

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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The Torque-Producing Ability of the Electric Motor

THE principal difficulty which has been experienced in the design of electric locomotives has been in the mechanical parts. The electric motor is so inherently different from the steam engine in the character of its output that it is natural that time should be required by designers in learning to adapt this motive power to heavy traction conditions. The electric motor, with almost unlimited power behind it, can produce torque many times in excess of its rating if it is overloaded. This is hard on the motor, to be sure, but it is worse on the mechanism driven by the motor unless provision is made for the resulting excessive stresses. When the steam engine is overloaded it simply "lies down" and refuses to injure itself. It can produce no more torque than is accounted for by the area of the piston and the "mean effective" steam pressure. The electric motor, if permitted to do so, will take on more load until either it is overheated and injured or until some mechanical part gives way. Failure fully and practically to realize this fact accounts for the high maintenance costs which have been incurred in some cases. As the mechanical difficulties are overcome, and they are rapidly being overcome, it will be possible still more fully to utilize the torque-producing possibilities of the electric motor.

This situation regarding the application of electric motive power to heavy traction reminds one of the early development of the electric motor itself. It will be remembered that inventors first made motors in imitation of the steam engine, with an iron plunger or core drawn into a coil of wire and then released, a device analogous to James Watt's in practically every particular except as to the service of the pull and push on the piston. This plan was soon abandoned for the more effective one of direct rather than indirect torque production. Just so in the case of the electric locomotive. In some cases the motor has been applied as a direct substitute for the steam engine, whereas it needed to be applied in such a way as most effectively to utilize its natural characteristics.

Sporting Events Assume a New Significance

TIPPITY WITCHET is the five-year-old son of Broomstick. One day recently he beat Salvestra under the wire at Belmont Park, with Gloomy Gus a bad third. That is history. It is not an omen of what Tippity Witchet may do the next time out. He may then be an also ran. There is no desire to tip you to a good thing. On the same day that Tippity Witchet won Babe Ruth again helped the Yankees to victory by crashing another home run into the grand stand at the Polo Grounds. If you are a railway manager operating

under service at cost or if you ever hope to operate under that plan, then Tippity Witchet, Babe Ruth, Georges Carpentier and other celebrities of the sporting world hold more than ordinary interest for you.

Take Cincinnati! Under service at cost, patrons of the Cincinnati Traction Company, with the champion Reds drawing record crowds, have recently been paying a 7½-cent fare. If it were not for Pat Moran's ball team the fare might even be higher. In fact, we shudder to think what the fare might be if the World Champion Reds had finished last instead of first in the pennant race last season. In Cleveland the case is very much the same. No doubt Mr. Stanley knows just what effect the present spurt of the Indians is having on the fares under service at cost in his city.

Take Louisville! Louisville isn't operating under service at cost. It isn't even certain that the company will operate under such an agreement, but indications point that it may possibly do so. In consequence, the railway management there is said to have begun to figure on the results which the return of boxing under the new law in that State would have on fares under service at cost. Fight fans in Louisville are said to be hungry to attend the coming bouts.

Of course, sporting events have always had their deep significance for the railway manager as traffic problems and as sources of revenue, but under no other system than service at cost has the general public enjoyed the exhilaration of knowing that the more it spent for fare in the aggregate the less it would really have to spend individually. A *reductio ad absurdum*, you say. No such thing. Violent fluctuations in traffic are not in themselves desirable, but you can't blame a railway manager operating under service at cost if his risibilities rise at the thought of the effect of the Kentucky Derby upon the rate of fare he is charging.

Fares and Franchises

THE precarious condition of railway properties is not improved and investments in railway securities are not encouraged by the chaotic conditions existing in commission rulings on franchise clauses fixing fares.

When the Pennsylvania courts uphold the power of the state commission to fix fares irrespective of franchise clauses and at the same time the New York courts hold that the commission in that state has no jurisdiction over franchises granted during the thirty-three years which elapsed before the formation of the commission the interested observer wonders what it all means. There is such a mixed combination of laws, legal rights, precedents and interpretations in the various state court and commission rulings that the fundamental elements in the franchise clause versus fare increases controversy are sometimes obscured.

What remedy for its financial ills can a company

obtain when bound by a franchise fare clause and how can the public get adequate service?

Legal battles on a confiscatory basis, receiverships, etc., simply augment the bill the consumer must pay and prolong the agony. When an economic ill exists an economic remedy must be applied and the quicker the better. Until our regulatory commissions are empowered to exercise complete jurisdiction over all elements incidental to the successful operation of a public utility, are released from legal restrictions of procedure and evidence, are made up of a personnel experienced, judicial and far-seeing and have the respect of the public as a court, but without the court's formality, the utilities can hope for little aid from commission regulation and the public can ask in vain for more adequate service.

The rainbow in the cloudy sky of regulation lies in the public's realization of the fact that the most practical method for maintaining private ownership and operation of public utilities with public supervision is by commission regulation. Government ownership and operation or uncontrolled private operation and ownership are both unsound from the public's standpoint, so that the good old weapon "public sentiment" is ready to be wielded in defence of commission regulation and has already accomplished results in many states.

Rome was not built in a day, but we hope that commissions can obtain their proper jurisdiction and status in the near future in order to afford the railway industry and the public an agency, and apparently the only one, whereby they can obtain quick and common-sense decisions on vital but disputed points.

C. E. R. A. Takes Action to Rejuvenate Member Interest

IN LAST week's issue we devoted a great deal of space to material which had as its plain purpose the arousing of greater activity and the overcoming of backsliding on the part of all of us who have contributed much to and owe much to the electric railway industry. To read in this week's issue the report of the C. E. R. A. convention at Ottawa Beach, one sees a concrete example of the condition, not uncommonly prevalent in the industry, which inspired the subject matter of our July 10 issue. At this meeting one of the most important matters proposed by this central association in a number of years—the formation of an electric railway express company similar to the American Railway Express Company—had to be abandoned because of the lack of co-operation on the part of the committee members and later the company members generally. The chairman of the important committee on standards had to report no action because of his inability to get the members of the committee to take any interest or do any work. The subsidiary association of the accountants, in its meeting following that of the parent body, passed resolutions looking toward the ultimate disbanding of the association if greater interest was not manifested at the next meeting.

But this is not a condition inherent with the men of our industry, though it shows a most lamentable situation and one which this paper is determined shall not be permitted to go on unchallenged. That the condition is not inherent is perhaps demonstrated by the incident at the Ottawa Beach meeting in which Mr. Scullin of Cleveland was game enough to give voice to his thoughts that the efforts of the standards com-

mittee, of which he is a member, were a waste of time and worry because the developments are so rapid that standards established today are obsolete in a few months. The promptness and vigor with which this frank expression was treated by the remainder of the delegates present gave ample proof of the fact that the men of the industry for the most part have not lost their interest in advancement, but need only to be aroused. And it was for this purpose that we sought for publication last week the very frank articles which appeared.

We believe that the action taken by the main body and accountants of the C. E. R. A. dealing with lack of active participation in the association work is indeed a healthy sign. There are only a very few circumstances which should be permitted to stand in the way of attention to association work. Repeated absences are inexcusable, for not only does this hamper the work of the association, and therefore do harm to all member companies by holding back progress, but it robs the individual of a splendidly broadening influence.

Every man owes it to his company to do his full part in association work and no one is too well informed himself but that he can derive new ideas from his fellows.

Can the "Piece Work" System Be Applied to Railway Management?

A VITAL element in the railway industry is efficiency in management, yet it has been found difficult to incorporate in any service-at-cost franchise a method by which this quality will be properly rewarded. As efficiency in operation is best obtained in any industry by the award of inducements rather than penalties, this problem naturally becomes one of offering rewards that will appeal to capital, labor and the public.

What rewards should be given and how can efficiency in management be measured or obtained?

Various methods have been suggested to solve this problem, *i. e.*, the allowance to capital of a return varying inversely according to an agreed ratio with the fare charged, a bonus system for capital based on an artificial standardized bogey consisting of a balancing fund between fixed limits, and a return based on the number of passengers carried. All these plans have faults, yet at least they make an attempt to solve the problem. In the interests of the future of the service-at-cost franchise a solution is desirable. The railway industry is facing a fact and not a theory; the companies need capital to supply the additional service required by an increasing population, yet when the general sentiment of investors is that any one is foolish who invests in railway securities, the need for some means to secure this investment is obvious.

If economic and regulatory conditions should remain constant the problem would be an easy one. It would be necessary only to set a reasonable bogey for the operating ratio and allow a higher return as the performance proved better than the standard set. But no matter how fair such a plan might be when established, changing conditions would make it in time inequitable for one side or the other.

One remedy would be to permit either side to ask for an alteration of the bogey at stated periods, just as standards for piece work in manufacturing may be altered periodically if found to be grossly unjust. Any change of this kind would have to be made with the

greatest fairness, yet this does not seem impossible of fulfillment if certain recognized standards, such as current rates of interest for different classes of securities, are taken into consideration, and perhaps agreed upon in advance. A provision of this kind would at least have obviated such injustice as has been caused to certain companies which accepted so-called service-at-cost franchises only a few years ago when a nickel was a reasonable fare for the average ride and 5 per cent mortgage bonds could be sold at par.

Here is a problem for the expert in railway economics. It may be that we need a Fred W. Taylor to supply the answer. The problem is difficult and differs from that in the manufacturing business, but the fundamental principles are the same, and the methods used in manufacturing which have proved to be practical and workable at least offer prospects of success.

Don't Forget "Safety First"

THE electric railway industry made the slogan "safety first" its own property in the minds of the public until the war arrived to work havoc with normal conditions. The war made "get there first" and not "safety first" the slogan of the nation.

Economic conditions in the railway industry have occupied the attention of the managements since the war—self-preservation is the selfish law of nature—and safety methods were allowed to lapse and grow into a rut. Then, again, a changed operating personnel, different operating conditions, changes in operating equipment and increased use of motor vehicles all put new factors in the safety problem.

The electric railway industry has made a splendid record in safety work. It decreased its death rate per 100,000 inhabitants from 4.37 in 1907 to 2.66 in 1916, as compared to a decrease in rate for the railroads of from 17.84 to 11.50 and an increase in deaths by automobiles from 0.68 to 4.92 for the same period. Such a record, considering the number of passengers carried and the operating conditions for each agency, shows how brilliantly the electric railways were enforcing their safety slogan just before the war.

There is a selfish interest in maintaining safety campaigns and devices. Accidents mean legal battles, insurance claims, damaged public relations and other disagreeable financial and operating conditions that may burden the railway system more than the efforts and money needed to maintain safety standards.

There are burdens, financial and otherwise, associated with high standards of safety. The public and the employees must be educated continuously, for safety campaigns never get results unless maintained with undiminished vigor; new devices must be tried out and purchased to suit changes in conditions and equipment; old safety methods and slogans must be continuously revamped to maintain efficiency and interest; the attitude and intelligence of the employee has changed considerably, as he must be induced, not ordered, to carry out, to him, non-essential policies such as courtesy campaigns and safety-first precautions, but the railway industry cannot afford to backslide on its "safety first" slogan.

In maintaining the lead in national safety movements it is rendering a national aid, gaining a national prestige, gaining public good-will and keeping its earnings intact. It can, with profit, co-operate in any safety

drive such as the Lehigh Valley drive, described in the last issue of this magazine, and can render material aid to the American Engineering Standards Committee in its attempt to codify safety methods.

Give the Master Mechanic a Little More "Head"

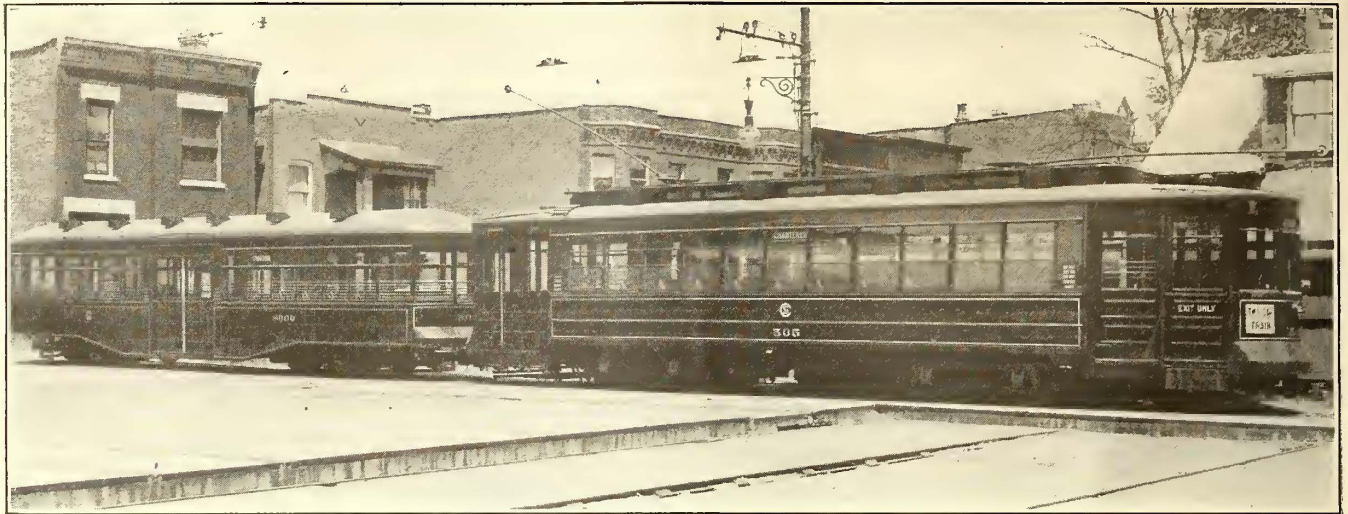
THE meeting of the equipment men, or Association of Electric Railway Men, at Youngstown, a report of which is given in this issue, is a move in the right direction. We wish there were more of such meetings fostered by parent associations like the C. E. R. A., the Illinois Association and Iowa Association, for there is good reason to believe that practical results of almost inestimable value to the company ultimately are derived from meetings of this sort.

To quote the admonition of "Engineer" in the issue of July 10, "what the railways need to do is to provide the public the sort of rides that the public wants." The master mechanic is in a strategic position to make or unmake strong public sentiment for the company through one of those elements of good service, namely, reliability of its equipment.

Now, there are all sorts of labor-saving devices, there are many methods of handling particular pieces of work and there are numerous shop kinks and other kinds of information which master mechanics can exchange when they get together around a table for informal discussion. An incident was recently related in which one master mechanic found himself entirely without repair parts of a certain kind, while on a connecting road the master mechanic had a surplus of this very thing. But master mechanic No. 1 was not even acquainted with master mechanic No. 2, and as a consequence service on his road was much crippled until sufficient time had passed to obtain parts from a factory. It seems almost inconceivable that such conditions do exist, and the way to eradicate them is to encourage the fullest sort of discussion, accompanied by visits to shops of the various companies with a view of benefiting by the other fellow's experience. It is probable that the smaller roads suffer from this situation more than the larger ones, but all can benefit from the other fellow's experience.

This is not so much a message to the master mechanic as it is to the manager, who ought to study this question carefully. He should do everything within his power to enable his master mechanic to attend meetings, not of managers but of master mechanics. These men are practical men and not only do they talk but they visit each other's plants and exchange first hand information.

We have mentioned this one line of work, but like results can be obtained by meetings of power plant superintendents, maintenance of way engineers and transportation men. Much of the real work of providing transportation is done by these various groups, and while the management which is ultimately responsible on each property tries to give encouragement to every element of its operating personnel, too often, we are afraid, this need of the men of the operating organization getting together with men in similar work on other roads is overlooked. We believe it to be one of the greatest fields of usefulness of local associations to foster such meetings, though not necessarily to make them a part of the program of the parent association meetings.



CHICAGO'S TWO-CAR TRAIN WITH NEW TRAILER AND REMODELED MOTOR CAR

Chicago's Trial Trailer Completed

Forerunner of Two Hundred Weighs 26,000 Lb. and Seats Sixty-two—Design Has Many Interesting Features and General Appearance Is Unusually Attractive

CHICAGO'S trial trailer, a magnificent piece of car design work, for which credit is due H. H. Adams, superintendent of equipment Chicago Surface Lines, and his staff of engineers, is now in daily operation. With its rearranged motor car it is making a morning and afternoon rush-hour round trip on various lines to demonstrate the practicability of trailer operation in general and the features of this particular train under all operating conditions and to acquaint the trainmen and the public of the several sections of the city with the aspects of this character of service.

An earlier story about this trailer, which appeared on page 820 of the April 17 issue of *ELECTRIC RAILWAY JOURNAL*, noted that a drive to build the car and rearrange the motor car within sixty days was being made. This bogey was made but for a few days, and on June 18 the train made its initial trip, carrying a party of company officials and engineers, city representatives and newspaper men. Since then it has been run about eighty miles a day on the same schedule that is maintained by the single-car units and further complete tests and trials will be made.

On these trial runs a careful watch has been kept of the motor temperatures to determine whether the Pullman cars, equipped with four GE-216, 55-hp. motors, 33-in. wheels and 15/71 gear ratio, could be safely used in the trailer service. The conclusion reached after more than two weeks' operation is that these cars can be used for rush-hour service without dangerous rise in temperature if a layover of three or three and one-half hours can be had between the two trips. The motor car used for the first trailer was equipped with a National A-4, 15-cu.ft. air compressor. This was not changed, and so far it seems to be standing satisfactorily the extra heavy duty imposed by the trailer. Actual temperature readings of the car motors and compressor motor taken in the morning after one round trip on route No. 22, having a mileage of 38.44, and again after the afternoon similar run, with a layover of three and

one-half hours between the morning and afternoon runs, showed the following temperature rises:

MAXIMUM RISE ABOVE ATMOSPHERE DEG. C. (Outside temperature 24 deg. C. in both cases)				
		Commutator	Field	Armature
Readings taken when	Motor No. 1.....	51	52	53
car stopped at 10:38	Motor No. 3.....	53.5	50	51.5
a.m.	Compressor	48		
Readings taken when	Motor No. 1.....	55.5	58	60
car stopped at 6:18	Motor No. 3.....	57	55	64.5
p.m.	Compressor	37		

The operating practicability of trailers in Chicago from traffic and equipment standpoints has now been pretty well established and the new management of the Chicago Surface Lines is about to take the progressive step of inaugurating trailer operation on a large scale by converting 200 of the Pullman type cars in the manner described below and securing 200 new trailer cars of the design here described, except for changes noted, as soon as the financing can be arranged. The company will probably build about fifty of the trailers, in addition to reconstructing the motor cars in its own shops, and buy the remaining 150 trailers.

PRINCIPAL FEATURES OF TRAILER DESIGN

In general, the trailer is a two-way, center-entrance car measuring 47 ft. 6 in. long, balancing the scale, completely equipped, at exactly 26,000 lb., and seating sixty-two passengers. The body is of arch roof design with a steel underframe and side girder up to the window rail and a wooden superstructure, this combination of steel and wood providing a lighter car than could be built of all steel. The steel portion is made up entirely of standard structural steel sections and plates and weighed when completed 6,260 lb. The body is mounted on Brill 67-F trucks with 22-in. rolled steel wheels and a 4-ft. 4-in. wheelbase. All of the main and many of the detail dimensions of the car body and other information are shown in the accompanying drawings. And the accompanying photographs of the completed car gives

a very good idea of the general design and of the pleasing lines and finish of the car, both inside and out.

In making up the superstructure, the design was so worked out as to eliminate the wooden side sill along the bottom of the side plate, thus saving that weight and avoiding deterioration of the sill. The side posts, which it will be noted are only 2 in. thick at their maximum section and taper off to 1 3/4 in., are fastened to the steel underframing by means of straps and bolts which clamp them to the side girder plates. Every other post is a pier post and is babbitted to permit the insertion of a 3/8-in. tie rod. A filler strip is glued in place to cover up the rod and fill in the remainder of the groove. These tie rods are bolted to the angle at the bottom of the girder and at the top, through the top side plate. The pier posts are fastened to the side plates by three straps at the top, center and bottom of the girder plates, and the straps are made short so that they can be drawn up tight. The intervening posts are through-bolted to the side plates at the top and middle and fastened with a strap at the bottom of the plate. The carlines are made of wood and those resting on the pier posts are reinforced by 1 1/2-in x 1/8-in. straps bolted to them and carried over the top of the side posts.

The flooring underneath the seats is built with a single layer of 1 1/8-in. maple. That in the center well and in the aisles is laid double, the first layer being of 3/8-in. yellow pine with a top layer of 3/8-in. maple boards, grooved in sections 4 in. wide. The floor of the well is level, but there is a ramp of 5 1/4 in. in 9 ft. each way from the well.

One of the features of the car body construction is the use of hollow brass tubing for the window guards, instead of the heavy wire screen formerly used in Chicago and shown on the motor car in an accompanying

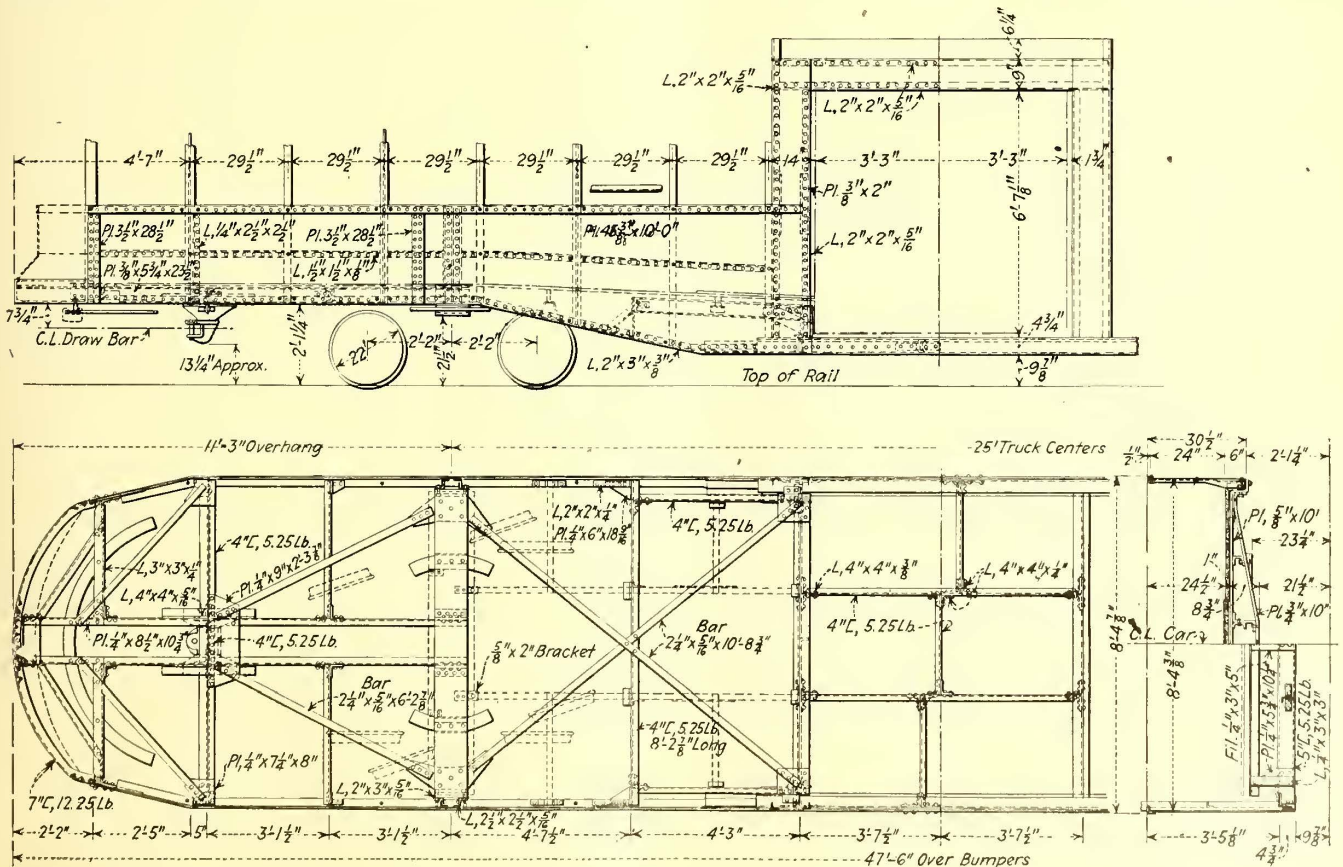
picture. This new type of window guard is made up of seven lengths of tubing, supported at the center and ends by brass castings and fastened between the side posts by means of four No. 12 flat-head wooden screws at either end. The brass tubing used is of No. 18 gage brass and has an outside diameter of 1 1/8 in. The guards are made up in short sections and fastened between the side posts, leaving sufficient clearance inside the outside post line for putting on storm sash without removing the guards. This manner of fastening the window guard in sections between the posts adds materially to the strength of the side construction of the car. Besides adding stiffness to the structure, this type of window guard saves about 100-lb. weight per car; it reduces maintenance, since it does not have to be painted or taken care of in any way, and it can be left on the car permanently winter and summer, since the windows can be readily washed through the guard. The weight of each section of the guard is 4 1/4 lb.

INTERIOR FINISH ATTRACTIVE

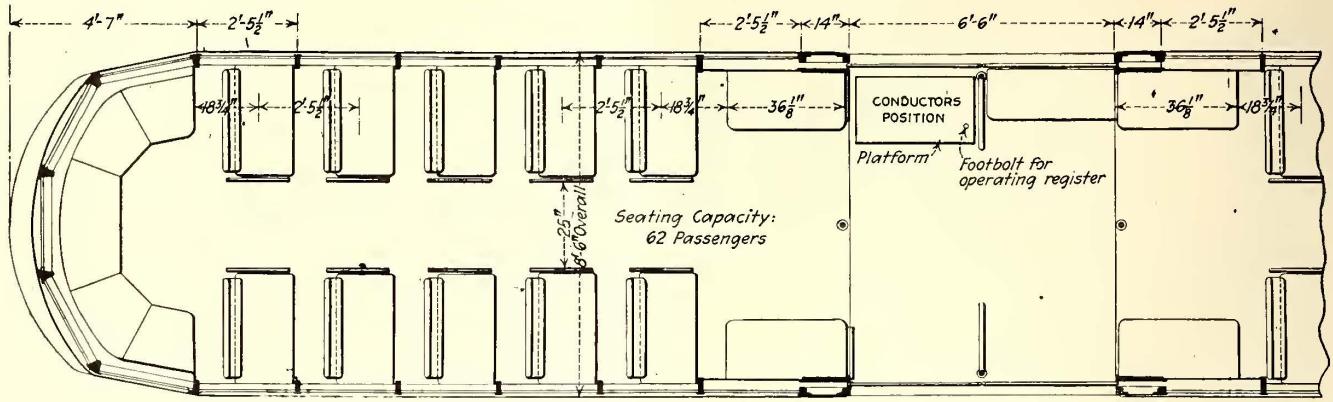
Agasote head lining, painted a very light buff, and a cherry finish of the interior woodwork, together with the installation of all molding in unbroken straight lines from one end of the car to the other, give the car interior an unusually clean, plain, attractive appearance.

The windows are made with wood sash with a brass channel at the sides and are so designed that it is not necessary to remove the sash from the cars in summer, since these are very light. Only one O. M. Edwards lock and rack is used per sash, the opposite side of the sash being equipped with an Edwards sash brake, which prevents the sash from falling all the way down.

The curtains are also installed in a manner which bears comment. These are made of a double-faced



PLAN AND ELEVATION OF CHICAGO TRAILER STEEL FRAME



FLOOR PLAN SHOWING SEATING AND LOADING WELL ARRANGEMENT

material supplied by the O. Bannon Company, and the rollers are mounted so that they are entirely exposed, the ends of the rollers and fixtures being covered up with a small curved brass plate. With the full curtain exposed in this manner, it is possible to clean both sides at the same time by wiping the roll and the inner side of the curtain as it is pulled down.

The cross seats are of the form fit springless type, rattan covered. The weight of the seat is 57 lb. complete, which, incidentally, is 18 lb. per seat lighter than the spring cross seat in the motor car. The rattan on the backs of the seats at the end of the car and those longitudinal seats adjacent to the loading well are carried only part way down to the cushions, thus saving rattan and at the same time making the seats more comfortable.

Ventilation is provided by means of twelve Railway Utility ventilators, there being four exhaust ventilators and two intake ventilators on each side of the car. This provides the same system of ventilation, making use of a compensated intake, that is employed on all of the motor cars of the Chicago Surface Lines.

ARRANGEMENT OF LOADING WELL

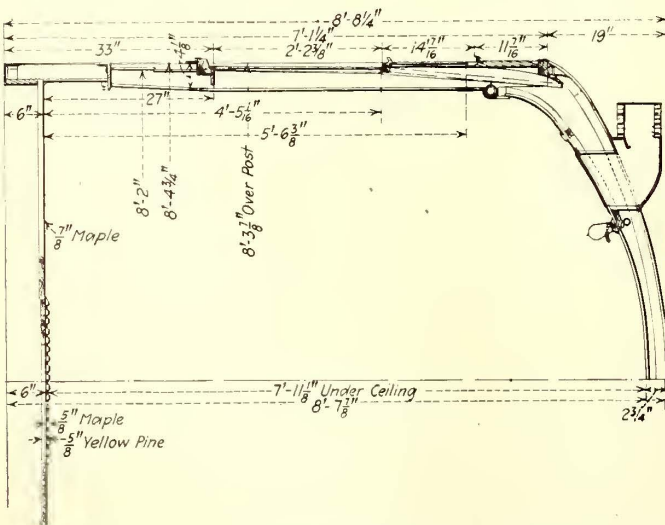
The loading well has been arranged with the idea of obtaining the maximum reservoir capacity for boarding passengers. Entrance or exit is made through either of two wide sliding air-operated doors, except only as entrance is blocked by the egress of passengers. The conductor's position is placed at the opposite side of

the well from the entrance doors and a platform 6 in. high is provided for him to stand upon, thus giving him a position elevated above the passengers and affording him full control. A seat or stool is made an integral part of this platform and as the direction of the car is reversed this platform is moved to the diagonally opposite position in the well. The register is mounted over the door and is operated by a foot pedal extending down through the conductor's platform and through the floor. When the platform is moved to the opposite position the register is operated in the same manner without moving it. Both positions of the conductor's register pedal engage with the same operating mechanism. The control levers for the doors are installed just above the stanchion beside the conductor and the push button for the single stroke bell signal system is mounted on the under side of this stanchion just below the door-operating levers. A duplicate push button for the bell signal system is installed in either stanchion, the stanchion being fastened permanently in place, but the door-operating levers are transferred from one to the other when the direction of the car is reversed. The four doors in the car are operated by four separate engines which are installed above the floor underneath the longitudinal seats.

In addition to the simple stanchion beside the conductor, there is also a vertical stanchion in the center of the aisle on either side of the well. A chain is swung across to the small bulkhead and this chain is swung to the opposite side with a reversal of direction.

This arrangement of the stanchions in the loading well and the arrangement in the motor car, described below, is based on the theory that the public has been educated to the prepayment system of fare collection and that therefore dependence does not have to be placed so completely upon rails now as was formerly necessary. The platform design at this time is therefore made from the point of view that the public is educated and that the primary object is to get the passengers into the car as soon as possible, to close the doors and then to collect the fares. Consequently it is not thought advisable to adhere too rigidly to the old scheme of complete separation of boarding and alighting passengers.

The most frequent condition encountered at a stop is either a heavy loading or heavy unloading. The number of points at which there are both heavy loading and unloading are few, and in most cases the public has become so accustomed to separate lines of travel for ingress and egress that the boarding passengers automatically give way to the alighting passengers, but when



CROSS SECTION OF TRAILER, SHOWING CONSTRUCTION OF SUPERSTRUCTURE

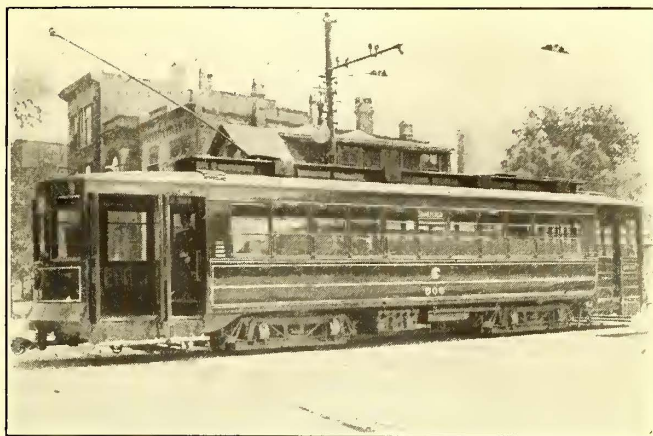
the latter are all off the former pour in at all points and make the loading extremely rapid.

The doors of the Chicago trailer have been equipped with electric door interlock control, and the motor car is likewise equipped, so that the motorman receives the go-ahead signal at the instant the doors are closed. The conductor is given control of the train in case of emergency by an emergency valve which is installed convenient to his position. A hand brake is provided for holding the car when detached from a motor car and this is installed adjacent to the vertical stanchion at one side of the well and so designed that it requires no support above the car floor. It is equipped with a drop handle and a heavy staff which is supported at two points below the floor. The ordinary service braking of the trailer is done by two 7-in. brake cylinders, located one on either side of the well. It is found that less weight is involved by installing two brake cylinders than to install one cylinder with the necessary connecting rods. The double-cylinder arrangement also avoids the necessity of having a rod extend underneath the well where the clearance is small.

Both motor car and trailer are equipped with two Tomlinson automatic couplers, with which the electric jumper for the light, signal and heater circuits is ingeniously combined. The electric coupler consists of a four-point socket fastened on one side of each car coupler by means of a special iron bracket bolted to the coupler. The jumper, with plugs attached to either end, is connected across underneath the coupler to the two sockets. The complete jumper with plugs is only 28 in. long. It carries five wires, two of which are connected together to carry the heater current. The neat appearance of this jumper arrangement may be seen at the extreme right of the accompanying straight side view of the trailer.

REDUCTION IN WEIGHT POSSIBLE

In planning the trailer, a weight of 24,000 lb. was set as the goal, and this will undoubtedly be attained in building additional cars. In building this first car

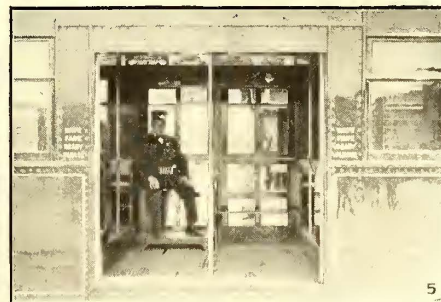
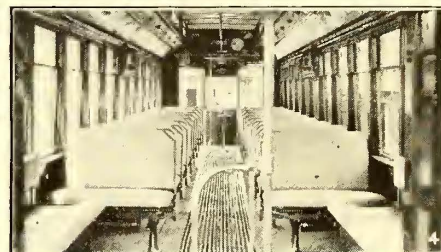
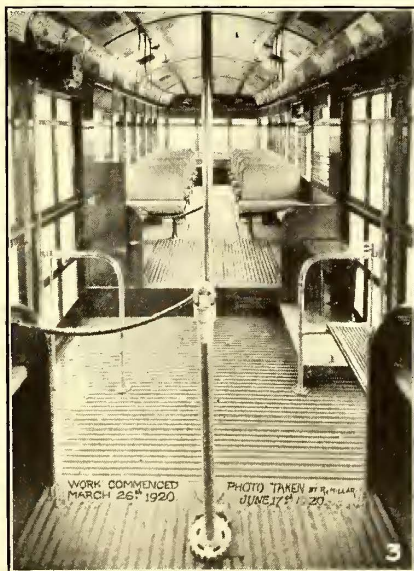
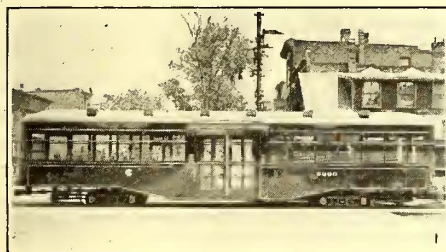


EXTERIOR OF REMODELED MOTOR CAR

time was an important factor, and when delivery of materials of just the desired kind could not be obtained soon enough it was necessary to resort to materials on hand as a substitute. For example, the side girders were made of No. 12 gage steel instead of No. 13, some angles and channels used in the underframe were heavier than was wanted, built-up type bolsters instead of cast-steel bolsters were used and the trucks are somewhat heavier, it is believed, than they will be when there is time for them to be built after the company's specifications. These factors should decrease materially the final weight.

There will also presumably be an opportunity to reduce the weight at least 1,500 lb. on future cars by making them one-way instead of two-way cars. On this trial car, in view of various considerations, it was thought advisable to make it a two-way type, but it is now practically decided that the one-way type will meet traffic requirements equally as well and will make possible several advantages from the standpoint of equipment design.

The present weight of 26,000 lb. is 419.35 lb. per seated passenger and the 24,000 lb. weight if attained



VIEWS OF THE FINISHED TRAILER FOR CHICAGO

Nos. 1 and 2—Views of Chicago's trial trailer. Note neat jumper connection at extreme right of the picture at the bottom.
 No. 3—The well arrangement and the pleasing interior finish are well protected in this picture. New devices are mounted in sight inside the car.

No. 4—Interior of the remodeled motor car, showing the addition of folding doors and steps, the new position of the conductor and the prepayment rail arrangement and two folding seats on the platform.
 No. 5—View of the center well as seen from outside the car.

would give 387 lb. per seated passenger. The weight of the present car is distributed as follows:

Body complete with couplers and fenders.....	17,950 lb.
Steel framing complete	6,260 lb.
Superstructure	9,580 lb.
Trucks with wheels and axles.....	8,050 lb.
Couplers and electric jumpers and fenders.....	2,110 lb.

RECONSTRUCTION OF THE MOTOR CAR FOR TRAILER OPERATION

Several changes in the interior arrangement of the motor car were made in preparation for trailer car operation. In the first place, the open rear platforms are closed up with air-operated folding doors. The bulkheads are removed for the purpose of increasing the seating capacity and of facilitating the loading and unloading of passengers through the provision of a larger reservoir capacity. With the bulkheads removed, the conductor's position is changed from the platform up onto the car floor, which is made to project out on to the platform beyond the end sill a distance of 10 in. This brings the conductor forward and in an elevated position, so that he can see the steps over the heads of the passengers and collect fares from the platform as the passengers pass on either side of him. This arrangement not only gives the conductor good supervision of passengers but provides an ample passageway on either side of his position for passengers to enter or leave the car body. Only the simplest kind of stanchion is provided, as seen in an accompanying photograph, dependence being placed on the theory that passengers are already educated to the prepayment plan, as noted in connection with the trailers.

With the bulkhead removed, it is possible to remove the sand boxes and combine them with the end longitudinal seats and move the longitudinal seats at the end of the car body toward the ends of the car a sufficient amount to permit of the installation of an additional cross seat on either side of the car at both ends. Furthermore, two folding platform seats are installed, providing a seat for six additional passengers. By these additions, the seating capacity of the motor car is increased from forty to fifty-four. At the same time, the addition of couplers and the other rearrangements bring the weight of the car from 53,440 lb. up to 55,400 lb. This brings the total seating capacity of the train up to 116.

More Economy in Operation

LOWER cost is an important item and any reduction, other things remaining equal, is welcome. The purchase of power-saving devices and recorders does not necessarily mean a reduction in power consumption of street railways, and in any event the employees must be instructed in their use and induced to follow directions. M. F. Skouden, superintendent of motor power, in a recent issue of the company paper, asks the trainmen of the Indiana Traction Company to improve their records and tells how to get results from power-saving meters.

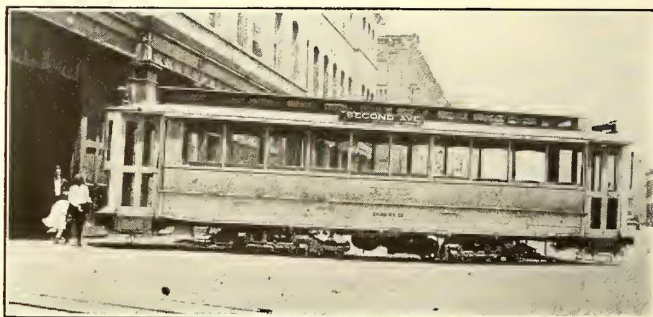
Every such device requires intelligent use and an educational campaign is an essential element in its success. In order to afford an inducement for better operation some companies offer cash prizes for the men making the best monthly records. Such prizes, however, must be used with care to avoid slowing down schedules, or causing jealousies and labor trouble, as routes, hours or traffic conditions differ.

One-Man Cars Used in New York

Second Avenue Railroad Making a Trial of Some Remodeled One-Man, Two-Man Cars for Its Service, with Marked Success

THE Second Avenue Railroad has remodeled five of its closed passenger cars for one-man operation. This work was done in its shops and additional cars are being remodeled for this service as rapidly as possible. These cars are equipped with maximum-traction trucks, hence have two motors each. The cars weigh 12½ tons and seat thirty-six passengers.

The changes made for this service consist in the addition of folding doors and steps to both sides at each end, together with the necessary operating apparatus and air brake equipment. The folding doors and steps are hand-operated, arrangements being made for the use of operating levers at two locations on each platform. One of these is just to the right of the motorman's brake valve and is used by the operator in one-man operation. The other location is on the right side of the front platform and left-hand side of the rear platform next to the bulkhead. This latter operating lever connects with the

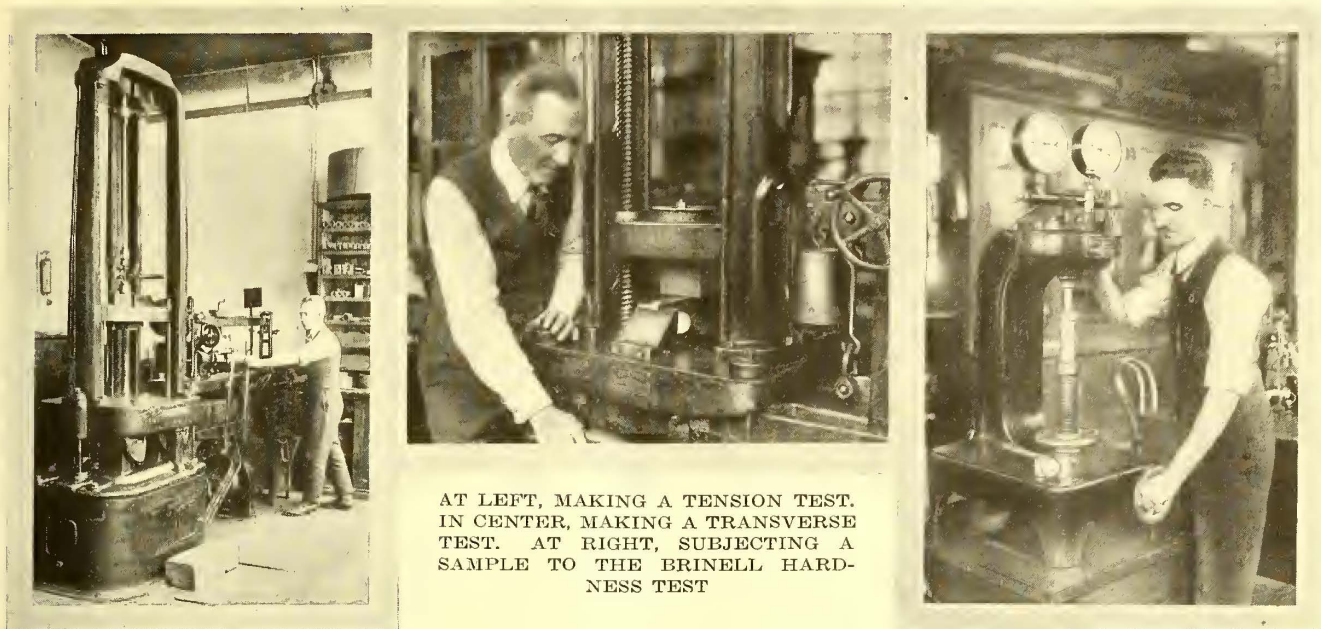


CAR REMODELED FOR ONE-MAN, TWO-MAN OPERATION IN NEW YORK CITY

rear right-hand door and is used by the conductor when two men per car are necessary. The right-hand front doors, which would be used for one-man operation, are operated from the position just to the right of the motorman's brake valve.

An accompanying illustration shows one of the cars as remodeled and now in service. On some of the cars which are now being remodeled some changes from this construction are being made. Among these is the use of a stationary panel about 15 in. in width extending back from the front of the platform. The doors and steps are moved to the rear a corresponding distance. The advantages of this arrangement are, first, to provide a space for the motorman which will not be invaded by passengers boarding and alighting; second, by moving the steps back from the front buffer, danger of damage from bumping of trucks or heavy vehicles is done away with. These cars are required to operate in extremely heavy traffic sections and considerable damage results from having the steps too close to the buffer, because whenever a vehicle is struck it either slides back and strikes the step mechanism, thus putting it out of commission, or if the front end is damaged the whole step and door mechanism is rendered useless.

These changes have been carried out at the direction of C. E. Chalmers, receiver for the railroad, and he states that the operation is proving popular both with the traveling public and the men who operate the cars as well.



AT LEFT, MAKING A TENSION TEST. IN CENTER, MAKING A TRANSVERSE TEST. AT RIGHT, SUBJECTING A SAMPLE TO THE BRINELL HARDNESS TEST

Railway Car Materials — Steel III

A Description of Special Tests that Are Used in Determining Car Material Qualities, Together with Heat Treatment and Alloys Used

By NORMAN LITCHFIELD

Physical and Chemical Properties Closely Connected

IN ADDITION to the usual tests for steel which were outlined in a preceding article certain special tests have been developed in the past few years which will be described briefly, as they enter but slightly into the realm of car materials.

The first of these is the Brinell test for measuring hardness, in which a hardened steel ball is forced under pressure against the piece to be tested, forming a depression in the latter. This depression is measured and the corresponding "hardness numeral" found from a table. A more or less definite relation exists between the numeral and the tensile strength and hence the test is useful in determining the strength as well as the hardness of the metal in an object which cannot be cut up for tensile test. Manufacturers of gears have used this method for checking up the character of the material in gears and pinions. It is a test, however, quite apart and distinct from the ordinary tensile tests and its use is hardly justified except in special cases.

Another instrument used to measure hardness is the scleroscope, in which a small steel hammer, diamond pointed, drops in a glass tube against the surface of the material to be measured. The hammer rebounds up the tube, the height of the rebound depending upon how much the diamond point penetrates the material—the softer the material the greater the penetration and the less the rebound. The tube bears a graduated scale, 100 being the point to which the hammer rebounds on hardened carbon steel. This highly rigorous test is somewhat special in nature and is not in general use in the realm of electric railway materials. Among the places where it is used is in the measurement of the relative

hardness of carbon motor brushes. All of the foregoing tests relate to the strength of the material under steady loads. Experience has demonstrated the fact that metal which shows up all right under the usual tension and bending tests will fail in service where it is subjected to shock, vibration or reversal of stress, and much study has been given to developing a laboratory test which will show the ability of the metal to resist these dynamic stresses.

Impact tests have been devised in which the test specimen is bent back and forward until rupture occurs. Others which are obtaining considerable favor are based on the principle of a swinging hammer falling in the arc of a circle from a given height against the specimen at the bottom of its swing, rupturing the specimen, and continuing upward in its circular path. The distance the hammer continues after breaking the specimen is measured, this being in some measure proportional to the resistance of the material to shock.

For the "reversal of stress" test or "fatigue" test the specimen is loaded with a weight sufficient to produce the desired stress and rotated, the number of revolutions to rupture being recorded.

Lastly, as a means of determining the nature of the metal, we have the micro-photograph. In this a small piece of the material is highly polished, etched and photographed through a microscope, at any desired degree of magnification, that recommended by the American Society of Testing Materials being one hundred diameters. The study of the character of materials by use of the microscope and the micro-photograph has developed into a science in itself, and the

microphotograph, or "micrograph," can only be used safely in judging of a material by one who is expert in that science. The railway engineer however, can, and to some extent does, use the micrograph to show the fineness or closeness of grain of the metal in cases where it is desirable to know this feature.

We have now carried the reader, in outline fashion, through the processes of production of the material and the ordinary methods of testing the finished product. Further discussion of the refinements of testing does not seem warranted in the limits of these articles, which are intended principally to point the path to those in the railway field who desire more knowledge of the materials they are constantly using.

We may therefore pass to the consideration of some special phases. One matter of general interest is that of how far the user should go in specifying the details of the manufacturing process which are or are not to be used. Some of them are quite generally used and are accepted by the manufacturers without comment. Such is the specifying by what process the steel must be made, whether open hearth, bessemer, crucible, etc. On the other hand, when we come to such a matter as discard, *i.e.*, the amount of the ingot which is to be cut off and not used, we enter a realm which is more or less in dispute. The purpose of the discard is to eliminate piping and segregation as far as possible and some ingots will require more discard than others. It therefore seems fairer, in specifications where it is desirable to guard against piping, to provide simply that sufficient discard must be made to prevent undue piping and leave the actual amount a matter for arbitration between the inspector and the mill.

AVOID NON-ESSENTIAL REQUIREMENTS

Somewhat analogous is the listing of definite limits for tensile properties in a specification, and the inclusion therewith of equally definite limits for the chemical composition. As we have previously pointed out, the physical properties and chemical composition travel, as it were, hand in hand, and to specify both is about like applying an overhead check rein to a horse pulling a heavy load up hill. The steel producer in such cases inevitably will kick much like the horse. It is perfectly fair of course to ask for limits to the impurities, such as phosphorus and sulphur, besides the required physical properties, but when it is attempted to require exact carbon and manganese contents besides the tensile requirements it becomes unreasonable. It seems only fair that the user should determine in his own mind what is the important feature for his purposes, the chemical composition or the tensile strength. Thus if he proposes to use the steel for some welding purpose he would naturally desire to limit the carbon content and he would be satisfied with a general knowledge of the tensile strength. On the other hand, if he purposes using the steel in a part where the working stress must of necessity run high he would require an exact knowledge of the tensile strength and be but little interested in the chemical composition. It should be remembered that too great particularity in such matters is reflected in the price of the material, for the minute any specification requires a class of material which cannot be produced regularly and commercially, but which necessitates the selection of heats, etc., the steel maker naturally has to be reimbursed for the extra labor and the upsetting of his production schedule. So the wise man will reflect whether all the provisions of his speci-

fication are entirely necessary before insisting on their fulfillment. Not but that there are cases when it pays to be particular; in such cases one must prepare to pay.

The demand for a greater strength than can be obtained with ordinary carbon steel led to two practices, one the subjecting of finished carbon steel to certain temperature conditions known as "heat treatment," the other the addition in the manufacture of the steel of certain other metals which have been found to raise the physical properties. Both of these matters obtained their original impetus in connection with the manufacture of tool steel, armor plate and projectiles, and later still greater strides were made and are still being made in connection with automobiles and aircraft. Other than for tool steel, the first introduction of heat treatment in its scientific phase into railway materials was in connection with gears and pinions, of which the life and the freedom from breakage were enormously increased with the introduction of these materials. Another field is that of axles and armature shafts. For many years it has been the custom to anneal passenger car axles after forging to relieve forging strains. This was done, as a general rule, by burying them when hot in dry ashes. While this relieved the strains and to some extent refined the grain of the metal it could hardly be called heat treatment in the present acceptance of the term.

The phrase "heat treatment" is one which has been very loosely used and may be said to have often covered a multitude of sins. Strictly speaking, it is any process of reheating to which a piece of steel may be put in order to alter its physical properties in some way.

A rough approximation of the various conditions of steel at different temperatures may be given somewhat as follows: As every one is familiar, steel, when subjected to a sufficiently intense heat, finally passes into a molten or liquid condition. Somewhat below this temperature there comes an actual separation of the grains of the steel. It is at that point that, if allowed to cool normally, the steel is in the condition, familiar to forge men, known as "burned" or overheated, and in this condition it cannot be restored to its normal state except by remelting. By cooling the steel again below this point there comes a state where there is a "remarkable development of sensible heat, causing the color to brighten up again, this phenomenon being known as *recalcescence*" (the language being that of Prof. Johnson). The temperature at which this occurs is known as the critical temperature, this varying somewhat with the composition of the steel. Or, as is expressed by another authority, "critical temperatures are temperatures at which retardation occurs in the heating and cooling curves of iron and steel."

Between the critical temperature and that which approaches the "burned" conditions, before mentioned, there comes a change in the grain structure of the steel, the grains becoming larger and larger and the steel harder. It is these changes, their control and interpretation that form the field of that interesting but complex science known as metallography which has received so much attention the past few years.

In the fabrication of the article, whether it be axle, gear or other forging, it often happens that the forging process or the cooling, or some other factor, disarranges the normal condition of the steel so that it is not in its best condition for use to resist strain or shock. Recourse is had therefore to some form of heat treatment to put the steel in a proper condition. This may

be a simple "normalizing," which consists simply in heating the steel to the critical temperature and cooling slowly in the air. This is a more or less approximate process and may or may not give definite results.

For definite results we must go to a more carefully controlled process, that now known technically as "annealing." The American Society for Testing Materials has formulated a recommended practice for annealing, under the serial designation A-35-11. In this it is stated: "The usual purpose in annealing is to remove existing coarseness of grain. This removal is brought about by heating the object to an annealing temperature, which varies with the carbon content of the metal. But the rate at which the object cools from this annealing temperature influences its properties very profoundly. Hence this rate of cooling should be suited to the duties which the object has to perform in service, and hence to the properties which we seek to give it. Under certain special conditions an annealing is required in order to remove, not coarseness of grain, but the effects of rolling or otherwise working the metal at a temperature so low as to set up serious internal stress." The specifications then proceed to outline the method of heating and the control of the temperature.

The following ranges of temperature should be used for the several ranges of carbon content indicated:

Range of Carbon Content	Range of Annealing Temperature
Less than 0.12 per cent.	875 to 925 deg. C. (1,607-1,697 deg. F.)
0.12 to 0.29 per cent.	840 to 870 deg. C. (1,544-1,598 deg. F.)
0.30 to 0.49 per cent.	815 to 840 deg. C. (1,499-1,544 deg. F.)
0.50 to 1.00 per cent.	790 to 815 deg. C. (1,454-1,499 deg. F.)

Attention is then called to the effect of different rates of cooling: "After the object has been held at the annealing temperature long enough to make its temperature nearly uniform throughout and to complete the refining of the grain it should be cooled in a way suited to its carbon content and to give it the specific properties needed. The general principles are, first, the higher the carbon the slower should be the cooling, and, second, the slower the cooling the softer and more ductile the metal will be and the lower will be its tensile strength, elastic limit and yield point. The greatest softness and ductility are obtained at a certain sacrifice of strength and elasticity and the greatest strength and elasticity at a certain sacrifice of softness."

It should be remembered throughout that all of these changes take place without any change in the total carbon and iron content of the steel, but are brought about solely through the alteration of the conditions in which the carbon exists in the steel, it being further remembered that the heating above the critical temperature coarsened the grain and hardened the steel. Hence it is natural to find that by cooling the steel slowly sufficient time is given the elements to rearrange themselves so as to put the steel in its most normal soft condition.

The specifications then point out that to give great tensile strength and high elastic limit, even at a certain sacrifice of ductility, the cooling should be more rapid, and "to give an unusually high combination of ductility with tensile strength and elastic limit, recourse should be had to water or oil quenching and annealing."

This process is often known as "quenching and tempering," this term in fact being used in the A. E. R. E. A. standard specification Et 9b, for "Quenched and Tempered Carbon Steel Axles, Shafts and Similar Forgings," which in a modified form has become an A. S. T. M. standard, serial A 19-18.

It was this particular form of heat treatment which

became first known generally to the electric railway industry, and hence, to some minds, the phrase "heat treatment" always means "quenching and tempering," although, as already pointed out, the latter is but one form of heat treatment. Not only is it but one form, it also is perhaps the most difficult, the specifications going on to say: "This process needs great care and intelligence and should in general be used only by those familiar with high grade steels."

The first step of the process is similar to the annealing already described, *i.e.*, the object is thoroughly heated to the annealing temperature correct for the given carbon content. It is then removed from the furnace and quickly, without delay, plunged into a bath of either oil or water. There is much discussion in regard to the relative merits of oil and water quenching, but it is generally argued that good results can be obtained either way with some characters of steel and shapes. The A. S. T. M. specification states: "It may be quenched in water if its carbon content is so low and its shape so simple that it is not in danger of cracking or receiving permanently harmful stress."

ANNEALING MUST BE DONE SLOWLY

In this condition (after being quenched) the steel is very hard and practically unfit for use without further treatment. As has already been explained, the heating of the steel above the "critical" temperature changes the grain structure, making it very coarse and the steel very hard. Now if allowed to cool very slowly, as in the regular annealing process, the crystalline structure gradually rearranges itself, the grains becoming finer and finer and the steel softer. This all takes time and annealing must therefore be done slowly. But if instead of allowing plenty of time the object, after attaining the annealing temperature, is suddenly plunged in a relatively cold bath, the effect is to hold the coarse crystallized structure peculiar to the region of the annealing temperature. It is as if it were frozen that way.

To put the steel now in a condition that it can be used with desirable values of tensile strength, elastic limit and elongation it must be annealed or "tempered." This tempering is done by reheating, the final temperature being considerably less than the so-called "annealing" temperature to which the object was heated before quenching. Thus, for instance, the "Range of Annealing Temperature" given in the table is from 1,454 deg. F. to 1,697 deg. F., while the tempering range is from 932 deg. F. to 1,382 deg. F. In general, the higher the temperature the more ductile will the steel become and the lower will be its strength and elastic limit. The object should be held at this second annealing or tempering temperature long enough not only to allow its interior to reach it but also to relieve the stress given in the water or oil quenching.

By this process the ultimate strength of carbon steel may be raised from a value untreated of say 60,000 lb. per square inch to as high as 85,000 lb. or 90,000 lb. per square inch and still maintain good ductility, say 20 per cent in 2 in. The ultimate strength obtained depends on the size of the section.

Another phase, or rather application, of heat treatment is that given to case-hardened steel objects, such as railway motor gears, which have the teeth case hardened to resist wear. The A. S. T. M. has developed a "Recommended Practice" for such treatment, Serial No. A 37-14, which is given after the regular case-hardening

ing process has been completed. This is a quench and temper treatment and is one which requires very expert handling.

ALLOY STEELS COMING INTO FAVOR

All of the foregoing has dealt primarily with ordinary carbon steel, *i.e.*, steel whose characteristics are dominated by the percentage of carbon present, whatever other elements there are represented being in such small quantities that they are not controlling, these elements being chiefly manganese and silicon, in addition to the ever-present phosphorus and sulphur, the two latter generally being considered as impurities.

There are certain other metals which when added to the steel materially increase the physical properties and refine the grain. From a structural standpoint the most useful of these is nickel, which is used generally in quantities of about 3 per cent. One advantageous property of nickel is that it does not tend to collect in separate crystals in the steel, as is the tendency of carbon, but forms a true chemical solution with the iron. Quenched and tempered nickel steel forgings will have an ultimate tensile strength as high as 100,000 lb. per square inch in the elastic limit of 65,000-70,000.

Just how much the use of nickel steel has come into favor in electric railway materials is somewhat of a question. To some extent it has been used for axles and possibly for armature shafts. On foreign railways it is extensively used for the screw couplings between cars which are common in European practice in the place of our automatic couplers.

A second element used as an alloy is chromium, which is somewhat similar to nickel and is often used with it, the steel then being known as chrome-nickel steel. Such a steel in objects of proper section can be made by heat treatment to produce extraordinarily high physical properties, some motor gears of the material having shown an elastic limit of more than 100,000 lb. per square inch, with an equally high elastic ductility.

It is, however, felt to be a very difficult material to handle properly and as yet has had but little use in the railway field, other than in some tool steels.

Vanadium is also being largely used as an alloy, sometimes by itself and sometimes with chromium, either in carbon steel or nickel steel. Both chromium and vanadium raise the elastic ratio, *i.e.*, the elastic limit is raised proportionately more than the tensile strength. Inasmuch as laboratory tests of resistance to shock and endurance under repeated or alternating stresses indicate that, for a given working stress, the higher the elastic limit the greater the endurance obtained, chrome and vanadium steels are in large use in places where the dimensions of a part exposed to shock must necessarily be small, as in the automotive industry.

Much interest has been aroused by the development of an ultra-lightweight gasoline-propelled car which is now in course of construction and which it is understood embodies in its construction a considerable amount of

alloy steel. Such an experiment is of undoubted value and may point the right way to a more extended use of alloy steels in the electric railway fields.

Another metallic element used as an alloy is manganese, which is added in amounts of about 10 or 12 per cent. It is used in places where great resistance to wear is required, notably in track special work and on curve rails in places of highly congested traffic. For some time a certain make of cast gear made from manganese steel was popular, but while showing great resistance to wear it proved exceedingly brittle and its use was, we believe, altogether abandoned in railway service.

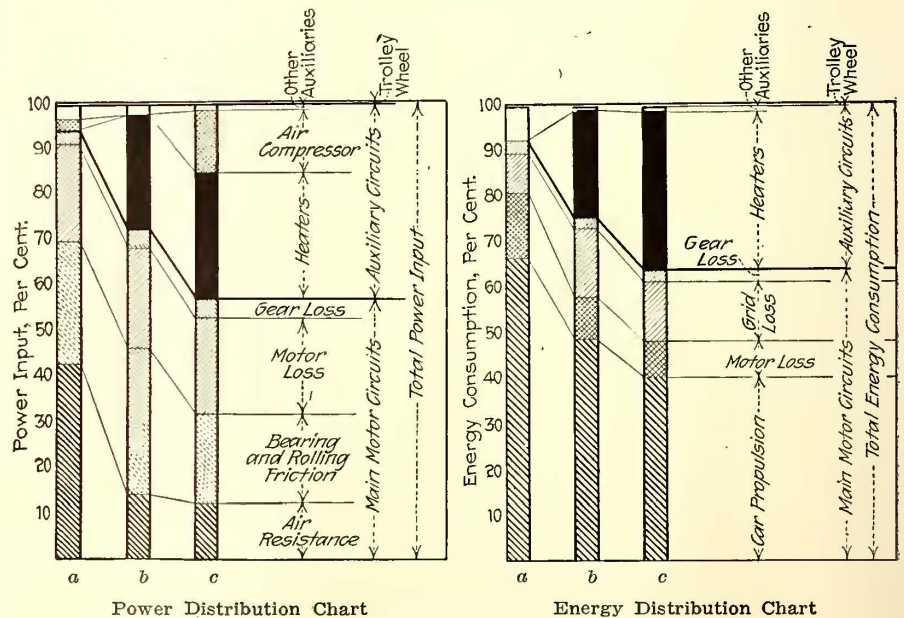
The foregoing are the more ordinary alloys that are met with; other and more unusual elements as alloys being tungsten, tantalum and molybdenum, entering into the composition of some tool steels and to a certain extent in rails.

No more interesting subject exists than that of the manufacture and use of steel in its widely varying modifications, and it is hoped that the foregoing series of articles may be of interest to electric railway men and stimulate further interest in the study of the subject which is of so great importance.

Car Losses Graphically Presented

At the annual meeting of the Central Electric Railway Association, held at Louisville, Ky., March 11, a paper on "Economical Use of Energy for Car Purposes" was read by D. D. Ewing, professor of electric railway engineering Purdue University. It was abstracted in the issue of this paper for March 27, page 641.

In connection with this paper Professor Ewing prepared charts which show graphically the relations of the data presented previously in tabular form. These charts



Power Distribution Chart
Energy Distribution Chart
WHAT THE CAR DOES WITH ITS SHARE OF THE POWER PLANT OUTPUT
a—Suburban car. b—14-ton city car. c—Birney car.

are reproduced herewith. They show respectively the sub-division of the power input to a car and the sub-division of the energy consumption among the several elements of loss and useful work. These distributions differ because the several parts of the equipment which consume power operate for different lengths of time.

Ohio-Pennsylvania-West Virginia Equipment Men Exchange Experience

An Informal Round-Table Discussion Brings Out the Best Methods to Be Followed in Many Detail Maintenance Practices—Many Points of Value to Electric Railway Equipment Men Are Emphasized

ON JUNE 9, at the Ohio Hotel, Youngstown, Ohio, a group of thirty railway equipment men and manufacturers' representatives from Ohio and Pennsylvania met for the fifth time for a round-table discussion and interchange of experience on the problems and practices of maintaining rolling stock. The group is loosely organized as the Association of Electric Railway Men and it had its inception three years ago, when the Westinghouse Electric & Manufacturing Company called the equipment men of these two States to Pittsburgh for a conference on ways and means to cope with the serious troubles all were experiencing as a result of the very severe winter. The benefits of such a conference were at once apparent and some one moved that the group be made into a permanent organization and that it meet regularly. The association resulted and officers were elected.

At this fifth meeting the president, Daniel Durie, superintendent of equipment West Penn Railways, could not be present, and the secretary, F. G. Hickling, Westinghouse company, Pittsburgh, asked Rufus Moses, assistant general superintendent Youngstown Municipal Railway, to preside. A set of twenty-five questions had been prepared in advance to organize the discussion and the men exchanged experiences and opinions back and forth across the table without restraint. A luncheon at the hotel and a chicken and waffle dinner at New Springfield in the evening helped to make the meeting enjoyable. Those present were H. P. Meyer, New Brighton, Pa.; M. M. Chalfant, Butler, Pa.; P. J. Wood, Erie, Pa.; W. R. Goodnight, Elyria, Ohio; C. D. Smith, O. R. Hill, Carl Knittle, J. B. Stewart, Rufus Moses, A. B. Creelman, A. D. Brackett and F. C. Gething from Youngstown, Ohio; C. W. Folwell, Parkersburg, W. Va.; P. J. Barron, Meadville, Pa.; J. A. Rogan and R. S. Bull, Pittsburgh; Walter Goodenough, Mansfield, Ohio; F. C. Martin, Wheeling, W. Va.; S. F. Witt, Connellsville, Pa.; A. A. Crawford and H. A. Rhoades, Leetonia, Ohio; J. M. Pneuman, F. W. McClosky, W. M. Hutchinson, C. S. Doddleson, W. D. Parker and F. G. Hickling, Westinghouse Electric & Manufacturing Company; W. M. C. Horner, Westinghouse Air Brake Company, and Mr. Dagan, Universal Lubricating Company.

THE BEST WAY TO REMOVE OLD PAINT

The first matter brought up for discussion had to do with the cheapest and most satisfactory method of removing paint from car bodies. Some of the men seemed to be having good success with the old method of using a blow torch and burning the paint off, while others had had better success with some kind of varnish remover. Those using the remover had varying success. Some were able to remove the paint down to the wood by this method, while others had success only in removing the outer coating. Several kinds of varnish remover were in use and the Pittsburgh Railways was

having good success with a solution of wood alcohol, benzol, camphor and nitric acid. The discussion developed no method that stood out as best or cheapest. All were agreed that the sand blast was the best method of removing paint from steel cars, for it not only removed the paint but took off the rusty spots and did the job quickly and cheaply.

In discussing methods for reducing the expenditures for incandescent lamps there seemed to prevail a general opinion that cars are overlighted. On different properties it was brought out that the number of lamps used in a car varied from one circuit of 94-watt lamps to six circuits of 23-watt lamps. One master mechanic testified that his company had to replace 100 lamps for every 10,000 car-miles operated. These were of the 23-watt size. It was pointed out that bad track has a strong influence on the life of lamps and that the life is better when the lamps are not suspended at an angle to the vertical. The consensus of opinion seemed to be that the cost of lamp replacements could be cut down by using larger wattage lamps and fewer circuits. The advantage of standardizing on one size of lamp on a property was spoken of as helpful. One master mechanic pointed out that it was cheaper to use carbon lamps in carhouse and shop pits because of their greater ruggedness.

SAFETY CARS DISCUSSED FROM ALL ANGLES

While a number of the equipment men present showed a strong tendency to "knock" the safety car because of its "extreme light weight and consequent costly maintenance," there were a few who were ready to acknowledge that the criticism was attributable mainly to the earlier safety cars built and that the weaknesses which had developed in these first cars had been largely overcome and that the maintenance characteristics were very satisfactory. Many of the men argued for the strengthening of the vestibule and platform framing to better withstand collisions with automobiles and motor trucks. Ball bearing armature and axle bearings were given an indorsement by Mr. Goodnight, Cleveland, Southwestern & Columbus Railway, when he stated that his company had been operating two cars weighing only 11,500 lb. and fully equipped with ball bearings for thirty months without any trouble. In fact the bearings had never been opened up for the second greasing until just recently. The safety cars were also discussed from the transportation, financial and nearly every other angle in addition to the maintenance of them.

Mr. Hill, Youngstown, Ohio, told of several alterations in the safety cars in use by his company which have tended to reduce maintenance costs. Ordinarily the hand-brake staff is braced from the bumper channel, and every bump which affects the bumper channel bends the brake staff and makes it inoperative. The likelihood of damage to the brake staff in small collisions has been

largely overcome by bracing the staff from the rear and disconnecting it from the bumper channel. A saving has likewise been realized from replacing the single steel sheet forming the dash by three separate sheets. Also, the buffer sheet has been made a separate piece and put on over the dash. The bumper channel was extended out slightly to the side to protect the doors in a collision. A 30-in. section of the same channel as used in the bumper was placed on the bottom of the bumper as a kind of anti-climber.

Mr. Wood, Buffalo & Lake Erie Railway, told how a very satisfactory economy has been realized in connection with the reclaiming of steel wheels with flanges worn thin. In order to restore the proper flange contour after a steel wheel has been in service long enough so that the flange has worn to the limit, it is often necessary to turn the tread of the wheel down an amount which is equivalent to perhaps 50,000 miles of travel. This mileage is almost completely saved by building up the flange by means of an electric welder to approximately the proper contour. Only a slight amount of the tread is turned off, or none at all, and the throat and gage side of the flange are not even turned smooth after the welding, for it has been found that after the wheel has been in use for a while it is difficult to tell whether it has the original flange or a built-up flange. Mr. Wood stated that the cost per 26-in. wheel was approximately \$4 for building up the flange in this manner.

The question was raised as to the desirability of reclaiming wool waste and lubricating oils, and while few of those present had had experience along this line, it was agreed that some method of reclaiming was an economy which should be put in. Mr. Wood said that he was installing a filtering system at a cost of \$200 which would have a capacity for filtering old oil of 30 gal. a day. This separates the oil from the water as well as dirt and waste and he expected it would result in a very worth-while saving.

The next question taken up was whether it would be economy to bring a steel wheel back to its original diameter, after it had reached its last turning, by making use of a steel tire. Mr. Creelman, Pennsylvania-Ohio Electric Company, had had a great deal of experience with handling steel tires and wheels when he was with the Boston elevated system. He told of some of the difficulties in keeping the tires from coming loose. In this endeavor, the allowable shrinkage had been gradually increased from 0.0030 in. to 0.0075 in. He pointed out that it was necessary to bore each tire specially for the particular center on which it was to be shrunk, since the diameter of the center had been found to compress from 0.005 to 0.010 in. after each new tire had been put on; in other words, a new diameter of the center had to be figured on upon each re-tiring. It was his opinion that the steel tire costs almost as much or more than steel wheels by the time it is turned and installed; that there is little if any saving in labor; that the steel-tired wheel is unsafe and unsatisfactory and introduces a good chance for an accident, and that taking into account the full consideration of labor and material cost the solid steel wheel is much more economical. Others corroborated this opinion, though two or three were having reasonable success with the use of steel tires. In this connection, Mr. Witt, West Penn Railways, brought out that his company is getting an average life for rolled steel wheels of more than 400,000 miles, many running more than 450,000 miles. These are wheels used in interurban service, where all

magnetic brakes are employed and the 34-in. wheels are permitted to wear down to as low as 29½ in. before being removed. The wheels are turned only when it is necessary to correct the flanges, which is usually necessary on account of the many curves over which the cars run. This long life is attributed to the absence of brake shoes and to the fact that the wheels are allowed to wear down to so small a diameter. Most companies cannot use wheels beyond a diameter of 31½ in. on account of motor clearance, but sufficient clearance is obtained on Mr. Witt's cars by tilting the motors up 1 in. when they are installed on the trucks.

The next topic brought up for discussion was as to the best method of installing tape bands on mica V-rings on old type armatures and as to what insulation is used. Inquiry developed that most of the men were making use of Hope tape and string bands and shellac. Mr. Bull, Pittsburgh Railways, supplied the interesting information that his company is not using any bands, but instead is simply applying a cement composition made up of dextrine, plaster of paris and shellac, with very good success. He said that he had had much less trouble in using this cement than he had with tape and string. He could not supply the proportions of the composition at the meeting, but stated that he would be glad to give this information to any one interested.

From the discussion as to what kind of circuit breaker had given the best result for double-truck cars, it developed that there are a great many types of circuit breakers in use, but that they have been the source of but little trouble. It was also brought out that the breakers are but rarely calibrated. Those companies which have attempted to check them up have taken them off the cars and calibrated by means of a water rheostat, but have found that only a few were out of calibration, and these not greatly. Some trouble was noted with trainmen setting the circuit breakers up to the top notch on the type which has a screw for adjusting the amperage at which the breaker operates. One company had had considerable trouble on account of the circuit breakers being mounted underneath the cars, where they collected a good deal of dust and hence frequently short-circuited.

The Miller trolley shoe came up for discussion and was generally thought to be very satisfactory except for one limitation, that it will not back up. Because of this limitation, one master mechanic had found it desirable to mount the type E Miller shoe in a bayonet harp so that on a big traffic day trolley wheels could be conveniently substituted for the shoes in order to aid in the switching of cars required on such occasions. Mr. Witt said that it had been the experience on his property that the Miller shoe would back up where the wire was low, but that it was impossible where the trolley was high. The average life of a Miller shoe was reported to be from 7,000 to 8,000 miles by several of those present. One company not represented at the meeting was reported to be securing a much better life by removing the shoes when they became grooved and grinding them to the original contour by means of a special emery wheel and jig, which brought the shoe to the proper shape without adjustment. There was a general agreement that the shoe provides a good current collector; that it eliminates noise and arcing, and that best results are obtained when all shoes are used rather than a mixture of shoes and wheels, since by this practice the wire becomes slick and the wear therefore less.

Open circuits resulting from broken leads to the

armature coils, in the neck of the commutator, have formed a prolific source of trouble for the maintenance men. Many schemes have been thought out to eliminate this trouble, but it appears to be an erratic one and difficult of solution. While it was difficult to pin the cause of the trouble down to any definite thing, in general it was thought to be caused by the magnetic and gear vibration. One company tried to overcome this difficulty by putting on a steel band over the ends of the coils just under the top leads, but it was found that the coils would shrink after they had been in use for a while and would become loose and vibrate and break.

Mr. Meyer, Beaver Valley Traction Company, said that he had adopted the practice of weaving heavy gray webbing in among the leads in order to make a solid mass, and as a result had had only one broken lead in a little over a year. Mr. McClosky told of the practice of the Westinghouse company in connection with the type 506 motors. After the leads have been soldered to the commutator they are first given a coat of very light shellac, followed by a coat of very heavy shellac and then bound with a band of heavy machine twine and again shellacked and baked. He said that while this process had given very satisfactory results for this type of motor the manufacturer was not yet ready to recommend it for all armatures. He pointed out that some companies have reported that this trouble has been practically eliminated by not soldering the leads to the commutator, on the theory that the vibration is then not concentrated at the neck of the lead, at the point where it is attached to the commutator. Mr. McClosky also spoke of the method which was used by the manufacturer in connection with the type 333 motors, a large number of which have been in service for three years without any broken leads. In this motor phosphor bronze clips were riveted to the leads to reinforce them. A high-necked commutator was also used, but the absence of breakage of leads is believed to be due to the better application of remedial devices than to the high-necked construction of the commutator, and in fact he said that not much advantage is apparent for the high neck.

Some one brought up the thought that the sharpness of bends in the leads had a bearing on the amount of breakage, but Mr. McClosky pointed out that he had had an excellent opportunity to experiment with more than 100 motors of a great variety of types, some with sharp bends and others with long leads and gradual bends, and he had found that more breakages had occurred where the leads were long and the bends gradual, probably due to the greater opportunity for vibration. Yet he said that he knew of an epidemic of breakages in some of the motors used in the subway in New York which was cured by putting on long leads. Mr. Bull, Pittsburgh Railways, said that his company had had good success with some of the large interurban motors in eliminating this trouble by plastering the neck full of a composition made up of about one-half dextrine and one-half plaster of paris, but said that this remedy could not be used on small motors. Another delegate pointed out that he had tried this remedy, but found that this made repair work on the armature exceedingly difficult if the composition had to be taken out.

The next question discussed was as to what results had been obtained from leaving front and rear hoods open to ventilate the windings of railway motor armatures. The tendency among the manufacturers, it was

stated, is to do away with the hoods, especially for inter-pole motors. Summing up the thoughts expressed by the railway men, it would seem that while they feel that the hood helps to prevent flashovers, yet the advantage of overcoming the accumulation of dirt behind the hood is of considerable value. The tendency seems to be toward leaving the hoods off. For example, the Cleveland, Southwestern & Columbus Railway is leaving the hoods off altogether on all of its old Westinghouse 56 motors and finds their operation more satisfactory.

The next question raised was whether it was advisable to prevent excess oil in the armature bearings from saturating the field windings by providing an overflow outlet in the housing. In the discussion it was pointed out that the later type motors and all modern compressor motors are provided with such an overflow. Some thought it as undesirable to have the excess oil dripping into the pits as to have it in the motor housing, but others thought that the dripping of oil into the pits would be a good telltale on poor workmanship on the part of the oiler. Mr. Rogan, Pittsburgh Railways, said that they had had so much trouble from excess oil that they had bored two 1½-in. holes in the bottom of the motor housings so that the excess oil could run off. This practice had to be changed later to prevent snow and ice from getting into the housing as the motor sheared along the snow and ice between the rails. Mr. Creelman has provided an outlet down through the housing of such construction so that the oil is drained out but water cannot get in, unless the motor actually stands in water.

Mr. McClosky spoke of the fact that some trouble along this line resulted with ventilated motors when operating at high speed. The cooling air is pulled in under such high velocity and pressure that it pulls oil from the bearings into the motors. He said it was planned on future motor designs to limit the amount of air that can get into the housing. He recommends that the air passages be kept perfectly clean so that there would be ample intake area and thus decrease the draught on leakage ports such as through the bearings.

The question was raised as to whether companies check the spring tension on brushholders frequently and as to what tension is used on different sizes of motors. The discussion developed the fact that few companies give any particular attention to the compression of brushholder springs. Most of the companies inspect the springs only incidentally and on rare occasions test the spring pressure with a pair of scales. A spring pressure of 4½ lb. per square inch is maintained in Pittsburgh, while 6 lb. is the amount carried on the West Penn Railways.

The discussion following the query as to what general types of pinion pullers are in use brought out the fact that the majority of the shops are making use of the old-fashioned sledgehammer and wedge method of removing pinions. The reason for this, it seems, was that many of the pinion pullers on the market are of such design that they cannot be used where the clearance between the pinion and motor housing is small. It was found that two of the companies follow the practice of heating the pinion when it is put on, having had fewer loose pinions as a result.

The discussion then turned to helical gears. It was soon apparent that the great reduction of noise and vibration and the apparent long life of the helical gears are giving them a real hold on the master mechanic's attention. Mr. Witt reported that the gear and pinion

manufactured by the R. D. Nuttall Company, which has been in use on this property for the last two and one-half years and was exhibited at the Atlantic City convention last year, has now run 386,000 miles to date with scarcely any noticeable wear. This property now has about eighty gears and pinions of the helical type in service and Mr. Witt stated that he is having considerably less armature trouble, presumably due to the lessened vibration. Other delegates testified that the use of helical gears and pinions with safety cars and large double-truck cars, with 24, 26 and 34-in. wheels, have uniformly given very excellent results and to date, after two years or more of service in some cases, have shown no appreciable wear.

Incidentally the session turned to bearings, and Mr. Witt offered the interesting information that he had done away with the castiron shell altogether and was using bearings made entirely of babbitt metal, having a composition of 80 per cent lead and 20 per cent No. 1 More-Jones babbitt metal. He said this had overcome the end play trouble and all undue wear on armature and axle bearings. When those bearings are worn out it is possible to scrap the whole thing rather than to melt out the babbitt and reclaim the castiron shell. He said that when this practice was first begun a fifty-fifty composition was used and some breakages followed, but no broken bearings have occurred since beginning the use of the eighty-twenty composition. In installing a pair of these babbitt bearings leather liners are placed between the two halves and the inspectors are instructed to watch carefully to see that the bearings are always tight. He said that this was essential to their successful use.

Mr. Bull remarked, in answer to questions, that motor failures on the road have been very materially reduced by the practice adopted in the shop of subjecting all motors to a test of 125 per cent of full load for a period of fifteen minutes in each direction before the motor is placed in service. This has been found to show up any broken down fields, armature shorts, etc., before the motor gets into service.

Rail Joint Reclamation

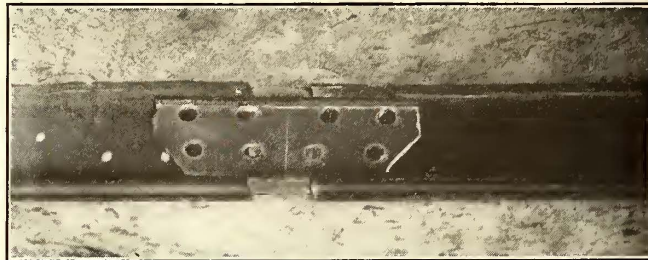
In New Orleans Old Angle Bars Are Built Up and Ground and a Novel Insert Is Used to Replace Broken Rail Ends

AT A cost of 80 cents for material and labor, as compared with \$2.50 to \$3.50 for a new angle bar, M. V. Houliard, superintendent of track New Orleans (La.) Railway & Light Company, is reclaiming about 6,000 joint plates a year. These are taken out of track that is to be rehabilitated or laid new and after reclaiming them they are used for rehabilitating the joints on other track.

As the old angle bars are taken out of the track they are accumulated at the track storage yard. There they are sorted and stored in neat piles and as rapidly as a small crew of men can handle them they are reclaimed and restored ready for future use. If they are bent they are heated and straightened in a press. They are often worn as much as $\frac{1}{4}$ in. at the top, and sometimes the bottom is somewhat worn. Slightly more than enough new metal is then deposited along the edges to make up for any amount that has been worn away.

The final step is to grind off the top and bottom edges so that the plate will fit the rail properly. This is done

by bolting the plate temporarily in a jig on a piece of track so that a Goldschmidt grinder may be used for the work. It is claimed that a better fit can be secured on old rails with these reclaimed plates than with new plates, since they can be made to take into account the fact that the railhead as well as the old plate has prob-



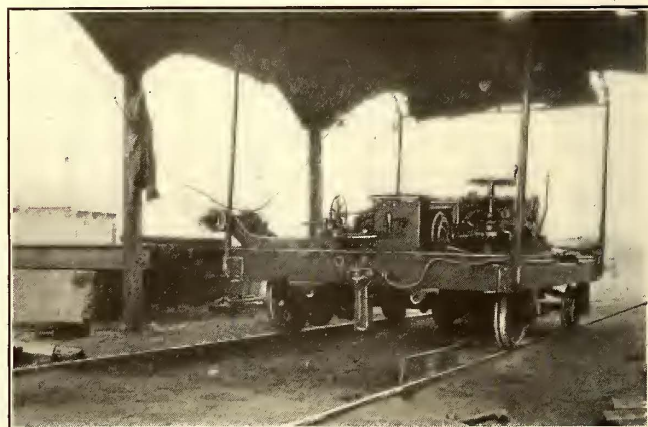
"DUTCHMAN" SPLICE BAR USED FOR REPAIRING BROKEN RAIL IN NEW ORLEANS

ably worn to a certain extent, whereas a new angle bar would be made correct for a new rail.

A NOVEL SCHEME FOR REPAIRING BROKEN RAIL

A rather unique method of repairing a break in girder groove rail has been used in New Orleans. Either an oxyacetylene flame or a saw is used to cut off a short section of the head of the rail at each side of the break. A piece of old center-bearing rail of 9-in. section is then prepared as a "dutchman" splice bar by burning off the base and all of the head except a short piece of about the right length to fill in the gap which has been made between the two broken railheads. Bolt holes are also burned in the web of this piece and it is bolted in place through the web of the running rail and welded at the edges and at the joints in the railhead. Enough metal is deposited along the flangeway, if needed, to make this continuous, and a grinder completes the job by smoothing up both the tread and the flange surfaces of the rail.

If the rail becomes badly cupped at any point or broken down at a joint, thus necessitating the cutting out of a short piece of the rail, such an opening can



GRINDING OFF THE EDGES OF RECLAIMED ANGLE BARS

also be filled in and repaired in the above manner. Very good success has been had with rails repaired in this way. The accompanying illustration of this method shows only the manner of preparing the dutchman and does not show the manner of preparing the rails to be spliced by cutting back the heads.

C. E. R. A. Midsummer Meeting Ashore

Ottawa Beach Resort Scene of Interesting Meeting, at Which Several Practical Papers Occupy Attention—Members Miss Usual Boat Trip, but Enjoy Shore Sports

WITH Robert I. Todd, president, presiding, the summer outing convention of the Central Electric Railway Association began its two-day meeting on July 8 at Ottawa Beach, with about 150 in attendance. Despite the attractions of golf, bathing, tennis and fishing, the sessions were well attended, while the evenings were made enjoyable with dancing and that other favorite indoor sport—favorite since the drought settled upon us. While the attendance was far below normal, those present seemed to enjoy themselves and the general feeling was that it was a good convention, though there were many references to the boat trip of former conventions, and if the meetings were short and the papers not as outstanding as they are at times, the interchange of ideas between operators was well worth the time spent off the job.

At the morning session on July 8 the first order of business, after the reading of the minutes of the Louisville meeting in March by Secretary A. L. Neereamer,

recommendations be referred to proper committees for further study and disposition and that other recommendations be indorsed, while issue was taken with one or two other recommendations. The committee report was accepted. (Mr. Collins' address appears in substance in the ELECTRIC RAILWAY JOURNAL for March 13, 1920, page 527).

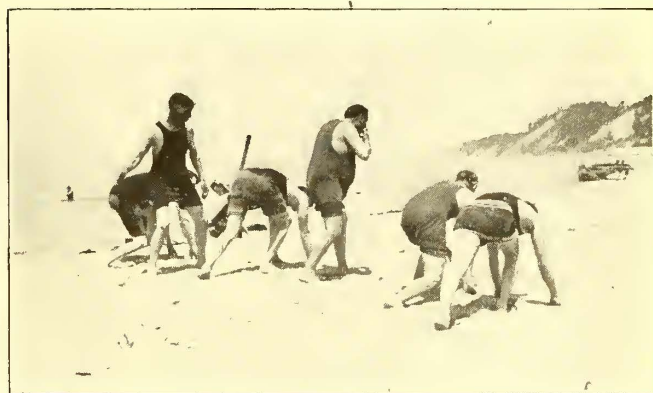
Reporting as chairman of the standards committee, H. H. Buckman, New Albany, Ind., also lamented his inability to get co-operation from members of the committee and repeated some of the excuses given, saying that for this reason he had no definite report to make. This aroused a lively discussion, in which the issue was whether or not the standards committee, which has always been a most important one and has done some very constructive work in the C. E. R. A. territory in times past, had ceased to be of importance. The discussion resulted in the loud approval of a motion proposed by C. L. Henry that President Todd be instructed



The ladies return from a launch ride to some of the 1,000 ports of Black Lake. John Benham was the host, you might know. Without him on the entertainment committee, there is a noticeable void.

was the report of the committee on the formation of an American electric express company by the chairman, H. A. Nicholl, Anderson, Ind. In presenting his report he expressed great regret at the lack of interest on the part of the committee members and member companies in connection with the compilation of data for the report. In view of this attitude on the part of the companies, the substance of the committee report was contained in a resolution stating that the committee did not recommend the establishment of such an express company at this time, but urged the installation of through express rates between companies and an endeavor to secure through business. This resolution was adopted, after amendment proposed by C. L. Henry, Indianapolis, Ind., that some provision be made for prompt settlement of disputes arising over the division of through rates. The finding which the committee found necessary to report was a distinct disappointment to some of the railway men.

Mr. Nicholl then was called upon to report for the committee on the president's address at the Louisville annual meeting. This was the address of former president John F. Collins, Jackson, Mich. The committee's report advised that certain of the president's recom-



The start of a 100-yd. (lame muscles) race. We don't know who won. There wasn't any finish to the race. But notice the variety of "form." Electric railway men aren't in the habit of running.

to address a personal letter to all the members of the standards committee and to the managers of the roads represented by these men urging the great importance of that committee work and that it be given full attention. In this connection W. H. Bloss referred to the very complete compilation made during the war of data covering rolling stock in use in the territory as being of great value in the study of further standardization.

Mention was also made, in answer to a query of "why standardization?" that of the steel wheels made, 90 per cent are used by steam roads and they are all to one specification and 10 per cent are used by electric roads and there are 360 kinds and sizes. Mr. Richardson of the Midvale Steel & Ordnance Company, whose paper came later in the session, said that the standardization of wheels would help roads as well as manufacturers because deliveries would be better and prices lower.

James Harmon, New Albany, Ind., chairman of the C. E. R. A. committee on safety work, recommended that the subject of safety be put on the convention program from time to time, saying that he believed it had not been so considered since 1907. His report was adopted.

A telegram from A. Gaboury, president Canadian

Electric Railway Association, was read. This called attention to Montreal as an ideal location for the next convention of the C. E. R. A.

The remainder of this first session of the convention was occupied by a very instructive and interesting motion picture and talk by G. A. Richardson on the mining of ore, production of iron and steel and manufacture of rolled steel wheels as carried on by the Midvale Steel & Ordnance Company. A motion picture of the members on the boat trip last year was also shown, much to the delight of those who had posed.

The second session was held Thursday afternoon and was devoted to an "experience meeting." C. L. Henry, chairman of the program committee, said that this sort of meeting was somewhat of an innovation and was an attempt to get some of the men who were really doing certain concrete pieces of work to come in and tell about them. He said a general request had been mailed to member companies to have some one in the organization relate some accomplishment of the past year. As a result, five prepared "experiences" were reported, one of these being given at the Friday morning session.

One of these reports was by Frank R. Coates, president Toledo Railways & Light Company, who detailed the "Moving the Cars to Michigan," which was done so dramatically and which has already been chronicled in these pages. Abstracts of the other experience discussions are grouped elsewhere in this issue.

G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, told of some work his company had done in order to make it possible to use Master Car Builder equipment satisfactorily on short curves in special work in city service. Considerable trouble had been experienced through derailment caused by the shorter gage distance between inside of flanges on equipment of this sort. It was decided to try to turn off $\frac{1}{8}$ in. of the wheel flange on the inside and this was accomplished, even though the wheels were made of chilled steel. In answer to questions, Mr. Jeffries said that this work was done on a regular lathe, that there was no apparent damage to the lathe or trouble experienced and that there was no apparent damage to the wheel, which seemed to wear as well as ever, although he did state that the finishing touches were done by an emery wheel.

Another member stated that his company had met the same difficulty and had merely set the wheels $\frac{1}{8}$ in. farther apart on the axle and had experienced no difficulty on account of this difference in spacing, but on the other hand had been able to negotiate the special work short curves satisfactorily.

In the discussion on the "experience" papers, Mr. Brown, in answering a question, stated that sidings which were put in by his company in order better to distribute freight and express, where these sidings were installed for a particular company, they were paid for originally by the companies benefited, but were finally paid for by the railway company by deducting from bills of the company in question at the rate of 5 per cent per month.

Mr. Gunn's paper on "Welding Flanges" attracted a good deal of discussion. He stated that the flanges were, of course, turned after being formed by welding, but that he had not included the cost of this turning as an additional cost of treating the wheel, because he assumed that any wheel brought in for working over on account of sharp flange would have to be turned, and it would be no more expensive to turn one on which the

flange had been built up than one on which the flange had not been built up. No difficulty was experienced in cutting the built-up flange. He stated that after much trial of almost every sort of steel he had determined that grade D steel rod gives the best service as material to build up the new flanges.

One interesting point was that the welder, that is, the operator, never had any previous experience on railways and had never had any experience with a welding outfit of this sort, although he had done a small amount of oxyacetylene welding. For this reason Mr. Gunn said he thought it was not necessary to obtain a high-priced man to start with. The welding outfit used was one bought originally for trackwork and adapted to this work, and while a larger machine would really prove advantageous, excellent work was being done with the one in use. From a sample Mr. Gunn brought with him it was impossible to tell where the weld began and where the original metal ended. Mr. Gunn said that he had used this same welder successfully for repairing drawbar heads, building axles up to standard and all general shop-welding work which he had found necessary on his road.

In a subsequent informal discussion Mr. Brown explained the lower cost per car-mile after abandonment of the power plant mentioned in his discussion by saying that the measurements of kilowatt-hours per car-mile were made at the substation and not on the car. Total car-miles were divided into total kilowatt-hours over a certain period of time. With the new arrangement, with a higher and more uniform voltage for distribution, with power measured only when actually being used by the cars, and, consequently, there being no operation of plant while no cars were running, the final result indicated a lower cost, or a lower kilowatt-hour per car-mile.

At the Friday morning session C. L. Henry of Indianapolis presided in the absence of President Todd, who had found it necessary to return home. Mr. Henry read a telegram from Robert M. Feustel, who was scheduled to present a paper on the "Interurban Electric Railways, Their Problems and the Solution Thereof." Mr. Feustel regretted his inability to be present and present the paper on this subject and stated that it had been impossible for him to obtain and digest sufficient data to make a presentation of the subject advisable, because if he presented it at the present time it would represent merely his personal opinion and he could present no conclusions drawn from data which he anticipated having and upon which he hoped to base a paper in the near future.

The other paper of the morning, on the subject of "City Electric Railways, Their Problems and the Solution Thereof," by A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, Akron, Ohio, was read by Mr. Henry in the absence of Mr. Blinn, H. A. Nicholl being in the chair.

Mr. Blinn in his paper passed over all other problems of the railways except the financial one, which he says stands out with such prominence that all other problems are of a secondary nature, for the business has been literally starved to death and can only be made well and strong again by increasing its nourishment in the form of more revenue. He also made the assertion that the conclusion must unquestionably be reached that, generally speaking, the fares are not only now wholly inadequate for the needs of the business but the income has never been wholly sufficient to pay expenses and a

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fair return on the fair value of the property. He argued that this was the result of the public's exercising its right to control without acting on its obligation to protect. He also blames the starvation policy of the municipalities for the fact that the physical properties are not now in the 85 per cent physical condition in which every street railway should find itself, but he does not lay all the blame on the municipalities, but partly on the managers of the properties, who have been at fault in not seeing to it that the conditions under which the railways have been operating for years be made public.

Mr. Blinn stated that the stockholders have been the worst losers, in that they have not only not received a return from their stock but their property has been worn out and the investment thus impaired.

He repeated the oft-heard statement that the present problem is to bring fares up to a point which will put the railways in a sound condition and emphasized the argument back of this, the troubles in the way of getting it, particularly political ones, and urged the taking of every opportunity of making public the story of the railways. He argued that until communities take more than a passing interest in the affairs of their public utilities full justice will never be done.

Referring to the pre-war condition, under which he said that the old rates were not sufficient to pay all of the cost of keeping properties in efficient operating condition, he urged that the railway industry should exert itself to maintain present increased rates of fare even though the country may some time enjoy pre-war price levels. This, he said, must be done for the benefit of both the public and the properties, to the end that the public may be served as it wants and the lines be maintained in satisfactory physical condition and at the same time capital be paid a justly deserved fair return.

There was no discussion of the paper.

Mr. Henry reported for the executive committee that an amendment to the constitution would be presented at the next regular meeting of the association, which amendment would provide for two regular meetings in place of three meetings per year.

With reference to the time and place of the next meeting, the executive committee announced that it would be held either at Purdue University, Lafayette, Ind., or at Indianapolis, and that the date probably would be Dec. 3.

The convention adjourned Friday noon.

Freight and Motor Truck Competition Report

A report from the committee on interurban freight and motor truck competition was presented to the executive committee and becomes a part of the record of the meeting. This report had no place on the program and so occasioned no discussion.

To the Officers and Members of the Central Electric Railway Association:

The following report of the committee on interurban freight and motor truck competition is respectfully submitted for your consideration.

Your committee sent a questionnaire to a great many interurban companies and for the sake of brevity your committee has combined in a general way the answers to the questionnaire with its own general views on the situation.

1. Have you any motor truck competition?

There is considerable motor truck competition and without having answers from all roads the committee assumes that at least 60 per cent of the interurban railways have such competition in the way of more or less permanent all year around service.

2. Approximate number and capacity and do they have trailers?

From answers received it would seem that within the three states covered there would be at least 700 motor trucks having a capacity of from 1 to 10 tons, with probably 250 trailers which average from 1 to 5 tons capacity.

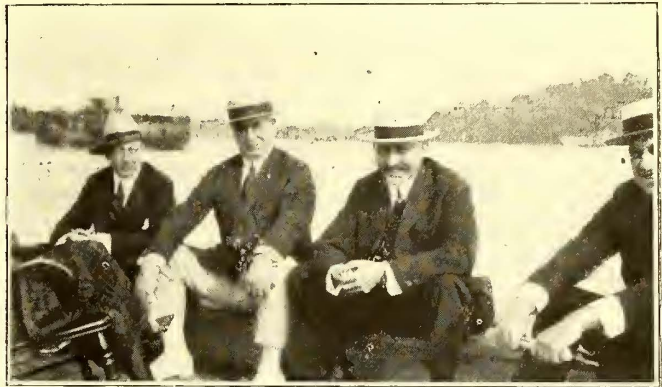
3. What service do they perform?

As a whole the service is practically similar to that performed by the interurban railways.

4. Between what points is this competition strongest?

Truck competition is most dense, radiating from commercial centers having large manufacturing interests and wholesale houses. This is especially true at cities like Indianapolis, Toledo, Cleveland, Akron, Detroit, Columbus, Grand Rapids, Kalamazoo, etc. A great deal of course is dependent upon the condition of the roads, but just as soon as good roads are completed leading from business centers it is there that competition quickly springs up.

4a. Give comparison of truck service with service furnished by your company.



Harry Reid, executive committeeman and Robert I. Todd, president of the C. E. R. A., are here seen loafing on the board walk at Ottawa Beach, Mich., between sessions of the convention. Ralph Brown, at the left, of Curtin Supply fame, got a "stand in" with Reid by leading the bunch in a song about "Old Kentucky."

No satisfactory replies were received to this answer, although service is given at all times during the day, usually, however, mostly in the morning and in the evening.

4b. Give comparison of rates.

Generally speaking, the rates are higher than those charged by the interurban railways, although in some few cases the rates are a trifle lower, this, however, being due to the lack of proper knowledge on the part of the truck owners of their costs. Higher rates are natural, as the truck service carries with it the pickup and delivery of all freight handled.

4c. Do the truck operators give receipts, take receipts, collect tax?

Generally speaking, the operators do give receipts and take receipts; however, to the best of our knowledge war tax is not generally collected.

5. Are the truck operators in your territory responsible?

Generally speaking, the trucking concerns are responsible and honor claims when presented.

6. What commodities are being handled by trucks in your territory?

The answer to this question has already been made in answer to question 3.

7. Have you any suggestions to offer as to manner of meeting this competition?

The consensus of opinion in the answers all tend toward the one general broad answer, which is that good service on the part of interurban railways is the best method of competing with truck competition.

8. Are any truck lines operating as "feeders" to your lines?

There are but very few instances where truck lines operate as feeders to interurban railways, as it is quite a pioneer movement.

9. State general conditions of roads on which truck competition exists.

It is obvious that the condition of the roads over which truck competition is handled must necessarily be very good,

as very little competition is found where the roads are poor. The owners of trucks competing are wise enough not to pick up any business except the cream of it and naturally stick to the best roads:

10. What is cost of operation of trucks in your territory?

The cost of operating trucks naturally varies as to size of the trucks, but when the information was gathered it seems that the cost of trucking varied from 35 cents to 60 cents per mile. It is natural to assume that under the present existing conditions of high wages and of great cost of trucks this figure might easily reach 75 cents per mile. As a whole, however, the owners of trucks or associations performing such service do not themselves know, or if they do they will not divulge, the real fact as to the real cost of performing such service. They are going through the formative period at the present time and must naturally learn by experience that they are not properly charging all the cost of such service and that they are not making proper allowance for depreciation, wear and tear, interest, etc. As far as the length of time which one concern may continue in business is concerned, that is hard to learn. However, at large centers of population already established, concerns which started truck competition are still in business and it has been going on for two or three years, with the likelihood that they will keep on, as they are more able, in a business way, to "carry on" than the individual truck operator, who as a rule does not last much longer than nine to twelve months.

11. Average number of months operated each year.

About nine months in the year, although there are sections where they operate only about six months and others where they operate all the year around.

In considering this report the committee wishes to extend its views to the association at this time.

It is quite evident from replies received that little enough attention has been given by various managers to the seriousness of truck competition, as there seems to be quite a lack of interest in the attempt to preserve their own business. The committee wishes to emphasize the necessity of the individual roads quickly waking up to a situation now confronting them which it believes is becoming more serious every day.

With all the money which is to be spent in the states canvassed it would seem quite advisable for the individual roads or this association, if deemed wise, to bring to the attention of the authorities in charge of building highways the fact that it would be well to build a road which could be utilized to act as feeders for electric railways rather than to build long stretches of road between important centers which will act as competitors for the electric railways. There is no question in the mind of the committee but that such competition is here to stay and that we may as well face the music; there is, however, no reason why this association or its individual members cannot do some missionary work with the before-mentioned authorities, for they have a perfect right to do so, as their investment is very much in jeopardy.

Your committee respectfully suggests to the association members the advisability of becoming more closely associated with the local Chamber of Commerce, or of any association which today is lending its aid to transportation by means of trucks. With the proper diplomacy we believe a great deal of good can be accomplished.

It is likely that opposition will be met on the part of such associations in the way of stating that the transportation system of this country as a whole has been near the breaking point several times in the past few years and that it is only natural as a matter of self-protection for individual shippers or associations of shippers to fall back on any means of transportation.

Such statements can only be met by a clean-cut counter-statement as to the financial condition of the interurban railways.

The committee of course realizes the financial stringency at present, but believes that better use can be made, with slight expenditure, of the terminals now used by interurban railways and that better results can be obtained if a closer co-operation is had with the shipper.

Since automobile industries have seen fit to spend thousands of dollars in advertising, it would seem advisable to this committee that the association carefully consider the necessity for spending some of its energies and real money in promoting an advertising campaign setting forth the service performed by electric railways.

The committee further brings out the point that it would seem advisable for the individual members or the association as a whole to bring to the notice of the public service commissions the seriousness of truck competition, suggesting the advisability on the part of the commissions of investigating the matter with the idea in view that owners of trucks should be classed as common carriers. The committee further believes that more attention should be given on the part of interurban railways to the matter of soliciting long-haul traffic rather than to worry themselves about the short-haul traffic, as the committee believes it will be impossible, for some years to come at least, to bring about the abandonment of truck competition in short-haul service. This of course means providing through rates as between various connecting interurban railways.

Your committee submits the foregoing report, with the hope that certain recommendations may come from it, with this statement, that the committee has not seen fit to offer any conclusive or definite recommendations as to the method of procedure in the future. It would seem that this committee should be discharged and that perhaps another committee should be formed to take its place, the duties of which might be for the promoting of the interests of the interurban railways, inasmuch as the duties expected of this committee seem to the general chairman to have been performed.

Knoxville Passes New Traffic Ordinance

THE passage of a new traffic ordinance by Knoxville, Tenn., furnishes one more example of stringent ordinances to increase safety and expedite traffic. In the near future it is hoped that more uniformity in urban traffic regulations will prevail, as it is very difficult for the touring motorist or interurban street car to conform to non-standardized traffic regulations.

The new Knoxville ordinance provides for the registration of all automobiles with the city police department and the licensing of all motor vehicle operators. It provides that no vehicle shall pass a stationary street car while it is receiving or discharging passengers. No street car is allowed to stand in excess of three minutes in the business district with certain exceptions. The ordinance provides for the "near" side stop of street cars and prohibits "jay" walking by pedestrians. One notable feature is that forty minutes is set as the standardized parking time for all restricted locations.

The motor speed limit is fixed at 15 miles in the business district, while the street cars cannot operate at a speed in excess of 8 miles. The penalties vary from \$3 to \$50 and revocation of license.

The Boy Scouts are aiding in the enforcement of the "jay" walking law, as it is the intention stringently to enforce this feature of the ordinance.

Symposium of "Experience" Papers

Power Plant Economies, Maintenance of Equipment and Inter-urban Freight Service Subjects of Special Attention in the "Experience Meeting" Session of the C. E. R. A.

AS INDICATED in the report of the Ottawa Beach meeting of the Central Electric Railway Association, July 8 and 9, one session was devoted to a recital of noteworthy accomplishments of the past year. The prepared reports of these are abstracted herewith:

Power Plant Economies

BY SAMUEL WAGGONER

Superintendent of Power Plant Indianapolis & Cincinnati Traction Company, Rushville, Ind.

WITH a view of reducing our coal consumption and other operating expenses, we instituted early last year a very comprehensive and exhaustive study of our power plant operating conditions. After duly digesting the information that we obtained from this study, it was decided that we would make a few of the many needed improvements to bring the operation of the plant to a more efficient and economical running condition. Up to that time we had been experiencing considerable difficulty with maintaining a uniform temperature of our boiler feed water; the best we could do with the equipment as it stood was to maintain a temperature of 180 deg. F. This condition was not brought about from the fact that the heater was too small, but was attributable to the unavoidable leaks in the condenser tubes, etc. In order that we might relieve this condition, it was decided that we install a hotwell tank on the outside of the power station proper, into which all condensation and other returns are piped. The tank is equipped with a closed coil, through which is passed a portion of the exhaust steam from the pump and other auxiliaries, bringing the feed water temperature up to 125 deg. at the tank before it is delivered to the feed water heater proper. This arrangement has brought the feed water temperature up to 210 deg. and effected a saving in the over-all operation at the plant of at least 4 per cent.

Other economies that were effected by this arrangement were the ability to recover the condensate from all over the station into this one central reservoir for boiler feed purposes, thereby eliminating the necessity of having to use such a large percentage of fresh water. This in turn holds down the amount of incrustable matter in the boilers, thereby enabling us to run our boilers for longer periods between cleanings.

It has been our policy for the past three years to give closer attention than ever before to the physical condition of all power station apparatus and appurtenances thereto, and especially to all auxiliaries that are using steam. It is my opinion that there is no source of so great a waste and that there is nothing that tells so heavily on the coal consumption as leaky pump valves, and that more attention than heretofore should be given to each piece of auxiliary equipment in our station operation.

Another thing we have done that has proved a source of great gratification to us is the thorough inspection

and overhauling of all valves and cutouts in connection with the boiler equipment every time a boiler is out of service for cleaning. We thus do away with all hissing of steam and dripping of condensate, which makes conditions in the boiler room intolerable for the man who has to make his living by working there.

In addition to the above improvements, we have installed S. C. water regulator, damper control, etc., and with a careful check-up of each day's operation we have been able to show a decrease in the cost of the fuel for 1919 of \$7,578.55 and for the first four months of 1920 of \$2,077.18. On an investment of not to exceed \$10,000 this would mean an interest return of at least 76 per cent.

Our average daily load amounts to 24,000 kw., average daily coal consumption 96,000 lb., average daily power factor 70 per cent, water used daily, from and at 212, 120,000 United States gallons, giving us an evaporation of better than 8:1, which we consider very good, under our operating conditions.

We have also been able to show a very gratifying economy in our power station lubrication. In the past we experienced considerable difficulty on this question, but in spite of the ever increasing cost of oils for power station lubrication in the past three years we have been able to show a steady decline in our monthly and annual cost. In the year 1919 we showed a reduction of \$341.96, and for the first four months of this year we show a reduction of \$269.48 over the same period of last year. This has all been brought about by making a few very necessary observations from day to day and keeping a close record of operating conditions from hour to hour.

Experiences on the Interstate Public Service Company's Lines

BY L. M. BROWN

Superintendent, Columbus, Ind.

Freight Service

FOR a number of years the freight business on the lines operating between Indianapolis, Ind., and Louisville, Ky., was regarded as one of the necessary evils and was discouraged in every possible way. Up to and including the year 1917 the total revenue from freight transportation was less than 8 per cent of the gross earnings, but there has been a steady growth since that time, until now more than 16 per cent of the gross revenue is from this service. It is felt that this steady growth can be further increased if the proper facilities are provided and adequate service maintained.

At the present time six local freight trains are operated daily on this system and through freight is handled in trail cars on these local trains. It is the plan further to improve this service as soon as the voltage for the entire system can be made uniform and some of the equipment rebuilt and equipped to handle a larger number of trail cars. The plan is to operate only a

local freight service during the daytime and to put on a through freight train at night from each terminal in each direction, so that shipments received one day will be ready for delivery the following morning at every station on the line. The operation of a through train will give the shipper quicker delivery and will facilitate the movements of trail cars and increase the business.

The present freight equipment consists of six motor cars and thirteen box trail cars. Each of the motor cars will handle one or two trailers and one is of steel construction with four 125 hp. motors and capable of handling as many as ten trail cars. An electric locomotive has been purchased and will be placed in service this month which can handle from ten to twenty trail cars. Most of the trail car equipment has been secured within the last two years, five of the cars being secured in November, 1919, at a cost of \$2,500 each. Within the last year fourteen flat cars, formerly used as service equipment, were placed in the freight service, and the revenue from this equipment amounts to more than \$5,000 per month.

Believing that the best methods of increasing the revenue to meet the high cost of operation is in the long haul passenger travel and in the freight business eight modern steel passenger cars are now being built and should be ready to be placed in service within the next few weeks. When this is done the cars now being used in limited passenger service will be rebuilt into passenger trail cars and the motors placed under some of the present freight motor cars, and these geared down so as to be able to pull five or six trail cars at a time.

The business now seems to be limited to the amount of equipment available. With the limited amount of equipment and inadequate terminal facilities the gross freight revenue for five months of 1920 has amounted to \$94,731, or more than the total gross for the year 1917; and an increase of 50 per cent over the same period for 1919. While we know that a large percentage of this increase is due to the inability to secure equipment from the steam lines, yet we believe that the point has been reached where the freight earnings can be made a very profitable part of the business.

Previous to this year most of the freight handled has been less carload shipments, but during the months of January and February, 1920, 88 carload shipments were handled, 125 in March, 147 in April and 192 in May. These carload shipments have practically all been local to our own line and had we been able to furnish cars for shipments to connecting lines this number could have been increased several times. The principal commodities handled on these cars consisted of cement, logs, canned goods, syrup and glucose. A number of industrial switches have been built into several large manufacturing plants and others are in progress, which will tend to increase this volume of business very much.

A number of improvements at stations have been made. A new freight station was built in Louisville last year at a cost of \$30,000 and a combined freight and passenger station was built at one of the smaller towns at a cost of \$10,000. The present facilities are to be increased, sidings lengthened for the handling of trains and other improvements are to be made as the expenditures can be met.

It has been the plan of the company to have a number of new box cars built, but owing to their increased cost, the inability to obtain labor and materials and the recent financial difficulties this plan has been tempora-

rily deferred. Efforts are now being made to secure box car equipment and several additional cars will no doubt be added in the near future.

This company has a well organized traffic and freight claim department which co-operates with the operating department in every possible way. Immediate attention is given to OS&D reports and many claims are eliminated in this manner. The best men available are used as freight trainmen, agents, checkers, truckers and helpers. Frequent meetings are held with these men and a recent campaign has reduced the claims for lost and damaged freight so that the claims account is less than 2 per cent of the gross freight revenue.

Tariffs are on file naming through rates to points on connecting lines and the tonnage from this is very heavy and could be considerably increased if carload shipments were accepted. The rates charged are practically the same as those on steam lines. No steam road connections are maintained and no interchange of steam road equipment has ever been made.

No attempt has been made in this article to furnish the actual net revenue from freight transportation, as no separate records are kept of the expenditures chargeable to the freight department, and these figures could not be secured in the limited time in which this paper had to be prepared.

It seems that one of the best ways to reduce the expenses to the freight business is in the handling of carload shipments, thus eliminating labor costs and congestion at stations. To do this it is necessary that industries be served by private sidings. If it were possible to work out some kind of an arrangement whereby sidings could be constructed from city street car tracks into industrial plants in the larger cities it would put the electric lines in position to compete better with steam lines and give superior service in the territory served.

Power Plant Abandoned

In November, 1919, for the 62 miles of the line operating between Indianapolis and Seymour, Ind., the use of the company's power plant at Edinburg was abandoned and arrangements were completed for the purchase of power from the Merchants' Heat & Light Company of Indianapolis. The abandoned power plant was very inefficient and in addition to furnishing power for the line supplied a large manufacturing establishment. The plant was equipped with steam driven engines that had been in service several years and the current generated was carried on the transmission line at 15,000 volts, 25 cycles, alternating current and on the trolley at 600 volts, direct current. Under this change the transmission line for the entire system is being standardized, carrying 33,000 volts, 60 cycles, a.c. on the high tension line and 600 volts, d.c., on the trolley.

This transmission system has been extended to a number of public utility plants which are owned by the Interstate company and power is being distributed to the various communities in this territory. It has also been connected with the steam and hydro-electric plant of another subsidiary, the Southern Indiana Power Company, and is almost completed into Louisville, Ky. This system will, by interconnection with other operating companies, ultimately be a part of a great transmission system extending from the large hydro-electric power plant on the Mississippi River at Keokuk, Iowa, across Illinois into Indiana and ultimately connecting with Indianapolis and Louisville.

The necessary work in changing the transmission line so as to carry 33,000 volts instead of 15,000 volts and the purchase and installation of six new 60-cycle substations was made at a cost of \$135,000. The following actual figures for the first four months of 1920 compared to the same period for 1919 show the saving in the cost of power which has been accomplished by this change:

	First Four Months	
	1919	1920
Net power costs	\$36,371.14	\$20,791.65
Kw.-hr. to feeders	1,550,900	1,318,238
Power costs per kw.-hr.	2.345	1.577
Kw.-hr. per car-mile	4.3	3.5
Car-miles operated	360,952	376,700
Power costs per car-mile	10.75	5.52

These figures for 1920 show a reduction from 1919 figures of 0.768 cent per kilowatt-hour. Applying this reduction to the kilowatt-hour consumption for 1920 (1,318,238 kw.-hr.) gives a saving of \$10,124, or an annual saving of \$30,372. Allowing 4 per cent for depreciation (\$5,400) and 7 per cent for return on the investment (\$9,450) leaves a net annual saving of \$15,522.

Under this plan three power dispatchers working in eight-hour shifts are located near the middle of the line and they receive hourly meter readings from all generating stations and issue such orders as are necessary to keep the voltage uniform and the system economically operated. The connections with the local power stations along the line enable their use in peak-hour periods or when necessary, or, in the event of a failure at one point, the other plants can carry the load until repairs can be made. When the demand for current is light all the small plants can be closed down and current furnished from the station where it can be produced at the least cost. With this system the voltage is more uniform at all times than formerly and trains are kept on much better time. This is particularly noticeable when traffic is heavy and additional service is provided.

The work of changing the 41 miles of line of the Indianapolis & Louisville Traction Railway between Seymour and Sellersburg, Indiana, from a 1,200-volt, d.c. line to a 600-volt, d.c., with 33,000-volt, 60-cycle, a.c. on the transmission line, is practically completed. This makes the voltage of the entire line from Indianapolis to Louisville uniform and will enable the use of all equipment on any part of the system.

The Welding of Flanges on Steel Wheels

BY E. B. GUNN

Master Mechanic Western Ohio Railway, Wapakoneta, Ohio

DURING the period of the war, when it was almost impossible to get steel wheels, it became a very serious question of how to get along and extend the life of the wheels in service.

I had had some experience in welding flanges on city car wheels and it had worked out satisfactorily on this class of work, and as our company had purchased an arc electric welding machine for use in track bonding, I started in July, 1918, to weld the flanges on our wheels in interurban service. Since July, 1918, we have carried this process through and up to June 1, 1920, have welded 114 wheels. We have had unusually good success, having had only three wheels to "shell" and these very slightly.

The method that we use is very simple and is carried through our shop by our usual shop workmen. We put the wheels through the turning lathe and take

the smallest possible cut from the tread of the smallest wheel. After making this cut we shape the flange as though we had stock enough for a full flange and leave a groove on the side of the flange toward the tread, varying in size according to the condition that the wheel was in when removed from the car. Ofttimes, of course, the opposite wheel of the pair will be in condition so that the flange will not have to be welded. The wheel is now ready for the welding operator, who carries the first weld in the bottom of the groove and welds this some deeper than the balance of the welds, and carries this at least 10 in. ahead of the balance of the welds. This allows the operator to inspect his work better, and I believe gets a better amalgamation by allowing the first weld to cool before putting the balance of the welds in the groove.

The greatest care must be taken to have a steady voltage, as a slight variation will cause a poor weld. Or if the operator is not careful in keeping his arc to the proper slant and length it will cause trouble. For this reason a welding machine that uses the grid for resistance and uses the direct-current arc is not so successful for wheel work as the machine that uses the alternating-current arc, as it is almost impossible properly to regulate the intensity of the current with the d.c. arc, and this will cause a burning of the steel, where, by using a stabilizer, the arc can be regulated and the depth of the weld controlled. Our operator is very careful to see that this work is not being carried on when cars are being moved in the shop or around the yard, as a variation of voltage as small as twenty volts will cause trouble.

The expense of welding flanges is so low for the results obtained that it is hardly worth mentioning. The machine we use requires 9 amp. on 650 volts, direct current, the average time to weld a wheel is four hours and it will require an average of about 25 lb. of welding metal per wheel. The following would be the average cost of welding the flange per wheel:

24 kw. at 3 cents per kw.	\$0.72
Four hours labor at 70 cents per hour	2.80
25 lb. grade D welding steel	3.00
	<hr/>
	\$6.52
Plus 25 per cent for overhead	1.63
	<hr/>
Total	\$8.15

On a basis of increasing the mileage 125,000 miles per wheel the cost would be 6½ cents per thousand miles. We are increasing the mileage of our wheels by the introduction of the welding process by more than 125,000 miles, as the cut that is taken off from the tread of the wheel will average 1/16 of an inch, while if a new flange would be required under the old method a cut would have to be made of from 5/8 to 3/4 of an inch, depending, of course, on the condition of the flange.

After all is said in regard to the success of flange welding, the greatest factor in it is a good careful operator, one who takes an interest in his work and tries to make a good record by being careful and conscientious.

In addition to the welding work that we have, such as armature shafts, axle building and other repairing, our welder takes care of the babbiting of the bearings and goes out on the bonding work when required, so that we do not have to charge his time up to the wheel welding except when he is directly employed in this work.

Experiences in Power Plant Operation

BY FREDERICK L. RAY
Union Traction Company of Indiana

ACCIDENTS cannot always be prevented, as hidden defects will develop to the breaking point before they can be detected. Proper inspection, however, will prevent most accidents and careful planning for the future will eliminate 80 per cent of what inspection fails to find.

The cost of a great deal of maintenance work can be lessened by doing the work before the life of the material is all gone, but a great cost can be burdened on a property by replacing machinery just because it has been in service for a certain number of years. We are justified in replacing the axles of the high-speed interurban cars after they have been in service for a given number of miles, for we know by experience that there is an average life of an axle beyond which we ought not to go because of the great danger to life and property if they should break, but we would not be justified in renewing all the tubes of a boiler just because they have been in service twenty years, for they may give many years of service, and even if one should give way it seldom results in more than the loss of the one tube.

The renewal of a few rows of blading in a turbine at an expense of say \$2,000 may easily prevent an accident in which perhaps all of the blading is ruined and which will cost many thousands of dollars, with a possible interruption of service.

How much better it will be to take a boiler off at stated intervals, thoroughly testing, cleaning and repairing, so that when it goes on it will be in first-class order, than to keep operating it until the efficiency drops to 30 per cent or a tube splits wide open with possible loss of life and interruption to service.

Just a few of the experiences of the writer are given below which I trust will be of interest to you.

Belts for Ash Handling: There have been a great many installations of belts for the handling of ashes, but in the writer's experience every installation has been a failure. One installation that we have in mind is where there were sixteen boilers and a system of 24-in. belts was put in to deliver the ashes to an elevator. This system consists of five different belts, four of these running parallel with the boilers and delivering to a cross belt which delivered to the elevator. This system was operated about one year and then discarded and the Irish buggy used in its place. During the period of operation about \$7,000 worth of belts were used, with about 30 per cent efficiency in labor while operating the belts. There was excessive maintenance of these parts in the few months' use of this system besides the belts, so that all together it was a very expensive experiment.

The one great trouble with the system was to keep men from pulling hot ashes onto the belt. All kinds of schemes were tried for quenching the ashes, but in spite of all that we could do by threats and discharges the men would persist in burning the belts so that in a short time they would have to be renewed. Of course while we were working on the belts or machinery the most of the laborers would be idle, waiting for the system to start. Sometimes the basement would be nearly full of ashes and then it would take excessive labor and several days' time to get cleaned up again.

On account of the small capacity of the ashpits it was

necessary to run two crews, night and day, on this work and this required about twenty-five men. After the belts were taken out and wheelbarrows used we decided to get more capacity in the ashpits, which was done. Now on a twenty-four-hour run one crew of nine men takes care of all the ash handling, using wheelbarrows, where formerly we had twenty-five men on the belt system.

There was also another feature of great importance in connection with this story, and this was the burning of stoker dump grates, due to shallow ashpits and the failure of the belt-handling system. However, the capacity of the ashpits was increased and the method of handling ashes was more efficient, our troubles disappeared entirely, so that we had much more satisfactory operation with a splendid saving in cost of labor.

Engine Crosshead Failures: Cast-iron crossheads on engines that have been in service for fifteen to twenty years should be closely watched, for there is very likely to be a failure of the threads in the crossheads where the piston rod screws in.

Taking charge of some old engines, I have found some conditions that were startling and proved to be narrow escapes from serious accident. Just one illustration is all that is necessary, which was on a 26-in. cylinder operating at 150 lb. steam pressure, where we found the threads in the crosshead practically broken off, just a few threads holding, so that the least shock from water or foreign matter would have stripped the rod out of the crosshead, with the result that we would have had an engine wreck of serious nature and possibly loss of life. Piston rods should be screwed out of crossheads often enough to make sure that they are in good condition.

Condenser Suction Pipe: Long lines of suction piping on jet condensers often are the cause of a great deal of trouble with the pumps attached to this line, as a very small leak of air into this line will cause serious trouble. The writer has had two separate systems of piping that were the cause of a great deal of trouble. One of these lines was a 20 in. riveted sheet iron pipe with steel wrought flanges, partly underground and about one-half exposed, but in the basement and in close quarters. To this line was attached four marine type condensers, and just as soon as we began to have trouble with our condensers our first thought was of the suction line and there was where we usually found trouble.

In another case we had five marine type condensers connected to an underground section line which was made up of bell and spigot pipe with lead packed joints, where we could not get any of the condensers to work satisfactorily. Investigation was started and before we completed the work we had dug up every joint on this pipe and caulked and packed every one of them. After this was done and the condensers overhauled either one of the condensers would pull down the required vacuum without any trouble at all.

Our method of discovering the leaks was to put a blind flange in as close to the source of water supply as possible and by having a water connection we could pump up about 40 lb. of pressure on the line and keep on making these tests until everything tested tight. Suction pipe to any kind of a pump should be absolutely tight, but where it is used for condenser purposes it is necessary that it be kept in perfect condition all the time.

Feed Water Treatment: Water for boiler purposes should be as near pure as it is possible to get it; in fact, if we could get distilled water it would be much better.

Water softeners, either hot or cold process, will give good results; neither one of them will give absolutely pure water, but will give water that will enable a plant to operate satisfactorily, even with very bad water before treatment. Care must be exercised in starting a softening plant where the boiler has been in service a number of years, using bad water, for every time the water is started in too soft the scale will be thrown from the tubes and great damage done by the consequent burning of the tubes.

As an illustration we cite one case where soft water has caused a great deal of harm. The softener system had been operating for some time, using a certain amount of lime and soda ash to take care of a creek water under certain conditions. It happened that a rainy season came on and it rained for about a week, with the result that the hardness in the creek was reduced considerably, but there was no change in the amount of lime and soda used. The result was that the water was reduced to a very soft state with a surplus of soda ash going into the boilers, which resulted in the throwing down of a lot of scale, which lodged in the lower tubes of Babcock & Wilcox boilers. The result was that a large number of them were burned and several boilers were put out of commission, so that the plant ultimately was in danger of interrupted service.

The remedy was to stop the treatment for several days, which at once cleaned up the situation and our tube trouble was stopped, the softener was put back in operation again and the treatment watched closely. Water softening systems are just like everything else about power plants, they must be closely watched, and it must be by some one experienced in the business if you expect to get results.

Increasing Capacity of Ashpits: In a certain plant the writer found that the ashpits under a certain grate stoker had not more than a four-hour run capacity, so that two crews of men were needed to handle coal and ashes, one crew for day and one crew for night, the men working in ten-hour shifts.

These ashpits were worked over and the capacity was increased so that they will hold a thirteen-hour run. After the change was made one crew of eight men and foreman do all the work in a ten-hour shift, saving the wages of seven men. This is a case where the saving in labor pays for the cost of making the improvement in four months' operation.

We do not often find where it is possible to make such valuable improvements in operating conditions as in this case, but there are no doubt cases of a similar nature where if the operating men would only present the matter in a correct manner the management would be only too glad to make the improvements.

In closing I wish to suggest to you that if you would but look about your power plant you will find where you can make changes in methods of operation or in changes of equipment that will save money, and if you are working for a public utility, whether it be an interurban, street railway, light and power, gas or heating, you should be even more diligent in this matter, for these interests are trying to serve the public under adverse circumstances and are expected to give service with a limited provision for the paying of the bills. Every operating man should have before him the slogan of safety, service and economy, and the greatest of these is service.

Utilities Present Coal Arguments

Representatives of Utility Associations Urge Continuation of Priority Order for Coal—Commission Extends Order to Aug. 19

NOTHING short of assigned cars at the mine will meet the serious situation in which public utilities find themselves as a result of the condition of the coal market. This was the point which representatives of the public utilities tried to impress upon the Interstate Commerce Commission on July 10 when a hearing was held on the supply, exchange, interchange and return of open-top equipment. As the commission was entirely familiar with the situation, only brief mention was made of the restrictions under which public utilities operate and which prevent them from competing with the luxury manufacturers or other consumers whose costs for coal bear a much less important relationship to their profits than is the case in furnishing public service. It was pointed out that deliveries on contracts are lagging behind from 40 to 50 per cent. Since these contracts were made to cover practically the entire fuel needs of the year, the public utilities are in no position to protect their fuel supplies except to make purchases in the open market at prices which are almost prohibitive, when their fixed income is taken into consideration.

The presentation for the American Electric Railway Association was made by E. B. Burritt, for the National Electric Light Association by J. W. Lieb and for the American Gas Association by Oscar H. Fogg.

The industries which use open-top cars made strenuous appeals for modification of the order, so as to allow the use of a limited proportion of open-top cars for their more essential purposes.

Representatives of the coal operators contended that the only way to meet the present situation is by mining more coal, which can be done only when the mines have an adequate car supply.

On July 13 the commission extended the life of the coal priority order for an additional thirty days from July 21. The extension is amended so as not to include flat bottom gondolas of certain measurements, these cars being automatically released to the service of steel building trades and certain other industries, but not to buildings, roads and some other construction industries. There is to be discrimination as to the assignment of the cars, public service utilities being preferred, and reconignment is condemned except in unavoidable circumstances.

Bituminous coal interest representatives agreed that with the exception of the amendment the order is a good one and will do much toward solving the present serious coal problem.

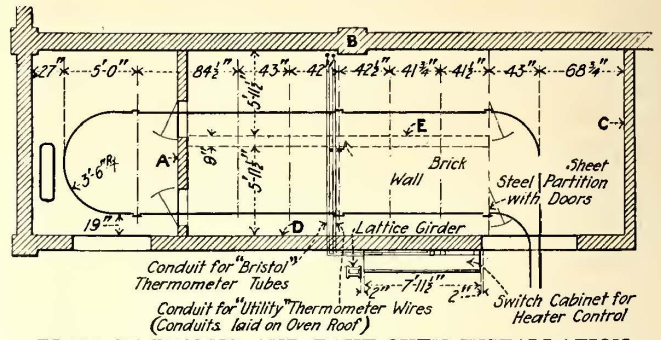
The Schuylkill Railway, Girardville, Pa., is installing a telephone dispatch system over its entire property. The wires are being placed on the 6,600-volt high tension poles and are properly protected with fuses ahead and behind. Telephone instruments are being located at each turnout in an iron box with the proper switch lock, to which each conductor carries a key. When completed jack boxes will be located at convenient points between the regular telephones and each car will carry a phone with an extension cord. The Kellogg 2,500-ohm 5-bar ringer instruments are being used.

Repair Shop Has Efficient Armature Bake Oven

Pittsburgh Railways Reconstructs Armature-Coil Drying Room into High Temperature Armature Bake Oven

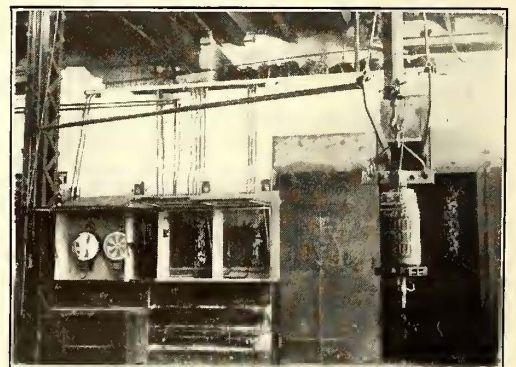
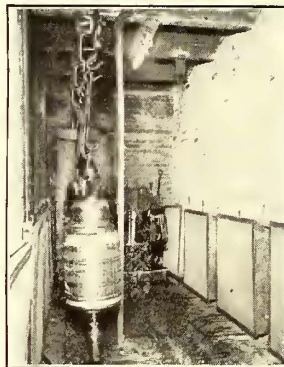
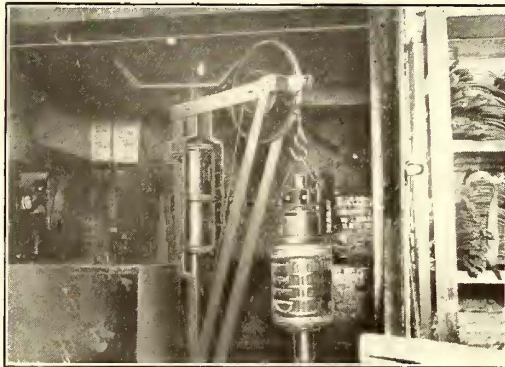
AT THE Homewood shops of the Pittsburgh Railways there has recently been put into service a drying, dipping and bake-oven combination which is simple, handy and very satisfactory. The former practice of the company was to dip and dry the armature coils in a room heated by steam before placing them on the armatures under repair. The present arrangement has been built in the same space formerly occupied by the coil-baking chamber.

Referring to the accompanying floor plan, all of the brick walls shown there with the exception of the one marked *E* were already built as a part of the coil-drying plant. The coil-drying room was the one bounded by the walls *A, B, C, D*. The floor of this room is an iron grating, under which are installed a large number of



PLAN OF DRYING AND BAKE-OVEN INSTALLATION

brought to this rail by the usual air hoist and transferred to hangers which follow the trolley rail. Armatures are left hanging on these hangers from the trolley rails in both the drying rooms and baking rooms for the necessary baking period. In the dipping room a turntable with an air hoist is installed. This takes the armature from the hanger, lowers it into the dipping tank, which is large enough for three armatures, and is then available for raising from the dipping tank to the



AT LEFT, TURNTABLE WITH AIR HOIST IN DIPPING ROOM. IN CENTER, DRYING ROOM. AT RIGHT, GENERAL VIEW OF ENTRANCE AND SWITCH AND INSTRUMENT CABINET

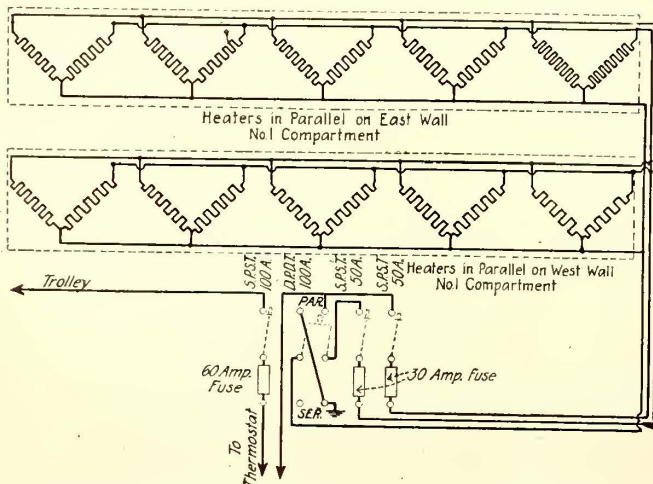
steam pipes. When it was decided to make an armature bake oven, to operate at higher temperature, the wall *E* was built and also the sheet-steel partition with doors. Electric heating was then installed in both of the small rooms thus formed, one room being for drying the armatures before dipping and the other for baking them after dipping.

In order to facilitate the handling of the armatures a trolley rail was installed as shown. Armatures are

hanger when the armature is ready to go ahead into the baking room. This turntable and hoist have proved of great convenience.

The practice is to dry the armatures in the drying room for about six to ten hours at a temperature of 90 deg. C. The armatures are left in the dipping tank about fifteen minutes and are then taken to the baking room, where they remain approximately eighteen hours at a temperature of about 120 deg. C. The temperature in these two rooms is regulated by means of ten heater units, such as shown in the accompanying sketch. Five of these heater units are on each wall of each compartment, the five in each case being connected in parallel. The heaters themselves consist of six Cutler-Hammer space-heating units, connected three in series, and the two sets thus created can be connected either in series or parallel for high or low-temperature regulation. Switches and temperature-recording instruments are mounted in a cabinet near the entrance door to the bake oven, as is also the equipment necessary for effecting heat regulation.

Since this outfit was put in operation, Nov. 1, 1919, the Pittsburgh Railways has found the results to more than justify the installation. The arrangement has also served as a model for two or three other railways whose equipment superintendents have happened to hear about it and see it and these details are given in hopes that they will be of assistance to others.



WIRING DIAGRAM OF HEATER CONNECTIONS

Convenient Circuit-Breaker Calibrating Outfit

The Third Avenue (New York) Railway Has Replaced a Temporary Water Rheostat with a Permanent Circuit-Breaker Calibrating Apparatus Using Grid Resistors

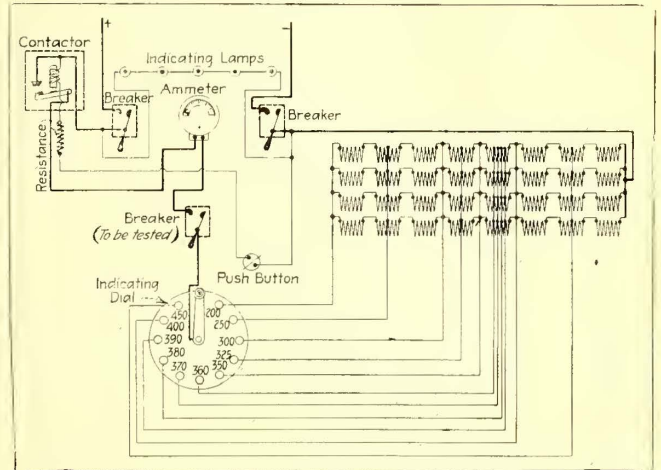
BY H. J. KROMBACH

Assistant General Foreman Third Avenue Railway, New York City

FOR years the circuit breakers used on the cars of the Third Avenue Railway of New York City were tested by means of a water rheostat. The success obtained was only partial and depended to a large extent on the man who was making the test. The difficulty encountered was that after testing one or two breakers the water in the water rheostat would become so hot that it had to be drawn off and replaced with fresh, cool water. If too much water was added the resistance would be too great and it then had to be reduced by the addition of salt. As the water increased in temperature more of the salt would be taken into solution, with a resulting decrease in resistance. Under these conditions it was practically impossible to get an accurate reading of the ammeter, as it was absolutely necessary that the time when current was flowing through the water rheostat be made as short as possible. Often the breaker under test would "blow" before the hand of the ammeter could reach its proper point. When an experienced man made the test conditions were not so difficult, but to break in a new man on this work was difficult, and many complaints were received from car operators that the breakers would not hold in or that they would not blow at all.

To remedy these conditions a new circuit-breaker outfit was constructed and installed in the Sixty-fifth Street shop which has proved entirely satisfactory. Accompanying illustrations show the apparatus used, the method of supporting the resistors and a diagram of connections for the outfit.

Referring to the diagram of connections, the path of the current may be followed from the positive line to a circuit breaker, installed as a matter of precaution, and then to a contactor whose operation is controlled from a push button by the man making the test. He can thus open and close the circuit readily and without danger of the current remaining on too long. With the

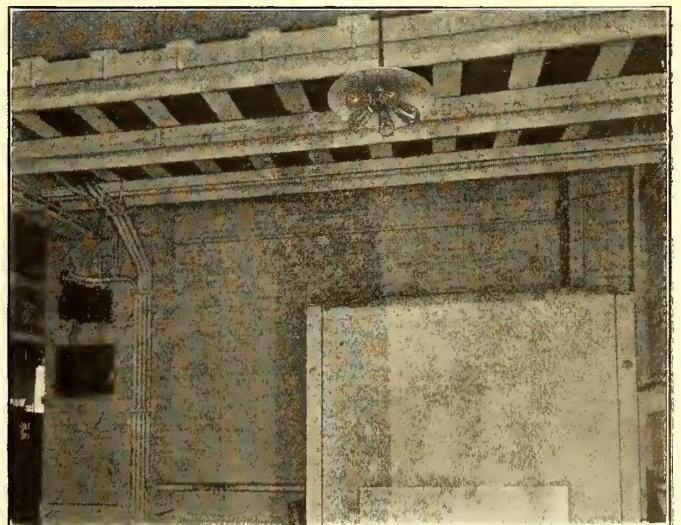
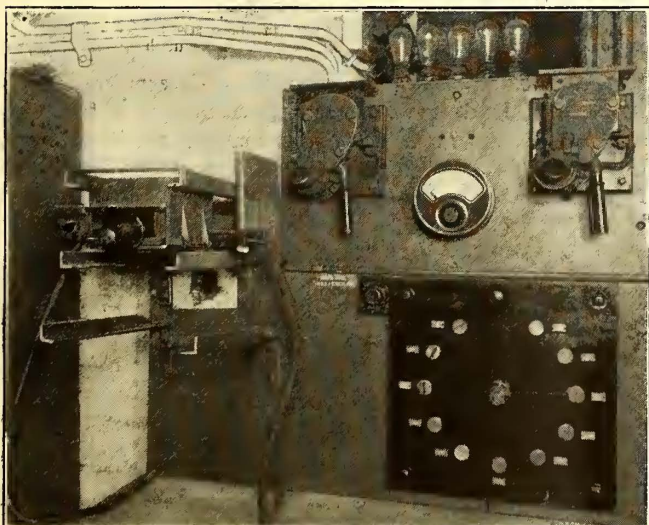


CONNECTIONS FOR CIRCUIT-BREAKER TESTING

controlling contactor closed the path of the current is from this contactor through an ammeter showing the value of the current and then to the circuit breaker under test. From this circuit breaker the current passes to the contact arm of an indicating dial rheostat. This contact arm can be turned to any contact desired. The value of the current that will pass through the breaker with the contact on any point is stamped on a small brass plate and fastened near the contact.

By means of this dial the various steps of grid resistors are cut out. These grid resistors are some car resistors which were available. After passing through the resistors the current passes through another circuit breaker installed on the negative side of the line and then to ground.

The indicating dial was constructed in the railway shop and is made of 1 in. x 18 in. x 18 in. slate. Threaded brass contacts pass through this slate and



CIRCUIT-BREAKER TESTING OUTFIT AND METHOD OF SUPPORTING RESISTORS

the wires for connecting to the resistors are fastened to the contacts. With the first installation a snap switch was used for energizing the contactor, but it was found that occasionally the operator would forget to turn off the switch and the contactor would thus remain closed, so this was later replaced by a push button having a rather heavy spring. It is thus necessary to hold the push button closed to hold the contactor in. At the top of the illustration showing the circuit-breaker test five incandescent lamps will be seen. These are connected as shown in the diagram and their purpose is to warn the operator whenever current is on.

The rheostats are placed on three I-beams which rest on girders near the ceiling. In this location they are out of the way and any heat generated is made use of in heating the shop. The connection of the grid resistors is shown in the diagram. Five hundred and seventy-six resistance grids, each of 0.074 ohm resistance, were used.

It will be noticed that the circuit breaker shown as being under test in the illustration is located in a position in which it would ordinarily be if installed on a car. Additional brackets will be seen just underneath the circuit breaker. Some cars have the breakers hung in an upright position, but on most cars they are suspended with the face downward. Experience has shown that breakers should be tested in the same position in which they are installed on cars, as the effect of gravity on the moving parts is sometimes quite marked, and by testing breakers in their regular operating position danger of wrong calibration is eliminated. All breakers on the Third Avenue Railway equipment are set to blow between 390 and 400 amp.

With the new testing outfit any shopman can be used for this work, while previously it was necessary to have an experienced man. No complaints have been received regarding the setting of circuit breakers since this test outfit was installed.

Pulling Pinions Off Safety Car Armatures

ACCOMPANYING illustrations show a type of pinion puller which is being used by the Connecticut Company for the removal of pinions from General Electric type 258 armatures. The pinions on these armatures are so close to the end bearings that it is difficult to get anything back of them which will assist in their removal. This type of puller is arranged to slide over the pinion and by giving the puller a slight turn the notches in the puller slide behind the pinion teeth. By screwing the puller in it is pressed against the pinion seat of the armature shaft and will not damage the threads or the center of the shaft. When this has been screwed down fairly tight the pinion can easily be loosened with a tap of a light hammer.

Auto Truck for Track Repairs

Analysis of Work Done and Cost of Using a Truck for Emergency Repair Jobs and Minor Track Maintenance

BY W. L. WHITLOCK

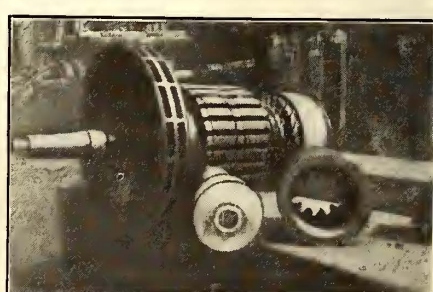
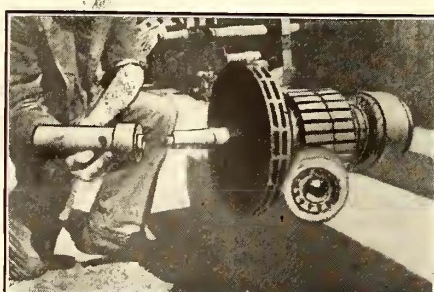
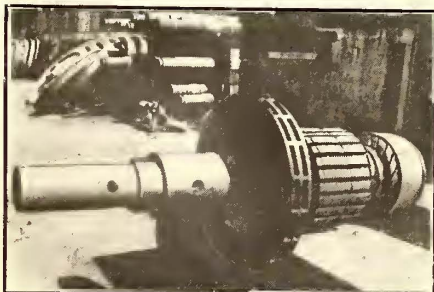
Superintendent of Way the Denver (Col.) Tramway Company

THE Denver Tramway Company has been using a 1-ton Ford Form-A-Truck for emergency track repairs and minor track maintenance work since 1916 and has found this a very useful addition to the way department equipment. This truck normally carries a crew of two men, but at present has in addition an apprentice track foreman, whose duties were outlined in the *ELECTRIC RAILWAY JOURNAL*, issue of Feb. 21, 1920, page 380.

This crew takes care of the majority of emergency track repairs and has in addition a regular order of work on minor track repair jobs. The emergency work comprises the usual jobs confronting any track department and consists of repairing broken rails, broken culverts, spread track, water on track, high paving, switches in bad order and items of similar nature. The minor track maintenance work is routine trackwork covered by authorized work orders or instruction sheets and includes replacing bad order rails, repairing joints, repairing special work, guard rail repairs, culvert replacements, cleaning track drains, cutting jobs by use of oxyacetylene torch, replacing mate tops, small paving jobs and other items of regular track maintenance work. Sometimes a job arises that requires more than two men; in such cases extra trackmen are furnished. The track truck carries the following equipment:

1 oxyacetylene cutting outfit	1 3/4-in. drift pin
1 low back saw frame	2 1/2-in. drift pins
1 high back saw frame	4 shovels, 2-lb.
1 "oldman"	1 lining bar
3 1/2-in. bits	2 tamping bars
7 1/2-in. bits	2 torches
1 1/2-in. bit	1 hand saw
6 1/2-in. bits	1 water bucket
1 1-in. bit	2 1/2x30-in. switch bars
1 1/2x1-in. S wrench	1 trowel
1 1/2x1-in. S wrench	1 gage, 56 1/2 in.
2 1/2-in. track wrenches	1 track broom
2 1/2-in. track wrenches	1 sledge
1 1-in. track wrench	2 spike mauls
1 scratch hammer	1 1/2-in. track punch
2 2-in. machinist's hammers	4 picks
1 100-ft. tape	2 claw and nipping bars
1 ratchet	2 track jacks
1 frame for ratchet drill	2 red lights
12 hand chisels (2 bent for mate tops)	1 axe
5 track chisels	1 adz
1 center punch	2 scrapers
1 monkey wrench, 12 in.	1 gage, 42 in.
1 1/2x14-in. round file	1 grease bucket and dauber
1 1/2x3-in. round file	1 "Jim Crow"
2 oil cans	1 chisel bar
1 gas pipe pliers	4 doz. hack saw blades
2 1/2-in. drift pins	1 1/2-in. track punch

The truck was weighed recently to determine exactly how much load it was carrying and it was found to weigh 5,200 lb., which is "going some" for a 1-ton truck. Certain material was removed to lighten the truck, but it still carries a heavy overload. Periodical checking



REMOVING A PINION FROM A SAFETY CAR ARMATURE WITH NEW TYPE PINION PULLER

up by the department head is recommended, as trackmen are human and accumulate things they "may need some time."

Experience demonstrates that a 1½ or 2-ton truck should be purchased to replace this 1-ton truck in a very short time.

The following is a summary of the operation of this truck during December, 1919, and January, 1920:

TABLE SHOWING MONTHLY RECORDS OF MOTOR TRUCK

	December, 1919	January, 1920
Performance data:		
Days worked	28	29
Locations worked on	96	105
Total hours worked	599	730
Average locations per day	3.42	3.75
Average hours per locations per day	6.23	6.95
Total number man-hours per day	21.39	25.17
Work done:		
Broken rails repaired	31	31
Spread track repaired	8	3
Special work repaired	27	28
Cutting torch jobs	24	18
Miscellaneous	15	35
Total	105	115
Operating data:		
Total cost operation, maintenance and depreciation	\$170.53*	\$ 72.01
Miles run	603.00	568.00
Cost per mile	\$0.2828	\$0.1268
Gallons of gasoline consumed	82	72
Miles per gallon	7.36	7.89
Average miles per day	21.53	19.58
Average miles per job	5.74	4.093

* Heavy repairs included in this item.

The cost of operation and maintenance for the years 1918 and 1919 was as follows:

TABLE SHOWING YEARLY DATA OF MOTOR TRUCK

	1918	1919
Miles run	4,984	5,551
Cost per mile	\$0.1422	\$0.1856
Gallons gasoline consumed	829	697
Miles per gallon	6.01	7.9
Total cost per year	\$708.85	\$1,030.43

New Signals at Anderson

Union Traction Company of Indiana Installs Overhead Contact Type Signals with Car-Counting Control on Busy Line

THE Union Traction Company of Indiana has a single-track block in Anderson, which is on the main line to Indianapolis. The block extends on Nichol Avenue or Eleventh Street, between Johns Street and Meridian, which is the principal business street of Anderson. This block is used jointly by a local one-man car line carrying the sign Hazelwood, giving frequent service, and also by interurbans between Indianapolis and Muncie, there being often following movements through the block. The two ends of the block are not mutually visible, and there is, furthermore, a railroad crossing within the block near the west end. To protect this traffic the railway company installed permissive signals of the overhead contact type having car-counting control, made by the Nachod Signal Company, Inc., Louisville, Ky., and known as type CD.

Referring to the accompanying plan, at the Meridian Street end the standard signal layout is used, with contactor 3 on the curve in advance of signal B, and contactor 4 on Eleventh Street, cars ordinarily entering the block by contactor 3 and leaving by 4, although both these contactors are directional and may be operated either way if desired.

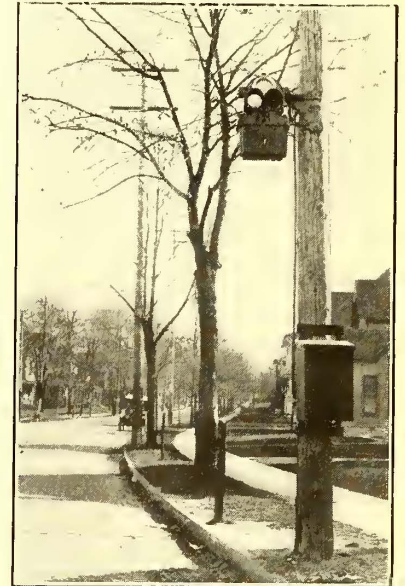
The office of the dispatcher for the interurban cars is on the sixth floor of an office building near Eleventh and Meridian, as shown, from which he can view a

great part of the block, though from his elevation he cannot see signal B itself. A repeater RB of signal B is therefore mounted considerably higher up on the same pole and directed along the dispatcher's line of vision.

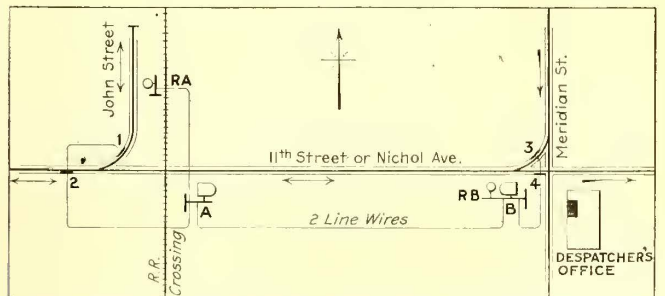
At the west end of the block at Johns Street the signal layout is suited to the reversed single end passing switch used there, with contactor 2 on the main line in advance of signal A, contactor 1 on the spur, and repeater signal RA to repeat the indications of signal A, so placed as to be observed by the motorman while he is on the spur.

A westbound car, for instance, enters the block, and in passing under contactor 3 sets signal A at "stop" and signal B at "permissive," the normal indications of both signals having been "neutral." This change takes place in the sight of the motorman. Should an eastbound car now approach Johns Street the motorman will observe signal A at "stop," and will, therefore, take the siding, passing under contactors 2 and 1 in succession. These contactors are so connected that a car passing eastward under 2 counts into the block and eastward under 1 counts out again. On account of the reversed direction of the spur it is necessary for the car to pass through the part 2-1 of the block in order to get in the clear and this is the novel feature of the layout.

The motorman of the second car waits until the first has passed westward under contactor 2 and cleared the signals, which he observes on repeater signal RA. As he backs further under contactor 1 he sets the block for his direction of movement, setting signal B "stop," sig-



SIGNAL INSTALLATION AT JOHNS STREET



TRACK DIAGRAM OF SIGNAL INSTALLATION

nal A "permissive," and observing this on signal RA. He passes through the switch and goes eastward on Nichol Avenue without touching contactor 2, which is set sufficiently far from the switch point.

The signals are car-counting, and if the Hazelwood local follows the interurban the signals will not clear or permit an opposing movement until both cars are out of the block, the counting relay having a capacity of 15

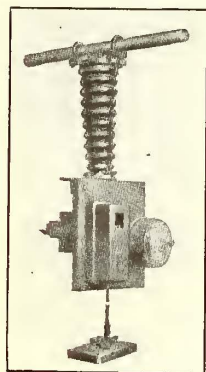
cars. The signal indications are given by lights behind colored lenses, reinforced by opaque color disks behind clear glass roundels, both indications are relay, being enclosed in a cast-iron case and hung on a leveling bracket attached to the wood pole, as shown in the accompanying illustration. All power to light the signals and operate the relay is taken from the trolley and the relays are operative down to a line voltage as low as 250. A junction box is mounted lower down on the pole for manual control of the signals if desired, to localize the circuits for test through disconnecting switches and to house the fuses.

The contactors are of the electrical type, being merely contact strips supported near the wire, but insulated from it and bridged by the flanges of the wheel on the trolley wire as it passes under the contactor. Two line wires run through the block connecting signals A and B and two wires run from the contactors to each local signal.

High-Voltage Overload Relay

FOR the protection of high-voltage alternating-current circuits of 100 amp. or less the Westinghouse Electric & Manufacturing Company has developed the type CB overload relay, which precludes the use of

high-voltage current transformers. The relay is designed for indoor use and is arranged for pipe mounting, as shown in the accompanying illustration. It consists of a circuit-closing element operated by means of a standard current transformer, an overload relay and a special transfer relay through a micarta chain of such length as to provide ample insulation for the voltage in use. The three units just mentioned are mounted on one base, which is in turn supported from an insulator. The overload relay has a 4 to 12 amp. range and a 2-second inverse-definite-mini-



A.-C. OVERLOAD RELAY

imum-time limit. The operation of this relay serves to close the circuit of the releasing coil on the transfer relay.

The current transformer can be used on all voltages, since it is thoroughly insulated from ground and from the remainder of the system.

Section Insulators for Reversed Potential

WHEN certain sections of the trolley were changed over to reverse polarity in connection with the extensive electrolysis investigation made in Omaha, Neb., in 1917, the positive and negative trolley sections were separated by a double installation of section insulators with a piece of dead trolley between, making a separation from live wire to live wire of 6 ft. This rather long dead section was installed to meet the objections of the linemen, who felt that they needed unusual protection in view of the 1,200-volt difference of potential between adjacent sections of the overhead. The insulators used were made of wood and it was found that they would sometimes carbonize and break down. The long gap was also a source of much trouble in operating the cars.

W. O. Jacoby, superintendent of electric lines Omaha

& Council Bluffs Street Railway, has now replaced these section insulators with a single fiber insulator which gives a separation of only 14 in. from live wire to live wire. The objections of the men were satisfied when they were shown that in case of a trolley break at the section insulator they have to place their blocks to span the dead section anyway in order to make the repair, and that the use of a single section insulator of better grade would also mean they would have one less insulator to maintain.

New Shunts for Switchboard Use

ALTHOUGH the type G ammeter shunts recently developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., are designed for use on horizontal busbars, they will operate in any position without overheating. The terminal castings of the 300 amp. shunts are slotted, to receive one ¼-in. copper bar per slot.

Sizes ranging from 10 to 300 amp. are mounted on a light micarta strip which takes all strain from busbar distortion, from the terminal lug and manga-



AMMETER SHUNT

nin plate joint. These shunts operate at a temperature rise of 30 deg. C. if connected to busbars of ample conductivity when carrying two-thirds of their rated current, which should correspond to the normal full-load rating of the circuit. They are adjusted for 50 millivolt drop at full rated current and are interchangeable with other standard makes of the same rating.

The resistance plates of the type G shunts have a negligible temperature coefficient and thermo-electromotive force, thus avoiding errors due to heating, which may amount to several per cent in other resistor materials.

Handling Hot Clinkers on Rubber Conveyor Belts

THE Standard Portland Cement Company, Leeds, Ala., uses a rubber conveyor belt for handling hot cement clinkers with a temperature of 200 deg. F. and over. In order to prevent scorching of the belt it was operated at an incline of 12 deg. and the lower pulley runs in a trough of water so that a film of cold water is carried upon the belt. It is impossible to cool the clinkers sufficiently before they are deposited in the loading hopper.

The joining of the belt ends to withstand the extremes of temperature and prevent wear of the pulleys is accomplished by the use of Crescent belt fasteners. The ends of the belts are brought tightly together in a snug joint, which makes the belt practically endless on the pulley side and there is no opportunity for clinker ash to get into the joint and cause abrasion of the belt ends. By the use of these fasteners no metal comes in contact with the pulleys to cause wear and a permanent joint is established.

In six months' operation this conveyor has carried 61,000 tons of clinkers. The belt used is Goodyear "Hy-Temp," which is made particularly to withstand high temperatures and is adapted for work on conveyor jobs where heat resistance and the ability to withstand hard wear are essential.

Bridgeport Restricts Jitneys

Important Meetings of City Council and Chamber of Commerce Precede Passage of Ordinance Eliminating Motor Buses from Streets with Tracks—Connecticut Company Agrees to Continue Service for Thirty Days

BRIDGEPORT, CONN., will not lose its trolley cars; that is, not at present. The Connecticut Company will hold off for at least thirty days on its threat to withdraw pending a trial for that period of regulatory ordinance passed by the Council in the early hours of July 13 after a session which lasted five hours. The regulatory ordinance was passed by a vote of fifteen to seven. It eliminates the jitneys from the principal streets of the city, giving the jitney men routes running parallel in some cases with the trolleys.

The new ordinance took effect on July 15, the date on which the Connecticut Company had indicated it would abandon service unless some measure of relief was extended. The ordinance is an amendment of Section 3 adopted by the Common Council on June 23, 1919, by which the power to fix traffic routes in the city is placed in the hands of the Board of Police Commissioners.

President L. S. Storrs of the Connecticut Company said that the company would continue to operate for thirty days to see whether the jitney restrictions enabled the company to do business without a loss. The jitney men say they will fight to a finish. Mr. Storrs' statement to the Mayor follows:

Having given full consideration to your suggestions and having communicated with those of the trustees who can be reached, in reply I will say that we are uncertain whether such regulation of the jitney will in fact fully protect the company, but that if such ordinance be passed and be made immediately effective the company will postpone the discontinuance of service for one month in the hope that the ordinance, aided by strict enforcement of its provisions and of other existing traffic regulations, may prove effective and in the further hope that the citizens of Bridgeport may realize that patronage and fair treatment of the trolleys are essential to a final solution of the transportation problem of the city.

CONDITIONS OF NEW REGULATORY MEASURE STATED

Section 3 of an ordinance entitled "An Ordinance Fixing Traffic Routes for Public Service Motor Vehicles as defined by Sec. 1523 of General Statutes of Connecticut, Revision of 1918" adopted by the Common Council at a meeting held on June 23, 1919, is amended by the Council to read as follows:

Sec. 3. The Board of Police Commissioners shall have power to fix the route over which public service motor vehicles shall operate in the city of Bridgeport, except in its public parks; and upon receipt of an application as above provided shall grant a written consent to operate over any one of the routes applied for as fixed by said board; provided, however, said written consent to operate over any route applied for may be denied by the Police Commissioners if, in their opinion, the granting of said written consent will result in excessive and unreasonable traffic on said route. If consent, as above provided, to run over any route is denied, the applicant may amend his application by specification of another route or routes, and such amended application shall be granted or denied by said board as above provided. But said board shall not deny to any applicant consent to operate on some route if applied for; provided further that no consent shall be given to the owner of any public service motor vehicle to operate as such upon the following named streets within the designated limits: [Ordinance then designates streets.—Eds.]

Any written consent given by the Board of Police Commissioners heretofore for the operation of any public service motor vehicle, within the limits of these streets, from which said public service motor vehicles are excluded by the terms of this ordinance, is hereby revoked.

When granting such written consent the Board of Police Commissioners shall furnish to the applicant a number plate bearing the number of said consent, which the applicant shall display conspicuously upon his motor vehicle, when the same is operated in the city of Bridgeport, and said applicant shall pay to the city the cost of said number plate, said written consent to operate

shall remain in force and effect until the first day of January next following the date when such consent was granted, and shall be renewed for a period of one year by the Board of Police Commissioners upon application of said owner or owners, for operation on route named in said consent, unless said Board of Police Commissioners, at time of such application for renewal shall be of the opinion that the issue of such renewal will result in excessive and unreasonable traffic on said route. Such consent shall be granted only to the bona fide owner of the vehicle, for which such consent is asked, and shall not be transferable. Such consent shall not be granted until the applicant has satisfied the Board of Police Commissioners that he can read and speak the English language sufficiently well to understand traffic rules and regulations and spoken directions of traffic officers. Such consent may at any time be revoked by the Board of Police Commissioners whenever such board shall be satisfied that the driver employed by the consentee does not understand the English language in compliance with the foregoing text.

Provided, however, that nothing herein contained shall prevent the holder of any such license from making application to the Board of Police Commissioners and securing as herein before provided, a written consent to operate a public service motor vehicle over such route or routes as are not denied by this ordinance.

This ordinance to take effect July 15, 1920. All ordinances or parts of ordinances inconsistent herewith are hereby repealed.

History has been made fast in the Bridgeport bus case since the company announced that the buses were carrying more passengers than the railway and that unless the conditions of competition were made more nearly equal the company would withdraw its cars from service. With the matter thus squarely put before it, the Council called a special meeting for the evening of July 12 to act on the matter. The Chamber of Commerce called a meeting for the same evening.

A special message was read to the Council by Mayor Wilson. In his message the Mayor expressed the belief that the motor bus would in time supplant the trolley. When that time arrived it would mean the granting of franchises to corporations for operating motor buses on city streets, but that "in the absence of such a responsible corporation for motor bus transportation in Bridgeport it is highly necessary, I believe, to retain primarily the trolley service." He thought that a *modus vivendi* could be arrived at between the motor bus operators and the company without detriment to either and that the types of motor bus or jitney permitted should be those with a seating capacity of twelve persons or more. He further believed that in the city there were a large number of incompetent drivers and recommended the appointment of inspectors to examine and certify drivers. He then suggested a list of streets from which the jitneys should be eliminated. He said that he had been assured that the restrictions he had outlined would enable the railway to continue the operation of cars. In conclusion he said:

The trolley company was granted a franchise by the State Legislature and in the nature of that grant it has a monopoly, and if it is to function in accordance with its intended purpose it must be relieved from unfair, unregulated, irresponsible competition.

With these restrictions put into effect Mr. Storrs advises me that the Connecticut Company will at once render adequate trolley service to the city.

It may be desirable to change some of these restrictions and I know that the jitneys and the Connecticut Company are both in a conciliatory attitude and will be pleased to meet in conjunction with such committee as your honorable body may deem wise to create, for the purpose of providing better transportation facilities for our citizens.

I recommend the appointment of such a committee.

It has been said very aptly that the 5-cent fare is an "accident in coinage," and in order to arrive at what would be a proper operating cost I would recommend that your

honorable body authorize the Mayor to appoint a committee of such size as he may deem wise for the purpose of considering and advising with the Connecticut Company in ascertaining what such fare should be. The Connecticut Company advises me that it has not, for the Bridgeport district, the per capita mile cost of its operation, which of course such committee must have. When this is arrived at the adjustment of the fare question is a simple matter.

After considering the matter of regulation in executive session the Council threw the meeting open. Mr. Storrs restated the case of his company substantially as he had done a few hours previously at the meeting of the Chamber of Commerce. The jitney men also had their session.

CHAMBER OF COMMERCE HOLDS MEETING

The meeting of the Chamber of Commerce was open to the general public. It was addressed by President Storrs of the Connecticut Company, John Schwartz and William Clancy, representing the jitney men, and Walter Jackson. The chairman of the meeting explained Mr. Jackson's presence by saying that he had been retained by Mr. Lashar, a member of the Chamber and a prominent Bridgeport manufacturer, to report on the railway and jitney matter and that Mr. Jackson was present at the personal request of Mr. Lashar to summarize for the benefit of the audience the facts contained in his detailed report.

Mr. Storrs, the first speaker, said that his company had been invited to enter Bridgeport and had invested \$7,000,000 in that city, \$1,000,000 of which was tied up in street paving. He enumerated the various obligations of the company to the city with respect to monetary payments and said that up to 1916 the company had been able to operate at a profit in Bridgeport. Last year, however, the outgo exceeded the income by \$170,000. The deficit of the company in Bridgeport for the first six months of this year was \$300,000. The company must be permitted to earn sufficient to keep going. The company could not compete with the jitney on unfair conditions. He urged one regulated utility. In no other way could the city get adequate service. The only States in the East where cities had unrestricted jitney competition were New Jersey and Connecticut. The company wanted the jitneys restricted to the territory not now served by the electric railway and also wanted the jitneys eliminated from the central section of the city.

Mr. Schwartz asked that Mr. Clancy, though not a member of the jitney association, be permitted to address the meeting. Mr. Clancy's remarks were confined almost entirely to the drawing of a parallel which indicated that the doom of the electric railway was sealed. He said that any utility that saved time, developed industry, and could be operated at a profit eventually would prevail. From 70 to 80 per cent of the people in Bridgeport used autos. He considered that the conclusive proof of his argument.

Mr. Schwartz characterized the service of the Connecticut Company as unreliable. He also quoted the Mayor to the effect that it was the jitney that filled the bill in the war period. As for the burdens which the jitney now bore, Mr. Schwartz referred to the necessity of the jitneys paying a license fee for the chauffeur and a vehicular license and the owner paying a revenue tax. He also said that the owners of the 300 jitneys, costing from \$2,000 to \$6,000, were paying a property tax. Jitneys operated last winter during the snow and ice when the cars of the electric railway were not in service.

Mr. Schwartz said that 80 per cent of the traffic between Bridgeport and Norwalk was handled by jitneys. While the trolley to Norwalk was tied up for four days during the winter the jitneys got through without serious interruption. The jitney men were responsible. They put through a liability bill themselves at the last legislative session. The jitneys settled accidents promptly. As for regulating the jitney Mr. Schwartz said that the factories were at the east and west ends of the town. There were only two streets on which the jitneys could run from one end of the town to the other and on both of these there were trolley tracks. He explained that the success of the jitney in Bridgeport was due to the fact that the Connecticut Company had not served the city adequately and that it had raised its fares in some instances to a point that became prohibitive.

Mr. Jackson said that if the trolley service had been adequate in Bridgeport there would probably have been little jitney competition. A large proportion of the traffic was for short distances, and short-distance riding had been greatly fostered by the jitney. He said that many industries in Bridgeport were at considerable distances from trolleys, and this fact had served as an opening wedge for the autos. He suggested the use of the auto as a complementary service to the railway. Should the trolleys be eliminated from Bridgeport the 5-cent fare on the bus would undoubtedly not remain. The present scheme of fare charges in effect on the lines of the Connecticut Company was not the most logical. It had been thrust upon the company by the Public Utilities Commission. For this the company should not be blamed. With restriction of the jitney to a supplementary service, the trolley could be run at a higher schedule speed with a possible reduction in fare. Mr. Jackson said that the base schedules of the electric railway should be provided with one-man cars; that all indirect service should be by motor buses operated in connection with the electric railway, and that most rush-hour service should be given with two-car trains.

At the conclusion of the meeting the following ballot was mailed to all the members.

Instructions—Please answer "yes" or "no" to the questions and return by next mail.

1. Do you favor action which would result in the cessation of trolley service and make us dependent on motor bus transportation?

(Answer)

2. Do you favor legislative action as recommended by the Mayor to the Common Council, which, in effect, will eliminate active jitney competition from the streets about the city's center on which the Connecticut Company operates trolley cars—this to be on guaranty of adequate trolley service.

(Answer)

3. Do you favor the ordinance under discussion by the Common Council as this referendum is being mailed, details of which will appear in papers of July 13?

(Answer this question only if ordinance shall differ materially from the Mayor's recommendations).

(Answer)

CONNECTICUT MAYORS CONSIDER MATTER

The executive committee of the Mayors' Association of Connecticut has also taken up the jitney matter. At a meeting in the Hotel Taft, in New Haven, on July 13 two self-explanatory resolutions were adopted and will be submitted for approval to the State association. They read as follows:

Resolved, That it is the sense of the Mayors' Association of Connecticut that the public must be protected and the best interest of the community conserved. To that end the public service vehicles should be regulated as to service,

schedules, rates, routes and liabilities as are the trolley companies. All municipalities should guard carefully their vested rights to regulate traffic and thus protect the safety of the general public; and be it further

Resolved, That the Mayors' Association of Connecticut invites co-operation with all municipal organizations and semi-public bodies interested in the welfare of their respective communities throughout the State to the furtherance of this end.

At a meeting of the Board of Aldermen at Waterbury on July 12 a committee was appointed to hold a hearing on July 14 to learn the views of representatives of both the electric railway and the buses. At the meeting on July 12 petitions were received from employees of the Connecticut Company in Waterbury, representing sixteen different departments and 600 employees, asking that the jitneys be restricted in their routes to streets not covered by trolley cars. The men argued that this step should be taken in defence of the

company, which has threatneed to abandon service unless the competition of the jitney is restricted.

In New Haven it is said that the employees of the Connecticut Company, backed by the Connecticut Federation of Labor, with which the union of trolley men is affiliated, are also prepared to protest to Mayor Fitzgerald against the competition of the buses.

Restriction of buses somewhat similar to that intended to be imposed in Bridgeport went into effect recently in New London. The terms of the jitney ordinance in New London were reviewed in the *ELECTRIC RAILWAY JOURNAL* for July 3, page 34.

The Hartford Board of Aldermen, on the evening of July 12 passed a resolution proposed by acting Mayor C. D. Alden, Jr., "that the transportation problem of the city in regard to electric, taxicab and jitney service be referred to the standing committee on railways of

Trolley Service or Auto Busses?

How much longer will the People of New Haven, and Vicinity, and the Connecticut Company be subjected to the impositions of Auto Busses? What is going to be done about this very outrageous local transportation condition? It's high time to ACT!

Last winter!—Do you remember it? Do you remember how the Connecticut Company kept the tracks clear so that You could ride on the cars?

Do you remember how the snowplows struggled through the streets to keep the paths open? Do you remember how the car crews bravely stuck to their posts despite the freezing weather? You admired them, didn't you?

We did.

But—do you remember how the auto busses came out after we had cleared the tracks and deliberately ran in front of the trolley cars? How many busses were there on the streets of New Haven during the storm? Remember that?

How many auto busses are there on the streets of New Haven during any rain-storm? If auto busses are a logical means of local transportation why are they only on the streets when the sun is out or the streets dry?

If auto busses are a logical means of local transportation why have they been ruled from the streets of some of America's largest cities?

You give the trolley car company an exclusive franchise to operate a local transportation service—a trolley car system. The trolley car company lays expensive steel rails, erects trolley wires, puts cars on the tracks, and before the company has barely had an opportunity to pay a dividend—you allow auto busses to unfairly compete with the trolley.

Where's the justice of that?

Have you built a house on the outskirts of New Haven and had full city service and advantages? Have you thought about your taxes?

When a new addition to the city is opened up it is the trolley car company that is called upon to build a track to the new section to "help build it up." When it's built up who gets the benefit of the pioneering?

Do you suppose that you could call on an auto bus owner to operate his bus to and from some sparsely populated section

of the city through Spring, through Summer, through Fall, and through WINTER? Would you practically ask him to operate at a loss until that section is a "paying" section?

It's been done with the Connecticut Company. And the Connecticut Company DID IT! Did it not from an altruistic standpoint, to be sure, but nevertheless DID IT, and because the Connecticut Company DID IT has the continued growth of New Haven in some sections been made possible.

The busses, of course—they're a bit "faster" you know.

And, too, it costs "less" to ride in an auto bus.

Does it?

No, it does NOT. If anything it costs a great deal more!

The Connecticut Company lays its tracks, puts up its wires, puts on an army of trolley cars. When the tracks wear out who puts new ones down?

The public?

No, the Connecticut Company.

The auto bus man buys a bus—either good, bad, or indifferent, and he's "ready for business." All he has to do is to follow behind, or as usual, run ahead of a trolley on any of the Connecticut Company's main lines. When the heavy, cumbersome auto busses wear out our streets—yours and ours—who pays for THAT?

The auto bus man?

No, not the auto bus man, but—YOU! The public pays for that. When they wear out a little more than usual then a little more taxes than usual is paid—that's all.

When the pavement between the tracks and for a distance on the outside of the tracks of the Connecticut Company are worn out by the auto busses who pays for the repairing?

The auto bus man?

The public?

NO, the Connecticut Company pays for it, even if never in its history it used that necessary pavement.

Where's the justice in THAT?

New Haven certainly does not want the same thing to happen that happened in Bridgeport—the issuing of a notice of removal of street car service. There is no sane reason why that should happen in any progressive city.

The Connecticut Company is sincere in its desire to serve the public. It is sincere in its wishes to serve quickly, courteously, economically—and SAFELY.

If the Connecticut Company must come to the same decision here as was made at Bridgeport it will do so, not because it wants to, but because it was FORCED to.

The Connecticut Company has always endeavored to give 365 days of uninterrupted trolley service every year.

It does not run on a haphazard, sunshine, intermittent schedule.

And this coming winter, if the Connecticut Company is still operating its trolley cars in New Haven, we will again try to keep the lanes of street car traffic open. We will again do our very best to give the very best for the very least.

We will in the future, as in the past, try, in so far as our finances will permit, to replace our rails as they become worn, and replace our cars as they become worn, in order to continue giving you service. REMEMBER that trolley fares are the only source of revenue the Connecticut Company enjoys from its passenger service.

And the Connecticut Company will go on paying for that work THEMSELVES, and they will go on paying the taxes levied on them by the city.

Now, what are YOU going to do? You've our side of the story. Are you going to remember past performances? Don't forget the story of the grasshopper—he didn't prepare for the winter.

Do you realize that the unfair competition of the Jitney has been one of the largest factors in bringing the Connecticut Co. face to face with bankruptcy and has therefore forced it in self-defense to increase its fares?

Don't forget last winter! If there is no trolley service this winter, what will you do?
The Connecticut Company

the board with instructions thoroughly to consider the situation, to hold such hearings and make such reports from time to time . . . as the said committee shall deem desirable in connection therewith, it being the intention hereof that any such regulation or problem be treated with moderation and deliberation and in a manner fair to all involved in any such regulation or problem."

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Exhibit Committee Optimistic

THE association exhibit committee met Tuesday, July 12, at the association headquarters in New York City. Although late in getting out the space application blanks this year, the returns have come in promptly. More than 40,000 sq.ft. of space has already been sold. This amount is two-thirds of the total area sold last year. Old exhibitors are taking additional space and indications point to a very successful exhibition. In order to expedite freight deliveries each member of the committee proposed to co-operate with the manufacturers in his district for making shipments in groups and to facilitate deliveries to the pier.

Fred C. J. Dell and George W. Wells were appointed members of a sub-committee on space assignment. The space rate this year is 60 cents per square foot. A sub-committee on decorations was appointed, consisting of S. D. Hutchins, chairman; L. W. Shugg, A. M. Robinson and A. N. Davis.

Those present were Frank H. Gale, chairman, General Electric Company; John Benham, International Register Company; Frank C. J. Dell, National Railway Appliance Company; S. D. Hutchins, Westinghouse Traction Brake Company; John B. Kilburn, Hale & Kilburn Corporation; J. C. McQuiston, Westinghouse Electric & Manufacturing Company; A. M. Robinson, J. G. Brill Company; E. F. Taylor, Texas Company; L. W. Shugg, General Electric Company; Secretary E. B. Burritt, and George W. Wells, manager of exhibits.

Committee on Code of Traffic Principles

A MEETING of the Transportation & Traffic Association committee on code of traffic principles met Wednesday, July 13, at the association headquarters in New York City.

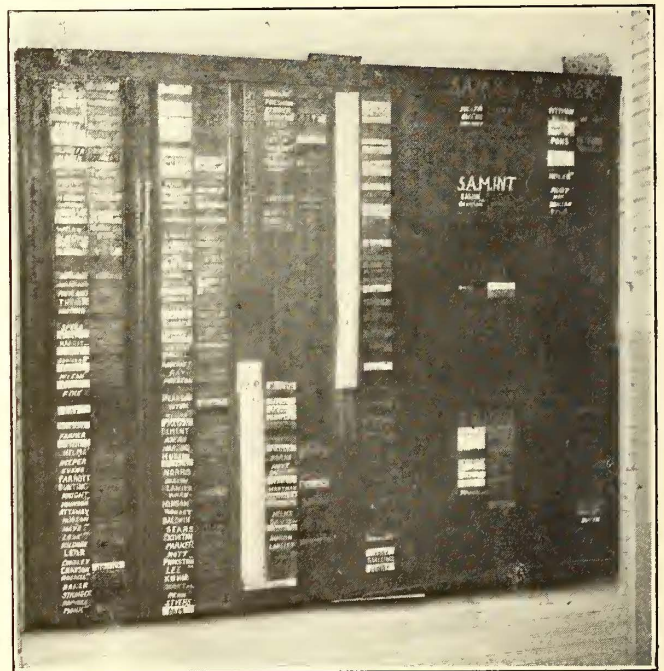
The committee put in a long day's session discussing the elements of a model traffic ordinance by comparing ordinances proposed by committee members and those of representative cities and expects to present valuable material to the convention. Those present were H. B. Flowers, chairman, and W. H. Maltbie, Baltimore, Md.; Fielder Sanders and P. E. Wilson, Cleveland.

Announcement has been made that the midsummer meeting of the Illinois Electric Railways Association will be held at Springfield, Ill., July 30, 1920. A tentative program calls for a business meeting in the morning, a convention luncheon at noon and a handicap golf tournament in the afternoon. The detailed program will be announced later.

Trainmen's Assignment Board

Complete Record of Men and Their Daily Activities Available at a Glance in Houston Electric Company's Office

THE Houston (Tex.) Electric Company has found it valuable to both the trainmen and the superintendent to maintain a bulletin board on which the names of all trainmen are so posted that the duties or assignments which they have for the day can be seen at a glance. This consists simply of a blackboard hung in the superintendent's office, on which the numbers of all runs are painted and rows of pegs provided for attaching the small cards bearing the trainmen's names opposite the run number to which they are assigned. Odd run numbers on the board designate daylight runs and even numbers night runs. There is also a color scheme of cards and lettering which assists



TRAINMEN'S ASSIGNMENT BOARD USED IN HOUSTON, TEX.

in classifying the men. A black card with white lettering designates a conductor; a black card with yellow lettering designates a motorman; a white card with black lettering indicates a safety-car operator who was formerly a conductor; a yellow card with black lettering indicates a safety-car operator who was formerly a motorman.

At 5 o'clock each afternoon the cards are properly arranged on the board to indicate the assignments for the next day. As the men come in off their runs they consult this board and note the run assignment for the next day and the time at which they must show up the next morning. When they report in the morning there is a form ready for their perusal on which is written, opposite the run number, the car number, leaving time, carhouse track on which the car is located and a check column in which they sign.

In addition to the run number assignments, the trainmen's board shows the unassigned extra men, men excused from duty, on sick leave, etc., so that every employee of the train service can be accounted for by observing the board.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

\$1,000,000 Transmission Line

Toledo Railways & Light Company Has Awarded Contract for Twelve-Mile 60,000-Volt System

The Toledo Railways & Light Company, Toledo, Ohio, has closed contracts for the building of a high-tension overhead power transmission line to circle the city of Toledo for the most part adjacent to the right-of-way of the Toledo Terminal Railroad, which at the present time connects up all of Toledo's twenty-three railroad lines into one system for interchange business and factory development. The new transmission line will be carried on specially constructed steel towers, averaging 65 ft. in height and consisting of two circuits designed for about 65,000 volts and 80,000 h.p.

WILL ENCIRCLE THE CITY

The power will be manufactured at the Acme Power Company's plant on the East Side. The line will extend from there to the corner of Front and Dearborn Streets in the city, thence to the Terminal Railroad. It will cross the Maumee River on high towers approved by the United States government. From the river it will extend along the Terminal belt line to Fitch, a station at the intersection of the Terminal and Toledo & Western Railroads. This is a distance of nearly 12 miles and is almost half of the city circle. From this point it is joined with the line extending to the city filtration plant in the southwest corner of the city. The closing of the gap in the rest of the belt will be made as soon as industries develop in the southeast part of the city.

The new line will furnish the power for the city's water system and also for a new sewage disposal plant to be built soon.

The new line is estimated to cost approximately \$1,000,000, and although plans and work of securing right-of-way have been in progress for almost a year, the actual work will be started this summer.

AUTO COMPANY LARGEST USER

The city of Toledo at the present time probably has more mileage of underground high-tension cables and transmission system than any other city of its size. By building a duplicate high-capacity line, the Rail-Light feels that it will provide Toledo industries with the maximum safeguard for continuous power supply so essential to efficient operation.

Most railroads and industries have shown a spirit of co-operation in the

work of getting the right-of-way for the new power line. A few pieces of property will have to be condemned.

The new line will furnish power for practically 85 per cent of Toledo's industries. The largest user is the Willys-Overland Automobile Company.

Power for the operation of the Ohio Electric Railway between Toledo and Lima and for the Toledo & Western Railroad between Toledo and Pioneer and Adrian, Mich., will be transmitted over the new overhead high tension line. Many cities along these lines are supplied with light and power by the Rail-Light through these connections.

The steel towers are being built by the American Bridge Company, a Toledo concern, and the work of construction has been awarded to A. Bentley & Sons Company and several other Toledo contractors.

Missouri Short Line Arranges for New Terminal

The Kansas City, Clay County & St. Joseph Railway will use a new passenger terminal in Kansas City, Mo., now being equipped. It is located in the Railway Exchange. During the war the ground floor was occupied chiefly by the railroad administration's joint ticket office. Since the war ended tenants not connected with steam railroad enterprises have been eliminated. The Kansas City, Clay County & St. Joseph Railway had its headquarters in a suite on the fifth floor of this building; its passenger station was at Thirteenth and Walnut streets, six blocks south. A five-year lease of the Railway Exchange has been secured.

The company has leased four rooms on the ground floor of the building, facing Seventh Street, including a corner room on Grand Avenue. All entrances from the large lobby of the Railway Exchange are being sealed, so that patrons will enter the station from the street fronts only. The interurban company is equipping excellent waiting room facilities, with toilets and washrooms for men and for women. The baggage room is being provided with manual trucks, so that baggage will be handled direct from the baggage room to the car.

The freight terminals of the company are only a few blocks north of the new passenger terminal, where the company has its own tracks; its shops and carhouses are a few blocks further away, across the Missouri River, in North Kansas City.

Another advantage is that practically all passengers will hereafter board the cars at the passenger terminal.

Terms of Akron Settlement

City Council Outlines to Railway Amendment to Franchise as Basis for Compromise

On July 10 the utilities committee of the City Council of Akron, Ohio, sent a communication to the Northern Ohio Traction & Light Company, outlining an amendment to the franchise which it is willing to make to the main body. This provides for a straight 5-cent fare for three months, during which an effort will be made to arrive at some conclusion for a permanent franchise with a sliding scale to take care of the expenses and returns on the investment of the company. The proposal follows:

Our committee will recommend to Council that the present franchise be amended by substituting a 5-cent cash fare for the present rate for a period of three months, after which the present rate shall again prevail; if a new franchise has not been agreed to by that time but progress has been made toward that end, the same arrangement shall be continued for a further period of three months.

Our committee will further recommend to Council that when a new franchise is drawn it shall provide for an initial rate of fare of 5 cents and shall be increased or decreased at stated intervals, after sufficient time for and when an audit of the company's books and records is had, as the necessity for such increase or decrease may appear, having in mind finding a rate of fare at periodic increases or decreases of one cent each that will provide revenues sufficient to meet operating expenses, depreciation and a return on the investment.

Such a franchise must contain ample provision for municipal control of service and extensions.

Further, the committee will recommend to Council that a new contract be drawn with all possible dispatch.

This proposal is conditional upon the company resuming operation immediately and of maintaining the same service as existed prior to the recent suspension of operation.

MR. BLINN NONCOMMITTAL

A. C. Blinn, vice-president and general manager, said he could not comment on the proposition until it had been submitted to the company.

Members of Council claimed that the men now on strike will return to work at once if the company accepts this plan. It is said that W. D. Mahon, president of the Amalgamated Association, has instructed them not to demand a wage schedule in excess of that granted recently by the board of arbitration.

The strike of the men on the local line at Massillon, called on July 8, lasted only one day. An understanding was reached between the men and the company. It is said that Council will pass an ordinance increasing the rate of fare from 5 to 8 cents in order to cover the additional wages granted the men by the board of arbitration recently. The company had asked for a rate of 10 cents.

Court Insists on Service-at-Cost Vote

Judge Killits Sends Measure to Toledo Council with a Valuation of \$8,000,000—Dangers of Municipal Ownership Pointed Out

Toledo's service-at-cost plan for the settlement of the railway controversy was started through the legislative mill at Toledo last week. This controversy has been holding attention there ever since the famous ouster proceedings of nearly a year ago and was thought to be absolutely deadlocked when the Milner commission and Henry L. Doherty were unable to agree to the valuation figure in the measure after six months of negotiations.

FEDERAL JUDGE JOHN M. KILLITS, who appointed the commissions to draft settlement measures, and to whom the Milner draft was finally given, sent the measure to Council with a valuation of \$8,000,000 for the initial capitalization which represents the present properties of the company. This figure is what the commission had agreed to place in the measure. It is \$1,000,000 less than the lowest figure offered by Mr. Doherty and possible of fulfillment conditionally.

COURT SUMMONS COMMISSIONERS

Members of the commission were called in by Judge Killits. They agreed to the plan he presented. The measure was then sent to Council with a lengthy letter, in which the judge explained his position with reference to the measure and also offered some suggestions with reference to the municipal ownership measure now before the people for a vote at the primaries on Aug. 10.

The service-at-cost measure could have been passed by Council and carried on the same ballot with the twin municipal ownership ordinances, but there is a question of constitutionality coming in the variance of the city and state initiative and referendum provisions. When the measure came up in Council on July 9 that body was confronted with an appeal from the service-at-cost commission that action on the ordinance be delayed in order to assure the legality of the measure if finally adopted by the people.

The vote in Council was indicative of the desire of some of the members to bring the plan up regardless of the safeguards for constitutionality. The vote on adjournment without consideration was nine to six, so that it appears the ordinance will easily pass whenever it is brought up again.

Several members of the Council asked for the repeal of the municipal ownership ordinances so that both measures might be submitted at the same time, but the adjournment vote indicated that they were in a minority.

ELECTION MAY GO OVER

It is possible now that the cost-of-service franchise will be submitted at the presidential election in November, provided the vote on public ownership on Aug. 10 does not preclude any further action toward a franchise measure.

In his communication to the Council Judge Killits also took occasion to settle one remaining point of difference between the commissioners and Mr. Doherty. That was over the provision

by which bonds providing additional capital for improvements to the system might be sold at a discount if necessary to get the funds.

Judge Killits held that the company contentions on this provision were valid and that so slight a difference in any advantage to the city would be made that it would help to yield this point if it might make the whole measure acceptable to the Doherty interests, if passed by the electorate.

The judge, speaking only as a citizen of Toledo, in his letter to the Council said:

As a local paper pointed out a few days ago, the charter requires that the car rider, under municipal ownership, must bear all of the cost of service. The same thing is absolutely true under any possible franchise—a street car company can no more be compelled to contract for service under cost than a merchant can be forced to agree to sell his wares at a loss. If the provision for selling bonds at a discount should remain, the car rider would carry the burden of the discount. Six per cent on each dollar for which but 90 cents of improvement was bought would be added to the cost of service. The provision, it seems to me, has possibilities against the city also in that it furnishes a chance to juggle securities. It is plainly to the city's interest that a company which is to serve the community have a chance to transact its business in a business way. The commission was alive to these controlling principles, but offered the provision in question to anticipate a situation when a necessity for expanded service might occur with a bad money market—giving to the city the power to force an immediate enlargement. But such a condition would be a temporary matter only, wherefore it seemed to me that a balancing of considerations advised that the commission recede, if in fact it had not already done so.

MILNER ORDINANCE SAFER

In submitting the cost-of-service plan to the Council, Judge Killits undertook to show that the Milner ordinance offers a safer and a much more direct road to municipal ownership than do the twin measures to be submitted next month. Indirectly he expressed the belief that the municipal ownership ordinances are both futile and dangerous. He adds a little argument to show that the contemplated piecemeal condemnation proceedings in the general unwritten plan of the public ownership commissioners will meet with serious objections and a possible interruption of service for several months.

Judge Killits said in part:

It is a sanguine man indeed who would expect a publicly owned transportation system to be in successful operation within eighteen months after Aug. 10. The requirement of the company's lines for city ownership by condemnation proceedings means tedious litigation, with some special embarrassment, if it is proposed to take over selected portions of the company's property and cause it to suffer scrapping of the rest. It is not reasonable to expect the company to submit without exhausting all available resources of defence.

If the city should determine to embark upon the experiment of utilizing, through

city ownership, acquired by condemnation, some, only, of the company's lines, supplementing this partial supply of the city's needs by some other method of transportation, there is nothing to hold the company to service here until the new arrangement is ready for use. Even if the construction of the Milner law, which the federal court has held is correct, the Utilities Commission could not legally compel street car service until processes were complete to dismember the property and to render much of it mere scrap.

With destruction of its system inevitable anyhow through the city's expressed purpose, it would be the company's privilege to leave us whenever departure seemed to be advantageous to it. Compared with what these delays and conflicts may mean to the city's development, what they may mean to the car rider in higher transportation fares, or deranged systems, the burden of a settlement figure of a million, or even two million dollars higher than we may think the property worth to buy, is insignificant.

In passing the ordinance and asking approval of the electors without the agreement of Henry L. Doherty, the judge declared that the city would then be in the position of offering a fair settlement and the company would not be liable to turn it down for sentimental reasons.

He also argued that the term valuation was used in connection with the service-at-cost plan as a term of agreement on how much would be the initial bond issue on which the return of the company is based.

The campaign for the municipal ownership ordinances is proceeding with open air street meetings addressed by members of the commission and others who favor public ownership.

City Restrained from Buying Buses

Justice Edward J. Gavegan, of the Supreme Court in New York, granted an injunction on July 1 in a taxpayer's action restraining the city from spending \$1,000,000 for a municipal bus project, but refused to order that the existing city bus lines be discontinued.

The injunction issued was upon the application of Edward Schafer, made after the Board of Estimate and Apportionment passed a resolution, on March 12 last, authorizing the expenditure of \$1,000,000 for the purchase of motor buses to be used upon several new lines which Grover A. Whalen, Commissioner of Plant and Structures, contemplated starting.

Justice Gavegan has had the matter under consideration for a long time. In the meantime the Supreme Court in Brooklyn has granted injunctions against the existing bus lines in so far as they parallel surface lines operated under franchises.

The Corporation Counsel has already taken steps to place the whole matter before the Court of Appeals, which will decide not only cases from Kings County but also from New York County, where the question of city buses competing with two crosstown lines running from Manhattan to Brooklyn already has been passed upon by the Appellate Division.

Justice Gavegan, while enjoining the city authorities from spending any of the \$1,000,000 for buying a bus plant and equipment, does not try to stop existing lines of buses running with the

permission of the Commissioner of Plant and Structures.

He also declares that should any new emergency arise by reason of the cessation of any surface lines, his injunction is not to be construed as preventing the Mayor from stepping into the breach to give transportation.

Corporation Counsel Burr will take an appeal from that portion of Justice Gavegan's order restraining the Comptroller from paying out any money to carry out the resolution of the Board of Estimate to have city owned and operated buses.

I. U. T. Safety Banquet

Superintendent of Transportation Turns Cook—Other Officials Entertain with Songs and Hornpipe Dance

The semi-annual safety banquet of the Union Traction Company, Anderson, Ind., for which all members of the various safety committees on the property were invited for one good round of fellowship, took place on June 21.

"JERRY" THE COOK

This affair has come to be an event of some note in the company's annals, and one at which attendance is much coveted. In general, it is a dinner at which there is a little talk about safety and a lot of fellowship, the officials from president down throwing off the cloak of reserve and formality and entering into the event as "one of the boys."

On this recent dinner, "Jerry" Keever, the superintendent of transportation, became cook. In the basement of the Methodist Church he prepared a dinner which, all reports have it, was a wonder. "Jerry" started them with grape fruit, and went the route with fried chicken, ending with strawberry shortcake. After the dinner, Mr. Keever and his division superintendents started off the lighter side of the program with a "sextette." He then announced that the department heads were to sing a song. They favored the men, much to their delight, with the song:

I'm a little prairie flower,
Growing wilder every hour;
No one cares to cultivate me—
I'm as wild as wild can be.

At the end Mr. Brady, the president; Mr. Nichols, the general manager, and all the other department heads danced the hornpipe as they sang. Then everybody joined in and some one shouted "everybody dance." The whole crowd fell into the hornpipe.

A SERIOUS SIDE, TOO

This simply characterizes the good fun and fellowship which is entered into in these safety banquets. Of course the president and general manager had something to say about the serious side of the safety work to begin with, but on the whole, the meeting is probably more important from its value as a "get acquainted" event, wherein workmen down in the ranks find out that the fellows up above are just humans after all.

Hydro-Radial Scheme Halted

Government to Appoint Commission of Full Inquiry Before Allowing Any Further Expenditure

E. C. Drury, Canadian Premier, on July 7 notified Sir Adam Beck, chairman of the Hydro-Electric Commission, in response to a letter from Sir Adam, that the Government, after full and careful consideration, had decided to defer any action in regard to the acquisition of the Niagara, St. Catharines & Toronto Railway, the Toronto Suburban Railway and the Guelph Radial Railway by the Hydro Commission until such time as the Government had satisfied itself by means of a thorough inquiry as to the advisability of going on with the project. Meanwhile the Government requested that, pending the result of such inquiries, further expenditure on the roads should not be made.

THE official statement by Premier Drury was as follows:

When the Government goes ahead, the province will be committed not only to the present proposals but to a province-wide, publicly owned radial electric scheme operated by the Hydro-Electric Power Commission, involving an ultimate mortgage of the province and of the municipalities interested of scores of millions of dollars.

The Government has therefore decided to appoint a commission to go into the whole problem from every point of view and present a report for its information and guidance.

In the meantime all action in the direction of further outlays or the assumption of further responsibilities in radial matters by the Hydro-Electric Commission will be stayed.

SIR ADAM'S RECOMMENDATIONS

Sir Adam had previously stated he hoped to be in a position to announce to the Ontario Government that the Dominion Government had accepted his offer to take over the three electric railways in Ontario owned by the Canadian National Railways. The terms on which Sir Adam Beck recommended the taking over of the railways in question were as follows:

Toronto & Eastern Railway—Price \$706,000; payable by Hydro Power Commission 4½ per cent fifty year bonds, guaranteed by the Province of Ontario.

Toronto Suburban Railway—On this railway there are \$2,628,000 of outstanding 4½ per cent bonds due 1961. This is to be taken over by the Hydro Power Commission, and the Hydro Power Commission to assume the bonds.

The Niagara, St. Catharines & Toronto Railway—Price for this railway to be \$3,544,374. On this road there are \$1,098,000 of 5 per cent bonds outstanding.

GOVERNMENT'S MEMORANDUM

The memorandum referred to by the Government in its communication to Sir Adam Beck follows in part:

The obligations of the province of Ontario now outstanding, approximately \$65,000,000, or 52 per cent of its present debt, is represented by assistance given to the Hydro-Electric Commission. It will in the near future have to supply between \$32,000,000 and \$33,000,000 more in cash to complete the Chippawa, Nepigon and other electrical power works in process of construction. In all, there are guarantees to a total of more than \$103,000,000 which the province and the municipalities are bound to repay.

Hydro-radial projects, while they may to some degree facilitate the distribution of power as incidental to the operation of the railways, are entirely new and separate from the main object and scheme of the commission.

The debt of the province will within two years amount to \$160,000,000 or more. If the radial scheme is gone on with and kept strictly limited (which would be practically impossible) to the lines mentioned,

the obligation of the province will approximate \$210,000,000. The annual interest charges would be almost equal to the total direct debt of the province in 1908, and the finances of the province would be seriously crippled and great confusion and hardship created for the municipalities if the scheme were not to meet the expectations of its promoters.

The province must not, of course, come into competition with the Canadian National Railway system, as Ontario, by taxation, must provide for from one-third to one-half the C. N. R. annual deficits. Then too, the vast amount that must be annually raised in Ontario to take care of the proportion of Dominion taxation cannot be overlooked.

The province must be assured that the new scheme will be at least self-supporting. It is contended by representatives of certain of the municipalities to be served by the projected roads that the covenant of the municipality relieves the Government of responsibility. If the municipalities were required to furnish the moneys for the construction of the roads this might to a large degree be true, but the fact is that the municipalities look to the province to supply all the money required.

Other points cited as worthy of careful consideration are:

The shortage of Hydro power; that many radials now, with cheaper construction, do not pay; that the experience of U. S. electric railways is financially unsatisfactory, and the municipalities would find it difficult, if not impossible, to float bonds for the projected roads, unless with the guarantee of the Government; that for medium and short distances good roads will serve the public better; that every few years new bond issues would have to be made to pay for additional rolling stock, new sidings, double tracks and many other betterments; that it is fairly open to question whether added responsibility for radials should be placed on the Hydro Commission.

In conclusion the report says:

Some of the foregoing arguments may not be valid and none of them may be conclusive against the ultimate adoption of the proposals. They are, however, as it appears to the Government, conclusive against their adoption at the present time and until the whole subject has been fully and exhaustively examined. The matter is of far too great importance to be dealt with hastily or lightly. A commission will be appointed, and requested to proceed immediately with its task, to hold public inquiries and to report without unnecessary delay.

As matters stand now the Hydro-Radials are tied up until the Royal Commission, to be appointed by the Drury Government, reports on the plans of Sir Adam Beck and the Hydro-Electric Commission.

The announcement of the Government's policy was made just two days before the annual meeting of the Ontario Municipal Hydro-Radial Association, which was held in Toronto on July 9. The meeting was thoroughly representative of all interests embraced in the association. Naturally the policy of the Government as announced came in for strong discussion. Sir Adam Beck was present and outlined the present position of the Hydro-radial and other undertakings.

Electrical Workers Forced to Arbitrate High-Handed Tactics of Special Force Alienate Sympathy of Other Organized Workers

Electrical workers and other craftsmen in the employ of the Wheeling (W. Va.) Electric Company, the Wheeling Public Service Company and the Wheeling Traction Company returned to work on May 28, after having been on strike since April 30. The men had previously refused to arbitrate. In consequence the companies announced that unless the men did return to work by May 28 their positions would be filled. This resulted in the company being notified that if such a course were followed the other employees would go out on strike in sympathy. The companies felt firmly convinced that the other men were too fair minded to violate their contract by any such procedure, but they laid the facts before the public in a full page advertisement so that the public would be fully informed.

FOR SEVERAL years the companies made concessions to the electrical workers. In the first place it was difficult to secure men to do this class of work and then the total number of employees belonging to these unions was relatively small. This resulted, apparently, in the men arriving at the conclusion that any demands which they might make on the company would be met. A summary of the steps in the controversy follows:

The contracts with the men expired on May 1 each year. They contain a clause which requires either party to have a memorandum of changes in the hands of the other party not later than April 1. In accordance with this clause, the companies submitted to the men on April 1 a contract such as it proposed and the men in turn handed back to the company a contract which they insisted should be accepted prior to May 1. The contract submitted by the men was objectionable in almost every paragraph. About April 10 the companies started a series of conferences with the committee representing the Electrical Workers' union. It soon became evident that the men not only proposed to insist on their demands but also proposed to strike unless their demands were met in their entirety.

The company offered to arbitrate any differences existing on which agreement could not be reached, but the men declined arbitration and on the night of April 30 went on strike on one hour's notice and did everything in their power to force the shutdown of the property. Fortunately, the companies, through the co-operation and support of their loyal employees, were able to operate without serious interruption of any kind.

MEN TOOK ARBITRARY STAND

About May 17 the companies notified their former employees that unless they were back on the job by the morning of May 17 the companies would proceed to fill their places with other men. On about the morning of May 18 the Chamber of Commerce of Wheeling asked the companies to postpone the date on which they proposed to bring in other men until May 26. This the companies agreed to do and later agreed to extend this time to May 28.

When this time came and the electrical workers had made no concessions the companies notified the representatives of the other unions on their property that the companies would expect them to co-operate in securing other employees for the electrical department. In consequence the representatives of these unions forced the electrical workers to go back to work under the terms of the contract which the companies had submitted to them, with the understanding that if there were any sections of the contract which were not acceptable to them the companies would agree to arbitrate any sections of the new contract which differed from the contract under which they worked last year.

It is generally conceded in the Wheeling district that these men took an arbitrary, unreasonable stand from the very beginning and that when the smoke cleared away they had received about as severe a setback as any of the unions in the valley have received in a number of years. The opinion prevails that if the electrical workers had re-

fused to go back to work under these conditions, the other unions would have refused to support them. The companies are hopeful that the entire matter can be settled without the need of arbitration between the contract under which these men went back to work and the contract which existed last year.

The large joint power house of the American Gas & Electric Company and the West Penn Power Company, located at Windsor, W. Va., and all of the Ohio side lines of the American Gas & Electric Company have always been handled as strictly open shop properties. The electrical workers have been trying to force the unionizing of these properties. It was their hope to use the Wheeling Electric Company's plant, which is a subsidiary of the American Gas & Electric Company, and the Wheeling Traction Company, which is a subsidiary of the West Penn Traction Company, to secure this result.

Company Seeks Relief

Denver Tramway Wants Case Decided
Which Prevents Company from
Reducing Wages

The Denver (Col.) Tramway on July 1 petitioned the Colorado Supreme Court for a writ of prohibition against District Court Judge Greeley W. Whitford, the District Court of the Second Judicial District and the city and county of Denver in the tramway injunction case. Owing to the short time interval which remained before the date set for the adjournment of the Supreme Court for the summer vacation, the case was not heard on its merits but simply on the application to file the petition and for the issuance of a rule upon the city to show cause why further proceedings in the lower court should not be stopped.

Permission was granted by the Supreme Court on July 6 to file the case and the order to show cause was issued. The further condition was attached that the lower court should not proceed further in the case except to enforce, if necessary, the provisions of the present temporary injunction against the company, and also to take up the matter of the issuance of a temporary writ against the local division of the Amalgamated Association. Dates were set for the filing of briefs by the parties at interest and oral arguments will be heard on Sept. 13.

The injunctive proceeding was instituted by the Mayor of Denver following the refusal of the City Council to pass a 7-cent fare ordinance and the announcement by the company of a reduction in wage scales which was to have become effective on June 1. The employees had announced their intention of striking as soon as the wage reductions became effective. Upon the application of the city and county of Denver, District Judge Whitford on May 29 issued a restraining order against the tramway and the local division of the Amalgamated Association. Under its provisions the company was estopped from taking any action which would interfere with continued railway service.

This literally compelled the company to continue in force the higher wage scales granted its employees by a local board of arbitration on March 18, 1920, even though its revenues are insufficient by about \$1,200 a day to meet the same. Judge Whitford on June 26, after a hearing, granted a temporary injunction against the company.

That part of the restraining order directed against the Amalgamated Association which prohibits it from calling a strike is still in effect, as the representatives of the association through continuances delayed the pleading date until after the company's part of the injunctive proceeding had been disposed of. The city's position is that the restraining order against the men has the same effect as a temporary injunction and is for an indefinite period, or at least until the District Court acts either to dissolve the same or change it into a temporary injunction. Counsel for the union on July 7 filed a demurrer to the city's complaint and a motion to dismiss the proceeding on the grounds of lack of jurisdiction, but apparently it will be necessary for them to endeavor to substantiate their claims by a direct appeal.

Without awaiting final decision by the courts regarding the present points involved the representatives of the men's union are endeavoring to confuse the issue still more by demands made on the company on July 2. They are seeking to establish a wage scale for trainmen of 70 cents the first three months, 73 cents the next nine months and 75 cents thereafter, with corresponding increases for the employees in the other departments. Demands are also made that negotiations be started looking toward a new working agreement to replace the one which expired by limitation on May 31, 1920. This the company elected not to renew. The union representatives insist that final action on these demands be taken by the company not later than Aug. 1. A copy of the demands was also filed with the Colorado Industrial Commission in compliance with the law creating that body which requires that thirty days' notice be given of any contemplated action by employers or employees which might result in stoppage of work. Jurisdiction over the case has not been taken as yet by the Industrial Commission.

\$332,500 for One-Man Cars

Norfolk Company, Planning Rehabilitation of System, Secures Approval of One-Man Cars

The City Council of Norfolk, Va., on July 8 granted permission to the Virginia Railway & Power Company to operate fifty one-man cars in the city of Norfolk, and an ordinance was enacted making this possible.

This decision on the part of the Council was reached after a lengthy public hearing. This permission was granted the company on the urgent recommendation of A. Merritt Taylor, traction expert employed by the city several months ago to make a survey of Norfolk's public utilities and determine what must be done to get better service. Mr. Taylor's recommendation for the "one-man" cars had previously been presented to the Council in executive session and decision was withheld until the public could be heard.

It was necessary to make a quick decision, Mr. Taylor pointed out, because an option on sufficient money to finance the proposition would expire July 9 at noon. The fifty cars, as approved, will cost \$332,500, and as a result of the Council's approval of the project, the money can now be secured.

The Virginia Railway & Power Company admitted it must have at least thirty double-truck cars or thirty-eight single-truck cars, to operate its normal schedule this coming winter with closed cars exclusively. The company secured bids for the construction and delivery of twenty double-truck closed cars and ten closed trailers, to cost \$420,000. It also secured bids for the construction and delivery of fifty safety cars to cost \$332,500.

The thirty double-truck cars, Mr. Taylor pointed out, could not be delivered until from five to six months after signing a contract and furnishing complete information and details of design and construction. The fifty safety cars, however, can be delivered during the month of August, if the order be placed promptly.

The company arranged to finance, by car trust certificates, the purchase of either twenty double-truck closed cars and ten double-truck closed trailers or fifty safety cars and requested the Public Utilities Commission and City Council to determine whether the city desired thirty double-truck cars or fifty single-truck cars. The company took the position that it would proceed at once to provide whichever type of car the municipality selected. It found itself unable, however, to finance the purchase of more than thirty double-truck cars. Mr. Taylor's recommendation follows:

As the city's representative. I have carefully considered all relevant factors involved and emphatically recommend that the company's proposition to provide fifty safety cars be promptly accepted for the following reasons:

1. Cost of operation of fifty safety cars will be much less than operation of forty double-truck cars, which would be their practical equivalent. Thus the burden of car riders of Norfolk would be lightened to

the extent of at least between one-half cent and 1 cent a passenger.

2. Operation of safety cars will furnish more frequent and efficient transportation at less cost than the operation of double-truck cars; frequency of service will be increased by safety cars at least 25 per cent and schedule running time will be materially decreased owing to quick stopping and quick starting of safety cars, which is impracticable with the heavy double-truck car.

3. Operation of safety cars with at least 25 per cent greater frequency than double-truck cars in giving the public better service will increase the riding habit and gross earnings of the company, in addition to decreasing the cost of furnishing transportation, and thereby tend to keep the rate of fare down to a minimum by providing more and better service which will induce more rides per capita.

4. I shall recommend as a part of the re-routing plan now being developed that Lamberts Point line be re-routed from Lamberts Point via Thirty-eighth Street, Killam Avenue, Thirty-fifth Street, De Bree Avenue, Broadway, new tracks on Granby Street, Eighteenth Street, Church Street to Plume Street, Atlantic Street City Hall Avenue, Granby Street, Main Street, to Church Street, returning via the same route, instead of as at present through Ghent and the business district of Granby Street.

My opinion is, the city authorities should emphatically decline to burden the people of Norfolk with the proposed thirty double-truck cars which will tend to increase fares from one-half to 1 cent per passenger; they would restrict the frequency of service and thereby retard the necessary increase in the riding habit which will be generated by more frequent service which the one-man car will give.

The success of the co-operative undertaking between the city and the company will depend largely upon the action taken today with respect to this subject by the municipal authorities. If the safety cars be approved, promptly ordered and placed in operation, the results will enable the working out of your transit problems in a way which will promptly bring to Norfolk first-class street railway facilities and give the Public Utilities Commission, City Council and citizens all they have hoped for in the way of transportation facilities, at a fair price.

There yet remains much to be done. If this important step is taken in the right direction, the way is clear and the success is assured.

My recommendations which are now being formulated will involve the expenditure of a vast amount of money by the company in building new tracks through district now lacking service, in rebuilding such of its present tracks as are worn out, in making new track connections required for necessary re-routing and in improving its facilities in general.

It is essential to aid the company in providing most efficient service at minimum cost in order to keep the rate of fare down and to build the company's credit up, so that it can meet the city's requirements at minimum cost to the car riders.

The *Ledger-Dispatch* said editorially:

Council is to be thanked and congratulated for having taken a courageous step in opposition to what seemed to be a large volume of popular clamor; the company is to be congratulated for being able to deal with a small body of courageous and quickly decisive men, instead of with an unwieldy bicameral body which generally kept its ear to the ground and frequently heard a false tone, and the city is to be congratulated because its representatives and the representatives of the company now place all their cards face up on the table.

Municipal Road Seeks Talent

The Board of Street Railway Commissioners of the city of Detroit, empowered by a vote of the people to construct a municipally-owned and operated street railway, is interested in receiving applications for the major executive positions, especially the position of general manager. Communications include a brief but complete history of the writer's experience. Ross Schram, secretary of the Board of Street Railway Commissioners, Detroit, Mich., may be addressed.

Detroit Awarding Contracts

City Going Steadily Ahead with Its Plans for System to Compete with D. U. R.

With contracts awarded for foundations, ties and steel for about 30 miles of municipal railway, Detroit has about one-third of the Class A lines (the first lines to be built under the Couzens plan) now under way.

Shortly after the awarding of the contracts, Judge Arthur J. Tuttle of the U. S. District Court dismissed the suits which were filed by the Detroit United Railway and the New York Trust Company, last May, in which it was sought to enjoin the enforcement of the Municipal Street Railway ordinance.

The suits were based on the alleged claim that the city's program included the contemplated purchase of certain of the Detroit United Railway lines at less than their actual value and therefore were confiscatory. The dismissal of these suits removed the last legal question concerning the proposed municipal lines.

Judge Tuttle held that while the ordinance adopted by referendum on April 5 did not provide the city with the power to purchase any of the Detroit United Railway lines, the ordinance was valid and operative for the construction of a municipal street railway system.

MAY AVERAGE DOWN ON PRICES

According to present estimates by the street railway commission, the cost of the newly contracted portions of street car lines will exceed the Mayor's original estimate of \$70,000 per mile by \$5,000 to \$10,000 per mile. This present cost of \$75,000 to \$80,000 per mile is based upon contract prices for excavating, concrete foundation, ties, steel, and paving between rails.

It is believed that the highest point in construction charges has been reached and that the remaining portions of the 101 miles of lines can be laid under more favorable conditions and at prices which will bring the general average for the whole system down to the original \$70,000 per mile estimate.

Detailed estimates of the cost of paving between tracks are being worked out by the commission's engineer, and will embody analysis of costs of various grades of paving material that may be used. The kind of paving between tracks will depend somewhat upon the kind of pavement in the streets lining the tracks.

The steel rails for the road were contracted for at \$71.90 per ton, or approximately \$25 per ton below the next highest competitive bidder and at a price which is considered much less than the prevailing market. Contract was awarded to the Lorain Steel Company, and the low bid is attributed to the policy of the company to stabilize prices at a lower level than can generally be obtained at the present time. No delay is anticipated in getting the steel delivered by the mills as rapidly as it is needed.

Omaha Case Closed

Men Withdraw from Investigation—
Acrimonious Passages at Arms
Mark Hearings

The hearing of a wage controversy between the Omaha & Council Bluffs Street Railway and its men, before the Nebraska State Railway Commission, was concluded when counsel for the men withdrew, after presenting the following statement:

Early in the hearing the men learned that the commission was not concerned with what was a just and proper measure of the value of their services, but only with the price for which that service could be bought in the open market. They were told that a jurisdiction grounded on the interest of the public in a public utility was purely the mercenary interest of how much labor could be bought for the least money and that the wages necessary to meet living conditions would not be inquired into. Refusing to accept the principle underlying the decision of the commission, that labor is a commodity, the union withdraws from the hearing and their counsel will not participate further in direct or cross-examination in the so-called inquiry.

Members of the state commission came from Lincoln to Omaha a month ago in response to an application of the union and at a time when the men made a demand of 13 cents an hour increase, holding a strike vote in suspension. The hearings have been marked by bitter controversies. Excerpts are illustrative. Counsel for the men said:

Why discriminate against testimony to show undue power exerted by an outside organization in Omaha, when this commission permitted cross-examination of union men on the power wielded by the Amalgamated Association outside of Omaha?

To this Commissioner Thorne Brown replied:

Only because the testimony on the strike vote by the union was pertinent to the question of impairment of service, whereas the courts have established the right of an employer to employ or to refuse to employ whomsoever he pleases, irrespective of the source of that policy.

R. A. Leussler, vice-president and general manager of the company, asserted in testimony that he was opposed to the closed-shop policy because it was un-American. When asked by counsel for men what standard he used to judge Americanism, Mr. Leussler replied, "The constitution of the United States."

"These investigations are necessitated by the autocratic tyrannies of unions led by counsel," retorted Alvin Johnson, counsel for company, addressing A. H. Bigelow, counsel for the carmen.

Mr. Leussler testified that the average pay received by trainmen of his company during the last nine months was \$155 per month; that during May of this year the average of all of the men was \$125, and that the May average of those who worked twenty-five days or more was \$152. He also stated that he had compiled a list of 325 cities and that only twenty-nine showed a higher scale of pay than Omaha. The present Omaha scale is 53, 55 and 57 cents an hour. This official of the company also testified that he has repeatedly told the men that the company's present problem is to maintain the existing schedule of pay. He also advised the commission that during a

cent period of two weeks the company received 107 applications from men anxious to become conductors and motormen at the present rate of pay.

The commission has taken the matter under advisement.

Chicago Shopmen Strike

Insist on Closed Shop—Company's
Wage Offer Satisfactory to Majority
—Intimidation Used

A strike of shopmen at the south shops and of linemen and substation operators called very suddenly early on July 15 brought about almost a complete tiup of the Chicago Surface Lines. About 300 men were involved. The thirty-two substations were of course the key to the situation. At four o'clock a great many of the night cars were left stranded on the system without power. Later sufficient substation capacity was put in operation by officials to return these cars to the carhouses.

By noon with the help of the Commonwealth Edison Company and what company stations could be manned, about 300 cars out of the normal mid-day schedule of 1,400 cars were running. This made it possible to give full service on some lines. An effort was being made at 10 a.m., July 15, to place the remaining substations in operation.

So far the trainmen and the west shop employees and all other employees have remained loyal. They all reported for duty as usual, the trainmen taking cars out as fast as power was made available.

The wage offer made by the company is considered generous in comparison with wages being paid by other companies. In fact, the company's offer was acceptable to a majority of the men, who are said to have been intimidated into striking.

The real issue of the strike is the refusal of the company to grant a closed shop at the south car shops. The trouble has been further stirred up by "Umbrella" Mike Boyle, business agent of the electrical workers' union, who was convicted of conspiracy by a Federal Court a few years ago and recently pardoned by President Wilson.

Wage offers made by the company average a 25 per cent increase with no change in working conditions. The union leaders have stated they would not consider anything until the closed shop was conceded. The strike has not affected the elevated system. A large amount of the morning rush traffic on July 15 was thrown on the elevated and the suburban steam trains.

Mr. Ford's New Car on His Own Road

Purchase of the Detroit, Toledo & Ironton Railroad by Henry Ford and his son, Edsel B. Ford, was announced on July 10 by E. G. Leibold, secretary to Henry Ford. The purchase price was not disclosed. In providing passenger service it is intended, according to the announcement, to utilize the new gasoline driven car of the interurban type which Ford engineers have developed.

News Notes

Vetoes Philadelphia Buses.—Mayor J. Hampton Moore of Philadelphia, Pa., has vetoed an ordinance recently passed by the City Council granting a franchise to the Philadelphia Transportation Company to operate a line of motor buses in Broad Street, Philadelphia. The company proposed to place between twenty and thirty buses in operation by Sept. 1 and to operate at a 5-cent fare, in competition with the Philadelphia Rapid Transit Company. It is pointed out that a subway under Broad Street is at present an important unit in the city's own program for transit development, and that a bus line on the same thoroughfare would be in direct competition with the city's own utility as developed by the present rapid transit plans.

Would Operate Frankford "L."—Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has notified Mayor Moore of that city that he will recommend to the company's board of directors that a lease be made with the city whereby the company will operate the Frankford elevated line now in course of construction, paying a rental equivalent to 5 per cent of the city's investment. Mr. Mitten points out that the Frankford line operated independently cannot be made to pay operating costs, without considering earning interest on the investment. He holds that the P. R. T. can operate the line as a part of its general system with greater economy, but that even then it cannot be made to earn operating expenses and carrying charges at the rate of 5 per cent per annum.

Check Assumes Five-Cent Fare as Inadequate.—A check reproduced in the Interborough *Bulletin* shows a gift received by the Interborough Rapid Transit Company, New York. It was for the amount of \$2.50 and was signed by F. B. Maloy of 714 Grandview Avenue, Pittsburgh, Pa. Mr. Maloy had been on a visit to New York and had ridden over the different transportation systems of the city the usual number of times. He does not consider a 5-cent fare as sufficient and in order to back up this statement he inclosed the check. Mr. Maloy assumed that while he rode in New York the company lost on each ride. The \$2.50 was forwarded with the statement to the effect that, "if it does not cover all the deficit, in any case it is at least an evidence of good will." Frank Hedley, president and general manager of the Interborough, in his reply was much gratified with the spirit with which the gift was sent. The money has been placed in the welfare fund.

Financial and Corporate

Lake Erie Sale Decree

Court Lays Down Conditions Under Which Buffalo Interurban Property Will Be Disposed Of

Bids for the purchase of the property of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., between Buffalo and the Pennsylvania state line, with the exception of the Dunkirk-Fredonia division, will be received by the receiver, George S. Bullock, until Sept. 15. On that day the interurban line will be discontinued as the result of an order granted by Justice Wheeler in the Supreme Court at Buffalo. As a pledge of good faith bidders must deposit part of the purchase price in advance of the sale.

The application of the receiver to dismantle the road will be held in abeyance by the court until after the court is advised of the bids received for the property. Bidders can bid on the property as junk or can bid on it as a going proposition.

Justice Wheeler cites a number of decisions holding that a public service corporation cannot be compelled to continue service indefinitely at a loss. The company at hearings before the court contended that to continue any longer would result in exhaustion of the road's assets.

The line between Dunkirk and Fredonia is not included in the order. The court rules this can be successfully operated by the company. This is the old Dunkirk & Fredonia Railroad taken over by the Buffalo & Lake Erie Traction Company soon after the latter was organized. If that road also is to be abandoned the court ruled that it would

have to be a separate application, and the intimation was drawn that such an application would be denied.

The Buffalo & Lake Erie Traction Company operates through express, freight and passenger cars between Buffalo and Erie, Pa., a distance of almost 100 miles. Part of the line is double tracked. Local service also is given in the city of Dunkirk. The road connects at Westfield with the James town traction line running south into the Chautauqua County fruit country. The discontinuance of service affects workers of the Lackawanna Steel Company living in Buffalo. The Buffalo & Lake Erie Traction Company operates the Buffalo & Lackawanna Traction Company and serves commuters between summer resorts on the south shore of Lake Erie and Buffalo.

Interborough Rapid Transit Shows Improvement

After deducting interest, rentals, etc., the Interborough Rapid Transit Company shows a net income of \$26,152 for the month of May, 1920. This is contrasted with a deficit of \$153,793 in May, 1919. For eleven months ended May 31 there was a deficit of only \$1,953,664. This was a decrease of 45.8 per cent over the same period ended May 31, 1919. For the month of May, 1920, the passengers carried increased more than 10,000,000. This was an increase of 14 per cent over those carried in May, 1919. Over the longer period of eleven months, the number of revenue passengers increased from 739,000,000 to 875,000,000, or 18.4 per cent.

New Financial Plan

American Railways Outlines Scheme for Taking Care of Obligations Now in Default

A grave situation confronts the American Railways, Philadelphia. Van Horn Ely, president of the company, ascribes this largely to the result of conditions imposed by the late war, which necessitated large expenditures of capital to meet the demands for power and transportation in the district served, large increases in the cost of maintenance and betterments, and made it impossible satisfactorily to market the securities of the subsidiaries owing to the changed money conditions, especially as to interest rates.

Mr. Ely says that in his opinion it is imperative that the company be provided with \$4,400,000 in order to protect the holders of the common stock. The company has a funded debt aggregating \$12,700,000, all of which is secured by pledge of various collaterals. The company has ample earnings to provide for the interest charges and no immediate steps are required with respect to such indebtedness for the protection of the common stock. The company owes about \$3,500,000 upon its own notes and upon the notes of subsidiary companies indorsed by it. The company and its subsidiaries also owe approximately \$900,000 for supplies.

OUTLINE OF PLAN

The company has worked out a plan whereby it is believed that the indebtedness now represented by notes of approximately \$3,500,000 can be funded into a five-year secured 8 per cent loan. Many of the holders of the present notes of the company have agreed to accept the new notes, but the extension is based upon the placing in the company's treasury of about \$900,000 to take care of the other floating debt.

This \$900,000 the company proposes to take care of by the issue and sale of second preferred 7 per cent stock. The company turns to the holders of the common stock as the purchasers of this second preferred stock. This is the same as turning to the holders of the 4-6 per cent bonds of the National Properties Company. Under the arrangement proposed the present 4-6 per cent bondholders by putting up \$17.50 with respect to each \$100 of bonds, would take all of the rights which will arise from the foreclosure of the 4-6 per cent bonds pledged, to the entire exclusion of the underwriting syndicate.

Mr. Ely explains that the bondholder will conserve his own interest by this payment of \$17.50 and will receive 80 to 90 per cent of the amount paid in second preferred 7 per cent stock of the American Railways, and will also receive more than the face of his bonds in American Railways common stock.

The committee representing the 4-6 per cent bonds of 1916 has submitted a plan based upon an offer from an underwriting syndicate. This offer must be accepted by the committee and the holders of a majority must deposit their bonds on or before July 26.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY.

	1920	1919	Percentage Change over 1919
Month ended May 31, 1920			
Total operating revenue.....	\$4,597,479	\$4,019,001	+ 14.4
Total operating expenses.....	2,721,661	2,353,366	+ 15.7
Net operating revenue.....	\$1,875,818	\$1,665,635	+ 12.6
Total taxes.....	221,575	238,576	- 7.14
Operating income.....	\$1,654,243	\$1,427,059	+ 15.9
Non-operating income.....	57,752	50,875	+ 13.5
Gross income.....	\$1,711,995	\$1,477,934	+ 15.8
Interest, rentals, etc., including Manhattan guarantee.....	1,685,843	1,631,677	+ 3.3
Net income.....	\$26,152	\$*153,743	-117.0
Operating ratio (per cent).....	59.20	58.55	+ 1.1
Revenue passengers carried.....	85,941,348	75,455,737.	+ 13.9
			Percentage Change over 1919
Eleven months ended May 31, 1920			
Total operating revenue.....	\$47,186,555	\$39,294,196	+20.1
Total operating expenses.....	28,963,080	23,904,732	+21.2
Net operating revenue.....	\$18,223,475	\$15,389,464	+ 18.4
Total taxes.....	2,402,385	2,919,142	-17.7
Operating income.....	\$15,821,090	\$12,470,322	+26.9
Non-operating income.....	535,813	542,331	- 1.2
Gross income.....	\$16,356,903	\$13,012,653	+25.7
Interest, rentals, etc., including Manhattan guarantee.....	18,310,567	16,624,228	+ 10.1
Net income.....	\$*1,953,664	\$*3,611,575	-45.8
Operating ratio (per cent).....	61.38	60.83	+ 0.9
Revenue passengers carried.....	875,108,977	738,912,604	+18.4

* Deficit.

Operating Ratio Increasing

Reports of Roads in Rhode Island Show Expenses Outstrip Gains in Earnings

According to the seventh annual report of the Public Utilities Commission of the State of Rhode Island for

It cost the companies 26.6 cents to run a car a mile. This was an increase of 22 per cent over 1917. The cost per car hour was \$2.07. This was an increase of only 2.5 per cent. The company's receipts were 34.6 cents per mile. This was an increase of 4 per cent. The operating cost per car hour was \$2.69

new freight or express cars. This makes a total increase in all types of rolling stock of 3 per cent.

Gross Increased 16 per Cent

Illinois Traction Company Has Increased Earnings from All Types of Public Utilities

According to the sixteenth annual report of the Illinois Traction Company, Peoria, Ill., the gross earnings from railways were \$9,927,872. This was composed of the earnings of the interurban lines of \$5,930,523, and the city lines of \$3,997,349. The earnings from the interurban lines increased over 1918 by \$1,190,444, or 25.1 per cent. Compared with 1918, the earnings on the city lines increased \$646,032, or 19.3 per cent. The total gross earnings of the company, which, in addition to the railways, includes gas, electric, heat and water companies, was \$17,756,584. Total expenses, including taxes, amounted to \$12,544,181, thereby allowing a net income from operation of \$5,212,403. The surplus for 1919, after deducting for interest on bonds, depreciation, etc., was \$1,335,394.

SUMMARY OF RHODE ISLAND OPERATIONS

	1918	1917	Percentage Change Over 1917
Number of companies reporting.....	10	11	+ 9.1
Number of companies operating.....	3	4	+25.0
Assets:			
Investment in road and equipment.....	\$49,066,860	\$48,502,335	+ 1.15
Other investments.....	3,169,703	3,100,670	+ 2.22
Current assets.....	1,223,846	1,691,620	+27.70
Unadjusted assets.....	224,202	236,841	+ 5.32
Total assets.....	\$53,684,611	\$53,531,466	+ 0.28
Liabilities:			
Capital stocks.....	\$28,835,596	\$28,694,596	+ 0.49
Long term debt.....	15,884,700	15,884,700
Current liabilities.....	4,700,716	3,888,575	+20.91
Deferred liabilities.....	45,579	103,029	-55.75
Unadjusted credits.....	866,042	785,217	+10.30
Corporate surplus.....	3,351,978	4,175,349	-19.71
Total liabilities.....	\$53,684,611	\$53,531,466	+ 0.28
Operating revenues:			
Revenue from transportation.....	\$7,431,868	\$7,058,470	+ 5.28
Other railway operations.....	154,088	161,440	-4.57
Total operating revenue.....	\$7,585,956	\$7,219,910	+ 5.07
Total operating expenses.....	5,849,527	4,742,887	+23.35
Net revenue railway operations.....	\$1,736,429	\$2,477,023	-29.93
Net revenue auxiliary operations.....	15,886	6,835	+132.30
Net operating revenue.....	\$1,752,315	\$2,483,858	-29.40
Taxes assignable to railway operations.....	684,245	535,257	+27.85
Operating income.....	\$1,068,070	\$1,948,601	-45.30
Non-operating income.....	1,087,563	1,083,582	+ 0.37
Gross income.....	\$2,155,633	\$3,032,183	-28.90
Deductions from gross income.....	1,954,486	1,930,592	+ 1.24
Net income transferred to profit and loss.....	\$201,147	\$1,101,591	-81.80

the year ended Dec. 31, 1918, there were ten companies reporting and three operating. This neglects the Bay State Street Railway, which at that time operated a small percentage of its lines in Rhode Island.

OPERATING REVENUE INCREASING

The net income for 1918 transferred to profit and loss decreased over that of 1917 by about \$900,000 or approximately 82 per cent. This large decrease in net income was due to the increase of 23 per cent in operating expenses. The operating revenue increased only 5 per cent. The operating expenses increased more than \$1,000,000 but the operating revenue increased only \$360,000. Taxes were \$150,000, or 28 per cent more than the preceding year. Items going to make up the income practically stood still.

Of the total operating revenue the revenue from transportation increased slightly to a total of \$7,432,000, whereas the revenue from other operations such as freight decreased.

The report shows that the total number of revenue passengers carried during the year was 144,336,765, of whom only 15,636,219 were free transfer passengers. This was an increase of 1.8 per cent in the total passengers and a decrease of nearly 10 per cent in the free passengers. The average fare paid by each revenue passenger was 6.22 cents, or a decrease of 4.16 per cent, while the average fare for all passengers was 5.90 cents or a decrease of 6 per cent.

or a decrease over 1917 of 13.5 per cent. The operating ratio increased by 17.5 per cent. The miles of road owned and

PACKAGE EXPRESS SERVICE INAUGURATED

The traffic department of the interurban lines was entirely reorganized the first of the year, and its headquarters moved from Springfield to Peoria. On June 1, 1919, an express service was inaugurated on the interurban lines and the revenue from this source will offset the loss sustained when the American

STATISTICAL INFORMATION—RHODE ISLAND

	1918	1917	Percentage Change Over 1917
Total car mileage.....	21,937,067	21,668,037	+ 1.24
Total car-hours.....	2,820,345	2,318,385	+21.63
Ratio C.M. to C.H. (speed m.p.h.).....	7.78	9.37	-16.96
Passenger traffic:			
Regular fare passengers.....	128,700,546	124,463,949	+ 3.4
Free transfer and other free passengers.....	15,636,219	17,332,532	-9.8
Total passengers carried.....	144,336,765	141,796,481	+ 1.8
Passenger revenue.....	\$6,959,992	\$6,632,900	+ 4.9
Average fare per revenue passengers (cents).....	6.22	6.49	-4.16
Average fare per all passengers (cents).....	5.90	6.28	-6.04
Operating ratio (per cent).....	77.2	65.7	+17.5
Car-mile statistics:			
Revenue from transportation (cents).....	33.9	32.5	+ 4.3
Operating revenue (cents).....	34.6	33.3	+ 3.9
Operating expenses (cents).....	26.6	21.8	+22.0
Net income (cents).....	0.9	5.1	-82.3
Passenger traffic (total).....	6.58	6.54	+ 0.6
Car-miles per revenue passenger.....	0.170	0.174	-2.3
Car-hour statistics:			
Revenue from transportation.....	\$2.64	\$3.05	-13.4
Operating revenue.....	\$2.69	\$3.11	-13.5
Operating expenses.....	\$2.07	\$2.02	+ 2.5
Net income.....	\$0.07	\$0.47	-85.1
Passenger traffic (total).....	51.2	61.2	-16.3
Taxes—per cent of gross revenue.....	9.0	7.4	+21.6
Percent of net operating revenue.....	39.0	21.5	+81.4
Gross income earned on stock outstanding.....	.19	.27	-29.6
Mileage statistics:			
Miles of road owned.....	184.98	186.12	- 0.61
Miles of road operated.....	546.47	556.24	- 1.76
Total all tracks owned.....	196.85	197.97	- 0.57
Total all tracks operated.....	658.27	668.01	- 1.45
Total single track (owned or operated).....	332.32	340.96	- 2.53
Rolling stock owned:			
Passenger cars.....	1,237	1,197	+ 3.32
Freight and express cars.....	114	107	+ 6.54
All other cars.....	222	223	- 0.45
Electric locomotives.....	4	4
Steam locomotives.....	4	4
Total equipment—all classes.....	1,581	1,535	+ 3.0

operated decreased very slightly as did the total track owned and operated. There were forty more new passenger cars purchased than in 1917 and seven

Railway Express withdrew its service. The Illinois Traction Company controls fifty-five companies, of which number thirty-two are railways.

Driving It Home

Newspapers Told That Public Utilities, Like Themselves, Must Have a Living Wage

Electric railway managers are often put to it to find a means of presenting their needs to the public through the newspapers. The raising of the price of many periodicals, however, offers an opportunity of getting "under the skin" of newspaper editors. At least one utility body is taking advantage of this increasing cost of subscribing to periodicals to point out the fact that public service companies have been forced to raise their charges to stay in business.

The Illinois Committee on Public Utility Information, Chicago, is driving home to newspaper editors the needs of Illinois utilities. To a notice of an increase in the price of a periodical to which it subscribes, the committee replies by drawing a parallel between its own case and that of the newspaper. In effect it says to the editor: "You have had to raise the price of your paper. You were entirely justified in so doing. You should therefore be tolerant toward us. We, like yourselves, must have a living wage."

The letter used by the committee for this purpose runs as follows:

Enclosed find check covering renewal of our subscription for the coming year.

While we note by the bill of practically all Illinois newspapers to which we subscribe that the price has been largely increased, we appreciate that newspapers have been confronted by the same after-the-war dilemma as the public service companies: that of having a fixed price for their commodity and no strangle-hold on rising costs of production. We appreciate that if a newspaper proprietor continues to stay in business—to buy paper, ink, machinery, pay current labor costs and serve his community and patrons as capably as in the days when production costs were not so high—he must have revenues commensurate to meet the increased prices, just as we have been insisting in behalf of the utilities over the last year. And we believe his customers should be fair with him about it.

Were a newspaper "starved" we would not renew our subscription to it, for the inefficient service it would render in the way of presenting the news of the community would be dear at any price. Our belief is that a well-supported newspaper can do a much more constructive and useful work in the community than a poorly supported one.

We have been gratified to find the press of the State, with but few exceptions, appreciates the problems of the utility industry in these difficult times and is fairly presenting to the public what under-development, resulting from "starvation" of electric light and power, gas, electric railway and telephone service would mean to the growth and prosperity of the State and to all business. Liberal use has been made of material contained in the weekly news bulletin issued by the committee, but this is not extraordinary as Illinois newspapers can usually be counted upon to aid in promoting any movement which is for the public good and intended to stimulate development of the State. The news service will be continued and we hope you will find increased use for it.

Municipal Road Reports a Profit

The passenger receipts of the Pekin (Ill.) Municipal Railway for June were \$3,233, the largest yet recorded. An additional \$11 was received from advertising, making a grand total of \$3,244. The total disbursements were \$2,054, leaving excess earnings of \$1,190. A 5-cent fare is charged.

Financial News Notes

Small Georgia Road to Suspend.—The Albany (Ga.) Transit Company has announced its determination to abandon service and scrap the equipment.

Wants to Issue \$313,000 Bonds.—The Little Rock Railway & Electric Company, Little Rock, Ark., has applied to the Arkansas Corporation Commission for permission to issue \$313,000 of bonds, of which \$263,000 is for improvements to the present water plant and \$50,000 for purchase of transformers, meters and other electrical equipment.

Service Resumption Planned.—The Council of Lockport, N. Y., has adopted a report of the streets committee approving a ten-year franchise to the International Railway, Buffalo, N. Y., for the resumption of local and interurban service on the Grand and Gooding Streets lines. Service on these lines was abandoned a year ago. The franchise was granted upon the condition that the company make certain track improvements suggested by the city.

Employees Paid for Selling Stock.—In connection with the campaign for the wider distribution of its stock locally, the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, is offering a special inducement in the shape of a substantial commission to such of its employees as sell the company's preferred stock to their friends and neighbors. One month recently one of the employees received \$200 as compensation for his work in selling stock. Another man received \$100.

Protective Committee Formed.—A protective committee has been formed to represent the holders of the \$5,000,000 of Lexington Avenue & Pavonia Ferry Railway first mortgage 5 per cent bonds of 1993. The members of the committee are: F. J. Fuller, vice-president of the Central Union Trust Company, New York; A. R. Horr, vice-president of the Equitable Life Assurance Society, and Reginald Foster, general counsel of the New England Mutual Life Insurance Company. Charles E. Sigler, 80 Broadway, New York, is secretary of the committee; the Central Union Trust Company is depository and Alexander & Green are counsel. The road is included in the system of the New York (N. Y.) Railways.

More Than One Ride per Capita per Day.—The May financial statement of the Des Moines (Ia.) City Railway shows an improvement over the month of April. Net profits for the month of May were \$7,577, as against \$362 for April. The number of passengers in

May totaled 3,863,443, compared with 3,689,006 for the previous month. Rush-hour traffic is falling off in Des Moines if the May figures are a criterion. A drop of from 74 to 69 passengers per car is reported. Sunday and park riding is showing a considerable gain. During May there were more passengers per day than Des Moines has population, as the new census figures give Des Moines a population of 126,468 and 127,852 daily rides were registered by the city railway.

Notes Extended at 7 Per Cent.—Holders of more than 98 per cent of the 6 per cent two-year gold notes of the Birmingham Railway, Light & Power Company, Birmingham, Ala., due on April 1, 1919, have deposited the notes under an agreement dated Feb. 15, 1919, and the committee has approved the extension of the notes at 7 per cent to April 1, 1921. The committee has made arrangements for the payment of overdue interest on the notes deposited with it together with interest on such deferred payments up to May 10, and holders of the undeposited notes who now decide to send their notes in for deposit with the committee will receive their back interest on the same basis. The time for deposit has been extended to Oct. 1 for the benefit of those who have not yet come in under the plan.

Seven per Cent Notes of Michigan Company Offered.—Edgar, Ricker & Company and Marshall & Ilsley Bank, Milwaukee, Wis., are offering at a price to net 8 per cent, according to maturity, \$200,000 of secured convertible serial 7 per cent notes of the Escanaba Power & Traction Company, Escanaba, Mich. They are dated May 1, 1920, and are due \$50,000 each May 1, 1922, to 1925. The notes are secured by deposit of \$400,000 of general and refunding mortgage 5 per cent bonds. The company is the successor to the Escanaba Traction Company organized in 1909 as a consolidation of the Escanaba Power Company and the Escanaba Electric Street Railway. The present appraised valuation is \$1,910,500. The company has \$729,000 of bonds and \$200,000 of notes outstanding.

Sees No Hope of Service Resumption.—In a letter to the Public Service Commission John G. Morgan, general manager of the New York & North Shore Traction Company, Roslyn, N. Y., states in part: "We have endeavored to interest outside capital, but with no success. It is our conviction that there is no money to be had for electric railway enterprises in this city. There appears to be no further steps the officials of the company can take toward obtaining a resumption of operation. It would, therefore, seem that if the road is to resume operation, it can only come about by persons interested in the development of the community served putting on foot a plan to secure this service. Any such movement will have our fullest co-operation, and we have no doubt that the property can be acquired at a very small figure."

Traffic and Transportation

Referendum on Fares

Seattle Municipal Railway Advance May Be Held Up—Suspension of Service Likely

If the fare increase on the lines of the Seattle (Wash.) Municipal Railway, set to become effective on July 19, is delayed by the circulation of the referendum petition calling upon the Council to submit the fare problem to the voters, the railway may be tied up and 2,300 employees may be unable to cash their pay warrants after July 25.

Ed Terry, City Treasurer, has stated that if the new 6½-cent and 10-cent fare schedule is not put into effect on July 19 he will place the railway on a warrant basis on July 25, the bi-monthly payday of city employees, and that warrants issued to the railway employees on that date will be stamped "not paid for want of funds." It would then be necessary for the employees to cash their warrants at local banks.

Representatives of the Seattle Clearing House Association have informed Mr. Terry that they will not honor railway warrants unless they can be assured the paper will not accumulate without being redeemed at some fixed date. As the matter stands now, according to Mr. Terry, the city can give the bankers no such assurance.

Since the railway began to run behind, the city treasury has been cashing warrants as pay to railway employees with the result that the overdraft against the railway on the treasurer's books now stands at approximately \$500,000.

Mr. Terry cited on this point the clause in the ordinance providing for the acquisition of railway lines, which reads as follows:

The city of Seattle further binds itself to establish and maintain rates for transportation upon such municipal street railway system which shall provide sufficient revenue to permit such sums being paid into such special fund which the city has pledged to be set aside semi-annually for interest, and annually for principal, to be applied for the payment of principal and interest of the bonds herein authorized, until such bonds have been paid in full, and in addition thereto all costs of operation and maintenance, and all bonds, warrants and indebtedness for which any revenues of such system have heretofore been previously pledged.

Mr. Terry says:

On the strength of this stipulation the banks have been advised that moneys cannot be raised by taxation for the operation of the railway, or payment of the bonded indebtedness without the direct vote of the people. That is why they will not honor railway warrants, if it comes to that. They have no assurance that the money could be raised by taxation.

A petition calling upon the Council to submit the fare increase ordinance to a vote of the people was begun one week ago, and if approximately 6,800 signatures of qualified electors are placed thereon, the Council will be required to submit the fare ordinance

either at the next regular municipal election or at a special election called for that purpose. According to the charter, the petition, if filed before July 19, the date the fare bill would otherwise become effective, will postpone fare increases on the railway until such time as the election is held on the matter.

Will War on Jitneys

Jitney competition must cease in Kansas City, Mo. This is the decision announced by the management of the Kansas City Railways after an exhaustive study of traffic conditions throughout the city. The traction officials have come to the conclusion that if the company is to continue to furnish adequate service at a reasonable rate of fare the jitneys must go. They have announced that the company will use every legitimate means at its disposal to drive the jitneys from the streets, and that to accomplish this end they will "fight to a finish."

Announcement of the company's new policy follows the completion of traffic checks by John A. Beeler. These checks showed that the buses were largely responsible for congestion in the business district of the city. Jitneys cause, by actual count, from 37 per cent to 52 per cent of the downtown vehicular congestion. Such a situation is, according to the company, not to be tolerated.

The City Council on May 24 passed an ordinance providing for a "jitney trail" around the downtown business district. Under the terms of the measure a line is established which the buses will be compelled to follow. The area within specified boundaries is described as the "congested district," from which jitneys will be barred between hours of 6 a.m. and midnight. The measure prescribes the same routes for jitneys as now exist until they reach this "congested" zone, when they will have to "hit the trail" and circle the control district.

The company announced its Anti-Jitney Campaign in a statement in a recent issue of the *Railwayman*, its official publication. This statement was concluded as follows:

In the end the public must choose between transportation monopoly or transportation furnished by a street railway company charging the minimum fare, with universal transfers on a basis of actual service at cost, operating non-paying lines for the benefit of the growing residence districts, continuing non-rush and low car service, and supplying the transportation needs of the city from the standpoint of the greatest good to the greatest number. The other is transportation competition. In the final analysis it will mean abolishing non-paying lines and the elimination of all unprofitable service, such as owl cars and non-rush. It will mean an increased fare without transfer privileges. It will mean transportation conducted not for the public good nor for public convenience.

No Action on Louisville Request

James P. Barnes, the new president of the Louisville (Ky.) Railway, assumed his duties on July 8. Previous to his arrival the executive committee reported to Mayor Smith following three months' trial operation of the properties. The Council has been asked for an initial 7-cent fare on a service-at-cost plan. The ordinance also provides a \$2,000 salary increase for the chairman of the Board of Public Works, and \$1,500 for each member, this additional salary to be paid by the railway and the board to become an executive body to aid in the management of the company.

The members of the Board of Councilmen and Aldermen appear to be strongly opposed to the plan. After a meeting of the members of the upper and lower boards on July 8 with nine Aldermen present and twenty-one of the twenty-four councilmen in attendance it was reported that practically all of the thirty men opposed the ordinance. Several members contend that service-at-cost is good for the company, and not the public. Objection was also raised to the city going into the railway business. Another objection was that under the service-at-cost arrangement the Board of Public Works would practically be placed in the position of employees of the railway.

No action is expected before the next regular meeting on July 20. The matter is now in the hands of the railroad committee of the General Council.

City Appeals Milwaukee Fare Increase

An appeal by the city of Milwaukee, Wis., from the recent order of the Wisconsin Railroad Commission granting the Milwaukee Electric Railway & Light Company an increase in the rate of fare within the single fare area was filed on July 8, 1920, in the Dane County Circuit Court at Madison. According to the City Attorney of Milwaukee the appeal is brought to preserve old questions that are pending before the courts. These are the claims that the company has \$4,500,000 in excess earnings and that the 1900 franchise, which provides that the fares shall not exceed 5 cents, is a contract.

An additional point which will be raised in the appeal, according to the City Attorney, is that the earnings of the electric lighting and steam heating departments should be considered as earnings of the company as a whole in determining whether or not it is making a reasonable return on the value of its railway property. The contention is that these departments are mere agencies for the merchandising of byproducts. If it is found that in all of these departments taken together the company will be making a reasonable return, with new wage scale in effect, an increase in fare is not justified.

The order appealed from was reported in detail in the *ELECTRIC RAILWAY JOURNAL* of July 3, page 42.

New York Situation Complicated

Recent Decision by Court of Appeals Appears to Have Added to Rate Uncertainty

The decision on July 7 by the New York Court of Appeals on the B. R. T. fare case has complicated the situation in New York City as regards fare increases. The decision denied the jurisdiction of the Public Service Commission over fare clauses in franchises granted between Jan. 1, 1875, and July 1, 1907, with three exceptions. The first reaction of the interested parties, the Brooklyn Rapid Transit Company, the Public Service Commission and the city, was one of satisfaction, according to published statements, in that each party considered it had won.

THE decision closely follows the Niagara Falls case and the International Railway where the vital clause reads as follows:

We are now urged to hold that the Legislature intended to delegate the power to the Public Service Commission to modify the rates prescribed in the contract between the local authorities and the railroad company, against the protest of the municipality, notwithstanding the refusal of three successive legislative bodies to accede to such demand for delegation of power. This we are not prepared to accede to.

The court in rendering a decision on the B. R. T. fare case states:

The petitions of the appellants to the Public Service Commission requested an order authorizing the appellant to charge and collect a cash rate of fare of 8 cents for the transportation of passengers "between any two points of any of said lines of railroad" of the company. We construe this as an application for an increase of fare on the entire route and so the record shows that it was construed by counsel.

We think the following classes of franchises fall outside the scope of our decisions in re applications of the City of Niagara Falls vs. Public Service Commissions of the State of New York for the Second District and the International Railway Company, decided herewith:

Matter of Quimby vs. Commission, 223 N. Y. 244:

1. All franchises granted directly by the Legislature.

2. All franchises granted by municipal authorities prior to Jan. 1, 1875. Such franchises are subject to proper legislative regulation.

3. All franchises granted by municipal authorities subsequent to the passage of the Public Service Commission law on July 1, 1907.

4. The following franchises granted between Jan. 1, 1875, and July 1, 1907:

(a) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Atlantic Avenue Railroad, dated March 13, 1882 (now a part of the Nassau Electric Railroad Company).

(b) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Prospect Park & Coney Island Railroad dated Dec. 21, 1885, consenting to the construction of a line on Park Avenue and other streets in Brooklyn.

(c) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Nassau Electric Railroad dated June 19, 1893, covering a number of lines as therein stated.

The orders, therefore, should be affirmed without prejudice to the right of the relator to make separate applications as to the franchises which come within the jurisdiction of the Public Service Commission as herein indicated.

According to one interpretation of this decision many complications will result, as the decision seems to indicate fare increase hearings on individual parts of a system with resultant delays and costly litigation and, in case fare increases are granted, a question as to a workable plan for applying the increases to the system as a whole.

In commenting on the decision Corporation Counsel John P. O'Brien stated:

The franchises which fall outside the scope of the Rochester ruling are so few and so interwoven with franchises, which are plainly controlled by the decision, as to make it practically impossible to work out any increase in fares upon any of the

systems of the street railways within the city.

Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, commented on the decision as follows:

It is impossible, in the short time now at my disposal, to apply the decision of the court to each of the lines and separate the different franchises so that the one class which is not under the jurisdiction of the commission can be put by itself. All but a very few of the franchises of these three companies are held to be without the jurisdiction of the Public Service Commission. I shall immediately comply with the privileges extended to me by the court and present to the commission proper application for action in respect of the franchises over which the commission has jurisdiction. Of course, the opinion of the court only dealt with surface lines because only applications of surface line companies were under review. The decisions, therefore, do not directly affect the subway or elevated lines.

The New York Times of July 9 editorially says of the decision:

The first prospect is for more litigation and more decisions in some years more, years having been wasted in finding out how to begin. It is certain there is no use in expecting permanent benefits by orders contrary to good business management of a matter which is rightly more a matter of business than of law. Nothing prevents reasonable men from altering a contract, and when a contract cannot be altered because one of the parties to it will not consider the matter for reasons outside the contract, that is unreasonable conduct. By standing immovable on its subway contracts the city has stopped the construction of the very roads on which it demands that a nickel fare shall be charged. The one sure thing is that, whatever the law in any particular case, the people will not long get more than they pay for, including a profit to the suppliers of the service, which is valued more as it takes its flight.

Public Service Commissioner Lewis Nixon stated that the decision was a complete victory for the commission. He believed that twenty-four companies in the city in whole or in part would be under the jurisdiction of the commission as regards rates.

Asks Increase in Illinois

Facing a greatly increased labor charge from the 70-cent-an-hour wage scale allowed trainmen by a board of arbitration recently, the Tri-City Railway of Illinois has been forced to petition the Illinois Public Utility Commission for an emergency fare of 8 cents and for a permanent fare of 10 cents with three tickets for a quarter.

This action was predicted by C. E. White, who represented the company on the board of arbitration. He refused to sign the majority report of the board, holding that the 70-cent wage scale would compel a raise in fares.

This increased revenue must be secured or the current payroll with its big advance cannot be met, company officials state. They asked that the emergency fare take effect July 10 and that the hearing on the permanent fare be set as soon thereafter as possible.

Only recently the commission granted the company an extension of the 7-cent fare to Sept. 30.

The municipalities of Moline, Rock Island and East Moline, Ill., which will be affected by the increased fare, while not objecting to the 70-cent wage award, have announced that they will fight an increase in fare.

The company will have to ask for an increase in fares in Davenport, but will take no action until the audit and appraisal now being conducted by the city on all public utility companies is completed.

Company officials hold that the City Council of Davenport must grant increased rates at that time, as their own figures will indicate both the railway and other local utilities are not receiving a sufficient return on the investment under present rates.

Eight Cents Now Proposed

Detroit United Railway Would Change the Fare on Non-Franchise Lines

—Company's Books Opened

The Detroit (Mich.) United Railway has given notice that it will establish a new rate of fare at 8 cents for cash fares and seven tickets for 50 cents, effective at midnight on July 31. The new rate is asked on all non-franchise car lines in the city in an amendment filed to its bill in the case pending before Judge Jayne in the Circuit Court.

The court is asked to decide whether or not the proposed rate of fare is reasonable. An injunction is asked by the railway to restrain the city from passing on the reasonableness of the rate of fare and it is also asked that the city be enjoined from urging the people not to submit to the fare.

The company's action is considered by Corporation Counsel Wilcox as a step in following out the agreement reached by the city and the company in recent conferences with the court. The action is taken, it is believed, to establish a legal issue in Judge Jayne's court on which the court can determine if it has the authority to pass on the reasonableness of any fare, and if such authority is vested in the court a uniform rate of fare for all city lines can be fixed which will yield revenue sufficient to pay the company a fair return on its investment.

The city will file an answer to the company's amended cross bill before July 31 asking that the company be enjoined from charging the proposed increased rate of fare, according to Mr. Wilcox. The legal issue thus established will be threshed out in the court.

In accordance with the agreement, the Detroit United Railway will open its books for examination by the court. A uniform rate of fare will be suggested by the court to apply on all lines, both franchise and non-franchise. Both the city and the company have agreed to abide by the court's decision, although both sides reserve the right to cancel their agreements at any time. Neither side is to forfeit any of its existing rights by this agreement.

Transportation News Notes

Six Cents Asked in Wichita Falls.—The Wichita Falls (Tex.) Traction Company has applied to the City Council for permission to increase fares 1 cent. The present fare is 5 cents.

Eight Cents Asked in Bangor.—The Bangor Railway & Electric Company, Bangor, Me., has applied to the Public Service Commission to increase its rates of fare from 6 cents to 8 cents. The commission fixed on July 14 as the date for a public hearing.

Asks Seven-Cent Rise.—The Northern Ohio Traction & Light Company, Akron, Ohio, has applied to the City Council of Massillon, Ohio, for permission to raise fares on the Massillon city lines from 5 cents to 12 cents. The company proposes to sell five tickets for 50 cents.

Must Have More in Marshall.—The Marshall (Tex.) Traction Company has made application to the Marshall City Commission for authority to increase its fare from 7 cents to 10 cents. The fare was increased from 5 cents to 7 cents about a year ago on authority granted by the commission. The company asserts that it is operating at a monthly loss of \$645.

Fares Increased at Calgary.—Higher fares are in force on the Calgary (Alta.) Municipal Railway. The new schedule provides for a 10-cent cash fare, and a system of tickets graduated up to twenty tickets for \$1. It was adopted in an endeavor to avoid the deficits that would be shown if a sufficient sum for depreciation were charged.

Supervisor for Trenton Utilities.—The office of supervisor of public utilities has been created by the city of Trenton, N. J. The supervisor will have as his duties the work of inquiring into complaints relative to the operation of electric railways and other public service corporations. No appointment has yet been made for the position.

Ten Cents Asked in Aurora.—The Aurora, Elgin & Chicago Railroad, Aurora, Ill., has petitioned the Illinois Public Utilities Commission for an increase in fare on its lines in Aurora and Elgin from 8 cents to 10 cents. The fare increase is asked to enable the company to meet the new wage scale recently granted the employees of the system.

Tokens in Buffalo.—Arrangements are being made by the International Railway, Buffalo, N. Y., for the substitution of metal tokens instead of the tickets now issued at the rate of four for 25 cents. It is planned to make the

change about Aug. 1. The metal tokens would be placed in the fare boxes. The high cost of printing tickets is given as one of the reasons for making the change.

Seven-Cent Zones Allowed.—The Board of Public Utility Commissioners of New Jersey has issued an order allowing the Monmouth County Electric Company to increase fares from 6 cents to 7 cents in each of its zones. The rate was originally 5 cents, but was increased by the order of the commission last October. The company had asked for an 8-cent fare. The railway is in the hands of receivers.

Special Edition of "Two Bells."—The patriotism of the employees of the Los Angeles Railway is reflected in the Fourth of July edition of *Two Bells*, the railway's publication. Both in appearance with its red, white and blue border and in its contents, where the brave deeds of its men during the World War are heralded, No. 5 is an interesting pamphlet for those inside and outside of railway concerns.

Wants More on Narrow Gage.—The Boston, Revere Beach & Lynn Railroad has petitioned the Massachusetts Department of Public Utilities for authority to discontinue the commutation tickets it is now selling on its narrow gage electric line in Winthrop at the rate of ten rides for 85 cents. As two tickets are now collected for each ride between Boston and Lynn, the change petitioned for would entail a 20-cent fare.

Seeks More on Penn Line.—Notice of an advance in fares from 8 to 10 cents and of an increase in the rate for workmen's tickets from 5½ cents to 7 has been filed with the Pennsylvania Public Service Commission by the Lykens Valley Street Railway operating between Lykens, Dauphin County, and Reinerton, Schuylkill County. The new rates become effective July 1 and remove all limitations on workmen's tickets, making them good until used.

Asks Ten Cents in Lewiston.—An increase in fare from 7 cents to 10 cents is asked in a petition filed recently with the Maine Public Service Commission by the Androscoggin & Kennebec Railway, Lewiston, the successor to the Lewiston, Augusta & Waterville Street Railway. The company's petition points out that there was a deficit of \$62,682 during the first five months of the year and that the increase is necessary to the continued successful operation of the road.

Hearing on Rate Petition.—H. C. Dillon, examiner for the Illinois Public Utilities Commission, recently heard petitions of the East St. Louis & Suburban Railway, East St. Louis, for permission to increase rates. The value of the company's property was placed at \$1,988,962 by H. E. Bartlett, engineer for the commission. Officials of the company stated this valuation was too low. This petition for permission to increase rates has been before the commission since 1918.

Wants Youngstown Fares Reduced.—Street Railway Commissioner W. L. Sause has demanded that fares on the Youngstown (Ohio) Municipal Railway be reduced from 9 to 8 cents as the result of alleged disclosures made by the arbitration proceedings to determine an operating and maintenance allowance for the railway, which operates under a "service-at-cost" franchise. The carfare was raised to 9 cents about four weeks ago.

Increase on Interurban in City Sustained.—The Appellate Division of the Supreme Court declared on July 2 that the New York, Westchester & Boston Railway has the right to charge a 7-cent fare within the limits of the city of New York. It operates lines between the Harlem River and points in Westchester County. The court decided that the Public Service Commission has authority to permit the collection of such fare within the boundaries of this city.

Troy Lines Going Behind.—The United Traction Company, Albany, N. Y., has filed a petition at the city clerk's office in Troy, asking that the Troy Common Council repeal the ordinance limiting the fare to 7 cents and enact one that will allow the company to petition the Public Service Commission for an increase. The amount was not mentioned. It is believed in Troy that the company will ask a 10-cent rate. In its petition the company notified the city that it has a deficit of \$100,841 so far this year.

Ten-Cent Fare Put Off.—On June 16 the period of five months expired in which the city was to agree with the Tacoma Railway & Power Company, Tacoma, Wash., upon a new rate of fare. When notified by the Public Service Commission that the time limit set by it was up, the city obtained from the company an extension until July 2, when the matter will go before the commission for argument. In view of these circumstances, the plan to put the 10-cent fare into effect has been postponed for the present.

Bus Compromise Reached.—As the result of an agreement reached between Grover A. Whalen, Commissioner of Plant & Structures of New York City, and John J. Kuhn, receiver of the Richmond Light & Railroad Company, operating on Staten Island, municipal bus routes paralleling the company's lines will be allowed to continue operation for the present. The buses will also be permitted to run on the viaduct where the company has exclusive rights. The arrangement was made with a view to serving the needs of the Staten Island public.

Fare Increase Necessary in Syracuse.—So far as the Syracuse lines of the New York State Railways are concerned the wage award referred to in the *ELECTRIC RAILWAY JOURNAL* for July 3 will add \$361,000 to the platform expenses of the company for the coming year. The present 6-cent fare will be inadequate to meet this added charge.

The company has estimated that at least 8 cents from each passenger will be required. As an alternative to such charge a service-at-cost arrangement has been suggested.

Fares Up on Interurban.—A ruling by the Missouri Public Service Commission on June 10 granted an increase of rates to the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, on the Savannah interurban line. The company is authorized by the commission to put into effect for a period of seven months from July 1 the following schedule: St. Joseph to county line, 10 cents; to Avenue City stop, 16 cents; to Holland stop, 24 cents; to Young stop, 30 cents, and Savannah, 36 cents. At the end of seven months the schedule must be reduced to the present rates.

Seven Cents in Grand Rapids.—A 7-cent cash fare was placed in effect on the lines of the Grand Rapids (Mich.) Railway on June 24. On the same date the company began rerouting a number of its lines. Tickets are sold on the cars and in drug stores throughout the city at the rate of sixteen for \$1. The fare formerly was 6 cents. The increase was authorized by the City Commission on May 24, the company at the same time being ordered to improve its service. The commission reserves the right to revoke the higher fare grant if the service furnished by the railway is not improved.

Accepts Six-Cent Fare Grant.—The Texarkana Traction Company, operating in Texarkana on both sides of the Texas-Arkansas State line, which recently sought authority from the city governments of both parts of Texarkana to increase its fare from 5 cents to 7 cents, has declined to accept the 6-cent fare offered by the Arkansas side of the city. The proposed increase is to remain in effect for six years, and then the fares were to revert to 5 cents. The Texas side of the city was also disposed to offer a 6-cent fare to be effective for six years, but it has as yet taken no official action to that effect.

Auto Drivers Warned.—Automobile owners of San Diego, Cal., have received from the San Diego Electric Railway a circular letter advising them that they are liable for damages suffered by occupants of their cars involved in an accident. The company points out that it has been determined by the court that the owner of an automobile who invites another to ride with him is personally responsible for his safety. Although the company's financial condition has improved considerably since the introduction of the two-zone system last January, it is at present running short of actual operating requirements by \$500 a day.

Wants Fare Increase in Sandusky.—A 7-cent fare, with four tickets for a quarter, is facing the citizens of Sandusky, Ohio, on the city lines there operated by the Lake Shore Electric Railway. City Commissioners have

been asked to ratify this change in fare at their next meeting. The present fare is 5 cents, with six tickets for a quarter, and free transfers. The transfer privilege would be continued under the new fare arrangement. F. W. Coen, vice-president of the Lake Shore, declares the company cannot meet the running expenses of its city cars unless the increase is granted by the commissioners.

Wants 10 Cents in Durham.—Claiming that it lost \$61,452 on its investment during 1919, the Durham (N. C.) Traction Company has filed a petition with the State Corporation Commission asking that it be allowed to increase its fares to 10 cents, or sell three tickets for a quarter. The petition of the company points out that in 1915 the net income from operation of its system in Durham lacked \$16,000 of meeting the 8 per cent allowed for its investment. These figures were doubled in 1916. A slight reduction was registered the next two years due to the increase of the fare from 5 cents to 7 cents, but the figures again jumped in 1919 when the total loss on the investment value was about \$61,000.

Mayor a Central Figure at Hearing.—Hearings have been resumed in the petition of the Georgia Railway & Power Company, Atlanta, Ga., before the State Railroad Commission, in the company's quest for increased fares and increased rates for gas and electricity. The case seems to have developed into a two-cornered fight with the company on the one side and Mayor James Key and Joel Hurt, a former president of the railway which was acquired by the reorganized corporation, on the other side. Preston S. Arkwright, president of the company, testified that the Mayor's enmity toward the company dates from 1904. The company is seeking to increase its fares from 6 cents to 8 cents.

New York Transfer Charge Continued.—Alfred M. Barrett, Acting Public Service Commissioner, signed an order on July 6 continuing indefinitely the permission given a year ago to the New York Railways to charge 2 cents for transfers at 99 of the 113 points of the system throughout the city where free transfers once were issued. In continuing the privilege Commissioner Barrett acted upon a report by officials of the commission that an additional charge for transfers was still necessary for the prosperity of the company. Instead of extending the privilege for a year, however, the commissioner made it for an indefinite period so that it could be withdrawn at the will of the commission.

Beach Riders to Pay More.—The Atlantic City & Shore Railroad, Atlantic City, N. J., has received permission from the State Board of Public Utility Commissioners to raise its fare from 6 cents to 7 cents. The Central Passenger Railway, operated by the Atlantic City & Shore, has also been authorized to raise its fare and to sell

tickets good for 100 rides between Atlantic City and Longport for \$7.50. The new rates went into effect on July 1. The board has refused permission to the Jersey Central Traction Company, Keyport, to raise its fare from 7 cents to 10 cents in each zone. The board has also denied an application of the Monmouth County Electric Company, Red Bank, for an increase in fare from 7 cents to 8 cents.

Court Refuses to Restrain Fare Advance.—Supreme Court Justice Tierney has denied the application of the city of New York for an injunction to restrain the Richmond Light & Railroad Company, Staten Island, N. Y., from charging more than a 5-cent fare. Under an order of the Public Service Commission, which the Corporation Counsel asserts is in violation of city contracts, the railroad is now collecting an 8-cent fare on its lines. Justice Tierney also handed down a decision refusing the city's petition for a writ of prohibition to forbid the Public Service Commission from entertaining the application of the Staten Island Midland Railway which has not operated its cars since Jan. 2, to permit the company to charge an 8-cent fare. The court held that some of the franchises under which the companies in Staten Island are operating do not require the carrying of passengers over all parts of the line for a single fare of 5 cents. Some of the franchises have no condition as to fare.

"Jim Crow" Law Upheld.—The Supreme Court of the United States has handed down a decision upholding the provision of a "Jim Crow" law of the State of Kentucky so far as it affects the lines of the South Covington & Cincinnati Street Railway and the Cincinnati, Covington & Erlanger Railway, a subsidiary, Covington, Ky. The company was indicted for violating a statute requiring companies operating railroads in the State to furnish separate coaches or cars for white and colored passengers. The company appealed to the United States Supreme Court from the Court of Appeals of the State of Kentucky, alleging that it was an interstate carrier and so did not come within the provisions of the act. In support of this contention it was stated that the company was engaged in interstate commerce, carrying passengers between Cincinnati and the cities across the Ohio River, and that 80 per cent of the passengers carried were interstate. The reply made by the State and expressed by the Court of Appeals was that the railway is a Kentucky corporation and by its charter was given authority "to construct, operate and manage street railways in the city of Covington and vicinity." The Supreme Court held that there was a distinct operation in Kentucky, authorized and required by the charter of the company, and it was that operation which the act in question regulated, and, therefore, the latter was not a regulation of interstate commerce.

Legal Notes

ARIZONA—*Liability for Negligence Resulting in Aggravation or Recurrence of Disease.*

Where a person suffering from tuberculosis was thrown from a car, the railway cannot claim immunity for its negligence resulting in recurrence or aggravation of the disease, because the passenger was already suffering from it; the gist of the action being the loss suffered by the injured person, caused by the defendant's negligence. [Tucson Rapid Transit Company vs. Rubiaz, 187 Pacific Rep., 568.]

CONNECTICUT—*Employment of Incompetent and Inexperienced Trainmen Not in Itself Negligence.*

In an action for injuries to a man on the track, an instruction authorizing the finding of negligence because of the employment by the railroad of inexperienced and incompetent trainmen, without regard to whether the accident was the result of some negligent act of the trainmen, was prejudicial error. [Carlson vs. Connecticut Company, 108 Atlantic Rep., 531.]

MINNESOTA—*City Collecting Cost of Street Paving from Property Owners Cannot Recover from Railroad.*

After a city has assessed the cost of repaving a street on abutting property owners and has thereby become fully reimbursed for its expenditure it cannot require a railway company to pay the cost of the paving done on the portion of the street occupied by its tracks. [City of Duluth vs. Duluth Street Railway, 176 Northeastern Rep., 47.]

MISSOURI—*The Creditor of a Corporation Whose Assets Have Been Transferred to Other Creditors Without Consideration Could Follow Assets.*

Where a corporation took over the assets of another corporation having the same officers and almost identically the same directors and stockholders without payment of full consideration therefor, and where the difference between the amount paid and the actual value of the assets received was in excess of the claim of a judgment creditor of the latter corporation, the judgment creditor could have his claim satisfied out of the assets of the first corporation. [Johnson vs. United Railways, 219 Southwestern Rep., 39.]

MARYLAND — *Obstruction Caused by Newspaper Bundle Thrown from Car.*

In an action against an electric railway company for the death of a motor-truck driver, the wheel of whose truck ran upon a bundle of papers thrown

from a north-bound street car, where the real issue in the case was whether the truck driver was guilty of contributory negligence in that the periodicals were lying in the street long enough to have given him an opportunity to avoid them, the court did not err in charging the jury to render a verdict for defendant if they should find "that there was no north-bound car immediately opposite or ahead of the truck at the time the truck struck the bundle of papers." [Kaufman Beef Company, et al., vs. United Railways of Baltimore, et al., 109 Atlantic Rep., 191.]

KANSAS — *Passenger in Automobile Who Could Have Seen Approaching Car in Time to Warn Driver, But Who Did Not, Cannot Recover for Injury.*

A mature person, who attempts to cross an interurban railroad track without taking any precautions for his own safety, while riding in an automobile with another who is driving, cannot recover damages for injuries sustained in a collision with a car on the track, when by looking he could have seen the approaching car in time to have warned the driver of the danger. [Kirby vs. Kansas City K. V. & W. Railway, 186 Pacific Rep., 744.]

MASSACHUSETTS—*Railroad Held Not Negligent in Moving Car Past Place Where Chemical Solution Was Dripping.*

Unless the motorman and the inspector of an elevated railroad knew that chemical compound dripping from the scene of a fire on the elevated structure would probably cause harm to any one it touched, they were not negligent in ordering an open surface car with a passenger aboard to go forward under scene of fire, though drops of solution had not ceased to trickle from structure. [Flaherty vs. Boston Elevated Railway, 126 Northeastern Rep., 798.]

NEW YORK—*Accident to Person on Crosswalk.*

A pedestrian having waited until an approaching street car stopped a yard away, it could not be said as a matter of law that she was guilty of contributory negligence in advancing to cross ahead of it, on a cross-walk, as she could assume the motorman would look before restarting the car. [Lipshitz vs. Third Avenue Railway, 173 New York Supp., 631.]

ILLINOIS—*Presence of Banana Skin on Stairway Insufficient to Support Recovery for Injuries.*

The mere presence on a stairway or stairway landing leading to a station of an elevated railway, of a banana skin on which a passenger leaving the station slipped, did not show negligence, in the absence of evidence of actual knowledge of its presence, or evidence that it had been permitted to be there for a sufficient time that notice might be implied. [Davis vs. South Side Elevated Railway, 127 Northeastern Rep., 66.]

New Publications

Direct Current Motor and Generator Troubles: Operation and Repair

By T. S. Gaudy and E. C. Schacht. Published by McGraw-Hill Book Company, Inc., New York, N. Y. 265 pages.

A practical work for engineers and operators. The book gives a very thorough treatment of motor and generator troubles with remedies and is written in an able manner by experienced men. The book should appeal to the operating engineer and electrician and be useful as a reference book in the technical schools.

Proceedings of Canadian Safety Leagues' Convention

Report of Toronto Convention, 1920, of Ontario Safety League and Canadian National Safety League. Issued by the leagues, 189 St., Toronto, Ont.

The two safety leagues mentioned have issued in pamphlet form the proceedings of a three-day safety convention held at the King Edward Hotel, Toronto, April 13 to 15, 1920. There were fifteen papers read on industrial safety, and an address on the safety movement was delivered by R. M. Little, director Safety Institute of America.

Visualizing Citizenship

By Ina Clement, Municipal Reference Library, City of New York, 32 pages.

In this pamphlet the author has included a list of motion picture films, devoted to civic education and classified according to subject. Its purpose is to give an opportunity to those interested to arrange for the presentation of films for educational purposes. Under public utilities are classified several reels on steam railroad electrification, and a reel on the large steam turbines in the Interborough Rapid Transit power station. "Fares, Please," under which title the safety car film is listed, is also mentioned.

United States Bureau of Standards, Washington, D. C.: Circular No. 83 on Specifications for the Manufacture and Installation of Railroad Track Scales. This circular comprises specifications for the manufacture and installation of railroad track scales to establish a standard for the ordinary railroad freight car weighing throughout the United States. They were prepared by a committee representing the American Railroad Association, the American Railway Engineering Association, the Railroad & Warehouse Commission of the State of Minnesota, the National Scale Men's Association, the Scale Manufacturers Association and the Bureau of Standards. This circular may be obtained upon request to the Bureau free of charge.

Personal Mention

Louisville Welcomes "Jim" Barnes

"Jim" Barnes, known the country over to electric railway men, has taken up his new duties as president of the Louisville (Ky.) Railway. He is making no predictions. Louisville has looked Mr. Barnes over and seemingly approves. To his many friends the following impression of Mr. Barnes from a Louisville paper should prove of considerable interest:

Mr. Barnes looks business and means business. He is the typical "all business" New Yorker, talking just enough to be affable, bald except for a slight fringe of hair beginning to show touches of gray, wearing shell-rimmed glasses, somewhat heavy as to chin and jaw, possessing the comfortable rotundity of a Colonel, tipping the beam at 207 pounds and carrying his flesh well distributed over a height of six-foot-one.

Mr. Barnes arrived in town last night, coming from Schenectady, N. Y., where he had been general manager of the traction system. He did not make any ill-considered statements about the street-car situation here, but indicated that he wished first to accustom himself to his new surroundings.

The meeting of the retiring and incoming presidents was such as to make a lasting impression on the six or seven company officials who were present. Mr. Minary, with the good nature that has characterized him during the last four months and its important changes, gripped his successor's hand, looked up at his serious face and with a suggestion of a quaver in his voice, assured him of his utmost desire to co-operate with him, adding:

"My heart goes out to any man who must take the responsibility of the management of a street-car company."

Members of the executive committee who have had charge of operation of the system during the trial period of four months named by Mayor Smith expressed their confidence in the man whom they have selected as the head of the company.

"We think he ranks not only next to the best, as one newspaper reported, but is absolutely the best street-car executive in America," said W. S. Speed, chairman of the committee.

"Yes, that's why we got him," said John W. Barr, member of the committee.

"He is the pick of the country, for we certainly looked them all over," said W. H. Kaye, member of the committee.

James Hamilton, Master Mechanic

James T. Hamilton, recently appointed master mechanic of the New York, Westchester & Boston Railway, was born in Howard, R. I. He received his education in the Cranston High School and the Bliss Electrical School of Washington, D. C. Mr. Hamilton has had broad experience in electrification work. During his summer vacations while at college he was on construction work for the Standard Electrical Company of Providence. In September, 1913, he entered the electrical department of the New York, New Haven & Hartford at the Van Nest Shops, Van Nest, New York. In this department he later was appointed electrical inspector. On May 1, 1917, he became chief inspector. It was in this capacity that he was assistant to the shop superintendent and later through changes in the organization he became assistant to mechanical superintendent. Before taking up work

with the New Haven, Mr. Hamilton had been engaged on electrification work with the Westinghouse Electric & Manufacturing Company. Mr. Hamilton succeeds R. R. Potter, who has become connected with the Hudson & Manhattan Railroad, as noted in this paper for June 12.

Mr. Lamb Superintendent of Kansas Interurban

O. S. Lamb has recently been made general superintendent of the Kansas City, Kaw Valley & Western Railway, with offices at Bonner Springs, Kan. Prior to this Mr. Lamb was superintendent of the Union Depot Bridge & Terminal Company, resigning this position the last of April, 1920, to become connected with the Kaw Valley & Western Railway.

Mr. Lamb is known to electric rail-



O. S. LAMB

way men as one of the most capable and efficient operators in the Middle West in his line. Before 1907, when Mr. Lamb entered the electrical field, he was a machinist in railway shops and held a number of responsible positions. In 1907 he joined the Waterloo, Cedar Falls & Northern Railway at Waterloo, Iowa, as master mechanic. Subsequently he took charge of the road as general superintendent, retaining his connection in this capacity until 1917, when he resigned to accept the position of superintendent of the Kansas City & Northwestern Railway. Later in the following year he became connected with the Union Depot Bridge & Terminal Company. Mr. Lamb, in accepting the position of general superintendent of the Kansas City, Kaw Valley & Western Railway, succeeded J. L. Moss, who is now acting as chief engineer of that line.

H. R. Mallison has been appointed purchasing agent of the Montreal (Que.) Tramways.

William J. Rausch has been made chief inspector at the Brooklyn Bridge depot of the Brooklyn (N. Y.) Rapid Transit Company.

V. R. Shick has succeeded G. M. Patterson as traffic manager and purchasing agent of the Fort Wayne & Northwestern Railway, Kendallville, Ind. Mr. Shick has also been made auditor of the company.

John Mooney, depot master of the Flatbush Avenue depot of the Brooklyn (N. Y.) Rapid Transit Company, has been promoted to the position of acting division superintendent at the Flatbush Avenue division.

Dennis J. Cullinan, track foreman, will soon retire from the employ of the Bangor Railway & Electric Company, Bangor, Me., after twenty-five years of service. He had previously worked for the Maine Central Railroad for sixteen years on track work.

William Walker, who recently became connected with the Hartford & Springfield Street Railway, Warehouse Point, Conn., has been given the title of general manager of the company. In an announcement of Mr. Walker's appointment published in the *ELECTRIC RAILWAY JOURNAL* for June 26, it was stated that he had been made superintendent of the road.

Joseph A. Lyons returned from New York City to Marlboro, Mass., on July 1 to retire from business. Mr. Lyons has accomplished some very big tasks in electric railway construction. Among big contracts handled by him were the Fresh Pond Yard of the Brooklyn Rapid Transit Company, a housing plant at Pelham for the United States Government and the construction of an electric railway from North Adams, Mass., to Bennington, Vt.

Dr. Royal Meeker, United States Commissioner of Labor Statistics, has resigned and will leave for Geneva, Switzerland, July 31, to take up the duties of editor in chief of the monthly bulletin of the International Labor Office of the League of Nations. Dr. Meeker has been secretary-treasurer of the International Association of Industrial Accident Boards and Commissions since April, 1916. In June, 1919, he was appointed by the president a member of the Federal Electric Railway Commission.

Obituary

George A. Chapman, assistant general claims attorney of the Detroit (Mich.) United Railway, died on July 6. Mr. Chapman was a graduate of the University of Michigan, and before becoming associated with the Detroit United Railway was connected with the Cincinnati, Hamilton & Dayton Railroad and the Père Marquette. He entered the claims department of the Detroit United Railway in 1916.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Foreign Demand for Steel Towers Good

Deliveries Are Lengthening Because of Material Shortage, but Prices Are Steady

Steel transmission towers are reported in better demand for foreign work than for domestic. This is especially true of the large units. At the same time there is a fair demand for smaller towers, both tubular and fabricated, and in amounts for use over relatively short distances.

Although European exchange is rather unfavorable, there is some demand at this time from that source, while inquiries are good. Buying prevails in the Far East, Australia, South America and Canada.

Poor condition of traction companies and high rate of borrowing money is the reason advanced for a rather light domestic tower market. The railway companies are interested to the extent of inquiries, and are keeping their plans rather forward for new extensions, but at the last moment the signature is lacking on the dotted line.

There is a shortage of material available for poles, but more particularly for tubular poles. The pipe demand in the oil regions is tremendous, with a consequent reaction on the amount of stock that can be turned into poles. For fabricated poles, supply in some quarters is a little short because of transportation hold-ups.

Deliveries on this material are lengthening and in some cases are running up to six months. At the same time prices are holding rather steady.

Lower Prices on Window Glass Unlikely

Scarcity of Labor and Raw Materials, with Strong Demand, Have Caused Acute Shortage

Prospects of any reduction in window glass prices seem remote, according to reports from the recent annual convention of the National Association of Window Glass Manufacturers, held at Atlantic City. A 50 per cent reduction of domestic production during the war, together with a shortage of labor and certain raw materials and an almost total suspension of the industry in Europe while fighting was going on, has conspired to bring about a serious shortage of glass. This shortage would be so acute as to amount to a famine at present were it not for the bottom having dropped out of the building market.

One of the materials used in glass manufacture is salt cake, and the war led to the discovery of many new uses for this product, one of them being the production of paper pulp. Consequently, salt cake is very hard to obtain. The seriousness of the fuel problem has also been further intensified by proposals to limit the use of natural gas in territories where the supply of this commodity was formerly thought to be illimitable.

Foreign countries are generally clamoring for glass from the United States to be used in their construction programs, but the policy of American manufacturers has been to meet home demands first. European competition is little feared as yet, since slow recovery is being made abroad from the paralysis of the glass industry induced by the war. One encouraging factor,

however, is the wonderful progress being made with glass production by machine. A type which has demonstrated its practicability draws cylinders 42 ft. in length up to 31 in. in diameter at the rate of one every twenty minutes. The utmost efforts of men have only produced cylinders up to 6 and 7 ft. in length by hand. A number of machine-equipped plants are being operated during the summer in an effort to catch up with the volume of unfilled orders.

The discount for window glass, single strength, A quality, first three brackets, is 17 per cent; for the same in B quality it is 37 per cent, and for double strength, A quality, all sizes, the discount is 79 per cent. These figures compare with discounts of 77, 77 and 79, respectively, on April 1 last.

Strong Demand Features Market for Special Trackwork

Prices Are Steady and Foresight in Ordering Raw Material Has Enabled Manufacturers to Make Prompt Deliveries

A vigorous demand for special trackwork, coupled with steady prices and excellent deliveries on standard products, characterizes the market for this class of material. One of the representative manufacturers in this field informed the *ELECTRIC RAILWAY JOURNAL* this week that by ordering raw material six to eight months ahead he has sustained little embarrassment in production and that deliveries can be made on standard layouts in from four to six weeks. This is a very satisfactory situation compared with that prevailing in many other branches of the traction industry. It is not possible to make as good deliveries as the foregoing on special orders, corresponding to unusual or particular layouts in street networks, but even here no serious delay appears to be holding back the completion of necessary output.

Labor conditions are believed to be better in this field than in many others. Wages increased 10 per cent this last spring in one representative mill, but the management states that the output per man is well maintained and the turnover in labor is much below that experienced in some other manufacturing plants of the vicinity. Night work is being done in this plant about three times a week, and the steady conditions prevailing are a great help to both management and workmen. Part of the output of the plant goes to other than electric railway customers, but it is understood that railway payments are being received on good credit bases.

The volume of business, both in inquiries and orders, is holding up to normal figures.

Prices are now about 100 per cent above pre-war figures and there seems to be no immediate prospect of their going lower in view of the high cost of labor. In 1918 the raw material prices rose to about 120 per cent above the pre-war figures, but since the armistice a reduction of about 16½ per cent has been attained. A good deal of renewal business is being entered on the books of special work manufacturers, and new construction held up by the war bids fair to keep up the sale of this class of equipment for some time to come. It is not customary to maintain factory stocks of special trackwork, so far as can be learned, but the railway companies make a practice of carrying more or less extra material for use in case of emergency calls. Considering the transportation situation between the steel mills and the special material mills, it is surprising that deliveries have been so well maintained to electric railways themselves. Foresight in ordering is the answer.

Electric Locomotives for the Swiss Federal Railways

The first of the fourteen electric locomotives ordered by the Swiss Government in the latter part of 1918 for the Federal Railways (Guebey Valley and Berne-Schwarzenbourg lines) has just been delivered by the builders, S. A. Brown, Boveri & Company, Ba-

den. The new locomotive has successfully passed the tests it was subjected to before acceptance. The average force developed by the locomotive is 1,000 hp. at a speed of 25 miles per hour. The maximum speed attainable is 37 miles per hour. The current used is single phase, alternating at 15,000 volts.

Of the fourteen electric locomotives that have been ordered, seven were to be made by the Swiss Machine & Locomotive Works at Winterthur, Switzerland, and seven by S. A. Brown, Boveri & Company, Baden, Switzerland.

Trolley Cord Market Firm Under Steady Buying

Demand Prevents Quick Deliveries in Quantity—Prices Firm Despite Fluctuating Cotton Quotations

Recent ups and downs in the price of spot cotton have had little effect on the trolley and bell cord market. A representative manufacturer informed the *ELECTRIC RAILWAY JOURNAL* last week that the cost of yarn to him has not shown much change and that the only recent factor of importance materially affecting prices has been wage advances in the textile field. A price readjustment averaging about 5 per cent increase was put into effect by this concern a few weeks ago. Another large producer of trolley cord and bell rope has made no change in prices since February. Buying on the part of electric railways continues steady, with little increase or decrease over the first half of last year. No immediate price changes are in sight beyond those above mentioned, but in some quarters the opinion is current that if the present dullness in the textile field continues easier quotations may find their way into this branch of the supply market.

Deliveries are running about sixty days on trolley cord, although small shipments can be made very quickly in case of necessity. Factory stocks are very low. Raw material is coming to hand well, both by water routes and by rail freight, in comparison with conditions earlier in the year. Some difficulty is experienced in outward transportation from rope factories.

The higher grades of trolley cord seem to be most in demand at present. The tendency toward purchasing braided cotton cord instead of leather for bell cord continues to be a feature of the market, records of wear and tear showing satisfactory results for the braided material. Approximately the prices of trolley rope and bell cord range from 85 cents to \$1.10 per lb., depending on quantity and quality of material. Inquiries are well maintained and there appears to be no present scarcity of labor worth mentioning in this particular field. One of the factors which bears a direct relation to production, however, is the partial shutdown of New England textile mills, with a consequent freeing of supplies of raw cotton needed for bell cord.

Lead Cable Being Bought in Good Volume

Some Mills Booked So Far Ahead Utilities Hesitate to Order at This Time

Power cable orders are being received by the mills in good quantities. Shipments are being quoted in increasingly longer terms, running from three to eight months for paper and lead cable and from six weeks to four months for varnished-cambrie and lead cable. A tendency is noted for the orders to run into larger sizes of cable, which forms some check on reports that fiber-conduit orders are also running to larger sizes.

The Middle West is providing the best market, but fair-sized orders are coming from New England, the Atlantic States and the South. Some good orders are coming from electric railroads and street railway companies in the East, South and Middle West.

In at least one case paper-cable producing capacity is sold throughout the best part of the present year, and no orders will be booked beyond Jan. 1, 1921. At the same time, many utilities are unwilling to book orders for shipment as long as six months. Utilities of regular standing at the mill, however, are generally able to squeeze in an order, if necessity warrants, where an outside customer would have to wait his turn.

An interesting trend toward standardization is found in the orders from utilities. Former habits of specifications all their own are being changed, and the engineers are coming to see that they can use cable built on A. I. E. E. specifications as well as that built on their own. The mills are refusing to accept special orders in many instances, and this is helping in the standardization.

New Canadian Firm Will Manufacture Hydraulic Turbines

Rather than import much of their machinery and other apparatus from the United States and Europe, as has been done in the past, power and paper manufacturing interests in Canada have organized the Dominion Engineering Works, Ltd., of Montreal, Que., which has entered into an agreement with the William Cramp & Sons Ship & Engine Building Company of Philadelphia for the exclusive use in Canada and the British Empire of the I. P. Morris designs for waterwheels and other hydraulic machinery. Through this association the Dominion Engineering Works expects to be in a position to supply most recent designs in such equipment and of any size to meet Canadian requirements. Other lines of manufacture will include hydraulic valves, governors and other accessories involved in hydraulic installations, and centrifugal and other pumps. An almost complete independence of Canada in supplying power machinery and equipment is expected to result.

Rolling Stock

Birmingham Railway, Light & Power Company, Birmingham, Ala., will purchase nine side-entrance double truck trailers from the Sheffield Street Railway at a cost of \$4,000 each.

Northern States Power Company, Fargo, N. D., placed an order with the National Safety Car & Equipment Company for fifteen new safety cars in the early part of June.

The Connecticut Company has received five more safety cars at Norwich, Conn., for use on the line taken over from the Shore Line Electric Railway of that city.

Track and Roadway

Eastern Massachusetts Street Railway, Boston, Mass.—As soon as it is approved the Eastern Massachusetts Street Railway will start at once laying double tracks on Hyde Park Avenue. It is estimated that the cost will be about \$75,000.

Eastern Massachusetts Street Railway, Boston, Mass.—Repairs have been started on the Whitman line of the Eastern Massachusetts Street Railway. This section of rail was in such poor condition that immediate work on it was necessary. The many repair jobs have given an opportunity for work to the men who were thrown out of employment by the discontinuance of freight service.

Municipal Street Railway, Detroit, Mich.—The street railway commission of Detroit has given its final approval to the \$1,400,000 worth of grade and steel work for the Detroit city system. This is the first step toward the municipal street railway construction as outlined in Mayor Couzen's \$15,000,000 plan.

East St. Louis & Suburban Railway, East St. Louis, Ill.—Harland Bartholomew, City Plan Engineer of St. Louis, Mo., has submitted a survey of the railway situation in East St. Louis to the East St. Louis & Suburban Railway, East St. Louis, Ill. He recommended the construction of a cross-town line and the rerouting of the Rosemont line over the Eighteenth Street route, connecting at Twenty-fifth and Lynch Streets with the tracks of the cross-town line.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company will double-track its interurban line between Fort Worth and Dallas, about 35 miles.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company has begun the work of installing new steel and special construction at the intersection of Front and Main Streets. New track work between Sixth and Weatherford on Commerce, the Railroad Avenue and Wheeler Street connection and double

tracking on the Polytechnic, Hemphill and Summit Avenue lines will be begun shortly.

Northern Texas Traction Company, Fort Worth, Texas.—The building of a car line from the present terminus of the Rosen Heights line to Lake Worth, a distance of three miles, is proposed. The matter has been taken up with the officials of the Northern Texas Traction Company. The company now maintains a line of automobile buses from the end of the car line to the lake.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company is making extensive improvements on the interurban line between Fort Worth and Dallas. Ultimately a double-track line between Fort Worth and Dallas will be built. Already more than one-half the line is double-tracked, and the company is now double-tracking another long stretch and straightening curves. The work is being done at a cost of several hundred thousand dollars.

Burlington Traction Company, Burlington, Vt.—The Burlington Traction Company expects to relay two miles of track with 70-lb. steel rail, 33-ft. and 70-ft. lengths.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are under way for the removal of the tracks in Mannington on East Market and Main Streets.

Power Houses, Shops and Buildings

Evansville & Ohio Valley Railway, Evansville, Ind.—The power house of the Evansville & Ohio Railway, located 10 miles beyond Newburgh, will be dismantled shortly and shipped to the Monterey Steel Company, Monterey, Mexico. This steel company has recently purchased same.

Schuylkill Railway, Girardville, Pa.—The Schuylkill Railway has recently constructed a new substation at Girardville, and will obtain power at 66,000 volt. The station contains two Westinghouse 500-kw. rotaries with the necessary transformer and switchboard apparatus. The transformer is a 31,000-kva., 66,000-volt to 6,600-volt. A new 500-kw. rotary has also been installed in the Frackville substation with new switchboard and transformer.

Public Service Commission of Indiana.—The Public Service Commission of Indiana has approved the schedule of power rates proposed by the city light and traction power companies. That is, for each five cent increase in the average monthly cost of coal above \$3.60 per ton delivered at the power stations there will be added to the monthly bill 15-100ths of a mill per kw.-hr. over and above present power rates. There will be a similar decrease when coal is delivered at a cost less than \$3.40 per ton. This coal clause became effective July 1.

Trade Notes

The Roller-Smith Company, 233 Broadway, New York City, held its annual sales conference at its works at Bethlehem, Pa., on June 14, 15 and 16.

The Habirshaw Electric Cable Company, 10 East Forty-third Street, New York City, is planning an extension, 60 ft. x 100 ft., one story, to its plant at Glenwood, Yonkers, N. Y., to cost about \$30,000.

The Carborundum Company, Buffalo Avenue and Eighteenth Street, Niagara Falls, N. Y., has made arrangements for rebuilding the portion of its works recently destroyed by fire. The cost is estimated at about \$50,000.

The Ajax Electric Specialty Company, St. Louis, Mo., is issuing \$100,000 in 8 per cent cumulative preferred stock and \$5,000 in common stock in order to permit the company to increase its facilities to handle the business in view.

The Hopewell Insulation & Manufacturing Company, Hopewell, Va., will soon place in operation a plant for the manufacture of hard-rubber, composition and molded insulated parts and high-tension insulators for wireless and transmission purposes.

J. E. Jennings, vice-president and secretary of Milliken Brothers Manufacturing Company, New York City, has recently sailed for Europe for an extended tour. The company has recently secured a large European contract for galvanized-steel transmission towers.

The Wagner Electric Manufacturing Company, St. Louis, has established a general service station at 501 Broadway, Milwaukee, Wis., in charge of S. B. Moyer. The sales office in the First Wisconsin National Bank Building, Milwaukee, under the management of F. T. Coup, will be continued.

The Westinghouse Electric International Company, East Pittsburgh, Pa., has appointed the following as foreign managers: F. M. Rodgers, London, England, European manager; J. W. White, Royal Bank of Canada Building, Havana, Cuba, manager for Cuba, and L. T. Peck, Bartolome Mitre, 754, Buenos Aires, manager for Argentina.

J. H. Williams & Company, Brooklyn, N. Y., announces that the drop-forging business and plants of the Whitman & Barnes Manufacturing Company at Chicago, Ill., and St. Catherines, Ont., Canada, have been combined and are operated by that company. The organization includes the individuals heretofore identified with both concerns.

The General Electric Company, Schenectady, N. Y., has awarded contract for construction of a one and two-story machine shop, 230 x 900 ft., at Erie, Pa. The total cost is estimated at about \$1,000,000.

The Midstates Engineering Company, Westminster Building, Chicago, has recently been incorporated as consultants,

specializing in industrial power and plant engineering. The engineering work will be in charge of R. J. Gaudy, president, who is known through activities with the Sessions Engineering Company and his connection with many engineering projects.

The American Insulator Company, New Freedom, Pa., with sales offices at 30 Church Street, New York City, and Detroit, Mich., announces the opening of another factory at Norwalk, Conn., in addition to expansion in production capacity at New Freedom, to meet the requirements of its rapidly increasing business.

American Brake Shoe Foundry Company stockholders have approved the plan calling for a readjustment of the company's capitalization. The proposal of the directors provides for an issue of \$10,000,000, 7 per cent cumulative preferred stock redeemable at 110 at option of the company, and 400,000 shares of common stock of no par value.

Parsons, Klapp, Brinckerhoff & Douglas, formerly Barclay, Parsons & Klapp, announce the removal of their general and engineering offices from 60 Wall Street to their own building at 84 Pine Street, New York City; also the executive offices of their subsidiary and operated corporations and properties and the Parklap Construction Corporation.

The Electric Tool Manufacturing Company, Petersburg, Va., has purchased the business of the American Electric Tool Company, including patents, manufacturing equipment, good will, etc. The complete line of electric hammers will continue to be manufactured on a greatly increased scale. Louis Paulero will remain in charge as chief engineer.

The Differential Car Company, New York City, has purchased from the United States government the plant formerly operated by the Grant Motor Company, Findlay, Ohio, for the manufacture of munitions. The company, it is understood, will equip the plant for the manufacture of electrically operated dumping cars, dumping bodies for motor trucks, etc.

The Worthington Pump & Machinery Corporation, 115 Broadway, New York, announces the purchase from the Platt Iron Works, Dayton, Ohio, of their drawings, patterns, jigs, templates, special tools, good will and name on the following lines of product: Oil-mill machinery, hydraulic turbine and waterwheel line, feed-water heaters and high-pressure air compressors.

New Advertising Literature

The Metal & Thermit Corporation, New York, N. Y., has issued the third edition of its pipe welding pamphlet, No. 16. The new edition describes and illustrates how pipe welds are made and gives tensile strength and comparative cost data of Thermit pipe welds against ordinary flange connections.