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Changes of advertising copy should reach this office by 10 a. m. Monday preceding the date of publication, except the first issue of the month, for which changes of copy should be received two weeks prior to publication date. New advertisements for any issue will be accepted up to noon of Tuesday for the paper dated the following Saturday.

Of this issue of the Street Railway Journal 8000 copies are printed. Total circulation for 1907, to date, 238,350 copies, an average of 8219 copies per week.

Instructing Employees in a New Generating Station

It not infrequently happens that the carefully planned arrangements of the designing engineer of a modern generating station are rendered useless for a longer or shorter period after the plant has been put in operation because the men in charge of the station are not given sufficient instruction regarding how it should be operated. We refer particularly to provisions made by the designing engineer for caring for emergencies; for instance, at the switchboard by shunting through other circuits, circuit breakers or any apparatus out of order. In the modern power station there are also usually several methods of feeding the boilers, any one of which may be employed in case of a break-down of the pumps, or the failure of the piping ordinarily used. Employees of the less intelligent class, and we must admit that labor conditions compel the employment of these in many sections of the country, are likely to do just what they are told to do and nothing more. The boilers may have ample auxiliary feed lines and connections and emergency pumps, but on the failure of the main feed line to any boiler the employees in a new station, unless otherwise instructed and drilled, are likely to cut the boiler out instead of using some of the other possible methods of feeding it.

The designer of a plant usually makes provision for caring for emergencies on many points other than those cited. It certainly should be the duty of the operating engineer to become informed from the designer regarding them and then to pass what information he may obtain on to the men in immediate charge of the different portions of the station. It might also be well to issue blue printed or written instructions to the men regarding caring for emergencies. Without such instructions the men will, of course, finally get familiar with these emergency features, but in the meantime operating costs may be increased or reliability of service may be lessened.

The One-Room Shop

In one respect the designs of new shops for small systems differ radically. In some one large room serves for all the departments except the paint department, while in others the blacksmith shop, winding room, carpenter shop and machine shops are in separate rooms. There is, we believe, a tendency towards the single-room idea, and this plan has much to recommend it. In the first place, it entails less expense, as the cost of the partitions are avoided. Another point in its favor is that it avoids a tendency towards killing time. When two or three men, armature winders, for instance, are located in a small room where they cannot be seen and where they will have warning of the foreman's coming by the opening of the door, there is a tendency towards horse-play and loafing. When the whole shop is open the men are never certain that they are unobserved, and they are, therefore, more likely to keep at work. Moreover, the less the number of separate rooms, the greater the ease with which material can be handled. So far as this feature alone is concerned, the ideal condition occurs where the winding room, machine shop and blacksmith shop are all in one room and are spanned by an

overhead crane. Another advantage of the one-room idea is the better lighting of the whole shop. The partitions, even those at right angles to the side walls in which the windows are located, cut off considerable light.

There is one objection to the one-room idea. With it in winter the whole shop must be kept comparatively warm and at the temperature required by those doing the lighter work. But in summer the one-room shop will be cooler, as the partitions cut off the breeze. Moreover, the partitions limit the size of materials to be handled and with them for the same convenience in handling materials the whole shop building must be considerably larger. At first thought, it might be urged that the blacksmith shop should be in a separate room to prevent the smoke, which we usually associate with a blacksmith shop, from interfering with the other work. But there is with modern equipment not much occasion for smoke. Forges provided with hoods and suction drafts obviate smoke.

Electric Shop Equipment

Very many railway construction and repair shops of recent construction have adopted electrically driven tools upon a rather large scale. Singularly enough the steam roads have often gone even further in this matter than the electric roads themselves, possibly because the latter have had shops that have just grown instead of being deliberately planned on a large scale. The equipment of railway construction and repair shops with electrical drive is, upon the whole, rather more of a task than in the case of ordinary shops and factories. This is mainly because of the very wide range of work that has to be done involving the use of many tools of various sizes and functions. The easiest kind of shop to equip is one for uniform output, since the character of the machines in such case determines the nature of the equipment at the very start and the rest of the work becomes mere reduplication. The railway shop may have everything between a 90-in. or 100-in. lathe or boring mill and a 6-in. buffing wheel with a wonderfully miscellaneous collection of machines for woodworking, a boiler shop and a foundry. The shops of an electric railway are usually somewhat less diversified, but are still in a class far removed from simple machine shops. They are exceptional, too, in the large amount of night work that may have to be done and in its diversity.

Such shops are, as a rule, especially the gainers by the introduction of electric drive. For, unlike ordinary works, they have no fixed hours of operation and no two parts of the shop are certain to be running at the same time. Power is needed now here, now there, and whenever special necessity arises. Broadly, the great gain in the electric drive is the abolition of the general transmission losses in the distribution of power to irregularly and insufficiently loaded machines. There may, of course, be gains in the absolute cost of power per unit, but these are small compared with those that come from the saving of power which would otherwise be spent in increasing the depreciation of the running parts. This saving is especially great in case of shops which must often run only in part and somewhat irregularly. The fundamental gain is the ability to confine the losses to the individual machines in operation. In a measure, even the general losses due to light load upon these are kept down, for both generators and motors can be run underloaded with less loss of efficiency than in the case of almost any other machines.

In deciding upon the initial plans of an electric drive for a railway or other miscellaneous shop, two main questions have to be settled, the general system to be employed and the degree to which the subdivision of power units shall be carried. As to the first matter the natural tendency now is to use induction motors, on account of their extreme simplicity and reliability, and also by reason of the general availability of alternating current and its advantages in case of distribution to a scattered group of shops. Unquestionably the induction motor is extraordinarily convenient and dependable, but it has disadvantages in certain classes of work that prevent its complete victory over its older competitor; chief among these is the difficulty of exact and efficient speed regulation.

An induction motor can be regulated in speed upon exactly the same terms as a single street car motor, i. e., it is entirely amenable to rheostatic control with all thereby implied. In a shop where there is a large preponderance of variable-speed work, one finds an induction motor-drive rather burdensome. In such cases direct-current motors have a material advantage at the cost of a certain amount of cost and complication. In fact the cost and complication are pretty nearly proportional to the perfection of the control. The Ward-Leonard system, for instance, with its duplication of machines stands quite in a class by itself in respect to the delicacy of speed control under all sorts of load conditions. More economical under ordinary shop conditions are the several multi-voltage schemes, with or without the use of interpole motors. Still simpler is the ordinary motor. A railway shop seldom has to go into the refinement of speed control, its work being too various to permit the fine training of specialists on single machines that is needed to give variable speed devices their greatest value. In fact, in most instances the ordinary mechanical speed changing methods with induction motors should generally give sufficient range. Usually the source of power tends to simplify the choice of motors. If it is derived from a large central station or a transmission plant the chances are more than even that induction motors will best serve the purpose. If an electric railway plant is operating its own shops, either a. c. or d. c. may be available, as is also the case where special generators are installed. Generally speaking, the conditions in railway shops do not demand a sufficient amount of variable-speed work to make d. c. distribution desirable, unless d. c. happens to be the more readily available.

As to extent of subdivision the tendency is more and more towards the individual driving of large machines, coupled with group drive on small machines. Machines frequently used by themselves and requiring 5 hp to 10 hp or more quite generally justify the use of individual drive. In the portions of a shop doing pretty steady work upon all the machines, group driving is ordinarily the more economical. In repair shops in which work may have to be done at all hours in scattering corners, individual driving can economically be pushed rather further than elsewhere.

The economies of group driving come mainly from saving in first cost, resulting from the use of one large motor and its shafting instead of numerous small motors. A few years ago this gain was much larger than it now is. At present the cost of motors per horse-power does not decrease rapidly in the sizes from 10 hp up, and it is very easy to eat up the saving in fixed charges by running unutilized shafting. Now and then one can find a corner of a shop where a number of small machines are in pretty regular use and then a group drive can be used to some advantage. Large machines, especially for variable-speed work, certainly deserve individual motors. More especially is this so in railway shops since one is very likely to have to do night work at a few points of a big shop and group driving would compel the operation of a large amount of shafting merely to get power to these few machines. To obtain an installation of minimum cost and maximum efficiency, means extreme care in arranging the details of the drives so that the minimum amount of useless work may have to be done. It would pay, frequently, we think, to take up the drive, not after the shop is planned and partly built, but before the departments and machines are definitely located, so as to eliminate awkward situations.

Electric Lighting Accounting and the Street Railway Companies

A circular letter issued a month ago by the American Street and Interurban Railway Accountants' Association to the members of that body is of much more than passing importance, not only to the street railways of the country, but to the electric lighting companies as well. It seems to mark a second radical step in the movement which started when electric railway and electric light companies discovered they could economically merge their interests and their plants and bring these two classes of business under one management. This plan has been followed in so many instances that questions of management, accounting and many other matters connected with electric lighting are of almost as much interest to a large number of street railway officials as are the same subjects when pertaining directly to their own field of work.

For several years the National Electric Light Association has made spasmodic efforts to formulate and adopt a standard classification of construction and operating accounts, but owing to various reasons no final action has resulted. A committee has been at work on the subject recently, however, and submitted at the annual convention lately held in Washington a proposed classification. Owing to the press of other business this report, after about two hours' discussion, was referred back to the committee for further consideration, so that the matter will be delayed for one year more at least.

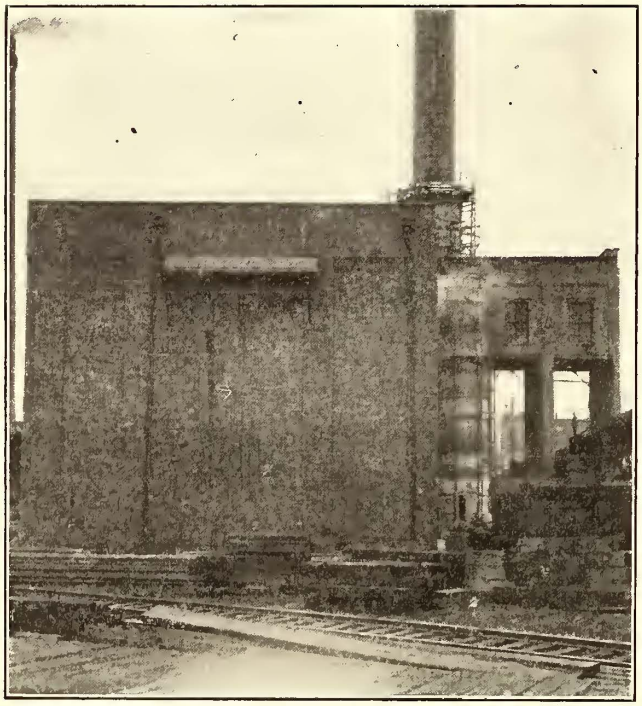
Heretofore the street railway accountants, who also have charge of lighting properties, have been willing to let the Electric Light Association lead in the preparation of a classification of lighting accounts because the work seemed particularly in their line. But as the number of cities in which lighting plants and street railways are owned by the same interests is increasing and is now very large, the subject is assuming a different aspect. Many street railway accountants are now very greatly interested in the subject, not only because they require such a standard classification for their lighting accounts, but it is obviously very important that the form adopted should be practically workable with their own standard classification, which has had ten years of service and has proved itself satisfactory by its general adoption.

The consolidation of railway and lighting companies has resulted in certain physical merging of power plants, shops, store rooms, etc., and it is evident that where this has occurred the two systems of accounts, in order to be useful, should be exactly alike in title and definition. This is particularly true in the case of general and power-house accounts. Up to this time the classifications proposed by the Electric Light Association have quite ignored this fact. The names, explanations and the arrangement of these accounts have been drawn apparently without reference to the needs of anyone else in the matter, so that had the classification proposed at Washington been approved by the Electric Light Association confusion would immediately have resulted in those companies that operate lighting and street railways jointly. The street railway departments would have to be guided by the street railway classification, and the electric light departments by a different classification, or else some companies would adopt the electric lighting accounts for the railway service or vice versa. The general effect would be an uncertainty almost as complete as if no classification at all were followed. In other words, street railway accountants who are interested in the joint service now find themselves face to face with the possibility of the formal adoption of a classification of electric lighting accounts which has so little in common with the street railway standard that it seems impossible for them to adopt it for their own companies without, in a serious way, destroying comparisons for their own use, not to mention comparisons with other companies. How very real the interests of the street railway accountants are in this subject is shown by the fact that about 21 per cent of the street railway companies reported in the 1902 United States Census were interested in commercial lighting. The percentage now is probably greater.

The effort of President Tingley, of the Street Railway Accountants' Association, to obtain information of the number of street railway companies interested in the electric lighting business, together with his letter regarding the classification proposed, may therefore be taken as a preliminary to a better understanding between the street railway accountants and the National Electric Light Association, which should be of benefit to both interests. We believe that Mr. Tingley's collection of data will show that so many companies are in the railway and the lighting business that their interests will be cared for. If the National Electric Light Association, after deliberation, decides not to follow the firmly established and satisfactory street railway classification at points where the two should harmonize, it will be exceedingly difficult to establish a real standard classification for electric lighting companies. This will be especially true if the street railway accountants eventually adopt a standard for their own lighting companies in as successful a manner as they have with their railway interests.

NEW TURBINE GENERATING STATION OF THE ILLINOIS TRACTION SYSTEM AT PEORIA, ILL.

In an article by John R. Hewitt on "A. C. Electrification" on the Illinois Traction system, published in the Street Railway Journal, July 6, 1907, reference was made of the new turbine generating station at Peoria. This station, which is now completed, is unique in several respects. The method of handling the coal and ashes is quite out of the ordinary, but the use of vertical machinery in the turbine room is probably a more distinctive feature of the station. The boiler feed-pumps, house pumps, circulating water pumps and hot-well pumps are all of the vertical type.



EXTERIOR VIEW OF PEORIA STATION, TAKEN DURING THE ERECTION OF THE STACK

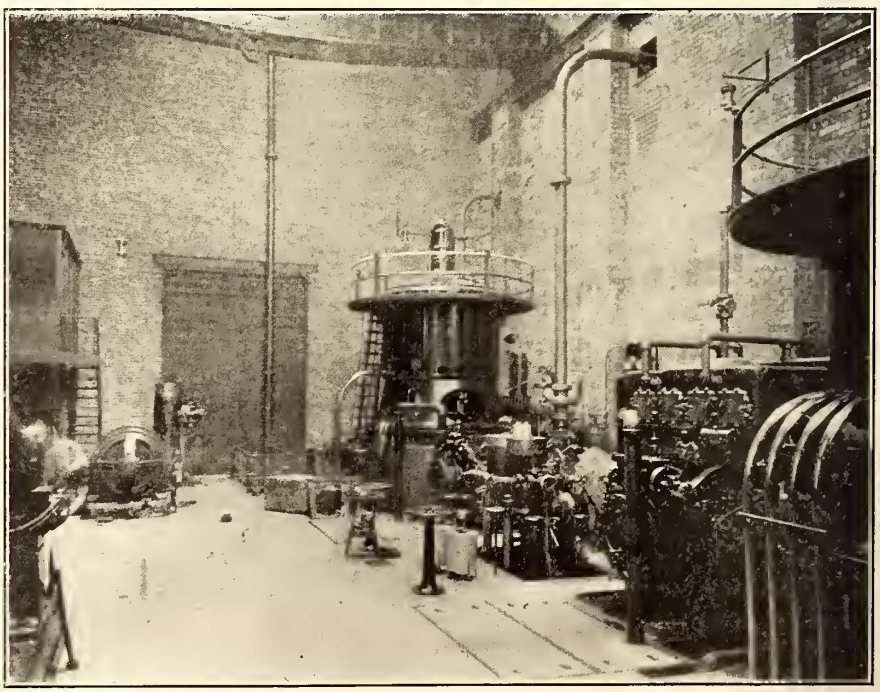
The new station is located adjacent to the old direct-current station for the Peoria city lines and is a few hundred feet from the Illinois River. In addition to supplanting the old station, which contains an 800-kw G. E. generator, driven by an Allis-Chalmers simple non-condensing engine and several belted units, the new station will feed into the high-tension system supplying current to the network of interurban lines of the McKinley syndicate throughout Central Illinois. At present it contains two 2000-kw G. E. turbo-generators, but provision has been made for extending the building and doubling the capacity whenever conditions necessitate.

The main portion of the building is of rectangular section. An extension on the north contains coal and ash pits, and the tracks of the Peoria-Bloomington interurban line of the Illinois Traction System pass through the extension over the coal pits. The building itself is of steel, brick and concrete construction. With the exception of a temporary south wall, which is of ordinary building brick, all of the walls are of paving block laid in red cement mortar. The floors are of concrete steel construction, and the roofs are of cinder concrete covered with tar paper and gravel. The ventilation of the building is well provided for by monitors over the boilers and over the center of the turbine room. The roofs, as well as the sides of these monitors, are provided with glass.

Two division walls separate the enclosed portion of the building into a boiler room, turbine room and a three-story compartment for the high-tension apparatus.

BOILERS

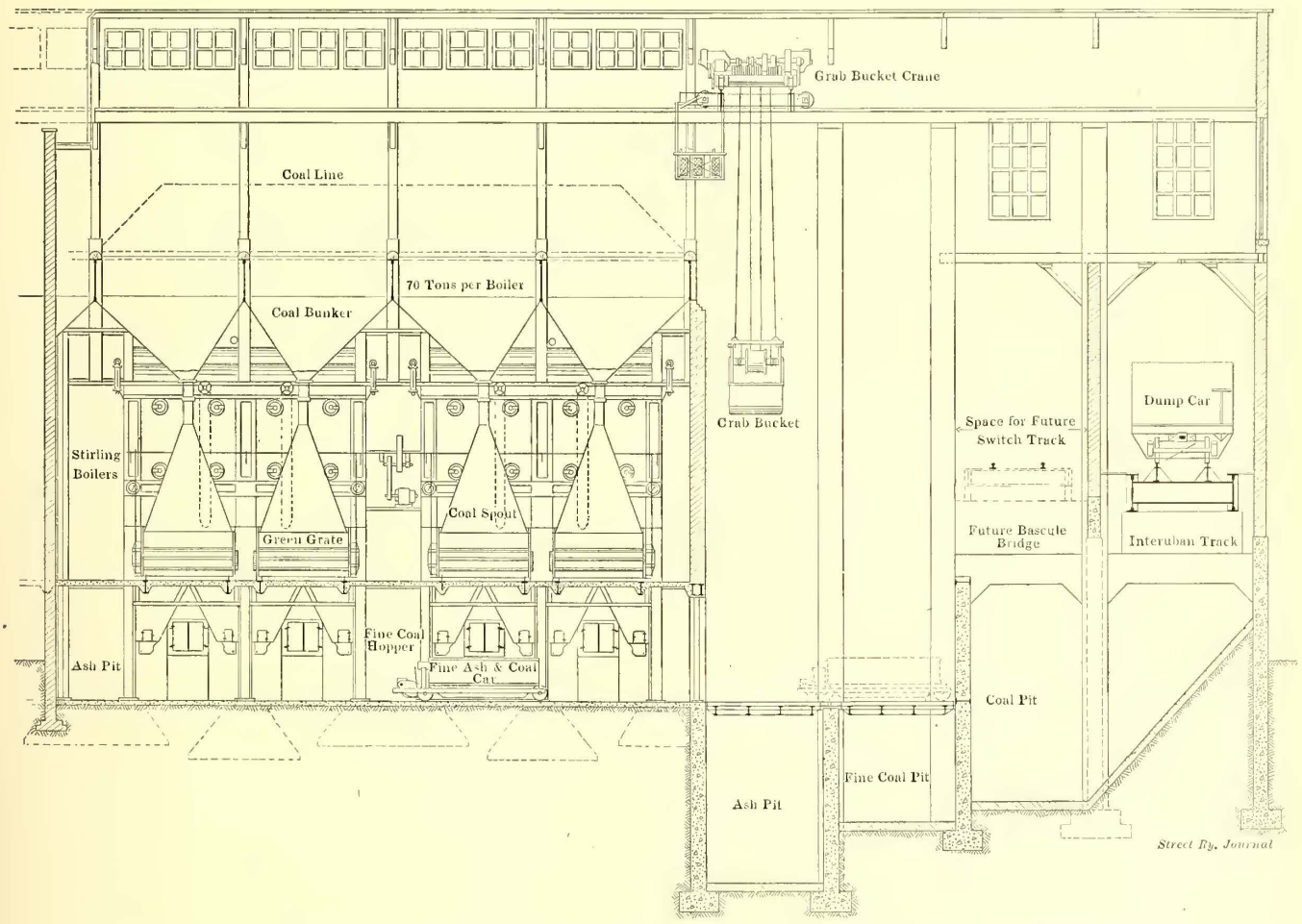
The boiler room contains eight 400-hp Sterling boilers, four of which are provided with Foster superheaters. They are arranged four on each side of a central firing alley running parallel to the division wall between the boiler and turbine room. A transverse passageway between the centrally located boilers divides the entire installation into two sets. The unit system of steam piping employed provides for the feeding of each turbine by the set of four boilers nearest to it. However, a transfer header along the rear wall of the building connects the headers of the two sets so that either turbine may be supplied with steam from any or all of the boilers. All of the main headers and the connecting header are of 8-in. pipe and are carried over the boilers at an equal height above the floor. This arrangement minimized the number of bends required. After each header passes through the division wall a single right angle bend brings it to the vertical leading to the turbine. No pockets are formed in the header system, and consequently no drip mains and connections are provided except at the turbine connections. The flue connections of the boilers are entirely free from bends. Uptakes about 3 ft. long make connections with steel breechings, one over the rear of each row of boilers. The breechings are suspended from the roof girders and each runs straight through the north wall of the boiler room into a reinforced concrete stack 11 ft. in diameter and 200 ft. high. The breech-



VIEW IN THE OPERATING ROOM, SHOWING ELEVATED OFFICE AT THE LEFT

ings are of ample size to serve the contemplated additional boiler installation, and measure 14 ft. 6 ins. by 9 ft. where they pass through the boiler room wall.

All of the boilers are equipped with automatic stokers of the Green chain grate type, supplied with coal from overhead steel bunkers. Each row of stokers is belt-driven from a motor located overhead in the transverse passageway between the centrally located boilers. Each motor is of sufficient size to operate all of the stokers in the event of the failure of one. A concrete hopper under the front of each boiler catches the fine coal sifting through the grates, and these hoppers, as well as the ash hoppers under the boilers, have outlets in the basement. The provisions for emptying the fine coal hoppers and the ash hoppers is rather unique. In the basement underneath the front of each row of boilers is a track of 60-lb. T-rails laid to a gage of 2 ft. 6¾ ins. These tracks extend under the north wall of the boiler room and over an ash pit and a fine coal pit in the extension previously referred to. Each is provided with a motor-driven hopper bottom car of steel construction, which, after being placed under the hopper discharge doors and filled, is run over one of the pits in the extension and emptied. The car is driven by a 5-hp, 125-volt motor geared to one of the axles. Current is supplied from protected trolleys supported on the hopper walls near the floor.



FRONT ELEVATION OF BOILERS IN THE PEORIA STATION, SHOWING ALSO THE FUEL-HANDLING FACILITIES

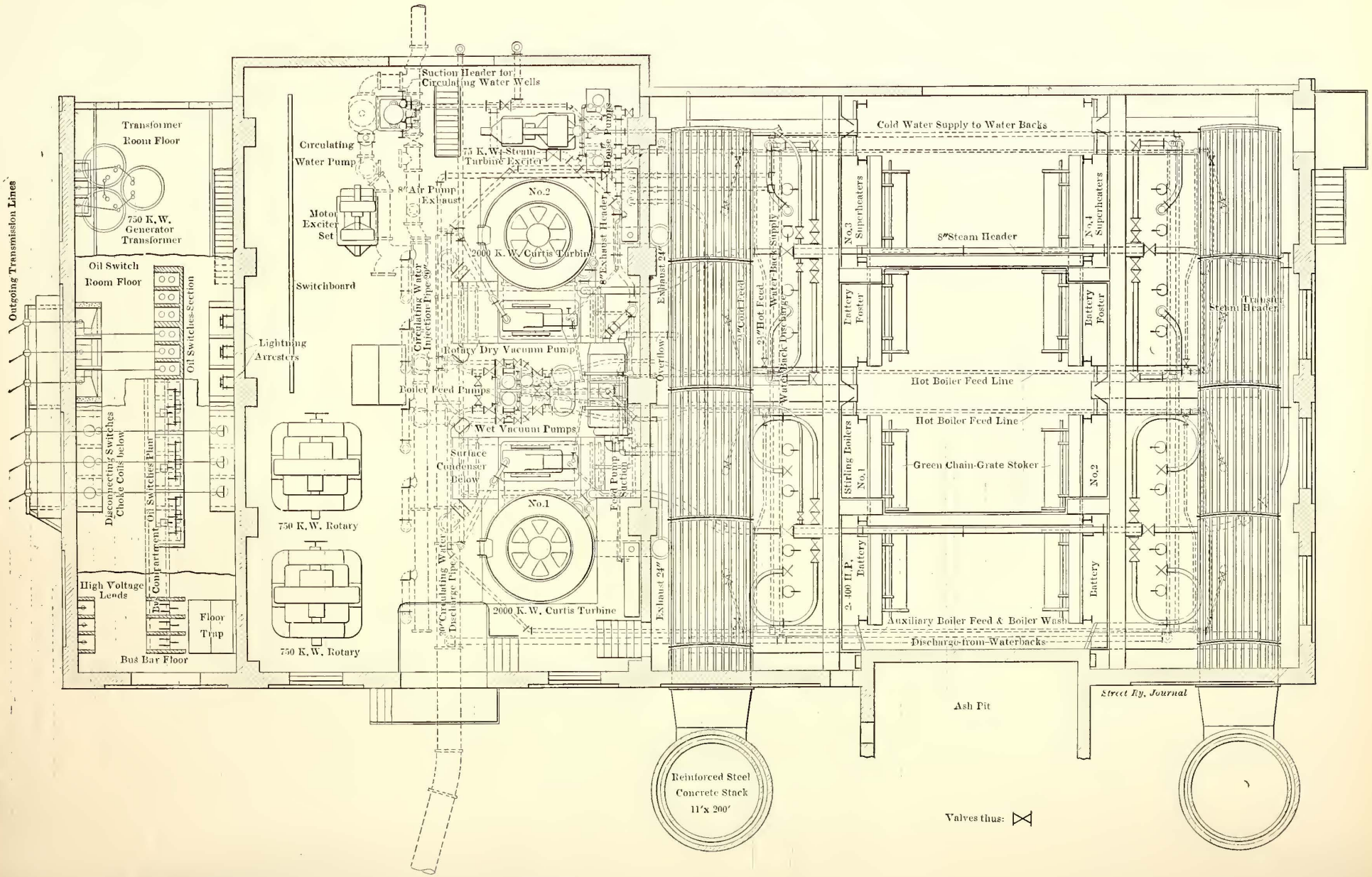
COAL-HANDLING APPARATUS

Coal is hauled to the station over the lines of the Illinois Traction System in hopper-bottom cars. The coal will probably be obtained from mines now being developed by the company in East Peoria. The cars are dumped into the coal pit previously referred to as being under the tracks. A second opening similar to that through which the track now runs is provided for the future installation of a switch track. Coal is carried from the coal pits by means of an overhead motor-operated crane provided with a clam shell bucket of 108 cu. ft. capacity. The crane runway extends the full length of the boiler room over the bunkers and also through the north addition containing the several pits. In addition to conveying coal the crane is employed to carry the ashes from the ash pit to cars placed over the coal pit.

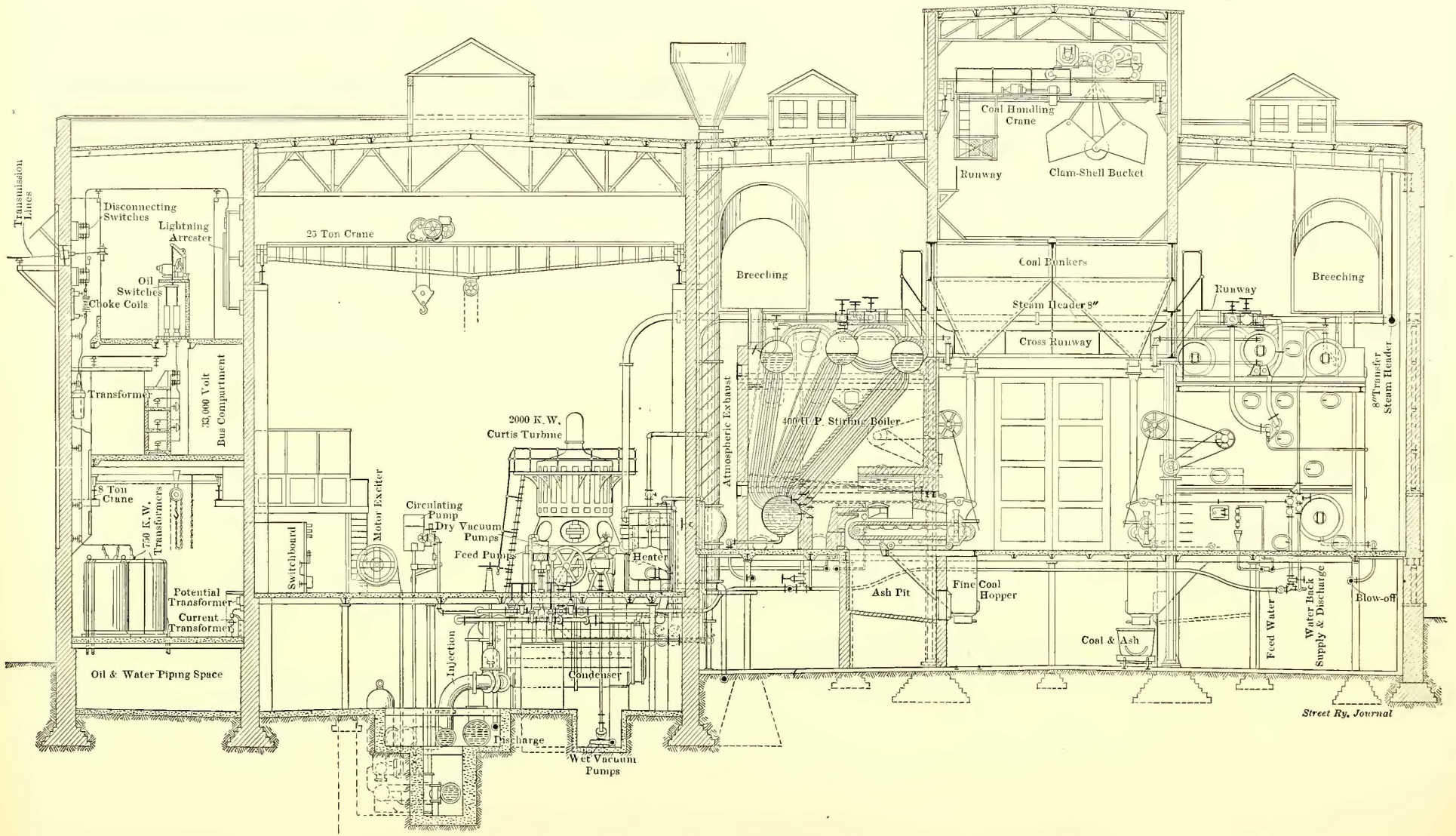
BOILER FEED

Two vertical simple Dean house pumps, with cylinders measuring 10 ins. x 10 ins. x 24 ins., located in the southwest corner of the turbine room, are piped to a Cochrane open feed-water heater of 4000 hp capacity, located on the turbine room floor near the boiler room division wall and midway between the two turbines. A line is also carried from the house pumps direct to two vertical Dean boiler feed-pumps, with cylinders 14 ins. x 10 ins. x 24 ins. The pumps are of the vertical type and are installed midway between the turbines with their water cylinders below the turbine room floor. All of the piping of these pumps is cross-connected so that either or both may be used to supply any of the boilers.

From the feed-pumps two independent sets of feed lines are carried to the boilers. One is regularly used to supply hot water to the boilers, while the other serves both as an auxiliary feed line and a boiler wash line. The two



GENERAL PLAN OF PEORIA POWER STATION

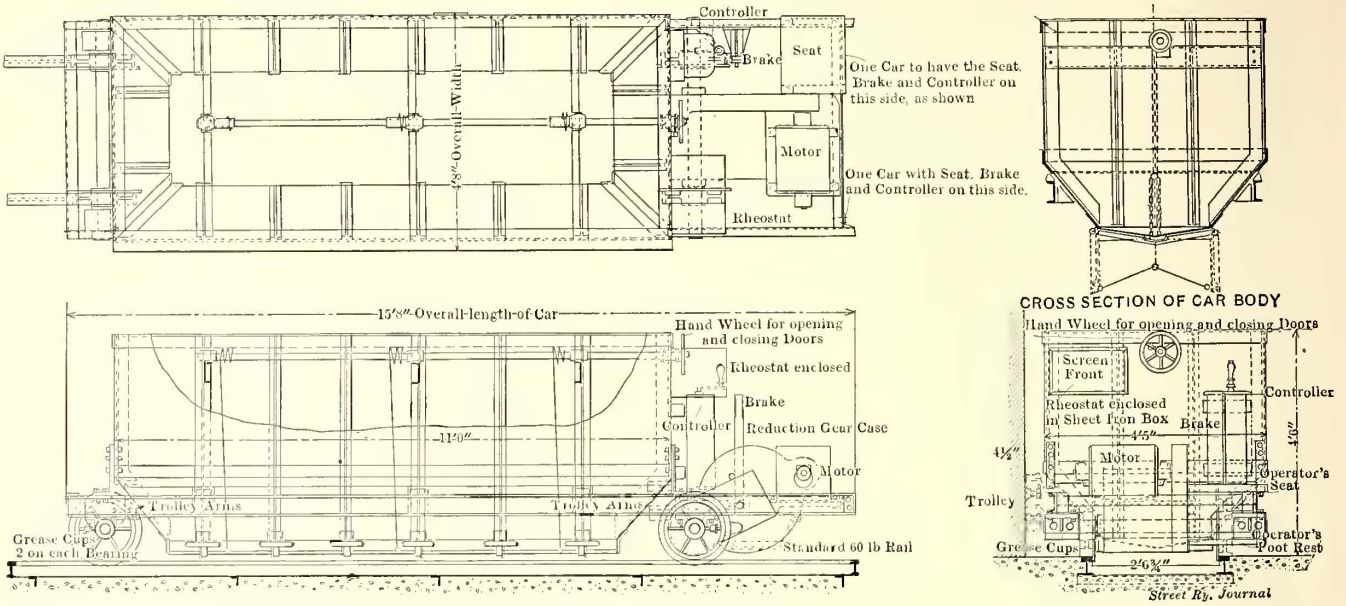


CROSS SECTION OF PEORIA POWER STATION

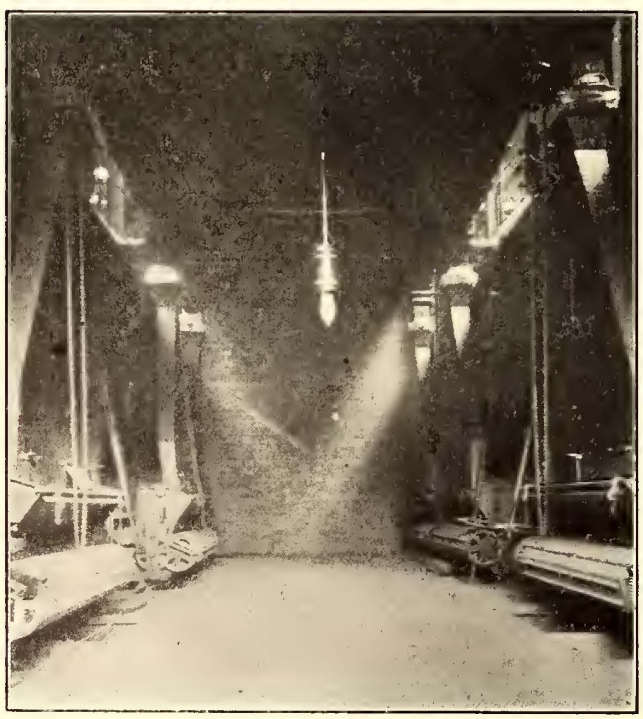
sets of feed lines run independently to the sides of the boilers, where they are brought together by valve connections and a single line enters the rear drum of each boiler.

THE TURBINES

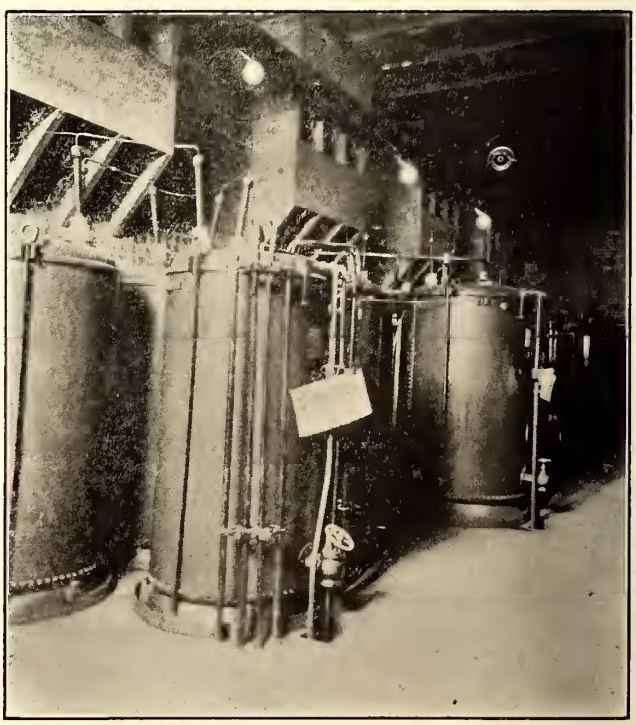
The two 2000-kw, three-phase, 25-cycle Curtis steam turbines are installed at such a distance apart as to permit the condensers and auxiliary apparatus to be located between them, and are placed on brick foundations built up from the basement floor to such a height as to bring the exhaust openings below the turbine room floor. Each turbine is provided with independent auxiliary apparatus, with the one exception that one accumulator will be installed in connection with the oil piping for the step bearings and the oil-operated governors. Wheeler condensers having 8000 sq. ft. of cooling surface are installed in the basement at the bases of the machines and in close proximity to the condenser water supply and discharge pipes. Circulating water is obtained from thirteen 8-in. tubular wells 35 ft. deep. These wells are drilled about 10 ft. apart directly under the turbine room in such a position that short pipes connect them to the suction of the circulating water pump. The wells are drilled in free water bearing gravel, and, although they are located only a few hundred yards distant from the Illinois River, tests have shown that the water drawn out of them comes from the land side rather than from the river. The wells have a continuous capacity of about 650,000 gals. per hour. The 20-inch circulating pump suction header is installed in a concrete pit about 9 ft. below the basement floor. It runs



DETAILS OF COAL AND ASH CAR



MECHANICAL STOKERS IN THE BOILER ROOM



TRANSFORMER ROOM, SHOWING THE CHUTES THROUGH WHICH HIGH-TENSION LINES ARE CARRIED TO THE FLOOR ABOVE

across the building parallel to the line of wells to the water cylinder of a Dean vertical direct-acting steam pump having a capacity of 4300 gals. per minute. While the water cylinder of this pump is installed at the level of the suction header, the steam cylinder is above the turbine room floor. The pump discharge is carried parallel to and directly over the suction and short laterals connect it to the condensers. The discharge of the two condensers is piped into a 30-in. main emptying into an adjacent sewer. Horizontal steam-driven dry vacuum pumps are located immediately over the condensers on the boiler room floor. The hot-well pumps, which are of the centrifugal type, are motor-driven from vertical motors placed above the turbine room floor. The pumps themselves are located in a pit in the basement.

EXCITERS

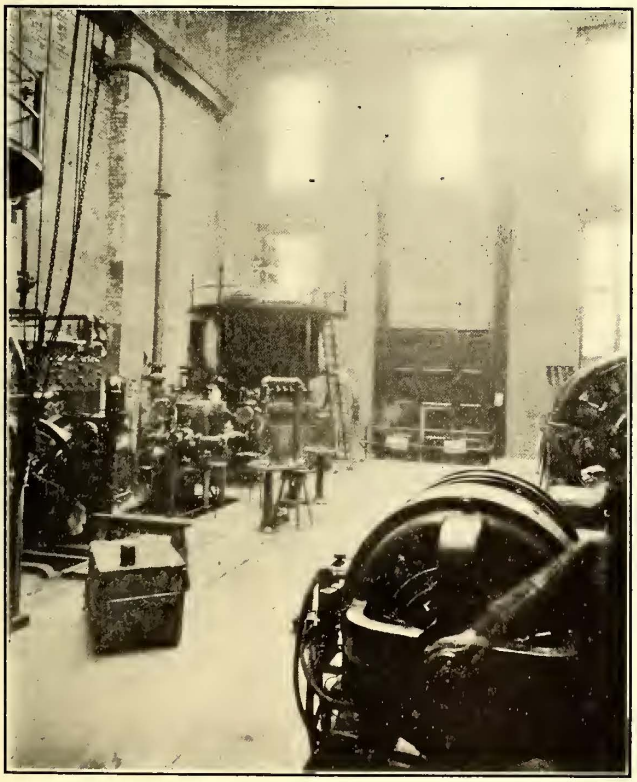
Both steam-driven and motor-driven exciter sets are installed. The steam-driven set is located near the house pumps and consists of a horizontal Curtis steam turbine with a speed of 2400 r. p. m. and a G. E. 125-volt, 75-kw generator. The motor-driven exciter set consists of a similar generator driven by a three-phase, 2080-volt induction motor.

AUXILIARY STEAM PIPING

Steam for the wet and dry vacuum pumps and the oil pumps of each turbine is supplied from the main header supplying the turbine. The two house pumps and circulating water pumps get their steam from the header of No. 2 turbine.

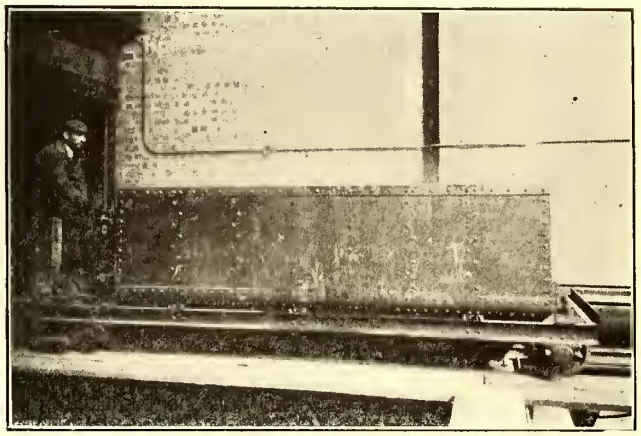
SWITCHBOARD AND ELECTRICAL APPARATUS

The switchboard is installed on the turbine room floor



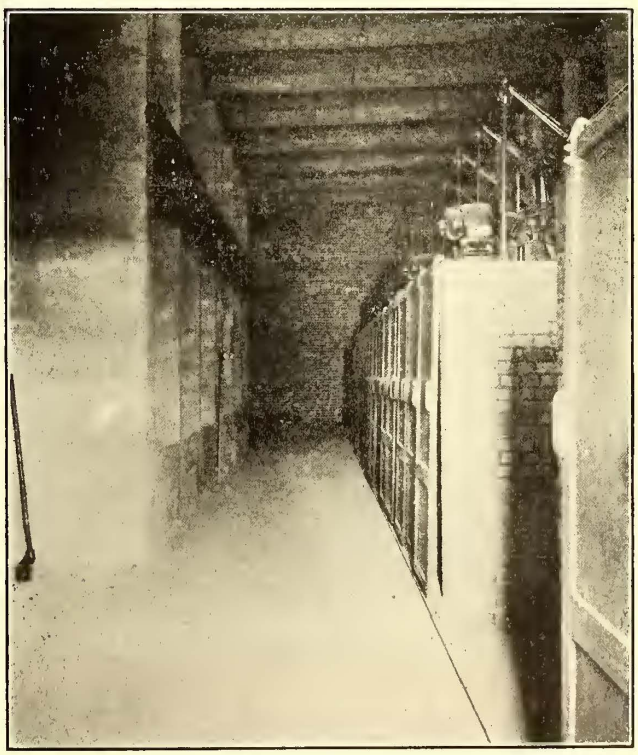
VIEW IN OPERATING ROOM FROM THE SOUTH

in the southeast portion of the building in such a position that the operator has a plain view of the machines being controlled. All of the high-tension apparatus is located in the three-story portion of the building connected to the operating room by one small door. The generator leads, consisting of 700,000-circ.-mil. paper-insulated, lead-covered cable, pass directly to banks of 750-kw oil-insulated



MOTOR-OPERATED ASH CAR

and water-cooled single-phase transformers on the first floor of the high-tension structure. These transformers, which have delta connections, raise the pressure from 2300 volts to 33,000 volts. The high-tension leads from the transformers, which are No. 4 solid bare wire, are carried up through concrete chutes to the motor-operated oil switches installed on the top floor of the high-tension structure. Immediately under these switches are the high-tension buses, which are carried in a brick bus structure having concrete barriers. Two three-phase, high-tension lines of No. 4 copper wire leave the station. The lightning ar-



THE MOTOR-OPERATED SWITCHES AND THE BARRIERS FOR THE OUTGOING HIGH-TENSION LINES IN THE THIRD FLOOR OF THE HIGH-TENSION COMPARTMENT

resters for these are placed on the walls of the switch chamber. Current for each of the two six-phase, 750-kw rotary converters is supplied from the high-tension bus-bars through motor-operated switches above the buses and

through three 250-kw, 33,000 to 400-volt, single-phase transformers located on the lower floor of the high-tension structure. These transformers have two intermediate taps for supplying low voltage for starting the converters. A single 75-kw, 33,000-volt to 2020-volt, three-phase transformer connected to the high-tension buses through an oil switch furnishes current to the motor-driven exciter set.

The engine room crane motor, stoker motors, wet vacuum pump motor, ash car motors and the station lights are supplied with direct current at 125 volts from the exciter bus-bars. A Tirrill regulator is employed in connection with the exciter circuits. The three motors of the boiler room crane are supplied with 325-volt direct current obtained by installing a set of balancing coils in connection with the rotary converter and taking the current from one side. Direct current from the railway feeder circuits was objectionable because of the variation in voltage.

CRANES

In addition to the crane for handling coal and ashes the turbine room is spanned by a 25-ton crane which, with the exception of the hoist, is hand-operated. An 8-ton hand-operated crane is placed over the transformers in the high-tension structure. The station was designed and erected by John A. Radford, engineer, Chicago.

FIFTEEN-CYCLE, SINGLE-PHASE, DEMONSTRATION LOCOMOTIVE FOR THE PENNSYLVANIA RAILROAD

On pages 1139 and 1140 of the Street Railway Journal for June 29, N. W. Storer gave a brief description of a 11,000-volt, 15-cycle single-phase locomotive built by the Westinghouse Electric & Manufacturing Company. It is now possible to report the results of tests of this locomotive and to explain more fully the service for which it was designed.

The locomotive has been developed by the Westinghouse interests in conjunction with the Pennsylvania Railroad, under George Gibbs, chief engineer of electric traction, according to the program laid out by the late President Cassatt; it is the third locomotive built under that program. The first locomotive, which was designed as No. 10,001, was of the geared direct-current type; the second, known as 10,002, was of the gearless, direct-current type. Both of these locomotives were placed in service on the Atlantic Avenue improvement of the Long Island Railroad; each is driven by four 350-hp motors and weighs about 100 tons. The mechanical parts of these two locomotives were constructed at the Altoona shops of the Pennsylvania Railroad, but the electrical equipment was supplied by the Westinghouse Company.

Locomotive No. 10,003, which is illustrated herewith, has been produced as a result of a systematic investigation involving elaborate and exhaustive tests that have been prosecuted for several years. On account of the limited time available, and the necessity for the elimination of all possible delays, both the mechanical and the electrical parts were supplied by the Westinghouse interests. It has been designed of sufficient capacity for the New York terminal operation of the Pennsylvania Railroad. The duty required will be appreciated when it is known that grades of 2 per cent are encountered, yet high speeds must be attained. On the test track at Pittsburg, which is about 5 miles long, and is in reality a succession of curves, locomotive No. 10,003 recently reached a speed of 73 m. p. h., and it is claimed that a speed of 90 m. p. h. can easily be reached on a straight track.

The complete locomotive is to consist of two separate halves, only one of which has yet been constructed; the half locomotive has been found to exert a maximum drawbar pull of 24,000 lbs., indicating a tractive effort for the whole locomotive of 48,000 lbs. The former locomotives were built for third-rail direct-current operation, while the latter locomotive will use single-phase current from an over-head trolley wire. Before the construction for the electrification of the Pennsylvania terminal in New York is undertaken, it is the purpose of the Pennsylvania Railroad thoroughly to test out the merits of these two systems. The decision as to which system will be used will probably not be reached before Jan. 1, 1908.

SINGLE-PHASE DEMONSTRATION LOCOMOTIVE FOR THE PENNSYLVANIA RAILROAD

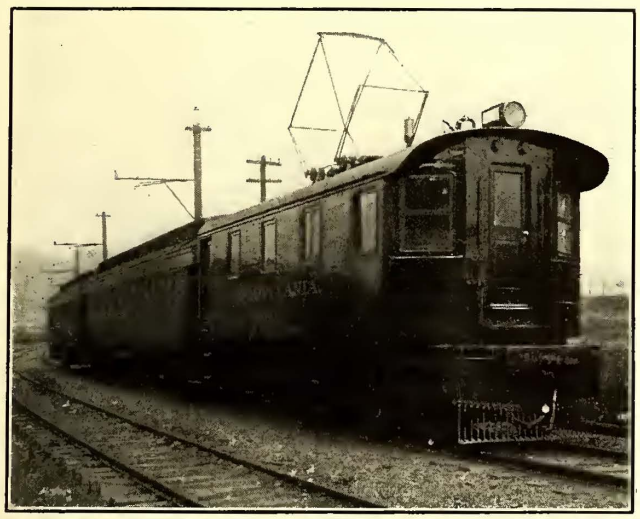
The most striking features of locomotive No. 10,003 are its entire simplicity and the accessibility of the parts that may require attention. All of the main control equipment is placed on a raised platform in the middle of the cab, on each side of which there is a wide passage way. The voltage regulating switches are arranged immediately above the main 11,000-volt auto-transformer which is carried under the cab in front of the motor axles, while the blower equipment and reverse switches are placed immediately over the

propelling motors. Ample space is left on all sides of the main motors for inspection and repair.

Some of the main data of the complete locomotive are as follows:

Total weight, tons	145
Weight on each driver, pounds	50,000
Diameter of drivers, inches	72
Diameter of pilot wheels, inches	36
Rigid wheel base, inches	90
Swivel-truck wheel base, inches	74
Total wheel base (half locomotive), inches	247
Length over all (half locomotive), feet	31
Height of locomotive, inches	160
Width of locomotive, inches	120
Weight of each motor, pounds	20,000
Rating of each motor, horse-power	500
Permissible overload, per cent	100
Number of motors per locomotive	4
Maximum output of locomotive, horse-power	4,000
Normal voltage per commutator, approximate	300
Power factor at full load, per cent	93

The motors are of the gearless type, the method of mounting being identical with that used on the New Haven



EXPERIMENTAL LOCOMOTIVE DESIGNED FOR PENNSYLVANIA RAILROAD

locomotives, as described in the issue of April 14, 1906. Other particulars will be found in Mr. Storer's paper already referred to.

It is interesting in this connection to note that the Westinghouse Company has already built, or has under construction, sixty single-phase locomotives and more than 2000 single-phase compensated series railway motors, and that at the present time at least 1000 miles of track have been arranged for single-phase operation.

The limited service on the Ft. Wayne, Van Wert & Lima road has been changed, the bi-hourly trains having been taken off and four limiteds per day substituted. All other cars will be local. President Schoepf believes that the time has not yet come for such a service and that the traction companies must draw more directly from the local business. He has never been an advocate of limited service, but this road will run enough cars to take care of the through business that comes to it. The Dayton-Toledo route of the Western Ohio is reported to be paying well.

PAY-AS-YOU-ENTER CARS FOR MADISON AVENUE, NEW YORK

It has been announced that the Madison & Fourth Avenue line in New York has been selected by the management of the New York City Railway Company as the one on which to try the pay-as-you-enter cars now being built for the company. If found to be practicable they will be introduced on other lines.

The Fourth & Madison Avenue line has been chosen for this experimental purpose as it is as free from curves and intersecting points as any of the lines in New York. The question of curves has much to do with the installation of the cars. They necessarily have long, extending platforms, capable of accommodating thirty or more passengers, but it is thought that no difficulty will be experienced on the line selected.

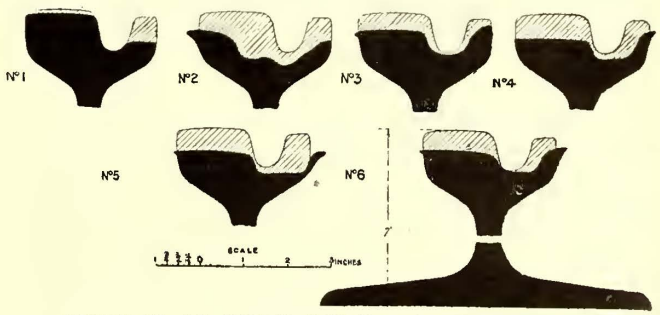
RAIL WEAR IN SHEFFIELD, ENGLAND

C. F. Wilke, city engineer of Sheffield, Eng., read a paper before the Incorporated Association of Municipal and County Engineers at Liverpool, June 20-22, on the wear of rails on the municipal road in Sheffield. The present standard rails are British standard section No. 5, 60 ft. in length, and weigh 110 lbs. per yard; the former rails were of the section shown below and weighed 108 lbs. per yard. The following table of costs of track renewals and repairs in Sheffield is given:

COST OF TRACK REPAIR AND RENEWALS IN SHEFFIELD.

Year Ending March 25.	Car miles in thousands.	Cost Per Mile of Single Track.		Cost Per Car Mile	
		Repairs.	Renewals.	Repairs.	Renewals.
1901	1,886	$136.36	$63 24	$ 00296	$ 00136
1902	3,525	291.02	188 62	00414	00268
1903	4,777	275.42	...	00344	...
1904	5,768	619.54	227 18	00712	00262
1905	6,049	670.44	193.00	00750	00204
1906	6,236	529.48	472.90	00598	00526
1907	6,804	486.96	831.36	00498	00950

Mr. Wilke also presented the accompanying sections of worn rails taken from busy routes. He says: "The rails,



SECTIONS OF WORN RAILS FROM SHEFFIELD

of which these are fair specimens, were of low carbon, but they have worn very evenly and given good running till the last without showing signs of corrugation." The following particulars are given of each rail:

	Grade.	Radius of Curve.	Life of Rail.	Per Cent. Carbon.
Number 1*	Unused.	Track.	78 months.	0.35 to 0.45
Number 2	1:11	130 feet.	92 months.	0.35 to 0.45
Number 3	1:542	tangent.	93 months.	0.35 to 0.45
Number 4	1:15	150 feet.	84 months.	0.35 to 0.45
Number 5	1:25	230 feet.	84 months.	0.35 to 0.45
Number 6	1:23	tangent.	84 months.	0.35 to 0.45

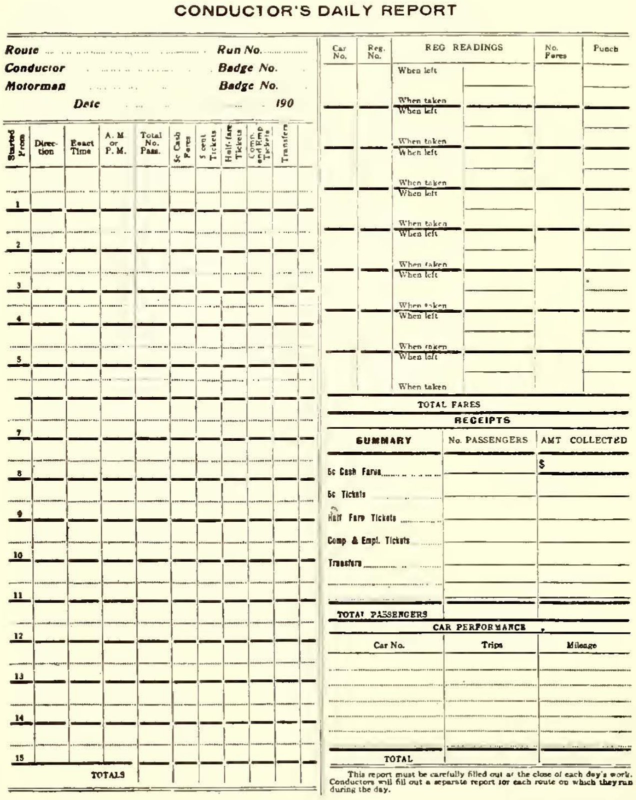
* This rail was worn by vehicles.

SOME FEATURES OF THE ACCOUNTING SYSTEM AT LITTLE ROCK

The accounting system at Little Rock to a certain extent corresponds to that of all the roads of the Newman Syndicate, but there is in connection with it several features and original forms that have been gotten up by local men.

The data from the conductors' trip sheets and from the reports of the conductors, the starters and the inspectors is used in filling out two daily reports, that of the superintendent of transportation and that termed the "car service daily report." The superintendent's report is concerned only with the operation of the cars. It shows the number of cars in service on each line each hour of the day, and note is also made on it of chartered cars or cars in special service. The lines on which accidents take place and their nature are reported, and likewise any delays, together with their cause and duration.

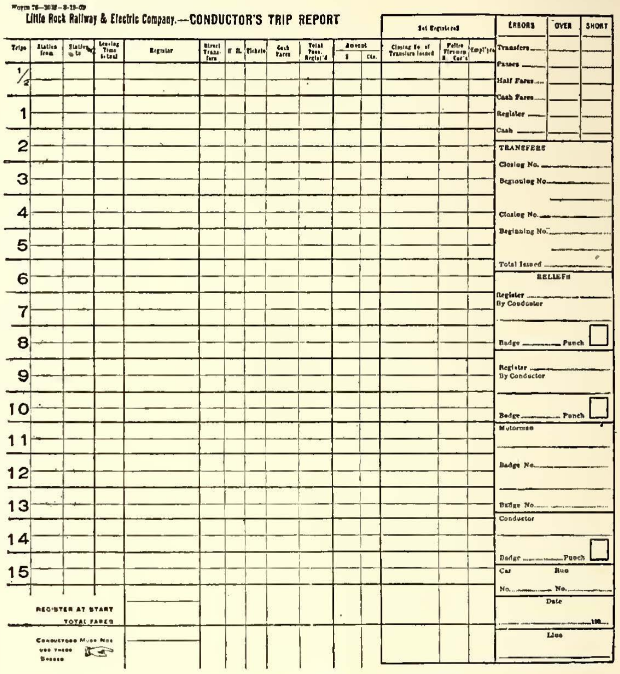
The car service report is concerned only with the fares collected, transfers issued and the number of persons carried free. The totals for each run number are given, together with the names of the conductor and motorman, the number of the car and the number of trips it made. All this data is copied direct from a trip book, the pages of which have a heading similar to the car service daily report, but which, instead of giving figures for each run, show the fares collected, transfers issued and other data for each trip of a run. Most of the data of this trip book is taken directly from the trip sheets and conductor's daily report. The number of transfers, however, is taken from the closing number on



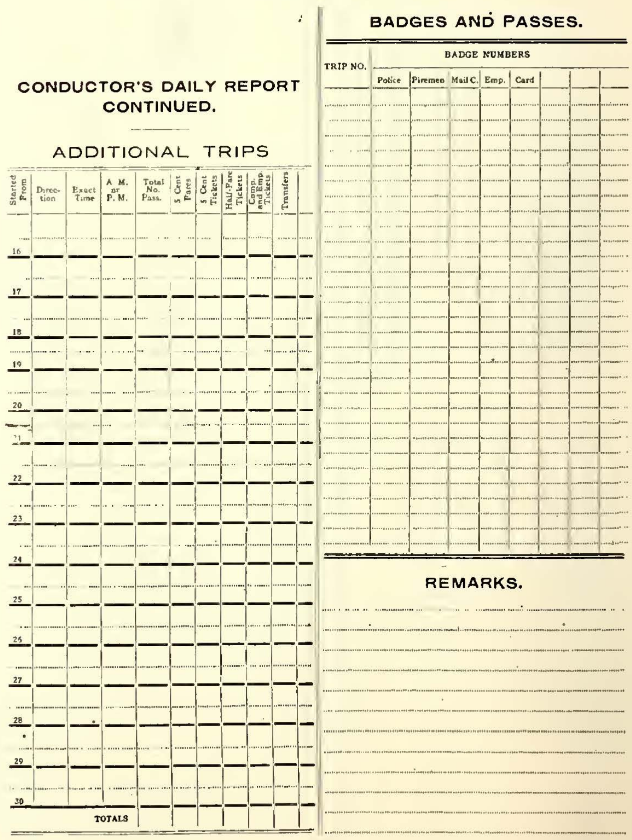
INSIDE PAGES OF CONDUCTOR'S DAILY REPORT

the pads turned in by the conductors each day. As transferred to the car service daily reports the totals of the footings on the trip book, of the transfers, dead-heads, half-fare tickets and cash fares must balance with the total number of passengers as indicated by the register readings, and the cash fares multiplied by 5 must of course equal the amount of money collected in cents.

The franchises of the company require that policemen, firemen and mail carriers be carried free and their passage, together with employees, is not registered, but account is kept of the number carried.



CONDUCTOR'S TRIP REPORT



OUTSIDE PAGES OF CONDUCTOR'S DAILY REPORT

Keeping a record of the totals of each trip might by some be considered to necessitate more work than is warranted by results. But such a record enables conductors to be checked by the method of averages. The receipts from trips at the same time of day for different days and for different months bear such a constant relation that if the receipts are tampered with a close comparison will usually

arouse suspicion, and the suspicion may then be verified by changing men on that particular route. The trip record also enables traffic curves to be made out which show whether larger cars should be used or the cars double-headed at certain portions of the day.

The trip sheet with which the conductor taking out the car in the morning is supplied is of course passed on from one conductor to another as reliefs are made, and it is finally turned in at night by the last conductor. Conductors are also required to keep records on daily report blanks. Each conductor is supplied with one of these and keeps it during the day. Upon this report blank is summarized by trips the fares collected by him during the day or during that portion of the day he ran on one line. Space is left on these reports for entering the badge and card numbers of those carried free.

FORM 92. 100M-9-06.

LITTLE ROCK RY. & ELECTRIC CO.

CONDUCTORS TRIP ENVELOPE.

DATE_____1906

_____LINE.

TRIP NUMBER._____

RUN NUMBER_____

LEAVING_____AT_____

	TRANSFERS RECEIVED.	DEAD-HEADS RECEIVED.	PAY-TICKETS RECEIVED.
OUT-BOUND			
IN-BOUND			
TOTALS			

NAME_____

BADGE NUMBER_____

LITTLE ROCK RAILWAY & ELECTRIC COMPANY, FRONT OF CONDUCTOR'S TRIP ENVELOPE

The Steadman time limit transfer, which has printed upon it in heavy type the day of the month, is used, and while it has been found that this form entails a loss in transfers of about 15 per cent, the fraudulent use of transfers is checked to such an extent as to warrant its use. The month is punched in the office so that the conductor is required to make only two punches. Each of the seven lines has a different colored transfer. Transfer points are punched rather than lines. The time numbers are arranged vertically opposite the transfer points to facilitate reading when punching. Canceled transfers are placed in trip envelopes, together with tickets, and are deposited in boxes at the downtown end of every trip.

There are three uniformed inspectors in the employ of the company, and these make reports on special blanks of the time cars pass a certain point, of defective cars, line, or track, of violations of rules by employees, and of accidents.

ACCIDENTS

Conductors carry preliminary accident reports which are made out at the time the accident occurs and are delivered immediately to the inspectors or are taken to the office of the superintendent of transportation. In addition to blank

WITNESSES

NAME	ADDRESS

Form 323—2 M—2-1406

LITTLE ROCK RAILWAY & ELECTRIC CO.

PRELIMINARY ACCIDENT REPORT

☞This report to be filled out at time of accident and to be delivered to first inspector you meet OR AT CAR BARN

Date..... 190..

Line..... Car No.....

Time..... M Direction of car.....

Exact place of accident.....

No. of passengers on car at time of accident.....

Condition of track.....

Condition of car.....

State of weather.....

Where was conductor.....

Nature of accident, and extent of injury or damage.....

Where was injured person taken.....

Accident reported to.....

Accident reported by.....

Time reported.....

OUTSIDE OF PRELIMINARY ACCIDENT REPORT

spaces for the names of witnesses other blanks are provided for noting the most important facts in connection with the accident.

Before leaving the car house for the day the trainman supplements the preliminary report with another, made in triplicate, in which all minor details of the accident are given. A diagram of a street crossing on the back side enables the trainman to indicate the relative point at which the accident occurred. The original of this supplementary report is sent to the general manager. One copy is sent to the claim department, another to the company's attorneys, and another is retained in the office of the superintendent of transportation.

The company employs a surgeon who is paid for attending

Form 321 500-9-06

LITTLE ROCK RAILWAY & ELECTRIC COMPANY

Daily Report of Superintendent of Transportation

Weather..... Date.....190....

NUMBER OF CARS IN SERVICE.

Each Trailer Counted as One Car.

LINE.	A. M.							P. M.											A. M.				
	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
Fifteenth Street																								
South Main																								
West Ninth Street																								
Highland Park																								
East Ninth Street																								
East Fourteenth																								
Pulaski Heights																								
Baseball Cars																								
Opera Cars																								
Owl Cars																								
Total cars operated																								

DAILY REPORT OF SUPERINTENDENT OF TRANSPORTATION

to its accident cases at a stipulated sum for each case according to the injury sustained. The surgeon is notified immediately when an injury is received by any one. If the injury is caused by cars or by employees of the company the surgeon visits the person injured and makes an examination of the injuries or alleged injuries. He reports on a surgeon's blank, and under "Remarks" reports anything he may have heard the injured person say regarding the acci-

Form 240—2m—9-06.

LITTLE ROCK RAILWAY AND ELECTRIC COMPANY

Accident Report

LITTLE ROCK, ARK....., 190....

Line..... Car No..... Run No..... Direction.....
Motorman..... Badge..... Conductor..... Badge.....
Exact time.....m. Exact place.....
Was car in motion..... What was speed of car.....
Was car starting up or slowing down.....
Number of passengers on car.....
Condition of car..... Where was Conductor.....
Condition of track..... State of weather.....
What was the accident or occurrence, and the cause of it.....
.....
Name and residence of person injured.....
.....
.....
What was the nature and extent of injury.....
.....
Was injured person male or female....White or colored....Age (about)...
Was any damage done by your car to any vehicle or other property, and what was the extent of it.....
.....
Description of vehicle.....
Owner's name and address.....
Driver's name and address.....
What part of wagon was struck, and by what part of car.....
Which direction was wagon going when first seen.....
Was car on time.....
How many feet ahead of car did wagon pull on track.....
Was gong being rung.....
Number of steps from front of car when stopped to place of accident .....
What was done for the injured person, and where taken.....
.....
What did driver or injured person say about the accident.....
.....
State here information not given above.

This report to be made out by employee before leaving the car house on the day of the accident.

Sign here .....

Occupation .....

INSTRUCTIONS REGARDING ACCIDENTS

In case of accident, however slight, in connection with, or near your car, to persons or property, you will render all necessary assistance, and at once obtain the names and residence of the persons injured, and of all witnesses on or near the car; then make a written report on this form answering all questions properly.

Give no account of an accident to any person other than an official of the company.

LITTLE ROCK RAILWAY AND ELECTRIC COMPANY

.....
Accident Report No.....
.....
.....
.....
At .....
Date ....., 190....

(DO NOT FILL OUT ABOVE)

WITNESSES

(White)

Name .....
Address .....
Name .....
Address .....
Name .....
Address .....

(Colored)

Name .....
Address .....
Name .....
Address .....

Form 323—2 M—2-14-06.

LITTLE ROCK RAILWAY & ELECTRIC CO.

PRELIMINARY ACCIDENT REPORT.

This report to be filled out at time of accident and to be delivered to first inspector you meet OR AT CAR BARN.

Date.....190....

Line..... Car No.....

Time.....M. Direction of car.....

Exact place of accident.....
.....

No. of passengers on car at time of accident.....

Condition of track.....

Condition of car.....

State of weather.....

Where was conductor.....

Nature of accident, and extent of injury or damage.....
.....
.....

Where was injured person taken.....
.....

Accident reported to.....

Accident reported by.....

Time reported.....

INJURY TO PERSONS.

NAME.	Address.	Color.

DAMAGE TO PROPERTY.

PROPERTY DAMAGED.	Name of Owner.	Address.	License No.

NAME OF DRIVER.	Address.	Color.

Remarks.....
.....
.....
.....
.....
.....

Motorman.....Badge No..... Conductor.....Badge No.....

WITNESSES.

NAME.	Address.

dent. This report is made in triplicate, one copy being furnished to the general manager, one to the attorney and one to the claim agent.

An examination is made of cars concerned in accidents as soon as possible after the accident is reported, and record

Form 211-12 Bks—2-05.

LITTLE ROCK RAILWAY & ELECTRIC COMPANY

Condition of Cars Report

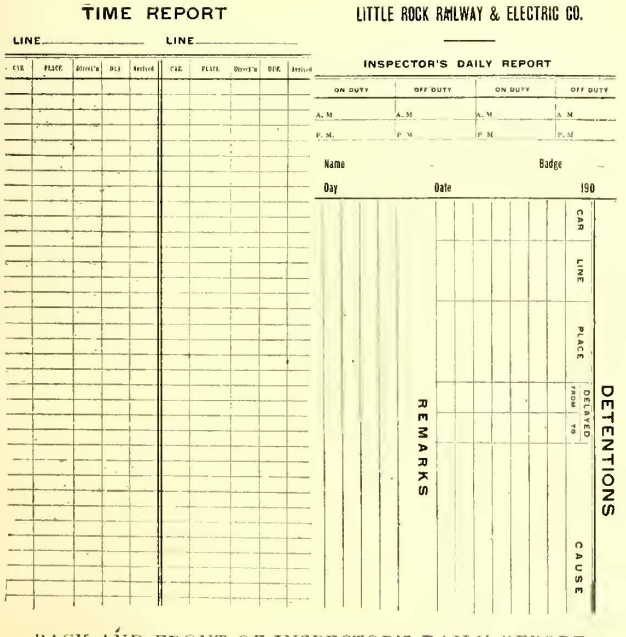
Day.....Date.....190....

CAR-BODY TROUBLE

	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.
Doors							
Window							
Ventilator							
Gate							
Seats							
Draw-bar							
Coupling pin							
Signal bell							
Bell cord							
Electric bell							
Register							
Register rod or handle							
Curtains							
Signs							
Grab-handle							
Dash or panel							
Step or runboard							
Brake staff or handle							
Gong							
Car dirty (leaving car house)							
Sand-box							

TRUCK TROUBLE

	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.
Hand brakes							
Hand brakes							
Air-brakes							
Brake-chain or rod							
Flat wheel							
Hot box							
Springs							
Motor supports							



BACK AND FRONT OF INSPECTOR'S DAILY REPORT

ELECTRIC EQUIPMENT TROUBLE

	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.	Car No.
Motor pulls power							
Motor flashed							
Motor "bucked"							
Motor leads							
Controller							
Fuse-box							
Circuit breakers							
Hood switch							
Trolley comes off							
Trolley pole							
Trolley wheel							
Trolley rope							
Light circuit							
Head light							
Gear or case							
Resistance							

Time..... A. M. P. M. Sign .....

PART OF CONDITION OF CARS REPORT

of the car's condition is made in a book at the shops used for this purpose. A copy of this record is made and is attached to the accident report so as to meet the contentions generally made in accident suits as to the condition of the car at the time of the accident.

CONDITION OF CAR REPORTS

All motormen taking cars out in the morning are supplied with a car report, and are instructel to indicate by a cross any defect of the car. Even when there is no defect, they

Form 317—10 M—3-06

Little Rock Railway and Electric Co.

CONDITION OF CAR REPORT

Car..... Line..... Run.....

Day..... Date..... 190....

Make Mark thus . X, opposite defect to be reported. If the defect cannot be easily located give in additional particulars which will assist in locating the trouble. This report must be made at the completion of each day's work.

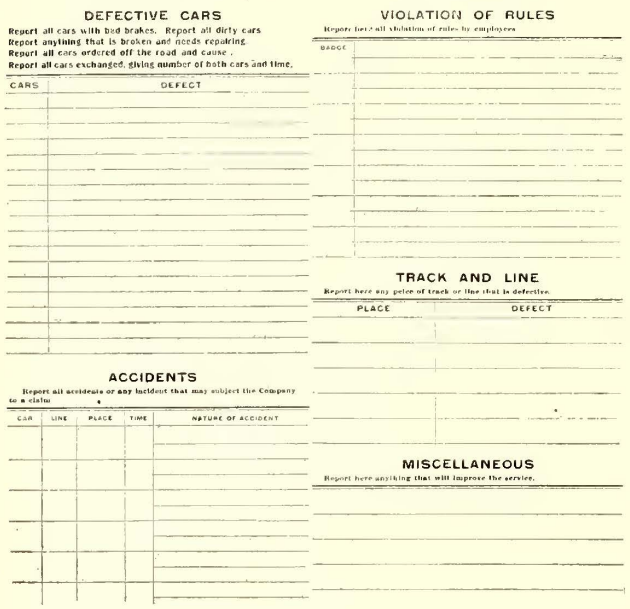
CAR BODY TROUBLE	TRUCK TROUBLE
Doors	Hand Brakes
Windows	Air Brakes
Ventilator	Brake Chain or Rod
Gate	Flat Wheel
Seats	Hot Box
Drawbar	Springs
Coupling Pin	Motor Support
Signal Bell	
Bell Cord	**ELECTRIC EQUIPMENT TROUBLE**
Electric Bell	
Register	Motor Pulls Power
Register Rod or Handle	Motor Flashed
Curtains	Motor "Bucked"
Signs	Motor Leads
Grab Handles	Controller
Dash or Panel	Fuse Box
Step or Runboard	Circuit Breaker
Brake Staff or Handle	Hood Switch
Gong	Trolley Comes Off
Car Dirty (leaving barn)	Trolley Pole
Sand Box	Trolley Wheel
	Trolley Rope
If car is in good condition make an "O. K." mark here.	Light Circuit
	Headlight
	Gear or Case
	Resistance

Signals out of order at .....
Track " " " " .....
Wires " " " " .....
Remarks .....

Time ..... A. M. P. M. Signed ..... Motorman

MOTORMAN'S REPORT ON THE CONDITION OF CARS

are required to sign the report and turn it in at night. From the separate reports a summary of all the defects is made on a separate sheet, and a duplicate of this sheet is sent to the night foreman, who puts his O. K. on all the repairs he makes and then leaves the sheet with the day foreman so that this foreman will know why each car is left


DEFECTIVE CARS

Report all cars with bad brakes. Report all dirty cars
Report anything that is broken and needs repairing.
Report all cars ordered off the road and cause.
Report all cars exchanged, giving number of both cars and time.

CARS | DEFECT

VIOLATION OF RULES

Report here all violation of rules by employees.

BADGE

TRACK AND LINE

Report here any piece of track or line that is defective.

PLACE | DEFECT

ACCIDENTS

Report all accidents or any incident that may subject the Company to a claim.

CAR | LINE | PLACE | TIME | NATURE OF ACCIDENT

MISCELLANEOUS

Report here anything that will improve the service.

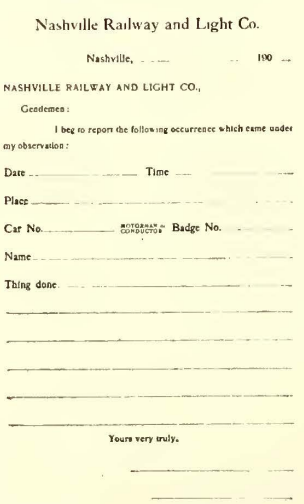
INSIDE PAGES OF INSPECTOR'S DAILY REPORT

in the shop. When all the repairs are made the sheet is O. K.'d and returned to the office. All the slips and reports are filed away to be used as reference in case of legal proceedings.

The details of the accounting system as outlined have been largely developed since the system was acquired by its present owners.

REPORTING OFFENSES AT NASHVILLE

At Nashville only the superintendent of transportation is allowed to criticise trainmen for shortcomings. Dispatchers, inspectors and all other officers noting violations of the rules make reports to the superintendent on special blanks. These give the time and place the offense was committed and describe briefly the nature of the offense. They are signed by the person making the report.


Nashville Railway and Light Co.

Nashville, ... 190 ...

NASHVILLE RAILWAY AND LIGHT CO.,

Gentlemen:

I beg to report the following occurrence which came under my observation:

Date ..... Time .....

Place .....

Car No. ..... Motorman or Conductor Badge No. .....

Name .....

Thing done .....

Yours very truly,

REPORTING OFFENSES AT NASHVILLE

The Easton Transit Company, of Easton, Pa., has adopted a rule requiring the conductors on open trail cars to work toward each other while collecting fares. That is, the conductor on the rear car starts at the back and works forward, while the one on the forward car starts at the front of the car and works toward the rear seats. This was done to prevent passengers from jumping from the front to the rear car to avoid the payment of fares.

THE LAWS OF MIXED VAPORS

BY W. H. BOOTH

In the modern search after good vacuums in steam engine condensers, especially with turbine engines, it is doubtful if many engineers give that full consideration to the law of mixed vapors to which it is entitled by virtue of its telling effect on steam condensation problems. Dalton it was who enunciated the law, and Rankine, in his classic work on the steam engine, gave more than ordinary attention to it, for he used language when dealing with this part of his subject that is more than ordinarily clear. Briefly, the law states that when two gases occupy the same space they will exert a pressure which is equal to the sum of the pressures each gas would have exerted had it been enclosed separately. If the law does not hold good then it is a proof of some combination between the gases.

Now we also know, or think we know, that the pressure of water vapor is a function of the temperature, and we are apt to think that if air is pumped into a vessel containing steam and hot water the steam must pass back into water so that the pressure may remain that proper to the water temperature. But such is not the case. It is one of the properties of water that the space above it must contain a definite mass of vapor proper to the temperature of the water, no matter what other gas may be present in that space. The water vapor, or presumably the vapor of any other liquid, will insist upon occupying that space to a definite fixed quantity. Pressure does not appear primarily to count, though necessarily it follows as a sequence of the temperature. In brief, if water at 0 deg. C. be enclosed in a vessel with a cubic foot of air and the whole be heated to 100 deg. C., the pressure will be something over two atmospheres; that is to say, one atmosphere for the water vapor and a full one atmosphere for the non-expanded air which started cold at one

Here the water vapor and the air follow the law of mixed vapors, but there is the unexpected phenomenon of water vapor at a pressure double that ordinarily looked on as proper to its temperature. It is simple enough when realized. The pressure will quickly fall to one atmosphere if the air be allowed to escape. A recognition of these facts makes it clear why a freshly started boiler often loses many pounds of its pressure when the engine starts, the fact being that the gage pressure shown was fictitious and caused by air imprisoned in the boiler when started up.

If the temperature in a condenser is known, the vacuum should be known. If the vacuum is not so good as the temperature would indicate, the reason must be sought entirely in air, for the vacuum pressure is the sum of the vapor pressure proper to the temperature and of the pressure the air would show on the gage if present dry and alone. Thus, if a condenser has a temperatuure of 126.1 degs. F. and a vacuum of only 11.7 lbs., there must be as much air present as would fill the dry, empty condenser to a pressure of 1 lb., for $14.7 - 11.7 = 3.0$, and the absolute pressure corresponding to a temperature of 126.1 is 2 lbs. Whence $3 - 2 = 1$ lb., and this 1 lb. is due to air, and where there is a wide difference between temperature and the vacuum obtained air leakage must be sought for. It is useless and wasteful to run an air pump quickly to remove air in large volumes. Air should be excluded so perfectly that the vacuum will not deteriorate 10 per cent in an hour after the plant is stopped.

THE PRINTING DEPARTMENT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

The printing department of the Milwaukee Electric Railway & Light Company was organized about one year ago primarily to print tickets and transfers, but the scope of its work has gradually broadened until practically all of the printing required by the company is done by it. From two employees, a man and a boy, the number has increased to approximately fifteen. The department's first quarters were in a small room on the fourth floor of the new Public Service Building, but it has outgrown them and is now located across the hall in two rooms—one 27 ft. x 125 ft. and the other 27 ft. x 30 ft. The large room, which contains the machinery, is provided with an overhead traveler for conveying stock paper from one portion of the room to the other and is lighted by Cooper-Hewitt and 64-cp incandescent lamps. The machinery is so located that in going through the several processes of trimming, printing, perforating and stitching the paper is carried continuously from one end of the room to the other. In accordance with the policy of John I. Beggs, president and general manager of the system, all of the machinery is the best obtainable. Transfers and tickets are printed on a specially designed press made by the Harris Automatic Press Company. It runs two colors, numbers and perforates 600,000 tickets per hour and prints, numbers, dates and perforates automatically 125,000 transfers per hour.

Ordinary press work is done on a Miehle press. In addition, there is a Colts Armory press for embossed covers and other heavy work and a Chandler & Price press for getting out small forms, such as tags and business cards. Ruling for ledgers and blank books is done on a Hitchcock ruling machine. Other apparatus consists of a Seybold cutter, a Latham numbering machine, a Latham stitcher, a perforating machine and a press for bailing canceled tickets and transfers. All of the machinery has individual motor drive.

The composing room equipment is very compactly designed. All the woodwork in the room is of the same finish as that of the interior of the building. The only things not printed by the company are the large posters or dash signs for the cars. The work of the department includes the printing and ruling of ledger, pay-roll and other large sheets, the printing of checks, personal cards, typewriter letters, load records, contracts and advertising matter.

Job No. 970

The Milwaukee Electric Railway & Light Co.

PRINTING BUREAU

This Job Ordered by .....

Authority .....

Date Received .....

To Be Delivered to .....

Not Later Than .....

If, for any reason this work was not delivered on or before date specifed, state why.

.....

.....

Quantity and Description .....

.....

Stock Required .....

.....

.....

.....

.....

Color of Ink .....

BINDING

Ruling	*Check Binding* .....
Stitching	*Cloth* .....
Numbering	*Half Leather* .....
Blocking	*Pamphlet* .....
Perforating	.....

STANDARD RECORD OF JOB ORDER

Report of PRINTERY for the Month of 190

JOB NO.	FORM NO.	DESCRIPTION.	ORDERED BY	Date Received	Date Finished	Delivered to	COST OF PRODUCTION: LABOR Accts 110-118	COST OF PRODUCTION: MATERIAL Accts 115-119	COST OF PRODUCTION: MISCELLANEOUS Accts 111-113-114	COST OF PRODUCTION: Total Cost	VALUE (Sold form price each and by outside party)	REMARKS

AMOUNT OF PRODUCTION, Based on price paid for each piece of work to concern doing same last previous to establishment of Printery, or in case of new or special work what would be considered a fair charge by outside concern.....

EXPENSES, as Itemized .....

PROFIT (black ink) or LOSS (red ink).....

COST OF PRODUCTION

Salaries and Wages (Accts 110 and 118).....

Materials (Accts 115 and 119) .....

Miscellaneous (Accts. 111, 113, and 114) .....

Fixed Charges (Accts 112, 116 and 117).....

Total Expenses .....

REMARKS:

.....
In Charge.

MONTHLY REPORT OF THE PRINTING DEPARTMENT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

Cloth and paper binding is done, but other binding is sent out.

A very close account of the expense of the department and of each job is kept and the cost compared with what it

would have been under outside contract. By this means the fact as to whether the department is a paying institution can always be determined.

Orders for work are received from the purchasing department in the same manner as they would be received if the department were not connected with the company, except that the requisition is termed an inter-department order. It is put into a numbered job envelope into which all information relating to the job is afterward filed. Compositors and other employees fill out time cards specifying the amount of time spent on each job. The labor charge for each job is entered on a "printery cost ticket" for that job from the time cards each morning. When the work is completed the cost of the stock is entered as material used and the cost of any other special expenses is entered under "special expenditures." To the material labor and special expense charges is added the proper percentage of the total charges for rent, power, light, superintendent's salary, interest on investment and depreciation. The proportion for each job is obtained at the end of the month by taking the proportion of the total general expense that the labor and material charges for that job bear to the total labor and material charges of the deprtment for the month.

At the end of the month a complete report of the department is sent to the auditor. This report specifies each job, by whom the work was ordered, and whether it was delivered to the proper department. The labor, material and miscellaneous costs are itemized and comparison of the actual cost with the cost if the work had been done outside is made, as in each job record.

STOCK RECORD

About $5,000 worth of material is usually carried in stock. This, however, is largely stock for transfers. Each grade or kind of paper is designated by a lot number and a stock record card is made out for it. When a job record card or envelope is made out the material used and its value is entered on the stock record card. The balance of stock on hand is carried out with each entry.

While the printing department, with investment depreciation, rent and everything considered, has been able to do work at a little less cost than the work could have been gotten for from outside concerns, there are several other features which make it a desirable institution. In the matter of transfers the ability to get these out on short notice is of great value. Moreover, more care is taken in getting the work out neatly and extra charges for changes of copy or form are eliminated.

The Milwaukee Electric Railway & Light Co.

PRINTERY TIME SLIP

Name.......................................Date..................190

JOB NO.	OPERATION	FROM	TO	TOTAL TIME
			Total Time............	

Every Employee is expected to fill out this slip properly and place on the Superintendent's desk at the close of each day's labor. Any time spent on work not directly chargeable to a specific job should be distributed judiciously among the various job numbers.

EMPLOYEE'S PRINTERY TIME SLIP

Job No .... Form No..........

Quantity............Name...

The Milwaukee Electric Railway & Light Co.

PRINTERY COST TICKET.

DATE	NAME OF EMPLOYEE	OPERATION	TIME	AM'T

Material Used Chargeable to Acc't 119.

Special Expenditures:

Cost ....

This Job's proportion of Month's General Expenses.....

Actual Cost of Production............

Price Charged by other concerns for above work...

If new or special form quote here a reasonable charge for same ....

Ordered by ....Date Rec'd.....................Date Del'd...............

Remarks...

DETAILS OF PRODUCTION COST

The Milwaukee Electric Railway & Light Co.

PRINTERY RECORD OF STOCK.

Items on this card chargeable to Account 119.

Quantity and Description..

Printery Requisition No..................on Purchasing Agent Price..........................

Rec'd and Put in Stock..............................190 . Designated as Lot No.............

Cupboard No..................... Row No. ....Shelf No......................

Remarks...

DRAWN FROM ABOVE AS FOLLOWS:

	Job No.	Date Taken	Quantity Used	Balance	Value
		* Total....		† Total....	

* Total Quantity Used must compare exactly with Quantity Purchased.

† Total Value must compare exactly with Price as designated above.

STOCK RECORD OF PRINTING BUREAU

MUNICIPAL OWNERSHIP VS. PRIVATE OWNERSHIP

After an investigation extending over nearly two years and embracing many of the principal cities both of the United States and Great Britain, the National Civic Federation Commission on Public Ownership and Operation has completed its duties. Four interesting reports have just been made public. Two of these are on labor conditions and two on the water, gas, electric lighting and power plants. Of the two reports discussing the labor situation under municipal and private ownership, one is by Prof. John R. Commons, of Wisconsin University, and the other by J. W. Sullivan, editor of the "Clothing Trades Bulletin," of New York. The report of Professor Commons is more favorable to municipal ownership of public utilities than is that of Mr. Sullivan. The reports upon the public utilities represented by the gas, electric lighting and power and water installations are made by Walton Clark, of Philadelphia, and Charles L. Edgar, of Boston, who are opposed to municipalization, and by Edward W. Bemis, of Cleveland, and Prof. Frank Parsons, of Boston, who favor it.

As already announced in this paper, the committe of investigation of the Commission is composed of twenty-one members, as follows: Prof. John R. Commons, of the University of Wisconsin; J. W. Sullivan, editor of the weekly "Clothing Trades Bulletin," and a prominent labor leader; Walton Clark, vice-president of the United Gas Improvement Company, Philadelphia; Daniel J. Keefe, president of the International Longshoremen, Marine and Transport Workers' Association; Walter L. Fisher, president of the Municipal Voters' League of Chicago; Melville E. Ingalls (chairman), chairman of the Cleveland, Cincinnati, Chicago & St. Louis Railroad Company; Prof. Frank J. Goodnow, of Columbia University; Dr. Albert Shaw (vice-chairman), editor of the "American Monthly Review of Reviews"; Edward A. Moffett (secretary), editor of the "Bricklayer and Mason"; Edward W. Bemis, superintendent of water-works, Cleveland, Ohio; Milo R. Maltbie, formerly editor of "Municipal Affairs," of New York; Charles L. Edgar, president of the Edison Electric and Illuminating Company, of Boston; H. B. F. Macfarland, Commissioner of the district of Columbia; W. J. Clark, foreign manager for the General Electric Company, New York City; Timothy Healy, president International Brotherhood of Stationary Firemen; Dr. Talcott Williams, journalist; F. J. McNulty, president International Brotherhood of Electrical Workers; Prof. John H. Gray, of Northwestern University; Prof. Frank Parsons, president of the National Public Ownership League, and Albert E. Winchester, general superintendent of the electric works of the city of South Norwalk, Conn., and W. D. Mahon, president of Amalgamated Association of Street and Electric Railways of America.

Fifteen members of the investigating committee sailed for Europe on May 22, last year, and returned to the United States in August. Among the cities visited abroad were Glasgow, Newcastle-on-Tyne, London, Liverpool, Norwich, Manchester, Birmingham, Dublin, Leicester and Sheffield. Investigations in the United States were made in Cleveland, Chicago, Philadelphia, Wheeling, Detroit, Indianapolis, Richmond, Atlanta, South Norwalk, Syracuse, Allegheny, New Haven and Hartford. A staff of engineers, accountants and statisticians, numbering over twenty, of national reputation, were employed to examine thoroughly every undertaking visited by the committee. These experts were so chosen, that in each examination made, both sides of the municipal ownership question were represented. Thus, one engineer, accountant or statistician approached the subject under consideration favorably disposed toward municipalization, while his colleague began his task holding views in opposition to that principle.

Abstracts of the reports already given to the press are printed below. It is expected that the reports on municipal and private ownership of street railways will be made public in about a week.

MR. SULLIVAN'S REPORT

The prevailing wage policy in the British municipalized undertakings investigated is to pay the skilled workman trade-union rates and the unskilled "a minimum wage." In all but the most poorly paid forms of labor municipalization has not raised the wage of workday conditions of the employees above conditions in the private undertakings, the exceptions noted showing the dubious advantages of possibly providing municipal employees with work at the expense of the community or furnishing them with a leverage for the play of politics.

But with respect to "common, unorganized labor," the investigators found a difference somewhat favorable to British municipal employees. The report cites facts that explain the causes. (1) The municipal laborer is a picked man. (2) This class of labor offers an especial field for the Municipal Employees' Association, the new political trade unionists, and the Socialists and humanitarians of all walks of life, who, demanding for labor at least "a living wage," desire to redeem municipal employment from participation in Great Britain's almost universal sweat-shop labor market. Steady, able-bodied and capable of exerting on city councils a combined pressure, municipal unskilled laborers, no matter how organized or whether organized at all, obtain better terms than the employing councillors accord to the men they hire in their private capacity for similar work.

BRITISH MUNICIPAL TRAMWAYS

Turning to the tramways and light railways, we find 3400 miles in the United Kingdom, the number operated by all the companies being some 1500 miles. The mileage operated by the seven companies and municipalities investigated by our experts reached perhaps 500, about that in Boston. The British tramway-wage situation can only be seen correctly in the light of municipal developments out of what were company undertakings, the latter invariably being far different in their status as to property and degree of progress from the street railways of America. No street car undertaking in Great Britain has ever been a "private" enterprise in the sense in which the word is applied in this country. The twenty-one years' term of the franchise, the veto of company petitions by village authorities, the enormous cost of Parliamentary powers and local assents and various other restrictions non-existent in the United States, shackle and impoverish British tramway company management, and consequently forbid an intelligent investigator to employ British example to illustrate possibilities in America through change from private to municipal ownership. British tramways have always been semi-municipal. The English field of tramway exploitation, if common report in Britain is correct, has been occupied by only the most venturesome promoters, and their work has certainly not been ordinarily successful in the development of the industry, as compared with American standards and results. As by the terms of their franchises all English tramway undertakings may be taken over by the municipalities, directors

manage their properties with that end in view. While the companies seldom equal average private employers in ability to pay the wages of municipal tramway undertakings, the municipalities investigated by our committee are the most famous scenes of notable attempts at social reform carried on both by the champions of collectivist ownership and humanitarians endeavoring to mitigate the evils of slum life and to lower a general death rate that gave several of the cities in question an unenviable reputation. As a result, chiefly during the transition from horse to electric traction, British municipalities have established a lead as to wages and workday, but by no means a notable lead, and one not yet finally established. Compared, however, with the remarkable changes for the better in wages and hours in the American street car industry under companies, the best of the British municipal labor improvements seem hardly more than trivial.

MUNICIPALIZATION IN AMERICA

In America, the municipalized enterprises visited by our labor investigators have been rich mines for significant facts relating to politics rather than to labor. These facts are not unusually among those heretofore emphasized by the American advocates of municipal ownership. The testimony as to political rottenness, root and branch, in several of the cities is conclusive. An employee can only hold office in uncertainty, with its consequent evils. He knows not what a coming term will bring. This form or disquiet is not usual in private employment. That it exists in Great Britain among municipal works managers is a certainty. Any advantage in wages or hours to be figured out for the municipal enterprises investigated in America over the private ones compared with them look much like stale illustrations of the soft berths to be found in public employment. To what extent the jobs are political for the employees, single or collectively, or a bid for the labor vote is constantly a question. On this point my colleague aptly says: "In the municipal undertakings a larger proportion of the positions are likely to be semi-political."

EFFECT ON LABOR UNIONS

Municipalization cannot but carry peril to the trade union. In the first place, the field for the labor vote manipulator enlarges with municipal employment. But many unionists refuse to be moved about like pawns, and the union member declining either to support or to fight the growing strength of pernicious labor politicians might drop out of the union should occasion arise. Again, individual unionists at work for municipalities learn to look to politics for help; whole unions do so, as in the case of the British electrical workers. They are engrafted political clubs, not trade unions. One showing of our labor investigations is a tendency of municipal employees in either country to refuse to enter unions when nothing is to be gained at once for themselves, or having organized and taken a profit to quit singly or in a body.

"Open shop" is the inevitable character of municipal, as all other government, employment. Appointments must be possible to all citizens. Union rules and orders must give way in the shop to the law and official decisions. Through the activity of business agents union men may obtain at some plants a larger proportion of situations than non-union, but rarely can the agent compel the municipal employee, if firmly unwilling, to pay his union dues. By the agitation of central labor unions, groups of municipal employees may get better terms from a city and then be free to remain apart from the labor movement. In fact, the enemies of trade unionism might divide and conquer it through municipal ownership, were the cost not socially prohibitive. Municipalities are impersonal employers. They operate through mechanisms. Petitions from individual employees, for example, may meet refusal by a reference of the signers to the regulations; those from a body, if recognized at all, must go by way of red tape finally to the power making appropriations. The higher municipal officials can arrange for such matters as the comfort and convenience of employees only as themselves invested with funds and authority, which is rarely the case, or they may affect to sympathize with the members of a force while really plotting against their interests. But the private employer or his representative can be reached directly by the employed and a decision arrived at quickly.

WELFARE WORK

So far as welfare work is concerned, British employees have not been taught to expect the same attention as the American. While the welfare works of Great Britain's municipal undertakings are a shade better than the private, they seem to have not been worth any especial notice from our own investigators. When a good word is said for Liverpool's coffee and cake and billiard rooms at one of the car depots, and the tidiness of two or three retiring places at other plants, the subject is quite exhausted. In this country the company plants visited have usually far better methods both for assuaging hardship and encouraging men in self-respect and worthy ambition than the municipal. In Chicago, the Edison Company's close personal relationship with its employees stands in sharp contrast with that municipality's neglect of even decent accommodations for its electrical workers. Mean appointments and dirt are characteristic of Chicago's municipal electric stations. The Edison Company's system of instruction and club-room features has no counterpart in the city's electrical department, while the company's gradation of employees and promotion on merit form a practical civil service that needs no commission with theories and is operative every day in the year.

Not one of the British or American municipal plants of any kind presented a systematized combination of features in the form of benefits, education, grading, welfare work, care for the aged, etc., that gave the slightest foundation for the claim of municipalization advocates that with public ownership arise striking evidences of closer sympathetic relations between employer and employed. On the contrary, in reciting the undeniable facts as to the watchfulness of American companies over the health, comfort, technical education and advancement in business of their employees, one's words may be construed as praise where no more than exact report is the intent. The reader is invited to consult our labor statements on these points and form his own judgment. The Chicago Edison Company and the Philadelphia United Gas Improvement Company, each far more extensive than the largest municipal gas or electric works visited abroad, exhibit both ripened business judgment and strong sentiments of fellowship in numerous forms of care for their employees, whether at work or at play. It is but one's plain duty to call attention also to the exemplary oversight of the Indianapolis Water Company in regard to the material conditions of its force, to the New Haven Company's record for retaining its employees, and to the Atlanta Company's interesting methods of rewards beyond wages.

The American employee properly infused with our

national spirit seeks a career in which he, alike with his fellows, may hope to reap due rewards and suffer just penalties, while retaining in every respect his liberties as a freeman. But the obstacles to this ideal condition are in public employ endless. A public employee without backing may never be given occasion to prove his peculiar abilities; even bare legal recognition of his proper claims may tardily be conceded. The average public employee displays a sufficiently high order of merit to hold his place if he merely follows the code of rules mechanically. To a certain limit he may be slovenly, indolent, ill-natured, unhelpful, selfish, unobliging to the public, and yet incur no punishment. Private employment in general does not develop this character; it rewards ideas, alertness, civility, cleanliness, energy.

POLITICAL CONDITIONS

There are striking differences in political conditions between the United States and Great Britain. In this country the three interests of local, State and national policies may be united in one executive committee; in Great Britain representative men of all the cities visited denied that any machine whatever in the American sense existed among them. In some of these cities any connection between local and national politics was also disavowed, and even where Councillors were classed as Liberals and Conservatives at election it was asserted that in Council, Conservatives at times spoke and acted as Radicals, while Liberals might be as reactionary as the Whigs.

In the United States there are nowhere such legal restrictions of citizenship as to cut away the laboring class vote by 25 per cent, or at times more, even as high as 40 per cent, as in London and Liverpool. Nor does there exist in this country such a relationship between municipality as employer and its wage-workers as to bring up for discussion the disfranchisement of city employees. There is no multiple voting here on property, no representation by citizens living in territory lying outside the constituency represented, no selection of men of other classes as the official spokesman of the labor element. The American workmen have no conception of the British system of caste. In America there has been no recent upheaval of the working classes resulting in the election of labor representatives in Congress and the City Councils composed of leaders with more or less revolutionary programmes.

These facts indicate either that the professional politician of Great Britain has not awakened to his opportunities or that the opportunities do not exist. In either event, that country has been barren ground for the boss, the heeler, the gang, and a mass of purchasable voters, represented in legislative bodies by a machine man. Further, our workingmen reformers have a different political outlook before them and different materials to work on from those of the British workingmen reformers. In education and democracy the American masses are immeasurably ahead. British workmen in the mass earn hardly as much money as our Southern negroes.

Living is often said to be cheaper in Great Britain, but this is so only when the poor people go without things that all Americans can have.

PROFESSOR COMMONS' REPORT

In order that my position may be clearly understood, I will say in advance that neither municipal ownership nor private ownership have accomplished the good results in the United States that should be expected of them, and both are far behind what both have accomplished in Great Britain. I attribute this backwardness mainly to the infancy of the movement for municipal ownership in the United States. The question has not yet been big enough here to attract attention, and all the energies of the people in municipal government have been consumed in fighting the private corporations which have possession.

The two most noticeable facts regarding the movement in Great Britain are the steady improvement made in municipal operation after municipal ownership had become a settled policy, and also the great improvement in private ownership and operation during the same period. In comparing the two countries, I have been impressed by this fact more than anything else, that successful private operation follows successful municipal operation. This is seen most strikingly in the fact that the British companies were willing that our engineers should make a physical valuation of their properties for comparison with their capitalization and their earnings, whereas the American companies would not permit such a valuation. Many of the British companies also for years have been subject to complete publicity of their accounts and examination of their books by public auditors and accountants, thus furnishing information that we were not able to get in America. This higher view on the part of the companies has come about because they have before them the menace of municipal ownership if they do not live up to their public obligations. They cannot afford to have strikes, because they would at once arouse into action the demand for municipal ownership. They cannot afford to keep their accounts private, because in order to head off municipal ownership they must let the people know just how much profit they are making.

MONOPOLIES AND POLITICS

The kind of business that we are dealing with are essentially monopolies performing a public service, and are compelled to make use of the streets which are public property. If their owners are private companies they are compelled to get their franchises and all privileges of doing business, and all terms and conditions of service from the municipal authorities. And in carrying out their contract with the municipality they are dealing continually with municipal officials. Consequently it is absurd to assume that private ownership is non-political. It is just as much a political question to get and keep honest or business-like municipal officials who will drive good bargains with private companies on behalf of the public and then see that the bargains are lived up to, as it is to get similar officials to operate a municipal plant. We do not escape politics by resorting to private ownership—we only get a different kind of practical politics.

In many American cities the employees of public service corporations take a most active interest in politics and in some cases the men are given leave of absence on pay to work in the primaries of both parties.

POLITICAL APPOINTMENTS

In cities where the convention system prevails instead of the direct primaries it was not found that the wage earners of the private companies took a similar active interest in political campaigns, but men are often employed by the companies on the recommendations of aldermen at times when their contracts were before the council for renewal. Curiously enough, the politician profits more in some respects by the appointments which he secures for his supporters with a franchise company than he does by those on municipal jobs. Since all parties understand that the

alderman's influence stops after appointment, there is no ill feeling on the part of his supporter if he is discharged.

It is for this reason that the private company has an advantage over the municipal management under the spoils system, for it can get rid of a political appointee after trying him out and finding him inefficient. He and his family and friends continue to be the supporters of the alderman who has done his best for them, and his discharge at the same time makes room for the alderman to name another man who also with his family and friends become supporters. It is different in municipal employment, where it is expected that the politician who gets the job for his follower will keep it for him. If he is removed from that job he loses confidence in the ability or good faith of the politician. On account of these differences in the attitude of workmen, politicians and managers, the private corporation in politics is more efficient from the standpoint of its stockholders than the municipal undertaking in politics, and at the same time the capable politician can build up his organization just as effectively under one system as under the other.

The experience of Glasgow is instructive. Fifteen years ago the practice of hiring employees on the recommendation of councillors was universal in all departments. But with the growth of municipal ownership it has almost disappeared. Our investigations have shown that the strongest safeguard for a manager against the pressure of outside recommendations is the recognition of organized labor within his department. Wherever we have found a class of employees organized and dealt with as such through their representatives we have found those positions exempt from politics. This follows from the nature of labor organization which cannot survive if individuals are given preference on political, religious, personal or any other grounds than the character of the work they do.

Under the convention system of nominations the principal activity of private corporations was found to be that of contribution to the expenses of campaign committees and candidates.

POLITICAL CONDITIONS

In all of the cities visited in Great Britain, except Glasgow and London, it was found that national political parties managed the municipal elections. The exception in Glasgow is mainly owing to the fact that there the Liberal party is so overwhelming that the Tories have no chance. In the British cities only the councillors are elected, one each year, holding three years for each ward. The councillors elect the aldermen and the city officials. Most important of all, the councillors and aldermen are not required to live in the wards they represent, and many of them live in the suburbs. One-half to four-fifths of the councillors and aldermen live outside the wards they represent, and the proportion is strikingly larger in the working-class wards which elect two-thirds to nine-tenths of their councillors from outside. Many inquiries were made as to the reasons, on the part of voters, for this indifference as to the place of residence of their candidates, and the explanation that seems adequate is the absence of campaign and corruption funds and the inability of councillors to find jobs for their constituents. Furthermore, councillors and aldermen are unsalaried. This freedom of choice makes it possible to elect both the leading business men and the leading labor men to govern the city. Not only do we find eminent bankers, financiers and employers of labor in the councils, but we find the secretaries and officials of trade unions, most of them living outside the wards they represent. The absence of such leaders and truly representative men from American city councils is the most discouraging fact brought to our attention. One reason for this condition of affairs in England is that the bankers, financiers and merchants who serve the cities as aldermen on the finance committees are free to do so because neither they nor their clients or business associates are interested in stocks which might be depreciated if they helped the city to drive a good bargain.

The increase in municipal ownership in Great Britain has, of course, brought an increase in the number of municipal employees, and this has caused apprehension in certain quarters. Generally the chief officers of the municipal enterprises take the ground that they and other employees should not vote in municipal elections, and they openly set that example to their subordinates. Some of them go even so far as to advocate the disfranchisement of municipal employees in municipal elections. This has also been advocated by some of the councillors. However, such a proposition is no longer seriously considered. If the vote of municipal employees is a menace the remedy must be looked for in directions other than disfranchisement. It goes without proof that such a remedy is needed, for municipal employees sooner or later cast their votes for candidates who promise or have secured a betterment of their condition, regardless of its effect on the enterprise as a whole. Omitting disfranchisement, there are two directions in which such a remedy can be found, first a limit to be set beyond which municipalization shall not go, and second, the attitude of the public and especially of the workmen in private employment.

MUNICIPALIZATION AND TRADES UNIONS

The municipal undertakings in both countries are necessarily "open shop," in the sense that employment is open both to union and non-union men. In the case of the more skilled trades this usually results in the employment of union men, depending partly on the attitude of the manager. This attitude is favorable to the unions in all of the British municipalities except Liverpool and is favorable in the American cities of Cleveland, Detroit and Chicago. In these places the managers consult the union officers in arranging wages, hours, and conditions of work. The three American places mentioned are those where the political machine, supported by the contractors and franchise corporations, has been eliminated from the control of the city government by a popular revolt against the corporations. But in Allegheny, Syracuse, Wheeling and Indianapolis, where a combination of politicians and franchise corporations is in control of the municipal government, the attitude is distinctly hostile to the unions, and appointments and promotions are made with reference to the political adherence of the employees.

The British organization of street railway employees, which nominally includes teamsters and drivers as well as motormen and conductors, is practically confined to the latter, and for the last six years has increased its membership solely among motormen and conductors. Its membership consists of 9,500 in municipal employment and 1,500 in private employment, a ratio of one-half of the motormen and conductors employed by all municipalities and one-third of those employed by all companies. The three private companies investigated, namely London, Norwalk and Dublin, have taken a decided stand against the organization, have discharged those of its employees who became members and have required bonds or deposits which are

forfeited if the men quit without giving one or two weeks' notice. Two of the municipalities, London and Manchester, are organized in this association to the extent of nine-tenths of their employees, while in two other establishments investigated, Liverpool and Glasgow, the municipalities have established benefit associations and in Liverpool the union was disrupted by embezzlement on the part of its officers. The wages are so much in advance of what these employees received from the former private companies that the union does not appear to offer them any particular advantages if they should join it.

WELFARE WORK

In the matter of "welfare work," or provision for the comfort, cleanliness and recreation of employees, the best conditions were found in the works of the Commonwealth Electric Company at Chicago, the municipal water works at Cleveland, the Philadelphia gas works, the municipal gas at Leicester, municipal trams at Glasgow and Liverpool and South Metropolitan gas at London. In general, the buildings and works constructed during the past four or five years both in private and municipal undertakings, show a great improvement over the older buildings and works, in the provision for baths, lavatories, lunch and cooking rooms, recreation rooms and grounds. Taking the entire list of properties visited, the best under one form of ownership is equaled by the best under the other form, and so on down to the worst. The superior character of the municipal undertakings over private undertakings in Great Britain is partly owing to their more recent construction and the converse is true in the United States.

INVESTIGATION OF WATER AND LIGHTING PLANTS

The review of the effect of municipal ownership on water and lighting plants is contributed by a committee of four appointed by the Commission. Two of the writers, Walton Clark, vice-president of the United Gas Improvement Company, of Philadelphia, and Charles L. Edgar, president of the Edison Electric & Illuminating Company, of Boston, criticise severely the municipal plants examined, while two other writers, Prof. Frank Parsons, of Boston, president of the National Public Ownership League, and Edward W. Bemis, superintendent of the Cleveland, Ohio, water-works, find much to favor in municipal plants which were investigated. Separate reviews of British municipalization, including tramway operation, will be made public later.

Messrs. Clark and Edgar concur in the statement that the inquiry of the committee, both from the standpoint of British and American experience, more especially the latter, has shown that "where municipal ownership has been removed from the realm of philosophic discussion and put to the test of actual experience it has failed ingloriously." The belief is expressed by these gentlemen that the "few enthusiasts" who still advocate municipal ownership "will soon be convinced by the logic of events, and turning their energies to other things will through them realize their ambitions of usefulness to their fellows." Professor Parsons and Mr. Bemis, on the other hand, take a most hopeful view as to municipalization, declaring that the failures of municipal ownership are insignificant compared to the failures of private ownership, either in number or importance. "It is not public ownership, but private ownership," Professor Parsons says, "that is responsible for our periodic crises and the ruin of our industries." As to the fitness of American cities to manage business affairs, many of them, he says, have proved their fitness, and the rest can be made fit. "It is not impossible," he adds, "that the elimination of the public service corporations through public ownership is one of the things that would do more to help along the process of making our cities fit."

AMERICAN AND FOREIGN PLANTS EXAMINED

The following American plants were visited and examined:

Public Gas Plants—Wheeling, W. Va.; Richmond, Va.; Holyoke, Mass.; Westfield, Mass.

Private Gas Plants—Atlanta Gas Light Company, Atlanta, Ga.; City Gas Company, Norfolk, Va.; United Gas Improvement Company, Philadelphia, Pa.; Fitchburg Gas & Electric Company, Fitchburg, Mass.; Beverly Gas & Electric Company, Beverly, Mass.

Public Water Plants—Cleveland, Ohio; Chicago, Ill.; Syracuse, N. Y.

Private Water Plants—New Haven Water Company, New Haven, Conn.; Indianapolis Water Company, Indianapolis, Ind.

Public Lighting and Power Plants—Chicago, Ill.; Allegheny, Pa.; South Norwalk, Conn.; Detroit, Mich.; Danvers, Mass.; Holyoke, Mass.; Westfield, Mass.; Marblehead, Mass.; Peabody, Mass.; Taunton, Mass.; Chicopee, Mass.; North Attleboro, Mass.

Private Lighting and Power Plants—Northampton Electric Light Company, Northampton, Mass.; Fitchburg Gas & Electric Company, Fitchburg, Mass.; Salem Electric Company, Salem, Mass.; Beverly Gas & Electric Company, Beverly, Mass.; Gardner Electric Light Company, Gardner, Mass.; Abington & Rockland Electric Light & Power Company, Abington, Mass.; Attleboro Steam & Electric Company, Attleboro, Mass.

THE REVIEW BY MR. EDGAR AND MR. CLARK

Mr. Edgar and Mr. Clark agree in setting forth numerous objections to municipalization, a very important one being that in several British cities which have tried public ownership, it has been found that the organization of municipal workmen constitutes a serious threat against the municipality itself, and, as a result, the disfranchisement of city employees is being seriously considered in England. Were municipal employees in this country to organize, under extended city control of public utilities, the writers declare the remaining voters would find themselves beneath "a tyranny of democracy which is no less galling to the individual oppressed and no less detrimental to the welfare of the State than is the tyranny of a despot." The remedy proposed in England, disfranchisement, is declared to be "unthinkable" in the United States. Under public ownership of public utilities, it is declared, those in control of the government are submitted to continuous temptations; first through the opportunity to build up a political machine, with the city employee as a basis, and, second, through the opportunity to unduly favor contractors, with the expectation of either financial or political benefit to themselves.

"There is little about municipal trading to attract men of the first class." Mr. Edgar and Mr. Clark unite in saying, "We have not found evidence in the United States that the personnel of the city government of Chicago (referring to Mayor Dunne's administration) or Wheeling is superior to that of Atlanta or Norfolk, or that the introduction of municipal water and electric plants in Detroit has brought a higher type of citizenship into the governing body than we find in New Haven, which has neither."

The labor situation at the gas plants examined is com-

pared to the advantage of the private plants. "The general impression made at Wheeling," says Messrs. Edgar and Clark, "was that no one about the works took any more interest in his duties than was absolutely necessary to enable him to hold his job, and no one, either at the works or on the street, was at all interested in getting work done in an efficient manner. The power of appointment at Wheeling did not rest with the superintendent, and therefore the employees did not have the fear of discharge by him in case they did not perform their work properly. At Norfolk and Atlanta the certainty of prompt discharge in case they did not satisfy their immediate superiors in the operation of the plant acted to make the men work better and more efficiently than was the case at Wheeling."

Referring to the Philadelphia gas works as an instructive comparison of the results of municipal and private operation, the reviewers quote Dr. L. S. Rowe as authority for the statement that the quality of the gas supplied has been improved by the company now operating the service, and that through the rental paid, the city has received for eight years an average profit of $491,674 annually, while for the last few years under city operation there was a loss of $245,398 per year. The private company, however, charges no more than did the city, but supplies better gas. "The Commission's records," say Mr. Edgar and Mr. Clark, "indicate a high degree of efficiency in the company operation of the Philadelphia gas works, and kindly and liberal treatment of employees. On these latter points Dr. Rowe speaks as follows: 'As has been shown (under municipal management), there were abuses in almost every branch of the operation. The purchase of coal and the residuals products were each under the control of favored individuals; the wages account was padded with incompetents, the friends of men prominent in city politics. It is unquestioned that there were leaks in the management of the gas works at other points than the distributing system; it is true that the labor account was debauched, and it is certain that in the purchase and sales departments there were influences at work which worked harm to the city's interests. But the loss through such sources was inconsiderable when compared with those inflicted by councils by the senseless blocking of the way to improvement in cutting off the appropriations for modernizing the plant. During the entire period of municipal operation the officers in charge were engaged in a losing fight to preserve the works from ruin. There never was a time during the entire period of responsible control when it could truly be said that the works were in an efficient condition.' "

Four of the best known American municipal electric plants, those of Chicago, Detroit, South Norwalk, Conn., and Allegheny, Pa., were examined by the Commission and the experts. Of these South Norwalk is the only one that does commercial lighting. As to the cost of operation of these plants, the Chicago plant is cited to show that including items for depreciation, interest, taxes, proportion of salary, insurance and water, there is a loss to the city, based on simple interest on the amount paid, of $6.70 per lamp per year, or a total of $284,202 annually, compared with what the cost would be if service were taken from a private company. Computed with compound interest on the amount paid, the loss is $11.07 per lamp, or $469,217 per year. These figures are based on statements submitted by the Commission's expert accountants and do not agree with the estimates of the city electric department, which show a saving to the city.

As to the character of the plants, that in South Norwalk is criticised for its use of a d. c. 220-volt two-wire system, a type never generally adopted in this country. This equipment, say Mr. Edgar and Mr. Clark, compels the consumer in South Norwalk to pay 20 per cent more for the light produced than would be necessary under a better system.

The Detroit electric undertaking is found to be of a type of about fifteen years ago and the capacity can hardly be expanded within the present building unless the type of operating units is charged to those of a more modern class.

The Allegheny plant is described as "poorly designed, inefficient and expensive to operate." Appropriations for technical equipment have been neglected to such an extent, say the reviewers, "that the electrician had to build his own switchboard out of such junk as he could collect from machine-shop yards."

Of Chicago's four municipal electric plants, three are declared to be of obsolete type, while the fourth is not properly constructed for economical operation. The stations are scattered through the city without system and are very poorly located. The plants use 1,400,000,000 gallons of city water (minimum) for which no charge is made. Of the 6700 lamps in use, 4180 are of a type which has been generally discarded throughout the country.

On the subject of operating efficiency, it is set forth that economical operation in Allegheny is much hindered by the unnecessary number of employees. Six or eight of the force could be dismissed, reducing the payroll 15 to 18 per cent, and "the half dozen extra laborers often put on for political purposes at election time could be dispensed with, changes which would add to the efficiency of the service as well as lowering its cost." In Chicago, the civil service rules are declared to be a source of inefficiency. Men who have become inefficient are held in responsible positions longer than they should be and the best men are often prevented from being advanced in rank or chosen from the outside because of lack of the special knowledge required by the civil service examiners.

In their examination of water plants Messrs. Edgar and Clark found the service in the private plants superior, on the whole, to those in the municipal plants. Summarizing the results of the investigation as to the quality and purity of the water supplied, Messrs. Edgar and Clark say:

"This phase of the question may be summarized with the statement that while the natural conditions in the different cities call for different methods of treatment, it is evident that the two companies examined were more solicitous regarding the purity of the water supply, and adopted more thorough means for insuring the same than did the three municipalities who ran their own water department. The conclusion drawn as a result of our investigation into the quality of the water is that the water supplied by the two companies is good, sanitary water; that its quality is much better than the water supplied in Chicago, somewhat better than the water supplied in Cleveland and quite as good as the water supplied at Syracuse. The latter place is blest with water from a source which, down to the date of this report, has remained pure without any special expense or effort on the part of the water department. It seems that the citizens obtain the cheapest water in Cleveland, while New Haven is the second cheapest. At Indianapolis the poor man gets water fairly cheap, but the cost increases rapidly as the class of dwelling improves. At both Chicago and Syracuse the poor man pays a high price for water."

Under the heading "Financial," an exhaustive review of the economic operations of municipal and private undertakings both in Great Britain and the United States is given by the reviewers, who find that it is admitted by the advo-

cates of municipalization that the debts of British cities have been enormously increased by its operations. "We venture to believe," they say, "that the loss to the communities whose municipal industries we have investigated from bad management and lack of enterprise, resulting in restricted service of modern utilities, is many times the profit these cities claim to have realized from their Rip Van Winkle methods of serving the public. It is not worth while to discuss the effect on the finances of American cities of the municipal operations of the industries that we have here investigated. Properly audited they have, with one or two exceptions, lost money, and their plants are all inadequate to good service, and have, with the exception of the water plants, little more than a scrap value in view of the present state of the arts. What effect could such poor efforts as we have witnessed have on public wealth or public comfort? It cannot fail to be bad."

THE REVIEWS OF PROFESSOR PARSONS AND MR. BEMIS

In favoring municipal ownership Professor Parsons declares that in most discussions of the subject too much attention is given to the purely financial side of the question. "Dollars and cents are not to be neglected," he says, "but life, liberty, justice, virtue and intelligence—the whole character product and social product of our institutions—are of greater moment than their money product." Taking up financial results, Professor Parsons gives it as his view that the municipal plants are more economical. "Broadly speaking," he says, "recognizing that there are exceptions to all rules, the facts show that municipal plants tend to make lower prices to ordinary consumers than private plants in the same country working under similar conditions, and they do not grant electric rebates or other favors by secret agreement with large users, as is not infrequently the case with the larger companies. In the comparatively few cases where municipal systems do not make low charges the public still gets the benefits that under private operation go to the stockholders, for the profits of the public plants are used to improve the service, pay off the capital, relieve taxation or accomplish some other public purpose. Municipal plants are found, as a rule, to have a lower capitalization than private plants, both in relation to output and in relation to assets."

Discussing so-called failures of municipal ownership, Professor Parsons claims that some of such cases are really failures of private ownership. "Take Philadelphia gas, for example," he says, "It does not appear that Philadelphia ever had real public ownership of the gas works. She had government ownership of gas works. But government ownership is not public ownership unless the people own the government. Philadelphia had the paper title to the gas works, but the people did not own or control them because they did not own the city government. The councils were full of the agents and allies of the private street railway, telephone, gas and electric light interests and they purposely mismanaged the gas works, allowed them to be filled with supernumeraries and let them get out of repair by refusing year after year to appropriate, even out of the receipts of the plant itself, the money necessary to keep it in order, so that they might have an apparently good excuse for executing a lease of the works to themselves. Philadelphia did not have real public ownership of gas, but one of the worst forms of private ownership—ownership by political grafters, in the pay of corporations but masquerading as public servants."

Mr. Bemis declares that the over-capitalization and high earnings thereon of private companies and the demoralizing relations often existing between private companies and city governments are the two great reasons for the municipal movement.

Mr. Bemis' review of the Philadelphia gas situation is in marked contrast to that of Messrs. Edgar and Clark. Mr. Bemis also quotes Dr. Rowe as authority on the subject, to show that when direct municipal operation began, Dec. 31, 1886, the plant had been entirely paid for out of profits, with the exception of $1,802,948. After including the expenses of collection, maintenance of street lamps, etc., borne by other city departments, the net cash turned into the city treasury during the years 1888-1897, inclusive, was $2,937,719.56. To this should be added the amount spent for extensions of the works, mains and services, which is easily computed from Professor Rowe's data at $4,344,316.92. This would make a total of apparent profit during the eleven years of municipal operation of $7,282,036.48. Since this profit was computed after including the operating expenses, and the expenditures for repairs of 8 cent to 10 cents per 1000 ft. a year, the depreciation could not have eaten up any large part of this apparent profit.

The price of gas was reduced from $1.50 to $1.00 at the close of 1893. At first there were deficits, but these rapidly declined. According to Professor Rowe, there was a net profit during the eleven months of city operation in 1897 of $123,915.06, after paying the expenses incurred on account of gas in other city departments.

"By reason of municipal ownership, Philadelphia was able to lease to the United Gas Improvement Company most valuable street mains, land and holders, to say nothing of such portions of its other plant as with moderate repairs could be put in good shape. By asking for no rental or taxes on this plant which had been paid for out of the profits of city ownership, Philadelphia was able to secure a lease under which it received 10 cents per 1000 ft. of all gas sold to private consumers during the first ten years of the lease, 15 cents during the next five years beginning next January, 20 cents from Jan. 1, 1913, to Jan. 1, 1918, and 25 cents for the remaining ten years. The city also receives free of charge 700,000,000 ft. of gas yearly for street lamps and public buildings, and the maintenance of those street lamps by the company."

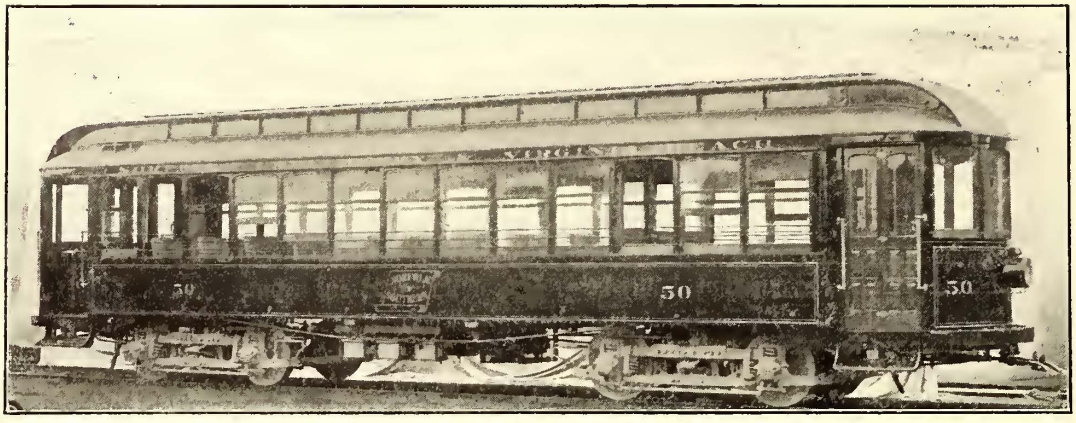
That the municipal electric light undertaking at South Norwalk, Conn., is one of the most successful plants, either public or private, in the United States or Europe, is the opinion expressed by Mr. Bemis. The operation of the Chicago plant, also, is commended, the expert quoted by Mr. Bemis estimating the profit to the city on the plant up to the close of 1905 at $710,433. The spoils system has been singularly kept out of the Chicago plant, according to Mr. Bemis, although the plant itself is not all that could be desired. He continues:

"Next to South Norwalk the most successful municipal electric lighting plant has been that of Detroit. If it had been allowed to do a commercial business, its success would have been even greater than has been possible with only the lighting of streets and public buildings.

"Allegheny, although confined to street lighting, and suffering from the spoils system and a poor location, has, nevertheless, saved enough to pay for her plant out of the difference between her operating expenses and the $96 a year which Pittsburg has had to pay for similar arc lights prior to 1906."

SEMI-CONVERTIBLE CARS FOR THE NORFOLK & SOUTHERN RAILWAY

Five very attractive combination passenger and smoking cars of the grooveless post semi-convertible type have been added to the equipment of the Norfolk & Southern Railway. Cape Henry and Virginia Beach, the points reached by this line, are indicative of a large excursion business and it was largely on this account that the type of car mentioned was chosen. Virginia Beach, one of the most attractive resorts on the coast, is 18 miles due east of Norfolk and has a stretch of sand second to none in the country, which is much frequented by automobiles and other vehicles, the run from Virginia Beach to Cape Henry Light, 6 miles away, being particularly well patronized in this respect.



SEMI-CONVERTIBLE CAR FOR THE NORFOLK & SOUTHERN RAILWAY

The new cars are equipped with every comfort including extra long seats which this particular type of car makes possible, arm rests, push buttons, basket racks, etc. The seats in the smoking compartment are of the longitudinal variety, and, like the transverse seats in the other compartment, of Brill manufacture. The trucks are the builders' 27 E-1½ type with 6-ft. 6-in. wheel base; both the motors on each car are of 75-hp capacity and are under the smoking compartment end of car. The chief dimensions are: Length over the end panels, 36 ft.; over the vestibules, 45 ft. 5 ins.; width over the sills, including the sheathing, 8 ft. 4 ins.; size of the side sills, 4 ins. x 8¾ ins.; end sills, 5¼ ins. x 6⅞ ins.; sill plates, 15 ins. x ⅜ in.

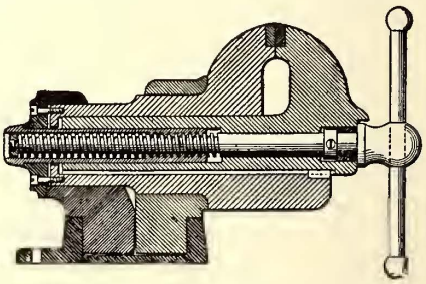
DOUBLE AND SINGLE SWIVEL VISES

The Pittsburg Automatic Vise & Tool Company, of Pittsburg, makes a line of vises so designed as to have their jaws describe any degree of two complete circles. This movement not only makes them high-speed tools for the work bench, as the operator is able to turn his work instantly to the most advantageous position, but the tools are also adapted as a chuck for the drill-press, planer or other machinery.

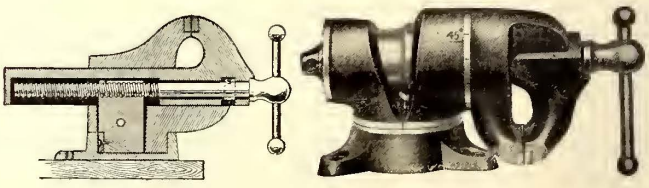
The operator can readily and easily remove the body of the vise from its base upon the bench to extra bases in other parts of the shop simply by lifting the body of the vise from the hollow base. Work too heavy to be lifted upon the bench and placed in an ordinary vise can readily be stood on one end on the floor, the jaws of the double swivel vise thrown at right angles, the jaws opened, and then thoroughly clamping the upper end of the object to be held. In this position any work can be accomplished on the end of the bar, such as sledging and chiseling.

The double swivel movement has many advantages, one of which is that in case of a workman desiring a smaller face vise than that of the one upon which he is working he can readily throw the jaws at right angles and use the side of the same, which will enable him to do the most delicate work, due to its small dimension. The double swivel vise, by the turning of the jaws, can be made to hold securely any work while lying flat upon the bench.

Another very important feature in this vise is a slight groove through the face of the front jaw, which permits a firm grip to be had upon any round work to be sawed, filed or worked upon in the regular machinist's vise. The vise is automatically locked by the tightening of the jaws upon the piece held. The vise is composed of eight sections. These consist of the front and rear jaws, two yokes, screw and nut, base and friction plate. The base is formed with an annular seat for the body of the vise. The body consists of two yokes, each provided with a section, or half of a hub, seated in the base, and adapted to be slightly tilted in respect to each other and their seat, so when they are drawn toward each other at their top they will be pressed outward below and locked in the base seat.


SECTION OF DOUBLE VISE

The rear jaw can be rotated about its axis within the body of the vise. It has two diameters, the larger working in the front yoke and the smaller in the rear.


SINGLE VISE COMPLETE AND IN SECTION

A special bearing is placed on the screw between its head and fixed collar to afford freedom of turning, but it is designed to be driven or forced tightly upon its seat in the front jaw, to serve as a reliable backing for the collar when the screw is rotated to open the jaws. This also gives the head of the screw a solid bearing against the full stock of the front jaw; therefore, there is nothing to break or give way or become weakened under the severe strains or pressure through the action of the screw. Thus it will be understood that when the screw is tightened it tilts the body sections towards each other and locks them against rota-

tion in the base. The inner jaw member has a splined connection with the inner jaw to prevent its rotation.

The single-swivel vise possesses but one movement. It is automatically locked by the tightening on the piece of the jaws. By lifting the body of the vise from the base, the vise can readily be carried anywhere. It can also be made stationary or any desired degree of friction secured in the swivels by tightening a small thumb screw.

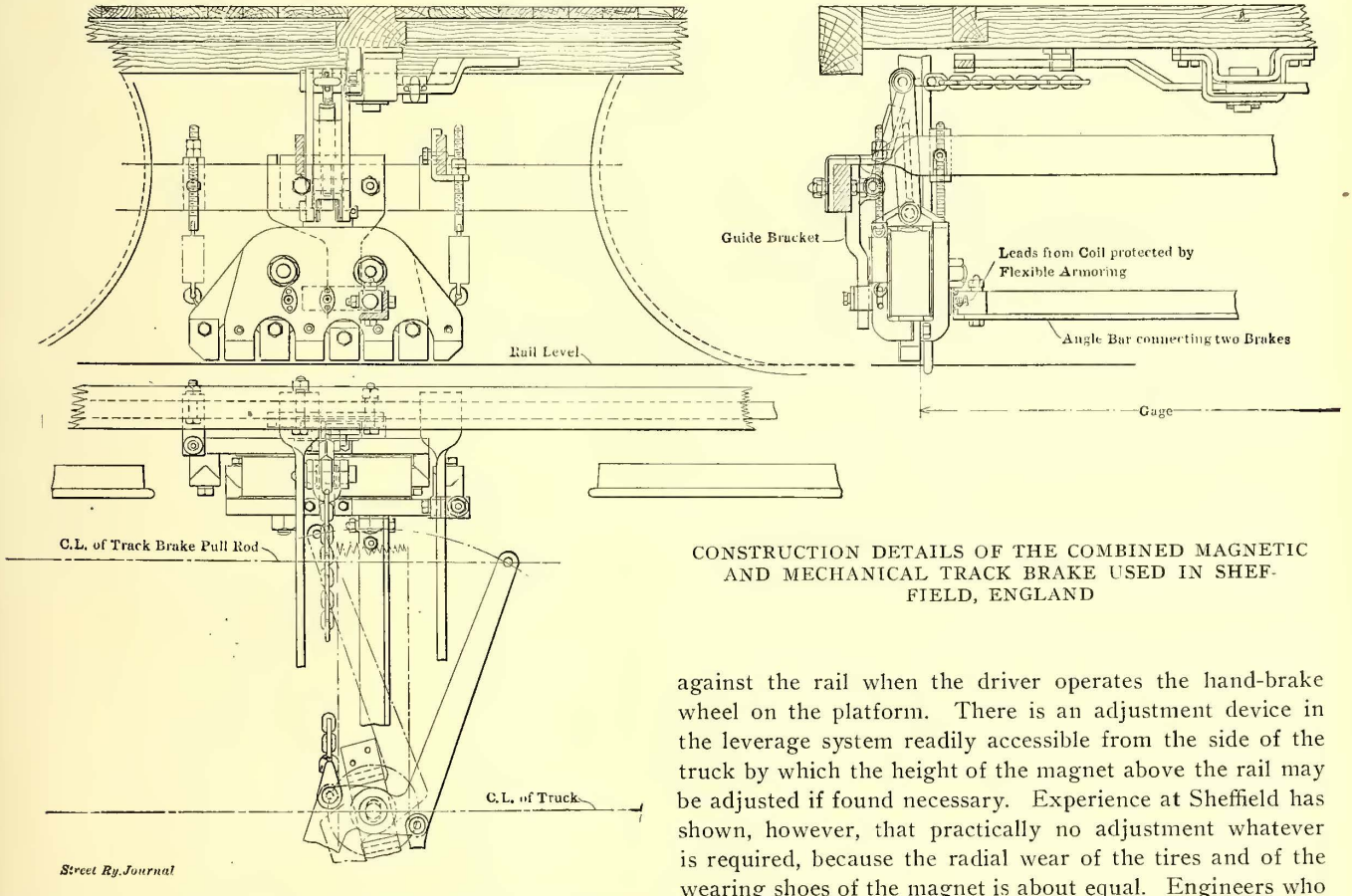
This vise consists of but five parts, the rear and front jaws, screw, nut and base. The locking dog is constructed to permit the screw to pass through its upper extremity. It is pivoted near its bottom upon an alloy steel bar supported by the base. Thus, when the jaws are tightened upon an object the screw draws the dog towards them, which naturally throws its bottom out against the walls of the base, thus locking it firmly, no matter what the pressure may be. The pipe attachment for the single-swivel vise takes any size pipe from ⅛ in. to 6 ins., inclusive.

SOUVENIR STAMPS FOR PARK ADVERTISING

Souvenir postal cards which have for their subject views along electric railway lines have long since been utilized by electric railway companies in different parts of the country for advertising purposes. Now comes the Twin City Rapid Transit Company, through its passenger agent, A. W. Warnock, with a variation of the postal card idea that is quite ingenious. It is a stamp book containing twenty-four souvenir stamps gummed ready for use, which have for their subjects, views along the Twin City Company's lines. Despite the reduction the engravings are very good. On the back of the book is a place for the address just as on the front of a postal, a 1-cent stamp only being necessary for mailing.

COMBINED MAGNETIC AND MECHANICAL TRACK BRAKE USED IN SHEFFIELD, ENG.

An improved form of track brake has been supplied to the Sheffield Corporation by the British Thomson-Houston Company which should go a long way toward solving the vexed problem of tramcar brakes. This brake is a combined magnetic and mechanical track brake, so designed that it can be applied by the driver as an ordinary mechanical slipper brake, as an electro-magnetic track brake, or as both combined. The general features of the brake will be apparent from the accompanying drawing. The track slipper consists of this company's usual track brake magnet, one attached to each side of the truck, with a simple system of levers by which the slipper is pressed



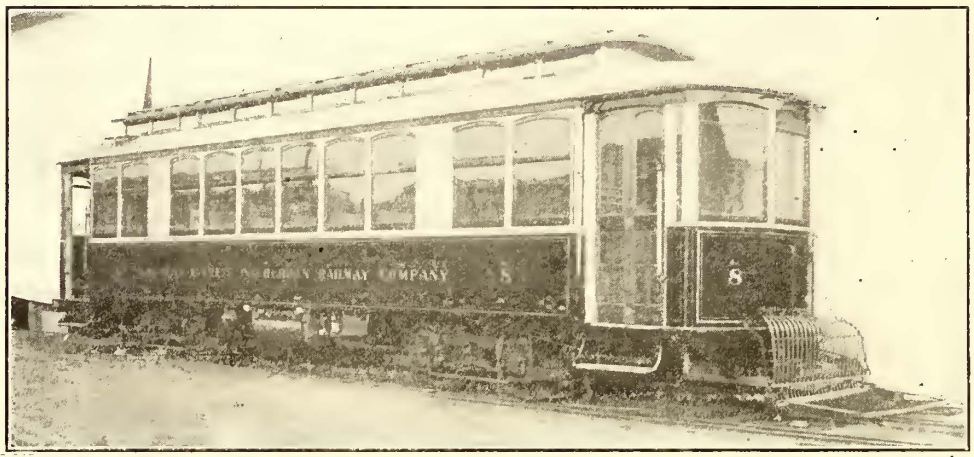
CONSTRUCTION DETAILS OF THE COMBINED MAGNETIC AND MECHANICAL TRACK BRAKE USED IN SHEFFIELD, ENGLAND

against the rail when the driver operates the hand-brake wheel on the platform. There is an adjustment device in the leverage system readily accessible from the side of the truck by which the height of the magnet above the rail may be adjusted if found necessary. Experience at Sheffield has shown, however, that practically no adjustment whatever is required, because the radial wear of the tires and of the wearing shoes of the magnet is about equal. Engineers who are using mechanical track brakes with wooden shoes will appreciate the value of this feature because it will allow the track brake wearing shoes to be renewed when the car is re-wheeled, instead of each day, as is necessary at present.

The power of the magnetic track brake and its ability to control a car is well known. Of the power of the brake when applied mechanically, the following test carried out at Sheffield gives ample testimony. The car was driven at full speed on a level track with the motors in full parallel. The track brake was then applied mechanically by hand without shutting off power. This rapidly brought the car to rest, the wheels spinning on the track through being driven by the motors. The ability of the brake to stop the car when the full power of the motors is acting to keep the car in motion, is ample proof of its great power and efficiency. When it is also remembered that the action of the brake is in no way dependent upon the rotation of the wheels, and that the brake cannot in any case lock the wheels, its safety and reliability should be fully appreciated.

RECENT EXTENSIONS ON THE SEATTLE-EVERETT INTERURBAN LINE

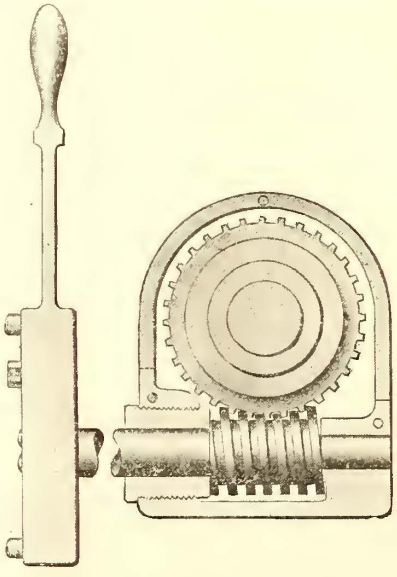
The Seattle-Everett Interurban Railway is a partially completed line now in operation between Seattle and Lake Ballinger (formerly Lake McAleer) a distance of approximately 14 miles. Five additional miles will be opened to the public at the end of the present month, which will put the lines past Hall's Lake. It is expected that by Jan. 1, 1908, the system will enter Everett, and when all the work is completed there will be 32 miles of track. The company operates twenty-five freight cars, one electric locomotive and fourteen passenger cars. The road is equipped with 60-lb. T-rails; the trolley wire used is 00, and the single feeder is a cable of 500,000 circ. mil capacity. The country through which the line runs is teeming with business and the company finds the hauling of ties, lumber, etc., very profitable; in fact the management states that at the present time it is impossible to procure sufficient freight cars to take care of the business.



ONE OF THE SEATTLE-EVERETT INTERURBAN RAILWAY COMPANY'S NEW CARS

Four of the passenger cars were recently purchased from the American Car Company and a specimen is shown in the accompanying cut.

The first thing to catch the eye on these new cars is the dead panel at each end. This lends additional strength to the construction and also gives a very pleasing appearance to the interiors as the panels on the inside are tastefully decorated. The same idea is carried out in a number of the Brill cars which are now operating on the Seattle Electric Company's lines in Seattle. The interior finish is cherry; ceilings of bird's-eye maple. The gongs, signal bells, seats, etc., are all of the builder's make. The trucks are of No. 27 G-1 type with 4-ft. 6-in. wheel base; four 40-hp motors are used per car. The chief dimensions are: Length over the end panels, 30 ft.; over the crown pieces, 40 ft.; width over the sills, 8 ft. 4½ ins.; height from the track to the under side of the sills, 32 13/16 ins.; from the under side of the sills over the trolley board, 9 ft. 3¼ ins.; the bottom framing consists of 6-in. I-beams with 3¾-in. x 7¾-in. fillings; center sills, 4¼ ins. x 4 1/16 ins.; end sills, 5½ ins. x 7¾ ins.

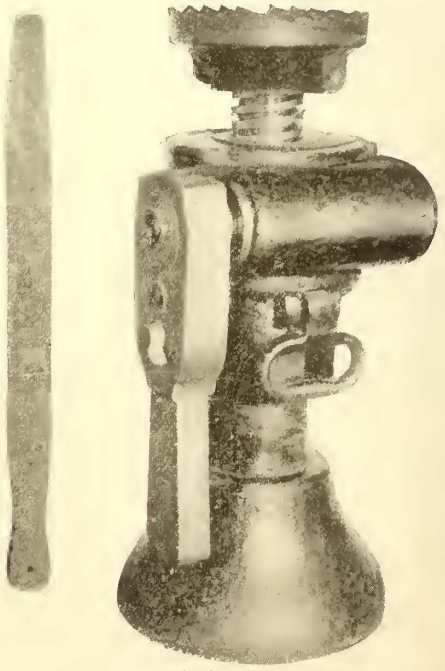


SECTION OF JACK

JACKS FOR RAILWAY SERVICE

The Security Register & Manufacturing Company, of New York and St. Louis, has acquired all the rights to make and sell the Roth high-pressure one-man jack. This device has been in use for several years, but hitherto has not been actively placed before the electric railway public.

Some idea of the work that can be done with this type appears from a United States Navy trial with a 20-ton Roth screw jack where one man raised 27.34 tons with an 8-in. lever, and 41.73 tons with an 18-in. lever. It is asserted that even 62½ tons have been raised with the 20-ton jack without injury. The wheel and screw are said to fit with such accuracy that the jack will not sink even one-thousandth of an inch under load. The ball bearings are of steel of such quality that in the navy test mentioned, the bearings, though embedded ⅛ in. to 3/16 in. deep in a lathe by 40,410 lbs. pressure remained uninjured. As the jack is not of the hydraulic type it has no pump, valves, stuffing boxes, freezing liquids or other trouble-making complications.



COMPLETE JACK AND LEVER

FINANCIAL INTELLIGENCE

The Money Market

WALL STREET July 17, 1907.

Monetary conditions have improved considerably during the past week. As a result of the payments of the special government deposits by the banks on July 10, rates for both call and time money hardened decidedly, but subsequently there was a relaxation in the asking charges for all classes of accommodation. From 8 per cent, the high rate of the week, call money declined to below 3 per cent, the average rate for the week being about 5 per cent. Time money likewise developed comparative ease, rates declining a shade below those heretofore quoted. By far the most important developments in the situation was the heavy gains in cash reported by the banks on last Saturday. The preliminary estimates of the week's currency movements indicated a very heavy loss in the cash holdings of the local institutions, but instead of this the bank statement published a week ago revealed an increase in cash of more than $4,000,000. Since that time the banks have gained upwards of $2,600,000, and it is expected that the cash holdings of the local institutions will be further augmented by the receipts of currency from the interior, and by the heavy government disbursements on account of pension and other payments. Another factor working in favor of this center is the shipments of gold from the Klondike region. Shipments have already begun, and the receipts of the yellow metal from this source are expected to be fully as large as those in the preceding years. The demand for money for stock market purposes has been comparatively light, and especially so for time money, owing to the high asking rates prevailing. During the greater part of the week six months' accommodations commanded the full legal rate of 6 per cent, which, together with the brokers' commission of 1-32 of 1 per cent, made the rate for such accommodations too high to induce borrowers to take on any considerable amount of money for that maturity. The banks, however, were not inclined to offer with any degree of freedom. The demand from corporations continues, the most important development in this connection being the decision of the "Soo" line to double its capital stock from $21,000,000 to $42,000,000. The new stock will be divided into $7,000,000 preferred and $14,000,000 common, and will be offered to stockholders at par. The foreign exchange market rules well below the gold export point, and it is expected that the outflow of the yellow metal has been arrested, at least for the present. The managers of the Union Pacific bond syndicate have sent notices to its members calling upon them to pay the initial instalment of 20 per cent of the amount of their subscriptions. This instalment is payable on July 22, and calls for upwards of $14,000,000.

The bank statement published on last Saturday made an extremely favorable exhibit. Instead of an expected decrease of $6,000,000 in cash, the bank showed an actual gain in that item of $4,075,700. Loans decreased $10,888,400, and deposits decreased $7,780,400. The reserve required was $1,945 100 less than in the preceding week, which, added to the $4,075,700 increase in cash, augmented the surplus reserve by $6,020,800. The surplus now stands at $6,877,050, as against $12,830,800 in the corresponding week of last year, $19,523,250 in 1905, $44,563,350 in 1904, $13,278,475 in 1903, $15,709,275 in 1902, $12,809,375 in 1901 and $19 960,125 in 1900.

The Stock Market

There was a marked falling off in the volume of business on the Stock Exchange during the week, and prices continued to move with more or less irregularity. Speculation was again confined almost entirely to the professional element. In some quarters it was reported that investors were more disposed to purchase the standard stock and bond issues at the prevailing level of prices, but apart from this buying there was nothing to indicate that outsiders were inclined to enter the market to any appreciable extent. During the first half of the week the general trend of values was downward, prices for practically all of the active leaders falling one to three points. The selling was due in part to the sharp rise in both call and time money rates, resulting from the repayment by the banks of the special government deposits, the asking rate for six months' accommodations rising to the full legal charge of 6 per cent. In addition, the small subscription to the new bond issues was used to depress prices, but the importance of this factor was greatly exaggerated. The puzzling situation in the copper metal market received considerable attention. At the close of last week the announcement was made that the large producers had ordered a sharp reduction in prices of practically all grades of copper metal, with a view to breaking the deadlock that had existed for months between producers and consumers. It was the opinion of those well versed in the market situation that the reduction in prices would result in the placing of large orders for the metal by consumers, but, contrary to general expectations, the producers have sold very little copper for domestic use. Sales for foreign account have been fairly large, owing to the scarcity of stocks abroad, but so far as the domestic consumers are concerned, there is a disposition to await a further lowering in prices before placing orders. The attitude of the producers, however, is against any further reduction in prices at this time, but in view of the sharp reductions in copper metal in the London market, and reported sales at below the prices fixed a week ago in the local market, some interesting developments may be looked for in the near future. At the close of the week sentiment was more cheerful and the closing market was strong. The improvement in the money situation resulting in lower rates, doubtless was largely responsible for the better feeling existing at the end of the week. Instead of an indicated loss in cash of nearly $6,000,000, the banks showed a gain in that item of more than $4,000,000, and since that time the cash holdings of the Clearing House institutions were materially augmented by the refunding of government bonds and pension payments. Sterling exchange rules well below the gold export point, and the monetary situation may be said to be more encouraging than for some time past. Other influences having a bearing upon the values at the close, were the continued heavy movement of freight reported by the traffic managers of large railway systems, substantial gains in railway gross earnings and favorable weather in grain States, the latter being reflected in lower prices for wheat.

Philadelphia

The trading in the local traction issues has been extremely light during the week, but prices show very little change from those prevailing at the close of last week. In the early dealings, Philadelphia Rapid Transit yielded a point under what looked like speculative liquidation, but in the subsequent trading there was a full recovery to 23½. Philadelphia Traction was steady at 94½, and Union Traction lost ½ from 58½ to 58. Philadelphia Company common sold at 41 and 40½ and the preferred stock changed hands at 44¾. American Railway held firm at 49. Fairmount Park Transportation was traded in at 12¾, and United Companies of New Jersey sold at 244.

Chicago

The most important development in the Chicago traction situation was the publication of the plan for the reorganization of the Chicago Union Traction Company. Its successor, the Chicago Railways Company, will have $100,000 capital stock, which will not be exchanged for securities of the Chicago Union Traction Company and underlying concerns, but will be held in trust and will receive dividends which will be disbursed by the new company upon certificates of participation. These certificates will be offered in exchange for stocks of the North and West Chicago Street Railway Companies and the Chicago Union Traction Company. The plan involves a scaling down of all classes of the old stock. Notes amounting to $10,000,000 will be issued to take the Chicago Union Traction Company out of the hands of the receivers and the bonds for rehabilitation purposes will also be issued by the new company. Both of these classes of securities will rank ahead of the participation certificates.

Other Traction Securities

Trading in the local traction issues was extremely quiet, but prices for nearly all of the shares ruled somewhat higher. North Chicago, for instance, advanced from 42 to 45, while West Chicago stock sold at 34 and 34¼. Northwestern Elevated common advanced ½ to 22, and South Side Elevated sold at 82½.

Transactions at Baltimore were confined to small amounts, as follows: United Railway 4s, at 85⅜ and 85½; United Railway refunding 5s, at 80; Baltimore Traction 5s, at 105⅝; Norfolk Street Railway 5s, at 102⅝; Norfolk Railway & Light 5s, at 95; Richmond Traction 5s, at 104¼, and United Railway incomes at 52¼. In the Boston market Massachusetts Electric common advanced from 16 to 17, but the preferred declined from 57 to 56. Boston Elevated sold at 135½, and Boston & Worcester common crossed 23⅞ and 23¾. West End common sold at 86 and the preferred at 100.

On Monday a total of 385 shares of Cleveland Electric changed hands within a short time. All the shares for immediate delivery were purchased at 47, but 150 shares were sold at 49, buyer sixty days. After this owners asked 50. Little trading was done in other traction securities, and the figures stand about where they did a week ago. Aurora, Elgin & Chicago was quoted at 33, but no bid above 30 was made. Preferred stock of this company stands at 72 bid and 77 asked. Northern Ohio Traction & Light held to 25 bid and 26 asked.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week.

	July 10	July 17
American Railways	48¼	48½
Boston Elevated	135	135
Brooklyn Rapid Transit	57¼	57½
Chicago City	155	150
Chicago Union Traction (common)	3	3
Chicago Union Traction (preferred)	16	15
Cleveland Electric	46¼	45¼
Consolidated Traction of New Jersey	72½	72½
Detroit United	66	67¼
Interborough-Metropolitan	17	16¼
Interborough-Metropolitan (preferred)	45⅞	45
International Traction (common)	—	45
International Traction (preferred), 4s	—	67
Manhattan Railway	—	132
Massachusetts Elec. Cos. (common)	16	16½
Massachusetts Elec. Cos. (preferred)	a58	56
Metropolitan Elevated, Chicago (common)	23	23
Metropolitan Elevated, Chicago (preferred)	a64½	64
Metropolitan Street	a91	a91
North American	69	68¾
North Jersey Street Railway	40	40
Philadelphia Company (common)	41	40
Philadelphia Rapid Transit	23¼	23¼
Philadelphia Traction	93¾	—
Public Service Corporation certificates	66	—
Public Service Corporation 5 per cent notes	—	—
South Side Elevated (Chicago)	82	82
Third Avenue	105	104
Twin City, Minneapolis (common)	94	92½
Union Traction (Philadelphia)	58¼	58

a Asked.

Metals

According to the "Iron Age" the pig iron markets are lifeless. The steel works and mills are still very well supplied with work, but new tonnage is not and cannot be well expected to come freely at this season of the year. At some of the independent tin plate mills some of the tin house labor has gone out, but the matter is of little consequence.

The copper market has weakened again. Electrolytic sold at 21 cents in New York, and it has since been offered at lower figures. Twenty cents for electrolytic is freely talked about.

LAKE SHORE IMPROVEMENTS NEARING COMPLETION

With the exception of an additional 2000-kw generator in the power house at Fremont, the Lake Shore Electric Railway Company has practically completed all the improvements begun eighteen months ago when E. W. Moore became president. The Sandusky-Fremont line has just been put into operation, and has been permanently financed. The main line has been double tracked between Cleveland and Lorain and a new 2000-kw unit has been installed in the power station at Avon Beach. Improvements have been made on the local lines at Lorain and new equipment has been purchased. It is believed that the road now has sufficient power and equipment to operate properly for the next five years. The money for the improvements, with the exception of that for the Sandusky-Fremont line, has been secured by loan and will be added to the floating debt. As soon as the money market clears up this debt will all be paid by the issue of bonds. At present nothing further in the way of extension will be made, but later on the line will probably be extended to connect with the Western Ohio and with the Columbus lines.

THE SAN FRANCISCO SITUATION

The strike among the employes of the United Railroads of San Francisco is practically over and the sympathies of the better class of citizens are now solidly in favor of the Railway Company. Although there is still some disturbance it is mostly in the poorer districts of the city. The strike has been a costly one for San Francisco and appears to have been engineered more for political reasons than from economic causes. Moreover, the situation has been complicated by attempts of outside parties to utilize the difficulties of the company to secure franchises for an opposition system.

According to Patrick Calhoun, president of the United Railroads of San Francisco, who has recently outlined the history of the trouble and defined his views on trade unionism, the men at the time of the strike were receiving 50 per cent higher wages than at the time that the United Railroads took over the street railways in March, 1902. The rate of wages on the Market Street line was then 22 cents an hour, and on some of the other lines it was 21 cents. Soon after the United Railroads was organized, the carmen struck for a flat rate of 25 cents an hour. That demand was acceded to. A year later they again demanded an increase, coupling their demand with a threat to strike. The question was arbitrated by W. D. Mahon and Mr. Calhoun, with Oscar Strauss, of New York, now Secretary of Commerce and Labor, as the third arbitrator. The arbitration board fixed the scale as follows: 25 cents per hour for the first year, 26¼ for the second, and 27½ for the third. On May 1, 1905, a two years' contract was entered into by which the United Railroads agreed to pay this rate of wages for the two ensuing years. It was this solemn contract which the carmen violated in August, 1906. Nevertheless, the company consented again to arbitrate the question of wages and hours, after the men returned to work. The award made by the arbitration board, of which Mr. Chief Justice Beatty was chairman, fixed the rate at 31, 32 and 33 cents an hour for the first, second and third years respectively. In other words, the Carmen's Union struck once within a year in flagrant violation of its solemn written contract, and it struck twice within a year in reckless disregard of its own general laws, and having failed once to acquiesce in the decision of an arbitration board by extending for a year the high rate fixed by the award, it puts itself forever beyond the pale of recognition.

In defining his views on trade unions Mr. Calhoun says: "I am not opposed to unionism, but I am opposed to the principle of force in unionism. The labor unions in San Francisco have by their excesses carried prices to such a height that they will be destructive unless men of courage are willing to check them. Unions must not be permitted to prevent free men from earning their daily bread unless they belong to a union. The United Railroads is by far the largest property owner in San Francisco, and I am one of the largest property owners because I am one of the largest owners of the stock of the company. I would rather see my property sink into the sea than surrender to the dictation of any set of men who said to me that even the humblest man, if he was a self-respecting American citizen seeking employment in my company, should not be allowed to work. The fight my company is making is vital to the prosperity of the city. If the United Railroads cannot operate its cars free from the dictation of anybody, then there is no such thing in San Francisco as property rights or civil liberty."

PLAN OF REORGANIZATION OF CHICAGO COMPANY APPROVED

The Chicago traction plan has been announced by George W. Wickersham and L. C. Krauthoff, the committee and counsel having the matter in charge. A hearing on the plan has been called for July 29, and, in pursuance with the provisions of the traction ordinances, the discharge of the receivers of the companies and the turning over of their properties and operation to the Chicago Railways Company will now be asked for. It is expected that the Chicago Railways Company will be in charge and the plan in working order within a short time.

The Chicago Railways Company has authorized or will authorize the creation and issue of the following securities:

1. A first mortgage to secure an issue of 25-year 5 per cent gold bonds out of which to provide the funds required to enable the Railways Co. from time to time to comply with the requirements of the ordinance concerning rehabilitation, additions, etc. As the amounts which will be needed for these purposes cannot be fixed with exactness, the amount is left without limitation, except as to the purposes for which such bonds may lawfully be authenticated under the mortgage.

2. A consolidated or second mortgage to secure an issue of 20-year 4 per cent bonds aggregating $32,800,000, of which $15,000,000 shall be of series A, having priority in all respects over bonds of series B, and $17,800,000 shall be of series B.

3. An issue of 20-year 4 per cent sinking fund income debentures of $5,000,000.

4. An issue of 5-year 6 per cent collateral notes redeemable at par on any interest date three years or more after date not to exceed $4,500,000.

5. An issue of 10-year 5 per cent collateral notes redeemable at par on any interest date three years or more after date, interest payable only if earned after payment of all prior fixed charges, not to exceed in the aggregate $5,000,000.

6. The stockholders of the Railways Co. will make the capital stock the subject of an issue of income participation certificates as follows: A. Series A, entitled to priority of annual income to the extent, if earned, of 8 per cent or $8 per share of the nominal value of $100, and as to principal if any over series B and C, amounting to $12,250,000. B. Series B, entitled subject to the prior rights of series A, and in priority over series C, and to the extent, if earned, of 8 per cent, or $8 per share of the nominal value of $100, and as to the principal, if any, amounting to $6,000,000. C. Series C, subject to the prior rights of series A and series B, amounting to $5,000,000.

7. Said first mortgage and consolidated mortgage and the bonds to be issued thereunder and said debentures and collateral notes shall be in such form as the committee and counsel with the approval of the board of directors of the Railways Co. may prescribe or consent to.

It is proposed that the cash requirements of the situation shall be met and supplied by means of two syndicates. The first is to be a rehabilitation syndicate to furnish $12,000,000 in cash, which sum shall be set apart and solely applied to the rehabilitation, etc. The second is to be an organization syndicate, which is to furnish about $4,000,000 in cash, which is to be set apart and solely applied to the following purposes: for paying or acquiring receivers' certificates, amounting to $400,000; for other certificates amounting to $250,000; for paying or acquiring car trust and equipment obligations issued amounting to $760,000; for paying or acquiring notes secured by real estate mortgages; and for cash to be paid into the treasury of the Railways Company on demand of its board of directors or of the committee for the discharge of organization legal and other expenses, and for other purposes amounting to $2,141,000.

The ten-year five per cent collateral notes are to be used in payment of the indebtedness of West Chicago Street Railroad, North Chicago Street Railroad Company, and Chicago Union Traction Company.

The various purposes to or for which the securities of the Railways Company are to be distributed and the amount of such securities respectively apportioned thereto are as follows:

1. For the $500,000 outstanding North Chicago City Railway 4 per cent first mortgage bonds, $500,000, or 100 per cent, consolidated mortgage 4 per cent bonds, series A.

2. For the $2,500,000 outstanding North Chicago City Railway Co. second mortgage bonds, $2,500,000, or 100 per cent, consolidated mortgage 4 per cent bonds series A.

3. For the $4,012,000 outstanding first mortgage bonds of the Chicago West Division Railway, $4,012,000, or 100 per cent, consolidated mortgage 4 per cent bonds, series A.

4. For the $3,171,000 outstanding North Chicago Street Railroad Co. 5 per cent mortgage bonds, $634,200, or 20 per cent of consolidated mortgage 4 per cent bonds, series A, and $2,536,800, or 80 per cent of consolidated mortgage 4 per cent bonds, series B.

5. For the $1,614,000 outstanding North Chicago Street Railway Co. 4½ per cent refunding mortgage bonds, $1,614,000, or 100 per cent of consolidated mortgage 4 per cent bonds, series B.

6. For the $3,683,000 forty-year first mortgage bonds of the West Chicago Street Railroad Co. $736,600, or 20 per cent of the consolidated mortgage 4 per cent bonds, series A, and $2,946,400, or 80 per cent of the consolidated mortgage 4 per cent bonds, series B.

7. For the $6,317,000 forty-year consolidated mortgage bonds of the West Chicago Street Railroad, $6,317,000, or 100 per cent of the consolidated mortgage 4 per cent bonds, series B.

8. For the $497,000 outstanding certificates of indebtedness of the West Chicago Street Railroad, $298,200 or 60 per cent of the consolidated mortgage 4 per cent bonds, series B, and $198,800, or 40 per cent of the 4 per cent sinking fund debentures.

9. For the $1,306,000 outstanding Chicago Passenger Railway Co. consolidated mortgage bonds, $653,000, or 50 per cent of the consolidated mortgage 4 per cent bonds, series B, and $653,000, or 50 per cent of the 4 per cent sinking fund debentures.

10. For the $1,500,000 outstanding West Chicago Street Railroad Tunnel Co. 20-year first mortgage bonds, $1,500,000, or 100 per cent of the consolidated mortgage 4 per cent bonds, series B.

11. For the outstanding 2,499 shares of the capital stock of the North Chicago City Railway Co., $499,800, or 200 per cent, of the consolidated mortgage 4 per cent bonds, series B.

12. For the outstanding 6,246 shares of the Chicago West Division Railway Co., $1,249,200, or 200 per cent, of the consolidated mortgage 4 per cent bonds, series B.

13. For the outstanding 6,103 shares of the capital stock of the Chicago Passenger Railway Co., $152,575, or 25 per cent, of the 4 per cent sinking fund debentures.

14. For the outstanding 59,200 shares of the North Chicago Street Railroad Co., $5,920,000, or 100 per cent of the participation certificates of series A.

15. For the outstanding 99,890 shares of the West Chicago Street Railroad Co. $6,243,125, or 62½ per cent, of the participation certificates of series A.

16. For the 120,000 outstanding shares of the preferred stock of the Chicago Union Traction Co., $6,000,000, or 50 per cent, of the participation certificates of series B.

17. For the 200,000 outstanding shares of the common stock of the Chicago Union Traction Co., $5,000,000, or 25 per cent, of the participation certificates of series C.

18. Deposited as collateral security to secure the Railways Co.'s 5-year 6 per cent collateral notes and subject thereto, charged under the Railways Co.'s 10-year 5 per cent collateral notes, $6,617,200 of the consolidated mortgage 4 per cent consolidated bonds, series A, and $150,000 of the consolidated mortgage 4 per cent bonds, series B.

19. Deposited as collateral security to secure the Railways Co.'s 10-year 5 per cent collateral notes, $35,600, of the consolidated mortgage 4 per cent bonds, series B, and $3,995,625 of the 4 per cent sinking fund debentures.

The number of shares given above under the numbers 11, 12, 13, 14 and 15, are those held by persons other than the various companies.

The securities or appropriate evidences thereof of the Railways Company allotted in respect of the shares of the stocks of the North Chicago City Railway, the Chicago West Division Railway, the North Chicago Street Railroad, the West Chicago Street Railroad, and the Chicago Union Traction, shall, all other things having been tended to, be delivered to the Chicago Title & Trust Company as trustee for distribution and delivery. All deposits and exchanges of securities shall be made as of Aug. 1, 1907.

The first mortgage to secure the bonds to be delivered to the rehabilitation syndicate for furnishing $12,000,000, is required by the Railways Company for rehabilitation, equipment, and other construction work shall be entitled to all the rights, priorities, and first liens mentioned in sections 7 and 20 of the ordinance.

Any and all payments of interest, dividends, or other sums on account of the principal, or as interest or dividends upon any of the deposited securities which shall be or become payable on and after Aug. 1, 1907, shall be paid to and collected by the depository, and upon receipt thereof the depositary shall pay and dispose of said amounts with the written approval or upon the written direction of the committee.

The City Council has extended the time for the acceptance of the street railway ordinance by the Chicago Union Traction Company From July 26 to Sept. 14, on the request of Judge Grosscup. The judge in his communication, which was addressed to Mayor Busse, stated that all the stocks necessary had been deposited with the Chicago Title & Trust Company, but that it will still be necessary for the circuit court to hear a petition asking that the property in his hands shall be turned

over to the Chicago Railways Company, and there was danger that this could not be done before July 26. The cause of the delay is the disagreement still existing among the stockholders of the companies under the control of the Chicago Union Traction Company. No action has been taken with respect to disposing of the unsubscribed balance of the $26,000,000 issue, which was offered to stockholders at par. It is understood, however, that several offers have been received by the company for a part or all of the bonds. Of the practically $9,000,000 subscriptions received thus far it is understood that $8,000,000 came from abroad.

INTERURBAN RAILROADS NOT AN ADDITIONAL SERVITUDE—ONLY SPECIAL DAMAGES MAY BE RECOVERED

The Indiana Supreme Court on June 26 rendered an important decision in the case of Lottie Kinsey vs. The Union Traction Company and other traction companies, involving the right of such companies to use the streets to operate heavy interurban cars. The complaint states that the original franchises granted upon College Avenue, Indianapolis, on which the complainant is a property owner, were for light passenger cars giving a local service, that since that time the company has reconstructed its track with heavy T-rails, that the cars operated over it, both freight and express, are fully as heavy as those of the ordinary steam roads and of the same pattern and shape; that these cars shakes the plaintiff's house and has caused the plastering and ceiling to crack, and that the noise and vibration disturb the rest and break the sleep of herself and family, etc. Other allegations declare that by reason of the large size of the cars and the noise made by them in running over the road, horses hitched in front of her dwelling have become frightened and have broken away; that the cars stir up "whirlwinds of dust," which are borne into her house, damage furniture and carpets and cause much additional labor to keep the house in order. This had reduced the value of the real estate at least $5,000. The plaintiff also alleged that she never consented to the use of the street for the operation of any interurban cars; that they have not paid for such use, and that they do not claim to have any right to such use other than those acquired by contracts with the local company and the city, to none of which she was a party or gave her consent. The complaint insisted that the use of College Avenue in front of her premises constituted an additional servitude and easement upon her property which neither the public nor the city of Indianapolis, nor any of the defendant companies was entitled to use without compensation for which she demanded judgment.

The court was divided, two for and three against the idea that special damage was shown. The opinion of Judge Jordan, which was concurred in by Judge Montgomery, was that the purposes, uses, equipments and mode of operation of the interurban roads are materially different from those of the urban and street railway, except that the former employ electricity as a motive power. The interurban road is not a street railway in fact, nor is it operated for street purposes, or to promote the utility of the public streets of the city of Indianapolis. It is absolutely an independent railway, engaged in a general passenger and freight traffic between distant cities and communities, and as a result of its operation the usual discomfort and annoyance due to the operation of the ordinary steam roads are present, viz., loud noises, dirt and dust, shaking or vibrations of the ground, and other annoyances or detriments which affect the owners of abutting property situated on the streets over which the road is operated. The opinion says: "Perhaps these and the perils of the street do not constitute a burden to the same degree as that imposed by a steam road, but the question is, is it a burden upon the public street in addition to that to which it was originally dedicated or appropriated? Surely this road so nearly approaches the ordinary steam commercial railroad that a dividing line between it and the latter cannot consistently with reason be drawn." While it may be conceded that the use of the public streets by appellee company for the operation of its railway is quite a matter of economy in its favor, still, such use, as shown in this case, is a diversion from and incompatible with the public use to which the streets were originally dedicated and appropriated, and is, therefore, an additional burden upon the fee of the abutting owner, for which the latter is entitled to compensation.

The cases cited, notably those of the courts of California, apparently adhere to the view that no railroad constitutes an added burden. The courts of Maine, Oregon and Kentucky appear, to an extent, at least, to entertain this liberal and antiquated view. This doctrine, as the decisions show, has no sanction in this State and under the circumstances the decisions of these latter courts cannot be regarded or accepted as influential authorities in the determination of the question presented in this appeal.

The majority of the court, however, have reached the conclusion, and so hold, that under the facts averred in the complaint and the law applicable thereto, appellee's railroad does not constitute an additional burden or servitude upon any of the public streets of Indianapolis; that the complaint states a cause of action in favor of appellant only for the recovery of the special damages which she has sustained, as shown by the facts alleged, and for this reason it is held by the majority that the lower court erred in sustaining the demurrer to her complaint. The judgment is, therefore, reversed and cause remanded, with instructions to the lower court to overrule the demurrer to the complaint and for further proceedings not inconsistent with the holding of the majority of this court.

JUDGE HADLEY'S OPINION

In Judge Hadley's separate opinion, he said:

As the uses of the village street are expected to expand to meet the exigencies of the increasing public, new and improved modes are expected to respond to the new requirements. It was the application of these principles that brought the telephone poles and wires into the curb line of the streets, and none will gainsay that the use of those wires in the city of Indianapolis dispenses with thousands of passages through the streets every day. It likewise brought the street car confined to a fixed track in the middle of the street, first 14 ft. long, propelled by horses and capable of carrying a dozen passengers; then about 22 ft. long, propelled by electricity, with capacity for twenty-five passengers, and finally cars 44 ft. long and capable of carrying 125 passengers.

Then what may a street railroad company, organized to operate a street railroad within the city of Indianapolis rightfully do within the limits of its charter? It may adopt any means for the transportation of persons and property not harmful to the abutter nor inconsistent with any proper use of the highway, and useful and efficient in facilitating the passing and repassing of persons and freight through the streets.

JUDGE GILLETT'S OPINION

Judge Gillett, in his separate opinion, said:

The cars of an interurban road, when operated in a city, do not materially interfere with the abutter, nor are they antagonistic to the rights of persons upon the street, and as they materially augment the convenience of the individuals (as distinguished from the carrier) who possess the easement of travel thereon, such a line should be particularly distinguished from that of a steam railroad, the presence of which upon a city street is for the sole convenience of the carrier, besides being largely subversive of the travel thereon, and, for reasons which have often been pointed out, extraordinarily burdensome to the abutter. With scarcely an exception, it is held by the courts of the various States that a local surface electric railroad is not an additional burden. (Note to 2 Am. and Eng. Anno. Cases, 530, 535.) With the fact admitted that the streets of the State belong to the whole people, it seems to me that it must also be held that an interurban line is not an additional burden, since it is in aid of what is proper street travel and traffic. Granting that the country is as much entitled to the use of the city street as the people of the municipality, and bearing in mind that there is no substantial difference in burden between the local and the interurban car, I perceive no ground in principle for a distinction between them. * * *

The mere fact that in the case before us the use involves the carriage of property (as in the Mordhurst case) affords no just ground for holding that thereby an additional burden is created, for the transportation of property is a primary use of a public way. I may further add that the suggestion that the companies are operating commercial railways appears to me as affording no ground in principle for holding that the abutter is entitled to compensation, for all railways, urban or otherwise, if conducted for private gain, are commercial railways. The use of this term may be justified in referring to a class of railways which occupy the street solely for their own convenience, but if a railway is upon the street for the convenience of individuals who have occasion to use it, it will at once be perceived that so far as its being commercial is concerned, its presence there can be abundantly justified, as in the case of an ordinary street railway.

Judge Monks concurred in the opinion of Judge Gillett, and by so doing constituted the majority of the court.

DECISION OF RAILROAD COMMISSION IN MILWAUKEE CASE

The Wisconsin Railroad Commission on July 12 rendered two reports on the complaints recently brought by the city attorney against the Milwaukee Electric Railway & Light Company and the Milwaukee Heat, Light & Traction Company. In its findings the Commission recommends that the Milwaukee Common Council co-operate with the street railway company in its effort to better the local car service by granting franchise privileges which President John I. Beggs has repeatedly urged are needed to round out the local facilities.

The original complaint alleged high fares and inadequate service on certain lines, demanded air brakes on all city cars, the cessation of the operation of freight and construction trains, the employment of flagmen at certain steam railroad crossings and a better condition of the cars.

Hearings were held in Milwaukee on Feb. 20, 21, 26 and 27, and March 19, 20 and 21, and arguments were made at Madison on April 23. Nearly 100 witnesses were heard and nearly 2,000 pages of testimony were taken. Among those who testified at the hearing were Prof. W. D. Pence, the Commission's engineer; George Weston, its expert, and Bion J. Arnold, of Chicago, all of whom endorsed the company's position and agreed with Mr. Beggs that the Common Council grant the franchises which he believes are necessary to unify the Milwaukee street railway system.

In discussing fares, says the Commission in its report: "By common consent the question of the reasonableness of the rates of fare was left in abeyance until after the valuation of the property of the company which is now in progress shall have been completed. The burden of the testimony offered on behalf of the complainant was directed toward the matter of service during so-called rush hours." The Commission then discusses the charges of overcrowding made on the Eighth Street line and cannot find them substantiated. At other points better policing would make possible the operation of a larger number of cars. The report then recommends the cleaning of cars once a day and the use of air brakes.

This latter point, the report says, was more stubbornly protested than any other. In reviewing the testimony on brakes the Commission says that its import was generally identical with the deposition of George Weston, the independent expert in its employ, who admitted that "for ordinary scheduled stops there is no question but that the hand brake is just as efficient as the air brake," but that "where it is necessary to make emergency stops and in congested territories particularly, an air brake is superior to a hand brake."

"Yet there is no escape from the conclusion that air brakes, as a matter of fact, do make it possible to prevent accidents which it might not be possible to avoid with hand brakes," says the Commission. "And if a single life can be saved through the use of the air brake, who will say that it should not be done. Taking into careful consideration all the testimony upon the question of brakes, we are convinced that the adoption of air brakes is in the direction of progress. We do not believe that the facts in this case warrant an order from this Commission compelling the railway company to equip all its cars with air brakes, but we do believe that it is our duty to prescribe the use of air brakes or other power brakes on all double-truck cars which may hereafter be constructed or acquired by the company. We also recommend that whenever it is practicable in reconstructing cars now in use to add the power brake equipment, that it be done."

The Commission finds that the company does not operate its utility cars for other than its own convenience and not as a common carrier, and that it has the right to transport its materials and supplies in that manner. While these cars are being operated at night, it says they should be operated in such a manner as to interfere least with the transportation of passengers and with the comfort of people living near lines over which such are being operated."

The Commission sides with the company in maintaining that sending a conductor forward to see that the Kinnickinnic Avenue crossing is clear is much safer than placing a flagman at the crossing.

Considerable space is taken to discuss the question of extension plans, and the report concludes as follows: "We respectfully suggest, therefore, that the city authorities of Milwaukee take whatever action may be necessary for the immediate execution of the plans of construction and operation recommended above, and we recommend that the street railway company likewise proceed to the execution of these plans as rapidly as the action of the city authorities may permit. The execution of these plans we believe absolutely necessary in order that the citizens of Milwaukee may secure relief from present conditions and to give all the citizens of the city adequate service in the future."

The second report rendered by the Commission was in the case of Charles Gillett against the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company, and related particularly to the service to Wauwatosa. The Commission finds that the service has been greatly improved and that it was adequate during last February and March. It orders that this service be continued, but on the question of a reduction of fare it does not order any change.

HANDLING EXPRESS ON NEW YORK, NEW HAVEN & HARTFORD'S ELECTRIC LINES

President Lucius S. Storrs, of the newly incorporated Electric Express Company, which has just taken charge of all express and freight business on the trolley lines controlled by the New York, New Haven & Hartford Railroad interests in Massachusetts, has outlined for the STREET RAILWAY JOURNAL how the company came to be formed and how it plans to do business.

"It was really the experience with carrying parcels and express matter on our Berkshire lines that suggested the new company," said Mr. Storrs. "The Berkshire Street Railway had trolley express rights when we acquired it, and it was doing some business carrying light matter on the regular passenger cars. The service was not satisfactory, however, and it was a source of bother to the operating department.

"The new company will do an express business on the trolley lines in just the same way that the American or any other big express company takes charge of that class of business on the steam railroads. The Electric Express Company will make contracts for the right to have its agents and goods carried by the cars of the street railway companies, and then will take charge of all freight and express matter. This will save a lot of trouble in handling that class of business, for it will put the responsibility under one head, and will relieve the operating department of a good many things that are really foreign to its sphere of duty.

"The officers of the Electric Express Company are the same as those of the New England Investment & Securities Company; but the express company has a manager of its own, who will have the actual direction of express business. The manager is C. V. Wood. Mr. Wood started the first express cars in Springfield this week. He will continue in Springfield alone until he gets the business well established there. Then he will take up Worcester and its surrounding district, and continue until the new service is established in that territory. Local rights have been asked for there. Similar work will later be done in the Berkshire district. There is no need to hurry. The development will be carried on gradually.

"We intend to have special freight and express stations for the new company. One has already been provided for Springfield by some slight remodeling of the old car barn on Bond Street. This is just off Main Street, in the business district, and was already connected by spur tracks with the principal track system of the city. We have two trolley express cars, double truck, weighing about twenty tons. These are similar to the double-truck passenger box cars, except that they have two sliding doors in each side and are practically without windows. Each car starts out by making two trips daily, one running from Springfield to Westfield and the other from Springfield to Palmer. We shall have express stations at these points before long. At Westfield it will be necessary for us to put up a small new building. At Palmer we expect to be able to make use of an old storehouse. Special track connections will have to be provided at each terminus."

Mr. Storrs, president of the Electric Express Company, is vice-president of the Investment & Securities Company, which is the New Haven's holding company for Massachusetts trolley companies. James T. Harmer as comptroller, and Leverett Candee as treasurer, serve for both the Securities Company and the Express Company. President C. S. Mellen, of the New Haven, is president of the Securities Company.

CIRCUIT COURT DECIDES IN FAVOR OF CLEVELAND ELECTRIC RAILWAY

Through the decision of the Circuit Court Friday, July 12, holding that the Low Fare Railway Company has no rights on Central Avenue and Quincy Street, the Cleveland Electric Railway Company has gained one more important point in its fight against Mayor Johnson and the city administration in general. This is the Isom injunction case, decided by Judge Phillips, of the Common Pleas Court, against the Low Fare Company some time ago, and every point he made is sustained by the Circuit Court. The questions entering into the case are as to whether consents of owners of abutting property are necessary and whether the consents secured by the Forest City Railway Company and used in securing a franchise on these streets could also be used by the Low Fare Railway Company.

The court held that consents are necessary and that this has been established by a number of decisions of the Supreme Court. Several of these decisions were mentioned in the finding. It was also held that the law requiring consents of property owners is valid and necessary to prevent the usurpation of the rights of the people. The objection that the law does not affect the people generally was met with the statement that, to be valid, a law does not necessarily have to do this, but that it does affect all alike who come under its provisions.

Consents used in securing the franchise of the Forest City Railway Company cannot be used for the Low Fare Company. The court presumed that the Forest City Railway Company's franchise is valid, and said that while it holds the rights, they cannot be granted to another. Among other things the court said: "A street railway franchise carved out of the severeignty of a State is not a thing to be played with, in the courts or out of them. * * * We are of the opinion that the municipality was without authority to grant the Low Fare Company franchise, with or without consents. It undertakes to grant the Low Fare Company not only the right to use the tracks of the Forest City Company, but to pre-empt the right of way to the exclusion of the Forest City Company's tracks. The Forest City Company grant included the right to make traffic arrangements with other companies. Its right to sell or assign cannot be violated, either by the city or the property owners. An ordinance which assumes the contrary is void, as a violation of the obligations of contract."

Requirements for consents, the court said, acts as a check on municipal authorities when they seek to make grants where the residents do not desire them. They form a protection against the encroachment of the authorities upon their rights.

No consents not given specifically to the Low Fare Company can be used by it, according to the decision. Consents given specifically might be used generally for a new grant, but this is an extension grant. In the case of a new grant, bidding is required by law and it is presumed the grant will go to the lowest bidder.

In case the Forest City Company grant is held to be invalid, then the Low Fare Company has nothing upon which to extend.

Notice is given that the case would be appealed to the Supreme Court. In order to secure a decision from that tribunal several months will probably be required. Meantime the residents of the two streets are complaining because of lack of facilities.

Shortly after noon Monday, W. B. Colver, of the Low Fare Company, tendered the Cleveland Electric Railway Company, through President Horace E. Andrews, a grip said to contain $19,000 in gold, the amount fixed by the City Council for the joint use of the old company's tracks on Euclid Avenue. The remaining $63,000 for the use of the tracks on Euclid, around and through the Public Square, over Superior Street from that point to the viaduct, over Detroit and West Twenty-Fifth Streets to the point reached by the Forest City Railway tracks, was not offered. President Andrews asked why the entire amount was not brought, but the answer was not forthcoming. It is presumed that the officials did not care to have the entire amount tied up, since their cars are already operating over all but the Euclid Avenue portion, the Cleveland Electric having never asked that the injunction secured against the company be enforced since it was suspended when a truce was declared. The tender was refused by the Cleveland Electric officials.

Monday was the day when the new ordinance granting the Low Fare Railway Company the right to operate over these streets went into effect. It was designed to evade a court decision made some time ago, when the first ordinance was found invalid. Between 2 and 3 o'clock the company ran its cars out Euclid Avenue to East Fourteenth Street, the point where the extension from the Erie cemetery loop reaches the lines of the old company. The connections had not been made, however, and the cars returned from that point. They were in operation all afternoon.

When it was seen that the Low Fare Company intended to operate its cars over that piece of track under what is considered a subterfuge ordinance, attorneys for the Cleveland Electric applied for an injunction to prevent its taking advantage of the supposed grant.

MEETING OF THE COLORADO ELECTRIC LIGHT, POWER & RAILWAY ASSOCIATION

J. F. Dostal, secretary of the Colorado Light, Power & Railway Association, has just announced that the fifth annual convention of the association will be held at the Savoy Hotel, Denver, Col., Sept. 18, 19 and 20.

TEXAS MIDLAND CONSIDERING ELECTRICITY

It is reported that the Texas Midland Railroad, which is owned by E. H. R. Green, son of Mrs. Hettie Green, is to be converted into a third-rail line. Mr. Green has been in active charge of the Texas Midland for the last twelve years. The road is 120 miles long, and runs from Paris to Ennis. Mr. Green is said to be investigating the water and fuel situation. If the report as to these factors is favorable the plans for converting the road into an electric line will be carried out without delay. The general offices of the road are located at Terrell.

DECISION ON ROANOKE FARES

About nine months ago certain citizens of Salem, Va., which is about 8 miles from Roanoke, petitioned the State Corporation Commission of Virginia to require the Roanoke Railway & Electric Company, which operates an interurban electric line to Salem, to reduce its fares. The rates in force were 35 cents for a round-trip ticket and 20 cents for a one-way ticket. The company also sold books of twenty-five coupon tickets for $2.50, or a rate of 10 cents each way. The petitioners asked that the fare be made 5 cents. In its answer the company agreed to reduce the round-trip tickets to 25 cents and to make the one-way fare 15 cents cash, dividing the line into three 5-cent zones. At the same time it applied to the American Street & Interurban Railway Association for information as to what rates of fare would be equitable between the two cities as compared with the practice of other roads with similar conditions.

The commission held a hearing upon the subject on July 19, and among those who gave expert testimony on the subject was Prof. B. V. Swenson, secretary of the American Street & Interurban Railway Association, who had previously made a trip to Roanoke to familiarize himself with the conditions, and who presented some elaborate statistics of the fares charged elsewhere. Before the Commission had finished its hearing a compromise was effected between the company and the petitioners and this compromise was adopted by the Commission. It provides that the company shall sell books containing ten tickets, good between Salem and Roanoke, for $1, good for three members of a family of the person who buys the book, the names of the members to be inserted in the book; also that the company is to sell books containing forty tickets between Washington Heights and Salem, or between Edgewood and Roanoke, for $3, the books to be subject to the same conditions as the ten-ticket books. The cash fare is to be 15 cents, with 25 cents for a single round-trip ticket.

STONE & WEBSTER PUBLIC SERVICE JOURNAL

This is the title of an attractive monthly magazine published in Boston by the Stone & Webster organization, and designed primarily to keep the members in touch with each other and to inspire an esprit de corps. The first number, that of July, 1907, has an attractive appearance and contains a number of original articles as well as news from the different companies owned or managed by the firm. The longer articles include the following: Early History of the Firm, by Russell Robb; General Electric Commutating Pole Railway Motors; Value of Public Confidence; Depreciation; Chemical Fuel Economizers, and The Retired Manager Talks. The department "News from the Companies" occupies more than half of the 48 pages of the pamphlet and gives a resume of recent events which concern the different properties. Quotations on the securities of the public service corporations under the management of Stone & Webster are included in the paper.

PLANS FOR BEGINNING NEW HAVEN'S ELECTRIC SERVICE OUT OF NEW YORK

The executive committee of the directors of the New York, New Haven & Hartford Railroad met at the Grand Central Station Thursday, July 11, and discussed plans for opening the electrified line from New York to Stamford, Conn. Favorable reports were received and it was stated that the road would be opened for service between New York and New Rochelle Sunday, July 21, and to Port Chester by Sept. 1.

STREET RAILWAY PATENTS

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 140 Nassau Street, New York.]

UNITED STATES PATENTS ISSUED JUNE 25, 1907

857,572. Track Lifting, Leveling, Ballasting and Tamping Machine; Clement I. Amey, Toronto, Canada. App. filed Dec. 31, 1906. Relates to a machine which will successively perform the operations of lifting and leveling the track rails, depositing the ballast between the ties and tamping it under them, the operations of ballasting and tamping being performed simultaneously at progressive places.

857,591. Trolley Harp; Arlington D. Brittain, Youngstown, Ohio. App. filed April 18, 1906. A pair of arms bolted to the trolley harp and projecting rigidly upward therefrom and adapted to guide the wheel on the wire. A specially constructed wheel having removable flanges is employed.

857,612. Trolley Stand; Edgar L. Fixler, Delta, Ohio. App. filed July 12, 1906. Relates to a trolley stand from which a broken pole may be quickly removed and replaced with safety to the operators.

857,643. Trolley Guard; George L. Matheney, Bridgeport, Ohio. App. filed July 12, 1906. A pair of upwardly spring pressed lugs are mounted at each side of the trolley wheel so as to yield downwardly in passing guy wires, etc.

857,686. Electrically Propelled Vehicle; Russell Thayer, Philadelphia, Pa. App. filed April 4, 1907. An electric truck adapted to run on a car track and receive current through a trolley pole when it is possible, but having storage batteries by which it may proceed independently of the track when desired.

857,729. Electric Brake; Emil Franke, Astoria, N. Y. App. filed Aug. 4, 1906. Electro-magnets mounted under the car have armatures coupled so as to work in the same direction when the magnets are energized, telescopic rods adapted to carry the armatures and permit them to move in the same line, and rods between the brake beams and armatures whreeby the brakes are set when the magnets are energized.

857,752. Mechanical Power Brake; Louis Pfingst, Boston, Mass. App. filed March 6, 1903. The usual hand brake has an armature thereon which acts to assist the application of the brake whenever the curcuit thereof is closed.

857,780.—Bridge and Gage Plate for Railroad Rails; Franklin E. Abbott, Buffalo, N. Y. App. filed Aug. 20, 1906. Provides a bridge plate arranged to span the space between adjacent ties and which is so constructed as to prevent endwise movement of the rail joint.

857,781. Combined Railroad; Franklin E. Abbott, Buffalo, N. Y. App. filed Sept. 24, 1906. Consists of a combined rail and rail base plate, the former being of standard form, except for the base, which is reinforced at the point of usual weakness, and the plate providing a seat or support for such rail.

857,792. Railroad Brake; Howard A. Coleman, Sanborn, Ia. App. filed March 4, 1907. The brake is applied through the medium of a crank shaft having soft iron contacts thereon which are attracted by electro-magnets to partially rotate the shaft.

857,860. Rail Joint; George J. Becker, Buffalo, N. Y. App. filed March 18, 1907. Consists in a base set into depressions in a plurality of ties so as to prevent lateral and endwise movement thereof, in providing the base with upstanding flanges between which the rails set upon the base are confined, and in securing the rails and the base to the ties with spikes which serve to secure the base to the ties and the rail to the base.

857,907. Cross-Tie; John S. Schaeffer, Brookville, Pa. App. filed March 4, 1907. Details of a reinforced concrete tie.

857,911. Fluid Pressure Brake; Walter V. Turner, Wilkinsburg, and Robert H. Blackall, Edgewood Park, Pa. App. filed Sept. 26, 1903. Provides a valve means operatively separate from the triple valve for releasing fluid from the maintaining chamber and also from the brake cylinder when the train pipe pressure is increased for the purpose of releasing the brakes, whereby this fluid will be discharged even though the triple valve should stick or for any reason fail to move to release position at that time.

857,912. Fluid Pressure Brake; Walter V. Turner, Wilkinsburg, and Francis L. Clark, Pittsburg, Pa. App. filed Dec. 27, 1904. Provides a feed valve device with certain additional regulating means and connections with the engineer's brake valve, whereby the same may operate to regulate the train pipe pressure to the desired degree when the brake valve is in running position, and also to control communication to the train line when the brake valve is on lap and to then maintain the train pipe pressure at whatever degree of reduction is made at the brake valve.

857,987. Fastening Device for Rails; Armand Flamache and Jules Gernaert, Brussels, Belgium. App. filed May 15, 1906. A fastening device for rails consisting of a resilient socket or sleeve longitudinally slotted from end to end.

858,067. Brake-Shoe; Joseph D. Gallacher, Glenridge, N. J. App. filed Feb. 19, 1906. The method of forming a brake-shoe consisting in placing the plate upon the back of the wearing sole, bringing the ends of the plate toward each other, to thereby lock the latter to the wearing sole and simultaneously form an attaching lug for the brake head.

858,110. Railway Track Construction; John H. F. Shulze, New York, N. Y. App. filed March 20, 1907. Consists of rails which are longitudinally divided on a central vertical plane. The two sections of the rail are bolted together, with the abutting ends of the aligning sections breaking joint with those forming the opposite side of the rail. Each rail section is constructed with an extended base flange which is embedded in a roadbed of concrete.

858,120. Signaling System for Alternating Currents; Louis H. Thullen, Edgewood Park, Pa. App. filed March 2, 1906. Relates to block signaling on railroads where alternating currents are employed to actuate the signals. Provides an inductive bond between the track sections which will be opaque to alternating currents, but give a free path for the passage of the propulsion current from block to block.

858,121. Air Brake System; Leroy Tucker, Peru, Ind. App. filed Oct. 19, 1906. An automatic air brake system operated by a triple valve having a valve adapted to be opened to produce the emergency pressure in a brake cylinder, a pressure gage so connected to the triple valve as to indicate the change in pressure due to the opening of the emergency valve.

858,178. Car Seat; Fred H. Henry, Phialdelphia, Pa. App. filed Dec. 15, 1906. Details of construction of a "walk-over" car seat.

858,235. Rail Joint and Anti-Creeping Device; Francis M. Volk, Minturn, Cal. App. filed Nov. 1, 1906. A rail chair having a base portion, a fixed integral angle plate, and a flange between which and said angle plate the rail is adapted to seat,

and a movable angle plate having its outer edge turnably fitted to the inner wall of the flange of the chair.

858,238. Trolley Finder; Frederick G. Weber, Askland, Ky. App. filed Feb. 19, 1907. V-shaped arms are pivoted in advance of the trolley wheel and are thrown to operative position by the trolley cord when the wheel is being positioned on the wire.

858,255. Trolley for Electric Railways; Harry Bennett, Newark, N. J. App. fild April 17, 1906. The trolley pole is formed in two pieces, the upper end telescoping into the main portion and spring impelled upward therefrom.

858,355. Trolley Catcher; Robert Shields, South Boston, Mass. App. filed March 14, 1906. Details of a spring drum and ratchet device for controlling the trolley cord.

12,667. Car Replacer; George H. Sargent, Flushing, N. Y. App. filed April 2, 1907. Details.

PERSONAL MENTION

MR. R. S. IVES, superintendent of the Chicago & Milwaukee Electric Railway, has announced his marriage last month to Miss Emma Nichols, of Shawnee, Okla.

PROF. W. F. M. GOSS, of Purdue University, has resigned from that institution to accept the position of dean of the engineering department at the University of Illinois.

MR. LEVERITT M. CLARK has been appointed master mechanic of the Indianapolis Traction & Terminal Company, of Indianapolis, to succeed Mr. W. H. Evans, resigned, who now is master mechanic of the International Traction Company, of Buffalo. Mr. Clark formerly was master mechanic of the Indianapolis & Northwestern Traction Company, of Lebanon.

MR. HARLAN A. WELLSMAN has resigned as superintendent of motive power of the Camden Interstate Railway Company, of Huntington, W. Va., with which he has been connected for several years. Mr. Scott Coalgrove, who has been Mr. Wellsman's assistant, will succeed him. Mr. Wellsman will devote himself entirely to the management of the H. Wellsman Electric Company, of Ashland, Ky.

MR. HERBERT S. WHITON, chief engineer of the Ponce Electric Company, of Ponce, Porto Rico, has been appointed manager of the company in place of Mr. Gardner Rogers, who is returning to the Boston office of Stone & Webster. Mr. James B. Walker, of the Boston office, has been appointed assistant treasurer at Ponce, vice Mr. William H. Stone, who is leaving the company to become manager of the Mayaguez Light & Power Company, of Mayaguez, Porto Rico.

MR. RICHARD F. GOTSCHALK, president of the Columbus Street Railway & Light Company, of Columbus, Ind., met with an accident on July 10 which resulted fatally. Trouble was experienced with the trolley wire, and Mr. Gotschalk, in endeavoring to fix it, slipped from the ladder which had been placed against the guy wire and fell into the street. Mr. Gotschalk was identified with the Columbus company and its constituents for a number of years, going to Columbus from Chicago in 1889. He was forty-two years of age and is survived by a widow and two children.

MR. CHARLES H. CHAPMAN, who has been superintendent of the Consolidated Street Railway Company's lines at Middletown, Conn., for some years, has been promoted to be superintendent of the Consolidated lines in Bridgeport, to succeed Mr. R. H. Smith, resigned, whose appointment as manager of the Albany & Hudson Company was recently announced in the Street Railway Journal. Mr. Chapman will be succeeded at Middletown by Superintendent Church, of Southington. Mr. Robert T. Lee, who is in charge of the Meriden division as superintendent, will have the territory formerly under Mr. Church added to his division.

MR. H. GILLIAM, who was formerly connected with the construction department of the Westinghouse Electric & Manufacturing Company, has been appointed electrical superintendent of the New York, New Haven & Hartford Railroad, with headquarters at Stamford. He will have general jurisdiction over the maintenance and operation of electric transmission lines, with accessories, power houses and electric locomotives on the New York division. Mr. C. L. Peterson has been appointed chief engineer of the power station, with charge of the operation of the maintenance of station equipment, and Mr. J. C. Welch has been appointed to have charge of the maintenance and operation of electric locomotives.

MR. GUY W. TALBOT, vice-president and general manager of the Corvallis & Eastern Railroad, lately acquired by the Harriman interests, has resigned to become vice-president and general manager of the Oregon Electric Railway. His connection with the Corvallis & Eastern will end as soon as his successor is chosen, when he will devote his entire time to the management of the Salem electric line, now nearing completion. Mr. Talbot came to Portland a year ago in April to become general manager of the two Hammond lines in Oregon, the Astoria & Columbia and Corvallis & Eastern. Both these properties have since been sold, one to the Hill interests and the other to the Harriman. Mr. Talbot began his railroad career with the Burlington at Des Moines, Ia., and was later connected with the Des Moines Northern & Western, the Des Moines Union & Terminal Company, the Iowa Central and the Peoria & Pekin Terminal Railway. He came from the general managership of this last property to Portland.

MR. WILLIAM J. WILGUS, vice-president of the New York Central & Hudson River Railroad, has tendered his resignation to take effect Oct. 1 next. The great work of Mr. Wilgus in conceiving and directing the New York - Croton - White Plains electrification of the New York Central is too fresh in the minds of all railway men to require elaboration at this time. He has desired for some time to sever his connection with this and other work, but he has stayed with the company long enough to see every New York Central train entering Manhattan Island electrically operated, and he will leave at a time when the important problems are solved and little more than the completion of the terminal and the extension of the system along its original lines remain. The hearty feelings of good will from the company that Mr. Wilgus takes with his departure are well expressed in a letter to him by Mr. W. C. Brown, senior vice-president of the New York Central, who declared the change of power in the New York electric zone and the rebuilding of the Grand Central Station to be the most stupendous work of engineering ever known; that it had gone forward under Mr. Wilgus' direction practically without a halt and certainly without a failure in any essential feature; and that such imperfections as experience had developed had been introduced in the work without material change in the original plans. Mr. Wilgus has been asked by the company to remain as consulting engineer on the New York electric zone, Detroit River tunnel and Buffalo terminal improvements, but he has not accepted this offer as he desires to be entirely free in making his plans for the future. Although he is only forty-one years old, Mr. Wilgus has had a career of remarkable range in the steam railroad line. After his graduation as a civil engineer from a school in Buffalo, his home city, he started in 1885 as a rodman and draftsman on the Minnesota & Northwestern Railroad. The following year he became the Minneapolis terminal engineer for the same company; in October, 1887, he designed the Chicago, St. Paul & Kansas City Railway, and after several promotions left in April, 1890, to become locating engineer for the Duluth & Winnipeg Railroad; the next year saw him as constructing division engineer of the Chicago, St. Paul & Kansas City Railway. During 1891 he first became actively interested in electrical apparatus, but continued with Western railroads until 1893, when he became assistant engineer of the Rome, Watertown & Ogdensburg division of the New York Central, and in 1895, in conjunction with his other duties, he became chief engineer of the Buffalo Terminal Railway. In 1897 he was transferred to New York and became successively resident engineer, chief assistant engineer, engineer of maintenance of way, chief engineer and vice-president, as well as chairman of the advisory board of engineers on the Detroit River tunnel.

W. J. WILGUS