

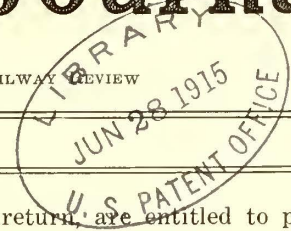
Electric Railway Journal

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

Vol. XLV

NEW YORK, SATURDAY JUNE 26, 1915

No. 26



MORE TIME FOR STUDY OF SAFETY CODE The United States Bureau of Standards has very wisely postponed the conference on the proposed National Electrical Safety Code, which had been scheduled for July 1 and 2, to Oct. 27. This gives practically four months of extra time for study, very much more than the original time available. It was a practical impossibility for railway men interested in this matter even to read, much less to digest the recommendations of the proposed code which are contained in two circulars aggregating 187 pages of standard Bureau of Standards form. While the heat of summer is not conducive to study, railway men are accustomed to working under conditions not always delightful. They will no doubt plan to include these circulars in their programs of summer reading. They might well be made the basis of conferences. It is safe to say that never has a proposed set of rules been inaugurated with more care than that being exercised in the present instance. If rules objectionable to the electric railways get by the October conference, especially after this extra study period has been allowed, the railways will be to blame.

ARBITRATION IN CHICAGO After the conclusion of the negotiations in Chicago which lead up to arbitration, the Surface Lines published a statement in the daily papers under the heading, "Arbitration Has Won." This statement appears in abstract elsewhere in this issue. It defines the issue at point as the acceptance of arbitration, and the companies, the men, the citizens of Chicago and the mayor of that city should all be congratulated upon the adoption of this policy. Industrial conflicts may not be so serious as those between nations, but in principle there is little which distinguishes them because both are based upon the idea of breaking or wearing the other side down. Surely the time has gone by when people really believe that the best way of convincing a man that his opinions were wrong is by knocking him on the head, especially when one has to do business with him later. Violence never proved anything in regard to the real merits of the affair at issue. The statement mentioned above, issued by the Chicago Surface Lines, is particularly happy in bringing out not only the real point at difference in the dispute but also the present viewpoint of corporation managers as regards the proper functions of utility companies. They are no longer considered by their owners as purely private corporations but as public agencies with definite duties to perform. The companies can properly be held by the public strictly accountable for the performance of

these duties and, in return, are entitled to protection by the public against excessive demands of labor and strikes. This protection was given in the Chicago case, both by a pronounced public sentiment and by the action of Mayor Thompson in insisting upon real arbitration.

THE COLOR LINE AND THE JITNEY Many people seem to think that the only thing which the jitney owner has to worry about is how he is going to get enough money to pay for all his repairs and to buy a new machine when the one which he is using at present wears out. But this is not all. One of the questions which the jitney owner has yet to solve is the color question, and it may prove an embarrassing one. So long as the jitney remained an unregulated private vehicle operating at the will of the driver, he could take such passengers as he chose, and he could refuse to carry others. Just as soon, however, as he began to operate on regular routes and charged a definite fare, he became a common carrier, and as such is obliged to carry anyone who presents himself or herself. The question has already come up in several Southern cities and is likely to arise in quite a number of others. Will it mean that certain seats in every jitney will be reserved for colored people? Or will separate cars have to be run? If the latter, what redress would colored citizens have if the service of jim-crow jitneys on any particular route is inadequate? There is still a good deal to be learned about the jitney before it can be considered an established transportation agent.

THE SCIENTIFIC SPIRIT IN THE SHOP One does not have to look very far to see that the spirit of investigation is at work in the electric railway shop as well as in the college laboratory. The same principle underlies the careful analysis of the mileage obtained from different kinds of gears and pinions and the counting of the numbers of millions of bacteria in a cubic centimeter of liquid. The purpose in each case is to obtain some knowledge which will improve conditions in shop maintenance and hygiene or medical practice respectively. Rule-of-thumb methods in all lines of activity enjoy a waning popularity, and analytical methods are supplanting them. Devices for testing one quantity or another are seen more and more in the shop, on the car or in the power house. This is illustrated in the statements made by W. L. Allen in his paper delivered before the Central Electric Railway Association and abstracted elsewhere in this issue. Mr. Allen endeavors to outline the ways in which purchasers

of gearing can determine what they are getting. As gears and pinions and other supplies come to be purchased more and more to specifications such tests will be increasingly necessary. While it is impracticable for most companies to own all of the machines described by Mr. Allen and the corresponding testing equipment needed in other lines, yet some of these devices can be owned, while neighboring or even distant laboratories can be depended upon for tests beyond the capacity of local equipment. The manufacturers, of course, have well-equipped laboratories, and much more extensive use could be made of college laboratories by the railroads than is the present practice. If the desire for test data on materials and structures exists the information can be secured in one way or another.

THE BAY STATE ARBITRATION DECISION

The decision of the arbitration board in the Bay State Street Railway wages case, abstracted in another column, is of interest from several angles. Like many other findings in industrial disputes, it sets a compromise between the contentions of the two parties, giving the men a smaller increase in pay than was demanded by them and yet awarding new rates imposing a serious additional burden upon the company itself. This burden cannot be met by present revenue, according to officials of the company who know, as few outsiders do, the struggle to make ends meet which has been going on within the system during the past decade, and if a good and adequate service is to be rendered and if the investor is to receive anything like a fair return upon his capital, just one course remains. Application must be made to the Public Service Commission of Massachusetts for authority to increase the price of transportation. Commenting for the press upon the finding, President Sullivan states that the company has postponed as long as possible an increase in rates, but that it will now get ready to act in this direction. With the Middlesex & Boston decision as a precedent, the outcome ought to be favorable to the road. This phase of the problem can be left for future comment, with the single remark that what, according to the last census report, was the world's largest electric railway system in point of mileage stands in front of an economic problem whose solution is sure to be as enlightening in method and as interesting in detail as have been the proceedings in the arbitration just closed.

The decision itself contains a revolutionary fiat in establishing a minimum wage for miscellaneous employees, such as shopmen, power plant workers, line and track maintainers, etc., after one year's service. More than half of the labor outside the blue uniformed men will be affected by the \$2.25 minimum named. How such a sweeping basic compensation rate will work out remains to be seen, but there is clearly a pretty small margin of profit in modern street railroading on which to build a structure resembling even the remotest degree the economic mansion of the famous automobile manufacturer whose products are the jitney and its uncommercialized relations, who toil not even if they spin.

The practice of dealing with a score or two of trades with all their individual complications on anything less than an extended consideration must of necessity lead to results more or less experimental.

The blue uniformed men receive by the award less than their maximum demands by 5 cents per hour, but the graduated scale was shortened from eight to six years and the former maximum increased from 28 to 30 cents. A considerable part of the increase granted these employees conforms closely to the rates offered them in conference prior to the arbitration. The latter has been costly, but if the estimated addition of \$300,000 in two years to the company's expenses is correct as a result of the decision, it would seem that the men came off fairly well and ought to accept the finding with good grace. The chairman and deciding member held to the opinion that the company should pay a standard of wages not defined by the financial condition of the road nor apparently influenced by its ability to fill the ranks of its employees at the existing scale. Whether one concedes this or not, the company's agreement to the arbitration means that it will stand by the finding. The suggestions of the board with respect to the standardization of classifications among miscellaneous employees open up another field for study, but the great interest in the decision lies in its relation to the future policy of the company with respect to the charges to be made for its service.

PRECAUTIONS FOR THE FOURTH

Fortunately there has been marked progress in all cities during the last ten years toward the establishment of a "sane fourth." It was not many years ago that railway companies had to make many special provisions for the day in the way of fire and accident precautions. Not only was the hose unreeled in carhouses and provisions made to direct streams of water promptly on the roof or elsewhere where a fire might start, but motormen had to be particularly careful not to run over children who were setting off crackers in the street and oblivious of everything else.

There are still cities where the day is celebrated in the old way and there these precautions will still be maintained. Even where individual displays of fire works have given place to displays by the municipality or by clubs, the danger is still present, although it may be less, and care about guarding against fire is desirable. It would be a good plan on all properties during the coming week to have an inspection to see whether the fire pails are filled, the hose in condition, the extinguishers and other apparatus ready for putting out an incipient fire promptly.

Preparations should also be made to handle the extra traffic which is always an accompaniment of our principal summer holiday. In the spread of the "sane fourth" idea, the railways as well as the public have been gainers. Nevertheless, we feel confident that most managers will breathe a sigh of relief when the fourth has passed without material casualties for which the company is responsible.

CONTINUOUS VS. NOMINAL RATING OF RAILWAY SUBSTATION MACHINERY

In last week's issue of the *ELECTRIC RAILWAY JOURNAL* the situation regarding the rating of substation machinery was briefly outlined. As the subject is coming up next week at the A. I. E. E. convention at Deer Park, Md., some further facts may be of interest.

Some of the arguments which are advanced against the continuous rating for substation machines are as follows: 1. Machines will be rated higher than hitherto and prices will be raised to correspond with the rating. 2. The continuous rating corresponds with neither the average nor the peak load of the substation, whereas the nominal rating corresponds roughly with the average load, and the overload capacity with the peak load, thereby enabling the railway engineer to determine by rule-of-thumb the size of machine required to perform a given duty-cycle. 3. Owing to the fluctuating character of the load on most railway substations, it is safer to obtain a machine which is too large for the service, than to run the risk of obtaining one which is too small. The manufacturer should therefore be given an opportunity to supply a machine of generous design, and in order to make competitive bidding fair, the requisite margin should be standardized and incorporated in the rating. 4. Substation operators have become accustomed to the nominal rating which resembles the old A. I. E. E. rating and a change is likely to lead to misuse of machines.

The first of these arguments is based upon three assumptions: (*a*) that machines are habitually given the maximum rating which their performance warrants; (*b*) that the new system of rating permits higher temperatures than the old, and (*c*) that manufacturers base their prices upon nameplate markings rather than upon production costs. On the other hand the following can be said: Regarding (*a*), it is probable that no synchronous converter ever sold attained the three temperature limits set by the old standardization rules. Regarding (*b*), the maximum observable temperature rise for continuous operation at rated load is the same in the old and new systems of rating for the type of insulation used in railway substation machinery. The temperature rises allowed for overloads under the old rules were recognized by the manufacturers as excessive and were seldom attained.

The second argument is based upon the further assumption that the capacity of a machine for continuous and short-period loads is completely specified by its nominal rating. The fact is, however, that the capacity of a machine cannot be fully stated by one rating, as it requires for its complete specification the enumeration of two independent physical quantities, the thermal absorption and the thermal dissipation. Any attempt to combine these quantities is absolutely futile for, while the specification of both of them separately calls for a machine of definite thermal characteristics, the specification of any rating which combines them may correspond to an infinite number of different kinds of ma-

chines. A given fluctuating load can obviously be most economically carried by a machine of certain definite characteristics. Hence the nominal rating of a machine cannot indicate its suitability for carrying a given fluctuating load. The only practical way to ascertain what machine is best suited for a given duty-cycle is to give a full statement of the duty-cycle to the manufacturers, making all necessary allowances for contingencies. The manufacturers will apply their knowledge of the thermal characteristics of their machines to the solution of the problem. This substitutes scientific engineering for rule-of-thumb processes, which, although easy to apply, are likely to lead the user into trouble. Thus the under-rating of machines, as by the use of a nominal rating, results in substation operators being given a false impression of the capabilities of their machines, tending to underloading, with resultant necessity for excessive substation equipment. Furthermore comparative bids obtained on machines to meet a given duty-cycle are much more fair than those based upon a given rating because, as stated above, equal ratings do not necessarily mean equal machines, whereas equal ability to meet a given duty-cycle reaches the real essence of the problem.

The third argument is a plea for the institute to provide a margin to allow for deficiencies in engineering estimates. It is hard to see why each engineer should not make his own contingency allowance in stating the load conditions upon which bids are to be based. Indeed, the futility of trying to do otherwise has been proved in the answer to the second argument already given.

The fourth argument neglects to take into account the fact that many railways are operated from d. c. power stations, the generators in which are rated in accordance with the A. I. E. E. continuous rating. Hence the retention of the nominal rating for substation machinery will result in operators having to change their perspective when they go from a d. c. power station to a substation or vice versa. Furthermore this argument does not apply to railway substations with any greater force than to lighting substations, and no difficulty has been anticipated or experienced by the lighting men, due to the change in rating. It should also be remembered that whatever inconvenience may attend the change from nominal to continuous rating will be of a temporary character, while the retention of the nominal rating will lead to permanent inconvenience, due to the difference which would always exist between the rating of substation and power-station machines.

It is understood that the standards committee of the institute will recommend the continuous rating, allowing the nominal rating to be used, however, where it is not convenient to use the former. This will give an option and the resulting custom will determine whether or not the nominal rating can be dropped later. This action is conservative, and if purchasers will buy on the standard basis the nominal rating will disappear from lack of use.

Chicago Elevated Medical Methods

An Account of the Methods of Examining the Sight, Hearing, Color Sense and Mentality of Applicants on the Chicago Elevated Railroads

BY DR. H. E. FISHER, SURGEON ELEVATED RAILROADS OF CHICAGO, ILL.

About two years ago the Elevated Railroads of Chicago employed a surgeon to take charge of its medical department and required all employees except those in the general offices and at stations, to pass a medical examination. The surgeon's office was located centrally and was completely equipped with modern devices for making examinations, as well as for ministering to injuries and physical ailments of employees. Recent editorial comments in the ELECTRIC RAILWAY JOURNAL on this department's work have produced numerous inquiries. While some of these have been answered by letter, it has been considered advisable to publish an account of the work done by departments.

The applicant for employment, after being accepted by the transportation department, is sent to the surgeon's office, where he presents his original application and an order for his medical examination. This order

disease. If the medical examiner is satisfied with the applicant's previous medical history, he begins a practical examination of the special senses, namely, sight, hearing, color perception and mentality.

SIGHT

In testing the sight the standard Snellen's test letters are used. One line of letters is displayed at a time in order not to confuse the applicant, as is frequently the case when charts have more than one line. These charts, illustrations of which are shown, are placed in a test-card rack with a black background, the letters being illuminated from both sides by incandescent lamps. The applicant is seated 20 ft. away from the rack, which is placed on a level with his eyes. A trial frame is then

SURGEON'S EXAMINATION OF APPLICANT

No. of Application _____ 191 _____

Dr. _____

Please examine _____ who has applied for a position as _____ and return report by mail.

Supt. of Transportation.

Is applicant's eyesight good? _____

Color of eyes _____ Hair _____

Can he distinguish ordinary railroad colors? **RED, WHITE, GREEN?** _____

Has applicant any defect of hearing? _____

Any defect of heart? _____

Any chronic or constitutional disease? _____

Any physical defect or deformity? _____

Applicant states that he was injured on or about _____

Has this injury disabled him permanently? _____

Has he marks of any injury not reported by him as above? _____

Has applicant been ruptured? _____

Is applicant fully able to fill the position of _____

Answer _____

Signed _____ Examining Surgeon.

191 _____

CHICAGO ELEVATED MEDICAL EXAMINATIONS—SURGEON'S EXAMINATION RECORD BLANK

is reproduced in the first form shown. The upper portion of this form is filled in by the superintendent of transportation and the lower portion is for the record of the examining surgeon. Upon receipt of this order the applicant is required to fill out a second form, also shown. This form is self-explanatory, and its main object is to secure a record of the applicant's past medical history over his signature, which may be used for future reference in case of injury. It is always desirable to know whether the previous medical condition had any bearing on the results of an injury received at a later date. At the time of examination this medical history is also used to determine whether the applicant is a safe risk for handling the work he is seeking, or whether he has any incurable or serious constitutional

STATEMENT MADE TO MEDICAL EXAMINER BY APPLICANT

File No. _____

- What is your Full Name? _____ 2. When were you Born? _____
- Have you ever been Examined by this Company before? _____
- Where? _____ When? _____ For what Position? _____
- How long have you been in the service continuously? _____
- Are you Married or Single? _____ 7. What is the name of your Wife or Husband? _____
- What are the names of your Children if married give married names and addresses? _____
- Sons _____
- Daughters _____
- What are the names of your Parents, Brothers, Sisters now Living? _____
- Father: _____ Mother: _____
- Brothers: _____
- Sisters: _____
- If either Parent or any Brothers or Sisters have died, give cause of death in each case? _____
- Have either of your Parents or any Brothers or Sisters had Consumption, Rheumatism, Insanity, Cancer or Scrofula? _____
- Have you had any of the following:

| | | |
|---------------------------------|--------------------|--------------------------|
| Appendicitis? _____ | Conorrhoea? _____ | Spitting of Blood? _____ |
| Asthma? _____ | Hay Fever? _____ | Stricture? _____ |
| Bronchitis? _____ | Hemorrhoids? _____ | Sun Stroke? _____ |
| Chronic Dyspepsia? _____ | Pleurisy? _____ | Syphilis? _____ |
| Dizzy or Fainting Spells? _____ | Pneumonia? _____ | Urinary Troubles? _____ |
| Dysentery? _____ | Rheumatism? _____ | |
| Fits? _____ | Rupture? _____ | |
- What long or serious Sickness or Sicknesses have you ever had? _____
- Where? _____ When? _____
- When, where, how long and with what were you last Sick? _____
- What injury or injuries have you ever received? _____
- Where and when? _____
- When were you last unable to work on account of injury? _____
- Were you ever Operated upon if so, when, where and for what? _____
- To what extent do you use Intoxicating Liquors? _____
- Have you now or have you ever had any Disease, Tumor or Ulcers or any Physical Defect except as above stated? _____
- Do you carry Accident, Health or Life Insurance? If so, give Name of Company and Amount? _____
- What position are you making application for? _____

I certify that my answers to the foregoing questions are recorded above correctly and truthfully.

Date _____ 191 _____ Signature of Applicant _____

CHICAGO ELEVATED MEDICAL EXAMINATIONS—EMPLOYEES' MEDICAL HISTORY BLANK

placed on his face and one eye is covered with an opaque disk. After this has been done the room is darkened and the applicant requested to read the letters displayed. Normal 20/20 test letters are used first, and then the increased sizes are shown until one line is read correctly. A record is made of the line so read, and then the other eye is tested in the same manner. Finally, both eyes are uncovered and the applicant is asked to read the letters in order to obtain a record of the combined vision.

Requirements

The classification used is as follows:

Class 1. All those handling trains and train signals, that is, motormen, extra motormen, yard motormen,

towermen, switchtenders, interlocking men, switchmen and signalmen.

Class 2. Conductors, regular guards, extra guards and student guards.

Class 3. Station platform guards, crossing flagmen, crossing gatemen and all other employees.

The requirements are as follows:

Class 1. Vision—Normal (20/20 required in each eye without glasses).

Hearing—Normal (whisper at 20 ft., acoumeter or rewind of watch at 4 ft. for each ear).

Color perception—Normal (by Holmgren's worsted color skeins and Williams' test lantern).

Employees under Class 2 seeking promotion to Class 1 must have a combined vision of 20/20 provided vision in one eye is not less than 20/30 without glasses.

Physical defects—All physical defects tending to impair the efficiency of individual disqualify.

Re-examination—Re-examination of employees in this class must be made once every two years.

Vision—Only those whose vision does not fall below normal in one eye, and 20/40 in the other, may be allowed to hold their regular or preferred runs.

Hearing—Same as requirements for entrance to service.

Physical defects—Same as requirements for entrance to service.

Class 2. Vision—Normal (20/20 required in one eye and not less than 20/30 in the other).

Hearing—Normal (whisper at 20 ft. acoumeter or rewind of watch at 4 ft.).

Color perception—Normal (by worsted and lantern the same as for Class 1).

Physical defects—All physical defects tending to impair the efficiency of the individual disqualify.

Re-examination—Re-examination of employees in this class must be made once every two years.

Vision—Combined vision must be 20/30 and not less than 20/40 in one eye, with or without glasses.

Hearing—Same as for entrance to service.

Class 3. Vision—Combined 20/40, not less than 20/50 in one eye, without glasses.

Hearing—Normal in one ear and not less than 2 ft. in the other (rewind of watch).

Color perception—Normal (worsted and lantern).

Physical defects—All physical defects tending to impair the efficiency of the individual disqualify.

FILE No. _____

EXAMINATION OF SIGHT, COLOR SENSE AND HEARING

191 _____

Name _____

Employed as _____ Applicant for Position as _____ on the _____ Division _____

SIGHT

| | | | | | |
|---|-----------|----------|--|-----------|----------|
| ACUTENESS OF VISION, WITHOUT GLASSES | RIGHT EYE | LEFT EYE | READING TEST | RIGHT EYE | LEFT EYE |
| Distance in feet at which standard test type are read | | | Size of test type in pamphlet read correctly | | |
| Line of standard test type read correctly | | | Yes or No | | |
| Field of Vision (Good or Defective) | Right Eye | Left Eye | Written train orders read correctly | | |

COLOR SENSE

| TEST SHEET SUBMITTED | Number Given to Test Skin | NUMBERS OF SKEINS SELECTED AS SIMILAR | WILLIAMS' LANTERN | COLORS SUBMITTED | NAMES GIVEN TO COLORS | SIGNAL FLAHS USED | NAME GIVEN | Number of Similar Scales in Match Page |
|----------------------|---------------------------|---------------------------------------|-------------------|------------------|-----------------------|-------------------|------------|--|
| A—Green | | | Large Diaphragm | | | Green | | |
| B—Rose or Pink | | | Medium Diaphragm | | | Red | | |
| C—Red | | | Small Diaphragm | | | White | | |

Semaphore Submitted _____

Position of Arms as Applicant called them _____

SELECTION (Promot or Meeting): _____

HEARING

| | | |
|---|-----------|----------|
| Number Feet at which Acoumeter is heard | Right Ear | Left Ear |
| Ease with which Conversation is heard | Right Ear | Left Ear |
| Applicants Conversation Loud | | |

Explanation _____

REMARKS: _____

Approval _____ is or is Not Recommended. Signature _____ Medical Examiner _____

CHICAGO ELEVATED MEDICAL EXAMINATIONS—SPECIAL SENSE RECORD BLANK

Employees over fifty years of age, or employees who require glasses to bring their vision to standard, must be examined every year. Employees who have suffered severe injury or illness must be examined before they re-enter the service.

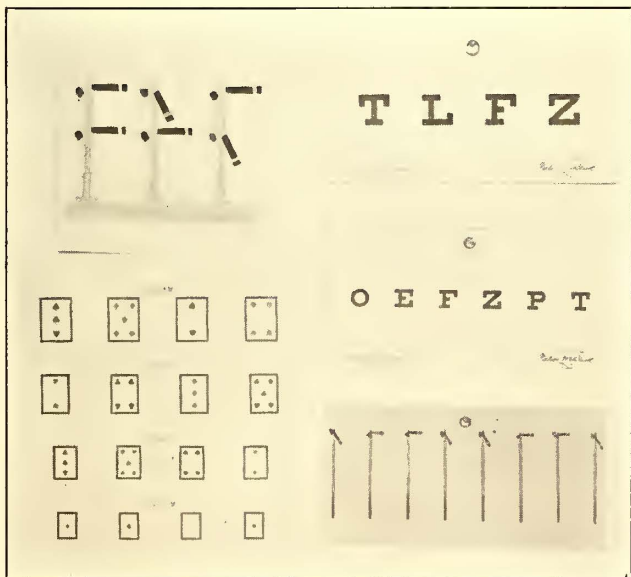
KNOWLEDGE OF ENGLISH

Frequently the examiner has to deal with a flagman or some other employee who is unable to read or write the English language or to speak it fluently, and it is necessary to provide a test to determine just what can be seen. For this purpose charts containing various sizes of playing cards corresponding to the various lines of Snellen's test letters are employed. Samples of these cards are shown in one of the accompanying illustrations. The applicant is required to indicate or call out the name of the card he can see, in order to prepare his record. Another test chart employed is one containing various sizes of figures which most applicants are able to read.

For transportation work, only those men who can read, write and speak English are employed. Men with these qualifications are of a higher grade intellectually, and they are more easily instructed and more readily understand orders. As witnesses in court they are also more valuable, and their testimony does not necessitate an interpreter, with the usual misunderstandings. Moreover, experience has shown that men who do not understand English are more liable to accident. Injuries that appear to be the result of carelessness will upon investigation often be found to be due to ignorance of English.

IMPAIRED VISION

Applicants whose sight requires glasses to bring it up to normal or standard are refused employment for train service. The reason for this rule is that the public does not feel as safe with trainmen who require glasses as they do with those who do not wear glasses. Moreover, such men must be examined more frequently, owing to the fact that glasses change the refraction of



CHICAGO ELEVATED MEDICAL EXAMINATIONS—VIEW OF TYPES OF CHARTS USED

their eyes. Again, a man obliged to wear glasses may break a lens or leave his glasses at home and while on duty without them may cause an accident either to himself or to the public. Glasses are also a menace to the wearer in times of accident, as they may be broken and the pieces injure the eyes.

Near vision is tested by the ease with which the applicant reads and fills out his medical-history blank. The printing on these blanks conforms to the letters on the Jaeger test card for near vision. Old employees in service, who are re-examined and found to have defective vision, are sent to an eye specialist to have the error of refraction corrected. If the defect is such that it cannot be corrected safely with glasses, the employee is assigned to other work where good vision is not so important.

All employees, including shopmen, yardmen, electrical and road department men, should have their sight examined at the time of entering the service so that in case of an accident a record of their condition is available. All employees whose eyes have been injured, or who have had eye trouble, should be examined for range of vision before being allowed to resume their former duties. Neglect of this sometimes results in claims being made on the ground of impaired vision as due to an accident occurring after the return of the employee, when, in fact, the defect already existed.

HEARING

Range of hearing is tested by the ordinary backwind of a watch. One ear is closed by placing a finger over it and the watch held near the ear to be tested. The distance between the watch and the ear is gradually increased until the applicant fails to hear the rewind. Various acoumeters have been tried and discarded owing to the change in the intensity of sound after prolonged use. The ease with which the applicant hears ordinary conversation both in a whispered and normal voice, without seeing the examiner's lips, is also sufficient to determine whether any defect is present. A record is made of each ear's range of hearing, and any degree of impairment is sufficient reason for refusing an applicant, even though he is otherwise perfect.

A man in the transportation service with defective hearing is a grave menace both to himself and to those associated with him. The tests in this respect are often slighted by examiners, and slightly deaf men are assigned to hazardous occupations. Even slight deafness often leads to an accident because the approach of trains is not heard. Carelessness in the examination of flagmen and gatemen for defective hearing probably causes more accidents than neglect of any other part of the examination.

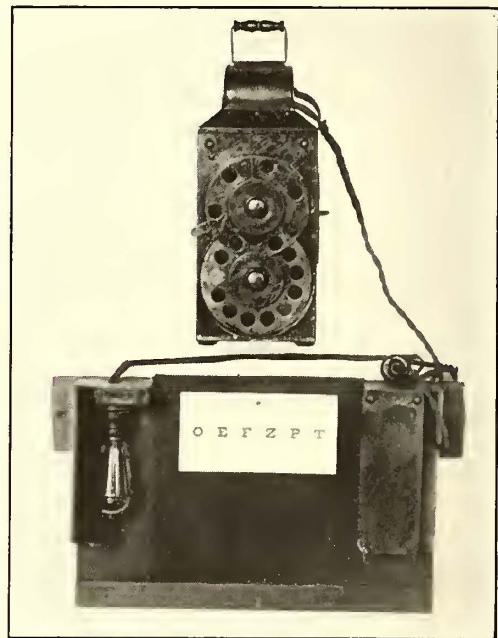
Perfect hearing is essential to trainmen so that they may understand quickly and accurately train orders and other instructions, and so that passengers need not shout their inquiries. The use of bell signals is another reason for perfect hearing. A man with defective hearing may confuse the number of bell signals and so cause an accident.

COLOR PERCEPTION

Color perception ranks a close second to sight in railroad work. Correct interpretation of colors is a safety-first rule for trainmen at night, because they must depend largely on signals for the safety of their trains. In testing the color sense, Holmgren's worsted color-test skeins are used. The applicant is required to pick out the regulation railroad colors, red and green, quickly and with precision. Calling the various names and shades of colors is often difficult for some people because they do not know the names and colors.

This condition is known as color ignorance. The railroad transportation business holds no place for a man who is color blind, color ignorant, or confused when he sees two colors at the same time.

The second color test is made with the Williams' railroad test lantern, which is shown in one of the accompanying illustrations. Every railroad company, regardless of its size, should use one of these lanterns in making examinations. As railroad signal colors, red and green, are those usually confused by color-blind persons, tests for color sense are particularly important. People may be color blind for green or for red, or for both. The lantern used by the elevated railroads is fitted with a revolving disk containing thirteen small lenses. These lenses are of various shades of red, green, blue, white and amber, and may be revolved before two apertures. On another revolving disk are small London glasses smoked to various degrees. When these smoked glasses are placed over the clear colors, they make the light appear like that of a dirty or smoky signal lamp. Two levers operating



CHICAGO ELEVATED MEDICAL EXAMINATIONS—WILLIAMS' LANTERN AND CHART RACK

small disks of frosted glass are used to make the light resemble that of signal lamps in a fog or a rain. An indication like that of a smoky signal lamp on a foggy night may also be obtained.

The Williams' lamp also has three sizes of diaphragms or openings—large, medium and small. When these are placed over the colors and the size of the apertures is changed, the appearance of a regulation switch lamp on a dark night at distance of $\frac{1}{2}$, 1 and 2 miles may be obtained. During the examination the lantern is placed in front of a dark background and all other light excluded. The applicant is seated 20 ft. from the lantern and each eye is tested separately. He is requested to call the colors quickly and correctly, and any confusion merits rejection.

Another test often used is to place two red signal lanterns, two green ones and a white one in a dark room and request the applicant to pick out the colors called by the examiner. Signal flags of various colors may also be employed in a similar test. Another simple method sometimes resorted to is to ask an applicant to name the various colors on the billboards within view of the office windows. To have more than one

method of testing for color blindness is essential to good practice.

MENTALITY

The degree of alertness and quickness of perception is tested by requiring an applicant to call out the positions of signal arms. Samples of these signal charts are shown in one of the illustrations. The small line of signals is used in testing motormen and gives them the appearance of a standard semaphore as seen in daylight one mile away and against a clear sky. The three larger two-arm signals, shown on another chart, are employed in testing quickness of perception. The chart is placed in the test rack, and the light is flashed for two seconds on one mast at a time. The applicant, after this two-second interval of observation, must describe the position of the two arms.

It is difficult to test for and grade degrees of mentality. The time during which an applicant is under observation is short, consequently when he is slow in comprehending directions or answering questions, he must be subjected to more rigid tests. Men who are inclined to be fresh, forward and talkative are rejected. Applicants who act peculiarly or are nervous or excitable are also examined carefully. Any applicant with an impediment of speech is rejected, as distinct enunciation, when the names of streets or stations are being called, is considered important.

PERSONAL APPEARANCE

Another point which should be considered in the examination of applicants is the personal appearance of the prospective employees. This applies particularly to the condition of the skin on the face and hands. No applicant with a contagious skin disease or disfigurement of the face should be appointed to a position where he comes into contact with the public. The carriage and poise of the applicant should also be noted. An upright, straight-backed man who avoids a slouching attitude is preferable to one who is not particular about his personal appearance.

Every transportation company should have a regularly appointed medical examiner who is a licensed physician. This work is too important to be left to some employee who gives a few insignificant tests. Complete equipment for conducting examinations is invaluable and soon pays for itself. It is always good practice to require a complete written report of every examination, as well as to employ only physicians who will give painstaking attention to their work.

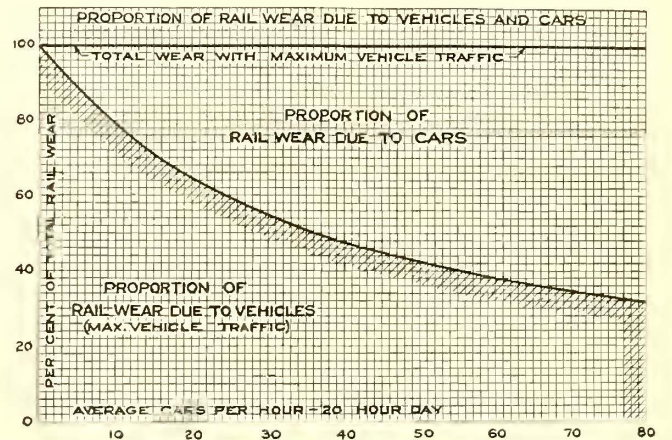
The standard of employees on the Elevated Railroads of Chicago is not exceeded anywhere in transportation circles. Strict requirements are not resented by any man. When an applicant finds that he must submit to a rigid examination which he passes successfully, he knows that he is in a superior class on account of his good physical condition. A fact that attests to the fine physical condition of the elevated railroad employees is that 70 per cent of them carry life insurance. Summed up, the essential qualifications of employees in transportation work are normal sight, normal hearing, perfect color perception, normal mentality and pleasing personal appearance.

In compliance with the request of the Austrian Minister of the Interior, the Vienna Tramway has had printed on the backs of all tramway tickets culinary advice as to how to cook economically in view of possible famine. The recipes are meant for the middle and poorer classes, who are unable to obtain flour, butter and eggs, and have to content themselves with dried fish, potatoes and rice.

Rail Wear in Chicago

Amounts Due to Vehicles and Cars—Notes on Paving, Ties and Electric Welding

Some interesting technical data on rail wear in Chicago are presented in the sixth annual report of the Board of Supervising Engineers Chicago Traction. The report says that it is the general impression that vehicle traffic causes but very slight wear on a railway track when it is properly built, but recent observation made on a section of unused track laid with a standard concrete base seems to contradict this conclusion. This section of track had never been used by cars since it was laid owing to the objections of abutting property owners, so that all of the wear upon it had come from vehicles. Careful measurements made with Vernier instruments after this track had been in the street for forty months showed that approximately 1/32 in. reduc-



RELATIVE PROPORTIONS OF RAIL WEAR DUE TO VEHICLES AND TO CARS ON STREETS OF MAXIMUM VEHICLE TRAFFIC IN CHICAGO

tion had occurred in the rail head, measured on the center line of the tread. This represents 5 per cent of the wearing life of the original section of the rail. As the tread was perceptibly coned, the maximum wear was greater than that shown by these measurements.

These results are corroborated by the fact that the lip of old girder rail had been worn down and bent over elsewhere in the city by team traffic, and in some cases the flangeway of standard 129-lb. rail has been considerably enlarged by the wear of wagon wheels, thus materially reducing the wearing width of the rail tread.

To determine the extent to which vehicle traffic is responsible for the wear of rails, a large number of observations were made at different points of the system. The results are thoroughly consistent and are shown in the accompanying diagram, in which the relative portions of wear from cars and vehicles are shown for varying average headway of cars along the street. This diagram shows that even on a line with a great deal of railway traffic, such as forty cars per hour for a twenty-four-hour day, vehicle wear may amount to as much as half of the total wear on the rail head, thus reducing the life of the rail by a corresponding amount. Other measurements, taken on short sections of track laid along the edge of Lincoln Park, where the rail was not subject to any vehicle wear but carried a large car traffic, showed a wear no greater than that on Cottage Grove Avenue and on Madison Street, with only half the car traffic but with heavy team traffic.

Elsewhere in the chapter on track the report says that study is being given to the development of an improved rail fastening so that the full advantages of

steel ties may be realized and also to the development of reinforced concrete ties with a suitable fastening. This is being done because of the rapid deterioration of wood ties, due to the seepage of moisture through the pavements, especially where frequent sprinkling of the track is practised.

As a result of rolling the subgrade and the use of a concrete foundation with tie plates, the settlement of the track structure has been reduced to an inconsiderable amount. However, the use of the usual sand cushion under granite block paving has proved unsatisfactory, particularly for pavement adjacent to the rails. Consequently, paving blocks, adjacent to the rails, are now

Brooklyn Safety Reports for Employees

Many Safety Suggestions Made by Employees—Table of Costs of Safety Installations

The third quarterly safety report of the mechanical department, Brooklyn Rapid Transit System, covering the quarter year ending March 31, 1915, shows a praiseworthy decrease compared with the preceding three months. The interest of the rank and file in the work is shown by the many safety suggestions which are made by them.

The first part of the report contains a plea for co-

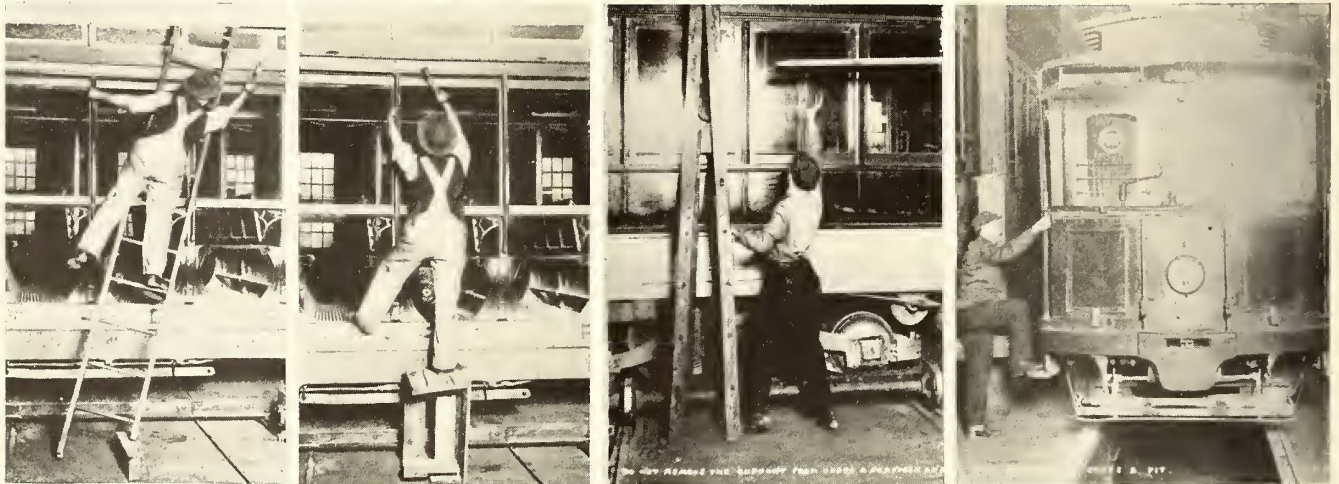


Fig. 1—Never use a broken ladder; it always slips—sometimes without giving you the chance to catch hold. Fig. 2—Never use a broken box or barrel to stand on; it is time well spent to get the proper horse or ladder. Fig. 3—Do not remove the support from under a scaffold and try to catch the plank; always climb up and carry it down. Fig. 4—The safe way to cross a pit.

CAUTION PICTURES USED IN THE SAFETY WORK OF THE MECHANICAL DEPARTMENT, BROOKLYN RAPID TRANSIT SYSTEM

being set in a cement mortar, applied either dry or wet. This simple expedient has practically done away with the settling of pavement along the rails.

The report also refers to the method of making track repairs by electric welding. Current is taken from the trolley wire through a resistance, and tool or alloy steel is deposited at defective points by means of the electric arc. Up to this time the attempt to repair defects in solid manganese special work has met with only indifferent success, presumably owing to lack of definite knowledge as to the metallurgical process involved. But on rails the plan has been successful. Cupped joints have been built up level, hammered special work has been resurfaced, flangeways have been built up so as to renew flange-bearing special work, broken intersections have been saved until the renewal is made of the whole layout, loose sections have been welded in place, and numerous other applications of extra metal have been made to lengthen the life of the track structure.

operative interest on the part of the employees, without which the efforts of the company in safeguarding the machinery and making other improvements will be of little value. There is a quotation also from the report of the National Safety Council in Chicago, stating that, as a result of an investigation made of 8000 accidents, the following were found to be the four principal causes: (a) Men falling from high places, (b) men dropping heavy parts, (c) things falling on men, (d) handling tools. Protective devices could have prevented very few of these accidents, the responsibility was entirely on the man on the job.

One feature of the quarterly reports of the company is to give a list of the safety suggestions received at the different regular meetings of the safety committee held every two weeks, and also the action taken. The following are some of the suggestions contained in the second quarterly report, and will give an idea of the kind of suggestions received:

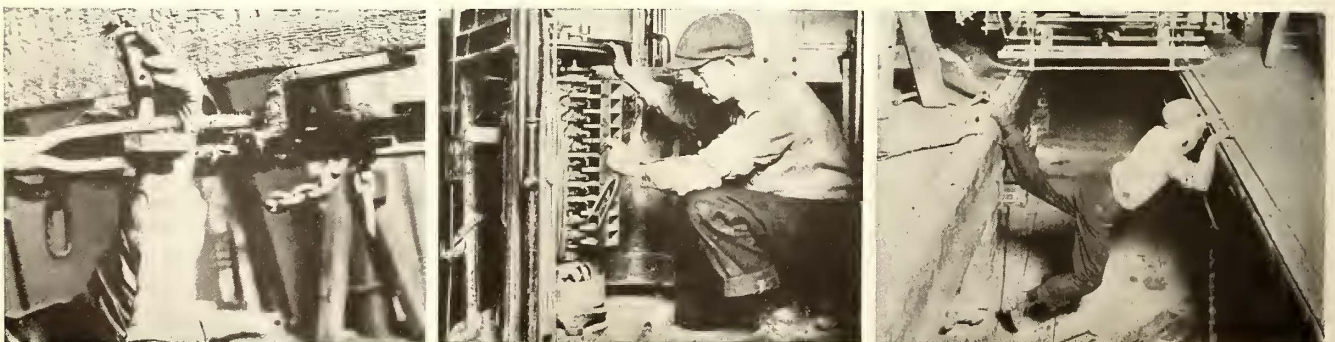


Fig. 5—Always use a drift pin in lining up the various members. Fig. 6—Is the pole off the wire? Fig. 7—Never attempt to jump across a pit.

CAUTION PICTURES USED IN THE SAFETY WORK OF THE MECHANICAL DEPARTMENT, BROOKLYN RAPID TRANSIT SYSTEM

SAFETY SUGGESTIONS RECEIVED

| Suggestions | Made by | Action Taken |
|--|---|------------------------------|
| Purchase special jacks for removal of air compressors. | Departmental safety committee. | Adopted |
| Paint red those equipment parts on snow sweepers that might under certain conditions be the cause of accidents. | P. S. Scott. | Adopted |
| Stop all cars operating on a track where other cars are jacked up a full car-length from the jacked-up cars. | W. S. Sutton. | Adopted |
| Install iron hooks or racks at all shops to hold spare trolley poles. | M. F. Hutt and departmental safety committee. | Adopted |
| Install troughs or similar protection under longitudinal belts over benches. | Bernhard Glinski, Fifty-second Street Shop. | Adopted |
| Cover open end of planers. | Departmental safety committee. | Adopted |
| Remove nails from top of kegs used by storeroom in shipping supplies. | E. Newmeyer, Crosstown surface car-house shop. | Referred to purchasing dept. |
| Fit chains used for lifting wheels and axles with rings on both ends; rings to be slipped over journals. | P. Rolleni, East New York surface car-house shop. | Adopted |
| Order "respirators" for men employed in blowing out motor controllers and similar work. | F. N. Smith, Canarsie Surface Carhouse Shop. | Under consideration |
| Use round cutting heads on jointers and planers. | Departmental safety committee. | Adopted |
| Place caution and danger signs at certain points around transfer tables and elevator doors leading onto tracks, etc. | Departmental safety committee. | Under consideration |

A list of safety work under way or completed, and its cost, also from the second quarterly report, follows:

| Description | Completed or Under Way | Cost |
|---|----------------------------------|--------------|
| Construction and installation of mail boxes for safety suggestions, and frames for pictorial matter at all shops. | Dec. 8, 1914. | \$85.96 |
| Installing safeguards around machinery at Fifty-second Street surface shop. | Under way. | 736.81 Est. |
| Purchase of four hydraulic jacks for use at DeKalb Avenue surface carhouse shop. | Under way. | 460.00 Est. |
| Safeguarding machinery at surface carhouse shops. | Under way. | 1074.73 Est. |
| Safeguarding machinery at Fresh Pond repair shop. | Under way. | 324.50 Est. |
| Purchase and place in use steel jack-up beams for supporting cars at surface carhouse shops. | Under way. | 502.18 Est. |
| Installing gates at elevator well at Fifty-second Street shop. | By way and structure department. | 127.00 Est. |

The following table shows the total number of accidents which have occurred in the shops of the company during the past three quarters:

| Class | Injuries | For three months ended— | | |
|--------------|---------------------------|-------------------------|--------------|---------------|
| | | Oct. 1, 1914 | Jan. 1, 1915 | April 1, 1915 |
| A | Cuts | 152 | 94 | 71 |
| B | Burns | 17 | 10 | 10 |
| C | Bruises | 85 | 44 | 37 |
| D | Bones broken | 1 | 3 | 1 |
| E | Sprains and strains | 14 | 12 | 5 |
| F | Electric shocks | 2 | 1 | 2 |
| G | Foot punctures | 6 | 1 | 4 |
| H | Nails torn off | 4 | 2 | 4 |
| J | Eye injured | 9 | 10 | 8 |
| K | Loss of member | 1 | 0 | 1 |
| L | Internal | 2 | 1 | 3 |
| Totals | | 293 | 178 | 146 |

These reports are put in the hands of every shop man on the system. Besides the text, each report contains a group of views. The views in the report for the quarter ended April 1 show different types of safety guards used on shop machinery. Those for the previous quarter were of common causes of accidents. The latter are reproduced herewith.

In the description of the test of the arc welded joint, described by E. C. Price of the Indianapolis Switch & Frog Company on page 1156 of the last issue of this paper, the pressure to which the joint was subjected should have read 300,000 lb. instead of 30,000 lb.

Jitneys at San Antonio

Jitney operation at San Antonio, Tex., began about the middle of January. Observations made by the San Antonio Traction Company on March 16 showed that there were then in service 154 jitneys, which carried 11,991 passengers on 7103 trips, or but 1.69 passengers per trip. The average revenue per car therefore was \$3.89. A second count, made on April 15, showed 182 cars in service, carrying 11,981 passengers on 7775 trips, or 1.54 passengers per trip. This reduced the average revenue per car to \$3.29. A later count, made on May 7, showed that the number of cars had increased to 201, but as the trips and passengers respectively had risen only to 8093 and 12,559, the average gross earnings per car decreased to \$3.14.

A peculiar characteristic of the jitney business at San Antonio is that the cars do not display route signs until they have picked up a passenger, who indicates his destination. Upon this they put up a sign in addition to the regular 5-cent symbol. The cars also do a great deal of sniping from taxicabs, and in the late afternoons they desert the business district to take the baseball fans home.

Although the jitneys generally operate over paved streets within a 2-mile zone they have failed to make a good living for their operators despite no allowances for depreciation and amortization. As in other cities, more than one-half of the jitney operators have dropped out after becoming acquainted with the harsh facts of tire renewal and general repairs. Nevertheless, the gaps in the jitney ranks have been quickly filled by others who, as the foregoing figures show, are earning less than their predecessors.

An ordinance to regulate jitney operation at San Antonio has been passed by the Council but is now under review by the Court of Criminal Appeals on application of the local Auto Service Association. This ordinance calls for operation over specific routes; a license fee of \$25; a bond which would call for a maximum payment of \$5,000 to one injured passenger and \$10,000 to all passengers injured on a given trip; definite stops in the central district; provision against riding on running boards or fenders, etc. The ordinance was passed on March 8 and was to have become effective on April 1.

An Envious Safety Record

Although it was making a perfect record in the matter of avoiding accidents, the St. Louis (Mo.) Electric Terminal Railway only recently had occasion to check up the results of its safety movement. The St. Louis Electric Terminal Railway operates a 7½-mile line between St. Louis and the Tri-Cities, namely, Venice, Madison and Granite City, Ill. Regular service includes 114 trips daily, during which an average of 9000 passengers are transported in the week days and 14,000 on Sundays. This line has now been in operation four and one-half years, and there has not been a single fatal accident in connection with the local surface or the through interurban cars of the Illinois Traction System, which also operates over this section of track. During the period approximately 238,000 car trips were made and 17,000,000 passengers carried. By making the safety-first movement a part of its every-day business in training employees and operating trains, the 100 per cent record of efficiency was obtained. In explanation of this record E. D. Bell, general superintendent, states that until he was requested by the head of the safety department for statistics regarding accidents, he was unaware of the unusual record of operation which has obtained since this line began regular service.

Coasting Records of Northern Texas Traction Company

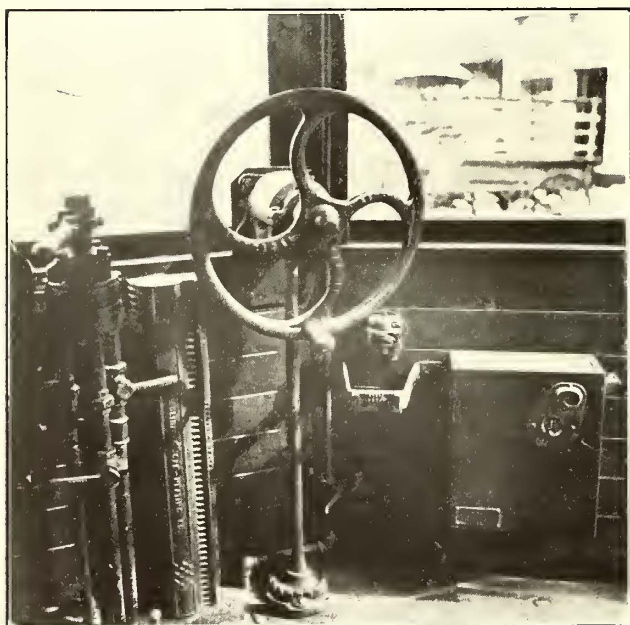
This Company Operates Coasting Recorders on Thirty Interurban and 153 City Cars—The Average Coasting on the Interurban Lines Is Now 38.2 Per Cent and 33.2 Per Cent on the City Lines—The Cost of Energy Has Been Decreased with the Increase in Coasting

About the middle of 1911 the Northern Texas Traction Company installed for trial twenty-three Rico coasting recorders which were placed partly on interurban cars operating between Fort Worth and Dallas and partly on city cars in Fort Worth. No special follow-up organization was formed at that time, but the men were advised of the purpose of the clocks and how to take readings. A representative of the Railway Improvement Company, however, spent some time among the men to show them how to coast efficiently. These pioneer efforts did not meet with the desired success, owing partly to defects in the recorders, since corrected, and partly to lack of understanding by the trainmen. Furthermore, the following up of the work was hindered by a lack of appreciation, even by the company officials, of the real possibilities of this device.

During the first six weeks following the introduction of the recorders, the Cleburne interurban line showed coasting amounting to 22.4 per cent, and the Hemphill city line, 29.6 per cent. This test showed that the ratio of increased coasting to decreased energy use was 1:1.06 on the city line and 1:1.2 on the interurban line. Since that time the coasting percentages have increased to 38.2 per cent and 34.2 per cent respectively, but the ratio of increased energy saving to increased coasting is somewhat less. During the same test period the reduction in brakeshoe costs was 38 per cent on the city line, but no record was kept of possible brakeshoe savings on the interurban line.

RESULTS OF LATER TESTS—COASTING DEPARTMENT

As a consequence of the satisfactory operation of the recorders on the two trial lines named, the railway installed, beginning March, 1915, 160 additional instruments, making a total of 183. To handle the records properly and to maintain a follow-up system the railway organized a "coasting department," the personnel of which calls only for a superintendent and one clerk. This permits the department to be operated for a total labor, maintenance and stationery expense equivalent to



NORTHERN TEXAS COASTING—RECORDER INSTALLED NEAR THE FLOOR IN DALLAS INTERURBAN CAR

In April, 1914, following a conference between representatives of the manufacturer and the railway, the old recorders were replaced by improved ones, which were not installed on the first interurban cars but were used in such manner as to equip completely the Hemphill city line and all the cars of the Cleburne interurban line of the Tarrant County Traction Company, an affiliated property. This gave the desired opportunity to make a thorough test and a comparison against previous conditions.

For six weeks preceding the use of the recorders, the individual lines were metered for energy-consumption records. During this time nothing was said to the motormen. Following that period, however, the men were instructed mutually by the manufacturer and the railway, both at general lectures and individually on the cars.

Northern Texas Traction Co. INTERURBAN DIVISION Coasting Recorder Envelope

Line *W. Dallas* Date *5/3/15*
Name *J. M. Moore* Run No. *27*

| CAR NO. | Leaving Time | Arriving Time | No. Stops | R. T. | C. T. | Per Cent. |
|---------|--------------|---------------|-----------|-------|-------|-----------|
| 15 | 520 | 542 | 1 | | | |
| | 557 | 725 | 2 | | | |
| | 800 | 921 | 3 | | | |
| | 957 | 1130 | 4 | | | |
| | 1209 | 127 | 5 | | | |
| | 157 | 305 | 6 | | | |
| | 400 | 507 | 7 | | | |
| | | | 8 | | | |
| | | | 9 | 546 | | |
| | | | 10 | 1881 | | |
| | | | 11 | | | |
| | | | 12 | | | |
| | | | 13 | | | |
| | | | 14 | | | |
| | | | 15 | | | |
| | | | 16 | | | |

Northern Texas Traction Co. Tarrant County Traction Co.

COASTING RECORDER ENVELOPE
Line *W. Dallas* Date *5/3/15*
Name *J. B. Daniel* Key No. *107*

| Car No. | Time On | Time Off | R. T. | C. T. | Per Cent |
|---------|---------|----------|-------|-------|----------|
| 124 | 540 | 730 | 550 | 248 | 47% |

GENERAL INSTRUCTIONS TO MOTORMAN

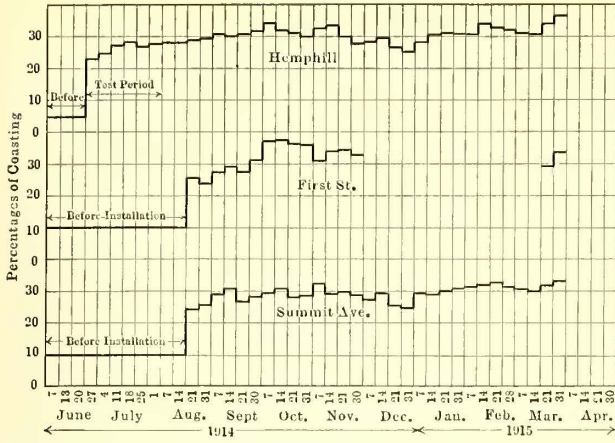
- Keylog Clock**
 1.—Key when taking car
 2.—Key at terminal per specific instructions.
 3.—Key when leaving car both at retail and at end of run.
- Tape**
 1.—Remove tape from clock each time leaving car.
 2.—Enclose in Coasting Envelope
- Envelope**
 1.—Fill out Envelope with necessary information, except columns on R. T.—C. T.—Per Cent. Do not seal envelope.
 2.—Deposit Envelope in Transfer Box in car at end of day's run.
- Trouble**
 1.—Report all troubles with Recorders AT ONCE.

NORTHERN TEXAS COASTING—ENVELOPES USED FOR MOTORMEN'S TAPE RECORDS

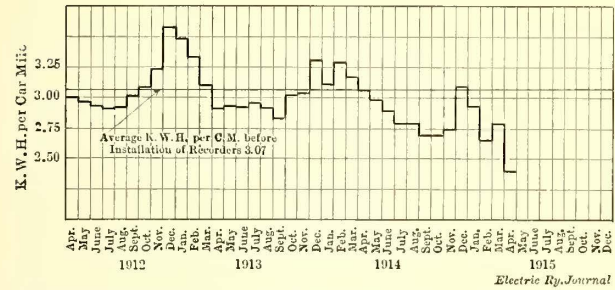
about 8 per cent of what the recorders now save. It is expected, that with increased experience the ratio will be decreased.

METHOD OF RECORD KEEPING

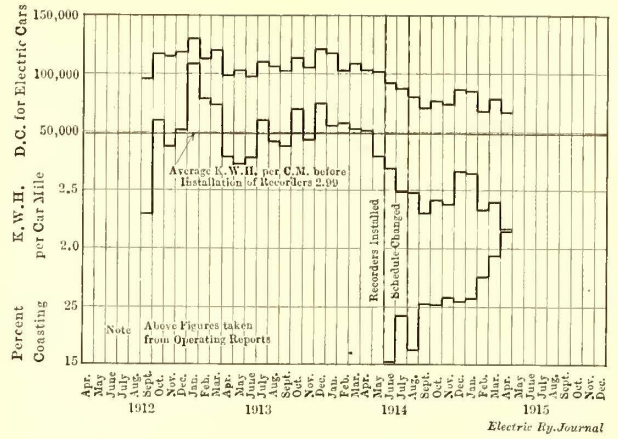
The record made by the recorder is of the Rico standard tape form. The tape is placed by the motorman in envelopes of the types reproduced, one form being used for city and the other for interurban service. The city envelopes are deposited in the conductor's transfer box, while the interurban envelopes are placed in a box at the dispatcher's office. The tape records, on reaching the coasting department, are figured for the proportion of coasting time to running time and entered for a full-



NORTHERN TEXAS COASTING—COASTING PERCENTAGES BY WEEKS



NORTHERN TEXAS COASTING—ENERGY CONSUMPTION DATA ON NORTHERN TEXAS LINES



NORTHERN TEXAS COASTING—ENERGY CONSUMPTION DATA ON TARRANT COUNTY LINES

local runs, express runs and miscellaneous runs made by extra men. In comparing the records in these subdivisions it should be noted that the limited runs which might be expected to have the highest coasting do not lead in this respect because the schedule speeds are so much greater (26.3 per cent) than on other runs. However, even with the high schedule speed of 42 m.p.h. on the strictly interurban section of 26.5 miles, coasting has been as high as 28.1 per cent over a one-week period. City men, it may be added, are subdivided according to regulars and extras. The comparisons of extra men are made regardless of the lines to which they may be assigned.

SPECIAL RECORDS

Several interesting records have been derived from the coasting figures as hereinafter described. In one of the accompanying line cuts is shown a set of graphs covering operations on several city lines, from which it appears that the coasting percentage on the Hemphill line was raised from 5 per cent before the installation of recorders to a maximum of 36.7 per cent after the recorders had been in use thirty-eight weeks, on the First Street line from 10 per cent to 37.7 per cent after eight weeks, and on Summit Avenue from 10 per cent to 33.2 per cent after twenty-nine weeks.

Another graph shows the d.c. kilowatt-hours per car-mile consumed for all services of the Northern Texas Traction Company from 1912 to April, 1915. The recorder operations during the first two years were not important enough to have any bearing on the energy consumption. This graph shows a reduction from 3 kw-hr. per car-mile in April, 1914, to 2.4 kw-hr. in April, 1915.

A similar record of the Tarrant County Traction Company's cars shows a reduction from 2.99 kw-hr. per car-mile to 2.15 kw-hr. The schedule change referred to in no way effected any alteration in schedule speed,

day basis on a form designed to take care of a man's performance for a full year. The original tapes are kept on file only one week or ten days, which is sufficient to give a doubting motorman a chance to check the published statements of the department.

Comparisons of the men are posted on weekly and monthly bulletins, each line being shown separately in order to avoid unjust comparisons. The absolute average of each line is also placed at the bottom of the list.

On some lines the men are subdivided according to regular, extra and express. Men of the first class make the best passenger car records owing to their greater familiarity with the conditions on the line, the maximum for a given week ranging from 43.7 per cent to 39.8 per cent. Still better records, a maximum of 45.1 per cent, have been obtained by the operators of the express-baggage cars because of fewer stops and other more favorable running conditions. The extras work only about 5 per cent of the time so that their lower records do not materially affect the general averages.

Still another kind of subdivision is in vogue on the Fort Worth-Dallas interurban line, where the men are divided according to limited runs, day local runs, night

| Run No. | Time | Running Time | | | | No. of Times to Key Clock | Graphic Schedule | | | | | | | | | | | | | | |
|-------------|--------------------|------------------------------------|---------|--------------|--------------------|---------------------------|------------------|----------------|--|--|--|--|--|------|--|--|--|--|--|--|--|
| | | Car On | Car Off | Car Wk. Days | Work Runs Wk. Days | | A.M. | | | | | | | P.M. | | | | | | | |
| Stock Yards | | | | | | | | | | | | | | | | | | | | | |
| 100 | 1 5:50 A. 11:04 A. | 290 | 304 | 674 | 674 | 674 | 8 | [Graphic bars] | | | | | | | | | | | | | |
| 101 | 2 8:00 A. 10:55 A. | 295 | 305 | 030 | 630 | 680 | 8 | [Graphic bars] | | | | | | | | | | | | | |
| 102 | 3 6:10 A. 11:51 A. | 314 | 344 | 044 | 644 | 644 | 9 | [Graphic bars] | | | | | | | | | | | | | |
| 103 | 4 6:25 A. 12:05 P. | 340 | 390 | 640 | 040 | 640 | 8 | [Graphic bars] | | | | | | | | | | | | | |
| | 6:20 A. 6:52 A. | Coasting shown under Hemphill Line | | | | | | [Graphic bars] | | | | | | | | | | | | | |
| | 4:40 P. 5:52 P. | " " " Evans Ave. Line | | | | | | [Graphic bars] | | | | | | | | | | | | | |
| | 6:15 A. 7:07 A. | " " " Samuels Ave. Line | | | | | | [Graphic bars] | | | | | | | | | | | | | |

NORTHERN TEXAS COASTING—GRAPHIC SCHEDULE FOR CHECKING RUNNING TIME

as it was purely an elimination of layovers which permitted three cars to do the work of four. It may be emphasized here that all schedule speeds with the recorders in use are exactly the same as they were before their installation.

On page 1199 is reproduced a chart showing a graphic schedule as prepared for individual lines. The purpose of this chart is to give a picture of each car's performance throughout the day so that the running time of the cars can readily be checked against the running times shown on the tape-holding envelopes turned in by the motormen. The record is made up as follows: The first column gives the motorman's work run number; the second column gives the car runs which make up the work run number, the number of the car run referring to the order in which the cars leave the car-house; the third and fourth columns show the on and off time with each car; the fifth column shows the running time, in minutes, of the different car runs; the sixth, seventh and eighth columns show the running time, in minutes of work runs for week days, Saturdays and Sundays; the ninth column shows the number of times the recorder should be keyed, this record serving

as a check on the correct number of recorder punchings; the remainder of the form is a straight line graph which shows the periods of time that the car is on work runs. A similar record is made for interurban service except that the graphic section is made to show the layovers at each terminal.

CHECKING BAD RECORDS

In case a car has been making appreciably less coasting than customary, the mechanical department is asked to make an examination of the equipment. One occasional source of trouble thus uncovered has been traced to poor brush contact on the traction motor which acts as a generator during the coasting period in order to operate the recorder. Therefore, if there is poor contact the recorder will not operate during the full coasting period. This defect, of course, is readily corrected. Tight brakes and low bearings have also been found to cause low registration. The fact that the recorder helps to reveal defective equipment is, of course, another point in its favor.

MAINTENANCE OF RECORDERS

The recorders are maintained in the mechanical department by the same man who handles register repairs. These instruments, however, have given very little trouble as will be seen from the tabulation of defects reproduced in the accompanying table. It may be worth noting that the thirty-seven cases in April of hand-brake contact-box trouble were due to unusually heavy rains. These rains caused the swelling of the fiber through which the plunger of the contact box passes, thereby causing the plunger to stick. This has been remedied by reaming out the hole in the fiber to make ample allowance for swelling in future. The principal cases of fuse blowing are due largely to emergency reversals, thus providing a check on the motormen in this respect as well. The troubles with paper stuck are due to careless tearing off of tape.

NORTHERN TEXAS TRACTION COMPANY AND TARRANT COUNTY TRACTION COMPANY—TABULATION OF TROUBLES WITH "RICO" COASTING TIME RECORDERS

| Name of Part Developing Trouble | For Month of | | | | | | | | | | | |
|--|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|----|
| | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | | |
| Clock Mechanism: | | | | | | | | | | | | |
| 1. Main spring | 1 | | | | | | | | | | | |
| 2. Release spring | | | | | | | | | | | | |
| 3. Balance wheel | | | 1 | | | 1 | | | | | | |
| 4. Escapement | | | | | | | | | | | | 3 |
| 5. Jewel bearings | | | | | | | | | | | | |
| 6. Hair spring | | | | | | 2 | | | 1 | | | |
| 7. Other wheels, gears, etc. | 2 | | | 1 | | | | | | | | 3 |
| 8. Armature | | | 1 | | | | | | | | | 3 |
| 9. Magnets | | | 1 | | | | | | | | | |
| 10. Terminals | | | | | | | | | | | | |
| 11. Dirty mechanism | | | | | | | | | | | | |
| 12. Miscellaneous | 1 | | | | | | | | | | | 1 |
| Total | 4 | 0 | 3 | 1 | 7 | 3 | 0 | 0 | 1 | 7 | | |
| Printing Mechanism and Case: | | | | | | | | | | | | |
| 1. Ribbon | 5 | | 1 | | | 1 | 3 | 1 | 1 | | | |
| 2. Impression hammer | | | | | | | | | | | | |
| 3. Tape chute | | | | | | | | | | | | |
| 4. Key mechanism | | | | | | | | | | | | |
| 5. Type wheel | | | | | | | | | | | | |
| 6. Other wheels, gears, etc. | | 4 | | | | | | | | | | |
| 7. Dirty mechanism | | | | | | | | | | | | |
| *8. Paper stuck | 7 | 10 | 7 | 9 | 2 | 5 | 2 | 3 | | | | 14 |
| 9. Lock | | | 1 | | | | | | | | | |
| 10. Case | 1 | | | | | | | | 1 | | | |
| 11. Miscellaneous | 1 | | | | | | | | | | | 1 |
| Total | 14 | 14 | 9 | 9 | 2 | 6 | 5 | 4 | 2 | 15 | | |
| Relay, Wiring and Contact Box: | | | | | | | | | | | | |
| 1. Armature | | | | | | | | | | | | |
| 2. Magnet | | | | | | | | | | | | 1 |
| 3. Air cylinder | | | | | | | | | | | | |
| 4. Air connections | | | | | | | | | | | | |
| 5. Piston | | | | | | | | | | | | |
| 6. Release spring | | | | | | | | | | | | |
| 7. Contact arm | 1 | | | | | | | | | | | 1 |
| 8. Contact plate | | | | 1 | | | | | | | | |
| 9. Blowout coil | | | | | | 1 | | | 1 | | | |
| 10. Terminal connections | | | | | | | | | | | | |
| 11. Resistance tubes | 1 | | | | | | | | | | | |
| †12. Fuse | 19 | 12 | 3 | 3 | 4 | 6 | 1 | 5 | 4 | 22 | | |
| 13. Controller connections | | | | | | | | | | | | |
| 14. Car wiring | | | | | | | | | | | | |
| 15. Miscellaneous | | | | | 1 | | | | | | | 1 |
| 16. Hand-brake contact box | | | | | | 1 | | | 4 | | | 37 |
| 17. Miscellaneous | | | | | 2 | | | 2 | | | | |
| Total | 21 | 12 | 3 | 4 | 7 | 8 | 1 | 7 | 9 | 62 | | |
| Grand totals | 39 | 26 | 15 | 14 | 16 | 17 | 6 | 11 | 12 | 84 | | |
| Average number troubles per car per month | 1.70 | 1.13 | 0.65 | 0.61 | 0.69 | 0.74 | 0.26 | 0.47 | 0.16 | 0.46 | | |

*Paper sticking due to motormen tearing off improperly.
†Fuse blown due to reversing car.

MAINTAINING INTEREST IN COASTING PERFORMANCE

Interest in the coasting recorders is maintained chiefly by posting the individual performance records at each car station. However, when a man has an unusually low record the inspector in charge of this man's division rides with him to determine and correct his operating methods. The superintendent of the coasting department also rides with such delinquents occasionally, to point out the advantages of good coasting from the standpoints of comfort and safety to the passenger and less energy consumption and decreased car maintenance for the company.

European Sand for New York Subway

Sand imported from Europe is being used in construction of the new subways in New York City. This is not because suitable sand cannot be obtained in this country, but because the war in Europe has cut down the cargoes which steamships ordinarily bring from the other side of the Atlantic to such an extent that it is necessary for many ships to come over in ballast, for which beach sand has been used. Upon arriving in New York this ballast is discharged to make room for the returning cargoes and is practically given away by the steamship company to anyone who will haul it away and dispose of it. Rodgers & Hagerty, Inc., who have the contract for the construction of Section No. 15 of the Lexington Avenue subway, extending from about 138th Street and Park Avenue through Mott Avenue and Franz Sigel Park and River Avenue to 157th Street, have used ten scowloads of this sand in back-filling what remains of the subway excavation.

C. E. R. A. Meeting

Details of the Non-technical Features of the Boat Trip and An Abstract of W. L. Allen's Paper on Railway Motor Gearing Are Given

An account of the trip of the Central Electric Railway Association from Cleveland to Buffalo on June 17 was published in the last issue of this paper.

Upon arrival at Buffalo the association and guests disembarked and were taken in four special cars furnished by the International Railway to Niagara Falls. After viewing the American falls special cars again took the party to the Canadian falls where, after a short time, the trip through the Niagara Gorge Route was begun. The cars stopped at all points of interest, and luncheon was served en route. At the Whirlpool Rapids a brief stop was made and the entire party assembled for a photograph. The special cars returned to Buffalo from this point, arriving at the boat landing about 5 o'clock. During Friday evening the association was entertained with music, by a full orchestra, and dancing. During the progress of the evening twenty prizes for the ladies were distributed by lottery. The method of giving these prizes was especially pleasing since, unlike the card games, all ladies had an equal chance to receive one.

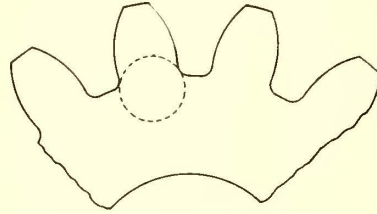
The trip was voted by all who participated in it a great success and as reflecting great credit on the enterprising and capable committee in charge.

RAILWAY MOTOR GEARING

BY W. L. ALLEN, COMMERCIAL ENGINEER, R. D. NUTTALL COMPANY

Gearing is subjected to very severe stresses and wear. Its first cost and the cost of installation are such as to make economical purchase possible only through the correct selection of the grade of material for the specific service. Both the manufacturer and the operator have come to realize that such operating conditions as horsepower of the motor, gear ratio, lubrication, bearing maintenance, number of stops per mile, and topography of the country are the controlling factors in determining the life of any given grade of material. As the possible variation in these conditions is largely dependent upon the service that must be rendered and the facilities for car maintenance, the operator is forced to vary the grade of gearing to suit these conditions rather than to rearrange his operating conditions to suit any given grade of gearing.

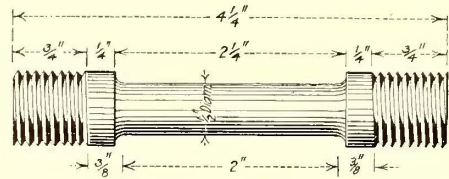
The progressive operator is compelled to give serious consideration to plans for determining the relative merits of the various grades of material in his specific service. The larger properties maintain test departments,



RAILWAY MOTOR GEARING—REGION FROM WHICH TEST PIECE SHOULD BE TAKEN

making service tests of each new grade offered, while the smaller properties conduct similar tests on a less elaborate scale or are governed by the results of tests made on other properties. Service tests are absolutely necessary to determine adapt-

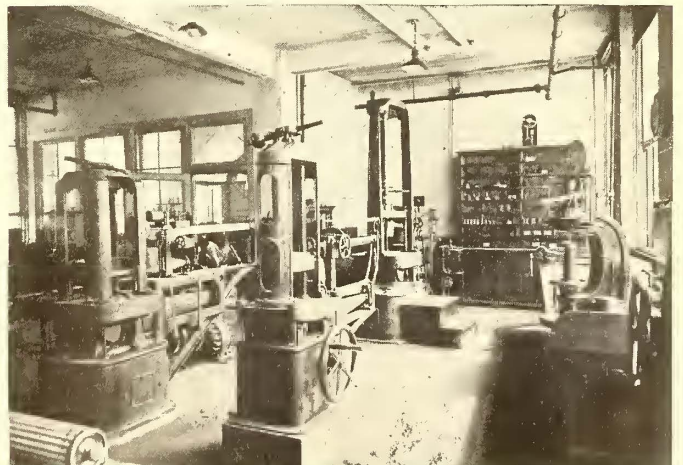
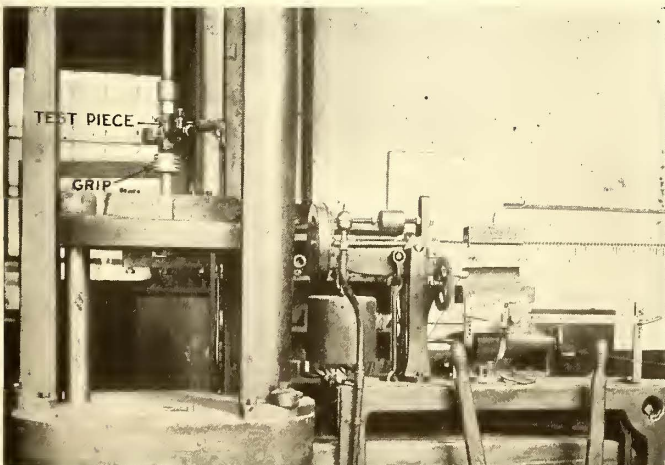
ability to a given service, but a great many operators have found that the indiscriminate testing of new materials is troublesome, costly and greatly retards the adoption of standards for their service. The necessity for more intelligent testing has led the operator to cast about for some method of comparing each new grade offered with materials used in the past and determining the possibilities of these new grades to solve his breakage and mileage



RAILWAY MOTOR GEARING—DIMENSIONS OF STANDARD TEST PIECE

problems. The American Electric Railway Engineering Association has endeavored to classify the respective grades of materials according to their physical characteristics.

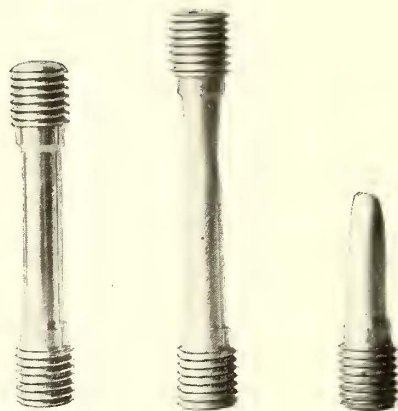
The stresses to which gearing is subjected are of two kinds; those produced by the normal static load due to transmission of power, and those occurring from the dynamic load due to the impact of starting and stop-



RAILWAY MOTOR GEARING—TEST PIECE UNDERGOING TENSION TEST, AND GROUP OF TESTING MACHINES IN LABORATORY

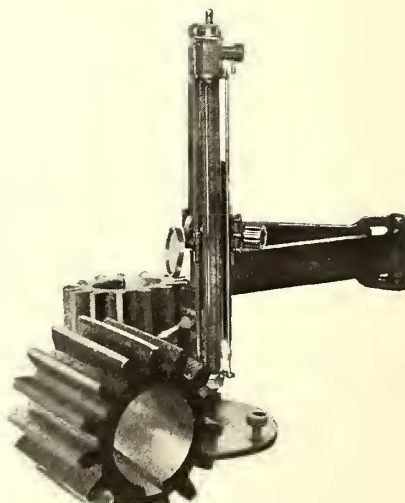
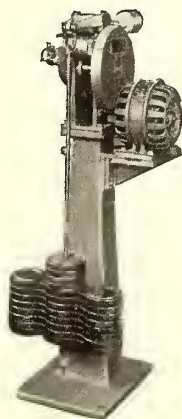
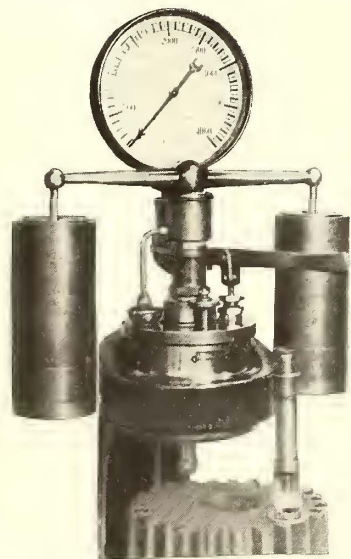
ping. The resistance to static load is dependent upon the strength of the material, while the resistance to dynamic load depends upon toughness as well as strength.

As the load which is applied to gear and pinion teeth tends to break them out at the root, the quality of the material at that point should be determined. This may be accomplished by ascertaining the "ultimate tensile strength," the "yield point," the "elongation" and the "reduction of area."



RAILWAY MOTOR GEARING—TEST PIECE
BEFORE STRETCHING, AFTER PASS-
ING ELASTIC LIMIT, AND
AFTER FAILURE

In testing, a standard test piece is machined from the gear or pinion at the base of a tooth, as shown herewith. Both ends are threaded and the center for two inches of its length is machined to a smaller diameter. The threaded ends are screwed into the grips of the testing machine, one grip being part of a beam scale, while a load is applied to the other grip sufficient to pull the test piece apart.



RAILWAY MOTOR GEARING—BRINELL MACHINE, MACHINE FOR TESTING RESISTANCE TO ABRASION, AND SCLEROSCOPE

As the load or force is applied the test piece will elongate proportionally until the "yield point" of the steel is reached, after which the rate of elongation is materially increased.

The tension necessary to bring about this change in the rate of elongation may be observed on the beam of the scales, and may be expressed in pounds per square inch of the test piece. Similarly the load exerted to cause rupture, may be expressed as the "ultimate tensile strength" per square inch.

The elongation of the test piece is determined by making two center punch marks, usually two inches apart, upon it before subjecting it to tension and measuring the distance between these marks before and after testing. The elongation obtained in per cent of the original length is termed the "elongation in two inches," if that is the length used. Elongation of a test piece is always accompanied by a reduction in its cross-section at the point of rupture, and the amount of this reduction expressed in per cent of the original area is termed the "reduction of area."

The "yield point" and "ultimate tensile strength" represent the strength of the material, while the elongation and reduction of area indicate the toughness or ductility, and represent the resistance to fatigue, alternating stresses or dynamic blows.

RELATIVE LIFE

Resistance to abrasion depends upon hardness and refinement of grain structure. Relative hardness may be determined by means of the Brinell machine or the scleroscope.

In the Brinell machine a hardened steel ball is pressed into the surface of the gear or pinion to be tested, at a pressure of 3000 kg (6615 lb.), and the impression then made is measured with a microscope. The dimensions of the impression forms the basis of calculation of the "Brinell hardness" and the approximate tensile strength at that point. This hardness is expressed in terms of a Brinell hardness numeral, for example, 600, which represents a glass-hard steel, or 150, which represents a soft steel. The Brinell test may be applied to gears and pinions without spoiling them.

The scleroscope is an instrument adapted to test surfaces where the Brinell machine cannot be used.

It consists of a glass tube, open at one end and having an air valve at the other end. In the tube is a diamond-pointed hammer. With the hammer at the closed end the open end of the tube is placed in contact with the gear or pinion to be tested and the hammer is released

by means of the air valve, falling upon the piece under test. The relative hardness is indicated by the height of the rebound. This hardness is expressed in terms of a scleroscope hardness number, for example, 100 for a glass-hard steel and 30 for a soft steel.

There has been no commercial method devised for determination of relative grain structure. Microscopic analysis has not been adapted to anything but research work up to the present time. As two gears and pinions of similar physical characteristics at the root of the

tooth and at the surface may have different grain structures, it would seem advisable for the railway operator to observe the structure of the gearing under consideration by the breaking up of a gear or pinion, or by observing the grain structure of the test gear or pinion from which the test piece is machined.

It is quite possible to machine a test piece from oil-tempered and other heat-treated materials, but it is impracticable to test a case-hardened gear or pinion in this way on account of the dual characteristics of the material. In the testing of case-hardened gearing, however, the surface hardness can be determined by testing each gear or pinion with a scleroscope or Brinell machine, while the depth of "case" can be determined by breaking out a tooth and fracturing the broken piece to show the cross-section of the tooth. By grinding the broken surface and dipping in nitric acid the high carbon case will stand out black in contrast to the lighter-colored, low-carbon core.

One probable result of gear and pinion investigation by operators and the railway association gear committee will be the purchase of gearing to specifications. These specifications could be made to cover strength, toughness and surface hardness. However, as slight variation in chemical composition and heat treatment have decided effects upon physical characteristics it would be necessary for these specifications to set minimum limitations rather than definite values. This would provide a definite basis of comparison of various materials. While all might meet the specifications, their relative merits could be judged according to the extent to which they exceed the specified minimums. This method of purchase would have the effect of encouraging the manufacturer constantly to improve his material and justify any increase in first cost thus brought about. It would have the further advantage of eliminating confusion, on the part of the operator, in purchasing to trade names without complete knowledge of the characteristics of the material and would permit him to judge intelligently as to the ability of the respective materials to develop the maximum worth per dollar invested.

Investigating and Handling Automobile Accidents*

The Author Points Out the Practical Aspects of the Question and Urges Careful Preparation for Settlements

BY JOHN S. MILLS, ASSISTANT SUPERINTENDENT SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS, OAKLAND, CAL.

While the greater number of automobile accidents result in damage to the vehicle only, the cost of repairs in the aggregate amounts to a considerable item in the claim accounts of every street railway company. The mental anguish of the owner is always a consideration. He has been hit in his tenderest spot—his pocketbook. When he calls on the claim agent the latter, if wise, will greet him pleasantly and treat him very much as he would an alarm clock by patiently waiting until he runs down. The claimant should be asked to put his claims in writing on a form provided for that purpose. Then, if the company's liability is not in doubt, repairs should be ordered promptly.

Nearly all companies repair their own automobiles at the car shops because it is cheaper than to have the work done by some outside concern. Obviously, then, it

should be more economical to repair privately-owned automobiles damaged in collisions with cars at the company's shop. The foreman, or man in charge, is then available for the inspection of damaged automobiles taken to public garages for repairs. If he is provided with catalogs containing the prices of parts for the several makes of automobiles and has a good knowledge of the cost of labor he should be able to prepare good estimates to protect the company from overcharge.

If an experienced repairman is not employed by the company and repairs must be made in a public garage, it is well to select one in charge of a reliable and competent mechanic and divert as much work as possible to him. He will also be available for making estimates of the cost of repairing damaged automobiles which are taken to shops selected by owners. Such a man is worth many times his hire in the saving he can effect through his knowledge of prices, labor, etc., and the protection he can give from the common practice of including the cost of replacing worn-out parts in the list of damages.

Generally speaking, the inspection of damaged automobiles in the manner outlined would be the same where responsibility for the accident is undecided, as it would be if it was admitted by the claim agent. The only difference would be in the manner of dealing with the claimant.

In nearly all cases of doubtful liability the claimant either plays the part of the injured innocent who never before had an accident—is too careful to be at fault—has no desire to claim anything more than the cost of repairs, notwithstanding the loss of his valuable time; or, he blusters into the office, hints at law, lawyers and witnesses; balks at the request for a written account of the accident and finally runs down. Patience and a knowledge of human nature if properly exercised on either type will usually secure the desired statement, names of witnesses, etc. It should then be explained that it is impossible to decide the question of responsibility until the statements of disinterested witnesses are secured, but repairs to the automobile need not be delayed on that account. They can proceed and the payment of the bill by one or the other will be decided when the evidence is all in. It should be firmly impressed on the claimant that he must order repairs made on his own account, as the company cannot undertake to assume payment of the bill at that time. Inspection of the damaged vehicle should be ordered at once, but it is not advisable to send the company's representative to the shop with the owner or to inspect it in his presence. It may be the agency through which he bought the automobile, or he may be a regular customer of the repairman. In either case the man in charge will wish to please the owner and either refrain from having anything to say or encourage the owner to include in the list of damages repairs which were needed before the accident.

Dealers in second-hand automobile parts are now to be found in all large cities, and claim agents can effect a considerable reduction in claim costs by patronizing them.

Collisions of automobiles and railway cars causing injury to persons or serious damage to the vehicles involved demand thorough investigation, of which the securing of statements from witnesses is only a small part. Preparation for settlement or lawsuit should be equally thorough. If tests, diagrams, photographs, etc., are not made until attempts at settlement have failed or suit is filed, it may not be possible to secure them. Everything for completeness of detail depends upon the intelligence, coolness and observing qualities of the men comprising the crew.

Many lawsuits have had their inception in the testi-

*Abstract of paper presented at annual convention of Pacific Claim Agents' Association, San Francisco, June 24 to 26, 1915.

mony of trainmen at coroners' inquests. At these inquisitions witnesses are asked to state opinions as well as facts, and capable motormen will give estimates of time and distance that would be laughable were the consequences not so serious.

Whenever a serious accident occurs or, at least, whenever death results, the car should be inspected by the company's mechanic for possible defects, and as soon as circumstances will allow, an experiment should be made with it at the place of the accident, with the same crew and under substantially similar conditions.

It is presumed the men are well trained and have marked the exact spot where the vehicles collided, also where the motorman was when he first had reason to apprehend danger, and the places where both car and automobile stopped. The company's surveyor should measure distances and secure data with which to make a comprehensive diagram of the scene. One diagram should show fixtures only—such as tracks, curbing, poles and obstructions to the view when looking in either direction, for the benefit of the jury, if needed. The other should show the locations of the car and automobile at different stages of the accident, measurements of distances and other detail. This would be for the guidance of the employees who may be required as witnesses. They may say they can explain it on the ground but not on the diagram. That is just the point. They must learn to indicate the essential features on the diagram or they will likely make a mess of it if called to do so in court.

At the time the test is made, the distance from the point where the danger first became apparent to the motorman to the place of accident should be noted, and the test made with reference to such distance as well as with reference to the rate of speed. The estimated rate of speed at the time of the accident should be duplicated as nearly as may be, the car running in the same direction at the time of the experiment as at the time of the accident. The same means for avoiding the accident which the motorman claims to have used at the time of the accident should be employed in the test. If the result of the test does not support the opinion of the motorman with reference to speed and distance, then it is evident that he made an erroneous estimate of the rate of speed the car was making at the time he first saw the other vehicle in danger, or he made an equally poor estimate of the distance from the point of his first apprehension of danger to the place where the vehicles collided. Such an experiment will demonstrate a much nearer approximation of speed and distance than is likely to be obtained from the conductor or motorman without such a test.

In nearly every trial of a suit for damages resulting from the collision of an automobile and street car the questions of speed and distance are always uppermost. The last chance doctrine must be considered.

Of course, these experiments must be in charge of other experts than the car crew—usually the division superintendent and an inspector, who should make a joint report showing the result of the test. With this report and the surveyor's diagram as aids to a thorough understanding of the situation, the carmen should be reasoned with as to speed and distance and a complete account of all features of the accident should be recorded by a stenographer to enable the men not only to answer truthfully but intelligently all the questions which may be put to them on the stand.

As an illustration of the necessity for such a course, a motorman recently testified at a coroner's inquest in the case of a man run over by the car that when he first saw the deceased in danger, he was about 126 ft. from him, the car running at between 8 m.p.h. and

10 m.p.h.; that he immediately shut off the power, applied the emergency air and did all in his power to avoid the accident. That he finally brought the car to a stop after running 126 ft., over the man and 5 ft. beyond him, making 131 ft. in all. An actual demonstration made with the same car under the same circumstances, after the inquest, showed that at the rate of 10 m.p.h. the car was easily stopped within 26 ft. Had this motorman seen this experiment before he testified at the coroner's inquest he could not have made such a glaring mistake both as to speed and distance.

He testified upon the trial that he was mistaken in his testimony before the coroner's jury as to speed and distance, but upon cross-examination by opposing counsel was finally brought around substantially to his first statement at the inquest, with the result that a verdict was rendered in favor of the plaintiff to the amount of \$15,000.

Collisions of automobiles and cars wherein passengers in the automobile are killed or injured present another phase of the subject for consideration.

Formerly there was considerable conflict in the authorities as to the law with regard to responsibility, but at the present time the law of this State is well settled that where the person injured is riding with another person upon a vehicle and has neither the control of nor the right to control the driving of the vehicle, the negligence of the driver of the vehicle contributing to the injury cannot be imputed to the person injured so as to constitute contributory negligence on his part, but the defense of contributory negligence must be sustained by proof of personal failure of the person injured to exercise ordinary care. It has also been held in this State that it cannot be said, as a matter of law, that the failure of the passenger to look to ascertain the position of the car or train before the vehicle turned across the track was contributory negligence.

The passenger has the right to assume that the driver of the vehicle is competent and that he should not put it in a perilous position. If the driver is an agent or employee of the person injured, then the negligence of the driver is imputable to the person injured. The passenger is also guilty of contributory negligence if the driver of the vehicle has been careless and reckless in regard to driving and this was known to the passenger at the time of the accident, in which event evidence of such knowledge upon the part of the passenger is admissible for the purpose of showing that he did not exercise ordinary care in keeping a lookout and warning the driver of the prudent course to be pursued by him.

If the liability is doubtful, or if it cannot be proved conclusively that the person injured had knowledge that the driver is or has been careless and reckless, then it is advisable to settle upon the best terms obtainable, provided the amount demanded is not unreasonable.

While regulation will never entirely eliminate accidents, a long step in the direction of reducing their number will be made when all drivers of automobiles are required to pass examinations for physical and mental fitness and familiarity with traffic regulations before being permitted to drive over the streets of a city. They are engine drivers and should possess all the qualifications required of an engineer or motorman. The outlook for such necessary requirements is not encouraging because of the self-interest of the governing classes and the difficulty of controlling the great number of unorganized individual owners of automobiles. The increasing death rate will eventually force the adoption of the requirement. In the meantime it is well to prepare for defense.

Bay State Street Railway Arbitration

Decision Grants Certain Increases, a Six-Year Scale and a Minimum Wage

The arbitration board in the Bay State Street Railway case handed down its finding at Boston, Mass., on June 21, with the result that the blue uniformed men of the company receive an increase in wages of 1/2 cent per hour above the present scale, covering the period from Oct. 1, 1914, to Oct. 1, 1915, and an increase of from 1/2 cent to 3 cents per hour above the present compensation for the period from Oct. 1, 1915, to Oct. 1, 1916. Extra men receive a guarantee of six hours work per day; the pay of shop men and all other employees is increased 1/2 cent per hour up to Oct. 1, 1915, and another 1/2 cent thereafter; the hours of shop men are reduced from ten to nine per day, and overtime is rated at time and one-half. A minimum wage of \$2.25 per day is established after the first year's service for union men other than blue uniformed employees.

The Bay State case is one of the most elaborate ever carried through in street railway arbitration and frequent references to it have appeared in this paper. Hon. Joseph C. Pelletier, district attorney of Suffolk County, Mass., was the third member and chairman of the board. The company was represented on the board by Henry E. Reynolds, assistant general manager, and the men by James H. Vahey, of Boston. The hearings covered sixty-two days, the record comprising 6800 pages of testimony and 463 exhibits, including testimony at other hearings, reports of conferences, tabulations, schedules, etc.

The Bay State company has 951.33 miles of track, about 20 per cent of which is double track, and all but 13.26 miles are in the public streets. On Oct. 1, 1914, the company employed 1577 motormen and 1628 conductors, 296 call men and about 1000 in other occupations. Since 1906 there have been four agreements or arbitrations relative to wages.

The company claimed that it could not afford to increase wages. The men claimed that the financial condition of the company should not affect the question of a fair wage. The board confesses its inability to express an opinion as to the exact financial status of the company and then says: "If the street railways generally, and this company in particular, are in need of increased revenue, it is not within the power nor is it the duty of the employees to take the initiative in securing such revenue. If we find, as we do, that an increase of wages is necessary to compensate to some extent at least for the increased cost of living, and that a minimum wage should be established, it follows that the increased cost of labor must be either paid out of the present surplus earnings or laid upon the fare-paying public through increased rates. It appears from the statement of the company that there are no surplus earnings applicable to the purpose, and no evidence has been produced which warrants the conclusion that the company is not honestly and economically managed. This being the case, the only escape from difficulties which may mean hardship upon shareholders and inefficient service to the public seems to be such an increase of fares as the Public Service Commission may approve as adequate for the purpose. The employees should not be expected to await the results of such a proceeding, although the uncertainty of its outcome, both as to the amount of increased revenue and the time when it will accrue, may be taken into consideration in fixing the scale of increased wages and reduced hours."

The unions asked for a reduction of the existing eight-year graduated scale to two years, with an increase in wages from 24 cents to 30 cents per hour for the first year, and to a maximum of 35 cents the second

year and thereafter, compared with the previous eight-year maximum of 28 cents. The board is impressed by the fact that of the thirty-one principal street railways in the State, only one company (with twelve men) has a flat rate, and that the average scale, taken by companies, is 6.3 years. At present 41 per cent of the men on the Bay State are receiving the maximum pay. The board holds that to determine when conductors and motormen attain their maximum efficiency is difficult and perhaps impossible. No evidence has been presented to justify the failure to raise for the fourth and fifth years over the third, or the seventh year over the sixth. An executive of the company admitted that the present scale is a compromise and unscientific, and the board sets six years as the length of time the new scale is to be effective.

In considering the rate of wage, the board notes that the men have fairly regular and continuous employment, in striking contrast with other occupations. "Work on the railways is nearly constant all the year around, while the joiner and the bricklayer are always in danger of being made idle by slackness of trade and the bricklayer's trade is further interrupted by frost and rain. Another consideration which means a money value to the men is the free transportation of these employees in the cars of the company to and from work; a daily expense to most men of at least 10 cents."

AWARD TO UNIFORMED MEN

The board finds the following rate of wages for conductors and motormen:

BAY STATE STREET RAILWAY WAGES AWARD MOTORMEN AND CONDUCTORS IN CENTS PER HOUR, 1915

| Year | Present Wage | Asked | Offered by Company Oct. 1, 1914 | Award as of Oct. 1, 1914 |
|--------------|--------------|-------|---------------------------------|--------------------------|
| First | 24 | 30 | 24.5 | 24.5 |
| Second | 25 | 35 | 25.5 | 25.5 |
| Third | 26 | 35 | 26.5 | 26.5 |
| Fourth | 26 | 35 | 26.5 | 26.5 |
| Fifth | 26 | 35 | 26.5 | 26.5 |
| Sixth | 27 | 35 | 27.5 | 27.5 |
| Seventh | 27 | 35 | 27.5 | 27.5 |
| Eighth, etc. | 28 | 35 | 28.5 | 28.5 |
| | | | From Oct. 1, 1915 | From Oct. 1, 1915 |
| First | 24 | 30 | 25 | *24.5 |
| Second | 25 | 35 | 26 | 26 |
| Third | 26 | 35 | 27 | 27 |
| Fourth | 26 | 35 | 27 | 28 |
| Fifth | 26 | 35 | 27 | 29 |
| Sixth | 27 | 35 | 28 | 30 |
| Seventh | 27 | 35 | 28 | 30 |
| Eighth, etc. | 28 | 35 | 29 | 30 |

*Second half-year after Oct. 1, 25 cents.
Extra men given guarantee of six hours work per day.

Motormen and conductors having regular runs with outside time exceeding twelve hours are to be paid additional compensation at the rate of 15 per cent of the employee's regular hourly rate for the first excess hour or fraction of it and 30 per cent for the second excess hour or fraction, and at the same excess rate for any further excess. All work of extra men performed in excess of fourteen consecutive hours is to be paid for, as and in addition to the six hours daily guaranteed time, and additional compensation is to be paid at the rate of 25 per cent of the employee's regular hourly rate for the first excess hour or fraction of it, and 35 per cent for the second excess hour or fraction of it, with the latter excess rate for any further excess. The board finds that men running extra trips starting before 8 a. m. are to be allowed two hours for them, this applying to all early morning crews required to report to cover the list.

EMPLOYEES OTHER THAN CONDUCTORS AND MOTORMEN

About forty classes of employees other than motormen and conductors are involved in the finding of the board, which emphasizes the importance and skill of

their work, its hardships and the present time and rate of pay. It is but fair to the company, in the opinion of the board, to state that the difference between men in similar employment on its system is due to the original existence of different companies. Whenever a raise has been given in the past, it has applied throughout the system, but no attempt at uniform or union wages and conditions has been attempted. The board is of the opinion that men in the same occupation should receive the same wage regardless of their location and that hours should likewise be standardized. It finds that on and after July 1, 1915, these employees be placed on a basis of nine hours a day and eight hours on Sundays and holidays, but without extra pay on Sundays and holidays for such regular time. Such employees, when required to work overtime, are to be paid time and one-half for it. In lessening these hours, it is the intention of the board that the present total weekly wage be not reduced.

An analysis of the different rates paid employees of the shop, power house, etc., service shows a considerable variety of wages paid for similar work. Thus, armature winders receive six different hourly rates; carpenters, twenty-seven; coil winders, three; pitmen, twenty-one; babblers, four; night watchmen, thirteen, etc. The board recommends that the company undertake a classification of wages and specifies a minimum wage of \$2.25 per day for all employees who have worked one year for the company in the classes outside the blue uniformed service. This minimum wage is not to reduce existing wages in any case. The board finds that the rate of wages per hour for these employees shall be increased $\frac{1}{2}$ cent per hour from Oct. 1, 1914, and another $\frac{1}{2}$ cent from Oct. 1, 1915, extending to Oct. 1, 1916.

In conclusion, the arbitration board expresses its appreciation of the courtesy extended by all the parties and particularly congratulates the company for "the fine spirit shown in producing evidence and witnesses upon request of the association." The good spirit shown by the union in the proceedings is also touched upon. The board recognizes the difficulties of arriving at a decision completely satisfactory to everyone but states that it has done its best to deal fairly with all concerned. The report is signed by all three arbitrators, but the company's representative, Mr. Reynolds, states that while signing the award in the interests of harmony, he dissents, in principle and in amount, to the minimum wage which is therein established.

PRESIDENT SULLIVAN'S VIEWS

Commenting upon the decision for the press, President P. F. Sullivan said: "I have little to say about the award. Some of the increases are no more than might have been expected, considering the results of recent similar arbitrations, although we are in no position at present to meet any increase. The minimum wage as applied to our miscellaneous labor, however, is somewhat revolutionary. More than half of our labor outside of the blue uniformed men will be affected by this minimum, and the result remains to be seen. Henry Ford says it pays, but I am afraid the street railway business has not so much margin of profit with which to try experiments as has the manufacturer of automobiles. The award means that if the investors of the Bay State company shall receive a reasonable return on the investment, the price of transportation must be increased. The Bay State company has postponed as long as possible an increase in rates; it will now get ready to increase such rates."

It is estimated that the increased cost to the company as a result of the award will be about \$300,000 in the two years ending Oct. 1, 1916.

COMMUNICATIONS

Jitneys vs. Light Cars

MOBILE LIGHT & RAILROAD COMPANY

MOBILE, ALA., June 10, 1915.

To the Editors:

From a four months' careful study and investigation of the jitney method of transportation I am satisfied that in all small towns and in the smaller cities up to 75,000 to 80,000 people, the best method of competing with the jitneys and killing them off is to give frequent service which, in the case of small towns and cities, can only be done with small light cars.

I have always opposed the use of double-truck cars for our service in Mobile. We use exclusively the single-truck cars, except on our suburban lines reaching out to small towns about 7 miles from the city. On these lines we operate double-truck cars carrying forty-eight people.

In Alabama, under the present motor-vehicle law, the cities have no right to regulate automobiles for hire nor to license them nor to require a permit other than under the provisions of the motor-vehicle bill, which was drawn up by automobile manufacturers. Notwithstanding this fact, which allows the jitney to operate at will, paying practically no taxes and without restrictions, we have been able to keep the number of jitneys down to the minimum. At the present time we have two white and three negro jitneys; the greatest number at any one time has been fourteen. The jitneys have never paid expenses, and of the first that started in, not one is now in business. But as some quit others take their places, and I believe this condition will continue for some time to come. I also believe that unless laws are passed increasing their taxes and requiring them to give indemnity bonds some jitneys may be able to operate during the rush hours with profit to themselves. For instance, the cost for the operator becomes practically negligible if the owner of the jitney has a boy who can work for an hour before school and for a couple of hours in the evening.

There is one jitney bus in Mobile which carries considerably more people than the seven-passenger car, and I would be more afraid if a regular line of jitney buses were placed in operation of the jitney becoming permanent. This kind of competition can best be kept out with small cars at frequent headway.

At the present time we are running on six-minute headway on Government Street, the street on which the two white jitneys operate. When depreciation is taken into consideration, the Government Street jitneys which are run by the owners are losing money, but it takes a few months before the jitney operator realizes what depreciation means. In the meantime he may possibly pay operating expenses; but he is practically living off of the investment in his machine, because at the end of a few months the machine is junk, and he has lost the money invested in it, which means he is unable to continue.

If we could operate on Government Street eight light cars, with 24-in. wheels, in place of the six cars we are now running, we could give a headway of five minutes instead of six. This would cut down the jitney's earnings and would increase our total earnings. Even though there were no jitneys in operation, the frequency of service increases riding by picking up the man who is walking, for if he continues to walk until he is within a reasonable distance of his destination, he will not get on the car. The cars would also secure as passengers many persons whom the private automobiles

now pick up. In fact, these private automobiles pick up more intending passengers than the jitneys. If we could decrease the headway to four minutes or three minutes, the jitneys would have a much harder time and would die so much sooner, and we would secure many of the persons as passengers who are now carried free by automobiles, and also induce more of the walkers to ride.

If we could operate one-man cars, there is no question in my mind but that we could keep the jitney out of the transportation business, but on account of the negro population the front entrance of a one-man car would be somewhat objectionable in the South, and as the idea is to give more frequent and rapid service, the motorman making change and issuing transfers would delay the car. Therefore, we still feel that two men are necessary on our cars, but that we should have small light cars having 24-in. wheels and low platforms so we can load and unload our passengers more rapidly and give more frequent and more rapid service. The more frequent the service the fewer the stops, and this means rapidity of service. The place where the jitney thrives is in small cities and towns where fifteen-minutes headway is maintained and long double-truck cars are run. Yet in many of these towns a man can walk over 75 per cent of the route in that time. If you are going to secure business from short-distance riders you have to give them frequent opportunity to ride.

To illustrate what frequency of service can do: When I was in a Texas city during the early part of February there were in operation 355 jitneys, which had reduced the revenue of the street car company \$1,000 per day, less than \$3 per day per jitney, yet when I talked with the taxicab men, garage men and others that were posted, I was informed that the jitneys were taking in from \$5 to \$6 and more per day. This shows that about half of their receipts were from riders that would not have used the street cars even if there had been no jitneys. Part of this riding was novelty riding, no doubt, but a large portion of it was caused by the fact that the jitney came along about every two minutes and sometimes oftener, and this provided a means of reaching town so frequently that the passenger did not have the opportunity of walking any distance before he had the chance of riding offered him.

Here in Mobile we have, as I have said (except on suburban runs), single-truck cars, seating twenty-eight to thirty-two passengers. If all of our cars (outside of our double-truck cars) had been light-weight cars seating twenty-four to twenty-eight passengers, on light trucks, with two 15-hp motors, we could have operated a sufficiently larger number of cars, with no more expense, to have kept the jitneys from paying daily operating expenses, and our receipts would have been higher by the increased riding caused by the more frequent service.

I believe that if the automobile manufacturers would get out a gasoline engine that could be put on a small light car that could be run on rails, such cars would be adopted to-day wherever a new line is being built in small towns or between small towns, and I believe there is a future for the small gasoline street car, unless small electric motors and light cars can be built. The development of automobiles has been much more rapid than the development of street cars and motors, but I am in hopes that the manufacturers of electrical apparatus will be able to develop a small motor and lighter control that will answer the present need.

Let us suppose a case, say, of a small city of 15,000 people which desires a system of transportation. Part of the streets only are paved, so that it is impossible to operate jitneys all over the town. A company is

organized, rails are laid and small gasoline cars are operated, the engines for the cars being designed by some of the engine makers now building engines for automobiles. I will assume that the cars are operated by one man and seat twelve to twenty passengers and are able to give six to seven and one-half minutes headway. Could not a system like the above operate more cheaply than an electric system giving fifteen-minutes headway with the present type of heavy cars? And on account of the more frequent headway would not their receipts be larger and would there be much chance for a jitney to exist in competition on the paved streets, which are apt to be the streets on which the best car lines operate?

Before jitneys began operating in Mobile we issued bulletins in the newspapers giving estimated operating expenses and receipts of jitneys and showing the injury to the general business of a town caused by jitneys and the irresponsibility of the jitney in every way. We believe these bulletins had a good deal to do with our success in keeping the maximum number so low, but the fact that we have always given frequent service with single-truck cars left no opening for any number of jitneys to operate. If our cars had been smaller and we therefore were operating a greater number at no more cost the jitney would have fared even worse.

In our fight with the jitneys we have never decreased car service, but have added service at the right times so that the jitney found it unprofitable to compete with us. The additional service cost us a small amount of money per day, but nothing in comparison with what we would have lost to the jitneys if we had not fought them with their own weapon, that is, frequency of service.

J. H. WILSON, President.

NEW YORK, June 18, 1915.

To the Editors:

I have been much interested in the editorial discussion in your paper on the effect of the jitney on the desirability of small car operation. There is no doubt that small cars can be operated at a much lower cost per car-mile than large cars and that the more frequent service will encourage riding.

If we say that the ordinary two-man operation with a mixture of single and double-truck cars represents an average cost of approximately 15 cents per car-mile and that one-man light cars can be operated at 9 cents per car-mile, a conservative figure, the saving for a company operating 1,000,000 car-miles per year would be \$60,000. If flagmen are required at railroad crossings, this figure would be slightly increased. If, in addition to the adoption of the type of car referred to, a zone system was installed and transfers were eliminated, additional benefits would be derived. To sum up:

1. The use of transfers reduces the average earnings of most railway systems to between 4 cents and 4½ cents per passenger. Therefore, the suggestion is made that transfers be either eliminated or given only when a 5-cent fare is paid.

2. A zone system could be established and tickets be sold at the rate of eight for 25 cents for rides within the first zone of say not to exceed two miles. This reduced fare would, in the writer's opinion, immediately be the means of recovering say 50 per cent of the jitney riders. With this reduction in jitney riders the jitneys could not exist, and within a short period of time all of the present jitney riders would again be street car riders.

3. The reduced fare would encourage many people to ride who now walk within a 1 and 1½-mile zone, and who would ride neither a jitney nor a car at 5 cents per

ride. This would result in additional business which has never before been enjoyed by the cars or jitneys. It is assumed that in some instances the additional riding from this source might be 30 per cent of the whole.

4. Collect a second $3\frac{1}{8}$ cent fare from those riding beyond the limits of the first zone, thus making a $6\frac{1}{4}$ cent fare to outlying districts, which would more nearly compensate the railway company for this long-haul riding.

It is the firm belief of the writer that the adoption of the above rate suggestion will re-establish gross earnings on a higher basis than they were before the advent of the jitney, and irrespective of jitneys this measure would be beneficial to both the community and the company in small and medium-sized cities.

Jitneys cannot hope to carry passengers at $3\frac{1}{8}$ cents per trip. The introduction of a zone system and the collection of a $3\frac{1}{8}$ cent fare for a short haul, $6\frac{1}{4}$ cents for a long haul, the elimination of the transfer, or possibly the issuing of the transfer on a 5-cent cash fare, would, no doubt, meet with great favor on the part of the riding public, the city and the state officials.

The introduction of one-man cars is likely to meet with opposition from the labor unions and from the general public unless they are educated up to this question. The answer to the former is that more cars will be operated and thus will provide employment to more than half the present number of men. The answer to the latter is that the accident hazard is very much less with a one-man car than with a two-man car, as evidenced by statistics shown in the accompanying table from railway properties under the same general management, the aggregate gross earning of which for the year 1914 were \$599,000. The average of the injuries and damage account for all of these companies was 3.75 per cent of the gross earnings. Two of the railway properties in this group were one-man operated and four of the properties operated with two men. The gross earnings of the one-man operated properties aggregated about 26 per cent of that for all the properties, and the injuries and damage account for this group was 1 per cent of the gross. The injuries and damage accounts of the four two-man operated properties averaged 4.7 per cent.

It may be objected that a zone system is impracticable with one-man operation. This is not the case. Both hand operated and automatic registering fare boxes are available and will overcome this difficulty. A one-zone passenger would place a ticket in the fare box on entering the car, and a two-zone passenger would place a ticket in the fare box when entering and another when leaving the car. A passenger entering a car in the second zone would not pay until leaving the car, therefore, every passenger leaving the car in the second zone would pay when passing out.

In some instances railroad crossings might be considered an obstacle. However, a considerable saving can in nearly every case be effected by establishing a flagman at railroad crossings or, if railroad crossings are near a congested traffic center, car riders could be provided to ride from the railroad crossings to the congested district and back.

The long-haul riders would object to paying a $6\frac{1}{4}$ cent fare. But as they represent an average of probably not more than 30 per cent of the total riders the vote of the larger proportion of reduced-fare riders would counteract such opposition. There might be some opposition on the part of the people to the elimination of transfers, but as an alternative the issuing of transfers might be continued on the payment of a 5-cent cash fare.

The introduction of small, one-man operated cars should be made a condition precedent to the establish-

ing of a lower rate of fare, and it is believed that by placing on the system and operating one demonstration car, the general public and state and municipal authorities may easily be convinced of the efficiency of such means of transportation.

A condensed summary of the benefits to be derived from the adoption of the two general foregoing suggestions would be as follows:

| | |
|--|---------------|
| Present operating expenses, 1,000,000 miles per annum.. | \$150,000 |
| Operating expenses, 1,250,000 miles with one-man cars... | 112,500 |
| Annual saving in operating expenses..... | \$37,500 |
| Present gross earnings, 1,000,000 miles at 20 cents..... | \$200,000 |
| Recovery of 50 per cent of jitney riders..... | 23,437 |
| Additional short-haul riders who now walk..... | 31,250 |
| Additional revenue from second-zone riders..... | 875 |
| Total gross revenue..... | \$255,562 |
| Reduction due to $3\frac{1}{8}$ -cent fare..... | 37,500 |
| Gross earnings with one-man cars and new zone system | \$218,062 |
| Net increase in gross earnings..... | \$18,062 |
| Saving in operating expenses..... | 37,500 |
| Total additional net earnings..... | \$55,562 |
| Estimated operating ratio..... | 51.6 per cent |

The foregoing is a conservative estimate of the result of applying the suggestions to the railway company listed as "D" in the following table:

INJURIES AND DAMAGES ACCOUNT, YEAR 1914, FOR SIX RAILWAY PROPERTIES, OPERATED UNDER SAME GENERAL MANAGEMENT

| | Gross Earnings | Injuries and Damages | Injuries and Damages as Per Cent of Gross Earnings |
|-----------------------|----------------|----------------------|--|
| City railway, A..... | \$119,099.62 | \$2,420.85 | 2.03 |
| *City railway, B..... | 142,866.88 | 1,517.88 | 1.06 |
| *City railway, C..... | 9,136.43 | 25.24 | 0.28 |
| City railway, D..... | 268,531.39 | 16,089.43 | 6.00 |
| City railway, E..... | †38,402.59 | 1,775.90 | †4.63 |
| City railway, F..... | 21,079.88 | 635.88 | 3.02 |
| Totals | \$599,116.79 | \$22,465.18 | 3.75 |

*One-man operated.

†Average for 2 years—1913 and 1914.

Many companies are probably in such a position that they could not finance additional car purchases at this time. In that event the savings to be derived from the modified plan of operation would permit the purchase of additional cars by the issuing of car trust certificates. The savings would be more than adequate to provide for a sinking fund to retire such certificates. Note that light one-man cars will reduce the operating accounts under every operating account classification, and the savings will not be limited to power and platform labor, as might naturally be assumed.

Short cars need not necessarily be rough riders. It is safe to assume that the equipment available will give easy riding, longer wheelbase and a minimum maintenance cost. Furthermore, it is quite within the range of possibility that one-man four-wheel cars suitable for train operation will be developed.

Note that cross-seats are a source of trouble and expense, and particularly objectionable in the case of one-man operation for the reason that the motorman would not have the time available for turning the seats. It is the writer's belief that the public can easily be converted to the longitudinal seats for short hauls providing such type of seat is introduced coincident with the new and attractive type of car.

A feature worthy of note is that the adoption of light cars will also permit the use of very much lighter track, or, in the case of heavy track now laid, will prolong its life. In either case track maintenance expense will be materially reduced.

The adoption of light cars will reduce the required investment for power station and substations to the

extent of \$1,000 to \$2,000 per car, or, in the case of the existing properties, will permit the operation of a greatly increased car mileage.

No attempt has been made to discuss schedules or minor transportation problems incident to the adoption of small cars. In general, there will be fewer stops and less time consumed in making stops, therefore, it should be possible to operate faster schedules, especially during rush hours.

RAILWAY OPERATOR.

Electric Locomotive Design

MCHENRY & MURRAY, ENGINEERS

NEW HAVEN, CONN., June 14, 1915.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for June 5 an article written by A. H. Armstrong, descriptive of the Chicago, Milwaukee & St. Paul locomotives, was published. This contained several statements with which I find it difficult to agree.

On page 1072, referring to the capacity of the locomotive motors, Mr. Armstrong states: "The motor has a continuous capacity of 375 hp. Special interest attaches to the large continuous capacity of the St. Paul locomotive, as this is the first instance where such a liberal motor capacity has been required and provided for." Several electric locomotives have already been built and are in successful operation with continuous horse-power capacities per axle much greater than the above. The horse-power per axle of the Chicago, Milwaukee & St. Paul locomotives is given as 375, continuously, or 430 on an hourly basis. The latest information as to the Norfolk & Western locomotives gives the continuous capacity of the motors as 400 hp per axle, with a correspondingly greater output on an hourly basis. The hourly capacity of the motors of the Loetschberg locomotive, Switzerland, is stated to be more than 500 hp per axle, whereas the corresponding figure for the new three-phase locomotives built for the Italian State Railways is authoritatively stated to be approximately 870 hp per axle.

It is also difficult to follow the reasoning by which Mr. Armstrong reaches the conclusion that, as a general proposition, a coefficient of adhesion of 17.75 per cent is admissible for electric locomotives operating on ruling mountain grades. Steam locomotives for freight work are commonly proportioned so as to exert maximum tractive efforts corresponding to a coefficient of adhesion which varies from 22.5 per cent to 25 per cent. A 10-per cent reduction in tonnage rating is the usual practice on steep grades. This corresponds to coefficients of adhesion varying from 20.5 per cent to 22.75 per cent. Accepting the lower figure (20.5 per cent) then to this should be added the increase in available tractive effort due to the equal turning effort of the electric locomotive when compared with the pulsating effort of the steam locomotive. This increase is not 10 per cent, as Mr. Armstrong states, but amounts to 20 per cent* and gives an equivalent coefficient of adhesion for the electric locomotive of approximately 25 per cent. Assuming a 2.2 per cent grade and an acceleration rate of 0.1 m.p.h.p.s., then the tractive effort required for acceleration is only 17 per cent of the total. With this allowance deducted, we get a net tractive effort available for hauling the tonnage corresponding to a coefficient of adhesion of 21 per cent. This is approximately 20 per cent greater than the figure quoted by Mr. Armstrong. In other words, an electric locomotive rated and designed on Mr. Armstrong's basis would sacrifice 20 per cent of its available adhesion, which means that 20 per cent more trains would need to be run for the same total tonnage moved.

Admitting, however, that under abnormal conditions, with coefficients of 21 per cent, tonnage would have to

be sacrificed, yet even so, for mountain grade work it is surely preferable to design electric locomotives so as to utilize their full adhesion for say 90 per cent of the time, rather than to handicap them permanently because of conditions applying to only 10 per cent of the time, conditions which can be separately negotiated when they arise.

WILLIAM ARTHUR, Assistant Engineer.

Experience with Ventilated Motors

PITTSBURGH RAILWAYS COMPANY,

PITTSBURGH, PA., June 14, 1915.

To the Editors:

In connection with the discussion on the subject of ventilated motors which has been going on for some weeks, and with particular reference to the article by R. E. Hellmund and a discussion of the same article by H. H. Adams, of Chicago, I would say that we have had a large number of ventilated motors in service for several years.

We are inclined to favor the parallel-path type of ventilated motor, i. e., one in which the air is drawn in on the one end of the motor and divides into two streams, one passing through the ventilating ducts in the core of the armature, the other stream passing between the field coil and over the surface of the armature, both streams being discharged at the other end of the motor.

Our experience with the motors so far has been similar to that referred to by Mr. Adams, in that a slight deposit of dust is found in the ventilating ducts of the armature and on the exterior surface of the insulation of the field coils.

We have also found that it is quite difficult to obtain the actual temperature of ventilated motors, when testing in the ordinary manner, after the car has been in actual passenger service, since the heat-radiating feature of the ventilated motor is such that a large and unknown quantity of heat is dissipated before thermometers can be placed. So that a test by thermometer to determine the actual temperature rise of this type of motor in regular service is liable to be more or less misleading. For determining motor temperatures in this manner, it is best to refrain from moving the car any more than is absolutely necessary.

Aside from the collection of dust inside the motor, which so far has not proved serious, I really know no disadvantages in this type of motor, and it would seem reasonable that the life of the insulation of the ventilated motor should be greater than that of one of the non-ventilated type, since even in actual service the heat generated during the accelerating period is largely dissipated in coasting and braking.

F. R. PHILLIPS, Superintendent of Equipment.

Reminiscences of Veteran Employee

Jacob Fishback, assistant superintendent of the Louisville Railway, is a veteran in the service, having been with the company in one capacity or another since the early '70's. He "reminisced" the other day, to say that in those times the mule drivers of the company had from four minutes to six minutes to eat their meals, and worked from twelve to fifteen hours a day at from 12½ cents to 15 cents an hour, standing out on the unsheltered platform in all weathers. He recalled a time in 1876 when all the company's mules were disqualified by epizootic. The drivers at the old carhouse which once stood at Fifth and Oak Streets, decided to make a trip during one of the rush periods and the company promised them all the fares they took in. Eight men laid hold of a car and pulled it downtown and back again. The fare they demanded and received was 25 cents per passenger, with no transfers.

*See C. R. Henderson, "Locomotive Operation," page 206.

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 to 8, 1915

American Association News

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 TO 8, 1915

Two-Day Session of Committee on Way Matters in Chicago—Committee on Equipment Meets with Electrical Committee of National Fire Protection Association—Company Section Activity

COMMITTEE ON WAY MATTERS

Full attendance of the committee on way matters of the Engineering Association and complete reports from all of its sub-committees marked the two-day session held in Chicago, Ill., on June 11 and 12. Those present were C. S. Kimball, Washington, D. C., chairman; H. F. Merker, East St. Louis, Ill.; E. H. Berry, Cincinnati, Ohio; E. P. Roundey, Syracuse, N. Y.; R. C. Cram, Brooklyn, N. Y.; C. W. Gennet, Jr., Chicago, Ill.; W. F. Graves, Montreal, P. Q.; L. A. Mitchell, Anderson, Ind., and E. M. Haas, Chicago, Ill. No new subjects were introduced at this meeting, but the final reports upon those assigned to the committee were discussed in detail, revised and put in final form. On the subject of further consideration of proper foundations for track in paved streets the committee decided to recommend for adoption Types B and C as presented in the 1914 committee report, excepting that they were modified slightly. This conclusion was reached after a full discussion and after obtaining the recommendations of a number of prominent way engineers throughout the country.

The report upon pavements for use in connection with girder rail will take the form of recommendations by the committee on the merits of the various types. In connection with this report, traffic counts taken in Brooklyn, Montreal, Cincinnati, Anderson, Chicago, Syracuse and Washington will be presented. These counts were made according to the method recommended by the 1914 committee. Because the Society for Testing Materials had expressed a desire to take up the question of specifications for sundry track materials, the final report on this subject will not be made this year. Revised recommended designs for 7-in. and 9-in. joint plates with special reference to sizes of bolts and fits were also submitted and incorporated in the report. Completely revised conventional signs for use in railway profiles, maps and plans and conforming as far as possible to those adopted by the American Railway Engineering Association and the Interstate Commerce Commission were adopted for publication in this year's report.

The entire session of June 12 was devoted to the preparation of special-work specifications. A committee of manufacturers, upon request, had submitted specifications for special work made of solid manganese steel, cast steel with hard centers, rolled-rail arms iron bound with hard centers, plain bolted and standard section rail bound with hard centers. Since these were the first special-work specifications ever prepared by this committee extreme care was exercised in their consideration. As revised these specifications will largely cover the chemical and physical properties of the materials used, general requirements and finish for five types of special work. The manufacturers' committee was represented by Victor Angerer, vice-president William Wharton, Jr., & Company; Charles A. Alden, chief engineer Pennsylvania Steel Company; R. B. Fisher, chief engineer Buda Company; E. B. Entwisle, chief engineer Lorain Steel Company, and G. C. Lucas, general manager Cleveland Frog & Crossing Company.

In connection with the various subjects discussed, in order to clarify and terminology, the committee decided on the following nomenclature for rails: All A. S. C. E. and A. R. A. sections to be known as standard-section

rail; all high T-rail sections to be known as plain girder rail; all grooved sections to be known as grooved girder rail; all girder rail with flat wagon treads to be known as tram girder rail, and all girder rail guards to be known as guard girder rail.

COMMITTEE ON EQUIPMENT

On June 8 in Boston there was held a meeting of the electrical committee of the National Fire Protection Association, of which Martin Schreiber is a member, at which a draft of rules for car wiring was considered. The meeting was a joint one between the equipment committee of the Railway Association and representatives of the Underwriters' Laboratory, the Fire Underwriters' Electrical Bureau, the General Electric Company, the Westinghouse Electric & Manufacturing Company, the American Car & Foundry Company, The J. G. Brill Company, the New York Board of Fire Underwriters and the Underwriters' Association of the middle department. The purpose of the conference was to draft rules to properly safeguard fire hazard and give reliability and continuity of service as well as efficient operation of cars at reasonable cost. The rules were drafted and approved by the electrical committee for insertion in the National Electrical Code to replace the present obsolete ones. The revised rules will appear in the report of the Railway Association committee on equipment, and the San Francisco convention will be asked to approve them from the association standpoint, although such action is not necessary for their inclusion in the code.

DENVER TRAMWAY SECTION

As announced in the issue for May 29, the May meeting of the Denver Tramway Company section, the concluding one of the season, was devoted to the subject of the inspector and his duties. In his paper on this topic, O. A. Waller, road officer of the company, gave his audience an impression of the human side of the inspector's work. He showed that inspection is not confined to railways but is a necessary element in all lines of work. The inspector system is not a system of espionage but is a necessary element in discipline. It insures smooth and regular operation, and makes it possible to continue such operation when one man drops out of his place. Proper inspection is a protection to the loyal employee, preventing "skinning the line," running ahead of schedule, "stealing the right-of-way," and other offenses against good discipline. Among the inspector's duties is that of intervening in any case of trouble that may arise in connection with car operation. He must assist in getting cars under way in cases of blockade; he must endeavor to help any employee who is having trouble with his car; he must be always on the lookout to serve the public, thereby serving the best interests of his company; his work requires good judgment, unflinching courtesy, and almost superhuman tact.

In the discussion of Mr. Waller's paper, Inspector E. T. Eckland showed how the inspector had developed on the local property from a person aloof from the men, whose duty was to report infractions of the rules, into one who is a real friend and helper of the men. Ten years ago efficiency was shown by the number of reports,

while now it is shown by the reverse. Mr. Eckland showed also that the word "discipline" is often taken to mean punishment, while the best discipline is characterized by the lack of punishment. Discipline, like charity, should begin at home. The trainman's point of view was given by John W. Dawson of the South Division. After referring humorously to his supposed function of exposing the dark and mysterious ways of the inspector, he paid a tribute to the helpfulness of that dignitary. In a pinch the trainman is greatly relieved to have the inspector at hand, although the former is not always as appreciative as he might be. Promotion to the position of inspector is a reward for faithful service, so that the inspector is entitled to respect and co-operation.

PUBLIC SERVICE SECTION

Company section No. 2 held its last meeting for the season on June 17, with a good attendance in spite of a severe storm which kept many away. The program comprised talks by Charles E. Eveleth, commercial engineer car equipment, General Electric Company, and Morris B. Rosevear, superintendent of distribution Public Service Railway.

With the aid of many diagrams thrown upon the screen Mr. Eveleth showed how operating conditions affect energy consumption in car operation. He took up the different variables separately to demonstrate how variations in acceleration, braking, length of stop, etc., affect energy consumption with different numbers of stops per mile. Each variable separately permits a considerable range in energy consumption even under practicable working conditions. The talk gave the members of the local section an excellent idea of the elements of good car operation. He incidentally touched upon the use of the tapped-field motor, stating that savings of from 4 to 6 per cent could be obtained by using it.

Mr. Rosevear analyzed the work of the distribution department of the company, commenting upon the kinds of supplies used in distribution and signal work. By means of a series of slides he showed typical overhead and signal construction, describing some of the peculiar problems which had to be met in overhead work particularly in connection with contactors for operating track switches.

MANILA SECTION

The fifth monthly meeting of joint company section No. 5 was held in Manila on May 4. The attendance at the meeting was very large and included a number of prominent business men of the city.

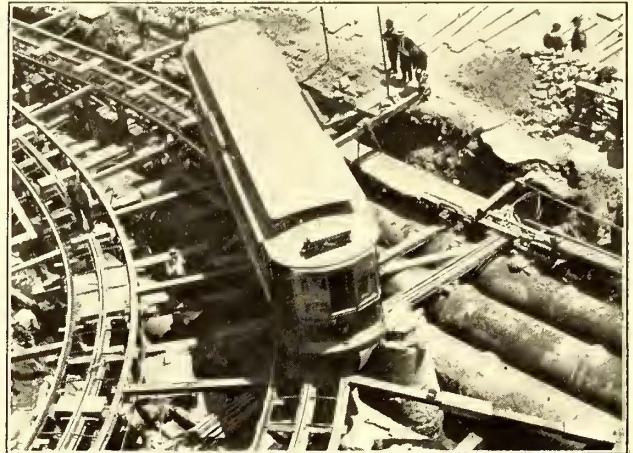
The paper of the evening was on "The Relative Advantages and Disadvantages of Private and Government Owned Public Utilities," by W. R. McGeachin, manager of the railway department of the Manila Electric Railroad & Light Company. This was followed by a spirited discussion which, with the paper, will be briefly abstracted in a later issue of the *ELECTRIC RAILWAY JOURNAL*. C. N. Duffy, vice-president of the company, stated that a number of individuals outside the employ of the company had been invited to become associate members of the section and that more than one-fourth of these had accepted.

The free public library of New Haven, Conn., has instituted a branch library at the Grand Avenue car-house of the local electric railway, the Connecticut Company. The library is open for the delivery of books every pay day, which is Wednesday. Books of fiction and books on electricity are proving most popular.

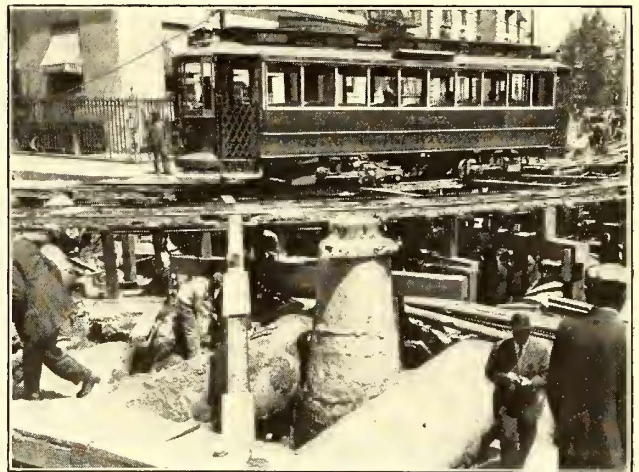
Operating Conduit Railway Over Broken Water Main in New York

Undermining of Big Conduit by Water Forces Railway to Meet with Unusual Conditions—Schedule Is Maintained Without Difficulty

The accompanying illustrations show unusual railway operating conditions on one of the lines of the New York Railways at the corner of 109th Street and Manhattan Avenue. Five 48-in. cast-iron water lines extend under Manhattan Avenue, four of them leading to the reservoir in Central Park. A break occurred in one of these pipes on the night of June 3, caused by the



UNUSUAL OPERATING CONDITIONS ON NEW YORK RAILWAYS



ANOTHER VIEW SHOWING TEMPORARY TRACK SUPPORTS

undermining of the big conduit by the water from a small leak. The break occurred directly below the point where the street car tracks form a curve between the two intersecting streets. The leak was not caused by shocks from the electric railway because the railway tracks were supported on I-beams from walls placed between the pipes for the very purpose of preventing shocks. Fortunately the construction of the conduit railway is such that the track and conduit form a self-contained structure, the rails and conduit being attached to the same cast-iron yokes. It was possible therefore to install temporary supports and car service was maintained without difficulty. The break disclosed a dangerous situation in view of the fact that the high apartment houses adjoining were in danger of being undermined from a break of this kind.

Equipment and Its Maintenance

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

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

The Life of Way Structure as Affected by Engineering and Municipal Conditions

BY P. NEY WILSON, ROADMASTER CONNECTICUT COMPANY, NEW HAVEN, CONN.

Concerning the period in which rails should be renewed in paved streets, it appears that if the problem is left to the railway company to solve, a good practical method of procedure is to renew when the annual cost of maintenance of the tracks and pavement is greater than the depreciation plus interest on the investment as represented by the replacement cost.

For example:

| STREET "A" | |
|--|-------------|
| 5000 ft. double track, laid 1894. | |
| Five-minute headway. | |
| 7-in., 70-lb. tee-rail. Electric welded 1908. | |
| Rock asphalt pavement on 6-in. concrete base. | |
| Cost of Replacement: | |
| 10,000 ft. track at \$6.00..... | \$60,000.00 |
| Interest on investment at 5%..... | \$3,000.00 |
| Depreciation at 5%..... | 3,000.00 |
| | \$6,000.00 |
| Cost of maintenance of present track structure and pavement: | |
| 1911 | \$11,957.44 |
| 1912 | 1,385.62 |
| 1913 | 501.82 |
| 1914 | 1,879.10 |
| | \$15,723.98 |
| Average cost per year..... | \$3,940.00 |
| Net saving | \$2,060.00 |

NOTE—The year 1911 shows heavy maintenance cost on account of unusual amount of pavement repairs.

An analysis of the above figures shows that it is still profitable to maintain the old track. When the maintenance figure reaches \$6,000 per year or over it will then be more economical to replace the old structure.

In this particular case the railway company will probably have the opportunity to be the judge of the proper time for the renewal as the pavement now is in good condition outside of the track area.

The increase in automobile traffic has created such a tremendous demand for smooth pavements that the city and state officials in charge of highways have spent great sums of money for so-called permanent pavements, particularly in the last few years. In many instances pavement has been renewed from three to five years before the old track and pavement had reached a point where replacement was really necessary.

These heavy and unnecessary expenses are thrust upon the operating heads, thereby greatly handicapping the property and harassing its officials. Usually no good business reasons for renewals are given except the pressure of public opinion as represented by a few individuals who have no such investment to carry and no responsibility as to results.

A great difference of opinion, no doubt, exists as to when permanent pavement may be economically placed around an old track structure. This is a problem not so easily solved. Those seeking its solution will always find a set of conditions peculiar to that particular structure.

Calculation as to head wear of the rail, probable life, etc., may throw some light on the question, but it occurs to the writer that it may properly be considered a

business proposition and the following is a suggested method which may be of interest.

Depreciation is figured at 5 per cent. This percentage is open to criticism and may be raised to conform to local conditions, type of pavement, car service and vehicular traffic.

| PROBLEM | |
|---|-------------|
| Street "B"—4000 ft. single track. Apparent result of allowing old track structure to remain in the street, placing new pavement around it, the city having decided to lay a new pavement of improved type. Present track structure good for five years. | |
| Pavement cost at \$3.50 per foot..... | \$14,000.00 |
| 5% interest for five years..... | \$3,500.00 |
| 20% depreciation for five years..... | 14,000.00 |
| Cost to reproduce in five years (track and pavement)..... | 24,000.00 |
| Total | \$41,500.00 |
| Effect of replacement, same street: | |
| Replacement cost at \$6.00 per foot..... | \$24,000.00 |
| 5% interest for five years..... | \$6,000.00 |
| 5% depreciation for five years..... | 6,000.00 |
| | 12,000.00 |
| | 36,000.00 |
| Saving due to complete renewal..... | \$5,500.00 |

NOTE—Value of material reclaimed may be deducted from loss as shown, the amount determined largely by character of pavement used.

Assuming that the placing of an improved type of pavement is postponed for five years (the life of the track) a careful estimate based upon recorded costs on this particular street shows expenses for maintenance as follows:

| | |
|--|------------|
| Maintenance of old track and pavement: | |
| First year | \$400.00 |
| Second year | 800.00 |
| Third year | 1,200.00 |
| Fourth year | 1,600.00 |
| Fifth year, replacement ..... | ..... |
| Maintenance for five years..... | \$4,000.00 |

If a complete renewal is made the first year on account of new pavement being placed, the interest and depreciation totals \$12,000 for the five years. The loss due to renewal at the first year therefore is the difference, or \$8,000.

These deductions are offered as showing one method by which some light may be thrown on a difficult problem, and if they provoke criticism and discussion, whereby more light on this subject is presented, it is certainly worth while, for the street railway engineer's decision in matters of this kind is important and involves large amounts.

In T-rail track construction in paved streets, from the viewpoint of head wear only, the limit of life under service is indefinite. Note the results from head wear as shown in Fig. 1. This rail is now under five-minute service and has been used constantly for twenty years. It is obvious that the life of the girder rail section is governed largely by the depth of the head.

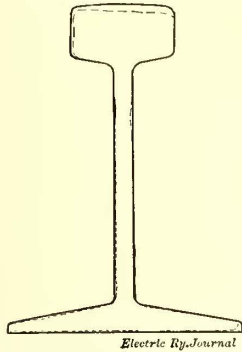
It is well known that the life of any rail section may be greatly prolonged by maintaining the tracks to at least a fair line and surface.

Two examples of rail wear in curves are shown in Figs. 2 and 3. It does not seem practicable to adopt a set rule governing the period in which rails should be renewed in curves.

The writer cannot entirely agree that the old adage,

"The life of the track is the life of the joint," has become passé. All improved facilities in this regard considered, the life of the joint still governs to a large extent the life of the track. Only in a few exceptional cases has the writer known of rails being renewed entirely on account of the head wear.

The most common reason for renewal of track in paved streets is an inadequate foundation. Of course,

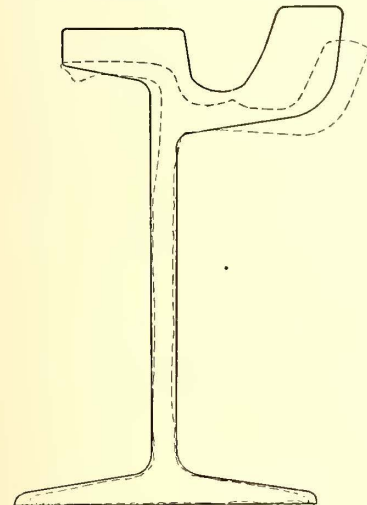


In service twenty years.
Five-minute headway.
Double-truck cars.
Gravel ballast.
Chestnut ties—2 ft. centers.
6-in. concrete base for pavement.
Rock asphalt top.

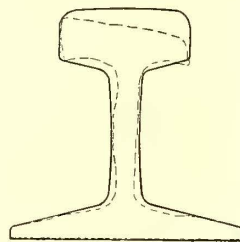
FIG. 1—SECTION SHOWING RAIL WEAR OF 7-IN., 70-LB. T-RAIL

a great variety of conditions affect the replacement period; unfavorable conditions such as pavement failure, broken and badly cupped joints, foundation failure, change of location and rail wear. These unfavorable conditions are accumulative and frequently result in track being discarded some years before it would be otherwise. It is true that pavement, joint and foundation failures bear a close relationship to each other and it is true also that these failures are the usual reasons for replacement.

Bad joints, bad surface and alignment, loose rails,



Four-minute service.
Double-truck cars.
40-ft. radius, single guarded curve.
Wear on head 60 per cent of original section.
Total wear 24 per cent of original section.
Rail taken out March, 1915, on account of fracture under the head.



Ten-minute service, summer.
Twenty-minute service, winter.
Double-truck cars.
50-ft. radius curve, single guard.
Wear on head 50 per cent of original section.
Total wear 37 per cent of original section.
Rail removed on account of fracture in web at the joint. February, 1915, rest of lay-out now in service.

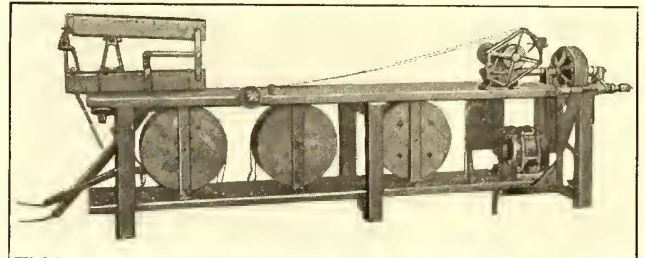
FIGS. 2 AND 3—SECTIONS OF GIRDER AND T-RAIL, SHOWING WEAR ON CURVES

rough, uneven pavement are more frequently the result than the cause of foundation failure. By foundation is meant the method used in supporting the rails, character of cross tie, spacing of same, depth and kind of ballast used, etc.

A Coil-Winding Unit

BY O. P. CHUBBUCK, SUPERINTENDENT OF SHOPS, ILLINOIS TRACTION SYSTEM

In order to give substation attendants work for leisure moments, the mechanical department of the Illinois Traction system built the coil-winding unit which is shown in the accompanying illustration. This unit is self-contained and is mounted on a substantially-built combined rack and bench so that it can be moved from one substation to another without dismantling. The unit method also eliminates countershafting because an installation is complete when the bench has been set in place. Beneath the bench three reels of wire may be mounted on as many brackets. These are so made that a reel can be easily removed in case another containing a different size of wire is to be substituted. Mounted at one end of the bench beside the reel rack, is a small



ILLINOIS TRACTION SYSTEM COIL WINDING UNIT

motor which drives the revolving forms used in winding coils. At the opposite end of the bench is a press with foot pedals, used in forming and completing the coils. The completed coils are taped by hand, dipped into a pan of insulating paint and placed on racks in a small baking oven heated by means of electric coils. This oven and pan are of portable size so that they also may be transferred between substations. The Illinois Traction System has been manufacturing its coils for some time and is well satisfied with the results. Later, if this experiment proves satisfactory, the substation attendants will receive other repair parts to finish. If this is done the mechanical department intends to adhere to the unit idea in assembling equipment for the work.

Electric Railway Freight in Maine

BY C. H. NOTTAGE, MASTER MECHANIC, LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY

There is a great field for the development of a freight business in the Androscoggin and Kennebec River valleys in the State of Maine, and the Lewiston, Augusta & Waterville Street Railway is making special efforts along this line. Shippers receive every encouragement, and rolling stock is provided to suit the needs of the various classes of traffic that originate on the route.

The view on page 1214 shows a motor freight car recently built by the Laconia Car Company for the railway. The body is 40 ft. over corner posts, has a steel underframe and is mounted on diamond-frame trucks with M. C. B. 4 1/4-in. x 8-in. journals in Gould journal boxes. The equipment includes four Westinghouse No. 56 motors and K-35-G controllers. The motors are spare machines that have been thoroughly overhauled. All cables are in wooden boxes bolted to the underframe, and thus are protected from moisture. The air brakes were furnished by the Westinghouse Traction Brake Company and are A M M quick service, graduated release quick recharge, high pressure emergency, automatic

equipment, with straight air application and release features. The compressor is of 25 cu. ft. capacity, and there are two main reservoirs 16 in. x 42 in. The motor-man's valves are located at the extreme right-hand side of the vestibule to allow the operator a full view of trail cars when coupling and operating.

The Lewiston, Augusta & Waterville Street Railway has in operation at the present time eight motor freight cars, seventeen flat trailer cars and two box trailer cars

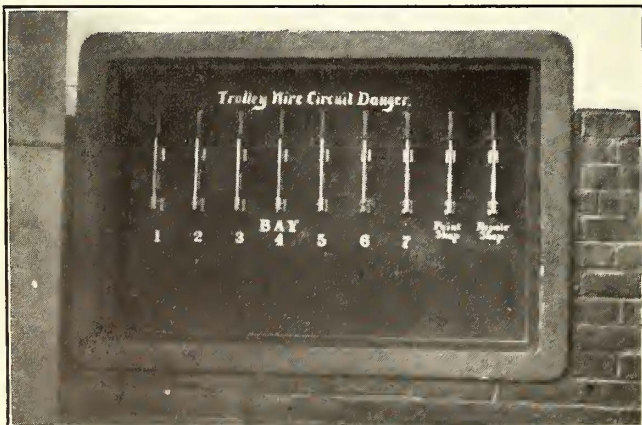


MOTOR FREIGHT CAR FOR LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY

of 60,000 lb. capacity each. The flat cars are used for handling granite from the Hallowell granite quarries, as well as wood and lumber, farming tools and general freight. The box cars are used for potatoes, apples, grain, hay and perishable goods. The company also transports the freight for the Eastern Steamship Company between Augusta and Gardiner and also handles freight cars from the steam roads.

Feeder Panel for Carhouse Trolley Wires

At the recently completed carhouse of the Holyoke (Mass.) Street Railway the overhead contact wires for the various bays are supplied with current from the positive feeders for trolley service, a control panel for the entire carhouse being located at one end of the establishment, as shown in the accompanying halftone. As a rule each bay contains three tracks, and the taps



CARHOUSE FEEDER PANEL AT HOLYOKE

feeding the three trolley wires for each one are supplied through a single-pole knife switch mounted with others of the same type on a recessed slate panel about 4 ft. long, 29 in. wide and set 6 in. deep into the wall. A slate border 1 in. thick provides additional protec-

tion. Nine circuits are separately fed through this compact and convenient board, which affords a high degree of protection in emergencies.

Car Maintenance Records at Los Angeles

For the twofold purpose of securing exact costs and spurring the division heads on to better results, the mechanical department of the Los Angeles Railway issues monthly comparative tabulations by divisions of car failures (pull-ins), wheel mileage and maintenance costs. The figures show such high reliability of service that they are well worth quoting. Those for April, 1915, which are reproduced in full, show the remarkable achievement of 1,207,319 miles per failure, or only 0.0001 per cent failure due to causes within the control of the mechanical department. The average mileage of cast-iron wheels between flats was 38,946 miles.

DIVISION PERCENTAGE—APRIL, 1915
DIVISION COMPARISON OF NUMBER OF MECHANICAL FAILURES FOR THE MONTH OF APRIL, 1915, WITH PERCENTAGE OF CARS OPERATED, AND MILES AND CARS PER FAILURE

| Division | Cars Operated | Per Cent of Cars | Failures | Miles per Failure | Cars per Failure | Per Cent of Car Failures | Miles per Division |
|---------------------|---------------|------------------|----------|-------------------|------------------|--------------------------|--------------------|
| 1 | 3,565 | 17.35 | 0 | 432,106 | ..... | ..... | 432,106.19 |
| 2 | 6,086 | 29.62 | 0 | 662,353 | ..... | ..... | 662,353.25 |
| 3 | 3,447 | 16.78 | 1 | 433,162 | 3,447 | 0.0003 | 433,162.36 |
| 4 | 4,027 | 19.60 | 0 | 496,103 | ..... | ..... | 496,103.30 |
| 5 | 3,421 | 16.65 | 1 | 390,912 | 3,421 | 0.0003 | 390,912.38 |
| Totals and averages | 20,546 | 100.00 | 2 | 1,207,319 | 10,273 | 0.0001 | 2,414,637.48 |

DIVISION COMPARISON OF SKID WHEELS REMOVED DURING THE MONTH

| Division | Mileage | PAIRS OF SKID WHEELS | | Mileage per "Flat" | Mileage per Cent of Total |
|---------------------|--------------|----------------------|----------|--------------------|---------------------------|
| | | Number | Cost | | |
| 1 | 432,106.19 | 4 | \$11.40 | 108,027 | 17.9 |
| 2 | 662,353.25 | 2 | 5.70 | 331,177 | 27.4 |
| 3 | 433,162.36 | 23 | 65.55 | 18,833 | 17.9 |
| 4 | 496,103.30 | 13 | 37.05 | 38,162 | 20.6 |
| 5 | 390,912.38 | 20 | 57.00 | 19,546 | 16.2 |
| Totals and averages | 2,414,637.48 | 62 | \$176.70 | 38,946 | 100.0 |

DIVISION COMPARISON OF CARS REMOVED FROM SERVICE FOR THE CAUSES STATED

| Division | Steps | Fenders | Glass | Miscellaneous | Wrecks | "O. K." Cars | Total | Miles per Car |
|---------------------|-------|---------|-------|---------------|--------|--------------|-------|---------------|
| 1 | 25 | 9 | 7 | 3 | 1 | 0 | 45 | 9,603 |
| 2 | 46 | 6 | 10 | 7 | 5 | 0 | 74 | 8,951 |
| 3 | 10 | 4 | 6 | 10 | 1 | 0 | 31 | 13,973 |
| 4 | 30 | 6 | 10 | 13 | 4 | 1 | 64 | 7,752 |
| 5 | 10 | 3 | 4 | 5 | 1 | 5 | 28 | 13,961 |
| Totals and averages | 121 | 28 | 37 | 38 | 12 | 6 | 242 | 9,978 |

DIVISION COMPARISON OF DAMAGES TO CARS

| Division | STEPS | | FENDERS | | DAMAGED | | GLASS | | Total | Cost per 1000 Miles |
|---------------------|--------|----------|---------|----------|---------|----------|--------|----------|-----------|---------------------|
| | Number | Cost | Number | Cost | Number | Cost | Number | Cost | | |
| 1 | 56 | \$106.67 | 26 | \$95.21 | 17 | \$72.21 | 19 | \$30.19 | \$304.28 | \$0.704 |
| 2 | 75 | 139.58 | 42 | 102.92 | 35 | 243.76 | 36 | 41.60 | 527.86 | 0.797 |
| 3 | 28 | 57.30 | 29 | 43.11 | 13 | 69.37 | 12 | 11.20 | 180.98 | 0.418 |
| 4 | 42 | 79.72 | 29 | 57.58 | 22 | 127.78 | 32 | 42.77 | 307.85 | 0.624 |
| 5 | 25 | 48.94 | 28 | 78.06 | 19 | 46.15 | 23 | 29.59 | 202.74 | 0.519 |
| Totals and averages | 226 | \$432.21 | 154 | \$376.88 | 106 | \$559.27 | 122 | \$155.35 | \$1523.71 | \$0.631 |

Another tabulation shows for what causes beyond the control of the mechanical department cars were taken to the shops. These items include torn-off steps, bent fenders, broken glass, etc. The mileage per failure made with these conditions included is also given, and the cost as well. It may be interesting to summarize the figures for the preceding months of 1915 as follows:

Miles per mechanical department failure: January, 491,606; February, 745,408; March, 826,113.

Percentage of car failures due to mechanical department: January, 0.0002 per cent; February, 0.0002 per cent; March, 0.00015 per cent.

Miles per failure, all causes: January, 12,168; February, 11,468; March, 14,082.

Miles per flat wheel: January, 51,209; February, 44,724; March, 56,326.

Repair cost per 1000 miles, all causes: January, \$0.72; February, \$0.60; March, \$0.50.

Fuse Examination by Bureau of Standards

The Underwriters' Laboratories and the Economy Fuse & Manufacturing Company have jointly appealed to the Bureau of Standards for decision on the following question: "Has it been shown that the use of the fuses manufactured by the Economy Fuse & Manufacturing Company results in no greater fire or accident hazard than the use of other cartridge-inclosed fuses at present listed as standard by Underwriters' Laboratories?"

The evidence on which the decision will be rendered will include that which is presented by Underwriters' Laboratories, by the Economy Fuse & Manufacturing Company, by any other manufacturers of cartridge-inclosed fuses, and by state, city or insurance inspectors—all such evidence being subject to investigation or check by the Bureau of Standards as it may see fit.

In accordance with this arrangement the Bureau of Standards has announced that there will be a public hearing at its bureau in Washington, D. C., on July 8, beginning at 10 a. m. Invitations have been sent to manufacturers of cartridge fuses, underwriter associations and others to be present at this hearing and to present any statements of fact or results of experience which have a direct bearing on the question at issue. Written statements will be received by the bureau on or before the above-mentioned date in lieu of personal attendance at the hearing. Written arguments in rebuttal of any statements made at the hearing may be filed within fifteen days after the date of the hearing.

Simplifying Equipment Repairing

In the current issue of the *Tramway Bulletin*, the employees' magazine of the Denver Tramway Company, W. C. Metzger, foreman of the armature department, states that through the use of the electrolytic lightning arresters on the cars, improved operation of cars and better methods in the armature room, it is now possible for five men to look after the repairs of the following equipment: 245 motor passenger cars; thirty-two motor utility cars; 203 air compressors; ninety-one extra armatures of eleven types; 4200 field spools; 825 resistance boxes; 290 lightning arresters; forty stationary motors and starting boxes; all arc headlight resistors and coils; coasting clock coils; Kitt electric track switches; bonding car; concrete mixer; elevator motors;

rock-quarry apparatus and crusher, and various pieces of electrical apparatus used on cars and in buildings. The number of armatures looked after is 1109.

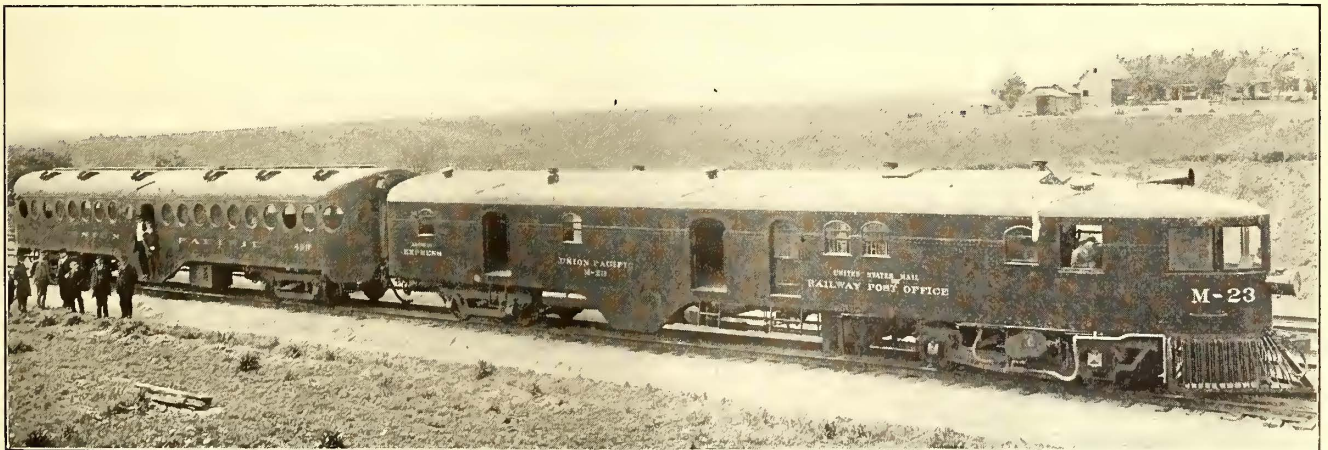
Record-Breaking Gasoline Motor Car

An unusual gasoline car has just been built by the McKeen Motor Car Company, Omaha, Neb., for the Union Pacific Railroad. It is a 70-ft. baggage, mail and express car equipped with a 300-hp engine, and it has capacity sufficient to haul a standard steel railroad coach as a trailer, making a double-unit motor-car train with all the facilities of the ordinary light steam train comprising a locomotive, a tender and three passenger cars. A. L. Mohler, president Union Pacific Railroad, has, since the original conception of gasoline motor cars, advocated higher powered units, and this new 300-hp engine was designed to meet his views. The equipment of the baggage, mail, express car with power is the conception of Charles Ware, general manager Union Pacific Railroad, the idea being to substitute the motor car and coach for the existing local and branch line trains.

The past ten years' experience in operating gasoline motor cars has shown such a stimulated traffic from their use that, notwithstanding the growth in size from the early 30-ft. car to the 70-ft. passenger and power car hauling a 30-ft. trailer, the size of the gasoline equipment must be still further increased. The new double-unit was designed in consequence. Large revenue capacity in comparison to the low dead weight, high acceleration and facility (account of light weight) in making local stops, all tend to very much improved economic results in handling passengers, mail, express and baggage on main line locals as well as branch line trains. Greater economy, less depreciation, greater safety, higher speed, greater flexibility, higher earning capacity and greater stimulation of the public good will are some of the advantages of the double gasoline unit over the five-unit steam train.

On its initial trip the new car made a speed of 55 m.p.h., and it will now go into service between Kearney, Neb., and Stapleton, Neb., displacing the old-style steam train. The distance is 103 miles, involving a round trip of 206 miles a day, which will result in a monthly average of something over 6000 miles, exceeding the average monthly mileage of passenger locomotives. The seating capacity of the motor-car train is 78 passengers, while that of the displaced steam train was 70.

The McKeen, Type "D," 300-hp, reversible engine truck is an enlargement of the latest model, Type "C," foolproof, 200-hp motor truck, the present standards and design being the results of ten years' experience



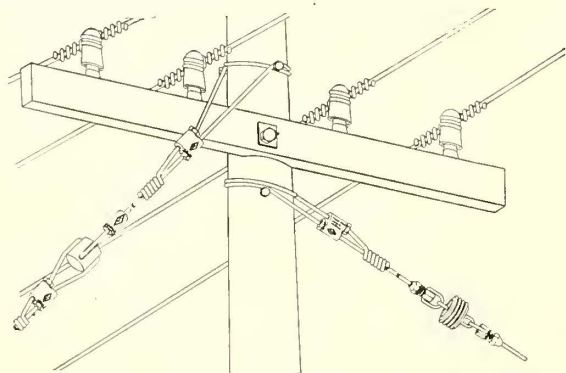
GASOLINE EXPRESS CAR WITH 300-HP ENGINE AND STEEL TRAIL COACH

in the practical operation of gasoline motor cars. The engine is reversed by air-pressure mechanism, the control of which, together with the throttle, is placed on the right hand side of the engine, enabling the motor-man to remain seated while taking signals and operating the car and affording the maximum of ease and convenience. The weight on drivers is 33,800 lb., and the tractive effort, 8200 lb.

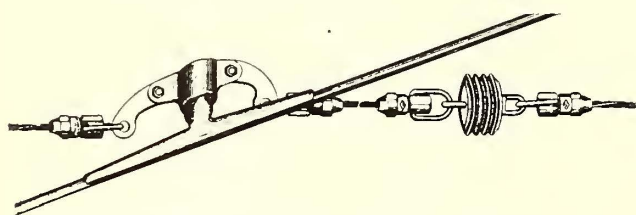
Mechanical Cable Connectors

Mechanical cable connectors that possess unusual features of reliability and rapidity of application have been brought out recently by the Fargo Manufacturing Company, Poughkeepsie, N. Y. These are made in two general types, of which one is a compression device whereby butt joints of cable ends are made so tightly that the metal is, to all practical purposes, actually welded together. The other is an ingenious scheme for twisting the ends of two cables together in much the same manner that a lineman makes connections except that the work of twisting is done mechanically, the lineman's pliers being replaced by a wrench, and the result is that absolute uniformity of each joint is attained with the expenditure of a minimum of time and skill. Both types are made in an infinite variety of forms.

The compression type of connection, known as "Type A," is made up of two couplings or sleeves, male and female, and two cone-shaped gripping cones with composition ends where they butt together. The cable ends that are to be connected pass through these gripping cones and when the couplings are screwed together the grips are wedged against the cables. At the same time they are drawn toward each other, so that the cable



APPLICATION OF COMPRESSION-TYPE CABLE GRIPS

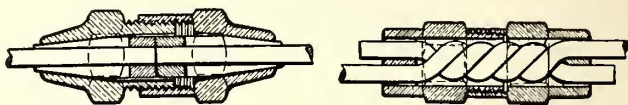


COMPRESSION-TYPE STEEL GUY GRIPS INSTALLED ON SPAN WIRE

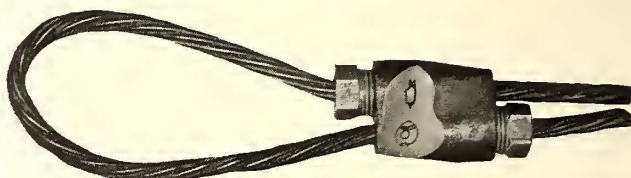
ends can be pressed one against the other as tightly as desired. When the couplings are unscrewed the joint, of course, is broken and the cable ends are separated, but unless a wrench is used the joint has all the strength and conductivity of a weld. This has been demonstrated by sawing the couplings off a made-up joint, the grips being found to be stuck together so tightly that the joint between them could not be broken by the hands.

The Type A connections are used not only for conductors but also for guy wires, span wires and, in fact, in all cases where cables are ordinarily spliced, all common

contingencies being provided for by variations that follow the general principle of the Type A straight connection. One of these is a steel cable grip in which the gripping cones are set side by side in a single casting, the pressure on the cable being applied by stuffing boxes that are screwed against the ends of the gripping cones. Another form, a guy grip especially adapted for span

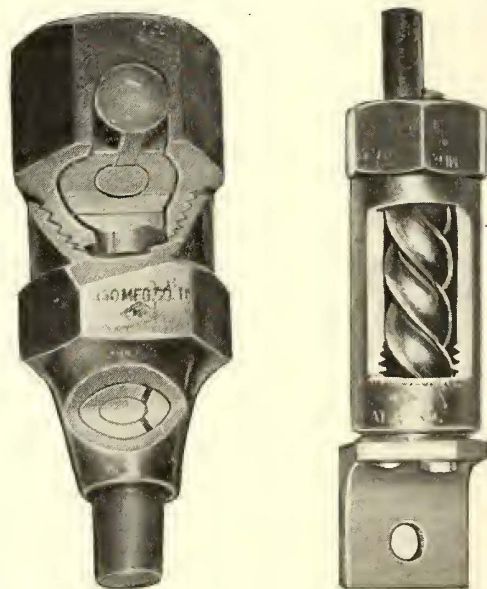


CROSS-SECTIONS OF COMPRESSION-TYPE AND TWISTED-TYPE STRAIGHT CABLE CONNECTIONS



CABLE GRIP OF COMPRESSION TYPE

wires, has a bail passed through the casting which takes the place of the male half of the coupling for the straight cable connection. This, like all the other forms of the general type, has its grip increased with a larger pull, and puts an absolutely even strain on all strands of the cable. The cutting of strands is naturally eliminated



TYPICAL CONNECTORS FILED AWAY TO SHOW CONSTRUCTION

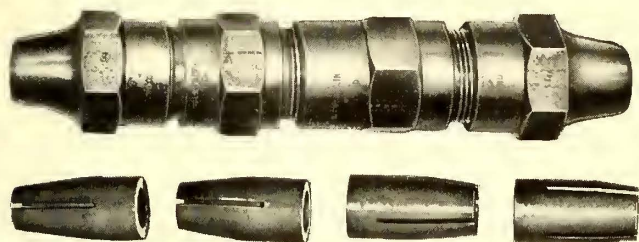
and a great deal of time is saved in installation, as the only work involved is pushing the cable end into the grip and then screwing up several turns on the male casting. One lineman is said to place one of these cable grips in six minutes. The connections are made either with single or with double grips in series, the latter form, with its four gripping cones, being shown in one of the accompanying halftones.

The same general principle is applied to cable lugs, busbar connections, guy terminals with bolts that thread into the dead-ending insulator, terminal connections, ground points and even wye, ell, and tee connections. These various devices are made up merely by changing the shape of the casting that takes the place of the couplings in the straight cable connection.

The other general type of cable-connecting device, which is known as Type B, is made in practically all of the various forms suitable for the Type A construction. The principle involved is exceedingly simple, the cables

to be connected being merely passed through two holes in the ends of a pair of hollow couplings which are then screwed together. As the couplings turn the cables are twisted together in the hollow interior and at the same time are compressed longitudinally. In consequence, the twisted strands lie closely and evenly together, making a much better joint than could be made by hand pliers.

The strands are, of course, locked without cutting or denting and beyond any possibility of physical failure.



CABLE CONNECTION OF DOUBLE GRIP FORM AND ITS FOUR GRIPPING CONES

At the same time the casing formed by the hollow couplings constitutes a perfect protection, and keeps the wires always bright and in good condition electrically and mechanically. The casing, however, is not needed as a current conductor, as the conductivity of the bond between wires is increased 50 per cent over that of the line. As in the case of Type A, the Type B connectors are made for either single or double joints, the latter being provided for by an extra section of coupling with a central diaphragm containing two holes for the cables. This forms the joint in two twisted sections in series with each other.

Trolley Frogs for High-Speed Operation

Considerable interest has developed in the Type BR trolley frogs made by the Westinghouse Electric & Manufacturing Company, because of the claim that with this frog the trolley wheel never travels on its flanges. The value of this feature is readily apparent, particularly at points where high speeds obtain. Frog troubles at high speed are due largely to the fact that the trolley wheel travels on its flanges for a short space and a bump is caused when the bearing of the wheel transfers from the groove to the flange, which dislodges the wheel from the wire at these points.

In the Type BR frog, all this is avoided without the use of a shifting tongue or similar device, simply by the overlapping of the runners, as was shown in the illustration printed on page 428 of the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 27, 1915. There is practically a continuous contact of the tread of the wheel during the period of transition. Another effect of this continuous contact between the wheel and the frog is the possibility of using malleable iron frogs, with the consequent long life. The chief objection to malleable iron frogs heretofore has been the short life of trolley wheels owing to the burning of the flanges. As there is no running on the flanges with the Type BR frog this objection disappears. One more feature tending to increase the life of trolley wheels is pointed out by the manufacturers in connection with the Type BR frog; that is, that the frog can be placed almost directly over the track switch point because the trolley wheel does not have to be dragged angularly before entering the frog. This saves not only the wheel but the life of the trolley wire at this point. The frogs are made regularly in angles of 8 deg. and 15 deg. with malleable-iron bodies and bronze approaches.

Performance of Pennsylvania Railroad Locomotives

Some interesting figures have just been given out on the performance of the Westinghouse electric locomotives used by the Pennsylvania Railroad on the Manhattan Division, operating passenger trains through tunnels that enter New York under the Hudson River.

These locomotives were designed to start and accelerate a 550-ton train in addition to the locomotive, on a 1.93 per cent grade, but in actual operation 850-ton trains are frequently started on this grade and trains of fourteen all-steel cars, weighing more than 1000 tons, are handled without difficulty. The weight on drivers is 199,000 lb., and tractive efforts of 79,000 lb. have been registered in actual service. The continuous rating of each of the two motors with which the locomotive is equipped is 1000 hp and its weight is 43,000 lb.

Each locomotive in service passes over an inspection pit every twenty-four hours, the average time required for this inspection being approximately ten minutes. After 3000 miles the locomotives are taken into the shop for a general inspection. Shopping for general repairs is governed by tire wear, and mileages of from 90,000 to 112,000 are not unusual.

On Nov. 28, 1914, the thirty-three locomotives had completed four years' service, and during that period the mileage made and the detention record is as follows:

| | |
|---|-----------|
| Locomotive-miles | 3,974,746 |
| Total engine failures | 45 |
| Locomotive-miles per detention | 88,328 |
| Total minutes detention to trains | 271 |

During this period 463,558 train movements were made, or an average of 1300 movements per detention due to engine failures.

Dual Ownership in Alsace

Consul Milo A. Jewett at Kehl, Germany, reports that Strassburg, Alsace, encouraged by the good results of the joint ownership of lighting stations, made a similar change in the street railway organization in 1912. The old private street railway was reorganized. The capital of the new company was divided into \$595,000 preferred stock, privately owned, and \$595,000 common stock in the possession of the City Council. Both kinds of shares carry preferred dividends of 6 per cent. Of the remaining profit the city takes 30 per cent in dues for the use of the streets and bridges until the profit reaches \$71,400; 40 per cent of the surplus profits between \$71,400 and \$95,200 and 50 per cent of the surplus over \$95,200. The concession extends to 1965. The by-laws of the company were modified and adapted to the new agreement. The Municipal Council appoints four of the ten members of the board of directors. The length of the street railway in Strassburg is about 56 miles and there are 144 cars with motors and 319 trailers. The net profit for 1913 was \$140,443, of which \$3,570 was added to the reserve fund and \$71,400 was paid as 6 per cent dividends on the capital stock; extra dividends of 1¼ per cent on the common stock and 4 per cent on the preferred stock were also paid. Thus the city received in first dividends \$35,700; in dues (30 per cent of the surplus), \$19,696; and extra dividends, \$10,402; total, \$65,798. To this sum may also be added the dividend on one extra majority share and that portion of the directors' percentage which falls to the four directors nominated by the Council. The above total received by the city is not net profit to the city, however, since the city must pay about half of the amount as interest on borrowed capital invested in the business and for reduction of liabilities.

News of Electric Railways

INTERURBAN MOTOR BUS SERVICE

In the Vicinity of Kansas City Many Automobile Lines Have Been Established as Electric Railway Feeders

In the immediate vicinity of Kansas City, Mo., the country is gradually being covered with a network of motor transportation service connecting the smaller towns of the outlying district with the city. For the most part buses are used, seating from twelve to twenty persons, but some smaller cars are also in service. The oldest line is that operated by Ray Renick, between the suburban manufacturing city of Leeds, about 2 miles to the east of the present built-up rim of Kansas City, and the terminus of the Twenty-seventh Street car line of the Metropolitan Street Railway. This line was first operated with horses, but in May, 1914, Mr. Renick put on a motor-driven bus. A half-hour schedule is maintained. The trip requires fifteen minutes and the twenty-passenger bus is usually well loaded. The fare is 10 cents.

Raytown, a small town 6 miles further to the east from Kansas City, beyond Leeds, also has a jitney service over a good rock road. The passengers pay 20 cents for the trip to the end of the Twenty-seventh Street line of the Metropolitan Street Railway, Kansas City.

F. W. Allen has established a motor-driven bus line between Belton, which has a population in excess of 1000 and is south of the city, through Grandview, Hickman Mill and Dodson to the corner of Thirteenth and Walnut Streets, in the heart of Kansas City, where connection is made with the Kansas City, Clay County & St. Joseph Railway. The distance is 20 miles, six of which parallel the Metropolitan Street Railway in the city. Mr. Allen does not consider this city service particularly profitable except as an advertisement of his service on the rest of the route he covers and he will probably discontinue the downtown run soon.

An autobus service between Parkville, Mo., a college town, and Kansas City, a distance of 9 miles, has proved profitable to the motor-bus owner, W. G. Leavel, who established it, for the reason that students use the line to and fro, going "out" in the morning and "in" in the evening, while the residents of Parkville come "in" in the morning and go "out" in the evening after a day's business or shopping. Thus the bus is loaded both ways. The one-way fare is 30 cents, with a charge of 50 cents for the round trip. North Kansas City, the new Swift-Armour suburban city across the river, is included in the route, which terminates at Eighth Street and Grand Avenue, Kansas City, Mo., and competes between North Kansas City and this point with the local traction system.

Independence, Mo., the eastern terminus of a Metropolitan Street Railway interurban line, now has two motor-bus lines connecting the rural towns Buckner and Osceola with Kansas City. The routes cover proposed trolley lines.

Another interurban feeder just established is the touring-car service between Platte City, Mo., which is a station on the Kansas City, Clay County & St. Joseph Railway, and Ferrell View, 8 miles beyond. This gives Ferrell View a Kansas City connection. Operation as yet is not on a fixed schedule.

The interurban motors are getting started also in the vicinity of St. Joseph. The latest line is that established by G. L. Rugg between Wathena, Mo., and St. Joseph. A combination Studebaker makes four round trips a day over 8 miles for 35 cents a single trip and supplements its passenger traffic with a light express traffic which consists largely in cargoes of butter, eggs and other country produce going "in" and supplies for the farm home going "out." Mr. Rugg plans to add a line from Wathena to Troy, a distance of 16 miles, making car service between Troy and St. Joseph, a distance of 24 miles. Residents of Wathena and Troy have been reaching St. Joseph by a roundabout steam railroad route. Motor-car service is also projected between St. Joseph and De Kalb.

The country-produce and store-delivery express business under proper regulation and restriction that will not permit delay and too much slowing of the schedule for passen-

gers is growing. It has been made a feature of the new interurban autobus service between Independence and Wellington, Kan.

Probably the best, or at least the most prolific, development of interurban jitney service in this section is in the general vicinity of Springfield, Carthage, Webb City and Joplin. Here the Southwest Missouri Railroad operates 76 miles of interurban electric railway. In this territory the population is dense and organized communities numerous. Hence the autobus interurban, which fills in the unoccupied places and carries the people to a trolley connection. In some cases the company itself has instituted the autobus service. In others it has merely encouraged and co-operated with it. The latest line is from Carthage to Jasper, Mo., where a \$30,000 bus line will cover the ground. Another is from Galena to Baxter Springs and another from Joplin to Neisho. Older routes in the Southwest Missouri section are from Joplin to Seneca, from Joplin to Granby and Diamond, from Granby to Neosho, from Carthage to Asbury and from Carthage to Golden City, a distance of 40 miles. There are also some lines out of Webb City and Springfield.

NEW SUBWAY LINES OPENED

Brooklyn celebrated the opening of the Fourth Avenue subway with appropriate exercises on Saturday afternoon, June 19, and opened the line for traffic on June 22. The company ran a special train carrying public officials and other interested citizens on Saturday afternoon. The train started from the Chambers Street station in the new Municipal Building, Manhattan, at 1:30 o'clock and made the run through the Fourth Avenue subway to Sixty-fifth Street, and thence over the tracks of the Brooklyn company's Sea Beach railroad to Coney Island. For the present the line will be operated over this route, but eventually it will be connected with elevated railroads running to Coney Island through New Utrecht Avenue and Gravesend Avenue and also with the Brighton Beach division of the Brooklyn Rapid Transit system. The New York Consolidated Railroad Company will operate the new line in accordance with the dual system lease, which provides for sharing the profits with the city.

On June 22, the Public Service Commission for the First District placed in operation the Steinway Tunnel line between Manhattan and Queens. This line runs from Forty-second Street, between Lexington and Third Avenues, Manhattan, under the East River to Jackson and Van Alst Avenues, Long Island City. Under the dual system contracts the title to the tunnel was transferred to the city, and it will be operated by the Interborough Rapid Transit Company with free transfers to and from the existing subway. The opening ceremonies were held at 11 o'clock, and the permanent operation for general traffic was begun at noon.

PROGRESS ON BOSTON TUNNEL

Rapid progress is being made by the Boston (Mass.) Transit Commission in the construction of the section of the Dorchester tunnel between upper Summer Street and the South Station. At Dewey Square one of the most important underground stations of the Boston rapid transit system is being built, and it is expected that by July 1 finishing work can be begun. Operation of the Summer Street section of the Dorchester tunnel will probably commence in the fall, providing rapid transit by trains of the Boston Elevated Railway between the South Station, Cambridge and points west. Upon the completion of the Dewey Square station it will be operated as a temporary terminal pending the extension of the tunnel along Fort Point Channel toward South Boston and Dorchester, and the new Washington station recently opened for traffic will become a way station. The Dewey Square station will include two platforms 350 ft. long for east-bound and west-bound traffic and a mezzanine lobby just below the street level, with escalator connections running to the exits. The station will be the lowest on the rapid transit system and will afford quick connection with

the Boston Elevated service east and west for passengers arriving in the city by the New York, New Haven & Hartford Railroad and the Boston & Albany Railroad. It is being built by the Hugh Nawn Contracting Company, of Boston, and the estimated cost of the station is \$500,000. Work has been pushed day and night since last August, and 325 tons of earth have been removed daily without closing the square to traffic. The station will be 44 ft. deep and although extensive changes in piping, sewers and building supports have been required no serious accident has as yet occurred on the work.

THE CINCINNATI VALUATION

Ward Baldwin has been selected by Director of Public Service Fosdick and City Solicitor Schoenle of Cincinnati as engineer to take charge of the city's interests in the valuation of the property of the Cincinnati Traction Company which is now being made by the Ohio Public Utilities Commission. For a number of years Mr. Baldwin was professor of engineering in the University of Cincinnati and is now chief engineer of the trustees of the Cincinnati Southern Railway. At one time he was chief assistant engineer of the Southern Railway.

Replying to the request of the People's Power League that E. W. Bemis, Chicago, be selected for this post Mr. Schoenle said he is neither a civil nor a mechanical engineer and is not familiar with conditions in Cincinnati.

The court of Common Pleas has returned a judgment of \$61,220 as the portion of the cost of the Ludlow Avenue viaduct that must be paid by the Cincinnati Traction Company. The Baltimore & Ohio Southwestern Railroad paid 65 per cent of the cost and the city sued the traction company for half of the remainder, claiming this to be due under an agreement in its franchise.

MUNICIPAL OWNERSHIP OPPOSED

Peter Witt, street railway commissioner of Cleveland, Ohio, replying to the demand of the Cleveland Socialists, recently went on record as opposed to the purchase of the Cleveland Railway property by the city at the present time. Mayor Newton D. Baker said that if the city purchased the railway property by issuing bonds a security franchise would have to be made in favor of the bondholders. Seemingly, he is of the same opinion as Mr. Witt with respect to the street railway, although he advocates taking over the property of the Cleveland Electric Illuminating Company as soon as possible.

The Broadway Improvement Association was organized at Cleveland on June 16 to oppose the granting of a franchise to the Cleveland & Youngstown Railroad Company that will close forty streets within the territory bounded by Broadway, Orange Avenue, East Ninth Street and East Thirty-fourth Street. At the meeting a resolution protesting against the grant was adopted. The franchise has been approved by the board of directors of the Builders' Exchange, following a tour of inspection of the line.

THE CLEVELAND & YOUNGSTOWN RAILROAD

The success of the effort of the Cleveland & Youngstown Railroad for a franchise for a high level freight terminal in the heart of Cleveland, Ohio, will probably depend on whether steam or electric power is to be used in the yards that have been planned. The company was originally incorporated to operate an electric railway, but Attorney J. L. Cannon told the City Council on June 21 that the company desired to use steam for the operation of the freight yards.

The public utilities and the transportation committees of the Cleveland Chamber of Commerce have both reported to the Council committee of the whole, approving the company's plan. The proposed location for the yards will damage private property less than any other place in the city, the reports say, and the fact that certain streets will be closed or diverted from their present course can be arranged satisfactorily. The company, however, has proposed a plan of building a subway that will prevent interference with Broadway and this will perhaps do away with much of the objection that has been made to the plan by property owners in the section to be used.

Pennsylvania Full-Crew Law.—Governor Brumbaugh has vetoed the bill designed to repeal the full-crew law of Pennsylvania.

Mr. Herr Honored.—Edwin M. Herr, president of the Westinghouse Electric & Manufacturing Company, received the honorary degree of Master of Arts on June 23 from Yale University, his alma mater.

Extension of Portland Electrification.—Robert E. Strahorn, president of the Portland, Eugene & Eastern Railroad, Portland, Ore., recently announced plans for the electrification of the line from Whiteson to Corvallis, a distance of 43 miles, in the near future.

Sale of New York Bonds.—The city of New York will receive bids on June 29 for the sale of \$71,000,000 of 4½ per cent bonds. Of the proceeds \$46,000,000 will be applied to payments on the new subway system, dock improvements and for water supply. Of the remaining \$25,000,000 a considerable amount will be used for refunding purposes.

Detroit Purchase Action Postponed.—As the contract for the purchase by the city of the lines of the Detroit (Mich.) United Railway within the city was not in shape to be submitted to the stockholders of the company on June 16, the meeting to act on the plan to sell to the city was postponed and the question will not come before the stockholders on June 30.

Chicago Elevated Damage Decision.—Litigation between the estate of Edwin P. Brand and the elevated railroads in Chicago, for damages from construction of the so-called "downtown loop," was decided on June 21 by the Supreme Court of the United States in favor of the railroads, because of insufficient proof and without consideration of constitutional questions.

Electrification of Birmingham Suburban Line.—The Birmingham (Ala.) *News* referred recently to the possibility of the Atlanta, Birmingham & Atlantic Railroad being electrified in the immediate Birmingham district, Woodward and Bessemer, and the likelihood of the operation of electric cars of the Birmingham, Ensley & Bessemer Railroad over the two systems.

Opening of Chicago Arbitration Delayed.—It was expected that the arbitrators selected to pass upon the questions at issue between the Chicago Surface Lines and the Chicago Elevated Railways and their employees would begin their sessions on June 21, but the absence of State's Attorney Maclay Hoyne, representing the men, from the city resulted in a postponement to June 24. The company will be represented on the board by James M. Sheean. Mayor Thompson will act as umpire.

Seattle Lease Plan Defeated.—Action on the plan advocated by Alderman Allen Dale of Seattle, Wash., of leasing Division A of the Seattle Municipal Railway to the Puget Sound Traction, Light & Power Company has been indefinitely postponed. Alderman Dale favored the abandonment of municipal ownership of the railway by the city until after the franchises of the Puget Sound Traction, Light & Power Company expire in 1925 and 1934. He pointed out that this was the procedure followed in San Francisco.

Service Resumed in Alexandria.—The Southern Power & Traction Company, Alexandria, La., which suspended the operation of its railway lines on May 18, has resumed service pending the sale of the property to the city for \$30,000. The inventory of the property of the company submitted to the city by I. B. White and C. F. Crockett, receivers of the company, totaled in value \$67,633. The receivers said: "For all of this we will accept in full settlement the sum of \$30,000 cash, with the further understanding that the city shall assume the paving charges or any other claims that it may have against the company."

The Philadelphia Transit Loan.—The surveys committee of Councils of Philadelphia has reported favorably a bill directing A. Merritt Taylor, director of city transit, to contract for the relocations and the rebuilding of certain sewers in Philadelphia in the interest of the proposed Broad Street subway and Frankford elevated line. The report of the sewer bill was followed by the passing of a resolution providing for additional stated meetings of both chambers of Councils on June 23 and 30 to act on the bills appro-

prising the money and authorizing contracts to be let for an immediate start on the work of transit improvement.

Subway Ventilation in New York.—The Public Service Commission for the First District of New York has adopted a resolution directing Alfred Craven, its chief engineer, to request the Interborough Rapid Transit Company and the New York Municipal Railway Corporation to designate their consulting engineers to act together with him as a board to investigate and report with recommendations upon the question of ventilation for the dual system subways. The consulting engineers of the Interborough Company are William Barclay Parsons and S. L. F. Deyo, and those of the New York Municipal Railway are Jacobs & Davies, Inc., and L. B. Stillwell.

Franchise Renewals Opposed.—The Board of Public Utilities of Los Angeles, Cal., has adopted and forwarded to the City Council a report which advocates temporary contracts instead of franchise renewals to public service corporations. The recommendations were based on the report submitted by Chief Railway Engineer F. C. Howell of the board. Mr. Howell said that the city could take over the lines as the franchises expired, but that this would involve heavy expenditures for renewals, etc., with only 7.67 miles of disconnected line on which franchises will expire before 1926. His idea, in short, embodies a plan under which the companies may continue to operate lines covered by expiring franchises until such time as the city is prepared to acquire and operate the lines.

Brooklyn Fender Order Modified.—By a vote of three to two the Public Service Commission for the First District of New York has adopted an order modifying its previous order, requiring the Brooklyn Heights Railroad and other companies of the Brooklyn Rapid Transit System operating surface cars, to equip their cars with wheel guards and projecting fenders. The effect of the modifying order is to relieve the companies from the requirement as to projecting fenders, while leaving the former order as to wheel guards in full force. Those who voted for the modifying order were Commissioners J. Sergeant Cram, George V. S. Williams and Robert C. Wood. The prevailing opinion was written by Commissioner Cram and a dissenting opinion was filed by Commissioner Hayward.

Banquet to Mr. Smith.—Daniel W. Smith, president of the Peter Smith Heater Company, was the principal guest at a dinner on June 15 given by a number of his railway, supply and other friends. This dinner was arranged to celebrate the anniversary of the arrival at Detroit of Mr. Smith's 110-ft. yacht purchased a year ago in New York. The following gentlemen accompanied Mr. Smith on his yacht from New York by way of the St. Lawrence River to Detroit: John J. Stanley, Cleveland; Peter Witt, Cleveland; David A. Belden, Haverhill, Mass.; Dr. Thaddeus Walker, Walkerville, Ont.; William Nagel, Detroit; George Stanton, Cleveland, and Dwight B. Dean, Cleveland. At the anniversary dinner a two-hundred piece set of dishes was presented to Mr. Smith. The design of the dishes exhibits the emblems of the New York Yacht Club, the Old Town Club of Detroit, and Mr. Smith's yacht, the *Virginia*.

Agreement on Cleveland Subway Terms.—An agreement was reached on June 21 between the city of Cleveland, Ohio, and the Cleveland, Akron & Canton Terminal Railroad on all the vital points in dispute. The company had insisted upon a franchise period of ninety-nine years, while the city desired that the grant be limited to seventy-five years. A compromise was reached at eighty-five years, making the rights expire on March 1, 2000, when the property will revert to the city. Another amendment provided for the valuation of made land at the foot of Fifty-third Street at the end of seventeen years. This value plus half the increment up to any date the city may actually purchase the land will be the price that is to be paid. The ordinance was placed on its second reading after these changes had been accepted and in all probability it will come up for passage at the next regular meeting. The franchise is for a freight subway under East Fifty-fifth Street to furnish an outlet from the lake to the southern end of the city and connect with all railroads that desire its service.

Toledo Rental Case.—A motion made by Councilman Hoffman at the meeting of the City Council of Toledo, Ohio, June 21 to take the matter of collecting rent from

the Toledo Railways & Light Company for the use of the tracks on the Cherry Street bridge out of the hands of the sub-committee of the street railway committee was lost. Chairman Kilbury of the street railway committee said no action had been taken toward collecting the rent because it would "muddle the situation." He also considered the rent charge exorbitant. Councilman Ruppell insisted that the committee act in some way. If the rent was too high the committee should recommend a reduction; if not, then the company should be asked to pay it. Councilman Dotson, chairman of the franchise committee, said that the company should pay rent for the use of the bridge tracks, but to take any action now, when the committee and representatives of the company were so near an understanding on the franchise draft, would be inadvisable. He favored postponing any action until after the franchise was disposed of in some way.

Memorial Service for Dr. and Mrs. Pearson.—At 2 p. m. on June 23 memorial services were held at the Church of the Divine Paternity, New York, N. Y., for Dr. and Mrs. F. S. Pearson, who lost their lives on the *Lusitania*. The services were attended by a large number of the late Dr. Pearson's associates and friends, including delegations from the American Society of Mechanical Engineers, of which he was a member, and the New York Alumni of Tufts College, of which he was a graduate. Services at the church were conducted by the pastor, the Rev. Dr. Frank Oliver Hall. Tributes were paid to the memory of Dr. and Mrs. Pearson by Prof. William L. Hooper of Tufts College and E. W. Rice, Jr., president of the General Electric Company. Work was stopped for five minutes on the Denver & Salt Lake Railroad, of which Dr. Pearson was chairman of the board of directors, and on the Rio de Janeiro Tramway, Light & Power Company, the Sao Paulo Tramway, Light & Power Company, Barcelona Traction, Light & Power Company, the Mexican Light & Power Company and the Mexico Tramways.

Storm at Indianapolis.—The city of Indianapolis, Ind., was visited by a severe wind and rainstorm on the afternoon of June 13. One of the heaviest sufferers was the Indianapolis Traction & Terminal Company, the central damage spot being St. Clair Street, from Canal Street east to East Street. The pole line on this street carries eight to ten feeders, ranging in size from 500,000 circ. mil. to 1,000,000 circ. mil. A pole at Canal and St. Clair Streets snapped and the weight of the cables carried down the entire line of poles to East Street, a distance of ten blocks. Service was maintained on the feeders, although car operation on all lines crossing St. Clair Street was at a standstill. The broken poles were removed at once and the cables cleared from the roofs and pole tops and laid in the street. At the corner of Illinois and St. Clair Streets two temporary poles were set and the feeders tied to these in order to clear the Illinois street car line. Service on this line was resumed six hours after the accident, but the other car lines were forced to suspend until early the next morning. Except at car crossings, the feeders were allowed to remain on the street until a new line of poles, on the opposite side from the old, was set and new feeders installed.

Urbana Franchise Carried.—At a special election held at Urbana, Ohio, on June 1, the twenty-five-year interurban franchise of the Ohio Electric Railway was approved by a vote of 757 to 499. This terminates a fight which has been waged for more than a year between the company and an element which opposed the extension of the franchise at a time when the company's present franchise had nine years to run. At a previous election held last February, the franchise was rejected by an adverse majority of five, but was promptly re-enacted by the Council. The company's opponents thereupon invoked a referendum, securing 708 names to a referendum petition calling the election which has just been held. An aggressive publicity campaign, embracing newspapers, letters and circulars, was conducted in behalf of the franchise by F. B. Wright, Jr., the company's special representative, with the result that the opposition were able to muster only two-thirds as many votes against the franchise on election day as they had signers on their referendum petition. The importance of securing an extension of this interurban franchise lay in the fact that it was the only interurban franchise on the Ohio Electric Railway system which expired previous to the maturity of the company's bonds.

Financial and Corporate

ANNUAL REPORT

San Francisco Municipal Railways

The net profit on operation of the San Francisco (Cal.) Municipal Railways for the calendar year 1914 was \$216,541. After deducting the comparison charges for services rendered by other departments of the municipal government, for insurance and for taxes—thus to show the accounts as if the railways were owned by a private corporation—the net profit was \$112,476. In the comparison charge there is included \$98,047 for federal, state and municipal taxes, and \$6,018 for the estimated value of service rendered to the railway by other municipal departments. With the profits of 1914 added to those of the Geary Street Division for 1913, the total profit for two years, i.e., since the beginning of operations Dec. 28, 1912, was \$301,887—or, after deduction of comparison charges, \$157,780. An amount of \$48,971 was taken from the surplus account and transferred to the general fund of the city and county of San Francisco.

The statement of income, profit and loss for the year follows:

| | |
|--|-------------|
| Operating revenues: | |
| Passenger revenues | \$1,150,236 |
| Miscellaneous revenues | 9,202 |
| Total | \$1,159,438 |
| Operating expenses: | |
| Way and structures | \$21,852 |
| Equipment | 48,083 |
| Power | 137,839 |
| Conducting transportation | 353,033 |
| Traffic | 356 |
| General and miscellaneous | 52,774 |
| General and miscellaneous comparison charges required by charter | 6,018 |
| Depreciation—18 per cent of gross revenue | 208,698 |
| Total | \$828,656 |
| Net operating revenue | \$330,782 |
| Miscellaneous income—Income from municipal bonds owned | 6,124 |
| Gross income | \$336,905 |
| Deductions from income: | |
| Taxes—comparison charges required by charter: | |
| State franchise 5 ¼ per cent on gross revenue | \$60,870 |
| Municipal franchise 3 per cent on pass. revenue | 34,507 |
| Municipal car license | 1,533 |
| Federal income—1 per cent on net income | 1,136 |
| Total taxes | \$98,047 |
| Interest on funded debt | 122,642 |
| Other interest | 3,740 |
| Total | \$224,429 |
| Net profit for 1914 | \$112,476 |

The municipal railway pays no taxes, nor is any payment made for services rendered to it by other departments of the municipal government. The above income statement includes the comparison charges required by the charter.

Taking the profit shown above..... \$112,476
 And adding comparison charge for legal and clerical services..... 6,018
 And comparison charges for taxes..... 98,047

Produces the true net profit for the year.....\$216,541

As compared to the period from Dec. 28, 1912, to Dec. 31, 1913, the last year's results show, as stated below. The passenger revenues increased from \$444,393 to \$1,150,236, an amount of \$705,843. This was caused by the addition to the Geary Street Municipal Railway, operating in 1913, of the Union Street Division in December, 1913, the Van Ness Avenue Line and Potrero Avenue Line to the Exposition grounds in August, 1914, and the Stockton Street, Columbus Avenue and North Point Line in December, 1914. As compared to the 1913 item of \$354 there was a 1914 credit of \$9,202 for miscellaneous revenues, so that the total operating revenues increased from \$444,747 to \$1,159,438, an amount of \$714,691. The operating expenses increased from \$291,431 to \$828,656, an amount of \$537,225. This increase was divided mostly as follows: Maintenance of way and structures, \$16,193; maintenance of equipment, \$37,522; traffic, \$274; conducting transportation, \$170,936; power (not segregated in 1913); general and miscellaneous, \$44,384, and depreciation and injuries and damages, \$128,643. The net operating revenue increased \$177,466, and miscellaneous

revenues \$4,795. The deductions increased \$115,088, and the net profit \$67,172.

The reserve for depreciation and renewals is computed at 14 per cent of the gross operating revenues, instead of on annual percentages of physical value of the property. The rate of 14 per cent is arbitrary, being based on Chicago experience as reported by Bion J. Arnold (12 per cent) and the opinion of Delos F. Wilcox as expressed in a paper on "Elements of a Constructive Franchise Policy." There is added 4 per cent on the gross revenue for accidents:

The following table gives other statistical data for the year:

| | Total Amount | Per Car Mile | Per Car Hour |
|---|--------------|--------------|--------------|
| Total passenger revenue..... | \$1,150,236 | \$0.35046 | \$3.1745 |
| Total operating expense..... | 613,939 | 0.18706 | 1.6944 |
| Operating earnings (taxes and depreciation not deducted).... | \$536,297 | \$0.16340 | \$1.4801 |
| Ratio of earnings to passenger revenue | 0.4662 | | |
| Total taxes and charter charges. | \$104,065 | 0.03171 | 0.2872 |
| Ratio to passenger revenue..... | 0.0905 | | |
| Operating expenses and taxes.... | \$718,005 | 0.21877 | 1.9816 |
| Ratio to passenger revenue..... | 0.6242 | | |
| Depreciation | \$208,699 | 0.06359 | 0.5760 |
| Ratio to passenger revenue..... | 0.1814 | | |
| Operating expenses and depreciation | \$828,656 | 0.25248 | 2.2870 |
| Operating expenses, depreciation and taxes | \$926,703 | 0.28236 | 2.5576 |
| Ratio to passenger revenue..... | 0.8057 | | |
| Net income from operation..... | \$223,533 | 0.06811 | 0.6169 |
| Ratio to passenger revenue..... | 0.1943 | | |
| Passenger car mileage..... | 3,282,012 | | |
| Passenger car hours..... | 362,333 | | |
| Total platform expense (37 ½ cents per hour, 8 hours per day) | \$291,606 | 0.08885 | 0.8048 |
| Number of cars owned..... | | | 197 |
| Total single-track mileage operated Dec. 31..... | | | 37.24 |
| Passengers carried..... | | | 27,933,049 |
| Revenue passengers carried at 5 cents..... | | | 22,732,478 |

KANSAS CITY REORGANIZATION TIME EXTENDED

The time limit for the acceptance of the franchise granted the Kansas City Railways, under which title the street railway properties in Kansas City are to be reorganized, was to expire on July 7. This time limit was extended on June 21 by the lower house of the City Council for four months. The upper house referred the extension ordinance for a week. It was represented by aldermen in both houses that the franchise was favorable to the city and that the street railway interests should receive consideration on account of general financial conditions.

The proposal to extend the time for acceptance of the franchise reached the Council with a request from Mayor Jost for its granting and a special letter from Judge Hook of the Federal Court, in whose hands the street railway properties now lie under the receivership. Mayor Jost had declared that he would not countenance an extension of time unless it should be demonstrated to his satisfaction that the stockholders and the note and bondholders were reasonably near an agreement. His action in asking extension is taken to mean that such agreement is not hopeless.

The letter from Judge Hook to the Mayor follows:

"The time for the reorganization of the street railway properties of Kansas City will expire on July 7. So far I have left the initiative to certain committees of bondholders and stockholders, but they have been unable to agree upon a plan which in my opinion observes the purpose and spirit of the new franchise. My position has been that the new franchise is primarily for the benefit of the city and that the city has a direct interest in the character of the financial structure of the new company as affecting the ability of the company readily and fully to discharge during the life of the franchise all of its obligations to the public. Those obligations are many and substantial, and there would be danger if the reorganization were solely from the standpoint of the bondholder or the stockholder, or both.

"Though I have devoted very much more time to the matter than could reasonably be required by official duty, still I wish to make a final effort, and for that purpose I personally and earnestly request an extension of time for four months. I am preparing a plan of reorganization myself, the general outlines of which I have explained to you, and I will shortly submit it to the stockholders and bondholders for their adoption or rejection. If at any time during the period given me such opposition develops as will defeat the plan I propose, I shall promptly advise you and the Common Council so that the franchise ordinance may be repealed."

Alton, Jacksonville & Peoria Traction Company, Alton, Ill.—The Public Utilities Commission of Illinois has authorized the Alton, Jacksonville & Peoria Traction Company, recently taken out of receiver's hands, to issue \$347,000 each of stocks and bonds. The commission was asked to authorize an issue of \$1,270,000 in securities. It is stated that the property will be operated in conjunction with the East St. Louis & Suburban Railway, controlled by the Clark interests.

Dominion Power & Transmission Company, Ltd., Hamilton, Ont.—A dividend of 2 per cent has been declared on the \$5,100,000 of limited preference stock of the Dominion Power & Transmission Company, Ltd., payable on July 15 to holders of record of June 15. This is the same amount as was paid on Dec. 15 last and leaves a dividend of ½ of 1 per cent to be paid, after which the stock becomes common stock.

Fairmount Park Transportation Company, Philadelphia, Pa.—The property of the Fairmount Park Transportation Company was sold under foreclosure on June 22 for \$58,000 subject to \$750,000 of mortgage bonds. The purchaser was P. E. Foederer, acting for the reorganization committee.

Fort Madison (Ia.) Street Railway.—The Mississippi Valley Electric Company, Iowa City, will take over the property of the Fort Madison Street Railway, provided the new franchise to the latter company which has been passed by the City Council is approved by the people at the election which is to be held on July 15. The property will be rehabilitated by the new owners.

Halifax (N. S.) Electric Tramway.—The Nova Scotia Tramways & Power Company has applied to the Board of Public Utility Commissioners of Nova Scotia for permission to proceed with its plans to take over the property of the Halifax Electric Tramway and the hydraulic development of the Nova Scotia Light & Power Company on the Gaspereau. The company's petition asks permission to increase the capital to \$9,500,000 and to authorize \$5,000,000 of first mortgage thirty-year 5 per cent gold bonds, \$3,000,000 of the bonds to be issued at once and the balance to be reserved for future requirements. The stock is to be divided into 32,500 shares of preferred and 62,500 shares of common of a par value of \$100 each. A public hearing on the petition will be held on July 7.

Interborough Consolidated Corporation, New York, N. Y.—The Interborough Consolidated Corporation announced that its preferred stock would be ready for delivery in exchange for preferred stock of the Interborough-Metropolitan Company on and after June 23. Voting trust certificates for the Interborough-Metropolitan preferred shares may be exchanged for either voting trust certificates of Interborough Consolidated preferred stock or for the preferred stock itself. Deposits of the Interborough-Metropolitan stock and certificates may be made at the company's offices. Deposits of voting trust certificates for Interborough-Metropolitan common stock will be received on and after July 6 for exchange for certificates of the new corporation. Application has been made to the New York Stock Exchange to list \$45,740,500 of preferred stock and 932,621 shares of common stock voting trust certificates of the Interborough Consolidated Corporation. On June 23 the directors of the company declared from surplus a dividend of 1½ per cent on the preferred stock of the Interborough Consolidated Corporation, payable on July 6 to stockholders of record at the close of business July 3, 1915, and thereafter to the holders of all such preferred stock of the Interborough Consolidated Corporation as may be issued in exchange for the preferred stock of the Interborough-Metropolitan Company and the Finance & Holding Corporation. The directors have decided that hereafter dividend action will be taken quarterly.

Interstate Railways, Philadelphia, Pa.—There has been listed on the Philadelphia Stock Exchange \$704,130 of permanent preferred stock of the Interstate Railways in shares of a par value of \$10 each, full paid and non-assessable, countersigned and registered by the Real Estate Title, Insurance & Trust Company, Philadelphia, issued in exchange for a like amount of redeemable preferred stock of the company, surrendered and cancelled and stricken from the list.

Janesville & Madison Traction Company, Janesville, Wis.—The Janesville & Madison Traction Company has filed for record a mortgage for \$1,344,000 in favor of the Peoples' Savings & Trust Company, Green Bay, Wis., authorized by the stockholders at a meeting on May 14 to provide funds with which to complete the proposed road of the company.

Lisbon (Portugal) Electric Tramways, Ltd.—The net financial result of operations of the Lisbon Electric Tramways, Ltd., for the calendar year 1914 was a profit of £84,708, making a total surplus of £86,457 at the end of the year. From this amount £15,000 was placed to the credit of the depreciation reserve, and £5,000 from the exchange reserve and £19,012 credited to premium on ordinary share capital were also transferred to the depreciation reserve. During the year the company carried 63,758,037 passengers, as compared to 58,840,923 in 1913. The increased cost of supplies and the falling off in the exchange rate, however, caused a diminution of the profits by nearly £20,000.

Municipal Railways, San Francisco, Cal.—It is expected that a considerable part of the earnings of the municipal railway system of San Francisco for the next year will be needed for the extension of the road through the Twin Peaks tunnel. With the tunnel nearly 25 per cent completed, plans are already being roughly sketched for financing the railroad through the tunnel and out into the territory beyond. At a recent meeting of the city's finance committee a resolution was ordered prepared providing for setting aside nearly \$300,000 of the earnings of the municipal street railway system for investment in library or other bonds.

Plymouth & Sandwich Street Railway, Plymouth, Mass.—The Plymouth & Sandwich Street Railway has petitioned the Public Service Commission of Massachusetts for authority to issue 870 shares of additional preferred stock of a par value of \$100 each, the proceeds to be used to pay off floating debt and to complete the extension of the railway in Plymouth, Bourne and Sandwich. The stock is to be offered to the present holders of common stock at \$100 per share.

Republic Railway & Light Company, New York, N. Y.—H. F. McConnell & Company, New York, N. Y., say: "Provision has been made by the Republic Railway & Light Company to the issuance of a blanket mortgage to retire maturing bonds due this year and the note due on Jan. 1, 1916. Unsettled financial conditions, however, have caused the bankers to hesitate in offering these bonds for sale, although all arrangements have been made for underwriting the issue and taking care of maturing obligations. Officials of the company state that the dividend on the preferred stock is absolutely secure."

Southern Iowa Railway & Light Company, Albia, Ia.—A. C. Mueller, Davenport, has been appointed receiver of the Southern Iowa Railroad & Light Company as the result of a suit filed by the trustee under the mortgage securing the holders of the bonds of the company. On June 1, the company had maturing \$9,000 of bonds, which it was unable to take up.

Southern Power & Traction Company, Alexandria, La.—The sum of \$30,000 has been agreed upon as the price at which the city of Alexandria will take over the railway property of the Southern Power & Traction Company in Alexandria. As noted briefly elsewhere in this issue, the company has resumed the operation of its railway line pending the completion of the negotiations for the sale to the city.

Stockton Terminal & Eastern Railroad, Stockton, Cal.—The Railroad Commission of California has denied the application of the Stockton Terminal & Eastern Railroad for authority to issue \$319,500 of bonds for the purpose of completing its road from Bellotta to Jenny Lind under an agreement with the De Mayo Engineering & Construction Company, New York. At the hearing of the application J. E. Adams, president of the company, stated that the opinion of the directors of the company was divided on the subject.

Tidewater Southern Railway, Stockton, Cal.—Subscriptions for \$100,000 of securities of the Tidewater Southern Railway have been advanced in Modesta, Ceres and Turlock to cover the proposed extension of the line from Modesta

through Ceres to Turlock. The total cost of the extension is estimated at \$180,000, of which \$80,000 has been subscribed outside of Stanislaus County.

Washington Railway & Electric Company, Washington, D. C.—Negotiations are being conducted in Washington for the merger of the Capital Traction Company and the Washington Railway & Electric Company. It is now said that the only thing standing in the way of an agreement between the two companies is whether proposed collateral trust bonds to be issued by the Washington Railway & Electric Company in exchange for the capital stock of the Capital Traction Company shall bear 5 per cent or 6 per cent interest. The proposed bond issue would be secured by deposit with the trustee, to be named, of the entire stock issue of the Capital Traction Company. Failure to meet payments on the collateral trust bonds when due would result in the reversion of the Capital Traction Company shares to the holders of the collateral trust bonds. The Capital Traction Company has outstanding \$12,000,000 of stock on which dividends of 6 per cent a year have been paid since 1905. The proposed basis of exchange of the stock for bonds has not been divulged. Besides requiring the approval of the stockholders of both corporations the plan would also have to be approved by the Public Service Commission of the District of Columbia and by the national Congress.

Western Ohio Railway, Lima, Ohio.—Application has been made to the Public Utilities Commission of Ohio by the Western Ohio Railroad for permission to sell its property to the Western Ohio Railway. Application has also been made to sell its property in Sidney to the Standard Power & Equipment Company.

DIVIDENDS DECLARED

Asheville Power & Light Company, Asheville, N. C., quarterly, 1 3/4 per cent, preferred.

California Railway & Power Company, San Francisco, Cal., quarterly, 1 3/4 per cent, prior preferred stock.

Carolina Power & Light Company, Raleigh, N. C., quarterly, 1 3/4 per cent, preferred.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1 1/4 per cent, preferred; quarterly, 1 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., 1 1/2 per cent, preferred; quarterly, 1 1/2 per cent, common.

Cincinnati (Ohio) Street Railway, quarterly, 1 1/2 per cent.

City Railway, Dayton, Ohio, quarterly, 1 1/2 per cent, common and preferred.

Columbia Railway, Gas & Electric Company, Columbia, S. C., quarterly, 1 1/2 per cent, preferred.

Columbus (Ga.) Electric Company, 3 per cent, preferred. **Columbus Railway, Power & Light Company, Columbus, Ohio**, quarterly, 1 1/2 per cent, preferred A.

Consolidated Traction Company of New Jersey, Newark, N. J., 2 per cent.

Germantown (Pa.) Passenger Railway, quarterly, \$1.31 1/4.

Halifax (N. S.) Electric Tramway, quarterly, 2 per cent.

Hestonville, Mantau & Fairmont Passenger Railway, Philadelphia, Pa., \$1.50, preferred; \$1, common.

Interborough Consolidated Corporation, New York, N. Y., quarterly, 1 1/2 per cent, preferred.

New York State Railways, Rochester, N. Y., quarterly, 1 1/4 per cent, preferred; quarterly, 1 per cent, common.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 1 1/2 per cent.

Reading (Pa.) Traction Company, 75 cents.

Republic Railway & Light Company, New York, N. Y., quarterly, 1 1/2 per cent, preferred.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, \$3.

Tri-City Railway & Light Company, Davenport, Ia., quarterly, 1 per cent, common.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., quarterly, 1 1/2 per cent, preferred.

Washington Water Power Company, Spokane, Wash., quarterly, 1 1/2 per cent.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1 1/4 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

| ATLANTIC SHORE RAILWAY, KENNEBUNK, MAINE | | | | | |
|--|--------------------|--------------------|------------------|---------------|--------------|
| Period | Operating Revenues | Operating Expenses | Operating Income | Fixed Charges | Net Income |
| 1m., May, '15 | \$27,879 | \$25,319 | \$2,560 | \$685 | \$1,675 |
| 1 " " '14 | 27,199 | 23,563 | 3,636 | 650 | 2,986 |
| AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL. | | | | | |
| 1m., Apr., '15 | \$142,011 | \$96,837 | \$45,174 | \$40,039 | \$5,135 |
| 1 " " '14 | 155,640 | 105,492 | 50,148 | 37,833 | 12,765 |
| 10 " " '15 | 1,653,821 | 1,061,363 | 592,457 | 398,809 | 193,648 |
| 10 " " '14 | 1,733,775 | 1,093,703 | 640,072 | 380,655 | 259,417 |
| BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS. | | | | | |
| 1m., Apr., '15 | \$69,861 | *\$61,584 | \$8,277 | \$17,177 | †\$8,809 |
| 1 " " '14 | 70,566 | *37,738 | 32,828 | 32,502 | 1,405 |
| 10 " " '15 | 795,163 | *715,638 | 79,465 | 172,338 | †\$191,472 |
| 10 " " '14 | 822,454 | *720,077 | 102,377 | 170,764 | †\$166,812 |
| CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO | | | | | |
| 1m., Apr., '15 | \$30,151 | *\$18,266 | \$11,886 | \$10,961 | \$925 |
| 1 " " '14 | 31,896 | *17,316 | 14,580 | 11,005 | 3,575 |
| 4 " " '15 | 113,038 | *69,127 | 43,911 | 43,779 | 132 |
| 4 " " '14 | 115,833 | *66,498 | 49,335 | 43,789 | 5,546 |
| THE CONNECTICUT COMPANY, NEW HAVEN, CONN. | | | | | |
| 1m., Apr., '15 | \$612,898 | *\$449,561 | \$163,337 | \$98,178 | †\$86,710 |
| 1 " " '14 | 618,574 | *414,349 | 204,225 | 88,372 | †137,269 |
| 10 " " '15 | 6,587,443 | *4,809,690 | 1,777,753 | 982,711 | †\$1,011,255 |
| 10 " " '14 | 6,626,482 | *4,878,424 | 1,748,058 | 890,634 | †\$1,074,659 |
| FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY, FORT WAYNE, IND. | | | | | |
| 1m., Apr., '15 | \$135,938 | \$80,340 | \$55,598 | \$53,257 | †\$2,624 |
| 1 " " '14 | 146,264 | 86,078 | 60,186 | 52,640 | †7,733 |
| 4 " " '15 | 566,280 | 324,105 | 242,175 | 213,871 | †\$29,623 |
| 4 " " '14 | 606,695 | 346,617 | 260,078 | 205,612 | †\$55,498 |
| HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y. | | | | | |
| 1m., Apr., '15 | \$465,488 | *\$190,929 | \$274,559 | \$211,748 | \$62,811 |
| 1 " " '14 | 484,776 | *196,942 | 287,834 | 208,008 | 79,826 |
| 4 " " '15 | 1,861,908 | *777,400 | 1,084,507 | 844,852 | 239,655 |
| 4 " " '14 | 1,911,468 | 787,848 | 1,123,020 | 831,199 | 292,421 |
| INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y. | | | | | |
| 1m., Apr., '15 | \$2,926,690 | *\$1,268,849 | \$1,657,841 | \$907,378 | †\$806,365 |
| 1 " " '14 | 3,020,204 | *1,245,325 | 1,774,879 | 907,378 | †\$904,740 |
| 10 " " '15 | 27,839,526 | *12,556,348 | 15,283,178 | 9,091,696 | †\$6,684,503 |
| 10 " " '14 | 27,851,791 | *12,472,276 | 15,379,515 | 9,299,842 | †\$6,581,146 |
| KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY. | | | | | |
| 1m., Apr., '15 | \$63,612 | \$33,153 | \$30,059 | \$29,754 | †\$15,193 |
| 1 " " '14 | 62,538 | 34,872 | 27,666 | 20,739 | †11,346 |
| 10 " " '15 | 673,217 | 358,307 | 314,910 | 197,748 | †144,690 |
| 10 " " '14 | 639,170 | 338,121 | 301,049 | 204,862 | †123,675 |
| LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO | | | | | |
| 1m., Apr., '15 | \$101,548 | *\$71,191 | \$30,357 | \$35,963 | †\$5,606 |
| 1 " " '14 | 109,200 | *75,175 | 34,025 | 35,287 | †1,262 |
| 4 " " '15 | 391,307 | *282,175 | 109,132 | 143,871 | †\$34,739 |
| 4 " " '14 | 410,161 | *278,344 | 131,817 | 140,929 | †\$9,111 |
| NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y. | | | | | |
| 1m., Apr., '15 | \$25,508 | *\$23,247 | \$2,261 | \$7,976 | †\$5,692 |
| 1 " " '14 | 25,903 | *23,520 | 2,383 | 7,807 | †\$5,402 |
| 10 " " '15 | 308,568 | *255,950 | 52,618 | 79,061 | †\$26,070 |
| 10 " " '14 | 301,058 | *248,200 | 52,858 | 77,301 | †\$24,054 |
| NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y. | | | | | |
| 1m., Apr., '15 | \$37,555 | *\$48,041 | †\$5,486 | \$5,990 | ††\$11,407 |
| 1 " " '14 | 34,340 | *41,385 | †7,045 | 5,013 | ††11,624 |
| 10 " " '15 | 366,508 | *435,442 | †68,934 | 63,608 | ††130,881 |
| 10 " " '14 | 325,413 | *480,065 | †154,652 | 57,159 | ††206,939 |
| NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO | | | | | |
| 1m., Apr., '15 | \$279,282 | *\$183,538 | \$95,744 | \$51,423 | \$44,321 |
| 1 " " '14 | 287,719 | *173,322 | 114,397 | 50,331 | 64,066 |
| 4 " " '15 | 1,101,351 | *709,451 | 391,900 | 204,347 | 187,463 |
| 4 " " '14 | 1,080,884 | *668,302 | 412,582 | 200,155 | 212,427 |
| PACIFIC GAS & ELECTRIC COMPANY, SACRAMENTO, CAL. | | | | | |
| 3m., Mar., '15 | 4,749,327 | *2,290,725 | 2,458,602 | 1,104,231 | †1,425,685 |
| 3 " " '14 | 4,342,576 | *2,237,961 | 2,104,615 | 1,108,079 | †1,094,898 |
| PHILADELPHIA (PA.) RAPID TRANSIT COMPANY | | | | | |
| 1m., May, '15 | \$2,070,160 | \$1,213,939 | \$856,221 | \$817,319 | \$38,902 |
| 1 " " '14 | 2,178,843 | 1,260,510 | 918,332 | 605,473 | 112,559 |
| 11 " " '15 | 21,846,997 | 12,700,116 | 9,146,851 | 8,918,780 | 228,071 |
| 11 " " '14 | 22,195,756 | 13,089,933 | 9,105,773 | 8,817,810 | 287,963 |
| PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE. | | | | | |
| 1m., Apr., '15 | \$442,526 | *\$248,634 | \$193,892 | \$182,985 | \$10,907 |
| 1 " " '14 | 533,973 | *286,989 | 246,984 | 176,595 | 70,389 |
| 12 " " '15 | 5,886,595 | *3,182,996 | 2,703,599 | 2,202,489 | 501,110 |
| 12 " " '14 | 6,751,158 | *3,335,666 | 3,415,492 | 2,082,284 | 1,333,208 |
| REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y. | | | | | |
| 1m., Mar., '15 | \$242,236 | *\$157,143 | \$85,094 | \$56,840 | †\$28,257 |
| 1 " " '14 | 248,882 | *156,756 | 92,126 | 55,963 | †\$36,208 |
| 3 " " '15 | 724,837 | *456,844 | 267,993 | 170,634 | †\$97,625 |
| 3 " " '14 | 739,118 | *466,070 | 273,048 | 166,682 | †\$106,586 |
| THE RHODE ISLAND COMPANY, PROVIDENCE, R. I. | | | | | |
| 1m., Apr., '15 | \$349,814 | *\$329,941 | \$19,873 | \$117,301 | †\$70,607 |
| 1 " " '14 | 415,948 | *304,859 | 111,089 | 111,264 | †\$26,225 |
| 10 " " '15 | 4,263,809 | *3,308,088 | 955,721 | 1,179,249 | †\$129,672 |
| 10 " " '14 | 4,404,417 | *3,301,197 | 1,103,220 | 1,080,699 | †\$139,363 |
| VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA. | | | | | |
| 1m., Apr., '15 | \$410,943 | \$201,145 | \$209,798 | \$136,904 | †\$80,505 |
| 1 " " '14 | 420,582 | 192,998 | 227,584 | 134,969 | †\$98,442 |
| 10 " " '15 | 4,271,727 | 2,060,012 | 2,211,715 | 1,362,488 | †\$916,559 |
| 10 " " '14 | 4,284,090 | 2,048,974 | 2,235,116 | 1,343,958 | †\$961,903 |
| WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y. | | | | | |
| 1m., Apr., '15 | \$19,369 | *\$21,097 | †\$1,728 | \$1,449 | †\$3,168 |
| 1 " " '14 | 19,384 | *21,241 | †1,857 | 1,190 | ††\$3,043 |
| 10 " " '15 | 213,056 | *224,792 | †11,736 | 13,168 | †\$24,799 |
| 10 " " '14 | 205,064 | *214,789 | †9,725 | 11,098 | †\$20,638 |

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

Traffic and Transportation

THE JITNEY BUS

The Jitney Problem in Philadelphia—Company's Interesting Tabulation of Bond and License Requirements in Ordinances Already Passed

The question of jitney regulation is before the law committee of the Select and Common Councils of Philadelphia. The original ordinance fixed the license fee at \$25 for each car, with a liability bond of \$2,500. On June 18 the law committee approved a bill that called for a license fee of \$50 and a liability bond of \$2,500 for all jitneys and taxicabs. The committee decided, however, that in case of a company operating more than ten cabs or cars it shall put up a single bond of \$50,000. The committee also decided upon zone rates.

The case of the Philadelphia Rapid Transit Company was presented to the committee of the Councils in the form of a memorandum from T. E. Mitten, president of the company, to which was appended a statement of taxes paid by the company in 1914 and a table giving information in regard to the indemnity bonds and license fees that are required in various cities which have enacted regulatory ordinances.

The statement of the company showed that the Philadelphia Rapid Transit Company has property devoted to the transportation business in Philadelphia which the State authorities last year assessed for taxation at a value of \$164,023,727. Out of gross receipts of \$24,255,813 it last year paid taxes to city, State and nation of \$1,903,662, or more than 7½ per cent of its gross receipts. It carries every day more than 1,500,000 passengers and it pays out every year in wages to its 10,750 employees more than \$8,500,000. The city is a part owner of the property, for in addition to receiving each year \$700,000 cash as taxes and on account of paving, a sinking fund is being built up out of the receipts of the company through which the city of Philadelphia will acquire the property of the company in 1957.

At the present time the loss from the jitney is estimated at not less than \$3,000 a day, or at the rate of \$1,000,000 a year. If continued, this loss can only be met by reducing wages or decreasing the number of cars operated. The company contends that if the jitney is to be operated it must be regulated, its routes should be ascertained, the fares to be paid should be fixed, the schedules should be maintained, congestion should be avoided, and those engaged in the business should not only pay their fair share of taxes through a proper license fee, but should also give a bond sufficient to insure a response in damages where accidents happen through their negligence. Mr. Mitten said that if it is felt that the best interests of Philadelphia require jitney competition in the transportation business then competition should be fair, as any unfair or wasteful competition can only do harm in the long run. At present the competition is unfair in respect to length of ride, in respect to regularity, in respect to responsibility for damages, and in respect to taxation.

The statement made by the company to the committee of the Councils is concluded in part as follows:

"All the company asks is a square deal. If you believe that the jitney should be licensed for the good of the community, then let the license be granted on such terms that the competition is fair. Let the jitney pay its fair proportion of taxes. Let it give assurances that it will respond in damages where accidents have happened. Let its routes be established and its schedules maintained in the lean hours as well as in the fat ones. In other words, make it a real business with real obligations to the public, and the Philadelphia Rapid Transit Company will then do its best to adjust its schedules and its business to the changed conditions."

The provisions of practically all the city ordinances included in the company's summary have been published previously in the ELECTRIC RAILWAY JOURNAL, but the table prepared by the company makes the data so convenient for reference that it is reproduced herewith.

| City | Population 1910 Census | Date of Passage | Amount of Bond | Annual License Fee per Car |
|--|------------------------|--------------------------------|--|--|
| Arizona: | | | | |
| Tucson..... | 13,000 | 4- 5-15 | \$2,500 | \$30—up to 7 seats 60— 8 to 10 seats 80—11 to 20 seats |
| Arkansas: | | | | |
| Little Rock..... | 45,000 | May, 1915 | \$2,000 | \$36—up to 7 seats 72— 8 to 12 seats 96—over 12 seats |
| California: | | | | |
| Long Branch..... | 17,000 | 10-27-14 | \$10,000 | \$25—up to 6 seats 30— 7 to 9 seats 35—10 to 15 seats 75—over 15 seats |
| Los Angeles..... | 319,000 | 3- 4-15 | \$10,000 | \$60 |
| Oakland..... | 150,000 | 2-12-15 | \$10,000 | \$60 |
| Pasadena..... | 30,000 | 11-21-14 | \$10,000 | \$30—up to 4 seats 35— 5 to 7 seats 45— 8 to 15 seats 55—16 to 29 seats 75—over 30 seats |
| San Francisco..... | 417,000 | May, 1915 | \$10,000 | \$10 to \$40 |
| Colorado: | | | | |
| Denver..... | 213,000 | (Must obtain a city franchise) | | |
| Pueblo..... | 44,000 | ..... | \$10,000 | \$50 |
| Georgia: | | | | |
| On June 8, 1915, the Georgia Railroad Commission rendered a decision taking full supervision over jitney buses in the State. | | | | |
| Atlanta..... | 155,000 | 4-10-15 | \$5,000 | \$75—up to 4 seats 100— 5 to 7 seats 125— 8 to 9 seats 150—over 10 seats |
| Idaho: | | | | |
| Boise..... | 17,000 | 1915 | \$10,000 for two vehicles or less \$20,000 for more than two vehicles | \$75—up to 4 seats 100— 5 to 10 seats 150—10 to 20 seats |
| Illinois: | | | | |
| Illinois Public Utilities Commission has ruled that all jitneys must obtain a Certificate of Public Convenience. | | | | |
| Kentucky: | | | | |
| Louisville..... | 224,000 | 4-22-15 | \$5,000 | \$10—up to 8 seats 20— 9 to 15 seats 25—over 15 seats |
| Louisiana: | | | | |
| New Orleans..... | 339,000 | 4-27-15 | \$5,000 | Regular motor vehicle fee. |
| Nebraska: | | | | |
| Lincoln..... | 44,000 | ..... | \$10,000 | \$25—up to 4 seats 30— 5 to 7 seats 35— 6 seats 40— 7 seats 50— 8 to 10 seats 75—11 to 20 seats 100—21 to 30 seats |
| New York: | | | | |
| New York State Law passed at 1915 session of the Legislature provides that no jitney shall operate until the owner has procured the consent of the local authorities and has executed a bond in an amount fixed by said local authorities. | | | | |
| Buffalo..... | 424,000 | 4- 7-15 | \$5,000 for one automobile \$1,000 for each additional automobile | \$75—up to 5 seats 100— 5 to 10 seats 150—over 10 seats |
| Schenectady..... | 73,000 | ..... | \$1,000 per seat Minimum \$5,000 | \$5 per seat Minimum \$25. |
| North Dakota: | | | | |
| Fargo..... | 14,000 | 4-16-15 | \$10,000 for not exceeding two vehicles | \$50—up to 4 seats 75—over 5 seats |
| Ohio: | | | | |
| Ashtabula..... | 18,000 | ..... | \$5,000 | \$100 |
| Youngstown..... | 79,000 | ..... | \$5,000 | \$25 |
| Oklahoma: | | | | |
| Oklahoma City..... | 64,000 | 2- 2-15 | \$10,000 | \$50—up to 8 seats 75— 9 to 12 seats 150—over 12 seats |
| Tulsa..... | 18,000 | ..... | \$5,000 | \$5 per seat. Maximum \$20 |
| Pennsylvania: | | | | |
| Pennsylvania State Law passed at 1915 session of the Legislature places jitney regulation under individual municipalities. | | | | |
| Rhode Island: | | | | |
| Providence..... | 224,000 | 5-13-15 | \$500 per seat | \$5 per seat Maximum \$50 |
| Tennessee: | | | | |
| Tennessee State Law passed April 1, 1915, defines a jitney as a common carrier and makes it unlawful for jitneys to operate without first obtaining from the municipality a license by ordinance and further provides that no such license shall be granted which does not require a bond of not less than \$5,000, said bond to be executed to the State of Tennessee. The amount of the license fee is to be fixed by each municipality. | | | | |
| Nashville..... | 110,000 | 1915 | \$5,000 | \$60 |
| Texas: | | | | |
| Bcaumont..... | 21,000 | 2-19-15 | \$10,000 | \$20—up to 5 seats 30— 6 to 7 seats 5—per seat over 7 |
| Dallas..... | 92,000 | 4-21-15 | \$2,500 | Not stated |
| El Paso..... | 39,000 | 4-24-15 | \$5,000 for less than 6 vehicles; \$10,000 for 6 and less than 11 vehicles; \$15,000 for 11 or more vehicles | Not stated \$18 |

| City | Population 1910 Census | Date of Passage | Amount of Bond | Annual License Fee per Car |
|---------------------|---------------------------|--------------------|-------------------|---|
| Texas (Continued): | | | | |
| Ft. Worth..... | 73,000 | 1915 | \$11,000 | \$10—up to 5 seats 20—6 to 7 seats 30—over 7 seats |
| Port Arthur..... | 7,000 | 2-13-15 | \$10,000 | \$7.20 per seat |
| San Antonio..... | 97,000 | 1915 | \$10,000 | \$25—up to 7 seats \$3.50 per seat over 7 |
| Sherman..... | 12,000 | 3- 5-15 | \$10,000 | \$10—up to 5 seats 20—6 to 7 seats 30—8 to 12 seats |
| Waco..... | 26,000 | 3-22-15 | \$5,000 | \$25—up to 5 seats 5 per seat over 5 |
| Utah: | | | | |
| Ogden..... | 25,000 | 4- 1-15 | \$10,000 | \$75—up to 5 seats 100—6 to 10 seats 150—11 to 20 seats |
| Salt Lake City..... | 92,000 | 3-24-15 | \$5,000 | \$75—up to 4 seats 100—5 to 9 seats 125—over 10 seats |
| Washington: | | | | |
| Seattle..... | 237,000 | 1-17-15 | \$2,500 | Not stated |
| West Virginia: | | | | |
| Huntingdon..... | 31,000 | 5-17-15 | \$5,000 | \$50—up to 4 seats 75—over 5 seats |

STATE REGULATION OF JITNEY URGED

Counsel for the Pennsylvania Street Railway Association has asked the Public Service Commission to require jitneys to secure certificates of public convenience from the commission, post tariffs and schedules, as other common carriers are required to do and furnish \$5,000 bonds for damages in case of accidents. The commission deferred consideration of the petition. In the course of the discussion, Commissioner Ainey remarked that if the jitney operators considered themselves common carriers they should post tariffs. This petition was presented by H. B. Gill, Philadelphia, counsel for the association, during the hearing by the commission on the protests of representatives of the Williamsport street railways against the incorporation of the Jitney Service Company, Williamsport. The Williamsport jitney people declared that the gross receipts from each car were \$13 a day, while the cost was \$8 a car daily. Counsel for the street railways contended that jitneys were soliciting street railway business and that they should not be permitted to parallel trolley routes which were set forth in charters and conducted by corporations under state regulation. One of the officials of the street railway system testified that the jitneys were impairing the credit of trolley companies and that there would either have to be a reduction of expenses, including salaries and wages, or an increase in suburban fares. C. L. S. Tingley, president of the association, said that the companies had made investments in good faith and having accepted regulation, ought to be protected. The commissioners asked numerous questions as to whether street cars were not frequently overcrowded and whether it would not be preferable to have jitney lines incorporated rather than have cars operated by individuals. Briefs will be filed later.

In New Orleans a temporary injunction has been granted preventing the enforcement of the ordinance regulating jitneys. The ordinance requires an indemnity bond of \$5,000 from each jitney and provides for strict regulation. It also requires the New Orleans Railway & Light Company to file indemnity bonds for its 535 cars.

The Governor of California did not sign the bill for State regulation of the jitneys. He said that local conditions vary so much that no general State law could be made equitable, and that the control of the jitneys should remain subject to local regulation.

The Washington Water Power Company, Spokane, has been considering the operation of electrically driven jitneys to afford transportation in the districts beyond the ends of the car lines and cheap gasoline cars in the more congested sections of the city in competition with private jitney machines. The reason for using electrically driven vehicles in the outskirts and cheap gasoline cars in the downtown districts, Vice-President McCalla states, is because it is not believed that the downtown service will be a paying business for very long, but that there will probably be need for making the service permanent in the outlying districts. In some cases the electric machines will serve as feeders for the street cars to which they will transfer on a 5-cent fare. In other sections it is thought that it will be necessary to charge a 5-cent fare to the car lines and then the regular fare into the city. Mr. McCalla said that the matter had been studied very carefully, but he did not know how soon the plan would be carried out.

The United Railroads, San Francisco, Cal., has been keeping a tabulation of the number of jitneys in operation passing different points of the city. One such tabulation, made during a pleasant day in the early part of this month of the jitneys on Market Street passing Sixth Street from 6 a. m. to 1 a. m. the following morning showed that the average number of passengers per car was 2.88 and the average earnings per car mile was \$0.0401.

Judge Pittman, of the Circuit Court of Tennessee at Memphis, has held the law providing for the regulation and bonding of jitneys, passed by the State Legislature, invalid. The chief point on which the law was declared unconstitutional was that it required the jitneys to file indemnity bonds and did not require these bonds for street cars or for other vehicles traversing the streets.

THE WASHINGTON AUTO BUS COMPANY

The Puget Sound Traction, Light & Power Company, Seattle, Wash., under the management of Stone & Webster and operating electric railways in Bellingham, Everett, Seattle and Tacoma, and interurban lines between Seattle and Tacoma, Seattle and Everett, and Mt. Vernon and Bellingham, has organized and incorporated the Washington Auto Bus Company, Stuart Building, Seattle, as noted previously in the ELECTRIC RAILWAY JOURNAL. The new corporation is capitalized at \$25,000, and the trustees are the managers of the properties of the Puget Sound Traction, Light & Power Company in the four cities previously mentioned. K. K. Carrick, of the Pacific Northwest Traction Company, Everett, is active manager of the bus company. Other officers are: president, A. W. Leonard, president of the Puget Sound Traction, Light & Power Company; vice-president, W. H. McGrath, who holds a similar position with the Puget Sound Company; secretary-treasurer, F. P. Dexter, general accountant of the Puget Sound Company. As business of the company advances and extensions are made, company managers in various territories will have local direction in their individual districts. The business of the Tacoma district will be cared for by L. H. Bean, manager of the Tacoma Railway & Power Company; Seattle District by A. L. Kempster, of the Puget Sound Traction, Light & Power Company; Everett territory by D. C. Barnes, manager of the Pacific Northwest Traction Company, and Bellingham section by L. R. Coffin, manager of the Whatcom County Railway, Light & Power Company.

The company began operating on June 1. The nature of the service is passenger transportation, and the run is from Buckley and Enumclaw to Auburn, a distance of 21 miles, making connections at the latter place with the interurban trains of the Puget Sound Electric Railway. The initial schedule calls for two buses, and a third is used for a stand-by. Flat fares are charged as follows: between Tacoma and Buckley, or Enumclaw, one way, 90 cents; round trip, \$1.50; between Seattle and Buckley, or Enumclaw, one way, \$1.25; round trip, \$2.10, with stop-over privileges at Auburn. A joint ticket is sold covering a ride on the bus between Buckley or Enumclaw, or Auburn, and Seattle and Tacoma, on the Puget Sound Electric Railway. No transfers are given to the local railway lines. The machines in use on this line are Studebaker cars, carrying bodies built in Seattle, with seats for twelve passengers.

The company also plans to institute service at once between Edmonds and Seattle Heights, where connections will be made with the interurban trains of the Pacific Northwest Traction Company and the Seattle- Everett line for Seattle or Everett. Operations on this line will begin with a Studebaker car, carrying a body constructed in Seattle, with seating capacity of nine passengers. Flat fares will also be charged on this line, and no transfers will be issued to the local railway lines. A joint ticket, however, will be sold similar to the one referred to above. Three Mack machines, with bodies constructed by The J. G. Brill Company, have been ordered, and will be placed in service as soon as the cars are ready. They are expected to be delivered in July. Each of these machines will seat twenty passengers. The route for these cars has not been selected. The Washington Auto Bus Company is the direct result of an effort on the part of the Puget Sound Traction, Light & Power Company to increase the patronage of its interurban lines in the Puget Sound country.

RULES FOR JITNEYS

MILWAUKEE FARE DECISION

Public Service Commission of Maryland Prescribes Rules for Jitney Operation

Some time ago W. Cabell Bruce, general counsel to the Public Service Commission of Maryland, rendered an opinion to the commission holding that jitneys are common carriers and as such are under the jurisdiction of the commission. As a result the commission ordered all jitney owners to register with it by June 1. The commission has now announced effective at once rules designed to insure the safety, adequacy and dependability of jitney service. In promulgating its rules the commission said:

"Upon proper registration, the owner or owners will be furnished with an identification card, one for each vehicle, whether in actual operation or held in reserve. Such card will give the name and address of owner or owners; the license number issued by the commissioner of motor vehicles; the maximum numbers of persons each vehicle shall be permitted to carry at any time; the definite route to be traveled, and the schedule of operation to be maintained.

"Each such public bus shall follow such route, and maintain such schedule, under the provision of Circular No. 41 (providing for the reporting of the commission of 'interruptions to service') to the same effect and in the same manner as said Circular No. 41 is applicable to electric railways.

"The identification card shall be carried by the operator of the public bus, upon the vehicle itself, and shall always be presented for inspection upon the demand of an authorized representative of the commission, or other legally constituted authority. Failure to produce said card shall subject the owner to the penalty set out in Circular No. 40.

"If, in the opinion of the commissions, any public bus fails to render satisfactory service, or is operated under such conditions as to render such services inadequate, unsafe or improper, the registration of such public bus shall be annulled and further operation prohibited.

"All the provisions of Circular No. 3-B in respect to 'accidents' shall be applicable to public buses to the same extent that they are applicable to electric railways, and to such further conditions as may be imposed by any revision or revisions of said Circular No. 3-B.

"Each public bus shall be provided with an indicator, upon which all fares collected shall be registered, showing both the fares collected during the current trip and also the total fares collected. A permanent record shall be kept of the total fares collected during each tour of duty of each public bus, giving the index of the register when first starting out, and the index at the completion of the tour of duty.

"Violations of existing laws or of street traffic regulations will, in the discretion of the commission, cause annulment of registration.

"Public buses shall adhere, as closely as practicable, to the established routes and schedules, and any departure therefrom must be reported to the commission."

The rules then state that not more than one person shall be allowed to occupy the front seat of a bus, in addition to the driver; that no one shall be allowed to ride upon the top of a bus, unless it be constructed for that purpose and be provided with seats and protective railings; that schedules of rates shall be filed with the commission before becoming effective; that the commission reserves the right to arrange or re-arrange routes and schedules to prevent unnecessary congestion on streets, and that sufficient reserve equipment shall be kept in good condition to insure maintenance of the established routes and schedules.

The commission, in conclusion, prescribes the following rule as to the maximum load:

"The maximum number of persons each vehicle shall be permitted to carry at any one time, and which carrying capacity shall be designated on the identification card when issued, shall be based upon the following rating, this rating being based upon the total length of seats in inches, allowing 16 in. per passenger when such number so designated does not exceed the carrying capacity of the chassis, allowing an average of 140 lb. per passenger:

| | | | | | | | | |
|-------------------------|------|------|------|------|------|------|------|------|
| Total length seats..... | 128 | 140 | 160 | 176 | 192 | 208 | 224 | 240 |
| Pounds capacity..... | 1120 | 1260 | 1400 | 1540 | 1680 | 1820 | 1960 | 2150 |
| No. passengers..... | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |

The United States Supreme Court has affirmed the decision of the Wisconsin Supreme Court of May 29, 1913, which in turn affirmed the order made by the State Railroad Commission of Wisconsin in August, 1912, requiring the company to sell tickets in packages of thirteen for 50 cents instead of twenty-five for \$1 as provided in an ordinance and accepted by the company in January, 1900.

The point at issue was whether the municipality had power to make a contract with the railway covering a term of years for a specified rate of fare, and the opinion upholds the Wisconsin Court in denying this right. According to President Mortimer of the Milwaukee Electric Railway & Light Company the case will now go back to the lower courts on the question of the reasonableness of the original order, and possibly also to the Railroad Commission of Wisconsin, and the company hopes to prove its case. While the question was before the courts, beginning in October, 1912, and up to last February, the company has been giving coupons as receipts for the excess fare charged. In view of the decision of the commission last January, reported on page 333 of the issue of this paper for Feb. 13, it is thought that the plea of the company as regards the unreasonableness of the fare charged will be favorably received.

Increase in Fare Suspended.—Public Service Commission of Massachusetts has further suspended until July 15 the proposed increase in the unit passenger fare on the Blue Hill Street Railway.

Re-hearing in Suburban Fare Case.—The Public Service Commission of Pennsylvania has denied the application of Philadelphia commuters for a rehearing in the commutation case involving fares over the lines of the Pennsylvania Railroad and Philadelphia & Reading Railway out of Philadelphia.

Lake Shore Electric on Standard Time.—Cars on the Lake Shore Electric Railway between Cleveland and Detroit are now being operated on Eastern standard time. This was done because of the adoption of Eastern time in Detroit recently. Cleveland has had Eastern time for a year or more.

Wage Adjustment.—The representatives of the trainmen in the employ of the Shore Line Electric Railway, Norwich, Conn., and the officers of the company have agreed upon an advance in wages from a minimum of 22 cents an hour and a maximum of 28½ cents to a minimum of 23 cents and a maximum of 29 cents.

Wage Conference in Rhode Island.—A. E. Potter, president of the Rhode Island Company, Providence, R. I., will confer with a committee representing the employees of the company in regard to new working conditions. On June 17 the representatives of the men were empowered by vote to call a strike of the employees.

Increase in Fare Asked.—Following an appeal made by George A. Stanley, president of the New York & North Shore Traction Company, Roslyn, N. Y., the Board of Trade of Port Washington has sent a communication to the Public Service Commission for the Second District favoring a 15-cent fare between Port Washington and Mineola, providing the claims made by Mr. Stanley regarding the inadequacy of the present fare are found to be correct.

Experimental Week-End Excursion Rate.—An amendment has been filed with the Public Service Commission to Puget Sound Electric Railway Experimental Tariff No. 6 covering passenger rates, which became effective on June 1, 1914, naming an experimental week-end excursion rate between Tacoma and Seattle of 75 cents for the round trip, effective on June 19. Tickets will be good for use on Saturdays and Sundays only during the months of June, July and August.

Complaint Against Jersey City Service Dismissed.—The Board of Public Utility Commissioners of New Jersey has dismissed the complaint of Jersey City against the Public Service Railway. The action related to the adequacy of service furnished. The commission said in part: "In this situation no useful purpose will be served by continuing

the consideration of the present proceeding, which is general in its scope and relates, in part, to conditions which have in the meantime been materially changed. Further consideration in the present proceeding will, therefore, be suspended and the matter taken from the board's conference list."

Wage Negotiations in Toronto.—The offer of the Toronto (Ont.) Railway to its employees to renew the agreement fixing the scale of wages at the present rate for a further period of three years has been rejected by the men. The latter have signified their willingness to withdraw the demand recently made for an increase of 2½ cents an hour and to consent to a renewal of the present agreement for two years. The suggestion of the men will be considered by the company upon the return of R. J. Fleming, general manager, to the city.

Complaint Against Scranton Railway Dismissed.—The Public Service Commission of Pennsylvania has dismissed the complaint filed with the commission against the city of Scranton to compel the Scranton Railway to accept an ordinance passed by the City Council requiring the company to extend its system upon certain streets. The commission held that the necessity for the establishment of the route covered by the proposed extension was not such as to justify it in compelling the company to make the extension and further that the public service company law did not authorize the commission to compel a public service company to extend its facilities beyond the territory covered by its charter or amendments thereto.

Suspension of Smoking Order for Summer.—On the application of the companies of the Brooklyn Rapid Transit system and the New York Railways, the Public Service Commission for the First District has adopted resolutions suspending for the summer months the orders forbidding smoking on the convertible cars of the Brooklyn system and the low-level center-entrance cars of the New York Railways. Under the suspension smoking will be allowed upon the four rear seats of the convertible cars in Brooklyn and upon the two rear seats and the circular seat in the rear of the low-level center-entrance cars of the New York Railways system. Action upon the Interborough Rapid Transit Company's application for permission to allow smoking on the open cars of the Third Avenue elevated railroad has been deferred.

Albany Wage Negotiations.—The demands of the employees on the Albany and Troy division of the United Traction Company, Albany, N. Y., that they shall have control of runs over the Hudson Valley Railway from Waterford into Troy has resulted in a temporary suspension of the negotiations looking toward the adjustment of the working conditions on the United Traction Company's lines before July 1, on which date the present agreement between the company and its employees expires. It is stated that about thirty motormen on the Hudson Valley Railway are members of the Brotherhood of Locomotive Engineers and that conductors to the number of thirty are members of the Order of Railway Conductors. The question of union jurisdiction has therefore arisen. C. F. Hewitt, general manager of the United Traction Company, threw the conference between the representatives of the company and the union open to the newspaper men.

New Advertising Policy in Brooklyn.—On June 17 a new policy was inaugurated for the benefit of all advertisers and consumers using the Brooklyn Rapid Transit System. On that date the Broadway Subway & Home Boroughs Car Advertising Company, Inc., which now controls the advertising privileges on the Brooklyn Rapid Transit System, began using the news and vending stands for furthering and exploiting all of the wares advertised in the cars and on the stations of the system by making it possible for consumers impressed with advertising in the cars or stations to order advertised goods by slip through the company. Any possible antagonism of the large or small storekeepers of Brooklyn has been guarded against by an arrangement for a suggested system of credits to the store carrying the goods nearest to the ultimate consumer. The plan is to make it possible for the consumer to secure the advertised product at once with the least possible inconvenience to himself.

Personal Mention

Mr. Julian M. Bamberger, vice-president and general manager of the Salt Lake & Ogden Railway, Salt Lake City, Utah, has been elected president of the company.

Mr. F. R. Southard has been appointed purchasing agent of the United Railroads, San Francisco, Cal. In addition to his new duties, he will continue to act in the capacity of storekeeper.

Mr. R. W. Crook, general manager of the People's Railway, Wilmington, Del., which has been absorbed by the Wilmington & Philadelphia Traction Company, was recently presented with a diamond pin by the employees of the People's Railway as a token of their esteem.

Mr. S. T. Henry, second vice-president of the McGraw Publishing Company, Inc., and formerly Western editor of the *Engineering Record*, has been appointed by Secretary of the Treasury McAdoo a member of the committee of the Pan-American Financial Conference which will have charge of the visits of American bankers and business men to Central and South American countries.

Mr. H. T. Matthew has been appointed Pacific Coast representative for the Society for Electrical Development. Mr. Matthew for six years beginning in 1901 was business manager of *Electrochemical Industry* (now *Metallurgical & Chemical Engineering*), one of the McGraw papers, and later was western manager for *Electrical World*. For the past three years he has represented the McGraw publications on the Pacific Coast.

Mr. L. F. Rye has been appointed auditor of the Kentucky Traction & Terminal Company, Lexington, Ky., to succeed Mr. G. L. Langton. Mr. Rye was formerly connected with the Detroit (Mich.) Edison Company as assistant general accountant. He was with the company for five years, entering its employ as chief clerk. Previous to that he was auditor of the Watt Motor Car Company, Detroit, for a year and a half and prior to that was chief clerk of the Detroit & Suburban Gas Company for a year. He also served as head bookkeeper of the Citizens' Gas & Electric Company, Waterloo, Ia., for two years.

Mr. Horace Field Parshall, formerly chairman of the Central London Underground Railway, London, England, will hereafter have charge of the physical property of the Barcelona Traction Light & Power Company, Barcelona, Spain, as a result of changes in the administration of the company following the recent death of Dr. F. S. Pearson. Mr. Parshall is an American, but has been in England about twenty years. He was electrical engineer for the Dublin Tramways, the Glasgow Tramways, the London United Tramways and the Bristol Tramways, and has been connected with many other large electrical projects in Great Britain. He prepared the plans for the Central London Underground Railway installation, the first railway in England to be operated on the multi-phase system with converting substation, and was associated with the work on the Central London Underground Railway for more than ten years.

OBITUARY

Richard S. Brown died on June 5 in New York City. Mr. Brown was born in Great Barrington, Mass., seventy-six years ago. He became connected with the Belt Railway in New York and subsequently joined the Daft Company in its early electric railway work. In 1890 he entered the service of the Westinghouse Electric & Manufacturing Company, continuing with that company until the end. Practically his entire period of service was spent as a salesman for railway apparatus at the Boston office.

Dr. Emil Rathenau, founder of the German Edison Company and for many years managing director of its successor, the Allgemeine Elektrizitäts Gesellschaft, Berlin, is reported dead at the German capital in a dispatch from that city by transatlantic wireless, June 21. Dr. Rathenau in recognition of his work in organizing the electrical industry of Germany had been the recipient of many honors from Emperor William, the German government, the universities and engineering schools, and leading commercial engineering organizations.

Construction News

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

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

RECENT INCORPORATIONS

***Calhoun County Railway, Pearl, Ill.**—Chartered in Illinois to build a railway from Pearl to Golden Eagle. Capital stock, \$2,500. John E. Melick, Kampsville, is interested.

FRANCHISES

***Birmingham, Ala.**—W. W. Shortridge, Birmingham, and associates have asked the Council for a franchise to construct an electric railway from the city limits of Birmingham to the Warrior River.

Aurora, Ill.—The Aurora, Mendota & Western Traction Company has received from the Council of Aurora a twenty-five-year franchise to construct a line through the city. The franchise gives the company the right to operate its cars from the north side of Benton Street along Broadway and across intersecting streets to the southerly limits of the city. This is part of a plan to build a railway from Aurora to Montgomery. It is proposed to extend later the line south through Princeton to connect with the Illinois Traction System. Upshaw Hord, Aurora, is interested. [April 10, '15.]

Evansville, Ind.—The Public Utilities Company has received a franchise from the Council to extend its Main Street line on Morgan Avenue to Heidelbach Avenue, Evansville.

Hutchinson, Kan.—The Hutchinson Interurban Railway has asked the Council for a franchise to extend its line on Second Street from Main Street to Walnut Street.

Revere, Mass.—The Bay State Street Railway has asked the Council of Revere for a franchise to alter and relocate its tracks on Revere Street between Pierce Street and Bellevue Street.

Youngstown, Ohio.—The Lake Erie & Youngstown Railroad has received from the Public Utilities Commission of Ohio an extension of time within which to complete its line from Conneaut to Youngstown. [May 8, '15.]

Pottsville, Pa.—The Schuylkill Electric Railway, which is controlled by the Eastern Pennsylvania Railway, has received a franchise from the Council to construct a railway over Broad Mountain, which separates northern and southern Schuylkill County.

TRACK AND ROADWAY

***Huntsville, Ark.**—It is reported that a stock company has been organized to build an interurban railway from Huntsville to a connection with the St. Louis & San Francisco Railroad, 15 or 20 miles.

Tidewater Southern Railway, Stockton, Cal.—Work has been begun by this company on the extension of its line from Modesto to Turlock. Grading and construction south of the Tuolumne River has been begun and a bridge will be constructed across the Tuolumne River. It is expected that trains will be operated over the new extension in about four months.

Connecticut Company, New Haven, Conn.—Extensive improvements in Hartford are being planned by this company to be carried out this summer. Double tracks will be laid on Wethersfield Avenue from Wylls Street to Bond Street. The track on Fairfield Avenue will be changed from the side to the middle of the street. The tracks on Main Street will probably be replaced with new track from South Green Street to a point near Pearl Street. A number of other improvements are also being considered. Double tracks are also being laid on Elizabeth Street from Main Street to Third Street, New Haven.

Waycross Street & Suburban Railway, Waycross, Ga.—Work has been begun by this company on the construction of its Lincoln Street line to Gilchrist Park. Material is being placed for the extension as fast as it is brought from the Gilmore Street line, which is being removed. The Gilmore Street line will be transferred to Lee Avenue, from which street the railway will go through Gilchrist Park. The

Lincoln Street line connects with the old Gilmore Street line at Screven Avenue.

***Bloomington, Ill.**—Residents of Stevensonville, a suburb of Bloomington, are working with members of the City Commission to secure an electric line to their part of the city. A loop system by which the West Washington and Miller Park lines of the Bloomington Street Railway can connect with a line through Stevensonville is proposed. Commissioner A. G. Erickson is trying to interest the Bloomington & Normal Railway & Light Company in the project.

Illinois Traction System, Peoria, Ill.—Officials of this company have been asked by the Mayor and the Commercial Club of Jefferson City, Mo., to build an interurban line from Jefferson City to Columbia, Mo., 35 miles.

Union Traction Company, Coffeyville, Kan.—This company is repairing its track on Eighth Street, east of Union Street. New ties are being laid and the roadbed being made more solid. Similar improvements have been made by the company on other streets traversed by its different lines.

***Lebanon, Ky.**—Right-of-way for an electric line from Lebanon to Smithville has been secured from John W. Overall by Charles Edwards, representing White & Company, Chicago. It is stated that the proposed railway will connect with the Nashville, Chattanooga & St. Louis Railway at Lebanon, which will later be electrified.

Louisville (Ky.) Railway.—This company reports that work has been begun on its 1.8-mile double-track extension from Twenty-seventh Street and Chestnut Street to Shawnee Park, via Madison Avenue, Louisville. The construction consists of Lorain Steel Company's 103-lb., No. 426 rail on wooden ties, 2 ft. centers, with crushed-rock foundation to the bottom of the ties, concrete being used on top for paving.

***Alexandria, La.**—Plans are being considered to build an electric railway in Alexandria. T. T. Constant, Alexandria, is interested.

Shreveport (La.) Railways.—This company has completed its extension from Shreveport to South Highlands. Heavy rails have been laid on creosoted ties and the track has been ballasted with broken rock.

***Skowhegan & Athens Electric Railroad, Athens, Maine.**—Plans are being considered to build an electric railway from Skowhegan to Athens, via East Madison and North Cornville, 12 miles. The line will connect with the Maine Central Railroad and the Skowhegan & Madison Electric Railway at Skowhegan. Subscriptions to the amount of \$80,000 have been pledged, leaving \$20,000 still to be raised, as the entire sum required to insure the road being built is \$100,000. H. E. Trueworthy, George F. Ayer and James Chapman, Athens, are interested.

Sandy Springs Railway, Kensington, Md.—This company reports that construction has been begun on an extension of its lines in Kensington.

Bay State Street Railway, Boston, Mass.—Work has been begun installing new rails on both the northbound and southbound tracks on North Main Street, Fall River, from the carhouse south to Bank Street. The old 6-in. rail is being replaced with 9-in. rail.

Detroit (Mich.) United Railway.—Grading has been completed on this company's extension to Imlay City and the work of laying track will be begun at once.

Twin City Rapid Transit Company, Minneapolis, Minn.—This company contemplates track extensions and rehabilitation amounting to approximately 20 miles of single track. This work will include new overhead construction and track laid with crushed stone and gravel ballast, treated hemlock ties, 7-in., 91-lb. T-rail and granite-block pavement.

***Kansas City, Mo.**—D. M. Proctor and associates plan to construct an electric railway in Kansas City.

Metropolitan Street Railway, Kansas City, Mo.—This company is laying new tracks on Woodland Avenue between Missouri Avenue and Tenth Street, Kansas City.

Springfield (Mo.) Traction Company.—The track on this company's Chadwick Street line as far as Sequiota Park has been raised 2 in. above the former level. Heavier rails and new ties have been laid.

Missoula (Mont.) Street Railway.—Work has been begun by this company on the construction of an extension of its Daly Addition line to the county fairgrounds.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—This company has been authorized by the Board of Public Utility Commissioners of New Jersey to issue \$190,000 of 5 per cent, first mortgage bonds and \$85,000 of capital stock for the completion of the construction and equipment of its line between Lakewood and Point Pleasant. Rails, ties, poles and other construction material have been ordered and construction will be begun at once under the direction of Roy C. Havens, constructing engineer. George O. Vanderbilt, Trenton, is interested. [May 29, '15.]

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has authorized the chairman and secretary to advertise for bids, to be opened Friday, July 9, at 12:15 p. m., for the installation of tracks on the New Utrecht Avenue elevated line. This line is a branch of the Fourth Avenue subway, extending from Fourth Avenue through Thirty-eighth Street in an open cut to New Utrecht Avenue, and thence over New Utrecht Avenue, Eighty-sixth Street and Stillwell Avenue as an elevated line to Coney Island. It will be operated by the New York Consolidated Railroad Company (Brooklyn Rapid Transit) in connection with the Fourth Avenue subway. As the city has arranged for the purchase of rails, ties and other track materials, the contractor will be required only to do the work of installing the tracks and switches. Operation was begun on June 22 on this company's new Fourth Avenue subway, Brooklyn, from Chambers Street, New York, to Coney Island, Brooklyn.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded the contract for the construction of Section No. 1 of Route No. 29, the Nostrand Avenue subway in Brooklyn, to Newman & Carey Company, Brooklyn, for \$2,073,303.20. The Nostrand Avenue subway is a branch of the Eastern Parkway subway, which in turn is an extension of the existing subway, and will be operated in connection therewith by the Interborough Rapid Transit Company. Section No. 1 covers that part of the line extending from Eastern Parkway southward under Nostrand Avenue to a point about 220 ft. south of Church Avenue. The contract must be completed within twenty-one months, and the contractor gives a bond of \$200,000. On June 22 the company placed in operation the line under the East River from Forty-second Street, Manhattan, to Jackson and Van Alst Avenues, Long Island City, known as the Steinway tunnel.

***Troy, N. Y.**—Plans are being considered by the Troy Chamber of Commerce for the construction of an electric railway from Rensselaer to Troy.

Alamance, Durham & Orange Railway & Electric Company, Burlington, N. C.—Burlington has voted to issue \$100,000 to aid in the construction of this company's line from Ossippee to Durham. Junius Harden, Burlington, is interested. [March 20, '15.]

Cincinnati (Ohio) Traction Company.—This company has been ordered to lay tracks across the Mohawk Bridge and to divert its Westwood and College Hill cars via that route. This is in accordance with an ordinance passed by the Council of Cincinnati in February, 1913.

Reading Transit & Light Company, Reading, Pa.—This company is laying new track on its line on Perkiomen Avenue between Thirteenth Street and Nineteen-and-One-Half Street, Reading.

Rhode Island Company, Providence, R. I.—Plans are being made by this company to install new 9-in. grooved girder rails in Clinton Street and South Main Street, Woonsocket. The company will also replace its present tracks in Providence Street with T-rails taken up in South Main Street.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—Operation of the Lookout Mountain incline railway of this company has been suspended to permit replacing of the cables which are used in handling the cars. Two new steel cables are being put in place, each 5000 ft. long. The old cables have been in service more than two years.

Carolina, Greenville & Northern Railroad, Greenville, Tenn.—Work has been begun on the construction of this company's line to be built between Knoxville and Bristol. Construction is now in progress at Rader's, Washington County, and the line is being built eastward to Kingsport. Engineers are locating the route for the section of the road between Kingsport and Bristol. An option has been taken on the lines of the Bristol Traction Company, and representatives of the company are in Sullivan County looking after terminal sites and soliciting subscriptions to a fund of \$75,000 to be used in obtaining rights-of-way, terminal sites, etc. The new line will connect the Norfolk & Western Railway, the Louisville & Nashville Railroad and the Carolina, Clinchfield & Ohio Railway. The connecting railroads will haul trains over the new road under steam power. Arrangements have been made to float a bond issue of \$5,000,000 for the construction of the line, and counties along the line will be offered the securities to the extent of 7½ per cent to 10 per cent of the amount to be expended in those counties. H. S. Reed, 205 Grant Building, Los Angeles, president. [April 17, '15.]

Nashville (Tenn.) Traction Company.—Operation has been begun on this company's 3-mile extension from the corner of Fifth Avenue and Church Street, Nashville, south on Fifth Avenue to Mulberry Street, thence to Second Avenue, thence to Lafayette Street, extending to the present terminus of the line on Murphreesboro Pike.

Charleston (W. Va.) Interurban Railroad.—A report from this company states that it expects to build an extension from Charleston to Cabin Creek Junction, 13.5 miles.

SHOPS AND BUILDINGS

Metropolitan Street Railway, Kansas City, Mo.—Plans are being considered by this company to construct an ornamental shelter house 46 ft. by 12 ft., on the east side of the street car tracks south of the Main Street viaduct for persons waiting for street cars at the Union Station. It is to contain no benches or concession stands, but is to be only a shelter from the elements. The proposed site is now occupied by a raised platform of concrete, an island of safety. The cost is estimated at \$2,000.

Slate Belt Electric Street Railway, Pen Argyl, Pa.—This company plans to remove its carhouse and powerhouse from Pen Argyl to Wind Gap. The new carhouse will be 175 ft. x 57 ft., one story, fireproof, brick construction. It will contain the offices of the company and a room for the employees, modernly equipped for their comfort. It is expected that the new carhouse will be ready for use by the fall. The cost is estimated to be \$12,000. The Pen Argyl property has been offered for sale.

POWER HOUSES AND SUBSTATIONS

Toledo Railways & Light Company, Toledo, Ohio.—This company will install one 1500-kw., 600-volt d. c., six-phase, twenty-five-cycle, 500-r.p.m. compound-wound commutating pole rotary converter and three 500-kva., single-phase, twenty-five-cycle, 2300-volt high-tension to rotary voltage low-tension, O. I. W. C. transformers. The contract for this apparatus has been placed with the Westinghouse Electric & Manufacturing Company.

Johnstown (Pa.) Traction Company.—A contract has been placed with the Westinghouse Electric & Manufacturing Company by this company for one 300-kw., 600-volt, d. c., three-phase, sixty-cycle, 1200-r.p.m. compound-wound, a. c., self-starting rotary converter; one 300-kva., three-phase, sixty-cycle, 22,000-volt high-tension to rotary voltage low-tension, O. I. S. C. transformer and one two-panel switchboard for the control of same.

Montreal & Southern Counties Railway, Montreal, Que.—This company reports that it plans to construct a substation at Granby, and expects to purchase a generator, switchboard and apparatus to be installed therein.

Ogden, Logan & Idaho Railway, Ogden, Utah.—This company is erecting a substation at Hot Springs. The building may also be used as a passenger station. The cost is estimated to be \$4,000.

Charleston (W. Va.) Interurban Railroad.—A report from this company states that it expects to build one 1200-volt substation and three 600-volt substations.

Manufactures and Supplies

ROLLING STOCK

Peoria (Ill.) Railway is contemplating the purchase of ten additional city cars.

Ogden, Logan & Idaho Railway, Ogden, Utah, is reported as having ordered six new trailers for its Ogden-Preston line.

Lake Shore Electric Railway, Cleveland, Ohio, has purchased three interurban cars from the Jewett Car Company.

Charleston Interurban Railroad, Charleston, W. Va., expects to purchase four interurban cars and one combination express and locomotive car, 300 hp.

Detroit United Railway, Detroit, Mich., has ordered fifty trail cars and twenty-five motor cars of the center entrance type from the G. C. Kuhlman Car Company.

Southern Traction & Power Company, Alexandria, La., in an unconfirmed report is said to have been purchased by the city of Alexandria, which will obtain several new cars.

Manhattan & Queens Traction Corporation, New York, N. Y., noted in the *ELECTRIC RAILWAY JOURNAL* of May 1, 1915, as considering the purchase of ten new cars through H. L. Doherty & Company, New York, has decided to postpone indefinitely the ordering of these cars.

United Traction Company, Albany, N. Y., has been ordered by the Public Service Commission of New York, Second District, to comply immediately with its order requiring the railway to purchase forty new cars or submit on or before July 6 an alternative plan of improving its present equipment.

TRADE NOTES

International Register Company, Chicago, Ill., states that after an extended test the Omaha & Council Bluffs Street Railway has purchased twenty International coin registers, type C 15.

Rail Joint Company, New York, N. Y., received a grand prize, the only medal of honor awarded for rail joint products in the transportation department by the Panama-Pacific International Exposition at San Francisco.

Union Switch & Signal Company, Swissvale, Pa., is completing an installation of interlocking signals at the crossing of the Newark-Trenton high-speed line of the Public Service Railway with the tracks of the Standard Oil Company, near Bay Way, N. J.

H. M. Byllesby & Company, Chicago, Ill., announce that their department of examination and reports, in the course of thirteen years' experience, has made commercial reports for public utility interests in every State in the Union, and in Canada and Mexico. In connection with these reports it has appraised property worth more than \$300,000,000.

Edward T. Sharp, Buffalo, N. Y., who owns the patent rights for the Ideal trolley wheel, and who has been in charge of that department of the Lumen Bearing Company for the past fifteen years, has purchased the patents, tool and equipment used by this company in the manufacture of trolley wheels and on July 1 will take over this part of the company's business and manufacture and sell the Ideal wheel under his own name. Mr. Sharp's offices are located at 56-58 Indiana Street.

Western Electric Company, New York, N. Y., on June 5 received a visit from the Honorary Commercial Commissioners of China, who are in the United States for an extended tour of inspection of the commercial activities of this country. On that occasion they inspected the cable shop, powerhouse, general merchandise building, and telephone apparatus shop. The distinguished visitors were treated to an electrically cooked luncheon, after which they were taken to the Dey Street building of the American Telephone & Telegraph Company, where a telephone connection was established between that building and one of the company's exhibits at the Panama-Pacific International Exposition.

Harvey Company, Baltimore, Md., has been incorporated for the purpose of selling railroad supplies and equipment.

Arrangements will be made for representing the principal manufacturers of the country and thereby giving customers the benefit of quick shipments, either direct from mill or stock at the warehouse in Baltimore. In addition to the office and warehouse, which will be at 113 South Street, a storage yard will be maintained at Curtis Bay, Md., on the Baltimore & Ohio Railroad track, where facilities will be arranged for the storage of contractor's engines, cars, etc. J. Edward Harvey, president of the company, was formerly the president of the South Baltimore Steel Car & Foundry Company, and was also connected as proprietor of the Eastern Railway Supply Company.

ADVERTISING LITERATURE

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder on its totalizing fare register system.

Davis-Bournonville Company, Jersey City, N. J., has issued a special Panama-Pacific International Exposition number of its publication *Autogenous Welding*, which describes the company's exhibit at the Exposition of oxy-acetylene apparatus for light and heavy welding and cutting in connection with car and boiler repairs and for use in iron and steel foundries.

Trussed Concrete Steel Company, Detroit, Mich., has issued the thirteenth edition of its comprehensive Hy-Rib handbook. This publication embraces all the information in previous editions and includes a number of additions. The photographs of installations are particularly comprehensive, including many new applications, among which are views of applications made on the repair shops of the Louisville (Ky.) Railway and the New York, Westchester & Boston Railway. Illustrations and information on pressed steel studs and Kahn pressed steel construction, as well as the floretyle construction, have been added.

R. D. Nuttall Company, Pittsburgh, Pa., has issued Catalog No. 13 covering electric railway gears, pinions and trolleys. This publication gives general data on Nuttall railway motor gearing for Westinghouse and General Electric equipments, Nuttall trolleys, harps and wheels, flexible couplings of the spring and buffer type, and electric railway compressor gears. This company has also issued Catalog No. 12 on mine and industrial gears, pinions and trolleys. This publication covers mine haulage locomotive gears, pinions and trolleys, mining machine gearing, mine haulage and general data for ordering industrial gears.

Railway & Industrial Engineering Company, Pittsburgh, Pa., has issued a reprint of an article by Lester C. Hart, general manager of the company, entitled "The Field of the Out-door Substations," which appeared in the *Electric Journal*. The reprint traces in an interesting way the development of the out-door substation stimulated by the facts of the heavy cost and losses of long line and the prohibitive additional cost of indoor substations. Among the main advantages claimed for the outdoor substation are its saving in the initial cost by omitting the building, its adaptability for enlargements or alterations and its simplicity. The article contains illustrations of typical installations of this character, under varying topographical conditions.

Weber Chimney Company, Chicago, Ill., has issued a new catalog for 1915 illustrating its reinforced concrete chimneys, among the illustrations being a view of the power house of the Havana Electric Railway, Light & Power Company, Havana, Cuba, where these chimneys are installed. The catalog also contains a list of users numbering nearly 1000 throughout the United States and other countries in which the names of the following electric railways appear: Capitol Traction Company, Chicago (Ill.) Railways, Illinois Traction System, Marquette Gas & Traction Company, Jackson Electric Railway & Light Company, Laurel Light & Railway Company, Meridian Light & Railway Company, City Railway, Portland Railway & Light Company, Nashville Railway & Light Company, Utah Light & Railway Company, British Columbia Electric Railway, Havana Electric Railway, Light & Power Company. At the end of the catalog is a table of chimney sizes for steam boilers of varying horsepower.