

# Electric Railway Journal

Consolidation of *Street Railway Journal* and *Electric Railway Review*

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## A West Virginia Railway Power-Plant Pump House on Stilts

SO IMPORTANT in power plants is the provision of sample and reliable supply of condenser circulating water that in many if not in most cases the location of the plant is determined largely with reference thereto. In examining a plant, therefore, among the first questions asked by the observing engineer are those referring to this feature.

In the design and construction of condensing-water systems many items have been standardized and have therefore become commonplace to engineers, but in each worth-while plant there are outstanding novelties that repay careful study. An example is furnished by the improvements recently completed in the power plant at Kenova, W. Va., which furnishes power to the Ohio Valley Electric Railway. These improvements are covered in some detail in an article in this issue. Here the supplying of water in sufficient volume was complicated by the distance of the power house from the natural source, the neighboring Big Sandy River, and the considerable elevation of the station above the river. Worse yet, the river is subject to annual floods, and the bank where the pumping plant would need to be placed, if the river water was to be utilized, is quicksand to a considerable depth. Previously the circulating water was cooled near the plant by means of ponds, but when forced to secure more water and cooler water the engineers "took the bull by the horns" and designed a plant for erection on the bank. They had to do some careful planning to insure satisfactory results.

The first consideration involved in the design was reliability. To get this meant that the machinery used must be simple and rugged. Induction motors of the slip-ring type met these specifications, as did also centrifugal pumps located under low-water level and direct-connected to the pumps. Of course the motors had to be placed above high-water level. The weight-carrying bearings, one to each unit, were incorporated in the motor frames and are thus always accessible. Reliability was further assured by the provision of duplicate units, and by retaining the former cooling ponds for emergency use.

The other main design factor was sufficiency of supply. This was insured by the use of liberal motor and pump capacities and by installing pipe lines of large cross-section.

Referring further to the structural difficulties imposed by flood and quicksand conditions, it will be noted that the structure had not only to be placed on a solid footing but it had also to be made strong to resist the surge of the water. Provision had, in addition, to be made against erosion of the bank on which the foundation was placed. These facts need to be held in mind as the account of the actual construction is read, in order that the real lesson of the story may be appreciated. The unusual form of the structure which is consequent upon these facts then appears to be a logical one.

In the article already referred to, attention was properly focussed upon the pump house. There is, however, a physically inconspicuous structure located part way between the pump and power houses which should not be overlooked. This is the sealing well. It is the terminal of the draft pipe from the condensers, its function being to insure the utilization of as much suction head as possible in the circulating system. Of course, all condensers have draft tubes, which have to be sealed, but the form which this one takes is a little out of the ordinary. The sealing well is of further interest as the possible future source of water for the neighboring towns. That there would be ample water for this purpose can be seen from a simple calculation. Assume an average load of 10,000 kw. on the plant for twenty-four hours per day. Then if each kilowatt-hour requires 16 lb. steam and each pound of steam 40 lb. of condensing water, the total daily weight of water will be 154,000,000 lb. and its volume more than 19,000,000 gal. At 200 gal. per day this would provide water for 95,000 people, which is more than the population which will need to be served for some time to come. However, whether the sealing well ever becomes a source of water supply or not, it is performing an important, albeit simple, function.

The sealing well, the pump house, the pipe line, the spillway over which the waste water slips back into the river, and the auxiliary cooling ponds of the Kenova power plant, taken all together, form an equipment which is playing an important part in the reduction in coal consumption from more than 3 to 2 lb. per kilowatt-hour which has recently been accomplished. They represent money well invested.

## Mr. Harkness Discusses New York Transit Situation

AS INDICATED last week, the affairs of the Interborough Rapid Transit Company in New York City were again placed in a critical situation by the application for a receivership. Another factor which enters into this situation and which ultimately will probably have a greater influence than anything else, not only on the solution of the difficulties of the Interborough but on the whole New York City traction situation, is the impending report of the New York Transit Commission. This report is expected about Sept. 15, and while there is no official indication as to the nature of its contents and recommendations, the remarks of one of the members, LeRoy T. Harkness, before the American Bar Association at Cincinnati doubtless is an indication of the attitude of the commission.

Mr. Harkness' statement presents what is probably as broad and impartial an analysis of the New York traction situation as has ever been made. It treats candidly and frankly of a situation filled with complexities, and a long history of financial, engineering, social and political developments. The address is given in substantially complete form elsewhere in this issue, as it is

believed that it will prove useful to railway men and men in public life who are interested in the solution of metropolitan transit problems any place in this country.

Mr. Harkness—and this probably means the entire commission—has not dealt lightly with either railway management or politician where he believes them to be at fault. Such candid and fearless studies and analyses of traction problems cannot but eventually result in equitable solutions even though that may entail some discomfiture and some radical measures in the process.

### Present Indianapolis Difficulties Not Deep Seated

INDIANA having passed a law permitting utilities to surrender local franchises and place themselves entirely under the jurisdiction of the state public service commission with the authority of an indeterminate state permit, the Indianapolis Street Railway chose to exercise this option. All was well until the company had to ask the city to legislate the jitneys off the streets. Then the city, having no contract with the company, wanted to know what guarantee and what control of service it would have in return for removing this ruinous and acknowledged unfair competition. It wants the company to sign a contract restoring local control, at least as to matters other than valuations and rates of fare. It would thus appear that the plea of the company for elimination of the jitney is being used as an opportunity to force submission to what may be an undesirable contract.

Two thoughts are inspired by this situation. First, it brings out clearly the injustice of having the street cars subject to state regulation while jitneys are subject to city regulation and outside the jurisdiction of the state commission. What is manifestly unfair competition is beyond the power of the commission to remove or correct, and no regulation of the railway, however enlightened, can place it in a position adequately to serve the public and earn a fair return in the face of unregulated, irresponsible and practically tax-free jitney or bus competition.

If the two forms of transportation are desired by the public, they should be under the same regulating body, else there will inevitably be the clashes between company and regulating body added to clashes between regulating bodies, with politics on both sides. This is a situation that must be recognized. For if the unfair competition springing from such divided authority is permitted to continue long, the street railway will have to cease operation. Fortunately, the city council of Indiana's capital city seems to have a much better and fairer conception of the position of the street railway than did the council in Des Moines, and there is also a fuller appreciation of what a complete shut down of car service would mean to the city, so that it seems likely that the jitneys will be properly dealt with before the railway is forced to the extreme action that became necessary in the Iowa capital.

The second suggestion which naturally presents itself is with reference to the needlessness of the contention of the Indianapolis city council that the railway must contract again with the city in order to provide a working agreement that will avert the probability of an appeal to the state commission on every order that the city may make. This seems to be begging a point for an issue, for the city's rights and interests are amply protected without a contract. It always has the right

to be heard before the commission, and certainly its arguments will have at least equal weight with those of the company.

Hence it would seem that with so slight a difference between the company and city and with such an apparently good understanding of the real transportation problem of today, the city council should not continue long to decline to relieve the street railway from the present unfair competition. Certain it is that whether the existence of unregulated jitney competition is due to indifference or willful retaliation of the city council or to divided regulation, or to some other reason, both forms of transportation cannot continue to exist in competition with each other in a business which is undeniably best handled as a monopoly. Some answer must be found soon, and this applies in practically all cities as well as in Indianapolis. And if the city officials are truly desirous that the decision made shall be for the best interests of the people of the city, there is no danger of a cessation of street car service.

### Good Will the Main Object in Traffic Advertising

A MAN who is responsible for some of the most elaborate traffic advertising in the world was asked by a representative of this paper whether the expense justified the results. "If you mean whether the extra traffic brought in would pay for this advertising," he replied, "I will say no. But that is not the underlying reason for this publicity. We would keep it up if we didn't have room for another passenger. It is good will we are after in this work. Every person who has the problem of 'Where or how or when to go' settled for him by these advertisements is a better friend of ours than he was before we took an interest in his spare time. Whether a man goes to such and such a place or not or whether he personally needs that time-table data, we want him to feel on reading the poster that we are alive; that we are always thinking of his needs, present or future. We don't take the all-too-common attitude that the patron, whether regular or transient, knows the roadway and train designations as well as our own transportation staff. So we would rather do too much than do too little to guide the 'fare guest,' to use a happy German term for the person on whom our business existence depends."

This broad-minded view of traffic advertising is precisely that of the real business man in relation to his own products. He does not try to trace the sale of every pair of shoes to a specific advertisement. It is enough for him if the public acquires the idea that he is awake to the problems of the shoe user. There is good-will value in his advertising tennis shoes in summer and overshoes in winter, even if they sold themselves. So, too, the great mass of passengers who take their two rides a day unvaryingly may not need any time-tables, traffic posters, thorough destination signs or street stops, but every evidence they see of a desire to help the passengers who do need these aids goes down to that good-will account which can prove so helpful when fares are to be adjusted, accidents to be paid for or new contracts to be entered into with the community. Therefore, let not the advertising account be scanned too closely in relation to passenger increase, but rather let it be treated as a good-will account of intangible but undoubtedly high value to the well-being of the concern as a whole.

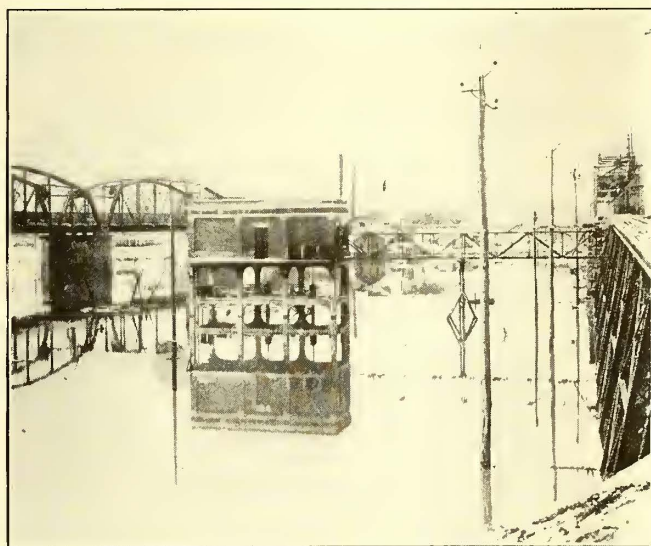
## Novel Condenser Pump House

American Railways Power Plant at Kenova, W. Va., Recently Enlarged in Capacity, Now Derives Circulating Water from New Electrically Driven Centrifugal Pumps, Housed in a Structure Which Is Designed to Be Flood Proof

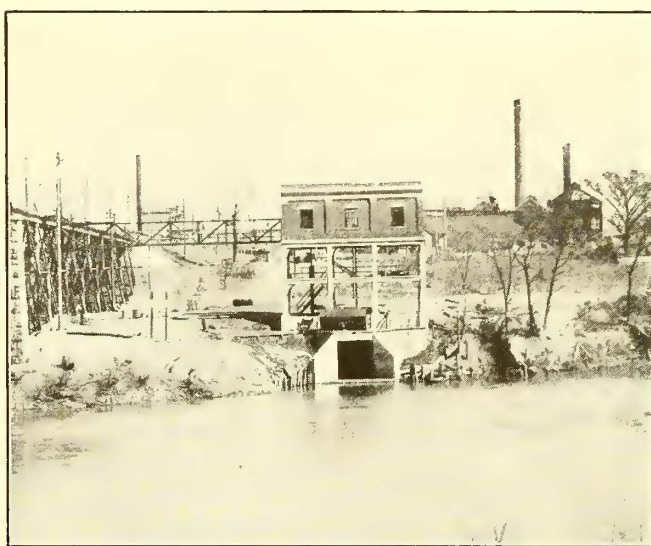
THE Ohio Valley Electric Railway, the headquarters of which are at Huntington, W. Va., draws its power supply from a plant located at Kenova, operated by the Consolidated Light, Heat & Power Company. Both of these properties are controlled by the American Railways Company, Philadelphia, Pa. Due to the rapidly increasing load on this power plant, which was originally designed by James Fagan, it has been necessary to make successive improvements within the past few years, one of the most notable of which has been the installation of a pumping plant for con-

economical arrangement because when the power plant was originally installed various considerations dictated the wisdom of placing it about 1,600 ft. back from the Big Sandy, on an elevation well above high-water mark in the flood season. The river rises normally about 30 ft. each spring, the flood occurring in March or earlier. The record high water was that of 1913, when the rise was 40 ft. No spraying devices were used in connection with the pond in the original plant.

Shortly after the plant was taken over, two 1,000-kw. Allis-Chalmers turbines were put in, one being a high-



PUMPING PLANT FROM LAND SIDE IN FLOOD SEASON, SHOWING TRANSFORMERS IN POSITION ON BALCONY



PUMPING PLANT ON THE BANK OF THE BIG SANDY RIVER, WITH POWER PLANT IN DISTANCE

denser circulating water on the bank of the Big Sandy River near the plant.

The increasing demand on the plant can be realized from the fact that its output is now 70,000,000 kw.-hr. per annum, as compared with 15,000,000 kw.-hr. eight years ago. The overload on the plant, in overtaxing the condensers due to their limited supply of cool condensing water, resulted in a coal consumption of about  $3\frac{1}{2}$  lb. per kilowatt-hour.

Due partly to the installation of the new condensing-water circulating equipment, the coal consumption has been cut down to about 2 lb., and it is estimated that the cost of the improvement, \$150,000, will have been covered by the saving effected in about ten months of operation. A vacuum of from 28 to 29 in. referred to a 30-in. barometer can now be maintained.

### POWER PLANT HAS AN ASSORTED EQUIPMENT

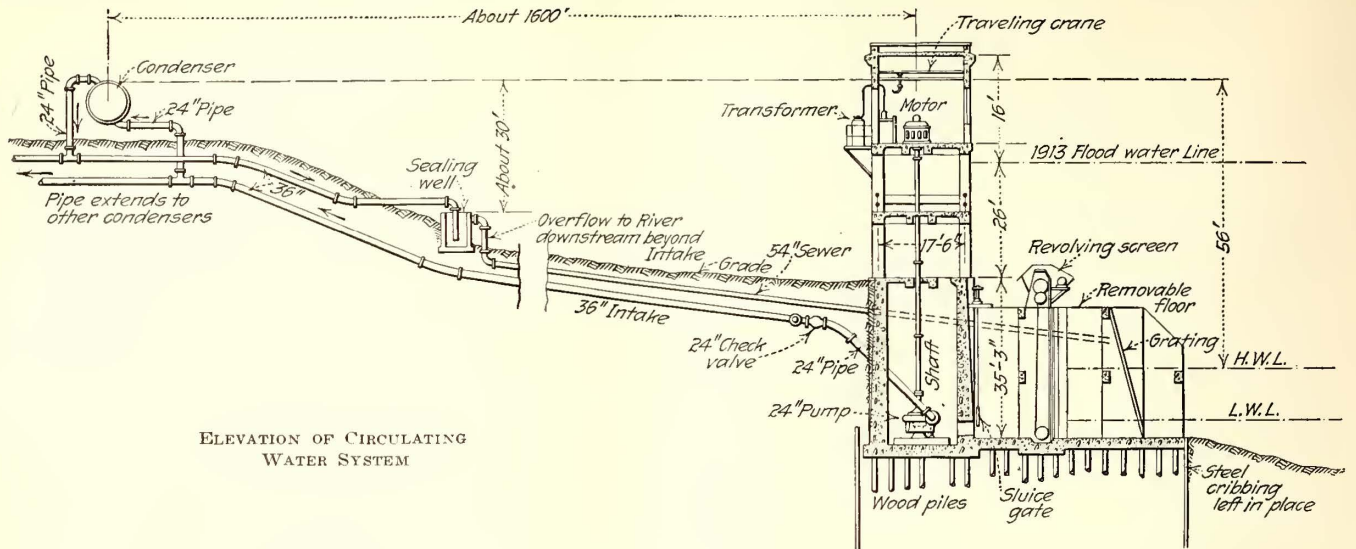
When this plant was taken over by the American Railways in 1910 the generating equipment in the station consisted of three 600-kw. and one 1,200-kw. cross-compound engine-driven generators, and the boiler equipment comprised four 400-hp. Altman-Taylor boilers and three 300-hp. vertical Berry boilers. The plant was operated with jet condensers, the condensing water being cooled in a pond. This was considered the most

pressure and the other a low-pressure machine. A spray system was installed in the pond, and an extension to the boiler house was built to house seven additional B. & W. boilers, three of which were used to replace the old Berry boilers.

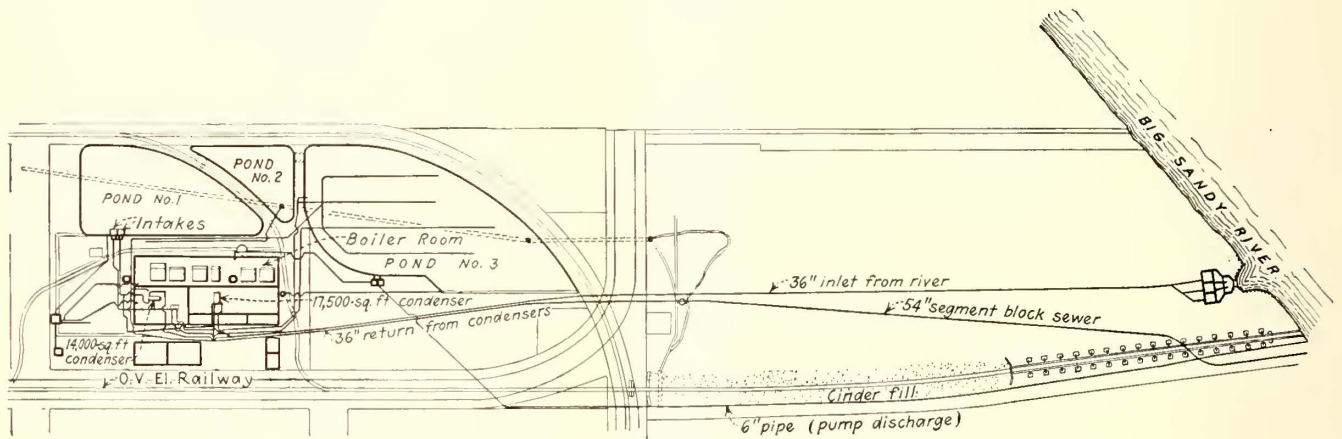
As soon as this equipment was installed the demand on the station increased so rapidly that it was decided to install a 7,500-kw. General Electric turbine with a surface condenser. When this unit was operated in connection with the spray pond, the load continuing rapidly to increase, it was found that the capacity of the pond had been exceeded.

Further, an additional generating unit was found necessary, and a 12,500-kva. (10,000-kw. at 80 per cent power factor) General Electric turbine was installed. This made absolutely necessary the increase in facilities for supplying circulating water and the decision was reached to install an electrically-driven pumping plant that would provide for future as well as immediate needs. The details of this are given in the following paragraphs and the accompanying illustrations.

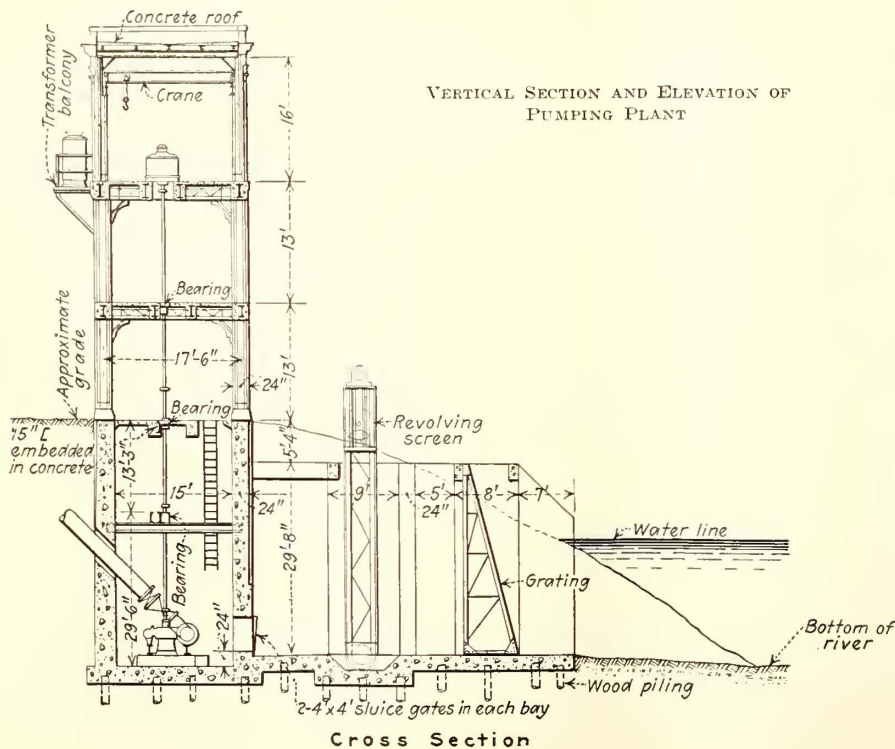
The new pumping plant displaces the old spray pond as far as the original purpose of the latter is concerned, but the pond is kept in good condition for emergency service, as a reserve against breakdown of the water main connecting the pumping station with



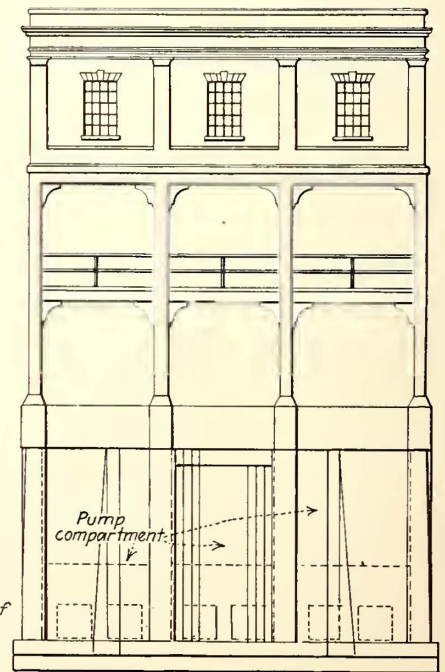
ELEVATION OF CIRCULATING WATER SYSTEM



OUTLINE PLAN OF CIRCULATING WATER SYSTEM



VERTICAL SECTION AND ELEVATION OF PUMPING PLANT

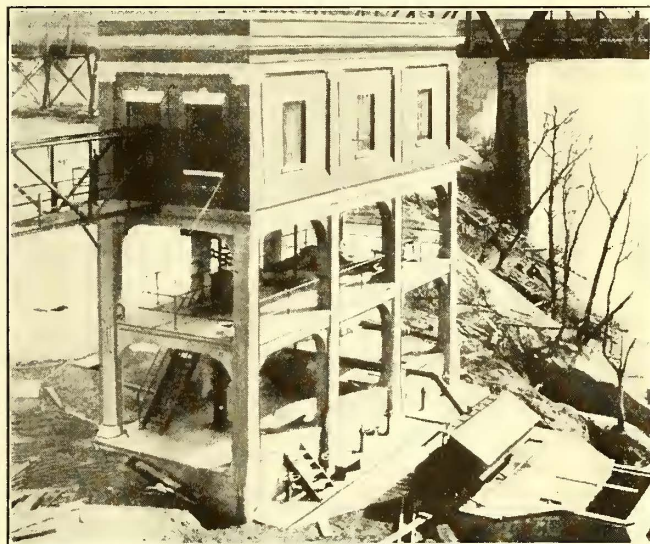


West Elevation

the power plant. It also serves a purpose as a settling pond from which water can be taken for boiler-feed and other plant purposes, a desirable feature in view of the sediment contained in the Big Sandy River water.

In the boiler room two 1,000-hp. B. & W. boilers were installed to furnish the steam required for the increased turbine capacity. These are equipped with B. & W. superheaters and Westinghouse underfeed stokers. These boilers can be operated at 200 per cent above normal rating. Besides these boilers the plant now contains eleven other boilers of 400-hp. rating each, the total rated boiler capacity thus being 6,400.

Summing up the present turbine and engine installation it will be seen that it is somewhat assorted. Inherited from the early days are the 1,200-kw. cross-compound Wetherill-Corliss engine-driven unit and two 600-kw. units with Harrisburg Foundry & Machine Company engines, one of the 600-kw. units having been displaced. These three machines have General Electric generators. There are also the two 1,000-kw. Allis-Chalmers units, the low-pressure machine using exhaust steam. Jet condensers are used with these



CONSTRUCTION VIEW OF PUMP HOUSE, RIVER AT LOW LEVEL

machines, which are called upon only in emergency. Finally, there are the newer 10,000-kw. and 7,500-kw. turbines with surface condensers.

#### FLOOD CONDITIONS A CONTROLLING FACTOR IN NEW PUMPING PLANT

Coming now to the new pumping plant, it may be said in general that it comprises a reinforced concrete structure to house ultimately three vertical, electrically driven pumping units, each of a capacity of 20,000 gal. per minute. Of these only two are installed at present. The pumps are set below low-water level and the motors above high-water level, considering the record rise of 1913. The construction of the plant was begun in October, 1918, and it was completed in the summer of 1919.

The structural steel-concrete structure has the form shown in the accompanying illustration, with the pump chamber floors well below river level, and the motor room high above, supported on substantial columns. The steel for the building is a complete structure in itself, although it is incased in concrete.

The structure rests on a sandy soil, and it was necessary to go down about 40 ft., nearly to bedrock, with

the foundations, for the purpose of locating the pumps below low-water level and also to obtain a solid foundation for the whole structure. The foundation space was inclosed with sheet steel piling, which was necessary to keep out the quicksand during construction. After the excavation had been carried down to the depth mentioned, short wood piles were driven and a 27-in. concrete cap was cast over their tops.

In order permanently to prevent spreading of the quicksand, the sheet-steel piling was left in place, but was cut off by means of a gas torch so as to salvage all that was not needed for permanent use.

#### A MOTOR ROOM ON STILTS

Resting on the foundation are the walls for the three pump chambers and the intake, as well as the concrete-steel columns of the superstructure. The form of the walls is shown in the outline drawing reproduced. It will be noted that the walls of the intake are of irregular form. This was selected to give the maximum resistance to the earth pressure, as well as to accommodate the screens and gates. The pump



MOTOR ROOM, WITH SWITCHBOARD IN BACKGROUND

chambers are roofed with concrete slabs, which also serve as a floor for the superstructure.

The columns supporting the motor house are of latticed-type section, incased in concrete. Lattice columns and girders were used because when they are incased in concrete the concrete forms a solid mass. This part of the structure was necessarily of open form to present a minimum of resistance to the floods. A floor was installed half way up to give access to the shaft steady bearings and to stiffen the columns.

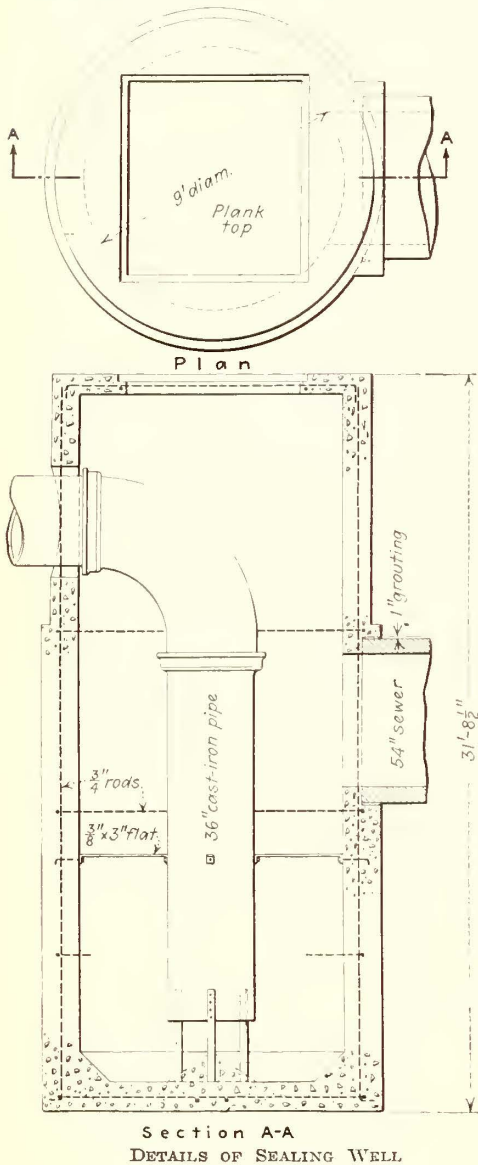
Design features of this superstructure, in addition to economy in the use of materials, were (1) strength to resist floods, and (2) stiffness to prevent vibration from the motors set high above the foundation.

The motor house, built atop this novel support, is of attractive design, the architectural features having been determined by the fact that one of the railway company's lines passes over a viaduct within a hundred feet of the building. The walls, of brick, were built on a reinforced cap on the columns, with brick pilasters and terra cotta cornices for adornment.

The pumps, located well below low-water level on the floor of the pump pits, are of special design for their particular duty in this plant. Their speed is 600

r.p.m. and they have an "unloading characteristic," that is, the power which they demand is in direct proportion to the head. They are designed for a maximum head of 60 ft., although the usual working head will be about 40 ft., and an efficiency at full load of 82 per cent.

The location of the pumps under water insures water sealing at all times—in other words, they are self-priming. There is thus no danger of loss of water through leakage, an important feature as the pumps



Section A-A  
DETAILS OF SEALING WELL

are so far from the power plant. Obviously, serious trouble in the condenser system would be caused by the pumps "losing water" or failing to start up the water circulation promptly. The flow of water to each pit is controlled by two 36-in. x 48-in. Newburgh sluice gates. These are water-tight and they permit the closing off of a pit, so that the water can be pumped out to permit repairs to the pump. Near the mouth of the main intake is an inclined trash rack and in the intake to each pump pit is a traveling screen made by the Chain Belt Engineering Company. Each screen slides in guides formed of angle irons

mounted in the concrete walls of the divided intake. A grab-bucket derrick is installed near the intake for the purpose of clearing it of the debris which at times accumulates in large quantities. The motors driving the pumps are of the induction type, with slip rings to permit the insertion of starting resistance in the secondary circuit. Their synchronous speed is the rated speed of the pumps, 600 r.p.m., and their capacity 425 hp. each. They are supplied with power through a bank of three 200-kva., self-cooling, oil-cooled transformers, mounted on a bracket-supported balcony behind the motor house. In addition there is a bank of three 150-kva. transformers for emergency use. These lower the voltage of the three-phase current from the power house from 11,000 to 440. The switchboard controlling the motors and

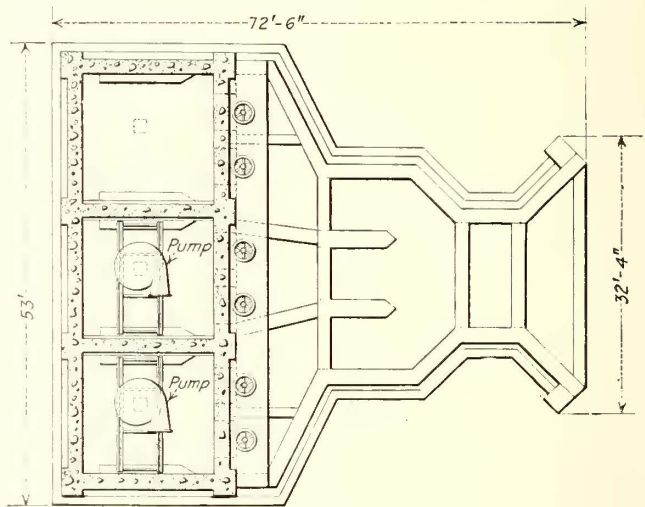
power circuits is located in the motor room near the wall next to the transformer balcony.

To facilitate repairs the motor room is equipped with an Alfred Box traveling hand-operated crane.

ROTATING PARTS HANG FROM ONE BEARING

The rotating element of a pump-motor unit, comprising motor armature, shaft and pump impeller, and weighing from 5,000 to 6,000 lb., is supported by one bearing of the "thrust" type, located on the top of the motor frame. This bearing is water-cooled. Steady bearings, as shown in one of the reproduced drawings, are provided for the 5-in. shaft at several levels.

With the present arrangement of motor-pump unit a pump can be put into action in less than one minute. This quick start is possible because all that is necessary is to throw in the motor switch. The pumps are always primed because they are located below low-water level and, as there is a check valve in each discharge pipe line, no manual operation of a valve is necessary.



PLAN OF PUMP PITS AND INTAKE

Oil for the thrust bearing is circulated by means of a small belt-driven rotary pump, hung below the motor frame.

The pumps, motors, transformers and electrical auxiliaries were furnished by the Allis-Chalmers Company. The electrical work and installation of the machinery are to be credited to the local force of the utility company.

INGENIOUS SEALING WELL UTILIZES SUCTION HEAD

The discharge from each pump is through 24-in. cast-iron pipe, the three pipes uniting in a 36-in. main. From this, branches lead to the several condensers.

The main discharge pipe from the condensers is also 36 in. in diameter. It leads down the hill to a sealing well of concrete, of 9 ft. inside diameter and 30 ft. inside depth. This return or draft pipe leads down centrally through the well, nearly to the bottom, from which the end is supported by T-irons "concreted in."

A conical spreader was cast in the well bottom to prevent formation of eddies. The sealing of the draft tube in this well eliminates about 20 ft. of head from the circulating water circuit.

From the sealing well a 54-in. interlocking-tile sewer overflow leads to the driver bank, discharging 1,100 ft. downstream from the pumphouse. The discharge is over a planked spillway in which a drop of more than 20 ft. occurs at low water. This gives a source of

water power which may be utilized at some future time. Also the sealing well may at some time be tapped for water supply for the neighboring population, as this water is reasonably free from sediment due to the screening and the opportunity for settling.

This plan, reproduced on page 388, shows a 6-in. cast-iron pipe which carries the overflow from the old spray pond. It leads from a cistern located near the pond wall to a point on the river bank below the pump house. This pipe line is utilized in washing the intake screens of the pump house, as it furnishes a head of 80 ft., which is ample for the purpose.

The general development of this plant is due to the

foresight and careful planning of General Manager H. J. Crowley and President Van Horn Ely. A word of credit is due the engineers who are responsible for the construction described, which was of more than ordinary engineering difficulty, due to the nature of the soil on the river bank and to the frequent inundation of this bank. The whole design was made under the direction of A. Kuylentsjerna, mechanical engineer American Railways Company, and the erection was done under the supervision of James Fagan, engineer of the company, located at Huntington. The steel work was furnished and erected by the Pitt Construction Company of Pittsburgh.

## Bonded Intersections Recommended

### Study by Bureau of Standards Results in Recommendation for Interconnection of Track Crossings of Detroit United Railways and Municipal System

**I**N A REPORT recently rendered by the Bureau of Standards to the Michigan Public Utilities Commission in the controversy of long standing between the Detroit United Railway and the Street Railway Department of the city of Detroit as to whether the track intersections of the two companies should be insulated or bonded the Bureau of Standards reaches the conclusion that best results would obtain if the two systems were electrically interconnected. In the course of the construction of the Detroit municipal system it became necessary to cross the tracks of the Detroit United Railway at numerous points, and the officials of the municipal system desired to make these crossings of the bonded rather than the insulated type. This form of crossing was objected to by the Detroit United Railway and subsequently, through the action of the State Legislature, the question was placed under the jurisdiction of the Public Utilities Commission. On June 1, 1921, the commission requested the Bureau of Standards to take charge and make an investigation, and report which type of crossing should be used. The bureau was requested to make such investigation as was deemed necessary and received full authority to do so. In co-operation with the two railway companies and an electrical engineer of the commission a study was made of the various factors affecting the problem, including the measurement of roadbed resistance, the magnitude of current drainage under various conditions, etc.

The arguments presented by the city in favor of interconnecting the two systems and in opposition to insulating the crossings were that (1) bonded crossings conform to standard practice; (2) the American Committee on Electrolysis and the Bureau of Standards recommend the bonding of different railway systems at points of intersection; (3) experience of insulating joints in Detroit under conditions practically identical with the present has proved unsatisfactory; (4) effective insulation cannot be maintained, and (5) insulating crossings will result in potential differences between tracks which may endanger the lives of animals, particularly horses.

The arguments presented by the Detroit United Railway in favor of insulated crossings and in opposition to bonded crossings are as follows:

1. Interconnection of the two systems would establish a condition whereby the Detroit United Railway would not be able to control the current originating on its system, and thereby involve it in liabilities for damage caused by stray current over which it would have no control.

2. The city, in employing a type of roadbed construction of lower electrical resistance to earth than the Detroit United Railway roadbeds, creates a low resistance leakage path through which the D. U. R. current will stray to earth and underground structures.

3. Voltage drops on the Detroit United Railway tracks are said to be reasonably low and the resistance of the roadbeds reasonably high, both conditions tending to prevent the escape of stray current from the tracks. This condition would be disturbed by the interconnection of the tracks of the Detroit United Railway and those of the city, by reducing the effective roadbed resistance of the former system. To offset this condition, the D. U. R. contends that it will have to install insulated negative feeders at a considerable expense in order to balance the potentials and prevent the escape of stray current.

Anticipating the report of the American Committee on Electrolysis, the Detroit United Railway contends that the tendency toward electrolysis mitigation is in the direction of the elimination of stray current, and that in asking for the interconnection of the track system the city is requiring something that will sooner or later impose additional expense on the Detroit United Railway in order to conform to prescribed requirements.

It is said that the Bureau of Standards' statements regarding the interconnection of tracks are in general valid, but that they do not contemplate interconnection under such conditions as prevail in Detroit. Furthermore, they apply only from a strictly technical standpoint, and without consideration of the fixing of liabilities or improving the conditions of one part at the expense of the other.

The report then presents a discussion of the fundamental principles involved in the interconnection of tracks and makes the observation that in an extensive and complicated system, such as will exist in Detroit with the completion of the city tracks, about 100 crossings will exist. Without this interconnection of tracks at these intersections each system will be more or less independent of the other and will be called upon to return the current originating on its own lines. This condition, aggravated by the intermittent character of street railway loads and the unbalanced loading on the several lines, will result in high potential differences between the two systems at many points. These potential differences will cause stray currents to concentrate near the points of intersection, and underground structures such as pipes and cable sheaths which are in the path of these stray currents will act as shunts to con-

vey them. Even under the most favorable arrangement of loading and return feeders these potential differences could not entirely be eliminated and would undoubtedly be a constant source of danger to underground structures in the vicinity of the crossings.

If, however, all points of intersection are bonded the two systems will act as a common network and currents will readily flow from one system to the other to equalize the potential differences due to the unequal loading on the various tracks. Long lines, over which relatively high-voltage drops would otherwise exist, will be intersected by tracks of the other system and parallel paths will thereby be provided and the voltage drops reduced.

#### DISCUSSION OF THE CITY'S ARGUMENTS

The report then takes up a detailed discussion of each of the arguments presented by the city, but finds that none of them is particularly valid except the one stating that effective insulation cannot be maintained. In regard to this point the Bureau of Standards explains that with a large track mileage, a large number of crossings and the close paralleling of many lines of two systems it would be impossible to prevent interchange of current between the two track systems even though all intersections were insulated. In many cases a long length of track on one system will be shunted by parallel track of the other system, and if an attempt is made to insulate them from each other the entire voltage drop on such a section of track may be concentrated across the two insulating joints and result in excessive leakage at those points. A condition similar to this has been found to exist in the vicinity of the Hart Avenue substation where the city now has cars in operation on Charlevoix Street and St. Jean Avenue.

Insulating joints exist between the two tracks at St. Jean and Mack, which the city put in according to the wishes of the Detroit United Railway in order to effect a crossing. In order to take care of the current from the city cars while on this crossing the negative buses of the two systems are connected at the Hart Avenue substation. A current exchange of from 0 to 500 amp. takes place over this bus tie, the direction being from the city bus to the Detroit United Railway bus. The report states that as there are no metallic connections between the two track systems it is evident that this current interchange takes place through the earth between them, and in so doing may traverse pipes and cables with consequent injury to them.

Measurements were made on June 17 at this substation to determine the magnitude of the current drained from pipes under various conditions and also to note the variation in the current interchange between the two negative buses under corresponding conditions. These two quantities were measured over a period of one hour, during which time the crossing at St. Jean and Mack was connected by cables for a short time. Also for a period of four minutes the power supply for the cars on the city system was interrupted in order to determine what effect this would have on the current interchange between the buses and the magnitude of the drainage current from the water pipes. The record shows that no material change occurred in the drainage current from the water pipes for the various conditions imposed. It also shows that there is no material change in the current interchange between the buses whether the crossing at St. Jean and Mack is insulated or connected.

It is pointed out that these measurements indicate that a considerable leakage takes place between the two systems when no metallic connection exists between them, but that the quantitative evidence is relatively of little value because conditions as they now exist are only temporary and will be materially changed with the completion of the track and with the more extensive operation of city cars. However, they do indicate that effective insulation between the two systems cannot be maintained and that considerable leakage between them will take place through the earth.

#### DISCUSSION OF D. U. R. ARGUMENTS

Of the arguments presented by the Detroit United Railway the disparity in the roadbed resistance of the two companies is the only one considered by the bureau to be valid and the only one which might qualify the advantages of interconnection. From the measurements that were made to determine the relative roadbed resistances it was found that for the city tracks they ranged from 0.0313 to 0.0746 ohms per 1,000 ft. of double track, with locations selected to include all types of construction. Measurements made on four different locations on the Detroit United Railway tracks indicated resistances ranging from 0.0689 to 0.16 ohms per 1,000 ft. of double track. The locations selected included various types of construction, ranging in age from three years to ten years.

The report points out that the reason for the evidently higher average resistance of the D. U. R. roadbeds is a subject of more or less speculation. It states that the early contention of the D. U. R., that cinders employed in the sub-base of some of the early tracks built by the city and the use of steel ties contributed to a low roadbed resistance, is not substantiated by the tests. A short section of track which had been temporarily filled in with cinders was found to have a higher resistance to earth than any other section of the city track on which measurements were made, and the roadbed on Charlevoix Street in which wood ties were employed was one of the lowest resistance roadbeds tested.

It was found that the roadbed resistance of the D. U. R. tracks increased with age, which fact is also supported by tests made by the Bureau of Standards on experimental roadbeds over a period of three years, although the change was small. It is pointed out that while the age of the roadbed may be one factor contributing to the difference in resistances between the two systems, it is believed that the type of construction is a more important factor. In all of the city lines a concrete pavement is employed which makes intimate contact with the web and head of the rail as well as with the base. The D. U. R. employs a type of construction in which the concrete is brought up around the base, but is not in contact with the web and head of the rail, brick or stone blocks laid with dry mixture of cement and sand being laid adjacent to the rail.

A careful inspection of the D. U. R. track and the testimony of the engineers indicates that after a period of years with the continual pounding of car wheels over the tracks, together with the action of frost, the pavement becomes loose and porous about the rails and intimate contact with the concrete is frequently lost. This seems to account for the difference in resistance between the new and old lines of the D. U. R. and also between these and the city lines. The report then states that if the city construction can withstand the disin-



tegrating influences of traffic and frost and the rails maintain an intimate bond with the concrete, the roadbeds will probably not undergo a change in resistance with time as the D. U. R. roadbeds appear to have done.

All of the resistance measurements of the roadbed were made under dry weather conditions and after a period of a number of days without rain. Judging from many measurements made by the bureau on numerous tracks under different weather conditions and over a period of years, it seems altogether probable that when wet the D. U. R. tracks with the porous pavement would have lower resistance, while moisture would have very little effect on the new city tracks with tight pavement.

Concluding the discussion on this subject, the report points out the desirability of considering the problem under ultimate conditions, when the city system will comprise a number of the day-to-day lines of the Detroit United Railway, rather than under the present temporary conditions. With this in mind, the bureau finds that while it is probable that for years to come the average resistance of the city roadbeds will be somewhat lower than the D. U. R. lines, this disparity and the injury to underground structures which might result from it appear to be more than offset by the greater advantages which will result from the interconnection of the two systems.

#### RETURN CIRCUIT SYSTEM

The contention of the Detroit Railway that the bonded crossings would change the disposition of the leakage currents, and require the installation of an insulated negative feeder system to correct this, does not appear to be well founded, the report continues. While the two systems will probably have common points of power supply in some cases, and while the greatest benefit to be derived from the interconnection of track does not obtain with coincident points of power supply, it is nevertheless not apparent that the D. U. R. will have to install insulated negative feeders to match any system of this kind which may be installed by the city for the return of the current. The condition of non-coincident points of power supply will be approached if the insulated negative feeders of the city system connect to the track network at points remote from the common source of power supply. Current originating on the network near the substation from either railway system will be returned over the D. U. R. feeders which presumably connect to the track close to the supply station, while current originating on the two networks at more remote points can be returned over the insulated negative feeders installed by the city. Each system of feeders, however, will return the amount of current used by its own cars, provided the negative buses of the two systems are not interconnected, and this will be quite independent of the voltage drops which may exist on the various feeders. If the power supply points do not coincide, then still further advantage may result from interconnection of track, for the voltage drops in the two track systems will be neutralized and the potential differences greatly reduced.

The bureau reaches the conclusion that the interconnection of different track systems at all points of intersection undoubtedly conforms to the best modern practice, and the benefits to be derived from such interconnection are so apparent and the arguments are so valid that to depart from this procedure would be

considered only where local conditions are of such a peculiar character as to vitiate the well-known principles involved in interconnection. Except for the difference in roadbed resistances of the two systems, the conditions in Detroit are in no way different from those usually existing where two track systems intersect, and in fact the large number of crossings involved in Detroit offer unusual opportunity to utilize the advantages of interconnection. Since the advantages to be derived from interconnection far outweigh the possible disadvantages resulting from a difference in the roadbed resistances of the two systems, the bonding of all crossings is strongly recommended.

#### Instructions for Police on Railway Duty

FOR the guidance of the police while on duty on the property of the Beaver Valley Traction Company, W. H. Boyce, general manager, has issued to them a copy of a pamphlet called "Instructions for Police." On account of the class of workers in the vicinity of New Brighton, Pa., with whom the conductors formerly had a great deal of trouble, the railway company found it necessary during the past fifteen years to employ one or more police at all times. The chief of police acts as inspector also, being on duty from 4 p.m. to 1 a.m. In addition to this man, who is the only regular policeman, there are other employees of the organization, such as dispatchers and inspectors, who are sworn in as special policemen with a view of keeping down disturbances on the cars and about the property. These men are so empowered by law that there is no question about their being legally authorized to handle such cases as may arise.

In order to insure harmony of working conditions a few general regulations were thought to be necessary, and with that purpose in view a set of instructions were prepared to increase the co-operation among the various departments. There is reprinted in the pamphlet the act relative to the appointment of police for street passenger railways incorporated under the laws of Pennsylvania. This says that a street railway may apply to the Mayor of the city in which the railway is operated to commission persons to act as private policemen for the railway company. All the general rules and duties of the officers are outlined so that they may know just how far their jurisdiction extends and just what to do in any circumstances. The pamphlet also includes the laws on arrests and warrants, the law on resisting an officer, the law on breach of peace, and an act which deals particularly with preventing fraud against common carriers. With such a guide in their work, it was believed that the police would be better able to perform their duties with dispatch and the least inconvenience to all.

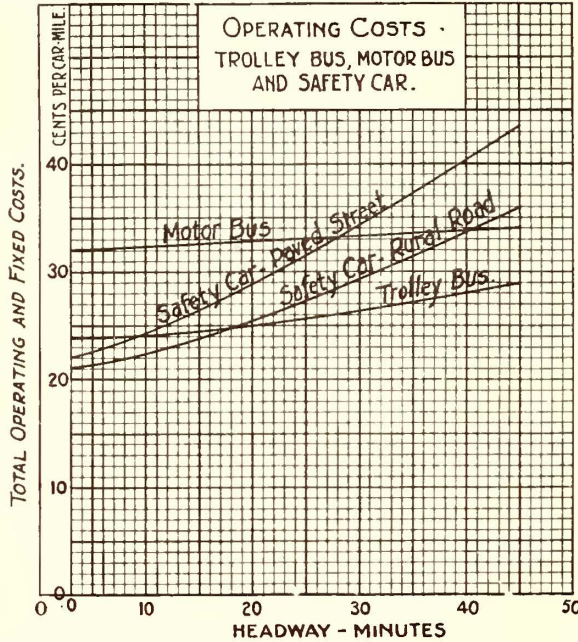
At one time a certain element in that community had an idea that it could, and at times it did, run things to suit itself on some of the cars and in some of the parks of the company. That condition has been done away with, however, but in starting to break up the practice it was necessary at first to have as many as seventeen policemen on duty on days of large traffic. But now it is known that the policy of the company is, "If we don't get them today, we will get them tomorrow, next week, next month, or even next year if it is possible to locate them." Consequently arrests have decreased each year and have been reduced from more than 400 several years ago to thirty-five last year.

# The Field of the Trolley Bus

Statistical Analysis Indicates Cost of Trolley Bus Operation Is Less than the Motor Bus or Safety Car on More Than Eighteen-Minute Headway

SOME comparative figures on cost of motor bus, trolley bus and trolley operation have recently been compiled by Karl F. Simmon of the railway department of the Westinghouse Electric & Manufacturing Company. In any consideration of the economical field of the trolley bus, according to Mr. Simmon, there are many elements that enter and some of the more important are the fol-

1. That the cost of the gas-driven motor bus does not decrease materially as density of service increases.
  2. That if the safety car tracks are laid on a rural or improved road, the safety car ceases to be more economical than the motor bus when the headway is materially increased beyond forty minutes.
  3. That the trolley bus or safety car service is fundamentally more economical than the motor bus service for frequent service due to the cost of gasoline and maintenance of gas engine equipment.
  4. That railless vehicles show up to advantage, due to practically free use of roads, whereas rail vehicles must maintain both rails and a portion of the street paving surface.
  5. That safety car transportation excluding paving expense is more economical for service where the headway is less than seventeen minutes. If paving burdens are imposed on the vehicle running on rails its economical field may be materially reduced.
- Only actual trolley bus service will tell the real story as there are many unknowns that cannot be evaluated at present.



lowing: (1) Existing transportation available, (2) are rural or paved roads involved, (3) density of passenger traffic, (4) condition of existing roads, (5) yearly tax burdens for buses, (6) labor and material costs, and (7) power equipment available.

The taxicab or "service at call" vehicles, the gas bus, trolley bus, safety car or double-truck car, all have an economical field, and in order to determine roughly what these are for gas bus, trolley bus and safety car some comparative figures have been compiled. In this comparison it is assumed that the motor bus and trolley bus have the same seating capacity, namely, thirty, and that the safety car—which is of the single-end type—seats thirty-five. The comparison is then shown in the accompanying table and curves.

While many assumptions are involved in this calculation:

	Motor Bus	Trolley Bus	Single-End Safety Car
Seating capacity.....	30	30	35
Schedule speed.....	10	10	10
First cost.....	\$7,000	\$8,000	\$6,250
Cost of paved city single track, per mile.....			\$50,000
Cost of paved city double track, per mile.....			\$90,000
Cost of rural improved single track, per mile.....			\$30,000
Cost of rural improved double track, per mile.....			\$54,000
Cost of 200 ft. siding.....			\$3,500
Cost of No. 0000 trolley construction, per mile.....		\$5,000	\$3,700
Cost of No. 0000 feeder, per mile.....		\$610	\$610
Cost of operation (cents per car-mile):			
Conducting transportation.....	7.3	7.3	7.3
Cost of power.....	2.5	2.5	2.5
Gasoline and oil.....	6.0		
General and miscellaneous expenses.....	4.0	4.0	4.0
Maintenance track and roadway.....	1.0		1.9
Roadway tax.....	1.0		0.60
Other way and structure expense.....	10.6	1.05	1.50
Maintenance of car and vehicle.....	5	8	12
Depreciation; life in years.....			

## Something New in Interurban Time-Tables

THE Fort Wayne, Van Wert & Lima Traction Company, of which S. W. Greenland is general manager for the receiver, has issued a new form of time-table for the convenience of travelers who may desire to know what connections with other electric lines may be made at either end of the line named. This new time-table folder presents in a compact form the main-stop schedules of all other electric lines running out of either Fort Wayne or Lima, the two terminal cities of the Van Wert line. The table occupies one side of the folder, while on the other side is presented the local time-table of the Van Wert line and various other general information about excess cash fares, class of trains,

READ DOWN		CONNECTIONS		READ UP						
Local Time Except East of Findlay	Central Time Except East	INDIANA SERVICE CORPORATION	FT. WAYNE AND DECATUR TRACTION	FT. WAYNE & NORTH-WESTERN RY. CO.	THE OHIO ELECTRIC RAILWAY					
L. pm	L. am	am	am	am	L. pm					
6:00	5:30	..... Ft. Wayne.....	6:32	7:20	8:35	10:45	11:10	2:20	4:00	5:15
6:32	7:00	..... Huntington.....	5:30	6:17	7:30	8:40	10:25	1:10	3:08	4:15
7:00	7:45	..... Wabash.....	6:30	6:46	6:58	7:54	12:35	2:27	3:38	
7:35	8:17	..... Peru.....	6:15	8:25	8:30	10:12	2:00	3:06		
8:00	8:30	..... Indianapolis.....	5:00	7:00	9:00	11:00				
8:30	9:05	..... Logansport.....	6:30	7:35	8:41	11:18	1:12			
9:00	9:45	..... Lafayette.....	8:00	7:20	8:40	11:50				
9:30	10:05	..... Ft. Wayne.....	6:45	7:58	6:57	6:50	11:15	1:58	3:00	
10:00	10:35	..... Bluffton.....	5:25	7:05	7:55	8:50	10:12	12:55	1:55	
10:35	11:05	..... Muncie.....	5:00		7:20	8:20	11:20			
11:05	11:40	..... Anderson.....			6:35	8:35	10:35			
11:40	12:10	..... Indianapolis.....			4:45	7:00	9:00			
12:10	12:45	..... Ft. Wayne.....	6:45	8:57	10:57	12:67	2:57	4:57	7:55	10:55
12:45	1:15	..... Decatur.....	5:45	8:00	10:00	12:00	2:00	4:00	7:00	10:00
1:15	1:45	..... Ft. Wayne.....	7:20	6:10	10:29	11:33	12:48	1:59	3:09	4:16
1:45	2:15	..... Garrettsville.....	6:30	8:20	9:30	10:40	11:50	1:00	2:10	3:20
2:15	2:45	..... Kenton.....	6:00	7:45	9:05	10:15	11:25	1:35	2:45	3:55
2:45	3:15	..... Waterloo.....	5:50	7:40	8:00	10:10	11:20	1:30	2:40	3:50
3:15	3:45	..... Lima.....	6:35	6:45	10:25	11:45	12:25	2:25	3:45	4:25
3:45	4:15	..... Ottawa.....	6:30	6:20	9:30	10:40	11:50	1:00	2:10	3:20
4:15	4:45	..... Leipsic.....	6:20	7:37	8:27	10:37	11:27	2:27	3:37	4:27
4:45	5:15	..... Deshler.....	5:10	7:18	8:10	10:17	11:10	1:10	2:23	3:10
5:15	5:45	..... Toledo.....	6:00	8:00	9:00	10:00	10:10	1:05	2:05	3:05

CENTRAL PORTION OF TIME-TABLE SHOWING CONNECTIONS WITH OTHER ELECTRIC LINES

how to stop a car at night, baggage service, mileage books, interline tickets, children's fares, requirements for special cars, etc.

This folder eliminates the difficulty experienced by many people desiring to patronize electric lines in determining the connections that can be made.

## Tendency in Train Operation

An Appreciable Rise in Motor Temperature Follows the Attachment of a Trailer to a Motor Car—Operating Expenses Should Be Less with Multiple-Unit Trains Than with Motor Car and Trailer and the Investment Is Often Less When Necessary Track Changes Are Considered

BY G. M. WOODS

General Engineering Department, Westinghouse Electric & Manufacturing Company



MOTOR AND TRAILER OPERATION IN BROOKLYN

**T**HE TENDENCY in street railway practice is toward train operation for heavy traffic. Several operators who heretofore have consistently favored single-car operation now feel that the time has come when train operation is the only solution to their traffic problems. Undoubtedly a reduction in the number of units reduces the congestion, and a two-car train will cross a street intersection just as quickly as a single unit. The question of the relative merits of multiple-unit trains and motor car and trailer trains is of primary importance.

The relative advantages of the two systems have been discussed at various times, but at present the problem in some respects must be considered in a new light. The street railways have just passed through a period of "starvation." Their equipment and property as a whole have deteriorated in many instances and must be revamped similar to many steam roads. This period has also had favorable aspects, for it has resulted in a better understanding on the part of the public, increased fares, and a thorough appreciation of the commercial side of the street railway business. The rehabilitation of the railways will take place under new conditions and the relative values of the factors entering into the choice of equipment will be changed. The public will be given more thought in the purchase of new equipment, and cars of good riding qualities and pleasing appearance will be bought. The cars must also be of such type that adequate service can be furnished at minimum operating expense during all hours of the day. The public, in return for the increased fare it is paying, expects new equipment and better

service. At the same time the standards of economy which have been set up must be maintained.

In the past the purchase of new equipment for train operation has been greatly influenced by the fact that in many cases cars with motors large enough to haul trailers a few hours per day were already owned. The motors were of the non-ventilated type, and while temperatures were frequently higher than desirable, the large copper section of the conductors and the high thermal capacity permitted of overloads for short periods without excessive motor maintenance. The motors of this class now available on most properties will soon be obsolete and will be replaced by ventilated motors with suitable capacity for the all-day service, but not with sufficient capacity to haul a trailer during the most severe traffic conditions of the day. It is obviously incorrect to purchase new trailer cars to be hauled by electrical equipment which has only a few more years of useful life and which can be replaced only at excessive first cost.

### COMPARISON OF MOTOR TEMPERATURES

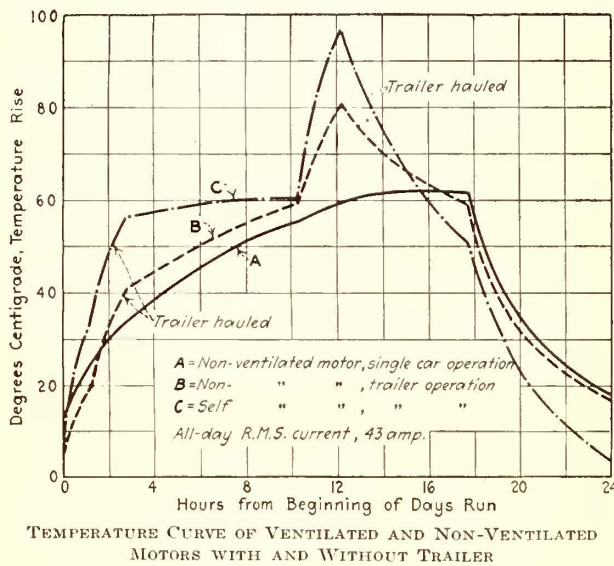
The graphs of temperature rise show at *A* the temperature rise of an inclosed motor used in single-car operation. At the start of the day's run the motor temperature was slightly above air temperature on account of its not having cooled completely after the service of the preceding day. The temperature gradually increased until the rise reached 62 deg. C. and remained fairly constant until the car was taken out of service.

Graph *B* shows the temperature rise of the same

motor when the car hauled a trailer on another route for one trip of one and one-half hours in the morning and for one and three-quarter hours in the evening.

The only effect of the morning trailer hauling was to cause the motor temperature to rise more rapidly than if the previous load had been continued, but if the trailer had been hauled for two trips, or three hours, the temperature rise would have nearly reached 60 deg. C. When the trailer was added in the afternoon the temperature rise increased to 80 deg. C. Attention is called to the fact that the trailer hauling resulted in a temperature rise 18 deg. C. higher than the operation without trailer, although the all-day service in both cases gave the same root mean square current value. When the trailer was detached the service became much easier and the temperature of the motor decreased rapidly. On the test without trailer operation the service remained at nearly the same severity until the last trip, which was the most severe of the day.

It is obvious that the addition of a trailer greatly



increases the loads imposed on a motor in any given service. In the example chosen a route on which single cars were normally operated and another route on which trailers were operated, both having the same all-day route mean square current, were taken so as to illustrate the higher temperatures reached when trailers are hauled. It is believed that the full effect of these short-time overloads is not usually appreciated.

Graph C shows the performance, with trailer operation, of a ventilated motor of such capacity that if operated in the service without trailer, the maximum temperature rise would be the same as that of the non-ventilated motor. The increase of temperature was more rapid at the beginning of the day than for the non-ventilated motor. When the trailer was added the rate of increase was very nearly the same as that for the non-ventilated motor because the temperature was nearly 15 deg. C. higher and therefore more heat was radiated and the load imposed was not much in excess of the motor's continuous rating. At the end of the trailer operation the ventilated motor was still approximately 15 deg. C. hotter than the non-ventilated motor. After the trailer was detached the temperature of the motor increased slowly until a constant temperature, practically the same as that of the non-ventilated motor, was reached. At the end of the one and three-quarter hours' trailer hauling in the afternoon, the

temperature rise was 96 deg. C., which is 34 deg. higher than the temperature rise would have been in the service without trailer, although the average all-day service was of the same severity.

#### SHORT-TIME LOADS ARE IMPORTANT FACTORS

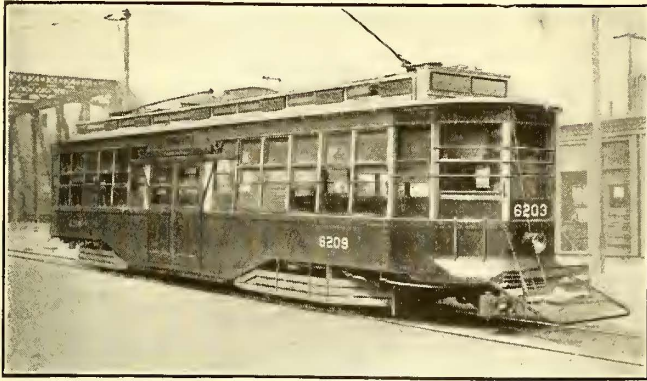
Short-time overloads, such as those caused by running on a grade with cars standing full of passengers, produce temperature rises considerably in excess of those shown on the curve. Hence, it is evident that short-time loads are very important factors in the application of the ventilated motor. Because of the more rapid rise of temperature the addition of a trailer requires a greater increase in motor capacity with the ventilated than with the non-ventilated motor.

After the trailer is detached, the temperature of the ventilated motor decreases rapidly because of the smaller mass of metal and the action of the ventilating fan. The ventilated motor has such marked advantages in weight and cost that its continued use is assured. It is well to keep in mind that trailer operation not only imposes an additional load on the motor when the stops are most frequent and operating conditions most severe, but also, by the reduction in speed it decreases the amount of air which passes through the motor with a resulting decrease in service capacity for this operation.

A study of the equipment required to provide service on an important city line recently disclosed the interesting facts that not only were the operating expenses less for multiple-unit cars than for motor cars and trailers, but the initial investment was also less. The chief savings were in power, labor and maintenance. The power saving is due to the use of a lighter car with equipment exactly suited to the service to be performed. When a motor car is to haul a trailer a few hours per day, it is unnecessarily heavy and the motors are of uneconomically high capacity and speed for single-car operation.

When a trailer is coupled to a motor car, even where there are no grades, the rate of acceleration is reduced, due to only part of the weight of the train being on the axles in which motors are mounted. This reduced rate of acceleration takes place at the time when speed and quick "get away" are most important in order to keep moving under congested traffic conditions. The reduction in schedule speed requires more cars to maintain the necessary headway and hence increases the cost of platform labor. On some railway properties where trailers are hauled, the nominal running time is kept the same as for single-car, non-rush operation and a considerable increase in layover time is allowed. This scheme has certain marked advantages, but it should not be permitted to obscure the fact that the car-hours are actually increased.

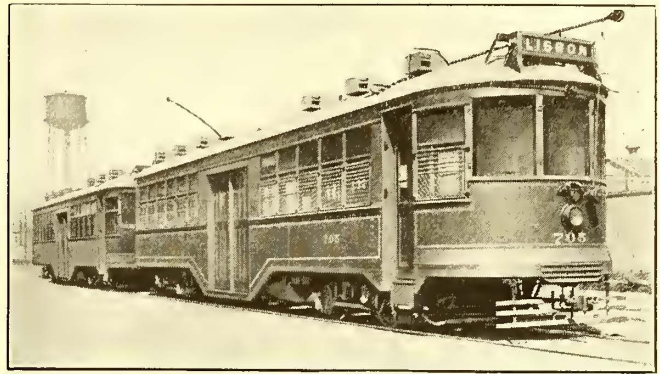
The maintenance of cars exclusive of electrical equipment should be slightly less for multiple-unit than for trailer operation, because the shocks are less severe. In the particular railway service mentioned, the motor car mileage was 27 per cent greater for the multiple-unit cars, but the motor weight was approximately one-half that for the cars intended for hauling trailers. The maintenance of motors per car-mile for the multiple-unit cars should, therefore, be from 65 to 75 per cent of that for the other cars. The result is that the maintenance of the multiple-unit electrical equipments was approximately 90 per cent of the electrical equipments for trailer hauling.



BOSTON CAR EQUIPPED FOR THREE-CAR, MULTIPLE-UNIT TRAIN OPERATION

When trouble occurs on a motor car hauling a trailer, both cars are tied up, whereas if trouble occurs on one car of a two-car train, only one is affected. When multiple-unit operation is employed, the individual units can be used interchangeably, and thus there are a number of cars in the barn during non-rush hours. The percentage of multiple-unit motor cars available for minor repairs and inspection is, therefore, greater than the percentage of motor cars available where trailers are hauled. The result is that a less percentage of spares need be provided for multiple-unit operation than for trailer operation, and while the cost of a single motor car and trailer may be less than that of two motor cars suitable for multiple-unit operation, the total investment is frequently greater. Some form of switching equipment is usually required for handling trailers, and even where an old passenger or work car is used its value is properly chargeable to the investment for rolling stock. The switching of trailers also increases the crew expense.

In recent years the general use of low-floor cars with 24-in. and 26-in. wheels makes it difficult to provide sufficient motor capacity to haul trailers under severe traffic conditions and at the same time to have satisfactory gears and clearances under the motor and gear case. Control equipment more suitable for multiple-unit operation and for mounting under low-floor cars

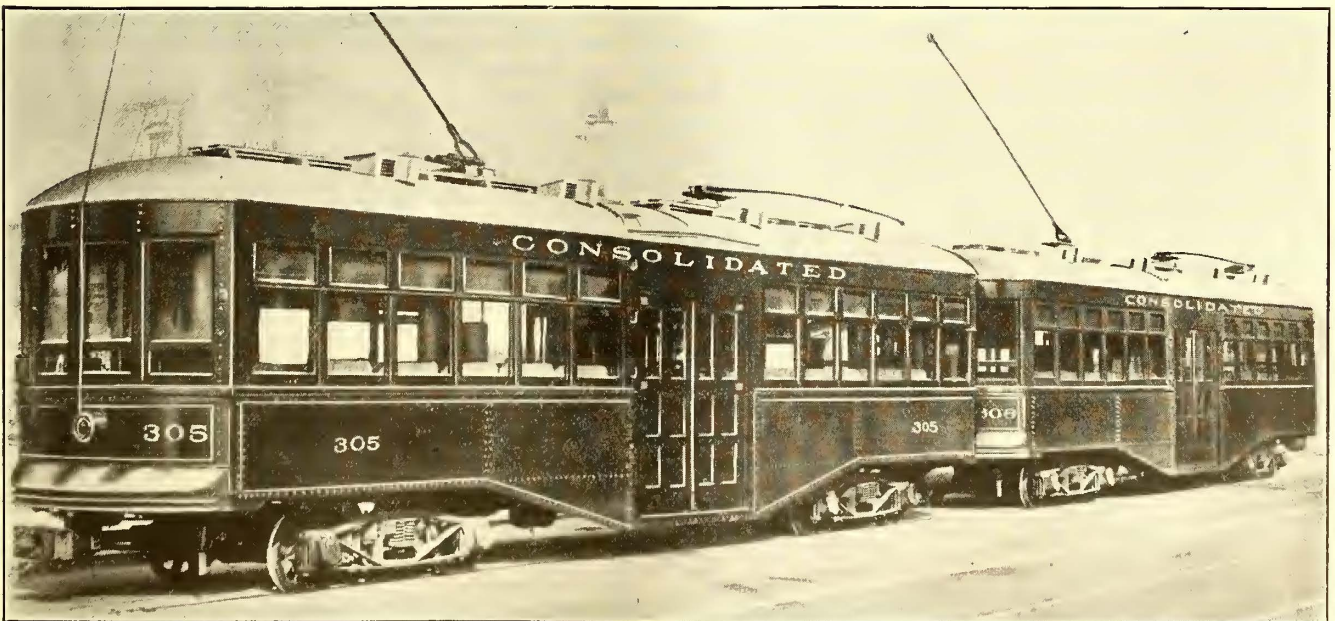


MULTIPLE-UNIT TRAIN OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

or in cabinets in the cars is available for all modern cars.

There are a number of lines on which trailers cannot be used satisfactorily, due to severe grades or snow conditions during the winter months. Most passengers have the feeling that trailers are unsafe and this feeling is enhanced by the occasional running away of trailers on grades. Even on level lines there is more jerking in stopping and starting a trailer than on a motor car and passengers generally prefer the motor car.

In the past there have been a number of electric railway lines on which it was generally agreed that multiple-unit operation was superior in many ways to trailer operation. There has been the impression in some quarters that, where physically possible, trailer operation is more economical than multiple-unit operation and that multiple-unit operation has only a certain inherent flexibility which cannot be obtained with trailers. If the comparison is made on a correct basis at the present time, the cost of multiple-unit operation rarely will be found to exceed that of trailer operation. Railway operators planning the purchase of new equipment for train operation will do well to investigate thoroughly the relative advantages of trailers and multiple-unit trains under their particular conditions before deciding on the type of equipment.



TWO-CAR TRAIN, CHARLESTON CONSOLIDATED RAILWAY. CARS EQUIPPED WITH HL CONTROL FOR MULTIPLE-UNIT OPERATION IN NAVY YARD SERVICE

# Perpetual Inventory as a Part of Accountants' Records

## Method of Compiling and Maintaining Inventory—Typical Record Forms—Arguments For and Against Other Methods—Co-operative Solutions by Engineering and Accounting Departments

By I. A. MAY, C.P.A.  
Comptroller the Connecticut Company

THE perpetual inventory has been discussed at length by accountants and engineers during the past few years and all agree as to its value in the railway industry. But as to the method to be used in compiling and maintaining the inventory there is no such universal agreement. This is the question that is disturbing and results in bringing out different ideas.

Actually, perpetual inventory is nothing more than a detailed history of the construction of the several parts of the plant. It seems to be a dream to certain engineers, but it is merely an extension of the construction records already found in the accounting department of every street railway company.

If the accounting department is unable to answer such questions as, "What did a certain power house, transmission line or distribution system cost? What is the value of this portion of track or the investment in that type of car?" then the accounting department system is not complete or has not been expanded sufficiently. With a proper system the accounting department should be able to give all such information down to the details of the cost of each unit in a power house from foundation to smokestack.

Adequate cost and construction records are essential to the intelligent operation of any railway system. Not only are they useful and necessary in the company's

THE CONNECTICUT COMPANY					
192__					
Appropriation No		Length of Line: Main Line		Sidings	Total
ACCOUNT	Estimate		Expended During Month	Expended to Date	Balance Available
<b>ROAD</b>					
501. Excavation and superintendence					
502. Right of Way					
503. Stone Laid out in Electric Railway Operations					
504. Grading					
505. Ballast					
506. Ties					
507. Rail, Fastenings and Joints					
508. Snow Work					

FORM TO BE FILLED OUT UPON COMPLETION OF WORK

operation but, if well kept, they may, as was pointed out editorially in the ELECTRIC RAILWAY JOURNAL, June 11, 1921, page 1067, be the means of a decided money saving in the event of civil, regulatory or appraisal cases.

The "Authorization" or the "Authority for Expenditures" systems, if complete, in any accounting department show the actual expenditures on construction work or additions. The accompanying Form C 601, as used by the Connecticut Company, is typical. Also, when any work has been completed a properly designed form can be filled out and forwarded to the engineer under whose direction the work was done. A typical form of this type is shown as Form C 690.

The engineer in charge can then show the correct distribution of costs in the blank columns and return the form to the comptroller's office for final adjustment, and the form when complete reflects the exact cost of the job and can be filed for reference. Unit costs computed from such forms, with due allowance for market and local conditions, afford valuable data for making

EXPENDITURES UNDER APPROPRIATIONS.									
C 601		AUTHORIZATION No.		LOCATION					
		NAME		CHARACTER OF WORK					
DIVISION									
PROPERTY OF									
				AMOUNT AUTHORIZED, \$					
DATE APPROVED				ENGINEER IN CHARGE		SUPERINTENDENT			
Month	No. of Entry	NAME	PARTICULARS	AMOUNT	Eng. and Superintendence 501	Right of Way 502	Grading 504	Ballast 505	Ties 506

AUTHORIZATION No.											
		Amount	%	Supplemental	TOTAL Amount	%	Supplemental	TOTAL Amount	%	Supplemental	TOTAL Amount
Operating Expenses											
Additions and Betterments											
" " " C. R. & T. Co.											
TOTAL											
CLASSIFICATION						FINAL DISTRIBUTION					
		SUNDRIES		Operating Expenses						Balance Available	
		Amount	Account								

TYPICAL FORM USED TO AUTHORIZE EXPENDITURES. LOWER PORTION SHOWS THE REVERSE OF THE RIGHT HALF OF THE UPPER PORTION

estimates on contemplated projects of a similar character.

From such construction forms the material for the perpetual inventory is readily obtained by any of several methods. An extra clerk could be employed to write up what might be called the construction ledger. Another way would be to keep it on a card index basis.

A proper co-operation between the engineering and accounting departments would then obtain a perpetual inventory by a relatively simple extension to existing practice in each of the departments. The engineering office should be in possession of all maps, blueprints, mileage charts, detailed unit costs of construction and the accounting office should be in possession of all ledger figures, construction records and cost books.

In an article by E. A. W. in the *ELECTRIC RAILWAY JOURNAL* for May 14, 1921, page 893, it is suggested that the engineering office prepare all detailed estimates (without costs) and then forward them to the accounting office to be checked and compared with similar work and that the accounting office then should make up the cost data on the estimates from data in its files. The writer does not agree to this procedure, but thinks that the engineering office should compile the complete estimates and then submit them to the accounting office for checking and suggestions, after which they should be placed in final shape by the engineering office and referred to the executive officers of the company for approval.

#### A PERPETUAL INVENTORY CAN BE OBTAINED FROM EXISTING DEPARTMENTS

To return to the perpetual inventory, some have suggested that a separate department be created to handle the work. The writer does not agree with such a suggestion for several reasons:

1. Since there are a certain number of fundamental departments inherent in any railway organization and as the engineering and accounting departments are in this category, no special departments should be established whose functions conflict with or overlap those of properly functioning fundamental departments.

2. A separate inventory department would be compelled to call upon the engineering and accounting departments continually for data. It would be compelled to check its figures with the ledger accounts of the accounting department. These conditions would result in duplication, lost motion and inefficiency.

3. The accounting department has the necessary office equipment and clerical staff already in operation and any duplication of investment in such items would not be warranted, particularly as such a department would need to operate only a portion of the time.

4. If the accounting department is functioning properly any question of cost regarding any portion of the plant can be answered.

5. The men in such a department would not be in close touch with actual construction or cost conditions. The engineer and accountant, inherently, are in positions where intimate relations with the job are maintained.

The perpetual inventory can be easily obtained by properly co-ordinating existing departments in a railway organization and, in view of its usefulness, should be a feature of all railway accounting systems. The costs involved in its maintenance are of little magnitude compared to the present and potential economies made possible by having it available.

## Signal System for Expediting the Starting of Trains

**T**O EXPEDITE the starting of trains a new system of communication has just been placed in operation at the Long Island Railroad's Flatbush Avenue Station in Brooklyn.

By the installation of an electrically controlled mechanism provision has been made for prompt communication between the gatemen on both upper and lower levels and train conductors. This is accomplished by means of boxes located on each platform, called "conductor's stations," which are equipped with "communicating buttons" and colored signal lights, connecting with similar apparatus found at train gates and in the signal tower.

The new system operates as follows: Ten minutes before a train is scheduled to leave, or as soon as it is ready for occupancy, the conductor goes to the "conductor's station" nearest the head end of the train, opens the locked box, then presses buttons which flash a white light at the gates on the upper and lower levels of the terminal, thereby notifying gatemen that the train is ready to receive passengers and indicating that the gates may be opened.

One minute before leaving time the gatemen at the upper and lower levels press a button on the gatepost which illuminates red lights at the "conductor's station." The conductor then pulls out the buttons under these red lights, which indicates to the gatemen that their signals had been received, and immediately thereafter the conductor pushes in a button that indicates to the towerman at "F. T." tower (which tower controls all train movements in and out of the Flatbush Avenue Terminal) that the train is ready to proceed. The towerman acknowledges this information by pushing a button which illuminates a green light at the "conductor's station," whereupon the conductor pulls out the button under the green light, closes and locks the "station" and, after ascertaining that all passengers are loaded, gives the motorman the signal to proceed.

In order to take care of the passengers using the gate on the subway level, as well as those using the entrances on the upper and lower levels, three "communicating buttons" have been installed on the south side of Platform No. 1. This "conductor's station" is operated in the same manner as the "stations" on other platforms, with the exception that communication is effected with three gatemen instead of two.

The railroad management expects that this new system will greatly facilitate the handling of passenger trains at the Flatbush Avenue Terminal.

## Lighting London Subway Connections

**A**N INTERESTING development in the lighting of subways is to be seen at the Charing Cross underground station in London, where the great increase in traffic during the last few years has necessitated the addition of several new passages, connecting the underground and the various tube railways. The lighting is effected by small lamps placed in recesses in the side walls.

The border of the recesses carrying the lamps is extended somewhat so as completely to screen the filament from the view of the passengers. The light is well diffused by the surrounding white walls of the passage and the method of screening the filaments seems to have a distinct advantage for this class of work.

## Baltimore's New Type Safety Cars

Wider Door Opening, Special Seating Arrangement and Wider Aisle Than Standard Safety Cars Are Some Features That Give Very Satisfactory Results

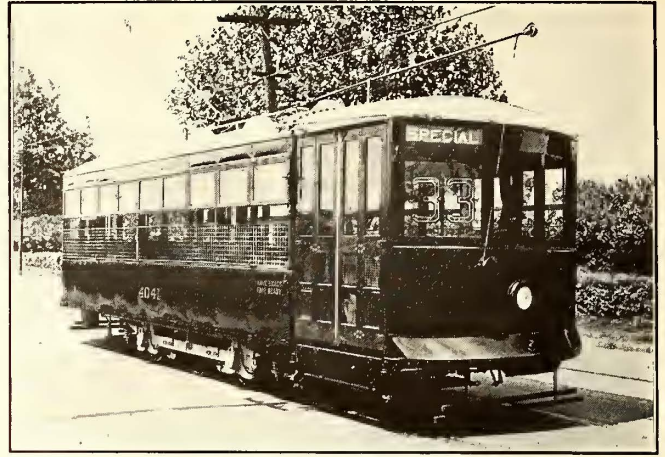
BY L. H. PALMER

Assistant to President, United Railways & Electric Company, Baltimore, Md.

**B**RIEF mention was made in the *ELECTRIC RAILWAY JOURNAL* for May 7, 1921, page 881, of the purchase of ten one-man cars by the United Railways & Electric Company of Baltimore, and the issue for July 31, 1920, described the initial operation of thirty-three so-called standard one-man cars on one of the company's heavy transfer lines. These latter cars have been in service since July 1, 1920. After these cars had been in operation a short time it was found that, due to the heavy riding and particularly to the heavy interchange of passengers (because this line intersects most of the main trunk lines of the system and acts as a belt line), the movement of the cars was delayed because of the single narrow door which permitted only one passenger to alight from or board the car at a time. One of the principal criticisms of the public in connection with the use of these cars was caused by this feature. The fact that passengers tended to congregate around the front door aggravated the situation. This latter was due to the fact that in many cases the passengers were riding only a few blocks, owing to the character of the route traffic.

As a result of these conditions and the continued study of the problem by the company's engineers when it was decided to purchase additional equipment for another line, in the early part of 1921, it was determined that we would go to a car having a wider door opening which would permit of separate exit and entrance. Specifications were accordingly drawn up with this idea in view, and the new car embodied these improved passenger interchange facilities. By reference to the floor plan and photographs shown in accompanying illustrations a clearer understanding of the changes in the design of this car from the so-called standard will be obtained.

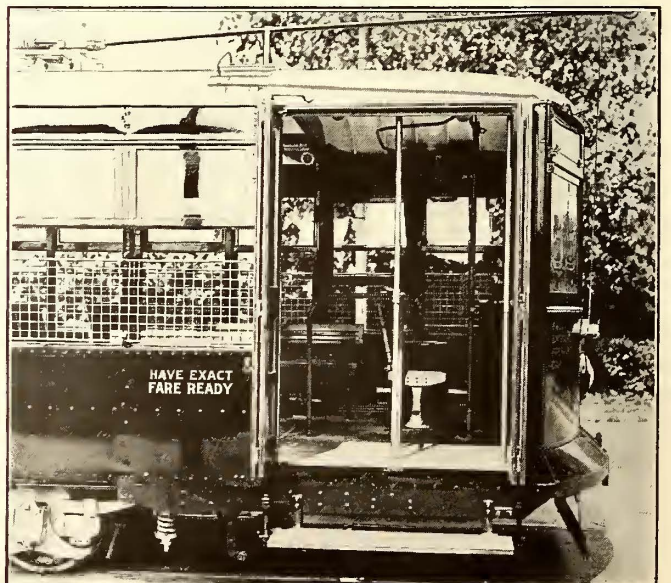
In addition to the wider door opening, a change in the arrangement of seats at each end of the car to give more standing room was worked out. In order



DOUBLE-ENTRANCE SAFETY CAR IN SERVICE

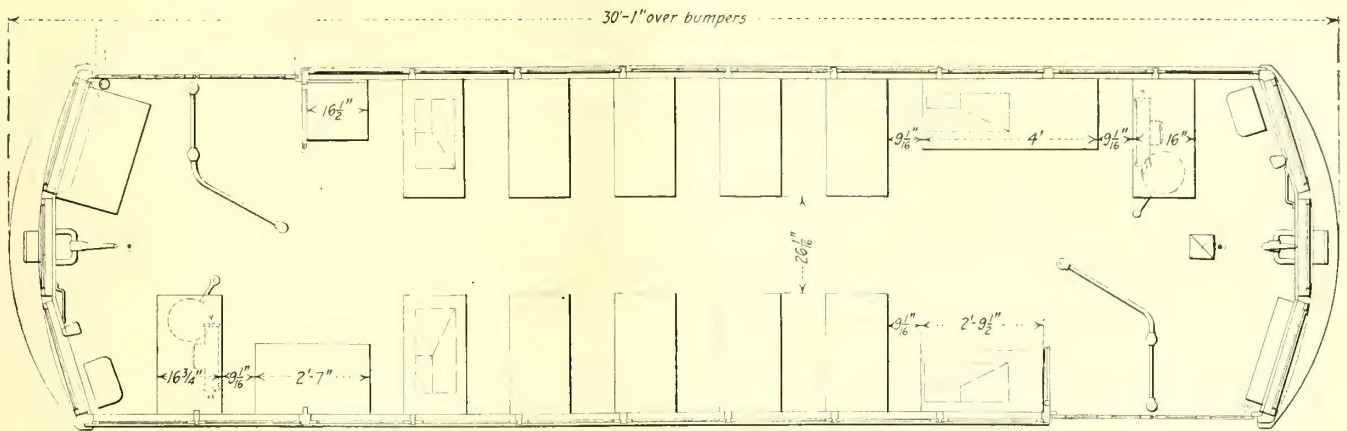
that the transverse seats might be kept opposite each other, and in order to obtain the maximum seating capacity, the longitudinal seats at the ends of the car body are not of the same length, but so far it is found that the somewhat shorter well at the No. 2 end of the car works out almost as satisfactorily as the longer one at the No. 1 end. The car is 4 in. wider than the standard car and this additional width has gone into the aisle, which is another feature that has greatly facilitated the better movement of passengers and contributed to their comfort. The present car is 30 ft. 1 in. long, that is 24½-in. longer over bumpers than the older design, and seats thirty-three passengers as compared with thirty-two on the other car.

Appreciating the desirability of maintaining the principle of standardization as much as possible, in practically all respects except those relating to facilities for passenger interchange, the design of the standard safety car has been retained, but the improvements referred to and which are clearly indicated on the floor plan and photographs shown herein have materially increased the efficiency and effectiveness of this type of car, and the results of practically a month's operation have entirely satisfied the company that the present design is an improvement over the old one, and that the arguments which have been advanced in connection with recent discussion and correspondence



AT LEFT, THE WIDE AISLE GIVES FREE MOVEMENT OF PASSENGERS. AT RIGHT, DOOR AND STEP ARRANGEMENT





FLOOR PLAN OF BALTIMORE ONE-MAN CAR

in the technical press on this subject are entirely justified. With the changes outlined, moreover, the increase in weight of the car, as shown on our own scales, is but 450 lb. the new car weighing 17,350 lb. as compared with 16,900 lb. for the older type.

The cars are equipped with Westinghouse DH-16 compressors and S-12 governors, and two Westinghouse 508 motors with K-63 double-end control. Peacock style G hand brakes were used. The brakes on the old cars were not efficient and had to be redesigned, and the experience gained in this regard was used in installing an adequate hand brake on the new cars, with rod connections from the brake staff to the brake beams, instead of cables. The Brill standard safety car trucks 79—E1 with friction bearing were used.

These cars were put in operation on the Fremont Avenue line the first of August, displacing ten of the older type, and are operating in daily service with the remainder of the older cars. Results to date have been exceedingly satisfactory, and have fully justified the decision to redesign and improve the so-called standard car, for service in Baltimore.

During periods of light riding, there is little difference between the operation of the two types of front-entrance one-man cars, but when riding is heavy, particularly during the morning and evening rush periods, the superiority of the newer type with wider door opening over narrow-door design is very evident.

A recent series of observations made with a stop watch, between the two types of cars during the rush hours, at points where heavy loading both on and off the car took place, shows that the new type of car has reduced the average seconds per stop 20 per cent, namely, from twenty-two seconds to seventeen and one-half seconds, and the average seconds stop per passenger 17 per cent from 1.8 second to one and one-half seconds per passenger. We anticipate that still more favorable results will ensue as the public becomes more familiar with the new equipment. There is naturally some lack of most efficient use because more than half of the cars in service are of the older type, and there is some hesitation and confusion on the part of passengers in availing themselves simultaneously of the entrance and exit facilities. This is gradually improving and we feel that were the whole line equipped with the new design, a still better showing would be made. The figures given are for an average of twenty-one stops for each type of car, taken at the same points and during the same rush periods.

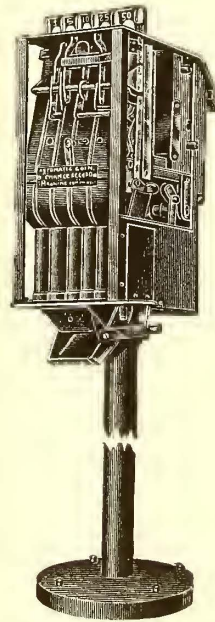
No difficulties have arisen in the collection of fares,

and our observations indicate that this is controlled as well as on the older type. When the doors are opened, the operator asks passengers to board by the right hand step, and this request is sufficient, so that there has been no increase in missed fares.

Altogether we feel that this new type is a logical development and is eminently satisfactory, and believe that where heavy traffic is to be handled, serious consideration should be given by railway managers to the purchase of front-entrance one-man cars, equipped with separate exit and entrance passageways.

### Fare Box That Makes Change

THE Automatic Coin Change & Record Machine Company, New York City, has developed a new type of fare box especially adapted for use on electric roads. This machine automatically collects and retains the stipulated amount required for fares, makes and delivers the correct change to passengers, sorts and stacks the coins received, records the number of persons paying, totals the amount of money received, records transfers received and rings a bell for every transaction. The machine is 15½ in. x 9½ in. x 7 in. in size and weighs 36 lb. It is arranged for convenient mounting on a pedestal, and can be detached so as to be carried from one end of a car to the other as required.



CHANGE ISSUING MACHINE

The top portion of the machine is occupied by a row of coin receptacles, each marked with conspicuous figures to indicate the value of the coin to be received. When a passenger places a coin in its receptacle, a small indicator is raised which shows the amount of change that is to be delivered to the passenger. The inserting of a coin unlocks the machine's mechanism and permits the operator to raise a lever. The initial movement of this lever closes the coin discharge box which is at the bottom of the machine. Further movement of the lever drops the coin received into its proper tube and discharges the coins to be given as change. The release of the lever opens the discharge box so

that the passenger can receive his change. If the fare is 7 cents and the passenger inserts a 50-cent piece into the machine, 7 cents is retained by the machine when the conductor raises the lever and 43 cents change is delivered to the passenger directly from the machine. The coins received are sorted and stacked in tubes, thus keeping each denomination by itself. At the same time the number of fares collected is recorded on one register, while the total amount of money collected is recorded on another. Should a passenger find it necessary to tender a bill for his fare, the machine issues change for \$1 by the operator pressing a small lever at the side. At the same time one fare is registered and a small indicator is raised showing the amount of change which is to be delivered. The discharge tubes for holding coins to be issued as change are separate from the receiving tubes, but the former can be replenished from the latter or otherwise as desired. The various tubes are arranged with a bottom slide, so that their entire contents can be dropped at one operation. The box is arranged so that it can be locked, making it impossible for any money which has once entered the machine to be handled by unauthorized persons. The machine can be set for any desired fare from 5 cents to 10 cents, by changing the penny slide. If the exact fare is deposited, of course no change is delivered, but the transaction is recorded in the usual manner.

**A TRANSFER REGISTER FOR INCOMING PASSENGERS  
FORMS A PART OF THIS MACHINE**

In addition to the fare collection and change-making mechanism, the machine is provided with a transfer register for incoming transfers and a record box which holds a roll of paper printed to cover the different items on which the railway company wishes a report from the conductor. An accompanying illustration shows a section of one of the printed rolls. Of course, the report may be changed to suit any condition as desired by the

CAR NO	ROUTE NO	RUN NO	CONDUCTOR	BADGE NO	MOTORMAN	BADGE NO
DATE	START TIME	END TIME	FARES	CASH	Tf + Tr	REVENUE
PASSES	READING	CAR NO	ROUTE NO	RUN NO	CONDUCTOR	BADGE NO
MOTORMAN	BADGE NO	DATE	START TIME	END TIME	FARES	CASH
Tf + Tr	REVENUE	PASSES	READING			

PRINTED RECORD FOR CONDUCTOR

railway company. In making out his report, the conductor enters the various items as designated, closes the cover and turns the knob and the blank is then ready for the next record. The operating lever of the machine has a removable handle which can be retained by the operator in the event that it is necessary for him to leave the car.

Some of the advantages claimed for the machine are, that the passenger inserts his own coin, or coins, into the machine and receives his own change from the machine. The conductor does not touch the money in any manner whatsoever. The machine is absolutely locked and cannot be operated unless a fare is collected. As the coins are inserted in the machine, they are sorted and stacked in tubes according to denomination. The stacked coins can be taken directly from the tubes and dropped into coin wrappers ready for deposit in banks if desired.

In addition to being a time saver the fare box machine insures mechanical accuracy in making change and permits the conductor to attend to his other duties in a more efficient manner.

# Letter to the Editors

## Discussion on Association Reorganization

FOUR COMMUNICATIONS discussing the recommendations with reference to the reorganization of the American Electric Railway Association and its affiliated associations were published in last week's issue. The communication given below is likewise directed toward this same subject. The columns of the ELECTRIC RAILWAY JOURNAL will be open to its readers for the discussion on these points in the other three issues which will precede the convention.

THE CONNECTICUT COMPANY

NEW HAVEN, CONN., Sept. 6, 1921.

To the Editors:

Answering your request to comment upon the report of the reorganization committee, I am sure I don't know what to say other than what I have said so many times before.

The original group that organized the association provided the most excellent medium for the exchange of information and discussion of policy throughout the electric railway fraternity of the country. The by-laws as originated by that group and amended from time to time have in general been sufficient for the guidance of the activities of the association, but I think all of us who have had anything to do with the workings of the association for the past few years have felt that the affairs of the association and the electric railroad interests of the country have outgrown the prescribed limits of the association and its duties and activities as defined by the by-laws.

Of course, the last few years have very materially changed all the standards as to policy and operating methods of the electric railroads and likewise have brought about the great changes in the work which the association should do to be of great value to the industry. This naturally brought about a real need for an entire revision of the machinery of the association.

It seems to me that the reorganization committee has done an exceptionally good job, and while there may be reasons for not heartily approving this, that or the other proposal as presented, the general result is most excellent and I believe that the final recommendations as coming from the executive committee should receive the hearty approval of all concerned.

Personally I think it would be better if the original recommendation of the committee is adopted relative to the relation of past-presidents to the executive committee. I have heard criticism of the requirement for a fixed date for executive committee meetings, but I think this is one of the most desirable of the features presented as the association needs the constant attention and guidance of those individuals in the industry who are actively engaged in the promotion of the industry itself.

I sincerely trust there will be no material modification from the proposal as presented to the convention.

You see that I can say nothing whatever that will be of any help in the real discussion of the issues, I am so thoroughly convinced of the necessity for making the changes and the desirability of adopting the plan as presented by the committee and approved by the executive committee.

L. S. STORRS, President.

# Transit Tendencies in New York City\*

By **LEROY T. HARKNESS**  
Member of the New York Transit Commission

**T**HE New York City transit situation, with its many, varied and complicated problems, presents, in perhaps the extreme form, the crying need for the adoption and application of public utility policies that are in full accord with changed conditions.

Transit has long been a political football, and that condition will continue while old sores remain and there is continual friction between the traction companies and the public. The attempt is now being made in New York City to develop a comprehensive and thorough-going plan of readjustment that will remove the old sores and causes of friction and permit transit to be viewed in its true light as an economic proposition.

The general features of the New York situation are well known. Systems of transit lines aggregating 1,800 miles in single track mileage, with outstanding securities approximating at par a billion dollars, are either in or on the verge of receiverships. In other parts of the country the financial difficulties of traction companies growing out of the World War have been met partially or completely and in general the situations are not acute. In New York City no relief has been obtained by the transit companies except through a cutting down of the number of free transfer points largely through the separation of lines under receiverships.

In addition to the inflation produced by the World War, the New York conditions are exceptional because of the element of a tremendous suddenly added competition due to carrying out the 1913 program, which involved the more than doubling of the rapid transit lines within a period of five years. Through the abolition of free transfers a large part of the public is paying an increased fare and the congestion is becoming progressively worse. On most of the lines conditions in the rush hours are a physical and moral menace.

The condition of the companies as viewed by the investing public may perhaps most readily be shown by contrasting the market prices of certain securities in 1917 and 1921, which is done in the following table:

The author first briefly recounts a history of the development of the electric railways in New York City and the conditions which brought about the depressed financial condition of these properties. He then outlines the purpose and powers of the present Transit Commission. In conclusion he says: "In meeting the governmental problems resulting from or brought to a focus by the World War, there is needed proper statesmanship that will not confine itself to measures of repression but will consider it its main and most important duty to search out and to relieve the underlying causes of public dissatisfaction and unrest. The situation of electric traction throughout the country furnishes not only the most immediate but also one of the biggest instances of the opportunity for the exercise of such statesmanship."

The question naturally occurs: If most of the cities in the country have relieved their traction situations by increases in fares, why has not New York City done so? To those who have examined the situation superficially a sufficient answer has been found in the hostility of the city administration. The city administration has been vigorously and bitterly opposing an increased fare. It has done nothing to relieve the situation except in so far as minor and isolated bus operation has served a few thousand people and a few localities. But the city administration would not have persisted in this course, nor would it have been sustained by public opinion, if the differences and difficulties had not gone far deeper than a mere matter of an increased rate of fare. The scandals connected with traction reorganization and speculation have probably been more flagrant in New York than in any other city in the country. The traffic congestion and poor service have been such as to cause real suffering. The past intolerance of public opinion on the part of railroad operators and their interference in politics and legislation have not been forgotten. This is the background of the transit fight in New York City, and because of it a very large part of the community has looked upon the company requests for rate increases with suspicion and considered them as attempts again to exploit the public for speculative and stock-jobbing purposes. It is this very strong feeling that the municipal administration has shrewdly appealed to, and its strength is perhaps indicated by the fact that in the pending municipal campaign the opposition parties are endeavoring to avoid the traction issue by also declaring for a continuance of the 5-cent fare.

The unfortunate part of the entire situation is that with traction in an admittedly deplorable condition and growing progressively more incapable of meeting the public needs, the local authorities have followed a drifting policy, have been guided by expediency and not principle, and have offered no real solution. What has been lost sight of is the fact that, even admitting all the alleged misdeeds of the past, transit in a city like New York is absolutely vital

to the well-being of the community. It must be put upon a basis where adequate service can and will be provided. If the difficulty lies in the present character of the relationship of the companies to the public and the city, and in existing organization and financing, necessary changes must be made to put the companies in a position where they can meet the public needs. The policy of mere obstruction in the long run must prove disastrous to the city, to the public and to the investors alike.

It is this critical situation that led to the transit legislation of this year, which will later be considered at some length.

Properly to appreciate the real issues and the special problems to be solved it is necessary to go back and briefly outline the development of transit in New York and note the underlying causes of the present antagonisms.

## GENERAL OUTLINE OF NEW YORK TRANSIT HISTORY

In the earliest days New York transit companies were directly chartered by special statutes. Some surface lines are still being operated under old steam railroad charters. Other lines are successors in ownership to old-time plank-road companies. In the main, however, the present surface lines grew out of the old horse-car companies that were developed during the period prior to 1890. The old horse car lines were projected during the times when the city was rapidly growing and, therefore, were in the main consistently profitable. Naturally, at that time, their value as an aid in the general development was appreciated and there was little or no objection to their perpetual franchises and the lack of financial returns directly to the city. Unfortunately, in certain instances—notably the so-called "Jake" Sharp franchise for the Broadway line—there was flagrant corruption and bribery and the public has since been led to believe that this condition was far more prevalent than it really was.

From 1865 to 1890 was the main period of elevated railroad development during which the Manhattan Elevated System and the Brooklyn Union and Kings County Elevated Systems were constructed. In the first stage of this development—prior to 1875—the franchises were granted by special acts of the legislature, and afterward by separate commissions appointed under the rapid transit act of 1875. Here too, of course, the lines were privately-owned under perpetual franchises with practically an entire absence of provision for public control.

In 1875 an amendment to the state constitution was adopted which prohibited private or local bills granting railroad rights.

This stopped the evil of special legislative railroad grants. The attaching, by the municipalities, of conditions as to rates of fare in giving their consent has furnished an important element in the situation and presented the question whether the legislature under the reserved police power can over-ride the action of a municipality in attaching a

### BONDS

	1917		January 1921	
	H.	L.	Bid	Acked
N. Y. Railways, Refg. 4's	76½	54	18	20½
N. Y. Railways, Adj. 5's	60½	22½	3½	3½
Third Avenue, Refg. 4's	82½	65	40½	41½
Third Avenue, Adj. 5's	81	38	25	25½
I. R. T. Refg. 5's	99½	76½	49	49½
Bklyn. Union El. 1st 5's	101½	88½	57	58
Manhattan Consol. 4's	94½	81½	53	56½

### STOCKS

I. R. T. Consol.	17½	5½	4½	4½
I. R. T. Refg.	72½	39½	11½	11½
Third Avenue.	67½	17½	13½	14
Manhattan El.	132	115	48	49
B. R. T.	82	36	9½	10

\*Abstract of a paper read before the Public Utilities Section of the American Bar Association, Cincinnati, Ohio, Aug. 30, 1921.

fare limitation in its consent. It is on this question that the fare litigation of the past few years has largely turned. (*Matter of Quinby vs. Public Service Commission*, 223 N. Y. 244; *Matter of International Railway Co. vs. Public Service Commission*, 226 N. Y. 474; *People ex rel. Garrison as Receiver vs. Nixon*, 229 N. Y. 63.) In the Garrison case the Court of Appeals in effect decided that the legislature had the power to alter rates of fare in franchises or consents granted prior to 1875 and subsequent to 1907 (the date of the enactment of the public service commissions law) but left open the question as to the power of the legislature over the fare limitations in municipal consents granted between 1875 and 1907. Recently the Appellate Division of the Supreme Court in the First Department has sustained the validity of the transit legislation of 1921 which expressly gives the commissions power to raise rates despite provisions in local consents (*City of New York vs. McAneny*, decided July 1, 1921).

The decade from 1890 to 1900 marked in New York as in other parts of the country the development of electric traction. The prospects for its success were exceedingly bright but unfortunately it was in great part financed on a highly speculative basis and was attended with the then common practice of stock watering.

Looking back over this period we see that it was the time of company exploitation. The grants were all perpetual, in most cases without provision for any payment to the city and without control by the municipality over construction or operation.

The construction of the elevated railroads failed to keep pace with the growth of the city and the construction of additional lines was constantly agitated, finally resulting in the passage of the Rapid Transit Act of 1891. This act provided that the Rapid Transit Board could lay out routes without reference to whether they were connections or extensions of existing lines, and, after obtaining the necessary constitutional consents, should offer the franchise for sale at public auction. Acting under the broad powers conferred upon it by this act the new board promptly adopted a route and general plan for an underground railroad under Broadway with elevated extensions in the northern part of the city, but the franchise when offered for sale at public auction failed to elicit a satisfactory bid.

Then came the then revolutionary proposal that the city should build and own the new roads and lease them for terms of years to operating companies. The Rapid Transit Act was so amended in 1894 and the Rapid Transit Board promptly proceeded to take the necessary steps preliminary to making a contract, but the difficulties to be overcome were so many and so great that it was not until Feb. 21, 1900, that the board was in a position to enter into the first contract. It then contracted on behalf of the city with John B. McDonald (Con-

tract No. 1) to construct, equip and operate the so-called Manhattan-Bronx Rapid Transit Railroad. The construction price was \$35,000,000 with certain additions for real estate and terminals. The contractor was obligated to furnish the equipment. The lease was for fifty years with a twenty-five-year renewal. The rental was the minimum permitted by the act—interest on bonds issued by the city for construction plus 1 per cent.

When this work was well under way the Rapid Transit Board also let, in 1902, to interests affiliated with Mr. McDonald, the contract (Contract No. 2) for the construction, equipment and operation of the so-called Brooklyn-Manhattan Rapid Transit Railroad, being an extension of the first subway to Brooklyn. The rental provision in this later contract was substantially the same, but the original lease term was shortened from fifty years to thirty-five years.

Realizing that the construction of the first subways was but a beginning and that extensive additional lines were necessary to keep up with the increase in traffic, the Rapid Transit Board, as soon as the first contracts were placed, proceeded with plans for new subways and continued negotiations for leasing them. As a result, it was finally possible in 1913 to enter into what are known as the Dual Subway Contracts, which involved a joint city and company expenditure estimated at that time at \$335,000,000 and which, by reason of increased war costs, has gone well over the \$400,000,000 mark.

In these contracts the companies would not agree to rental provisions similar to those in the first contracts. Looking at the situation from their standpoint, however, it must be said that there was justification for their insistence upon having a prior lien on the earnings. The Dual Subway plan involved the more than doubling within a period of five years of rapid transit lines in the city at a cost then estimated at about \$335,000,000. This unparalleled expansion was necessary for the well-being of the city and for that reason it was thought that the city could afford to enter upon it even in the face of inevitable deficits during the early years of operation. On the other hand private capital had to look at the matter solely from a hard-headed dollar-and-cents point of view and could hardly be expected to enter upon the project unless its returns were amply safeguarded and it was protected from deficits almost from the start.

Under the new plan the city's returns were subordinated to the companies earning their existing income and 6 per cent upon the new money provided by them. The situation was somewhat akin to the city's taking a second mortgage. The various estimates used in forecasting financial results were all dependent upon certain assumptions as to increase of population, ratios of operating expenses and the like which were bound to be more or less colored by one's point of view. Even the most favorable estimates indicated that the

city would have to bear deficits for a number of years to come and therefore be subjected to the experience of raising amounts to pay these operating deficits either from its tax levy or through some refunding operations. The allowance to the companies as part of their preferential payments of their then existing profits,—\$3,178,000 a year in the case of the Interborough and \$1,500,000 in the case of the B. R. T.,—placed a heavy burden upon these roads, representing as it did the extraordinary profits swollen by the intense traffic congestion of the two years ending June 30, 1911. Naturally, as new lines were placed in operation they would relieve this congestion and thereby cut down, if they did not for a time destroy, these profits, but, unless the right of recapture were exercised, the new lines would have to bear this burden for half a century.

The foregoing very generally outlines the history of the development of transit in New York City. One tendency is very plain: municipal ownership is not a new thing in New York but represents a settled policy long in effect and steadily growing in popular favor and importance since its original adoption in 1894. From it flows two results that are setting in train tendencies that even now point rather definitely to certain conclusions. In the first place, the city in 1894 in effect decided to go into the railroad business and has already put into operation two great transit programs—the subway expansions of 1900-1902 and 1913—with a city investment of over \$250,000,000. As a railroad owner the city cannot stand still. It must not only continue to expand its own lines but the logic of events points to its also increasing and already dominant position in the transit field by swallowing private lines. In the second place, the city must take steps to protect its investment under the 1913 contracts and set up a new kind of participation that will insure its receiving a proper return so as to relieve its tax budget and also to provide funds for further subway extensions.

#### UNDERLYING CAUSES OF ANTAGONISM

Bad service is, of course, a continual irritant. But back of that there is in the mind of the public the remembrance of past transactions. To appreciate the public point of view and the difficulty that always besets any attempt to consider transit problems on their merits it will be helpful to consider a few of the more notable grounds of controversy.

In the early days there was flagrant corruption in obtaining some of the franchises and the "Jake" Sharp manipulation of the Broadway surface line is the example most often referred to. The Metropolitan Street Railway financing, too, has left bitter memories in its wake.

In 1902 when the subway work was well under way the Interborough Rapid Transit Company, to which Mr. McDonald had assigned the operating rights under Contracts 1 and 2, leased in per-

petuity the Manhattan Elevated System under a lease which provided that the lessee should pay the interest on approximately \$45,000,000 of the lessor's bonds and pay 7 per cent per annum upon the \$60,000,000 of the lessor's capital stock, together with taxes which amount to over \$2,000,000 annually. This lease has been the subject of severe public criticism, especially during this period of increased costs when the operation of the combined elevated and subway system was burdened with paying what were in effect 7 per cent dividends to the Manhattan stockholders, while the net receipts from operation were so low as to threaten a receivership at almost any time.

The Manhattan Company also carried a heritage of public antagonism because of its past collisions with the public. One of the bitterest of these fights was the one for the reduction of the fare from 10 to 5 cents, which was finally forced by the enactment of Chapter 743 of the Laws of 1894.

Soon after the building of the first subways came the Interborough-Metropolitan combination. The competition between the Interborough Company's subway and elevated systems and the Metropolitan Street Railway's system reached the point where it was possible for certain financial interests to force a combination. There was, therefore, organized a holding company first known as Interborough-Metropolitan Company, which held practically all the stock of the Interborough Rapid Transit Company and of the Metropolitan Street Railway Company. This was most unfortunate for rapid transit, because, aside from the throttling of competition through combination it largely turned the control of the Interborough properties over to those interested in the street surface lines and thereby prevented the city's operator from considering the matter of rapid transit development solely from the standpoint of a rapid transit operator.

This also gave ground for public resentment because, without the city having any say in the matter, the city railroad, upon which approximately \$50,000,000 of public money had been spent, was made one of the main points in a financial maneuver that was actuated primarily to throttle competition and raise the market value of the various securities.

During the period from 1890 to 1900 there also took place the consolidation in one form or another of the surface and elevated lines in Brooklyn to form the Brooklyn Rapid Transit System. The scandals connected with the Metropolitan Street Railway combination fortunately were not duplicated, but in some of the companies there undoubtedly was considerable water and the consolidation was attended with a burst of speculation, B. R. T. stock at one time being forced up to around 130.

Another matter, perhaps small in comparison but affecting a class of the community least able to bear a loss—the tort creditors—was the corruption

of juries in accident cases. It is greatly to the credit of the present heads of the companies that in this respect they themselves cleaned house and did it with ability and thoroughness.

At the time the Dual Subway contracts were entered into there was, of course, no thought that shortly more than a year later a world war would break out. The prospective burden upon the city in carrying its investment was serious enough under normal conditions, but the effect of increased costs due to the war has completely altered the situation. The city has not yet received interest and amortization charges on its new investment. Even with preferential rights the Contract No. 3 company deficit now amounts to over \$25,000,000 and the Contract No. 4 company deficit, to over \$10,000,000. The extent of the city's burden is indicated by the fact that in its annual budget it is now including an amount approximating \$10,000,000 to meet interest and sinking fund deficits on the rapid transit account. Having in view the large cumulative company deficits (and under Contract No. 3 the deficits are cumulative at compound interest), which must be wiped out before the city receives its fixed charges, it is probable that if the contracts are permitted to continue as at present the city will never receive any return under them. This not only subjects the tax budget to this enormous drain but also operates as a bar to needed further subway expansion because, until it is in receipt of sufficient current funds to carry the annual charges on this investment, the city cannot exempt equivalent amounts from the debt limit and use them for any new work.

The declaration of large dividends by the Interborough Company and its attitude in respect to changes in its contracts with the city had had an important effect in preventing a readjustment. The 1913 estimates indicated a number of lean years, due to putting the new lines in operation and the attendant heavy interest burden. Then came the World War and the consequent certainty of inflation. These factors should have dictated extreme prudence and the husbanding of resources. In spite of this, however, the Interborough Company declared dividends of 20 per cent in 1915, 1916 and 1917, and 17½ per cent in 1918. When it felt the full effect of its interest burdens and war costs it applied to the city authorities for a modification of the subway contracts so as to provide for an increased rate of fare. The company, however, was averse to any other change in the city's interest. This had a most far-reaching effect on the working out of a solution of the transit problem. The public not unnaturally, in view of the fact that the company had so recently been declaring such unusually large dividends, was suspicious of its good faith and antagonized by the attitude of demanding something and conceding nothing.

Before considering possible measures of relief, it will be of assistance briefly to chart the underlying causes of the

present unsatisfactory relationship between the companies and the public and the city.

#### PUBLIC GRIEVANCES

1. Service has been bad and a considerable part of the public has undergone real inconveniences and sometimes actual suffering twice a day for six days a week. Many of the roads are in badly depreciated condition; for example, some still using rolling stock thirty years old.

2. The public believes, in view of the enormous traffic in New York City, that transit is or should be very profitable. (The unduly large dividends paid in recent years by the Interborough Company are taken as strong confirmation of this belief).

3. With this belief the only explanation that accounts to the public satisfaction for the bad service is that the companies are really making large profits but are concealing them through excessive rentals and capitalization and using these excesses again as a reason for cheapened service to pay returns on water.

4. The very unsatisfactory situation of the city's great investment in the subways.

These are grievances and in so far as they are justified in fact constitute, of course, valid objections to increased fares.

Beyond this, and one of the main grounds of public antagonism, is the past interference of public utility interests in politics. The public's idea of the influence now wielded by those interests is exaggerated, but the enmity resulting from past struggles is lasting.

#### COMPANY GRIEVANCES

On the private side the investors, too, have their grievances. The transit properties, even though impaired, represent investments running into the hundreds of millions and furnish an indispensable service to which we have become so accustomed that we take it largely as a matter of course, and without any adequate realization of the extent to which the well being of the community is founded upon it. The securities of the companies are widely distributed, generally in small holdings, and the public interests, as well as good morals, require the protection of proper bona-fide investment.

For the past few years all the companies have been hard hit by the same trouble that has affected every individual and business in the country—the decreased purchasing power of money. Operating expenses that before 1914 would run around 50 per cent of revenue have jumped to 85 or 90 per cent, or higher. As a result of this decrease in purchasing power, wages have had to be largely increased. The companies have, therefore, been in the position of having to meet the existing economic situation in paying bills, but have been unable (except partially in the case of abolition of or charges for transfers) to have that situation recognized in respect of payment to them for the

services they render. With business generally meeting such a situation by raising charges, holders of utility securities are aggrieved by the refusal to let them follow the same economic law even in cases where returns will not pay operating expenses to say nothing of interest on bonds.

There are two other subordinate but nevertheless important grievances of the transit companies: Street paving and maintenance charges and taxation.

The companies are required by law to pave and maintain the paving between the tracks and for a certain distance outside the tracks. They claim that while these charges may have been proper in days gone by when horse car operation did damage the pavement, they are not proper now when the electric-car operation does practically no damage and when the great wear and tear is occasioned by heavy trucking. The paving expenses for the year ending June 30, 1920, were:

B. R. T. Surface Lines . . . . .	\$449,308 35
New York Railways . . . . .	288,282 46
Third Avenue Railroad . . . . .	527,691 08
Total . . . . .	\$1,265,281 89

The burden of taxation has been steadily increasing. New York state and city taxes for the year ending June 30, 1920, were:

Interborough Rapid Transit System . . . . .	\$2,529,517 54
Brooklyn Rapid Transit System . . . . .	2,005,897 33
New York Railways System . . . . .	1,007,850 58
Third Avenue Railroad System . . . . .	756,019 43
Total . . . . .	\$6,299,279 88

A large part of this taxation is imposed through the special franchise taxes, the theory of which is that the companies should be required to pay taxes commensurate with the value of the rights granted by the public. However just such a tax may be in principle, the burden on transit operation is exceedingly heavy. Moreover the adoption of the principle of regulation as exemplified in the Public Service Commissions law has worked a change from the situation as it existed at the time the special franchise tax was first enacted. The better view is that the return to the public should be in service and not in taxation and that if the revenues become more than needed for adequate service, the proper remedy is a reduction in rates. At the present time as the subway properties are owned by the city, the Interborough and B. R. T. are substantially free from taxation in connection with the operation of city-owned properties, while the elevated and surface lines bear an increasingly heavy burden.

The public and private attitudes may, therefore, be summarized as follows:

*Public* : Dislike and distrust founded on

1. Bad service.
2. Belief in existence of excessive returns, rentals and capitalization.
3. Belief that rights and functions exercised by the companies are antagonistic to the public interest.

4. Unsatisfactory situation of the city's transit investment.

*Private*: Distrust and bitterness founded upon believed injustice

1. In not being allowed the same privilege as business generally of increasing rates to meet increased costs,

2. In unfair street paving and maintenance charges, and

3. In excessive taxation.

In working out any solution of the transit problem, these other elements must be considered.

The companies took franchises and contracts based on 5-cent fares with the expectation of large profits both from dividends and increases in the market value of securities. Most of the stocks were speculative to a high degree. The companies heretofore have insisted on the rigidity of the 5-cent fare—American urban traffic was based upon it, franchises had been granted and contracts let in reliance upon it and, therefore, it could not be disturbed. This, before the war, was the companies' position. They, however, have changed their base and see now, not profit but loss and possible disaster in a fixed rate of fare. In short, they ask that the underlying basis upon which they entered the transit field be changed from risk to protection, their securities from a speculative to a stabilized character. With such a radical change it would seem that they themselves should recognize the entire justice of requiring the readjustment of their engagements with the public as expressed in outstanding franchises and contracts to accord with the new base.

Furthermore, a readjustment necessarily involves the element of consolidation, for otherwise a flexible fare does not seem practicable. Relatively, the surface lines are much worse off than the rapid transit lines and, therefore, more in need of relief. But an increased fare on the surface lines alone would drive the greater part of their traffic to the rapid transit lines and leave them worse off than before. A similar raise of fare on the rapid transit lines would give them more than they need and, therefore, amount to overcharging the public using them.

In the case of the surface lines, and to a much lesser and possibly negligible extent in the case of the elevated lines, the projection of the lines was originally on a competitive basis. There are even now existing a multitude of companies that were engaged in the building of these lines. Gradually the lines were absorbed in large systems, especially during the period of electrification. Despite this absorption and the substitution of virtual monopoly for competition, there was little or no attempt to revamp the lines to accord with the changed conditions. Furthermore, in 1900-1902 and in 1913, the city placed under contract great subway systems that radically altered the transportation map. Again, there was no attempt to revamp the surface lines to meet the changed conditions and this suddenly added great competition. The reason for this, in most cases, of course,

is patent. The existing lines were covered by existing and generally blanket mortgages and the franchises and financial structure was too rigid readily to be changed. So that there is also involved the important element of revamping existing lines to meet present needs and conditions.

#### ELEMENTS OF A SOLUTION

This, then, in general was the situation and the "set-up" when the companies felt the full force of the increased prices growing out of the World War. In December, 1918, important companies of the Brooklyn Rapid Transit System went into the hands of a receiver, to be followed soon after by the New York Railways Company operating most of the surface lines in the Borough of Manhattan. The Interborough Company has only avoided a receivership with extreme difficulty. The efforts of the companies to secure increased rates of fare were bitterly fought in the legislature and the courts. The disintegration of the big B. R. T. and the New York Railways systems began and was continued by sluffing off through the receiverships of important lines. Service became progressively worse and public resentment increasingly bitter. This condition continued for over three years before a real effort was made constructively to meet the situation.

Early in this year's session of the legislature Governor Miller, in a special message, directly faced the issue and recommended the delegation and concentration of all the powers the legislature could grant to a commission to be composed of three members. This precipitated one of the bitterest political fights in years and the legislation was vigorously attacked on the ground that it violated the principles of home rule for municipalities and was a "fare grab." Of course, the bill did not raise any rate of fare but merely empowered the new commission to raise a rate if necessary and the home rule argument largely lost its force because of the utter failure of the local authorities to attempt any constructive measures of relief.

The legislation (Chapter 134 of the Laws of 1921 as amended), however, bears upon its face proof of the endeavor to reach down and remove the underlying difficulties and causes of antagonism. It provides for the commission preparing a plan of readjustment that will accomplish as nearly as may be the following three main purposes:

1. The combination, rehabilitation, improvement and extension of existing railroads so that the service thereon may be increased and improved to the fullest extent possible.
2. The receipt as soon as practicable by the city of sufficient returns from the operation of the railroads so that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempted in computing the debt incurring power of the city under the constitution of the state, and
3. The assuring to the people of the city the continued operation of the railroads at the present or lowest possible fares consistent with the just valuations of the railroads and their safe and economical operation.

To carry out such a plan of readjustment the commission is vested with the

broadest powers to vary rates (including the power to vary rates fixed in municipal consents and contracts), to revise existing contracts and to make new ones and to value and acquire railroad properties for and in the name of the city. Provision is made for submitting the plan and contracts to the local Board of Estimate and Apportionment, but if that board finally refuses to approve, the ultimate power to carry the plan into effect is vested in the commission.

An important and interesting feature of the legislation is that respecting valuation. This provision is:

In connection with the preparation of such plan the commission shall cause a valuation to be made of the property, other than franchise or going value, necessarily used in public service of the railroads it proposes to include therein. Such valuation shall be made with due regard to the estimated prospective earning capacity of the property necessarily used in the public service at the rate or rates of fare that the company prior to the taking effect of this act was entitled to charge in view of the provisions of the contract or franchise under which the property is operated or held or of any lawful order in force fixing or regulating rates of fare and of the competition of other lines and with due regard to all other pertinent facts and conditions; but such valuation shall not in any case exceed the fair reconstruction cost of the property less depreciation. Such valuation shall be in such detail and shall include such elements of cost or values and shall be made in such manner as the commission may prescribe. Such valuation as finally determined by the commission shall be the basis for all allowances to the railroad companies under the plan and for thereafter fixing the return on the property so valued, anything in this chapter to the contrary notwithstanding.

The theory of this provision is that in approaching this subject the point of view would be largely that of a banking house considering the purchase of a transit property. Its natural first question would be: "What will the property normally earn considering any franchise or charter limitations and any other incumbrances?" So, if under the plan it be decided to take over any given road, the normal earnings would first be considered and capitalized. The earnings would, of course, be upon the basis of the present fare engagements—almost universally 5 cents—but the returns would be estimated during a normal period—for example, averaged over the next ten years—for present conditions are abnormal and taking over roads on present earnings would amount to virtual confiscation. Against the figure thus obtained would be checked a figure obtained on some reproduction cost basis. It will be seen that these provisions are very general and much more indefinite than formulas usually applied in rate cases. This is necessarily so, first, because a rigid formula could not be adopted that would be sure to meet the widely varying circumstances and conditions of the many different lines and second because if it were attempted to handle this valuation in the same manner rate case valuations usually are handled years would elapse before the work would be completed.

The practical aspects of making these valuations offer many interesting features. It is not purposed to duplicate the usual "nut and bolt" inventory where everything in the minutest detail

has to be examined and counted. In general it should be possible to take the plans and records and compute quantities from them and check conditions by a field inspection. It is believed that in this way substantially the same results would be obtained without the usual large expenditure of time and money.

In a public letter dated Feb. 11, 1921, Governor Miller, in describing the purposes of the legislation recommended by him, outlined a possible plan of readjustment, as follows:

1. The value of the physical property used in the public service, without reference to present capitalization, should be determined. The data for such valuation of many of the lines must already be in the possession of the present commission. It should not take long to make a valuation of the others.

2. Eliminate all outstanding inter-company leases.

3. Retire outstanding securities, except such underlying liens as cannot readily be retired, for which provision looking to eventual payment must be made.

4. Vest in the city title to all lines not already owned by the city, free and clear of all incumbrances, except such underlying liens.

5. Make a lease to a new company, which shall provide for amortization of the determined valuation and for adequate reserves for depreciation, contingencies, and the like.

6. Mortgage such lease to an amount approved by the commission, and issue stocks and bonds not in excess of the valuations determined by the commission, in exchange for the securities retired.

7. To promote prompt reorganization and revamping of lines without assessing security holders, defer interest and dividends for one or two years, as might be determined by the commission, and at the end of such period prescribe a rate of fare sufficient to pay all charges provided for in the lease.

8. As an incentive to efficient management provision could be made for increased return on capital as fares are decreased, and a reduced return as they are increased.

9. Looking to the eventual transfer of general regulatory powers to the single state-wide public service commission, provision could be made for a board of control, on which the city and the company should have proper representation. The alternative to that would be representation by the city on the board of directors of the company. The board of control plan is probably preferable, and that board might well have the powers of the present Transit Construction Commission.

10. As all approved charges will adequately be provided for under the plan, the provisions of the dual contracts for preferential payments could be eliminated and such other changes made as will fit these contracts into the plan, and as may appear to be in the public interest.

11. Provision for the imperative and immediate needs of the city for further transit facilities should be made promptly.

To many a plan involving these fundamentals would seem extremely radical. The situation in New York City, however, is acute. Palliatives will not do. The case has gone beyond that and calls for surgery. So that the unusual scope and nature of the plan to be adopted must be considered in relation to the most unusual conditions that imperatively call for a remedy. Having set out at considerable length the general history of transit and some of the underlying difficulties and having indicated the fundamentals of a plan of readjustment, it should be helpful if in conclusion the endeavor is made very briefly to attempt to forecast the advantages that might be expected to flow from the adoption of such a plan.

#### ADVANTAGES TO THE CITY

*Ownership*—The city would get the ownership of the transit lines. They would be subject to a lease or leases,

but the value of the lines would be amortized by the earnings and at the end of the term the city would own the entire transit system free and clear. Furthermore, as time passes the city through the mounting up of the amortization funds could terminate the leases and acquire possession on increasingly easy terms.

*Division of Profits*—If it should be decided that the parties in interest should divide any surplus, instead of having it applied either to reduction in rates or improvement in service, the city's present investment would furnish ample consideration for the city insisting on a large—or possibly a predominant—percentage of the profits. On the basis of proper capitalization with preferential profits eliminated and with the main existing obstacles to fare readjustment removed, the transit system should be profitable and on the return of normal conditions, if that course should seem preferable, the city should receive substantial profits from its transit lines.

*Receipt of Fixed Charges on Subway Investment*—Through the revision of the dual contracts and the elimination of preferential profits, the city would get out of its present unsatisfactory position and would receive presently interest and sinking fund payments on its investment in the new subways. Expressing it in another way: If the city does not take advantage of this opportunity to adjust the situation it would have to continue to pay out of taxes about \$10,000,000 a year as interest and sinking fund payments on city bonds. Therefore, by this adjustment the city would insure the receipt of the fixed charges on its bonds.

*Exemption of City Bonds*—Such an arrangement would put the city bonds issued for transit purposes on a self-sustaining basis and permit of their exemption in computing the debt limit. This would increase the city's debt incurring capacity for transit improvements by more than \$200,000,000.

*Indirect Advantages*—Of perhaps less material return to the city directly, but very material to its citizens, would be the revamping and rehabilitation of the transit lines that is a necessary element of the readjustment. This would permit of the substitution of good service where it is bad and would not only substantially ease, if not eliminate, the existing dissatisfaction, but would be reflected in all the varied business and financial activities and social and living conditions affected by the character and extent of transit service. The results should be especially apparent in the increased value of real estate—the city's main source of revenue.

#### ADVANTAGE TO THE PRIVATE INVESTORS

While the profit making and speculative elements would be eliminated the real values in the transit properties should be protected and securities stabilized by the official valuation findings and a proper provision for secured returns. The big profit making and

speculative days have gone in transit in New York City and most investors realize that fact. A reasonable, assured return on a fair valuation seems to be the only basis on which the consolidated systems can permanently be financed.

Although it may be felt that with the transit companies under the present circumstances it is a case of "any port in a storm," nevertheless, considering such a readjustment from their standpoint broadly and fairly, it would not only give them a very good port but one in the long run better for their security holders than the pre-war one.

Nor are the immediate or proximate financial results of operation the only factors to be considered. Transit conditions on many of the lines are nothing short of disgraceful because of depreciation in structure and equipment and of cutting down of service, both to save expense. The roads and their equipment must be rehabilitated and adequate service must be restored. To do this new money in substantial amounts will be needed and more and better service must be given with consequently increased operating costs. Under the present circumstances the companies cannot meet these requirements. A continuance of present conditions, therefore, means a continuance of impaired service. That the public cannot be expected to submit to, especially if the companies are offered and refuse a fair plan of adjustment. The result would be that the companies would engage in intensified differences with the public, in which they would be bound to lose in the long run. Instead of this, under the plan proposed the main causes of friction would be removed; the companies would be assured of a fair return on actual values and their securities would be stabilized.

#### ADVANTAGES TO THE PUBLIC

It remains to consider such a readjustment from the standpoint of the third party in interest—the public as distinguished from the municipality. Taking up the public grievances as already listed:

1. *Bad Service*—The rehabilitation of lines and the modernization of equipment would physically fit the lines for giving proper and adequate service. The question of how intensively those facilities are operated would thus become a matter of the traffic available and the cost of operation with the determination of how much service is to be rendered in public control.

2. *Excessive Returns*—This fear on the part of the public should be disposed of by the determination of the real values of the transit properties and the elimination of "water" of every description.

3. *Antagonistic Rights*—A part of the community will probably never be satisfied with anything less than complete municipal operation. Generally, however, the elimination of perpetual franchises and other private rights and the restricting of the companies to the roles of lessees or operators should sat-

isfy any reasonable objection to present conditions.

4. The unsatisfactory situation with respect to the present city's transit investment would be remedied.

The transit situation, and especially the present public resentment, should be considered from a far broader viewpoint than that of merely a settlement of an increased fare question of local nature. The dissatisfaction and unrest caused by the present ownership and operation of public utilities is acute. The effect politically is apparent and political success often goes, not to the deserving, but to the one who can damn railroad interests the loudest. In meeting the governmental problems resulting from, or brought to a focus by, the World War, there is needed proper statesmanship that will not confine itself to measures of repression but will consider it its main and most important duty to search out and to relieve the underlying causes of public dissatisfaction and unrest. The situation of electric traction throughout the country furnishes not only the most immediate but also one of the biggest instances of the opportunity for the exercise of such statesmanship. On the one hand is involved the proper protection of an investment running into the billions in one of the country's major industries and, through protecting that industry by readjusting it to meet modern conditions and policies, to reduce or eliminate one of the most prolific and important causes of public dissatisfaction and unrest.

## Railway Accountants Discuss Commercial Power Customers

Delegates Enjoy Toledo Beach—Discuss Power Accounts and Methods for Computing Costs at Points of Delivery

THE forty-first meeting of the Central Electric Accountants' Association was held in Toledo, Ohio, Aug. 26 and 27, 1921. This meeting was one of unusual interest, there being an attendance of forty-eight, representing practically the entire railway membership of the association. Luncheon was served Friday, Aug. 26, at the Toledo Yacht Club, and all sessions were held at this club. The two papers were given by J. N. Hagan and F. E. Eaton, entitled "Power Costs and Method of Arriving at the Same at Point of Delivery" and "Handling of Light and Power Consumer Accounts" respectively.

In his paper Mr. Eaton, who is head bookkeeper of the Toledo Railways & Light Company, discussed briefly the method used for handling commercial customers by his company.

The operations essential to the handling of customers' accounts are classed in three divisions: (a) Origin of information, (b) record of information, (3) recapitulation. The customer's account is started on the books when he signs an application or contract for

service. This contract is now the authority for the issuance of work orders to the proper departments to give the customer his connection to the lines. The executed order is returned to the contract department, where complete information is transferred to the original application and is then turned over to the house card clerk, who records the necessary information.

The bookkeeper then takes the order and from it makes up the customer's ledger sheet, on which is recorded such information as name, address, meter number reading, etc. Also, the meter reader slip is sent to the meter reading department. These slips are bound together in covers provided for them and are routed according to districts in which the territory served is divided. These books contain an average of from 200 to 300 slips, covering streets and numbers running consecutively north and south or east and west. Following this the meters are read and the meter books are returned to the bookkeeping department to have the indexes recorded and bills made out.

At the completion of the billing for each period, which may be monthly, bi-monthly or tri-monthly, based on the number of consumers served, a recapitulation of the month's earnings or revenue is made on a form of stationery which shows classification of kind of current used, whether used for domestic or commercial purposes, and further classified as to whether the current is charged for at regular meter rates, contract or flat rate, readiness to serve, or minimum charges for services rendered. This recapitulation is added from the ledger or listing machines and the results checked and verified by comptometer, the totals of the distribution columns verifying the grand total. The recapitulation of the month's revenue from all divisions is then combined and reported to the auditing department and charged by them against the bookkeeping department.

Ledgers are bound bi-monthly, at the close of the billing period and at the close of the discount period. This divides the labor in finding balances and does not burden the bookkeeper unnecessarily, particularly during the billing period, as the balance taken at close of same is merely applying the cash received against arrears unpaid at the close of discount period.

In entering cash and charges on the merchandise ledgers, which are set up in the same rotation as the electric and gas consumers' ledgers, the flag system is used. After the sales and cash for each day are entered, a recapitulation is made of the previous balance, new entry and present balance at close of each day's business; in this manner taking daily balances of each clerk's work is a great help in preventing errors, which would be hard to locate in a balance of a month's business.

For taking care of complaints forms are provided on which requests for investigations and inspections are made. In order that errors in recording work orders be reduced to a minimum, a system is installed whereby all work orders



that have been entered on ledgers are checked by a competent employee, particularly to see that the meter constants and rates are recorded correctly. Consumers and extension deposits are kept in separate ledgers and are handled by one of the older employees in length of experience and service and are balanced monthly with the control as shown on the general ledgers of the auditing department. A card system and loose-leaf ledger sheets are used.

These operations and methods as outlined have given abundant satisfaction in accuracy and efficiency and any time are open to personal inspection, and any inquiries in regard to the same will be given prompt attention.

The paper by Mr. Hogan on power costs is abstracted elsewhere in this issue of the *ELECTRIC RAILWAY JOURNAL*.

The report of the Committee on Freight and Express Accounts was adopted on the basis of the steam railroad practice in the settlement of differences on monthly accounts, the minimum amount of settlement being 25 cents.

The Astray Freight Waybill authorized at the January meeting was reported by the committee as ready for the printer, and it will be put into operation at once. The committee was authorized to complete the form for an Interline Unit Waybill to be used by member lines.

It was decided that the next meeting of the association would be held at Indianapolis, Ind., on Jan. 27 and 28, 1922. One of the special features of this meeting was the attendance of the wives and families of the members. On Saturday some of the accountants and their families availed themselves of the invitation of the Community Traction Company and spent the day at Toledo Beach, where all had an enjoyable time and good things to eat.

The following were elected to membership in the association: J. F. Keller, auditor of freight and ticket accounts, Dayton & Troy Electric Railway, Tippecanoe City, Ohio; F. M. Kemp, assistant treasurer, Gary & Valparaiso Railway, Gary, Ind., and D. A. Moore, secretary and treasurer, Community Traction Company, Toledo, Ohio.

cluding the railway and commercial power substations. To obtain an exact division of the costs, each railway substation and transformer substation on the main transmission line should be considered as a separate load.

Inasmuch as the demand cost is fixed by the peak load on the system, it is necessary to determine the degree to which each substation is responsible for the peak load, or, in other words, the capacity of the power system. Off-hand, it would appear that the portion of the demand cost chargeable to each substation would be in the ratio of the load on that station to the total peak load on the system at the time of the system peak load. It will be seen that this is not the correct viewpoint, when it is pointed out that at the time of the peak load in a given year a large number of consumers may not be using any power. While it is true that certain consumers probably will have their peaks coincident with the system peak load each year, it is also true that a portion of the peak load will be made up of different consumers in succeeding years. If it were possible to obtain continuous load curves of every substation and of the power plant over a long period, the portion of the demand cost which each substation theoretically should bear could be calculated. Practically, this is not feasible.

The load curves of interurban power stations have characteristics different from those of the ordinary central station. During the hours of operation of the railway, the railway load is fairly constant. On ordinary weekdays a slight peak occurs during the morning and evening rush hours. However, on holidays, or when some local attraction results in passenger traffic above normal, the power plant may be called upon to supply a practically constant railway load, considerably higher than the weekday peak. The interurban railway peak load, therefore, may occur at any time during the day or evening and probably will vary in time in different years. It is apparent that a commercial load which occurs during any hour of the day or evening may coincide with the railway peak.

The peak load on a power plant or on any part of a system is always less than the sum of the peak loads of the constituent parts, due to a time difference between the peaks of the individual loads. This introduces a diversity factor which may be defined as the ratio of the sum of the consumers' demands to the peak demand on the system measured at the point of supply. Coming back to the question of determination of the division of demand cost between substations, it is reasonable to assume that the demand cost chargeable to each substation is proportional to the maximum demand of that substation, taking into account the diversity factor between the various loads. As an example, suppose that there are but two substations, "A" and "B." Suppose the maximum demand of substation "A" is 8,000 kw., that of "B" 6,000 kw., and that the maximum demand on the power station

## Power Costs at the Point of Delivery on Interurban Electric Railways\*

Power Costs Must Be Segregated When Commercial Consumers Are Supplied—Demand, Energy and Customer Costs Explained—Intelligent Rate Schedule Must Be Based on Accurate Power Cost Data

WHEN the majority of interurban electric railways were built but little consideration was given to the possibility of supplying commercial loads from the railway transmission systems. In most instances excess capacity was installed to permit of future expansion of the railway. Fixed charges and a large part of operating expenses, relating to the existing power system, were not increased by the addition of small commercial loads. In many cases the railway managements considered that the only increased expense would be in the coal bill, which at that time was a relatively small item. Based on this hypothesis, very low rates were made to attract as much commercial business as possible.

At this time a majority of interurban railways are carrying commercial power and lighting loads amounting to between 10 per cent and 30 per cent of the entire output. Due to increase in both railway and commercial loads, many power plants have been enlarged. The increasing importance of accurately determining the cost of power at the point of delivery is obvious.

The cost of supplying electric energy to consumers is made up of three elements, namely: (1) That portion of the total expenses fixed by the maximum demand on the system, which is often termed "Demand Cost"; (2) that portion of the total expenses which is proportional to the energy used, called

the "Energy Cost," and (3) that portion of the total expense which is nearly proportional to the number of customers served, which may be called the "Customer Cost." It is evident, therefore, that there is no single unit of measurement which will accurately define power costs, as we think of the cost of an ordinary commodity. Obviously, since there are two cost factors in addition to that proportional to the actual energy used by any customer, the time-worn phrase, "Cost per kilowatt-hour," does not express the cost of supplying a particular consumer, but rather it expresses the average cost of supplying a kilowatt-hour to the average consumer on the entire system. If the load curves of all consumers were exactly similar, with peak loads occurring at the same time of day and year, then "Cost per kilowatt-hour" would be a true measure of the cost of supplying power. However, fortunately for all concerned, the peak loads of all consumers do not occur at the same time. Further, the ratio of maximum demand to average demand or load factor is different for the several consumers or classes of consumers.

### NECESSARY TO SEPARATE COSTS

In the problem of the interurban railway it is necessary first to arrive at the division of demand, energy and consumers' costs for that portion of the installation used jointly by railway and commercial loads. This includes the costs incident to the power plant and main transmission system, but not in-

\*Abstract of article by J. S. Hagan, Westinghouse Electric & Manufacturing Company, before Central Electric Railway Accountants' Association, Toledo, Ohio, Aug. 26, 1921.

is 10,000 kw. The diversity factor of the substation loads is then

$$\frac{8,000 + 6,000}{10,000} = 1.4$$

Substation "A" should be charged with

$$\text{the demand cost of } \frac{8,000}{1.4} = 5,710 \text{ kw.}$$

$$\text{and substation "B" } \frac{6,000}{1.4} = 4,290 \text{ kw.}$$

In calculating this division of the central station demand cost, the maximum demand of each railway and commercial substation should include power plant, transformer and line losses, which can be calculated approximately. Neglecting power factor, line losses of a transmission system at any instant are not proportional to the power delivered, but to the square of the power delivered. In practice it is impossible to determine with exactness the line loss properly chargeable to each consumer. In so far as the main transmission line, used jointly by railway and commercial power, is concerned, it is usually sufficient to assume that the total line loss is divided in proportion to the energy consumption of the various substations.

The power demand of each substation can be obtained by the use of maximum demand meters. The demand of large commercial power substations serving a diversity of loads is difficult to estimate and always should be obtained either by the use of maximum demand meters or recording wattmeters. In this manner the total demand costs of power plant and transmission lines may be divided between railway and commercial power loads.

Each commercial substation with its distributing system must be considered separately, and the total costs incident to that particular distribution system should be divided in the manner previously described. The demand costs which consumers receiving power from a given substation should bear consist of the part of the main power system demand costs determined above plus all of the demand costs of the substation distribution system. The division of this total demand cost of a particular substation could be made between every consumer receiving power from that system. It is apparent that this calculation of the division of demand costs could be carried down to the individual consumer, but for practical purposes it is sufficient to determine the division between only a few classes of similar load characteristics.

The determination of energy costs for each consumer requires but little comment. The total energy cost of the central station and the energy cost per kilowatt-hour at the power plant busbars can be determined, as outlined before, from data easily obtained. It is again pointed out that losses in the distribution system should be added to the energy delivered, to obtain the total energy consumption charged to any consumer or class of consumers. Because of the difficulty in accurately separating losses in power station step-

up transformers and main transmission line, this energy loss may be divided on a kilowatt-hour basis, where energy is metered at the substations.

The third part of the cost of power, namely, the customer cost, takes care of capital charges on customers' account and expenses incidental to billing and inspecting.

It should be borne in mind that this discussion is upon the determination of power costs, and not upon rates to consumers. While the fixing of rate schedules should be preceded by a thorough study of the costs, upon which any logical system of rates is based, there are many other factors involved.

Rate schemes are in use which take proper account of the division of power costs and yet are very simple. Even though it may be necessary to deviate somewhat from the theoretical costs of service for different classes of consumers, it is folly to attempt the determination of equitable rates without first knowing with a fair degree of accuracy the cost for each class of consumer.

### Dinner to Returning Engineers

A DINNER will be tendered at the Engineers' Club on Oct. 10 by the national engineering societies to the returning members of the deputation which represented the John Fritz Medal Board in Europe. The guests will include representatives of the British and French societies by which this delegation was received. Invitations have also been extended to many men prominent in public life, including Secretary Hoover, Viscount Bryce and Secretary Hughes.

Ambrose Swasey of Cleveland is chairman of the John Fritz deputation, and the foreign organizations which will be represented include both British and continental engineering societies. A committee of arrangements has been appointed consisting of the secretaries of the A. S. M. E., A. I. M. & M. E., A. S. C. E., A. I. E. E. and United Engineering Society.

### Iowa Association Meeting

THE mid-year conference of the Iowa Electric Railway Association has been definitely scheduled to take place on Sept. 15 and 16 at the Russell-Lamson Hotel, Waterloo, Iowa. The first session of the meeting will be at 9:30 Thursday morning, while an inspection trip and a banquet and entertainment have been arranged for Thursday afternoon and evening. The third and final session will begin at 9 o'clock Friday morning. Supplementing the information as to program printed in last week's issue of the ELECTRIC RAILWAY JOURNAL, the following information is available: F. V. Skelley, Davenport; F. B. Hudson, Omaha; J. E. Kuntz, Cedar Rapids, and D. D. Bentzinger, Burlington, will discuss the paper on "Transportation" by Maurice A. We'sh. The paper by H. J. Connell on the relation of the claim department to the other

departments of a railway is to be discussed by W. P. Thomas, Omaha; J. E. Marcussen, Davenport, and Dan Finch, Des Moines. R. J. Smith's paper on "Laying and Maintaining Track" will be discussed by R. H. Findley, Omaha; T. E. Rust, Waterloo, and W. L. Wilson, Des Moines. The paper by Frank R. Grant on "Dipping and Baking Armatures" will be discussed by Tom Wood, Omaha; W. G. Lamb, Waterloo; C. M. Feist, Sioux City, and John Sutherland, Davenport. A discussion on the relative cost of maintaining one-man and two-man cars will be led off by John Sutherland, C. M. Feist, W. G. Lamb and Tom Wood. John Sutherland, Davenport, will act as chairman of the meeting.

### Pacific Railway Club Active

THE Pacific Railway Club held its fifth annual electric railway night Thursday evening, Aug. 11. George H. Harris, assistant to the vice-president and general manager, San Francisco-Oakland Terminal Railways, who is the club's president, presided. There were over three hundred steam and electric road officials and employees present.

The following papers were read: "The Electric Suburban Railway," by E. E. Thornton, San Francisco-Oakland Terminal Railways; "The Possible Field for Trackless Trolleys," by A. V. Thompson, General Electric Company; "History and Comments on the Third Rail System," by C. E. Hatch, Northwestern Pacific Railroad.

Following the reading of these papers, the meeting adjourned to the Market Street Railway's new downtown substation, where an address was made by J. E. Woodbridge, resident engineer for Ford, Bacon & Davis, by whom the station was designed. Mr. Woodbridge explained the details of design and construction and also the method of operation. The station was placed in operation to illustrate this talk.

## American Association News

### Modification in Program

THE title of the paper to be presented by H. C. Hopson at the Tuesday morning meeting of the Accountants' Association has been changed from that given in the issue of Aug. 27 to "Adaptation of Routine Accounting Results to Particular Uses."

### Leaflet on Des Moines

THE advertising department of the American Electric Railway Association has prepared a leaflet giving some facts with regard to the Des Moines situation, extracts from papers commenting on the bus service in that city, etc.

# News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION  
PERSONAL MENTION

## City Takes Toronto Railway Operation Assumed by New Transportation Commission, But Purchase Details Remain to Be Adjusted

Toronto has taken over the property of the Toronto Railway. The lines are being operated by the city in conjunction with the lines of the Toronto Civic Railway. The statement made previously in the *ELECTRIC RAILWAY JOURNAL* to the effect that the details of the negotiations would not be completed by Sept. 1 was correct, but it was decided to go ahead with the transfer of the road to the city at this time. It is anticipated that all the negotiations in connection with the purchase will be completed by Jan. 1 next and that the Toronto Railway will be liquidated before that time.

In view of the fact that the financial arrangements have not all been perfected, it was announced that payment of the principal on the balance of the outstanding 4½ per cent first mortgage bonds of the Toronto Railway, which fell due on Sept. 1, would have to be deferred until the company was in receipt of funds arising from the sale of its assets to the city and of its subsidiaries to the city and province. As a concession to the bondholders concerned, the directors announced that interest on the bonds would be paid as usual and that from the date of maturity until the date of payment of the principal of the bonds, the interest rate would be voluntarily increased from 4½ to 6 per cent. The bond issue was originally for \$4,550,000. It was dated Sept. 1, 1892. Of the original sum \$2,275,000 has been retired by the sinking fund, leaving a balance of the same amount. The statement to the bondholders said:

The arbitration proceedings will of necessity occupy some weeks, and until the award is made, the company will not be entitled to payment for its property. It is, therefore, unable to provide the necessary funds for the redemption of its bonds on Aug. 31. The interest due on that date will be paid as usual.

The bonds are of first charge on the undertaking of the company until taken over by the city and, therefore, upon the money payable by the city as compensation. The directors counsel the bondholders not to sacrifice their bonds, as they are amply secured and will be paid at their full face value.

H. H. Couzens, general manager of the Toronto Transportation Commission, has assumed the management of the properties taken over. One of the first acts of the city was to cancel after midnight on Aug. 31 all bus service licenses granted for use in the city by the Board of Police Commissioners. When bus owners operating services in the city were granted their licenses, they were notified that the right to operate would not be good after Sept. 1.

According to the Toronto *Globe* Sir William Mackenzie, president of the To-

ronto Railway, is credited with the statement that the stockholders of the railway were badly used. In commenting on this, the *Globe* said that there will be very general agreement with that statement, but there will be as general a dissent from Sir William's suggestion that the action of the city in any way prejudiced the interests of the shareholders. The *Globe* said in part:

He, himself (Sir William), is chiefly responsible for the grievous losses that have fallen upon the investors who bought the Toronto Railway shares in boom years of 1911 and 1912 at prices ranging from \$130 to \$160 a share and who are now confronted with a stock market valuation around \$70 for the same shares.

If Sir William, looking back over thirty years of street railway direction and control in Toronto, can feel that he did the best he could, either for the citizens or the shareholders of the Toronto Railway, he must hold himself to a far less strict standard of conduct than he would exact from any of his subordinates. When he tells of how badly the shareholders have been treated, the answer of the citizens must be: "Thou art the man."

The *Globe* is further of the opinion that the citizens of Toronto "who enabled the company to pay dividends on \$6,000,000 of watered stock as well as the charges on the borrowed capital invested in the enterprise, were compelled to use obsolete rolling stock dragged over worn-out rails." The *Globe* says that the extensions to which the people of Toronto believed themselves entitled under the franchise to the Toronto Railway were refused and that a system of civic railways had to be built by the city on the outskirts and operated at a loss, while the Toronto Railway fed fat on the highly profitable traffic of the central district.

While the city does not of course acquire title to the road until the award of the arbitrator has been received and the papers to the negotiations finally signed, the commission in charge of the property has gone ahead on the assumption that the road must be made to pay from the very start. As the result of its consideration of the whole problem, it was, therefore, decided that instead of the straight 5-cent fare the cash for adults should be 7 cents or four tickets for 25 cents and sixteen tickets for a dollar, or fifty tickets for \$3. Night rates for all passengers will be 15 cents. As for children's fares, infants in arms are carried free, but for all others, irrespective of age, not exceeding 51 in. in height, the rate is 4 cents cash or seven tickets for 25 cents.

It is reported that the Mayor declared that he would not sign the documents necessary to the transfer of the property because of the 7-cent fare decision and issued instructions for the railway to be temporarily operated by the municipal officials at the old rate of fare, which averaged about 3½ cents, compared with the higher fare required by the commission to pay expenses.

## Situation in Des Moines

### No Agreement on Offer of Employees— City Files Answer to Foreclosure Proceedings

City officials and the railway failed to agree on union employees' proposal for resumption of service in Des Moines. Company officials declare that the men's plan does not give adequate financial guarantee, particularly to cover possible damages. W. E. King of Toltz, King & Bay, Minneapolis, was called into conference with Corporation Counsel Miller on Sept. 7 and it is reported that he will be employed by the city during the franchise negotiations.

Electric railway service in Des Moines was shut down again on Friday night, Sept. 2, after eight days' service during the period of the Iowa State Fair. Operation of cars during the period of the state fair showed sufficient receipts to cover operating expenses with no provision for interest and depreciation.

After a mass meeting of the railway men's union on Friday application was made to Judge Martin J. Wade, on behalf of the union, to order a resumption of service for a period of thirty days while the franchise negotiations are under way.

In their offer the union employees agree to guarantee expenses to the Des Moines City Railway during the trial period under an arrangement similar to that made by the State Fair Association.

This offer is that the revenue during the thirty-day period will be used to pay all expenses except those for labor, any balance of revenues to be prorated among them, but no allowance to be made for the payment of taxes, bond interest or depreciation charges during the period of thirty days. This arrangement is similar to the conditions laid down in the agreement with the State Fair officials for the resumption of street car service temporarily.

The text of the men's offer in part follows:

Whereas, we, the employees of the Des Moines City Railway, members of Division No. 441, believe it to be to the best interests of the citizens of Des Moines to be provided with the best street car service possible, pending a final settlement of the differences between the city and company; and,

Whereas, we have been informed that the company will discontinue service at midnight today unless it is guaranteed against loss; therefore, be it

Resolved, that we, the members of Division 441, employees of the company, instruct our officers to notify the City Council and all others concerned that we will operate the cars for a period of thirty days and will agree to accept as wages, divided pro rata per hour, such amount as may be after paying actual operating expenses. Provided, however, that interest, taxes and depreciation shall not be considered as operating expenses during this period.

Corporation Counsel Miller announced on Sept. 3 that he would also make application to Judge Wade for a restoration of service on the offer made by the men. Judge Miller's statement came after a conference with F. C. Chambers, general manager of the Des Moines City Railway.

Saturday brought another development with the filing of the city's reply in federal court to the foreclosure complaint. The city maintains that the franchise under which the Des Moines City Railway has been operating is still in force and that the franchise is the only authority for the company to occupy the streets. Claim is made that suspension of service is a direct violation of the franchise and that occupation of the streets without operation of service constitutes an obstruction of the streets, and that if it continues "the city will deem it necessary to tear up the tracks, poles and wire and clear the city streets."

In the event that a sale of the property is made the city asks that it be made as soon as possible, and "that the property so sold be treated as a unit and subject to the ordinances preserving to the city the franchise intact." The city also points out that the purchaser at any sale takes the properties subject to the lien and franchise of the city. The reply is the first definite declaration of policy by the city during the controversy.

The franchise prepared by the Harris interests had not yet been returned on Sept. 31 to the City Council by Corporation Counsel Miller.

Upon complaint of the superintendent of schools that buses were failing to meet the situation and were keeping children from school, operators agreed to reduce the fares to 2½ cents for school children and to provide extra buses for certain schools.

### P. R. T. Wage Cut Hinted

A wage cut affecting the employees of the Philadelphia (Pa.) Rapid Transit Company looms up as a possibility. Thomas E. Mitten, president of the company, said recently that the wage scale must continue to follow the average scale of Chicago, Cleveland, Detroit and Buffalo even if reductions result. Mr. Mitten's remarks were made at a picnic and dinner tendered to 500 officials and departmental heads of the Co-operative Welfare Association of the company. The affair was held at the Willow Grove Casino.

Mr. Mitten reviewed the important developments in the history of the company during the last eleven years, and said that Philadelphia had been transformed "from the worst-served city in 1910 to a service which compares favorably with that of any other city." Touching on keeping up with the four-city average Mr. Mitten said:

No matter how much our inclination may run in the direction of retaining the present 65-cent wage as we had hoped, we must now, in fairness to the car rider and to the P. R. T. stockholders, be as exact in making reductions in accordance with the four-city average as we were in grabbing off the increase when the four-city average made that a fair thing for us to do.

### Seattle Jitneys Must Go

The State Supreme Court on Sept. 2 denied the petition for a rehearing of a group of Seattle jitney drivers. This petition was recently filed by the H. P. McGlothorn group of jitney drivers and a second group of drivers later intervened in the suit.

This decision upheld the order of the Superior Court and means the jitneys must leave the streets of Seattle. Their only recourse is to appeal to the United States Supreme Court where the chances for obtaining a review of the jitneys' litigation against the city of Seattle is very remote, according to those familiar with the situation.

### Milwaukee Company Inaugurates Limited Interurban Service

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced a limited service from Milwaukee to Watertown, located about 50 miles away from Milwaukee, at the terminus of one of the company's interurban lines. The service will consist of two trains each way daily, except Sundays and holidays. In view of the lower fare on the electric railway as compared with the steam road rate for the same trip it is hoped materially to increase the company's interurban business on this particular line. At the same time announcement has been made of changes in the leaving time of interurban trains operating on some of the other interurban lines of the company to aid connections and to increase through traffic on the interurbans.

Beginning June 1, the company placed on sale new twenty-five-ride commutation tickets between Milwaukee and the more important stations on the interurban system at very attractive rates. These will be limited to the use of the purchaser and will be good for six months. There will also be on sale 500-mile mileage books at about 2½ cents per mile plus 90 cents war tax, or at a total of \$12.15. The mileage book will be transferable, good for one year from date of purchase and will permit of its being used by any number of persons at one time. On Sept. 1 the company will begin selling forty-four-ride commutation ticket books for the individual use of the school children.

The company's announcements of proposed changes in service and in ticket rates have been made through advertisements in the various local papers and through a small, attractive leaflet which will be distributed on the cars and at the various terminals. The leaflet contains a form for making suggestions for the betterment of the interurban service. The interurban rates of the company are 3 cents per mile cash, 2.75 cents per mile if single tickets are bought, 2.25 cents per mile when 500-mile mileage books are bought, 2 cents per mile with twenty-five-ride books and as low as 1½ cents per mile if fifty-two-ride non-transferable one-month books are bought. In connection

with the inauguration of limited service, the company will also undertake to transport free of charge a certain amount of baggage.

### New Orleans Council Approves Maloney Plan

The trolley troubles of New Orleans which have dragged settlement for these many months appear to have reached an end, in a plan of action proposed by Commissioner Paul Maloney of the Department of Public Utilities, at a special meeting of the Commission Council on Sept. 3.

The Maloney scheme, it may be stated, has received the indorsement of the civic, commercial and financial bodies of New Orleans and was approved at the meeting of the council by a vote of 4 to 1, Mayor McShane alone standing out against settling the controversy on a basis of \$44,700,000, for making the rate of return, though not opposed to the Maloney estimate of \$44,700,000, as the value of the property.

Neither Judge Foster of the Federal District Court, who will of necessity be required later on to pass upon the recommendations of Commissioner Maloney and the Commission Council, when the matter is brought to his attention officially, nor Receiver J. D. O'Keefe of the Public Utilities Company would comment upon the new plan of settlement. It is planned, however, to ask Special Master Chaffee of the Federal Court to postpone the hearing which was to have started on Sept. 6 for a period of three weeks, in order to give the security holders of the company time to assimilate the plan.

C. C. Chappelle, representing the New York Security Holders Committee, was the only voice raised in a criticism of the Maloney plan. He thought the restrictions and conditions imposed under the Maloney plan were unique in public utility financing and regulations, and that this departure from approved standards and principles might have the effect of preventing investors from financing the reorganization. He intends to return to New York immediately.

The city's ultimatum is as follows, briefly speaking:

Valuation, \$44,766,000; rate of return, 7½ per cent. Immediately on reorganization and discharge of receivership, the rates and charges to be as follows, for a test period of six months:

Car fare, 7 cents with universal transfers; gas rate, \$1.30 per 1,000 cubic feet; electric rates unchanged; the city to have a perpetual option on the following utilities of the company as of Dec. 31, 1920:

Gas plant, \$8,652,000; Electric Light & Power Co., \$10,048,000; Street Railway, \$20,000,000. The company to be reorganized within a period of six months, the Commission Council to have one-third of the Board of Directors on the directory of the new organization, who shall be neither state nor city officials.

## Interurbans Run in Albany

Amalgamated Requires Schenectady Railway Employees to Operate in Strike Zone

There is no change in the Albany-Troy-Rensselaer strike situation and the endurance contest between the United Traction Company and its former employees will apparently continue for some time yet, although it is generally conceded that the strike, as such, is over.

Interurban cars from Schenectady were run into the strike zone in Albany and Troy on September 1 for the first time since the strike was started in January, the cars so operating carrying no local passengers within the city.

The operation of interurban cars into the strike zone of Albany and Troy is the result of the order of the executive committee of the Amalgamated Association given out in Detroit on Aug. 31 to obey the request of the Schenectady Railway and the Hudson Valley Railway to run into the strike zone.

Politics, both big and small, is being played with the traction situation. In Schenectady George R. Lunn expects to win for mayor on the Democratic ticket this fall and next fall become the logical Democratic candidate for Governor on the strength of having averted a strike of railway men in Schenectady and the cities west of Albany. In Albany Patrick E. McCabe, former Tammany boss of Albany County, is running on an independent platform for Mayor, declaring for a 5-cent fare and the eternal damnation of the United Traction Company.

### JITNEY SITUATION IN COURTS

The attitude of the United Traction Company is that the strike is over. The officers of the company expect that the fall and winter months will bring a return of most of the former patrons, who are now walking or jitney riding.

The entire jitney situation is now in the Supreme Court before Justice Harold L. Hinman. It is generally conceded that the New York State statutes and constitution afford a wider protection to interests holding transportation franchises as against competitive transportation systems than do the statutes of some other states, and that in all probability the proceedings now pending before Judge Hinman will result in a set-back to all jitney operations in the State, unless the Legislature should by chance intervene, a proceeding which appears very unlikely.

After reciting circumstances and conditions in the three cities, the decision of the Amalgamated read in part:

The feeling of your general executive board is that the order is put up to the association for the purpose of placing us in an embarrassing position with no alternative except to violate the principles of collective contract.

Now, therefore, your board lays down to you as the establishing of a decision upon the question, a rule to be followed: That you live up to your contract and operate your cars into the terminals of Albany and Troy, with the direct understanding that you are to carry the regular passengers of your own roads in and out of those cities in a manner that, in fully conserving your agreement relations, you will

do nothing detrimental to your fellow workers that are waging a struggle for the right of organization in those cities. You are hereby instructed to carry out this rule.

Every means available within this association will be used to assist the men of Albany and Troy now engaged in fighting the lockout, and at least \$7,000 a week will be placed behind these men until the convention of the association can act upon the matter.

In addition to this, officers of the international association will be sent to our various local divisions, to explain to them that the rumors that are being spread that the lockout is lost and that the amalgamated is not behind the Albany and Troy members of this association, are absolutely untrue, and to appeal to the membership of those local divisions, that each of these locals pledge, through their membership, financial aid and assistance in addition to what the convention may do for them.

We will place this situation before the representatives of the various political parties of the state of New York and lodge with state, city and county officials an appeal that they give their assistance and exercise their good offices to bring about an honorable settlement of the lockout situation in Albany and Troy, on the ground that the company is operating under concession and solely by the right of franchise of the people, and that the people's rights should and must be respected and served by them.

## Birmingham Files Injunction

Following Appeal From Decision of Commission the City Files Injunction Proceedings

Injunction proceedings have been filed by the city of Birmingham against Lee C. Bradley, as receiver, and the Birmingham Railway, Light & Power Company, in the Chancery Division of the Circuit Court, attacking the constitutionality of the Alabama public utilities act. The city, by these proceedings, seeks to restrain the receiver and the Birmingham Railway, Light & Power Company from collecting the 8-cent fares and the 2-cent transfer charge put into effect weeks ago by the Public Service Commission.

The court is asked in the proceedings to declare the franchises of the company forfeited for alleged violations of the contracts between the city and the company, and to enjoin the collection of any fare in excess of the sum of 5 cents, which is provided in the old contract between the city and the company.

Vigorous attack on the constitutionality of the public utilities bill, which gives the Alabama Public Service Commission exclusive right to regulate the rates charged by public utilities in the State, is made in the suit. It is charged that the Birmingham Railway, Light & Power Company was largely responsible for the adoption of the bill.

The case has not yet been set for hearing. Under the law the receiver and the company have thirty days in which to answer the proceedings. When the answers have been filed the case will be set down for hearing.

The time for appeal from the decision of the Alabama Public Service Commission granting the 8-cent fare has not yet been announced. This appeal was filed in the Circuit Court of Montgomery County. Under the provisions of the public utilities act, an appeal from one of the decisions of the Public Service Commission can only be filed in the Circuit Court.

## Toledo Prospect Better

First Year's Operation at Service-at-Cost May See Deficit Wiped Out and System Stabilized

There will be no electric railway extensions in Toledo, Ohio, for at least a year. This announcement has been made by Street Railway Commissioner Wilfred E. Cann. It is believed, however, that the completion of the first year's operation under the service-at-cost plan will see the deficit largely wiped away and the system in a fair way to reduce fares and greatly better operation.

During the present summer 40 per cent more repair work and track improvement have been undertaken than in the last three years. Many downtown intersections have been repaired and replacements have been made in some long stretches of track. Commissioner Cann said:

While car riding continues to fall off—there were 55,000 fewer passengers carried in the first twenty-five days of August than in the same number of days in July—we have been able to stem the deficit.

I thought 10 cents a car-mile for maintenance would be none too much when I came here. That ratio has been turning in \$58,000 to \$60,000 a month to the maintenance fund. That figure has been cut down because we weren't spending the money that fast.

We have been able to economize through the elimination of the Huron line, speeding up service, cutting out surplus employees, doing away with dead car mileage, and splitting lines in the downtown district. I believe that by Oct. 1 we will have cash in all the funds up to their limit and then we can start putting money back into the stabilizing fund.

### AUGUST STATEMENT AWAITED WITH INTEREST

The stabilizing fund now stands at \$140,000. It must come up to \$500,000 before the reduction of fares is possible.

It is believed the statement of operations for August, to be presented to the board of control at its meeting on Sept. 12, will be the best yet brought out by the commissioner. Fare raises have changed the complexion of operations.

The Toledo Railways & Light Company has made arrangements for the lifting of the \$12,000,000 mortgage against its properties. This indenture also binds the holdings of the Community Traction Company. It was agreed at the time of the transfer of the property that a large cash forfeit would be made by the Doherty companies if the mortgage was not lifted by December.

Morton Seeley, attorney for the Toledo Railways and Light Company has been in New York, arranging for the new financing of the local properties.

### Third Wage Cut in Effect

Trainmen of the McKeesport branch West Penn Railways, Pittsburgh, Pa., have been notified of a wage reduction amounting to 5 cents an hour. Motormen and conductors will now receive 48 cents an hour for the first three months of service, 53 cents for the next nine months, and 55 cents for all time after a year's service. This is the third reduction in effect since May.

### Suburban Men Cut 15 per Cent

A wage cut of 15 per cent, retroactive to July 1, has been announced by the arbitration board in the case of the Middlesex & Boston Street Railway, Newtonville, Mass. This award will make the wages of blue-uniform men for the ensuing year as follows: First three months, 42½ cents; next nine months, 47 cents; thereafter, 51 cents an hour. This compares with 50 cents, 55 cents and 60 cents an hour under the heretofore existing scale. The award was accepted by the union.

Owing to the retroactive feature of the award, the employees will be obliged to refund to the company the excess wages received under the old scale since July 1. Negotiations were commenced prior to that time, but were not completed until recently, so the company continued to pay the old scale with the understanding that the employees would refund any difference which might exist when the arbitrators finally settled the new rate.

The arbitration board consisted of Colonel Charles R. Gow, Pitt Drew and James H. Vahey. Messrs. Gow and Drew formulated the majority report, which fixed the new scale. Mr. Vahey presented a minority report dissenting from the award.

The majority members accepted the company's contention that the existing high wage scales were the result of a series of upward boosts in rates which were in every case intended to enable the employees to meet the increased cost of living. This cost has now receded materially, according to the report, and therefore a downward revision of wages is justified.

In his dissenting opinion, Mr. Vahey maintained that the rates fixed are entirely inadequate, and claims that the majority finding was based on the law of supply and demand for labor, that is, on the ability of the company to employ men at lower wages because of the present widespread conditions of unemployment. Mr. Vahey said:

When employees agree not to strike, when they surrender this industrial weapon, and when they agree with the employers to submit their question of wage rates to a board of arbitration, both sides are thereby precluded from invoking the law of supply and demand.

And yet the majority of the board allows the wage rates to be fixed by the hunger of unfortunates who are at present out of a job.

### Trolley Crashes Into Hotel

An electric train consisting of three freight cars en route from Worcester to Springfield, Mass., on Aug. 31 jumped the track on the incline of State Street, Springfield, and crashed into a stone and brick building occupied principally by the Victoria Hotel. The impact tore away the supporting pillars and the falling walls exposed the sleeping rooms on the upper floors.

The express messenger in one of the cars was the only person who received serious injuries. The motorman was only slightly hurt, but a hotel guest was severely cut. The damage to the building is estimated at \$50,000. Two of the express cars were destroyed and

the other is almost a total loss. Manager Flanders of the Springfield Street Railway began an investigation at once. He himself is of the opinion that slippery rails was the cause of the accident.

### Railway Doing Its Best

Company at Portland, Ore., Is Putting Money Back Steadily Into Its Properties

In a petition to the Public Service Commission of Oregon the City Council of Portland, through City Attorney Grant, urges that the Portland Railway, Light & Power Company be required to perform certain maintenance and construction work on railway lines in Portland or reduce the fares on such lines.

The city, in its petition, maintains that the company has failed entirely to do extra maintenance work, and has also failed to do a large part of reconstruction work, all of which was set up by the company as one of the reasons necessary for an increased fare granted on June 20, 1920, by the Public Service Commission.

Franklin T. Griffith, president of the company, denies the allegations of the City Council, asserting that not only has the company carried out its obligations, but in addition it is the only employer of large numbers of men in the State of Oregon that has a greater force at work than is shown in the records one year ago.

In its petition to the Public Service Commission, the city contends that when the railway requested an increase from a 6-cent to an 8-cent fare, representation was made that the additional revenue was required to perform reconstruction work estimated to cost \$656,900; also that for a period of twelve months following the allowance for increased fare, it would be necessary to spend \$10,000 a month for maintenance work which had been deferred because of lack of funds. The city alleges that the company has failed to perform the extra maintenance work, and has also failed, neglected and refused to do a large part of the reconstruction work.

President Griffith stated that during the period from July 1, 1920, to July 31, 1921, the company actually expended on maintenance and reconstruction of its railway system a total of \$869,389, and that the number of reconstruction jobs under way will require an additional \$193,782 to complete. This is exclusive of the increased maintenance program. Mr. Griffith said:

It is true that prior to the inauguration of the 8-cent fare, the railway was unable to expend the sums of money necessary for proper and complete maintenance. The 8-cent fare materially helped the situation, but the 8-cent fare was calculated to provide a sufficient revenue for normal maintenance and operation, and was not intended to and has not provided any surplus revenues to care for deferred maintenance or reconstruction.

As a matter of fact under present reduced railway earnings, the 8-cent fare is insufficient to provide for normal maintenance and operation, and a reasonable return upon the value of the property. This condition is due to the widespread unemployment in Portland, which is reflected in a reduction of railway patronage, which will doubtless continue until there is a general improvement in business conditions.

### Wages Reduced on Market Street Railway, San Francisco

The wages of all platform men in the employ of the Market Street Railway, San Francisco, Cal., were reduced 4 cents an hour beginning Sept. 4, and a new wage scale was put into effect for all men employed after that date.

During the period of rising prices from 1917 to 1920 the company advanced the wages of its platform men from a maximum of 33 cents an hour and a minimum of 25 cents to a maximum of 56 cents an hour and a minimum of 50 cents. The average wage in 1917 was 30 cents an hour; in 1920 and today the average is 54 cents.

William von Phul, president and general manager of the company, in addressing the men, said:

Based on the reports of the United States Department of Labor prepared for the San Francisco and Oakland Districts, the cost of living reached its maximum in June, 1920. Since that time and up to June, 1921, the Department of Labor reports a decrease in all items of expenditure constituting the average budget of 20.14 per cent. The department similarly reports a decrease of 13.10 per cent in all items of expenditure for June, 1921, as compared with December, 1919.

During the period preceding the reorganization of the United Railroads, San Francisco, the property was operated not only without any return to its owners, but interest on the \$23,500,000 of 4 per cent sinking fund gold bonds of the then operating company was not paid and no dividends have been paid on the stocks of the new Company.

For the last few months the earnings of the company have fallen off on account of the reduction in receipts and it is necessary that expenses be reduced.

For these reasons, effective on Sept. 4, 1921, there will be a reduction of 4 cents an hour in the wages of all platform men now in the service of the company. The 2-cent-an-hour increase effective after each six months of the first year of employment and a final increase of 2 cents up to a maximum of 52 cents an hour after a further period of one year will still apply to all platform men in the service on Aug. 30, 1921.

In addition to the above modification of the wages of present employees, a new scale will become effective, applying only to men employed on and after Aug. 31, 1921, providing an additional period of six months, which does not apply to present employees. The new scale in cents per hour will be as follows:

First Six Months .....	42c.
Second Six Months.....	46c.
Third Six Months.....	48c.
Next Twelve Months .....	50c.
Thereafter .....	52c.

The management realizes the service rendered by the platform men and has been reluctant to make any change in the wage scale, but does so with the knowledge that the employees of the company realize the situation and will continue to render the same co-operation which they have in the past.

### Wage Hearing Set

The arbitration board is now ready to settle the dispute between the employees and officials of the Schenectady (N. Y.) Railway. J. Teller Schoolcraft was recently selected third member of the board, the two others being Talmadge C. Cherry, representing the company, and Lawrence E. Gerrity, representing the union.

All meetings will be held in the county court house. They will be started at once. Prior to June 1 the men were receiving 60 cents an hour. The wages on that day were cut 25 per cent. If the board awards anything over 45 cents, that amount will be retroactive from June 1.

## Financial and Corporate

### Interborough Optimistic

#### Security Holders Renew Notes in Order to Prevent Appointment of Receiver

It was announced on Sept. 6 at the offices of J. P. Morgan & Co., financial agents for the Interborough Rapid Transit Company, that the renewals on the \$38,144,400 worth of three-year 7 per cent gold bonds to next Sept. 1 had reached \$33,000,000. This leaves about \$5,144,400 in renewals to come in before the hearing on Sept. 9.

It was pointed out that the total of \$33,000,000 represented only the actual amount of notes already deposited for renewal, and that notifications of intention to renew had been received from holders of several hundred thousand dollars of additional notes. Many of the holders have been on their vacations and were able to send only notices, and hundreds of the Interborough's letters requesting renewals have been returned because of changes of address and other postal difficulties. The holders are scattered through forty-six States and seventeen foreign countries.

On their success in obtaining renewals on these notes at 8 per cent, so that the principal of \$38,144,400 would not have to be paid until next year, the officials of the Interborough base their hope of averting the receivership, because they are able to meet their current bills or obtain the "indulgence of creditors." The large total of renewals has increased the hope that the Interborough counsel on Friday will be able to tell Judge Mayer that the company will fight the application of President Clarence H. Venner of the Continental Securities Company for the appointment of a receiver.

#### COURT OPPOSES RECEIVERSHIPS FOR CORPORATIONS

As indicated briefly in the account of the Interborough receivership proceedings which appeared in the *ELECTRIC RAILWAY JOURNAL* for Sept. 3, page 376, Judge Mayer left the matter open, at least until Sept. 9. The court clearly intimated that he was opposed to any more receiverships, especially of large corporations, if there was any way of avoiding them. In setting the day for further argument Judge Mayer said:

Both in public interest, and in the interest of security holders, there should be no receivership for this company if it can possibly be prevented. These are tender times, and many complications might arise in case of the receivership for this corporation, which would have a drastic effect upon the convenience and the comfort of a large community. I realize that the arguments this morning, are upon the matter of adjourning the appointment of a receiver. As to the actual merits of the original motion, to appoint a receiver on the bill of complaint, the court will take up that matter on its merits later. I shall adjourn this motion until Friday of next week, or Sep-

tember 9, upon express condition that counsel get together and see if some arrangement cannot be made by which this proceeding can be obviated.

If, however, this cannot be done, counsel may feel free to come to me any time on proper notice to the court and other counsel for such action as may be deemed fit. I take this stand in view of the fact that the company has but \$1,365,000 of current bills which have been running for only three or four months, and also in view of the overwhelming majority of the note-holders who have consented to an extension of time for the three-year 7 per cent notes.

At the hearing before the court on Sept. 1 James L. Quackenbush, counsel for the railway, asked the court to dismiss the application for receivership. This Judge Mayer refused to grant, stating that the case was ready for argument and it must go ahead. In his argument against the appointment, Mr. Quackenbush told the court that the Interborough had in round figures \$35,000,000 in stock, \$160,000,000 first mortgage 5 per cent bonds and \$40,000,000 of 7 per cent notes, the proceeds of the bonds and notes having been sold for the construction of subways for public service. It was only the credit of the Interborough heretofore, he said, that made possible the construction of the subway system in New York. It has grown to be indispensable to the public. He reminded the court that the total claims against the Interborough, including current obligations, amounted to only \$1,365,000, or less than ten days' receipts. The tort claims against the company he said amounted to less than \$100,000. Mr. Quackenbush said:

We have never defaulted on a single obligation we ever contracted for. It is true that we have been slow paying for the past two years, but in spite of adverse conditions we had to meet we have paid, and I would remind those who are assailing our credit that we are still the largest taxpayers in New York City. I admit the charge made against the company that it exhausted its credit three years ago, through circumstances that it could not control, and was obliged to issue these notes which do not become due until the end of this day.

We have at this moment more than 76 per cent or over \$29,000,000 of the outstanding notes deposited, and it is my firm belief before the day is over we will have most of the 24 per cent still outstanding. If a receivership should be precipitated at this moment, I do not know when the Interborough may ever again be able to go before the public for the purpose of procuring the necessary means to give them the conveniences in the way of transportation that they need.

In so far as this action is concerned, or in the alleged claims which it asserts the Interborough is not able to pay, I can only point to its financial solvency by the way of statements open to the public. However, the time may come when I may have to come before this court and either consent to such an application as has been made or to ask myself that a receiver be appointed.

In view of the opinion of the court and the hearty response of the security holders to the request of the Interborough that they renew their notes, the officials of the company feel hopeful that a receivership can be avoided. It is hoped to have all the notes renewed before the hearing on Sept. 9 and that arrangements can be made for satisfying current claims against the company.

### \$10,000,000 Increase in Ohio Valuations

Tax valuations of Ohio street, suburban and interurban railroads have been boosted \$10,119,330 over the 1920 valuations, according to the 1921 figures announced on Aug. 26 by the State Tax Commission.

The total valuations of properties of eighty-two companies are placed at \$197,874,300. The 1920 total was \$187,754,970.

The valuations of sixteen companies were decreased this year, twenty-three were left the same as last year, and increases were made in forty-three instances.

Included in the new valuations were the following:

Ohio Electric Railway, \$10,622,980; last year, \$11,672,440; decrease, \$1,049,460.

Toledo Railways & Light Company, \$14,137,460; last year, \$13,718,360; increase, \$419,100.

Cleveland Railways, \$32,696,760; last year, \$29,243,960; increase, \$3,352,800.

Cleveland, Southwestern & Columbus Railway, \$4,651,260; last year, \$4,734,980.

Cleveland, Painesville & Eastern Railway, \$2,181,950; last year, \$1,916,540.

Cincinnati Street Railway, \$21,194,960; last year, \$20,716,930; increase, \$478,030.

Cincinnati & Dayton Traction Co., \$1,736,380; last year, \$1,637,720.

Northern Ohio Traction & Light Company, \$24,777,930; last year, \$22,642,470; increase, \$2,133,460.

Ohio Traction Company, operating Cincinnati & Hamilton Traction, \$2,457,600; last year, \$338,270; increase, \$1,619,330.

Scioto Valley Traction Company, \$2,301,470; last year, \$2,362,170.

Lake Shore Electric Railroad, \$5,114,390; last year, \$4,988,240.

Columbus Railway, Power & Light Company, \$17,825,190; last year, \$17,097,520.

### Cities Oppose Indiana Utility Merger

The petition of the Indiana Electric Corporation to issue securities for the purchase of seven Indiana utilities, which has been the subject of an extended hearing before the Public Service Commission, was discussed on Sept. 2 at a conference attended by Governor McCray and members of the commission. Governor McCray, following the conference, said the matter is entirely in the hands of the commission and that he has complete confidence in its ability to reach a fair decision.

In answer to the charge that the corporation would not be able to meet its fixed charges, counsel for the corporation filed a memorandum with the commission showing an estimated annual increase of surplus after payment of all charges, including depreciation. "Any computations of earnings based on conditions now existing and likely to prevail in the future," said the memorandum, "and with proper deduction for depreciation and other charges will show net earnings ample to meet all proposed fixed charges of the petitioner."

Harry O. Garman, engineer for the commission, has testified that the value of properties which the corporation proposed to acquire and merge is \$10,284,361, or slightly more than half of the value ascribed to the properties by attorneys for the corporation. Mr. Garman was called as a witness at the request of attorneys for cities and in-

terests opposing the issuance of \$21,000,000 of securities, which, they say, is in excess of the value of the property.

Witnesses for the corporation contend that the value of the property is approximately \$19,000,000, and its attorneys are asking the commission to allow them to issue securities to the amount of \$21,000,000, the margin being intended to cover the loss entailed by selling the securities at a discount. Mr. Garman placed the reproduction cost of the companies at \$12,180,443. He said that the difference between the present value and the reproduction figures is due to depreciation.

### Start of Akron Appraisal Delayed

The plan of bringing A. S. Richey of the Worcester Polytechnic Institute at Worcester, Mass., to Akron by the city for the purpose of making a valuation of the Akron city lines of the Northern Ohio Traction & Light Company has been delayed for the reason that there is an insufficient sum in the city's public utility fund to pay Mr. Richey for his services. The city's legal department has held that the ordinance hiring Mr. Richey could not become effective until the necessary funds are in the treasury.

Mayor Carl Beck announces, however, that an effort is now under way to devise a plan to have a valuation of the property taken before Jan. 1, 1922. It is expected this plan will come before the Council at an early meeting. Mayor Beck announces that the appraisal should be taken with as little delay as possible for the reason that such action will tend to hasten the solution of the local traction problem. The Mayor points out that railway service in the city cannot be materially improved and developed until the proposed new franchise becomes effective. He adds that by delaying the taking of the appraisal until after the first of the year the passage of the franchise would be delayed about four months.

Negotiations between the city and the company looking toward a satisfactory solution of a method whereby the valuation may be taken immediately, despite the fact that there are no funds in the treasury for this purpose, are progressing satisfactorily and it is probable that an adjustment will be reached at an early date.

### Electric Railway Service Suspended

Manistee, Mich., is without electric railway service as the result of the action of the Consumers Power Company, owner of the lines, in putting the cars in the carhouses at midnight on Sept. 1. Since that time this city has been without electric railway service.

Jitneys have been pressed into service to serve the outlying factories and the suburbs of Filer City, Oak Hill and Maxwelltown. The motor buses which have been in service this summer between this city and the summer resorts

at Orchard Beach will be brought into the city and used on the streets formerly used by the car lines.

Manager C. S. Kressler of the Manistee Railway gave the following explanation of the situation:

We haven't any money to operate cars longer, and as there is no prospect of obtaining relief we had no alternative but to suspend service.

I had hopes that enough factory managers would be present at the commission meeting to bring pressure to bear that would have saved the service. But the little interest shown convinced me that they did not care what course we took.

I still have hopes that street car service can be resumed in the near future. If we are permitted to lie idle, in the meantime, this will be possible, but if an attempt is made to force operation it will be necessary for the company to go into the hands of receivers, and probably complete bankruptcy, which means that the rolling equipment will be disposed of and the tracks torn up.

### Small Surplus Earned by Sacramento Northern Railroad

According to the annual report of the Sacramento Northern Railroad of California for 1920, the company earned about \$30,000 in excess of the interest on its bonded debt, although

### B. R. T. Assures Employees Against Loss of Thrift Accounts

Considerable concern has been caused to many employees in the metropolitan district through the recent taking over of the affairs of the National Thrift Bond Corporation, New York City, by the banking department of the State of New York. Among the employees who invested with the company were a considerable number of men and women in the service of the Brooklyn Rapid Transit Company, but the total of their subscriptions is understood not to have been large. Lindley M. Garrison, receiver of the railway, with the approval of the court, has determined to protect against loss employees who have subscribed to the bonds. As soon as the details have been worked out the management will arrange to take over the thrift receipts, etc., so the employees will receive the money which they invested.

The plan under which the Thrift Corporation worked was sound in theory, but the depreciation in security

#### INCOME ACCOUNT — SACRAMENTO NORTHERN RAILROAD

	1920		1919	Per Cent Change Over 1919
	Actual	Per Cent of Operating Revenue		
Operating revenue.....	\$1,648,017	100.00	\$1,506,734	9.3
Operating expenses.....	1,266,463	76.80	.....	.....
Depreciation.....	184,219	11.28	.....	.....
Total operating expenses.....	\$1,450,682	88.08	\$1,210,767	19.8
Net revenue—Railway operations.....	197,335	11.95	295,967	33.3
Auxiliary operations, net.....	14,681	0.89	12,244	20.0
Net operating revenue.....	\$212,016	12.84	\$308,211	31.3
Taxes—Railway operation.....	73,571	4.47	61,531	19.6
Operating income.....	\$138,445	8.37	\$246,680	43.8
Non-operating income.....	32,414	1.96	29,980	8.1
Gross income.....	\$170,859	10.33	\$276,660	38.4
Interest on funded debt.....	140,126	8.51	117,610	19.0
Interest on unfunded debt.....	1,612	.09	.....	.....
Amortization of discount on funded debt.....	50,241	3.04	52,218	1.2
Miscellaneous debits.....	1,047	.06	.....	.....
Total deductions.....	\$193,026	11.70	\$169,828	14.8
Net corporate income.....	( ) 22,167	1.37	106,832	110.5
Road and equipment account.....	\$9,932,572	.....	\$9,651,320	2.92
Miscellaneous physical property.....	203,167	.....	154,904	13.1
Total.....	\$10,135,739	.....	\$9,805,224	3.0
Capital stock.....	\$4,480,598	.....	4,469,023	.....
Funded debt.....	5,222,866	.....	5,225,360	.....
Total securities outstanding.....	\$9,703,464	.....	\$9,694,383	.....

(a) This was offset by the current profit and loss balance, leaving a net profit balance of \$2,334, which amount was applied to amortize a like amount of the balance of \$39,715 reorganization expenses.

Figures in boldface indicate decrease.

the accompanying statements show a deficit. This is due to the fact that a deduction of \$50,241 is included under the item "Deductions" for "amortization of discount on funded debt."

Altogether, the company did not make a very bad showing, operating as it did under handicaps and in a year when many roads found it difficult to make both ends meet. Railway operating expenses increased about \$240,000 over the previous year. The item of bond interest also increased due to the fact that interest on the "B" issue did not become a fixed charge until July 1, 1919.

The income account for the year 1920 compared with 1919 is shown in the appended statement.

values proved its undoing. The company invested in Liberty Bonds and the securities of political subdivisions, depositing its purchases with the Equitable Trust Company as trustee and issuing its own participating certificates in \$10 denominations against the bonds pledged as collateral. It is confidently expected that the company will eventually pay dollar for dollar, but it is of course very uncertain how long it may be before the company can dispose of the collateral without suffering a loss.

By the very liberal offer of that company the employees of the Brooklyn Rapid Transit Company are assured of the return at an early date of all of their money.



### Zurich Abandons Zones

Commutation Tickets Popular When Short Ride Fares Are Withdrawn — Deficit at End of Year

The report of the Zurich Municipal Street Railways for the calendar year 1919 indicates that the transport system serving the chief industrial city of Switzerland has been hampered by war and post-war conditions from enjoying extensions that, in at least one instance, were approved as early as 1913. Seven other extensions were approved but funds were voted only for one during 1919. This left the total number of route miles at 23.7 (38.3 km.) or 1.1 miles (1.8 km.) per 10,000 inhabitants. The total number of single-track miles was 53.1 (85.6 km.).

Rails were renewed on several routes and rehabilitated on one. The addition of an electric track switch raised the number of these automatic devices to thirty-five. In carhouse rehabilitation, for the first time in the history of the undertaking wooden instead of metal rolling doors were used. The rolling stock was increased from 224 to 231 motor cars and from 63 to 82 trailers. Energy consumption averaged 1.49 kw-hours per car-mile, a car-mile in this case being figured with motor-car miles as unity and trailer-car miles as one-half the energy consumption.

The total number of car-miles operated was 8,214,245 (13,248,782 car-km.) of which 1,846,336 car-miles (2,977,962 car-km.) were trailer miles. One route is always operated with trailers. The increase in service was 13.51 per cent, despite which the number of passengers fell 1.2 per cent (from 57,753,813 to 57,058,905) and the density from 7.8 to 6.7 passengers per car-mile. Rides per inhabitant per annum dropped from 272 to 270. Because of a 100 per cent increase in fare to the most numerous riders, as hereinafter detailed, the revenue per passenger rose from 11.74 rappen to 17.96 rappen. The earnings per car-mile increased 33.11 per cent or from 58.1 to 77.3 rappen per car-km. At the pre-war rate of exchange (100 rappen = 1 franc = 19.3 cents) the gross receipts per car-mile work out as 17.9 cents in 1918 and 23.9 cents in 1919. The total revenue increased from 6,781,355 francs to 10,246,629 francs (\$1,308,793 to \$1,977,599) or 50.69 per cent while operating expenses jumped 50.44 per cent to 10,186,867 francs or \$1,966,065.

The net result for the year 1919, making allowance for renewals, reserves and 4 3/4 per cent return on investment was a deficit of 1,259,111 francs or \$243,008 while the total deficit including losses in 1914 and 1915 was 2,842,256 francs or \$548,555.

An analysis of the accompanying table of fares paid shows that 55.3 per cent of the trips were made on the 20 rappen (say 4 cents nominally) fare whereas in the preceding year, when the zone system was used, 23.9 per cent of the one-ride passengers had enjoyed a 10-rappen and 12 per cent of

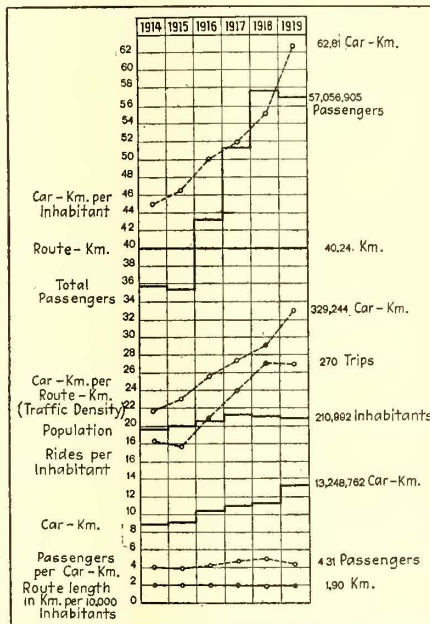
the one-ride passengers a 15-rappen fare. The rest of the rides were divided among a variety of subscribers, including 14.8 per cent of any-hour riders, 10.2 per cent of mid-day and evening riders and 4.4 per cent of early morning riders. The abolition of 10 and 15-rappen fares led to a great increase in the sale of workmen's early hour and of off-peak (noon and night) tickets. The workmen's ticket which may be presented by anybody up to 7:45 p.m., is sold on a thirty-one-ride basis and costs but 10 rappen per ride if every trip is used. The off-peak ticket cover twenty-one rides and averages 14.2 rappen per trip if completely used. It is therefore possible for the thrifty Switzer to get his early morning

### \$2,900,636 Net Reported by Municipal Railway

Comparative receipts of the San Francisco (Cal.) Municipal Railway for the fiscal year 1919-1920 and 1920-1921 were reported in the San Francisco *Municipal Record* for July 28. The statement follows:

Line	1919-1920 Receipts	1920-1921 Receipts	Increase or Decrease of 1920-1921 Over 1919-1920
A (Park).....	\$308,237	\$321,825	\$13,580
B (Beach).....	397,585	422,418	24,834
C (California St.)	333,639	352,001	18,362
D (Presidio).....	308,981	303,722	*5,259
E (Union St.).....	243,261	241,002	*2,261
F (Stockton St.)..	168,306	181,923	13,618
H (Van Ness Ave.)	209,708	223,190	13,481
J (Church St.)...	359,819	393,948	34,129
K (Tunnel).....	321,089	368,928	47,838
L (Taraval St.)..	8,897	10,056	1,159
Bus No. 1.....	14,982	16,380	1,397
Bus No. 2.....	7,693	9,433	1,739
Total 5c. fares..	\$2,682,197	\$2,844,825	\$162,627
School tickets...	17,699	19,763	2,063
Q. M. tickets....	3,928	3,551	*376
Special cars.....	241	337	96
Cond. shorts....	525	493	*30
U. R. R. transfers.	4,708	.....	*4,708
Miscellaneous...	40,353	31,667	*8,686
Total receipts..	\$2,749,651	\$2,900,636	\$150,985
Deduct U. R. R. transfers issued	6,235	.....	.....
Deduct insurance on auto buses..	14,400	.....	.....
Net receipts.	\$2,729,015	\$2,900,636	\$171,620

\* Denotes decrease.



GRAPHS OF CITY TRAFFIC

ride for 10 rappen and his luncheon round trip and return home at night for 14.2 rappen per ride. The practical effect of these rates is to favor the regular short ride customer as long riders naturally have less time to ride home for lunch.

### Montreal Tramways Does Better

The Montreal Tramways Commission has issued the annual statement of the year's operation of the Montreal Tramways to June 30 last. It shows gross receipts for the year amounting to \$11,773,005, as compared with \$10,782,470 in the preceding year.

Operating expenses were higher in the year, being up about \$500,000 to \$6,327,841. This left operating profit at \$47,442, up from \$46,606 the previous year. Maintenance and renewals are up some \$400,000, to \$2,529,055. Surplus balance is given at \$378,708, against \$243,124 the previous year, after taking into consideration allowances due the company.

City rental of \$500,000 and contingent reserve, both payable when earned, reduce the showing, making a deficit on the year of \$239,022, against \$364,700 the previous year.

STATISTICS OF ZURICH TRAMWAYS FOR 1918 AND 1919

Character of Fare	Number of Tickets		Number of Trips		Per Cent of (Income)	
	1918	1919	1918 Total	1919 Total	1918	1919
Single ride tickets: at.....	10 Rp.	.....	13,972,820	.....	23.91	.....
at.....	15 Rp.	.....	7,029,053	.....	12.03	.....
at.....	20 Rp.	20 Rp.	4,519,609	31,692,299	7.73	55.34
			25,521,482	31,692,299	43.67	55.34
Commutation tickets: Number of Tickets	1918	1919				
General.....	901,928	528,545	17,951,228	8,456,720	30.73	14.77
Suburban.....	125,669	.....	3,141,725	.....	5.37	.....
Off peak.....	7,365	277,690	154,665	5,831,490	0.26	10.19
Early a.m.....	41,235	84,234	2,004,070	2,527,020	3.43	4.41
Three months.....	18,133	.....	6,527,880	.....	11.18	.....
To 1000g.....	.....	33,815	.....	4,064,160	.....	7.11
Six months.....	3,457	4,443	2,489,040	3,198,960	4.26	5.59
One year.....	.....	534	.....	768,960	.....	1.35
School tickets.....	911	1,015	130,326	156,772	0.22	0.27
Interline A.....	138	283	2,760	5,662	.....	.....
Interline B.....	248	415	4,960	8,300	0.01	0.01
Telegraph, telephone and mail employees.....	.....	.....	508,550	555,521	0.87	0.96
Total gross.....			58,436,686	57,265,862	100.00	100.00
Refund for unused tickets.....			682,873	206,957	.....	.....
Total net.....			57,753,813	57,058,905		

### Trade Body Committee Opposed to Reorganization Plan

Reorganization of the Pittsburgh (Pa.) Railways with "one owner, one franchise, one debt and one operator" is urged in a report submitted by the joint committee on better street car service of the Allied Boards of Trade and adopted by the boards' executive committee. The report contains nineteen objections to the reorganization plan already proposed and submitted to Council for approval. The report will be submitted to constituent bodies of the Allied Boards of Trade for their individual action before being formally taken before Council.

The report contends that, in the reorganization, all leases of underlying companies should be surrendered for cancellation on the grounds that they have previously been the largest factor in preventing successful operation of the company. It holds that the valuation of \$62,500,000 is excessive and that this figure was reached by the Public Service Commission, using wartime prices as a basis of calculation.

One clause of the report urges that an agreement for an indefinite franchise be reached and that the city refrain from tying its hands on the terms of the proposed franchise agreement. It also urges that the city reserve the right to purchase the entire system at any time at a price not to exceed the Public Service Commission's valuation. It holds the agreement should stipulate for no collection of increased fare until the proposed increase is approved by the Public Service Commission and the Appellate Courts.

The report maintains there should be provision for through routing of cars in the contract. It also takes up certain specific points of the proposed agreement and attempts to show wherein their acceptance would prove either foolhardy or burdensome.

### Canadian Roads Show Deficits

Of the 66 electric railways operating in Canada during the year 1920 only 13 declared dividends. A further 12 companies made a surplus, and the remaining 41 showed deficits. The average fare collected per passenger was 5.37 cents, as against 5.01 cents for the preceding year.

According to a bulletin just issued by the Dominion Bureau of Statistics, the total capitalization of these 66 electric railways was \$170,826,404, made up of \$91,321,955 of stocks and \$79,504,449 of funded debt. As a whole, these railways showed a net operating revenue of \$9,804,762, as against \$9,312,884 for the year 1919. Total operating revenues increased from \$40,698,586 in 1919 to \$47,047,246, and expenses increased from \$31,385,702 to \$37,342,483. After paying taxes, interest, etc., there was a net corporate income of \$954,818, as against \$3,704,066 for 1919 and after making deductions for dividends there was a total deficit of \$2,421,286.

There was an increase of 7.4 per cent

in the number of passengers carried, and an increase of 15.3 per cent in passenger receipts. The number of employees was 17,341, an increase of 401, while the total payroll amounted to \$24,435,932, an increase of 19.4 over the previous year.

### Michigan Commission Charges Bad Faith

The Michigan State Public Utilities Commission has refused the Detroit United Railway the right to issue a stock dividend amounting to \$385,000. The opinion, written by William W. Potter, says in part:

The approval of the issuance of a stock dividend is a matter of discretion. This commission ought not to exercise its discretion in favor of a company which violates the law of the State and flouts its pledged word. The issuance of a stock dividend means only that the surplus earnings are transferred to capital and certificates of stock issued against them.

If the company has earned, as it claims, a fair return, an addition to its surplus, capitalizing the contributions of the public to the company's stockholders, results in the public being compelled to contribute a fair return on a surplus accumulated from what, in excess of a fair return, the company has taken from the public.

The Detroit United Railway already has so many bonds and so much capital stock outstanding that its shares are worth considerably less than par in the open market.

To say the least, the actual value of the company's lines where franchises have expired, or will expire, is uncertain, speculative and conjectural and forms an altogether unsatisfactory basis for a stock dividend. The company's immediate prospective losses appear to demand the most skillful husbanding of its surplus, rather than the creation of a liability in perpetuity.

The reference to the company floating its pledged word is believed to refer to the railway's refusal to file its fare rates according to the Glaspie Act.

### Business Splendid, Report of Motor Bus Company

Accomplishments of Detroit Motor Bus Company, Detroit, Mich., for first full year of operations exceeded expectations. First line was opened June 11, 1920, with six buses covering a four-mile route on Jefferson Avenue. Gross earnings now are averaging \$3,500 daily, compared with \$500 the first day.

During six months and twenty days of 1920, gross earnings were \$250,000. For six months ended June 30, 1920, gross was \$324,820 and for July \$108,160. The following table shows how service has been expanded and monthly gross earnings increased:

	Buses Operated	Miles Covered	Gross Earnings
1921			
July	59	259,434	\$108,160
June	47	205,600	80,524
May	37	172,432	66,845
April	29	133,408	53,521
March	28	132,337	46,982
February	27	112,393	35,956
January	27	125,685	41,000

August figures show 68 buses in operation over 19 miles of route. Gross earnings for the month are expected to be about \$110,000. After reserves for depreciation, the company shows a surplus of \$62,000 from its operations.

Paid-in capital is \$453,040 out of \$1,500,000 authorized. The first dividend of 1½ per cent was paid July 1, 1921. Capital purchases are being made out of surplus and it is understood little additional stock will be offered.

### Toledo Railway & Light Changes Name

The Toledo Railway & Light Company, Toledo, Ohio, controlled by Henry L. Doherty & Company, has called a special stockholders' meeting for Oct. 6, to vote on a plan to change the name of the company, increase its capital stock from \$15,000,000 to \$25,000,000, and merge it with the Acme Power Company, another Doherty property.

As the company's railway properties have been transferred to the Community Traction Company, a municipal project, the company proposes to change its name to the Toledo Edison Company. It is planned to issue \$4,000,000 preferred stock at this time, to provide for developments and as a part of the plan for permanent financing of the company.

If the plan is approved, it means the cleaning up of practically all of Toledo Railway & Light bonds, and freeing the Community Traction Company of obligations. The \$1,900,000 mortgage on the latter company, which was extended some time ago, will be taken up.

## Financial News Notes

**Line Abandoned.**—Permission has been granted the Los Angeles (Cal.) Railway to abandon the line from the junction of La Salle and Washington Street south. The territory is served by the Washington line, which largely duplicated transportation. For this reason the city regulatory authorities permitted the track removal.

**Receivership Terminated.**—By a decree entered in the Superior Court on Sept. 6 by Justice Tanner, the receivership of the Rhode Island Company, Providence, R. I., has been terminated. The decree directs the receivers to deliver about \$1,070,000 in cash and all their books and accounts to the United Electric Railways Company. The Rhode Island Company, organized to take over the largest part of the trolley lines in this state, went into a receivership on January 30, 1919.

**More Franchises Surrendered.**—Notice of the surrender of eight franchises from counties and municipalities has been filed with the Indiana Public Service Commission by the Terre Haute, Indianapolis & Eastern Traction Company and the Indianapolis & Northwestern Traction Company. The surrenders were made under the provisions of an act of the last Legislature. The companies will operate under an indeterminate permit from the commission. The franchises were from the following cities and counties: Frankfort, Zionville, Boone County, Clinton County, Crawfordsville, Montgomery County, Englewood and Lebanon.

# Traffic and Transportation

## "Club-Plan" Buses Busy

Police Officials at Bridgeport Restrained From Interfering With These Vehicles

Another complication has been added to the bus situation in Connecticut. Judge John J. Walsh, of the Court of Common Pleas signed an injunction restraining Superintendent of Police Flanagan and Assistant Prosecuting Attorney Vincent L. Keating from restraining the Bridgeport Bus Association from operating their 150 buses under the "club plan."

The bill of complaint was drawn up by DeForest & Klein, and Attorney Kilpatrick is named as the complainant. Immediately upon his return to Bridgeport with the signed injunction Attorney Kilpatrick delivered it to Attorney Klein, and the latter communicated with City Sheriff Dan D'Elia, who was given copies of the order for immediate service upon the superintendent of police and the assistant prosecutor.

### BUSES TO BE OPERATED AT ONCE

President Kilpatrick stated that the buses of the association, which were stopped from operating on Sept. 1, would be operated on their regular schedule at once.

The injunction, which is returnable on Oct. 4, follows in part:

Now therefore, you, the said Patrick J. Flanagan, superintendent of police of the said city of Bridgeport, and Vincent L. Keating, the assistant prosecuting attorney of the said city court, your servants, agents and attorneys under a penalty of \$5,000 are hereby sternly commanded and enjoined that you do from henceforth wholly and absolutely resist from in any manner interfering with the use by the plaintiffs of the said conveyances for their own transportation over and along said highway until the first Tuesday in October, 1921, or until further order of the court or the undersigned in the premises.

On Sept. 1 the buses were stopped from operating by Superintendent Flanagan, after Jacob Sherwindt had been fined \$5 and the costs for a violation of the jitney law. There followed two days of conferences between President Kilpatrick and Attorney Klein. On Sept. 3 the bill of complaint asking for the injunction was drawn up, setting forth the following claim:

### BILL OF COMPLAINT

1. The plaintiffs are and for some time previous have been organized and associated as a partnership under the said name for the purpose of promoting and protecting their mutual rights and interests in transporting and conveying themselves over and along the public highways of the said city of Bridgeport and the adjoining territory.

2. For said purpose, they have at large expense procured for themselves conveyances known as motor buses and have been and are now desirous of lawfully operating same over said highways for the convenience of themselves.

3. The defendants claiming to act by virtue of their authority as public executive officers in the said city of Bridgeport have assumed to prohibit and interfere with these by the plaintiffs of said conveyances for their own transportation over the said

highways and have threatened and are lawfully threatening to use force and violence to restrain and interfere with the exercise by plaintiffs with said right in using said highways for said purposes.

4. By reason of the said unlawful acts of the defendants the plaintiffs have been, and are prevented, from exercising said rights to use their said privileges for the purpose aforesaid and are therefore and have been put to great inconvenience, loss and expense, and will continue to be so interfered with and deprived of said rights and to suffer great inconvenience, loss and expense unless said unlawful acts of the defendants shall be restrained and prevented by injunction.

5. The plaintiffs have no adequate remedy for their loss. The plaintiffs claim:

(a) \$10,000 damages.  
(b) By way of equitable relief an injunction restraining the defendants, each and every one of their servants, agents, and attorneys from further interfering with restraining or preventing by force, threats, or otherwise the plaintiffs from operating their said conveyances over said highways for said purpose.

William F. D. Kilpatrick of Bridgeport is recognized in \$50 to prosecute. Of this writ with your doings thereon make due service and return.

## Five-Cent Fare Privilege Extended

Additional 5-cent local fares were established by the Boston (Mass.) Elevated Railway on Aug. 13. The lines affected are those in Cambridge, Dorchester, Roxbury and Charlestown terminating at Sullivan Square or Harvard Square.

In Charlestown new rates of fare and method of operation will be put into effect on Main Street and Bunker Hill Street lines, running between Sullivan Square station and Brattle Street station subway, providing 5 cent local fare without free transfer, or a dime with free transfer.

Two lines will be run between Sullivan Square station and Brattle Street subway station, one via Main Street, the other via Bunker Hill Street, using the tracks in the subway now used by cars of the Eastern Massachusetts Street Railway Company. Prepayment cars will be used on both routes.

The 5-cent fare privilege will be further extended on Sept. 24 to eight additional local lines radiating from Dudley, Egleston Square and Forest Hills. The story of the new payment system on the lines of the Boston Elevated Railway was given in detail in the ELECTRIC RAILWAY JOURNAL, issue of July 9.

## Would Furnish Complete Service

Long Beach (Cal.) residents can be assured of a complete transportation system if the city will enter into an agreement with the Pacific Electric Railway to arrange a fare schedule that will net a fair return. This opinion was recently expressed by Paul Shoup, president of the Pacific Electric property, during a visit to Long Beach.

Mr. Shoup explained how the plan worked in Fresno, where the city guar-

anteed the company an 8 per cent return. He said that temporarily bus feeders would have to be used, but that later an entire street-car system would be in operation.

## Jitneys Ordered to Stop

Chief Executive of Kansas City to Compel Compliance With City Ordinance

The Mayor of Kansas City, Mo., on Aug. 29 ordered the suspension of jitney service on a northeast jitney route because of non-compliance with the regulatory ordinance. As a matter of fact, however, jitneys are still operating on many routes, though spasmodically.

The ordinance requires that operators of jitneys shall secure petitions containing names of the owners of a majority of the front feet of property on proposed routes. Jitneys were permitted to operate while petitions were being circulated, but in no case has an operator been able to obtain the "majority petition." In several instances petitions presented were found upon examination to lack the necessary majority, and jitneys which had continued on the assumption that the petitions were satisfactory were ordered to suspend.

Jitneys covering routes to the southeastern part of the city continued running several days after they were ordered to quit. They displayed signs offering rides free. Patrons usually gave the drivers tips. The practice was prohibited. Some jitneys are operating under signs indicating interstate traffic, as "Intercity Bus," or with names of cities in Kansas, adjoining Kansas City, Mo., displayed. Some buses merely extended their routes a few blocks in order to secure a terminal in the adjacent state.

A restraining order has been asked by the jitney association to enable the jitneys to operate without "consents" required by petitions. Up to Sept. 1 no such order had been issued.

An earlier ordinance ruled jitneys off of streets having street railway tracks. The park board has prohibited jitneys from operating on boulevards.

## Perfect Safety Score Made by Pacific Electric in June

In a movement of 4,110,000 motor miles, equivalent to encircling the globe 164 times, the Pacific electric lines running out of Los Angeles to points throughout Southern California went through the entire month of June, 1921, without a single mishap in the way of a casualty accident in the operation of its cars and trains over its 1,100 miles of lines. The record is the more remarkable in the light of the fact that many of the casualties on railway lines are attributable to recklessness for which the carrier, its agents or employees are in no way responsible and against which no effective precaution can be taken.

## Boston's "No Accident Week"

Drive Will Begin Sept. 25, Coincident with the National Safety Council Convention

A state-wide "No-Accident" Week, Sept. 25 to Oct. 1, is to be held in Massachusetts coincident with the annual session of the National Safety Council, which is scheduled to take place this year in Boston. An elaborate program of safety activities has been worked out in great detail. The plans for this "No-Accident" Week include a large amount of co-operation from the electric railways.

A special electric railway committee on safety matters has been functioning in Massachusetts for nearly a year in connection with the Massachusetts Safety Council, which is in reality a union of the local units of the National Safety Council. H. B. Potter, assistant general manager of the Boston Elevated Railway, is chairman of the electric railway committee, which numbers among its members representatives of the Worcester Consolidated, Boston & Worcester, Eastern Massachusetts, Union, and other large Massachusetts electric railways. Generous contributions have been made by the various electric railways toward defraying the expenses of the convention and the "No-Accident" campaign.

During the progress of the campaign special electric railway cars bearing appropriate banners advertising the safety work will be operated through all the cities and towns reached by electric railway tracks and will make themselves conspicuous by blowing whistles at frequent intervals. They are scheduled to run every day throughout the week. Dasher signs bearing the motto "Don't Get Hurt" are to be furnished to companies and carried on all cars during the whole seven days. Larger display posters are to be furnished for subway and elevated stations, terminals and waiting rooms.

Although the street railway end is only one detail of the main program, which is to include no-accident propaganda in shops, factories, stores, schools and on the highways, it is expected that very considerable benefits will result to the railway companies. A special drive is to be conducted to secure better co-operation from automobilists and motor-truck drivers in preventing collisions with street cars.

Governor Channing H. Cox is greatly interested in the coming events. He has volunteered the use of the State House Auditorium for the convention sessions of the National Safety Council. The Governor will address one of the meetings.

### Establishes Freight Business

Freight earnings on the West Penn Railways, Pittsburgh, Pa., increased during the business depression as the passenger earnings decreased. Wholesale houses finding business falling rapidly diverted deliveries to its freight service, discontinuing use of

trucks. The company is now negotiating with the Pittsburgh (Pa.) Railways for the Pittsburgh Terminal service with fair prospects of a favorable arrangement. Officials of the railway hope that having established this business it will continue when conditions return to normal.

### Be "On Your Toes"

The significance of safe operation and courteous treatment of passengers is told by W. E. Dunn, vice-president of the Los Angeles (Cal.) Railway in the Aug. 29 issue of *Two Bells*, the official publication of the company. Mr. Dunn's remarks were occasioned by a statement in a previous issue of *Two Bells* to the effect that the complaint department would pretty soon be out of a job. He said that he remembered and had been inspired by the lively rivalry that had existed among the divisions for first place in the safety contest. He praised the men for their splendid record, and said that he felt

"I don't know which is more important, safety in operation or courtesy in operation. If a car is smashed in a collision, that car can be repaired and put back into service; but if the public is hurt by a collision of ideas or a collision between the mind of the trainmen and the public mind, there ensues a damage that cannot be easily remedied. "Public favor is sometimes a very hard thing to gain, and once gained it should be treated as a priceless jewel."

proud to be associated with a property which was attracting the attention of operators of great systems in other cities. Mr. Dunn emphasized the exacting attitude of the public and the need for employees to be "up on their toes" at all times.

### Another Successful Five-Cent Line

Ft. Madison, Ia., now occupies the unique distinction of being the only city in Iowa to retain 5-cent fares. The Mississippi Valley Electric Company, which operates there, has been able to hold down to the traditional fare only because there is an unusual condition in Ft. Madison. In the first place, the city has a population of 12,000 people, and there are only 4 miles of track. Power obtained from the Keokuk dam, only 25 miles away, is cheap. Contracts for this power were made before the war. Another feature in keeping expenses down has been the operation of one-man cars. Still another factor has been the absence of buses or jitneys. The Mississippi Valley Electric Company bought the plant six years ago from the Ft. Madison Street Railway when it was a losing proposition. In spite of improving service, the new company has been able to put the line on a paying basis.

### Interurban Fare Ruling Reargued

The State Supreme Court recently heard the appeal of the Georgia Railway & Power Company, Atlanta, Ga., from the decision of the lower courts in the matter of 7-cent fares on its interurban lines to College Park and Decatur.

The Railroad Commission, in granting the 7-cent fare in the city of Atlanta, held that it had no authority to regulate the fares to College Park and Decatur, because of existing contracts between these municipalities and the power company. Thereafter the power company sought to institute 7-cent fares of its own accord, and the municipalities instituted injunction proceedings in the superior court, where each of them was successful. The courts granted the injunction restraining the power company from charging 7-cent fares on the lines between College Park and Decatur.

The power company appealed to the supreme court, and the case was argued last winter. Since this argument, it appears that Associate Justices Hill and Atkinson have been disqualified through the fact that they are related to persons who own stock in the power company. In their places were Justices Meldrum of Savannah and Wright of Rome. No decision has been handed down.

### Jitneys Will Be Barred

As the result of action taken by City Manager Locke and the city commissioners of Grand Rapids, Mich., jitney buses will undoubtedly be barred from those streets on which the railway operates lines. The Grand Rapids Railway recently protested against jitney competition and the matter was referred to the city manager and a special committee of commissioners for investigation. The company presented figures which showed large losses due to jitney competition.

City Manager Locke in explaining the proposed action said that it was not the intention to abolish the jitney in the city, but that the lowest possible electric railway fare was desired. Further, he said that the jitneys should not be permitted to operate on streets occupied by car lines.

This ruling will be put into effect as present licenses expire. A reduction in car fares, made effective recently, makes the cash fare in Grand Rapids 10 cents, with four tickets for 25 cents.

**Lower Fares Increase Traffic.**—Since fares have been reduced a half a cent to 8 cents and the "pay-as-you-enter" system re-established on the lines of the Cincinnati (Ohio) Traction Company, there has been a noticeable increase in the number of passengers. William Jerome Kuertz, Director of Street Railways, said that on Aug. 1, when the reduction went into effect, the number of fares increased 6,000. The fares collected were 295,517 on Aug. 1, as compared with 289,176 on the previous Monday.

### Increased Rates Refused— Service Cut

The South Carolina Railroad Commission has refused the petition of the Augusta-Aiken Railway & Electric Corporation for an increase in zone fares from 5 cents to 9 cents a zone. At the same time the railway was authorized to reduce its service 50 per cent.

Several months ago the company requested an increased zone rate between Augusta and Aiken. A hearing was held on March 16 and much testimony was submitted. In its findings the commission states that conditions in the communities served by the railway were far from normal and that a solution to the problem was needed which would retain the traffic and at the same time reduce operating expenses.

It was a question of reducing service or increasing rates. The commission was of the opinion that in view of the present conditions the people could better put up with a reduced service than with higher fares. The order went into effect on Aug. 28.

### Inspiring Employees to Merchandise Transportation Service

Upon taking up his new position as general manager of the Tri-City Railway of Iowa, Davenport, recently, R. J. Smith sent out a letter to each employee at his home which was intended to inspire a better idea of the merchandising aspects of his job. The letter was very well received, and is considered worth reproducing. The part of the letter dealing with this aspect follows:

We are manufacturers and sellers of transportation, and as such we shall require a good property throughout and the brain and heart of each individual of us—brain to plan, and heart to keep at it and enjoy it. Of these three requisites only the property is at all lacking. In some respects, as for example certain trackage, we shall have to bend our every effort to improve the property. Many of us forget the selling end of the business. It's of no use to make a commodity that you don't dispose of. Empty car seats are transportation unsold. The manufacturer must sell his product. Let's sell ours. How?

By doing as other merchants do—furnish a good article; charge a fair price; advertise; and be friends with the customer.

What have you and I to sell? More than just a ride. For 8 cents we are now selling not only a ride from 500 ft. to 50,000 ft. in length, but also cool breezes in summer, snug warmth in winter, safety, reliability, cleanliness, decency, good light for reading, room for carrying bulky articles, a lost-and-found service, general information, watchfulness over children and the infirm, and finally an insurance policy covering person and property. A splendid package for 8 cents! Surely a good article at a fair price. We salesmen, then, can take pride in handling such a line of goods.

Therefore advertise this excellent buy. Talk and act its virtues every chance you get. Study to improve the quality and then advertise the improvement.

And let's make every customer feel that we are glad to have him with us and want him to come again. Pleasure in our work of serving him, courtesy and good appearance will help us immeasurably in making him feel how really interested we are in giving him the most for his money.

Our principal salesmen are those among you who operate the cars. You are the business getters, for you come in direct contact with the customers, and it is your personal responsibility to attract every possible rider. Your acquaintance is enormous, and to all these people you operators are the representatives of the company—you are the company. They judge it by you. See to it that their judgment is favorable. The personal contact with the customer is invaluable. Use it to serve and to sell.

For, that is the heart of the problem—to sell. If we can sell all we can make, we shall do our job well.

You have heard that the street car is passing on—is a dead one. The ablest students of transportation state that for dependability, speed, safety and cheapness, nothing has yet been devised to equal the electrically driven car on rails. We shall have such cars for some considerable time.

And we must remember this. It is not the Pierce-Arrow nor the Ford which we have most to fear. Our greatest competitor is shoe leather. We must sell the services of the Tri-City Railway of Iowa until no one will think of refusing to pay our small fee and receive the great benefits we are so ready to give.

Efficiency in operation, integrity in collection, and courtesy with our patrons will put this company upon its feet and make better jobs for us all. Our boss is the Public. Let's please it.

## Transportation News Notes

**Cash Fare Advanced.**—Permission has been granted to the Frankford, Tacony & Holmesburg Street Railway, Philadelphia, Pa., to charge an 8-cent cash fare with eight tickets for 50 cents, zone limits at Blakiston and Decatur Streets and a monthly book of tickets for \$4.50. The new rates will continue in effect for a year.

**Increased Fare Allowed.**—The Athens Railway & Electric Company, Athens, Ga., was recently authorized by the State Railroad Commission to increase its fares from 6 cents to 7 cents. The order became effective on Sept. 1.

**Fare Rise Granted.**—The State Railroad Commission of Georgia recently issued an order authorizing the Valdosta Street Railway to increase its carfare from 6 cents to 7 cents. The Chamber of Commerce of the city wrote the commission that it approved of the increase.

**Popularizing Parcel Post.**—Letter mail boxes have been placed on the Lake Minnetonka cars of the Twin City Rapid Transit Company, marked: "Minneapolis to Tonka parcel post service. Deposit request for pickup in this box and carrier will call at your door for package. Trucks will arrive at this point at — a.m. E. A. Purdy, postmaster." This is designed to expedite and make popular the new parcel post delivery by automobile truck.

**Will Appeal Ten-Cent Fare.**—Following the decision of the Public Service Commission authorizing the Buffalo & Lackawanna Traction Company, Buffalo, N. Y., to charge a 10-cent fare without transfer, the councilmen have directed Corporation Counsel Rann to appeal the ruling. The railway will first apply for a rehearing. If this is denied a certiorari proceeding to review the commission's decision will be started.

**Arrangements Made for Classifying Freight.**—The Northwestern Ohio Railway & Power Company has arranged with the Detroit (Mich.) United Railway for the issuance of class rates on freight from all points in Michigan

served by the Detroit United to points on the Northwestern Ohio system. The Detroit United serves practically all of Southeastern Michigan and it is believed that large business will be the result under class rates.

**Railway Co-operates With Auto Club.**—The Public Service Railway, Newark, N. J., has notified the New Jersey Automobile & Motor Club that it will co-operate in the campaign to rid the streets of broken glass and bottles. N. W. Bolen, general superintendent of the railway, says that all the motormen and conductors will be instructed to remove broken glass from the streets or report it to the proper authorities when they discover it along the tracks. The order will also apply to glass scattered along the streets following collisions.

**Applies For Ten-Cent Fare.**—The New York State Railways applied to the Public Service Commission on Aug. 6 for a 10-cent fare in Oneida and between the zone of Wampsville and Kenwood. The fare at present is 5 cents. B. E. Tilton, vice-president of the company, said he thought the decreased patronage was due more to business depression than to jitney competition. J. E. Duffy, general superintendent at Oneida, stated that although there was no bus competition in the city of Oneida there was considerable in outlying districts, especially between Oneida, Sherrill and Kenwood.

**Jitney Dispute Before High Court.**—Claiming that a half dozen jitney buses have been operating between Pennsgrove and Carney's Point, N. J., without approval of the Public Utility Commission, the Salem & Pennsgrove Traction Company on July 28 carried the dispute to the New Jersey Supreme Court. The railway charges that licenses were granted to the jitney men by Upper Penns Neck Township since March 15, the date when the 1921 law placed the jitneys under the regulation of the Commission. Supreme Court Justice Katzenbach has directed the jitney operators to show cause in Camden, N. J., why the jitneys should not desist from operating, pending approval of their municipal licenses by the Commission.

**Bus Permits Granted.**—Nine applications for the privilege of operating bus lines within New Jersey were granted on Aug. 23 by the Board of Public Utility Commissioners. Nineteen other applications were denied on the ground that existing electric railways with which the proposed bus lines would compete now furnish adequate service. Eight of the applications granted were for routes in Camden County, between Camden and Brooklawn, Camden and Gibbstown, Camden and Blackwood, Swedesboro and Camden, Williamstown and Camden and Camden and Highland Park. Franchise was also granted for operation of buses between Butler and Newark. Provision was made in each case that local traffic within the areas served by electric railway systems would not be carried.

## Personal Mention

### Mr. Hukill Traffic Manager

New York Central Man Joins F. H. Wilson, a Former Associate, on Cleveland Southwestern

Edmund L. Hukill is the new traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, succeeding C. C. Collins, who resigned on July 15. Mr. Collins, who had been traffic manager of the interurban line for more than four years, has not announced his plans for the future.

Mr. Hukill is new to the electric railway industry, having been associated with steam railroads prior to assuming duties as traffic director of the Ohio interurban line. When he accepted the position with the Cleveland, Southwestern & Columbus Railway, Mr. Hukill was special representative of the assistant general manager of the New York Central Railroad, D. R. MacBain, Cleveland.

Mr. Hukill's experience as a railroad man began in 1907 when he started work in the freight offices of the Lake Shore Railroad in Chicago. He was there two years when he was transferred to Sandusky, Ohio, where he remained four years. In 1915 he was transferred to Toledo, where he was chief clerk in the office of the terminal yardmaster and later in the traffic department of the New York Central.

In 1918 Mr. Hukill became associated with F. H. Wilson, who was then general superintendent of the New York Central and who is now president and general manager of the Cleveland Southwestern. Mr. Hukill was in the office of Mr. Wilson until the latter went with the Cleveland Southwestern in March of this year. Since March, Mr. Hukill had been in the office of Mr. MacBain.

Mr. Collins has been traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, since 1917. His career as a railway man was begun in 1890 and has been largely concerned with traffic problems. In that year he became chief clerk in the traffic department of the Columbus & Eastern Railroad. This road was later merged with the Columbus, Sandusky & Hocking Railway upon its completion and Mr. Collins was made division freight agent at Toledo. When the road was sold to the Pennsylvania Lines in 1898, Mr. Collins engaged in business in Porto Rico.

Upon his return to Ohio and following a short connection with the Detroit, Toledo & Ironton Railroad he was appointed general express and passenger agent of the Columbus, London & Springfield Railway, Springfield, Ohio, the position he held until 1907. At that time he entered the service of the Western Ohio Railroad, Lima, Ohio, and a year later was made traffic man-

ager of the system. He resigned this position in 1911 to take a similar one with the Lehigh Valley Transit Company, Allentown, Pa. Mr. Collins was one of the organizers of the Central Electric Railway Association, and has displayed an active interest in its affairs.

### Bion J. Arnold the Subject of a Magazine Sketch

Bion J. Arnold, engineer, and a pioneer in electric railroad projects, is the subject of an interview by Neil M. Clark in the *American Magazine* for August. More than forty years ago, in the small town of Ashland, Neb., Mr. Arnold's greatest sport was watching repair work in progress on the bridge of the Burlington Railroad over Salt Creek near the Platte River. He was fascinated by the locomotive and hoped for a day when he could "make engines go." His genius for invention found expression in an engine he himself built at the age of fourteen. This engine is now in his office in Chicago. Despite opposition to his ambition, lack of facilities and a none too strong physique, he went ahead. His technical training was obtained at Hillsdale College. His early position as a draftsman in Milwaukee and another building a 300-hp. cross-compound engine for a Dubuque company, started Mr. Arnold on the road to success. The various achievements in the years that followed are well known to engineers everywhere. "To want something so hard that it hurts if you can't get it" gives some idea of Mr. Arnold, the man. He says that nothing can stop a man who has that desire and that, in his own particular case, obstacles became stepping-stones to his objective.

### F. H. Harris Leaves Charleston Consolidated

F. H. Harris, superintendent of equipment of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., recently resigned to accept an appointment as master mechanic of the Charleston (W. Va.) Interurban Railroad. Before his departure for Charleston, W. Va., to take up his new duties on Sept. 1 the shop employees presented him with a silver tea set and all expressed their best wishes for his success in his new position. His thirteen years' association with the employees of the Charleston Consolidated had made many ties that were hard to break. The position made vacant by Mr. Harris has been filled by Ernest C. Barker, formerly in charge of the electrical department of the railway shops of the Charleston Consolidated Railway & Lighting Company.

Mr. Barker was born in Barking,

Essex, England. He was educated in English schools and came to the United States while a young man, in 1906. He went into the shipping department of the Western Electric Company, New York, testing telephone switchboards for shipping. About a year later he tested and installed meters for the Public Service Electric Company in Hackensack, N. J., while in 1908 he had charge of wireless operation on one of the ocean liners of the American Steamship Line. In the latter part of 1908 he went into the repair shops of the New Jersey & Hudson River Railroad & Ferry Company, and remained on the property when it became the Bergen division of the Public Service Railway.

Mr. Barker went to the New York Subways to wire the new cars for 10-car train operation, and was there about a year. He then returned to the Bergen division of the Public Service Railway, entering the repair shops at Edgewater as electric repairman and became foreman of the shops in 1917. In February, 1919, he accepted a position in the Charleston Consolidated Railway & Lighting Company shops at Charleston, S. C., as electrical foreman, and was appointed master mechanic Aug. 16, 1921.

Thomas G. Hill now occupies the position as chief claim adjuster of the Capital Traction Company, Washington, D. C.

F. C. Eckmann, general manager and purchasing agent, has become vice-president of the Joliet & Eastern Traction Company, Joliet, Ill., following the resignation of Robert Kelly.

A. E. Robertson, formerly vice-president of the Coal Belt Electric Railway, Marion, Ill., has been appointed president of the company to succeed J. G. Drew of St. Louis. Also O. E. Coyne is the successor of H. H. Berry as superintendent of the property.

Kazutada Sakurai, equipment engineer of the Municipal Street Railway lines in Tokio, Japan, has recently arrived in New York, where he expects to make his headquarters for the next year or two in his study of American electric railway car shops, carhouses, and car buildings. Mr. Sakurai has spent about seven months in Chicago making similar studies. He may be reached in care of the Japanese Consul-General, 165 Broadway.

C. M. Bange, whose appointment as master mechanic of the Interstate Public Service Company, with headquarters at Scottsburg, Ind., was announced in these columns on Aug. 27, was for three years master mechanic of the Detroit, Rochester & Romeo Railway. For five years he served as master mechanic of the Detroit-Ypsilanti-Ann Arbor & Jackson Railway. Both of these companies now form a part of the Detroit United Railways. He served as superintendent of power and equipment of the southern division of the Northern Ohio Traction & Light Company for two years and for eleven years was superintend-

ent of equipment and overhead, Elmira Water, Light & Railroad Company, Elmira, N. Y.

Frederick I. Cox, of New Jersey, was nominated on July 22 to be a member of the Interstate Commerce Commission in place of Edgar E. Clark, chairman, who has resigned. It was said that Judge Clark felt that he had reached a time in his life when he could no longer afford to serve the public at the comparatively small compensation, and will go into private business. Mr. Cox was selected by President Harding as a representative of the great body of commercial traveling men. The President has set a policy of appointing to the board men characteristic of various elements of the national life affected by the railroads. Mr. Cox was born in Dover, O., in 1849.

## Obituary

Martin J. White, chief supervisor of the city buses of the New York Department of Plant and Structures, died Sept. 1 at the age of forty-four. Mr. White took charge of the bus system a year ago. He graduated from Manhattan College in 1897.

William H. Guyton, superintendent of transportation East St. Louis & Suburban Railway, died recently. Mr. Guyton began his street railway career as a conductor in Kansas City and later in St. Louis and was a conductor with the Old Day Line Company, one of the predecessors of the East St. Louis & Suburban Railway. He later became superintendent of this company when it was consolidated with the East St. Louis & Suburban Railway and subsequently became superintendent of the entire system.

George C. Killeen, superintendent of the Southern New York Power & Railway Corporation, Cooperstown, N. Y., died on Aug. 31. Mr. Killeen was a native of Elizabeth, N. J. His age was 46 years. After attending the public schools of Middletown, N. Y., where most of his early life was passed, he entered the employ of the Middletown Traction Company, with which he remained four years. Later he removed to Staten Island, where he was engaged with the Staten Island Railway, remaining there for two years and going afterward to Brooklyn, where he held for ten years a responsible position as master mechanic and where he did some excellent work directing new installations and development plans. Five years ago he came to the Southern New York company as master mechanic and later was made superintendent both of the shops and of the company's power plants and trolley lines. In the latter position he was proving most capable and efficient and his loss will be felt not only by the officials but by all employees of the company as well.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE  
MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Lower Prices on Some Poles and Cross-Arms

Reductions were reported last week in certain poles and cross-arms. Chicago, St. Louis and New York territories report that Northern white-cedar poles in lengths from 25 ft. with 4-in. top to 35 ft. with 7-in. top were reduced about Aug. 19 in varying amounts from 15 to 25 per cent, depending on size, grade and classification. Utilities around St. Louis showed a tendency to hold off buying until the fall demands make it necessary, and the reduced prices are stimulating pole sales. Present inquiries indicate a rather healthy business for the next few months. Stocks are in good shape.

Around Chicago the demand has been slow and uneven, and pole movement has not reacted as yet to the price cost. Buying around New York, too, is rather quiet.

Yellow-pine cross-arms have come down about 10 per cent in the past ten days. No change has been reported in fir arms. Railways and utilities in the Southwest are providing a fairly good call for these yellow-pine arms.

## Coal Output Has Found a Level

Production of soft coal, says the weekly report of the United States Geological Survey, appears to have found a level for the time being at about 7,750,000 tons a week. The total output during the week ended Aug. 27 is estimated at 7,755,000 net tons, as against 7,771,000 and 7,713,000 tons in the weeks of Aug. 13 and 20, respectively. Preliminary reports indicate no great change during the week Aug. 29 to Sept. 3. Stationary production at this season of the year is exceptional. The normal trend is upward fairly steadily from April to November.

## High-Voltage Transmission Equipment for Midi Railway

The order for electrical equipment for the Midi Railway in France, as announced in the *ELECTRIC RAILWAY JOURNAL* for July 20, will be used on the transmission system being built by the Midi Company for supplying power to operate the railways and also industrial concerns. The Westinghouse Company will use its Essington works, near Philadelphia, for the manufacture of a large part of this machinery and equipment, the order for which totals between \$1,200,000 and \$1,500,000.

The equipment includes only apparatus for the construction and operation of this power line at 154,000 volts. Eleven 6,660-kva. single-phase, 50-cycle outdoor-type transformers with

a voltage ratio of 60,000 to 89,000 will be connected in star on the high-voltage side to give the transmission voltage of 154,000. For step-down service 14 6,600-kva. 86,700 to 34,600-volt transformers will be required. These will be connected in groups of three for 3-phase operation and connected in star on the high-tension side for 150,000 volts. Also they will be designed with a tertiary winding for 6,600 volts delta connected for supplying power to synchronous condensers. For line regulation 2 15,000-kva. and 4 2,000-kva. self-starting synchronous condensers are to be installed. They are 6,600-volt 3-phase 50-cycle machines, operating at 600 r.p.m. Lightning protection will be afforded by 13 154,000-volt 3-pole electrolytic arresters.

## Crocker-Wheeler Company Sells Canadian Plant

The plant and business of the Canadian Crocker-Wheeler Company, Ltd., St. Catharine's, Ont., have been purchased by the newly incorporated English Electric Company of Canada, which is a subsidiary of the English Electric Company of London, England. Gordon F. Perry, president of the National Iron Corporation, Ltd., Toronto, is chairman of the board of directors of the English Electric Company of Canada, Ltd., and the Canadian concern will have on its board of directors a number of other men prominent in industrial and financial circles in Canada.

It is understood that this company has obtained a large order from the Hydro-Electric Power Commission of Ontario and several weeks ago the company was awarded a large contract by the Toronto Transportation Commission. The Canadian company holds the exclusive manufacturing rights for Canada in perpetuity for all lines manufactured by the English Electric Company, Ltd., and will also act as selling agent for the latter company. The Canadian company has the right to sell its own products in the United States as well as in Canada, and is to have the use of all patent designs and processes of the British company.

Special attention will be paid by the company to the manufacture of electrical equipment and rolling stock for railways and tramways, and of switch gear and control apparatus of all kinds.

The parent company in England is said to be the largest manufacturer of electrical supplies and allied machinery and equipment in the British Empire, and the directorate includes some of the most prominent men in Great Britain. The company maintains eight branches in the United

Kingdom and ten abroad. The parent company is now undergoing a world-wide development and is putting up several new plants, particularly in France near Lyons, and in Belgium near Liege. A new plant has been erected at Tarbes and the works in Ghent will also be extended shortly.

### Electrification Postponed

The Delaware, Lackawanna & Western Railroad recently rejected all bids received for electrical equipment for the electrification of a section of its line in the anthracite region of Pennsylvania. It is expected to advertise for new bids at an early date. Gibbs & Hill, New York, are consulting engineers.

The Delaware, Lackawanna & Western is the only road at present actually in the market for electrical equipment. While the plans of that company are pretty definite, they have not been announced beyond the statement of President Truesdale in the last annual report that a mountainous section of the company's line in Pennsylvania would probably be electrified soon, although the recent advertisements for bids gave no clue to probable time that will elapse before work is begun.

### Wire Makers Considering Monthly Survey

Manufacturers of insulated wire now have the opportunity to have their product included in the survey now being made for twenty other industries, the reports of which are published by the Department of Commerce in the monthly *Survey of Current Business*, first issued under the date of July 1, 1921. Herbert Hoover, Secretary of Commerce, has appointed W. M. Steuart, who is director of the *Survey of Current Business*, as his representative to meet in New York City on Sept. 13 the manufacturers of insulated wire, represented by four groups—bare wire, rubber-covered wire, weather-proof wire and magnet wire. It is his intention to have Mr. Steuart discuss with them the best methods to adopt for obtaining from each group monthly reports on production, current stock and distribution in their respective industries.

If insulated wire manufacturers succeed in having their products included in this survey, they will have before them current comparative information never before available which should enable them to better forecast the volume and conserve the stability of their industry.

### Westinghouse Order from Japan

The Westinghouse Electric International Company has received an order for two electric freight locomotives from the Japanese Government to be used in service near Tokio. These locomotives, which will weigh 62 tons and have a capacity of 1,000 horsepower each, will operate on the 1,500-volt direct-current system.

### Rolling Stock

**Preston Car & Coach Company, Ltd.**, Preston, Ont., has entered into an arrangement with car manufacturers in the United States, who, it is understood, have orders from the Toronto Transportation Commission and from other Canadian sources, whereby the manufacturing for the Canadian trade will be done by the Preston Co. It is understood that shareholders will give their approval to the arrangement when details are placed before them at the meeting which has been called for the purpose.

**Bamberger Electric Railroad, Salt Lake City, Utah**, has included in its program this fall the purchase of twenty box cars of the latest type. They are constructed with steel underframes and equipped with the latest improvements. The first one of these cars has just arrived, and two others are expected shortly. The remainder of the cars will be received later in the fall. The new cars were ordered to replace some of the older equipment, and to provide better and more service for Salt Lake and Ogden merchandise. The company is constructing its own passenger cars, and is keeping an adequate supply on hand to meet the demands of the passenger business.

### Track and Roadway

**Detroit (Mich.) Municipal Railway** has commenced operation on the Charlevoix-Buchanan crosstown line.

**Midland Pennsylvania Railway, Pottsville, Pa.**, will be built shortly according to the new owners who recently bought the right-of-way for \$33,000. Tracks had never been laid by the original owners.

**Petaluma & Santa Rosa Railroad, Petaluma, Cal.**, has asked the city to build a new bridge over to D Street which will be wide enough for the electric trains to cross. If this is done the railway will share the expense with the city.

**Pacific Electric Railway, Los Angeles, Cal.**, has asked the trustees of the city of Whittier for permission to remove its tracks on Greenleaf Avenue. The tracks extend about two blocks from Philadelphia south on Greenleaf.

**Meridian Light & Railway Company, Meridian, Miss.**, must level its track on the Twenty-fourth Avenue car line or else remove it. The city has reached this point in this paving program and will proceed to pave over the tracks unless the company takes immediate action.

**Cincinnati (Ohio) Traction Company** will build an extension to one of its lines from Price Hill to Covedale. The North American Railway Construction Company, Chicago, has been awarded a contract for this improvement, which will cost approximately \$20,000.

**Grand Rapids (Mich.) Railway** may eliminate interurban traffic from its tracks in the city. Engineers of interurban railroads have been inspecting all the property along Front Avenue between Bridge and Shawmut Streets with a view of acquiring it for a union station, the necessary yards and sidewalks.

**Northern Ohio Traction & Light Company, Akron, Ohio**, is making extensive repairs to its track in Akron, Canton and Massillon. In Akron repairs are being made to tracks in Main Street from Federal Street to Thornton. The East Akron carhouse and tracks layout are being finished at an approximate cost of \$30,000. In Canton double track on South Main Street from Sixth Street S. W. to Navarre is being renewed. Single track on East Tuscarawas is being replaced by double track at an approximate cost of \$136,000. In Massillon about 500 ft. of track has been renewed at the City Hospital.

### Power Houses, Shops and Buildings

**The Hydro-Electric Railway** will install additional rotary converters at Windsor and Amherstburg, Ont., with an automatic sub-station at the latter point.

**Bamberger Electric Railroad, Salt Lake City, Utah**, and the Orem Railroads will have a joint terminal at the corner of South Temple and West Temple Streets,

Salt Lake City. The cost is estimated at more than \$200,000.

**Tacoma, Wash.**, has purchased a transformer weighing 80,000 lb. to be installed in its new substation at North Twenty-first Street. This shortest street railway line, which went into operation recently, will be used in transferring the transformer to its concrete platform built for it between Washington and Adams Streets on Twenty-first Street. The line will be taken up as soon as this transformer has been removed.

### Trade Notes

**The Green Engineering Company, East Chicago, Ind.**, has placed on the market its Green sidewall waterboxes for furnace settings.

**Industrial Products Company, Philadelphia, Pa.**, has recently placed on the market a first aid dressing for serious burns and scalds. It consists of a solution of bicarbonate of soda and mineral placed in a patented container.

**Automatic Sliding Trolley Company** has been organized at Frankfort, Ind., and incorporated under Indiana laws with a capital stock of \$10,000. The company will manufacture automatic sliding trolleys and other devices for street railways. Organizers of the company are William Robinson, E. C. Spray and J. A. Lucas.

**Westinghouse Electric International Company** has opened an office in Shanghai, owing to the growth of business in China. This office will have eventually several branches throughout the country in order to adequately handle inquiries and negotiations for electrical equipment. J. D. Birrell, who has long been engaged in business in the Far East, is the manager of the new office.

**Edward A. Craig**, manager of the export department of the Westinghouse Air Brake Company, Wilmerding, Pa., died on Aug. 28. He was first taken ill while he was making preparations for his transfer to the West, where he was to reorganize the Westinghouse Pacific Coast Brake Company and the Pacific Coast district. Mr. Craig's position in the air brake organization was in many respects unique. His connection with the company began in 1888, when he became a messenger at the age of fifteen. His first promotion was to secretary of the general superintendent of the works. This led to his appointment as assistant auditor and then as auditor and assistant secretary. In 1906 the air brake company established the Southeastern District and in the selection of a manager for that office, the choice fell upon Mr. Craig, who conducted its affairs with marked success until 1920. In January of that year the company organized the export department and, in the consideration of an executive head for that department, the management once more showed its faith in Mr. Craig's ability by giving him the appointment. Mr. Craig grew up with the organization and never forgot his former associates in the shops even after taking up executive work.

### New Advertising Literature

**Demand Meter.**—The Esterline-Angus Company, Indianapolis, Ind., has recently developed a graphic kilowatt-ampere demand meter.

**Panels.**—The Automatic Electrical Devices Company, 120 West Third Street, Cincinnati, is distributing bulletin 624, describing its new "Unipanel" refinements.

**Electric Welder.**—The Automatic Electrical Devices Company, 120 West Third Street, Cincinnati, has issued bulletin 623, describing its automatic arc welder.

**Temperature Regulation.**—The Gold Car Heating & Lighting Company, Bush Terminal, 220 Thirty-sixth Street, Brooklyn, is distributing a new catalog on its electric thermostat temperature regulating systems.

**Portable Compressors.** "Portable Air Service" is the title of a four-page leaflet distributed by the Ingersoll-Rand Drill Company, 11 Broadway, New York City, describing the different types of "Ingersoll-Rand" portable compressors.

**Texas Company, New York**, is issuing a booklet called "Lubrication of Steam Turbines." It describes various lubricating methods and oiling systems besides discussing the effects of heat, water, deposits, cleaning, starting and oil coolers on the effectiveness of lubrication.