882 on Dec. 31, 1913. During 1914 gas rates decreased \$127,702 and electric rates \$92,100, while coal and oil costs increased \$66,000 and taxes increased \$94,132 for subsidiaries and \$31,788 for the holding company.

**Bay State Street Railway, Boston, Mass.**—The Bay State Street Railway has applied to the Public Service Commission for authority to issue \$1,500,000 of preferred stock for new construction and improvements. The stock will be offered to the stockholders at \$112 a share. The petition states that the company plans to use \$371,999 of the proceeds for track and line construction, \$142,822 for cars and rolling stock and \$135,377 for power stations and machinery.

**Bryan-College Interurban Railway, Bryan, Tex.**—The Texas Railroad Commission on April 22 granted the application of the Bryan & College Interurban Railway for permission to issue \$28,000 of bonds for additions and betterments. This issue will complete the original authorization of \$100,000 of bonds.

**Columbus Railway, Power & Light Company, Columbus, Ohio.**—The gross receipts of the Columbus Railway, Power & Light Company during 1914 were \$3,066,299 and the operating expenses \$1,657,619, leaving net receipts from operation of \$1,408,679. Interest, taxes, rentals and depreciation amounted to \$783,101, so that there remained a surplus of \$625,578. From this amount dividends of \$448,185 on the preferred and the common stock were paid. The company suffered during 1914 on account of foreign dis-

turbance and domestic depression. In the street railway department there was less travel, 78,949,559 passengers being carried in 1914 as compared to 79,560,640 in 1913, a decrease of 0.8 per cent. The decrease in revenue passengers was 0.9 per cent and in transfer passengers 0.4 per cent. The electric light and power department accomplished some growth during 1914.

**Idaho Railway, Light & Power Company, Boise, Idaho.**—In the suit brought by the Guaranty Trust Company, New York, as trustee, Judge Dietrich on April 19 passed a decree of foreclosure for all the properties operated by the Idaho Railway, Light & Power Company, with the possible exception of the lines formerly operated by the Boise Railroad. It is understood that the properties will be sold some time in June. The foregoing decision was made subject to a decree in the cross-complaint of E. H. Jennings, who asserts a claim of \$180,000 against the old Boise Railroad lines. The court in a prior decision recognized the Jennings claim but reserved decision as to whether it should be given preference over that filed by the trust company.

**Indianapolis Traction & Terminal Company, Indianapolis, Ind.**—The gross earnings of the Indianapolis Traction & Terminal Company, which leases the lines of the Indianapolis Street Railway, for 1914 were \$3,378,757, as compared to \$3,321,088 for 1913, an increase of \$57,669, or 1.74 per cent, caused largely by a comparison with losses sustained in 1913 on account of flood and strike. During 1914 there was expended for maintenance of way and structures, \$387,238, and for maintenance of equipment, \$218,926, or a total of \$606,164. A total of 18 per cent of gross earnings was expended upon maintenance of property. During 1914, a total of 27,150 ft. of single track of the Indianapolis Street Railway Company was rebuilt, 95 lb. of steel girder rail on concrete foundation with brick and granite block paving being used. A large amount of repairs to special work was done during the year, and two electric welding machines were kept constantly at work welding joints.

**Interborough-Metropolitan Company, New York, N. Y.**—Upon motion of Commissioner Hayward, the Public Service Commission for the First District of New York has instructed its counsel to prepare a letter to the Interborough Rapid Transit Company and the New York Railways requesting detailed information as to the proposed consolidation plan of the Interborough-Metropolitan Company, noted in the *ELECTRIC RAILWAY JOURNAL* of May 1. The commission desires to obtain this information to determine whether the proposed transaction involves any transfer of stock in violation of section 54 of the public service commissions law, which forbids any stock corporation not a railroad corporation to acquire or hold more than 10 per cent of the total capital stock of any common carrier. Inasmuch, however, as the Interborough-Metropolitan Company is not an operating company and the present plan simply embodies the reorganization of a holding company possessing lawfully acquired securities, it is doubted by many as to whether the commission has supervision in the matter. C. H. Venner has protested against the proposed plan on the ground that it does not give preferred stockholders any valid equivalent for their back dividends.

**Kentucky Traction & Terminal Company, Lexington, Ky.**—At a recent meeting of the directors of the Kentucky Traction & Terminal Company, arrangements were made to retire the last of the Passenger & Belt bonds, originally \$138,000.

**Little Rock Railway & Electric Company, Little Rock, Ark.**—C. P. Perrie, secretary of the Union Trust Company, Little Rock, has been elected a director of the Little Rock Railway & Electric Company to succeed the late W. M. Kavanaugh.

**Manchester Traction, Light & Power Company, Manchester, N. H.**—The Manchester Traction, Light & Power Company has applied to the New Hampshire Public Service Commission for authority to issue \$1,000,000 of bonds to provide for extensions and additions and to pay off floating debt.

**Oakland, Antioch & Eastern Railway, Oakland, Cal.**—It is stated that the agreement submitted to the bondholders of the Oakland, Antioch & Eastern Railway some time ago for approval has been signed by more than the necessary

75 per cent, which renders effective the decision to defer interest on the outstanding bonds for three years. More than 75 per cent of bondholders have deposited with the Union Trust Company of California their coupons for such a period and it is expected that the whole plan will be completed within a short time. The California Railroad Commission has authorized the railway to refund certain promissory notes aggregating \$200,400. The company is also given authority to pledge \$36,000 of its first mortgage 5 per cent bonds as collateral security for a note held by the Union Switch and Signal Company, amounting to \$21,028.

**Pacific Gas & Electric Company, San Francisco, Cal.**—The Pacific Gas & Electric Company has announced that up to April 5 \$9,585,600 of its \$12,500,000 of 6 per cent first preferred stock, offered at 82½ in June, 1914, had been sold. More than 80 per cent of the authorized issue has been subscribed for, and none of the stock will hereafter be sold except to investors residing within and contiguous to the territory served in California. The company has called for redemption on May 27 the remaining \$1,500,000 of its one-year 5 per cent notes due on Dec. 15, 1915. This redemption entirely clears up the floating debt.

**People's Railway, Dayton, Ohio.**—It is reported that a holding company is in process of organization in Dayton, Ohio, to take over the power, light, gas, street railway and interurban interests of that city. A meeting of railway men was held on April 30 to discuss the proposition. It is said that officers of the American Railways, Philadelphia, Pa., largely interested in the People's Railway, are promoting the consolidation, and that all the companies are agreeable, with the exception of the Oakwood Street Railway. The Dayton Power & Light Company and the Dayton Gas Company are included in the plan.

**Portland Railway, Light & Power Company, Portland, Ore.**—E. W. Clark & Company, Philadelphia, have sold or exchanged for maturing notes more than \$4,500,000 of the new issue of \$5,000,000 of two-year 5 per cent gold coupon notes of the Portland Railway, Light & Power Company, the offer of which was noted in the *ELECTRIC RAILWAY JOURNAL* of April 24. These notes are dated May 1, 1915, and the proceeds are for the retirement of \$5,000,000 of 5 per cent one-year notes due on this date. The unsold balance of the new notes is being offered at 98 and interest. Holders of the maturing notes are offered the privilege of exchanging these to the extent to which the unsold notes remain available. Holders making the exchange will receive \$20 in cash for each \$1,000 of notes exchanged.

**Public Service Corporation, Newark, N. J.**—The New York Stock Exchange has listed \$261,000 of general mortgage 5 per cent sinking fund fifty-year bonds of the Public Service Corporation of New Jersey, due in 1959. This listing makes a total amount to date of \$37,261,000. The bonds were used in part payment for betterments to subsidiaries.

**San Antonio (Tex.) Traction Company.**—It is reported that leading stockholders of the San Antonio Traction Company have paid off \$1,100,000 of indebtedness by taking additional shares of stock to redeem notes that had become due for the recent improvements to the company's holdings in San Antonio. The financing covers only past expenditures. A formal notification of the increase in capitalization to \$2,500,000 is being prepared for the Secretary of State.

**Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.**—Robert Toland has been elected a director of the Trenton, Bristol & Philadelphia Street Railway to succeed Edward P. Toland, deceased.

**United Railways Investment Company, San Francisco, Cal.**—Announcement has been made that about \$300,000 of collateral trust sinking fund 5 per cent bonds of the United Railways Investment Company, due in 1926, has been purchased by the trustee for the sinking fund.

**Washington Railway & Electric Company, Washington, D. C.**—The Public Utilities Commission for the District of Columbia has authorized the Washington Railway & Electric Company to issue \$13,500 of general improvement 6 per cent debenture bonds dated Jan. 2, 1915. The proceeds are to be used for the following purposes: Portion of estimated cost of relaying tracks on a section of Upshur Street, \$8,000; portion of estimated cost of placing sections of tracks on Butternut Street, on grade, \$5,500.

DIVIDENDS DECLARED

Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.  
 Detroit (Mich.) United Railway, quarterly, 1½ per cent.  
 Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1⅜ per cent, preferred.  
 Ohio Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred.  
 Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, first preferred; quarterly, 1½ per cent, original preferred.  
 Tampa (Fla.) Electric Company, quarterly, 2½ per cent.

# Traffic and Transportation

## THE JITNEY BUS

Further City and State Legislative Progress Recorded—  
 Interesting Chamber of Commerce Report in Oakland

The passage of legislation regulating the jitney continues to lag in most cases a cycle or two behind the movement for which it is a corrective. In New Orleans and Birmingham where the game of legislative battledore and shuttlecock has been played with the jitney measures for some weeks, it now seems likely that regulation will be finally enacted, while in Providence, Ashtabula, Shreveport and other cities noted this week regulatory measures have actually been enacted. In Houston the jitney ordinance passed recently by the City Council has been held to be unconstitutional and void, in the State of Washington the jitney bill passed by the Legislature has been declared by the Supreme Court of that State to be in force since April 10, and in Massachusetts the Attorney-General regards the bill there as unconstitutional.

The jitney regulatory ordinance passed by the Council of New Orleans has an amendment attached requiring a \$5,000 indemnity bond for every vehicle operated for fare along a fixed route. At the final hearing before the Council to consider the matter of regulation more than 200 jitney representatives were present. Attorneys for the jitney operators implored the Councilmen and the Mayor not to pass the amended ordinance. They asserted that the measure would legislate the jitneys out of business or at least force the owners into a costly battle in the courts. The attorneys also emphasized their belief that the new amendment while in their opinion worded so as to be operative against the street railway, could not in reality be enforced against the company because of the latter's charter rights. In insisting on the unreasonableness of the bond, Attorney Warren Doyle, representing the jitney men, produced a letter from a bonding company saying that the company would not write a bond such as that provided for in the ordinance unless the applicant deposited collateral security to the full amount of the bond.

An ordinance regulating the jitneys was passed on May 3 by the City Council of Providence, R. I. Included in the terms of the ordinance are provisions that drivers must not stop jitneys within 25 ft. of white poles and the exclusion of these machines from certain portions of Dorrance, Mathewson and Exchange Streets, in the congested business area. The license fee is fixed at \$5 per passenger seat for local machines and at \$3 for inter-city buses. All drivers must be at least twenty-one years of age and pass a road test before licenses are issued. Drivers are allowed to solicit passengers "by voice," so long as the solicitation does not amount to an outcry. A bond of \$500 per seat must be filed before the driver can engage in the business.

On the evening of May 3 the trustees of the Rhode Island Company petitioned the City Council to reduce the franchise tax from 5 per cent to 1 per cent of the gross earnings. The statement pointed out that at present the entire gross receipts of the Rhode Island Company are less than the amount which the road is called upon to pay for operating expenses, rental, taxes, and interest upon its indebtedness. The trustees stated that the cost of power offers no opportunity for reduction; that wages cannot be reduced unless and until existing agreements with employees are modified; that rolling stock maintenance cannot be reduced; and that track repairs offer the only opportunity for cuts in expenses. Usually 600 men are employed in track repairs in the summer, but this year only 300 can be given work because of the effect of the jitney. The trustees suggested that in addition to reducing the franchise tax, the city authorities relieve the company of the payment of the cost of maintaining that portion of the highways lying between its rails and a space 18 in. wide on each side and the payment of 4.5 per cent per annum upon one-third the cost of certain new highways. The statement points out that the jitney of the four-seated type has to pay less than 1 per cent of its receipts of \$6 a day compared with 15 per cent in the case of the company.

### ELECTRIC RAILWAY MONTHLY EARNINGS

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.					
Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Mar., '15	\$68,847	*\$63,015	\$5,832	\$17,230	†\$11,269
1 " " '14	67,111	*\$3,972	†16,861	15,931	†132,372
9 " " '15	725,302	*654,114	71,188	155,161	†182,664
9 " " '14	751,888	*682,339	69,549	138,262	†167,216
CALGARY (ALTA.) MUNICIPAL STREET RAILWAY					
1m., Mar., '15	\$46,157	\$32,195	\$13,962	\$16,735	†\$2,673
1 " " '14	56,606	47,480	9,126	15,121	†5,995
3 " " '15	135,966	93,495	42,471	49,586	†7,385
3 " " '14	166,311	145,118	21,193	45,365	†24,172
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, COLUMBUS, OHIO					
1m., Mar., '15	\$95,760	*\$66,362	\$29,398	\$27,540	\$1,859
1 " " '14	97,316	*68,408	28,909	27,419	1,490
4 " " '15	272,865	*190,014	82,852	82,231	621
3 " " '14	274,298	*193,227	81,071	81,650	†578
CONNECTICUT COMPANY, NEW HAVEN, CONN.					
1m., Mar., '15	\$621,543	*\$432,428	\$189,114	\$98,298	†\$112,268
1 " " '14	598,386	*431,518	166,868	88,370	†99,795
9 " " '15	5,974,545	*4,360,129	1,614,416	884,532	†924,545
9 " " '14	6,007,908	*4,464,075	1,543,833	802,263	†1,937,389
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.					
1m., Feb., '15	\$444,421	*\$187,972	\$256,449	\$33,046	\$223,403
1 " " '14	451,276	*187,905	263,371	30,060	233,311
2 " " '15	917,614	*387,408	530,206	66,612	463,593
2 " " '14	938,331	*392,558	545,773	62,629	483,144
INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.					
1m., Mar., '15	\$3,055,709	*\$1,341,969	\$1,713,740	\$912,878	†\$857,142
1 " " '14	3,129,767	*1,314,896	1,814,871	912,524	†952,607
9 " " '15	24,912,836	*11,287,498	13,625,338	10,809,312	†5,878,138
9 " " '14	24,831,587	*11,226,952	13,604,635	11,017,464	†5,625,000
NEW YORK (N. Y.) RAILWAYS					
1m., Feb., '15	\$982,481	*\$732,115	\$250,366	\$285,395	†\$9,202
1 " " '14	951,832	*741,382	210,450	276,583	†135,389
8 " " '15	8,887,645	*6,379,241	2,510,105	2,287,660	†147,007
8 " " '14	9,292,845	*6,593,318	2,699,525	2,213,866	†742,700
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.					
1m., Mar., '15	\$24,051	*\$23,916	\$136	\$7,976	†\$7,811
1 " " '14	22,703	*22,722	†19	7,800	†17,792
3 " " '15	283,060	*232,704	50,356	71,085	†120,378
9 " " '14	275,154	*224,679	50,475	69,494	†118,652
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.					
1m., Mar., '15	\$36,136	*\$45,049	†\$8,913	\$6,259	†\$15,102
1 " " '14	30,874	*47,627	†16,754	8,245	†124,565
9 " " '15	328,953	*392,401	†63,448	57,618	†119,474
9 " " '14	291,073	*438,679	†147,607	52,146	†195,316
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Feb., '15	\$23,986	*\$15,868	\$8,118	\$7,658	\$459
1 " " '14	26,244	*15,502	10,742	7,639	3,103
12 " " '15	301,658	*193,016	108,643	91,567	17,676
12 " " '14	297,442	*195,034	102,408	90,624	11,784
RHODE ISLAND COMPANY, PROVIDENCE, R. I.					
1m., Mar., '15	\$372,156	*\$311,891	\$60,265	\$117,309	†\$56,214
1 " " '14	392,406	*302,571	\$89,835	111,264	†120,709
9 " " '15	3,913,995	*2,978,147	935,847	1,061,948	†159,065
9 " " '14	3,988,469	*2,996,339	992,130	969,435	†112,938
TAMPA (FLA.) ELECTRIC COMPANY					
1m., Feb., '15	\$82,890	*\$39,521	\$43,369	\$4,427	\$38,942
1 " " '14	80,357	*42,018	38,340	5,074	33,266
12 " " '15	988,785	*514,697	474,038	53,205	420,833
12 " " '14	874,942	*484,777	390,164	56,331	333,834
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.					
1m., Mar., '15	\$785,582	\$529,704	\$255,878	\$52,720	\$203,158
1 " " '14	748,576	492,993	255,583	49,649	205,934
3 " " '15	2,269,752	1,555,125	714,627	153,295	561,332
3 " " '14	2,173,420	1,452,077	721,343	144,174	577,169
WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.					
1m., Mar., '15	\$18,408	*\$22,664	†\$4,257	\$1,449	†\$5,698
1 " " '14	16,249	*23,422	†7,173	1,164	†8,327
9 " " '15	193,687	*203,696	†10,009	11,719	†121,631
9 " " '14	185,679	*193,548	†7,869	9,907	†117,593

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



The Commission Council of Shreveport, La., has passed an ordinance regulating the jitney. The measure provides for the payment of a license before engaging in the business, registration with the chief of police of the number of the car, the State license, the name and make of car and the seating capacity. The chief of police is to assign to each jitney a number, after the driver or owner has complied with the regulations, and this number is to be painted in black in type at least 4 in. high. The route and the rate of fare of every car are to be plainly marked and no signs are to be placed on the upper left-hand windshield where they might obstruct the view. Not more than two passengers are to be seated in the same seat as the driver, nor are any jitneys to be operated while any of the passengers or others are standing in the car or on the running board.

An ordinance regulating the jitney was passed by the Council of Ashtabula, Ohio, on April 26 on its second reading by suspending the rules. The ordinance provides that before applying for a license the applicant for permission to operate a motor vehicle for hire at a fare of less than 15 cents must first file a bond of \$5,000 with the city treasurer for each and every car to be operated. In the event that the bond is a personal instrument there must be two signers thereon and each must make affidavit that he is worth the amount of the bond over and above all exceptions. The license is placed at \$100 for each car covering a period of one year and is payable in advance. The measure also provides that the number of passengers carried by such motor vehicles shall not be more than the manufacturer's rating, this to include the driver. All passengers must be discharged at the curb, and the drivers of the jitneys must comply with the city traffic ordinances in addition to a section in the ordinance which prohibits racing for prospective passengers. No passengers are to be carried on the doors or the running boards. No person under the age of twenty-one years is to be allowed to drive a motor in public service. The law also provides that the motor buses shall operate continually from 5 a.m. until 11 p.m.

The jitney operators in Ashtabula have had two meetings for the purpose of organization and have employed an attorney to contest the ordinance. In the meantime they have suspended all operations as they claim the restrictions which are imposed by the new measure are too severe. The ordinance will probably be attacked on the ground that its restrictions tend to confiscate property and are unconstitutional. The Councilmen claim that the measure will withstand any form of attack. The jitney started in Ashtabula about Feb. 15 with one second-hand car and gradually increased to about twenty in the peak load of the day. Car owners from surrounding towns would even drive to the city in the morning and after operating their cars as jitneys all day return home at night. Several accidents have resulted from the careless handling of jitneys. One man was run over, a child was run down, a collision was caused by a car which had come to a sudden stop being rammed from the rear by another car, and still another auto was struck by a switch engine at the Center Street crossing.

The city authorities of Louisville, Ky., have been prevented from putting the ordinance affecting to regulate jitney buses into operation by court proceedings, which were begun by the attorneys representing some seventy jitney bus owners on the day before the measure was to become operative. The plaintiffs allege that the ordinance is unconstitutional and ask the court to enjoin the city from attempting to enforce any provision of the regulation or to conduct any prosecution for alleged violations during the time that the action is pending. The city asked for a continuance when the first hearing was called and postponement for a week was granted, the court ruling against the city attorney's request that the plaintiffs give bond. In the petition it is stated that the jitney operators find they cannot obtain bonds such as are required by the ordinance without depositing amounts equal to the bonds in cash or collateral with the bonding companies, a prohibitive requirement. Apparently no step has been taken by the jitney operators in the direction of complying with the ordinance and jitneys are operating without hindrance.

A bill to fix the liability in case of injury sustained by jitney passengers is advocated for passage either by Councils or the Legislature, by Mayor Blankenburg, of Philadel-

phia. The Mayor said that while he believed the city's police regulations for the operation of jitneys were as good as any in the country, the administration was not empowered to require the drivers to take out city licenses, and that in cases of accidents, there would be difficulty in placing the responsibility on the proper persons. The number of jitneys in Philadelphia on May 3 was well above 350, whereas there were only 250 a week ago, according to a census taken by reserve policemen on Broad Street, under orders from Superintendent of Police Robinson. The census does not include jitneys operating in other parts of the city.

In the Pennsylvania Legislature, by unanimous consent, the Jones jitney regulator was stricken from the House calendar on motion of its sponsor, E. E. Jones, Susquehanna. The measure would have made it necessary for owners of jitneys to file a \$2,500 bond with the State and pay 2½ per cent of the gross receipts to the municipality in which the cars are operated. With the Jones bill out of the way, the House passed the bill authorizing street railways to operate jitneys in connection with their systems.

Owners of automobiles who convert them into jitney cars and drive them for hire must obtain chauffeurs' licenses, and any person engaged by such owners to drive the converted jitneys must also obtain licenses, according to an opinion by Attorney-General Egbert E. Woodbury of New York State, rendered to the corporation counsel's office of Schenectady. He based the opinion upon the provision of the motor vehicle law which reads: "The term 'chauffeur' shall mean any person operating or driving a motor vehicle as an employee or for hire." Many owners of automobiles in up-State cities have recently converted their autos into jitney cars, and in many instances have failed to obtain chauffeurs' licenses. The Attorney-General says that the driver of a so-called jitney car is driving it for hire as much as the driver of any other public conveyance. In his opinion such chauffeurs should be licensed.

The Thompson bill, now before Governor Whitman of New York, has been referred to previously in the ELECTRIC RAILWAY JOURNAL. A hearing on the bill was held before the Governor on May 6. The principal contention of the representatives of the jitney operators was that the regulation of the buses should be left to the individual cities. Senator Thompson said that the original draft of the bill had been prepared by counsel for the Public Service Commission.

The consideration of the question of the regulation of the jitney in Davenport, Ia., which came before the City Council on April 22, was continued for two weeks. John G. Huntoon, general manager of the company, said that the jitneys were taking away from the street railway between \$400 and \$600 daily. It was not possible to make an accurate estimate of the amount because of the business depression and other conditions which were responsible for losses. The attorney representing the jitney interest insisted that if the ordinance now pending before the Council was passed the jitneys would be legislated out of business. This ordinance provides for a bond of \$5,000 and a license fee of \$75 for each car.

Mayor Bloom, of Pine Bluffs, Ark., has directed a letter to City Clerk William A. Lee urging the passage of a jitney ordinance to require an indemnity bond of not less than \$5,000 and a license fee of not less than \$25 a month for each car operated in Pine Bluffs.

The jitney bill passed by the Washington Legislature has been declared by the Supreme Court to be in force since April 10. The measure specifies that it is unlawful for jitneys to operate unless a permit has been obtained from the Secretary of State. It also holds jitney operators liable for the full amount of damages incurred to passengers or pedestrians through negligence or carelessness of the operator, but holds the surety companies only to the amount of the \$2,500 bond. The law specifies that each applicant for permission to carry passengers for hire shall deposit and keep on file with the Secretary of State a bond running to the State of Washington in the penal sum of \$2,500, with a good and sufficient surety company, which the law asserts is to pay for all damages which may be sustained by persons injured by reason of carelessness and negligence of the principal or agent in the conduct of the said business, or in operating a motor-propelled vehicle for hire. Every person injured by carelessness, negligence, or unlawful act of the person or corporation receiving a permit under the pro-

visions of the act, or his heirs, shall have cause for action against the principal and surety upon the bond provided for all damages sustained. The full amount of the damages may be recovered against the principal, but the amount of recovery from the surety shall only be up to the amount of the bond. If any part of the act is held invalid, the remainder shall be held valid.

Official announcement made by Prosecuting Attorney Alfred H. Lundin, of Seattle, recently, indicates that, pending the hearing of the test case filed against the Seattle Taxicab & Transfer Company alleging illegal operation of vehicles for hire, no attempt will be made to bring about arrests in the twenty-two cases presented to the prosecutor's office by the Puget Sound Traction, Light & Power Company against jitney bus operators who were operating without bond or permit.

Tacoma jitney operators recently gave up further hope of delaying the operation of the jitney law requiring the \$2,500 bond, and as a result many of them have filed their bonds with the Secretary of State.

The Auto Transit Welfare Association, representing the jitney interests, on May 3 filed petitions invoking the referendum on the jitney regulation ordinance passed by City Council. This action will hold up jitney regulation in Portland, Ore., for two years, unless the City Council is willing to take steps to force the issue at the election on June 7. The only way this can be done is by repealing the ordinance as passed and preparing and passing another measure to submit to the voters under the initiative.

The jitney ordinance passed recently by the city of Houston has been held to be unconstitutional and void by Judge William Masterson in the Fifty-fifth District Court at Houston. Judge Masterson decided the matter upon the question as to whether the ordinance was reasonable and discriminatory. The provision requiring a bond of \$10,000 formed an important element in the case. Judge Masterson said in part: "The ordinance to regulate the jitney undertakes to regulate people who are engaged in a business similar to the Houston Electric Company. The question at issue seems to be the regulation of a dangerous or hazardous business. It therefore requires a test as to qualification. It seems to me that the operation of electric cars is just as dangerous and hazardous a business as the operation of an automobile, and yet no examination is required of motormen. I believe that the city has ample power to regulate both and to go just as far as consistent with their rights to operate. There can be no question but that the ordinance discriminates."

Two petitions were filed on April 27 by the Georgia Railway & Power Company, Atlanta, Ga., with the Georgia Railroad Commission. They deal with the jitney bus and both were drawn by the company. One is signed by P. S. Arkwright, president of the company, and the other is signed by a number of citizens to whom it was presented by representatives of the company. Among the sixty-three signers of the citizens' petition are practically all the bankers of Atlanta, the leading capitalists, wholesalers, retailers and real estate men. The list represents well the best in Atlanta's business life. Most of those who signed the citizens' petition declared themselves as being opposed to allowing the jitneys to operate at all in their present character. Recently the jitney bus operators in Atlanta sued for a permanent injunction against the city ordinance taxing them and requiring them to furnish a bond. They secured a temporary restraining order and their petition was heard with the city's answer. The decision of Judge W. D. Ellis of the Fulton Superior Court is expected to be rendered soon. The operators have declared repeatedly their intention of appealing to the highest court in the event of unfavorable action in this case. Their main contention is that by differentiating them from taxicabs the City Council drew a distinction that is unconstitutional. The number of jitneys in operation in Atlanta appears to be diminishing gradually, notwithstanding that they may still operate practically freely as when the first of them started in business on Jan. 28. It is evident, however, that the fortunes of the jitney operators are approaching a crisis.

A tentative ordinance drawn by City Attorney Boyd has been introduced before the City Commissioners of Birmingham, Ala. No license from the chauffeur or owner of the

car is proposed. The requirement in regard to the indemnity bond is fixed at \$1,000. A permit to cost \$2 is provided for. The ordinance will apply to both jitneys and taxicabs. It is proposed to regulate the routes of jitneys.

The Chamber of Commerce of Oakland, Cal., has received the report of a committee it appointed to study the jitney in that city from the community standpoint. The committee states that "the jitney driver is living upon his capital, or the capital of someone else, because the income is not sufficient to provide for his living and the necessary operating expenses, plus fixed charges and depreciation." Extended investigation of the committee showed that the average jitney travels 137 miles a day with a car-mile income of 5½ cents. Considering depreciation and cost of operation and allowing \$3 to the driver, it was found that even the smallest jitney could not run for less than 7 cents per mile. Investigation of standard traction bonds in California with a par value of \$107,422,000 showed a shrinkage from December, 1914, to March, 1915, of \$8,887,000, or about 3¼ per cent. The ultimate effect of this was apparent, the committee thought, to anyone who considered that more than \$60,000,000 of California electric railway bonds were held by savings banks and local investors in California. The State received 5¼ per cent of the gross income of street railways, and the total tax paid on gross income amounted to about 12 per cent. This meant a total loss to the public on the principal lines of the State of \$300,000 per annum, aside from the other forms of taxation placed by the public upon street railways in the building and maintenance of that portion of the street occupied by the roadbed. From 5 p.m. to 6 p.m. the average number of passengers transported in the 5-cent limit from the business center of Oakland (a length of three blocks on Broadway) was 113,500. Approximately thirteen jitneys would be required to give the same carrying capacity as one street car. Handling this traffic required 234 street cars with a headway of fifteen seconds. To move the same traffic with jitneys at thirteen to one would require 3000 cars. If the public continued to support the jitney it must expect a zone system of fares, because the small jitney cannot operate over a much longer route than 3 miles at a profit. The report is an extremely interesting one and quotes from the report of the bureau of fare research of the American Electric Railway Association, and from the *ELECTRIC RAILWAY JOURNAL*. A significant paragraph contained in the conclusion of the committee follows: "Time only can determine the outcome of the probable development of the motor-bus system of urban transportation as applied to our American cities. But it is quite conclusive that if the motor bus has come to stay it will not be in the shape of the present jitney. The final outcome will be evolutionary and the survival of the fittest."

H. A. Robson, public utilities commissioner for the Province of Manitoba, has addressed a memorandum to the different municipalities in which the Winnipeg Electric Railway operates, the notice being prompted by repeated application to the commission for the extension of the street railway lines and reduction in fares. The note from the commissioner is an intimation to the municipalities that if jitney transportation is not put under proper regulation the Winnipeg Electric Railway can no longer be expected to continue its progressive policy of extensions.

Attorney-General Attwill of Massachusetts has filed an opinion with the Speaker of the House to the effect that House Bill No. 2042, regulating the jitney, is unconstitutional. The opinion holds that the provisions of the bill requiring drivers of such vehicles to secure licenses from the municipal authorities and to file a bond as a condition precedent to a license appear to be constitutional, but that certain specified exemptions, including persons, firms or corporations engaged in bus service in connection with the hotel business, are inadmissible. The distinction could be well supported, says the Attorney-General, if the classification proposed were along the line of the number of passengers carried, the size or power of the vehicle, the rate of speed at which it may be operated, the skill of the operator, the nature of the district served or the control of the operator by the passenger. The bill was in the engrossment stage when the opinion by the Attorney General was rendered.

## THE JITNEY CONVENTION

### Brief Account of the Proceedings on the First Day of the Kansas City Convention

The inaugural convention of the International Jitney Association opened at the Coates House, Kansas City, Mo., at 10 a. m. on Tuesday, May 4. Perry T. Allen, Springfield, Mo., was in the chair, and E. K. Carnes, Kansas City, who had made the arrangements for the meeting, was acting secretary. These officers were elected permanently for this convention. Mr. Perry is an attorney and represents the jitney interests of Springfield in the suit to make permanent the temporary restraining order against the jitney ordinance in that city. An address of welcome by the assistant city councillor of Kansas City was responded to by Editor Palmer of *The Jitney Bus*, New York, the organ of the movement. W. H. Miller, president of the Kansas City Jitney Association, delivered an address.

In the afternoon Harry G. Kyle, an attorney, talked on legislation passed by municipalities affecting jitney transportation. Ross B. Gilluly, attorney for the Kansas City Jitney Transportation Company, discussed insurance, reviewing recent legislation in Missouri under which an insurance organization could be effected among jitney owners. L. M. Emlet, representing the Automobile & Bus Owners' National Protective & Benevolent Association, outlined the plans of that organization for liability insurance. Mr. Emlet is a Kansas City man and is vice-president of the association. This association was organized about two months ago at Muskogee, Okla., but plans to extend its scope over other forms of transportation. The other officers of the company are Muskogee men. The headquarters are to be moved to Kansas City. Dr. Gordon A. Beedle, surgeon of the Kansas City Jitney Transportation Company, talked on jitney accidents. Committees were appointed on the following subjects: finance, legislation, insurance, equipment, and regulation of cars and drivers. Among the visitors present from outside Kansas City were representatives of jitney associations in Iowa, Kansas, Missouri, Texas and Oklahoma and many unattached jitney owners and drivers and attorneys.

### NORFOLK & BRISTOL FARE HEARING

The Massachusetts Public Service Commission heard the petition of the Norfolk & Bristol Street Railway on April 27 for authority to establish a 6-cent fare unit on the system. The company was represented by Robert H. Holt, counsel; Michael A. Cavanaugh, general manager, and F. M. Perry, superintendent.

In twelve years only two dividends had been paid by the company. Each of these was a 3 per cent declaration, and occurred in 1912 and 1913 respectively. The road was built by the Norfolk & Southern Street Railway in 1899, but went into the hands of a receiver soon afterward. It was sold at auction in 1901 and the present owners formed the Norfolk & Bristol Company and purchased the property for \$345,000. There are 22 miles of track, built of 60-lb. rail, excluding 2 miles of 9-in. girder rail in Norwood and Walpole, an 1100-hp generating plant in East Walpole, eight double-truck semi-convertible cars equipped with air brakes and forced ventilation, and a 150-ft. x 50-ft. brick carhouse.

Financial data filed by the company showed that the total cost per mile of road was \$22,804, compared with \$39,084 for all other Massachusetts electric railways with the exception of the Boston Elevated. The company had paid about 0.5 per cent on its investment since its organization. The operating ratio increased from 74.4 per cent in 1909 to 84.3 per cent in 1914. Mr. Cavanaugh emphasized the company's policy of making repairs to property whenever these became necessary, regardless of the showing on the books. The latest increase in operating ratio is due to a reduction of \$3,000 in revenue and an increase in expenses of \$5,000, the latter being necessitated by the purchase of new trucks in place of old equipment and the rebuilding of a trestle. The road has felt the business depression in its effect on local industries. Its cost of power per car-mile is 3.6 cents, compared with 3.7 cents on the Fitchburg & Leominster Street Railway, 4 cents on the Boston & Worcester Street Railway, 4.5 cents on the Middlesex & Boston Street

Railway, 4.9 cents on the Berkshire Street Railway, 5.2 cents on the Nahant & Lynn Street Railway, and 5.3 cents on the Worcester Consolidated Street Railway.

The gross earnings per car-mile were 20.6 cents in 1914, and in recent years these earnings had been about 8 cents per car-mile less than on other Massachusetts roads. Operating expenses per car-mile in 1914 were 17.3 cents. In the year 1914 the operating revenue was \$93,978, compared with \$96,007 in 1913; net earnings were \$14,730, against \$21,150, and net income was \$11,936, compared with \$18,308. The cars ran 455,736 car-miles compared with 459,120 in 1913. Transportation expenses came to \$27,106 compared with \$25,914 the previous year. The company estimates that the proposed fare increase will add \$9,876 per year to the revenue. In putting the 6-cent fare into effect the company intends to sell tickets at the rate of fifty for \$2.75, school children's ticket books at the rate of \$1 for thirty-four rides and 10-strip tickets for school children at 3 cents per ride. Tickets good morning and evening are to be sold at the rate of ten for 50 cents. The hearing was continued until May 11 to give representatives of towns an opportunity to be heard.

**Increase in Wages in Maine.**—The Cumberland County Light & Power Company, Portland, Maine, has voluntarily increased the wages of its trainmen approximately 2 cents an hour.

**Tail-Lights in Houston.**—The City Council of Houston, Tex., has passed an ordinance requiring the street cars operated in the city to carry red tail-lights from a half hour after sundown until a half hour before sunrise.

**Reduction in Fare Denied.**—The Public Utilities Commission of Connecticut has denied the petition of citizens to enter an order to require the Connecticut Company to reduce the fare between St. Luke's Church, Noroton, and Atlantic Square, Stamford, from 10 cents to 5 cents.

**Head-End Collision in Ohio.**—A wreck occurred on the Lake Shore Electric Railway a few miles from Fremont, Ohio, on April 29, when two limited cars collided head-on. Many passengers were slightly injured, but no deaths have been reported. The cars took fire and were badly damaged.

**Service Terms Under Discussion.**—The representatives of the employees of the East St. Louis & Suburban Railway, East St. Louis, Ill., have taken up with the management the question of the modification of the service terms under which the men served in accordance with the agreement which expired on May 1.

**Reduction in Fares Denied.**—The Board of Public Utility Commissioners of New Jersey has denied the application for a reduction of the rate of fare to 5 cents from all points on the Bloomfield line of the Public Service Railway, a subsidiary of the Public Service Corporation of New Jersey, and also for the discontinuance of identification slips on the line.

**Fare Changes on Peninsular Railway.**—The Peninsular Railway, San José, Cal., has been authorized by the Railroad Commission to cancel its theater round-trip fares applying from various points upon its lines to Palo Alto, San Jose and Los Gatos, but the company was denied authority to increase its Sunday and holiday excursion rates from Palo Alto, Mayfield and Los Gatos to Congress Springs.

**Transportation Lectures for Employees.**—The first of a series of illustrated lectures on transportation has been given before the employees of the Third Avenue Railway, New York. The lectures trace the history of the development of transportation from the earliest time. The text and the lantern slides were prepared particularly to meet the needs of the men on the system. The second lecture will be delivered soon before the men in Yonkers connected with the Westchester lines.

**Prepayment Cars in Interurban Service.**—Pay-as-you-enter cars were put in operation on the Akron, Barberton & Wadsworth division of the Northern Ohio Traction & Light Company, Akron, Ohio, on April 18. Patrons have in general shown every disposition to make the plan successful and there has been a noticeable facilitation of traffic. Passengers pay the entire fare, whatever their destination, upon entering the car, and if they go beyond the Akron 5-cent fare zone, west bound, or beyond the Wadsworth 5-cent

limit, north bound, they receive leave-car checks indicating destination.

**Brooklyn Advertising Contract Terminated.**—The Inter-City Car Advertising Company on May 5 began removing its closed candy stands from the station platforms of the Brooklyn Rapid Transit Company. The stands were sealed by employees of the railroad on May 1 when the advertising company's platform and car advertisements were ripped out and pasted over, following the expiration of its contracts with the railroad at midnight on April 30. The contract had been in force eight years. The railroad is said to have received \$170,000 a year for the privilege. This was considered "ridiculously inadequate." The matter of advertising has been taken up with the Public Service Commission. According to T. S. Williams, president of the Brooklyn Rapid Transit Company, the company will probably undertake to carry on the business itself.

**New Company Publication.**—The Tri-City Railway & Light Company, Davenport, Ia., has begun the publication of *Tri-City Railway Service* in the interest of the employees of the company. The paper is 7 in. wide x 8½ in. high. It contains general news of interest to the employee and to the public and the complete schedules of car service in the tri-cities, corrected weekly. A feature of the publication is an "Answers to Correspondents" department. The following appeal to readers was published in the issue for April 12: "Readers of *Tri-City Railway Service* are requested to send in their ideas to the editor. The general public, as well as employees, are included in this invitation. If you have an idea concerning any branch of the service, write it out and mail it to the editor. Sign your name and street address, not for publication unless you wish it, but because the idea that is hidden behind an anonymous name is not worth considering."

**A Jitney Contemporary.**—*The Jitney Bus*, published in New York, has gone into its second issue. The paper is a monthly. The first number, dated April, contained thirty-two pages, including the cover. The May issue contains twenty-four pages, including the cover. The editorials in the respective issues are "Better Transportation and Fair Play" and "Stand Up for Your Rights." As might be expected the April issue bears unmistakable evidences of somewhat hasty preparation. A cross-page half-tone taken near Stearn's new store at Forty-second Street and Sixth Avenue, New York, carries as a caption "A Busy Jitney Thoroughfare." There is no doubt about the thoroughfare being busy, but the cars are the limousines of New York's first families and not purveyors of 5-cent rides. A great deal has been written about the hazards of the jitney as regards the pedestrian. Here is how the editor of *The Jitney Bus* has unconsciously made out the case against his friends: "The average citizens in the jitney belt stands on the curbing and takes a careful survey of the street in both directions before he starts to cross. Then when there is a break in the stream of jitneys he hurls himself across the street as if he had been shot from a cannon or was hurrying to flag a flock of thousand dollar bills."

**Movies in an Accident Suit.**—The following account of the use of moving pictures in an accident suit was contained in the *Minneapolis Journal* of April 28: "The Death Race," a three-reel motion picture, with the death scene deleted by censors, was shown in District Judge W. E. Hale's court late yesterday with judge and jurors as spectators. The movies may invade the Minnesota Supreme Court as the exhibition was made in presenting evidence in the trial of a case, and the film was ordered sealed by Judge Hale to be used in the event of an appeal. Jurors gripped their chairs, Judge Hale leaned forward, court attaches craned their necks, a hush fell over the courtroom and for four minutes the thrilling race of an automobile and a street car was on to see which first would reach the crossing. Just as the car and auto were about to crash, the picture machine gave its final splutter and the courtroom was in darkness. The object of the innovation in court procedure was to bring before the eyes of the court and jury the actual conditions at Clear Spring crossing on the Minneapolis-Minnetonka line, where on Dec. 13, 1913, Frederick W. G. Krumwiede, nineteen years old, was killed when an automobile in which he was riding with his father was struck by an electric car. The suit is for \$7,500 against the railway brought by the mother of the boy."

## Personal Mention

Mr. H. S. Collette has resigned as secretary of J. G. White & Company, Inc., and the J. G. White Engineering Corporation, and expects to reside permanently in California.

Mr. W. P. Geary, formerly assistant rate expert of the Railroad Commission of California, has been appointed acting rate expert to succeed Mr. H. H. Sanborn, who resigned recently.

Mr. H. H. Vreeland, director of welfare of the Interborough Rapid Transit Company and the New York (N. Y.) Railways, was the guest of the National Civic Federation at its welfare conference in New York recently. Mr. Vreeland outlined the great work which the corporations he represents are accomplishing in this particular movement.

Mr. Thomas W. Martin and not his brother, Mr. W. L. Martin, has had charge of the legal work for the Alabama Power Company and its associated companies since 1912. Mr. W. L. Martin lives in Montgomery, Ala., and he was inadvertently confused with his brother, Mr. Thomas W. Martin, in a personal which was published in the *ELECTRIC RAILWAY JOURNAL* of March 20.

Mr. L. S. Reagan, formerly superintendent of construction of the Des Moines (Ia.) City Railway, has been appointed electrical engineer of the Charles City Western Railway, Charles City, Ia. In the new position Mr. Reagan will have charge of the electrification of this company's line between Charles City and Marble Rock, a distance of 17 miles, as well as of the 22-mile extension between Charles City and Alta Vista. Mr. Reagan was graduated from the school of electrical engineering of the University of Pennsylvania in 1904. He was in the employ of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., until 1913, when he resigned to accept the position at Des Moines.

Mr. Halford Erickson, who is now chairman of the Railroad Commission of Wisconsin, is the only member of the commission who has served continuously since it was established in 1905, and the enviable reputation which this commission enjoys is due in no small measure to the efficient and untiring efforts of its present chairman. Mr. Erickson was born and received his early education in Sweden and came to the United States in 1884. After taking his academic training in Minneapolis, Minn., he entered the service of the Chicago, St. Paul, Minneapolis & Omaha Railroad in 1890. He served the company in various capacities until he was appointed labor commissioner of Wisconsin in 1896. He held this position until 1905, when he



HALFORD ERICKSON

was appointed a member of the first Railroad Commission of Wisconsin by Governor La Follette.

Mr. Clinton White, for the last fourteen years a member of the Massachusetts Railroad and Public Service Commission, will retire from public life on May 18, when he will reach the age of seventy. Mr. White has been in the employ of the State for twenty years, and is well known in the public utility field as the "financial" member of the Public Service Commission. He was born in Charlestown in 1845 and for thirty years was in charge of shipping and receiving for a syndicate of manufacturers at Boston. He became an authority on terminal and wharf facilities early in his business career, and was for many years prominent in the Boston Chamber of Commerce. He is the senior vice-president of the Charlestown 5-Cent Savings Bank. Mr. White was appointed to the Massachusetts Railroad Commission in 1901 by Governor Crane, and has taken an important part in the work of that board and its successor, the Public Service Commission.

Mr. Donald Goodrich, son of Mr. C. G. Goodrich, president of the Twin City Rapid Transit Company, Minneapolis, Minn., has been appointed superintendent of the Minneapolis division of the Twin City lines. He will succeed Mr. Edward Karow, who has been appointed to the position of assistant to Mr. Horace Lowry, vice-president of the company. Mr. Goodrich has had experience with the company in various departments.

Mr. W. S. Hays has joined the staff of the McGraw Publishing Company, Inc., to undertake special sales promotion work for the *Electrical World* and *ELECTRIC RAILWAY JOURNAL*. Mr. Hays comes from the commercial department of the Union Gas & Electric Company, Cincinnati, with which he has been connected since the completion of the merger of the New Midland Power & Traction Company, Cambridge, Ohio, with the Ohio Service Company, where he was superintendent and local manager.

Mr. D. H. Cantrell, who has been elected president of the Little Rock Railway & Electric Company, Little Rock, Ark., as noted briefly in the *ELECTRIC RAILWAY JOURNAL* of April

24, is a member of the law firm of Rose, Hemingway, Cantrell, Loughborough & Miles, Little Rock, and was admitted to practice by the Supreme Court of Arkansas on June 22, 1889. Mr. Cantrell became connected with the street railway which was doing business in Little Rock in 1897 as claim agent and assistant attorney, handling small matters. In 1901 he was made an assistant attorney, the firm of Rose, Hemingway & Rose then being general attorneys and counsel for the Little Rock Traction & Electric Company. In 1905



D. H. CANTRELL

Judge Hemingway, now senior member of the law firm, who was president of the Little Rock Railway & Electric Company, relinquished to Mr. Cantrell the entire legal department of the road, and since that time Mr. Cantrell has been its general attorney and counsel. For the last four or five years Mr. Cantrell has been vice-president of the company, and on April 10, 1915, he was elected to the presidency to succeed Judge W. M. Kavanaugh, who died on Feb. 21, 1915. Mr. Cantrell has lived all his life in Little Rock and has been actively engaged in the practice of law since he was admitted to the bar. He will exert his energies in directing the plans and policies of the company and will continue personally to look after the company's legal business. The *Arkansas Gazette*, Little Rock, concluded an editorial, "The New Head of the Street Railway," as follows: "We feel sure that in D. H. Cantrell the street railway people have found the man to continue the broad-gage policies that have advantaged both the company and the people it serves. In fact, with Mr. Cantrell as president and Mr. C. J. Griffith as general manager the street railway owners need not worry about their Little Rock property. It will always be found in good shape."

#### OBITUARY

William H. Bancroft, formerly president of the Utah Light & Railway Company, Salt Lake City, Utah, now included in the system of the Utah Light & Traction Company, is dead. Mr. Bancroft was vice-president of the Oregon Short Line and first vice-president of the San Pedro, Los Angeles & Salt Lake Railroad. He retired from active service on Feb. 1, 1914, retaining the title of vice-president of the Oregon Short Line. He was born on Oct. 20, 1840, at Newburg, Ohio, and entered railway service in April, 1856, as telegraph operator and ticket clerk of the Michigan Southern Railroad. He remained continuously in railroad service from April, 1856, until 1914. He rose through the various grades to be executive head of all the Harriman lines in the inter-mountain territory, and when the Harriman interests acquired control of the Utah Light & Railway Company in November, 1906, Mr. Bancroft was elected president of the company.

## Construction News

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

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

#### RECENT INCORPORATIONS

\***Montana Railway Company, Montana, Ark.**—Incorporated in Arkansas to build a 3-mile railway in Montana to mines of Johnson & King Mining Company. Capital stock, \$7,000. E. H. Johnson and Lee King, incorporators.

**Jacksonville & Florida Railway, Jacksonville, Fla.**—Application for a charter has been made by this company in Florida to build a 60-mile electric railway between Jacksonville and Providence. Capital stock, \$500,000. Headquarters, Jacksonville. Officers: A. W. Mackinlay, president and general manager; R. F. Ensey, vice-president, and Charles G. Wilson, secretary and treasurer. [May 1, '15.]

\***Furman & Yemassee Railroad, Furman, S. C.**—Chartered in South Carolina to build a 20-mile interurban railway between Furman and Yemassee. Capital stock, \$10,000. Incorporators: J. H. Adams, W. P. Ellis and H. Weindal.

\***Richmond & Eastern Railway, Richmond, Va.**—Chartered in Virginia to build a line from the Fulton Brick Works at Richmond to Fort Lee, Va., 5 miles. Capital stock, \$2,000 to \$5,000. Officers: John C. Robertson, president; J. Taylor Robertson, secretary and treasurer.

\***Kanawha Traction & Electric Company, Parkersburg, W. Va.**—Chartered in West Virginia to build an electric railway in Parkersburg from a point on the west bank of the Ohio River to extend by the most practicable route to a point at or near Murdock Avenue. Capital stock authorized, \$3,000,000. Incorporators: Mason C. Ambler, Edward Brast, W. W. Jackson, Harry Logan and Ben T. Neal, all of Parkersburg.

#### FRANCHISES

**Lowell, Mass.**—The Bay State Street Railway has asked the Council in Lowell for a franchise to extend its Varnum Avenue line from Lexington Avenue to Fowler Street.

**Lincoln, Neb.**—The Lincoln Traction Company has asked the Council for a franchise in Kansas City for an extension down K Street south to J Street and east to Randolph Street.

**New Rochelle, N. Y.**—The Westchester Electric Railroad has asked the Council for a franchise for an extension of its line on Winyah Avenue from North Avenue to the Pelham line in New Rochelle and also for a franchise to double-track its line on Franklin Avenue in New Rochelle.

**Cleveland, Ohio.**—The Cleveland, Akron & Canton Terminal Railway has asked for a franchise to build a four-track line between the lake and the Cuyahoga River Valley and under East Fifty-fifth Street, Cleveland. O. C. Barber, Barberton, president. [Jan. 30, '15.]

**Windsor, Ont.**—The Sandwich, Windsor & Amherstburg Street Railway has asked the Council for permission to build the Ferry Avenue loop line in Windsor.

**Petersburg, Va.**—The Petersburg & Appomattox Railway has received a franchise from the County Commissioners for an electric railway along the county road from Petersburg to City Point, 10 miles. Two small bridges will be required. Bids for construction will be received within sixty days. The company has given a bond for \$20,000 to Prince George County to complete the line by Dec. 1. Officers: T. M. Wortham, president; B. W. La Prade, vice-president, and W. W. La Prade, treasurer and chief engineer, all of Richmond. [May 1, '15.]

**Seattle, Wash.**—The Puget Sound Traction, Light & Power Company has asked the Council for permission to relinquish its franchises covering Stewart Street, between Sixth and Eighth Avenues; on Eighth Avenue, between Stewart Street and Lenora Street; and on Seventh Avenue, between Olive Street and Stewart Street in Seattle. The tracks on these streets have not been used by the company for many years. Some time ago the company asked to be allowed to suspend operations on these tracks, without relinquishing its franchise, and the Council opposed this proposition. The franchise committee of the Council has

stated that it will recommend for passage the ordinance accepting the relinquishment.

#### TRACK AND ROADWAY

**Monterey & Del Monte Heights Railway Company, Monterey, Cal.**—This company has received permission from the Railroad Commission to abandon the operation of its line between Monterey and Del Monte Heights.

**\*Jacksonville, Fla.**—Charles H. Mann, president of the Jacksonville Chamber of Commerce, has received preliminary surveys and data in connection with a proposed electric railway from Ortega to the Florida State camp ground at Black Point.

**Miami (Fla.) Traction Company.**—This company's line in Miami is nearing completion and a new bridge is to be built at once over the river at Twelfth Street. B. B. Tatum, Miami, president. [Feb. 6, '15.]

**Freeport Railway & Light Company, Freeport, Ill.**—Work has been begun on the 1-mile extension of this company's line to the southwest section of Freeport.

**Chicago & Joliet Electric Railway, Joliet, Ill.**—Announcement has been made that work on the proposed extension of the Hickory Street line in Joliet from Smith Street to Theilers Park will be begun at once.

**Quincy (Ill.) Railway.**—Among the improvements planned by this company during the year will be the rebuilding of its south track on Maine Street from Eighth Street to Eighteenth Street in Quincy. The roadbed will be leveled and new creosoted ties laid in a bed of concrete. Heavier and longer rails will be laid.

**Charles City (Ia.) Western Railway.**—This company will be operated under 1200-volt power. Seven miles of poles have been placed. There are 18½ miles to be electrified and 8 miles of extension. The grading is being done under the management of R. E. Shugert, Nevada. The bridge work has been let to William O'Neal, Sioux City. There will be 1500 ft. of bridge work; the longest bridge to be 750 ft. across the Little Cedar and a 30-ft. span over the Chicago, Milwaukee & St. Paul Railroad east of Charles City. Surveys are being made to Elma and Alta Vista, both of which connect with the Great Western Railroad. When completed it will be decided which one will be used.

**Iowa City (Ia.) Electric Railway.**—Plans are being made by this company to extend its lines to Manville Heights Addition via the City Park. The proposed line will extend to the intersection of Ferson Avenue and River Street in Manville Heights Addition to Iowa City. Work will be begun at once and it is expected that it will be completed by Aug. 1.

**Joplin & Pittsburg Railway, Pittsburg, Kan.**—This company has placed in operation its extension from Quincy Avenue in Pittsburg to Lincoln Park.

**Paducah, Ky.**—Plans are being made to revive the project to build an interurban electric line from Mayfield, Ky., to Humboldt, Tenn. Arrangements to finance the road were suspended last fall. R. H. McNeely, Paducah, is interested. [April 18, '14.]

**Kentucky-Southwestern Electric Railway, Light & Power Company, Paducah, Ky.**—Arrangements are being made by this company to resume work on the construction of its proposed electric railway from Paducah to Murray, via Mayfield.

**Brandon (Man.) Municipal Railway.**—The City Council of Brandon has decided to make the following extensions of its line in Brandon: Princess Avenue from Twenty-second Street to Twenty-fourth Street; from the present terminals on Victoria Avenue and Princess Avenue east to Percy Street; on Eighteenth Street, from Victoria Avenue to College Avenue and along College Avenue to Thirteenth Street.

**Boston (Mass.) Elevated Railway.**—This company plans to construct soon a new surface line in Fourth Street and across L Street, South Boston, which will provide a short route between City Point and the post-office district of Boston. By the new route the running time from City Point to the South Station will be cut to seven minutes and from City Point to Post-office Square to ten minutes. Nearly double this schedule is required on the more circuitous of the existing routes.

**Springfield (Mass.) Street Railway.**—Among the improvements planned by this company for the near future will be the relaying of new rails on its Bircham Bend line in Springfield.

**St. Paul Southern Electric Railway Company, St. Paul, Minn.**—Plans are being made by this company to extend its line through South St. Paul into St. Paul over the lines of the Minneapolis & St. Paul Suburban Railway which join that of the interurban company at Inver Grove.

**Kansas City (Mo.) Railways.**—Plans are being considered by this company to build 14 miles of double-track extensions in Kansas City. The new extension of the Prospect Avenue line northward from Fifteenth Street to Independence Avenue, Kansas City, has been placed in operation.

**Springfield Railway & Light Company, Springfield, Mo.**—The construction of an extension of the Monroe Street line to Phelps Grove Park in Springfield is being contemplated by this company.

**Omaha & Council Bluffs Street Railway, Omaha, Neb.**—This company contemplates 4 miles of track reconstruction in paved streets this year. This will be laid with 97-lb. 7-in. girder-grooved rail on 6-in. x 8-in. x 7-ft. white oak and creosoted red oak ties with 6 in. of crushed-rock ballast. Vitri-fied brick and granite block will be used as the pavement surface.

**Public Service Railway, Newark, N. J.**—Among the improvements planned by this company is the relaying of nearly 1 mile of new tracks in Orange Street, Newark, and the double tracking of the Newark-Paterson line through Passaic. The work will be of standard construction, with girder rails laid on a concrete foundation.

**United Traction Company, Albany, N. Y.**—Work has been begun in Albany on this company's extension of the Arbor Hill line. The branch will be double track and will extend from Judson Street to North Lake Avenue.

**International Railway, Buffalo, N. Y.**—This company plans to build an extension of its line to be known as the Abbott Road line, which will extend between Pearl Street and Erie Street and Abbott Road and Woodside Avenue in Buffalo.

**Walden, N. Y.**—Surveys will be begun at once by Thomson & Wooster, Walden, for the proposed line to connect the Orange County Traction Company's line at Walden with that of the Walkkill Transit Company at Goshen.

**Oakwood Street Railway Company, Dayton, Ohio.**—Construction has been begun on this company's extension in Oakwood. The line will begin at the junction of Brown Street and Main Street in Oakwood, and extend over Oakwood Hill and southward through Oakwood, following the Lebanon Pike as far as Peach Tree Road.

**\*Findlay, Ohio.**—Plans are being made to build an electric line between Ada and Findlay. No names are yet given of those interested in the project.

**Lake Erie & Youngstown Railroad, Youngstown, Ohio.**—Plans are being made by this company to resume work in the near future on its line to connect Youngstown with the shores of Lake Erie near Conneaut. Work was suspended several months ago on account of financial conditions. [Jan. 30, '15.]

**Toronto, Ont.**—The Ontario Legislature has passed acts authorizing the Hydro-Electric Power Commission of Ontario to report on, construct and operate electric railways under certain conditions, and some 300 municipalities have asked for surveys and reports on the feasibility of constructing lines through their districts. The commission has made preliminary surveys on about 1500 miles of line chiefly in southwestern Ontario and expects to issue reports soon to the municipalities. A report on the construction of a 100-mile line in the district north and east of Toronto has been made, and the ratepayers in eleven municipalities have passed by-laws and their councils have signed contracts with the commission asking for the construction of a line about 80 miles long through this district. This work will probably not be begun until the government has announced whether or not it will grant subsidies to these railways, and until the city of Toronto has arranged for a satisfactory entrance to the city. Frederick A. Gaby, Toronto, chief engineer, of the Hydro-Electric Power Commission.

**Toronto (Ont.) Suburban Street Railway.**—Construction has been begun by this company on its line between Toronto and Guelph. The roadbed is being constructed beside the Canadian Pacific Railway tracks from the Humber River to Islington. The new roadbed at this point is south of the Canadian Pacific Railway tracks. At Islington it runs under the steam railway line northward to Dundas Street. A new bridge is being built over the Humber River.

**\*Germantown, Pa.**—Plans are being urged by the Business Men's Association of Germantown to build an electric line in East Germantown, north of Cheltenham Avenue. The route will extend on Chew Street north of Cheltenham Avenue to Gorgas Street, east on Gorgas Street to Stenton Avenue, north on Stenton Avenue to Mount Airy Avenue to Germantown Avenue.

**Hershey (Pa.) Transit Company.**—Rails are being laid by this company on the last section of its line between Hershey and Elizabethtown.

**McConnellsburg & Fort London Railway, McConnellsburg, Pa.**—A contract has been placed with Reed & Company, Hazleton, to build this company's line between McConnellsburg and Fort London. [April 17, '15.]

**Charleston Consolidated Railway & Lighting Company, Charleston, S. C.**—The new interurban line between Charleston and North Charleston has been placed in operation.

**Chattanooga (Tenn.) Railways.**—This company, which is a subsidiary of the Chattanooga Railway & Light Company, will resume work within the next few months on its line between Roseville and Fort Oglethorpe. About two years ago work on the construction of this line was begun and about two-thirds of the cost of the work has been expended. All material for this work has been purchased.

#### SHOPS AND BUILDINGS

**Pacific Electric Railway, Los Angeles, Cal.**—Material has been received and construction will be begun at once by this company on its new passenger and freight building in Rialto. The structure will be of the Mission type and of cement construction. The work is being done by the Kling Contracting Company, Los Angeles.

**Ottumwa Railway & Light Company, Ottumwa, Ia.**—The office building in Ottumwa in which this company maintained its offices was destroyed by fire on April 22. Temporary offices have been secured.

**Charlottesville & Albemarle Railway Company, Charlottesville, Va.**—This company plans to construct an office building with substation in rear in Charlottesville. It also expects to purchase a 2000-kw rotary converter and material for 20 miles of 22,000-volt transmission lines.

#### POWER HOUSES AND SUBSTATIONS

**Pacific Electric Railway, Los Angeles, Cal.**—This company has ordered from the Westinghouse Electric & Manufacturing Company one 1000-kw, 600-volt d.c., 15,000-volt a.c., three-phase, sixty-cycle, 750-r.p.m. compensated wound d.c. generator, synchronous motor generator set.

**Baton Rouge (La.) Electric Company.**—This company expects to build a new \$200,000 power plant in Baton Rouge to replace the present power house. The structure will be 100 ft. by 75 ft. It is expected to install three 500-kw turbines and three 400-hp boilers.

**Scranton & Binghamton Traction Company, Scranton, Pa.**—This company plans to install in its power house at Scranton one 400-kw, 600-volt d.c., six-phase, twenty-five-cycle, 750-r.p.m., compound-wound, a.c., self-starting rotary converter; three 150-kva, 370-volt, high-tension to rotary voltage low-tension, single-phase, twenty-five-cycle, oil-insulated, self-cooled transformers and one two-panel switchboard. This apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

**Sheboygan Railway & Electric Company, Sheboygan, Wis.**—During the next few weeks this company plans to build a new water intake at its power station, lay seven new 440-ft. submarine cables across the river and build one brick distributing station on each side of the river into which the above mentioned cables will be brought. The company expects to purchase new circuit breakers, meters and other apparatus that may be necessary to rebuild its present railway switchboard.

## Manufactures and Supplies

### ROLLING STOCK

**Sioux Falls (S. D.) Traction System** has recently bought two cars.

**Norton & Taunton Street Railway, Norton, Mass.**, has ordered seven cars and one snow plow.

**Indianapolis Traction & Terminal Company, Indianapolis, Ind.**, contemplates the purchase this year of fifty city passenger cars.

**Connecticut Company, New Haven, Conn.**, advises that it is prepared to issue specifications for ninety-two new cars.

**Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine**, has ordered one motor freight car body from the Laconia Car Company.

**Androscoggin Electric Company, Lewiston, Maine**, has ordered one motor express car body with arch-bar trucks from the Laconia Car Company.

**Chicago (Ill.) Elevated Railways** has placed an order with the Cincinnati Car Company for 122 all-steel cars. The new cars are to be 48 ft. in length and similar in design to those built for the railway in 1914.

**Shore Line Electric Railway, Norwich, Conn.**, has ordered a dump car from the Universal Car & Manufacturing Company. The car is of the Universal 2-A trailer type and is equipped with M. C. B. couplers and Westinghouse air brakes.

**Detroit (Mich.) United Railway**, according to an official announcement, is taking steps to place orders for 100 center-entrance cars for use in the Detroit city service. The motors of the new cars will be of sufficient capacity to pull trailers, fifty of which the company expects to place upon the lines this year.

### TRADE NOTES

**Lord Manufacturing Company, Brooklyn, N. Y.**, has located its general sales office at 105 West Fortieth Street.

**Keyes Products Company, New York, N. Y.**, has removed its New York office from 71 West Twenty-third Street to Room 1847, 120 Broadway.

**Esterline Company, Indianapolis, Ind.**, has received orders for twenty-four SE-95 "Golden Glow" headlights from the St. Joseph Railway, Light & Power Company, and for twenty-two SM-95 "Golden Glow" headlights from the Bristol & Plainville Traction Company.

**Edwin G. Hatch, New York, N. Y.**, has received orders for sixty protective clamping sets for the overhead line crossings of the Lehigh Navigation Electric Company. Other recent purchasers are the Illinois Traction System and the Edison Electric Illuminating Company, Cumberland, Md.

**O. L. Remington**, general manager William McLean & Company, engineers, manufacturers and importers, Melbourne, Australia, is on a trip to this country investigating methods, apparatus and new developments in the electric railway field. Mr. Remington is accompanied by Mr. McColl, engineer of the firm.

**L. S. Brach Supply Company, New York, N. Y.**, advises that additions of its automatic flagman for road-crossing protection have been made on the following railways: Fort Wayne & Northern Indiana Traction Company; Lake Shore Electric Railway; Cleveland, Painesville & Eastern Traction Company; Wilkes-Barre Railway; Lackawanna & Wyoming Valley Railroad; Rhode Island Company.

**Mechanical Rubber Company, Cleveland, Ohio**, mechanical branch of the United States Rubber Company, recently held its fifth annual convention in Cleveland, at which meeting 106 of the department managers and representatives of the United States Rubber Company's stores were present. During the convention, which lasted one week, many interesting papers were read and discussed relating to the products of the company. A paper on tape, which comprises one of the large departments, was read by George E. Austin, manager of the New York branch.

**Jeffrey Manufacturing Company, Cleveland, Ohio**, has re-

moved its New York branch from 77 Warren Street to 50 Dey Street, adjoining the Hudson Terminal. The company in its new headquarters will carry stock in power transmission machinery, including shafting, hangers, pulleys, collars, couplings, clutches and bearings, and elevating and conveying appliances. It will also be prepared to handle orders pertaining to electric mines, industrial and storage-battery locomotives. George H. Mueller, assistant sales manager of the company, is manager in charge of this office.

**Philadelphia Toboggan Company, Germantown, Philadelphia, Pa.**, is manufacturing at its plant in Germantown a line of carousels and coaster cars for electric railway parks. The president of the company, Henry D. Auchy, was formerly in charge of the management of Chestnut Hill Park, near Philadelphia. The company formerly supplied its amusement devices to various parks in the United States on the concession basis, operating them from Germantown. It now has discontinued operating them and is only concerned with manufacturing them. Shipments have been made to Sydney, Australia, for White City Park of that city, and coaster cars have been built for parks of Paris and London. Devices have also been furnished for the Philadelphia Rapid Transit Company's Willow Grove Park, and for the Lehigh Valley Transit Company at Central Park, Allentown. The company is now building an artistic and elaborate device known as the "Panama Canal" for the Mahoning & Shenango Railway at its Idora Park, Youngstown, Ohio. The company is located at No. 130 East Duval Street.

#### ADVERTISING LITERATURE

**MacGovern & Company, New York, N. Y.**, have issued a bulletin of their electrical and steam machinery, cars and car equipment, etc.

**Chicago Pneumatic Tool Company, Chicago, Ill.**, has issued Bulletin No. 34-M describing and illustrating its Class "O" pneumatic steam and power-driven compressors.

**Edison Lamp Works of General Electric Company, Harrison, N. J.**, have issued Bulletin No. 43,550, which contains illustrations of various installations of its Mazda lamps for sign lighting.

**Ohio Brass Company, Mansfield, Ohio**, prints in its O-B bulletin for March-April, 1915, illustrations of the overhead construction in various locations of the lines of the Havana Railway, Light & Power Company, Havana, Cuba. Large quantities of O-B materials are employed in the construction of this double-trolley overhead system.

**Underwriters' Laboratories, Inc., Chicago, Ill.**, have issued a catalog which describes the organization, purpose and methods of the laboratories for the testing of appliances and devices in respect to life and fire hazards and accident prevention. The chief financial support of the laboratories has been received from the National Board of Fire Underwriters, under whose general direction the work is carried on. The casualty features are carried on in co-operation with the Workmen's Compensation Service Bureau.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.**, has issued a 135-page revised reprint of a series of articles which appeared in the *Electric Journal* and which describe switchboards for a.c. power stations. A large number of illustrations and diagrams of switchboards are contained in the bulletin. The switchboards are classed under the three following types: "The self-contained" panel type, the "remote mechanically controlled" type, and the "electrically operated" type. The company has also issued a folder describing its lightning arresters, of the multipath spark gap, condenser, magnetic blow-out, and electrolytic types.

**Albert & J. M. Anderson Manufacturing Company, Boston, Mass.**, has issued a catalog of its automatic time switches for opening and closing an electric circuit at any predetermined time of the day or night. These switches consist of three units, the switch proper including the current-carrying part; the propelling mechanism which operates the switch and the time element or clock. These time switches will close and open the circuit a number of times without resetting, thus requiring attention only when winding is necessary. Their performance may be

easily varied, as for instance, omitting operation on Sundays and holidays, and proceeding with the usual cycle on the following days. Various types of these time switches are described in detail in the catalog.

**Fort Wayne Electric Works of General Electric Company, Fort Wayne, Ind.**, has issued Bulletin No. 46,101 illustrating and describing in detail its Type P demand indicator or printometer. This indicator is designed for use in connection with a watt-hour meter whereby, at regularly recurring time intervals, a printed record is made of the total energy consumption as registered by the watt-hour meter. The indicator, besides registering the energy consumption, makes a simultaneous record of the time of day at which the various amounts of energy were consumed. From such record, the maximum demand, the time at which it occurred, and the demand during each period of the day can be easily determined. This information is of value in verifying or establishing equitable rates, determining load factors, or diversity factor, regulating the use of off-peak load, determining the use of break-down service, handling complaints and making special tests of power conditions. Bulletin No. 46,100 describes the Type M demand indicator or maxicator. This device is designed to give information in regard to the maximum demand for energy from the line as well as information in regard to the total number of kilowatt-hours used.

**Harrison Safety Boiler Works, Philadelphia, Pa.**, have recently issued a leaflet entitled "Testing V-Notch Meters," which points out that the feed-water meter is a sort of cash register for the coal pile, since it keeps a record of the returns in amount of water evaporated for the expenditure for fuel. When the evaporation is low, the operator will naturally look for the cause, and though he cannot watch everybody and everything the meter can do it for him, so far as the performance of the boiler is concerned. These facts lend special interest to the publication, which is No. 18 in the series of engineering leaflets issued by the company. It contains reprints of two important papers on the V-notch weir such as is used in the Cochrane metering heater. The first paper, by James Barr, describes at considerable length and detail the apparatus used by him and the results obtained in tests conducted at Glasgow University in 1907-1909, by which he established the fact that with a V-notch weir the true discharge for given conditions could be determined within 0.33 per cent. The other paper, by W. S. Giele, describes a commercial testing apparatus of large capacity installed by the Harrison Safety Boiler Works for the purpose of carrying out an extensive series of tests upon V-notch weirs of different dimensions as actually installed in commercial meter chambers which are manufactured by them. Both papers are interesting as illustrating on the one hand the many refinements which are essential in the precise investigation of problems in hydraulics, and on the other the admirable constancy of the V-notch weir when used under known and predetermined conditions.

#### NEW PUBLICATIONS

**The Act to Regulate Commerce.** By Herbert C. Lust. La Salle Extension University, Chicago, Ill. 1914, 337 pages. Cloth, \$1.75.

The average man has little knowledge of the work involved in the establishment and supervision of the national rate system. This is not surprising, however, for the interstate commerce act is itself long and intricate, and until recently there has been no analysis made of the principles governing traffic. Now, however, about 15,000 principles governing the movement of interstate traffic have been classified and analyzed, and this book presents these in such condensed and simplified form that a study of its pages will enable the laity to apply the interstate commerce act with a substantial degree of understanding. Electric railway operators who desire a readable and broad description of the theory and practice of the present rate system will do well to examine this treatise. The act is discussed section by section, and each is clearly and concisely explained. There is an appendix containing the complete text of the interstate commerce act and various amendatory acts.