

Electric Railway Journal

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No. 17

**INVESTIGATE
SNOW-FIGHTING
EQUIPMENT** Among the subjects which will be assigned for consideration this year by the Engineering Association, it has been suggested that it might be well to include an investigation of the subject of snow-fighting equipment. So far as we know, this matter has not been treated within recent years certainly by any committee, yet it is of very live interest to all companies in the northern sections of the country. A great variety of equipment is now in use on these properties, and almost an equally large number of theories exist as to the proper methods of combatting snow. All of these cannot be best for all conditions. One reason for a variety of practices in snow-fighting equipment is undoubtedly the fact that much of this equipment is home-made because it is used for only part of the year. Of course, home-made equipment may be just as efficient as any other for this purpose, but this fact is another reason why the subject could well be reviewed by a committee to compare the practices that are now used by different companies and to outline the requirements that are demanded of equipment for effectively removing snow.

**A FINE
REPORT OF
PROGRESS** We have already referred to the high character of the Atlantic City report of the sub-committee on social relations, abstracted elsewhere in this issue. Although called a progress report, it is actually one of the most important ever presented to the American Electric Railway Association. It is not only a dispassionate exposition of the advances made by electric railways in solving employee problems through social insurance, but also a far-sighted discussion of the future application of social economics along insurance lines. The committee strongly suggests, as a necessary and probable development of the near future, compulsory life and health as well as accident insurance for all American wage earners, most of which insurance, it states, could well be managed by joint boards of employers and employees in the various industries under regulations made by law. In the electric railway industry the best progress in procuring social insurance has already been made through mutual benefit associations thus jointly supported and managed, but if the industry is to secure the maximum benefits for employees as social insurance spreads, it must continue its good work along this line and so efficiently perform its social function as to keep itself free from the loads of other industries or overhead government costs. It is essential, therefore, that the electric railways thoroughly

understand the social insurance theory of assisting individual progress through the co-operative handling of hazards—a sane compromise between extreme paternalism and extreme individualism—and that they know the relative efficiency of methods under this theory. The sub-committee has furnished in elaborate form the material for such knowledge, and it should be used to the fullest possible extent by all electric railway officials.

**AXLE-MOUNTED
MOTORS ON
THE MILWAUKEE** On the giant locomotives for the Chicago, Milwaukee & St. Paul Railway, which are described in considerable detail on another page, there is one feature that seems to us to stand out in importance before all others, with the possible exception of the ingenious scheme whereby regenerative braking is accomplished with direct-current motors. This dominating feature is the successful application of the so-called trolley-car drive, or the direct-axle-mounted arrangement for the motors, and the fact that it has passed satisfactorily through practically a full year of service on these heavy engines cannot fail to have far-reaching influence on electric locomotive design of the future. To the axle-mounted motor may be ascribed the very great advantages of simplicity and accessibility, but for heavy, high-speed locomotives the low-hung non-spring-borne weight has frequently been regarded with suspicion. On the Milwaukee's electrified divisions the rail is of 85-lb. and 90-lb. weight with four-bolt and six-bolt joints, the rail being double spiked and equipped with tie plates at all curves. Manifestly, this construction is of a high grade, but it does not by any means go beyond the practice that is customary for the better class of steam railroad. As a matter of fact, there is no difference between the track construction on the Milwaukee's electric zone and that found throughout the remainder of the road. If, then, the Milwaukee's high-speed and ultra-heavy electric locomotives can be operated for a year without troubles on this score, it seems to be safe to say that the old bogey of track damage from electric locomotives with direct axle-mounted motors may well be laid away permanently. Whether the simplicity of this arrangement can overbalance the advantages of wider clearances and concentration of power that are possessed by the frame-mounted motor is, of course, still to be determined, but from the evidence at hand the issue between the two types of design can no longer be complicated by the highly nebulous question of the relative influence that is exerted by each one upon the track.

ELECTRIC RAILWAYS IN MOBILIZATION

We are very glad to see the military authorities taking up seriously the work long ago advocated in these columns, of organizing the electric roads of the country for maximum efficiency in case they should be needed for military purposes. The addresses of Colonel Baker and Captain King at the Atlantic City convention last week pointed the direction in which electric railway companies and their officials can be of assistance to the War Department, and we feel sure from the indications already plain that electric railway men will co-operate in the heartiest and most patriotic manner to the furtherance of so good an end. Not only can this great network of subsidiary lines be made immensely useful for mobilization, but it can be turned to admirable account in the organizing of a proper supply system.

The time has gone by when an army can cut loose from its base, as did Sherman's, and live on the country while carrying its supplies of ammunition with it. These last must now be so prodigious as to demand in themselves transportation facilities to an amount hitherto unimagined. The work of military transportation requires a close co-ordination of facilities which cannot be attained by any suddenly extemporized means. Everything must work intelligently together on a well-devised plan in order that the steady stream of material can be kept up. It is notable during the progress of the European war on the western front that more than one promising drive has been checked, not for lack of men, but for lack of shells.

There are hundreds of active and patriotic young men in the electric railway service, not immediately available for the organized army, who would esteem it both a duty and a privilege to fit themselves to deal efficiently with the work of the quartermaster's department along their own familiar lines of operation. They could do this without interfering with their ordinary duties or giving time which they could ill spare to temporary service, if only the military authorities would arrange a proper scheme of instruction. If our country unhappily should get into war it would need an immense host of officers trained at least in the rudiments of their duties, and how can it better further efficient preparatory work than by taking advantage of men who are professionally trained already in part of what would be their military duties. Many a man who is extraordinarily competent to devise and carry out an emergency supply system may be from age, physical disability or temperament unfitted for active service. This indeed is one of the great problems in England at the present time, to make each man fit into a co-ordinated scheme of defense in the most efficient fashion.

The working out of a great scheme of transportation service, utilizing the personnel made available by its experience, is of particular importance in a country of great distances like our own, and we earnestly hope that the good work now inaugurated will go on with the co-operation of the War Department. Such a movement is part of the general scheme of preparedness which is so clearly shown to be necessary at the present time.

MAKING SALARIES PUBLIC

At a recent commission hearing in which the cost of service was being analyzed with great care, counsel for the city requested that the names of all employees in the company's engineering department, with the salary received by each man, be read into the record or filed as a public exhibit. Representatives of the company immediately offered objection on the ground that the publication of names and compensations corresponding had never been the policy of the utility in question, and that such a course would be likely to impair discipline. As the city did not press for a ruling at the time, the issue was not forced, but the point raised was of much interest, and its discussion occupied the hearing for about half an hour.

The point was made that since salaries of employees in the public service are fixed and open to all inquirers, those of employees in quasi-public duty should be equally exposed. An important distinction, however, was overlooked in this connection. In the particular company before the board, salaries are paid to men as individuals of proved value to the utility rather than to the occupants of certain well-defined positions. In the public service, a stated position generally carries with it a stated salary, and so long as the incumbent can fill the office, his personal abilities expressed as variants above the normal have comparatively little effect upon his compensation. This, in fact, is one of the most depressing features of public service and is one of the chief arguments against governmental ownership and operation. The stimulus of financial reward is lacking in comparison with that in private or semi-private business.

It may be conceded that the city was entitled to know the details of the so-called special payroll of the company, so far as relates to the number of men receiving salaries of each grade, but it is hard to see that it is of the slightest consequence to the public interest to make public the facts that Mr. A receives \$150 per month, that Messrs. B and C receive \$125 per month each, and so on. We believe that fairness to the individuals whose compensation is often unknown to each other, and whose pay is settled by the management after careful consideration of their individual and personal qualifications, justifies a company in refusing to give out this information in any other form than the number of men receiving \$150 per month, the number receiving \$125, and so forth. In fact, it ought to serve the ends of justice in many cases to present a total of salaries for a department with the total number of men employed, enabling the average salary to be determined by simple division, and if demanded by the tribunal sitting in the case, the maximum and the minimum compensation accorded. Some consideration for the personal aspects of employment is still essential, and needless publicity of the earnings of specific individuals adds nothing to the value of evidence in a rate case, but tends to create dissatisfaction and possibly internal friction in an otherwise harmonious organization.

The Newspapers—Your Friends or Your Enemies?



The Public Utility Corporation Is Full of News—LET IT OUT!

WHAT would become of the department store that used, misused or didn't use at all the newspapers the way most utility companies use, misuse or don't use the press?

A public utility is even MORE DEPENDENT than a department store upon the good-will of the press and public.

But you say you have no lingerie bargains to advertise.

Perhaps not; but you have even more important things to gain than 49-cent customers.

You have a public service to sell.

To sell it in peace and profit you must have public UNDERSTANDING and GOOD-WILL.

You can get both by proper use of the newspapers.

The public utility corporation is full of news; LET IT OUT.

If you have anything to announce that is not news, pay for its publication in the form of advertising.

But your day-by-day affairs; what you are doing; how you are doing it; how that accident happened and how you purpose to prevent another like it; how

your income is spent; why you don't do some of the things that the public wants you to do—

All this is information that any newspaper is glad to print.

And the printing of it, coupled with the established conviction that your door is open to newspaper men, to anyone, in fact, who has a question to ask or a criticism to offer, will make the newspapers your AIDES instead of your enemies.

Do you cultivate newspaper men—owners, editors, reporters—as you cultivate bankers and politicians?

IF NOT, WHY NOT?

These days the newspapers make and break bankers and politicians—and railways.

If the press and the general public—which largely derives its opinions and impressions from the newspapers—

If these are your friends you won't need any others.

The best man to do the every-day cultivation of newspapers is a newspaper man—a PUBLICITY MAN.

What's that? you ask.

See Talk No. 4, next week.

Illinois Traction System's One-Man Car

A 32-ft. Two-Compartment, Single-End Design Has Been in Satisfactory Service for the Past Three Years on City Lines with Light Traffic Operated by This Company, the Equipment Including a Number of Novel Features

JITNEY bus competition on several of the Illinois Traction System's street railway properties, together with a desire on the part of the management to furnish a more frequent service at a lower operating cost resulted in the construction of a number of one-man cars by this company some three years ago. These equipments seat thirty-seven people and weigh 23,500 lb., so that they not only reduce platform cost but furnish a seating capacity equivalent even to some double-truck cars. Moreover, the reduction in weight decreases energy consumption, overhead and track maintenance. Aside from these features, there were incorporated in the car equipment safety appliances consisting of a dead man's control, air-operated doors and steps and an emergency rear door, all so arranged that the car cannot be started when the doors and steps are open and the doors and steps cannot be opened when the car is in motion. As a result the cars have proved to be as safe as any type operated by two men, and the past three years' experience with them has been thoroughly satisfactory from an operating standpoint.

CAR BODY ARRANGEMENT AND CONSTRUCTION

The general design, being of the one-man type, is arranged for single-end operation with exit and en-

trance doors at the front and an emergency exit door at the rear. The car floor is continuous through the car body and vestibules. The body is arranged in two compartments, namely, the main passenger compartment at the front end of the car, where space is provided for the entrance and exit of passengers as well as for the motorman, and a smoking compartment occupying the rear vestibule, the latter being separated from the main passenger compartment by a bulkhead fitted with a sliding door. Longitudinal seats are provided in the main passenger compartment, and there are seats along the sides and around the end of the rear vestibule, except for an aisle to the emergency door. The general dimensions are as follows:

Length overall, 32 ft. 4 in.

Height from top of rail to top of trolley, 10 ft. 9 $\frac{5}{8}$ in.

Height from rail to car body floor, 28 in.

Height from rail to top of first step, 14 in.

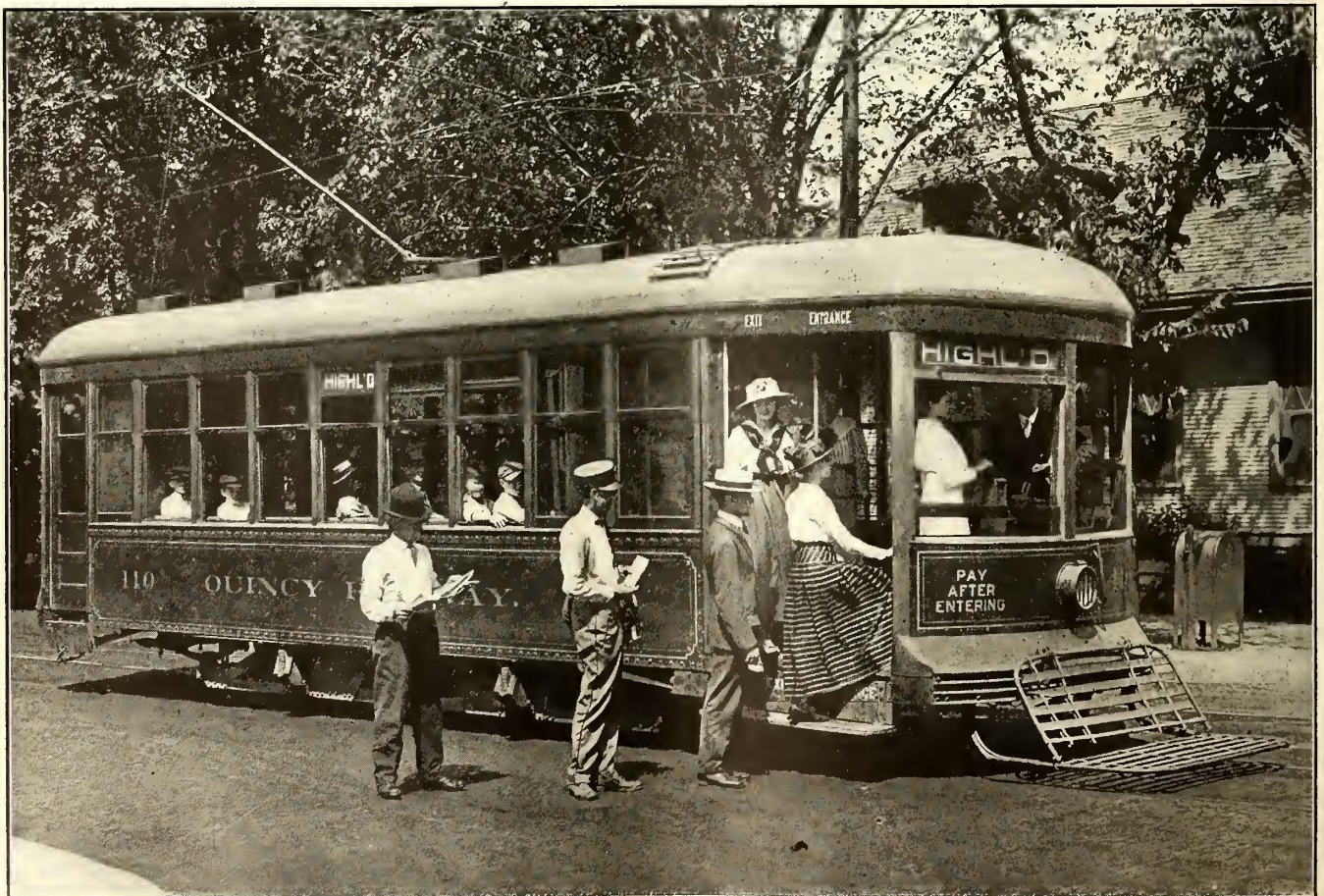
Height from first step to car body floor, 14 in.

Distance between side posts, 2 ft. 3 $\frac{1}{2}$ in.

Width of car over side plates, 8 ft. 2 in.

Gage of track, 5 ft.

The underframing of the car, which was greatly simplified by the omission of drop platforms, includes side sills that consist of $\frac{3}{8}$ in. x 2 $\frac{1}{2}$ in. x 3 in. angles running



ILLINOIS TRACTION'S ONE-MAN CAR—VIEW OF CAR IN SERVICE

ii. one continuous length from buffer to buffer and offset at one side for the exit and entrance doors in the front vestibule and for the rear emergency door. The two cross-bearers in the center of the underframe and those at the vestibule corner posts are formed of 3-in., 5.5-lb. I-beams. The next set of cross-bearers to those in the center of the underframe are 3-in., 7½-lb. I-beams, and those at the body corner posts are 4-in., 7½-lb. I-beams. Diagonal bracing in the two vestibule panels of the underframe is provided by two ½ in. x 3 in. x 3 in. angles. The underframe is of the side girder type, and the girders are formed of ½ in. x 32 in. plates reinforced at the top by ¾ in. x 3 in. belt-rails which extend the full length of the girder.

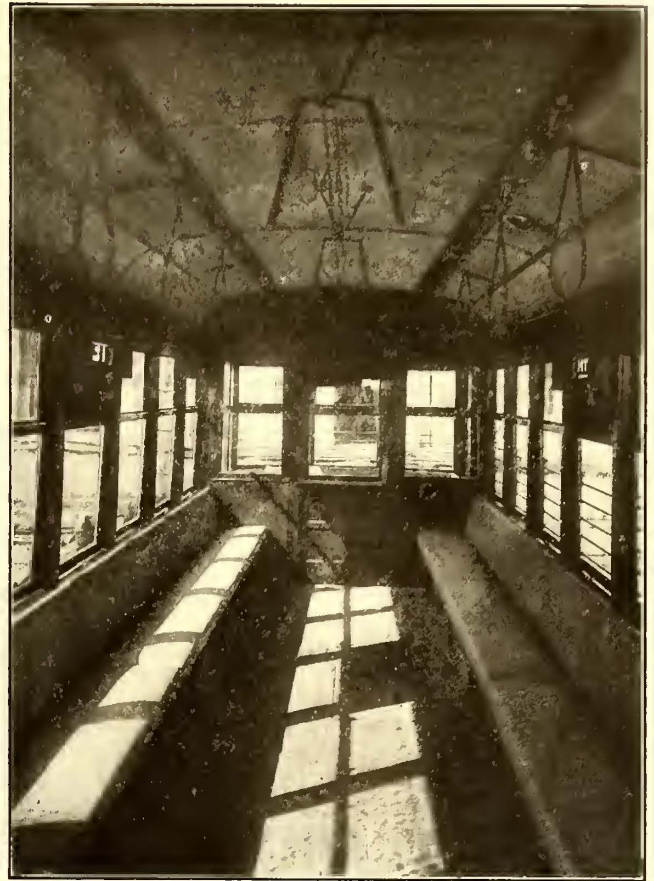
The posts are of ash mortised into long-leaf yellow pine sills which are bolted to the steel underframe. Each post is securely bolted to the girders by four ¾-in. turned-head carriage bolts. Plates are installed and these also are of long-leaf yellow pine and they are mortised for top-post tenons. The letterboard is made of poplar dapped over the side posts to which it is securely glued and screwed. The arm rails are made of ash dapped over the side posts, and the outside of the vestibules below the windows is covered with No. 14 gage steel. The roof is of the plain-arch type and of wooden construction, except over each side post where it is reinforced with a ¾ in. x 1¼ in. steel carline.

Mahogany of a plain design is used for an interior finish. The ceilings are formed of three-ply poplar veneer, the sashes are of mahogany and the hardware is highly polished bronze. The seats are of the longitudinal type and they are upholstered in rattan. Other specialties include the Consolidated Car Heating Company's buzzer system, Empire Safety treads and Pantasote curtains on Edwards spring rollers, fitted with Curtain Supply Company's ring-type fixtures.

TRUCKS AND SAFETY APPLIANCES

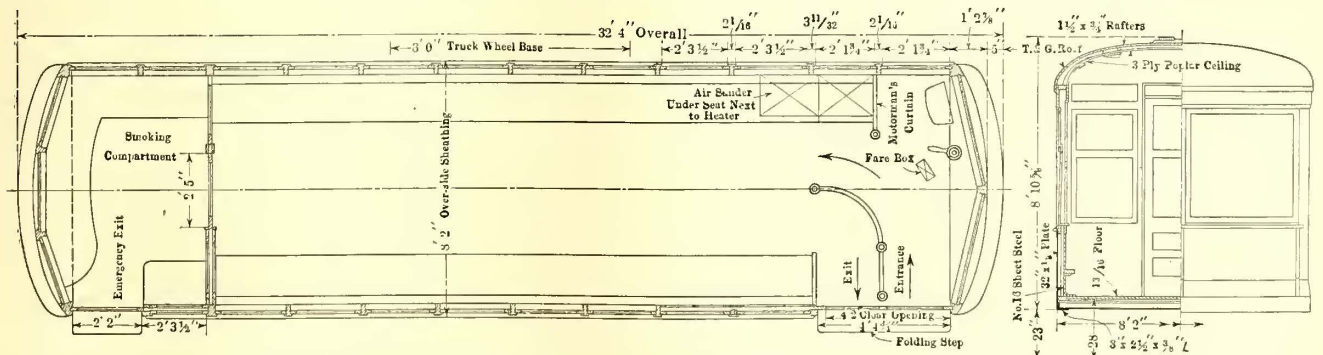
A single truck of special design has been provided for the car, the bottom member of the truck frame being formed of ½ in. x 3 in. x 3 in. angles, and the top member of ½ in. x 4 in. x 4 in. angle. Four elliptic springs are mounted on the four outside corners of the truck frame and these carry the body. The journal-box yokes are arranged to permit the wheels to be removed in an ordinary drop pit, and longitudinal motion of the car body is limited by providing a dampener between the truck frame and one of the body-underframe cross-bearers. Similarly, coil springs are provided in conjunction with the elliptic springs to obviate unnecessary vertical movement. The truck is fitted with 28-in. wheels, and has an 8-ft. wheelbase. The motors are Westinghouse Type 328, similar to those used on the original low-floor Pittsburgh car.

Undoubtedly the most interesting features of the car are included in the provisions to make its operation by one man safe under all conditions. As mentioned earlier



ILLINOIS TRACTION'S ONE-MAN CAR—INTERIOR VIEW OF CAR

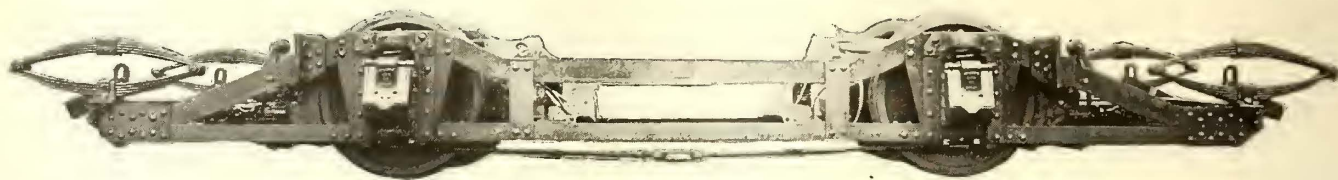
in this article, these features include air-operated doors and steps so arranged that the car cannot be started when the doors and steps are open, and they in turn cannot be opened when the car is in motion. In order to combine these functions in as simple an apparatus as possible for one-man operation it was necessary to purchase special equipment. Since doors and steps were to be air-operated and interlocked with the brake system the Westinghouse Traction Brake Company was requested to develop a brake apparatus which would not only perform its function, but would also operate the doors and steps and sand the rail in one operation. The resulting new type of equipment was described in the ELECTRIC RAILWAY JOURNAL for Sept. 2, 1916. Some features of the scheme of operation, however, were not mentioned in that description and may well be outlined at this time. Obviously, the object of the combined air-brake and door-operating apparatus is to reduce the number of handles to be actuated by the motor man. The brake valve, as described, has been arranged not only to supply air pressure to the air-brake apparatus



ILLINOIS TRACTION'S ONE-MAN CAR—FLOOR PLAN OF CAR AND CROSS SECTION

in the usual way, but to supply air pressure to the front-door operating cylinder, and also includes a feature which enables the motorman to sand the rails, merely by depressing the brake-valve handle.

edge gained in their operation has led to the development of a still lighter car designed on the same principles, and equipped with the same safety appliances, which have shown themselves to be an important oper-

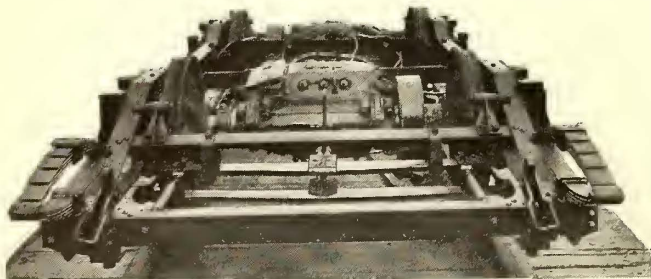


ILLINOIS TRACTION'S ONE-MAN CAR—SIDE VIEW OF SPECIALLY DESIGNED SINGLE TRUCK

In normal operation the plan is to control only the front door and step in addition to the air brakes by means of the brake valve. The rear door is intended for an emergency exit, and its operation is controlled by an emergency valve and not directly by the brake valve. On any occasion which produces an emergency action of this valve, an emergency application of the air brake is made, and the front and rear doors and steps open. After such an application of the emergency valve a pause of approximately twenty seconds is required before release of the brake and doors can be effected. In order to avoid holding the front and rear doors open for that period of time in disagreeable weather, a cut-out cock with a side vent has been installed in the motorman's cab adjacent to the brake valve, which, if operated, will serve to release and close the doors and steps, but this in no way affects the air brakes. Emergency operation may be caused in four different ways—by placing the brake-valve handle in the emergency position; by removing the hand from the controller handle while in a feeding position; by opening the conductor's valve, or by a rupture in the air-brake piping system.

Safety under all operating conditions was the motive which also governed the design of the door-operating mechanism. When the front door is opened the step drops quickly and it is in the lowered position by the time the door is opened 12 in. or 14 in. Any additional travel of the door toward its open position does not affect the step, and consequently when it is being closed the door will travel to within 12 in. or 14 in. of its closed position before the step is raised. The general operation of the rear-door mechanism and step is similar to that of the front door step, except that the rear door is automatically fastened shut so that it cannot easily be opened by hand.

Reference has already been made to the fact that these especially-designed one-man cars were put in operation in August, 1913. The complete description,



ILLINOIS TRACTION'S ONE MAN CAR—END VIEW OF SPECIALLY DESIGNED SINGLE TRUCK

however, has been withheld until experience has proved the equipment satisfactory from every standpoint. Since their construction the cars have thoroughly established their reliability and economy and the knowl-

ating feature of this type of car. The cars were designed by J. M. Bosenbury, superintendent of motive power and equipment, under the direction of H. E. Chubbuck, vice-president executive of the Illinois Traction System, and they were built in the shops of the St. Louis Car Company, St. Louis, Mo.

Doherty Railway Managers Meet

Discuss Operating Topics—F. R. Coates Suggests Ten Commandments for Improving Public Relations

THE first separate convention of traction managers of the Doherty Organization was held at Toledo on Oct. 5, 6 and 7. What bids fair to be a permanent result of the convention was the appointing of a committee consisting of J. H. Van Brunt, St. Joseph, chairman; Albert Swartz, Toledo; B. Waller Duncan, Cumberland; C. D. Flanigen, Athens, and R. L. Lindsey, Durham, to draw up recommendations for the handling of Doherty railway problems, and which will be submitted to the firm. This committee at the conclusion of the convention announced that on account of the many meritorious features of the discussion, it was decided to hold a conference before drawing up the final recommendations. This meeting will be held at St. Joseph, Mo., very shortly.

The two-day session was attended by about forty Doherty men, many of whom were cadets at the Toledo school. All the traction managers were present with the exception of Guy W. Faller, Amarillo; W. H. Merritt, Bartlesville, and A. B. Paterson, Meridian. These managers were prevented from attending by pressure of business. Meridian was represented by T. F. McArthur.

The convention was opened by Chief Engineer Bump and the visitors were welcomed by Frank R. Coates, president Toledo Railways & Light Company, and also by Mayor Milroy of Toledo, whose address showed the standing of the Rail-Light Company and Mr. Coates personally in that city and with its chief executive. This tribute was considered an excellent example to the other managers of the value of a friendly public policy.

A letter written by Henry L. Doherty to Harry Abel some fourteen years ago, when the latter was managing the San Antonio property for the American Light & Traction Company, was read by Mr. Scott as a standard example of what a managerial report and analysis should be. R. F. Carbutt, traction and district engineer, then explained the purpose of the gathering.

Mr. Coates spoke on "Public Relations" and told of his Toledo experience and recommended courteous reception of all complaints and also a careful investigation. "Welfare Work and Public Policy" were the topics treated by Mr. Bump. "Transportation" was the subject treated by Mr. Van Brunt, and one of his important points was the consideration of schedules.

R. L. Baker, electric and district engineer, read a paper on "New Business Methods for Railways," and advocated the adoption of a numerical system to indicate routes to the traveling public, this system having been in successful operation in Chicago and Philadelphia for several years. E. R. Kelsey, advertising manager Toledo Railways & Light Company, in an address on advertising advocated a central bureau to handle all Doherty advertising and particularly that in the street cars. This was along the lines suggested by S. B. Severson, general manager of the Manhattan & Queens Traction Company, who spoke on "Discipline" and believed in the merit and demerit system, as he has used this on the M. & Q. with good success.

Dewey C. Bailey, of the legal department of the Toledo Railways & Light Company, spoke on "Claims," and believed that the trained man is the best preventer of accidents. Harry L. White, assistant commissioner of safety, reviewed the work done in the last year. J. M. Enright read a paper on "Handling Crowds."

At the conclusion of the first day's session the delegates visited the Water Street plant and the Overland works and at night were the dinner guests of Mr. Coates at the Toledo Club.

On Friday W. W. Lowe, in charge of the Toledo Cadet School, spoke on possible economies in electric railway operation and advised rapid braking and starting. C. E. Murray, secretary Toledo Railways & Light Company, led the discussion on accounting and referred to several short-cut methods in use in Toledo, such as the counting of transfers. The paper on "Track" read by Albert Swartz, track specialist of the Doherty organization, uncovered a great difference of opinion on what should constitute standard construction and maintenance. It was generally agreed that uniform practice was not yet practicable because of the many differences in traction properties. Improvement in design of overhead work both as regards money expended and maintenance was treated by W. E. Richards of Toledo. H. F. Wheeler, general manager of the Hattiesburg (Miss.) Traction Company, spoke on the problem of the small company because of the serious competition with privately-owned automobiles. He stated that his company had partially met this obstacle by one-man car operation. Mr. Lindsey, general manager of the Durham (N. C.) Traction Company, in discussing one-man operation reviewed operations in Durham and discussed types of cars and methods of fare collection. This latter topic also showed great diversity of opinion.

At the conclusion of the Friday session the visitors were the guests of E. H. Close, who took them on his private yacht to Put-in-Bay. On Saturday the delegates went to Cleveland on a special interurban car and visited the Cleveland Railway shops. The sixty new cars for the Toledo system being built at the Kuhlman shops of the Brill Company were also inspected.

TEN COMMANDMENTS FOR IMPROVING PUBLIC RELATIONS

One of the features of the convention was the suggestion of ten commandments to be observed by corporation men in their dealings with the public. This suggestion was made by Frank R. Coates and the commandments were as follows:

"A kind word quietly spoken will make friends.

"Take the public into your confidence. Lay all cards face up on the table.

"Give service that is everything that the word implies.

"Treat your employees and the public as you would be treated. Apply the Golden Rule in business.

"Remember we are all human and likely to err. Be patient.

"Keep your property maintained as nearly as possible to the 100 per cent standard.

"Officials should become connected with civic uplift bodies. Be an active member. Do your share of the work. Don't hesitate to let the public know you. Be one of them.

"Corporation offices should be devoid of red tape, and the doors should be open to the public.

"Don't keep callers waiting too long.

"Keep promises. Don't make any that you can't keep."

According to Waller B. Duncan, general manager of the Cumberland & Westernport Electric Railway, the good conductor is a mindreader. Mr. Duncan, who rose from conductor to general manager, was of the opinion that this was a necessary mental attainment. Some of his ideas were as follows:

When a passenger gets on, the conductor sometimes has to be a mindreader to sell tickets and prepare a transfer.

If he is acquainted with the men and women on the routes, he must know at which department store the women want to shop first and whether the men want to get breakfast or go to the barber for a shave before going to the office.

The mindreading conductor tells the hurried man he has forgotten his umbrella or the forgetful woman that her pocketbook is open. He must be a directory, timetable and show guide.

He should know where Mary Pickford is playing on that particular day and the chance for seeing the first inning at the ball park. Sometimes he holds the baby while mother gets out the tickets. He must be a fount of information. But mindreading is the most important part of his work.

Company Section Exhibit at the Convention

The committee on company sections of the American Electric Railway Association made a very attractive exhibit near the Greek Temple on the pier at the recent convention, showing the lines of work and social activity followed by several of the sections. Framed groups of



BOOTH OF THE COMMITTEE ON COMPANY SECTIONS ON THE
PIER AT ATLANTIC CITY

photographs, volumes of circulars and data sheets, etc., were attractively displayed. The booth, which was arranged to serve as the headquarters of company section members, proved to be a popular rendezvous, as is shown in the accompanying illustration.



R. C. GREEN



J. J. REYNOLDS



S. B. HARE



H. G. WINSOR

Accident Prevention and Adjustment

Papers and Written Discussions Before Claims Association in Atlantic City, Oct. 9-12, Covered the Four General Topics of Compensation Laws, the Near-Side Stop, Automobile Accidents and Traffic Regulations, and Fundamentals in Claim Work

THE ELECTRIC RAILWAY JOURNAL of Oct. 14, page 820, contained a report of the president's address and the proceedings of the Claims Association at the convention in Atlantic City on Oct. 9-12. According to the usual custom of this journal, the various papers read at the several meetings, together with the scheduled written discussions thereon, are presented in abstract this week on the following pages:



A. D. BROWN



E. P. WALSH



C. G. RICE

Ohio's Compensation Act

BY R. C. GREEN

Accident Department, Cleveland (Ohio) Railway

OHIO passed its first compensation act May 31, 1911. The constitutionality of the act was attacked by a suit filed in the Supreme Court, the chief grounds being the taking of private property without due process of law and interference with freedom of contract. The court, however, decided the act to be constitutional.

Most innovations in their inception are crude, and in this respect Ohio's compensation act was no exception to the rule. This was an elective measure making it optional with the employer as to whether or not he would join the state fund, and his failure to make such an election denied him, in an action for personal injuries by an employee, the defenses of the fellow-servant rule, assumption of risk and contributory negligence. It provided for the payment of premiums by both employers and employees. Employers, however, were not to be stampeded, and out of a total of about 18,000 employers only 4000 became members of the fund. This attitude, of necessity, resulted in lack of funds, and it was apparent that before the act could become successful an amendment would be necessary, embracing the feature of compulsory membership.

This, however, could not be done until there was an amendment to the state constitution. Accordingly, in

1912 the constitution was amended, providing for compulsory contribution by employers to a state fund to be administered by the state. This was adopted by the people at a special election Sept. 3, 1912. In February, 1913, the General Assembly amended the act of 1911. The act of 1913 did not differ materially in principle from the act of 1911, except that it was compulsory and applied as well to public as to private employers of five or more workmen. An employer under the amendment who failed to contribute his quota to the state fund or, in other words, failed to become a member thereof, was denied the common law defenses of fellow-servant rule, assumption of risk and contributory negligence. Furthermore, an employee might, in lieu of an action for damages, file application for compensation with the board, and if the claim was honored and not paid by the employer a penalty was added. This forced employers to join the fund.

In view of a decision by the United States Supreme Court (*Noble State Bank vs. Haskell*), an Oklahoma case which provided that it was constitutional to levy an assessment against banks and thereby create a fund from which depositors might be reimbursed in cases of insufficient funds of insolvent banks, all doubt seemed to be removed.

DEFINING "WILLFUL ACT"

Under the act as it now stood, the employer was not protected if the injury was caused by the "willful act" of the employer or his agent, and up to this time there had been no legal interpretation of the words "willful act." The ambiguity of this phrase afforded a loophole for the damage lawyer, inasmuch as it became a question for the determination of the jury under the instructions of the court.

It fell to the lot of the Standard Boiler & Plate Company, a corporation doing business in Ohio, to be the martyr. A suit was filed in the federal court by an employee who had been injured. The cause of action was predicated upon the alleged "willful act," and the defendant set up by way of answer that it had paid its premium into the state fund and was therefore protected by the terms and defenses of the compensation act. The court charged the jury that willful negligence must amount to wanton negligence, or to use the language of the court, "the act complained of must have been such an act as to evince an utter disregard of consequences so as to inflict the injuries complained of." The jury returned a verdict of \$14,000, which was affirmed by the Court of Appeals of Cincinnati and paid.

At the reconvening of the Legislature, however, another amendment was passed defining "willful act" to be an act done knowingly and purposely with the direct object of injuring another. This stopped that sort of litigation, but did not restore to the Standard Boiler & Plate Company its \$14,000. Legal ingenuity aided by legislative ignorance had exacted its tribute and had been paid in full.

PAYMENTS UNDER OHIO LAW

In the event of an injury to an employee of an employer who has elected to operate under the act and paid his premium into the state insurance fund, it is the duty of the Industrial Commission to award to the injured employee, upon application and proof of his claim, an allowance for medical, nurse and hospital services and medicines, not exceeding in any instance the sum of \$200 and 66 2/3 per cent of the impairment of his earning capacity during the continuance of his disability, not to exceed a maximum of \$12 and not less than a minimum of \$5 per week, and if the employee's wages are less than \$5 per week, his full wages for a period of time not exceeding six years from the date of the injury, the aggregate amount of such payments not to exceed \$3,750. If the disability is permanent and total, the award is 66 2/3 per cent of the average weekly wage, to continue during the disability of the injured employee, with a maximum payment of \$12 per week. When the injury causes death within the period of two years after the injury and the decedent leaves no dependents, funeral expenses only are paid. If there are wholly dependent persons at the time of the death, the payment is 66 2/3 per cent of the average weekly wage, and continues for the remainder of the period between the date of the death and six years after the date of the injury, with a maximum and minimum of \$3,750 and \$1,500 respectively. If there are partly dependent persons at the time of the death, payments are made for all, or such portions of, the period of six years after

the date of the injury as the board in each case may determine, with a maximum of \$3,750.

DEALING DIRECTLY WITH EMPLOYEES

Under Section 22 of the act, employers of sufficient financial ability or credit to render certain the payment of compensation to injured employees, or to the dependents of killed employees, may deal directly with the employees or their dependents. Employers so electing are compelled to pay into a fund, provided for by the act, a sum equal to 10 per cent of their premium. This 10 per cent rate was to prevail until the fund totaled \$100,000, when it was to be reduced to 5 per cent. It has long since been reduced, as the fund is now approximately \$500,000.

At the time of the preparation of this paper, a suit was pending in the Supreme Court attacking the constitutionality of Section 22. It is contended that Section 22 is in contravention of the state constitution, which provides that all laws of a general nature shall have uniform operation throughout the state. It is further asserted that it conflicts with the fourteenth amendment of the federal constitution, which provides: "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor deny to any person within the jurisdiction the equal protection of the laws."

About 1200 of the large employers of labor throughout the state are paying the 5 per cent into the fund and compensating their employees direct. Out of a total of thirty-four street railways within the state, eleven being urban and twenty-three interurban, all of the urban lines are operating under Section 22 and twelve of the interurban are so operating.

In 1914 the premium of the Cleveland Railway, the largest street railway of the state, was \$49,519. A total of 5 per cent of this amount, \$2,476, was paid to the state, and to its employees in compensation it paid \$12,968, making a total cost of \$15,444. In 1915 5 per cent of the premium amounted to \$2,292, and to its employees the company paid \$6,700, making a total of \$8,992. This decrease was due to the fact that the number of accidents to employees was reduced 50 per cent in 1915 as compared to 1914. The estimated premium for the first six months of 1916 is about \$24,000, making the 5 per cent premium \$1,200. About \$3,500 was expended in compensation.

OHIO COMPENSATION IS SATISFACTORY

Because of the growth of the properties, it would be difficult to make any very satisfactory comparison with former years, but it is safe to say that state compensation is satisfactory to the street railways of Ohio and to their men. Compensation has resulted in a benefit not only to employers and employees, but to the commonwealth generally. Employees have been benefited in that they have received the compensation due them without having been compelled to divide it with some damage lawyer. Moreover, the ordinary juror of to-day regards himself as a sort of avenging hero whose duty it is to see how quickly and how thoroughly he can separate a defendant in a damage suit from his bank roll, never for one moment thinking that ultimately the consumer, "Mr. General Public," must foot the bill. He goes upon the theory that the defendant has some mysterious source of revenue. The saving, therefore, to the community also is generally of no small consequence.

LEGISLATION FOR INJURIES TO PUBLIC

Everyone will agree that this fixed statutory method of compensation is a step forward. It is a progressive

enactment, promoting prosperity and personal happiness. Am I stepping beyond the realm of reason, therefore, if I suggest that a legislative enactment, providing a fixed method for compensating those injured by public service corporations, would be beneficial? Is it any more fanciful or chimerical than the idea of state compensation twenty years ago?

The time may not be propitious for an innovation so radically divergent from the methods employed at present, but inasmuch as such a change can only be accomplished through the creation of a favorable public sentiment, it seems to me that it should be the sense of this organization, both individually and collectively, that it bend every effort toward the conversion of this idea into a reality, the undoubted result of which would tend to bring about a better feeling between this class of corporations and their patrons.

Written Discussion

BY LEONARD J. TYNAN

Attorney Public Service Railway, Newark, N. J.

Personally, I like compensation law. I have always felt, and still feel, that it is logically unsound, but it is a wise provision for the state, for the courts, for the master and for the servant. And it has come to stay. The drift of legislation, however, will be to make the burdens of the law excessive. This inclination of our law-makers will have to be constantly watched. I know of no better safeguard in this direction than to fight to keep all classes of employers within the provisions of the law. Some of the states attempt to draw a distinction between hazardous employments and non-hazardous employments. This is an absurdity. The man who loses a leg does not much care whether he lost it making cheese or making dynamite. His remedy should be the same in either case. Whether an industry be non-hazardous or not, it should be kept within the law. If the hazard is low, the insurance against hazard also will be low.

COMPENSATION LAWS LEVEL GOOD AND BAD CASES

In states in which compensation laws are new, and while they remain new and untested in the courts, it is wise to have express written agreements between master and servant, if the compensation plan is adopted, providing that settlements made under the new law shall remain conclusive whether or not the law be upheld by the courts. This is a safeguard against possible confusion, for otherwise the nullifying of a statute, after many cases have been settled under it, would open up all the supposedly settled cases. Such a result would perhaps compel the employer to pay further damages in cases in which he had been negligent, without any hope of recovering back money paid in cases where he had not been negligent. It must always be borne in mind that the theory of compensation laws is the levelling up of all cases, good and bad, so that compensation is paid whether the employer be to blame or be absolutely innocent. In New Jersey, the only exceptions are those very rare cases in which the employee willfully and intentionally injures himself or commits suicide, and where the accident is caused by the intoxication of the injured person. And to meet the additional cases that must thus be paid for, there is a levelling down of the amount to be paid.

The man who loses a leg, for instance, cannot get a verdict for \$5,000 or so as he once might. In New Jersey, the compensation for loss of a leg is 50 per cent of daily wages during 175 weeks, with a minimum of \$5 a week and a maximum of \$10 a week. So \$1,750 dis-

tributed over a period of 175 weeks, or approximately three and one-half years, is the highest compensation that such a man can receive for the loss of his leg. There is, of course, something additional in that he will get 50 per cent of his daily wages while the wound is healing, and his medical expense for the first two weeks. Thus the reduced damages payable enable companies without undue strain to pay for the greater number of cases, although in the case of my company compensation as a whole is somewhat in excess of the charges for litigation and damages under the old system. Perhaps the difference is made up in the better relations that exist between company and employees. The bad blood and rancor of the old days have practically disappeared. Cases are almost always settled without friction, and men who would formerly leave our employ and hire a lawyer to sue us, now get better and go back to work.

POINTS ARISING UNDER NEW JERSEY LAW

In New Jersey, we have to be careful to get our rate of compensation properly adjusted, for the courts have held that over-payments will not, on adjustment, be credited to the payments due in the future, but that they will be considered as gratuities. In the early days of the law, we did some things which we would not dare to do now. I recall one case in which we loaned a poor fellow \$200 to get a cork leg, and then went into court and got a commutation to a lump sum of sufficient of his payments to enable him to repay to us the loan. In the present state of our law, we would not dare to do that, for the courts would hold that the injured man's weekly payments could not be commuted in order to pay a debt.

Occasionally a case arises in which commutation is an advantage to the injured party. Some times weekly payments over a considerable period will be commuted to a lump sum in order to enable him to buy a store or start in some small business. It is quite common to commute future payments to a lump sum for a widow who, with her children, is about to return to Europe. Such commutations are calculated upon a 5 per cent simple interest rebate basis. One of the odd features of our New Jersey statute is that in death cases, if a dependent dies, or if a widow re-marries, the right of such dependent or widow to compensation shall cease. Nevertheless, our courts, following the language of the statute, will commute future payments in death cases to a lump sum, and allow the widow and children to take that lump sum abroad, regardless of the fact that such commutation must be on a 5 per cent simple interest basis, and that no allowance is made to the employer for the chance of the widow marrying again, or for the possibility of the death of the widow and other dependents.

An interesting feature of our statute is the situation that arises when one of our workmen, while about our work, is injured by a third party. For instance, one of our conductors might be knocked off the running board of a trolley car by a recklessly driven automobile. In such a case, our New Jersey statute provides that we must pay compensation to the conductor for his injuries, but that any money recovered by him from the owner of the automobile shall be credited upon such compensation, and if we file a notice with the owner of the automobile, setting forth our position, such automobile owner could not settle with our conductor until he had first paid us, out of the money payable by him to the conductor, the amount which we up to that time had advanced to the conductor as compensation, or such part of said amount as the payment by the automobile owner to the conductor amounted to.

Our statute contains a great deal about agreements

between the parties. For instance, it contains a statute of limitations, that unless an agreement be made, or a petition for compensation filed, within a year, the injured party will be too late. Now, as a matter of fact, agreements are seldom made in injury cases. They are in death cases, because there the amount can readily be fixed, but injury cases depend upon the length of time required to heal the injury. Our usual practice in such cases is to begin payments at the end of the first two weeks, during which time we pay only the medical expenses, and to continue the payments until the injured man goes back to work, of course having due regard for the statutory limitations as to the time that payments shall continue. The limitation for temporary disability is three hundred weeks. The limitation for disability total in character, and permanent in quality, is four hundred weeks. The limitation in death cases is three hundred weeks.

In New Jersey there is no obligation to the employer to insure for the benefit of injured workmen. I am inclined to think that such insurance should be required from all employers, except those who are able to prove their solvency to the satisfaction of the state authorities. Where insurance is required, a momentous question is whether to insure in a private company or in a state fund, which the states requiring insurance are providing, or to carry one's own insurance, depositing insurance with the state as a guarantee. The state fund is usually safer insurance than that of a private stock company, because in some states, at least, insurance in a private stock company only relieves the employer if such private stock company makes good, while insurance in the state fund is an absolute and final relief to the employer. It must be remembered that, under the laws of some of the states, these weekly compensation payments have, in some cases, to be continued over a period of many years. An insurance company which is at present perfectly solvent, may, ten or fifteen years from now, get into financial difficulties, and the burden that it had undertaken, and could not carry out, would be returned to the shoulders of the employer that had trusted it.

ADMINISTERING THE LAW

In New Jersey, we consider ourselves fortunate in being able to administer the law ourselves. This would be more difficult where insurance was required. The advantage of an employer dealing directly with his workmen is that it gives a chance for good feeling and sympathy to develop between the master and the servant. Our settlements are all reported to a State commission, and the settlement is not considered conclusive until this commission has approved of it. The commission also undertakes to bring parties together where misunderstandings exist, without the intervention of lawyers and with as little expense and delay as possible. Where the parties fail to agree, the commission can order the matter into court for a hearing. A very small percentage of our cases reach the court. Occasionally we are compelled to go there because of unreasonable demands by the injured party, or because some legal question concerning the case may arise, which can only be settled by a court decision.

Under our New Jersey statute, we are supposed to supply medical aid to the injured man for the first two weeks. Of course it is sometimes an advantage to ourselves to supply such aid for a longer period, as it pays to get the man well and back to work as soon as possible. The injured party must accept the medical aid which we tender. If he insists on getting his own physician, we do not consider ourselves responsible for such physician's bill unless, of course, we approve of his being

hired in the first instance, which, as a matter of fact, we sometimes do.

We have some difficult problems to decide in the administration of the statute. A watchman is set to guard a trench which we have dug in order to locate a leaking gas pipe. At four o'clock in the night, he tells a policeman that it is cold; he wishes he had his overcoat. Two hours later he is found dead, sitting at the bottom of the trench. He died from gas asphyxiation. There is no evidence that the guards about the trench have been disturbed. There is nothing to show that he fell into the trench. Did he die while performing his duty, or did he die while neglecting his duty to take a nap? The welfare of three or four little orphan children depends upon our decision in this matter.

A conductor on our trolley car is hit in the eye by a stone which a boy threw. The stone first hit the wire gate, and then bounced off against the conductor's eye. If the stone was not thrown intentionally at the conductor or the car, then getting in range of the stone was merely one of the incidents of travel in the street, and was not one of the hazards peculiar to the conductor's employment. If the stone was thrown at the conductor, it was merely one of the ordinary hazards of the street. If the stone was thrown at the car, or at the conductor because he was in charge of the car, then it was an extraordinary hazard due to the conductor's employment. As we could not find the boy who threw the stone, it was difficult to ascertain whether we should, or should not, recognize the claim of the conductor for the loss of the eye.

SETTLING WITH DEPENDENTS

It is important in death cases to get signed statements from the decedent's relatives as early as possible. Our New Jersey statute provides for a varying percentage of compensation in death cases, the percentage depending upon the number of dependents left by the decedent. If the relatives of a decedent are carefully approached before they are acquainted with the intricacies of the law, they are likely to tell the truth. After they learn from some lawyer what the requirements of a dependent are, they cannot so well be relied upon. Sometimes the desired information can best be obtained by back-handed action. If we say to the father of a man who has been killed—"Why, your son supported you, didn't he?"—he will become indignant, and will say: "No, indeed, I am quite able to support myself; he never did anything for me." Then is the time when you want him to put the statement in writing and sign it.

We recently had a case of a conductor who came from North Carolina and was killed at his work. We located his people, had the body shipped to his home, paid \$100 toward the funeral expenses and had an interview with the father, who came North to our office to talk over the matter. The father signed a statement to the effect that the boy was single and had no dependents, and that while he occasionally sent money home to his sister, the father did not know how much. Later on, this father hired a lawyer, and the case got into court. We lost it. Despite the father's statement that the son had no dependents, he testified that the son sent him money every few weeks, \$15 or \$20 at a time, and that he, his wife and daughter had great trouble in getting along without this money. When questioned about the signed statement that he had made, he was prepared to argue about the meaning of the word "dependent," and said: "I meant by that to say that we did not entirely depend on the boy, that I earned something." We lost the case, but we learned a lesson. We seldom use the word "dependent" any more.

Just now we have the case of a colored man who was killed. He was single and childless. His father was in our office recently and made a statement about his boy. We did not ask him whether the boy had anybody dependent on him. Instead of that, the father made, signed and swore to a statement before a witness, that since the boy left home last Christmas, he had not sent any money home except a present of \$15 to his mother. That colored man will have hard work to argue aside the expression, "had not sent any money home."

This question of dependency in death cases gives us considerable trouble. Sometimes, in case of the death of a single and childless man, his entire family circle, father, mother and sisters and brothers, whether adults or not, are held to be dependent upon the decedent, on the theory that the family fund has been depleted by his death. For instance, in a recent case, a single man aged thirty was killed in an accident. His earnings were approximately \$12 per week. He left a father whose weekly earnings were \$22, a sister whose weekly earnings were \$7, and a mother who was janitress of the house in which the family had its home and got some allowance from the family rent because of her service. All moneys were paid to the mother. She spent it all for living expenses, except some small amount for life insurance.

Here a very pertinent question was as to whether the decedent in his contribution to the family fund contributed more than he consumed. Calculations were made on different theories, and they all were very close; but the court held that the decedent's contribution to the fund was in excess of what he consumed from the fund, and so held that the father, mother and sister were all dependent upon the decedent and were all entitled to compensation for his death.

One of the distinctions made in that and another case recently decided in New Jersey, is between decedents who are more than twenty-one years of age, and decedents who are under that age. In both of these cases it was decided that, in regard to those under twenty-one and single, the father is entitled to all their earnings, and therefore is the only person dependent upon them. When the decedent is more than twenty-one, his contribution to the family fund is assumed to be voluntary on his part, and all beneficiaries of that contribution, within the prescribed limits of relationship, are held to be among his dependents.

DEALING WITH MINORS

A doubt has arisen in our courts as to the applicability of our statute to persons under twenty-one years of age who have parents. The theory is that the parent is entitled to the service of the minor, that a contract of hire made by a minor is really made by him as the agent of his parent, and that when the law attempts to force into such contract a compensation provision that may under some circumstances greatly reduce the minor's recovery of damages for injuries, the minor, being the injured party, should not be bound by the provisions of a contract which was not really made by him or in his interest, but was, in law, made by the parent and in the parent's interest.

This matter has not as yet been thoroughly threshed out in the courts. In New Jersey, where the compensation provision is an implied feature of the contract of employment, I feel that the parent should not be able to bind the minor so that the minor could not sue for his injuries, when the contract is not that of the minor but rather that of the parent. In New York, where the compensation provision is not contractual but automatically follows the fact of employment, the same subject may arise on a different theory, to wit, that the minor is not employed. It is really his parent who is employed and

who is using the minor as an instrument to perform the work. It may, therefore, in the end be held that the minor is in the same position as a bondman or slave, and it may possibly follow that the courts will hold that he is not subject to the provisions of the compensation law.

In New Jersey, in a recent decision, a child under fourteen years of age was put to work. He claimed to be injured through the negligence of his employer, and brought an action at law for damages. When the employer set up as a defense the workmen's compensation statute, the court held that, as our factory law forbade the employment of children under fourteen, and as our legislature in enacting the compensation statute clearly intended it to apply only to lawful employees, it could not be held to apply to the case of a child under fourteen. Of course, this decision has enabled the child, through its proper representative, to proceed with its suit for negligence, but what will the court do when a similar case arises in which there is no negligence, and a child of tender years asks for compensation under the workmen's compensation act? It happens that the decision, as recently promulgated, will probably work out for the benefit of the child. The same logic, in a case where no negligence of the master existed, would work to the detriment of the child.

The Near-Side Stop

BY JOHN J. REYNOLDS

Claims Attorney Boston (Mass.) Elevated Railway

TOPOGRAPHY probably stands first among the obstacles which have retarded the fullest development of the near-side stop. Where irregularity of street intersections exist, the near-side stop is impracticable. A very large percentage of railway men, however, favor the near-side stop. Indeed, so completely has this stop satisfied them that they would not willingly return to the old method of the far-side stop. It seems reasonable, therefore, to believe that if all those companies which are not prevented by the condition of the layout of streets, or by municipal ordinance, were to adopt the policy of extending the near-side stop as much as possible, and above all of advocating it, not only on the strict safety-first ground but also upon those other and very substantial economic grounds indicated by those who have made a careful study of the subject, we would, despite all skepticism, begin a new era in the development of accident prevention.

There are four principal influences which encourage belief that the near-side stop will ultimately be adopted, as far as possible, on all railway systems of any size: (1) Safety of operation; (2) lower maintenance cost; (3) greater regularity of schedules, and (4) a saving in power. Economic reasons will one day place this stop in the operating policy of efficiently managed railways, just as economic reasons brought about the adoption of those types of car which are to-day recognized as instrumentalities of safe, efficient and economic operation.

REDUCES OPPORTUNITIES FOR ACCIDENTS

The near-side stop does not leave open the same opportunity for accidents that the far-side stop does. For instance, it is obviously less difficult to control the speed of a car when it is accelerating after a service stop on the near side of the street than it is to do so while it is being braked for a service stop on the far side of the street. Many passengers are thrown in cars which make the far-side stop on account of very abrupt or short stops due to the motorman being sud-

denly surprised by a pedestrian, team or other vehicle unexpectedly coming out of intersecting streets. Not only does this cause accidents to passengers, but its effect on the brakes, shoes, wheels and general car equipment is very damaging.

Accidents of this character would be prevented, or very greatly reduced, by the near-side stop, because the motorman would have a chance to observe fully the movement of street traffic before crossing and to avoid that "hitching along" due to vehicular interference and other traffic. This practice of "hitching along" is peculiar to the far-side stop, and is responsible for the partially set or "dragging" brake habit, so common with present-day motormen, as the brakeshoe and power cost items of maintenance will show. Maximum acceleration and braking to the limit of adhesion on the rail, practices causing discomfort as well as accidents to passengers and increased maintenance cost, may also be fairly charged to the far-side stop. Moreover, with the near-side stop passengers generally alight from the front end of the car, thus eliminating that class of accident where passengers step from behind the car and in front of a car traveling in an opposite direction on the other track.

Various reports of association committees have shown how the near-side stop has been increasingly adopted by member companies and what its advantages are, while these facts have also been discussed in the proceedings and reports of safety organizations and the technical press. * * * In order to get for this paper some statistics that would be conclusive in favor of the near-side stop, approximately 100 letters were sent by the writer to the claim departments of as many railway companies. Answers were received from more than 60 per cent, but, unfortunately, comparatively few companies furnished any statistics. Apart from the absence of statistics, however, there was a practically unanimous opinion by thirty-five companies that the near-side stop tends to prevent accidents. * * * In other words, those companies know from actual experience that the near-side stop does prevent accidents, although most of them are without figures to demonstrate it. It is submitted, therefore, that the non-existence of statistics is of no consequence as an argument against the near-side stop. Moreover, it is believed that no sufficient evidence of opposition to this stop has been disclosed by the inquiry to warrant its recital in this paper. It is significant that several companies have requested a return to the near-side stop, where it had been done away with.

Somewhere beyond the ocean of impossibility and the shifting sands of the improbable, is a shore upon which claim men may safely land in their quest for information to establish facts so generally believed to exist and yet apparently so incapable of mathematical demonstration. A statistical classification will one day, I hope, give us such a shore, from which we may be able to procure incontrovertible figures to back up or disprove the efficacy of just such institutions as the near-side stop.

Oral Discussion

BY SAMUEL B. HARE

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The testimonies from companies operating under this system, the gradual increase of the percentage of the companies adopting the near-side stop and the unanimous opinion that it is the better mode of operation and that there will be no return to the old system, are self-evident facts that the near-side stop has come to stay. In

our opinion it is the greatest safety device that has been adopted for the protection of passengers, pedestrians and vehicular traffic.

1. *Passengers in Cars:*

A great majority of the people on a street car arise and go to the front end of the car at the street where they desire to get off as the car is gradually coming to a stop, with the result that at most every corner many persons will be standing immediately before the car stops. Should, therefore, the car be brought to a smooth stop, as is most frequently done with the near-side stop, there is no confusion and the standing passengers are discharged without trouble. When the far-side stop is used the car is passing the intersecting street; if a vehicle or pedestrian suddenly approaches the car, it is necessary for the motorman to make a quick stop, with the result that the passengers standing in the aisle are often thrown or struck.

2. *Boarding Accidents:*

When a car has stopped at the near side, the passengers board the car some distance from the corner of the intersecting streets and on the right side, this in reference to prepayment cars. Almost every municipality has an ordinance requiring vehicles following a car to stop and not pass the street car while it is taking on or discharging passengers, and the very fact that the car is being brought to a stop is a signal to following traffic, making it possible for the passenger to occupy the street and board the car with greater safety to himself.

When the far-side stop is used, vehicles going at right angles turn to the right at an intersecting street and traverse the spot where a person must necessarily stand to board a car. In the case of reckless drivers of vehicles, the position that the person must be in to board the car makes an accident quite possible. No vehicle turns directly left at an intersecting street, it being a universal custom to cross over to the right side, and the position of the car at the near side is a guard and protection to all the individuals who are about to board it.

3. *Alighting Accidents:*

When a car stops at the near side and a passenger alights from the front to the right, the opportunity is afforded to look for an approaching vehicle or obstruction. There need be no apprehension of accidents from any direction but the rear, and in that direction the passenger is protected as stated. Should the passenger, after alighting, desire to cross to the left side of the street, there is the opportunity of seeing the traffic on the highway before starting across. It has become the custom in such cases for the passengers, after alighting, to wait until the car has started before going across the street.

4. *Pedestrians:*

Inhabitants of a municipality soon learn the method of operating of cars and when it is known that cars will stop at the near side, the street can be crossed by a pedestrian with greater safety. As he comes to the edge of the property line he sees the car approaching and its speed indicates that it is about to stop; or, if the car has stopped and is taking on or discharging passengers, he knows it will remain still until all have been taken on or discharged. He knows that all vehicular traffic, moving in the same direction with the car, has stopped at the rear of the car. Nothing can obstruct his view and he sees that traffic coming in the opposite direction has also stopped, and he has a right

to believe that the ordinance pertaining to the passing of street cars will be observed by the drivers of vehicles. On the other hand, should the car proceed to the far side and the pedestrian, as it starts, cross the street, the position of the car will obstruct his view and there is a possibility of being struck by a vehicle coming in the opposite direction.

5. *Vehicular Accidents:*

When a car comes to a near-side stop at intersecting streets, the line of vision of the motorman extends to the right and left a distance of at least 120 ft., and he is able to see in both directions any approaching vehicle, and the car can be seen by the drivers of these vehicles for a like distance. In the more congested districts the signal of the traffic officer controls the starting and stopping of traffic and few vehicular accidents occur at these places. Yet, in other districts, in the absence of the officers, the motorman of the car and the driver of the vehicle are the ones to control the operation. If, therefore, the car stops at the near side it would seem impossible that an accident could occur, unless through the gross negligence of one of the parties. There is no prevention or safety device or hope for the absolutely careless and reckless driver. Where the far-side stop is used the operator of the car must have his car in motion to cross the street, and that motion carries him sometimes quickly beyond the street line and into a collision.

6. *Traffic Squads:*

Inquiries from traffic squad officers, patrolmen and cornermen have brought forth the opinion that the movement of traffic is facilitated by the use of the near-side stop. These officers have stated that vehicles and pedestrians are protected, that there is a greater co-operation between the operators of the street cars and the traffic squad by the use of the near-side stop than otherwise, and that officers thereby have less trouble in regard to handling the traveling public to cross the streets.

7. *Accommodation to Public:*

Every accident or collision means the stopping of the car, the examination of the damage done, the procuring of the names of witnesses, the clearing of the track, etc. Aside from the possible fright and injury to passengers, they are inconvenienced in the meeting of important engagements. It needs must follow that anything that leads to accident prevention means the removal of that which is inconvenient to the traveling public.

8. *Character of Accidents:*

While all forms of accidents have not been eliminated by the near-side stop, there has been a marked decrease. With a decrease in number, we also have a corresponding decrease of the accidents of a more serious nature. This result is, no doubt, obtained by reason of the fact that at intersecting streets the car is stopped in front of the impending collision, and all parties concerned have but to use their eyes intelligently to avoid that which under the circumstances of the far-side stop could not have been avoided. It is a significant fact that every motorman is in favor of the near-side stop, and we have been unable to discover any railway line that has once adopted this stop to have returned to the old method. It, therefore, can be safely stated that the installing of the prepayment cars and the adopting of the near-side stop are the two most important and beneficial safety devices known to street railway operation.

Motor Vehicle Accidents and Traffic Regulation

BY H. G. WINSOR

Superintendent of Investigation and Adjustments Puget Sound Electric Railway, Tacoma, Wash.

IN the consideration of the first part of the subject, "Motor Vehicle Accidents," let us observe first what the development of motor vehicle traffic has been during the last few years and what effect this development has had upon the electric railway claim business. As an indication of the progress which has developed in the motor vehicle industry during a period of ten years, it may be said that the number of automobile registrations in 1905 totaled 24,051 for nine states, while in 1910 they amounted to 414,678 for twenty-six states and in 1915 to 2,297,843 for forty-two states. For the nine states having records back to 1905, the percentage of increase in the 1905-1910 period was 340 per cent and in the 1910-1915 period 471 per cent. The twenty-six states whose record of registrations in 1910 showed 414,678, in 1915 registered 1,886,116 motors, an increase of 355 per cent. At the same rate of increase during the five years ending in 1920, these twenty-six states will have registered at that time 6,695,711 motors, and in the forty-eight states nearly 10,000,000 of motor vehicles will be in use. It is probable, however, that the rate of increase recorded during the last five years will not be maintained, as the automobile industry will have more nearly reached a point of saturation. A very conservative estimate would place the number at 5,000,000, which with a population of 110,000,000 would allow a motor vehicle in operation by one person in every twenty-two, one adult person in every six being licensed to operate a high power motor in the public streets.

HOW COLLISIONS HAVE INCREASED

In order that we may have a comprehensive idea of the effect this phenomenal increase in motor vehicle traffic has had on the problem of vehicle accidents, let us now consider the increase in collisions in which street and interurban cars were involved. The record on page 875 for twenty-five cities shows the number of cars in service, the number of car-miles operated, the total number of vehicle collisions and the number per 10,000 car-miles operated, during the years 1911 and 1915, with the percentage of increase or decrease in each case. In the arrangement of this record, cities are divided into classes, as follows: Class A—cities where 800 or more cars are operated; Class B—cities where 400 to 800 cars are operated; Class C—cities where 200 to 400 cars are operated; Class D—cities where less than 200 cars are operated, and Class E—interurban lines.

A careful analysis of these figures shows that while the increase in traffic has been phenomenal, electric railways have up to this time succeeded in keeping the percentage of increase in collisions between cars and motor vehicles within reasonable bounds. The record is certainly creditable and worthy of commendation, but can this record be maintained? What of the much greater number of street accidents in which the cars are not concerned? Single-handed, we have but little influence over the control of traffic conditions.

TRAFFIC CONDITIONS LEADING TO ACCIDENTS

In the thickly populated portion of one of the largest cities, a check was made recently for the purpose of observing the people who during the period of one hour entered upon the traveled portion of the streets under observation in such a manner as to place themselves in a position of danger. The three persons who made the

experiment traveled in an automobile 12 miles in the hour and the following interesting table resulted:

Children passed who were roller skating.....	237
Children passed who rode bicycles.....	116
Children passed who were playing ball.....	98
Children passed who were playing other games.....	74
Nursemaids who wheeled baby carriages.....	53
Men who looked in our direction before crossing streets.....	91
Men who did not look in our direction until aroused by loud sounding of horn.....	152
Total	1,163

One of the party conducting this investigation said: "All of these 1163 men, women and children had placed themselves within easy striking distance of our car, and each demanded from every driver near him a certain amount of care and consideration. There were

TABLE SHOWING INCREASE IN COLLISIONS WITH VEHICLES

	Year	Number of Cars	Car-Miles	Vehicle Collisions	Collisions per 10,000 Miles
Class A:					
Public Service Railway	1911	1,300	44,561,141	5,013	1.12
	1915	1,375	51,194,087	5,295	1.03
Cleveland Railway	1911	967	27,851,112	4,249	1.52
	1915	1,375	34,138,776	7,047	2.06
Boston Elevated Railway	1911	.....	46,123,852	3,933	0.85
	1915	1,250	45,711,578	3,135	0.69
United Railways of St. Louis	1911	1,015	540,01,181	5,440	1.34
	1915	1,086	42,305,802	4,893	1.15
Detroit United Railway	1911	850	27,059,465	4,672	1.73
	1915	1,000	33,500,941	8,325	2.48
Five companies—average collisions per 10,000 car miles.				1911	1.31
				1915	1.48
				Increase..... 13 per cent	
Class B:					
Los Angeles Railway	1911	566	24,159,824	4,278	1.77
	1915	704	29,542,701	5,437	1.84
Minneapolis Street Railway	1911	444	15,028,319	1,347	0.90
	1915	606	18,031,328	2,379	1.32
International Railway	1911	599	22,228,176	1,597	0.72
	1915	561	22,119,054	1,631	0.74
United Railroads of San Francisco	1911	539	22,077,429	2,821	1.28
	1915	597	24,632,749	4,766	1.94
New York State Railways	1911	462	11,881,054	1,496	1.26
	1915	559	11,531,730	1,701	1.48
Milwaukee Electric Railway & Light Company	1911	442	17,244,497	1,307	0.76
	1915	540	17,437,171	2,149	1.23
Capitol Traction Company, Washington Railway & Electric Company	1911	510	18,463,790	1,737	0.94
	1915	536	18,514,483	1,411	0.76
Seven companies—average collisions per 10,000 car miles.				1911	1.09
				1915	1.33
				Increase..... 22 per cent	
Class C:					
Portland Railway, Light & Power Company	1911	404	12,264,618	964	0.79
	1915	365	14,969,001	1,724	1.15
Puget Sound Traction, Light & Power Company	1911	361	12,730,740	1,012	0.80
	1915	358	12,662,487	1,789	1.41
San Francisco-Oakland Terminal Railways	*1913	338	16,399,409	933	0.57
	1915	333	16,447,519	1,161	0.71
Rhode Island Company	*1913	220	13,606,092	1,089	0.80
	1915	215	16,382,610	1,949	1.19
Indianapolis Traction & Terminal Company	1911	228	9,655,103	1,095	1.03
	1915	239	10,370,785	1,253	1.21
Five companies—average collisions per 10,000 car miles.				1911	0.82
				1915	1.14
				Increase..... 39 per cent	
Class D:					
Omaha & Council Bluffs Street Railway	1911	153	9,537,552	**212	0.22
	1915	171	10,431,444	**270	0.26
Denver City Tramway	1911	170	10,888,780	869	0.80
	1915	150	9,778,055	851	0.87
Columbus Railway, Power & Light Company	1911	150	8,459,395	714	0.84
	1915	134	8,204,525	872	1.06
Memphis Street Railway	1911	131	7,277,396	1,830	2.51
	1915	125	7,690,462	666	0.87
Bay State Street Railway (Fall River Division)	1911	.....	2,696,829	188	0.70
	1915	.....	2,981,834	271	0.91
Tacoma Railway & Power Company	1911	96	4,028,994	163	0.40
	1915	97	4,111,893	269	0.65
Grand Rapids Railway	1911	67	4,016,462	290	0.72
	1915	72	4,305,987	2,045	4.75
Washington Water-Power Company	1911	59	3,634,400	128	0.35
	1915	59	3,293,540	68	0.21
Eight companies—average collisions per 10,000 miles.				1911	0.82
				1915	1.19
				Increase..... 45 per cent	
Class E:					
Pacific Electric Railway	1911	560	16,964,784	828	0.48
	1915	675	31,864,470	1,448	0.46
Terre Haute, Indianapolis & Eastern Traction Company	1911	53	4,660,339	97	0.21
	1915	61	5,233,532	184	0.35
Puget Sound Electric Railway	1911	11	1,364,509	35	0.26
	1915	11	988,701	51	0.52
Indianapolis & Cincinnati Traction Company	1911	11	1,559,081	34	0.22
	1915	11	1,443,807	37	0.26

*No previous record.
**Collisions resulting in claims.

times when a score or more of those just listed were counted within 100 ft. of our car, which was going ahead at a speed well within its legal rate." Such a condition as this is not confined to any particular city or locality, but is only an example of what exists wherever traffic conditions are congested.

The public does not exhibit reasonable care while traveling over the highways. Moreover, it is an undisputed fact that immunity from the operation of the present admittedly inadequate laws is extended in many cases and serves to encourage the motoring public in their disregard of the rights of others. The indiscriminate licensing of automobile drivers as at present in many states is also without doubt an extremely dangerous practice. This is, of course, not apparent in some states, Massachusetts, Connecticut, New Jersey and Minnesota being among those that have very good laws intended to protect the public by licensing only those who are physically and mentally capable. I am not prepared to say whether or not these laws are enforced, but protection in this regard should be given the public in every state.

Credit should be given experienced chauffeurs for the part which they play in the game of chance which is going on continually on the streets and highways. They, in nearly all cases, handle their motors efficiently and carefully, with due regard for the rights of others, and are seldom concerned in accidents. The proper description of a chauffeur, as given in a recent publication, is "One employed to prevent pedestrians and children from committing suicide."

REGULATING TRAFFIC

Frank Upham Adams in the April issue of the *American Magazine* has an article which describes street problems which are arising and suggests: (1) The restriction of the operation of automobiles to those mentally and physically equipped for this responsibility. (2) The strict enforcement of state-wide laws fixing speed limits. (3) The legal restriction of pedestrians to the proper use of streets. (4) The absolute prohibition of streets as playgrounds for children and others. While the enactment and a strict enforcement of such laws would admittedly bring about the desired condition, there is a serious question as to whether legislative bodies could be prevailed upon to enact such laws, and if successful in securing their enactment, whether it would be reasonable under present conditions to expect a rigid enforcement.

1. Restricting Automobile Operation:

With reference to the first suggestion, that of restricting the operation of automobiles, there is no question concerning the urgent need of immediate action in every state where indiscriminate licensing is allowed. In a recent discussion on this subject at the Pacific Claim Agents' Association convention, a comparison was drawn between the requirements of a locomotive engineer who must serve a number of years before being entrusted with the operation of an engine, and the automobile driver who only requires a few hours instruction from a salesman, whose sole desire is to make a sale. On the one hand, the railway superintendent has the interest of both the public and his employees at heart; and on the other, the salesman has a purely selfish motive and no thought or responsibility concerning what may happen as a result of his purchaser's inexperience or temperament.

2. Enforcing Speed Laws:

The second suggestion could probably be worked out in a satisfactory way as far as the framing and passage

of suitable laws are concerned. The difficulty, however, is in the enforcement. While the traffic officer has been successful in bringing about order and compliance with regulations at street intersections, his useful influence, unfortunately, does not extend beyond the limit of his vision. The motorcycle officer soon becomes known to those who care little for speed laws, and while arrests are frequent, it is getting to be quite the fashion to be arrested for speeding and have your case placed on file with the admonition, "Don't do it again." Lack of sufficient funds is another obstacle which seriously interferes with the enforcement of speed laws, and is usually pleaded by the authorities when their actions are criticized.

A rather novel experiment has been proposed in California which is intended to aid in the observance of the "Stop, Look, Listen" regulation. Authority has been asked of the Public Service Commission to install so-called "Thank you, ma'ams" or depressions in the highway at a certain distance from steam and interurban railroad crossings for the purpose of forcing automobiles to reduce their speed. I am told that such a plan is or has been used in the State of Ohio. The attorney-general of Oregon has rendered an opinion that such action would be illegal, and that any damage occasioned as a result could be recovered from the county in which the accident occurred. A reasonable requirement in my estimation would be for automobiles to stop before approaching within, say, 50 ft. of a crossing and to reduce their speed to not more than 10 m.p.h. at a distance of 100 ft.

3. *Restricting Pedestrian Travel:*

Mr. Adams, in his third suggestion, has covered a wide field. If plans or laws could be devised and successfully prosecuted which would influence pedestrians to the proper use of streets, an immense amount of suffering would be avoided and many lives saved. It is a condition well worth striving for, but it seems to me that only a small part of this accomplishment could be brought about by legal measures. You might by law or ordinance require a person to cross the street in a certain way and only at street intersections, but there are so many possibilities during the act of crossing that it would be impossible to remove the individual responsibility or the danger involved in the act. To my mind, simple but well defined laws are all which we could expect to enforce with regard to control of pedestrians. We should bend our energies to the education of the public in safe practices and the matter of caution in the use of the streets.

4. *Prohibiting Street Play:*

Not the least important is the fourth suggestion—the absolute prohibition of streets as playgrounds for children and others. With the advent of extensive asphalt streets and the natural desire of children to use them for roller skating, wagon coasting, ball playing and other sports, an especially dangerous traffic condition has been brought about. Many children are so poorly housed that they practically live in the streets. To refuse them the privilege of playing in the traveled portion would indeed be a hardship. Yet, with the startling record of serious and fatal accidents to little ones engaged in street play—a record which is multiplied year by year—some action must be taken to protect them from the results of their own carelessness and the negligence of their parents. Just how stringent the required legislation should be depends in a measure upon local conditions. The principle involved, however, should be considered in all cases, and such laws as are enacted should be enforced.

While giving consideration to such legal regulations as seem necessary, we should not forget our duties or opportunities along educational lines. In this phase of our work, no better field can be found than in the public school. In our city the plan of lecturing to pupils during the school year has been elaborated upon, and we now have a working safety organization in each school building, assisting in the enforcement of safety rules and practices and working out well defined plans to conserve the lives and health of not only themselves but also their relatives and friends and the public generally. One of the results of this effort on our part has reduced street playing 50 per cent, and within the next two years we expect practically to eliminate the habit. These children of school age, who are known to us as "Safety Scouts," have taken up the work with an enthusiasm which is surprising, and their keen conception of what benefits can be derived from their efforts, acts as an inspiration to every one who observes it. As our traffic problems of the future must be solved by these same boys and girls, our energies in teaching them the principles of care and caution will serve effectively to build up a sentiment for the conservation of mankind.

OTHER POINTS NOT TO BE OVERLOOKED

As to the enactment of other laws which are of importance, there are a number which should not be overlooked. On pages 57 and 58 of the Proceedings of our 1915 convention, you will find a proposed statute submitted by Russell A. Sears, Boston, Mass., which it was intended should be introduced at this year's session of the Massachusetts legislative bodies. This has a great deal of merit and should become effective in every state. This proposed statute defines the meaning of and establishes so-called thoroughfares and regulates the operation of vehicles upon and entering such.

Uniform laws governing the positions of slow and rapidly moving vehicles, passing and overtaking other vehicles, lights and dimmers, turning at street intersections and the parking of idle cars should be considered with a view of securing such changes in existing laws and the passage of such laws as are needed in addition to enable operators of automobiles to understand clearly just what is required of them, not only in the state where they reside, but in any other state which they might enter. There is fully as much violation of traffic laws through ignorance of their requirements as through wilful acts.

Written Discussion

BY A. D. BROWN

Claim Agent New York State Railways, Syracuse, N. Y.

Laws should be enacted prescribing regulations and restrictions that will prevent the indiscriminate licensing of drivers of high-power motor vehicles. There should be certain qualifications necessary, such as age, physical fitness, habits, etc., before a person, owner or otherwise, is allowed to drive a motor vehicle upon the public streets and highways. Such laws should be rigidly enforced, and the public should co-operate with the state, county and municipal authorities in enforcing them.

There should be a standardization of road signs and signs and signals at grade crossings, and in order to perfect such a standardization, the municipal, county and state authorities, railways and automobile associations must co-operate. With standard signs and signals at grade crossings to warn the motorist of danger, then some regulations should be imposed by law that he either stop before crossing the track or else limit the speed of his car so that he could stop in case it became necessary to avoid a collision.

There should be a like co-operation to enforce existing laws and ordinances and to secure uniform state laws to govern the rate of speed in rural districts and in incorporated villages and cities. Municipal ordinances governing speed, line of travel, safety zones, passing standing cars, etc., are not uniform. This state of affairs cannot be other than confusing to the most careful tourist as he passes from one municipality to another.

Many motor vehicle accidents are not the fault of the drivers of such vehicles, but are rather due to the carelessness of the public in general, and many of these accidents may be prevented by the education of the public as to safety first. Railroads have been pioneers in this movement, but it must be carried on further and railways, automobile associations and other organizations interested in the problem of prevention of accidents, should endeavor to bring about the actual introduction into our public schools of a system whereby the youth of to-day will receive, as a part of his or her education, a thorough course of instruction by lectures or otherwise on accident prevention.

Claim Work Fundamentals

BY E. P. WALSH

Attorney United Railways, St. Louis, Mo.

THE claim agent of other days found his tasks comparatively simple. In the days when cars and all other vehicles using the streets were drawn by animals, accidents were few and usually of a not very serious character, but because some accident did occur the claim agent was tolerated as a necessary evil and was generally considered by his employer as a constant source of expense from which no compensatory returns were received.

That condition is now materially changed, however, and to-day the claim agent is considered as a respectable part of the company organization. His task, however, is none the less difficult, and I see no prospect of his being able to recline upon a bed of roses in the immediate future. The hazard of accident is greater to-day than it ever was. Horse-drawn vehicles are diminishing in number, while those driven by motor power are greatly increasing. The claim agent of the future must be the man who will not only speedily and efficiently take care of and minimize, as far as possible, the ill-effects of accidents that happen, but will be most far-seeing in his ability to devise ways and means whereby accidents may be avoided.

POLICIES AND PRINCIPLES

Street railways are confronted with a twofold task, the education of the employees upon the one side, and the education of the public upon the other. Every mechanical appliance that would seem to tend toward the avoidance of accidents has been employed, and yet our experience has convinced us that the most perfect mechanical appliances are almost nil in their effect unless they are handled by men who are educated and trained to be careful. The healthy, happy, comfortable, satisfied employee does the best work and is the safest custodian of the company's equipment. In order that these conditions may prevail among employees, our various companies have established for them welfare associations, building and loan associations and employees' mutual benefit associations, and have provided times and places of enjoyment that demonstrate more forcibly than mere words could tell the mutual interest and co-operation between employer and employee. These conditions in large measure assist the claim agent in his work of education with a view to preventing accidents. The

claim agent, however, finds that his school of education must continue constantly. Spasmodic efforts now and then have their effect, but unless persisted in cannot obtain the necessary result.

In attempting to educate the public the claim agent finds an even greater task. As a result of the work begun by the public service companies, inspiration has been afforded to many thousands of citizens in every commercial pursuit to interest themselves in safety-first work, and their efforts have been valuable in that they have caused the people to think along the lines of accident prevention. Yet those of us engaged in this work know that no matter how often the public is told to be careful many of them will not heed. We can put up signs at crossings and we can tell them to stop and look and listen, but we know that the only sure way to avoid accidents at such places is absolutely to do away with grade crossings. This particular instance will serve as an illustration that must guide us throughout the entirety of our efforts in this class of work.

The successful claim agent to-day is the man who will quickly perceive liability and adjust it when it can be reasonably adjusted before there is the added element of the lawyer and the provocation that comes from the feeling on the part of the claimant of undue delay. When the claim agent is convinced that liability exists the claim should be settled without loss of time or energy. More of us every day are coming to a realization of this fact. With these matters that must be settled out of our way, we have left more time and energy to expend in the defense of those claims which we feel to be without merit.

PSYCHOLOGY AND CLAIM WORK

Mental states and processes have much to do with successful handling of claim work. They are important not only with reference to the mind of the claim agent himself but with reference also to the minds of his subordinates and other officials of his company. The development of proper mental states and processes with reference to the subordinates comes as the result of training and developing each in his special line according to his fitness and adaptability. The mental attitude of other department heads with reference to claim work is also much affected by the attitude of the claim agent. In recent years there has been a passing out of disconnected efforts by different department heads, each selfishly striving to advance the interests and credits of his own particular department regardless of what may happen to some other department, and a coming in of a spirit of co-operative effort for the all-around development of the interests of the organization. By this means the claim agent has enlisted with him in his services the very best that every organization affords.

The claim agent's task does not end, however, with his associates. He must go further and inculcate in the minds of the members of the community at large certain attitudes of thought that will cause the public to understand the workings of the claim department in a way that will rid it of the prevailing notion that wherever and whenever anyone is injured some one must pay for it. The mind of the public at large should be impressed with the fact that all cannot receive damages, but that those entitled to them will receive reasonable compensation for their loss. In determining what shall be a fair compensation, however, the injured one must co-operate in a businesslike way with the claim agent, submitting to all reasonable investigation and furnishing whatever evidence is necessary to establish the truth of his contention. Care should be taken in the handling of a claim that no false impression is conveyed that will cause expectation of more than a claim is worth, and

then when a settlement is made there will remain a satisfied claimant and a friend.

Such a course of action with reference to legitimate claims will enable the company to pursue with more vigor a policy of absolutely no quarter with frauds and impostors and no compromise with unjust or improper claims. The feelings of the public must be regarded, and the company which gets the reputation of dealing fairly with legitimate claims will find the task easier when compelled to defend itself against improper demands, because the feeling that the company is willing to do all that is fair and right will be reflected in the verdicts of the jurors and in the judgments of the courts. The claim agent who can best induce conditions of this sort is the man who will best serve his company's interests.

Oral Discussion

BY CECIL G. RICE

Assistant to President Pittsburgh (Pa.) Railways

I have nothing to say against the claim agents of the past. I believe that, under the conditions which they had to face, their work was equally as good as the work of the claim agent of to-day. The years, however, have brought changes and it is my opinion, based upon my experience, that there has been a complete reversal of the methods of handling claims. Formerly, a claim agent dared not go to a person who had been injured, or who was involved in an accident, for fear of suggesting a claim. To-day, however, there is not one out of five people in any large community but knows that there are such things as claims. By reason of the publication of large verdicts, and the almost universal publicity in connection with the workmen's compensation laws, the idea has got into the minds of a great many people that no matter how they are injured, the state makes companies pay them something. Every compensation case that is settled, every case that is settled by the courts, adds one to those made by the claim departments of a member company. So that to-day, instead of being fearful to give to a person information, it is necessary to see him in order to convince him that he has no claim. It was just the opposite in the days of old. Years ago the matter of adjusting claims was a battle of wits. To-day it is a purely business proposition; and when it is not so regarded, something is wrong either higher than the claim man or with him or below him.

PSYCHOLOGY NOT DIFFICULT

The matter of psychology sounds rather fearful, but it does not mean a great deal. It is merely the science of the mind. The science of psychology is merely the orderly arrangement of relative facts. The thing to keep in mind in considering this subject is that the claim agent does not settle the claim, but does settle with the claimant. John Jones may have a broken leg, and it will cost so much. Tom Brown has exactly the same injury, but it may cost ten times as much or only one-tenth as much. The individuality of the person involved has really more to do with any settlement than does the actual occurrence itself.

Let me illustrate how psychology may be useful in settling claims. Recently, a man who was a cheat claimant acting throughout the country, came into our office. His general practice was to report to the claim agent within two or three hours after the occurrence of the alleged accident. He would say that some attorney had happened along and invited him to call, but that he had refused to have anything to do with attorneys and would rather settle with the company. In ten

or fifteen cases around Milwaukee he had used the name of a particular attorney, and he made the mistake of telling the same story when he came in to us.

We all knew that he had been tried for perjury in Milwaukee. I said to him: "Do you suppose, Mr. So-and-so, that this man who invited you to come to see him was attorney — of Milwaukee?" Immediately he was confused, because the name I used happened to be the name of the lawyer with whom he had worked.

I said: "Did you make the statement that you had never had any accidents before this one, and did you swear to that statement? Now, we don't want to take advantage of you, but in this State it is a felony to swear to something that is not true. We might put you in the penitentiary for that." By that time he was sweating quite a little, and said he spoke German mostly but knew how to count money. So I said to him: "Suppose you go home to the American House, where you stayed last night, and write out the accidents you have been involved in, and bring them to me to-morrow morning." The first train went out at eleven o'clock the next day, and he was there about an hour before train time, but he did not leave with any of our money in his pocket.

As far as the claim was concerned, he was easy to handle. There was no fear of paying him anything at any stage of the game, but I want to make the point of the value of the use of suggestion, which is psychology, rather than the strong arm method, saying, "You are a thief and a crook." The mere suggestion to him that this man, who he said was on the car near him and gave him his name, was the attorney out in Milwaukee, had let him know at once that we knew something about his work in Milwaukee, and he would reasonably suppose that if we knew something about him there we would know something about him somewhere else. The suggestion about the danger of committing crime put fear into his heart, and that was all that was necessary.

HOW TO OVERCOME PREJUDICE

Just what are claim agents going to do to offset the prejudices that exist against all traction claims departments regardless of how fair and square they may have been? The point is, do the people know that claim agents are fair and square, and how are they going to show this fact? The solution of this by the Pittsburgh Railways is to publish what we term a "Code of Ethics and Policies." It is not a theory. It is merely a collation of facts and a description of principles and policies by which we are attempting to handle all business relating to the adjustments for accidental occurrences in and around Pittsburgh. This was described and favorably commented upon in the *ELECTRIC RAILWAY JOURNAL* of Oct. 7, pages 706 and 712-713.

In conversation with a judge of one of our courts recently, I mentioned this "Code of Ethics and Policies" to him. He brought up the subject of claims himself, and I opened up and told him some few things he had not heard before. He was very much interested, and he asked me to send him a copy. While it is copyrighted, if anyone cares to make use of it and will send me a postcard, I shall be glad to have a copy forwarded to him.

My particular interest in this Claims Association is the development of a higher standard of work and added dignity, in the hope that the ultimate result may be that the claim agent will take his place in the official counsels of his company as a man, as an officer, as some one who has a right to consider, suggest and advise—instead of being thought of as a nuisance because everything seems to be going out and nothing coming in.

Social Relations of Electric Railways

Comprehensive Progress Report to American Electric Railway Association on Important Problems Arising Out of Co-operative Activities of Management and Employees—Main Subject Covered in Present Report Is Protection of Employees Through Life, Health and Accident Insurance

By JAMES D. MORTIMER, Chairman

HENRY C. BRADLEE

EDWIN W. RICE, Jr.

Composing the Subcommittee on Social Relations of the Committee on Public Relations

THE problems considered under the heading of "Social Relations" naturally group themselves into two parts: (1) The protection of the employee, including the subjects of industrial injury compensation, life insurance, health insurance and old age pensions. (2) The betterment of the status of the individual employee, including such subjects as the best form of wage payments, the minimum wage, education, practices of efficiency, standards of living, thrift and profit-sharing plans with the employer. The committee has not approached the problems of protection or insurance from the standpoint of policy but solely from the standpoint of economic and efficient administration. It has not concerned itself with philosophical aspects or with the desirability or expediency, in individual cases, of providing such insurance.

AGENCIES FOR SOCIAL INSURANCE

In conceding the need for such forms of social insurance as compensation for industrial accidents, life insurance, health insurance and old age pensions, the question arises as to the agency best suited to provide this protection. Shall it be the state, an organization of employees, the employer, co-operative action of employee and employer, or an underwriting agency such as the insurance company? These agencies may be compared thus:

1. State Insurance:

It seems generally conceded that the provisions for sickness, accident, life and old age in Germany have been well administered. The scheme has comprised central government supervision supplemented by local administration by employees' benevolent organizations. The same cannot be said of the English insurance act administration. The German success appears to be due to strong bureaucratic control and racial characteristics of thrift and obedience to authority lacking in more populistic forms of government. A number of our states, notably Washington and Ohio, provide for state administered funds to care for industrial accidents, and one state, Wisconsin, provides for life insurance upon the voluntary plan. On the basis of charges which have been made concerning the conduct of business of those states, this form of administration does not seem to have been a conspicuous success. A number of governmental divisions, including our federal government, have provided staff pension plans for public employees.

The failure to make adequate provision for the accruing liabilities under these pension plans has been the universal shortcoming of such administration.

Lack of a broad and far-sighted financial policy and the usual inefficiency under political management are recognized shortcomings which will probably postpone the day when state insurance will become the ultimate method in the solution of the problem of social insurance.

The obvious advantage of administration by state agency is its widespread effectiveness. Under such a plan the individual would be free to change his employment or affiliation without being deprived of like protection in some other pursuit. The very comprehensive character of any plan of state insurance, however, comprising as it would every diversified vocation and trade, constitutes its greatest weakness from the standpoint of efficient administration. If such a plan were supported by contributions from various industries it would be a long task, if not a hopeless one, to determine equitable premium rates to be charged for each occupation and each industry.

2. Employees' Organizations:

There have been no comprehensive plans of social insurance, health, accident, life and pension,

inaugurated by trade unions. In fact, insurance benefits have not been considered germane to trade union activities. Where such benefits are provided the funds for such purpose have not been organized.

According to statistics given in the *Quarterly Journal of Economics* (May, 1916), out of 154,684 persons engaged in electric and street railway occupations, only 33,773 or 21.8 per cent were members of trade unions in 1910. These figures evidently include only platform labor, as the total number of persons employed in 1912, according to the 1912 census report on street and electric railways, exclusive of six companies which failed to make report, was 282,461. The Amalgamated Association of Street & Electric Railway Employees of America instituted a system of death and permanent disability in 1895. Death benefits of from \$100 to \$800 are paid, dependent upon the length of term members have been in good standing. Disability benefits are limited to total disability "through sudden accident while in service." Old age benefits accrue only "after twenty years of continuous membership and reaching the age of sixty-five." During the six months' period ended June 30, 1916, the association reports having

There is perhaps no single industry in the country which has accomplished more in the betterment of social relations than the electric railway industry. Yet, although reports have been many in regard to other phases of its work, not much information regarding the progress made in solving problems between companies and their employees has heretofore been available in printed form. For this reason the report of the subcommittee on social relations of the public relations committee of the American Electric Railway Association, presented at the Atlantic City convention on Oct. 11, is a record work. The accompanying abstract gives in detail the survey of the industry contained in the report, but, owing to limitations of space, only the general points of the elaborately prepared chapters on life, health and accident insurance are here presented.

expended \$144,789 for 320 death benefit claims and \$2,200 upon three disability claims. No old age benefits were paid. The benefits are supported by an assessment of 25 cents per member per month. There are no liability funds established for accruing obligations due to increased age and period of membership. At the fourteenth convention a report of the general executive board—reading “Disbursements (from the benefit fund) were 79 per cent of receipts the previous year and 84 per cent this term. This is not an alarming increase, but should serve as a caution against adding to the present liability”—was concurred in with the recommendation that no further burdens be added to the benefit fund.

In addition the association reports that thirty-three of its locals pay death benefits in one form or another. These range from definite payments of \$50 to \$200 per member to the amount available from per capita assessments or the proceeds of “passing the hat.” While the benefits of the parent association do not include sick benefits or accident disability benefits, eighty-nine divisions pay limited benefits reported to range from \$2 to \$9 per week usually for a period of thirteen weeks. That these benefits are much restricted is evident from the fact that for the eighty-nine divisions these benefits during 1915 aggregated \$55,725 or \$626 per local.

Whatever advantages there may exist in theory to the employees’ organizations as administrators of the protection provided by the various forms of social insurance, the fact remains that these have not developed in practice. The benefit liabilities assumed have not been handled in a business-like manner. The effectiveness of the organization is limited to the trade in which it operates rather than the entire industry.

3. Employers:

Few electric railway companies exclusively administer and support benefit funds, aside from pension systems. Twenty-six electric railway companies reporting pension systems sustain these funds. Only three out of ninety-four companies reporting sickness and accident relief funds report exclusive administration of these by the employing company. Nine out of fourteen companies operating under the “group insurance plan” pay full premium for the amount of such policies. The objection to this form of administration lies in the lack of interest and consequent lack of economic administration which exists where the employee does not co-operate in the maintenance and distribution of such funds.

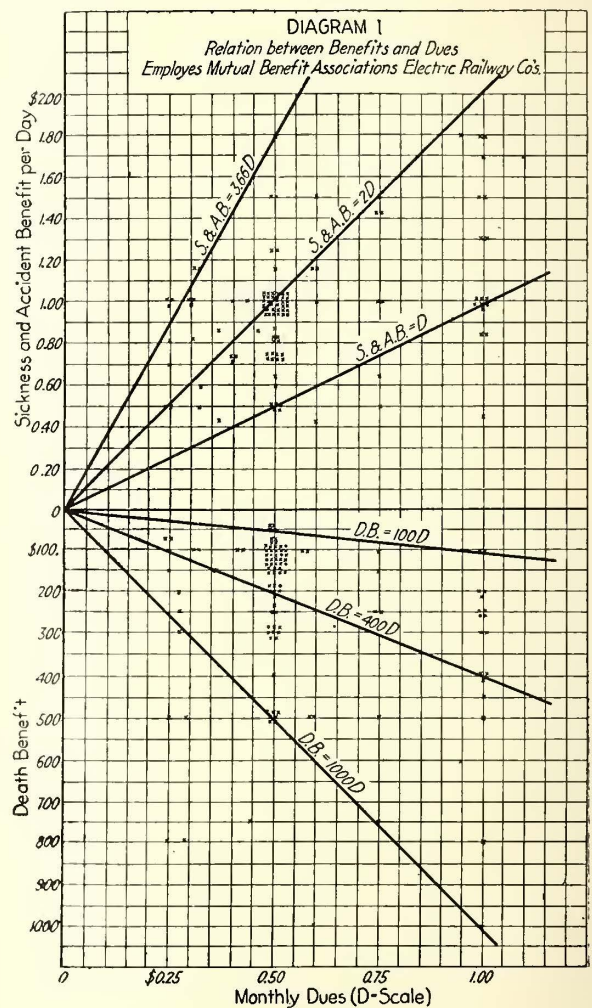
4. Co-operative Associations:

One hundred and eighteen electric railway companies report benefit associations maintained in co-operation with employees and providing sickness and accident disability benefits, medical supervision and death benefits. Although membership in these associations is voluntary, the percentage of total employees cared for is substantial. Out of thirty-nine associations which reported the number of employees and the number of members in the relief associations, fourteen have a percentage of membership between 85 per cent and 100 per cent, fourteen a percentage of membership between 65 per cent and 85 per cent, and only eleven a percentage of membership under 65 per cent.

Twenty-five associations reported whether or not medical examination is required for admission to membership, and only one does not require such medical examination. Twenty-three associations reported limitations of age below which the association will not admit members; five of these will not admit to membership employees under sixteen years, six will not admit employees under eighteen years, six will not admit employees under twenty-one years, and two make no such

limitation. As regards the upper age limit of twenty-three associations reporting, thirteen will not admit to membership employees over forty-five years of age, four will not admit employees over fifty and the age limits of the remainder vary from thirty-five to sixty-five years. Of the forty-three associations reporting on the length of service necessary before admitting to membership, twenty-four, or 65 per cent, make no such requirement; nine, or 21 per cent, require a probation period of three months; six require a probation period of thirty days, and the rest range from sixty days to three years.

The majority of associations are administered by boards of trustees or directors consisting of a number of employees elected by members and a number elected by the company, although in some few instances the administration rests entirely with the employees. Of ninety-four companies reporting as to the sources of financial support of the association, the great majority report contributions from the employing company in excess of 50 per cent of the entire cost of conducting



SOCIAL RELATIONS—FIG. 1—RELATION BETWEEN BENEFITS AND DUES IN ELECTRIC RAILWAY EMPLOYEES’ MUTUAL BENEFIT ASSOCIATIONS

the association. In almost all instances the administrative overhead expenses, including cost of keeping records, medical inspection, etc., are carried by the employing company. Of 107 companies reporting membership dues, 60 per cent require monthly dues of 50 cents, 10 per cent require monthly dues of \$1, and the remainder, dues ranging from 25 cents to \$4. Of forty-seven companies reporting initiation fees, 67 per cent require a fee amounting to \$1, 15 per cent a fee of 50 cents, and the remainder, fees ranging from 25 cents to \$2.

For such membership fees and company contributions eighteen associations report maintaining a medical staff and five report maintaining hospitals and infirmaries in addition to benefits. The disability benefits range from \$5 to \$12 per week, although one association reports, under its additional insurance plans, benefits for members at cost of as high as \$120 per month. Out of sixty companies reporting disability benefits, 35 per cent of the cases limit the payment of the benefit to thirteen weeks in one single case and 22 per cent limit the payments to 100 days.

Death benefits vary over a considerable range among the different associations from \$50 to \$1,000. Out of sixty-eight associations, fourteen report paying death benefits upon the death of the wife and eight upon the death of the child of the employee. The usual benefit paid by these associations upon the death of the wife is \$50 and upon the death of the child \$25. A number of associations also bear part of the funeral expenses.

The relations between benefits and employees' dues is shown in Fig. 1 on page 880. For the majority of associations a sickness and accident benefit of \$7 per week and death benefit of \$100 is provided for monthly dues of 50 cents and the employing company's additional contribution. That the benefits as compared with the dues vary over a wide range is apparent from the figure.

The reports indicate that in most instances the benevolent associations are working well. In addition to medical supervision and free medical care in cases of sickness by the association physician, visiting committees appointed by the members supplement such care and comfort in case of disability, and no doubt exercise a deterring influence upon malingering. A number of associations are now increasing their benefits. In one instance as high as 80 per cent of the weekly wages is paid in the case of sickness and accident disability, \$2,000 in the case of death from natural causes and \$5,000 in the case of death from accident.

5. Underwriting Agencies:

At the present time there is no single insurance company which is attempting to write a policy covering life, accident, sickness and old age pensions or annuities in a form sufficiently attractive to be considered as an acceptable agency for the carrying out of insurance plans. The forms of life policies are not attractive for employees with moderate incomes except for nominal amounts. Some few companies write so-called industrial insurance at 5 and 10 cents a week, but these are unusually heavily burdened with collection overhead expenses. The only form of insurance adapted to social insurance plans is the group insurance policies recently offered for employees of a single industry. These are confined to the payment of only life insurance benefits.

A number of the old-line life insurance companies originally writing sickness insurance, have abandoned the business. Disability for sickness and accident are now underwritten almost exclusively by the casualty companies and at rates not designed to be attractive to any but select risks. Few companies are pushing the sale of annuities, and none of these has made any effort to underwrite pension plans or annuities deferred until the usual age of retirement. The State of Massachusetts has, since 1907, permitted savings banks to issue policies for life insurance and annuities limited respectively to \$500 and \$200. These consist of straight-life policies with premiums to cease at the age of seventy-five, endowment policies maturing in twenty years and at the age of sixty-five, and insurance endowment policies under which insurance continues to the

age of sixty-five, at which time premiums cease and the payment of the annuity begins.

The reason for this lack of development does not lie in the sparse demand for such forms of underwriting, but in the unlimited field for regular policies and the unattractiveness of policies carrying small reserves and possibly increasing risks due to inadequate supervision.

6. Relative Advantages:

Of the various types of administration enumerated, co-operative association of employee and employer is best suited to the future development of a comprehensive plan of social insurance. It is the most readily available means. It comprises the entire industry rather than the separate trades. It is assured of economical management and close supervision. Should state administration ever occur, it may, in all likelihood, take the form of supplementing rather than superseding existing agencies. In trade unionism, the social insurance is and will continue to be a matter of secondary importance. Present tendencies do not suggest the marketing of underwriting suitable in scope and form for the electric industry.

INSURABILITY OF ELECTRIC RAILWAY EMPLOYEES

It is well to make a general survey of the characteristics of the electric railway business affecting the insurability of employees, which must be kept in mind in providing permanent plans of insurance. These characteristics may be commented upon under suitable headings:

1. General Characteristics:

There are few industries which require in their scheme of organization so many diversified kinds of employment as the electric railway. In addition to motormen and conductors operating in outdoor environment, the list of employees includes power plant operators, firemen, engineers, electricians, linemen, troublemen, all employees with widely different duties, but necessary solely to provide the motive force which propels the electric car. The maintenance of roadway, track, and buildings and structures requires another group of employees embracing every type of employment from surveyor to painter. The maintenance of rolling stock also requires every type of employment from founder and machinist to car cleaner. In one typical company the occupations represented in the electric railway business number 124. Of these the largest group naturally is the trainmen intrusted with the operation of cars. Employees connected with maintenance and furnishing of power, however, constitute more than 50 per cent of the number of employees.

Electric railway employees vary in degree of skill from the common day laborer to the highest skilled electrical, civil and mechanical engineers. Many of the employees in specialized occupations require years of preparation. Such employees have chosen their life vocation. If they were to leave one electric railway, it would be only to pursue their calling in some other electric railway or allied industry. On the other hand, those engaged in other occupations, among them trainmen, are constantly changing. Trainmen are usually recruited from the untrained additions to the city's industrial population from the country. The vocation requires intelligence and skill, but it is easy to learn. The compensation usually exceeds that of other trades requiring a like degree of education and skill. The work is congenial and out-of-doors. The average hours of employment are not excessive, nor is the calling hazardous. Such work is likely to attract young men of more than ordinary intelligence and ambition, and

serves as a stepping-stone to the more skilled industries. There are naturally variations in the length of employment and in the compensation paid therefor, because of these differences.

Finally, the complexity of the industry requires employment under the most extreme variations of hazard, ranging from office employees and others usually classed in the "select group," to employments classed as "extra hazardous" and "non-insurable" in the standard accident insurance classification of casualty companies. This latter class includes operators of electrical machinery, linemen, structural steel workers, wiremen, and operators of special machines.

2. Classification by Age:

A factor of great importance in life and sickness insurance and pension plan cost computations and of some importance in accident insurance computations is the age of the insured group. The figures given in Table I are derived from analysis of the records of a single company. The change in average age in this case has been due to higher standards of labor and the operation of social insurance plans.

3. Classification by Years in Service:

This is a factor of importance in determining the cost of a pension plan where, as is usual, the amount of pension liability is dependent upon the years of service prior to retirement. The data given in Table II cover the same company and periods for which classification of employees by age is made in Table I.

4. Recession Rate:

Factors of importance in determining the cost of life insurance and pension plans are the resignations and dismissals. The usual insurance computations assume that with the exception of those removed from participation by death, all surviving members will be entitled to death benefits or pension annuities. Needless to say, this factor is of varying importance in different companies. Tables III to V, giving data for a single company, indicate the tendency of the recession rate by age and years of service and occupation.

5. Classification of Compensation:

A factor of importance in all insurance is the extent of the possible burden for premiums as compared with the compensation paid. The question is, in short: "How much insurance can the average employee afford to carry?" The federal census throws some light on the average wages paid electric railway employees, variously classified in its reports. Table VI shows the average wage during 1907 and 1912 for each group and the proportion represented in each. The average wage of \$711 for the entire country is somewhat less than that obtaining in the larger companies.

The distribution of average wage by ages and years of service is also of importance. Such an analysis has been made for years past by one of the member companies, and the results, for a typical year, are given in Fig. 2 and Fig. 3 on page 883. These illustrate a maximum earning capacity at about forty years of age and fifteen years of service.

6. Conditions for Improvements of Risk:

The success of any plan of insurance is dependent upon the elimination or reduction of risks. The cost of life and sickness insurance depends upon careful initial selection and periodic supervision of health and mode of living. Accident liability depends principally upon education and safety-first measures; age and health are important. The extent of preventive efforts in each of these fields has a marked effect upon cost.

TABLE I—DISTRIBUTION OF EMPLOYEES BY AGE IN PER CENT OF TOTAL

Age Group	1912	1913	1914	1915
16-19 years	7.9	6.3	4.3	3.2
20-24 years	22.7	23.8	20.0	17.8
25-29 years	21.3	22.4	24.5	22.9
30-34 years	14.7	15.2	17.2	18.4
35-39 years	10.9	11.2	13.3	13.6
40-44 years	9.0	9.0	8.7	9.4
45-49 years	6.4	5.4	5.5	6.1
50-54 years	3.9	3.4	3.3	4.5
55-59 years	2.1	2.2	2.2	3.4
60 years and over	1.1	1.1	1.0	1.7
Total	100.0	100.0	100.0	100.0
Average age	31.6	31.4	32.0	33.1

TABLE II—DISTRIBUTION OF EMPLOYEES BY YEARS OF SERVICE IN PER CENT OF TOTAL

Years in service group	1912	1913	1914	1915
Less than 1 year	42.2	37.3	21.5	17.3
1 year	11.1	20.6	13.6	6.2
2 years	9.6	7.1	16.8	13.9
3 years	4.7	6.4	10.9	13.9
4-5 years	6.7	5.2	10.4	16.3
6-10 years	13.0	11.3	12.9	14.9
11-15 years	7.2	6.9	7.5	9.1
16-20 years	4.5	4.1	5.2	4.7
Over 20 years	1.0	1.1	1.2	3.7
Total	100.0	100.0	100.0	100.0
Average years of service	4.12	3.98	4.97	5.97

TABLE III—RECESSION RATE OF EMPLOYEES OF A SINGLE COMPANY, BY AGE

Age Group	Ratio Withdrawals During Year to Number of Employees at End of Year	Ratio Withdrawals During Year to Number Employed During Year
15-19 years	86.6 per cent	46.4 per cent
20-24 years	56.4 per cent	36.1 per cent
25-29 years	39.4 per cent	28.3 per cent
30-34 years	26.5 per cent	20.9 per cent
35-39 years	23.9 per cent	19.3 per cent
40-44 years	24.7 per cent	19.8 per cent
45-49 years	17.9 per cent	15.2 per cent
50-54 years	20.1 per cent	16.8 per cent
55-59 years	9.7 per cent	8.9 per cent
60 years and over	30.3 per cent	23.3 per cent
Total	36.7 per cent	26.9 per cent

TABLE IV—RECESSION RATE OF EMPLOYEES OF A SINGLE COMPANY, BY YEARS OF SERVICE

Years of Service	Ratio Withdrawals During Year to Number of Employees at End of Year	Ratio Withdrawals During Year to Number Employed During Year
Less than 1 year	95.4 per cent	48.8 per cent
One year	63.4 per cent	38.8 per cent
2 years	23.1 per cent	18.7 per cent
3 years	11.8 per cent	10.6 per cent
4-5 years	8.8 per cent	8.1 per cent
6-10 years	6.6 per cent	6.2 per cent
11-15 years	4.5 per cent	4.3 per cent
16-20 years	4.1 per cent	3.9 per cent
Over 20 years	5.3 per cent	5.0 per cent
Total	36.7 per cent	26.9 per cent

TABLE V—RECESSION RATE OF EMPLOYEES OF A SINGLE COMPANY, BY REPRESENTATIVE OCCUPATIONS

Occupation	Ratio Withdrawals During Year to Number of Employees at End of Year
Accounting clerks	49.2 per cent
Record clerks	68.4 per cent
Track repairmen	117.0 per cent
Yardmen	95.0 per cent
Trainmen	23.6 per cent
Car house repair crew	30.8 per cent
Car cleaners	132.0 per cent
Carpenters and helpers	116.0 per cent
Painters and helpers	77.8 per cent
Blacksmiths and helpers	25.0 per cent
Machinists and helpers	79.3 per cent
Firemen	88.2 per cent
Oilers	44.5 per cent
Coal passers	150.0 per cent
Boiler washers	38.4 per cent
Pumpmen	50.0 per cent
Switchboard operators	35.0 per cent
Wiremen	60.5 per cent
Polemen	202.0 per cent
Groundmen	105.0 per cent
Electrical repairmen	54.2 per cent
Steamfitters and helpers	36.4 per cent

TABLE VI—ANNUAL COMPENSATION OF ELECTRIC RAILWAY EMPLOYEES (From Census Report)

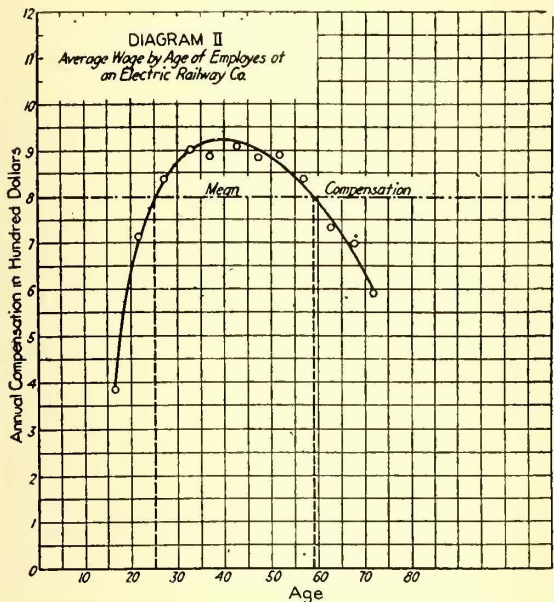
	1912		1907	
	Per Cent of Total Number of Employees	Average Wage	Per Cent of Total Number of Employees	Average Wage
Salaried officers of corporations	2.8	\$2,962.40	2.5	\$2,537.72
Managers and superintendents	2.7	1,865.55	2.4	1,709.82
Clerks, stenographers and other salaried employees	7.5	814.85	3.6	677.16
Conductors	23.4	716.64	25.3	636.90
Motormen	24.1	737.10	24.8	675.36
All other employees	39.5	620.28	41.4	662.09
Total	100.0	\$711.22	100.0	\$681.89

Fig. 4 and Fig. 5 show the reduction in accidents per employee with increased years in the service. These figures refer to the experience of one company only, in connection with employees in the power plant and transportation departments respectively. This reduction in

of the industry will, of course, vary in importance with the conditions found in each particular locality and company. They are essentials, however, of the successful administration of social insurance.

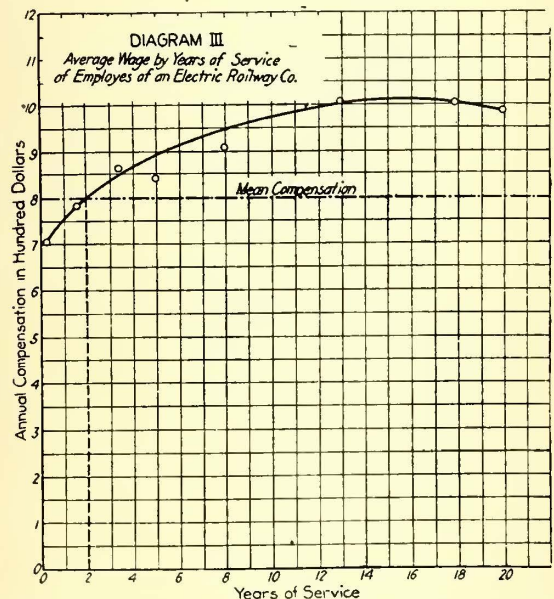
LIFE INSURANCE

According to the sub-committee, the necessity of life insurance in some form or other is well recognized by all students of sociology. Its influence in reducing poverty in old age and charitable and poor home relief is quite generally appreciated. Life insurance in some form will sooner or later become universal. If the determination of the method is left to the sociologists, it will likely take the form of compulsory insurance, in whole or in part, supported by taxation, as in the case of many European countries. American industry will soon have to decide whether it wishes to be forced into



SOCIAL RELATIONS—FIG. 2—AVERAGE WAGE BY AGE OF EMPLOYEES ON ONE ELECTRIC RAILWAY

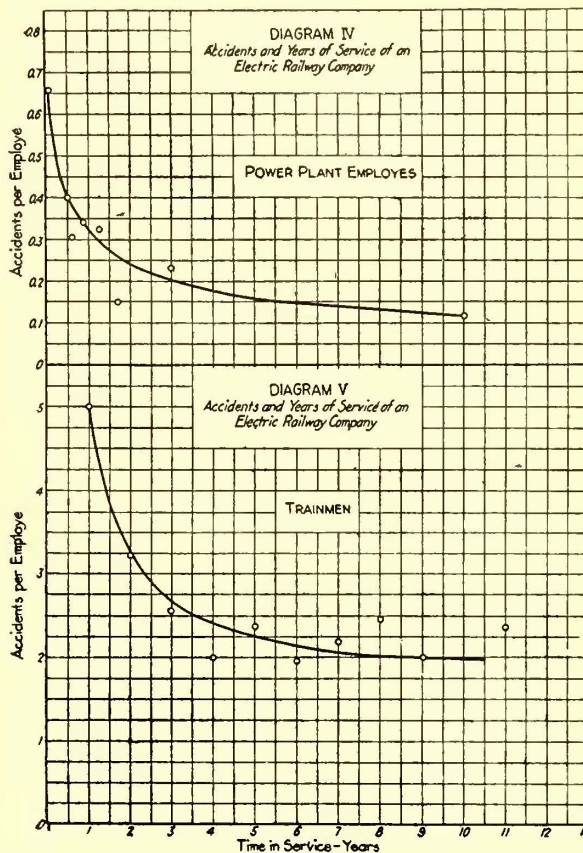
accident hazard is due presumably to a number of causes. The company which reports the figures has had a safety campaign under way for several years, and the older men naturally give the matter more attention than the younger men. The men longest in service usually do work in which there is less liability to minor injury, although, insofar as major accidents are concerned, this does not appear to hold. A number of other causes are doubtless operative, but the conclusion is cer-



SOCIAL RELATIONS—FIG. 3—AVERAGE WAGE BY YEARS OF SERVICE OF EMPLOYEES ON ONE ELECTRIC RAILWAY

tainly warranted that if the hazard decreases with experience, education will accelerate the process and that some form of safety-first measures is a condition of a successful system of accident insurance.

The factors outlined in the above preliminary survey



SOCIAL RELATIONS—FIGS. 4 AND 5—ACCIDENTS AND YEARS OF SERVICE FOR POWER PLANT EMPLOYEES AND TRAINMEN ON ONE ELECTRIC RAILWAY

this kind of life insurance, or whether it wishes to anticipate such legislation by voluntarily providing life insurance for its workingmen and other wage earners, or utilizing existing machinery for placing life insurance at their disposal in a way to cause it to be used.

A large number of electric railways of the United States provide some life insurance for their employees either through the medium of benefit associations or through life insurance companies. Out of ninety-five companies reported as having benefit associations and providing death benefits, twenty-three pay death benefits of \$100. The benefits vary from \$50 to \$1,000. Fourteen associations report paying death benefits upon the death of the wife, and eight upon the death of the children of the employee. One association writes endowment as well as life policies for as high as \$2,000. The cost of such benefits, including insurance against sickness and accident as well as death, is borne in the

majority of instances jointly by the employee and the company. A medical examination is usually required by these associations prior to admission to membership. Out of fourteen companies reported as insuring their employees in insurance companies, the greater number provide insurance of \$1,000. In a number of these companies the insurance provided is equal to the yearly wages of the deceased employee. In a majority of these instances the cost is shared by the company and the employee, although a number of companies foot the entire bill. Such insurance usually requires no medical examination. The protection thus provided electric railway employees is supplemented in many cases by industrial insurance, assessment society benefits and regular old line insurance policies.

1. Cost Factors:

The most important factor in the cost of insurance is the chance of death at various ages. Under the American experience table, at the age of thirty a contribution of \$8.43 by all the 85,441 living at that age would pay a death benefit of \$1,000 for each of the 720 deaths during that year. At the age of sixty the necessary contribution would be \$26.69, due to the higher death rate, while at the age of twenty the necessary contribution would amount to only \$7.80. These amounts are, for these varying ages, the net cost per premium of an insurance of \$1,000. The very substantial increase in the net cost with increased age demonstrates clearly the fallacy of uniform contribution to life insurance funds irrespective of age. Where the life insurance benefits are small, as is now the case with the large number of electric railway benefit associations, the ill effects of uniform contributions are not so apparent, but it is certain that if an increase in death benefits is contemplated, the scheme of monthly dues of associations must be made to conform with the ages of members or the contributions changed yearly if the fund is to continue to remain solvent.

2. Determination of Self or Purchased Insurance:

There is, of course, at the outset considerable force to the argument that an industrial concern cannot afford to go into a business which is foreign to its particular field, concerning which it knows little and which it is not equipped to handle. The argument is not, however, strictly applicable to the electric railway business. Many street railways are carrying their own public medical and claim departments, which are capable of taking on a small additional amount of business in making examinations and investigating claims, with little added cost. The problem of investment of reserves presents no difficulties as electric railway securities and real estate mortgages, legal investments for insurance funds, are familiar investments. These are important advantages. At least, as is the case with other supplies and services which the electric railway company buys or produces, the possibility of self-insurance offers a competitive advantage which should permit it to negotiate for insurance with the underwriting agency, if it chooses to do so, at the most economical figure.

The advantages and disadvantages of self-insurance may be summarized as follows:

(a) Unless the group is sufficiently large the mortality experience will only apply in part, so that net premium or annual cost may exceed that of an underwriting agency. Actuaries consider a group of 500 sufficient to come within the usual mortality experience. There is nothing to indicate that electric railway employees are subnormal or extra hazardous risks. Should this occur, insurance rates would be expected to conform to the added risk. Where the group is sufficiently large,

the company or association representing it would, by carrying its own insurance, immediately secure the benefit of selection arising out of the more careful preservation of the health and safety of its employees.

(b) Reserves can be more profitably invested than the reserves of insurance companies, and where necessary the company can guarantee the earning.

(c) More liberal terms and conditions as to the cash and surrender values can be given the employee under the self-insurance plan.

(d) By making insurance compulsory, the cost of solicitation can be reduced to a minimum, and a large part of the overhead cost eliminated.

There is a final consideration which must not be overlooked, namely, that of increasing the *esprit de corps* of the employee organization. The benefits of mutual co-operation are only appreciated where such activities are self-administered. The solicitation committees and visiting committees are important factors in increasing the educational value of co-operative activities. A live association which provides the benefits as well as conducts the funeral is of greater importance to the employee than a mere nominal organization which turns the work over to some impersonal underwriting agency. This last advantage is intangible, it is true. Its importance will be more readily appreciated by those who have had experience in the promotion and administration of benefit associations.

3. Group Insurance:

Insurance written upon the lives of a large number of employees of an industry, on one contract, has come to be known as group insurance. This plan is based upon the one year term, and where the group is sufficiently large, the risk is accepted without medical examination. There is, of course, a selective influence due to the fact that the members insured are regularly employed, and hence not likely to be impaired lives.

Replies from fourteen companies that have contracted for group insurance for their employees indicate that 12,190 employees are so insured, the average age being about thirty-six years, and the average premium \$11.10 per \$1,000 of insurance. Four companies provide \$500 benefits; seven companies, \$1,000 benefits. Two companies provide insurance equal to a year's salary, and two companies vary the benefit with the length of service. Eight companies contribute all the premium; two contribute \$4 per policy; one contributes \$1 per \$1,000 policy; one the full premium on a \$1,000 policy, while in two companies the entire cost is borne by the employees.

Owing to the newness of the group insurance form of contract, many features might, in the sub-committee's opinion, be suggested which have not as yet been incorporated in the policies. The cost on the one year term plan is certain to increase with the increase in the average age of employees. This is likely to be a serious objection, as the entire tendency of employment in the street railway industry, with the operation of pension systems and other co-operative activities, is certain to be more permanent. Nothing has as yet been done to give preferred rates where the conditions of medical attention are such as to entitle the insuring company to such a reduction. The term plan, moreover, does not permit of automatic provision for a continuation of insurance should the employee leave the service of the company. Because both protection and employment are terminated simultaneously, the one year term system is not likely to be enthusiastically endorsed by the employee. These objections would be obviated by an ordinary life rather than one year term system of insurance.

4. *Form of Insurance Desirable:*

The general specification of the type of insurance protection, which it seems should be furnished either through employees' associations or some underwriting agency, is as follows: (a) Protection should be offered to all employees and participation for a minimum amount made compulsory during employment. Individual contracts with individual employees should be provided. (b) A sufficient number of kinds of protection should be provided to suit the variety of conditions of income, age, dependency, etc., which will be found among the various employees. The term insurance plan with its increasing cost is not desirable. One form of policy should be provided on the ordinary life plan, providing for level premiums as long as a protection is afforded. A second form of policy should be provided which will permit the payment of full protection in twenty installments. A third form of policy which has much to commend it, is a limited term endowment policy. (c) The policy should make liberal provisions for automatic extension where through sickness or misfortune premiums are not paid and should provide for the payment of the face of the policy where the total disability makes it impossible to continue employment. (d) The policy should automatically give the employee the right to continue the insurance should he leave the employment of the company; accept the cash surrender value reserved to his credit, or apply such reserves without further payment to the purchase of paid up or extended insurance. (e) With the accumulation of reserves, liberal provisions can be included in the policy for the extension of protection, even where for some reason premiums are not paid. The policy should contain the usual provision for grace in payment and reinstatement. (f) A change in beneficiary should be provided at the option of the insured, at any time during the continuation of the policy, but the matter of assignment of policy should be carefully safeguarded, provision being made in the interest of the employee that the association assumes no liability as to the validity of any assignment and that satisfactory proof of the assignee's interest must be produced on making claim. (g) Payment of premium should preferably be provided in monthly installments and the employee's share collected by payroll deductions or deducted from the dividends of profit-sharing plans. (h) It is the usual experience that single payment life benefits are dissipated in a short time by unwise investments and extravagances. Many policies now provide for the payment of an income to the beneficiary for a specified period of time desired by the insured. The so-called Gilder weekly income policy plan, designed for moderate sums, features an immediate payment of \$75, at death, to defray funeral expenses, and the payment of \$10 per week for fifty-two weeks to the beneficiary. This benefit is the equivalent of an insurance of \$587 if paid in one sum. A policy of \$1,000 would provide a monthly income of \$40 for two years in addition to a funeral benefit. These are a desirable form of payment. Larger policies should permit of the payment of an annuity for the life of the beneficiary.

5. *Administrative Problems:*

Various administrative problems present themselves in placing in operation some plan of insurance as outlined, but the subsequent operation of the plan is more or less automatic. Insurance accounting does not require a separate account for each policy, the costs, reserves, paid up insurance and extended insurance values being readily determined at any time from the tables, and a copy of the table covering the history of the policy being contained in each individual contract. A check up or valuation of reserves is necessary each year. The

annual reports usually required present no unusual difficulties for the accounting departments of electric railways. Many companies now require a more exacting medical examination upon employment than is required by insurance companies. If, as is now the case in the administration of many of the benefit associations, the employing company supplies office space and contributes supervisory and accounting work, the complication of loading can be directly obviated.

If the surrender values are made equal to the reserve, there will be no accruing surplus other than that arising out of more favorable mortality. It is not necessary, therefore, to complicate the policies by making them participate and providing payment of dividends. Savings from a better selection of mortality will serve to enhance the reserve and create a surplus. When these surplus reserves reach a substantial point, the premium rates may be reduced. The rates, reserves, surrender values, paid-up insurance and extended insurance options may be definitely stated in the policy and no question or dissatisfaction can arise as to the participation of the employee, should he leave the service of the company.

6. *Social Problems:*

The regular routine work of examination, selection of premiums, payment of death benefits and surrender values must, of course, be supplemented by the work of employee members of the association in benefit promotion, visiting and funeral committees. The largest social service to be rendered lies in the education of the employee as to his duties toward those dependent upon him and the business-like way of meeting such responsibilities.

The extent of the protection which is necessarily provided if any plan of life insurance is to be effective, will depend upon the living necessities of the employee's wife and his children until they attain the age of self-support. The protection should be at least \$1,000, permitting an income of \$40 per month for two years and funeral expenses. Adequate protection requires an insurance of at least \$5,000 if a small annuity is to be provided during the remaining life of the wife. The premiums for this latter benefit fall well within 10 per cent of the annual income of any regular electric railway employee.

HEALTH INSURANCE

Because of their immediate and recurring nature, health benefits are probably the most popular form of insurance. For this reason also they are the least available form of insurance on the market and the most desirable form from the employing company's own standpoint.

Of the one hundred and eighteen companies having employees' mutual benefit associations, ninety-nine give data on sickness and accident benefits; 48.5 per cent of these provide a benefit of \$1 a day during sickness, and 12 per cent from 50 cents to \$1 a day, dependent upon the dues paid. In a large majority of cases this disability benefit together with the death benefit is supported by dues of \$1 per month, half of which sum is contributed by the employee. Sickness and accident disability insurance plans usually provide that a certain stipulated duration of disability elapse before the member becomes entitled to the benefit. This is required to safeguard the association against claims for imaginary sickness or trifling indispositions. Thirty-nine associations report a length of time ranging from four days to twelve days, 27 or 69 per cent of these fixing the duration at seven days.

It is usual also to limit the period during which benefits will be paid for a single continued disability. This

period is usually sufficient to cover the period of sickness, including convalescence, but excludes permanent disability. From information reported by sixty associations, it is noted that in twenty-one or 35 per cent of the associations the benefits are limited to ninety days. In thirteen or 22 per cent of the associations the limit is placed at one hundred days. The associations usually maintain a medical staff entrusted with the care of disability cases. A number of associations furnish medical supplies and surgical treatment free of charge. One association reports giving free medical and surgical aid to the families of employees. A few associations have reduced rates for family service.

The plan of insurance best suited to mutual benefit associations appears to be the renewable term plan with increase in rates at ten year intervals, full benefits limited to three months or one hundred days, half benefits for an additional three months for a single case; no benefits paid for disability of less than one week and no benefits paid for disabilities covered by workmen's industrial injury compensation acts. Under this plan rates based on Manchester unity experience place the cost of disability at about \$3.60 per annum for a \$1 a day benefit at the age of thirty and somewhat exceed the present costs of some mutual benefit associations. To this rate there must be added the component of medical attention, hospital care, sickness supplies, etc.

There are two selective factors which can serve materially to increase or reduce the disability cost. The first of these is medical attention. Prompt investigation is necessary in all cases of illness. Supplementing this a health propaganda as intensive as a safety program is well worth while. One of the member companies publishes monthly a series of health talks written in non-technical manner for employees. Herein lies the largest field of activity for preventive medicine. The second factor is the moral hazard. It is believed that its influence in employees' mutual benefit associations has been exaggerated. Fellow employees, the doctor and the visiting committee of the association are strong inhibiting forces to any tendency to "play hooky" on sick leave.

There is no question but that the employees' mutual benefit association has a field to itself in the most efficient and economical development of health insurance. In so doing it is performing a much needed social service which other industries can do well to emulate. There is a widespread need for cheap insurance. Underwriting agencies are not keen for sickness insurance business. Largely because of these conditions there is an active propaganda for health insurance in the United States modeled upon the German and English systems. Such legislation has been recommended by the Industrial Relations Commission and embodied in the platforms of the old Progressive party. At present the American Association for Labor Legislation is sponsor for a health insurance bill which, it is said, will be introduced in twenty-five states of the Union. It is desirable that American employers examine these proposals and their European counterparts with some care.

The benefits of health insurance can only be made widespread by making the insurance compulsory. Compulsory insurance can be best introduced by the employer making a substantial contribution toward the cost of insurance, considering such contribution as a part of the wage payment and an element in the cost of production. Whatever system of compulsory health insurance is provided in this country will, following the historical development in European countries, recognize the employees' mutual benefit association. It may regulate and prescribe its activities so as to make it less effective. Herein lies the greatest danger of pres-

ent tendencies. The interest of the electric railway industry lies in the maximum benefits for its employees. It should not be burdened with caring for the load of other industries or governmental overhead costs. It can most effectively preserve its identity by leading the way and so efficiently performing its social function that state interference cannot hamper it.

WORKMEN'S INDUSTRIAL INJURY COMPENSATION

Every good workmen's compensation act gives and should give expression to these four fundamental objects, viz.: (a) To promote the prevention of work accidents; (b) To provide for adequate medical and surgical care for injured employees in order to forestall or at least to reduce resultant disability for work. (c) To establish definite compensation schedules which will assure to injured employees certain financial relief in proportion to their industrial impairment and which will limit the employer's liability as a practical insurance proposition; and (d) To create a simple but authoritative mechanism of administration to avoid costly and time-absorbing litigation and in its place introduce a large measure of the personal element in the settlement of disputes arising out of personal injuries.

The employer can be materially stimulated to practise effective accident prevention by requiring him under the law to report to the supervising state authority every accident in employment causing injury. The employer's attention is thus focussed upon every accident in his plant, which is the first important step toward arousing him to measures of prevention. The majority of all accidents, however, have their chief source in carelessness, and this in turn points to persistent and consistent efforts to make employees reasonably careful by conscious effort at first and eventually by habit, as the most effective method of accident prevention.

If the claim is justified that the enactment of a workmen's compensation law is for the best interests of employees, it stands to reason that the protection of this law should extend to all employees regardless of their specific occupation, unless their employment is only of such casual nature as to make it impracticable or even impossible to set the compensation machinery in motion before the casual employment ceases.

There is no justification for an insurance monopoly under the law. Every legitimate and properly safeguarded method should be allowed to enter the field of compensation liability insurance, and that form of insurance should be most encouraged which in itself carries the greatest incentive for accident prevention. Stock insurance companies have recognized the importance of this feature by providing differentials in the premium rates of employers, according to the condition of safety of their premises; quite often also they stimulate safety in employment among their clients by advising and assisting the latter in regard thereto. Mutual insurance companies, in which employers in similar industries form a group and each pays in addition to the proportionate cost of administration a proportionate share of the total compensation liability of the group, make it decidedly more interesting and important for the employer to reduce accidental injuries in his own plant and to work toward their elimination in the plants of all group members. Yet even under this arrangement the employer must still contribute his proportionate share of the cost of management and participate financially in the creation of a general reserve fund. To eliminate also this economic waste and to give greatest expression to efforts for accident prevention, employers should be permitted to carry their own insurance under such safeguards as the state au-

thorities may deem necessary for the benefit of injured employees. Since the claim has been advanced that state insurance is the best form of social insurance, it should be made one of the elective forms of insurance in order to experiment with this new and practically untried phase of governmental activity. To most thoughtful people state insurance commends itself least as an effective agency for preventing accidents, ferreting out fraudulent compensation claims, or for economical administration. Whichever form of insurance, however, the employer selects as a condition *sine qua non* for his acceptance of the workmen's compensation law, such action on his part should at once relieve him of all other liability for damages for personal injuries to his employees, and conversely, compensation claims should constitute the only remedy of an injured employee against his employer, if both operate under the compensation law.

It stands to reason that the compensation schedule should be predicated on a part of the wages. All early compensation laws provided that the compensation due an injured employee should be equal to 50 per cent of his average wage during the time for which compensation is payable. Compensation laws more recently enacted, however have adopted a more liberal schedule by recognizing 55 per cent to 66 2/3 per cent of average wages as a basis of compensation, and some of the older laws have undergone amendments to the same effect. The resistance of employers to such liberalizing of the compensation schedule does not merely arise out of the justified desire to keep the cost of compensation insurance at a reasonable level, but more from the conviction and experience that the higher the compensation schedule, the more frequent malingering and fraudulent claims by some injured employees. To the degree to which effective safeguards against these unjustified claims are developed and put into practice, the opposition to a liberal compensation schedule will lose much of its present potent force. Stringent enforcement of the injured employee's duty to give prompt notice and to accept willingly adequate medical care by the employer's physician even during the whole period of disability, if the latter so chooses, is perhaps the most effective of these safeguards.

The tendency to malingering has also a direct relationship to what is commonly called the waiting period under a compensation law. Two weeks is the common provision in the law; some laws, however, have a waiting period of only one week and the general tendency toward a shorter waiting period is seen in the recent amendments to compensation laws, reducing that period from two weeks to ten days and in some instances to even one week. This situation warrants very careful, unbiased consideration. When disability continues beyond two weeks, then, with few exceptions, physicians are able to determine quite definitely whether or not continued unfitness for work exists. Many more might try to simulate disability if the waiting period were of one week's duration only. Some states have compromised the situation by providing that compensation payment shall be due from the beginning of disability, if the latter should continue beyond two weeks. Such a provision offers great inducement to prolong the disability period. A retroactive proposition obviously seems unwise.

Data supplied by a member company show the extent to which disability varies in different departments. Employment on work cars appears to be the most hazardous, on roadway and buildings next in order, and the work of linemen third in order of hazard, showing 4.47 per cent, 1.34 per cent and 0.74 per cent days disability to days worked respectively. The class of motormen and conductors shows 0.19 per cent disability.

In those states where compensation laws have been in effect the longest and where comparative data have been compiled, costs under the usual scales of compensation have at first been proportionately higher under the law than under the conditions obtaining prior thereto. Safety campaigns, better selection of employees, the application of safeguards to machinery and the more continuous use of safety appliances, however, have tended to bring down the cost of industrial injury compensation. It is quite improbable that any member company now operating under such laws would be willing to return to the old conditions.

National Safety Congress This Week

THE fifth annual congress of the National Safety Council, which was held in Detroit, Mich., from Oct. 17 to 20 inclusive, was attended by about 1200 delegates, including a number of electric railway men. Sectional meetings devoted to public utilities, electric railways and public safety were held on Tuesday, Wednesday and Thursday, respectively. Abstracts of some of the papers will be printed in a later issue of the ELECTRIC RAILWAY JOURNAL.

A list of the electric railway section papers was printed in the issue for Sept. 30. In addition to the papers delivered before the section itself there were other papers of value to railway men, notably one on "Station Safeguarding," by Charles Penrose, Philadelphia Electric Company, and others on public safety.

R. W. Campbell of the Illinois Steel Company presided over the public safety meeting in the place of Edward C. Spring, Lehigh Valley Transit Company, who was detained by business. Perhaps the most interesting single feature of the electric railway section was the records given of the rapidly increasing number of collisions with automobiles.

At the meeting on Oct. 20, H. A. Bullock, Brooklyn Rapid Transit Company, was elected chairman and Edward C. Spring, Lehigh Valley Transit Company, vice-chairman of the electric railway section. L. R. Palmer of the Department of Labor and Industry of Pennsylvania, was elected president for the ensuing year of the National Safety Council.

The papers and discussion brought out clearly the influence which safety considerations are having upon all lines of industrial and public utility work. The earnest interest in the proceedings shown by the delegates indicated that the safety movement is taken seriously from both the economic and humanitarian standpoints.

As an adjunct to the congress a safety exhibit was held in the armory located at Larned and Brush Streets. While no electric railways exhibited, there were steam railroad exhibits, and many safety appliances applicable to electric railways were shown. The meetings were held on the second floor of the Hotel Statler.

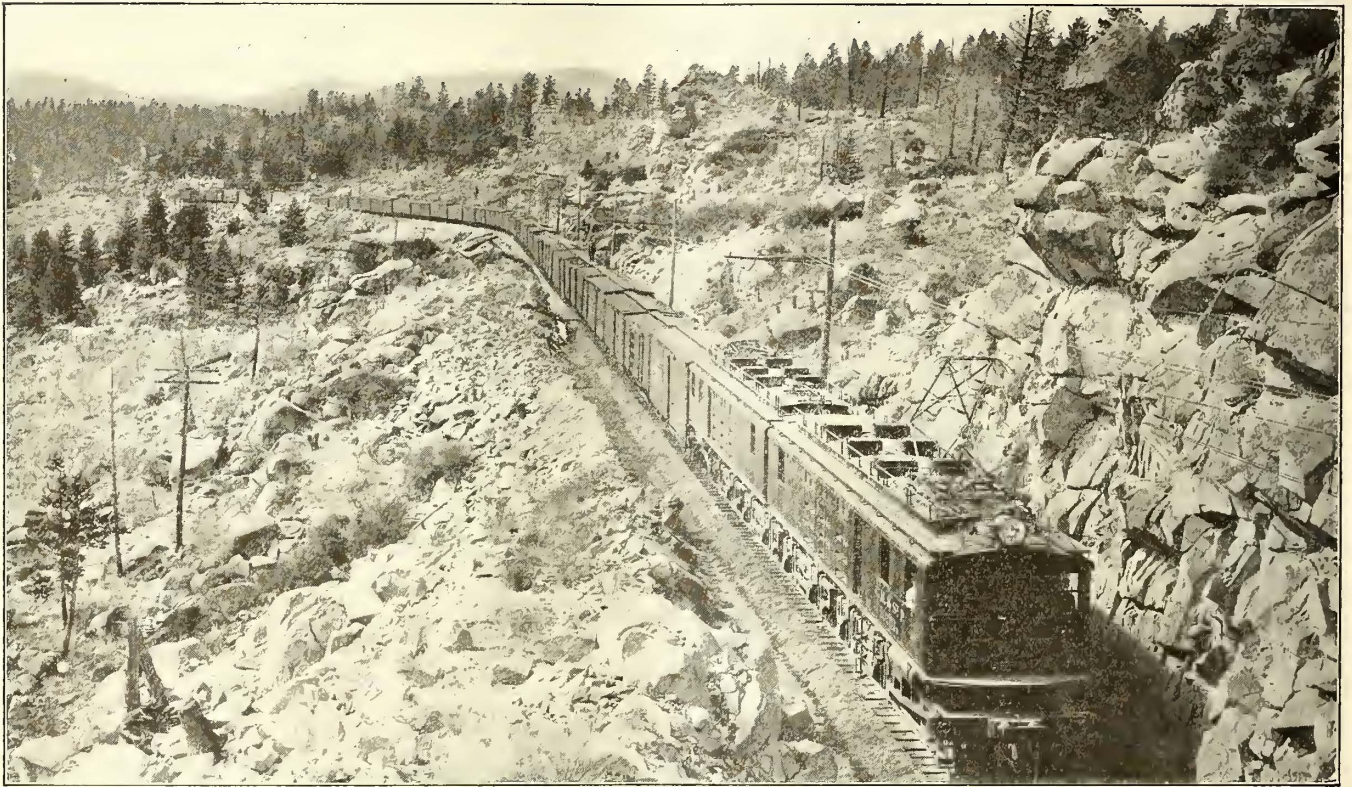
Attendance at the Atlantic City Convention

The registration figures at the Atlantic City convention last week, as compared with those at the 1914 convention, are given below. Comparison is made with the 1914 convention as that is the last one that was held at Atlantic City.

	1916	1914
Officials of the different associations.....	66	31
American Association	248	196
Accountants' Association.....	125	101
Claims Association	81	75
Engineering Association	547	360
Transportation & Traffic Association.....	300	158
Individual Members	44	73
Ladies	725	416
Guests	231	144
Manufacturers	904	900
	<hr/>	<hr/>
	3,271	2,454

Mechanical and Electrical Features of the C., M. & St. P. Locomotives

Details Are Published for the First Time Regarding the Method of Regenerative Braking with D.C. Motors, Also Regarding the Mechanical Construction of the 288-Ton Locomotives Which Have 450-Hp. Axle-Mounted Motors and Operate Satisfactorily at 65 m. p. h. in Passenger Service



C., M. & ST. P. LOCOMOTIVES—FREIGHT TRAIN DESCENDING 2 PER CENT GRADE ON EASTERN SLOPE OF ROCKY MOUNTAINS

THE locomotives for the Chicago, Milwaukee & St. Paul Railway's electrification, which has been discussed in various past issues of the *ELECTRIC RAILWAY JOURNAL*,* possess more than ordinary interest through their many novel features, the most notable among these being the use of 3000-volt direct-current and the adoption of direct-current regenerative braking. These locomotives were first placed in regular service in December, 1915, so that some of them have had practically one year's service. During this period the engines have been operating most successfully, permitting an increase in train load on maximum grades from 1700 tons to 2500 tons, and an increase of speed from 8 m.p.h. to 15 m.p.h. At the same time there has been a reduction in the number of helper engines on the grades, and half of the dispatchers originally employed are now able to handle trains on the 226 miles of route that are electrically operated at the present time. Indeed, according to C. A. Goodnow, assistant to the president Chicago, Milwaukee & St. Paul Railway, who is in charge of the electrification, the installation has been such a tre-

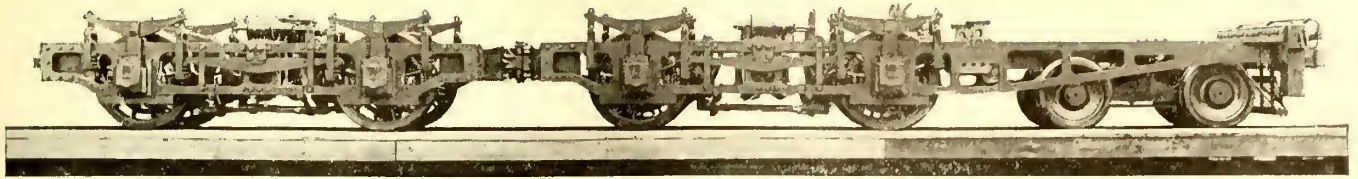
mendous success that the fact of the existence of the Continental Divide has been altogether forgotten.

MECHANICAL DETAILS OF THE LOCOMOTIVE

The decision to use 3000-volt direct current for the Milwaukee locomotives followed a careful study of the relative cost and other features of split-phase and alternating-current systems and of the other practical direct-current voltages. This review showed figures and operating characteristics favorable to direct current with but little difference in the investment between 3000 volts and 5000 volts. However, the investment in copper for the former case was transferred to investment in locomotives for the latter case, and copper was obviously subject to less depreciation and maintenance than in the case of rolling stock. Further, as the investment for substations and copper was sufficient for a material increase in traffic, such locomotives as might be subsequently purchased, if built for 5000 volts, would continually add the burden of a higher cost. As installed, the initial investment for the 440 route-miles of the electrification will be something less than \$30,000 per mile, according to figures published by the railway company.

The first of the four engine divisions to be electrified by the Milwaukee extends through a most difficult sec-

*Among the previous articles on this installation in the *ELECTRIC RAILWAY JOURNAL* are the following: Nov. 21, 1914, Construction Plans; Dec. 19, 1914, Operating Plans; June 5, 1915, Locomotive Design; Oct. 16, 1915, Substations and Overhead; Dec. 18, 1915, Operating Tests; March 4, 1916, Switching Locomotives; April 1, 1916, Features of Operation; June 17, 1916, Operating Notes.

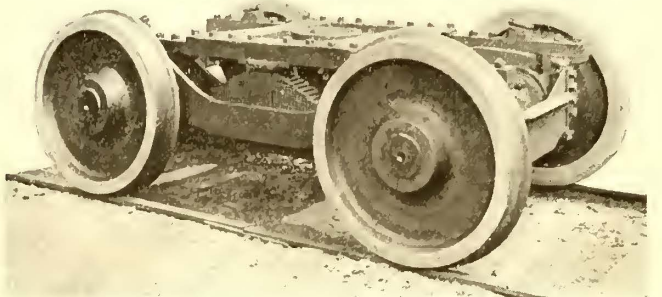


C., M. & ST. P. LOCOMOTIVES—RUNNING GEAR FOR ONE HALF-UNIT

tion of the Rocky Mountains. During the past year, however, this division has been operated by the electric equipment without any apparent difficulty, not only keeping the road clear of congestion, but almost universally making up time that had been lost on adjoining steam-operated portions of the road. From the mechanical standpoint, the electric locomotives that have been making this remarkable record are of unusually large size, the principal dimensions being as follows:

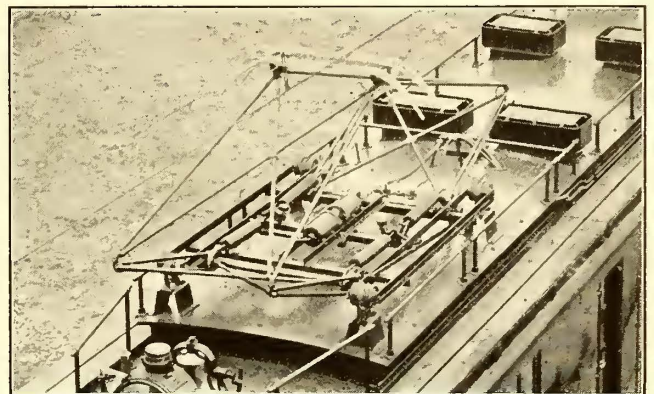
other parts taking longitudinal stresses are designed to withstand a 500,000-lb. static pressure with liberal factors of safety. The side frames are of cast steel 4½ in.

Maximum tractive effort.....	132,500 lb.
Continuous tractive effort.....	71,000 lb.
Length overall.....	112 ft. 0 in.
Total wheel base.....	102 ft. 8 in.
Width overall.....	10 ft. 0 in.
Height, pantograph lowered.....	16 ft. 8 in.
Rigid driving wheel base.....	10 ft. 6 in.
Rigid guiding wheel base.....	6 ft. 0 in.
Diameter driving wheel.....	52 in.
Diameter guiding wheel.....	36 in.
Size main driving journals.....	8 in. x 14 in.
Size guiding journals.....	6½ in. x 12 in.
Total weight.....	576,000 lb.
Weight on drivers.....	450,000 lb.
Weight per driving axle.....	56,250 lb.
Spring borne weight per driving axle.....	40,000 lb.
Dead weight per driving axle.....	16,250 lb.
Weight on guiding wheels.....	126,000 lb.
Weight per guiding axle.....	31,500 lb.
Spring borne weight per guiding axle.....	27,274 lb.
Dead weight per guiding axle.....	4,226 lb.
Maximum tractive effort in per cent of weight on drivers.....	30 per cent
Continuous tractive effort in per cent of weight on drivers.....	16 per cent
Normal braking power in per cent of weight on drivers.....	89 per cent
Normal braking power in per cent of total weight..	69 per cent



C., M. & ST. P. LOCOMOTIVES—GUIDING TRUCK

thick placed on 80-in. centers. Midway between the wheels on each of the trucks is a hollow cast-steel transom with supporting lugs for the nose of the traction motors, and ventilation from the blower in the cab is

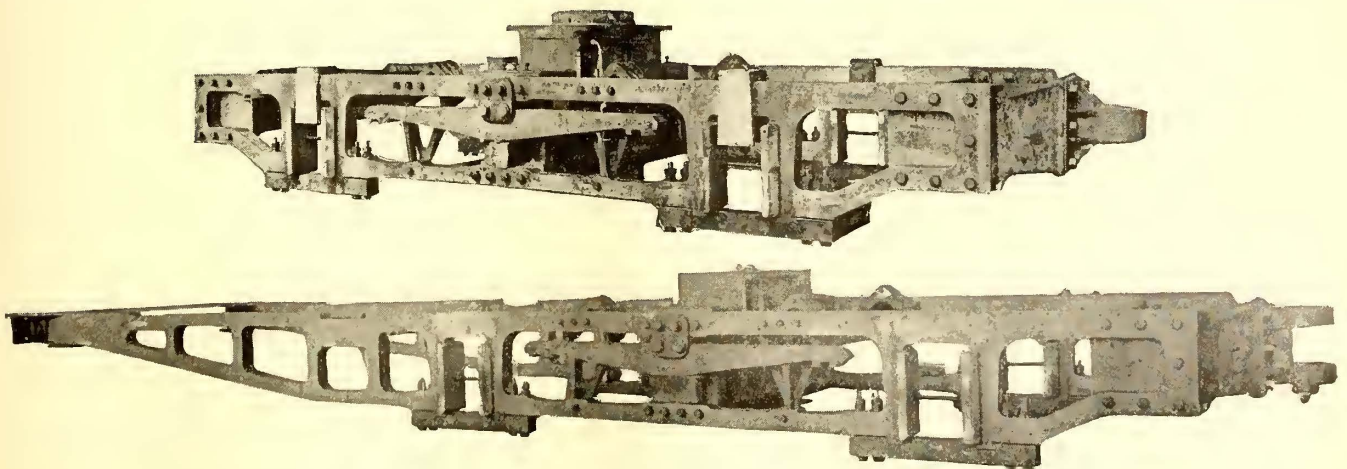


C., M. & ST. P. LOCOMOTIVES—DOUBLE SHOE PANTOGRAPH AND VENTILATORS ON CAB ROOF

The locomotives, which were built by the General Electric Company, are each made up of two duplicate sections, each section having a cab mounted on two driving trucks, of which one is unsymmetrical in that it has an extended frame to carry the draft rigging and the center pin for the guiding truck. The guiding truck is of the well-known equalized type common to steam locomotives, and it carries the load on a center bearing through a bolster which provides 4 in. of lateral movement each way from the center against a constant pressure. The riding characteristics have been most satisfactory, speeds of 65 m.p.h. being attained in passenger service. There is absolutely no nosing on tangent track.

transmitted through this direct into the motors. The equalizing arrangement for each driving truck is similar to that used upon steam locomotives. No vertical

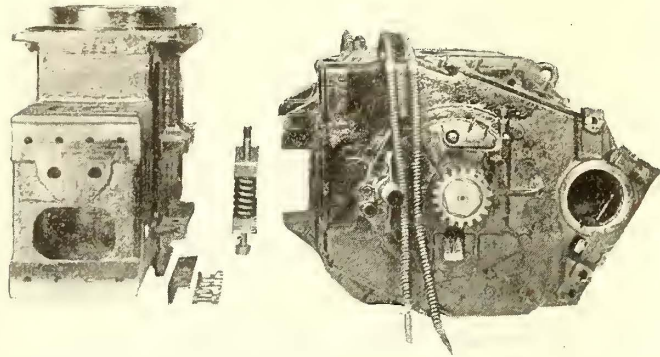
In the driving trucks the side frame, transoms and



C., M. & ST. P. LOCOMOTIVES—FRAMES OF SYMMETRICAL AND UNSYMMETRICAL TRUCKS

play is allowed in the hinge between the trucks for each half unit, but it is provided in the hinge joint between the two half-locomotives.

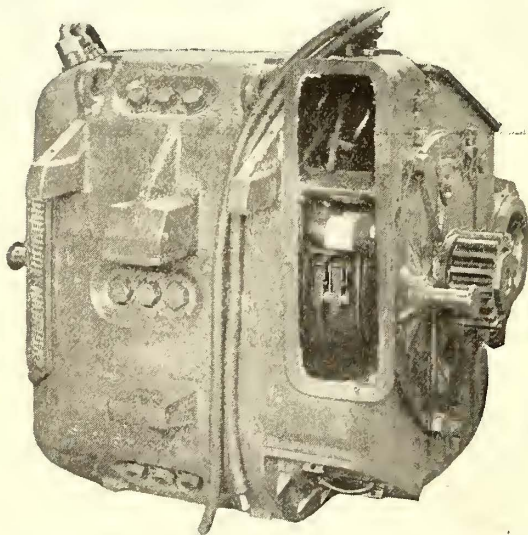
The frames are provided with pedestal shoes at the journals so that when the shoes are dropped the journal boxes can be removed from place without lifting the frame. This makes it convenient to renew the thrust



C., M. & ST. P. LOCOMOTIVES—DISSEMBLED VIEW OF NOSE-SUSPENSION OF MOTOR ON TRANSOM

plates which are provided at the back of each box. The motors are supported in the usual way directly on the axle at one side, and by a nose bracket through double-acting springs to the bolster in the other side. The motors drive through flexible gears that are mounted directly on the axle, one at each end of the motor.

The superstructure of each section of the locomotive is made up with two 12-in. longitudinal center sills placed 31 in. apart, this forming a box girder and providing for an air duct to conduct the ventilating air from the blower to the motors. A secondary floor of 6-in. channels forms ducts for the wiring conduit and serves as a floor for the cab. The cabs are built in the usual way, with ventilating louvres in the sides. Each is divided into two compartments, consisting of the main apparatus cab, 47 ft. long, and the motorman's cab, 5 ft. long. The apparatus cab is arranged with an aisle



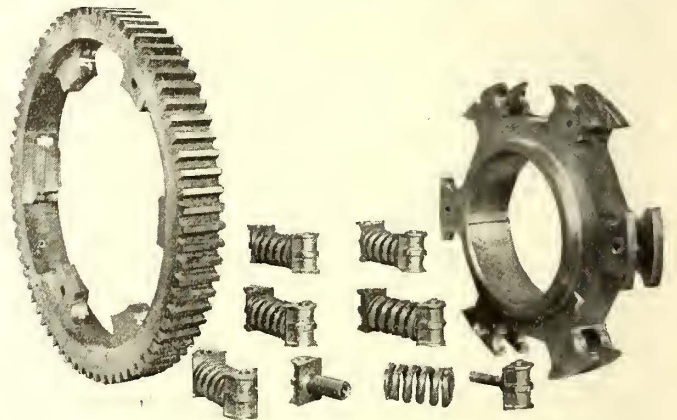
C., M. & ST. P. LOCOMOTIVES—VIEW OF 450-HP. MOTOR SHOWING VENTILATING AIR INTAKE

23 in. wide that extends for the entire length on each side, with compartments for the control and other apparatus arranged in the middle, hatches being provided in the roof for handling all apparatus with overhead cranes. The motor-generator set, the blower and the compressor are carried directly on the box girder forming the main air duct.

In the compartment for rheostats and switches the rheostats are supported near the floor, and above them are mounted the contactors. Ventilating flues leading from the rheostat compartment through the roof provide natural ventilation, air being taken through openings in the floor. The front of the contactors and switches is accessible from a center aisle into which all contactors face, thus providing liberal arcing space. This arrangement of rheostat and contactor compartment has been found particularly desirable on account of the ease of inspection and removal of parts that need replacement. By this means also all of the high-tension apparatus that might be a source of danger is safely inclosed.

MOTORS

The motors used with these locomotives are the largest of the axle-mounted type that have been used in the electrification of steam railways. They are known as the General Electric type 253. Based on the A.I.E.E. standard method of rating, their one-hour rating is 452 hp., and the continuous rating, based on a temperature rise of 100 deg. C. in the armature and 120 deg. C. in the fields, is 396 hp. These ratings are for a poten-



C., M. & ST. P. LOCOMOTIVES—DISSEMBLED PARTS FOR FLEXIBLE GEAR

tial of 1500 volts, two motors being coupled permanently in series for operation on 3000 volts from the line. The motor is designed for operation with an external blower and the volume of air at the continuous rating approximates 2500 cu. ft. per minute. The air is blown into the motor through a large opening on the front of the magnet frame at the commutator end, then passes in parallel streams through the armature and over the field coils, and is exhausted through openings in the magnet frame and bearing head at the opposite end.

Each motor complete, including spring gears, pinions, gear case and axle lining, weighs 14,860 lb. It has four main poles and four commutating poles, and is designed for field control, the field being shunted 50 per cent in motoring at full speed. The armature has forty-nine slots with seven coils per slot, and the commutator 343 segments. The armature has a single-turn winding, and the diameter of the armature core is 29½ in., the coils being insulated with mica and asbestos. At the one-hour rating the speed of the armature is 446 r.p.m. There are four brush holders per motor, each having two brushes 11/16 in. x 1¾ in.

The main field coils are wound with strip copper in two sections with asbestos between turns. They are insulated with mica and asbestos, and have a final wrapping of strong cotton tape. The commutating coils are made of edgewise-wound strip copper, and are insulated in a similar manner to the main field coils. The main exciting field coils are not subjected to full volt-

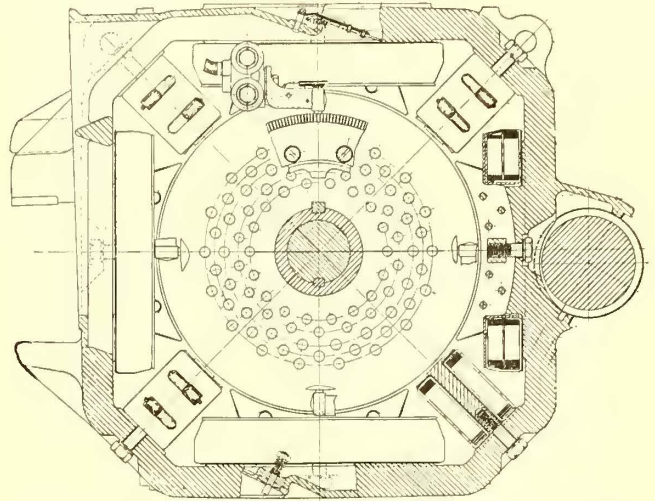
age, since the armatures of two motors are connected in series with the fields of both motors on the ground side. The clips connecting the top and bottom bars at the back end of the armature are electrically brazed to the bars, thus insuring a reliable connection at any abnormally high temperature which might occur at excessive overload. The magnet frame is made of cast steel, and except in size differs but little in general appearance from standard box frame railway motors.

The commutating characteristics of the motor are excellent, and it has been found possible to raise the voltage on a stand test 50 per cent above normal without injurious sparking. When the motors are regenerating at voltages materially higher than 3000, the fields can be shunted to a surprising extent without appreciable sparking.

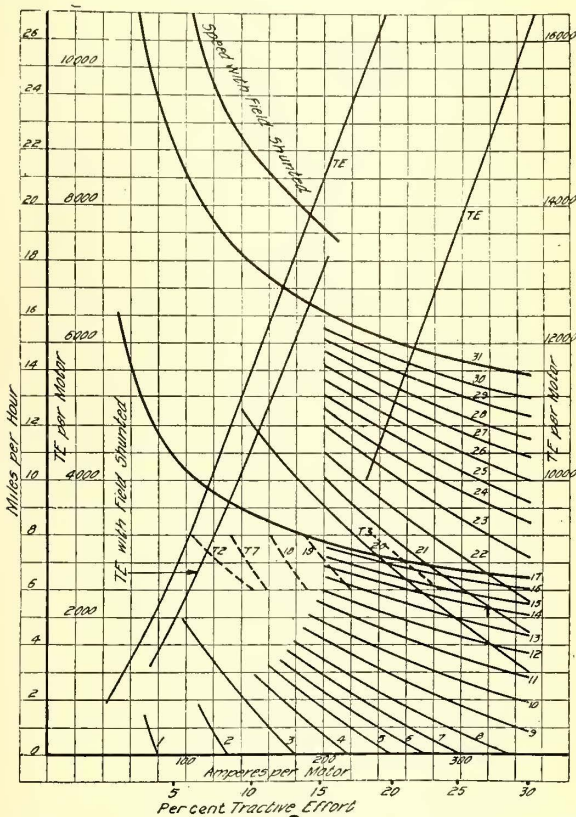
The motor has twin gears with a 4-in. face and two-pitch. For the freight locomotive the gear ratio is 18:82, and for the passenger locomotive 29:71. Both gears and pinions are made of high-carbon, oil-treated stock, having an elastic limit of 85,000 lb. per square

the heavy currents that obtain in the service. Sparking is entirely eliminated, although the current required for a single locomotive at continuous rating is 840 amp., and in passenger service speeds up to 60 m.p.h. are attained.

The motorman controls the operation of his pantograph by means of an air valve, which admits air to a pair of cylinders energizing powerful springs, the latter in turn raising the pantograph and at the same time



C., M. & ST. P. LOCOMOTIVES—TRANSVERSE CROSS-SECTION OF MOTOR



C., M. & ST. P. LOCOMOTIVES—CHARACTERISTIC CURVES FOR VARIOUS CONTROL POINTS, AND SERIES-PARALLEL TRANSFER STEPS FOR 1500-VOLT FREIGHT-SERVICE MOTOR WITH GEAR RATIO OF 18 : 82 AND 52-IN. WHEELS

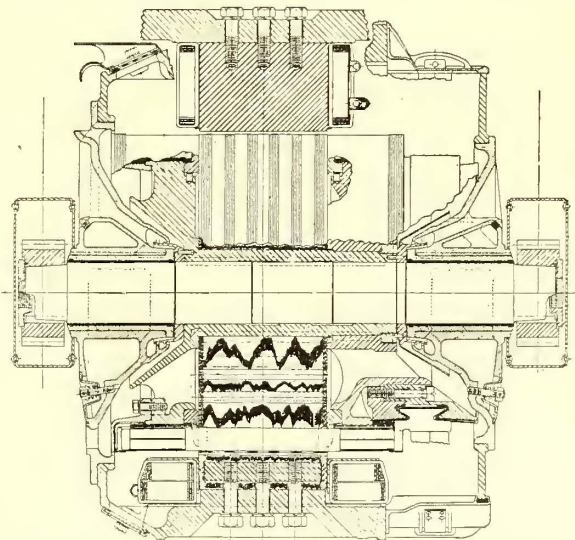
inch. In service the motors have operated with excellent results, and there is no noticeable gear noise or vibration while the locomotives are in motion. At present the motors run at a comparatively low temperature because their capacity is sufficient to handle heavier trains than originally contemplated.

CURRENT COLLECTION AND CONTROL

As mentioned in previous articles the locomotive has two pantographs, one mounted on each half unit of the locomotive. Each pantograph has two sliding contacts or shoes, which are provided with copper wearing strips, and further provision for increased contact area is obtained by the use of double-contact wires of copper for the overhead catenary system. With the four points of contact at the pantograph it becomes easy to collect

regulating the pressure against the trolley wire. The range of action of the shoe is between 17 ft. and 25 ft. above the rail. An auxiliary trolley pole with a swivel base is supplied to collect current for the air compressor when the locomotive is first put into service. The two pantographs on each complete locomotive are connected by a bus line so that the duplex electrical equipment can be supplied from either one.

Great importance has been accorded to the design of the main emergency switches and fuses, and accordingly



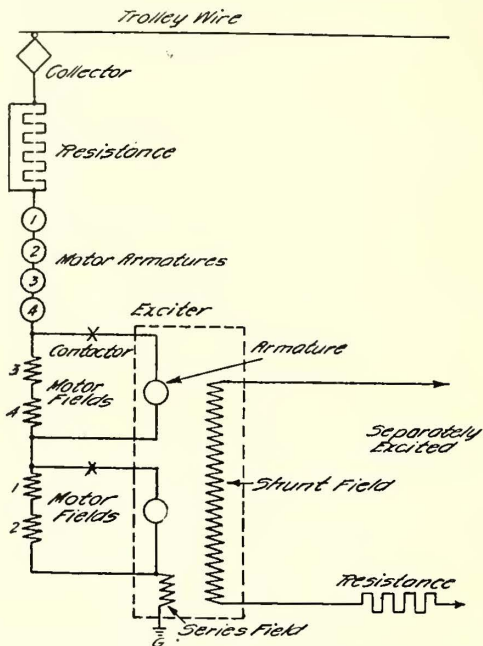
C., M. & ST. P. LOCOMOTIVES—LONGITUDINAL CROSS-SECTION OF MOTOR

these devices are mounted in a separate high-tension compartment. The trolley lead, starting from the pantograph, first enters this high-tension compartment and is divided into main and auxiliary circuits therein. From the main switch and fuse the main power lead goes directly to the controlling apparatus of the trac-

tion motors. The auxiliary lead passes to three disconnecting switches from which separate circuits run to the motor-generator set, the air compressor and the cab heater. For each lead the switch and fuse are mounted on a cradle that disconnects the fuse when the switch is open. A 3000-volt aluminum-cell lightning

and the third group contains the overload relay and a set of line contactors governed by it. The latter apparatus protects automatically against careless operation on the part of the engineer, the fuse in the high-tension compartment serving as a final protection against short circuit. In the fourth group are contactors that are assembled along and actuated by a compressed-air-driven camshaft, their functions being to series-parallel the traction motors in order to obtain two efficient continuous running speeds. Two handles at the end of this group provide for cutting out either of the two series pairs of motors on each half locomotive, permitting the other pair to be controlled either direct or in multiple unit locomotive operation.

The master controller provides for operating the permanently connected pairs of traction motors in series through sixteen rheostat points, with a seventeenth full series running point, then through eleven rheostat points in parallel and a twelfth full-parallel point. An additional parallel point with the field of the traction

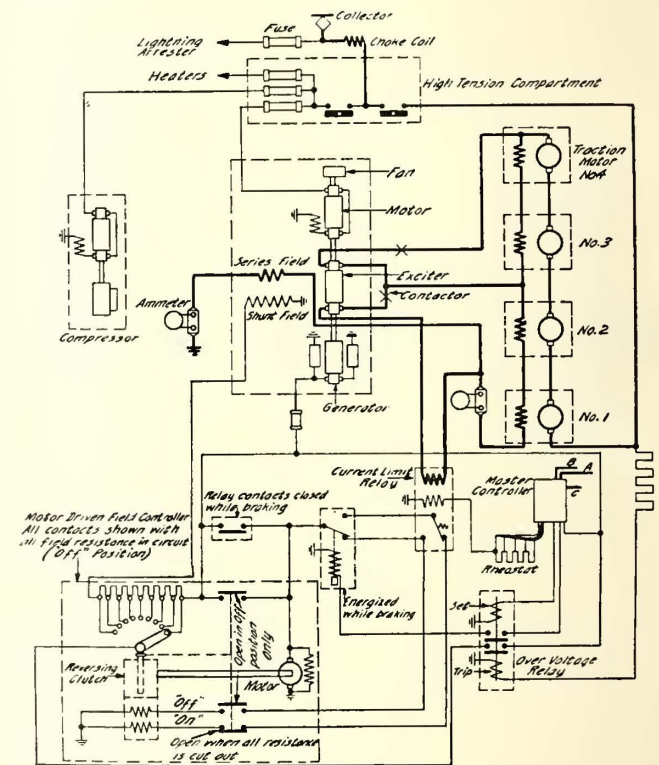


C., M. & ST. P. LOCOMOTIVES—SIMPLIFIED ARRANGEMENT OF CONNECTIONS FOR ELECTRIC BRAKING

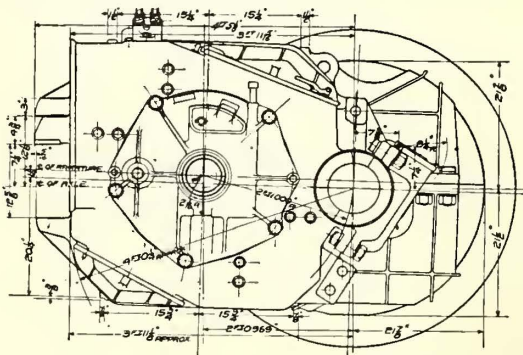
arrestor is tapped into the main lead and is mounted on the back of the high tension compartment.

The controlling apparatus which, in general, is of the well-known Sprague-General Electric type "M," is grouped in a sheet-iron compartment located near the center of the cab. At the bottom of this compartment are assembled the starting rheostats, which are of the cast-iron grid type and mounted upon 3000-volt insulators. The rheostats are separated from the equipment groups above them by a horizontal partition, and the bottom of the rheostat compartment is open, ventilation being obtained by six chimneys leading up to ventilators in the cab.

Between the chimneys four control groups are installed, the first of these including the high-voltage dis-



C., M. & ST. P. LOCOMOTIVES—SCHEMATIC DIAGRAM FOR ELECTRIC BRAKING CONNECTIONS



power for the master control circuits, cab lights, head-light and other low-voltage auxiliary circuits.

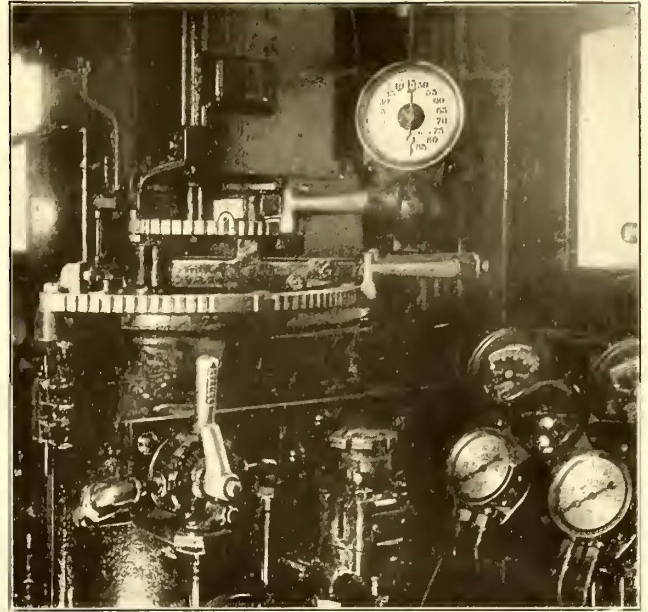
REGENERATIVE ELECTRIC BRAKING

Regenerative electric braking is, doubtless, the most interesting feature of the control equipment. With the simple direct-current motor adopted for the Milwaukee



C., M. & ST. P. LOCOMOTIVES—MOTOR-GENERATOR SET WITH FAN HOUSING REMOVED

locomotives, operation as a motor or a generator depends upon whether the trolley voltage at the locomotive is above or below the voltage at the motor terminals. Hence, when the locomotive descends a grade and is to brake regeneratively, it is necessary only to effect an increase in the voltage across the motor terminals so that power is pumped from the locomotive into the transmission system. The means for thus raising the voltage level of the motor rests in the use of the before-mentioned exciter, which is so connected as to super-excite the traction motor fields. By properly proportioning the design of the exciter for its service, the stable characteristic of the series motor is inherent in the braking connection as in the motor connection. Since the generative function is a reversal of the motor function, the traction motors provide in regeneration that, with an increase in speed, there is an automatic increase in braking effort, and with a decrease in speed there is an automatic decrease in braking effort, a definite torque corresponding always to each particular speed and voltage. The fact that this stable characteristic is closely maintained during regenerative braking is one of the greatest contributing elements to the success of electric braking in this service, because it permits operation down grades at constant speed with but little regulation by the motorman, except as changes in grade or curves produce large variations in the intensity of braking power required.

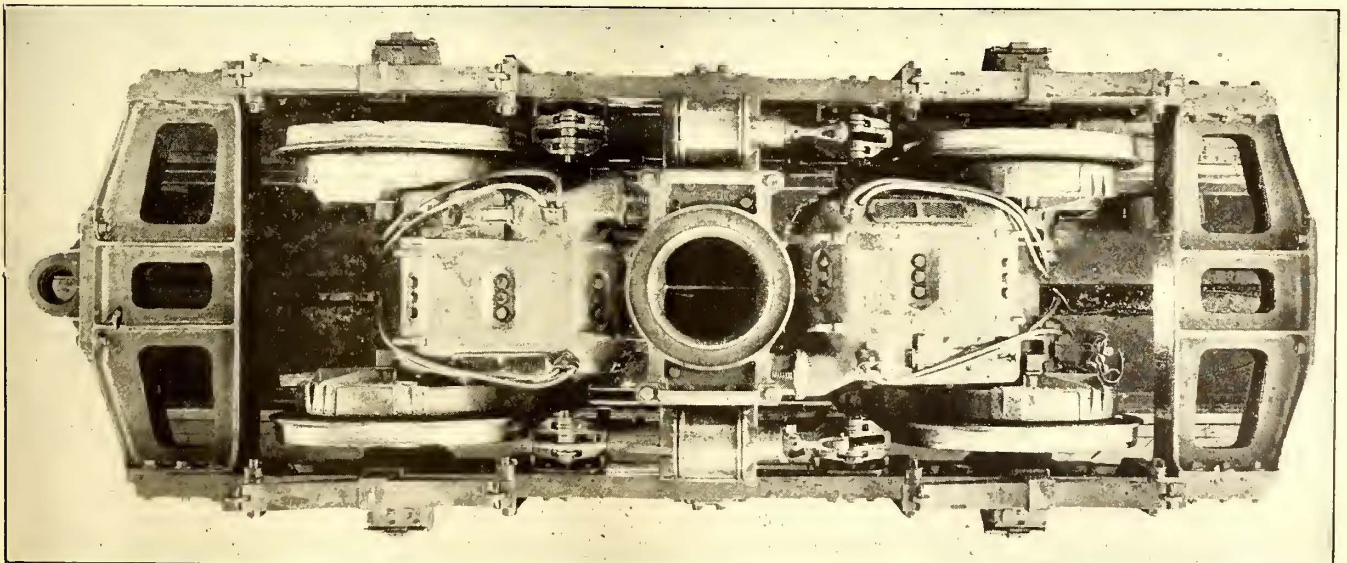


C., M. & ST. P. LOCOMOTIVES—INTERIOR VIEW OF MOTORMAN'S CAB SHOWING CONTROLLER AND ELECTRIC-BRAKING HANDLES AND OPERATING GAGE BOARD

So far as the motorman is concerned the operation is simple. When motoring he varies his tractive effort by changing the resistance in series with his traction motors, thereby limiting the amount of power to be expended in the motors. When braking he merely changes the resistance in the shunt field of his exciter, thereby regulating the increment of voltage above the line, the returned power reacting as a braking effort.

The equipment used in producing this result includes a small controller inverted upon the large master controller, the handle for the former being used for varying the intensity of the retarding torque, which may be accomplished when the motors are running either in full series or full parallel. An illuminated ammeter and gage panel is located directly in front of the motorman. This is provided with a center-zero ammeter for the line, and a field ammeter, which measures the current in the traction motor fields when they are being super-excited during regeneration. Red marks are located on the ammeter scales to show when the continuous capacity of the motor is being exceeded.

The exciter current for strengthening the main motor



C., M. & ST. P. LOCOMOTIVES—TOP VIEW OF DRIVING TRUCK SHOWING VENTILATING AIR INLET IN CENTER PLATE

fields is controlled by a specially-designed motor-driven controller which is regulated by the braking handle on the master controller. To assist in multiple-unit operation so that the different sets of motors will properly divide the load, a current-limit relay is used in the system of connections between the master controller and the exciter field controller to fix the setting of the latter.

Emphasis may well be laid upon the ease and simplicity of operation of the regenerative system by noting the fact that, during the past year of operation, steam locomotive engineers have been intrusted with the electric locomotives after having but a few days of instruction. In the first days of operation the electric locomotives were even pooled with the steam machines, and an engineer would not know until he was called whether he was to take out an electric locomotive or a steam machine.

Under regeneration the regular operation of the locomotives is not interfered with in any way, electric braking being immediately available at any time. If the speed of the train on any grade reaches a higher point than desired before braking is applied, the electric brake can be put on very slightly and gradually brought up to the point required to slow down the train and hold it at the desired speed. The regenerative control is entirely automatic, and the braking effort is held constant for any definite setting of the braking controller, being entirely independent of changes in trolley voltage, distance from substations or from the nearest locomotive, changing grades, etc. In effect, the locomotive under regeneration acts exactly the same as a port-

able substation that is moving between the permanent substations but is electrically and physically connected to the substation busbars. The substation generators fix the voltage and the locomotive must generate this voltage plus the voltage drop due to current returning to the substation busbars. If power is fed into another locomotive, the generated voltage is dependent upon the drop in voltage due to the load taken from the substation by the locomotive that is not regenerating. It is possible for one train descending a grade to take a lighter train up the other side of the mountain with all power passing through the substation busbars, but without the delivery of any power from the substation, the generating apparatus merely floating on the line and determining the trolley voltage.

In past years it has always been considered necessary to figure on a larger motor for electric braking than would ordinarily be used, because in this case the motor would be operated continuously, but the internal ventilated type of motor that is installed on the Milwaukee locomotives has such a high continuous capacity that it can be operated continuously at the normal locomotive rating without being overheated. In brief, the advent of the commutating-pole motor, with its greatly increased commutating capacity and its rugged construction, has contributed most largely to the establishment of direct-current regeneration, because the standard commutating-pole motor automatically becomes an excellent generator, when driven by the weight of the locomotive and train on down grades without necessity for adding to the weight of the motor or changing its fields or connections.

American Association News

President Phillips of the Engineering Association Announces the Appointment of Committee Chairmen—Scale of Dues for Manufacturing Members—Meetings of Company Sections in Chicago, New Haven and Milwaukee Were Addressed by Prominent Speakers and Showed Good Attendance

Engineering Association Appoints Committee Chairman

Immediately following the last session of the Engineering Association meeting at Atlantic City, President Phillips called a meeting of the executive committee. Among other items of business the president was authorized to appoint a special committee to confer with the United States Bureau of Standards on the National Safety Code. He was also authorized to appoint a delegate to the Good Roads Congress. A tentative plan of subjects for the consideration of the new committees was also submitted.

President Phillips then announced the appointment of officers of committees as follows: H. H. Adams, Chicago Surface Lines, secretary standards committee; C. H. Clark, Cleveland Railway, chairman way committee; J. W. Welsh, Pittsburgh Railways, chairman power generation committee; C. L. Cadle, New York State Railways, Rochester, N. Y., chairman power distribution committee; E. R. Hill, consulting engineer, New York, chairman committee on heavy electric traction; C. S. Kimball, Washington Railway & Electric Company, chairman committee on buildings and structures; L. P. Crecelius, Cleveland Railway, chairman committee on engineering-accounting, and W. G. Gove, Brooklyn Rapid Transit System, chairman committee on equip-

ment. President Phillips named as the special committee to confer with the Bureau of Standards: C. L. Cadle,

chairman; J. W. Welsh, co-chairman; W. G. Gove, C. S. Kimball and E. R. Hill.

Chicago Elevated Section Inaugurates Educational Talks

The meeting of the Chicago Elevated Railroad Company Section, held recently, was attended by 150 members and guests. The meeting was largely taken up with power matters, W. O. Barnhart, chief power supervisor, being the principal speaker. He first described visits made by the section during the summer to the great Fisk Street and Quarry Street power plants of the Commonwealth Edison Company, later giving a talk on "An Explanation of Electrical Terms." As explained by President H. A. Johnson, the latter was the first of a series of fifteen-minute educational talks on subjects pertaining to the operation of the elevated railroads. These talks are to be followed by general discussions. It was expected that John W. Bunn, Galena Signal Oil Company, would deliver an address on "Signal Oil," but he was obliged to postpone his talk.

Several items of business were disposed of at the meeting, among which were the election of J. H. Mallon, safety engineer, as section delegate to the Atlantic City convention, and the appointment of a nominating committee to prepare a slate for the election which occurs at the meeting. During the evening the members were entertained with music and crayon drawing, the latter to piano accompaniment.

Scale of Dues for Manufacturing Members

In the report published last week of the new scale of dues for manufacturing members of the association, as adopted at the Atlantic City Convention, the scale quoted by error was that for foreign members of the association. The action taken at Atlantic City was to make dues for manufacturing members uniform with those of railway companies. These dues in both cases are based on gross earnings from electric railway operation or from the business of manufacturing or selling material for electric railways, or from other electric railway operation in the preceding fiscal years of the respective members, and are as follows:

Gross Receipts		Dues Annual
Under	\$50,000	\$25
Between	50,000 and 100,000	50
Between	100,000 and 250,000	75
Between	250,000 and 500,000	125
Between	500,000 and 1,000,000	175
Between	1,000,000 and 2,000,000	225
Between	2,000,000 and 3,000,000	275
Between	3,000,000 and 4,000,000	325
Between	4,000,000 and 5,000,000	375
Between	5,000,000 and 6,000,000	425
Between	6,000,000 and 7,000,000	475
Between	7,000,000 and 8,000,000	525
Between	8,000,000 and 9,000,000	575
Between	9,000,000 and 10,000,000	650
Between	10,000,000 and over	750

Meeting of Connecticut Company Section

At a meeting of the Connecticut Company Section in New Haven, Sept. 19, A. L. Donnelly, assistant engineer of the Connecticut Company, read a paper on the maintenance of way department and its relations with the operating department.

After saying that the work of this department includes the maintenance and construction of track, pavement and bridges, Mr. Donnelly explained that for maintenance of way purposes the 746 miles of the system is divided into three sections, assistant engineers being in charge of each section. There are six engineers in the field and office corps, with two additional men during the summer. The track work is in charge of four roadmasters. The department holds a "roadmaster's meeting" once a month from October to May or June, during which the work done during the past summer and that proposed during the next season is discussed. Pavement repairs are made by the track department, but pavement construction, including reconstruction of old pavement, is let out on contract. Last year \$1,149,561 was spent for track and roadway maintenance and construction. The department keeps in close touch with the operating department on all matters of mutual interest. The reading of the paper was accompanied with lantern slides.

After the conclusion of this paper, J. F. Berry of the legal department read a paper on "Some Trial Experiences and Other Observations," after which Col. N. G. Osborn of the *Journal-Courier* gave a talk on "The Obligations Between Electric Railways and the Public."

In the general business meetings P. Ney Wilson, chairman of the committee appointed to investigate snow fighting methods and equipment, said that the report on that subject would be presented at the next meeting of the section.

Standard Schedule for Milwaukee Meetings

The Milwaukee Company Section (Section No. 1) held its first meeting of the season on Sept. 21. This was also the first meeting to be held under the new schedule adopted at the previous council meeting, according to which the plan for future meetings is as follows:

1. The chairman of the program committee will consult with the various heads of departments in regard

to the appointment of a man to present a paper on current events in his department. As there are nine departments represented in the company section, this will give material for nine meetings. It was suggested that the first paper be presented from the transportation department.

2. At each meeting there will be an outside speaker when one can be procured to present a subject appropriate for the occasion.

3. At each meeting there will also be an entertainment feature, such as a musical number or short act, between the reading of the two papers.

4. The president will appoint a booster committee with a member from each department to boost the attendance at the meetings.

5. Individual notices will be sent in advance to each member of the regular meetings giving the features to be presented.

At the meeting on Sept. 21, R. H. Pinkley, engineer of way and structures, gave an account of a trip which he had taken through the Far West and told of the points of electric railway interest which he had seen. Slides were used to illustrate the talk. Following this address was a musical number. Harry Wunderlich, supervisor of the transportation department, then gave a talk on the current events in his department, including an account of the methods used to handle the transportation of large masses of people at parks, picnics, places of amusement, etc. When such extra transportation is required, orders are issued in advance to each station as to the number of cars it shall supply and to each supervisor as to just what is expected of him.

The usual review of the technical press, dated Sept. 21, 1916, was also distributed at the meeting.

COMMUNICATIONS

A Few Letters on the Convention Issue

LOS ANGELES RAILWAY

LOS ANGELES, CAL., Oct. 8, 1916.

To the Editors:

I am in receipt of the Convention Section of your journal for Sept. 30. When a person does an extra good thing, I think it due him that he should be told of it. I have been a constant reader of your publication for many years, and I feel that the fraternity will vote your latest effort in convention numbers as being the best and most useful you have brought forth.

E. L. LEWIS, Superintendent.

DALLAS, TEX., Oct. 10, 1916.

To the Editors:

On my return from a "visiting trip" among some of our members in the western part of the state, I found your issue of Sept. 30 on my desk and have spent most of my leisure time since then in reading it. I am not yet through with it and I have put it on my desk among my books of reference where it will be used quite constantly within the next few months, as the jitney has made the "car" the most important question of the moment.

I am, as you know, somewhat of a crank on the subject of the usefulness of the trade and technical journal, and if there is an electric railway official anywhere who cannot obtain at the least a year's subscription value from the perusal of this single number of the JOURNAL, then he is either impermeable to new ideas or his property is so perfect that he ought to tell us all about it.

H. S. COOPER.

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

Combination Car for City and Interurban Traffic—Recent Tests on Steel Conductors—Labeling Fuses Prevents Accidents—Recent Induction-type Time-limit Relay—Pit Lighting in New Car Shops—Combination Outdoor Metering Set—Other Articles of Practical Interest

All-Steel Center-Entrance Cars for Interurban Service

This Car Has Been Developed for Service on All Lines, Combining the Virtues of Recent City and Interurban Types

BY H. R. FEHR

President and General Manager Lehigh Valley Transit Company,
Allentown, Pa.

The Lehigh Valley Transit Company operates 215 miles of electric railway in eastern Pennsylvania, located mainly in the counties of Lehigh and Northampton, and serving Allentown, Slatington, Easton, Bethlehem and South Bethlehem, together with numerous other towns and boroughs. Connections are made on the north with the Delaware Water Gap, and on the south cars are operated directly into Philadelphia. The cement and slate industries of this section are far-famed, and the great works of the Bethlehem Steel Company at South Bethlehem stand foremost among the large and varied manufacturing plants located on its lines.

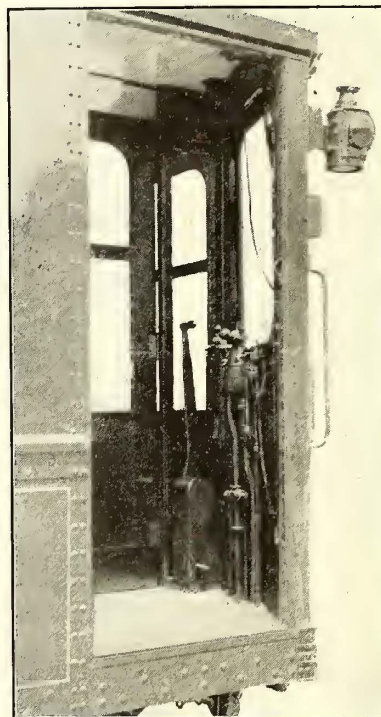
At the beginning of the year it was decided to purchase additional passenger equipment to meet the rapidly increasing business, and it appeared advisable to design a car which could be used equally well either in local or interurban service. Heretofore the interurban cars used between Allentown and Philadelphia, a distance of 55½ miles, weighed 41 tons, whereas the city cars weighed 26 tons, so that each type was limited to its own special service. Therefore, a detailed study was made of all existing conditions, such as clearances, grades, schedules, etc., and future needs were estimated as far as possible, with the result that plans and specifications were drawn up by superintendent of equipment Harry Branson and the writer for a universal car of the double-end, all-steel, center-entrance type, adapted for operation on all lines equally well, and weighing

complete 34½ tons. From Norristown to Sixty-ninth Street Terminal, Philadelphia, a distance of 13½ miles, the Lehigh Valley Transit cars operate over the tracks of the Philadelphia & Western Railway, so have to be

equipped for third rail operation. For current collection over the remainder of the line they are equipped with Miller trolley shoes and the usual trolley poles.

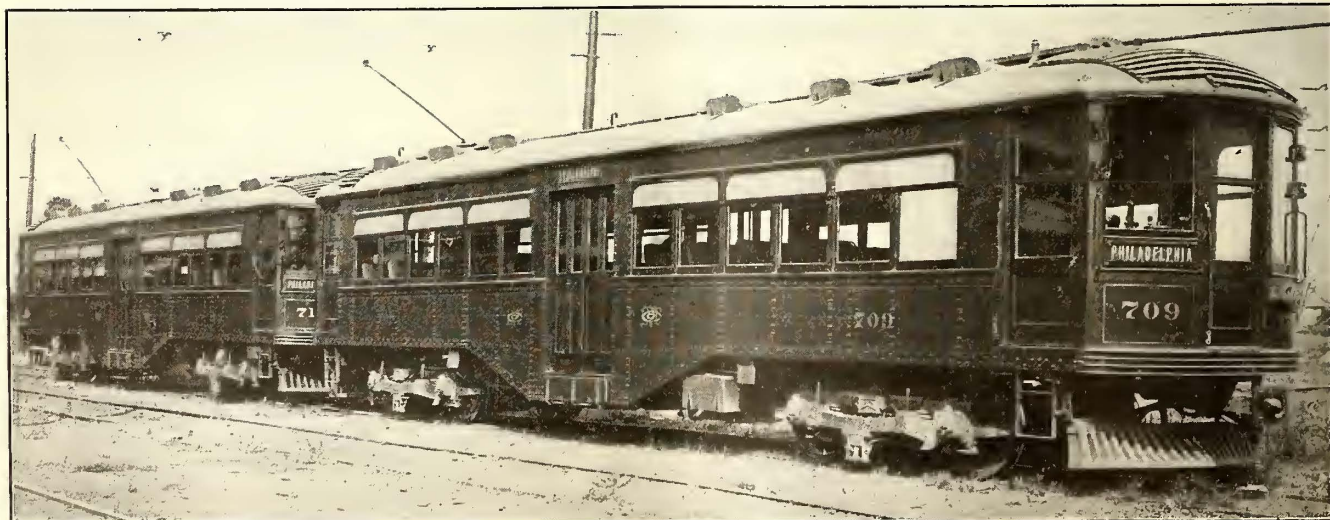
Twelve cars were ordered from the Southern Car Company and these were received and placed in operation early in September. They met with the instant approval of the public and the trainmen, and have more than justified the original expectations of the management.

The cars are mounted on Brill M.C.B.-2X trucks, with 36-in. rolled steel wheels, with a 3½-in. tread, and equipped with West-



MOTORMAN'S CAB SHOWING BRAKE AND CONTROL APPARATUS

inghouse 547-A motors, with ALM control, and Westinghouse straight and automatic air brakes, Schedule A. M. M. Safety and comfort were not sacrificed in



A TWO-CAR LIMITED TRAIN ON THE LIBERTY-BELL ROUTE OF THE LEHIGH VALLEY RAPID TRANSIT COMPANY

favor of weight in the design of these cars, as is so often the case, and the easy riding qualities of these cars are worthy of mention.

The general dimensions of these cars are as follows:

Length over bumpers.....	50 ft.
Width over all.....	8 ft. 10 1/2 in.
Width of aisle.....	23 3/4 in.
Height from rail to top trolley base.....	12 ft. 6 in.
Truck centers.....	29 ft. 6 in.
Diameter of wheels.....	36 in.
Wheelbase of trucks.....	6 ft. 6 in.
Step heights:	
Rail to top of first step.....	15 1/4 in.
First step to second step.....	13 1/2 in.
Second step to floor.....	11 1/4 in.
Entrance width in the clear.....	4 ft.
Ramp of floor from bolster to center.....	5 in.
Seating capacity.....	60
Weight.....	69,200 lb
Weight per seated passenger.....	1,153 lb

The miscellaneous equipment includes Tomlinson couplers, Rico anti-climbers, Edwards sash fixtures, Curtain Supply Company's curtains, Automatic ventilators, Horne double acting hand brakes, Western Electric push buttons and buzzer system, Ohmer registers, National Pneumatic Company's manual door devices, and Keystone illuminated signs.

The car body is all steel, with arch roof, steel tee posts, and with pan floor construction, of No. 18 gage sheet steel, divided to meet cross and longitudinal members. On the steel floor are laid 7/8-in. maple, 1-in. cork and 5/16-in. linoleum, the only other wood besides the floor reinforcements, being in the sash, doors and in-



VIEW SHOWING INTERIOR ARRANGEMENT ON CARS OF LEHIGH VALLEY TRANSIT COMPANY

side ceiling trim. The use of cork, linoleum and agasote will insure warmth in winter and coolness in summer.

The interior of the car is constructed on the most sanitary lines, and with the elimination of all dust collecting pockets. The side windows raise 52 in. above the floor line, so as not to obstruct the view and at the same time giving ample ventilation in warm weather. The lighting system is of the center type. Heat is furnished by a Cooper B-5 forced ventilation hot air heater in conjunction with Consolidated electric heaters. On each end the motorman's compartment is placed at the right of the car, thereby giving an extended view through the observation windows to the passengers, who have not hesitated to express their approval of this feature. In one end of the car is a large smoking compartment seating thirteen, with Hale & Kilburn latest type "Walkover" seats with embossed pressed steel arm rests and Chase leather finish. The cross seats in the balance of the car are of the "Walkover" type, finished in green plush. In the center of the car are four

longitudinal seats, and there are three folding seats and one stationary seat at each end.

In the opposite end of the car, from the smoking section and just behind the motorman's compartment, is located a toilet room, finished in white enamel and completely equipped according to the most modern practice. Drinking water and paper cups are also provided.

In laying out the various pieces of apparatus underneath the car floor special attention was paid to its location in order to obtain an equal distribution of weight according to center pin and side loads, thereby eliminating all vibration and the hammer blows due to unequalization. Particular care was devoted also to the inspection and renewal of all parts.

Although there is considerable difference of opinion regarding the merits of the center-entrance car as compared with the end-entrance type, the Lehigh Valley Transit Company believes it is a question to be solved by the public and the local conditions of operation. The attitude of its patrons, therefore, toward this new type of car will be noted carefully by the management, and will be of considerable influence in determining the design of future equipment.

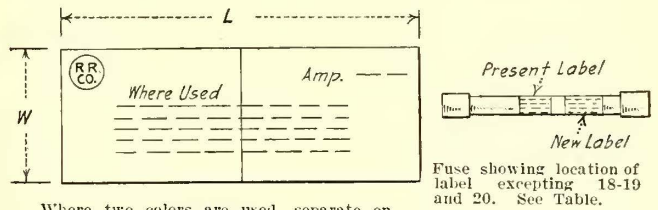
Labeling Fuses Conduces to Safety

Additional Fuse Labels Guarantee Proper Capacity Fuses in All Circuits

BY E. D. RANSOM, B.E.

As a result of certain accidents which occurred on a large street railway system, an investigation showed the cause to be due to fuses of improper capacities in the air compressor circuit. On one occasion a motorman placed a 1-amp. fuse in this circuit where one of 8-amp. capacity should have been used. As the 1-amp. fuse did not have sufficient capacity for the circuit, it "blew," unknown to the motorman. Although sufficient air remained in the main reservoir for a few service applications there was not enough air to make a quick stop, and an accident resulted.

To all external appearances the 1-amp. and 8-amp. fuses are the same with the exception of the capacity label. Where twenty-two different fuses are used in the numerous circuits and types of equipment, the average motorman can not be expected to remember the



Where two colors are used, separate on center line.
Paper label—Gummed on one side.
Note:—Paper to be of good quality and to receive two coats of fish glue gum.
Labels 18-19 and 20 to be placed on fuse opposite manufacturers label.

PAPER LABEL AND FUSE SHOWING LOCATION OF OLD AND NEW LABEL

correct capacity for each circuit. This also applies to line inspectors, maintenance men and any others who must handle or replace fuses.

The accompanying drawing is of a label which is now placed on all fuses used in car circuits. The table on page 898 shows the fuses of different capacities tabulated by number, color and size of label and the location in which each is used. For example, the 15-amp. fuse bears label No. 8. It is pink in color and is inscribed to show that it can be used in No. 1 heater circuits of ele-

FUSES TABULATED BY NUMBER, COLOR AND SIZE OF LABEL

Label No.	Amperes	Where Used	L, In.	W, In.	Color
1	1	Signal bell, buzzer and door, center-entrance car; light-elevated, subway and surface cars.	1 1/8	3/4	White
2	2	Register, center-entrance cars.	1 1/8	3/4	Blue.
3	5	Fan motor, center-entrance cars; are light trolley, elevated cars.	1 1/8	3/4	Light green.
4	5—Special	Battery, elevated cars.	1 1/8	3/4	Green.
5	8	Pump, No. 1 heater, surface cars.	1 1/8	3/4	Red.
6	10	Controller relay, center-entrance cars; are light ground, elevated cars.	1 1/8	3/4	Yellow.
7	10—Special	Pump, elevated cars.	1 1/8	1	Red.
8	15	No. 1 heater, elevated cars; No. 2 heater, surface cars; pump, subway cars.	1 1/8	1	Pink.
9	15—Special	Heater, B. O. cars.	1 1/8	1	White and red.
10	25	No. 2 heater, elevated; all heaters, subway cars.	1 1/8	1	White and green.
11	30	Main heater, center-entrance cars.	1 1/8	1	White and blue.
12	35—Special	Heat and light line, elevated trailers.	1 1/8	1	Green and yellow.
13	50	Auxiliary, center-entrance cars; heat and light line, elevated motor cars.	1 1/8	1	White and brown.
14	150	Main motor, S. T. surface cars.	1 1/2	1	White and pink.
15	225	Main motor K-11 controller, surface cars.	1 1/2	1	Red and blue.
16	250	Main motor K-28-L controller, surface cars.	1 1/2	1	Red and green.
17	300	Main motor, convertible surface cars.	1 1/2	1	Red and yellow.
18	15	Emergency lights and compressor control, subway cars.	1 1/2	3/4	Red and pink.
19	20	Control, subway cars.	1 1/2	3/4	Blue and pink.
20	5	Buzzer, door magnets, empty and load brake and speed control, subway cars.	1 1/8	3/4	Blue and yellow.
21	3	Speed control, A. C. subway cars.	1 1/8	1	Blue and green.
22	75	Main auxiliary, subway cars.	1 1/2	1	Green and pink.

vated cars, in No. 2 heater circuits of surface cars or in compressor circuits of subway cars. The drawing shows the location of the label on the fuse, the method of attaching and instructions as to the division of coloring.

When fuses are ordered, this information is furnished the manufacturer, who properly labels all fuses before delivery. By the use of these labels the proper capacity fuse is insured in its respective circuit by any one who can read, regardless of his knowledge as to the proper capacity fuse required. In addition fuses are sorted and stored easily as it is not necessary to stop and read the capacity label.

Steel Conductors for Transmission Lines

Electrical Distribution Properties Include Low Cost and High Strength

Tests of the electrical properties of steel wires and cables used as conductors of alternating current show attractive possibilities from both commercial and engineering points of view for the use of steel instead of copper in certain classes of work. This statement and supplementary opinions were voiced by H. B. Dwight, Canadian Westinghouse Company, Ltd., Hamilton, Ontario, in a paper on the subject presented at the joint session of the Association of Iron & Steel Electrical Engineers with the American Institute of Electrical Engineers, held in Chicago recently. Mr. Dwight pointed out the advisability of making complete tests of American grades of steel so that transmission-line engineers may be able to learn more fully the characteristics of steel conductors and thus be better able to decide where the use of steel will prove economical and advisable.

The resistance of an iron or steel conductor is considerably greater for alternating current than for direct current. This is partly due to the skin effect, that is, the crowding of the alternating current to the outside parts of the conductor by the alternating magnetic flux in the conductor, and partly to hysteresis caused by the alternating magnetic flux in the steel. In copper or aluminum conductors of the usual size the skin effect

increases the effective resistance only 1 or 2 per cent and so is practically negligible. But in steel or iron conductors the flux has a magnetic path and so attains a value of from twenty to several hundred times as great as in a non-magnetic conductor. The result is that the skin effect is very pronounced and the effective resistance is increased by a large amount, in some cases 100 or 200 per cent or more. However, tests indicate that if the strands are moderately fine and are properly put together, the increase of resistance at 25 or 60 cycles may be kept down to a reasonably small percentage. Curves published by the *Elektrotechnische Zeitschrift*, and conclusions stated in Bulletin No. 252 of the U. S. Bureau of Standards regarding the quality of iron or steel to be used, set forth that of the wire tested, the grade with the highest resistance to direct current had the lowest resistance to alternating current, and was also the least expensive.

A large part of the magnetization is caused by the spiraling of the wires in a cable, and if the spiraling of the different groups of wires is properly reversed, the increase in effective resistance can be reduced as much as one-half. The pitch of the spiral should be as long as possible without endangering the strength of the cable.

Another point brought out that should be of particular interest to electric railway distribution engineers and manufacturers of line materials is that the iron and steel conductors have the peculiar property that the effective resistance and reactance increase to a maximum as the current is increased, and then decrease. This is evidently due to the iron becoming saturated. In most cases, especially with larger cables, the decrease is very slow and the resistance maintains approximately its maximum value for most large values of current. This property should prove useful in transmission-line work, for the conductor will have a low impedance to the normal load current but will have about twice as much impedance to the current flowing in the case of a short-circuit. The impedance will also be large to high-frequency surges caused by switching or lightning. Mr. Dwight also points out that it may prove more economical in certain cases to protect the line against short-circuits and surges by using steel conductors than by installing current-limiting reactors, or by increasing the reactance of the transformers. This property also may be of use in the case of feeders of direct-current interurban systems. If the feeder is a steel cable it will have low resistance to direct current, but high impedance to alternating current. It will, therefore, tend to damp out the suddenness of short-circuits and lightning surges which cause synchronous converters and generators to flash over. If the feeder is of steel, and especially if the stranding is coarse, the required protection will be still more complete.

Steel conductors would probably be economical only where it is allowable to use bare cables, for the large size of steel cables compared with copper cables would greatly increase the cost of the insulating covering. The higher conductivity of steel for direct current than for alternating current makes the use of bare steel cables for d.c. feeders more economical than for a.c. lines. A steel cable has about eight times as much resistance to direct current as copper cable of the same size, and, therefore, seven times as much resistance as the copper cable of the same weight, since copper is more dense than steel. But galvanized steel cables usually cost less than one-seventh as much as copper cables per pound, and so should be more economical, other things being equal.

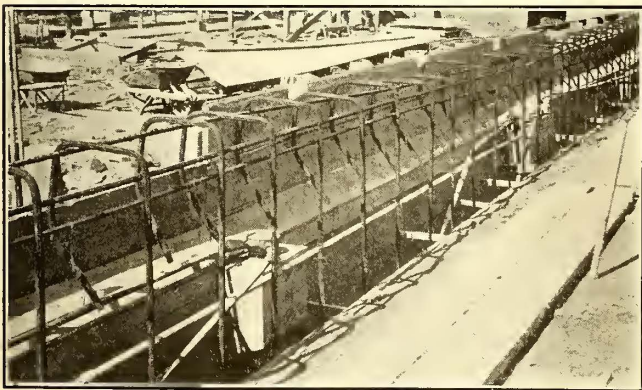
These statements of Mr. Dwight should command

the interest of the distribution engineers on the large group of interurban railways in the Central and Western States. Most of these roads are selling energy from the railway transmission lines for distribution and use in commercial and industrial power and lighting work. With small loads a line with small conductors can be built of steel more cheaply than when minimum size copper is employed. An example is cited of a seven mile line designed for 75 k.v.a., 60 cycles, using a seven wire steel cable with a resistance of 17.6 ohms per mile at full load. The smallest copper line that could be designed would be rated at 750 k.v.a., 11,000 volts being the transmission voltage. While the poles and insulators for this line would be the same in both cases, the steel conductor would cost only \$220 against a cost of \$2,600 for copper. It is this large difference in cost which has been the main reason for using steel conductors on the branch lines of some of the big power distribution systems. This difference in cost is greatest when the price of copper is highest.

Steel cables have the added advantage of being mechanically stronger and less liable to be burned through arcs. Their useful life is much shorter than that of copper cables and their scrap value practically nothing. The price of copper cable per pound may be assumed as being ten times that of galvanized steel cable. This ratio is the usual one, being approximately true for times of low price of metals as well as for high times, and the use of steel will always increase the reliability of the transmission system.

Installing Pit Lighting Conduit

At the Hooker Street shops of the Springfield (Mass.) Street Railway, now under construction, conduit for pit lighting service is installed in horizontal runs as shown in the accompanying illustration, alternate recesses in



HORIZONTAL RUN, SHOWING CONDUIT AND JUNCTION BOX INSTALLED FOR PIT LIGHTING

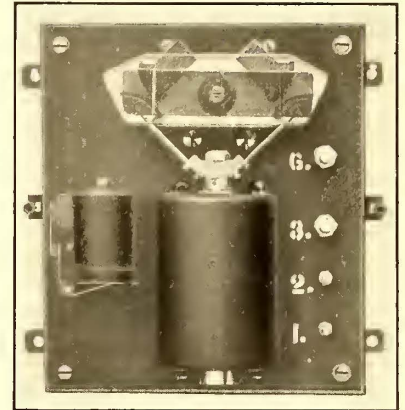
the pit walls being equipped with single and double outlets. The pit walls are about 8½ in. thick and are reinforced with ½-in. rods which are tied to the conduit pipes by iron wire at alternate vertical supports. Junction boxes located at the ends of the conduit runs are mounted at the top of wooden form boxes as shown, the concrete being poured around the rods and boxes so as to cover the junctions. The form boxes are removed after the setting of the concrete takes place, leaving the pit outlet recesses open and ready for pulling the wire. Pit recesses equipped with single outlets are 12 in. x 7½ in. x 5 in. in size, and these outlets are provided for drop light service by the use of flexible cords. The recesses containing two outlets each are designed to accommodate pit lamps of the fixed type, and are about double the length of the single recesses.

A New Forced-Ventilation Electric Heater

Light Weight Heater Fits Snugly Under End Car Seat, Utilizing Space Otherwise Unoccupied

An electric heater built on the same plan as the coal-burning type of forced ventilation heater manufactured by the Peter Smith Heater Company of Detroit, Mich., has now been perfected and put on the market. The assembled standard outfit consists of a transite lined

sheet-steel cabinet containing nine heater coils, a motor resistor and heat fuses assembled between the fresh air receiving chamber and the hot air mixing chamber, and all attached to the motor-driven blower. This arrangement of the elements in the heater gives an air distribution which heats all the coils practically to the same temperature. The heat is distributed through

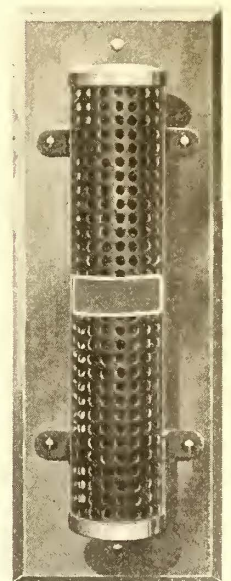


AUTOMATIC SWITCH WITH CASE REMOVED

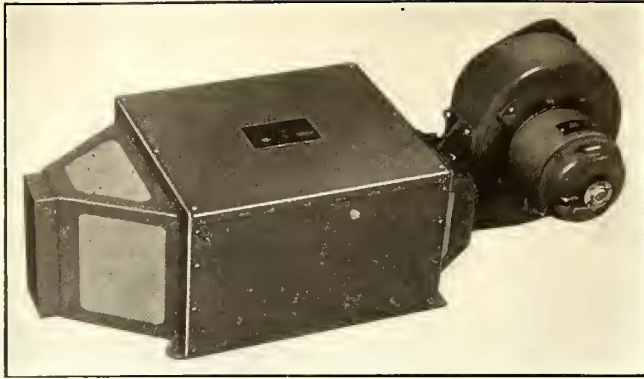
the car by a duct system similar to that employed with the forced ventilation coal heaters manufactured by this company. Fresh air is taken from the outside or the inside of the car as desired, and forced over the heating elements. The standard equipment will deliver from 300 cu. ft. to 500 cu. ft. of air along the floor line. This will heat a cold car starting from depots or lay-over points in approximately ten minutes. It requires a space 13 in. high, 18 in. wide and 3 ft. long, and exclusive of the duct system weighs 138 lb.

The heating element consists of resistance wire wound on porcelain spools complete within themselves. These spools make contact automatically when slid into place between two porcelain cheeks which contain the spring connections that make the contact between the coils and the line. The spools are interchangeable, and to remove any or all of them it is only necessary to take off the heat fuse plate, requiring less effort than to replace an ordinary inclosed fuse.

The heater wire proper is a high-grade, non-corrosive alloy which has a temperature coefficient of nearly zero. Such sizes of wire are chosen that the temperature under normal operating conditions never rises above 600 deg. Fahr. Under these conditions the wire attains only 33 1/3 per cent of the allowable temperature at which it could be worked indefinitely. In order to meet the underwriters' requirements provision is made for breaking the heater circuit by heat fuses when the air supply fails. Under normal operating conditions these heat fuses carry the current for which they are intended, but will fuse and cut off the current when the



VIEW OF THERMOSTAT



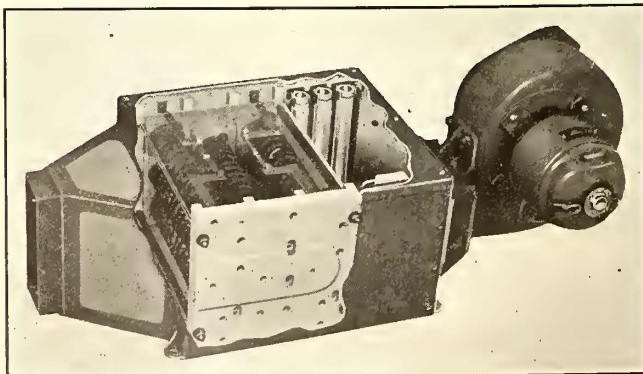
VIEW OF HEATER ASSEMBLED

draft of air is insufficient to keep the temperature below 800 deg. Fahr.

The blower used with this heating equipment is of the multivane type and the fan is built of a number of concave blades mounted like the buckets in a turbine engine. This type of blower is very efficient, as is indicated by the fact that it is but one-half the size, two-thirds the weight and delivers 20 per cent more air than its equivalent in the blade type of fan. The blower has sufficient capacity to furnish from 300 cu. ft. to 500 cu. ft. of fresh air per minute, depending upon the size of the heater and the speed of the fan. The motor which drives this fan was designed especially for this forced ventilation electric heater, and it is both light in weight and as small in size as consistent with good practice. The motor is entirely inclosed to make it dustproof, and a hinged cover is provided over the commutator to make access easy to the brushes and for inspection.

All of the heater motors are insulated to stand a 1200-volt a.c. potential test for a period of three minutes, and they require but little attention, it being necessary to inspect them about once a week during the heating season. The standard heater is equipped with a motor requiring a $\frac{1}{2}$ amp., and the drop across the terminals is 350 volts when the speed of the motor is 2300 r.p.m.

Suitable resistance is connected in series with the motor to form a part of the control circuit and, as mentioned in the beginning of the article, this is mounted in the heater cabinet so that the heat dissipated is not lost. The standard heater outfit may be arranged for any size of car by simply changing the heating elements and the speed of the fan. The capacity of the heater ranges from 12 amp. to 36 amp., or from 7.5 kw. to 22 kw. The over-all dimensions of the standard heater equipment were so selected that it could be installed under the end car seat and utilize space otherwise unoccupied.



VIEW OF HEATER AND PARTS

The coils are arranged in two sections so that they may be controlled manually or through an automatic switch. One group of coils is of such capacity that it will raise the temperature of the ventilating air 70 deg. Fahr. above the outside air, while the total capacity of the sections will raise the temperature 145 deg. Fahr., depending upon the amount of air delivered by the blower.

The automatic control equipment includes an automatic switch and a thermostat. The switch consists of two solenoids, which close the main and auxiliary heater circuits, installed in conjunction with a small relay which is in the thermostat circuit. When the car has reached the predetermined temperature this relay short-circuits the main solenoid which, in releasing, opens the main heater circuit. Line voltage fluctuation was taken into account in the design of these solenoids and magnets as well as the whole heater apparatus. In fact, actual service experience has demonstrated that the apparatus will work satisfactorily when the drop in voltage from normal is 50 per cent, and it will not overheat at 25 per cent rise above normal.

The thermostat used in connection with this forced draft electric heater equipment is of the mercury column contact type, but of special design. Both the difference of the potential and the current employed in the operation of the thermometer is so low that it is in no way destructive to the mercury. Regarding the special construction of this thermometer it may be said that while any thermometer with a wire contact might seem sufficient to control car heating equipment, yet the mercury column bore is accurate to $\frac{1}{10,000}$ in., hence the placement of the contact wire in the mercury column and the shape of the wire at the point of contact frequently means the success or failure of the control equipment. To obviate any difficulty which might arise from these sources the thermometers in the automatic control have been very carefully manufactured, and are said to cost about five times as much as the thermometers ordinarily used in thermostatic control.

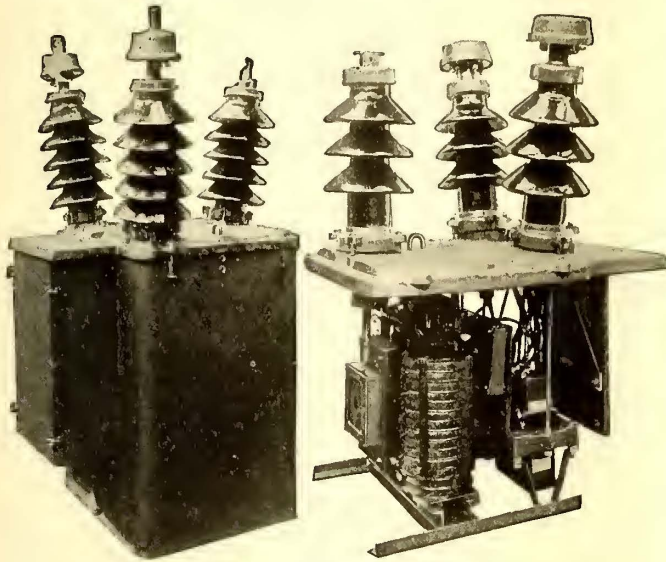
Convenient Outdoor Metering Equipment

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently placed on the market the outdoor metering equipment shown in an accompanying illustration. Each equipment consists of a standard polyphase watt-hour meter, two current transformers, a polyphase voltage transformer, and three choke coils, all inclosed in a sheet steel case with a cast-iron cover supporting three high-tension outdoor-type terminals.

This device has been developed to be used in 60-cycle polyphase service for voltage ratings from 11,000 volts upward and for current ratings not exceeding 200 amp. The sheet steel case is subdivided into two compartments, one of which is filled with oil, in which the transformers and choke coils are immersed, while the other serves to inclose the meter and meter panel. On this panel are also mounted two fuses to protect the voltage circuit of the meter and two calibrating links located in the current circuit of the meter. These calibrating links consist of fuse clips with a brass tube inserted instead of fuses. The meter may be read or checked upon opening the hinged door which covers the entire front of the meter compartment. The arrangement is such that the entire outfit, including meter panel, can be raised out of the tank without disconnecting the meter leads.

Three primary outlet terminals provide the necessary primary connections, one of the terminals serving as the common connection of the voltage transformer windings, while each of the other two terminals provide connection for one current transformer and one end of one of the voltage transformer windings.

The current transformers each have two primary windings which may be connected in series or in parallel by connecting links in the weatherproof cap at the



VIEWS OF OUTDOOR METERING EQUIPMENT WITH CASE REMOVED AND WITH CASE INCLOSED

top of the outlet terminals. The polyphase voltage transformer consists of a three-phase core having windings on the two outer legs only, and is therefore equivalent to two single-phase voltage transformers connected in open delta. Choke coils are inserted between the voltage transformer windings and the outgoing leads to protect the transformer windings against high-frequency disturbances.

Induction Relay for Selective Overload Protection

An induction-type, time-limit, overload relay which is particularly applicable to those systems where extreme accuracy in timing is required for tripping two or more air or oil circuit breakers selectively has just been placed on the market by the General Electric Company, Schenectady, N. Y.

The operating or characteristic curves for the various time-current settings are entirely separate and distinct at even the heaviest overloads and never become instantaneous. This is because of the inherent characteristics of the relay which produce a curve consisting of an inverse time portion up to approximately 2000 per cent of minimum contact closing current, blended into a definite time portion with a slight downward slope. Consequently, the relay will do the work ordinarily required of both inverse and definite time-limit relays. According to the claims of the maker the heaviest overloads do not disturb the form of the curve nor cause vibration or chattering of the moving parts.

The relay is made in single-pole elements, is circuit closing, and operates with a time delay which is inverse for the lower current values and which approaches a definite minimum for the higher current values. It is designed for use in the secondary of current transformers, the normal load rating being 5 amp. However, by means of the current tap plate, the relay may be set

TIME IN SECONDS TO TRIP												
	1.5	0.81	1.18	1.88	2.36	3.60	3.86	4.98	5.25	8.00	10.0	15
TIMES	2	0.55	0.88	1.26	1.65	2.25	2.60	3.25	4.25	5.70	6.60	2
CURRENT	3	0.40	0.66	0.94	1.21	1.58	1.85	2.33	2.95	3.62	4.50	3
TAP	5	0.34	0.53	0.74	0.94	1.20	1.41	1.83	2.22	2.73	3.30	5
SETTING	10	0.26	0.43	0.59	0.76	0.96	1.10	1.44	1.72	2.10	2.55	10
	20	0.23	0.38	0.51	0.63	0.81	0.95	1.20	1.45	1.75	2.13	20
	30	0.25	0.36	0.49	0.59	0.75	0.87	1.12	1.33	1.63	2.00	30
	50	0.25	0.35	0.47	0.58	0.70	0.80	1.04	1.25	1.55	1.93	50
LEVER SETTING	1	2	3	4	5	6	7	8	9	10	LEVER SETTING	

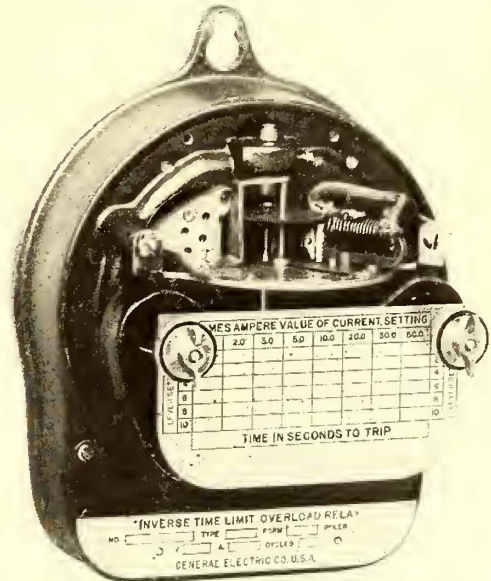
INDEX PLATE WITH TIME DELAY FIGURES

for 4, 5, 6, 8 and 10 amp., positive operation being obtained throughout this range.

The contacts are closed on overload by the rotation of a disk actuated by a "U"-shaped driving magnet with shading coils on the pole pieces. No tripping current is carried through the revolving parts. When the contacts have been closed they are firmly held in that position until tripping occurs, by the armature of a holding coil connected in series with the contacts, the trip coil of the air or oil break circuit breaker and an auxiliary switch which opens when the breaker is tripped. This insures current on the trip coil continuously until the circuit breaker opens, and prevents flashing at the relay contacts.

The values given in vertical columns 1 to 10 on the index plate are the time delays which will be obtained at the different degrees of overload, represented in the "Times Current Tap Setting" columns at the extreme right and left sides of the index plate. The factors appearing in the "Times Current Tap Setting" columns, when multiplied by the current tap setting, represent actual secondary current values.

The contacts, which are made of a special non-corrosive metal, are designed for use on direct current.



TIME LIMIT OVERLOAD RELAY WITH COVER REMOVED

They will carry 18 amp. momentarily without damage to the contact surfaces. A thermostatic device within the relay compensates for any variations in room temperature.

This relay is being furnished in two styles, one for 25-cycle and one for 60-cycle circuits. Although the principle of operation and the inherent characteristics are the same in both relays, the relays themselves differ only in slight details of construction.

NEWS OF ELECTRIC RAILWAYS

MINNEAPOLIS VALUATION FIGURES PRESENTED

City Engineer Presents Figures in Connection with Franchise Renewal

City Engineer F. W. Cappelen, in a report to the City Council of Minneapolis, Minn., says that a "fair valuation" of the Minneapolis Street Railway is \$25,914,308. This is the physical value, the report says, together with capital invested in the development of the property and present commercial value of water power leases. It does not include value of franchise or good will. The report was ordered as a basis for franchise renewal negotiations.

Mr. Cappelen has also submitted an inventory of various items which he did not include in his valuation figures. In the valuation estimate \$21,152,221 represents cost to reproduce, less depreciation. In the secondary inventory this item, as cost to produce physical property new, without depreciation, is given as \$22,432,073. This secondary estimate also includes value of leased steam station property, valuation of the downtown terminal block owned by a subsidiary of the company, and the cost to reproduce physical property that is in the 5-cent-fare district but outside the city. The total arrived at in this secondary inventory is \$28,789,085. This is the table presented by Mr. Cappelen in his first valuation estimate:

Summary of values as of Jan. 1, 1916:	
Present value of physical property, being cost to reproduce new less depreciation, table No. 1.....	\$21,152,221
Capital invested in the development of the property, being the fair going concern value, table No. 2....	4,270,230
Total capital invested in the property.....	\$25,422,451
Present commercial value of waterpower leases to July 1, 1923.....	491,857
Fair value of the property.....	\$25,914,308

The secondary estimate contains these items:

Value of all items inventoried and valued:	
Cost to reproduce physical property new, table No. 1.....	\$22,432,073
Capital invested in the development of the property, table No. 2.....	4,270,230
Present commercial value of waterpower leases to July 1, 1923.....	491,857
Value of lease of steam property, table No. 3.....	140,000
Value of terminal block, table No. 3.....	1,300,000
Total inside city of Minneapolis.....	\$28,634,160
Cost to reproduce physical property new in 5-cent fare district outside of city, comprising the Columbia Heights and Fort Snelling lines.....	154,925
Total.....	\$28,789,085

The part of the report wherein is shown the difference between existing value as of Jan. 1, 1916, and the cost of reproduction, as of Jan. 1, 1916, follows:

Item	Cost to reproduce new	Present value
Grading.....	\$13,948	\$13,948
Track.....	4,092,658	3,732,098
Bridges.....	126,427	126,309
Paving.....	2,221,029	1,906,208
Electrical distribution system.....	2,038,675	1,965,434
Rolling stock.....	4,649,318	4,356,134
Power plant equipment.....	2,339,603	2,190,007
Substation equipment.....	549,886	549,886
Buildings.....	1,504,915	1,451,524
Furniture and fixtures.....	66,003	57,885
Stores, tools and miscellaneous equipment.....	700,368	673,497
Real estate.....	1,088,862	1,088,862
Expenditures due to municipal improvements and real estate dedicated to city, administration, organization and legal expense.....	254,206	254,206
Taxes during construction period.....	329,420	329,420
Interest during construction period.....	325,194	325,194
Interest during construction period.....	2,131,554	2,131,554
Total.....	\$22,432,072	\$21,152,221

In commenting on the physical value estimated Mr. Cappelen in his report says:

"All prices on material, apparatus and equipment used in the valuation are the average normal market prices during the five years from 1911 to 1915 or the ten years from 1906 to 1915 as quoted by the manufacturers of each class of material, apparatus and equipment so as to eliminate

the abnormally high prices prevailing at the present time due to industrial and war conditions. For illustration, the present market price of copper wire is 100 per cent more per pound than the price used in the valuation; also the present market for high T rail is about 15 per cent more per ton than the price used in the valuation."

NEW CARHOUSES AND SHOPS FOR LOS ANGELES

The Pacific Electric Railway, Los Angeles, Cal., has sold a considerable part of its twenty-acre tract at Seventh and Central Avenues, that city, to the Wholesale Union Terminal Company. This, added to the other land acquired, will give the Union Terminal Company approximately twenty acres on which to construct its buildings and tracks. The Pacific Electric Railway will change the location of its carhouses and tracks now occupying the ground sold. A new carhouse will be constructed in the eastern part of Los Angeles, near Echandia Junction. A similar carhouse will be constructed at Watts. The necessary land is all acquired. In the new buildings recreation rooms will be provided for employees. The cost of the new carhouses will be approximately \$120,000, to which value of real estate is to be added to represent the total investment. The shops of the Pacific Electric Railway will be removed from the location adjoining the Union Terminal property to Torrance, in accordance with arrangements made some time ago. The investment will be several hundred thousand dollars.

TENTATIVE TOLEDO DRAFT SUBMITTED

Johnson Thurston, president of the Street Railway Commission of Toledo, Ohio, and Ralph Emery, its general counsel, presented a tentative draft of a street railway ordinance to that body on Oct. 12. They have been working on the ordinance since July 25, when the commission held its last meeting. It suggests two plans in case the city wishes to take over the property from the Community Traction Company, to which the Toledo Railways & Light Company is to sell its property other than its lighting and power equipment, in case a satisfactory agreement is reached.

One plan contemplates an outright purchase at any time the city is able to raise the money. The other provides that after five years the city may lease the property from the Community Traction Company, with a clause in the contract agreeing to buy it. This is a new idea incorporated in the plan. Under it the city would operate the lines, pay the maintenance and operating charges, together with 3 per cent semi-annually on the par value of the stock and 1 per cent semi-annually which would be applied on the purchase price. If the payments were continued the city would discharge the entire purchase price in fifty years, when the property would be taken over.

In a general way this ordinance follows the one outlined some time ago in conference with Henry L. Doherty, chairman of the board of the company, although it was not formulated in the same way at that time. It proposes to grant a franchise to the Community Traction Company, to which the property is to be transferred by the Toledo Railways & Light Company. In some respects the provisions of the grant are similar to those of the Cleveland franchise. One of the features is the establishment of an equalizing fund. This is to be accumulated from the earnings after the payment of 6 per cent dividends on the par value of the stock, allowing for cost of operation, maintenance, depreciation and renewal. After starting with an arbitrary rate of fare, the rate at the end of each six months is to be determined in accordance with the amount of money in the fund. If the sum in this fund has increased beyond a certain fixed amount, the fare will be reduced, and if it has fallen below a certain minimum the fare is to be increased.

AGREEMENT REACHED IN DALLAS

Conditions Announced Under Which Local Dallas Interests Will Take Over Dallas Properties

An agreement has been reached between all parties interested in the Dallas traction and electric lighting problems by which J. F. Strickland and C. W. Hobson, backed by the General Electric Company, will lease the Oak Cliff street car lines from the Northern Texas Traction Company. This is the announcement made by Mayor Henry D. Lindsley of Dallas on his return from New York and Boston, where for two weeks he had been in conference with representatives of the Stone & Webster interests and the General Electric Company.

According to Mayor Lindsley, the lease agreement permits the consolidation of all the street car lines of Dallas under one management and also gives the city the same option for purchase of these lines as is retained over the lines east of the Trinity River. The lease agreement, however, is conditioned upon two points that must be settled by the people of Dallas. The contests that have been brought in the courts against the model service-at-cost franchises, adopted in the municipal election of last April, must be disposed of so as not to invalidate these ordinances; and the straw vote that is to be taken on the proposed valuation of \$8,500,000 for the traction and lighting properties in the city of Dallas instead of the valuation of \$7,100,000 as fixed by E. W. Bemis, utility expert, must be favorable to the higher valuation. Steps will be taken at once to dispose of both of these questions in the interest of the lease agreement.

Immediately on his return from the East, Mayor Lindsley prepared a lengthy statement for the Board of City Commissioners reviewing in detail the negotiations and the results obtained in the New York and Boston conferences. This statement, which was approved by the Board of Commissioners and published for the information of the people of Dallas, is as follows:

"After weeks of effort on the part of J. F. Strickland and C. W. Hobson and their associates, a lease has been at last concluded with the Northern Texas Traction Company of the Oak Cliff street railway lines, thereby making it possible for all of the street railway lines in the city of Dallas to be operated under one franchise. This lease gives the city the same control of service and extensions in Oak Cliff as exists with the lines east of the Trinity River. It also provides that the city may buy the Oak Cliff lines on the same terms as would apply to the lines east of the Trinity River. The Oak Cliff situation presented difficulties which at times seemed insurmountable, and Messrs. Strickland and Hobson and their associates have only just been able to conclude a lease which will be approved by the city of Dallas in event the new franchise goes into effect. The people of Dallas have heretofore been advised very fully through the public press relative to the propositions made by Messrs. Strickland and Hobson for a settlement of the traction and electric lighting and power problems.

"1. The maximum rate for electric lights in the city of Dallas will, on Jan. 1, 1919, be reduced to 6 cents per kilowatt-hour, and this rate thereafter will be the permanent maximum rate for lights in the city of Dallas. This means that the maximum rate when the franchises may become effective will be 8 cents per kilowatt-hour; that on Nov. 1, 1917, the maximum rate will be 7 cents per kilowatt-hour and that on Jan. 1, 1919, and thereafter the maximum rate will be 6 cents per kilowatt-hour.

"2. One million dollars additional in cash will be guaranteed to be spent by the electric light and power company within five years from the time the franchise goes into effect; that is, the guarantee will be that \$1,000,000 will be spent within eighteen months from the date the franchise becomes effective, and an additional \$1,000,000 within the forty-two months succeeding thereafter, making a total of \$2,000,000 guaranteed to be spent on the electric light and power property alone.

"3. The basic rate of return on the valuation allowed in the electric light and power franchise will be reduced from 8 per cent per annum to 7 per cent per annum, thus making the basic rate of return on the valuations allowed in both

the electric light and power franchise and the street railway franchise 7 per cent per annum.

"4. That twenty-two tickets for a dollar will be sold by the new street railway immediately upon the franchise becoming effective, and that the maximum permanent guaranteed rate thereafter will be 5 cents cash fare and twenty-two tickets for \$1 and universal transfers.

"5. That as soon as the street railway lines can earn 8 per cent per annum they will sell six tickets for 25 cents on all street cars in Dallas.

"6. A more definite time has been determined when a second interurban will be built out of Dallas. The agreement is that the second interurban will be commenced within six months after the street railway lines east of the Trinity River equal in gross receipts per mile the receipts per mile in the year 1913, or (if this should occur sooner) when the gross receipts of the street railway lines east of the Trinity River bear the same proportion to the then investment as the gross receipts for these lines in 1913 bore to the valuation of \$4,100,000.

"The above enumerates the advantages to the people of Dallas which have been recently secured from Messrs. Strickland and Hobson and their associates in addition to those which have heretofore been stated through the public press.

"An agreement was reached on practically all points except that of valuation. Messrs. Strickland and Hobson had an option on these properties at \$8,500,000, at which price they proposed to value them in the franchises. The Board of Commissioners had valued these properties at \$7,100,000.

"It was agreed between Messrs. Strickland and Hobson and the Board of Commissioners that the issue would be submitted to the people of Dallas in order that by a postal-card vote the Board of Commissioners might be advised whether our citizens desire to approve the conclusion of franchises with Messrs. Strickland and Hobson.

Prior to the securing of the conditions just mentioned Messrs. Strickland and Hobson, as the result of negotiations with the Mayor and Commissioners since the election last April, had agreed as follows:

"(1) That two interurbans would be built into Dallas of not less than 30 miles each in length, the construction of the first to commence within six months from the time these franchises go into effect and to be completed within eighteen months thereafter. The time for the construction of the second interurban was indefinite, but has recently been made more definite, as above stated.

"(2) That the maximum rate for electricity to be charged small consumers would be 8 cents per kilowatt-hour from the time the franchises would go into effect, and this rate would be 7 cents on Nov. 1, 1917. (As a result of the recent negotiations this maximum rate would be further reduced to 6 cents per kilowatt-hour.)

"(3) That the rate for power in Dallas would be as low as 1 cent per kilowatt-hour.

"(4) That in no case would any rates for light or power now existing in Dallas be increased over present rates, so that if the new schedules of rates do not in every instance enable a reduction in the price of lights and power then, the consumer affected would have the option of retaining the rate now paid.

"(5) That the new terminal building would, at its actual cost, become the property of the new traction company, subjecting it to the control of the city of Dallas in the interest of present and future interurbans.

"(6) That the Oak Cliff street car lines would, through either purchase or lease, be placed on the same basis, and have the same advantages to the citizens of Oak Cliff and to the people of Dallas generally as would pertain to the lines east of the Trinity River.

"(7) That the street railway would expend, within eighteen months from the time the franchises went into effect, \$1,000,000 in cash on improvements and extensions of the street railway lines in the city of Dallas.

"(8) That the electric light and power company would expend the sum of \$1,000,000 in cash within eighteen months from the time the franchises went into effect in improving and extending the electric light and power system in the city of Dallas. (As a result of the recent negotiations, the

electric light and power company will contract to expend \$2,000,000.)

"(9) That the basic rate of return on the street railway valuation would be 7 per cent per annum, and that the basic rate of return on the electric light and power valuation would be 8 per cent per annum. (As the result of the recent negotiations, the basic rate of return on both of these properties will be 7 per cent per annum.)

"(10) That the 'London Sliding Scale' would be introduced into both the new franchises, permitting the owners and operators of the properties to earn a higher rate of return than the basic rate in event of corresponding reductions in rates for service to the people of Dallas.

"(11) That the holding company, organized under the laws of Maine, known as the 'Dallas Electric Company,' would be eliminated, and that these properties would be held by corporations organized under the laws of the State of Texas, and that all of their stocks and bonds would be held by many investors instead of by a holding company."

The official statement says further:

"All of these agreements Messrs. Strickland and Hobson are now prepared to carry out, and, in addition thereto, the new advantages to the people of Dallas herein specified.

"It is estimated that the two new interurbans will cost at least \$3,000,000, which, if added to the \$1,000,000 guaranteed to be expended by the street railway company and the \$2,000,000 guaranteed to be expended by the electric light and power company, will make a total of about \$6,000,000 to be expended in and immediately at Dallas.

"This would mean the withdrawal of Stone & Webster from ownership, control or management of public utilities in Dallas, and the substitution of Dallas men who would have the immediate financial backing of the General Electric Company.

"It would mean that bonds in the total sum of \$1,000,000 would be executed in favor of the city to insure the expenditure of \$3,000,000 in cash on the street railway and electric light and power properties, and for the building of the two interurbans. In addition, the franchises provide that in event said \$3,000,000 is not expended as stipulated the franchise will be forfeited."

It is now proposed by the Board of Commissioners and by Messrs. Strickland and Hobson that copies of these franchises will be shortly mailed to every voter in Dallas; also copies of the Oak Cliff lease; also copies of the contracts to build the two new interurbans; also a statement from the Board of Commissioners; also a statement from Messrs. Strickland and Hobson, and that the citizens be requested to indicate on a card to be inclosed whether they now desire to approve or disapprove the passage of the franchises by the Board of Commissioners. As a result of this postal-card vote the position of the Board of Commissioners will be determined as follows:

"(1) If the franchises are disapproved we shall consider it is not the desire of our citizens for the Board of Commissioners to pass them, and it will not do so.

"(2) If the franchises are approved by a substantial majority of those voting, then the Board of Commissioners will pass them as soon thereafter as will be legal.

"The people of Dallas will then have the opportunity to do one of two things:

"(1) By a referendum vote require that these franchises be submitted at the regular election on the first Tuesday in April, or

"(2) Permit these franchises to become law at the expiration of sixty days after their final passage by the Board of Commissioners, without a referendum vote."

The Board of Commissioners say in conclusion:

"We desire the citizens of Dallas to know that we consider the agreements which have been reached with Messrs. Strickland and Hobson and their associates to embody all of the advantages which can possibly be secured at this time in an amicable settlement of the street railway and electric lighting and power problems. The very best has been done that could be done by the representatives of the people. We leave to the people of Dallas to determine whether the work which has been done is worth while, and whether it is now their desire finally to settle these problems on the basis stated."

SEATTLE AND TACOMA OPPOSE RAILWAY

Puget Sound Company Seeks Relief from Burdensome Franchise Provisions

The City Council of Seattle, Wash., at a recent meeting, adopted a resolution directing Corporation Counsel Hugh M. Caldwell to join with City Attorney U. E. Harmon of Tacoma to resist the application of the Tacoma Railway & Power Company to the Public Service Commission for relief from certain of its franchise obligations. In a communication to the City Council Mr. Caldwell said that the same questions involved in the application of the Puget Sound Traction, Light & Power Company, operating in Seattle, for relief from payment of its gross earnings tax, the pavement of street areas between its tracks, one-third the cost of bridges, and similar obligations, were involved in the Tacoma case. He said that the decision in the Tacoma case would have a most important bearing on the Seattle case. Although the Seattle case has been pending for a longer period than the Tacoma case, the latter will have precedence because the Public Service Commission has made a physical valuation of the Tacoma properties.

The complaint of the Tacoma Railway & Power Company in the matter was filed with the Public Service Commission against the city of Tacoma on Oct. 4. The complaint declares that the revenue of the company is insufficient to comply with any of the provisions of the city franchise, except to render adequate and sufficient service at a fair and reasonable rate. The company lays special stress on the statement that "it is impossible to continue to operate its street railway line for a 5-cent fare throughout the limits of the city of Tacoma, to maintain the present standard of service required by the commission and demanded by the public, and continue to make the payments and contributions required from the plaintiff by the city of Tacoma. The time has arrived when the plaintiff will be forced to cease operation unless it obtains some relief."

A hearing is prayed for by the company, and the plea made that the result will be relief from fulfilling its franchise obligations. Figures compiled by the company show that on Dec. 31, 1915, exclusive of the depreciation costs of physical property, a loss of \$218,872 was sustained. It is further shown that within the last five years the company has paid \$97,224 in gross earning taxes and \$59,334 in contributions to city bridges. During the next five years, the complaint recites, the company will be called upon to pay \$175,000 for paving and \$100,000 for renewals and maintenance on paving. The gross earnings tax, it is estimated, will be between \$16,000 and \$20,000 annually. Free transportation furnished to city employees, exclusive of firemen and policemen in uniforms, is placed at approximately \$6,000 a year. Through the "gratis franchise rights" tendered the jitney bus the company has not had enough net earnings left to pay the interest on its bonded indebtedness, it is claimed.

Comptroller Shoemaker of the city of Tacoma, in speaking of the complaint, said:

"I am of the opinion that the company has a legitimate complaint in respect to the jitneys. In the franchise to the company the city pledged itself to hold certain streets and avenues exclusively for the operation of street cars without competition. It is my opinion, personally, that the city violated a part of its franchise agreement in allowing the jitney bus to compete with the street cars on streets and avenues given exclusively to the railway company for the operation of its cars. With regard to the gross earnings tax, the maintenance of streets and bridges, and the free transportation to city employees, it is a fact that the company expressed a willingness to do all these things in return for the franchise. If the company believes it has made a bad bargain that is its fault, not the city's."

The City Council has been asked by the city attorney to decide what shall be done by the city by way of reply to the complaint filed by the company. Mayor Fawcett's reply to the company's action was the sending of a letter to Pierce County candidates for the Legislature, asking their support for legislation to abolish the power of the Public Service Commission in interfering with home rule in cities of the first class.

REPORT ON TRANSIT CONDITIONS IN PITTSBURGH

Attorney C. Elmer Bown, adviser to the Council of Pittsburgh, Pa., in traction matters, has handed in a report winding up with a recommendation that the city take its case for better transportation before the State Public Service Commission. Mr. Bown's report deals with these subjects: Service, transfers, routing, rehabilitation, the finances of the Pittsburgh Railways, the ordinances pending in Council, freight transportation by street cars and new franchises. He says that observations of the rush hour service show that the Pittsburgh Railways is violating the order of the Public Service Commission. The report says that with respect to transfers Pittsburgh is at a disadvantage. In discussing routing of cars Mr. Bown advises that the present system of looping be retained for the regular service, except in some cases where the terminal loops should be lengthened. Some through routes are recommended, and there is a recommendation that the shorter terminal loops should be used for the rush tripper service.

Regarding pending ordinances Mr. Bown advises that two ordinances be not approved. These are the one for tracks in Diamond Street and the one for connections for the belt line. The report closes thus:

"As to the policy to be followed by the city, it is recommended that the questions of service, routing and transfers be made the subject of a complaint to be filed before the Public Service Commission. Negotiations on these subjects have been carried on between the city and the company for about ten years, and the company has positively declined to agree to fix a standard of service, to establish through routes, or to increase the number of transfers issued. While the other subjects mentioned in this report are proper matters for negotiation between the city and the company, the company's attitude on these questions and its defiance of the order of the Railroad Commission indicate that nothing is to be gained by further discussion of these subjects."

At the meeting of Council at which the report from Mr. Bown was received an ordinance was introduced to authorize the Mayor to appoint a transit commissioner. The commissioner must file, soon after his appointment, a budget, showing the number of engineers, draftsmen and other staff help needed. This measure was then referred to the finance committee. The question of taking the case of the city to the Public Service Commission was referred to the public service and surveys committee of the City Council.

On Oct. 13 the City Council affirmed the ordinance for the employment of an \$8,000 transit commissioner. The ordinance carries with it an allowance for a corps of assistants for the commissioner.

I. T. S. AGAIN SEEKS CONNECTION IN ST. LOUIS

The St. Louis Electric Railway, which is the St. Louis division of the Illinois Traction System, has renewed its effort to obtain a connection with the Terminal Railroad Association tracts at the St. Louis end of the McKinley bridge. Henry I. Green, Champaign, Ill., counsel for the Illinois Traction System, has filed with the State Public Service Commission an application for an order authorizing the connection of the tracks and apportioning the cost between the two systems. The Public Service Commission has announced that it will allow ten days for the filing of an answer by the Illinois Traction System. It is stated in the petition that the Illinois Traction System does a large business in hauling freight from Illinois and Indiana points, but has never been able to maintain adequate terminal facilities in St. Louis.

About three years ago the Illinois Traction System attempted to have a bill passed in the Municipal Assembly authorizing it to connect its tracks with those of the Terminal Association in the Hall Street yards in North St. Louis. The bill was defeated. The Terminal Association opposed the measure on the ground that it would be required to handle the Illinois Traction System freight on the St. Louis side of the river without receiving any of the arbitrary rate charged for bringing it across the McKinley bridge. The Terminal Association said that under those circumstances the service would be unremunerative. The arbitrary charge

on coal brought across the McKinley bridge is 10 cents a ton. This is only half the charge made on the terminal bridges, but it covers delivery to the end of the bridge and hauling from that point must be done by shippers.

NEW YORK POLICE OFF STRIKE DUTY

Chief Police Inspector Max Schmittberger of New York, in an order issued on Oct. 16, reduced the number of policemen assigned to strike duty to 900. The extra men were sent back to their various precincts in the five boroughs. The 900 men remaining on strike duty have been divided by day into automobile and motorcycle squads and will work in citizen's clothes. The motorcycle men will patrol the various lines, while those in charge of the automobiles will hold themselves in readiness for any emergency. The men in plain clothes will ride on the various surface cars, elevated trains, and subway trains. No men in uniform will ride on the cars during the day, but at night a uniformed man will be assigned to every car.

At the chief inspector's office it was said that reports from the street railways showed that most of the roads were running the normal number of cars by day and increasing the number on night service. In the Bronx, it was said, the Union Railway has 150 cars in operation, the normal number, and that by the end of the week cars would be running on the old schedule night and day. Out of the normal number of 927 cars, the New York Railways on Oct. 16 had 726 running day and night. Police reports from the Borough of Queens show that car lines are giving full service by day.

A number of new hurdy-gurdies appeared in the streets of New York on Oct. 16, the operators of which appealed for funds to aid the striking carmen. The machines bore placards with the inscription: "Watch your step on Election Day. Union for Union."

On Oct. 13 F. W. Whitridge, president of the Third Avenue Railway, called the attention of the men still out on strike to the insurance standing in their names under a group contract arranged between the railway and the Travelers Insurance Company. He notified the men that if they did not return to work on or before Oct. 20 the policies would be cancelled. In concluding his statement, Mr. Whitridge said:

"You will perceive that if you desire to continue the policies on your own account you must so notify the Travelers Insurance Company and get the new terms from them. If your union, that is, the Amalgamated Association of Street & Electric Railway Employees of America, were anything more than the irresponsible humbug I have declared it to be, that association might arrange to handle the insurance for you hereafter, but I assume that it will do nothing of the sort and I do not suppose any of you can expect the company to carry this insurance for you any longer. Therefore, if you wish your families to have the benefit of this insurance you must attend to it yourselves. It would be a pity to give it up, and although you have seen fit, without any reason, to part company with me, I urge upon you for the sake of your wives and children to endeavor to take care of this insurance."

CONTRACT AWARDED FOR CINCINNATI BORINGS

The Rapid Transit Commission of Cincinnati, Ohio, awarded a contract on Oct. 13 to A. P. Birnbaum for the borings to be made on Walnut Street for the purpose of testing the nature of the earth to be excavated in building the proposed rapid transit loop.

The conference committee of the Federated Improvement Associations held a meeting on the same day to discuss the terms of a lease to be formulated for the loop. The majority of the members seemed to favor a plan that would allow the city to share in any profits or losses that may accrue from the operation of the line by the leasing company. W. C. Culkins, executive secretary of the Chamber of Commerce, urged that any contract which is formulated be based upon a fair return on a fair valuation. Judging from remarks made by Walter A. Draper, secretary of the Cincinnati Traction Company, his company would hesitate to enter into a leasing agreement with the city if the entire risk of profit or loss must be borne by it.

HOLYOKE ARBITRATION BOARD REACHES FINDING

The arbitration board sitting in the wages and hours of service case on the Holyoke (Mass.) Street Railway has concluded its investigation. At the final session on Oct. 12, it was announced that Chairman James E. Cotter of Boston would at once draft the report of the board for acceptance by the entire commission. The principal issue between the company and its men was on the question of wages, and whether wages should be paid on a daily or an hourly basis. The arbitration board has decided for an hourly rate, and will set any run of more than eight hours and not more than nine hours as a regular scheduled run to be paid for as such. At present the maximum pay for not more than 9.5 hours is \$2.85. The new rate to be fixed by the award for not more than nine hours and not less than eight hours is \$2.97, with extra pay for more than nine hours. The pay of those who do not at present draw the maximum rate will be increased in the same proportion over what they now receive. Carhouse and shop employees will be placed on a nine-hour basis, without reduction in pay.

At present the men receive \$2.85 for working not more than nine hours on Sundays. Under the previous agreement anything more than two hours counted as five hours on Sunday work and more than 2.5 hours was counted as a full nine hours. The formal finding of the board is expected to discuss various points of this character, some of which have already been concluded in conference between the company and the union. It was the contention of the latter that the Springfield Street Railway maximum wage of \$3.10 for a nine-hour day should be granted to Holyoke carmen, but the company's argument that conditions differ in the two cities was favorably received by the board in concluding to establish a maximum of \$2.97 a day. Mayor John J. White of Holyoke represented the men. Attorney William H. Brooks was the company's spokesman on the board.

CONDITIONS OF HUDSON & MANHATTAN RAILROAD LABOR SETTLEMENT

The account of the labor settlement on the Hudson & Manhattan Railroad, published in the New York morning papers of Oct. 13 and in this paper last week, was erroneous in so far as it related to a recognition of the union by the company. The facts are that G. H. Sines, vice-president of the Brotherhood of Railroad Trainmen, acted as an individual for the men who had been discharged and not as a representative of the brotherhood. Mr. Fisk agreed on Mr. Sines' representations to take back the thirty-two discharged men, and the men agreed not to request the company to treat with the brotherhood on any subject before Feb. 1, 1918; and also agreed not to engage in any coercive measures among the men on behalf of the brotherhood.

George W. W. Hanger, assistant commissioner of the United States Board of Mediation and Conciliation, on Oct. 12, authorized the publication of the following agreement entered into between Mr. Fisk and Mr. Sines, representing the men:

"The Hudson & Manhattan Railroad has discharged thirty-two men for insubordination in promoting the formation of a lodge of the Brotherhood of Railroad Trainmen, in opposition to the wishes and orders of the management, which has already recognized the Hudson & Manhattan Railroad employees' organization, embracing the trainmen, towermen, stationmen and other employees in the transportation department of the road, and for attempting to enforce the recognition of the Brotherhood of Railroad Trainmen in opposition to the company's orders, and for stirring up trouble and dissension in connection therewith.

"Mr. Sines, acting on behalf of the men who have been discharged, as an individual who has been selected by said employees to represent them in this matter, and not as an official of the Brotherhood of Railroad Trainmen, has claimed that these men have not been intentionally guilty of the offense charged, and has requested that the management of the road should consider the reinstatement of the discharged men upon the following conditions:

"1. Such consideration by the company or the reinstatement of the men in question is not to be construed as a recognition of or as any promise, expressed or implied, to

recognize the Brotherhood of Railroad Trainmen at any time.

"2. The railroad company shall treat solely with the Hudson & Manhattan employees organization in respect to the wages and working conditions of trainmen, towermen, stationmen and other employees of the transportation department, excepting motormen and motor switchmen, and may enter into a contract with the proper representatives of such organization in respect to such conditions.

"3. Any men who may be reinstated, or any other men who may be members of the Brotherhood of Railroad Trainmen, are not to request the company to treat with the said Brotherhood on any subject before Feb. 1, 1918, and are not to engage in any coercion among the men on behalf of said Brotherhood.

"The railroad company agrees to reinstate the men discharged, without pay for time lost, upon the foregoing conditions."

NEW YORK COMMISSION INDORSES FENDER

The Public Service Commission of New York, First District, has adopted a report of its committee on safety devices approving the American Safety Fender, an automatic type of equipment that was described in the *ELECTRIC RAILWAY JOURNAL* for April 10, 1915. The report, which is signed by W. C. Whitson and George F. Daggett, said that the fender had been submitted to the most drastic tests on rough pavements and with dummy figures. It was used on a large motor truck. "While the demonstration was made on a truck instead of a car," the report says, "we believe that conditions would be at least as favorable for its operation on a street car, and that its adoption on cars as well as upon buses and motor trucks would be a distinct advance in existing means for safeguarding the lives and limbs of persons who are struck or come into contact with vehicles." This is the first device of the kind to receive the indorsement of the New York Commission.

ARBITRATORS NAMED TO CONSIDER CLEVELAND POWER BID

Mayor Harry L. Davis has indicated that he will not approve of the selection of a partisan Democrat as the city's member of the arbitration board which is to decide whether or not the Cleveland Railway shall enter into a contract with the Cleveland Electric Illuminating Company to furnish power for the street railway system to take the place of that at present furnished by the old Cedar Avenue power station of the Cleveland Railway which is to be abandoned. The Council, the majority of whose members are Democrats, is to make the selection, but its action must be approved by the Mayor.

Attorney Thomas L. Sidlo, law partner of Secretary of War Newton D. Baker, has been named by the City Council as the city's member of the board of arbitration to adjust the controversy with the Cleveland Railway over the contract. Joseph Alexander will represent the company and the two men are to select a third member of the board. Both Mr. Sidlo and Mr. Alexander were at one time employed in the Street Railway Commissioner's office during the administration of Peter Witt. Mayor Davis has not intimated what step he will take regarding the appointment.

Muskogee Strike Settled.—After being in progress for more than two weeks, the strike of employees of the Muskogee (Okla.) Electric Traction Company was ended Oct. 11, when a contract was signed by R. D. Long, manager of the company, and the president of the newly organized union.

Final Report on Chicago Traction Situation Being Prepared.—Daily meetings are being held by the Chicago Traction and Subway Commission to consider the many data it has collected for the analysis of existing conditions with a view of recommending transportation improvements. As mentioned previously in these columns, this commission is composed of William Barclay Parsons, Robert Ridgway and Bion J. Arnold. Rumors regarding the findings of this commission have appeared in the local press at different times, but they were premature. The report and recommendations are now in preparation.

Change in Suburban Franchise.—The Commissioners Court of Dallas County has authorized a change in the franchise granted several years ago to the Dallas (Tex.) Southwestern Traction Company canceling the provision for a 5-cent fare between Dallas and Eagle Ford. In its stead there has been inserted a provision for a 5-cent fare between Dallas and Cement City. A change also has been made to make explicit the provision for hourly service each way between 6 a. m. and 7 p. m. E. P. Turner, president of the company, presented the application for the change in the franchise, explaining that the company planned to build that portion of its proposed line from Dallas to Eagle Ford at once, and later to carry out the rest of the provisions of the franchise by constructing an extension of the line to Cleburne via Grand Prairie.

Chicago Terminal Electrification Recommended.—The Railway Terminal Commission, composed of John F. Wallace, Walter L. Fisher and Bion J. Arnold, has recommended the electrification of the proposed Illinois Central Railroad passenger terminal in a report to the City Council of Chicago. This recommendation was essentially embodied in the following terms: "The commission feels that the development of a terminal station on the lake front of a capacity sufficient to care for all or practically all of the roads having terminals in the territory south of Van Buren Street, between State Street and the Chicago River, will permit the working out of a plan for the adoption of electrification of the passenger traffic of the Chicago terminals, and that the electrification of the passenger terminals will be a step toward electrification of all railroad tracks within the terminal district." This recommendation of the Railway Terminal Commission was made in connection with the petition which was presented for a permit by the Illinois Central Railroad Company to build its new passenger terminal station.

Des Moines Tax Case Decided.—The Supreme Court of Iowa has decided that the Des Moines City Railway must pay \$44,040 assessed against the right-of-way of that company for paving on Ingersoll Avenue from Twenty-eighth to Forty-second Street. The high court, in reversing the case, said: "The judgment and order appealed from must be set aside and the cause remanded with directions to the court below to confirm the special assessments as made." The company owns a 20-ft. strip of ground in the center of Ingersoll Avenue on which a double-track line is operated. The city paved on both sides of the right-of-way, but not between the rails or between the tracks, except at the street intersections. The cost was assessed against the abutting property. The company refused to pay the assessments. In the arguments filed in the Supreme Court the company claimed that its right-of-way could not be assessed as "abutting" property, and that the city had no authority to assess the company for street improvements. The company further claimed that it was a street railway and not a railroad, therefore exempt from the liability of a railroad. Justice Weaver, in writing the opinion, says that the company owns the strip of land on which its tracks are laid, and that it is more than a mere right-of-way, "therefore assessments for street improvements is that of a holder or a mere easement."

PROGRAM OF ASSOCIATION MEETING

New England Street Railway Club

In accordance with the plans made by the new administration of the New England Street Railway Club, by which six of the regular club meetings will be in charge of the vice-presidents from the several New England States, the first fall meeting after the summer respite, to be held on Oct. 26, will be Vermont Night, in charge of W. F. Corry, vice-president from that State. Mr. Corry has secured as speaker Clarke C. Fitts, Brattleboro, Vt., a former attorney-general for the State and one of its most prominent citizens. At the present time he is counsel for the New England Power Company, which is interested in the big development of the Connecticut River at South Vernon, Vt., for power purposes. His subject will be "Transportation and White Coal." The meeting is to be held at the Hotel Brunswick, on Boylston Street, just off of Copley Square, Boston.

Financial and Corporate

ANNUAL REPORT

New York Railways

The comparative statement of income, profit and loss of the New York (N. Y.) Railways for the years ended June 30, 1915 and 1916, follows:

	1916	1915*
Gross operating revenue.....	\$13,714,531	\$13,399,767
Operating expenses	8,374,079	8,545,043
Net operating revenue.....	5,340,452	\$4,854,724
Taxes	1,038,122	1,042,859
Income from operation.....	\$4,302,330	\$3,811,865
Non-operating income	567,869	527,242
Gross income	\$4,870,199	\$4,339,107
Income deductions:		
Interest on underlying bonds, rents, etc.	\$2,707,884	\$2,747,404
Interest on New York Railways first real estate and refunding mortgage 4 per cent bonds	722,609	691,538
Total	\$3,430,493	\$3,438,942
Balance	\$1,439,706	\$900,165
Add:		
Surplus balance at beginning of year...	64	
Addition during the year (net).....	145,445	61,279
Net income—surplus available for interest on adjustment mortgage bonds.....	\$1,585,216	\$961,445
Interest distributed on adjustment mortgage bonds	1,584,946	961,381
Surplus	\$270	\$64

*The figures for the year ended June 30, 1915 (as contained in the published annual report of last year) are adjusted in the foregoing to accord with changes in classification made during the year ended June 30, 1916.

The gross passenger revenue for the year was \$13,379,048, an increase of \$368,115 or 2.83 per cent. Other street railway operating revenue was \$335,483, a decrease of \$53,351 or 13.72 per cent. This is accounted for principally by a decrease in revenue from advertising and sale of power. The gross operating revenue thus produced was \$13,714,531, an increase of \$314,764 or 2.35 per cent.

Street railway operating expenses were \$8,374,079, a decrease of \$170,964 or 2 per cent. The operating ratio was 61.06 per cent, a decrease of 2.71 per cent as compared with the preceding year. There was actually expended in the maintenance of way and structures and equipment \$1,898,272, and there was set aside in reserve \$844,634, the total charge to the maintenance accounts during the year (equal to 20 per cent of the total operating revenue) amounting to \$2,742,906, an increase of \$62,953. There was expended during the year for maintenance of track and roadway, electric line, buildings, structures, etc., \$1,042,356, and for maintenance of equipment, \$855,916.

The transportation expenses were \$4,293,407, a decrease of \$51,254, while the power supply costs showed a decrease of \$93,798. There was an increase of \$42,544 in the cost of car operation, due principally to the higher scale of wages prevailing during the last six months of the year. The actual expenditures during the year for injuries to persons and property were \$1,054,651, an increase of \$125,265 as compared with the preceding year. The cost of injuries and damages, however, as charged to operating expenses was \$809,660, the difference being charged to the accumulated accident reserve account on the basis of 7 per cent of the passenger revenue. Detailed comparative figures showing the efficiency of operation are presented in the table on page 908.

There was a decrease in taxes assignable to street railway operations of \$4,737 or 0.45 per cent. The taxes during the year amounted to \$1,038,122 or 7.76 per cent of the revenue from transportation. The valuations of the special franchises for 1916 were finally fixed by the State Tax Commission at \$29,417,000, a decrease of \$5,528,000 from the similar valuations for 1915. The litigation which the company instituted in the federal courts to recover the sums which it had paid to the government as excise taxes,

on account of its various lessors, under the congressional act of 1909, were successfully concluded. Refunds aggregating \$29,234 were secured as the result of this litigation.

The non-operating income of the year amounted to \$567,869, an increase of \$40,627 or 7.71 per cent. Such increase is accounted for by additional income from dividends and interest revenues, the remainder of the items in this account representing decreases in real estate revenues and in net income from operation of local cars over the Williamsburg Bridge. The gross income for the year, viz., \$4,870,200, increased \$531,092 or 12.24 per cent over the previous year. Income deductions during the year amounted to \$3,430,493, a decrease of \$8,449. During the year there was credited to surplus as available for interest on the adjustment mortgage bonds, the sum of \$128,926, representing an adjustment of accident and damage costs of the calendar year 1912 and the first half of the calendar year 1913.

The aggregate of the tax and other obligation items, estimated in part, for the year ended June 30, 1916, is as follows:

Taxes:	
Gross earnings.....	\$196,257
Stipulated rents.....	41,000
Car license fees.....	57,829
Real estate.....	278,899
Special franchises.....	278,355
Other obligations:	
Removal of snow and ice.....	149,022
Paving.....	293,867
Rent of tracks, ferry terminals, etc.....	3,054
Williamsburg Bridge tolls.....	20,593
Track and terminal rental—Williamsburg Bridge....	3,916
City inspectors.....	9,724
Total.....	\$1,332,521

A comparison of similar figures for the other years shows that this total is under rather than above the average. Nevertheless, that total is almost 10 per cent of the gross passenger revenue for the year. If the taxes which the company pays the State and the federal government were included the total and percentage would be much greater. Some arrangement, it is said, should be made for paving and snow removal as well as special tax burdens on a basis that will enable the operating railway companies to secure a reasonable return on the capital invested and proper compensation for services performed.

COMPARATIVE OPERATING STATISTICS FOR THE FISCAL YEARS ENDED
JUNE 30, 1916 AND 1915

	1916	1915	Change
Total revenue from operation.....	\$13,714,531	\$13,399,767	+ \$314,763
Total operating expenses.....	8,374,078	8,545,042	- 170,964
Per cent of operating expenses to total revenue from operation:			
Maintenance of way and structures:			
Expended.....	7.60	7.53	+0.07
Reserved.....	4.15	4.22	-0.07
Maintenance of equipment:			
Expended.....	6.24	6.82	-0.58
Reserved.....	2.01	1.43	+0.58
Operation of power plant.....	6.09	6.93	-0.84
Operation of cars.....	25.22	25.49	-0.27
Injuries and damages:			
Expended.....	7.69	6.94	+0.75
Reserved.....	-1.79	0.35	-2.14
General and miscellaneous expenses.....	3.85	4.06	-0.21
Total.....	61.06	63.77	-2.71
Number of passengers carried:			
Cash fares.....	257,028,563	251,264,521	+5,764,042
Revenue transfers.....	17,752,628	15,062,586	+2,690,042
Free transfers.....	108,521,893	109,943,330	-1,421,437
Total.....	383,303,084	376,270,437	+7,032,647
Per cent of free transfer passengers to revenue passengers.....	39.49	41.28	-1.79
Average fare per passenger (cents):			
Per passenger (including transfers).....	3.490	3.458	+0.032
Per revenue passenger.....	4.869	4.885	-0.016
Operating expenses per passenger (cents):			
Per passenger (including transfers).....	2.185	2.270	-0.085
Per revenue passenger.....	3.048	3.208	-0.160
Car miles.....	34,360,986	34,891,203	-530,217

PRESIDENT LILIENTHAL INDORSES UNITED RAILROADS REORGANIZATION PLAN

In referring to the United Railroads of San Francisco reorganization plan, as proposed by the bankers' committee and reviewed in the ELECTRIC RAILWAY JOURNAL of Sept. 30 and Oct. 7, President Lilienthal in an article in the October issue of *The United Railroads Magazine* made a statement in part as follows:

"In the first place, the capital and debts of the company are being reduced from nearly \$92,000,000 to about \$47,000,000. The holders of the company's 4 per cent bonds are being asked to surrender these bonds and accept in place of them 25 per cent of the amount due them in bonds and 46 per cent of such amount in stock, thus sacrificing at least 29 per cent of the par of their holdings. The holders of the company's notes are asked to surrender these and accept stock in their place.

"If the plan is accepted by the stockholders, as I am sure that it will be, their generosity and their willingness to incur sacrifices will appear to be all the greater when it is remembered that, instead of drawing money out of the system, as our enemies have insinuated, they have, on the contrary, during the last ten years, provided the company with \$8,000,000 in cash, of which \$5,000,000 was provided immediately after the earthquake and fire of April, 1906, to permit the reconstruction of the road. In addition, the stockholders have offered to lend an additional \$5,200,000 now to take care of the underlying bonds, namely, \$1,800,000 of Market Street Cable Company bonds, \$400,000 of Ferries & Cliff House bonds, \$2,000,000 of Omnibus Cable bonds and \$1,000,000 of Sutter Street Railway bonds.

"None of us in the organization is responsible for the conditions that have made these great sacrifices necessary. The competition of the municipal lines and of the jitneys, constantly increasing taxes and the high cost of materials are responsible, but it is the part of courage and honesty to look a situation squarely in the face and meet it. I want to make the sacrifices to our creditors as small as possible, but I deem it a paramount duty to apply the knife when it is needed, so that the company may be placed on a sound financial basis, where it cannot be attacked for sinister purposes, where it can perform its whole duty to the public and where it can do full justice to its employees. It is with these objects in view that I am throwing my whole heart into carrying out this reorganization."

Beaumont (Tex.) Traction Company.—An amendment to its charter has been certified to Secretary of State McKay at Austin by the Beaumont Traction Company, increasing its capital stock from \$600,000 to \$1,000,000.

Dominion Power & Transmission Company, Hamilton, Ont.—At a special sitting of the Supreme Court of Ontario, at Hamilton, on Oct. 2, presided over by Justice Middleton, the hearing of evidence was commenced in the action brought by Charles William Moodie, a shareholder of the Dominion Power & Transmission Company, on behalf of himself and other shareholders of the company, against certain officers and directors of the company. Mr. Moodie contends that some of the properties were secured at excessive prices; that bonds amounting in all to \$6,850,000 were sold for inadequate consideration, and that large profits were made in this connection by the defendants. Mr. Moodie asked for damages and an injunction against the continuance of the acts of the directors, and for a receiver of the defendant company. He also wants the court to set aside an issue of \$1,000,000 of common stock which, he claims, the defendant directors received as a bonus.

Eastern Pennsylvania Railways, Pottsville, Pa.—The Pottsville Union Traction Company, controlled by the Eastern Pennsylvania Railways, has applied to the Pennsylvania Public Service Commission for permission to purchase the stock of the Pottsville & St. Clair Electric Railway, recently completed.

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Ohio Public Utilities Commission has authorized the Kanawha Traction & Electric Company to issue \$1,700,000 of 5 per cent bonds to be sold at not less than

86 per cent of par. Of the amount authorized \$1,100,000 is to be used to retire two-year notes, \$40,000 to be used for improvements in Parkersburg and \$33,000 to construct a reinforced concrete viaduct at Boaz, W. Va. The remainder of the issue will be used to retire \$150,000 of bonds of the Marietta Traction Company which mature early in 1917. The company asked originally for permission to issue \$2,000,000 of bonds.

Louisville (Ky.) Traction Company.—Officials and directors of the Louisville Traction Company, controlling the Louisville Railway and through it the Louisville & Interurban Railway, incorporated with \$15,000,000 of capital stock, are considering liquidation of the New Jersey corporation and operation of the system as a single Kentucky corporation. A. P. Humphrey, vice-president and general counsel of the company, in a recent statement, indicated that executives of the company were making preparations for a course of action to be determined upon in the future. The purpose of taking the step proposed would be to reduce tax payments. The new federal revenue act, effective on Jan. 1, increases the tax on corporate earnings from 1 to 2 per cent and assesses a new corporation tax on the capital. Liquidation would eliminate the New Jersey corporation tax and federal, New Jersey and Kentucky inheritance taxes would be affected in favor of the stockholders. The action, it is estimated, would save the company \$31,000 annually. The Louisville Railway is a Kentucky corporation, owning the interurban lines and is capitalized at \$7,956,500.

Municipal Railway, San Francisco, Cal.—The receipts of the Municipal Railway of San Francisco for September totalled \$123,766, or slightly more than \$4,000 daily, according to a statement of the bookkeeping bureau of the Board of Public Works. During August the receipts from all sources totalled \$123,026, which with operating expenses of \$81,715 left a balance of \$41,311 to be used for depreciation, payment of bonds, interest and additions to the existing system.

Northern Electric Railway, Chico, Cal.—A suit in equity has been filed in the Superior Court of California by Edward Bonnhelm, representing stockholders of the Northern Electric Company, to prevent the reorganization committee from carrying out the recently announced plans for reorganization. A temporary restraining order was also issued to prevent the reorganization committee and the Mercantile Trust Company from foreclosing on the deeds of trust which are held by the latter, on the charge that the committee is controlled by the bankers and that it is their intention to establish first liens on the Northern Electric Railway properties for the benefit of the Northern Electric Railway stockholders. A ninety-page complaint attacking the validity of the Northern Electric Company, the parent corporation, and the \$4,000,000 bond issue was filed by Mr. Bonnhelm. This complaint undertakes to show that the Northern Electric Company never legally existed because of defects in its incorporation; that its acts in California are void by reason of failure to comply with the laws of the State; that the bond issues are invalid in both Nevada and California; that failure to comply with the law invalidated the deeds of trust, and that the company does not hold first-class liens on all properties, as the plaintiffs also have liens totaling about \$2,000,000.

Northern Ohio Electric Corporation, Akron, Ohio.—E. W. Clark & Company, Philadelphia, Pa., and Hodenpyl, Hardy & Company, New York, N. Y., have announced a plan to organize the Northern Ohio Electric Corporation to acquire not less than 95 per cent of the common capital stock of the Northern Ohio Traction & Light Company. They are offering for subscription subject to allotment when, as and if issued, ten shares of 6 per cent preferred stock of the new company of a par value of \$100 a share and five shares of common stock without par value for \$1,000. The present offering is \$6,000,000 of stock. The Northern Ohio Electric Corporation was incorporated under the laws of New York on Oct. 19 with a capital stock of \$6,375,000. The circular of the bankers says that the company will have 60,000 shares of 6 per cent cumulative preferred stock of a par value of \$100 a share and 75,000 shares of common stock without par value. It is stated that the Northern Ohio Traction & Light Company has outstanding

\$14,075,000 of bonds and \$4,600,000 of preferred stock, but that it has no floating indebtedness other than current accounts and has approximately \$1,800,000 in cash in its treasury. The bankers say that to the extent that any stock of the Northern Ohio Traction & Light Company is not acquired the amount of the indebtedness assumed will be reduced and the cash in the treasury of the Northern Ohio Electric Corporation will be increased.

Oxford Electric Company, Mechanic Falls, Me.—The Oxford Electric Company, lately organized, comprises what was formerly the Mechanic Falls Electric Light Company, and the Norway & Paris Street Railway & Power Company.

Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.—At a recent meeting of the directors of the Tuscaloosa Railway & Utilities Company, the following officers were elected: F. S. Morris, Philadelphia, president; C. R. Carter, Birmingham, vice-president; J. L. Etheridge, Philadelphia, secretary and treasurer; D. Swann, Birmingham, assistant secretary; G. A. Daniels, Tuscaloosa, assistant treasurer; I. W. Ross, Tuscaloosa, general manager.

Worcester (Mass.) Consolidated Street Railway.—The Massachusetts Public Service Commission has issued a decision on the petition of the Worcester Consolidated Street Railway allowing it to issue \$10,000 of new stock and \$60,000 of bonds to be applied to the extinguishment of floating debt.

DIVIDENDS DECLARED

Bangor Railway & Electric Company, Bangor, Me., quarterly, one-half of 1 per cent, common.
 Cape Breton Electric Company, Ltd., Sydney, N. S., 3 per cent, preferred; 1½ per cent, common.
 East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-quarters of 1 per cent, preferred.
 Jacksonville (Fla.) Traction Company, quarterly, 75 cents preferred.
 Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.
 Northampton (Mass.) Street Railway, 2½ per cent.
 Public Service Investment Company, Boston, Mass., quarterly, 1½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$36,528	*\$25,464	\$11,064	.....	.....
1 " " '15	35,131	*22,871	12,260	.....	.....

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Aug., '16	\$100,761	*\$74,951	\$25,810	\$27,700	†\$1,708
1 " " '15	91,618	*67,116	24,502	16,964	†7,680
2 " " '16	198,596	*151,303	47,293	55,531	†7,886
2 " " '15	182,862	*129,298	53,564	33,986	†19,839

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Aug., '16	\$628,823	\$24,501	\$604,322	\$720	\$603,602
1 " " '15	312,737	14,568	298,169	40,833	257,336
12 " " '16	7,149,948	219,437	6,930,511	421,003	6,509,508
12 " " '15	4,051,578	155,846	3,895,732	490,000	3,405,732

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

1m., Aug., '16	\$40,814	*\$28,078	\$12,736	\$7,987	†\$4,811
1 " " '15	46,258	*29,937	16,321	8,000	†8,390
2 " " '16	85,745	*58,742	27,003	15,974	†11,137
2 " " '15	96,041	*60,738	35,303	16,000	†19,443

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.

1m., Aug., '16	\$473,434	\$291,304	\$182,130	\$47,995	†\$134,135
1 " " '15	360,054	214,559	145,495	53,318	92,177
8 " " '16	3,334,077	2,011,571	1,322,506	403,001	919,505
8 " " '15	2,488,442	1,535,909	952,533	413,588	538,945

PACIFIC GAS & ELECTRIC COMPANY, SACRAMENTO, CAL.

1m., Aug., '16	\$1,462,480	*\$912,643	\$549,837	\$337,198	†\$244,558
1 " " '15	1,478,867	*898,304	580,563	340,579	†257,180
12 " " '16	18,593,438	*10,764,139	7,829,299	4,069,017	†4,247,832
12 " " '15	17,989,092	*10,324,560	7,664,532	4,292,759	†3,716,732

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Sept., '16	\$2,226,059	\$1,210,784	\$1,015,275	\$814,411	\$200,864
1 " " '15	2,009,979	1,115,491	894,488	815,611	78,877
3 " " '16	6,590,825	3,655,733	2,935,092	2,444,689	490,403
3 " " '15	5,847,648	3,297,930	2,549,718	2,448,149	101,569

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

HANDLING WORLD SERIES TRAFFIC AT BOSTON One Hundred and Ninety Cars an Hour Were Operated to the Field Through the Boylston Street Subway at the Height of the Outward Rush

The Boston (Mass.) Elevated Railway handled the heavy extra traffic resulting from the two opening games of the World Series at Braves Field, Allston, without a single accident to passengers or employees. A few days before the games began a conference was held in the office of Edward Dana, superintendent of traffic, at which the detailed arrangements for extra service were prepared with a typewritten outline of the headway planned on the more important lines, the provisions for supplying extra cars, co-operation of different operating divisions and storage facilities for rolling stock during the game itself.

On Oct. 7, the day of the first game, a high-frequency service was inaugurated at 8 a. m. by two-car, motor-trailer trains between the North Station and Braves Field. Between Dudley Street and the latter point at the same time a five-minute service was inaugurated by 25-ft. articulated cars. At 9:30 a. m., the headway on the North Station-Braves Field line was reduced to two minutes, this schedule being maintained until noon, when it was cut to one minute and remained at this figure until the game began at 2 p. m. The Dudley Street service was increased to a three-minute headway from 9 a. m. to 10:30 a. m., and a two-minute headway was maintained until 2 p. m. From 8 a. m. until 2 p. m. trailers were added to the regular four-minute service over the Watertown-Park Street line, and to the six-minute services from Lake Street to Park Street and from Union Square to Park Street. This increase of service provided for through car movements from important subway and elevated transfer stations and certain outlying terminals of the system directly to the ball park, with the result that little congestion occurred on the loading platforms. About 190 cars an hour were operated to the field through the Boylston Street subway at the height of the outward rush, providing a total seating capacity of nearly 20,000 an hour from the down-town district via the underground lines.

The arrangements for supplying cars immediately after the close of the game were highly satisfactory. As described in the ELECTRIC RAILWAY JOURNAL at the opening of Braves Field last year, a prepayment area with trackage facilities for holding twelve two-car trains for immediate use is a prominent feature of the park arrangements. Arriving trains were operated around a loop from Commonwealth Avenue into the prepayment area until the full capacity of the two parallel tracks within had been attained, all passengers being discharged outside the area. Two temporary cross-overs were installed on Commonwealth Avenue between Brighton Avenue and Harvard Street, and a section of the double-tracked line located in the reservation on this avenue was operated as single track, regular cars being flagged through. This released track for the storage of eight trains and five articulated cars within two minutes' run of the park, allowing for stops in loading traffic. Ten trains and three articulated cars were stored on a corresponding temporary single-track section on Brighton Avenue, equally convenient to the grounds; eight trains were stored during the game at Watertown carhouse, ten at Oak Square carhouse, and twelve articulated cars were side-tracked at Allston carhouse.

Prompt work by inspectors at the telephones enabled these cars to be started for the park as soon as the last man was declared out, and in time to load the homeward-bound "fans." As fast as the trains stored on the two tracks of the prepayment area at the field were loaded, additional trains were routed into the area, the average loading period being approximately 1.5 minutes per train. Other extra cars and trains were loaded on the main line tracks outside the grounds.

Twenty minutes after the game the rush was virtually over in the vicinity of the grounds, the total attendance being about 40,000. In the half-hour following the game fifty-six trains and fifteen articulated cars passed through the prepayment area. Many hundreds of private automobiles were parked near the grounds and the police co-operated effectively in handling the street railway traffic. Extra employees of the department of maintenance of way, emergency linemen, inspectors and switchmen manned important points on the main lines to the field.

In speaking of the service the Boston *Globe* stated that "the trolley car arrangements were well-nigh perfect."

COUNCIL PUTS OFF ACTION ON BUFFALO FARES Little Inclination Manifested to Enter Into Action of Ex- tremely Doubtful Outcome

Action on the recommendation of the corporation counsel of Buffalo, N. Y., urging the City Council to start a proceeding for a reduction in the fare charged by the International Railway from 5 cents to 4 cents within the city, has been postponed until Nov. 9 by a vote of four to one. There appears to be little inclination on the part of four of the five members of the Council to approve the recommendation in view of the situations which prevailed in Cleveland and Detroit during the rate proceedings. Mayor Louis P. Fuhrmann at the last hearing before the Council, asked the corporation counsel for statistics to substantiate his charges of alleged excessive earnings and dividends by the company. The Mayor said:

"You ask for a reduction in fare of 20 per cent, or from 5 cents to 4 cents. The receipts of the International Railway were \$6,000,000 last year. You now ask for a reduction of one-fifth that sum or \$1,200,000. Have you any figures to show that that is a proper reduction?"

Other members of the Council recalled the so-called Milburn agreement made in 1892 when there were three companies operating in Buffalo—the Buffalo Railway, the Buffalo East Side Railway and the Crosstown Street Railway. This agreement provided for a 5-cent fare with interchange of transfers. It has been ratified by the State Legislature and its provisions are recognized in the public service commission law.

Thomas Penney, vice-president and general counsel for the railway, who has appeared at all hearings, brands the proposal of the city's law department as a mere reprisal against the company because of the latter's civil action to have its alleged exorbitant special franchise assessment reviewed in the courts.

There has been much division of opinion expressed by Buffalo newspapers over the proposed investigation advocated by the corporation counsel in an effort to force the railway to lower its Buffalo city fares. The *Times*, in a recent editorial opposing the investigation, said:

"There ought to be a very thorough understanding of the terms and conditions of the Milburn agreement before the Council becomes too far involved in any litigation with the local public utility corporations. The Milburn agreement has stood since 1892; was ratified by the Legislature, and its provisions are recognized in the public service law of the State. It is all very well to say that it will not be construed to be involved in any of the proposed proceedings, but it is equally possible that able corporation lawyers will involve it because of the closeness of the question, just as they will bring about other very severe entanglements. It would seem to be the part of wisdom for the Council thoroughly to dissect the agreement in the interim during which some of these questions are to be held in abeyance. If the city starts baiting these local corporations it may necessarily mean a battle with all of them all along the line, and the officials should be thoroughly fortified.

"In these battles in Cleveland under Tom Johnson and in Detroit under Mayor Thompson, the first of which was successful and the latter not so much so, the cities were forced to the expenditure of many millions of dollars. Tom Johnson lost his own great fortune, and Detroit was in a municipal riot of one sort or another for upwards of four years. If the city enters into a battle with its public utility corporations, it must go in prepared to fight it out on that line if it takes a decade."

SUBURBAN FARE INCREASE ALLOWED

New Jersey Commission Grants Request for Increase from 15 to 20 Cents Between Trenton and Princeton

The State Public Utilities Commission of New Jersey has made an order permitting the New Jersey & Pennsylvania Traction Company to increase the rate of fare on its division between Trenton and Princeton from 15 cents to 20 cents, and has dismissed an application by the company for authority to transfer 10,000 shares of capital stock to the Pennsylvania-New Jersey Power & Light Company.

In granting permission to the company to increase its fare to Princeton, the board pointed out that the company's property was worth approximately \$575,000. The net profit for the last three years had averaged about \$18,000 a year, or a little more than half what the board regarded as a fair return on the investment. The company is still required, however, to sell tickets at the rate of twelve for \$1. The board allowed a 5-cent fare to be charged in each of these zones—Trenton to Sand Pit, Sand Pit to Lawrenceville, Lawrenceville to Provinceline, Provinceline to Princeton. The board said that in its opinion the application of the fares mentioned going in either direction between any point in Princeton and the town of Lawrenceville and between any point in Lawrenceville and any point in Trenton should not exceed 10 cents.

The commission, in its report, says that the experience of the company for two years operating the division at a 15-cent fare "demonstrates that the company is still earning less than the return to which the board determined it was entitled in 1913," when the rate was established. The board found in 1913 that the 10-cent rate between Trenton and Princeton was insufficient and fixed the fare at 15 cents for an experimental period of twelve months. That rate was made permanent.

The evidence submitted at a recent hearing, the report says, shows that the net income of the company for the year 1913, after paying taxes, was \$18,794; for 1914, \$15,451; and for 1915, \$17,637. The company, it appears, lengthened its time of running in order to lessen expenses, but even this, the board says, did not change the situation very much:

Continuing the board says:

"The counsel for Trenton frankly admits that the petitioner is not securing a fair and reasonable return. It is objected, however, to an increase of the rate of fare that a competing line charges a fare of 15 cents between Trenton and Princeton and that this petitioner should not be permitted to charge a higher rate than its competitor. This objection ordinarily is an important one, but it must give way when proof of insufficiency of revenue to yield a fair return on its property is adduced by the applicant, and the rate it is proposed to establish does not appear to impose excessive charges for the service afforded.

"It should be noted in this connection that since 1913 substantial improvements have been made in the company's property. New cars of enlarged capacity have been put in operation and the track has been bettered materially. Operating for the greater part of the distance between Trenton and Princeton on private right-of-way the company is able to afford and appears to provide an interurban service, in which large and heavy cars are operated at comparatively high speed. This involves a heavier capital expenditure and a greater expense for maintenance than would be the case where lighter rolling stock is operated at a slower speed. The speedy operation of the new equipment is a detail of the service advantageous to the public and must receive due credit in considering the question of the reasonableness of the company's charges."

The board says that it has adopted the policy recognized by all public utility commissions in the United States that competition between utilities is not to be encouraged because of the inevitable ultimate double burden which must be assumed by the public in the maintenance of the dual system of utilities. The report further says:

"Undoubtedly the existence of a utility in any territory which furnishes satisfactory service is sufficient ground for refusing permission to another utility to enter the same territory. But the policy referred to is of recent origin and the construction of the petitioner's line in the territory served by another line took place at a time when it was the policy

of the State to encourage and promote competition in the utility field as well as in all other fields of industry. To deny the company a reasonable return because the State has changed its policy would be an exhibition of bad faith toward the petitioner and an injustice as well."

In its refusal to allow a transfer of the company's capital stock the board says:

"In view of the fact that the New Jersey company in 1913, without the approval of this board, sold to the Bucks County syndicate, the owners of both the New Jersey and the Pennsylvania properties, or some of them now owned by the Pennsylvania company, for \$439,445 less than the book value thereof, without a reduction of capitalization or securing permission to set up a property abandoned account, the matter of capitalization and transfer of stock becomes vital. . . . Whether the board will give its approval to a transfer of stock, the only purpose of which is to secure its control by a holding company, which will indirectly be a burden on the New Jersey company, is not now decided."

The board says it wants to be satisfied that the transfer intended will not so intermingle the management and liabilities of the two companies as to make separate operation and supervision practically impossible.

ONE-MAN CAR APPROVED FOR BAY STATE STREET RAILWAY

The Public Service Commission of Massachusetts has issued an order approving the use by the Bay State Street Railway of a type of one-man car closely resembling the Birney design described in the *ELECTRIC RAILWAY JOURNAL* of March 18, 1916, page 556. The car is to be equipped with double-end control and is 27 ft. 9½ in. long over bumpers. The platform length will be 4 ft. 6 in. and the steps will be of the folding type. Fourteen double cross seats will be provided and the sand box on each platform can be used as a seat. A revolving seat with back is provided on each platform for the use of the motorman. A 26-in. opening will connect the platform and the car interior proper, pipe stanchions being used instead of a bulkhead. A fare box stand will be located slightly to one side of the platform center line, and the car will probably be equipped with 24-in. wheels.

BOSTON TRANSFER HEARING STARTED

The Public Service Commission of Massachusetts gave a hearing on Oct. 6 upon the petition of T. P. King and other patrons of the Boston Elevated Railway for increased transfer facilities at Dewey Square, Boston, in connection with surface lines to and from South Boston. H. B. Potter, assistant to the president, appeared for the company. The petitioners represented a growing manufacturing district and objected to the present limitations placed upon transfers between Summer Street extension cars and various lines passing the South Station.

Mr. Potter emphasized the existing transfer abuses on the system and called attention to the investigation of the company's financial condition now in progress by a special legislative commission, pointing out that some solution of the general transfer problem is necessary. The company maintains that it cannot afford to increase existing transfer facilities at Dewey Square pending the opening of the Summer Street section of the Dorchester tunnel from Washington station to Dewey Square.

In closing the hearing, Chairman McLeod said that the difficulties of dealing with the general transfer situation at Boston along broad lines were great, and that in the main the work of the commission must be associated with the study of specific cases and action thereon. He said:

"It seems to me that the commission is bound to recognize the condition created by the establishment and construction of rapid transit lines, and if the system is to be utilized by the public to its maximum efficiency we cannot expect that after the rapid transit line is built the whole service is going to be duplicated by surface lines. That means bankruptcy to the company—the establishment of a rapid transit line over certain territory must inevitably mean some reduction in surface car facilities if the company is to remain in a proper financial condition to furnish the service the public has the right to expect."

Key Route Issues Bi-Monthly Publication.—The first issue of *Key System News*, published by the San Francisco-Oakland Terminal Railways, Oakland, Cal., has recently made its appearance. Its aim is "to establish a closer understanding between the management, the employees and the patrons of the Key System," and to act as a "clearing house of information and ideas on transportation needs and problems." The paper is issued the first and fourth Saturdays of the month.

Railway Protests Bus Service.—The International Railway, Buffalo, N. Y., has filed a complaint with the Public Service Commission for the Second District of New York, against automobile owners who are operating a 10-cent motor bus line along the River road from the city line to the Grand Island ferry in competition with the company's stub service car. The Buffalo General Electric Company's new \$2,000,000 electric generating plant is being built just north of the city line on the River road and hundreds of employees have been patronizing the motor bus.

"Traveling Conductor" to Study Troubles.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has appointed one of its trusted employees to the newly-created position of "traveling conductor." It is his duty to travel continuously on the various lines and act as a sort of buffer for alleged complaints from patrons and to assist in any other way possible in increasing efficiency of the platform men and the service generally. He travels in uniform and his title appears on his cap. As the plan has been in effect only a very short time, results cannot be reported at this time.

New Jitney Measure in Effect in Houston.—The new jitney ordinance, requiring an annual license fee of \$72 and imposing numerous restrictions as to routes, painted signs on cars, number of passengers, etc., is now in force in Houston, Tex. Only 117 licenses have been issued under the new ordinance, whereas there were more than 500 cars in operation a short time ago. One of the greatest hardships imposed, according to the jitney men, is requiring the cars on the Houston Heights line, which operates from Houston to Houston Heights, either to take out a city license, paying the fee of \$72, or to carry only inter-city passengers from a fixed stand in Houston to a fixed stand in Houston Heights.

Additional Testimony Presented in Fare Case.—Additional testimony has been taken by the Board of Public Utility Commissioners of New Jersey in the protest that was filed several weeks ago against the proposal of the Burlington County Transit Company to increase fares on its lines between Mount Holly and Moorestown. The company asked the commission for authority to increase its Mount Holly-Moorestown fare from 15 cents to 20 cents. Some time ago the company was allowed to increase the fare providing it operated additional cars and gave through service. It is alleged that while the company is charging the increased fare, it has not given additional and improved service. Some residents along the line claim that the company, following a serious fire in the carhouse some time ago, purchased second-hand cars and is operating these under the increased fare. The board will announce its decision later.

Writ of Error Denied in Fort Worth Jitney Case.—Application for a writ of error in the case of the Auto Transit Company, *et al.*, versus the city of Fort Worth, Tex., involving the validity of the jitney regulations was refused by the Supreme Court of Texas on Oct. 4. This case originated in the Sixty-seventh District Court of Tarrant County when a petition was filed asking that the city commissioners of Fort Worth be restrained from enforcing the ordinance. A temporary injunction was granted on June 21, 1916, but a permanent injunction was refused after the hearing a few days later. The ordinance was attacked by the jitney men on the grounds that the city had no authority to enact such an ordinance and that the provision of the ordinance requiring an indemnity bond was discriminatory. No written opinion was rendered by the Supreme Court. The case was disposed of by Chief Justice Nelson Phillips and Associate Justice Yantis. Assistant Justice Mawkins did not assent or dissent in the decision, but stated that he would file an opinion in connection with the matter at a later date.

Personal Mention

V. Everit Macy has been elected president of the National Civic Federation by the executive council, to fill the vacancy caused by the death of Seth Low.

B. W. Lynch, formerly assistant general auditor of H. M. Byllesby & Company, Chicago, Ill., has been promoted to the position of general auditor of H. M. Byllesby & Company.

I. W. Ross, formerly connected with the Birmingham-Ensley & Bessemer Railroad, Birmingham, Ala., has been appointed general manager of the Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., to succeed C. R. Carter, resigned, as noted elsewhere in this column.

G. R. G. Conway, formerly chief engineer and assistant general manager, and now consulting engineer for the British Columbia Electric Railway, Vancouver, B. C., has left for Mexico City, to represent the bondholders' committees of the Mexican Light & Power Company and the Mexico Tramways.

D. H. Robinson, who on June 1 was appointed overhead superintendent of the Ogden, Logan & Idaho Railway, Ogden, Utah, has been made roadmaster and is filling both positions. Prior to June 1 Mr. Robinson was superintendent of overhead lines of the British Columbia Electric Railway, Vancouver, B. C.

C. R. Carter has resigned as treasurer and general manager of the Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., as most of his time in the future will be taken up in the bond department of Morris Brothers Company, Philadelphia, owners of the property. He continues with the company, however, as vice-president.

William V. Brumby, formerly of the editorial staff of the *St. Louis Republic*, has been appointed editor of the *United Railways Bulletin*, published by the United Railways, St. Louis, Mo., in the interest of its employees. Mr. Brumby succeeds Pope Y. White, who has become connected with the *St. Louis Star*, as noted elsewhere in this column.

Pope Y. White, who has been connected with the United Railways, St. Louis, Mo., for two years as editor of the *United Railways Bulletin*, has resigned from the company to become connected with the *St. Louis Star* in an editorial capacity. Mr. White established the *Bulletin* for the company. Before becoming connected with the railway he was city editor of the *St. Louis Times*. He was engaged in daily newspaper work for fourteen years, advancing from reporter to city editor.

Mason D. Pratt, for nearly four years chief engineer of the United Railways & Electric Company, Baltimore, Md., has severed his connection with that company to resume private practice as consulting and constructing engineer. Mr. Pratt was for many years, during the development of the modern electric railway track, connected with the Lorain and the Pennsylvania Steel Companies. From 1904 to 1913 as consulting engineer in Harrisburg, Pa., he was identified with the rehabilitation work of the Harrisburg Railways, for which company he designed and built the first reinforced concrete carhouses and repair shops so constructed in the United States, as well as a modern power plant which holds a record for continuous, reliable and economical operation. In addition to these, his work included the construction of numerous buildings, bridges, industrial plants, water works, etc. Mr. Pratt will make his headquarters at Roland Park, Md.

Alfred Craven, chief engineer of the Public Service Commission for the First District of New York, was the guest at a dinner at the Harvard Club in New York, given by about 100 friends in honor of his seventieth birthday, which was Sept. 16, 1916. Most of the diners were from the staff of the Public Service Commission, but there were many engineers not connected with the commission, other old friends of Mr. Craven. Among them was William Barclay Parsons, consulting engineer for the Interborough Rapid Transit Company and former chief engineer of the

old Rapid Transit Commission. Mr. Parsons was the man who built the first subway and Alfred Craven was a division engineer under him. Others from outside the commission who came to do honor to the chief were William R. Wilcox, former chairman, and George V. S. Williams, former member of the Public Service Commission for the First District. Mr. Parsons presented to the guest of the evening a magnificent silver service with the compliments of all those assembled. In the place of speeches, the dinner committee provided vocal and instrumental music.

C. W. Squier has resigned as assistant engineer for the New York Municipal Railway, Brooklyn, N. Y., to accept the appointment of assistant electrical engineer with the Public Service Commission for the First District of New York. Mr. Squier was graduated from the University of Michigan with the degree of bachelor of science in electrical engineering in 1898. Since then he has been engaged in electric railway engineering. For four years he was with the General Electric Company as designer of control apparatus, later becoming head designer of multiple-unit train control for the company. He was also connected with the Sprague Electric Company as designing engineer at the time that this company was the pioneer in multiple-unit control apparatus. In 1904 he went to England as electrical engineer on railway apparatus for the British Westinghouse Electric & Manufacturing Company, and while there designed that company's type "T" line of railway controllers, which has since remained standard for tramway work. Mr. Squier returned to the Pittsburgh works of the Westinghouse Company at the time the first New Haven single-phase locomotive was introduced. He followed the testing and equipping of these locomotives as engineer. In 1908 he became engineer for the mechanical department of the Brooklyn Rapid Transit System and since that time has been engaged in operating engineering work for the company and the New York Municipal Railway, which is included in the Brooklyn Rapid Transit System. Mr. Squier has contributed many articles on railway subjects to the *ELECTRIC RAILWAY JOURNAL*, among them a series, "Equipment Defects," which attracted special attention.

OBITUARY

W. T. Woodroffe, who was connected with the British Columbia Electric Railway, Vancouver, B. C., from 1908 to 1912, was killed in action in France while serving with the Canadian forces, according to recent dispatches. After he resigned from the British Columbia Electric Railway, Mr. Woodroffe became city electrician of Vancouver and later superintendent of the municipal railway at Edmonton. Shortly after war was declared he joined the Fifty-fifth Battalion of Edmonton. Two weeks after arriving in England he was transferred to the Victoria Rifles of Montreal. Mr. Woodroffe was born in England. He took up his residence in British Columbia when a young man.

Virgil Gay Bogue, formerly consulting engineer of the Department of Public Works of New York City, died suddenly on Oct. 14 on the Ward Line steamship *Esperanza* on which he was returning from Mexico. Mr. Bogue was born in Norfolk, N. Y., more than seventy-one years ago, and was graduated from Rensselaer Polytechnic Institute at Troy, N. Y., in 1868 with the degree of C. E. Mr. Bogue managed much important work during his long career. He made the examination and report on the cost of reproducing the lines of the Southern Pacific in Oregon; he prepared the plans of the tidelands and the waterfront improvements of Seattle, Wash.; he was a member of the commission appointed by President Harrison to investigate and report on methods of improving the navigation of the Columbia River at The Dalles and Celilo Rapids; he made the examination and report on the cost of revisions and improvements of the Tehuantepec National Railway of Mexico and its port facilities and the comparison of its improved route with the route of the Panama Railway. In addition to being the consulting engineer of the Department of Public Works in New York, Mr. Bogue was a member of the committee appointed by Mayor Strong to determine the feasibility of operating surface cars on the Brooklyn Bridge. He was one of the commission appointed by the president of the Long Island Railroad to report on the feasibility and cost of a tunnel beneath the East River.

Construction News

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

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

RECENT INCORPORATIONS

*Knoxville (Tenn.) Interurban Railway.—Application for a charter has been made by the Knoxville Interurban Railway to construct a line from Vestal, south of Knoxville, to Marysville, about 13 miles. Capital stock, \$10,000. Incorporators: M. T. DeVault, Norman B. Morrell, E. R. Oates, John H. Knox and John W. Hudson.

*Hopewell & City Point Railway, Hopewell, Va.—Incorporated to construct a line about 2½ miles long. Capital stock, minimum, \$10,000; maximum, \$50,000. Officers: James C. Rees, Jr., president, and T. Tyler Ellis, secretary and treasurer, both of Petersburg.

FRANCHISES

Cleveland, Ohio.—The Cleveland, Southwestern & Columbus Railway brought suit in the Common Pleas Court at Cleveland on Oct. 13, to compel the County Commissioners to grant it a franchise to cross certain county highways in building its track around Berea. The Commissioners some time ago refused a franchise without certain grade-crossing eliminations.

San Angelo, Tex.—The Interstate Electric Corporation of New York will operate the electric traction lines in San Angelo under the proposed franchise recently submitted by the city authorities, if the taxpayers of the city approve that franchise in a referendum election. Acceptance of the franchise will mean the immediate expenditure of \$125,000 in improvements and betterments to the present street car lines in San Angelo.

Steilacoom, Wash.—The Pacific Traction Company, a subsidiary of the Puget Sound Traction, Light & Power Company, has received a franchise from the City Council to construct, maintain and operate a single or double-track street railway on the following route: on Steilacoom Boulevard, between the town limits of Steilacoom and Starling Street; thence along Starling Street to and into Steilacoom Street; then along Steilacoom Street to and into Union Avenue; thence along Union Avenue, to the intersection of Union Avenue and Lafayette Street; also, consenting to the abandonment of operation of the present line of the Tacoma Railway & Power Company on Lafayette Street, between Wilkes Street and the town limits of Steilacoom, and to the removal of tracks and appurtenances from Lafayette Street, between Wilkes Street and the northerly town limits of Steilacoom. This franchise shall not be considered or construed as an exclusive franchise, the town of Steilacoom reserving the right to grant similar rights and privileges to other persons and incorporations.

TRACK AND ROADWAY

Edmonton (Alta.) Radial Railway.—It is reported that the city of Edmonton plans to spend about \$75,000 for extending its street-railway lines.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—It is reported that this company will construct an extension on San Pablo Avenue from Grand Canyon Park up San Pablo Canyon to the new dam of the Peoples Water Company, about 6 miles.

*Havana, Cuba.—A presidential decree has been granted for the construction and operation of an electric railway between Matanzas and Havana. This road will be about 60 miles long. It is understood that the road will operate at first with steam power and that electrification will be begun in 1917. The concession is held by the Hershey Corporation, a Delaware corporation whose president is Milton W. Hershey. Address Mercaderes 36, Havana.

St. Louis-East Side Belt Terminal Railway, East St. Louis, Ill.—Application has been made by the St. Louis-

East Side Belt Terminal Railway to the Board of Public Service of St. Louis to use the free bridge when it is completed. It is stated that the company plans to take over the holdings of the Southern Traction Company and operate an electric line from Belleville and other Illinois cities to St. Louis. [July 29, '16.]

Southern Illinois & St. Louis Railway, Harrisburg, Ill.—It is reported that work will be begun in the early part of November by the Southern Illinois & St. Louis Railway on its proposed line from Marion through Harrisburg, Herrin, Benton and West Frankfort to Johnson City. It is estimated that the line will cost about \$3,000,000. W. H. Schott, Chicago, president. [April 1, '16.]

Kankakee & Urbana Traction Company, Urbana, Ill.—Work will be begun in the spring by the Kankakee & Urbana Traction Company on the construction of an extension from Paxton to Kankakee, and work of securing the right-of-way will be begun as soon as complete plans are made.

Terre Haute (Ind.), Indianapolis & Eastern Traction Company.—It is reported that the Terre Haute, Indianapolis & Eastern Traction Company will spend \$45,000 in raising its tracks 7 in. from Richmond to Indianapolis.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company reports that it is in the market for a second-hand deck girder bridge about 60 ft. long.

Cumberland Traction Company, Edmont, Ky.—A number of citizens of Metcalf County, Ky., have purchased the property of the Cumberland Traction Company, which was in the hands of Master Commissioner A. J. Thompson, and will endeavor to sell it to some company which will complete it. About \$75,000 had been spent and 2 miles of track have been graded on the proposed line between Edmont and Horse Cave. [Oct. 30, 1915.]

Detroit (Mich.) United Railway.—Operation was begun Oct. 15 on the Kercheval Avenue extension, which includes tracks on Kercheval Avenue from St. Jean to Hart, on Hart to Jefferson and on Lycaste, from Jefferson to Kercheval Avenues. The construction of this extension makes a direct connection between the Sherman and Jefferson Avenue lines.

Michigan Railway, Kalamazoo, Mich.—This company will reconstruct its tracks on South Washington Street from the tracks of the Grand Trunk Railway to Ridge Street.

***Biloxi, Miss.**—Plans are being made by the Biloxi Vegetable and Fruit Growers Association for the construction of a line from Biloxi to Ocean Springs, 8 miles. W. A. Reno, president.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company plans to construct an extension from Twenty-fourth and O Streets to Nineteenth and W Streets.

Morris County Traction Company, Morristown, N. J.—A report from this company states that it has placed a contract for one mile of 7-in. T-rail to be used in the construction of second track from Maplewood to Millburn.

International Railway, Buffalo, N. Y.—This company has been granted permission by the City Council to lay electric conduits in Twenty-fourth Street from Allen to Buffalo Avenue, Niagara Falls.

Buffalo & Williamsville Electric Railway, Williamsville, N. Y.—The residents of Akron, N. Y., have petitioned the Buffalo & Williamsville Electric Railway to extend its lines from Williamsville to Akron. The company now operates a line between Buffalo and Williamsville and officials of the company are inclined to build the desired extension.

***Asheville, N. C.**—It is reported that surveys are now being made under the direction of the J. G. White Engineering Corporation, New York, for an electric railway from River Falls, S. C., to Asheville, about 60 miles. W. A. Smith, Hendersonville, N. C., is reported interested.

Cleveland, Alliance & Mahoning Valley Railroad, Alliance, Ohio.—It is reported that this company plans the construction of an extension to Hudson.

Cleveland (Ohio) Railway.—This company plans to construct an extension on Lakeside Avenue from Ontario to East Ninth Street.

Oakwood Railroad, Dayton, Ohio.—This company has applied to the Public Utilities Commission for authority to

issue \$10,000 in bonds, the proceeds to be used for improvements.

Dover (Ohio) Millersburg & Western Railway.—This company plans the construction of six bridges in connection with its proposed line from Dover to Millersburg. D. F. A. Wheelock, Woodward Building, Warren, Pa., engineer. [July 29, 1916.]

***Lorain, Ohio.**—It is reported that plans are being considered by the Board of Commerce of Lorain for the construction of an electric railway to connect the residence and business districts with a new industrial center on the East Side.

***Troy, Ohio.**—Plans are being considered by the Troy Chamber of Commerce for the construction of an electric railway between Troy and Pleasant Hill and probably to Greenville.

Oklahoma Railway Company, Oklahoma City, Okla.—This company has placed a surveying crew in the field for the purpose of locating a line northeast from Guthrie to Langston, Coyle, Perkins and Stillwater for an extension of the interurban line. The proposed new line will traverse a rich agricultural section and also touch two important state institutions, including the Oklahoma Agricultural and Mechanical College at Stillwater.

Tulsa (Okla.) Street Railway.—Plans are being made by the city of Tulsa and the Tulsa Street Railway to repair the Third Street viaduct. The cost is estimated at about \$6,071.

Pacific Power & Light Company, Astoria, Ore.—This company has informed the City Council that it is ready to extend its line over Date Street as soon as the improvements under way on that thoroughfare are completed.

Wilkes-Barre & Hazleton Railway, Hazleton, Pa.—It is reported that the Wilkes-Barre & Hazleton Railway plans to construct an extension from Hazleton to Tamaqua. The new line would branch off from the present line near Black Ridge and then pass through Cranberry, Tresckow to Quakake Valley. It would extend to the Tresckow Waterfalls and would also pass over a steep grade on Quakake Mountain.

Hershey (Pa.) Transit Company.—This company reports that it is building two small reinforced concrete bridges near Campbelltown.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—This company is reported to be considering the purchase and electrification of the Pittsburgh, Lisbon & Western Railroad, extending from New Galilee to Lisbon, in addition to the plan of an extension from Darlington, through East Palestine and New Waterford to connect with the Youngstown & Southern Railway at Columbiana.

Womelsdorf (Pa.) Richland & Myerstown Street Railway.—The Lebanon Valley Construction Company has the contract for the construction of this company's line from Womelsdorf and Myerstown to Richland, 8 miles. [Sept. 30, '16.]

***Greenville, S. C.**—Preliminary surveys are being made for the construction of an electric railway from Greenville to Asheville, N. C., via Hendersonville. Russell N. Edwards, Indianapolis, is interested.

Dallas (Tex.) Northwestern Traction Company.—Work will be begun by this company early in November on the construction of its proposed line from Dallas to Krum. It is proposed eventually to construct the line to Wichita Falls. E. P. Turner, Dallas, president. [Sept. 9, '16.]

El Paso (Tex.) Electric Railway.—This company has asked the City Council for authority to place its wires underground in the downtown district.

San Antonio, Gonzales & Houston Interurban Company, Houston, Tex.—A contract has been awarded by the San Antonio, Gonzales & Interurban Company for the construction of its line between Houston and San Antonio to T. D. McLaughan at about \$600,000. Steeve Holmes, Leesville, Tex., president.

San Antonio & Austin Interurban Railway, San Antonio, Tex.—Vories P. Brown, president of the San Antonio & Austin Interurban Railway, reports that construction on this company's line to connect San Antonio and Austin will be begun before the end of the year. The project has been

held up by the European war, but financial backing has now been assured. [Jan. 20, '16.]

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The Board of Public Works, at a recent meeting, granted the petition of the Puget Sound Traction, Light & Power Company to reconstruct its track on Lakeside Avenue and East Sprague Street.

West Virginia Traction & Electric Company, Wheeling, W. Va.—It is reported that this company contemplates the construction of an extension to Morgantown.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company has sold a considerable part of its twenty-acre tract at Seventh and Central Avenues to the wholesale Union Terminal Company and will change the location of its carhouses now occupying the ground sold, to the eastern part of Los Angeles, near Echandia Junction. A similar carhouse will be constructed at Watts. The cost of the new carhouses will be approximately \$120,000. The shops of the company will be removed to Torrance.

Illinois Traction System, Peoria, Ill.—A new station will be erected by the Illinois Traction System at Mount Olivet.

International Railway, Buffalo, N. Y.—This company has awarded a general contract to John Moon, Lockport, for the construction of a new passenger terminal in Lockport. The structure will be of concrete and steel construction and will replace the present frame building which has been in use for thirty-five years. Work will be started at once. The new station will be used by the Buffalo & Lockport and Lockport & Olcott divisions of the International Railway and by the Buffalo, Lockport & Rochester Railway. The cost will be about \$23 600. The International Railway and the New York Central Railroad will construct a joint passenger terminal for interchange facilities at Burt, N. Y. The Lockport & Olcott division of the International Railway crosses under the Ontario division of the New York Central Railroad at Burt, but the two stations have been almost ½ mile apart. Under an agreement reached, a shelter-house 12 ft. long and 8 ft. deep with an overhanging roof will be built on the New York Central Railroad's right-of-way; a 4-ft. wide stairway will be constructed from the steam tracks to the cut of the electric line and a platform 25 ft. long and 4 ft. wide will be laid along the International Railway's tracks.

Hershey (Pa.) Transit Company.—A report from this company states that it has just completed a new carhouse with a capacity for thirty-five cars.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company has broken ground for a new carhouse at Ravenna Park, near Milwaukee. The new building will replace the old Farwell station, which was erected at North and Farwell Avenues in 1888, when the company was operating horse cars. Included in the facilities in this carhouse will be a running repair shop, car cleaning and washing bays and car storage space. A substation will also be erected on this site to serve East Milwaukee and White Fish Bay, and provisions will be made in this building for the station offices and employees' club rooms.

POWER HOUSE AND SUBSTATIONS

Connecticut Company, New Haven, Conn.—A building permit has been granted the Connecticut Company for the construction of an addition to its power house in Grand Avenue. The structure will be 78 ft. x 148 ft., two stories and of fireproof construction. It is estimated that the new plant, complete with equipment for producing power, will cost about \$250,000.

Albia Light & Railway Company, Albia, Iowa.—Preparations are being made by the Albia Light & Railway Company for remodeling its plant. New equipment will include one 100-kw. and one 350-kw. generating unit for light and power, one 200-kw. generator to supply energy for the railway, and three 250-hp. water-tube boilers.

Dover, Millersburg & Western Railway, Dover, Ohio.—This company, which proposes the construction of an electric railway between Dover and Millersburg, will construct a power house and two substations. D. F. A. Wheelock, Woodward Building, Warren, Pa., engineer.

Manufactures and Supplies

FOREHANDEDNESS DESIRABLE IN BUYING

Manufacturers Striving to Make Deliveries—Roads Should Co-operate—Better Prices and Quicker Delivery Will Result

Production is now the watchword in manufacturing circles. Raw materials are high priced and hard to obtain and labor is extremely scarce, so that every manufacturer, big or little, must be on guard to accelerate the progress of all jobs in his plant. This driving spirit which now pervades the manufacturing industry to a greater extent than ever before has brought forth opinions and helpful suggestions pointing toward the betterment of the existing relations of railways and producers of railway supplies.

Many manufacturers stress their organizations and ingenuity to the limit in their endeavor to speed up production only to have their successful efforts nullified by slow freight delivery. In like manner, by strenuous manufacturing efforts, deliveries are made, and then it is learned that the road has not received the complementary materials. Thus one manufacturer's efforts have been for naught because another's delivery was slow or, more likely, because of a lack of systematic ordering by the purchaser.

This has happened so frequently of late that the sales forces of the supply side of the industry are preaching to their customers "forehandedness in buying" at a risk of engendering enmity or at least of straining the harmonious relationships of earlier years—years when any order of any size was welcome, no matter "if it had to be delivered yesterday."

The situation to-day, with the innumerable delays in delivery due to lack of raw materials, car shortage, etc., will no doubt result in an improvement in future buying methods, and benefits will accrue to both buyers and sellers.

One well-informed salesman, in making comparisons with the buying methods in the electric railway and in other industries, characterized the situation as follows: "The average electric railway makes its purchases in a hand-to-mouth way, but as soon as it places an order it puts pressure on the manufacturer in an endeavor to get quick delivery. The electric roads as a class don't look far enough ahead for their construction and maintenance materials. They don't show the forehandedness that is evident in the steam railroad or electric power industries. If the electric railways paid more attention to purchasing their supplies ahead of the time of actual use, that is, sent out specifications, a reasonable period in advance of the purchase dates, they could get better prices and the manufacturer could give better quality and quicker deliveries."

This article was written in a spirit of helpfulness. The same motive actuated the author of the foregoing statement, and if by discussion of this subject of forehandedness in buying, both buyer and seller are helped, this article will indeed have been of service.

It might be well to consider in detail some of the conditions confronting the average buyer. He must first learn what he needs to buy. This information comes from various associates in the other departments of his property. The authority for the expenditure must be given, and the degree of need for the article will establish the requirements for the time of delivery. Unless his associates are well organized the purchasing agent of an electric railway has considerable official work to do in his own organization before he can afford to call in bidders on the material needed. Thus it is seen that the matter of forehandedness in buying is not alone a question for the purchasing department but for the entire engineering and operating staff.

Lack of definiteness in specifications, demands for quick delivery and haste in placing orders, all combine to involve a purchase. If a road waits until the last minute before calling in the manufacturers it often happens that sufficient time is not available in which the salesman can go to the actual bottom of the proposition and make really close estimates on cost, profit and delivery. Thus the road may not

have the advantage of final figures from the maximum number of bidders, nor, in the haste for delivery, can the long-time-service basis be used in deciding which material should be purchased. Materials of lowest first cost and of least long-time efficiency usually can be delivered quickest. And so, by delay in buying, a road is sometimes forced to make purchases that otherwise would not be considered. This means increased ultimate cost.

There are instances in which emergencies demand quick delivery. Manufacturers exert every resource to meet these cases. But such orders could much more readily be filled by the manufacturers as a group if a policy of earlier attention to future needs was regularly followed by the railways.

Take, for example, heating and ventilating equipment for cars. Most orders for such material for maintenance and reconstruction uses are being placed now, although they should have been under active consideration in June or July. "Load factor" and "rush hour" problems are just as important to the manufacturer as they are to the railway operator. It has been noticed year after year that the first cold snap of fall brings forth inquiries for heaters and ventilators that might just as well have been discussed by buyer and seller months before when the manufacturer's plant was working part time. On the contrary, a rush comes to his plant in the fall and early winter, and he must run double time. This means a higher average cost for the year's output and a lessening of the rigidity of inspection, for both of which the manufacturer could properly charge the customer. Also it means difficulties in making deliveries. This argument applies to any other seasonable supply just as much as it does to heating and ventilating equipment.

Another point to be considered here is this: Why do some roads order cars for delivery in the spring and summer and yet not specify the heater equipment until fall? Why not order such material earlier and specify future delivery, thus giving the manufacturers' plants a more even load factor and enabling them to produce a product of higher quality? Contract delivery dates could more easily be met, and the cost to the road would be the same. Such orders are paid for on or after delivery, so the only extra cost to the road would be the small effort necessary to advance the date of ordering.

These thoughts are based on the experiences of several years, not on those of the present year when deliveries of raw materials to the manufacturer and finished supplies to the railways have been most uncertain. Reserve stocks were available in 1915 with which to fill the comparatively small orders placed that year, but in 1916 conditions have changed. No warehouse stocks are now available, and the roads have ordered fully twice as great a volume of supplies, so that now no one may safely guarantee prompt deliveries.

It is thought that the present situation with regard to deliveries will have its educational effect, an effect which it is to be hoped will assure greater forehandedness in the buying of electric railway supplies.

INCREASE IN THE PRODUCTION OF LUMBER FOR THE CURRENT YEAR

For the first eight months of 1916 as compared with the same period in 1915, there was an increase of 13.5 per cent more lumber produced and 10.5 per cent more lumber shipped, according to an official statement by the secretary of the National Lumber Manufacturers' Association, Chicago, Ill. This statement was based on reports from more than 500 firms. The total production in 1916 will be approximately 42,000,000,000 ft.

ROLLING STOCK

Cleveland (Ohio) Railway is reported to be in the market for 250 cars.

Detroit United Railways, Detroit, Mich., is contemplating the purchase of 100 cars for city service.

Lake Shore Electric Railway, Cleveland, Ohio, is said to be in the market for fifteen 60-ft. cars.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., is said to be in the market for three interurban cars.

Long Island Railroad, New York, N. Y., noted in the ELEC-

TRIC RAILWAY JOURNAL of Sept. 9 as being in the market for forty-five trail cars and fifteen coaches, has ordered this equipment from the Pressed Steel Car Company.

New Jersey Motor Transportation Company, Newark, N. J., has ordered thirty auto-buses from the George C. Marx Company, Brooklyn, N. Y., to be used in and around Newark, N. J. The buses will have a capacity of thirty passengers each.

Michigan United Railways, Jackson, Mich., is reported as considering the purchase of forty trail cars and is receiving this month from the St. Louis Car Company twenty new cars which will be distributed among the local railway properties at Lansing, Kalamazoo and Battle Creek.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., has purchased a snow plow from the Wason Manufacturing Company to be used on interurban service. This is an eight-wheel snow plow with a 30-ft. body, and is somewhat unusual on account of having side wings 5 ft. high extending from the heel of the plow back to the center of the journal box. It will be operated by GE-201 box-type motors, K-35-G controllers, and GE air-brake equipment. Delivery is to be made by Dec. 15, 1916.

TRADE NOTES

L. S. Brach Supply Company, Newark, N. J., has discontinued its branch office, 142 Liberty Street, New York, N. Y., and hereafter all offices will be consolidated at the factory, 127-129 Sussex Avenue, Newark, N. J.

The Elleon Company, New York, N. Y., has received an order to equip twelve cars being built by the Osgood-Bradley Car Company for the Union Street Railway of New Bedford, Mass., with the Elleon white porcelain enameled stanchions.

Holden & White, Chicago, Ill., through their Eastern agents, the U. S. Metal & Manufacturing Company, have received an order from the Public Service Railway, Newark, N. J., for 400 Garland ventilators. They have also received an order from the Elmira Water, Light & Railroad Company for four Johnson type "B" fare boxes.

Goldschmidt Thermit Company, New York, N. Y., has nearly completed its first contract with the Public Service Railway of New Jersey which is for 200 welded rail joints made by the thermit insert process. The joints are being installed on Maple Avenue, Merchantville, N. J. The tracks on this street are being relaid, using Pennsylvania Steel Company 80-lb. rails, section 238. On completion of the welding one of the equipments comprising a rail grinder, a squeezing machine and a set of crucibles, preheaters and molds is to be kept in the Camden district and a similar equipment will be kept in the Newark district.

Lord Manufacturing Company, New York, N. Y., reports the receipt of the following orders: six Lord screenless air cleaners from the Boston & Worcester Street Railway, Boston, Mass.; six Q.-P. trolley catchers from the Worcester Consolidated Street Railway, Worcester, Mass.; ten Q.-P. trolley catchers from the Monongahela Valley Traction Company, Claremont, W. Va.; fifty Q.-P. trolley catchers from the International Railways, Buffalo, N. Y.; 152 Giant brakes from the Public Service Railway, Newark, N. J., and Giant brakes from the American Car Company for use on the new cars of the Pekin (Ill.) Traction Company.

ADVERTISING LITERATURE

Ohio Brass Company, Mansfield, Ohio, has issued a pamphlet on the Crouse-Hinds Imperial incandescent headlights for interurban service.

The Eureka Company, North East, Pa., has issued a catalog on trolley wheels. Among the latest developments in trolley wheels illustrated are the bushingless wheels and an improved type of sleet cutting wheel.

Chicago Pneumatic Tool Company, Chicago, Ill., has just issued bulletin E-44 superseding bulletin E-31 on Duntley electric portable tools, which include sensitive drilling stands and heavy duty side spindle drills.

Whiting Foundry Equipment Company, Harvey, Ill., has issued catalog 110 describing and illustrating their electric traveling cranes, Gantry traveling cranes, electric mono-rail trolleys, and jib cranes. A large number of illustrations show the various appliances of this company installed on electric railways, industrial and central station plants.