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### The Los Angeles Disclosures

It did not require the confession of the McNamara brothers in Los Angeles to place upon organized labor at least the moral responsibility for violence during strikes. The disclosures there simply proved to the community that the labor leaders were not merely the abettors of that crime, they were the principals. People are so accustomed to the prevalence of lawlessness at the time of a strike that the enormity of such action and of its tacit approval by those in charge of the labor campaign during such a time is overlooked. It is as if the moral sense of the community has become blunted in this particular through constant familiarity with disregard of law. At present, the premonitory signs of a strike on a street railway system are always a warning that the company must not only prepare to operate its lines without the help of its employees but that it must be ready to defend its property and its new employees from injury. We do not mean that the leaders openly advocate violence. That would be going a little too far even in the present state of the public conscience. They may even mildly deprecate it and claim that no union men are participants. But there is little moral difference between active participation in crime and an enjoyment of the benefits derived from its perpetration. If the strike leaders were in earnest in regard to their opposition to stone-throwing, the use of dynamite and other means of intimidating an electric railway company engaged in fighting a strike, they could stop them quickly in most cases. A few words of straightforward condemnation, a statement that union men who engaged in disorder would be expelled from the union and a real effort to co-operate with the authorities in the maintenance of order and in the apprehension of the rioters would soon settle the matter. But to do so would be to lose such benefit as might be derived from terrorizing an opponent by unlawful means. Hence the acquiescence and tacit encouragement of violence which makes the strike leader morally as responsible for the destruction of property, assaults and murder as the man who wields the blackjack or throws the stone or bomb.

### Changes in Financial and Fare Conditions in Cleveland

The changes in the Cleveland Railway franchise authorized recently by the voters of Cleveland tend to make more effective the protection of capital value which was designed to be one of the cardinal principles of this measure. In anticipation of the approval of the voters of Cleveland, the stock of the Cleveland Railway advanced in market price before the election and is now selling around 104. This is due to a stronger belief by the banking and investing public in Cleveland in the security for the stock which

is afforded by the present grant. Other changes appear to be under way which will affect the financial position of the company. At present the rate of fare charged on the Cleveland local lines is 3 cents if the passenger tenders the exact change or a ticket. Otherwise a fare of 5 cents is charged. If a transfer is requested it is given by the conductor on payment of 1 cent by the passenger, and this sum is returned when the transfer is presented to another conductor for a second ride. This low rate of fare has prevailed most of the present year. However, the ordinance provides that when the "interest fund," the account to which the surplus or deficit after provision for operating expenses is carried, falls to \$300,000, it shall be evidence of the necessity of raising the rate of fare. Conversely, if the interest fund rises to \$700,000, it shall be evidence of the necessity of reduction in the rate of fare. For some months, owing to deficits in the operating and maintenance accounts, the interest fund has been approaching the point at which, under the ordinance, the rate of fare would be increased automatically. Of course, a further curtailment of service may be ordered by the city with the object of preventing any increase in the rate of fare, but this would lead to still greater crowding on the cars than now exists. It would thus produce increased public inconvenience in order that the rate of fare might be kept at the present low point.

#### Energy Consumption Tests in Chicago

During the rehabilitation period of the Chicago Railways the engineering department of that company has conducted an elaborate series of investigations into the principal factors of the cost of car propulsion. Some months ago we described the notable economies effected by the Chicago Railways Company in car lighting as the result of a somewhat similar series of observations with different types of lamps, extending over a period of twelve months. It is understood that in this case the saving already secured by the use of the more efficient lamps amounts to more than all the expenses of the test. In this issue we present the records of an exhaustive study which the engineering department of the Chicago Railways has made to determine how the energy consumed in car operation may be reduced to a minimum by properly proportioning the periods of acceleration, coasting and braking of each car movement. The extent and duration of this test have been such that the results are far more reliable than if they had been obtained during a shorter test period on a smaller number of cars. As an indication of the thoroughness of the test, it will be noted that 7 miles of track on one of the most congested streets in Chicago were segregated from the rest of this large railway system for a period of more than four months, and that the characteristics of operation there have been continuously observed during this period. The power delivered to the trolley wires was separately metered, the mileage run and the operating speeds of the cars were carefully recorded, and the passengers were counted. The proportionate coasting time on each trip was determined, and careful records were kept of the details of maintenance of equipment. With the data thus obtained basic curves were drawn and operating factors were derived which disclosed the relative values of the chief factors of

the energy consumption during a car run. The principal variable among these factors is the motorman. He can exert such an important influence on the power situation of a road as to double the power requirements, or he can, by careful manipulation of his controller and brake, bring about a saving in power of nearly 30 per cent compared with that which ordinarily obtains.

#### THE SYRACUSE MEETING

The papers and discussions at the quarterly meeting of the Street Railway Association of the State of New York, published elsewhere in this issue, indicate that the association has adopted the Empire State's motto, "Excelsior." There are few larger organizations which have produced two such thoroughly compiled or valuable reports as those of the committees on passenger traffic and on the joint use of poles. The extent of the first report and its late receipt preclude its publication in this issue, but an abstract will be published next week. The report of the committee on the standard form of contract for the use of poles is an elaboration of the draft submitted by the same committee last June. It has proved a most difficult task to harmonize the conflicting interests of all the various public utility corporations which have pole lines, but some such agreement is essential unless the companies interested wish to have many of their wires forced underground in a large number of the larger cities of the country.

The discussion on pay-as-you-enter cars was notable for the figures contributed on earnings, schedules and accidents, as affected by the adoption of prepayment operation. The most striking feature brought out was that while the prepayment car may increase the number of accidents, the total cost of the accidents is less. Of course, the reason for this is that the prepayment car has greatly reduced the serious boarding and alighting accidents, which have been very expensive, but it has originated certain minor accidents on the rear platform, due to sudden starting of the car while fares are being collected. This objection is not serious but is annoying and may be minimized by a more effective arrangement of platform railings, coupled possibly on longitudinal-seated cars with the installation of vertical stanchions.

The discussion on accident prevention brought out the novel opinion that the State owes a duty to its citizens to warn them against the consequences of their own negligence on railway property, similar to that which it has in educating them against epidemics. Of course, the State has not hesitated to enforce the installation of safety devices, but this has been done on the assumption that the greater part of the accidents would thereby be prevented. As statistics show, however, by far the greater number of accidents on street railways could have been avoided by the exercise of care on the part of the injured person. Hence, there is ample reason why the State should encourage every educational campaign against accidents. We fear, however, it will be a long time before laws similar to those in force in European countries are passed to punish passengers who leap on or off moving cars.

The papers and discussion on the life of railway physical property disclose the common interest of the accountant

and engineer in keeping accurate cost data principally by means of the job order system and mileage or other life records.

In conclusion, attention might well be directed to President Choate's statement at the banquet that the greatest field for the future usefulness of the association is the fostering of closer relations with the public and the national and State commissions which are its accredited representatives. The electric railways have much to gain by a policy of frank publicity concerning their problems of operation and their desire to take a leading part in developing the communities which they serve.

#### THE USE OF LARGE BOILER UNITS

A paper by D. S. Jacobus read at the last meeting of the American Society of Mechanical Engineers reports a series of tests on large boilers which point to a possible revolution in power station practice. It has long been known to engineers who were original enough to rise above the limitations imposed by manufacturers' catalogs that the furnace and boiler plant is the weak spot in station design and that in particular, through misjudged conservatism, designers have been in the habit of using boiler units absurdly small for the huge prime movers now customarily employed. Until the advent of successful mechanical stokers there was a natural limit imposed upon the sizes of boilers available because of the difficulty of hand firing in furnaces having very large grate areas, but successful mechanical stokers have now been with us for more than a decade and nothing much has been done in the way of increasing the size of the boiler units. Granted the ability to keep the fires in good condition over a large grate area by suitable mechanical appliances, it is perfectly obvious to every student of thermodynamics that the advantage in efficiency should rest with large boiler units because of the smaller heat losses, the higher temperatures obtained in the furnace and the diminution of incidental losses due to the long and complicated piping necessarily employed in utilizing the steam from a huge battery of small boilers. Of course, there have always been timid souls afraid of using large units lest the temporary crippling of one of them should cut down the available capacity, but precisely the same argument was used against the large electrical units which have done so much to increase the economy of power generation.

The boilers tested in the paper under consideration mark a very great advance over anything that has been done toward rational station design either here or abroad. It is true that some of the Continental stations have considerably passed the limits of advanced American practice in the size of the boiler units, but there has been nothing done, so far as we recall, comparable with these great boilers built for the Detroit Edison Company, each with nearly 24,000 sq. ft. of heating surface and more than 400 sq. ft. of grate area. Their nominal rating is 2365 hp each, as against less than 1000 hp employed as the maximum size of unit in most of the very large modern stations. In actual practice each of the Detroit boilers supplies steam to turbines developing 6000 kw to 8000 kw easily. In other words, two of these units will carry a 15,000-kw turbine

which in common practice would be coupled to, say, eight boilers of the largest "standard" capacity in regular use. The results obtained are the due reward of progressive engineering, and they are indeed altogether remarkable. Obviously there should be gains from lessened radiation and high furnace temperature, but there are in addition to these great practical gains in the simplification of the entire steam plant and in the reduction of the number of boiler-room attendants, not to mention the reduction of standby losses when the fires are banked.

The tests themselves were of the most elaborate character, extending over a period of nearly three months and involving the services of over fifty men working in eight-hour shifts for about half this long period. The coal used was of good grade, averaging about 14,000 b.t.u. per pound, with ash averaging about 6.5 per cent. The tests were mostly from twenty-four to thirty hours on a single run and the general result was to show a combined efficiency of boiler and furnace rising to fully 80 per cent at the rated load of the boilers. This, of itself, is remarkable enough, although an increase of efficiency over anything attainable in smaller boilers was certainly to be expected, but even more extraordinary and not so easily foreseen was the remarkable efficiency attained under the conditions of forced combustion sufficient to carry the boilers to double their rating. Under these circumstances the boiler and furnace efficiency still held up to about 76 per cent, which is considerably better than most first-class boilers will do at the highest point of their efficiency.

Apparently the unusually large furnace space and the high temperatures reached in combustion over so large a confined area made it practicable to burn efficiently a much larger amount of coal per unit of grate area than is the case with smaller grates. These boilers, therefore, seem not only to give most extraordinary results under circumstances of ordinary use, but to stand forcing with much higher efficiency than has usually been reached even in first-class practice at normal load. In view of these facts it would seem wise from now on to abandon the use of a numerous battery of boilers to supply a single large turbo-generator and to go once for all to boiler units commensurate in size with the rest of the plant. The simplification of station design will be very notable. It will no longer be necessary to construct a huge boiler room with elaborate piping connections merely to accommodate an expensive and relatively inefficient group of small boilers. The whole steam supply system can thus be simplified and the condition reached in which a station of very great output will be merely a station having a modest number of very large units from the boiler furnaces clear through to the generators.

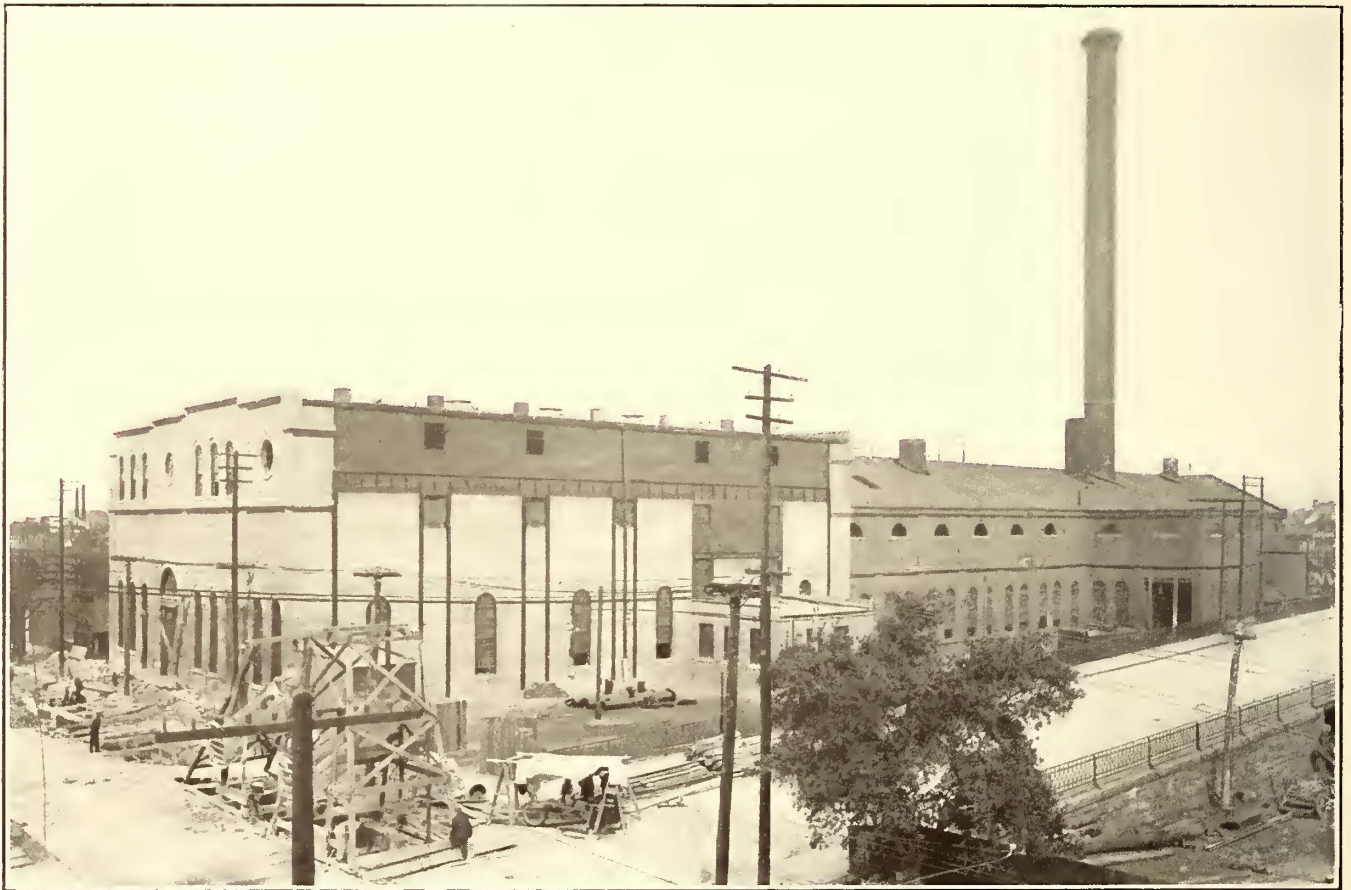
With the over-load capacity which can be carried by modern turbines and such boilers as were under test there is relatively small inconvenience from the temporary loss of any single unit and indeed nothing to be gained on the whole in reliability by adhering to the older and less efficient practice. To use eight or ten boilers where two or three will give the same output of steam at higher efficiency is merely a wasteful concession to timidity, which should not be tolerated in a station designed for economical generation of power.

# Power Plant Extension of the Denver City Tramway Company

The New Equipment Includes a 2,000-kw Turbo-Generator and Six 700-hp Boilers—Each Boiler Has a Separate Short Stack with a Motor-Driven Induced Draft Fan in the Uptake

The Denver City Tramway Company, of Denver, Col., has recently built an addition to its Platte Street generating station. The enlarged station is an interesting combination of engine and turbine-driven equipment for handling efficiently the street railway load of a rapidly growing municipality. In the past ten years the population of Denver has increased from 133,859 to 213,381, or 59.5 per cent, and accompanying this growth has been a demand for more electric transportation facilities which has severely taxed the power system of the street railway company. During the entire period the service has been handled from the Platte Street station, which originally contained only

In 1904 a 1600-kw, 600-volt direct-current General Electric generator, direct-driven by an Allis horizontal cross-compound engine, was added. At about this time the demands of voltage regulation in the suburban districts led the company to install a 1500-kw, 2300-volt, 25-cycle General Electric alternator of the three-phase type, direct-driven by an Allis horizontal cross-compound engine. A little later three 600-kw transformers were installed for raising the potential to 13,200 volts for transmission to substations located at Clear Creek and in an outlying section of Broadway. In 1908 the capacity of the plant was further increased by the addition of a Westinghouse-Par-



Denver Power—Exterior View of Enlarged Platte Street Station

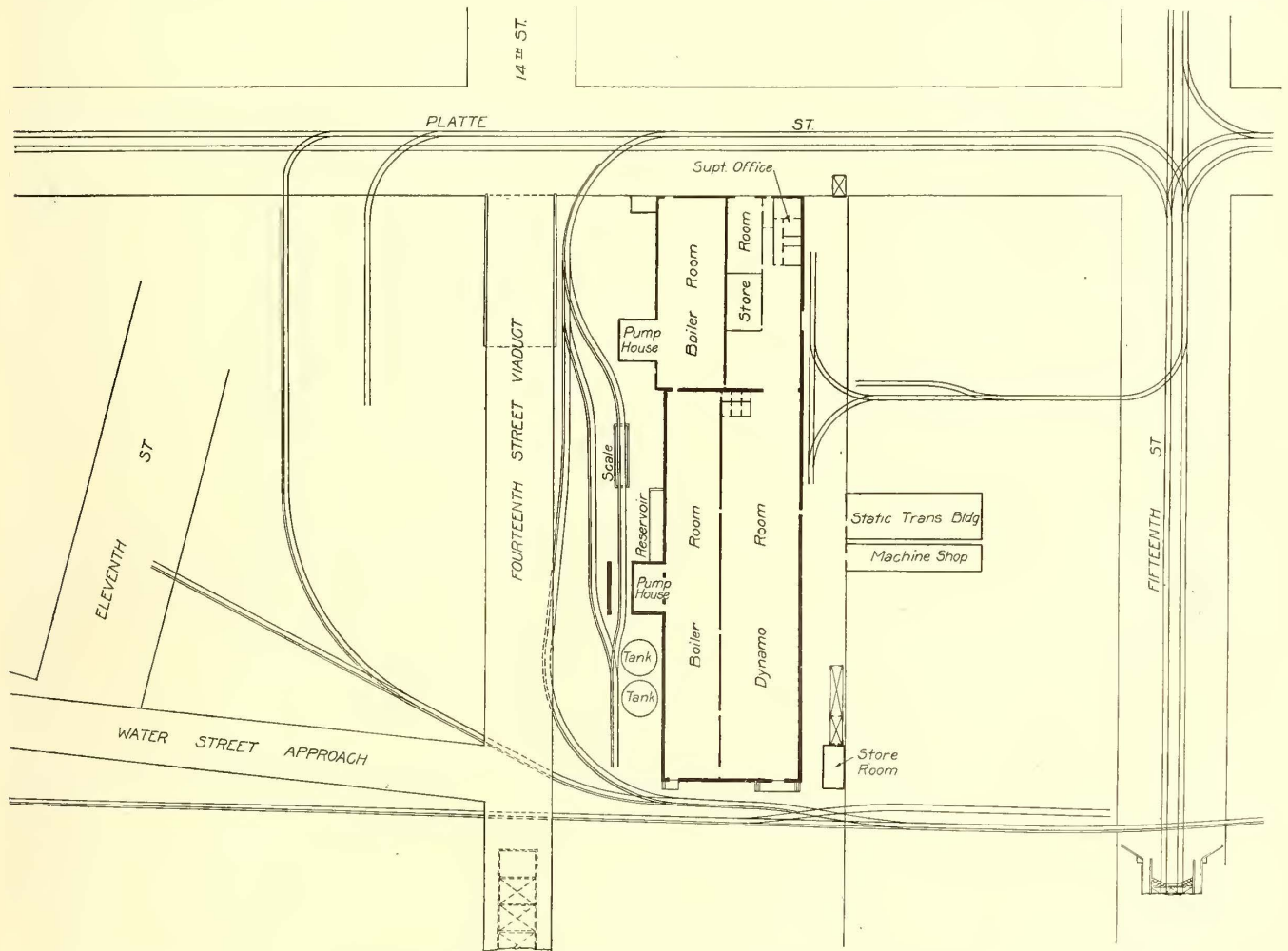
direct-current equipment delivering electrical energy to the system at 600 volts. With the growth of the system and extension of new routes into the outlying suburban districts there arose a demand for alternating-current transmission to distributing substations located at important load centers remote from the business section of the city. The station to-day furnishes an example of the efficient use of both direct and alternating current in handling a heavy city and suburban traffic, and its recent enlargement illustrates the availability of the steam turbine to meet new demands for additional power.

Less than ten years ago the equipment of the Platte Street plant consisted of three 800-kw, 600-volt General Electric generators direct-connected to Green-Wheelock horizontal cross-compound engines running at 78 r. p. m.

sons 2000-kw, 6600-volt, 25-cycle turbo-alternator, and the latest machine added is a duplicate of this, bringing the total normal capacity of the station up to 9500 kw. To enable the alternating-current machines to operate in parallel in feeding various substation loads, a suitable installation of raising transformers has been made in a separate brick and steel building adjoining the main generating plant. The general plan of station operation includes the division of the units between the urban and suburban load in such a manner as to secure so far as possible the most efficient outputs from the individual machines, and by careful attention to this matter, combined with close scrutiny of the handling of boilers and the strict accounting for supplies, the cost of power production has been reduced 20 per cent within the past year.

The Platte Street station is located on the north bank of the Platte River about 1 mile from the business center of the city. The building is a brick and steel structure, the total length being about 460 ft., with a width of about 108 ft. over all. The latest extension includes a boiler room about 48 ft. wide and a turbine room 60 ft. in width, the length of each being 143 ft. Both rooms are practically extensions northward of the corresponding sections of the original plant, and the station now occupies practically the entire block between the river and Platte Street, lying between Fourteenth and Fifteenth Streets as indicated on the accompanying general plan. The enlarged plant contains nineteen Stirling water-tube boilers operating at 176-lb. steam pressure, the last six boilers, which are rated at 700 hp each, being located in the boiler room extension. Green chain grate stokers are used in all furnaces, and the new

with a 6-in. centrifugal pump belt-driven by a 25-hp motor. Sheet steel piling installed in a diagonal line on the opposite side of the river deflects the water toward the intake, from which it is pumped through a reinforced concrete pipe 5 ft. in diameter and about 100 ft. long into a concrete screen basin located about 260 ft. from the plant. This basin is provided with a 4-in. centrifugal dredge pump belt-driven by a 10-hp motor, and is fitted with three vertical wire mesh screens which are conveniently handled by a pulley and chain hoist running on a channel iron mounted above the basin. The screen meshes are respectively 1 in.,  $\frac{3}{4}$  in. and  $\frac{1}{2}$  in. in size, and the condensing intake and piping between the river and the plant have sufficient capacity to handle water for an ultimate installation of 30,000 kw in steam generating machinery. From the screen basin a pipe line runs under ground to the



Denver Power—Map of Platte Street Power Station Site

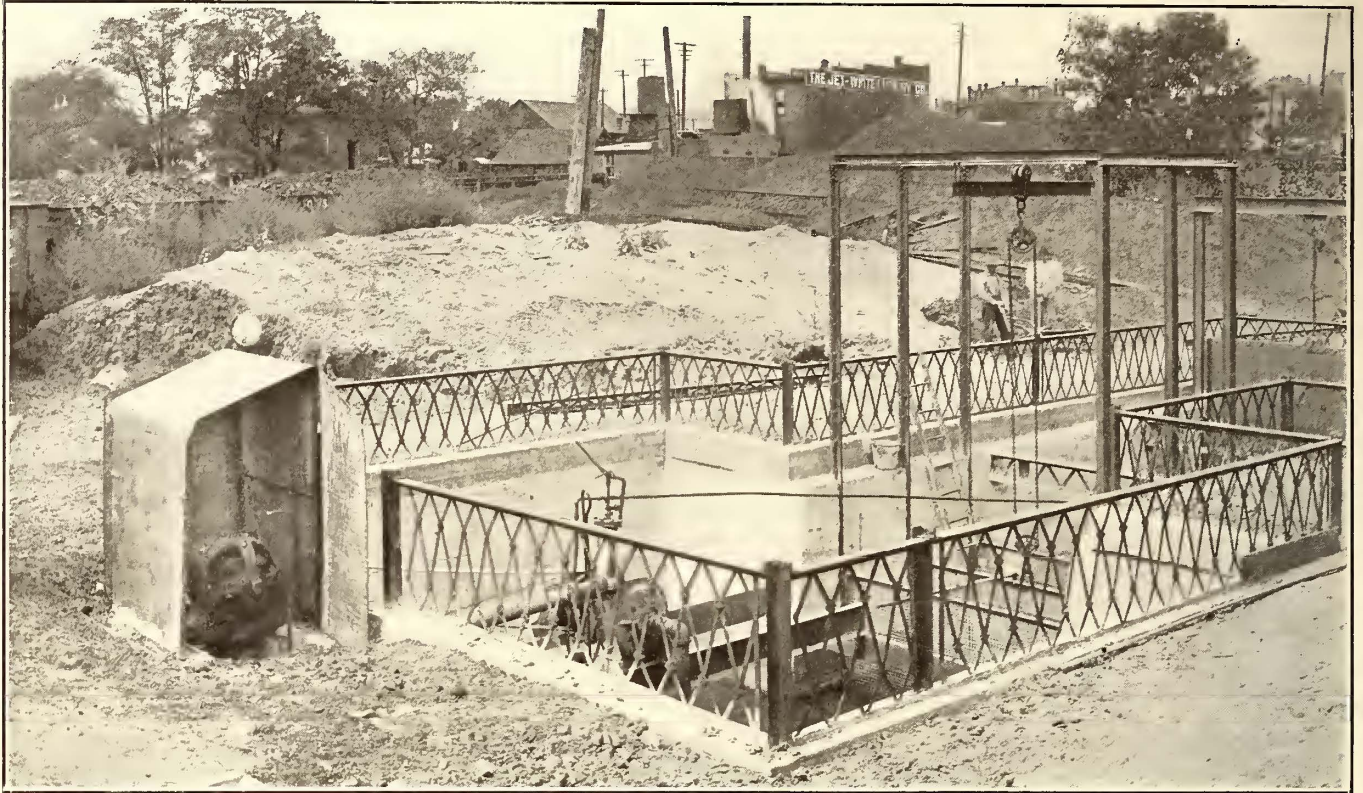
boilers are provided with mechanical draft and short steel stacks for each unit. The steam is superheated from 50 to 60 degrees Fahr. Lignite coal mined in Colorado is burned successfully by the stokers. The stokers for the thirteen original boilers are operated by two 15-hp motors, and those in the six new boilers are driven by a separate 15-hp motor. The early boiler installation discharged the smoke into a steel stack 185 ft. high and 12 ft. in inside diameter, located near the southerly end of the plant. The enlargement of the boiler plant required the provision of three supplementary stacks about 8 ft. in diameter and 10 ft. high in the old boiler room section, while each of the six new boilers is equipped with a steel smoke discharge 5 ft. in diameter which projects 4 ft. above the roof.

Condensing water for the station is drawn from the Platte River. At the water's edge a concrete intake 78 ft. long x 25 ft. wide x 18 ft. deep has been built and equipped

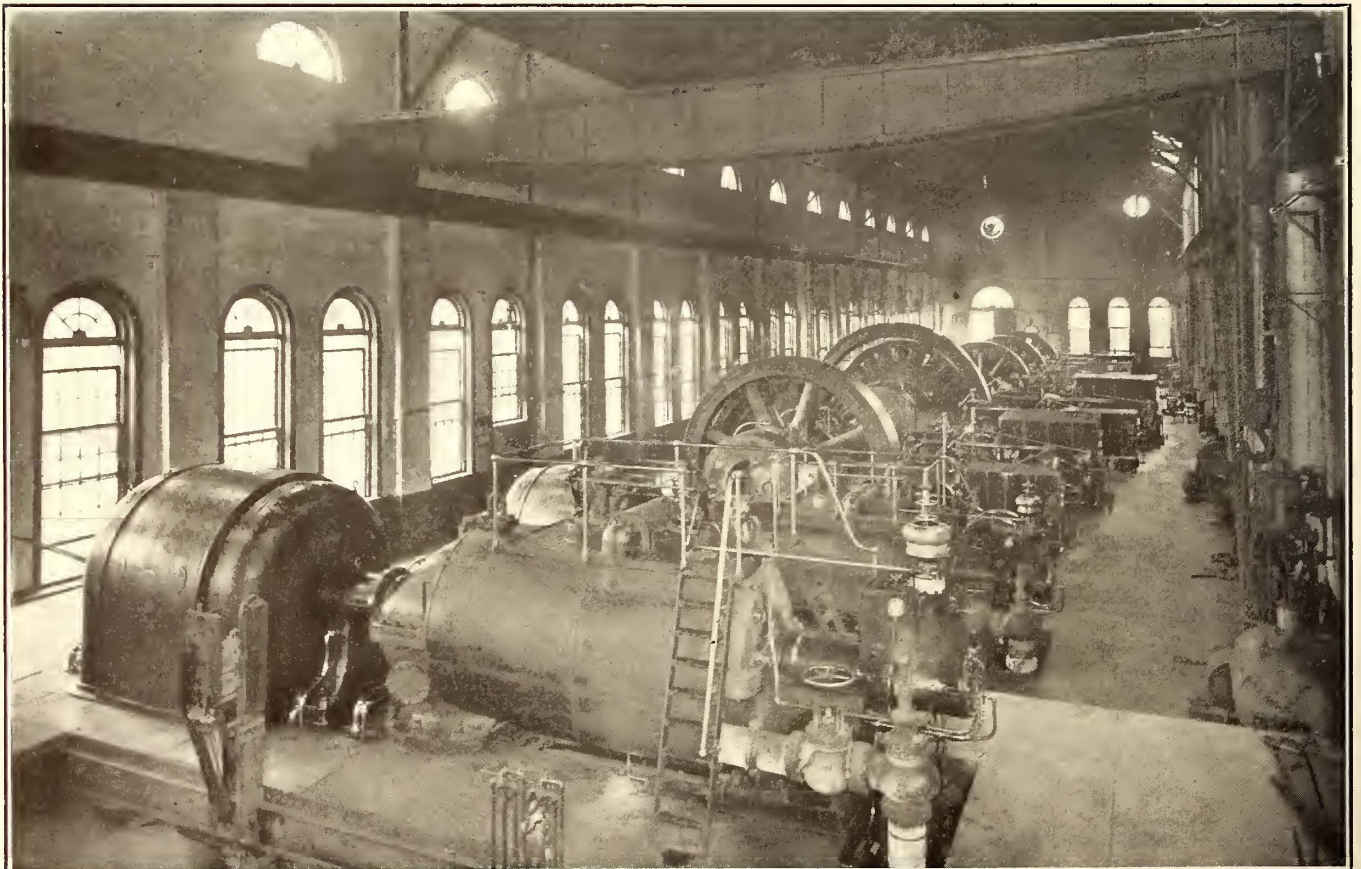
condensing apparatus in the power house. A feature of the intake chamber is the provision of four gates operated by screws with ball bearings at the threads, the gates being of 3-in. x 6-in. timber set in steel frames. They cut off the supply of water from the river to the extent required by operating conditions. The intake chamber is thus sectionalized, and each section is equipped with a separate suction pipe. The station is well equipped with transportation facilities, each side of the plant being served by a spur track connection. The yard space beneath the Fourteenth Street viaduct is utilized for the storage of heavy supplies and material, but within the station the section of the turbine room extension at present not required for generating apparatus is fitted up as a storeroom for power house and substation material. This portion of the building is equipped with temporary shelves, work and supply benches, and is protected by stiff wire screening to the

height of the ceiling. Records are kept of all material issued for power generation and distribution service, with the result that substantial economies have been effected in the cost of such items.

20-hp motors mounted on sheet steel housings at the sides of the blowers. All motor wiring is run in conduit, and the motors have rheostatic two-to-one speed control regulated from the boiler room floor. A very flexible instal-



Denver Power—Condensing Water Screen and Pump Well

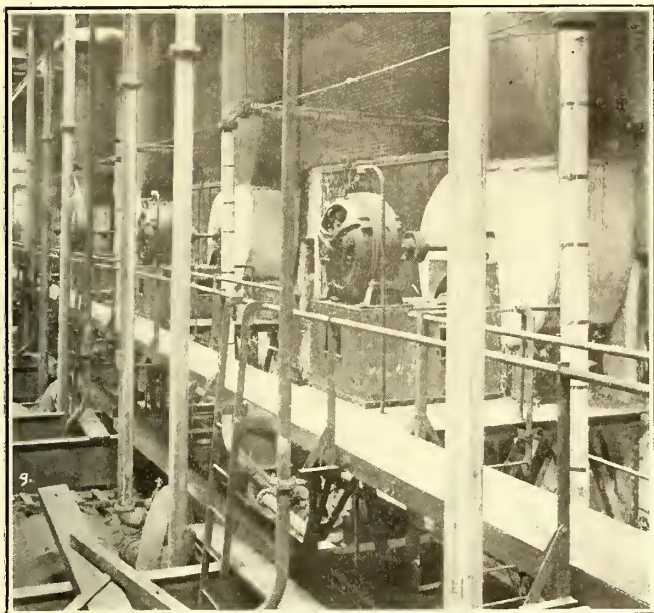


Denver Power—Interior of Engine Room Showing Turbine Units

Auxiliaries in the plant extension in general are driven by 600-volt direct-current motors. The fans on the new boilers are each of the horizontal type, direct-driven by

lation has resulted from the use of motor-driven fans on individual boiler uptakes. It is possible to follow the load changes with unusual accuracy, and to fit the draft condi-

tions to the most economical operation. Other auxiliaries include a 115-hp, motor-driven LeBlanc circulating and air pump on the latest turbine set; a 25-hp motor driving a McCaslin coal conveyor with a capacity of 250 tons per



Denver Power—Individual Draft Fans in Boiler Uptakes

hour and a total length of 1000 ft.; two 15-hp motors operating cross-conveyors, and a 25-hp motor driving a coal crusher. All fuel is handled by the McCaslin conveyor, which elevates it and distributes it from the receiving hopper into steel-plate bunkers located above the boilers. The ashes fall into hoppers built as a part of the boiler settings, from which they are carried by the conveying system to cars located on a siding near the end of the building.

The pipes distributing compressed air around the fan gallery section of the boiler room are utilized as railings at the sides of foot passages, fittings being provided at various points where an outlet is needed. Increased aisle space and enlarged width characterize the new boiler room, which, with the north end of the turbine room addition, is



Denver Power—Storeroom in Power Station

separated from the rest of the plant by a brick fire wall.

The load factor of the station on a twenty-four-hour basis is about 50 per cent. Service from 1 a. m. to 6 a. m. is usually handled by one 800-kw, 600-volt direct-current gen-

erator at the station, all substations being shut down during this period. Four substations are now in regular service on the system, these being located outside the business district in each case. In general, 500-kw rotary converters are employed, there being two of these machines in each of the substations designated as Argo and Clear Creek, three at Broadway, and three 300-kw machines at the Colfax substation, serving the easterly side of the residential district back of Capitol Hill. The extension above described has been completed under the supervision of the company's own staff.

### MEETING OF THE NEW ENGLAND STREET RAILWAY CLUB

A regular monthly meeting of the New England Street Railway Club was held at the American House, Boston, on Nov. 23, 1911, with President Franklin Woodman in the chair. Owing to the continued illness of John J. Lane, secretary of the club, E. P. Shaw, Jr., South Framingham, Mass., acted as secretary pro tem. during the meeting. At the conclusion of the usual dinner a paper was read by C. C. Copp, foreman car painter Boston & Maine Railroad, Boston, Mass., on "Car Painting." Mr. Copp gave many interesting reminiscences of the easy-going methods of painting departments in the earlier days of railroading, and contrasted the pressure for quick deliveries of cars to-day with the time permitted for the paint-shop work years ago. In the modern rush to accomplish rapid maintenance the work of different departments tended to overlap. It was quantity rather than quality of painting that appeared to count to-day, although a reasonable life was required after each shopping. The rapid increase in the amount of rolling stock to be handled and the inadequacy of shop facilities had in many cases led to infrequent painting, with the result that the appearance of cars had suffered badly, and when the painting was finally done the job cost twice what it would have cost if the work had been done at the proper time.

More time should be spent in putting on material than in securing a highly finished surface. The scraping knife and sandpaper instead of the rubbing stone were the important tools to-day. The car painter sought to get the greatest durability consistent with a fair finish. Lead and oil played an important part in modern priming practice. Mr. Copp spoke briefly in favor of substituting piece work and bonus systems for day work, and urged that fair prices and a careful selection of men be made when the piece work system was introduced. The results under such conditions would be surprisingly good. The payment of labor on a day basis had passed in progressive shops. Piece work put production on a strict foundation of cost. Mr. Copp touched upon the importance of relieving large plain painted surfaces with striping. This frequently was possible with little if any additional expense. He recognized the greater need of decoration on city street cars than in the steam railroad field and emphasized the tendency of managers to forget that new cars had thin skins of paint, especially when received from contract shops. He urged that operating officials honor the requisitions of the paint shop with liberality, and pointed out that it paid to paint as well as to advertise.

Replying to several questions, the author stated that in his opinion there were no serious difficulties to fear in the painting of all-steel cars. Steam locomotive tenders had been successfully painted for years, and there was no more severe test of paint than on a tender behind a locomotive. Lead and mineral brown were both used in priming steel cars, and the knife was freely used in skimming. The sun rather than wind and rain was the chief cause of paint destruction. Expansion, contraction and vibration were the main causes of the cracking of paint and varnish.

# Study of Operating Characteristics of Chicago Railways Company's Cars as Influenced by Coasting Time

Engineers Who Conducted Exhaustive Tests to Determine the Saving in Power Consumption and Brakeshoes Which Would Result from the Use of Coasting Time Recorders on All of the Double-Truck Cars of the Company Estimate that the Annual Net Saving Will Be \$265,792

A detailed study of the operating characteristics of the cars and motormen of the Chicago Railways Company has recently been made by the engineering department of that road. The results show possibilities of making a considerable saving in cost of power and wear of brakeshoes. Very elaborate observations were taken of car accelera-

and approximates the calculated time which is consistent with the established scheduled running time; (4) a direct saving in brakeshoe wear; (5) lessening of armature and other motor troubles due to smaller rise in temperature resulting from lower average current passing through motor; (6) decrease in wear and tear on equipment in general, resulting also in saving in maintenance and renewals of wheels, gears, controllers, etc.; (7) a lessening of accidents in general, due to more uniform speed and more uniform braking, as well as because power is on a smaller percentage of the time, thus requiring one less operation to stop the car, and also because to obtain maximum coasting the motorman must always be on the alert to avail himself of opportunities, and if a motorman is on the alert accidents to pedestrians and street traffic will diminish; (8) regular running time is made more uniform on each trip and the schedule is followed more closely because of ease of checking these details with coasting time recorders.

The object of the tests made by the Chicago Railways Company was to determine the correctness of the foregoing claims of the manufacturer of the coasting time re-

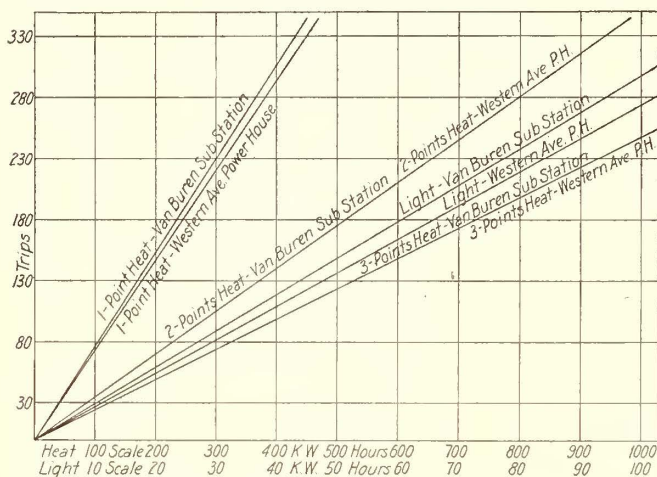


Fig. 1—Chicago Coasting Tests—Current Consumption for Heat and Light

tion, running speeds, retardation, energy consumption and the correlated factors which so largely influence the cost of street-car operation. Continuous tests were made and observations taken on the Van Buren Street line during the period beginning Feb. 25, 1911, and ending July 1, 1911. The fifty all-steel, double-truck, pay-as-you-enter cars operated on this line are equipped with Rico coasting time recorders, and the purpose of the investigation of operating characteristics was to determine the merits of the coasting time recorder as a factor in reducing the energy required for operating the line, reducing the brakeshoe wear and otherwise improving the service. The results of the tests made are incorporated in a report signed by J. D. Elsom, engineer in charge of tests for the Chicago Railways Company. The following data have been abstracted from this official report.

The introduction to the report includes the following statement: "It is a well-known fact that the best results in operating cars are obtained by efficient acceleration, efficient braking and anticipating the stops or slow-downs for traffic." The Railway Improvement Company of New York, manufacturer of the coasting time recorder, presented claims to the Chicago Railways that its device would serve to obtain these results by increasing the coasting time on all runs without decreasing the schedule time. It also claimed that the increased coasting resulted in the following: (1) A saving in power consumption; (2) the percentage of power saving is directly proportional to the increased percentage of coasting; (3) a lowering of the peak on the power station is accomplished, due to a decrease in the power consumption and also because the motormen's time in accelerating becomes more uniform

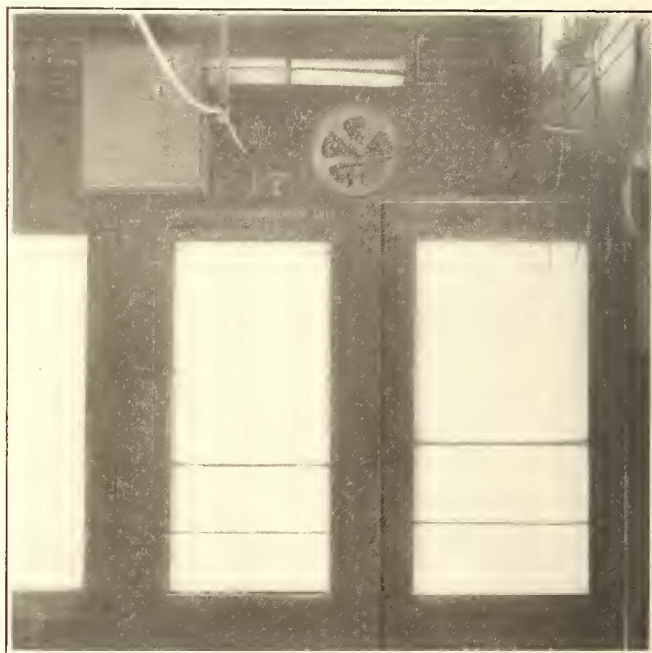


Fig. 2—Chicago Coasting Tests—Coasting Clock, Mounted in Car

recorder under the conditions of operation on the Chicago Railways lines. It was decided that the most reliable method of determining the saving in power consumption was to select a line on which it was most difficult to coast and to meter the substation output to this line. The Van Buren Street line, on account of the narrow street, extreme congestion of team traffic and relatively fast schedule, was chosen as the line on which to make the test.

This line consists of five trolley sections and extends



from Kedzie Avenue on the west to State Street on the east, a round-trip distance of 8 miles. It is one of the principal thoroughfares for heavy team traffic leading westward from the "Loop" district of Chicago. To make possible an accurate checking of the energy consumption on the line during the test period, four of the five trolley sections, extending from Kedzie Avenue to the center of

Motors, four General Electric No. 216.  
 Controllers, two K-35 C.  
 Air brakes, National with A-4, 16-ft. compressors.  
 Heaters, Consolidated electric.  
 Trucks, Baldwin-Pullman No. 150.  
 Weight complete, 52,000 lb.

The report considers the several claims of the Railway Improvement Company in the order in which they have been stated above, and then summarizes the results of the tests on the Van Buren Street line. It applies the results established on this single line to the entire system of the Chicago Railways, and concludes with a statement showing a total net saving on 1560 cars for one year in kw-hours of current and increased life of brakeshoes of \$265,791.94.

SAVING IN POWER CONSUMPTION

Previous to the installation of the coasting time clocks on the cars the energy fed to the Van Buren Street line was carefully metered for five weeks and the car miles run and the ton miles moved were determined. The energy consumption was found to be 3,890 kw-hours per car mile and 141 watt hours per ton mile. These figures include

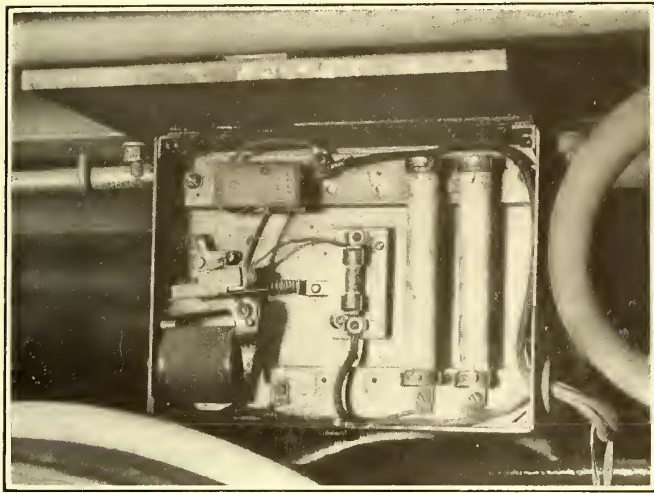


Fig. 3—Chicago Coasting Tests—Relay Box Mounted Under Car Body

the Chicago River, a round-trip distance of 7.02 miles, were independently fed through meters in the Van Buren Street substation and the Western Avenue power house. The meters used were the General Electric type G-3 of 2000-amp capacity, and these meters, as well as all other instruments used in the tests, were carefully calibrated at the close of the test period. The rolling-stock equipment of the Van Buren Street line consists of fifty all-steel, pay-

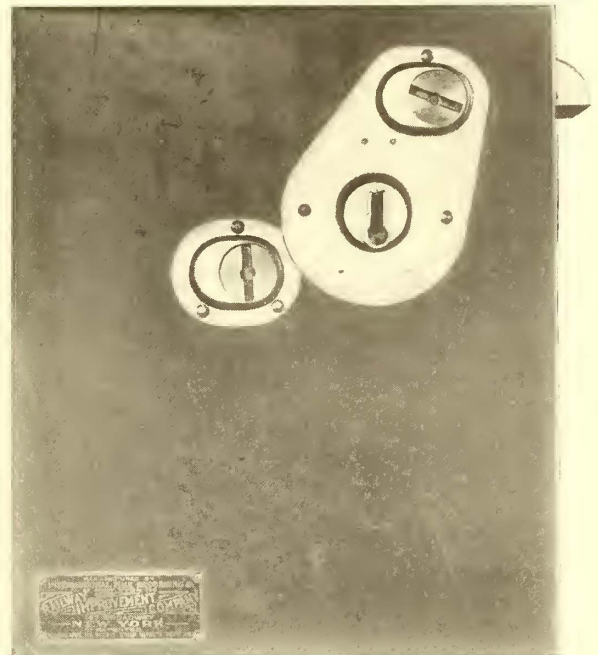


Fig. 5—Chicago Coasting Tests—Coasting Clock

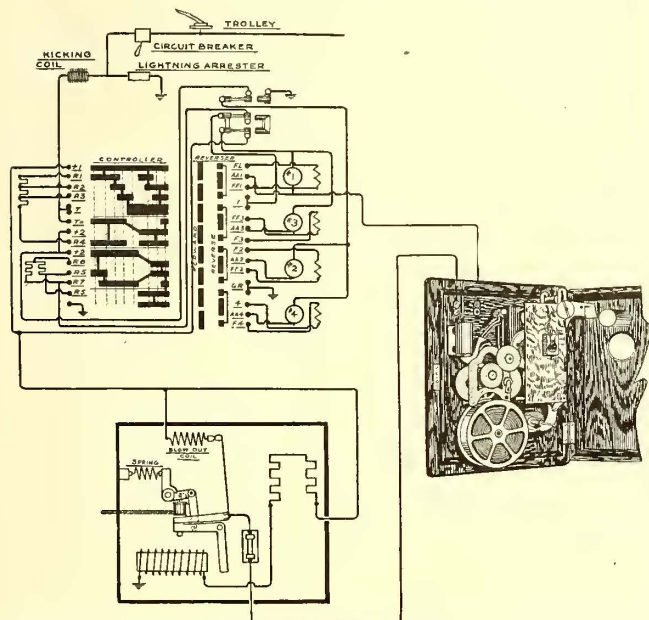


Fig. 4—Chicago Coasting Tests—Wiring Connections of Coasting Clock and Relay

as-you-enter type, double-truck cars having the following general dimensions:

- Length over all.....49 ft. 2 in.
- Width over corner posts..... 8 ft. 9 in.
- Height, rail to trolley board.....11 ft. 8 in.
- Truck-center distance .....20 ft. 1 in.
- Length of body.....32 ft. 5 in.
- Truck wheel base..... 4 ft. 10 in.
- Seating capacity .....40 passengers

power for operating only the car motors and the air-brake motor compressor. A special series of tests to determine the current consumption of the heaters in the steel cars was made on March 6. The average result of fifteen-second voltage and ampere readings taken on four trips over the length of the line showed the following hourly consumption of energy for the electrical heaters:

	At Western Ave. Power House.	At Van Buren St. Substation.
One point of heat.....	3.475 kw	3.766 kw
Two points of heat.....	7.300 kw	8.241 kw
Three points of heat....	10.356 kw	11.757 kw

The foregoing energy consumption demand for the heaters was used in reducing the total metered output for the line for the five weeks of the test during which the heaters were used to a basis of energy for car propulsion only. The accompanying curves, Fig. 1, show the energy consumption for the heating and lighting as fed from the two sections of supply plotted with the number of trips as ordinates and the kw-hours as abscissac. The horizontal scale for the heater consumption is ten times that for the lamp consumption.

During the fifth week of the test period the coasting

time recorders were used all on the fifty cars operating on the Van Buren Street line. The accompanying engravings, Figs. 2, 3 and 4, show the location of the recorder above the door at one end of the car, the relay under the car body and the wiring connections of the relay and recorder.

Previous to the installation of the coasting clocks the motormen had not been advised that any measurements

until the high mark of 51.5 per cent was reached. He made as high as 63.7 per cent coasting time for a single day's run.

The report states that this is typical of the gradual increase in efficiency of motormen classified as "good," which was made possible by the checking system inaugurated by the coasting time recorders, thus enabling the management as well as the motormen to check efficiency, trip by trip,

TABLE I.—CHICAGO RAILWAYS—SUMMARY BY WEEKS ON OPERATION OF CARS EQUIPPED WITH COASTING TIME RECORDERS

Week Ending	Total Kw-hours Traction	Total Car Miles Operated	Kw-hours per Car Mile	Total Passengers	Watt Hours per Ton Mile	Total* Running Time in Minutes	Total Coasting Time in Minutes	Percentage of Coasting	Percentage of Saving	Remarks
March 4	108,120	26,678	4.053	319,024	146	.....	.....	} 19%	.....	.....
March 11	101,475	26,678	3.804	322,441	137	.....	.....		.....	.....
March 18	104,285	26,678	3.909	330,961	140	.....	.....		.....	.....
March 25	100,898	26,678	3.782	326,807	136	.....	.....		.....	.....
April 1	103,592	26,678	3.883	323,872	140	.....	.....		.....	.....
Averages & Totals	518,370	133,390	3.890	324,621	141	.....	.....	.....	.....	.....
April 8	102,442	26,678	3.838	331,436	138	.....	.....	.....	1.3	Transition
April 15	87,367	25,415	3.438	339,900	124	146,171	37,493	31.8	11.6	.....
April 22	86,344	25,415	3.397	340,360	122	176,270	52,725	33.0	12.7	.....
April 29	83,333	25,415	3.277	334,224	118	181,289	59,974	36.3	15.8	.....
May 6	87,837	25,415	3.456	333,909	125	180,084	54,171	31.0	11.2	.....
May 13	89,524	25,415	3.522	338,046	127	152,634	38,342	29.5	9.5	.....
May 20	89,388	25,415	3.511	338,527	126	186,086	54,113	29.3	9.8	.....
May 27	89,069	25,415	3.505	341,637	126	195,900	61,462	31.2	9.9	.....
June 3	83,079	24,176	3.439	328,144	124	184,982	62,936	34.2	11.6	.....
June 10	85,468	25,431	3.363	340,741	121	200,065	67,573	33.8	13.5	.....
June 17	85,999	25,431	3.383	338,297	121	201,433	66,819	33.2	13.0	.....
June 24	85,252	25,431	3.352	343,706	120	195,142	64,059	32.8	13.8	.....
July 1	82,055	25,515	3.316	336,122	115	198,297	67,854	37.0	17.03	.....
Averages & Totals	1,034,715	303,889	3.405	337,801	122.5	2,168,353	68,752	31.7	12.5	.....
July 1-7	76,766	24,260	3.160	316,849	114	186,277	62,350	36.8	18.8	.....
July 8-14	83,722	25,431	3.292	323,081	119	184,313	57,266	34.4	15.4	.....
						NEW SCHEDULE				
July 15-21	83,854	24,880	3.370	328,295	121	187,536	55,550	29.6	10.4	*4.03
July 22-28	85,726	24,661	3.476	352,935	125	.....	.....	.....	15.0	**4.09

\*\*Schedule changed, running time reduced 3 min. 4.09 kw-hours per car mile used instead of 3.89.  
\*4.03 kw-hours per car mile used instead of 3.89.

were being taken of the energy consumption of the cars which they were operating. The average percentage of coasting during this time was found to be 19 per cent. This was determined by a large number of stop-watch observations.

The first bulletin showing the relative rank of the motormen based on percentage of coasting time was published on April 8 and similar bulletins were published each week thereafter until May 13 when daily bulletins were published until the end of the test on July 1. After about four weeks of operation with the coasting time recorders it was found that the relay, type D-B-590, form B-1, did not fulfill the requirements because it permitted motormen to falsify their records by allowing their cars to drift to a standstill without applying the brakes, thus permitting the coasting clock to continue running after the car had stopped. The possibility of thus manipulating the recorders was overcome by substituting form F-3 relays, which pre-

vented the coasting clocks from operating unless the car is in motion and the brakes and current are off. Each man on the Van Buren Street line was made the subject of a special test under regular operating conditions. Thus each man had the opportunity of operating the test car for an entire day, and his efficiency was determined by other instruments besides coasting time recorders. With the men under observation on the test car runs it was found possible and practical to maintain an average of 50.9 per cent coasting for all scheduled runs, which is practically 15 per cent more than the average coasting of all motormen on regular cars.

Table I is a summary by weeks of the coasting percentages, kw-hours per car mile, percentages of saving, etc., as established by the tests. The average saving for the entire test period after the installation of the coasting clocks was 12.5 per cent. Table II shows the average by weeks of the different classes of motormen.

A fairly constant percentage of coasting and consequent

TABLE II.—CHICAGO RAILWAYS—WEEKLY RECORDS OF MOTORMEN'S COASTING PERCENTAGES.

	WEEK ENDING									
	May 20	May 27	June 3	June 10	June 17	June 24	July 1	July 7	July 14	July 21
Average for regular men.....	30.0	32.2	34.6	34.6	35.0	34.0	38.5	37.4	34.8	29.7
Average for extra men.....	26.8	28.4	30.7	30.6	29.4	30.1	29.3	30.7	28.8	28.2
Average for night men.....	27.3	32.1	35.2	34.1	33.5	34.7	36.8	36.2	37.8	36.5
Average for all men.....	29.3	31.2	34.2	33.8	33.2	32.8	37.0	36.8	34.4	29.6
Record for best man.....	33.2	36.1	45.2	44.9	44.0	46.1	49.5	51.5	45.9	44.4

Average of all runs=350 trips on test car=50% coasting.

vented the coasting clocks from operating unless the car is in motion and the brakes and current are off.

The report includes records of the weekly coasting percentages of the various motormen, including both the regular and extra men. These records provided a basis for the classification of motormen into "good," "fair" and "indifferent." The record of a motorman who had for years been recognized as one of the best operators and one of the most consistent men on the system is of interest. On tests made previous to the installation of the recorders his coasting time was found to be approximately 20 per cent. After the installation his increase in coasting was gradual

saving was reached about the eleventh week after installing the coasting time recorders. Therefore, the savings obtained for seven weeks, including the last three weeks of the test period ending July 1, 1911, and the first four weeks under regular operation, were averaged and found to be 15.6 per cent, which is thought to be a conservative estimate of the saving that can be effected without special effort on the part of the motormen.

Special test car runs showed it to be practicable to run with an average of 15 per cent more coasting time than is done at the present time, which would mean an additional saving over the saving actually accomplished of approxi-

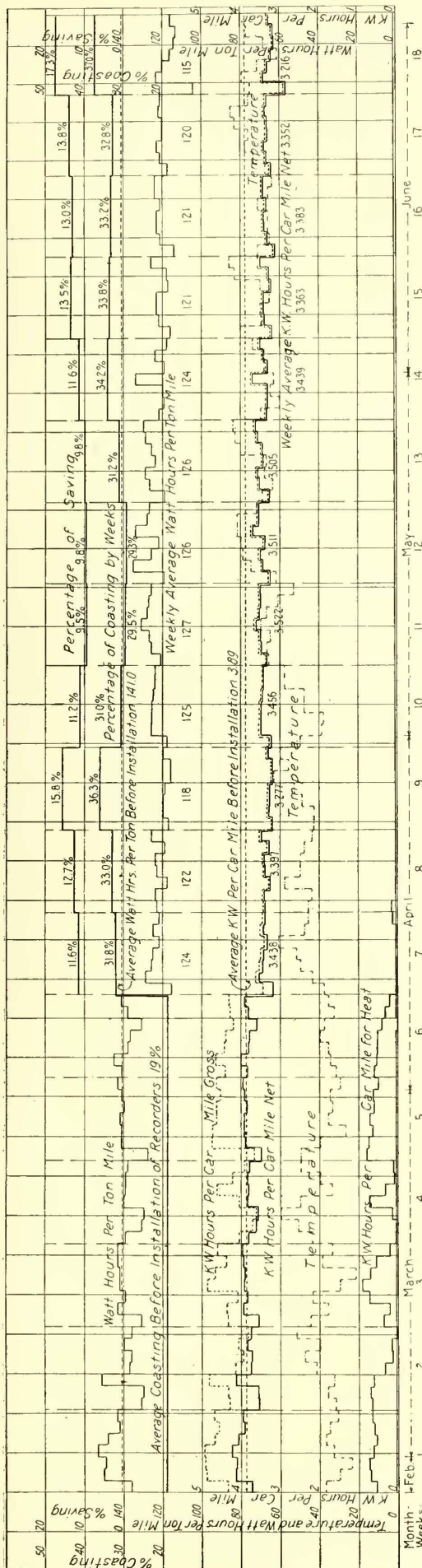


Fig. 6—Chicago Coasting Tests—Chart of Summarized Data for Test Period.

mately 12 per cent. This would mean a total saving of 27 per cent if the men did as well on their regular runs as they did on the special test car runs.

The author of the report holds the opinion that 27 per cent saving in power consumption is possible and practicable. He states that this opinion has been arrived at with a full realization that considerable pressure and co-operation must be brought to bear to compel the motormen to maintain on their respective regular runs the records established by themselves voluntarily on the test car runs.

Fig. 6 is a summary of the data obtained for the entire period under consideration. The completeness of the information presented by the curves of this chart should be

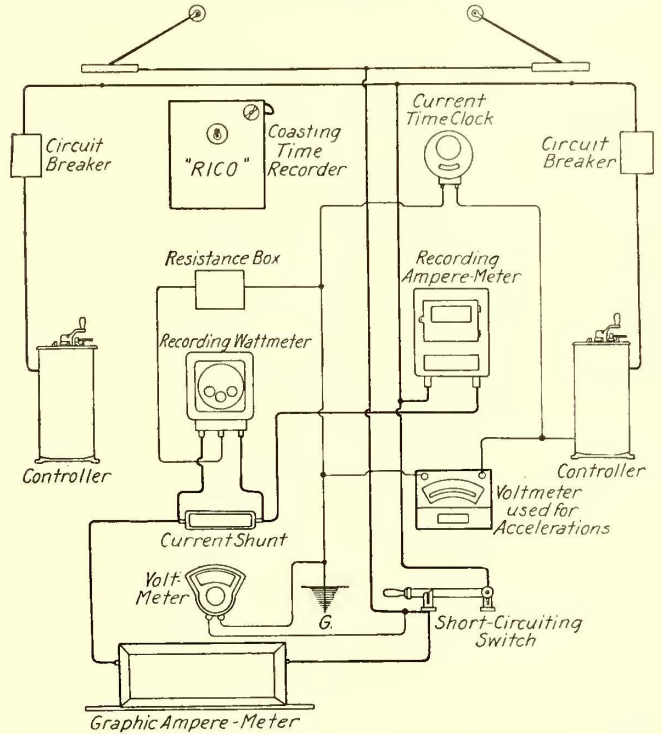


Fig. 7—Chicago Coasting Tests—Instruments Installed on Test Car

noted. It should be remembered that the figures for watt-hours per ton mile exclude the current used for heating and lighting, but include the current required to propel the passenger load. The method of obtaining the weight of passengers was as follows: First, an investigation of the length of riding on this line determined that the average passenger rode 2 miles. Thus, the total number of passengers handled when multiplied by two and divided by the total car miles gave the average passengers per car. The average weight per passenger was estimated as 140 lb. The average number of passengers per car multiplied by 140 lb. and divided by 2000 gave the tons of passenger load, which was added to the dead weight of the equipment before calculating the watt-hours per ton mile.

In connection with the temperature curve on Fig. 6 and the kw-hours per car mile required for heat it will be noted that on some days when the temperature was high the heaters were used. Heat was required on these days on account of dampness.

RELATION BETWEEN THE PERCENTAGE OF SAVING AND PERCENTAGE OF COASTING

In order to substantiate the manufacturer's claim that the percentage of saving is directly proportional to the increased percentage of coasting, a regular car was equipped with the instruments as shown in Fig. 7 and approximately 350 regular trips were made for the purpose of obtaining data which would apply to existing conditions. The meters used were calibrated after the test and the results corrected

accordingly. From these four curves (Fig. 8) were plotted, showing:

(1) Variation in kw-hours per car mile with percentages of coasting based on actual running time.

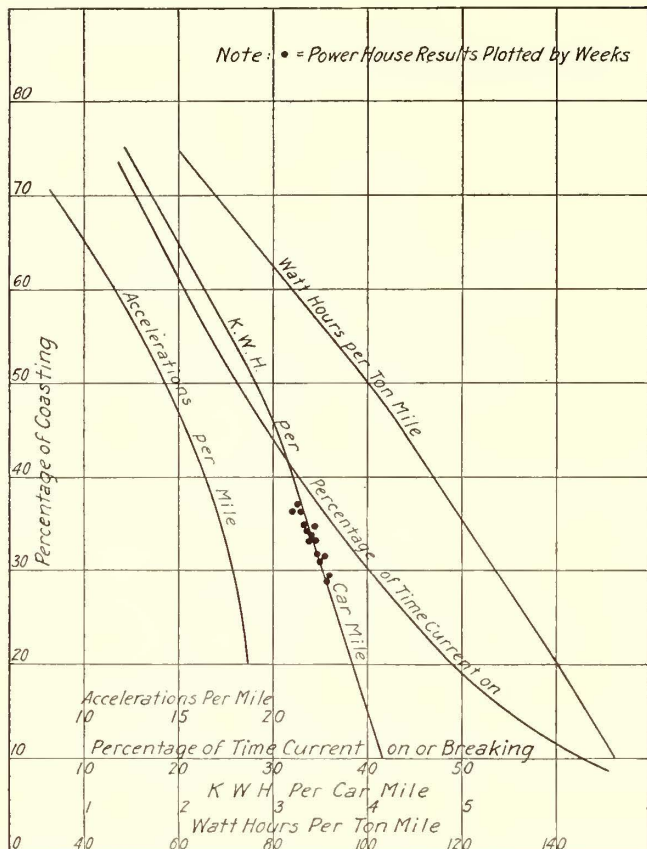


Fig. 8—Chicago Coasting Tests—Effect of Coasting Percentage on Energy Consumption and Other Factors

- (2) Variation in watt-hours per ton mile at car with percentages of coasting based on actual running time.
- (3) Variation in percentage of time current was on, with percentage of coasting based on actual running time.
- (4) Variation in accelerations per mile with percentages of coasting based on actual running time.

The manufacturer's claim that the percentage of saving is directly proportional to the increased percentage of coasting was practically substantiated. For example, assume 20 per cent as normal coasting and increase this coasting step by step to 50 per cent. It will be noted from the following tabulation that an increase of 30 per cent coasting gives a corresponding saving of 27.3 per cent in power consumption. After passing 50 per cent the coasting ratio becomes slightly greater than one to one, instead of slightly less.

Per Cent Coast-ing.	Per Cent Coasting.	Per Cent Saving.	Kw Car Mile Saving.	Kw Car Mile.
20	..	....	....	3.835
30	10	8.5	.325	3.51
40	20	16.9	.645	3.19
50	30	27.3	1.045	2.79
60	40	41.6	1.595	2.24
70	50	56.5	2.160	1.675

With the curve of kw-hour per car mile in Fig. 8 are shown the variations in kw-hours per car mile at the bus, with percentages of coasting based on schedule running time in actual operation, allowing 10 per cent for line losses.

The power house results obtained in kw-hours per car mile are indicated by dots, each dot representing one week. This close relation of the power house and test-car figures tends further to substantiate the statement that the percentage of saving is directly proportional to the increased percentage of coasting when applied to substation output.

LOWERING OF PEAK ON POWER STATIONS

To determine what effect the 15.6 per cent saving had on the peaks at the Van Buren Street substation the engineers plotted the station load by hours (Fig. 9), and for comparison plotted the total car miles by hours operated on the Van Buren Street line, the corresponding percentages of coasting and the total kw-hour consumption.

It will be noted that the coasting is divided into three periods:

Coasting Percentage.
1—7 p. m. to 7 a. m. .... 40.7
5 p. m. to 7 p. m. } average..... 31.8
2—7 a. m. to 9 a. m. }
3—9 a. m. to 5 p. m. .... 33.8

The coasting for all-day runs (7 a. m. to 7 p. m.) is prac-

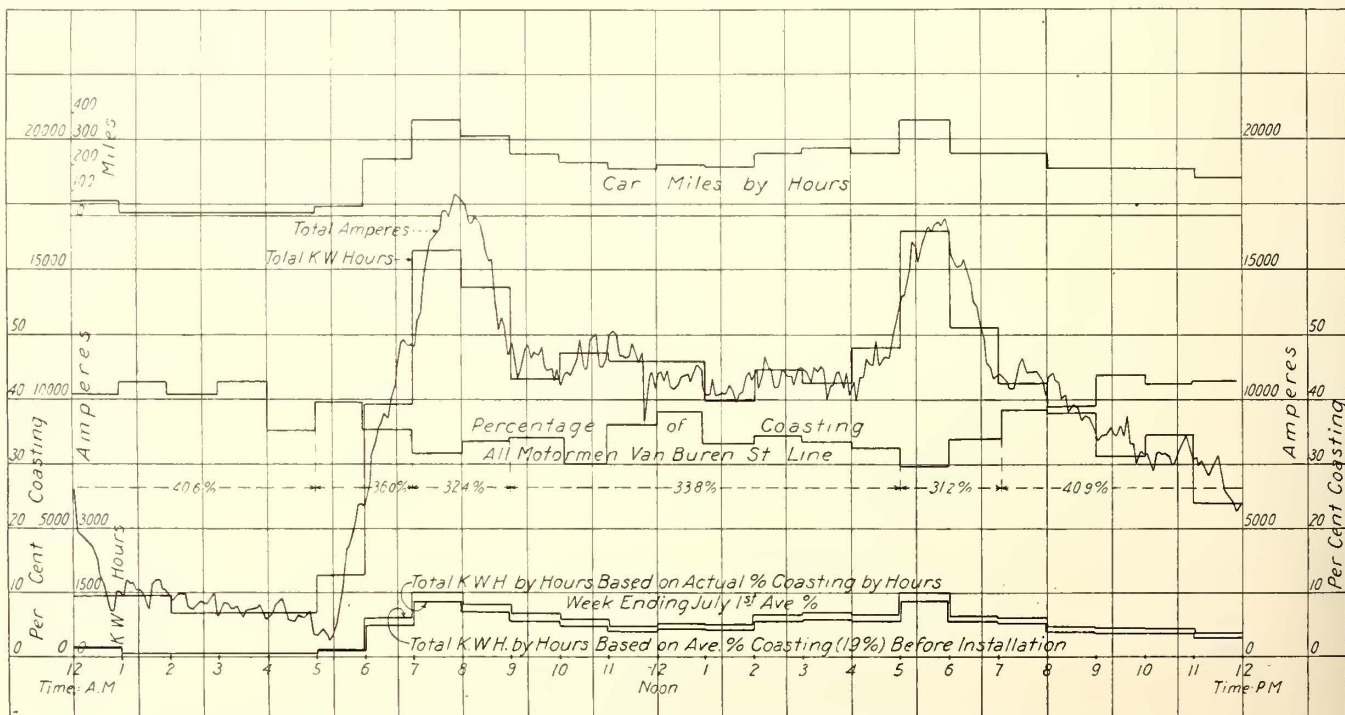
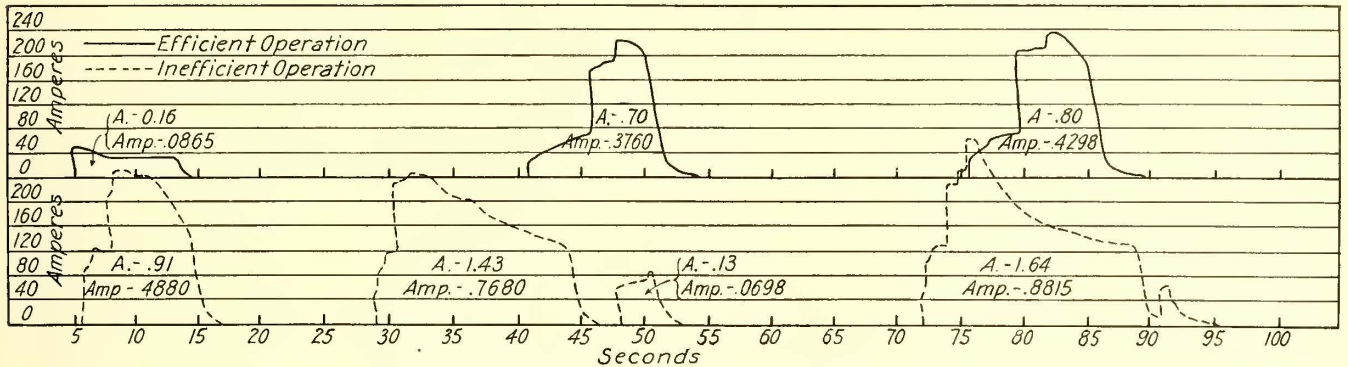


Fig. 9—Chicago Coasting Tests—Percentage of Coasting by Hours and Daily Load in Amperes

tically the same, being only 2 per cent less during the peak hours. It will be noted that the peaks on the several curves correspond in general. Therefore it will be seen that a 15.6 per cent saving in total kw-hours results in approximately 14 per cent lowering of the peak, allowance being made for the difference in coasting in accordance with

the same general conditions are shown in Fig. 10. The inefficient motorman approaches the general conditions of running, both as to power consumption and coasting, which prevailed on the Van Buren Street line before the installation of the coasting time recorders. The marked difference in power consumption of the equipment as handled by the



	RUNNING TIME IN MIN.	COASTING TIME IN MIN.	% OF COASTING	NO. ACCEL.	TOTAL AMP. HRS.	TOTAL K.W. HRS.	K. W. H. P. C. M.	AVERAGE LINE VOLTAGE
Efficient Operation	25.5	12.4	48.6	46	16.40	8.98	2.087	546
Inefficient Operation	25.0	5.5	22	46	30.85	16.30	3.800	528

Comparison of Efficient and Inefficient Operation of Test Car for Complete Trip on Van Buren St Line

Fig. 10—Chicago Coasting Tests—Comparison of Energy Consumption by Efficient and Inefficient Motormen

the ratio of coasting to kw-hours per car mile, shown in the curves in Fig. 8.

Lowering the peak at the cars assists largely in lowering the peaks at the power house. Low peaks at the cars are obtained by:

- (1) Accelerating only to the necessary speed, whether by the use of one or eight points on the controller.
- (2) Adhering at all times to the prescribed rate of acceleration.

Both of these methods, while decreasing the peaks, will

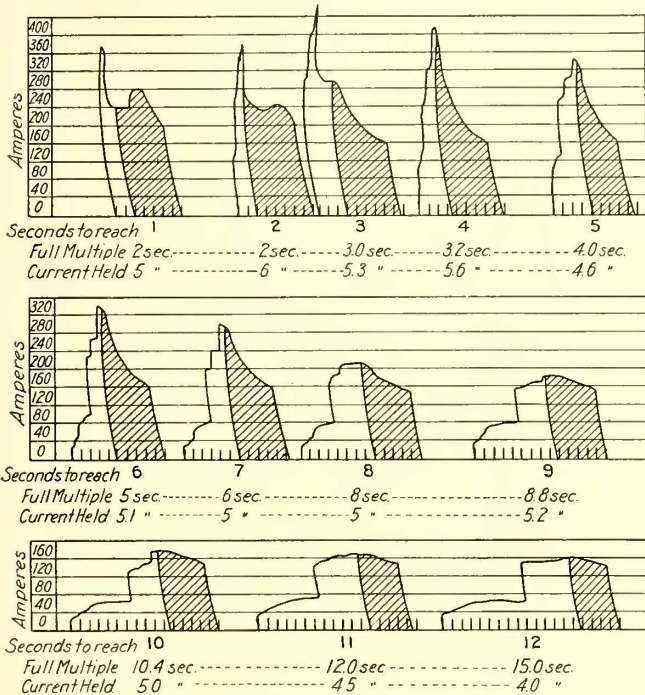


Fig. 11—Chicago Coasting Tests—Comparison of Energy Consumption with Different Rates of Feeding

materially increase coasting as well. To illustrate graphically the effects on peaks and the continuous power house load produced by coasting, two partial records which are representative of efficient and inefficient operation under

two men over the same track with the same stops is easily noted. The inefficient operator used 81.8 per cent more power than the efficient operator, although to a casual observer the only difference in car operation on the two trips was in the starting and stopping of cars more evenly and in a less jerky manner.

As a general check on these two runs shown in part in Fig. 10 tests were made to determine the rate of acceleration and the possible coasting distances resulting from the use of from one to eight points on the controller. These special tests were made with the test car at night and readings were made to check the curve-drawing instruments which were used to obtain the current curves.

Fig. 11 shows graphically the current values when accelerating to full multiple from a dead stop in various progressive intervals of time. These curves clearly illustrate the excessive peaks brought about by feeding faster than the proper rate for the motors and their gearing.

Fig. 12 shows graphically the current values and variations which occur when the car is in motion and the con-

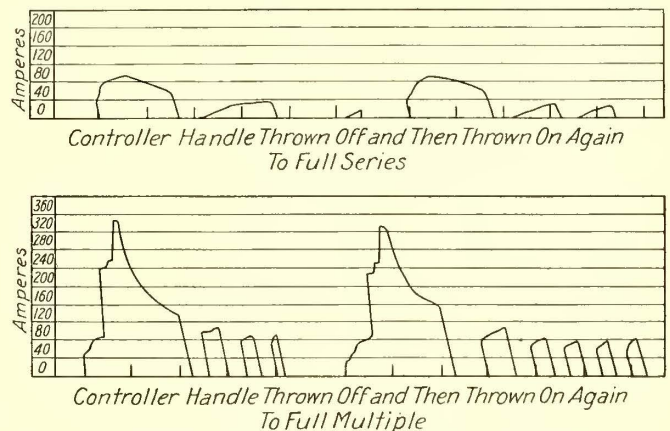


Fig. 12—Chicago Coasting Tests—Current Variations on Moving Car When Current Is Thrown On and Off

troller is thrown on and off from full series and full multiple. The effect of the counter emf of the motors, when the armatures are revolving at running speeds, in holding down the peaks should be noted.

Fig. 13 shows graphically the current variations, coasting distances and rates of acceleration when starting a car with from one to eight points of the controller using the uniform and correct rates of feeding.

These curves clearly substantiate the statement that the

peaks on the inefficient runs are too high, averaging per acceleration 250 amp, against 117 amp on the efficient runs. This is the direct result of too rapid acceleration and use of poor judgment in estimating the speed necessary to carry the car to the next stop.

The general summarization of the distances that can be coasted with the use of from one to eight points on the controller indicates how further savings can be made if the facts are properly brought to the attention of the motormen. No fixed rules for operation can be laid down, but the realization of distances that can be covered in coasting when applied practically by the motorman will enable him to anticipate correctly the necessary amount of energy his car must store up to coast to the next stop, thus greatly increasing his efficiency in coasting. The proper time element for feeding is between five and seven seconds. Feeding faster than this tends toward crowding the motors and slipping the wheels. Slower feeding results in too low acceleration and heavy rheostat losses, as shown in Fig. 11. All the graphic results made during the tests checked closely with the theoretical speed-time curves, which showed that the theoretical rate of acceleration actually gives the best results in practice and should be adhered to.

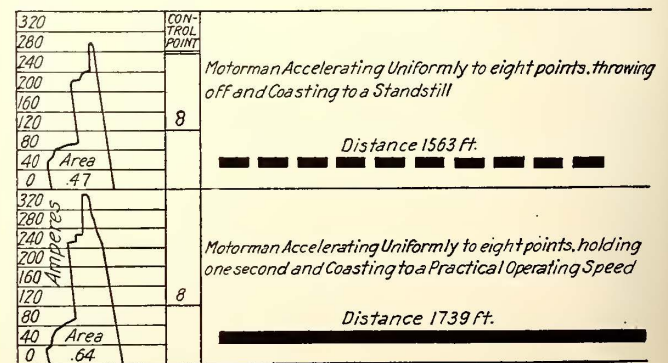
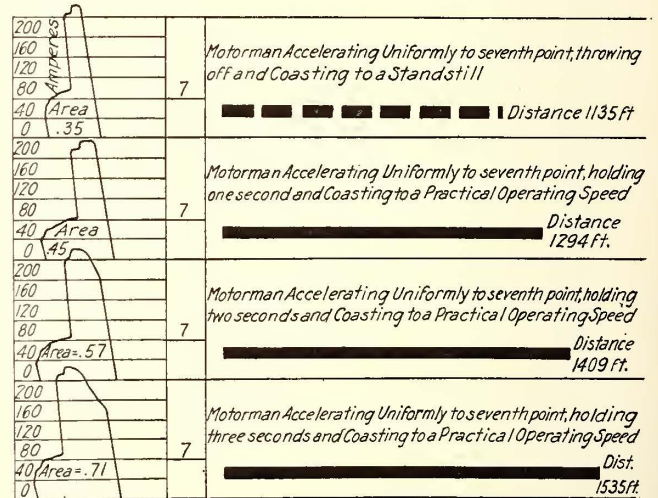
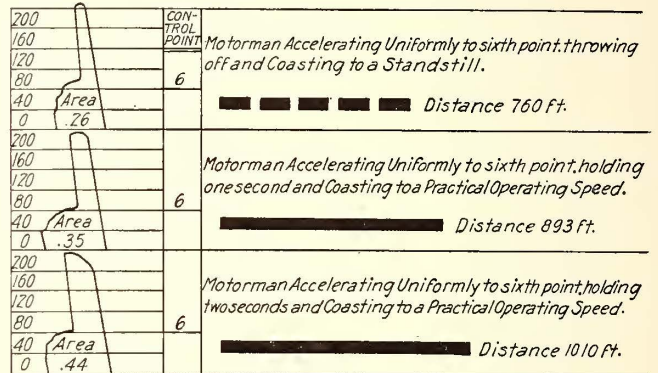
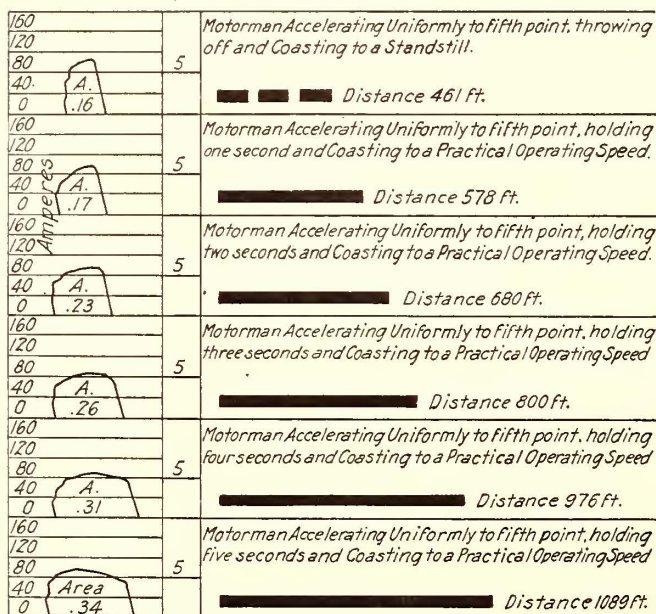
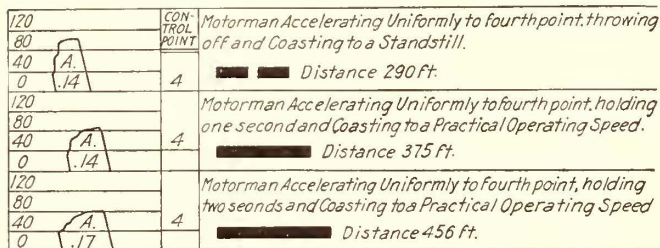
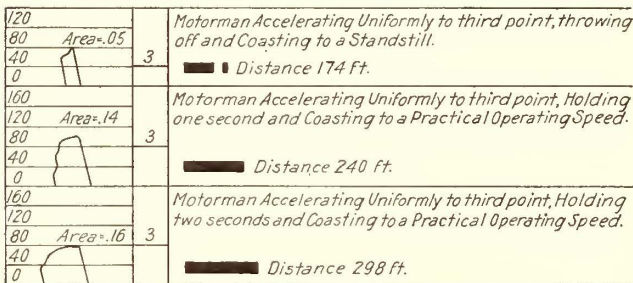
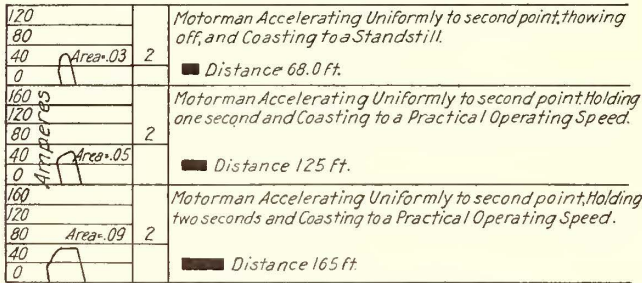
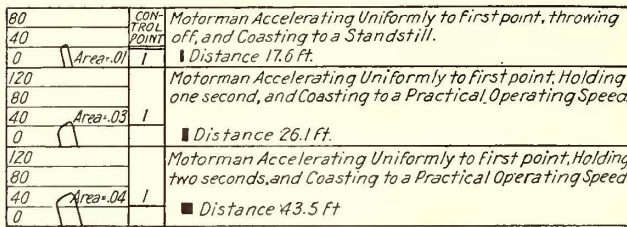


Fig 13—Chicago Coasting Tests—Current Variations and Coasting Distances for Different Controller Operations

In line with the foregoing observations the engineer in charge of the test suggested that a special instruction car should be equipped and a competent instructor be placed in charge. Each motorman should be required to pass an

examination as to his efficiency and then be required in actual operation to approximate his established efficiency, and, failing to do so, should be sent to the instruction car for further instruction. This practice gradually would raise the standard of efficiency of all the motormen until the full benefit from the

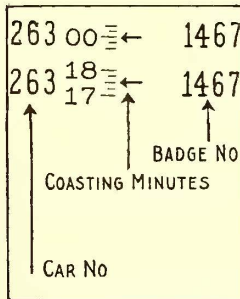
average saving of 40.8 per cent in the wear of brakeshoes was found.

Tables III and IV show the unit wear of brakeshoes, their life in terms of car miles, the pounds lost per car mile and a summary of the average saving after coasting time recorders had been installed, compared with the brake-shoe wear on twenty-three cars on the Kedzie Avenue line, which were not equipped with the recorders.

The following data are the results of tests made with one of the all-steel cars earlier described, the object of the test being to check the braking time and braking distance for making stops from various maximum speeds. In connection with these tests it should be noted that the track was wet, clean and very good for braking. The following figures are averages of several observations:

No. of Points Run on.	NORMAL OPERATION.		
	Maximum Speed m.p.h.	Braking Time.	Braking Distance.
1	12.8	6.5 Sec.	78 ft.
2	14.7	7.6 "	97 "
3	16.0	8.4 "	116 "
4	16.2	8.2 "	126 "
5	17.6	8.2 "	125 "
6	25.8	10.6 "	221 "
7	26.9	10.2 "	247 "
8	28.6	11.4 "	281 "
VERY RAPID RETARDATION USING SANDER WHEN NECESSARY.			
	Maximum Speed m.p.h.	Braking Time.	Braking Distance.
1	12.8	4.0 Sec.	38 ft.
2	14.7	3.7 "	48 "
3	16.0	4.1 "	57 "
4	16.2	4.7 "	66 "
5	17.6	5.3 "	79 "
6	19.0	8.1 "	158 "
7	26.9	7.9 "	171 "
8	28.6	8.7 "	220 "

CHICAGO RAILWAYS CO. RUNNING TIME CARD			
..... Ave. Line		Date..... 191.....	
Name.....		Key No.....	
Leave	221	Arrive	9 57
Arrive	221	Leave	8 40
Leave	122	Arrive	10 58
Arrive	122	Leave	10 00
Leave	023	Arrive	11 57
Arrive	023	Leave	11 00
Leave	614	Arrive	
Arrive	614	Leave	
Leave	815	Arrive	
Arrive	815	Leave	
Leave	216	Arrive	
Arrive	216	Leave	
Leave	917	Arrive	
Arrive	917	Leave	
Leave	918	Arrive	
Arrive	918	Leave	
Leave	119	Arrive	
Arrive	119	Leave	
Leave	810	Arrive	
Arrive	810	Leave	
Leave	211	Arrive	
Arrive	211	Leave	



Figs. 14 and 15—Chicago Coasting Tests—Trip Envelope and Sample Coasting Clock Record

general use of the coasting time recorders was realized.

DIRECT SAVING IN BRAKESHOE WEAR

The report states that increased coasting is the result of efficient acceleration and retardation. Efficient retardation results in a minimum dissipation of energy through brakeshoes, which means a direct saving in brakeshoe wear. This in practice means the stopping of a car on one application of air when practical, and also eliminating "fanning of air." Extensive tests were conducted and an

The report contains the following general conclusions regarding the claims made for coasting time recorders:

EQUIPMENT

"From facts brought to light in previous discussions and evidenced in practice, armature and motor troubles as well as the wear and tear on equipment in general will be lessened. Actual figures in percentage of saving for the entire system are not available, as the Van Buren Street line forms but a small unit of the railway company's whole equipment. The saving along this line is necessarily difficult to ascertain in as short a time as the test period covered.

ACCIDENTS

"The claims regarding accidents made by the Railway

TABLE III.—CHICAGO RAILWAYS—BRAKESHOE TEST BEFORE INSTALLATION OF COASTING RECORDERS.

Number	Car Number	Total Trips Made	Total Car Miles	Weight New Shoe Set (8)	Weight Old Set	LOSS IN WEIGHT PER SET (8)			Remarks
						Total Car Miles	Pounds per Car Mile	Pounds per 1000 Car Miles	
1	717	175	1400	192	107	85	.0607	60.7	Entirely worn out
2	702	178	1424	192	111	81	.0568	56.8	Entirely worn out
Average.....		176.5	1412	....	109	83	.0587	58.7	

TABLE IV.—CHICAGO RAILWAYS—BRAKESHOE TEST OF CARS EQUIPPED WITH COASTING TIME RECORDERS.

Number	Car Number	Total Days on Car	Total Trips Made	Total Car Miles	Bad Castings in Set	Percentage of Bad Castings	Weight of Old Shoe per Set	LOSS IN WEIGHT PER SET (8)			Remarks
								Total Car Miles	Pounds per Car Mile	Pounds per 1000 Car Miles	
1	733	14	160	1280	0	0	148.50	44.86	.0350	35.0	Not worn much
2	729	20	179	1432	2	25.	138.93	54.51	.0378	37.8	6-Badly worn
3	701	18	191	1528	0	0	142.00	51.36	.0336	33.6	Not worn much
4	725	17	195	1560	0	0	140.45	52.71	.0338	33.8	Uniformly worn
5	720	17	205	1690	2	25.	133.60	59.76	.0364	36.4	3-worn out
6	746	25	208	1664	0	0	143.20	50.16	.0345	30.5	1-Badly worn
7	720	19	220	1760	0	0	139.50	53.86	.0306	30.6	1-Badly worn
8	739	25	226	1808	0	0	128.50	64.86	.0352	35.2	Uniformly worn
9	743	21	231	1848	0	0	128.00	65.36	.0352	35.2	4-Badly worn
10	722	19	237	1896	1	12.5	126.48	66.88	.0334	33.4	2-Badly worn
11	717	29	247	1976	0	0	127.44	65.97	.0306	30.6	3-Badly worn
12	735	24	252	2016	0	0	132.00	61.36	.0309	30.9	1-Badly worn
13	714	22	262	2096	0	0	128.48	64.88	.0309	30.9	4-Worn out
14	707	25	269	2152	0	0	117.50	75.86	.0352	35.2	Uniformly worn
15	709	21	271	2168	0	0	129.53	63.83	.0294	29.4	Uniformly worn
16	703	21	272	2176	0	0	118.00	75.36	.0346	34.6	Worn out
17	744	20	272	2176	1	12.5	127.48	70.88	.0363	36.3	Uniformly worn
18	702	24	278	2224	2	25.0	122.88	70.48	.0316	31.6	Uniformly worn
19	749	26	298	2384	0	0	122.96	70.40	.0295	29.5	Uniformly worn
20	718	28	311	2488	3	37.5	109.96	83.44	.0334	33.4	Uniformly worn
21	705	29	327	2616	0	0	129.25	64.11	.0245	24.5	Uniformly worn
22	711	32	328	2624	3	37.5	110.62	82.74	.0315	31.5	1-Worn out 7-uniform
23	745	30	328	2624	0	0	120.00	73.36	.0229	22.9	Uniformly worn
Average.....		32.9	250.074	2005.9	14	7.6	127.83	64.65	.0322	32.2	

Average saving based on Van Buren St. before installation = 45.1 per cent.  
 Average saving based on Kedzie Ave. before installation = 35.7 per cent.  
 Average saving based on Van Buren St. and Kedzie Ave. before installation = 40.8 per cent.

Improvement Company are both logical and conclusive, and agree with the opinions of several of our operating officials as well as with the experience of the motormen themselves. Although the period of operation with coasting time recorders has only been a few months, the official records of accidents on the Van Buren Street line show a considerable decrease.

RUNNING TIME

"The operating department has been able with the records of actual running time for each motorman, obtained as part of the system inaugurated by the Railway Improvement Company, so to check the motormen as to maintain schedule running time, both at the terminals and time points."

SUMMARY

Based on the test described, the saving that can be converted into dollars and cents is presented by the engineers of the Chicago Railways Company in their report as follows:

1—Power .....	15.6 per cent
2—Brakeshoes .....	40.8 per cent
The actual saving in power on the Van Buren Street line, up to the present time, due to the use of "Rico" coasting time recorders is shown below:	
Feb. 26 to April 8, six weeks consumed in determining kw-hours per mile, namely .....	3.890
April 8 to July 1, twelve weeks, actual consumption of power for traction...	1,034,715 kw-hours
Total car miles operated.....	303,889
Average kw-hours per car mile.....	3.405
Average saving per car mile.....	12.5 per cent
Had the above 303,889 car miles been operated on a basis of 3.890 kw-hours per car mile the power consumption would have been.....	1,132,128 kw-hours
A saving in total kw-hours of.....	147,413
The above saving figured on a basis of 1 cent per kw-hour.....	\$1,474.13
Saving in brakeshoes during the test period was 22.2 lb. per 1000 car miles. This would amount on the mileage made during the test to.....	132.22
<hr/>	
Total saving in power and brakeshoes .....	\$1,606.35
During the month of July the saving in kw-hours was 64,360, which at 1 cent would be .....	643.60
Saving in brakeshoes.....	43.16
<hr/>	
Total saving to July 31 (16 weeks) ..	\$2,293.11
During the next thirty-six weeks, estimating a saving of 15.6 per cent, will amount to .....	\$5,664.14
Estimated saving based on above, actual saving in brakeshoes (36 weeks)...	386.30
<hr/>	
Actual and estimated saving of power ..	\$7,781.87
Actual and estimated saving of brakeshoes .....	561.68
<hr/>	
Actual and estimated total saving for year based on the operation of fifty cars on Van Buren Street line.....	\$8,343.55
Cost of fifty "Rico" coasting time recorders, \$5,000, at 10 per cent interest and depreciation.....	500
Cost of installation at \$5 per car, \$250 at 10 per cent interest.....	25
<hr/>	
Total interest .....	\$525

Cost to keep records, repairs, etc.....	\$1,200
Paper, envelopes, proportion of supplies and proportion of rent, etc.....	200
<hr/>	

Total operating charges.....	\$1,925
Net income first year Van Buren Street line .....	\$6,418.55
The dividend on the investment necessary to equip this line would be.....	122.2 per cent.

ANNUAL SAVING ON ENTIRE ROAD

The established savings applied to the entire system of the Chicago Railways Company based on operation during 1910 would be as follows:

Total car miles operated.....	51,646,428
Total kw-hours, traction.....	182,171,511
Power saving at 15.6 per cent as shown on Van Buren Street line, kw-hours .....	28,418,756
The above at 1 cent per kw-hour...	\$284,187.56
Total tons of brakeshoes consumed.	2,100
Total saving based on 22.2 lb. per 1000 miles .....	\$22,472.38
Total saving brakeshoes and power consumption due to installation of coasting time recorders.....	\$306,659.94
Cost of 1560 "Rico" time recorders, \$156,000, assuming 10 per cent interest and depreciation.....	\$15,600
Cost of installing 1560 recorders at \$3 per car, \$4680, assuming 10 per cent interest.....	468
Cost of maintaining records.....	20,000
Cost of paper.....	1,800
Cost of motormen's envelopes.....	1,200
Cost of rent.....	1,800
<hr/>	
Total cost of operation.....	\$40,868
Total net saving for one year in kw-hours and brakeshoes.....	\$265,791.94

KEEPING RECORDS

Fig. 14 shows a sample envelope used by motormen on which to record their arriving and leaving time as indicated on the terminal printing time clock. This gives a valuable check on any variations from the scheduled running time.

A sample of the slip taken from the coasting time recorders at the end of each trip also is shown. This gives the recorded coasting time in minutes and the necessary badge number to identify the record. These slips are placed in the envelopes previously mentioned and are dropped in a cabinet by the motormen at the end of their day's runs. The envelopes are gathered once a day and sent to the engineering department for analysis and tabulation. At the end of each week a bulletin is published showing the percentage of coasting and average running time for all motormen.

The latest designs of "Rico" coasting time recorders print the elapsed coasting time, car number and motormen's key number. The new feature of recording the elapsed coasting time will materially decrease the cost of maintaining the records, shown in the summary of savings applied to the entire system.

The engineer of tests concludes the report as follows:

"From the foregoing discussion and facts gathered during the test the claims made by the Railway Improvement Company for its coasting time recorders have been fully substantiated.

"The test of the coasting time recorders has brought to light the enormous waste in power, brakeshoes, etc., and the use of the coasting time recorders has furnished a practical method of eliminating such waste. \* \* \* I therefore recommend their adoption for use on our entire system."



# Papers Read at New York State Association Convention

The Subjects Include Pay-as-You-Enter Cars, Accident Prevention, and Life of Railway Physical Property from the Standpoint of the Engineer and the Accountant

## THE ADVANTAGES OF THE PAY-AS-YOU-ENTER CAR

BY THOMAS W. CASEY, GENERAL MANAGER PREPAYMENT CAR SALES COMPANY

In considering the developments of the pay-as-you-enter system, it must be remembered that the all-important and basic principle back of these developments and on which they are all founded is found in the standard open platform pay-as-you-enter car originally installed in Montreal, Chicago and New York. It has never been found necessary to change these cars in the five or six years of operating experience, and all prepayment cars in use to-day are operated on the same principle as the original pay-as-you-enter cars. Practically all benefits to be derived from prepayment operation were obtained in these original cars. There have been developments, however, of the prepayment principle, which, while not materially altering or interfering with the original design, have reduced the cost of converting old-style cars to the new type, and to a great extent have increased the general efficiency of the system.

When the first pay-as-you-enter cars were installed in Montreal in 1904, it was thought necessary to have a considerably enlarged rear platform for the accommodation of passengers boarding the car, this platform, in some instances, having a length of 9 ft. Practical operating experience proved that this extremely large platform was unnecessary as the passengers boarded the car and paid their fares much more promptly than had been anticipated, thus causing practically no congestion on the rear platform. Therefore the size of the platform has been reduced until to-day the maximum size is 6 ft., while many prepayment cars with rear platforms only 5 ft. long are being successfully operated. These platforms, therefore, are practically the same size as those on standard cars of the old type. This reduction in the size of the rear platform is an important one from the standpoint of the railway company as it eliminates the expense of providing an extra long platform. This saving is especially noticeable in the cost of converting existing old-style cars to the prepayment type, making it unnecessary to rebuild the rear platforms when they are of a reasonable size and greatly reducing the cost when rebuilding is found necessary.

### FARE COLLECTION

One of the principal objects of the pay-as-you-enter car is to collect a fare from every passenger. To accomplish this the conductor has a permanent station on the rear platform and collects the fares as the passengers enter the car. Perhaps the greatest problem of the traction manager is the elimination of the "missed fare," caused by the failure of the old method to meet adequately modern operating conditions. The prepayment system is the only known method of overcoming this difficulty; that it does overcome it is a matter of record. While the results achieved from the first pay-as-you-enter cars were highly satisfactory from the start and showed a substantial increase in the receipts of the railway companies, a further development to insure that every fare would reach the company's treasury has been the use of the fare-box. There are a number of different styles of fare-boxes which can be satisfactorily used in connection with pay-as-you-enter cars.

A second advantage of almost equal importance is the

better maintenance of schedule time. One of the most satisfactory results shown in actual practice has been the speed with which a crowd can be loaded and unloaded simultaneously at the stopping points. This means economy in operation and a marked reduction in expense.

### ACCIDENT PREVENTION

Perhaps the most important feature of the prepayment car is the prevention of accidents. The primary design of the car with the fixed station of the conductor on the rear platform places him at all times in a position to observe the passengers, stop and start the car when it is safe to do so and be ready and able to prevent an over-eager passenger from possible injury. As the front platform of the first prepayment cars was used only for an exit, it was found desirable to have an inclosing door on the front platform in order to prevent passengers entering there. This was found wholly to eliminate alighting accidents at the front platform as the inclosing door was not opened by the motorman until the car had come to a full stop. This naturally suggested that the same result could be accomplished by inclosing the rear platform; thus the next development of the prepayment principle was the inclosing of the rear platform, thereby preventing passengers from alighting before the car had come to a full stop, and resulting in eliminating alighting accidents.

The other most prolific source of accidents was from boarding the car while in motion, and while such accidents were greatly reduced by the inclosing door on the rear platform, yet so long as the stationary step offered the opportunity some passengers who were over-zealous to enter the car would jump on the step only to find their way blocked by the inclosing door. Therefore, in order entirely to eliminate boarding accidents, the folding step was the next development. Such a step, working simultaneously with the inclosing door, completely shuts in the rear platform and removes any opportunity for "flipping" the car.

The pay-as-you-enter car with these additions effectually prevents the two most common causes of accidents. The claim agent of one well-known road testified in a recent suit that while the company had had 681 accidents during a period of nine months with the old-type cars, since the introduction of the pay-as-you-enter cars there had been only three accidents in six months. None of these accidents had resulted in any claim against the company. In this connection the figures contained in the report to the Pennsylvania State Railroad Commission of March 7, 1911, are interesting. These figures show that the ratio of boarding accidents had diminished from 84 per cent on old cars to 16 per cent on the prepayment type cars; that alighting accidents had decreased from 93.5 per cent to 6.5 per cent, and that the percentage of passengers falling from cars had dropped from 97 per cent to 3 per cent. These figures are startlingly conclusive and are confirmed by similar results in other states. According to the last published United States Census report, the cost of damages and legal expenses incident thereto resulting from accidents to street car passengers throughout the country totaled the gigantic sum of \$18,176,305 during the year under review. During the same year the companies concerned paid out in dividends a sum of \$54,000,000; thus nearly 40 per cent of the sum paid in dividends was wasted in preventable accidents.

When the pay-as-you-enter car was first placed in opera-

tion it was thought that its use would be limited, as it was feared that the prepayment principle could not be adapted to more than one type of car. Experience has demonstrated the fallacy of this opinion. Single-truck cars of the prepayment type are being as successfully operated as double-truck cars, although at one time this was believed to be impossible. As further evidence of the flexibility of the prepayment principle, showing that it can be adapted to practically all operating conditions, attention might be called to the one-man prepayment car, now being successfully operated in Oklahoma. In this type of pay-as-you-enter car the front platform is designed with a separate entrance and exit, the motorman acting as conductor and collecting the fares as the passengers board the car. This is considered advantageous on small lines where the travel is light and economy in platform expense is a factor.

Another modification is the center-entrance type of car, successfully operated in Tacoma, Wash., Oklahoma and Montreal. This car is most flexible in its operation, as it can be used for first and second-class passengers, or for smokers and non-smokers, or in the South for the separation of white and colored passengers.

Another recent development of the prepayment principle is the near-side, one-end prepayment car now being operated in Buffalo and Philadelphia. With this car the conductor and the motorman are stationed at the front end of the car, the passengers boarding and alighting from that end; this is an added advantage in those cities where traffic regulations compel a stop on the near side. Through only recently introduced, these cars have shown themselves to be very successful in operation and are an added illustration of the adaptability of the pay-as-you-enter principle.

Still another modification is what is known as the "Universal" prepayment car, which is designed for either near-side or far-side operation, as may be desired. The ordinary type of car is adapted only for far-side operation; the one-end near-side car can be used only for near-side operation, but the universal prepayment car is adaptable to both methods of operation. As near-side stops are required in certain sections of some cities, while far-side stops are required in other sections of the same cities, this is an important feature.

#### GROWTH OF PREPAYMENT SYSTEM

Regarding the growth of the pay-as-you-enter principle, prepayment cars have been adopted by over 100 traction companies, which are operating more than 10,000 prepayment cars to-day, while more than 50 per cent of all the cars built for city use in the United States and Canada during the first six months of the present year were prepayment cars.

Prepayment cars are now giving satisfactory service under all kinds of operating conditions. They are being used in large cities, such as New York, Chicago and Philadelphia, where the traffic is much congested, and also in Hutchinson, Kan., with a population of 16,000, where eight cars comprise the entire rolling stock. It is very evident, therefore, that the original impression that the prepayment principle was only suitable for large cities was an erroneous one. The constant increase of companies adopting the system, and in particular the fact that these same companies are day by day increasing the number of cars in use on their respective lines, offers the best evidence of the advantages which the system has been proven in actual tests to present.

The advantages of pay-as-you-enter operation are now being recognized abroad and a company was recently formed, under the name of the International P-A-Y-E Tramcar Company, Limited, to exploit and develop the system. Within a reasonably short time, pay-as-you-enter cars will be familiar sights in foreign cities.

At the Tramway Congress recently held in Glasgow, the presidential address, read by J. Dalrymple, general

manager of the Glasgow Corporation Tramways, contained the following:

"In America considerable changes have been made within the past few years in the style of car, and now nearly all the large street railway companies collect the fares of the passengers on the platform before they enter the car. That change, which seems a very simple one, must have proved in many ways a great boon to the street railway companies of America. It must have been the means of increasing the revenue enormously, and the adoption of this system must have minimized to a considerable extent the number of platform accidents. What would it mean to us here if we could devise some method which would insure that the conductor would never require to leave his platform?"

In the city of Sheffield, England, the collecting of upper-deck fares in advance has been instituted, and plans are now in the shops of the company for the remodeling to pay-as-you-enter operation of certain cars of the Gateshead & District line of the British Electric Traction Company, an organization controlling some thirty English lines.

It is eloquent testimony to the appreciation of American far-sightedness that such European cities as Paris, Milan, Rome and The Hague are now closely investigating the pay-as-you-enter system with the officials of the International Company.

In the following four prime elements the prepayment system of fare collection presents a solution of the chief difficulties confronting the street railway operator:

The abolition of missed or lost fares.

The reduction of car hours, or economy in operation.

The prevention of accidents and reduction of claims and damages.

The definite and unquestioned advantage of the approval of the public.

#### OPERATION OF PAY-AS-YOU-ENTER CARS IN SYRACUSE

BY J. E. DUFFY, SUPERINTENDENT SYRACUSE RAPID TRANSIT RAILWAY

Pay-as-you-enter cars were put in use by the Syracuse Rapid Transit Railway on Oct. 2, 1910, so that at the present time the results of a full year are available for comparisons and deductions.

The type of car put in service was a double-truck, single-end car, 45 ft. long over all, with a rear platform 6 ft. 6 in. long, and seating forty-two passengers. As the rear half of the platform, which is used as an entrance, was not protected by a door, the mechanical facilities for preventing boarding accidents were no better than with the older type of car, but it was hoped that on account of the conductor being on the rear platform at all times there would be a very material reduction in the accidents of this class. These frequently happen when the conductor is engaged in collecting fares in the forward part of the car and depends upon passengers on the rear platform to notify him when the steps are clear and when it is safe to start the car. The fact that each exit was controlled by an agent of the company and no passenger would be able to alight without one of these agents permitting him to do so led to the expectation of a marked reduction in, if not the total elimination of, alighting accidents.

These cars were put in operation on what is known as the Dudley & East Genesee division, which is 4.84 miles long. Previous to the introduction of the pay-as-you-enter cars the cars on this division were operated on a four and five-minute headway with an allowance of thirty-five and thirty-six minutes for each half trip, which is a schedule speed of 8.3 m.p.h. Although at first it was thought that the slower operation of the pay-as-you-enter cars would require the running time to be increased, this was not

found necessary after the first week. The same schedules have been maintained with the pay-as-you-enter cars as were in use with the other type of car. The operation of this line through the center of the city is particularly favorable, as it traverses the business section for a distance of only two blocks.

Following are some statistics which will serve to show the success of the operation of pay-as-you-enter cars on this division:

The receipts from this division for twelve months ending Sept. 30, 1910, during which period the old cars were in use, were \$241,898, which was an increase of 6.38 per cent over the previous year, while for the same period the increase on the whole system, including this division, was 8.86 per cent. This shows that this particular division did not keep up with the general increase for the whole system for the period mentioned.

The receipts from this division for the twelve months ended Sept. 30, 1911, were \$269,556, an increase of 11.4 per cent over the preceding year, while the increase on the whole system, including this division, was 6.66 per cent.

While this division showed 2.48 per cent less increase than the percentage increase for the entire system for the year ending Sept. 30, 1910, it showed 4.74 per cent more than the percentage increase for the entire system for the year ending Sept. 30, 1911. This proved quite conclusively that the larger part of the increase in 1911 was due to the operation of the pay-as-you-enter type of car. It was not caused wholly, as one would expect, by failure to register fares, but rather because the conductor was in a position to see that every person paid his fare. The public is more to blame for the loss of fares than the conductor.

ACCIDENTS

Prior to the introduction of this type of car in Syracuse several companies reported marked reductions in the number of accidents occurring on divisions where they were in operation. Our experience, so far as platform accidents were concerned, was not as satisfactory as we had anticipated. The increase outside of this division for the year ending Sept. 30, 1911, for platform accidents was but 4 per cent, while the increase on this division was 46 per cent, divided as follows: Alighting accidents decreased 0.085 per cent, boarding accidents increased 66 per cent, and "injured on car" accidents increased 171 per cent; all as compared with the previous year.

We found that the accidents classed as "injured on the car" increased greatly on account of the numerous grades and curves on this division. As soon as the passengers were on the rear platform the conductor started the car. Many times people were thrown either to their knees or against the sides of the vestibule as the car was rounding a curve or starting down grade. Upon analysis, however, it was found that the amount of money paid out for platform accidents was much less than during the previous year. This showed that while they increased in number they were of a less serious nature.

The amount of money paid out for alighting accidents which occurred on this division decreased 63.5 per cent. The amount for boarding accidents decreased 15 per cent, and the amount for "injured on the car" accidents decreased 22.5 per cent, making a total decrease of 40 per cent for all platform accidents. This means that, while the number of accidents increased 46 per cent for the period named, the amount of money paid for the same period decreased 40 per cent.

We found that about one-half of the money paid for alighting accidents was due to women catching their skirts on the snow scraper handle, which is located on the front platform near the exit door. When this was discovered a guard was placed over the handle and our records show that but one accident of this nature has occurred since.

Our patrons from the first have been well pleased with this type of car, and by October, 1911, the company had

found them so satisfactory in operation that twelve more were added to the original twenty-three cars. These twelve new cars are practically the same type as the ones which have been in service on the Dudley & East Genesee division, except for the addition of a folding door at the rear entrance and folding steps at the rear entrance and exit.

The twenty-three cars purchased a year ago recently have been equipped with folding rear steps and a folding door at the rear entrance. This makes the rear platform arrangement uniform on all cars of this type now in operation. This feature should effect a very material reduction, both in the number of accidents and in the amount of money paid out for accidents, if the conductors and motormen obey instructions that the doors must not be opened until the car stops and that the car must not be started until the doors are closed.

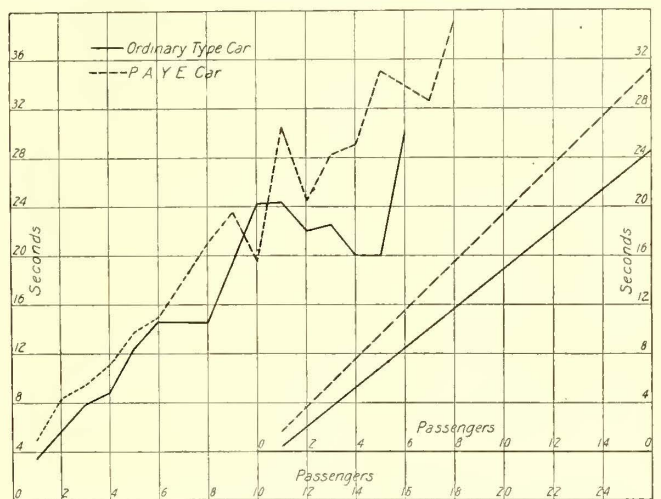
The "injured on the car" accidents have a tendency to increase in number but not in severity. We hope, however, by educating the conductors to allow elderly or feeble persons to reach the seats before starting the car to keep down the number of accidents of this class.

CONCLUSIONS

We have drawn the following conclusions as to the advantages of pay-as-you-enter cars:

First—The abolition of lost or missed fares is accomplished.

Second—A reduction in car hours and economy in operation is not obtained, judging from our experience. It



Loading and Unloading Time of Prepayment and Ordinary Type Cars

might be possible that the pay-as-you-enter cars with open front and rear platforms could accomplish this, but that type of car could not be used in a climate such as we have in Syracuse. On the Dudley & East Genesee division, where the pay-as-you-enter cars were first put in service, it has been possible to use the same running time per trip as was used with the old type of car, but on the Midland & Butternut Park division, which was the last line equipped with pay-as-you-enter cars, it was found necessary to add practically 7½ per cent to the running time. This perhaps is due to the fact that this line runs through the business district for a considerable distance, where it is the practice to stop at both the near and far sides of the streets. From tests made under practically the same conditions with the pay-as-you-enter type and a full convertible car it was found that as the number of passengers per trip increased the pay-as-you-enter car was slower in operation.

The conclusion as to reduction in car hours is based upon a series of tests made with full convertible cars from which passengers may leave by the front door. In 215 cases recorded where only one passenger boarded or left the car at any point seventy-two boarded or alighted without the car coming to a full stop, or with a stop of such short

duration that it was impossible to record it with a stop watch. From the same series of experiments it was found that in eleven out of 114 cases where two passengers boarded or left the car at one point the car did not stop.

To indicate that the pay-as-you-enter type is used efficiently in Syracuse, as a result of eleven tests made on the Dudley & East Genesee division and thirteen tests on the Midland-Butternut Park division, 60.7 per cent of the passengers left the car through the front exit. In comparison with this, sixteen tests made on the Court & Salina division, where the full convertible type of car is used, showed that only 30 per cent of the passengers left by the front door.

The chart on page 1203, based on these tests, shows the average length of time required to receive and discharge different numbers of passengers varying from one to eighteen at a single point.

Number of Passengers.	LENGTH OF STOPS WITH CONVERTIBLE AND PAY-AS-YOU-ENTER CARS.			
	Full Convertible Car.	Pay-as-You-Enter Car.		
	No. of Tests.	Av. Seconds.	No. of Tests.	Av. Seconds.
1	215	3.4	347	4.9
2	114	5.6	184	8.3
3	81	7.8	100	9.4
4	46	8.8	58	11.1
5	18	12.4	34	13.8
6	13	14.6	24	15.0
7	13	14.5	23	18.0
8	4	14.5	17	21.1
9	8	19.7	6	23.6
10	3	24.2	6	19.5
11	6	24.3	4	30.5
12	1	22.0	2	24.5
13	2	22.5	4	28.2
14	1	20.0	1	29.0
15	1	20.0	2	35.0
16	1	30.0	0	...
17	..	...	3	32.6
18	..	...	1	39.0

Third—The prevention of accidents and reduction of claims and damages are marked. The statistics given in the first part of this paper, which showed the amount of money paid out by this company, indicate that this claim is well founded.

### PREVENTION OF ACCIDENTS

BY R. E. M'DOUGALL, CLAIM AGENT UTICA & MOHAWK VALLEY RAILWAY

Each year shows a decided increase in the number of accidents and the amount of damages that companies are compelled to pay because of them, no matter how efficient the claim departments may be in their settlement. All common carriers are giving the matter attention, and are trying to devise ways and means of preventing accidents.

Traction companies on the Pacific coast for some years have been conducting a campaign of accident prevention, and the results obtained by them have been such as to justify other companies in taking up the question. More than one-half of the accidents that occur are due entirely to carelessness, either on the part of the person hurt or someone else. Many of these accidents can and should be prevented. This prevention can be brought about by organization and education. By this I mean systematic education of employees and of the public, thus getting their interest and co-operation. Much can be done along this line.

WHAT CAN BE DONE TO INCREASE THE INTEREST OF ALL EMPLOYEES IN ACCIDENT PREVENTION?

The following classes of accidents in many instances can be prevented by employees of the various departments outside of the transportation department:

(1) Miscellaneous accidents, such as passengers and others being injured on or near railway property, but not while on cars or struck by cars.

(2) Platform and station accidents.

(3) Injuries to employees.

Let the heads of these departments get together and organize a campaign for the prevention of accidents

among the employees. For example, the track employees should be impressed with the necessity of keeping platforms, steps, walks, station entrances and exits in good repair and free from snow and ice at all times; of guarding holes and excavations made by them in the performance of their work; of properly barricading and lighting at night all unfinished work in streets and highways. Particular attention should be given to the condition of the 2-ft. strip outside of the track in streets and to landing places where cars stop for passengers to alight, so that a passenger who gets off a stationary car and falls cannot make the claim that the fall was due to the company's negligence in having an improperly constructed landing place or in permitting a hole to remain alongside of the track.

What applies to the trackmen also applies to the linemen, carmen, shopmen and all other employees. They should be reminded constantly that they are to be careful to protect themselves and others at all times. Get the men to know that this is expected of them and see that they do it.

THE BEST MEANS OF PROMOTING GREATER CAUTION ON THE PART OF PLATFORM MEN

This is also a matter of education, and I believe that this education should be carried on jointly by the superintendent and claim agent. After the new man has been "broken in," and before he reports for work, he should see either the superintendent or the claim agent for instruction in accidents and their prevention. It should be impressed on him how to handle an accident; what he can and should do to prevent one; that he should be sure no one is boarding or alighting before he starts the car; that he should warn passengers who are getting on or off a moving car. These points and many more should be thoroughly gone over with him before he reports for work. While breaking in, the new man has had his whole attention centered entirely on how to collect and account for fares or how to operate a car, and the accident end of the business has been given but little thought by him. Get him thinking and then follow him up.

Talks with the platform men in a body, say every two or three months or oftener, will produce the best kind of results. Have short talks by representatives of both the operating and claim departments, giving figures as to number and cost of accidents; the cause of accidents and how they could have been avoided, etc. If you interest your men you will get much in the way of results and also suggestions from the men that are oftentimes valuable.

HOW CAN THE PUBLIC BE EDUCATED IN THE PREVENTION OF ACCIDENTS?

This is where your real work can be done, and there are many ways to go about it. While much can be done among the adults, better and more lasting work can be accomplished with the children. If the necessity of being careful at all times is thoroughly impressed on them the impression will remain, and the results will be felt now and in the future. They are your riders of to-morrow. A special effort should be made to get to them to see that they are instructed where the danger is, and that they are taught to be always on the safe side. How to go about the work is a question that each must decide for himself.

As to the education of the adult population let me make these suggestions: Get in touch with employers of teamsters, such as truckmen, liverymen, express men and the like, and ask them to take up the subject directly with their men. Get traffic regulations passed in your municipalities and see that they are enforced. Get the newspapers interested in the subject; they would be only too glad to assist if the matter is put before them. Use printed cards in your cars with short, pointed warnings. These and a hundred other things will tend to educate the public along this line.

If a campaign of this kind is started, however, it should be followed up continuously and not be allowed to lag.

Better not start it at all if you do not intend to follow it up. This policy does not necessarily mean the expenditure of a great deal of money, but it does mean a considerable amount of work. There is no method of knowing what or how many accidents a campaign of this kind prevents, but every road that has tried it asserts that it has benefited through very material reductions in the number of accidents.

#### LIFE OF RAILWAY PHYSICAL PROPERTY FROM THE ACCOUNTING STANDPOINT

BY W. O. INGLE, ASSISTANT AUDITOR NEW YORK STATE RAILWAYS

This important subject has been taken up by a committee of the Accountants' Association with the view of compiling and getting information on all of its aspects. When this committee presented its report in October at the Atlantic City convention the suggestion was made that the Engineering Association be asked to co-operate. The suggestion was a timely one. The committee of the Accountants' Association has already prepared plans for obtaining information on which to base its report next year. The importance of keeping complete detail records cannot be emphasized too strongly. The more complete are the records the more information can be obtained on the life of the property. This matter is something which possibly has not been given necessary attention. Records are deemed an expensive burden to keep up, but their importance is forcibly called to the attention of railways to-day when it becomes necessary to clear fixed capital accounts of the original costs and an estimate has to be made of the cost instead of having the actual figures. With a complete job order system this would be changed, as it would be possible to get the original costs of installation of any particular piece of property, track or equipment, and also the maintenance costs in complete detail year by year. Such a system would show at a glance the original cost of laying a piece of track, giving in complete detail the kind, weight and length of rail, number and kind of ties, the paving, etc., entering into the construction, together with the date of installation and dates when repairs were made and the various kinds of repairs. But in considering the life of this piece of track should not the territory through which the road runs be taken into consideration? It may run through low land where the soil or the weather conditions are such as to cause rapid depreciation, such as decay of the ties; or it may be laid in soil in which the ties would have a very long life. The kind of ties should be considered also, as this has a close bearing on the life. A road built by a contractor who uses a lot of cull or second-hand ties would not be so good physically as one which was laid with the very best material. Again, the section where the track is laid might have very heavy grades. This would cause greater wear and tear on the rails as well as on the equipment which was operated. On a city property having much special work over which city and interurban cars are operated there is always great wear and tear due to the heavy interurban cars which are operated. This fact not only affects the wear and tear of the track, but very materially shortens the life of special work, causing repairs to be made more often as well as requiring replacements after a very short service. The charges for operating foreign cars over city tracks should be based to a certain extent on the wear and tear of track and special work used.

Another important item in considering the life of track is that, while the car mileage made on a certain route is often taken as a measure of the life, the fact that there are several lines operating over a common piece of track is overlooked. The total mileage made by all these lines over this common piece of track is not considered. One section of track in a street may be giving twice as much service as

another. In making comparisons of costs and life of various sections, if the various operating conditions and elements are taken into consideration some interesting information of great value to the engineer would be obtained.

With regard to the life of equipment of the various classes, consideration should be given to the fact that certain equipment may become obsolete through more effective and economical equipment taking its place, or through the growth of the community, which would demand improved equipment.

For some time past the writer has kept the costs of maintenance of various types of motors, controllers and their different parts and it is and has been the intention each year to try to keep such individual records of the various types of equipment as will furnish all information on the life of these parts that will be of value. However, the mileage and elements of operation should be taken into consideration. This is just as important as other records. The operating man realizes more and more the importance of keeping individual car mileage for use, not only in overhauling and inspecting cars, but in comparing the wear and tear of different parts. Brakeshoes are now furnished on the basis of mileage of the shoes.

Should we not make and keep more accurate and permanent records of individual car mileages? One car may be out continually, making a large mileage, while another of the same type in every respect and built at the same time may not be making one-half the maximum mileage. This illustrates the need of individual records.

The accounting department should keep such detail records of the life of maintenance of way and equipment as will be of value to the engineer, who must take into consideration the various elements of operation which enter into the same.

#### LIFE OF RAILWAY PHYSICAL PROPERTY FROM THE ENGINEERING STANDPOINT

BY F. A. BAGG, CHIEF ENGINEER FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD

Reliable information on the probable and actual life of the various physical elements which make up railway property is often called for in these days for various purposes, and each railroad company would do well if it would keep up a system of records covering the life of the physical parts of the property from which such data may be obtained. There is no good reason why such information should be hidden from ourselves or from the public.

Physical valuation is largely but not entirely a summation of the cost less depreciation of all the various items which make up the physical property, and the depreciation, of course, is based on the known or assumed life of each item. Depreciation on account of obsolescence is not here considered, for it would be taken into account only in exceptional cases pertaining to the equipment of power plants or buildings.

The economy of one kind of material or one type of construction compared with another is not determined by first cost alone, but in the light of the known or estimated life of each. Durability depends upon inherent qualities, conditions of manufacture, installation, maintenance and service, and no records are valuable without a certain amount of information concerning such matters.

In our reports to the State Board of Tax Commissioners we are required to estimate the cost of reproduction new, also the cost new less depreciation, and the reliability of these estimates will depend upon the correctness of our assumption of the life of each item.

In this paper two classes of railway property are considered, the track and the overhead lines, and following is a list of most of the items making up these two classes. Track is divided under two heads, open and paved:

Under open tracks are—grading, stone ballast, gravel

ballast, other ballast; ties—chestnut, cedar, yellow pine, oak, treated or untreated; switch timber; rail—Bessemer, open-hearth, specially treated, new or relaid; joints; joint bonding; frogs and switches; switch stands; bridge masonry—rubble, ashlar, concrete; bridge superstructure—timber, steel, concrete; fencing—chestnut posts, cedar posts, concrete posts, galvanized wire, board fence, permanent snow fence, movable snow fence, public crossings, private crossings.

Under paved track are—grading, ballast, cedar ties, pine ties, treated ties, steel ties; rail—Bessemer, open-hearth, special high carbon, other specially treated, section of rail to be noted in each instance; joints; joint bonding; special work—regular construction, hardened steel center, solid manganese; paving—gravel, macadam, brick, asphalt, asphalt block, granite block; overhead transmission lines—wooden poles, treated and untreated cross-arms; insulators, copper wires and cables, aluminum wires and cables; towers, tower foundations; trolley line and distribution system—cedar poles, chestnut poles, yellow pine poles, treated poles; cross-arms—pine, fir, treated arms; feeder insulators; feeder cables, bare and insulated; trolley wire, section and size to be given; galvanized wire spans; hangers and ears; telephone lines.

It is practicable for every railroad to keep records of the life of nearly all these parts, and from such records simple empirical formulas may be deduced for determining the depreciation of each particular item, and more elaborate formulas for any portion made up of a number of items.

On the Fonda, Johnstown & Gloversville Railroad records are made of every new section of track when it is laid. These records give detailed information concerning date when laid, length, location, character of foundation, ballast, ties, joints, rail fastenings, bonds and paving. Similar records are made of every piece of special work. Records are kept of the number of ties put in and the number, age and cause of removal on each track section each year. The age is known by the date mark on the tie.

The date of the erection of all trolley wires is kept. Pole records are not so complete, but the company recently has begun to number all poles systematically and those located in the streets will be plotted on appropriate maps together with the number, date of erection and any other data desired.

Reliable data on the life of joint bonding is now possible by the use of the autograph bond-testing car of Albert B. Herrick. All of the track of the Fonda, Johnstown & Gloversville Railroad has recently been gone over with one of these cars and the condition of the bonding of every joint is clearly shown on the record.

The following general figures as to the life of some of the most important elements of railroad property are submitted, principally to bring out in the discussion the judgment of others as to the life of some of these elements based on their records and observations:

Material.	Life, Years
Ties in open track:	
Cedar .....	15 to 20
Yellow pine .....	10 to 15
Treated ties .....	25 and more
Untreated ties in pavement or concrete .....	15 to 20
Treated ties .....	30 and more
Galvanized wire fencing .....	10
Wooden bridges .....	20
Steel bridges .....	30 and over
Ashlar concrete bridge masonry .....	100 and over
Asphalt pavement .....	10 to 15
Brick pavement .....	15 to 25
Yellow pine trolley poles .....	10 to 15
Chestnut trolley poles .....	15
Cedar trolley poles .....	15 to 20
Trolley wire .....	15 to 20

Rail in paved streets in cities up to 25,000 population; weight 70 lb. or less, life fourteen years, and weight over 70 lb., life eighteen to twenty years; rail on interurban lines, weight 60 lb. or less, life fifteen years, and over 60 lb., life twenty-five years; special work one year to ten years—depending upon type of construction and character of service.

On 49 miles of interurban track consisting of 80-lb. rail

laid in 1902, joints connected with 8½-in. pin expanded No. 0000 bonds, a recent test showed that 13.8 per cent of the bonds were open or defective, an average of 1.53 per cent a year. On about 4 miles of track in paved streets laid during the past four years no bonds were found defective. The latter bonds are of the compressed terminal type. This result would indicate that their depreciation would be about one-half that of bonds in open track.

### SYSTEM OF ACCOUNTS IN NEW JERSEY

Hearings were held by the Board of Public Utility Commissioners of New Jersey on Dec. 5 and 6 at Trenton in reference to a tentative scheme of general balance sheet and income accounts applicable to all utilities. The proposed balance sheet divides fixed assets acquired prior to Jan. 1, 1912, from those acquired after Dec. 31, 1911. The text of the balance sheet account "reserve for accrued amortization" is as follows:

"On and after Jan. 1, 1912, every public utility shall carry on its books a reserve for accrued depreciation of tangible fixed assets and for accrued amortization of intangible assets. To this account should be credited and charged to 'operating expenses' or other accounts the amount estimated to be necessary to cover such wear and tear and inadequacy as have accrued during the year in the tangible fixed assets of the corporation, such portion of the life of intangible assets as has expired or been consumed during the year, and the amount estimated to be necessary to provide a reserve to cover the cost of property destroyed by extraordinary casualties, less the amount charged to the various maintenance accounts for repairs.

"When any property is retired from service the original money cost thereof (estimated if not known; where estimated, that fact and the facts upon which the estimate is based should be stated in the entry), less salvage, should, except as provided in the account 'fixed assets acquired prior to Dec. 31, 1911,' be charged to this account. The amount originally entered or contained in the charge to any fixed asset account with respect to property going out of service should be credited to that account, and any necessary 'adjusting entry should be made through 'profit and loss' account.

"Note.—Until otherwise prescribed, the amount estimated to be necessary to cover such wear and tear and obsolescence and inadequacy as have accrued during the year should be based on a rule to be determined by the accounting corporation. Such rule may be derived from consideration of the said corporation's history and experience. A general statement of the rule used by each company, together with the general information upon which it is based, should be filed with the Board of Public Utility Commissioners.

"Separate accounts should be carried for depreciation accrued prior to Jan. 1, 1912, and for depreciation accrued since Dec. 31, 1911, or since Dec. 31, 1910, in case of those utilities for which depreciation accounts have already been prescribed."

At the conference of the board and representatives of electric railway, electric light and power, and gas companies on Dec. 5 considerable objection was made to the plan to require a full compliance with the proposed system of accounting to be adopted by the board for the year beginning Jan. 1, 1912.

It was decided by the board that for the current year the companies should file reports consistent with their current system of accounting. It was agreed by the board and representatives of the companies present that a committee should be appointed, representing each utility, that the statistician of the Board of Public Utility Commissioners should be ex officio a member of each committee, and that on April 1, 1912, the committees be called upon to report progress made in the formulation of a uniform system.

# Syracuse Meeting of the New York Street Railway Association

The Principal Subjects Discussed Were the Operation of Pay-as-You-Enter Cars, the Prevention of Accidents, Joint Use of Poles and the Life of Railway Physical Property—A Complete Guide for the Making of Passenger Tariffs Was Also Submitted

The fourteenth quarterly meeting of the Street Railway Association of the State of New York was held at the Hotel Onondaga, Syracuse, N. Y., on the evening of Tuesday, Dec. 5, and Wednesday, Dec. 6. The meeting was well attended, over seventy-five delegates being present at the business session.

## WEDNESDAY SESSION

The proceedings on Wednesday were confined to a continuous session from 10:30 a. m. to 2 p. m. for the convenience of those members who wished to leave on early afternoon trains.

The first order of business was the presentation of a paper on "Pay-as-You-Enter Cars" by Thomas W. Casey, Prepayment Car Sales Company. An abstract of Mr. Casey's paper is published elsewhere in this issue.

DISCUSSION ON PAY-AS-YOU-ENTER CARS BY T. C. CHERRY, SUPERINTENDENT UTICA & MOHAWK VALLEY RAILWAY

Mr. Cherry said in part:

"Mr. Casey has called attention to the three cardinal benefits to be derived from the operation of pay-as-you-enter cars, as follows:

"First—The solution of the problem which all operating men have sought, that is, the positive collection of a fare from everyone boarding a car.

"Second—The better maintenance of schedule time.

"Third—The practical elimination of the boarding and alighting accidents.

"I believe that there is no doubt in the minds of railway men that the pay-as-you-enter car has accomplished much in solving the problem of collecting fares. This seems to be generally conceded, although I feel that many improvements will be made in the manner of the collection and registration of these fares. With reference to Mr. Casey's statement that pay-as-you-enter cars maintain better schedule time, I believe that there will be some difference of opinion which can be supported by actual operating records. I have prepared some figures obtained on the Utica & Mohawk Valley Railway which tend to cause us to disagree somewhat with Mr. Casey.

"On Oct. 1, 1911, ten pay-as-you-enter cars were installed on the Utica & Mohawk Valley Railway. These cars have bulkheads, folding doors and folding steps. The cars are 44 ft. 6 in. over all, equipped with four GE-216 motors. They seat forty-three passengers and have 5-ft. 6-in. platforms. The test covered three weeks, ending Dec. 1, 1911. We found that an average passenger would consume 3.5 seconds in either boarding or alighting from these cars, while he would consume three seconds in either boarding or alighting from the old-type car. These figures would tend to show that the pay-as-you-enter car with folding doors and steps is about 16 per cent slower than the old type of car. It was found that the doors were opened at about the time the car came to a stop, but that after the passengers had boarded the car at least five seconds were consumed in closing the doors and steps before the car started.

In total time consumed in loading and unloading, the pay-as-you-enter and old-type cars show practically the same, namely, three seconds per passenger. I believe that this proves that, while the pay-as-you-enter car is slower for the single operation of either boarding or alighting,

yet, when passengers are boarding at the rear end and alighting from the front end during the same period, the time per passenger is much less on the pay-as-you-enter car than on the old type of car unless the passengers are allowed to leave by the front end on the old type of car, as is the practice on the Utica & Mohawk Valley Railway. Confirming this statement, our tests show conclusively that in the business districts where passengers are both boarding and alighting during the same period the time consumed per passenger is 2.7 seconds as against 3.25 seconds in residential districts.

"It is doubtless a fact that the statement that pay-as-you-enter cars better maintain schedule time would be true on a line which was operated entirely through congested business districts, as it has been shown that where passengers are loading and unloading simultaneously the time consumed per passenger is less than on the old type of car; but on a line which runs a short distance through a business district, and a much greater distance through a residential district, the pay-as-you-enter car has proved itself at least 16 per cent slower.

"In discussing the third benefit mentioned in Mr. Casey's paper, 'the prevention of boarding and alighting accidents,' a comparison of the month of October, 1911 (which was the first month of operation of pay-as-you-enter cars on the Utica & Mohawk Valley Railway), with October, 1910, would be of interest. On the pay-as-you-enter division the company also operated suburban cars and Oneida Railway cars for part of the distance, so that accidents occurring on any of these cars would be charged against this division. While the boarding and alighting accidents on this division have increased 233 per cent comparing October, 1911, with October, 1910, but one accident of this class occurred on a pay-as-you-enter car during October, 1911. This was a report of a woman stumbling after she was inside the car, and no claim was made. The increase shown in all classes of accidents was largely due to the fact that the men have been impressed with the necessity of reporting all unusual occurrences and incidents as well as accidents. The company now feels that it has practically eliminated the boarding and alighting class of accidents by the installation of pay-as-you-enter cars.

"An interesting change was the removal of the rear vestibule grab handle, which passengers who come around the rear of the car are so apt to grab while the car is in motion, thereby causing accidents which are often of a serious nature.

"On these prepayment cars all fares are registered by the conductor on a car register. These cars are also equipped with Johnson fare boxes, which receive cents, nickels and dimes, registering and returning all cash to the conductor for change purposes. This fare box does not take tickets or transfers, but, inasmuch as less than 0.1 per cent of the receipts on the prepayment division are in tickets, the company believes that the fare box which receives the cash, registers and returns it to conductor is an ideal one for its operating conditions.

"A comparative statement of earnings shows that the pay-as-you-enter cars during October, 1911, earned 11.06 per cent more than the old type of cars during October, 1910, while the entire city division showed an increase of but 6.42 per cent for the same period. These cars also

earned 2.5 cents per car mile more for October, 1911, than the old type of cars for October, 1910.

"The cars have been in service on the Utica & Mohawk Valley Railway for sixty days, and the company feels that, in view of the increased earnings and decreased accidents, the cars may be considered a success for its service. It also believes that after these cars have been in service for one year they will be as fast (taking everything into consideration) as the public will board or alight; in other words, the act of depositing fares or receiving change on the platform will not retard the boarding of passengers to any noticeable degree. Furthermore, when the carmen become accustomed to the operation of the doors and steps, very little if any delay will be caused by this operation.

"The Utica & Mohawk Valley Railway spent about \$1,200 in educating the public as to the use of prepayment cars. This was done by full-page advertisements in all the English, Italian, German and Polish newspapers. The company was rewarded by the prompt as well as intelligent use of the pay-as-you-enter cars by all of its patrons. The pay-as-you-enter car pleases the public, makes good return to the company and taken all in all is entirely satisfactory for operation."

John E. Duffy, Syracuse Rapid Transit Railway, presented a written discussion of Mr. Casey's paper. This discussion is printed in another column in this issue.

#### GENERAL DISCUSSION ON PAY-AS-YOU-ENTER CARS

C. H. Smith, superintendent United Traction Company, Albany, said that on Nov. 18 his company had installed ten pressed-steel cars which were 47 ft. 2 in. long over all and seated fifty-six passengers. These cars, which were of the pay-at-entrance type, had not been in use long enough to determine what advantages if any they had over the pay-as-you-enter car, but up to the present time they have been very satisfactory. The passengers were somewhat slower in boarding and alighting as compared with the old cars, but this slowness was probably due to lack of familiarity with the car. The revenue of the Pine Hills line, on which these cars were installed, had increased in fifteen days from 33 cents per car mile to 50 cents per car mile. The line is  $4\frac{1}{4}$  miles long and operates on a schedule of 8 m.p.h. It had been thought by some that the United Traction Company had made a mistake in putting on a car weighing as much as 28 tons for service through congested sections, but so far as its present experience went the company felt that it had done the right thing. Furthermore, it believed that when the conductors and motormen, as well as the passengers, became more familiar with this type of car there would be no appreciable delays. The prepayment car was the only type which should be operated on city lines.

Charles R. Barnes, electrical expert Public Service Commission, Second District, said that the prejudice first manifested against prepayment cars had gradually worn away and that now the general public was well pleased with them. He believed that they had justified almost all of the assertions made for them by the people interested in their manufacture and sale. Even a fraction of a second delay per passenger was of moment in handling traffic in congested sections, but it was his feeling that greater familiarity with the prepayment car would gradually eliminate any disadvantages which it now suffered in this respect.

W. C. Callaghan, superintendent transportation New York State Railways, Rochester, said that his company had long advocated that passengers should leave by the front doors no matter what type of car was used. In fact, the conductors were disciplined if when passing through the business district they failed to call out that passengers should leave by the front door. In Rochester men were stationed in the congested sections to assist in loading the cars. Actual tests had shown that but  $1\frac{1}{2}$  seconds per passenger are required on pay-as-you-enter cars from the time that the wheels are stopped until they are started again.

The company was now trying the experiment of eliminating the conductor's hood-bell signal entirely. The starting signal was obtained by the closing of the signal circuit when the doors closed against certain contact plates. This scheme was similar in principle to that used in New York subway cars. The Rochester company had rebuilt twelve cars along pay-within lines; that is, without a front bulkhead. One of these cars ran into a steam roller because the vestibule window was covered with snow. It was apparent that in snowy weather the motorman must be permitted to lower the vestibule window, but if he did this on a pay-within car the passengers would certainly complain. The pay-as-you-enter design was very popular in his city.

R. H. Smith, general manager Albany Southern Railroad, asked what causes were assigned for the increased traffic on the steel prepayment cars in Albany.

C. H. Smith, superintendent United Traction Company, Albany, replied that possibly some of the increased traffic was due to the novelty of the car, but it was not noticeable that any traffic had been drawn from neighboring lines.

E. S. Fassett, general manager United Traction Company, Albany, said that the new cars had been of particular value in relieving congestion over the first mile of the Pine Hills line, which was very crowded.

In reply to a question of J. H. Cain, superintendent transportation Buffalo, Lockport & Rochester Railway, Mr. Casey said that pay-as-you-enter cars had not yet been applied to interurban service. They were in use, however, on two suburban lines, one of them running out of Montreal. On the latter line the conductor collected the first fare on the platform at the beginning of the trip, but entered the car when it reached the second fare zone to collect the fares of the few passengers who were still in the car.

Referring to C. H. Smith's statement that the new Albany cars had decreased the car mileage about 2 per cent, A. L. Linn, Jr., assistant secretary and assistant general auditor Utica & Mohawk Valley Railway, suggested that the users of prepayment cars should employ some common unit for comparing results. Many companies were deceiving themselves, he thought, with the car-mile unit. In Albany, for example, the same unit was used for the new long cars as for the old short ones. It might prove on closer analysis that the extra gross income of 17 cents per car mile gave no greater profit, if any, when all of the extra costs were considered. He had no special unit to offer himself, but said that no matter what unit was used all of the attendant circumstances should be stated so that the comparisons could be made intelligently.

#### REPORT ON THE JOINT USE OF POLES

The report of the committee on the joint use of poles was then presented by its chairman, W. J. Harvie, chief engineer Utica & Mohawk Valley Railway. Mr. Harvie offered a revised report of the proposed standard agreement which was presented at the Cooperstown convention June 27 and June 28, 1911, and published in the *ELECTRIC RAILWAY JOURNAL* of July 1, 1911. The revisions, which were mostly of minor character, were made after a conference held on Nov. 2, 1911, by the committee of the association, William McClellan, engineer Public Service Commission, Second District, and W. T. Oviatt, superintendent Narragansett Electric Light Company, Providence, R. I., who represented the overhead line construction committee of the National Electric Light Association. Invitations to be present had also been sent to C. R. Barnes and E. B. Rogers, of the Public Service Commission, and to H. L. Davis, of the New York Telephone Company, but these gentlemen had found it impossible to be present.

The discussion on the report was opened by H. L. Davis, New York Telephone Company, who said that an agreement for the joint use of poles was economical for the companies and also desirable from the public standpoint.



He had found that many of the companies in the upper part of the State preferred rental rather than joint ownership agreements. His company had printed an agreement but it was merely as a matter of convenience, as it had made no attempt to force a standard upon anybody. He was glad that it was proposed to refer this subject to the national associations interested as it was most desirable to have one standard for the whole country. He understood, however, that two years must elapse before the American Electric Railway Association could approve a standard. It would seem advisable, therefore, that the New York interests should come to an agreement of their own pending action by the national association.

H. M. Beardsley, general manager Elmira Water, Light & Railroad Company, stated that the report would be a great help in discussing the joint use of poles with other companies. In his experience it would be more desirable to make individual agreements for particular pole lines rather than one agreement to cover all cases. It might be that a blanket agreement would be satisfactory in an ideal organization, but unfortunately organizations were not ideal. There was a possibility that attachments might be made to poles and no rental paid for them.

J. L. Hinkley, secretary Poughkeepsie City & Wappingers Falls Electric Railway, mentioned that he was also negotiating with other companies in his territory and wanted to follow along the lines of the committee's report.

W. H. Collins, general manager Fonda, Johnstown & Gloversville Railroad, said that the number of poles of the several companies had increased to such an extent that one of the cities which his company served had seriously considered the question of putting all electric wires underground. Owing to the fact that the committee's report had not been completed as soon as expected he had made a joint agreement with the telephone interests for particular situations. His company was going largely into the joint ownership of poles.

Mr. Barnes, who had attended several meetings of the committee, expressed his appreciation of its thorough work. There were too many poles in the public streets and the Public Service Commission had already taken some steps to reduce their number by suggesting their joint use. He believed that an opportunity would soon present itself for the discussion of this report before the commission.

Mr. Fassett thought that the telephone interests had anticipated the electric railways by getting out their joint agreement first. He believed that the differences between the two forms of agreement could be reasonably adjusted. Most of the differences were probably due to the attorneys, who naturally tried to shift the burden of accident liability one way or the other.

Mr. Harvie said that the form of agreement presented was intended to cover both general situations and specific situations. Continuing, in reply to a criticism by Mr. Davis, he stated that the committee had not presented detailed rental charges because it believed that this point should be settled by the local conditions.

C. Loomis Allen, vice-president and general manager Utica & Mohawk Valley Railway, said it seemed to him that the electric railways had been asleep on this question. The electric light and telephone companies had been considering the problem for six years whereas the electric railways had been considering it for only one year. Nevertheless there was hope that all interests could come together to-day, whereas ten years ago few if any would have admitted the possibility of the joint use of poles by railways, lighting, telegraph and telephone companies. He asked if there was any objection to submitting this agreement to the Public Service Commission for its approval until such time as a national agreement could be made.

The following resolutions contained in the committee's report were then put to a vote and carried:

"Resolved, That this association lay before the American

Electric Railway Association this joint pole agreement, together with a résumé of the situation in the State of New York, urging upon the American Association the advisability of making a thorough investigation of the entire subject of the joint use of poles, including such standard construction as it may be advisable to take up, and that the American Electric Railway Association be requested to take up the matter jointly with the National Electric Light Association and the American Institute of Electrical Engineers and by the appointment of such joint committee as may seem advisable either to indorse one of the existing agreements or develop one which will be more satisfactory to the railway and other interests involved, and further, that the agreement produced shall be such that it can consistently be approved by such public service commissions as may have jurisdiction in any section of the country, and

"Resolved, That the agreement herewith presented be adopted as the standard of this association for use by its members until such time as a more suitable one is produced and approved and that the secretary be instructed to keep on hand a supply of these agreements which can be had on request at a nominal cost."

Upon motion it was decided to continue the committee with instructions to confer with organizations representing the electric light, telephone and telegraph interests of the State of New York to consider mutual agreements until such time as the national bodies act.

#### PREVENTION OF ACCIDENTS

The subject of the prevention of accidents was opened by a paper by R. E. McDougall, claim agent Utica & Mohawk Valley Railway. The paper is printed elsewhere in this issue.

The discussion on the prevention of accidents was opened by H. C. Beatty, secretary Auburn & Syracuse Electric Railway, who considered the subject from the legal rather than from the operating standpoint. A most important factor in preventing accidents was the careful selection and the thorough instruction of the men chosen for trainmen. The proper material must be had to begin with if a good finished product was wanted. After the men had received the usual instruction in the operation of the cars they should be turned over to the claim agent, if the latter is a lawyer, or to the trial attorney to receive an explanation of the legal duties and obligations of a railway and its employees. Regarding the instruction of the public, he said that probably 75 per cent or more of all accidents were due to the sudden momentary negligence of the passenger or pedestrian rather than to a deliberate act. If statutory requirements were made against the comparatively small percentage of accidents for which the railways were held responsible, why should the State not make some effort to see that its citizens exercise at least ordinary caution on or near railway vehicles? He thought that the fundamental duty of education rested on the State in this particular just as it did in matters relating to the public health. A campaign of education carried on by the railway companies alone could produce no great improvement. One thing that ought to be done at once was to demand punishment for trespassing. The public should be taught that the right-of-way of a railway was not only a dangerous highway, but also an unlawful one. Furthermore, he believed that the power which the Governor now has to vest police authority in steam railroad trainmen should be broadened to include the same employees on suburban and interurban electric lines.

J. P. Maloney, superintendent of transportation and claim agent Albany Southern Railroad, said that his company had recently installed signs warning pedestrians and others that there was a dangerous crossing 500 ft. away. These danger signs cost about \$1.50 each. Lights, which were visible at a distance of 500 ft., had also been installed.

W. H. Hyland, division superintendent Fonda, Johnstown & Gloversville Railroad, believed that while it was the

duty of the State to take care of the children in the schools and elsewhere it was the duty of the railways to take care of their passengers. The railways could do much to mold public opinion in their favor by arranging to give full publicity to every important accident. It was the policy of his company to give a frank report of all accidents to the newspapers with the result that its account was published first. This action prevented the publication of garbled reports which would instil prejudices hard to overcome. Some capable member of the claim department should call upon the dispatcher or traffic superintendent every night to gather such material for publication.

#### LIFE OF RAILWAY PHYSICAL PROPERTY

The next order of business was the subject of the life of railway physical property. The first paper, entitled "Life of Railway Physical Property from the Accounting Standpoint," was presented by W. O. Ingle, assistant auditor New York State Railways, Rochester. This paper is presented elsewhere in this issue.

W. C. Austin, auditor Otsego & Herkimer Railway, Hartwick, said that he thought Mr. Ingle's paper would be along the lines of depreciation. This question varied so greatly on different properties that a general rule for its treatment would be almost impossible on account of physical conditions, methods of construction, character of equipment and service, type of men operating the cars, etc. The question of obsolescence was also a difficult one, particularly in cases where the installation of high-powered, large cars on one line awakened the public appetite for similar cars on lines where slower and smaller rolling stock was ample for the service. He agreed with Mr. Ingle that individual records and job orders were of value to every property.

Following Mr. Austin's remarks a paper entitled "Life of Railway Physical Property from the Engineering Standpoint" was presented by F. A. Bagg, chief engineer Fonda, Johnstown & Gloversville Railroad. This paper appears elsewhere in this issue.

The following discussion on Mr. Bagg's paper was presented by M. J. French, engineer maintenance of way Oneida Railway, Syracuse.

#### DISCUSSION ON LIFE OF PHYSICAL RAILWAY PROPERTY BY M. J. FRENCH

"Up to the present time practically all estimates of the life of electric railway track structures have been merely intelligent guesses. The increase in weight of rolling stock, the change in depth of wheel flanges, the change from single to double-truck cars and continually increasing traffic have been large factors in upsetting calculations based on previous experience. In some of the larger cities like New York, Boston and Philadelphia the life of railway structures on the more frequented streets is determined by the wear due to vehicular traffic. Yet with the advent of motor trucks for the heaviest draying, calculations made last year may be decidedly below the ultimate life of the track structure, as rail and pavement wear will undoubtedly be greatly reduced under soft tires and horseless vehicles.

"Another cause of failure that cannot be foreseen and that is most aggravating to the way department is the continual undermining of tracks by contractors or by corporations working under city permits for the construction of sewers, subways and water or gas mains or house connections. Usually the track is tunneled and the excavation is improperly back-filled, unless the railway company has its own men on the work, with the result that the track soon settles and cannot be restored to its former surface or line. On the other hand new devices or means for rehabilitation of track may lengthen the life at comparatively small cost. The use of base-supported, upset joints and grinding of rails with a power-driven grinder have, in the writer's experience, prolonged the life of track at least 25 per cent at comparatively slight cost.

"The above reasons might be considered sufficient excuse for dodging the question of life of the track structure or at least leaving the matter to be determined after a long term of years by the experts of the State Tax Commission or the Public Service Commission from the data that are contained in the annual reports of the railway companies.

"The amount of wear obtainable from the rail head determines the life of the track structure if we discard all foreign elements and improper construction methods that may cause premature failure. The writer's investigations of rail wear have determined that under ordinary city traffic 1/16 in. of wear a year under one-minute car headway is about right for Bessemer girder rails of regular mill specifications. This rate was determined in 1903 in the city of Cleveland, and recent measurements taken on the Lorain Steel Company's 95-lb. No. 297 9-in. girder rail have practically checked this figure. The latter measurements were taken in four places differing as to car operation, sixty measurements being taken. The method employed was to invert a section cut from new rail, resting its head on the tram of the worn rail. By inserting a tapered and graduated wedge between the head of the worn rail and the tram of the full section, the wear was accurately determined to 1/64 in.

"Under this rule, a rail having 1 1/4 in. depth of head should have a life of thirty years under 7/8-in. wheel flanges on cars operating on five-minute headway. Yet where is the road that can report such good rail service? The joints fail and the rails become permanently cambered under the cold rolling action of the car wheels.

"Improved types of rail joints such as the Clark joint, the old and new type thermit-welded joints, electric and cast-welded joints have not been in use a sufficient time to obtain data on which to base an intelligent estimate. However, it is safe to estimate the life of common twelve-bolt joint plates on girder or high T-rail at eight years under heaviest city traffic and twelve years under ordinary conditions.

"For exposed track work there is in the writer's opinion no doubt as to the economy of a base-supported joint. The Utica & Mohawk Valley Railway interurban lines are built with 80-lb. A.S.C.E. T-rail spliced with 24-in. Continuous joints. After an average service of nine years on 60 miles of track the joints are in an excellent condition, with no wear apparent in either the rails at the joints or in the plates. We are using this type and Atlas joints on girder and high T-rail repairs with most gratifying results.

"Untreated merchantable ties in exposed or unpaved track have an average life of eight or ten years as determined by our experience. We have begun the use of treated ties for main-line service. Our specifications call for hewed, long-leaf Southern pine, square-edge ties, sap no objection, impregnated with 10 lb. of creosote oil per cubic foot of timber. This treatment increases the cost 60 per cent and we feel confident of 100 per cent increase in life over untreated ties. We have no failures due to rail wear, our loads being light compared with those of steam roads.

"Our experience has been that ties on crushed stone ballast with concrete between and on top of the ties are in good condition when ties of the same quality placed in open track have become worthless. I do not believe it necessary to use creosoted ties in concrete. I should prefer to apply the cost of treatment to purchase a better grade of timber, a better type of joint, or better grade of rails.

"Economy of track construction requires the use of paving materials that wear out at the same time as the rails or that are of such a durable nature as to warrant relaying and giving satisfactory service throughout the life of the renewed rails.

"For heavy vehicular traffic stone paving block has no superior. Some large cities are giving creosoted Southern pine blocks a thorough test. The advantage of a block pavement is its elasticity and relaying qualities. Stone blocks may be reclipped with economical results. We have standstone block pavement on Genesee Street in Utica that will undoubtedly outwear the present rails which are the second installation and will be serviceable for a third time when reclipped.

"The joint is at present the weak point in track construction with ordinary plates. We cannot tell as yet what life the newer types of joints will give us.

"In 1906 the Utica & Mohawk Valley Railway Company adopted the following percentages per year for track depreciation: Congested districts under heaviest operation, 10 per cent to 12 per cent; principal residential districts, 8 per cent; lightest traffic conditions, 6 per cent.

"After five years of service we are firmly convinced of the fairness of the above estimate."

#### REPORT OF COMMITTEE ON PASSENGER TRAFFIC

The report of the committee on passenger traffic, of which J. M. Campbell, co-receiver Buffalo, Lockport & Rochester Railway, is chairman, was presented by B. E. Wilson, general passenger agent New York State Railways. The report, as submitted, consists of approved copies of model forms of title pages and arrangements of contents of the various fare schedules which member companies are compelled to file with the Public Service Commission and the Interstate Commerce Commission. These, and the various rules and regulations covering tariffs, have been drawn to conform with the requirements of both commissions. The committee also included rules and regulations of miscellaneous character in connection with the transportation of passengers and their effects. It is believed that the information in this report is extensive enough to enable a traffic man of little or no experience to issue a tariff of such nature that it will be accepted as satisfactory by either the Public Service Commission of the Second District, New York, or the Interstate Commerce Commission. The committee acknowledged the material assistance of Commissioner Martin S. Decker and W. E. Griggs, chief of the Tariff Bureau, Public Service Commission, Second District, and J. M. Jones, chief of the Tariff Bureau, Interstate Commerce Commission.

Both commissions had complimented the association, through the members of the committee, on the fact that it was the pioneer in the movement toward uniformity of tariffs and tariff conditions. The committee deemed it advisable to submit the report in the form of sample proofs, believing that it would be better to have the recommendation and approval of the association before ordering the finished copies for distribution.

After R. M. Colt, general passenger agent Fonda, Johnstown & Gloversville Railroad, had described the procedure followed by the committee on passenger tariffs, Mr. Wilson moved that the sum of \$250 be appropriated to complete the work of the committee. This subject was referred to the executive committee for further action after the report itself had been accepted.

The meeting then adjourned.

#### THE BANQUET

The banquet held on Tuesday evening was the opening feature of the meeting. It was attended by about 100 members and guests.

Among the entertainment features of the banquet were topical verses and cartoons on Messrs. Choate, Peck, Collins, Duffy, Reel, Allen, Fassett, Beebe, Stedman, Hamilton and other members. These verses and pictures were projected by a stereopticon on the wall back of the toastmaster's chair, where they were visible to all. A professional

quartet, reinforced by the volunteer glee club of the association, sang frequently throughout the evening.

President Choate announced that, instead of having one address as expected, he would call upon various individuals present to give short talks on the best methods of advancing the interests of the Street Railway Association of the State of New York. He said that this occasion was the beginning of the thirtieth year of the association and that the association now represented a larger membership and greater mileage than ever before. This anniversary was therefore an appropriate time to discuss what should be done during the coming year to continue the policies which had made the association successful in the past and which would keep it abreast of the times in the future. The association should study more closely such questions as relations with the public, familiarity with the work of public utility commissions of the State and nation, and public welfare problems in general, besides the most scientific methods of operation. This year, he said, a determined effort would be made to have approved by the Public Service Commission of the Second District those rules and regulations for the operation of city and interurban railways which had been adopted at the Cooperstown meeting of the New York Association in 1911 and at the last Atlantic City convention of the American Electric Railway Transportation & Traffic Association. If the commission did not see fit to approve these rules the New York association would endeavor to have the commission formulate its own codes of rules which could be submitted to the companies within its jurisdiction. There was no question in his mind but that the safety of life and property would be served best by using the same rules not only in one State but throughout the entire country. Questions of safety in operation should be among the most prominent considered during the coming year.

Continuing, President Choate said that more consideration would be given to the relations of electric railways with steam railroads and other public service companies. A splendid start in this direction had been made by Mr. Harvie's committee on specifications for the joint use of poles by electric railway, lighting, telegraph and telephone companies. With a view to reducing the unsightly pole conditions in villages and towns, this committee had formulated an agreement which was fair to all concerned. It was the most thorough report which, to his knowledge, had ever been submitted to the association.

President Choate was followed by W. C. Callaghan, superintendent of transportation of city lines New York State Railways, Rochester, and C. Gordon Reel, former secretary of the association and now first deputy superintendent of State highways. Both speakers cordially indorsed the policies outlined by Mr. Choate.

C. Loomis Allen, vice-president and general manager Syracuse Rapid Transit Railway, made a plea for more hearty personal interest in the association, which now had thirty years of excellent work behind it, from the early horse car days to the Cooperstown meeting which had been signalized by the splendid and inspiring address of Oscar T. Crosby, one of the great pioneers of electric traction. The electric railway man should work every minute to make the transportation business the greatest under the sun. He said further that the great future of the association lay in committee work. Much had been done in such matters as accounting and rules, but much more could be done on the subject of standards.

Charles R. Ellicott, speaking in behalf of the allied members, said that the manufacturers' representatives always felt encouraged because of the courteous treatment given to them by the railway members whether or not there was a possibility of business in hand.

H. C. Donecker, secretary American Electric Railway Association, spoke on committee work. The parent body and its allied organizations now had about fifty committees composed of some 350 members. Most of these com-

mittees were working along technical lines, but, as President Choate had pointed out, the greatest work to be done was the cultivation of better relations with the public at large and with public utility commissions.

Charles R. Barnes, electrical expert Public Service Commission of the Second District, said that the efforts of the association to improve electric railway operating conditions throughout the State were highly appreciated.

W. J. Harvie, chief engineer Syracuse Rapid Transit Railway, said that President Choate had struck the keynote in saying that the association should keep abreast of the times. He would go even further, for he wanted the association to keep in advance of the times. Many of the problems now before it could be handled most advantageously by committees.

E. S. Fassett, general manager United Traction Company, Albany, appreciated what had been said about committee work, but deplored the tendency to load all the work on the chairmen of committees.

T. C. Cherry, superintendent Utica & Mohawk Valley Railway, Utica, thought that every member should do four things, namely, attend the meetings, take part in discussions, accept committee appointments and work.

C. D. Beebe, president and general manager Auburn & Syracuse Electric Railroad, pointed out that the interurban electric railway was doing a great work in bringing the benefits of civilization to the country districts. The cities had been growing and the country standing still because the country districts lacked accessibility and many other conveniences of life. The interurban railways, however, were directing the people back to the country and he thought that there was an opportunity for greater effort in that direction. He had advocated for his lines the establishment of an industrial department through which the officials could come into closer touch with the farms, villages and towns along the lines to learn the needs of their inhabitants. By the upbuilding of these rural districts the interurban roads would build up their own lines besides developing business for the steam railroads. There should be closer contact with boards of trade and business associations in the districts served in order to have this industrial development handled intelligently. The development of the country would also prove of benefit to the cities in fostering more frequent intercourse.

J. Stanley Moore, general passenger agent of the Beebe system, said that the electric railway of any community was the one organization which catered to the greatest number of people and therefore it should have the most friendly relations with the greatest number of people.

A. L. Linn, Jr., assistant secretary and assistant general auditor Utica & Mohawk Valley Railway, stated that so far as accounting matters were concerned the relations of member companies of the association with the Public Service Commission were most satisfactory.

R. H. Smith, general manager Albany Southern Railroad, believed that the future of the association's best activities was in committee work.

W. H. Collins, general manager Fonda, Johnstown & Gloversville Railroad, said that during all his long membership he had always found the meetings of the association of the most interesting character and he had gladly labored for the usefulness of the association. Mr. Harvie's report on the joint use of poles was characteristic of the detailed and thorough methods developed by the association. In conclusion, he said that the quarterly meetings were productive of even better results than the annual convention.

S. R. Payne, general superintendent Western District, New York Central & Hudson River Railroad, and Frank Cizek, superintendent Syracuse & Utica division of the Lackawanna Railroad, complimented the members on the progress of the association and electric railroading in general. Mr. Cizek was deeply impressed with the great

advance of interurban electric railways as compared with steam railroads. The steam railroad men were no longer depreciating the electric railways since the latter had begun to enter the long-distance, heavy-traction field. Referring to the question of accident prevention, Mr. Cizek said that the employees of the Lackawanna Railroad had been organized into committees of safety with excellent results.

E. J. Dickson, manager Springfield (Mass.) Street Railway and a former steam railroad operator, said that the interurban railways of New York were ahead of his own State in such important matters as joint operation with steam railroads and length of right-of-way. Standards and accident prevention offered a big field for future work.

J. C. Calisch, vice-president and assistant treasurer Buffalo & Lake Erie Traction Company, made an address favoring committee work and the adoption of standards.

H. M. Beardsley, general manager Elmira Water, Light & Railroad Company, said that the companies should follow the policy of taking the public into their confidence.

J. Harry Stedman, the well-known raconteur, as a fitting postlude to this December meeting, recited a Christmas poem entitled "The Little Gray Lamb." The assembly was then adjourned after all those present had joined in singing "America."

## MANUFACTURE OF ELECTRICAL MACHINERY, APPARATUS AND SUPPLIES

A preliminary statement of the general results of the thirteenth census of establishments engaged in the manufacture of electrical machinery, apparatus and supplies was issued on Nov. 28 by Director Durand, of the Bureau of the Census, Department of Commerce and Labor. The manufacture includes dynamos and dynamotors, transformers, railway and other motors, storage and primary batteries, arc and incandescent lamps, searchlights, transmitters and receivers, rheostats and resistances, electric welding and therapeutic apparatus, electric switches, signals and attachments, and similar machinery, apparatus, and supplies. The report was prepared under the direction of William M. Steuart, chief statistician for manufactures, Bureau of the Census, and contains a summary which gives the general figures for 1904 and 1909. The figures are subject to such revision as may be necessary after a further examination of the original reports.

### THE TABULAR SUMMARY.

A comparative summary follows, giving the general statistics for the industry, 1909 and 1904:

	Census		Per Cent of In- crease, 1904- 1909.
	1909.	1904.	
Number of establishments.....	1,009	784	29
Capital .....	\$267,844,000	\$174,066,000	54
Cost of materials used.....	108,566,000	66,837,000	62
Salaries and wages.....	69,574,000	42,933,000	62
Salaries .....	20,193,000	11,091,000	82
Wages .....	49,381,000	31,842,000	55
Miscellaneous expenses.....	23,630,000	17,949,000	32
Value of products.....	221,309,000	140,809,000	57
Value added by manufacture (products less cost of materials).....	112,743,000	73,972,000	52
Employees:			
Number of salaried officials and clerks .....	17,905	10,619	69
Average number of wage earners employed during the year.....	87,256	60,466	44
Primary horsepower.....	158,768	105,376	51

It is reported that the Prussian State Railways are planning to electrify the suburban service in and about Berlin with single-phase locomotives despite the successful operation of single-phase motor cars on the Blankenese-Hamburg Ohlsdorf lines. This decision is not only due to the fact that the present steam trail cars must be used, but also on account of the lower cost of maintaining one large engine as compared with eight to ten motor cars.

## ORDER FOR ADDITIONAL EQUIPMENT AUTHORIZED IN PHILADELPHIA

Directors of the Philadelphia Rapid Transit Company, at a special meeting on Dec. 6, authorized the purchase of 500 additional near-side cars. Formal announcement of the proposed action of the company was made in a statement issued on behalf of the board of directors after the conclusion of the meeting.

The statement by the board of directors follows:

"The thirty new cars recently purchased for the Market Street Elevated line are now being delivered. The company purposes by the addition of these cars to operate trains of from five to six cars in length at intervals of two minutes during the rush hours of the Christmas holidays. This service, it is expected, will adequately serve patrons of the Market Street Elevated road during the Christmas holiday season.

"The Stotesbury management regrets that the service on the surface lines will not be as satisfactory, owing to shortage of surface equipment. Every car at the company's command will, however, be in operation, including the fifty new near-side cars which have been delivered this fall, and as these cars have now stood the test of actual use and have demonstrated that they are the best type yet developed to meet the needs of this system, the board of directors has accordingly adopted this type of car as the Philadelphia standard, and at the special meeting called to-day for this purpose has ordered 500 more of these cars, with the option on the part of the company to increase the order to 800.

"The H. B. wheel guard, which is now the standard of the Philadelphia Rapid Transit Company, and with which these cars will be equipped, is now making an exceptional record. During the month past this guard picked up 96 per cent of the persons struck by the company's cars.

"Deliveries of these new cars should commence by April 1, 1912, and be made at the rate of 100 a month, thus completing the whole number well in advance of the following winter's traffic requirements."

### LETTER TO THE STATE COMMISSION

President Charles O. Kruger, of the Philadelphia Rapid Transit Company, sent a letter to the Pennsylvania State Railroad Commission on Dec. 6 in reference to the plans of the company. An abstract follows:

"It gives us great pleasure to acknowledge your hearty expression of approval following the inspection of our 'near-side' cars in service Nov. 28.

"In this connection, we desire to advise you that, following a satisfactory report upon the sufficiency of the ventilating system by Dr. Joseph S. Neff, director of the department of health and charities, and an inspection of the general excellence of the car by Mayor Blankenburg and of the accident elimination features by the committee on public safety, it has been determined to adopt this type of car as a Philadelphia standard.

"Fifty 'near-side' cars have been in continuous operation upon route No. 2 (old Twelfth-Sixteenth Streets line) for almost two months. The result of the operation of this experimental line has been to demonstrate that the 'near-side' cars are admirably suited to meet Philadelphia traffic conditions, and the directors of this company have, therefore, recognizing the insufficiency of the present equipment, to-day authorized the purchase of 500 cars of the 'near-side' type, which, with the 50 'near-side' cars heretofore purchased, makes a total of 550 surface cars, against the immediate requirement of 489 cars, as set forth in the report made to your commission by Ford, Bacon & Davis.

"Forty-five elevated cars have also been purchased, as compared with the twelve additional elevated cars recommended in the Ford, Bacon & Davis report."

## DATE OF THE MID-YEAR CONFERENCE

Secretary H. C. Donecker, of the American Electric Railway Association, has issued a preliminary announcement regarding the forthcoming mid-year conference, which will be held at the headquarters of the association, New York, on Jan. 26, 1912.

This conference will follow the regular mid-year meeting of the executive committee at the same place on Jan. 25. The plan of having various committees meet during the conference has been successful and will be maintained at the next conference, affording an opportunity for these committees to report their progress to the executive committee.

The notice issued by Mr. Donecker states that the allied Manufacturers' Association, following precedent, will invite the members of the executive committee and visiting railway officials to be its guests at a banquet to be held at the time of the conference. The exact date and place of the banquet and the program of speakers will be announced later.

In conclusion the preliminary announcement says:

"The committee on subjects has already tentatively arranged the program for the conference, the details of which will be sent you shortly. The development of the proposed plans will insure a meeting of unusual worth and importance to those to whom is intrusted responsibility for the proper conduct and results of the business of our member companies. You can aid materially in carrying out the objects for which it is held by personal attendance and participation in this mid-year meeting."

## ANNUAL MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

The American Society of Mechanical Engineers held its thirty-second annual meeting in the Engineering Societies Building, New York City, Dec. 5-8, 1911. Six professional sessions were held, and an elaborate program of entertainments and excursions to points of engineering interest occupied the remainder of the time. On Tuesday evening the annual election of officers took place. Dr. Alexander C. Humphreys, president of Stevens Institute, Hoboken, N. J., and one of the foremost gas plant engineers in America, was elected president, succeeding Col. E. D. Meier.

At the professional session on Wednesday afternoon D. S. Jacobus presented an interesting paper on "Tests of Large Boilers at the Station of the Detroit Edison Company." The tests described in this paper were made on two boilers at the plant of the Detroit Edison Company. Each of the boilers has a rated capacity of 2365 hp on the basis of 10 sq. ft. of boiler heating surface per horsepower, and in everyday practice carries a load of 6000 kw and in the evening from 7000 to 8000 kw. One of the boilers tested was fitted with Roney stokers and the other with Taylor stokers. The test results secured indicated that the efficiency obtainable with each stoker is about the same. The combined efficiency of the boiler and furnace varied from about 80 per cent at slightly below rating to about 76 per cent at double rating, on the basis of 10 sq. ft. of boiler heating surface per rated horsepower. In obtaining these efficiencies the steam used for driving the stokers and for producing the forced blast in the Taylor stokers has not been deducted from the total steam generated by the boiler. The amount of steam used by the Roney stokers was about 1½ per cent of the total steam generated by the boilers, and for the Taylor stokers about 2½ to 3 per cent.

At the meeting on Thursday several papers on gas and oil engines were presented.

# News of Electric Railways

## Investigation of Electrification of Railway Terminals in Chicago

At the "municipal dinner" given by the Chicago Association of Commerce on Nov. 28 the first official progress report of the Chicago Association of Commerce committee of investigation on smoke abatement and electrification of railway terminals was made public. This report was prepared under the supervision of the chief engineer for the committee and took the form of a sketch of the origin and progress of the investigation of the subjects mentioned in the long title of the committee. By way of introduction to the report a brief history of smoke abatement in Chicago was given, leading up to the statement that in the report of the smoke inspector of Chicago for 1910 it was declared frankly that there was necessity of a radical change in existing conditions of smoke abatement, so far as the railways are concerned; in fact, the electrification of railway terminals within the city was recommended in explicit form.

The recent history of the agitation for railway terminal electrification in Chicago is recounted. In October, 1909, a committee of experts appointed by the Chicago Association of Commerce reported favorably on electrification as a mechanical problem, but was less confident as to the financial feasibility of the proposal. About that time co-operation between the city administration and the Association of Commerce was suggested, with the formation of a joint committee of investigation. It was understood that the railways would provide the funds for the promotion of the investigation. At a meeting of the association held in September, 1910, representatives of a dozen different railways declared that the electrification of the railway terminals in Chicago would involve an enormous expense which would have to be borne by the commerce of the city and that immediate electrification was premature. Smoke abatement, it was added, need not depend wholly upon electrification. At a meeting of the Chicago Association of Commerce held on March 18, 1911, a general committee of eighteen was appointed to investigate the whole subject. This committee consisted of representatives of the city, steam railway executives and other citizens, with Jesse Holdom as chairman and Frederick H. Rawson as secretary. It is this committee under whose auspices the present investigation is being conducted. The engineering staff organized to do the work of this committee is as follows: Chief Engineer, Horace G. Burt; electrical engineer, Hugh Pattison; terminal engineer, Louis H. Evans; mechanical engineer, Theodore H. Curtis; consulting electrical engineers, Messrs. Gibbs & Hill, New York, N. Y.; consulting mechanical engineer, George R. Henderson, Philadelphia; assistant engineer, James Walker; editor for the engineers' staff, Benjamin C. Burt. Headquarters are maintained in the People's Gas Building, Chicago.

The scope of the investigation includes: (1) A determination as to the necessity of changing the motive power of steam railways to electric or other power; (2) the mechanical or technical feasibility of such a change; (3) the financial practicability of such a change. In the scope of the investigation as to the necessity of changing the motive power of steam roads to electric or other power are embraced the following heads: (1) Safety, (2) health, (3) comfort and convenience, (4) questions of loss and damage. Under each of these heads are included the subdivisions "passengers," "employees" and "the public." Each of these subdivisions is in turn subdivided. Much of the attention of the engineering staff so far has been devoted to the smoke abatement portion of the problem, and it has been decided to eliminate coke entirely from further consideration as locomotive fuel.

In concluding its progress report the committee says that the investigation so far (the report is dated Nov. 24, 1911) has been chiefly occupied with the subject of locomotive smoke abatement. Nevertheless, the subject of the electrification of terminals has been kept well in view, and a beginning made in the consideration of it. The concluding sentences of the report follow:

"In proportion as it has progressed the problems presenting themselves for solution have rather increased than diminished in number, and it is sufficiently clear, even at the present stage, that for the accomplishment of definite and valuable results much labor and considerable time will be required. The task imposed upon the committee proves to be one that is rather special, even unique, in scope and character, and while much may be learned from what has already been accomplished in various lines, yet much will have to be done *de novo* or for the first time. It is confidently hoped, and even believed, that if that which has to be done is well done the results will be of interest and value, not only for the present time and place, but for other times and places as well."

## F. R. Coates Succeeds A. E. Lang as President at Toledo

Frank R. Coates, of Chicago, was elected president of the Toledo Railways & Light Company, Toledo, Ohio, to succeed Albion E. Lang at a meeting of the directors on Dec. 5, 1911. Mr. Lang continues as a member of the board of directors. Mr. Coates succeeds W. J. Walding as a director. Mr. Coates and Mr. Lang were authorized to frame a franchise plan to be presented to the city at a meeting to be held on Dec. 11. No details of the plan discussed at the meeting were made known. The representatives of the bondholders and creditors' committee have decided to extend the expiring bonds another year. The right of calling in the bonds on sixty days' notice to the holders was agreed upon by the members of the board. The bonds which were extended cover a total of \$6,000,000. Of this amount \$5,300,000 expire on Jan. 1, 1912, and the other \$700,000 were due on Feb. 1, 1910. The bondholders and creditors were represented at the meeting by W. W. Miller, of New York; J. R. Nutt, Cleveland, chairman of the creditors' committee, and others.

Mr. Coates is reported to have said after the meeting: "During the week Mr. Lang and I will try and frame a proposition to be made to the city and have it ready to submit at the meeting with the city committee on Dec. 11. Mr. Lang and I will work together on the plan. We have not decided definitely what it will be. Each department of the company is in charge of capable men. There will be no changes."

Mr. Miller was quoted in part as follows:

"The city expects the Toledo Railways & Light Company to make a proposition in an effort to settle the franchise question, but what kind of a proposition can the company make when it does not know what the city wants? If I should say to the people of Toledo to-morrow 'I am going to give you 3-cent fares,' they would not accept. They would say that I had something up my sleeve, that I was going to play a joke on them.

"The city is said to be willing to give us a reasonable return on our investment. What do the citizens think a reasonable return is? We have not heard their opinion on that. A rate of fare which will assure the company a reasonable return can only be determined by a valuation. The city is welcome to place its engineer at work on the books of the company and determine the valuation of the street railway property. If city officials believe that the operation of the lighting and heating plants complicates matters, they can secure the separate valuations."

## Inspection of Property of United Railroads, San Francisco

Patrick Calhoun, president of the United Railroads of San Francisco; Mason B. Starring, president of the United Railways Investment Company, and James H. Reed, president of the Philadelphia Company and first vice-president of the Pittsburgh Railways, arrived in San Francisco on Nov. 20, 1911, to inspect the property of the United Railroad. Mr. Calhoun said:

"There will be no stockholders' meeting at this time, as has been reported, and there may not be a meeting of the stockholders until next spring. At any rate, I am not

going to abandon the presidency of the United Railroads. I believe that there is a great upbuilding coming to the Pacific Coast, and I think that there will be a great improvement in San Francisco during the next few years.

"Ernest Thallman, whom Mr. Starring succeeded as president of the United Railways Investment Company, is sick, and Mr. Starring will automatically take his place eventually in the Investment Company. The development of our system will be along lines parallel with the development of San Francisco. I am optimistic in my estimate of the future of California in general, and San Francisco in particular. The development of the intramural roads, in connection with the handling of the Panama-Pacific Exposition traffic, is a matter of detail. Arrangements will be made for that traffic as the demands increase. In connection with the matter of power, we now have more power than we know what to do with."

Mr. Starring said:

"This, my first trip to California since my connection with the United Railways Investment Company, is for the purpose of inspecting the properties and of gaining information as to their physical condition and environments. It has no other significance. My relation to the United Railroads of San Francisco is that of a stockholder, not that of an officer or director, in charge of or operating the properties. I have long entertained the view that the duties and obligations to the public on the part of public service corporations and those on the part of the public for such corporations are reciprocal. That is to say, that the greatest benefits to each can only be reaped by each showing a due regard for the rights of the other."

**Preliminary Tax Values Fixed in Wisconsin**

The Wisconsin Tax Commission has made public the preliminary assessment of property of the public service corporations of Wisconsin for 1912. The total assessment is fixed at \$48,825,000, as compared with \$42,163,000 for 1911. The values for 1912 as made public follow:

Ashland Light, Power & Street Railway.....	\$500,000
Bay Shore Street Railway.....	20,000
Beloit Traction Company.....	200,000
Chicago & Milwaukee Electric Railroad.....	225,000
Chippewa Valley Railway, Light & Power Company.....	1,350,000
Duluth Street Railway.....	1,100,000
Eastern Wisconsin Railway & Light Company.....	1,050,000
Grand Rapids Street Railroad.....	120,000
Green Bay Traction Company.....	750,000
Janesville Traction Company.....	45,000
Kenosha Electric Railway.....	350,000
La Crosse & Onalaska Railway.....	25,000
La Crosse City Railway.....	500,000
Manitowoc & Northern Traction Company.....	120,000
Menominee & Marinette Light & Traction Company.....	250,000
Merrill Railway & Lighting Company.....	130,000
Milwaukee Electric Railway & Light Company.....	28,000,000
Milwaukee Light, Heat & Traction Company.....	7,280,000
Milwaukee Northern Railway.....	1,650,000
Rockford & Interurban Railway.....	340,000
Sheboygan Railway & Electric Company.....	900,000
Southern Wisconsin Railway.....	1,050,000
Twin City General Electric Company.....	65,000
Wausau Electric Light & Railway Company.....	80,000
Wausau Street Railroad.....	725,000
Wisconsin Electric Railway.....	650,000
Wisconsin Traction, Light Heat & Power Company.....	1,350,000
Total .....	\$48,825,000

**Transit Affairs in New York**

The Attorney-General of New York State has begun a proceeding in the Supreme Court to take away from the Metropolitan Street Railway its franchises for several of its subordinate lines and for the removal of the tracks of these lines on the ground that they constitute a nuisance. The Attorney-General said in the complaint that the Metropolitan Street Railway is the successor to the companies originally owning the franchises and that the lines about which complaint is made have not been used for several years.

By unanimous opinion the Appellate Division has refused to grant an injunction in a taxpayer's action to prevent the carrying out of the contracts for the construction of the new subways allotted to the Brooklyn Rapid Transit Company by the Board of Estimate in July, 1911.

Bids have been opened by the Public Service Commission of the First District of New York for the construction of

Section 9 of the Lexington Avenue subway, which extends from Sixty-seventh Street to Seventy-ninth Street.

The Board of Estimate of New York has before it a proposition for a surface railroad to operate over the Manhattan Bridge and transfer to the Third Avenue Railroad in Manhattan and to the lines of the Brooklyn Rapid Transit Company and certain other surface lines in Brooklyn, one transfer to be given free with the original 5-cent fare. The proposition includes a 3-cent local bridge service, two local tickets to be sold for 5 cents. The franchise asked for covers the construction and operation of a surface line from the North River in Manhattan through Canal Street, across the Manhattan Bridge to the Flatbush Avenue extension, to Fulton Street, the junction with the lines of the various Brooklyn companies to be made there. The communication to the Board of Estimate is signed by Edward A. Maher, general manager for the receiver of the Third Avenue Railroad; Timothy S. Williams, president of the Brooklyn Heights Railroad, the lessee of the Brooklyn City Company; C. D. Meneely, vice-president of the Nassau Electric Railroad, and S. W. Huff, president of the Coney Island & Brooklyn Railroad.

**Rapid Transit Developments in Pittsburgh**

The Pittsburgh (Pa.) Subway Company has written a letter to the Council of Pittsburgh calling attention to the applications for rapid transit rights in Pittsburgh and stating that its proposition is not open for an indefinite period. The United Terminal System, through the Painters Run Railroad Company, has presented a resolution to the Council which provides that the United Terminal System shall comply with the specifications and conditions of the subway ordinance and then be granted a franchise, the ordinance to be introduced in Council and referred to the special committee. A communication has been filed with the Council from J. D. Callery, president of the Pittsburgh Railways, saying he had prepared a statement on the construction work done by the company in 1911 and the work contemplated in 1912 and asking for a conference with the Council.

The Pennsylvania Railroad has denied the report that the plans which it is making for improvements in Pittsburgh and vicinity call for the electrification of the main line between Pittsburgh and Pitcairn, 15 miles, and the construction of subways to do away with many grade crossings.

**Outline Plan for Subway in Toronto**

City Engineer Rust, of Toronto, Ont., has forwarded to the Board of Control of Toronto an outline of the system of subways which Assistant Engineer Cousins has prepared, the whole to cost approximately \$23,000,000. Mr. Rust declares his preference for diagonal subways if diagonal streets are to be opened through.

The subways which are designed to be added to this take the form of east and west lines, which, with connecting north and south surface lines, form a belt around the city. The subways run adjacent to Queen Street from the Woodbine to High Park, and adjacent to Bloor Street from Broadview to High Park. An express surface line along the edge of High Park connects these two systems on the west, while on the east the line is carried from the Bloor viaduct along Danforth Street as a surface line and down Coxwell Street to the other subway.

Entrance for the radial railways is provided at the Woodbine on North Yonge Street, at the south of High Park, and at Davenport Road. Many proposed surface lines are shown on the map in the report, in addition to those now authorized and under way.

Mr. Cousins concludes his report in part as follows:

"Rapid Transit facilities, or what are frequently termed exclusive lines of travel, will, in the judgment of the undersigned, have to be constructed. Messrs. Jacobs and Davies in their report to the city have shown that if the Toronto Railway franchise were terminable in 1915 a system of subways consisting of about 11.6 miles of double tracks, operated in conjunction with the present Toronto Railway, with liberal transfer facilities, would be self-sustaining, from which I conclude that the conditions in 1921 will be even more favorable.

"In my judgment it would be advisable to continue the policy already adopted; that is, constructing surface lines in the outlying districts, which, for the present, if operated at a loss, are only meeting the requirements of the citizens in those districts and at the same time giving them no more than they are justly entitled to. These surface lines at some future date must act as a feeder to a rapid transit system or become part of the street railway system.

"I think we should begin subway construction somewhat as outlined on attached plan having in view the completion of the rapid transit system in 1921, at which time it can be operated in conjunction with the present Toronto Railway with universal transfer system.

"The estimated cost of the rapid transit lines complete and ready for operation, including equipment, is \$23,000,000. With this system complete the city would in 1921 be practically in an independent position. As different portions were constructed and put in operation I feel, in all probability, they would at least meet the operating expenses and carrying charges, or, in other words, be self-supporting, and from a municipal ownership viewpoint that is all that is required, provided adequate service is given the public. Serious consideration should, I think, be given to the fact that it takes a considerable length of time to construct rapid transit lines and have them ready for operation."

#### Freight Terminal Plans in New York

The construction of a freight tunnel under the Hudson River, to be built by New York and New Jersey, for the use of all the railroads, with the rates to be fixed by the Interstate Commerce Commission, in that way abolishing terminal competition, is part of the comprehensive plan for the development of the port submitted to Mayor Gaynor by Calvin Tomkins, commissioner of docks. Mr. Tomkins says the physical plan of the New York Central & Hudson River Railroad to extend its tracks along the river front of the lower west side agrees closely with the plan proposed by the Dock Department. The difference is in the control, whether it shall be private under the company or public under the port authority. He declares in favor of the joint use of the improved terminal, the New Jersey roads using the elevated freight structure by ramping to it from the car floats and yards. Mr. Tomkins says in part:

"A comprehensive port plan and policy must include a full discussion of the port relations of New Jersey and of New York. All the railroads agree that freight tunnels must some day be built and that whenever this shall be done the elevated freight way will be available to them as to the New York Central & Hudson River Railroad. The city cannot build these tunnels, neither is any one of the New Jersey roads now able to do so, nor in view of their traditional habit of competing at terminals rather than joining in common use are they able jointly to accomplish such purpose."

#### Transfer Order in New York

The Public Service Commission of the First District of New York formally issued on Dec. 5, 1911, an order requiring the restoration of free transfers at 151 points in Manhattan and the Bronx. This order was referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 2, 1911, page 1168.

The order set forth that after Jan. 1, 1912, passengers must be permitted to transfer from the cars of one company to those of another and back again, if they desire, to the cars of the first, but not to the cars of a third company. However, when a passenger has returned on a free transfer to the cars of the company to which he paid his fare he will be entitled to any further free transfers that that company is accustomed to grant.

In its opinion the commission refers to the failure of the 8-cent and 10-cent transfer system, which has been tried for several months on the Fifty-ninth Street line, and declares "That the curtailment of the transfer privilege in 1908 worked a great hardship to many, and was a great inconvenience to many more is shown by the testimony, and is generally conceded. Industrially the city had become adjusted upon the basis of a 5-cent fare with free transfers."

To show the effects of the discontinuance of transfers

the commission takes the years 1907 and 1909, those immediately preceding and following the revolution in the street car system. It gives this table:

	Year Ending June 30, 1907.	Year Ending June 30, 1909.	Decrease.
Passenger car miles.....	57,676,104	55,255,497	2,420,607
Free transfers.....	194,820,920	139,607,286	55,213,634
Paying passengers.....	377,017,192	362,077,663	14,939,527
Amount of fares.....	\$18,810,457	\$17,997,252	*\$813,205
Operating expenses.....	\$1,383,557	13,326,858	*1,943,301
	Increase.		

The commission also says:

"From this comparison it appears that any expectation which the receivers of the companies or the court that authorized the abandonment of the transfers may have entertained that the restriction of transfer privileges would transform millions of free passengers into paying passengers was not fulfilled. Instead of an increase of passenger revenue there was an actual decrease of \$813,205, or approximately 15,000,000 pay passengers."

The opinion is expressed that the passenger who under the new conditions refused to pay two fares "either walked to their destination from the former transfer point or took a more roundabout journey (making a longer haul for the street railroads) or were driven to the subway and elevated lines."

**Boston & Eastern Railroad Location.**—At the continued hearing on Nov. 20, 1911, by the joint board composed of members of the Boston Transit Commission and the Massachusetts Railroad Commission on the location of the proposed tunnel of the Boston & Eastern Railroad under Boston Harbor, the board postponed further action until the location of the road in East Boston has been determined by the Railroad Commission. A hearing has been set for Dec. 11, 1911, by which time it is expected that the Railroad Commission will have acted upon the surface location in East Boston.

**First Year of Pennsylvania Railroad Terminal in New York.**—At 12:01 a. m. on Nov. 26, 1911, the first year of operation of the new Pennsylvania Station in New York was completed. In the year approximately 10,000,000 passengers used the station. There was not in the year a single serious accident on the entire New York terminal division, and of the 111,942 trains operated in and out of the station 99.59 per cent made schedule time over the division. The Pennsylvania Railroad has 750 employees at its terminal in New York whose duties have solely to do with operating trains and accommodating patrons. In the first year of the operation of the station a total of 1,929,320 tickets were sold. Approximately 1,500,000 pieces of baggage were handled and hundreds of thousands of parcels checked. There were 230,197 taxicab calls and the bureau of information, at which telephone inquiries alone are received, answered 377,714 calls, more than 1,000 a day.

#### PROGRAM OF ASSOCIATION MEETINGS

##### Central Electric Accounting Conference.

The following program has been announced for the annual meeting of the Central Electric Accounting Conference to be held at the Boody House, Toledo, Ohio, on Dec. 16, 1911:

##### MORNING SESSION.

10 a. m.—Annual address of the president. Regular business session and reports of special committees.

Address, "Departmental Co-operation," by E. B. Peck, president of the Central Electric Railway Association.

Report of the standing committee on freight accounting. Discussion.

Adjournment for luncheon.

##### AFTERNOON SESSION.

2 p. m.—Report of the standing committee on passenger accounts.

Discussion.

Report of the committee on constitution and by-laws.

Election of officers.

The executive committee will meet at the Boody House at 7:30 p. m. on Dec. 15.



# Financial and Corporate

## New York Stock and Money Markets

Dec. 6, 1911.

With the opening of the exchange on Monday a spirit of hesitancy appeared in the market, and price changes and volume of transactions have been unimportant since that time. The opening of Congress, with its uncertainties, and the question of the tone of the presidential message were cited as the causes of Monday's inactivity. At the end of last week call money reached 6 per cent, but has declined slightly. Quotations to-day were: Call, 4@5 per cent; ninety days, 4 per cent.

### Other Markets

Chicago Railways Series 2 certificates led the activity in the Chicago market to-day, making a slight gain over the quotation at last night's close.

Business in Philadelphia has been lifeless thus far in the week and aside from Steel shares the list has been uninteresting.

Similar indifference has been shown in the Boston market and prices have been irregular.

The Baltimore market has been quiet and featureless.

Quotations of traction and manufacturing securities as compared with last week follow:

	Nov. 29.	Dec. 5.
American Brake Shoe & Foundry (common).....	a90	a90
American Brake Shoe & Foundry (preferred).....	a133 1/2	a131 1/2
American Light & Traction Company (common).....	a295	a295
American Light & Traction Company (preferred).....	a107	a107
American Railways Company.....	a46 1/4	a46
Aurora, Elgin & Chicago Railroad (common).....	a37 1/2	36
Aurora, Elgin & Chicago Railroad (preferred).....	a84 1/2	a84
Boston Elevated Railway.....	a129 7/8	a130
Boston Suburban Electric Companies (common).....	a15	a15
Boston Suburban Electric Companies (preferred).....	a75	a74
Boston & Worcester Electric Companies (common).....	a12	*12
Boston & Worcester Electric Companies (preferred).....	a58	a55
Brooklyn Rapid Transit Company.....	77 3/4	77
Capital Traction Company, Washington.....	127	a127 1/2
Chicago City Railway.....	a180	180
Chicago Elevated Railways (common).....	a30	a30 1/4
Chicago Elevated Railways (preferred).....	a93	a93
Chicago Railways, pteptg., cft. 1.....	a97	a97
Chicago Railways, pteptg., cft. 2.....	a33 3/8	a35
Chicago Railways, pteptg., cft. 3.....	a11 1/4	a11 1/2
Chicago Railways, pteptg., cft. 4.....	a6 1/4	a7
Cincinnati Street Railway.....	*129 1/2	a130 1/2
Cleveland Railway.....	a104 1/2	a104 1/2
Cleveland, Southwestern & Columbus Ry. (common).....	*4 7/8	*4 7/8
Cleveland, Southwestern & Columbus Ry. (preferred).....	*33 3/4	*33 3/4
Columbus Railway & Light Company.....	*37 1/2	a37 1/2
Columbus Railway (common).....	*83	a83
Columbus Railway (preferred).....	90 1/2	a90
Consolidated Traction of New Jersey.....	75 1/2	a75 1/2
Consolidated Traction of N. J., 5 per cent bonds.....	a105	a105 1/2
Dayton Street Railway (common).....	a25	a25
Dayton Street Railway (preferred).....	a101	a101
Denver & Northwestern Railway.....	145	*145
Detroit United Railway.....	*80	a85
General Electric Company.....	154 3/8	152 1/2
Georgia Railway & Electric Company (common).....	159	a158 1/2
Georgia Railway & Electric Company (preferred).....	a91 1/2	a92
Interborough Metropolitan Company (common).....	15 1/8	15
Interborough Metropolitan Company (preferred).....	47	45 1/2
International Traction Company, 4% notes, refts.....	*70	*70
Indiana Union Traction Company.....	12	11
Kansas City Railway & Light Company (common).....	18	a20 1/2
Kansas City Railway & Light Company (preferred).....	a52	52
Lake Shore Electric Railway (common).....	*7	*7
Lake Shore Electric Railway (1st preferred).....	*81 1/2	*81 1/2
Lake Shore Electric Railway (2d preferred).....	*25	*25
Manhattan Railway.....	a136	a137
Massachusetts Electric Companies (common).....	a22	a21 7/8
Massachusetts Electric Companies (preferred).....	a94	a93 1/4
Metropolitan Street Railway, New York.....	*8	*8
Milwaukee Electric Railway & Light (preferred).....	*105	*105
North American Company.....	73 7/8	a73 1/2
Northern Ohio Light & Traction Company (common).....	58	a58 1/2
Northern Ohio Light & Traction Company (preferred).....	105	a105
Philadelphia Company, Pittsburgh (common).....	a53	53
Philadelphia Company, Pittsburgh (preferred).....	a43 3/4	a43 3/4
Philadelphia Rapid Transit Company.....	a23 7/8	23 3/4
Portland Railway, Light & Power Company.....	99 1/2	*99 1/2
Public Service Corporation.....	a110	a110
Public Service Corporation, cft.s.....	106 1/4	a106 1/4
Seattle Electric Company (common).....	a107	a107
Seattle Electric Company (preferred).....	101 1/2	a101 3/4
Third Avenue Railroad, New York.....	3 5/8	5
Toledo Railway & Light Company.....	8	4 1/2
Twin City Rapid Transit, Minneapolis (common).....	106	a105 1/4
United Ry. & Electric Company (Baltimore).....	18 1/2	18 1/2
United Rys. Inv. Co. (common).....	34	32
United Rys. Inv. Co. (preferred).....	61 1/2	59
Virginia Railway & Power Company (common).....	.....	a41 1/2
Virginia Railway & Power Company (preferred).....	.....	81
Washington Ry. & Electric Company (common).....	46 1/4	a47
Washington Ry. & Electric Company (preferred).....	88	a88
West End Street Railway, Boston (common).....	88	a87 1/2
West End Street Railway, Boston (preferred).....	103 1/2	a103 1/2
Westinghouse Elec. & Mfg. Co.....	65 1/8	a65 1/4
Westinghouse Elec. & Mfg. Co. (1st pref.).....	a118	a118

\*Asked. \*Last sale.

## ANNUAL REPORT

### Columbus, Delaware & Marion Railway

The annual report of Eli M. West, receiver of the Columbus, Delaware & Marion Railway, covering the year ended June 30, 1911, has been filed in the Court of Common Pleas, Franklin County, Ohio. The principal figures, with a comparison, are as follows:

Year ended June 30.	1911.	1910.	1909.
Gross earnings from operation.....	\$385,345	\$352,658	\$316,424
Operating expenses.....	223,380	201,336	178,830
Net earnings from operation.....	\$161,965	\$151,322	\$137,594
Fixed charges and other deductions.....	157,662	150,521	140,111
Surplus income.....	\$4,303	\$801	*\$2,517

\*Deficit.

Mr. West says in part:

"During the receivership the service on the road has been greatly improved and in order to do this it has been necessary to spend a large amount of money in improving the physical condition of the roadbed, the power plant and the rolling stock. I believe that our roadbed is now in fairly good condition, although it had been allowed greatly to deteriorate for several years prior to the receivership.

"During the receivership I have also put nearly all of the main line equipment through the shops and have put the power plant in good condition and substantially increased its generating power.

"As a result of the work mentioned I have been enabled to operate limited cars on a fast schedule and have shortened the local schedules somewhat. During the greater part of the day we are also operating a thirty-minute service between North Columbus and Glenmary Park. We have also shortened the street car schedules in Marion and Delaware.

"I have eliminated some of the bad curves on the railroad at a considerable cost and have begun filling in some of the smaller trestles, thus avoiding a large maintenance cost in the future.

"No receiver's certificates have so far been issued and no money has been borrowed, excepting \$10,000, which was borrowed during the first month of the receivership for the purpose of making a permanent improvement in the city of Delaware.

"Several new shelter houses have been constructed along the right-of-way. Corrugated culverts have been placed at more than fifty road crossings and a substantial and permanent improvement has been made in the right-of-way in the street just north of Clintonville.

"The State Tax Commission has fixed a valuation of \$1,255,030 on the properties covered by the receivership and it is on this valuation that taxes will have to be paid in the future.

"Our total valuation heretofore has been \$460,748, but we expect a substantial reduction in the tax rate. It is probable, however, that our total taxes in the future will be substantially increased on account of this increase in valuation and in spite of the reduction in the tax rate.

"I think the auditor's report speaks for itself and I have no comment to make, except to call the court's attention to the apparent increase in expenses for maintenance of ways, structures and equipment since the receivership. For the year 1909 the company charged up to maintenance approximately \$28,000, while the first year of the receivership exceeded \$44,000 for the same purpose; and the year ending June 30, 1911, exceeded \$49,000 for maintenance. Prior to the receivership the company charged up at least 50 per cent of its total maintenance charges to 'additions to property,' instead of to operating expenses, where they properly belonged."

The traffic statistics relating to the interurban line are as follows:

Year ended June 30.	1911	1910	1909
Passenger car mileage.....	759,730	740,491	660,648
Revenue passengers carried.....	1,335,874	1,185,872	1,081,853
Passenger earnings per car mile.....	.2710	.2664	.2722
Average amount received per passenger.....	1.541	1.663	1.682
Freight car mileage.....	97,536	98,683	124,741
Number tons freight carried.....	12,050.52	9,246.18	8,336.97
Average distance haul of one ton.....	28.84	29.29	27.48
Average amount received per ton.....	3.30	3.78	3.45
Freight earnings per car mile.....	.4073	.3540	.2303

**Georgia Light, Power & Railways**

The Georgia Light, Power & Railways has been formed under the laws of Massachusetts as a voluntary association to acquire the securities of the Macon Railway & Light Company, Macon, Ga.; the Central Georgia Power Company, the Central Georgia Transmission Company and the Macon Gas Company and to acquire the securities of other public utilities in Georgia, in accordance with the plan mentioned in the *ELECTRIC RAILWAY JOURNAL* of Nov. 18, 1911, page 1078, and Dec. 2, 1911, page 1177. The authorized capital liabilities of the company total \$14,500,000, consisting of \$8,000,000 of common stock, \$2,000,000 of 6 per cent preferred stock and \$6,500,000 of first lien bonds. Of the authorized common stock \$6,000,000 is outstanding, of the authorized preferred stock \$100,000 is outstanding, and of the first lien bonds \$2,355,000 are outstanding and \$4,145,000 are reserved under careful restriction to acquire other properties and for extensions and improvements. The bonds will be secured by a first lien on practically all of the common stock of the Macon Railway & Light Company, practically all of the common stock and \$300,000 of preferred stock of the Macon Gas Company and \$2,000,000 out of \$4,000,000 of stock and \$4,500,000 of notes of the Central Georgia Power Company, all of which securities will be deposited with the New York Trust Company, New York, N. Y., the trustee. A sinking fund is provided to retire the bonds. To this fund \$50,000 will be contributed annually from 1916 to 1920; \$75,000 annually from 1921 to 1925, and \$100,000 annually from 1926 to 1940.

A. B. Leach & Company, New York, N. Y., are placing at 92½ and interest, yielding 5½ per cent income, the present issue of \$2,355,000 of first lien 5 per cent sinking fund gold bonds of the Georgia Light, Power & Railways, dated Sept. 1, 1911, and due Sept. 1, 1941. The bonds are redeemable on any interest date at 105 upon 30 days' notice.

**Arkansas Valley Railway, Light & Power Company, Pueblo, Colo.**—The Arkansas Valley Railway, Light & Power Company has been incorporated in the interest of H. M. Bylesby & Company, Chicago, Ill., as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 2, 1911, page 1181. The company has an authorized capital stock of \$10,000,000 of which \$4,000,000 is preferred and \$6,000,000 common. There is no preferred stock outstanding, but there is \$3,500,000 of common stock outstanding, of which the Standard Gas & Electric Company owns all but the shares held by the qualifying directors. Of the \$10,000,000 of bonds of the company the Standard Gas & Electric Company owns \$3,500,000 and \$3,147,000 have been reserved to retire a like amount of underlying bonds. The \$3,500,000 of bonds of the Arkansas Valley Railway, Light & Power Company which the Standard Gas & Electric Company owns are pledged to secure the new 6 per cent convertible bonds.

**Boise Railroad Company, Ltd., Boise, Idaho.**—W. E. Pierce, president of the Boise & Interurban Railway Company, Ltd., and his associates are said to have secured control of the property of the Boise Railroad Company, Ltd.

**Chicago (Ill.) Railways.**—The Chicago Railways has sold to the National City Bank, New York, N. Y., and Harris, Forbes & Company, New York, N. Y., enough of its consolidated "A" bonds to redeem at par on Feb. 1, 1912, all of its \$4,776,000 of collateral trust 6 per cent notes and \$1,000,000 of funding 6 per cent notes, which are secured by the deposit of \$8,433,200 of "A" 5 per cent bonds.

**Citizens' Light & Transit Company, Pine Bluff, Ark.**—It is understood that negotiations are pending for the consolidation of the Citizens' Light & Transit Company and the Pine Bluff Corporation, which operates a power and light system in Pine Bluff.

**Joliet & Southern Traction Company, Joliet, Ill.**—The Continental & Commercial Trust & Savings Bank, Chicago, Ill., as trustee under the mortgage of the Joliet & Southern Traction Company of 1907 has begun foreclosure proceedings against this company in the Kane County Circuit Court in Geneva, Ill. This action is in accordance with the instructions of the bondholders' protective committee, representing more than 75 per cent of the bonds. The resolution

authorizing this step was noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 4, 1911, page 1009.

**Lincoln (Neb.) Traction Company.**—O. W. Webster, has been elected a director of the Lincoln Traction Company to succeed S. A. Foster, resigned.

**Montgomery County Rapid Transit Company, Norristown, Pa.**—The Montgomery County Rapid Transit Company has gone out of the hands of a receiver and has been reorganized under the name of the Montgomery Transit Company, with N. H. Larzelere president. A new mortgage of \$150,000 has been provided to settle all claims and build extensions.

**Waterville & Oakland Street Railway, Waterville, Maine.**—Papers have been filed to change the corporate name of the Waterville & Oakland Street Railway to the Waterville, Fairfield & Oakland Street Railway and to increase the authorized capital stock from \$100,000 to \$500,000. The Waterville & Oakland Street Railway and the Waterville & Fairfield Railway & Light Company recently passed into the control of the Central Maine Power Company.

**Dividends Declared**

- Brooklyn (N. Y.) Union Elevated Railroad, 2½ per cent, preferred; 2½ per cent, common.
- Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.
- Continental Passenger Railway, Philadelphia, Pa., \$3.
- Second & Third Streets Passenger Railway, Philadelphia, Pa., \$3.
- United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.
- Virginia Railway & Power Company, Richmond, Va., 2½ per cent, preferred.
- West Penn Traction Company, Pittsburgh, Pa., quarterly, 1 per cent, common.

**ELECTRIC RAILWAY MONTHLY EARNINGS**

CLEVELAND, PAINESVILLE & EASTERN RAILROAD.							
Period.			Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.
1m.,	Oct.	'11	\$30,975	\$18,669	\$12,275	\$8,691	\$3,584
1 "	"	'10	31,818	16,397	15,421	8,083	7,338
10 "	"	'11	310,567	169,826	140,741	83,066	57,675
10 "	"	'10	301,199	155,443	145,756	80,691	65,066
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY.							
1m.,	Oct.,	'11	\$100,010	\$56,529	\$43,481	\$30,070	\$13,412
1 "	"	'10	97,087	54,462	42,624	29,794	12,831
10 "	"	'11	952,146	533,236	418,909	300,862	118,047
10 "	"	'10	888,546	512,523	376,024	297,939	78,084
FEDERAL LIGHT & TRACTION COMPANY.							
1m.,	Oct.,	'11	\$138,305	\$80,355	\$57,953	.....	.....
1 "	"	'10	127,343	72,457	54,886	.....	.....
10 "	"	'11	1,074,558	642,842	431,716	.....	.....
10 "	"	'10	986,215	576,818	409,398	.....	.....
LAKE SHORE ELECTRIC RAILWAY.							
1m.,	Oct.,	'11	\$107,620	\$58,876	\$48,744	\$34,625	\$14,119
1 "	"	'10	105,075	55,941	49,135	34,669	14,465
10 "	"	'11	1,069,857	565,105	504,753	347,026	157,727
10 "	"	'10	1,018,739	529,101	489,638	347,678	141,961
NORTHERN OHIO TRACTION & LIGHT COMPANY.							
1m.,	Oct.,	'11	\$220,343	\$123,854	\$96,488	\$44,321	\$52,168
1 "	"	'10	208,342	113,371	94,971	43,367	51,604
10 "	"	'11	2,240,081	1,234,359	1,005,730	443,391	562,340
10 "	"	'10	2,045,748	1,123,229	922,528	433,528	488,991
TOLEDÒ RAILWAYS & LIGHT COMPANY.							
1m.,	Oct.,	'11	\$265,654	\$166,721	\$98,933	\$84,523	\$14,411
10 "	"	'11	2,561,071	1,595,022	966,049	802,235	163,814
TWIN CITY RAPID TRANSIT COMPANY.							
1m.,	Oct.	'11	\$655,591	\$313,915	\$341,676	\$341,676	\$201,597
1 "	"	'10	645,358	308,743	336,616	336,616	196,295
10 "	"	'11	6,508,029	3,212,702	3,295,327	3,295,327	1,894,536
10 "	"	'10	6,265,727	2,996,850	3,268,878	3,268,678	1,866,904

A compilation by the *Journal of Commerce*, New York, shows that papers filed in the Eastern States during November for companies with an authorized capital of \$1,000,000 or over, including increases in capital, represent a total of \$150,593,400, an increase of \$26,373,400 over October, and \$31,570,400 as compared with November, 1910. Charters taken out by other companies with an individual capital of \$100,000 or over, including states other than those in the East, increased the month's total to \$362,158,400, which compares with \$187,178,500 in October and \$183,388,000 in November last year.

# Traffic and Transportation

## Stops and Transfers in the Twin Cities

C. G. Goodrich, president of the Twin City Rapid Transit Company, Minneapolis, Minn., has issued a statement in which he recommends to the City Council that the near side stop should be confined to the loop district, bounded by High Street, Seventh Street, First Avenue, North, and Second Avenue, South, and has announced a change in the transfer system by which passengers will be allowed to transfer from short-line cars to long-line cars. Mr. Goodrich says in part:

"Our company has been criticised considerably as to the near-side and far-side stop systems now in effect. I agree with our patrons that the present plan is confusing and annoying, but in simple justice we should not be entirely blamed for it. The present system was developed on account of the reasonable rules of the traffic squad. To prevent congestion and facilitate travel it was necessary for them to order our cars, after crossing the street, to run to the middle of the next block. This plan confused passengers, who never knew just where their cars would stop. Hoping to relieve the situation, we announced the near-side stop system wherever there was pavement and the far-side system where there was no pavement. This plan did not meet with the entire approval of the city authorities, and so the present zone system was established and confirmed by ordinance.

"I have been asked to state what I would consider the best stop system to adopt. Perhaps a number of years' operating experience entitles me to explain. I believe we would handle our traffic more satisfactorily by having cars stop on the near side, but owing to many unpaved crossings I would suggest near side on all streets in the loop district, bounded by High Street, Seventh Street, First Avenue, North, and Second Avenue, South, and far-side crossings everywhere else.

"Traffic officers are obliged to hold cars on the near side before allowing them to cross streets, and we can use such time to load and unload without delay. Such stops mean safety to pedestrians, autos and all street traffic, and altogether the near-side stop in the business district means the safest way to handle the growing business of the city. Our company stands ready to do just what the people want it to do in this respect, and I am sure the City Council stands ready to do what the people want it to do.

"I take this opportunity of announcing some changes in our transfer system which are made with the idea of improving our service generally, and I hope the changes will please our patrons."

The company has announced that R. W. Harris, of the engineering staff of the Railroad Commission of Wisconsin, has been retained to investigate street railway conditions in Minneapolis. W. J. Hield, vice-president and general manager of the company, said:

"Mr. Harris is here at our solicitation, with the idea of going into conditions, not theorizing, but to get at the real facts. We want him to investigate thoroughly and find what they are. This investigation is the result of the general agitation that has been going on about street railway conditions, and we want to find out what these are. Mr. Harris has conducted investigations for the Wisconsin commission. In this connection he has been in Minneapolis and is more or less familiar with the city. He is well informed and is a traction expert."

**Conference in Indiana on Signals Postponed.**—The conference to consider the report of the block signal committee called by the State Railroad Commission of Indiana for Dec. 4, 1911, has been postponed until Dec. 11, 1911.

**Exchange of Traffic in Carload Lots in Indiana.**—The Railroad Commission of Indiana has ordered the Chicago, Cincinnati, Cleveland & St. Louis Railroad to turn over coal in carload lots to the Belt Railroad at Indianapolis to be switched to the tracks of the Terre Haute, Indianapolis & Eastern Traction Company and transported by that company to Plainfield, a distance of 12 miles. The electric rail-

way is held responsible for all damage to the cars while they are in its possession.

**Proposed Terminal Improvements in Atlantic City.**—It is understood that at a meeting in Atlantic City, N. J., on Dec. 1, 1911, between members of the Council of that city and representatives of the Pennsylvania Railroad preliminary plans were discussed looking toward the expenditure by the company of \$2,000,000 for a new terminal station to be used jointly by the Pennsylvania Railroad and the West Jersey & Sea Shore Railroad and in track elevation work in Atlantic City.

**Street Railway Congestion in Montreal.**—City Surveyor Barlow of Montreal, Que., has submitted to the City Council a communication on street railway congestion in Montreal. He recommends the construction of lines along both Dorchester Street and Sherbrooke Street, which have been reserved as residential thoroughfares, and he points out that much might be done by limiting the distance between stops to 600 ft. It is also suggested that the Montreal Street Railway should establish a two-and-a-half-minute service during the day and a five-minute service from the cessation of the evening rush until midnight.

**Appeal to Supreme Court in Maine Bridge Case.**—The Bangor Railway & Electric Company, Bangor, Maine, has appealed to the Supreme Court of Maine from the decrees of the Railroad Commission of Maine ordering the company to rebuild and maintain the highway and electric railway bridge over Stillwater River in Orono. The decree provides that the town reimburse the company for a portion of the expenses of construction and maintenance. The appeal petition asserts that the decree is in violation of the law which provides that the company shall maintain that portion of the highway which it uses for railway purposes.

**United Traction Company Will Comply with Service Order.**—Edgar S. Fassett, general manager of the United Traction Company, Albany, N. Y., has announced that the company will comply with the order of the Public Service Commission of the Second District of New York directing it to increase the seating capacity of its cars on the hill lines. The order directs the company to provide a seating capacity of 1000 persons on eastbound service between 7:30 a. m. and 9 a. m., on the Pine Hills line, and a seating capacity of 1300 on that line westbound between 5 p. m. and 6:30 p. m. The order also provides for a seating capacity of 1000 persons eastbound between 7:30 a. m. and 9 a. m., on the West Albany line, and 1400 persons westbound between 5:30 p. m. and 6 p. m., on that line.

**Rerouting Cars in Los Angeles.**—An order was issued recently by the Los Angeles (Cal.) Railway eliminating cars of the Temple Street line from the most congested district of the city. The Temple Street cars now terminate on Broadway, north of First Street, instead of continuing east on that thoroughfare, crossing Broadway, Spring, Main and Los Angeles Streets as heretofore. The removal of the cars of the Temple Street line from First Street has lessened the congestion on First Street and has helped considerably in accelerating the movement of cars on Broadway, Spring Street and Main Street, and to clear the way at the Los Angeles Street curve where the Pasadena, South Pasadena, El Molino, San Gabriel and other Pacific Electric Railway trains leave the business district to operate into the rural regions.

**New Jersey Commuters Indorse Fare Increase.**—The New Jersey State Commuters' Association and the Commuters' League of New Jersey have issued the following statement indorsing as reasonable the increase in fares announced recently by the Hudson & Manhattan Railroad: "After a careful examination and consideration of the sworn public statements filed with the Interstate Commerce Commission and presented by W. G. McAdoo in person, Resolved, that the statement issued Nov. 23 by Howard Marshall, president of the Commuters' League of New Jersey and the New Jersey State Commuters' Association, in regard to the proposed increased fare on the Thirty-third Street branch of the Hudson & Manhattan Railroad as being reasonable and just, be and the same is hereby approved by the officers of both organizations in joint meeting assembled."

## Personal Mention

**Mr. James W. Fox** has been elected president of the Northampton, Easton & Washington Traction Company, Easton, Pa., to succeed Mr. R. M. Petty.

**Mr. J. Frederick Mooney** has been elected treasurer of the Northampton, Easton & Washington Traction Company, Easton, Pa., to succeed Mr. R. M. Eilenberger.

**Mr. F. E. Marsh**, who has been assistant superintendent of the Athol & Orange Street Railway, Athol, Mass., has been appointed assistant superintendent of the Massachusetts Northern Railways, Greenfield, Mass., under Mr. John A. Taggart.

**Mr. John A. Taggart**, who has been superintendent of the Connecticut Valley Street Railway, Greenfield, Mass., has been appointed general superintendent of the recently organized Massachusetts Northern Railways, which has taken over the Connecticut Valley Street Railway and other lines as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 2, 1911, page 1177.

**Mr. Russell Armstrong** has been elected first vice-president and a member of the executive committee of the Federal Utilities, Inc., New York, N. Y. Mr. Armstrong was connected with Harvey Fisk & Sons, New York, N. Y., for many years and more recently was vice-president of the Electric Bond & Share Company, New York, N. Y.

**Mr. Charles E. Lenhart** has been appointed master mechanic of the Mahoning & Shenango Railway & Light Company, with headquarters at Youngstown, Ohio. Mr. Lenhart began electric railway work in November, 1888, after nine years' service in the engineering and mechanical departments of steam railways. He has lately been connected with the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., and the Lehigh Valley Transit Company, Allentown, Pa.

**Mr. John D. Sallee**, for the last six years superintendent of the lines of the Kentucky Traction & Terminal Company, Lexington, Ky., in Frankfort, Ky., has been appointed general freight agent of the company, a newly created position. Mr. Sallee will continue to have supervision over the Frankfort terminal and will also look after the terminals at Paris, Georgetown and Nicholasville, his duties as general freight agent requiring him to visit these cities at regular intervals. Mr. Sallee is one of the oldest men in point of service now with the company. Previous to going to Frankfort he was for several years dispatcher in Lexington.

**Mr. Frank R. Coates** was elected president of the Toledo Railways & Light Company, Toledo, Ohio, on Dec. 5, 1911, to succeed Mr. Albion E. Lang, who remains a director of the company. Mr. Coates was born in Philadelphia in June, 1869, and was educated in the public schools of that city and at Lehigh University, from which he was graduated in 1890. He took a post-graduate course in 1891. He became connected with the Baltimore & Ohio Railroad immediately after graduating. He was later transit man and assistant engineer, being appointed supervisor of track on the Wheeling division in 1892. Early in 1893 he accepted a position with the New York, New Haven & Hartford Railroad and continued with that company until May, 1904. He next engaged in engineering construction work until February, 1908, and then became connected with Stone & Webster, Boston, Mass. In December, 1910, he accepted the vice-presidency of the Inter-Ocean Steel Company at Chicago.

**Mr. Albion E. Lang** resigned as president of the Toledo Railways & Light Company, Toledo, Ohio, on Dec. 5, 1911, and Mr. Frank R. Coates was elected to succeed him. Mr. Lang, however, remains as a director of the company. Mr. Lang was born at Huntington, Lorain County, Ohio, and settled in Toledo in 1869, entering at that time the employ of the Western Union Telegraph Company. He remained with that company until 1874, when he entered business for himself in Toledo. In 1881 he purchased an interest in the Monroe & Dorr Street Railway and soon thereafter was elected president of the company. In January, 1885, while acting as president of the company, he effected a consolidation of several of the local companies, and in 1888 was elected vice-president and general manager of the Toledo Consolidated Street Railway. Soon thereafter followed the

consolidation of all the street railway companies in Toledo, including the Robison lines, under the name of the Toledo Traction Company. Mr. Lang was elected president of this company and was also placed at the head of the Toledo Consolidated Electric Company, which for a time owned and operated all the electric plants in the city. In 1901 the Toledo Traction Company passed to the control of the Everett-Moore syndicate and was reorganized as the Toledo Railways & Light Company, Mr. Lang remaining as president until 1902, when he resigned and was succeeded by Mr. H. A. Everett. Mr. Lang retained a large interest in the company, and from 1901 to 1908 annually succeeded himself as a director and chairman of the board of directors. He was re-elected as president of the Toledo Railways & Light Company in 1908.

## OBITUARY

**Francis May**, who was president and a director of the Dunkirk & Fredonia Railroad, which is now part of the system of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., is dead.

**Frank Ridlon**, president of the Berlin (N. H.) Street Railway, president of the Boothbay Harbor Electric Light & Power Company, Boothbay Harbor, Maine, and president of the Ridlon Electric Company, Boston, Mass., died at his home in Brookline, Mass., on Dec. 1, 1911, after a lingering illness.

**W. S. Franklin**, who was president of the Baltimore (Md.) City Passenger Railway prior to the organization of the United Railways & Electric Company, Baltimore, died in New York on Dec. 3, 1911. Mr. Franklin was graduated from Harvard in 1857. In 1870 he entered business in Baltimore and at various times was connected with the Ashland Iron Company, Maryland Steel Company, Towson Bank of Maryland, Baltimore City Passenger Railway and the Provident Savings Company of Baltimore. Mr. Franklin also served for a time as a director of the United Railways & Electric Company, Baltimore.

**George B. Moffatt**, a director of the Electric Bond & Share Company, New York, and formerly president of the Oregon Electric Railway, Portland, Ore., died in Portland on Dec. 4, 1911. Mr. Moffatt was born in Brooklyn, N. Y., in 1854. He entered banking in New York as a clerk in 1879 and subsequently was connected with Spencer Trask & Company, White, Weld & Company and Moffatt & White, New York, N. Y. He was largely instrumental in organizing the Oregon Electric Railway in 1906 and succeeded in interesting in the company influential men like Mr. Charles M. Pratt and Mr. A. C. Bedford, of the Standard Oil Company. In 1910 control of the Oregon Electric Railway was acquired by interests in the Great Northern Railway and the Northern Pacific Railway, and Mr. Moffatt retired as president of the company and as a director in favor of Mr. John F. Stevens.

**A. M. Young** died suddenly on Dec. 3, 1911, in New York. Mr. Young was born in Hadley, N. Y., in 1853. He spent his early life in Connecticut. He was connected with the Connecticut Railway & Light Company, Bridgeport, before it was taken over by the New York, New Haven & Hartford Railroad. At the time of his death Mr. Young was the senior member of the firm of Young & Warner, New York, N. Y. At the convention of the National Electric Light Association in Chicago in 1898 Mr. Young was elected president of that body, succeeding Mr. Samuel Insull. Mr. Young at the time of his death was associated with the following public service corporations either as an executive officer or as a director: Albany & Hudson Railroad, American Gas & Electric Company, Corning Gas & Electric Company, Dayton Lighting Company, Edison Electric Illuminating Company of Brooklyn, Electric Bond & Share Company, Fairmont & Clarksburg Traction Company, Kings County Electric Light & Power Company, New London Gas & Electric Light Company, Northern Westchester Lighting Company, Norwich Gas & Electric Light Company, Rockville Gas & Electric Company and the Stamford Gas & Electric Company. He was also a director of the National Carbon Company and the Consolidated Engine Stop Company and president of the New England Engineering Company and other industrial enterprises.

## Construction News

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

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

### RECENT INCORPORATIONS

**\*Birmingham & Chattanooga Railroad, Birmingham, Ala.**—Application for a charter has been made by this company in Alabama to build an electric or steam railway to connect Birmingham and Chattanooga, via Albertville and Boaz, passing through seven Alabama counties and three Tennessee counties. Capital stock, \$5,000. Officers: J. M. Spradlin, Boaz, president; W. W. Shortridge, Albertville, vice-president and treasurer, and D. J. Spradlin, Boaz, director.

**\*Sacramento & Eastern Railway, Sacramento, Cal.**—Application for a charter has been made by this company in California to build a 60-mile electric railway between Sacramento and Folsom. Capital stock, \$1,000,000. Charles H. Hammond, Berkeley; Leon J. de Sabla and Samuel Lillienthal, San Francisco; George E. Springer, Oakland; Herbert W. Furlong, Pleasanton.

**\*Southwestern Traction Company, Indianapolis, Ind.**—Application for a charter has been made in Indiana by this company to build an electric railway between Mooresville and Sullivan, via Eminence, Cloverdale, Cataract, Clay City and Terre Haute. Capital stock, \$50,000. Directors: Joseph A. Davidson, John W. O'Hara, Gilbert Bray and F. F. James.

**\*Washington Trunk Railway, Vancouver, Wash.**—Incorporated in Washington to build an electric railway between Vancouver, North Yakima and Ellensburg. Incorporators: E. E. Waite, Lawrence Harmon and E. R. Ernsberger. [E. R. J., Nov. 11, '11.]

### FRANCHISES

**Edmonton, Alta.**—The Edmonton Radial Railway will ask for an extension of time at the next session of the Legislature in which to build its line from the end of Pirron Street, St. Albert, to the Edmonton city boundary.

**Jonesboro, Ark.**—The Jonesboro & Nettleton Interurban Railway has received a six-months extension of time on its franchise in which to complete its electric railway in Jonesboro. It will connect Jonesboro and Nettleton. J. E. Thompson, Jonesboro, vice-president. [E. R. J., Nov. 18, '11.]

**\*Los Angeles, Cal.**—The City Council has authorized the publication of a notice for the sale of a franchise to construct a cross-town line in Los Angeles. Bids are to be opened on Dec. 19.

**Pasadena, Cal.**—The Pacific Electric Railway has asked the City Council for a franchise over East Washington Street in Pasadena.

**Sacramento, Cal.**—The Pacific Gas & Electric Company has received a franchise from the Board of Trustees to extend its lines through the recently annexed districts in Sacramento.

**San Jose, Cal.**—The San Jose & Almaden Railway, San Jose, has received a franchise from the City Council in San Jose. Charles A. Nones, Almaden, is interested. [E. R. J., Nov. 4, '11.]

**San Luis Obispo, Cal.**—W. G. Lincoln, San Luis Obispo, has received a franchise from the Board of Supervisors to build an electric railway from the coast as far north as Coalinga and east to Bakersfield. [E. R. J., Sept. 23, '11.]

**Santa Clara, Cal.**—The Peninsular Railway, San Jose, will ask the Town Trustees for a franchise over certain streets in Santa Clara to the city limits, where it will connect with the line that is to extend along the Saratoga Road to Meridan Corners.

**Stockton, Cal.**—The Tidewater & Southern Railroad has asked the City Council for a forty-three-year franchise to extend its lines over various streets in Stockton.

**\*East Pueblo, Col.**—The East Pueblo Tramway has received a franchise from the City Council in East Pueblo through the East Side to the city limits.

**Moline, Ill.**—Moline, East Moline & Watertown Railway has asked the City Council for a franchise to extend its Fourth Avenue line south to the city limits of Moline.

**Louisville, Ky.**—The Louisville & Interurban Railway has asked the General Council for franchises in Louisville. One franchise is for the extension of a double-track line from the loop at the old city limits on the Bardstown road to the new city limits, nearly a mile further east. The other franchise is to permit the company to operate a trunk line over this route, which will result in the present Louisville & Interurban Railway's tracks on the north side of the road being removed nearer the center of the highway, to be used by both city and interurban cars.

**\*Brandon, Man.**—B. C. Donham & Company, 52 Broadway, New York City, have applied to the Council for a franchise to build and operate the water supply, electric light and power and the electric railway systems in Brandon.

**St. Boniface, Man.**—The Winnipeg Electric Railway, Winnipeg, has asked the City Council for a franchise for the extension of its lines from Marion Street to the southern limits of St. Boniface, along the St. Mary's Road.

**Somerville, Mass.**—The Boston Elevated Railway has received the approval of the Railroad Commission and the Board of Aldermen to double track some of its lines in Somerville.

**Fulton, Mo.**—The Mexico, Santa Fé & Perry Traction Company, Mexico, has received a year's extension of time on its franchise in Fulton. The company has also been granted a year's extension of time by the City Council in Columbia.

**Dolgeville, N. Y.**—The Little Falls & Johnstown Electric Railway, Little Falls, has received a franchise from the Town Board in Dolgeville. It will connect Little Falls, St. Johnsville, Ephratah and Johnstown. J. L. Hess, 103 Park Avenue, New York, president. [E. R. J., Nov. 18, '11.]

**Tonawanda, N. Y.**—The Frontier Electric Railway, Niagara Falls, has received a franchise from the Common Council in Tonawanda. This line will connect Niagara Falls, Buffalo, Tonawanda and North Tonawanda. [E. R. J. Oct. 28, '11.]

**Dilworth, N. D.**—The Fargo & Moorhead Street Railway, Fargo, will ask the City Council for a franchise in Dilworth.

**Dayton, Ohio.**—The Dayton, Springfield & Xenia Southern Railway has received a twenty-five-year extension of time of its franchise in Dayton.

**Lima, Ohio.**—The Ohio Electric Railway, Cincinnati, has received a twenty-one-year franchise from the County Board of Commissioners in Lima.

**Troy, Ohio.**—The Cincinnati, Hamilton & Dayton Traction Company, Cincinnati, has received a franchise from the City Council to extend its tracks in Troy.

**Portland, Ore.**—The Portland Railway, Light & Power Company has asked the Council for approval of franchises to double track its line into Rose City Park, an extension of its line to Reed Institute, a Stark Street loop and a crossing on the Broadway bridge in Portland.

**Bentleyville, Pa.**—The West Side Electric Railway, Charleroi, has received a franchise from the Council to build through Bentleyville. Eventually this line will be extended to Ellsworth.

**Pottsville, Pa.**—The Schuylkill Electric Railway has asked the City Council for a franchise in Pottsville.

**Sunbury, Pa.**—The Sunbury & Selinsgrove Street Railway has received a franchise from the City Council to relocate its tracks from the Reading Railroad bridge to Market Street in Sunbury and to extend the line to the proposed site of the new bridge across the river near Fort Augusta.

**Chattanooga, Tenn.**—The Chattanooga Traction Company will ask the City Commissioners for a franchise to build interurban railways out of Knoxville. Four definite routes are asked reaching the corporate limits. C. E. James is interested. [E. R. J., Nov. 18, '11.]

**Dallas, Tex.**—John T. Witt, Dallas, has received a franchise from the County Commissioners' Court to build an electric railway from the west bank of the Trinity River to a point 10 miles west of Dallas. [E. R. J., Nov. 11, '11.]

## TRACK AND ROADWAY

**Ft. Smith Light & Traction Company, Ft. Smith, Ark.**—Work has been begun by the Hayes & Pogue Company on an extension from Ft. Smith to South Ft. Smith.

**Little Rock, Pine Bluff & Eastern Traction Company, Little Rock, Ark.**—Plans are being considered by this company to build a \$650,000 bridge across the Arkansas River at Pine Bluff. This interurban railway will connect Little Rock, Altheimer, Stuttgart, Helena, Clarendon and Pine Bluff. C. C. Kavanaugh, president. [E. R. J., July 8, '11.]

**British Columbia Electric Railway, Vancouver, B. C.**—Bids will be called for shortly for the construction of an extension of this company's Main Street line in South Vancouver. The grading of Main Street from the terminus of this line to meet the Eburne line will be begun in the near future.

**Clear Lake Railroad, Lakeport, Cal.**—This company advises that it will use steam to haul freight and gasoline or electricity for passenger service on its 23-mile railway to connect Hopland, Kelseyville, Lakeport and several large summer resorts. Capital stock authorized, \$500,000. Capital stock issued, \$100,000. Bonds authorized, \$350,000. The company's repair shops will be located in Lakeport. Officers: C. H. Hammond, Lakeport, president; M. M. Gopcevic, Lakeport, vice-president; E. Howard, Lakeport, secretary; Joseph Levy, treasurer; C. R. Rankin, Hopland, superintendent and engineer. [E. R. J., Dec. 1, '11.]

**Oakland, Antioch & Eastern Railway, Oakland, Cal.**—This company has secured the right-of-way for an extension through Contra Costa and Alameda Counties to Oakland.

**San Jose Terminal Railway, San Jose, Cal.**—Plans are being prepared by this company to build a line between San Jose and Hollister. This railway will connect San Jose and Alviso, a distance of about 12 miles, where it will connect with a fast line of steamers that will run to San Francisco. R. Metson and E. H. Lee are interested. [E. R. J., Sept. 30, '11.]

**San Joaquin Valley Electric Railway, Stockton, Cal.**—This company has completed the roadbed for its line between Modesto and Stockton.

**Grand Junction & Grand River Valley Railway, Colorado Springs, Col.**—This company plans to build a 6-mile extension from Grand Junction northeast to Clifton.

**Key West Electric Company, Key West, Fla.**—This company has awarded a contract for rebuilding its lines in Key West to Ferguson & Ward.

**Macon Railway & Light Company, Macon, Ga.**—This company has awarded a contract to the Hall-Parker Construction Company to build its 3-mile extension to the Idle Hour Country Club. Grading has been begun.

**Northern Illinois Electric Railway, Chicago, Ill.**—This company plans to build a 5-mile extension from its present terminus in Bradford, eastward to Newburg, this year.

**Chicago (Ill.) Railways.**—This company has placed in operation the 10-mile extension of its Fortieth Avenue line in Chicago.

**Richmond & Eastern Indiana Traction Company, Richmond, Ind.**—This company has awarded the contract for the surveys for its railway between Richmond and Portland to Jesup & Moore, Indianapolis. Construction of this line will be begun in the spring. A. H. Bartel is interested. [E. R. J., Oct. 7, '11.]

**Boone (Ia.) Electric Company.**—This company plans to build an extension to Ogden. The line will cross the Des Moines River just north of the Chicago & Northwestern Railway viaduct.

**Ft. Dodge, Des Moines & Southern Railway, Ft. Dodge, Ia.**—It is reported that this company has purchased the abandoned line of the Northwestern Railroad between Des Moines and Newton and will electrify it at once.

**Sioux City, Crystal Lake & Homer Railway, Sioux City, Ia.**—This company plans to build an extension from Dakota City to Homer, Neb., and from Sioux City to South Sioux City.

**\*South Hutchinson (Kan.) Street Railway.**—This company has been organized to build an electric railway in

South Hutchinson and a pile bridge across the Arkansas River.

**Kentucky Southwestern Railway, Light & Power Company, Hickman, Ky.**—An announcement was made by E. F. Wheaton, general manager of this company, which is constructing an interurban line in western Kentucky, to the effect that the American Traction & Power Company has authorized him to sign a contract with the interurban company for the delivery of \$1,000,000 to a Paducah bank on Feb. 1, 1912, and \$100,000 per month thereafter until the cost of the construction work has been defrayed. [E. R. J., Oct. 23, '11.]

**Towson & Cockeyville Electric Railway, Cockeyville, Md.**—Track laying has been begun by this company on its line to connect Towson and Cockeyville, via Lutherville, Timonium, Texas and Marble Hill. This line has been graded between Towson and Lutherville and will be operated first. J. A. Shriver, Belair, president. [E. R. J., June 10, '11.]

**\*Detroit, Mich.**—Surveys are being made for an interurban railway between Detroit and Bad Axe, via Mt. Clemens, Capac, Brown City, Snover, Argyle and Uby, with the ultimate destination of Port Austin. It is said that the use of gasoline motor cars on the new line is being considered.

**Flathead Interurban Railway, Kalispell, Mont.**—This company advises that construction has been begun on its 74-mile electric railway to connect Kalispell, Whitefish, Somers and Big Fork. The company will purchase power. Capital stock authorized, \$50,000. Bonds authorized, \$50,000. David R. McGinnis, Kalispell, president. [E. R. J., Nov. 25, '11.]

**West Jersey & Seashore Railroad, Camden, N. J.**—This company is considering plans to elevate its tracks in Atlantic City in connection with the construction of a new terminal.

**Buffalo & Lake Erie Traction Company, Buffalo, N. Y.**—This company plans to build an extension on Twelfth Street from East Street to the city limits of Erie.

**Corning, Keuka Lake & Ontario Railway, Corning, N. Y.**—This company has asked the Public Service Commission, Second District, for a certificate of necessity to build an 83-mile electric railway from Corning to Sodus Bay, via Savona, Bradford, Penn Yan and Geneva.

**Syracuse (N. Y.) Rapid Transit Railway.**—Plans are being made by this company to double track its present line to Liverpool and extend a double track line through Liverpool.

**Piedmont Traction Company, Charlotte, N. C.**—This company plans to build a line from Greensboro to Durham, via Saxapahaw and Chapel Hill.

**Akron, Canton & Youngstown Electric Railway, Canton, Ohio.**—Work has been begun by this company on its line from Britain to Akron, a distance of 4 miles, and from Erie Junction to East Akron, 1 mile. It will be extended east to Youngstown, via Mogadore. F. E. Bissell, Canton, chief engineer. [E. R. J., July 22, '11.]

**Ohio Electric Railway, Cincinnati, Ohio.**—This company has placed in operation its extension from Trenton to Middletown.

**Sand Springs Interurban Railway, Tulsa, Okla.**—This company has laid 8 miles of track between Tulsa and Sand Springs and plans are being made to build a 20-mile extension from Tulsa northeast to Collinsville.

**\*London, Ont.**—The Lake Erie Coal Company has made a proposition to City Council to electrify the London & Port Stanley Railway, owned by the city, when the lease with the Père Marquette Railway, which company now operates the London & Port Stanley Railroad, expires in 1914.

**Niagara Falls, Welland & Lake Erie Railway, Niagara Falls, Ont.**—This company has received construction material and work will now be rushed to completion on its electric railway to connect Niagara Falls, Welland and Port Colborne with branches to Port Dover on Lake Erie and to Fort Erie on the Niagara River opposite Buffalo. C. J. McLaughlin, Toronto, is interested. [E. R. J., May 13, '11.]

**Grant's Pass & Rogue River Railroad, Grant's Pass, Ore.**—Preliminary surveys have been made by this company for its railway through the Rogue River Valley between Grant's Pass, Medford and Ashland. The following officers were elected: J. Arnold Doyle, president; H. M. Farren, vice-president and general manager; George E. Boos, secretary; L. A. Rosenbaum, Seattle, counsel; George Godfrey, Spokane, treasurer. [E. R. J., Nov. 18, '11.]

**\*Metslin, Ore.**—Louis Gerlinger, Jr., Dallas, Ore., and associates plan to build an electric railway from Metslin to Prineville, via the Ochoco River and Crooked River valleys in central Oregon.

**Portland, Eugene & Eastern Railway, Portland, Ore.**—It is reported that this company will soon build an extension between Salem and Stayton.

**Ellwood City & Kopple Electric Railway, Ellwood City, Pa.**—Work has been begun by this company on its line at Koppel and the contract for three miles of the track to Morado Park, near Beaver Falls, has been awarded. It is expected to award the contract for the line between Ellwood City and Koppel in the near future. H. K. Gregory, president. [E. R. J., Dec. 1, '11.]

**Conestoga Traction Company, Lancaster, Pa.**—Surveys are being made, right-of-way has been secured and it is expected to begin construction in the spring on this line between Lititz and Rothsville.

**Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.**—This company is preparing to enter McKeesport over its own tracks. It is stated that this company's line from West Newton to Herminie is being financed and that work will be begun in the spring.

**\*Palmyra, Pa.**—M. S. Hershey and associates are securing right-of-way for an electric railway between Palmyra and Campbelltown.

**Philadelphia & Western Railway, Philadelphia, Pa.**—This company has completed its bridge over the Schuylkill River and viaducts at Norristown. Grading from the Pennsylvania Railroad to Bridgeport is also well advanced. This line will connect with the Lehigh Valley Transit Company's lines at Norristown. It will also connect at Sixty-ninth and Market Streets in Philadelphia with the Philadelphia & West Chester Traction Company.

**Pottstown & Phoenixville Railway, Pottstown, Pa.**—Plans are being made by this company to build a 1-mile extension in Lower Pottsgrove and Limerick. This is supposed to be a link in the line from Spring City to Pottstown and Reading. George N. Malsberger, president. [E. R. J., June 10, '11.]

**\*Florence, S. C.**—It is reported that Charles E. Johnson, Raleigh, president of the Yadkin River Power Company, and associates plan to build an electric railway from Raleigh to Florence.

**Knoxville Railway & Light Company, Knoxville, Tenn.**—This company has begun construction along its new line to Sevierville, about 1 mile out of Knoxville. It is expected that the road will be ready for operation by the first of the year.

**Denton (Tex.) Traction Company.**—The contract between this company and the Chamber of Commerce has been approved and construction will be begun soon for the north side extension of the line.

**Greenville Railway & Light Company, Greenville, Tex.**—Work has been begun by this company on its extension from Greenville to Peniel.

**Marshall (Tex.) Traction Company.**—Preliminary arrangements have been made and construction will soon be begun by this company on its new line in North Marshall.

**San Benito (Tex.) Interurban Railway.**—Work will be begun at once by this company on its line in Brownsville.

**Tioga (Tex.) Interurban Promoting Company.**—This company will begin construction within the next sixty days on its 109-mile electric railway between McKinney, Tioga, Gainesville, Montague and Nocona. The company's power house and repair shops will be located at Tioga. Capital stock, authorized, \$600,000. Officers: J. P. Mason, presi-

dent and general manager; A. R. Bradley, vice-president; A. J. Scott, secretary, all of Tioga. [E. R. J., Nov. 18, '11.]

**Gray's Harbor Railway & Light Company, Aberdeen, Wash.**—Plans are being considered by this company to extend its line north to Forks.

**Highland Park & Lake Burien Railway, Seattle, Wash.**—This company has awarded the contract for grading its line to McQuade & Moore Company. It will be 7 miles long and will extend from Oxbow to Lake Burien, via Highland Park. Officers: W. H. Murphy, Seattle, president; George W. H. White, vice-president, and Charles Schoening, treasurer. [E. R. J., Oct. 14, '11.]

**Morgantown & Dunkard Valley Railroad, Morgantown, W. Va.**—This company's extension from Barker to Cassville has been placed in operation. The company expects to extend this line to Blacksville, a distance of about 13 miles.

## SHOPS AND BUILDINGS

**Pacific Electric Railway, Los Angeles, Cal.**—Plans and specifications for the new and enlarged carhouses which will be built in Redondo are now being considered by this company.

**Pueblo & Suburban Traction & Lighting Company, Pueblo, Col.**—This company has purchased the White Triangle block at the intersection of Main Street and Union Avenue in Pueblo. Plans for a structure to be erected on this site have been prepared and work will soon be begun. The building will contain the offices of this company.

**Ft. Wayne & Northern Indiana Traction Company, Ft. Wayne, Ind.**—About April 1, 1912, the interurban passenger station and the baggage station of this company will be moved to the premises which the company has recently acquired on West Main Street in Ft. Wayne.

**West Jersey & Seashore Railroad, Camden, N. J.**—Plans are being considered by this company, which is controlled by the Pennsylvania Railroad Company, to build a new terminal at Atlantic City for the use of trains of both the steam and the electric divisions.

**Salisbury & Spencer Railway, Salisbury, N. C.**—It is reported that this company will build a new carhouse at the site of the present switch in Salisbury.

**Northern Ohio Traction & Light Company, Akron, Ohio.**—This company will construct a new passenger and freight depot with train sheds on Main Street and High Street in Akron. The structure will be 180 ft. x 250 ft. Work will be begun in the spring.

**Niagara Falls, Welland & Lake Erie Railway, Niagara Falls, Ont.**—It is reported that this company will soon build its new carhouse at Lincoln Street and Muir Street in Welland. C. J. McLaughlin, Toronto, is interested.

## POWER HOUSES AND SUBSTATIONS

**Boston (Mass.) Elevated Railway.**—Plans have been completed by this company for the construction of a new transformer station for the Malden terminus of the proposed elevated structure from Sullivan Square to Malden.

**Norfolk & Bristol Street Railway, Foxboro, Mass.**—This company will soon purchase one 250-hp or 300-hp boiler for its power plant.

**Twentieth Century Transportation, Winona, Minn.**—This company plans to build power houses at Lancaster, Wis., and at Watertown, S. D., in the spring to furnish current for its proposed road. Ernest Norwood, Lancaster, general manager.

**Nebraska Transportation Company, Omaha, Neb.**—This company will soon build a new power house plant at Elk City, having a capacity of 21,000 hp. The structure will be 600 ft. long.

**Trenton, Bristol & Philadelphia Street Railway, Bristol, Pa.**—This company has awarded a contract for a 650-hp Hamilton compound Corliss engine. An addition will be built to the company's present plant in Croydon to accommodate this new equipment.

**Central Pennsylvania Traction Company, Harrisburg, Pa.**—This company has placed an order with the Harrisburg Foundry & Machine Works for two engines with a total capacity of 300-hp.

# Manufactures & Supplies

## ROLLING STOCK

Slate Belt Electric Street Railway, Pen Argyle, Pa., is in the market for several new cars.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa., it is reported, will soon purchase several new double-truck cars.

Savannah (Ga.) Electric Company has been recommended by the State Railroad Commission to add eight cars to its rolling stock equipment.

Seattle (Wash.) Electric Company has ordered one double-truck car of the standard Stone & Webster T-post construction from the St. Louis Car Company.

Keokuk Electric Railway & Power Company, Keokuk, Ia., has ordered four single-truck cars from the St. Louis Car Company, through Stone & Webster, Boston, Mass.

Stark Electric Railway, Alliance, Ohio, has ordered three quadruple equipments of No. 304-A motors with type HL unit-switch control from the Westinghouse Electric & Manufacturing Company.

## TRADE NOTES

Mesta Machine Company, Pittsburgh, Pa., is erecting an addition to its office building at its plant in West Homestead, Pa.

Root Spring Scraper Company, Kalamazoo, Mich., has shipped sixty No. 2 special scrapers to the Montreal (Que.) Street Railway.

Whipple Supply Company, New York, N. Y., has been appointed Eastern sales agents for the Railway Supply & Curtain Company, Chicago, Ill.

Alvey Brothers Machinery Company, St. Louis, Mo., has been organized by G. Alvey, P. C. Alvey and others of Elizabethtown, Ky., to manufacture conveying machinery.

H. P. Ahrnke, who has been associated with the Barrett Manufacturing Company, has accepted a position with the Dairy Machinery & Construction Company, Derby, Conn.

Chicago Pneumatic Tool Company, Chicago, Ill., has awarded the contract for the construction of a factory on East Forty-ninth Street, near Lakewood Avenue, in Cleveland, Ohio, to Edward A. Weiland.

Western Electric Company, New York, N. Y., has appointed Charles B. Barnes assistant works engineer of the Hawthorne works, Chicago. Mr. Barnes was formerly connected with Holabird & Roche, Chicago.

Universal Safety Tread Company, Boston, Mass., has received an order for step treads for the 215 cars which the Chicago Railways is building in its own shops. The company will also furnish the step treads for the seventy-seven cars which the Chicago Railways is rebuilding to the pay-as-you-enter type.

Hall Signal Company, New York, N. Y., has almost completed its financial reorganization. The company now has contracts and orders on hand aggregating \$450,000, and its business prospects are very good. Plants of the company continue to operate with an extra night shift three times a week, and there are more orders on hand than at any time since the summer of 1909, when full double-time shifts were worked.

John A. Roebling's Sons Company, Trenton, N. J., had one of its shops partly destroyed by a fire on Dec. 2. The fire was confined to one shop only, which is used in the manufacture of special wire. The facilities of the other shops will be ample to accommodate for the present the work which would have been done in the burned shop. The company states that no difficulty will be experienced in filling all contracts and orders.

Walter B. Snow, Boston, Mass., publicity engineer, has recently added to his staff Sidney G. Koon, who was editor of *International Marine Engineering* for four years and later metallurgist with the Jones & Laughlin Steel Company. Mr. Snow has also added to his staff John S. Nicholl, lately with the New York Edison Company, and formerly acting manager for F. W. Horne, importer of American machinery, Yokohama, Japan.

## ADVERTISING LITERATURE

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued several data sheets on H-B ball bearings and their correct use.

Emerson Company, New York, N. Y., efficiency engineer, has issued a booklet entitled "A Comparative Study of Wage and Bonus Systems."

Ohmer Fare Register Company, Dayton, Ohio, is mailing a folder entitled "Records versus Receptacles" which discusses the many advantages of the company's recording registers.

W. N. Matthews & Brother, St. Louis, Mo., are mailing a circular which contains some suggestions for using Matthews guy anchors in difficult situations. The circular also gives net quantity prices and a convenient order form.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has issued Bulletin No. 1003, which illustrates and describes a complete line of high-grade telephone construction material and specialties. The catalog contains 208 pages.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has issued Circular No. 1198, which illustrates and describes the different types of alternating-current water-wheel generators, both vertical and horizontal, manufactured by the company.

N. W. Halsey & Company, New York, N. Y., who financed the Peoria Railway, the St. Louis, Springfield & Peoria Railroad and the Bloomington, Decatur & Champaign Railroad, all of which are included in the Illinois Traction System, are distributing among investors copies of the illustrated booklet describing the features of the physical property of the Illinois Traction System prepared recently by the railway company's publicity department. This booklet was reviewed in the *ELECTRIC RAILWAY JOURNAL* of Oct. 28, 1911, page 966.

## NEW PUBLICATIONS

"Das Deutsche Eisenbahnwesen der Gegenwart" ("German Railway Practice of the Present"). Published by Reimar Hobbing: Berlin, 1911. Cloth, two volumes; 1170 pages, 9½ in. x 12½ in.; illustrated. Price, \$4 net.

This work, which is published under the auspices of the several state railway administrations of Germany, is a summary of German trunk-line, interurban, mountain, narrow-gage and colonial railway practice. The several sections were prepared by recognized authorities in the respective fields treated. To familiarize laymen with the broader outlines of railroading, the text is arranged so that the popular descriptions are in large type and the technical details in small type. The work opens with the social, economic and engineering history of German steam railroad systems. The following chapters then describe in logical order the construction of a steam railroad, such as the survey; the construction of bridges, viaducts and tunnels; the track and special work; yards, stations, terminals and similar structures; signal systems; locomotives and auxiliary equipment; rolling stock, brakes and draft rigging; experiments with storage battery cars. Chapter XIII describes inspection and track lighting, snow removal and forest-fire fighting. The next two chapters discuss track, shops and cars. Chapter XVI describes the sources, costs and characteristics of locomotive fuels. Chapters XVII to XXXII treat, in order, the preparation of schedules, make-up of trains, passenger and freight tariffs and service, railway law, forms of organization, relations with employees, methods of accounting in interline business, transportation of mail and military trains, etc., and relations between earnings and expenses. Special topics are considered in the rest of the work. Thus Chapter XXXIII is a comprehensive study of freight and passenger movement into and out of Berlin, by G. Kemmann, retired government councilor. Chapter XXXVI reviews the work done on the Oranienburg experimental line in studying the effect of electrical operation on various forms of track construction. About 500 pages are used to describe the shops and products of the principal makers of steam and electric railway equipment. It is announced that an English edition of this work will be issued at \$4 net about April, 1912.