THE STREET RAILWAY JOURNAL

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Electric Cars in Albany.

Under the heading "Notes from the Field," in the January issue of the STREET RAILWAY JOURNAL, we gave a detailed account of the operation of the electric lines of the Albany Railway Co. In the same connection we take pleasure in presenting the accompanying illustrations, Fig. 1 illustrates, in a striking manner, the old and the new in the evolution of rapid transit. The car shown to the left of the figure is one of the original horse cars with which the lines were equipped. The centre figure is of a horse car that was employed on State Street before the advent of electric traction, and which ordinarily required four horses to haul up the steep grade, and frequently in snowy weather six horses. An electric car with which the lines were first equipped, manufactured by J. M. Jones' Sons, of Troy, N. Y., is shown at the right of the figure, and as we stated in the previous "Notes," makes the ascent of State Street with apparent ease and fair speed. Fig. 2, given on the next page, shows a view of State Street with three electric cars ascending the eight per cent. grade, and the New York State Capitol in the background. Since our last "Notes" some of the new cars, with Thomson-Houston S. R. G. motors, have been put in service.

Rapid Transit in Omaha.

THE OMAHA STREET RAILWAY.

The present company who control all lines running in Omaha with the exception of that to Council Bluffs, and the Benson & Halcyon Heights Railway, a suburban line, are composed of three originally distinct companies, the Omaha Cable Tramway, the Omaha Horse Railway and the Omaha Motor Co. The result of the simultaneous existence of these three roads, until their consolidation, was great competition which damaged all three, by building unnecessary lines, and by running some in the wrong direction. The three companies, appreciating their imprudence, very sensibly joined hands and formed the Omaha Street Railway Co. The result of this amalgamation has been the abandonment of unprofitable lines and the substitution of electricity on the horse roads and on the Harney Street cable line, the result of which has been a great saving of expenses. Notwithstanding this good management a troublesome obstacle has constantly to be contended against, and that is the natural disadvantages of the city. Above Twentieth Street the city is very sparsely settled. Just west of the new City Hall on Eighteenth and Farnam Streets—the latter the principal business thoroughfare of the city—a great deal of open

FIG. 1.—THE OLD AND THE NEW IN RAPID TRANSIT—ALBANY, N. Y., STREET RAILWAY.

country is encountered, the houses are scattered over a great deal of territory, and there are deep ravines on each side of the street. This is the situation out as far as the western city limits. Besides, the grades are extremely heavy and there are a great number of them. There is one on Farnam Street of nine and a half per cent. and they range in general from four per cent. to nine per cent. The result is that on some lines trailers cannot be run, but it is necessary to run a more frequent service of motor cars which, in passing, is much more convenient for the public. Notwithstanding these disadvantages the public are well pleased with the rapid transit afforded by the company's cars. When the question was asked whether the traveling public would consent to returning to the horse cars, the answer was a most emphatic "No," and that whether the company would be willing to make the change met with the same reply.

There are at present in operation about fifty-three miles of electric road and six and a half of cable. The standard rail used on the former weighs fifty-eight and a half pounds to the yard, of the Johnson girder type with a very small flange. On the cable road and the Harney Street electric line there is used a forty-five pound to the yard, section D, centre bearing, Johnson girder rail. Oak ties are employed to a greater extent than any other. On the down-town portion of the city they are laid sixteen inches from centre to centre, as in railroad practice, while at the outskirts they are laid five feet apart. All joints are suspended between two ties laid sixteen inches from centre to centre. The curve rails are of the same type as the straight rails, but are provided with guards. The joints are standing up very well where the ties are laid close together, but not otherwise. There is a good deal of pounding to be observed on the western portion of the Farnam Street line.

The general manager of the company, Mr. W. A. Smith, stated that the joints stood up better on single track lines where the cars ran in both directions, than on double track roads where they ran in one direction only. He said that he had noticed in stringer construction that the stringer joint plates were worn at one end only on double track lines, and the head of the rail beaten down where the car jumped from one rail to the other, and on single track lines the joint plates were worn at both ends and the rail heads were smooth. He also stated that he would advise the use of a girder rail by all means in the city streets, but a T rail in the outlying districts where the authorities would allow it. The steepest grades on the various lines are very abrupt, and, in consequence, it has been necessary several times to bend the rails vertically. There are not many short curves, the radius of the shortest being about thirty-eight feet; the rest range all the way up to sixty feet. The poles to support the trolley wires are of pine, with the exception of those on the viaducts, which are of steel. On the Edison lines No. 00 trolley wire is used, and on the Thomson-Houston lines No. 0. No guard wires are used to prevent interference with the telephone service.

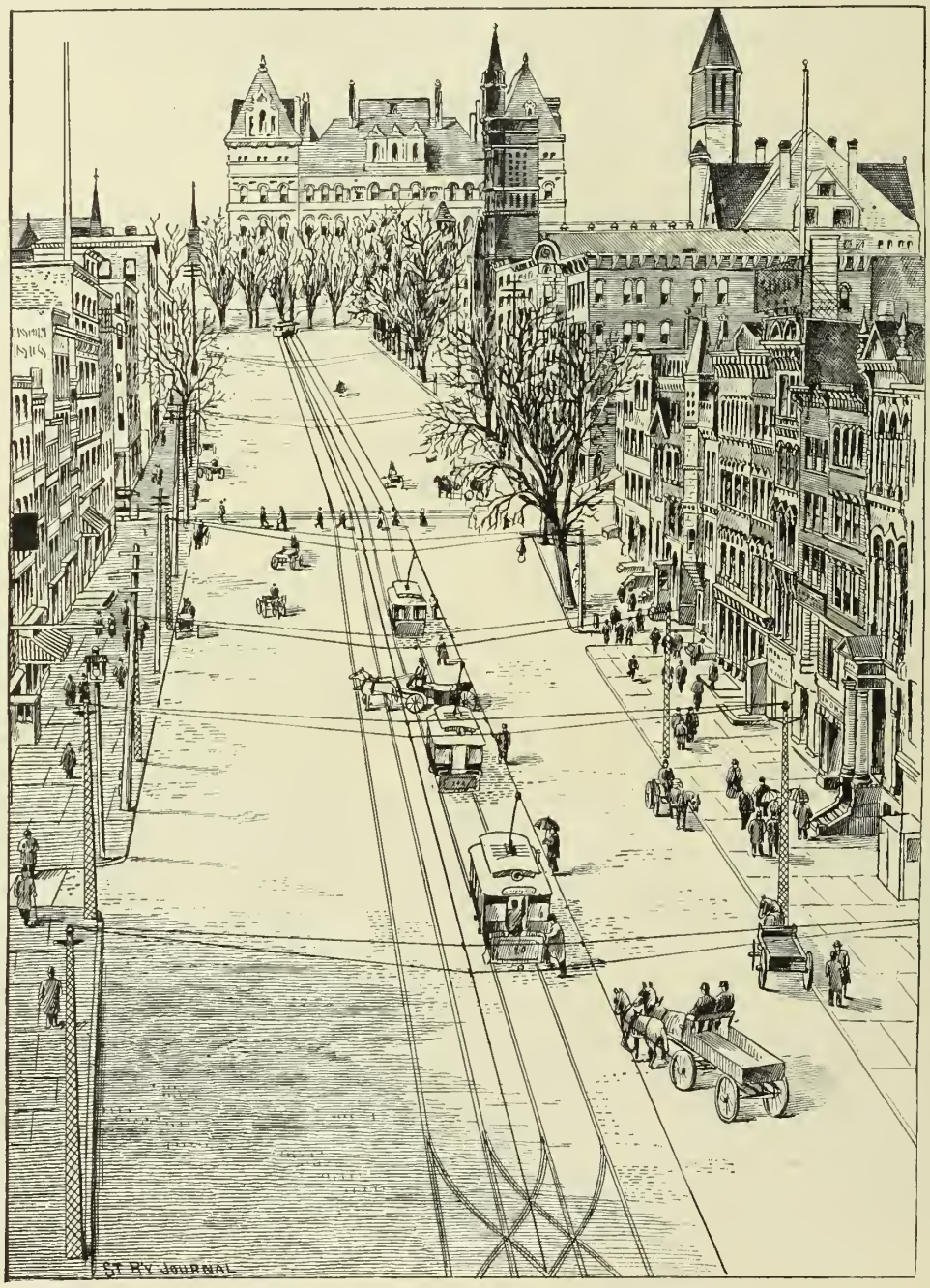


FIG. 2.—VIEW ON STATE STREET—ALBANY STREET RAILWAY.

There are two electric systems employed by the company, the Edison and the Thomson-Houston. There are at present in operation forty-five Edison and thirty-one Thomson-Houston motor cars, each equipped with two fifteen H. P. motors. This number has been distributed over seven routes, namely, the Walnut Hill line, eleven and three-quarters miles long, and operating one-half Edison and one-half Thomson-Houston motor cars; the South Omaha line, eighteen miles long, operating Thomson-Houston cars; the Farnam Street line, six and a third miles long, operating Edison cars; the Park Avenue & North Twenty-fourth Street line, thirteen and a half miles long, operating Edison cars; the Harney Street line, four and three-fifths miles long, operating Edison cars; the Thirteenth Street line, six miles long, operating Edison cars. The above mileage represents single track. The Walnut Hill line was the first in the city to be operated by electricity, and has been running almost three years. About two-thirds of the motor cars haul trail cars. The cable equipment consists of twenty-two grip cars and twenty-two trailers; the latter are duplicated in summer by open cars. About two-thirds of the car equipment was supplied by the John Stephenson Co. Ltd., and one-third by the Pullman car company.

There is but one cable road in operation at present, the Dodge and Twentieth Streets line. This has been operating about four years, and is the only line in the city that uses track brakes. There was another cable line running on Harney and West Dodge Streets where five trains were in operation. It proved very unprofitable, and was replaced by four Edison electric cars. It has been rumored that the Dodge Street line is also unprofitable, but as it is next to impossible for an electric car to climb the grades along its route the cable cars have been retained. When the Harney Street line discontinued operating as a cable line the reserve power was utilized for running two 135 H. P. Edison generators. The engine doing this work is of 600 H. P., and operates the generators by an extension of the flywheel shaft, and on to which was coupled a large flywheel connecting by a belt to Hill clutch pulleys which in turn operate the two generators by means of belt connection with the latter. The generators in this power plant are of the latest Edison type.

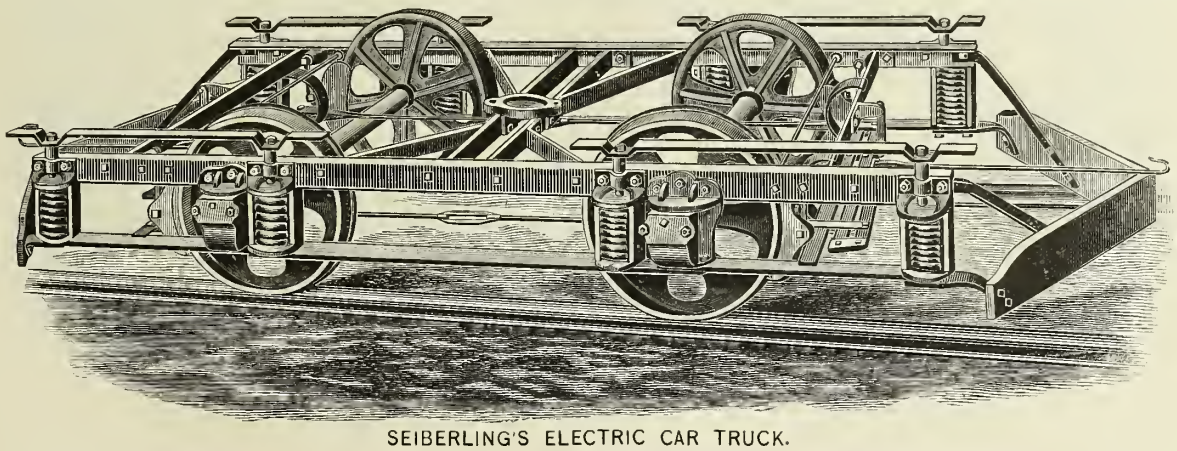
Since the publication of the last article in the STREET RAILWAY JOURNAL on the Omaha street railways there has been but one addition to the power, an increase in the Edison plant. At that time there were two Westinghouse compound engines of 250 H. P. each in the latter plant. There has since been added a 600 H. P. E. P. Allis tandem Corliss engine. This machine does the greatest credit to the manufacturers, standing up splendidly under the varying loads attendant upon the roads. The cut-off mechanism is a fine piece of workmanship, and represents the latest designs in the Allis company's machines. The cylinder dimensions of this engine are 24 ins. × 36 ins. × 48 ins. The switch board is not elaborate, but is very neatly fitted up. We noticed that the indicators showed very little variation in the amperage. There are at present ten Edison generators in the plant of 100 H. P. each, one-half of which number is kept in reserve. The Allis engine operates one force, while the two Westinghouse engines operate the other. In connection with the Allis engine and its generators is used the Hill clutch, and with the Westinghouse engines and their generators the Eclipse clutch. The boiler equipment was increased when the Allis engine was put in by the addition of five boilers of 100 H. P. each, made by the Milwaukee Boiler Co. of Milwaukee, Wis. The entire boiler equipment has at present a capacity of 1,000 H. P. The steam piping outfit is overhead. The smokestack is of brick, and is 125 ft. in height. The trolley wires are so connected with the power station that one or more stations or parts of stations can operate one or all lines, or, in other words, the power at command is perfectly interchangeable.

The company wind their own armatures and have a fully equipped machine shop for the purpose. The cores have to be b ught, but the winding is an easy matter if put into the hands of a few intelligent and experienced men, such as the Omaha management certainly have in their employ.

The number of passengers carried within the last two years is as follows: In 1890, 11,900,000; in 1891, 12,500,000. There are but eight horse cars in operation at present; they are chiefly employed in traversing lines not in full operation, and run upon them to hold the franchises. Most of the old horse cars are now used as trailers.

THE BENSON & HALCYON HEIGHTS RAILWAY.

This road is owned by Mr. William Crary, of Omaha, is suburban in character, and was built to build up Benson and Halcyon Heights, two suburbs of Omaha. It is two miles in length, single track, with one turnout, and at its eastern terminus connects with the Walnut Hill line. Its trolley wires connect with those of the latter, and thus it derives its current from the Thomson-Houston power station of the Omaha Street Railway. The roadbed is laid with a twenty pound to the yard T rail which is bending between ties laid about three feet apart. Two cars constitute the present equipment of the line. They were made by the J. G. Brill Co., of Philadelphia, are painted white and are neatly fitted up. They are equipped with fifteen H. P. single reduction Westinghouse motors, resting on two spiral springs and mounted on a McGuire standard truck. Each car is provided with a Burton electric heater, which gives great satisfaction. The car shed only accommodates the two cars and a small bench for tools and repairing purposes. The car equipment will undoubtedly be increased in the spring, as business will certainly demand it. One Sunday afternoon last fall both cars carried 1,200 passengers, and one car has carried the extraordinary number of 120 on one trip. Both cars are of the standard length, sixteen feet, and each makes 112 miles per day. The Westinghouse single reduction motor is practically noiseless and brings the car up a heavy grade with a celerity and an ease that are admirable.



SEIBERLING'S ELECTRIC CAR TRUCK.

THE OMAHA & COUNCIL BLUFFS RAILWAY & BRIDGE CO.

Practically no changes have taken place on this road since it was last described in the STREET RAILWAY JOURNAL. The car equipment has been increased by a few cars. The management is at present trying a new rail joint on the portion of the road laid with T rails, and which is about the same as the one adopted by the Broadway (N. Y.) cable road.

A New Electric Car Truck.

A new type of truck for electric cars designed by J. F. Seiberling, president of the Akron Street Railway Co., of Akron, O., has been in use for some time on the line of that road with satisfactory results. The principal features of this truck, which is illustrated in the accompanying engraving, are simplicity, durability and strength. It has, as shown, two sills which are the main support of the car body; these are mounted on the car axle in the usual way and on them are suspended four brackets with the coil springs which support the car by carrying plates. Ample space is allowed for the motor.

The brake operates on the four wheels simultaneously and, as will be seen, the leverage being large, its application is quite simple. Five of these trucks have been in use since the spring of 1891 on the Akron railway, above mentioned, carrying heavy Pullman cars with perfect suc-

cess. During the summer the loads on these cars have been as high as 150 passengers at one time. The line has heavy grades, so that the car brakes have been tested severely, but no difficulty has been experienced in controlling the cars. The parts are all substantially constructed and put together and no renewals have been required except for brake shoes during the nine months of service. A number of these trucks will soon be installed on the electric line at Zanesville, O., and the inventors propose to manufacture them for the general market during the coming season

FIG. 1.—BOWLING GREEN LOOP—BROADWAY CABLE RAILWAY.

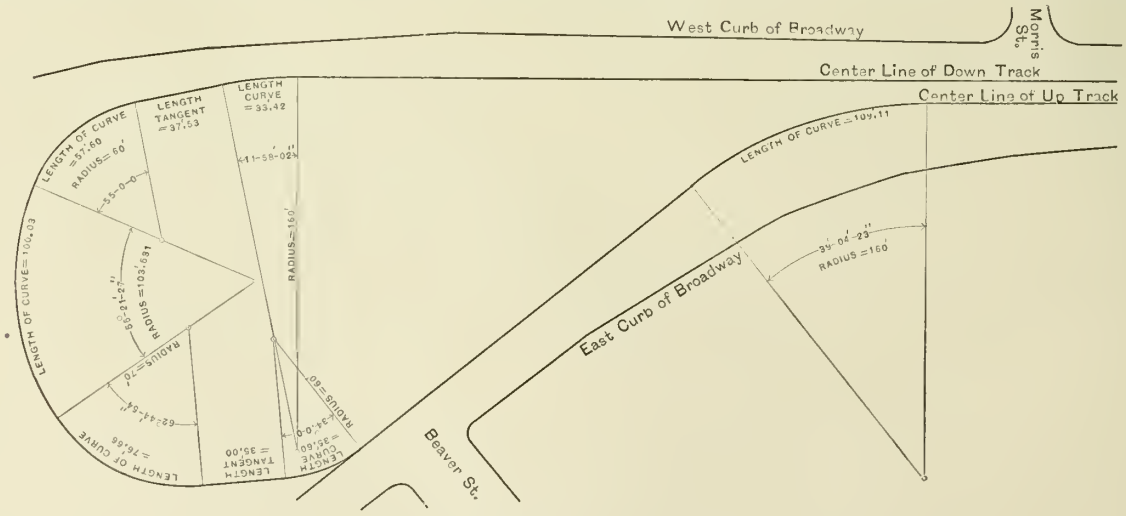


FIG 2.—PLAN OF BOWLING GREEN LOOP—BROADWAY CABLE RAILWAY.

IN THE STREET CAR.—"Paul, sit still or you'll get a thrashing!" "Mamma, if you punish me I shall tell the conductor that I was four years old yesterday, then you'll have to pay."—*Fliegende Blatter.*

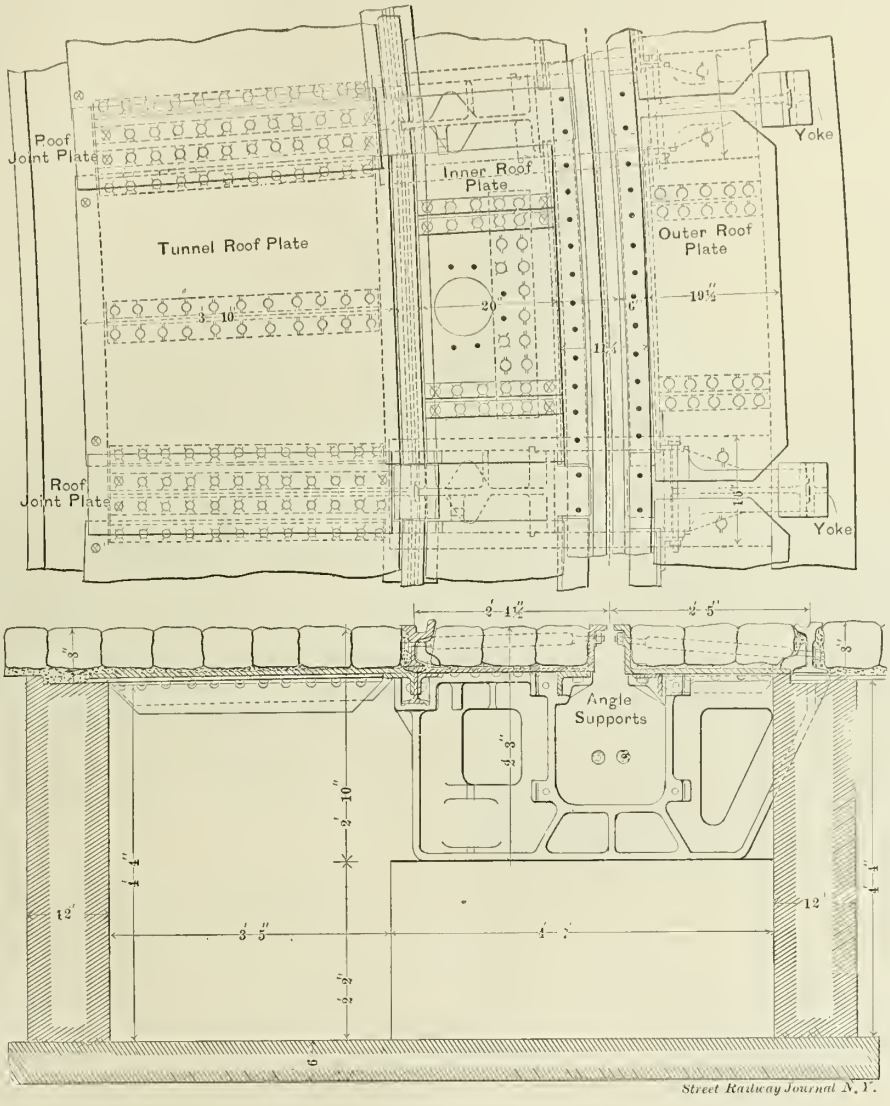
The Broadway (N. Y.) Cable Railway.

The work of laying the conduit and rails for the extensive cable line on Broadway has been almost completed, the only portion remaining to be done being a short section at the lower terminus of the road at South Ferry. Broadway is again open for uninterrupted traffic, and the street cars will continue to be operated by horse power over the cable tracks until the summer or fall, when it is hoped the cable will be in operation. The engineers in charge of the work are now busily engaged in perfecting the working drawings of the power stations and other details in regard to the road. As has already been stated, there will be two main stations, one of which will be at Fifty-first Street and Sixth Avenue and the second in a large building to be erected by the company at the corner of Broadway and Houston Street. There

will also be a third smaller station, to operate the loop between South Ferry and Bowling Green, the location of which has not been decided upon.

The present Broadway car stables cover nearly the entire block bounded by Seventh Avenue, Fiftieth Street, Sixth Avenue and Fifty-first Street. Work has already been commenced at the Sixth Avenue end for the power station which will occupy this portion of the building from Fiftieth to Fifty-first, the horses formerly stabled at that end being transferred to another part of the building. The architect of this power station and car house is W. B. Powell, of Philadelphia. The architects of the Houston Street station are McKim, Mead & White.

The road is divided into four sections. The first of these will extend from Fifty-ninth Street and Seventh Avenue to Thirty-sixth Street and Broadway, and will be operated from the upper station. The second section will extend on Broadway from Thirty-sixth Street to Houston Street and the third from Houston Street to Bowling Green, these two being operated from the Houston Street station. The fourth section, that between Bowling Green and South Ferry, has already been referred to. The duplex system of cables will be used throughout, except for the South Ferry loop, which will have a single rope. The last portion of the street construction on the main line to be finished was that at Bowling Green, of which we present an illustration in Fig. 1. The problem presented here compelled the adoption of a three centre curve in making the circuit of Bowling Green. The radii of the several curves are 60 ft., 103½ ft. and 70 ft. The curve pulleys will be placed here, as elsewhere, four and a half feet apart. Fig. 2, shows a plan of the loop. Figs. 3 and 4 are reductions from the working drawings of the curve construction used.



FIGS. 3 AND 4.—CURVE CONSTRUCTION—BROADWAY CABLE RAILWAY.

As will be seen from these drawings, a tunnel is provided on the concave side of each track of the curve by which access to the carrying sheaves may be had. The yokes are supported upon a brick foundation fifty-five and a half inches wide and twenty-six inches high which in turn rests on a concrete floor six inches deep, as shown. The retaining walls are twelve inches thick. The tram rails are, for clearness, not shown in Fig. 3. A method of arrangement for the carrying sheaves at curves which has been proposed, but has not been finally determined upon, is shown in Fig. 5.

On tangents the two cables in the conduit run at a distance of threee and a half inches apart, and on the same level, except at the approach to curves when one is carried above the normal level, and the other is lowered below that level. A special device will be used at the beginning of each curve by which the grip can be carried a constant height irrespective of which cable is being used, with a certainty of the cable returning to its proper sheave when released.

The present proposition is that every other car at Bowling Green will pass around the loop, and that the alternate cars will release the main cable and connect with the cable on the lower loop to carry them to South Ferry. The cars on the main line during the busy portions of the day will run on forty seconds headway. The length of the car decided upon is thirty feet, to be mounted on four wheels with a nine foot wheel base. The contract for these cars, at the date of publication, had not been awarded.

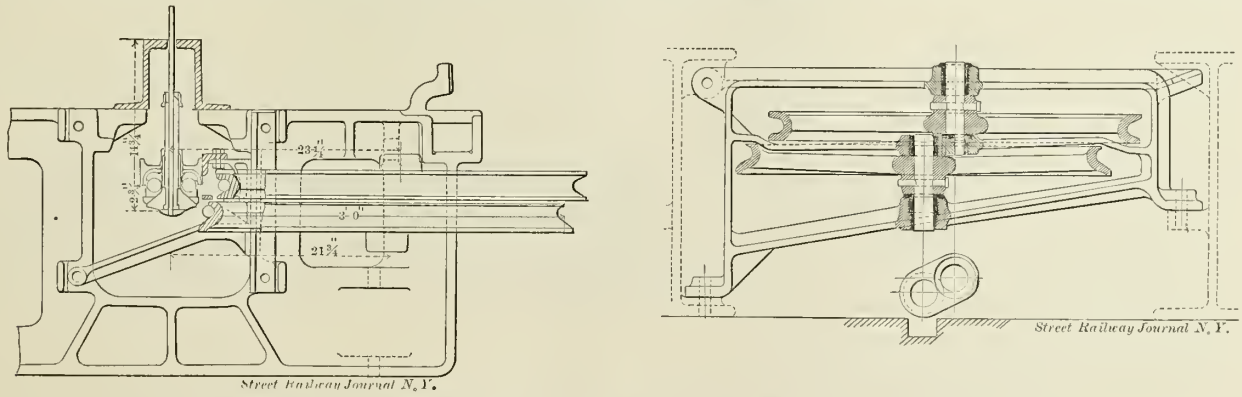


FIG. 5.—PROPOSED ARRANGEMENT OF CURVE PULLEYS—BROADWAY CABLE RAILWAY.

THE Philadelphia & Reading Railroad have ordered two electric switch engines built by the Thomson-Houston Electric Co. These will operate on the overhead system, wires for that purpose being strung through the company's yards.

Automatic Electric Car Lighting in a Chicago Tunnel.

The cars of the North Chicago Railway Co. pass through the La Salle Street tunnel which connects the north and south divisions of the city. This passage under

FIG. 1.—CARS ENTERING AND LEAVING CHICAGO TUNNEL.

the Chicago River is brilliantly lighted by arc lamps which, for the most part, are suspended from the roof of the tunnel. While the illumination is brilliant outside the car so that the gripman can see as well as in the daylight, the car roof shuts out the light from the interior and the passenger is unable comfortably to continue the perusal of his paper. To enhance the comfort of the passengers the company have introduced a system for lighting the cars by electricity while they are passing through the tunnel.

To the electric railway man the plan which was followed will be obvious; it is simply an overhead trolley system with a few peculiar details. Fig. 1 shows cars entering and leaving the tunnel. The general arrangement of the trolley can be seen in Fig. 2. It is a little over three feet in length and is ordinarily held horizontal, as shown in the engraving, by a hook resembling in form an inverted L (⅂). When the cars reach the mouth of the tunnel the contact wheel strikes against a copper guide or inverted trough to which a peculiar bend has been given. As a result the trolley arm is pressed down, and out from under the ⅂-shaped hook. The wheel is guided through the chute to the trolley wire; good contact with the latter is insured by a strong spring as in the case of an electric railway trolley. When the car emerges from the tunnel the same operation takes place but in a reverse order, and the trolley is left in a horizontal position, held down by the hook. In the diagram, the chute or guide, the guide rail and the trolley spring are shown.

Three or four lamps are used in each car. In the cars which are now being wired the latter number is used.

The cable cars on the system are run to a great extent in trains of three. In these cases the trolley is located on the grip car, and the others are connected by an ordinary form of connector attached to a flexible insulated conductor.

Current for supplying the lamps is generated in the power house at the corner of La Salle Avenue and Illinois Street, a block north of the northern entrance of the tunnel. Three dynamos are located here, all of the Thomson-Houston type. Two machines furnish the current for the arc lights in the tunnel. The third, a 100 light, 110 volt dynamo, is used entirely for the car lighting system. This dynamo always carries a light load, for during the rush trips not over eight or ten cars are in the tunnel at one time. The ground is used as a return. Connection is made with it through the grip mechanism. This plan was adopted instead of employing the rails for a return, because the latter are dry and sandy and a good contact could not be made.

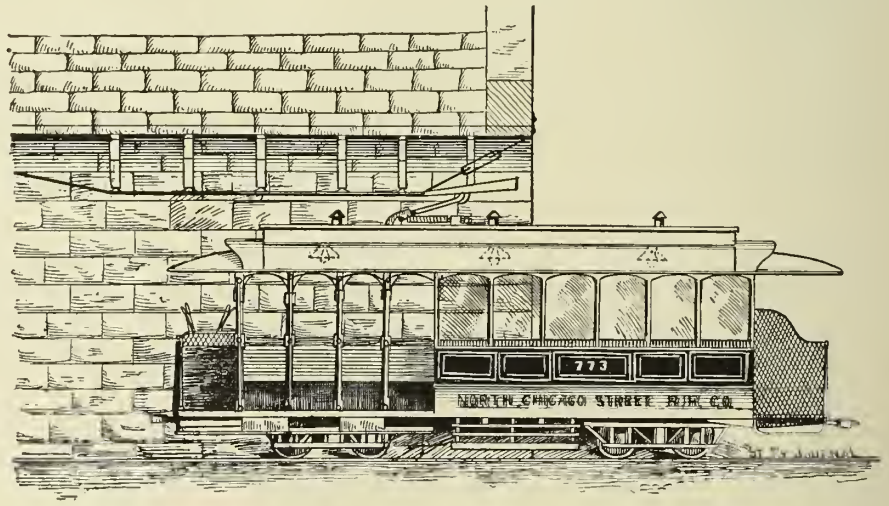


FIG. 2.—DETAILS OF THE ELECTRIC LIGHT SYSTEM IN CHICAGO TUNNEL.

Cleanliness and Godliness.

One of the Chicago papers has been waging war on the street car passengers who, regardless of the rights of others, insist upon indulging in the habit of tobacco chewing while riding on the cars. The results of this practice are sufficiently well known the country over. Efforts have been made to prevent passengers from making nuisances of themselves, but the contract was a large one, and it was difficult for conductors to enforce the regulations without continually getting into trouble. Unfortunately, little if any attention was paid to the prohibition printed on a placard within the car. It had become too familiar; it was rather mandatory in expression. A new sign, which it is hoped will work a reform, has been hung up in the North Side cars. It is worded so as to catch the eye of the most wary, and reads as follows:

> Cleanliness is next to godliness, they say! We can't be gods, but we can be clean. Do not spit on the floor!

Street Railway Convention at Cleveland.

A large number of companies have already engaged quarters at the Cleveland hotels for the convention of the American Street Railway Association. Provision has been made so that ample accommodations will be available for all who attend the meeting. A building has been secured near the Hollenden which will be the headquarters of the Association, for exhibition purposes. It is large and convenient, so that all exhibitors will be provided for.

J. B. Hanna of the local committee of arrangements says the delegates will have a thoroughly enjoyable time, and that they may be perfectly confident they will not be victimized by hotels.

The Healy Steam Motor.

The Healy steam motor is now in operation on two lines running out to a Detroit suburb. The illustration shows the latest type of motor which was recently adopted as a standard. It has recently been stated in the daily papers that C. E. Healy, the inventor of the engine, would leave Detroit and make his headquarters in Chicago, where a plant for the manufacture of the motors would be erected. This report, Mr. Healy says, is incorrect, although he does not deny that he has received overtures from Chicago capitalists.

HEALY STEAM MOTOR CAR IN DETROIT.

The problem which Healy undertook to solve was the construction of a steam motor for street car service, which would be practically noiseless. What has condemned the steam engine for this work has been the puffing of steam. This, it is claimed, has been accomplished and the plan followed is explained in the inventor's own words as follows: "I went at the problem in exactly the opposite way from other workers in this field and enlarged instead of cramping the exhaust. No puffing of steam can now be heard, and, consequently, there is nothing objectionable about the motor. It can be run through crowded streets and no one finds fault with it."

The motor does not create a smoke nuisance; in fact, no more smoke issues from the flue than from the chimney of an ordinary car stove. Hard coal, and gas coke are used as fuel.

The standard motor shown in the illustration weighs five tons. As to the capacity in horse power Mr. Healy makes no statement, for the reason that he has made no tests to ascertain it. He states, however, that the motor has drawn five loaded freight cars "without slack." He uses a steam brake of his own design.

In regard to the economy Mr. Healy states that eighteen cents' worth of fuel runs the motor one hour. He asserts with great confidence that the operating expenses are much less than any tram locomotive in the market; indeed, he goes so far as to say that they will be found greatly below those of an electric railway even when compound engines drive the generators.

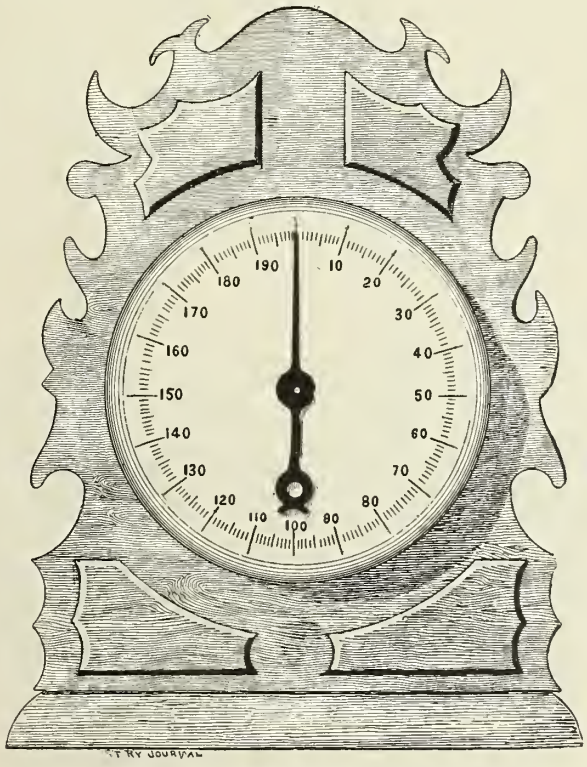
Seven motors are now in use on the two lines mentioned. An order has recently been received for motors to be operated on the line connecting Owosso and Corunna.

THE Augusta (Ga.) Railway Co. have recently installed a number of arc lights operated by the railway circuit. The Ward lamp is used.

An Electrical Fare Register.

A fare register for electric cars and operated by electricity derived from the same source as that for operating the car has been devised by A. O. Mackin, of Johnstown Pa. The general appearance is shown below.

The face of the register is formed on the flat surface of the bell and registers up to 200 fares. In addition there is a secret record kept within the register where consecutive fares can be registered.



AN ELECTRIC FARE REGISTER

The interior mechanism of the register consists of a small brass cog wheel having a lever and ratchet movement, the lever being operated by an electric magnet; the circuit through the core of this magnet is made by the conductor by pressing suitable switches situated at different points in the car. The secret record is made upon a roll of paper drawn from one spindle to another.

Toledo Line Wagons.

The wagons used by the Toledo Electric Railway were made in accordance with designs made by officers of the company. They have served their purpose well, and are

FIG. 1.—TOLEDO "HURRY UP" WAGON CLOSED.

now considered essential parts of the equipment. The two wagons for line work are illustrated in the accompanying engravings. Figs. 1 and 2 show the "hurry up" wagon. The framework, ordinarily, is folded in the vehicle, as shown in Fig. 1; but on reaching the point where the hurried job of repairing is to be performed, the superstructure may be raised, as shown in Fig. 2, in half a minute. This is accomplished by means of a crank at the end of the wagon, which turns the reel on which the cable running to the top of the upright or stake is wound. The

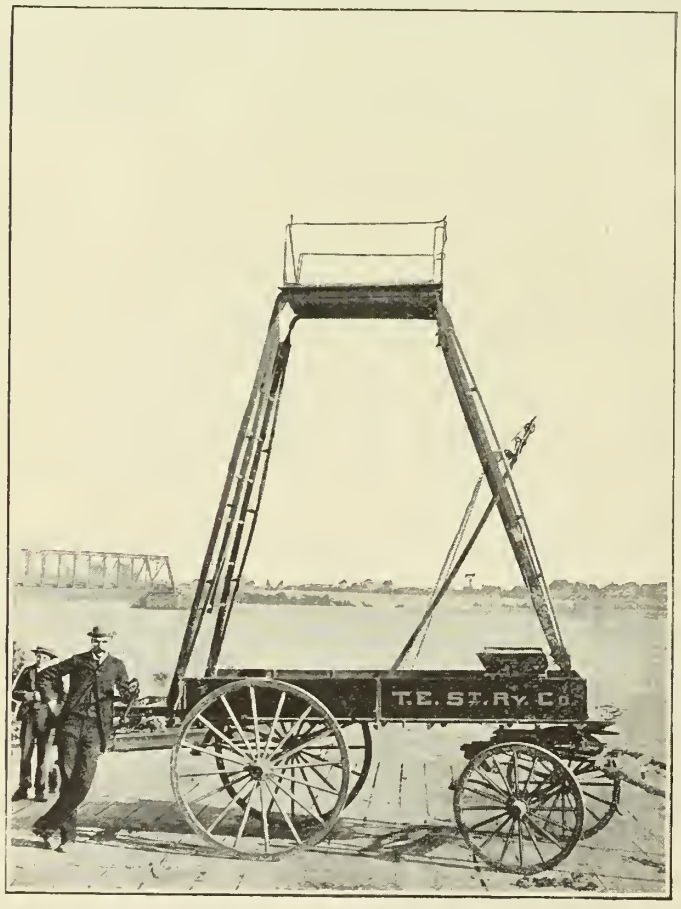


FIG. 2.—TOLEDO "HURRY UP" WAGON OPEN.

platform is thrown into position by the workman as soon as he mounts one of the two ladders on the framework. The platform is protected by an iron guard rail which folds down when desired. The arrangement is such that the framework can be raised to any desired height; whatever this may be the platform is always level. The wagon is provided with a gong, so that an alarm may be sounded when a hurried run is made to a point where repairs are needed.

The regular line wagon is illustrated in Fig. 3. The distance between the wheels is four feet eight inches, and the platform has the same width. The latter can be widened four feet on each side by raising folding extensions, which are supported by two iron rods fastened in the main upright. The advantage of this arrangement is obvious. Work can be carried on at the same time on both wires on a double track or at a switch. The framework on which the platform is supported may be raised or lowered when necessary, as for example, in working under a bridge. On the body of the wagon tools and supplies are carried.

Switch and Signal Tower, Chicago.

Since the introduction of the cable system on the West Side in Chicago the operating company have adopted

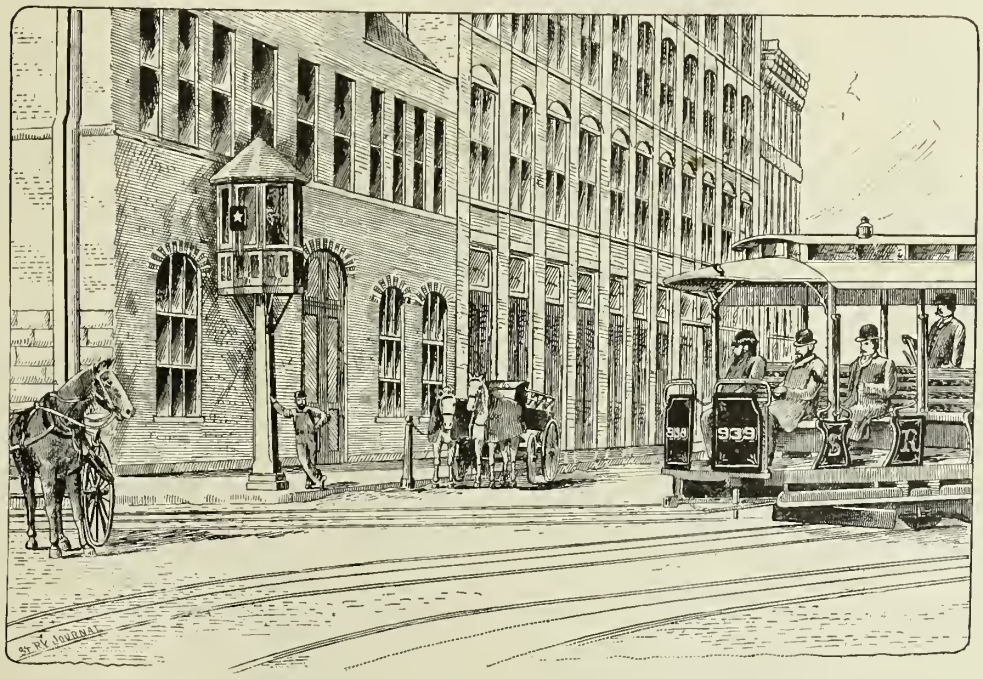
FIG. 3.—TOLEDO STANDARD LINE WAGON.

a number of improvements in details, which have increased the reliability and safety of the service. One of the most interesting and important of the auxiliary devices is the switch and signal tower at the corner of Washington and Jefferson Streets. The Madison Street and Milwaukee Avenue cars which use the same tracks up to this point diverge at this corner. The former turn to the south; the latter continue westward for a block.

The switch is located 200 ft. east of the corner, and it was formerly operated with a lever by an employe stationed between the track and the curbing. This method was found to be objectionable. The traffic at this point is quite considerable, so much so that it formerly caused delays in one of two ways: Either the switchman was driven from his post by wagons, and the cars remained at a standstill till he was able to return, or the drivers, to avoid the switchman, would turn their vehicles on the tracks and a blockade would follow. The annoyance was so great that it led to the present system in which the switch is moved by compressed air.

The tower, which is located on the northwest corner of Washington and Jefferson Streets, is fifteen feet in height. The little windowed station is supported by a hollow iron column. The operator reaches his post by steps on the column. The little apartment is just large enough for the switchman to turn about when sitting down. This tiny room is extremely comfortable even on the coldest day, for steam is carried in a pipe from the power house, a few feet distant, up through the centre of the supporting column to the switch station where it can be regulated by a valve.

The switch, 200 ft. east, can always be seen by the operator, so that he can tell whether the compressed air has done its work. At night the switch can be seen by the light of a city arc lamp; as an additional precaution the rays of a 100 C. P. incandescent lamp are thrown on the switch by a reflector attached to the lamp post.



SWITCH AND SIGNAL TOWER—WEST SIDE RAILWAY, CHICAGO.

The air is compressed in a small reservoir in the power station. The pressure ranges from twenty-five to thirty pounds; if it increases materially the reservoir is relieved by a device practically identical to the safety valve of a steam engine. The compressed air passes up through the hollow supporting column to the signal station and thence to the cylinder which operates the switch. The operation of the cylinder is not different from that of an engine. The admission of compressed air through the pipe connected to one end of the cylinder throws the switch in one direction; the opposite movement is effected by the admission of air through the second pipe leading to the other end.

The duties of the switchman are simple. With his left hand he controls the cock which admits and releases the compressed air from the pipes; with his right hand he turns the signal which guides the gripmen.

While the switchman is always supposed to be able to see the switch, he has in front of him an indicator which shows how the switch stands. This device is extremely simple; it is merely an arm actuated by the exhaust, which points to the words "Madison" and "Milwaukee," This indicator, while almost superfluous ordinarily, is useful, of course, in a fog. One other device completes the equipment of the station; this is an alarm box by means of which a signal may be sent to the engineer to stop the power. In case of an accident of any kind the ropes can be stopped within a minute or two.

The signal is four-sided; three sides are red and the fourth green with a white star. The gripman must see the green before he can start. It was at first intended to operate the signals by the exhaust, but it was subsequently decided that the operator could manipulate it to better advantage. Experience has demonstrated that this decision was wise. At night an ordinary railway switch lantern was used, with three red windows and the fourth green.

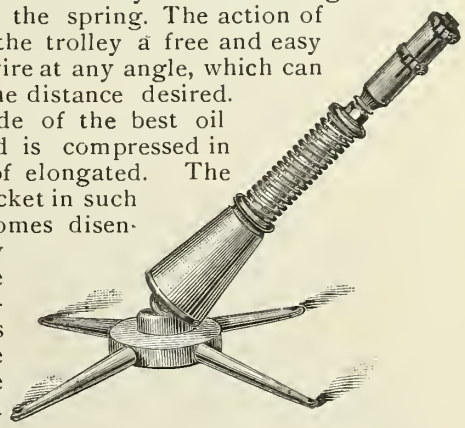
Practice has demonstrated that the signal tower is successful in all respects. The location of a man there where his vision is not cut off by carts, and where he is not in momentary danger of being run over, makes his work far superior to that of his predecessor the flagman. The arrangement of the signal is such that the gripman cannot make a mistake except through gross carelessness. The operator has complete control of the switch so that no time is lost. The result of the operation of the new system has been the almost complete avoidance of accidents and collisions at, perhaps, the worst corner on the West Side.

The illustration is reproduced from a photograph taken while a Madison Street train from the east is turning from Washington Street into Jefferson Street. The view is taken on Jefferson Street looking north. It will be noticed that a star is shown on the signal which permits the gripman coming in the opposite direction on Jefferson Street to advance.

The company's power house is at the building on the left. The horses at the right of the power house are attached to the wrecking wagon which is always kept in readiness. The driver stands leaning against the signal tower.

Bill Trolley Base.

The Bill trolley base shown in the illustration has but one spring, which gives a steady pressure on the wire. It is so made that the pole may come to the roof of the car without injury to the spring. The pole can be swung from front to the rear of the car at an almost horizontal position without injury to the base, and it can also be left in a horizontal position for any reasonable length of time without injury to the spring. The action of the base gives to the trolley a free and easy movement on the wire at any angle, which can be regulated to the distance desired. The spring is made of the best oil tempered steel, and is compressed in its action instead of elongated. The pole is held in a socket in such a way that it becomes disengaged if the trolley should catch in the wire, so that breaking of the latter is prevented. The castings are of the best grey iron, and are neat in design, without angles to cause easy breaking. The base weighs fifty-five pounds complete, and has been commended by all those using it. Alfred G. Hathaway, of Cleveland, is the sole agent for the trolley base.



BILL TROLLEY BASE.

New Grip Cars for a Chicago Company.

The North Chicago Railway Co. have started the construction of ten new grip cars in their new car shops at the corner of Fullerton Avenue and Sheffield Street. The cars will be exceedingly strong and well built, and will embody some new features. The interesting fact about this construction lies in the probability that, hereafter, the North Side company will engage in car building.

Steam Tramway Locomotive for Chicago.

The North Chicago Railway Co. will make the experiment of running a tramway locomotive on certain sections of their line. When the president of the company, Charles T. Yerkes, was in Europe last summer he came to the conclusion that a steam motor such as he had seen in operation in several places could be used to advantage by the company. He found a type in Paris which seemed to be noiseless and to give satisfaction. Mr. Yerkes determined to order an engine of similar design, and he gave the order to Carels Bros., of Ghent, Belgium. It has recently reached Chicago, and has since then been in charge of Superintendent Miller at the car shops, Sheffield Avenue, where the photograph for the accompanying was taken.

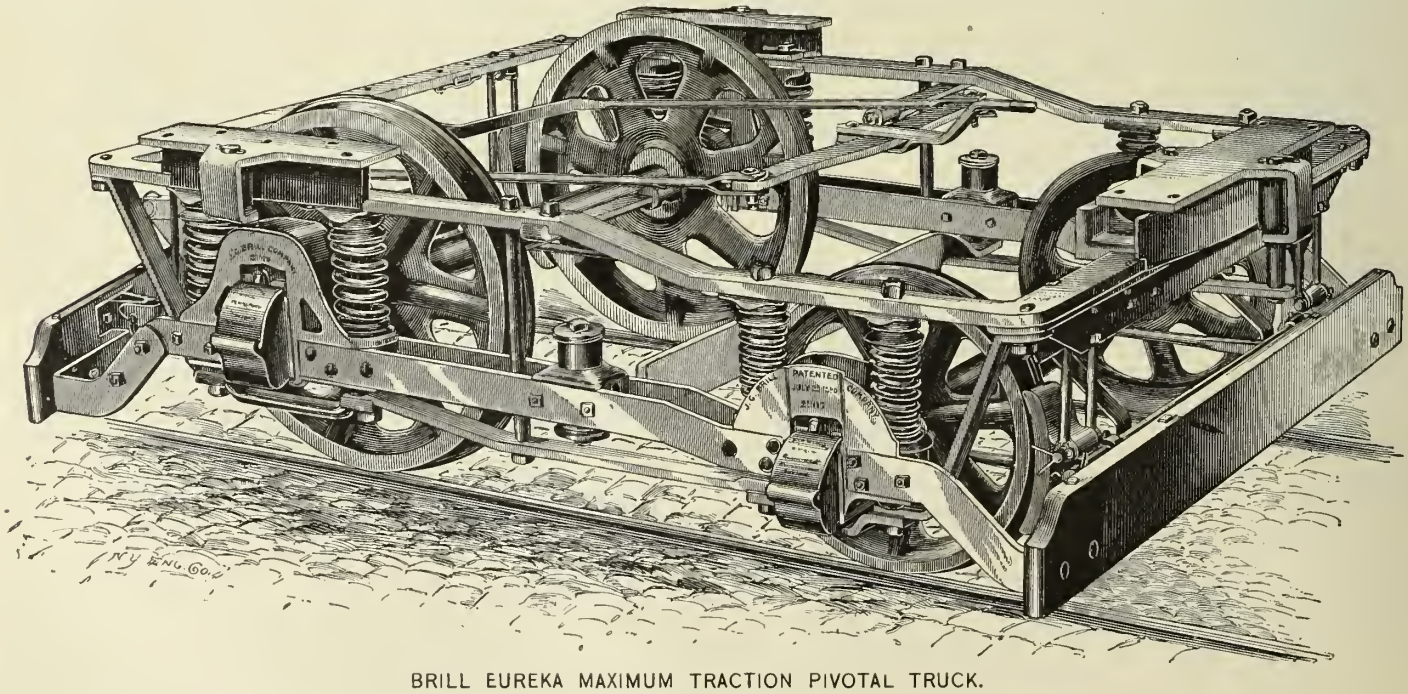
STEAM TRAMWAY LOCOMOTIVE FOR CHICAGO

The locomotive is built entirely of steel, and the construction is of the most substantial character. Its weight is about seven tons. It is twelve feet in length, seven feet eight inches in width and nine feet high. The engines, which are below the floor, drive directly the four driving wheels. The engines are of the double cylinder pattern. The exhaust steam passes into the series of condenser pipes which are shown on the roof of the locomotive.

Eureka Maximum Traction Pivotal Truck.

When John A. Brill's maximum traction truck was invented many of the disadvantages of pivotal trucks were overcome. The height of the car body was reduced ten inches, and the necessity of double steps was thereby obviated. The wheel base was shortened, and the amount of power required was materially reduced. A gain in traction of forty-two and one-half per cent. was secured, it was also claimed. The only objectionable feature—although this was not by any means serious—resulted from the fact that the pivotal centre or drawing point, which came over the axle, was in the way in dismounting the motor and had to be removed, though this trouble was overcome by using a movable spider. In the truck which is illustrated herewith the objection has been entirely overcome.

This truck has been styled the Eureka maximum traction truck. It has no mechanical pivot, and is specially adapted for the "waterproof" and, 'ironclad" types of motors which have their upper portion hinged so that they can be raised when it is necessary to get at the armature or other parts of the motor. The space above that occupied by the motor is free and clear, so that when the trap doors



BRILL EUREKA MAXIMUM TRACTION PIVOTAL TRUCK.

in the cars are raised every part of the motor can be reached and the armature taken out without removing or disturbing any part of the truck. A reduction in the height of the car to the extent of one and a half inches is obtained, and the weight of the truck is reduced by 150 lbs.

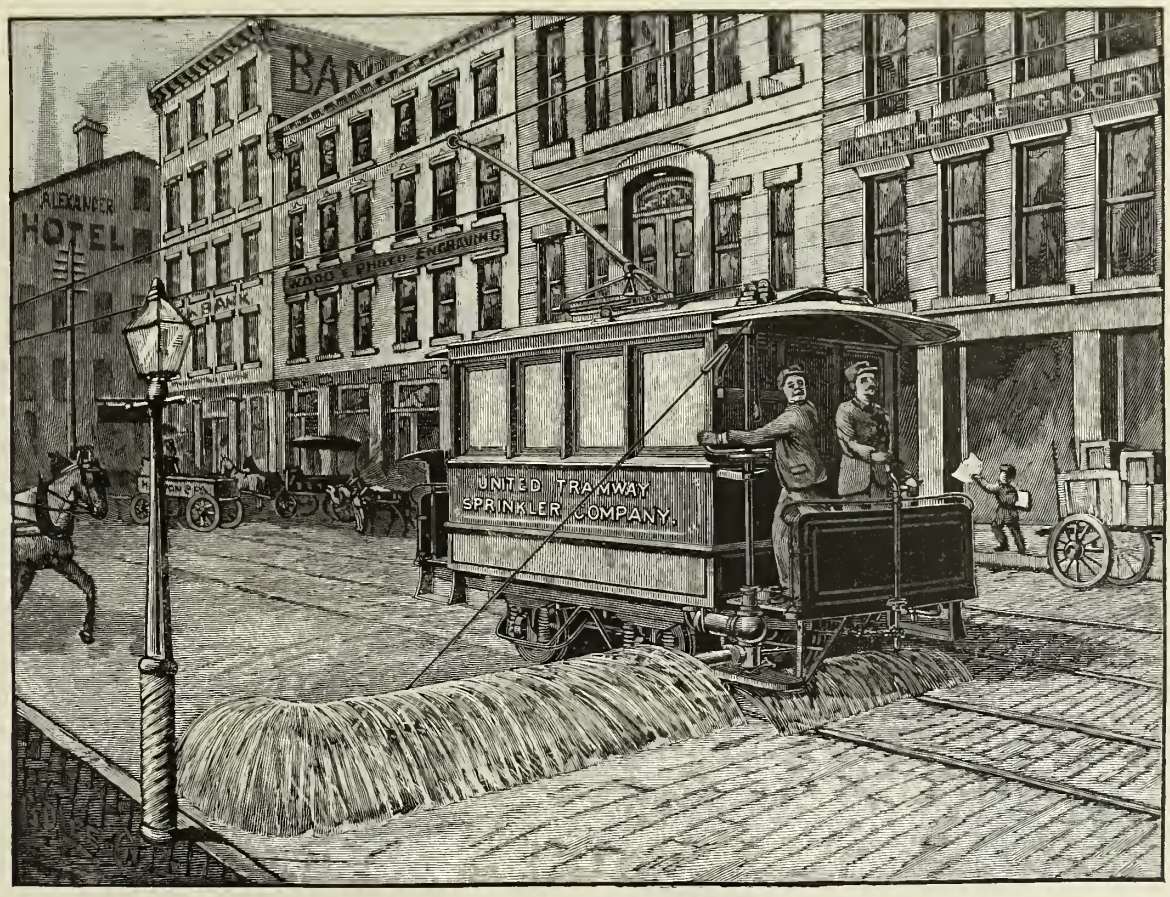
The pivoting in this truck is accomplished by the combination of rollers on the side of the rub plates on the upper part of the truck. The drawing (draught) of the truck and car body is done from the small end of the truck, and this feature affords additional means of keeping the small wheels from climbing the rails. Since their introduction by the J. G. Brill Co. several hundreds of them have been sold and are in operation.

An Electric Street-Sprinkling Car.

The accompanying illustration represents a street-sprinkling car as it appeared while making a regular run on Market street, Louisville, Ky. The device is a tank car not unlike in appearance to an ordinary car, there being blind windows in the sides which may be utilized for advertising purposes. The car is equipped with a cross pipe beneath the floor, which sprinkles the track and a short distance on either side, and a swinging or derrick perforated pipe, which is attached by means of a slip joint to the standpipe and is controlled by means of a lever operated from the front platform. When in operation this pipe is thrown out at right angles to the track and is of sufficient length to sprinkle a very wide street. When not in use, or when it is necessary to pass vehicles or other obstructions, it is swung back to any angle or beneath the projecting sides of the car body alongside the truck. Valves are provided which control the supply of water to the pipe, and there is a mechanism which regulates the discharge orifices. A flush valve at the end provides for discharging any mud or other obstruction that may enter the pipe.

The tank, which holds about 2,000 gals., is charged by means of a hose which is carried on the car, one end being attached to the bottom of the tank by an inlet valve and the other end provided with a coupling which admits of its being attached quickly to a flush hydrant. Hydrants, if not already properly located, should be provided at the terminals and at intervals of about three-quarters of a mile along the route. With proper arrangements the car can be stopped, the tank filled, and the car started in less than two minutes, so that it can be operated between passenger cars running on schedule time, provided it has two or three minutes the start, and the passenger car is required to stop to take on or let off passengers. One of these cars, it is claimed, will distribute daily between 600 and 700 tons of water.

This car street sprinkler, then operated by horses, was described in our field notes from Louisville in January, 1891, but we understand that during the last season, when operated by electricity it was even more successful than when drawn by horses. Even on Market Street, which is sixty feet wide and often crowded, it is said to have done its work satisfactorily to the people and to the street railway management, as it did not interfere with the passenger traffic.



AN ELECTRIC SPRINKLING CAR.

Other advantages besides the laying of dust to prevent annoyance to passengers and the public are claimed for this system of sprinkling on electric lines. Among these are an improved return circuit by reason of wet rails, and less wear on the motor and running gear owing to the absence of dust. The advantage of wet rails in the saving of power was quite fully explained in a paper by Geo. K. Wheeler, printed in our January issue. As this car not only sprinkles the track but also the remainder of the street, the sprinkling company could doubtless sprinkle the tracks of the railroad in return for the right of way and motive power, and derive its revenue from abutting property owners.

We have seen a number of letters from local railway men and others, fully supporting the claims made for this method of street sprinkling.

Mr. H. H. Littell, while superintendent of the Louisville lines, in a letter endorsing the system, says: "The car has no difficulty in keeping the street sprinkled down from curb to curb and without delaying the cars."

Thos. J. Minary, superintendent of the Louisville Consolidated Street Railway Co., says: "I am very glad to say that we find the system to work successfully, and

would take pleasure in recommending it to the street railroads throughout the country."

Mr. A. V. DuPont, chief stockholder and president of the old Central Passenger Railroad Co., says: "I was at first doubtful whether these cars could be operated on our line without interference with our passenger traffic. I am now convinced of the entire practicability of the system, and it appears to work here even more satisfactorily upon the electric lines than upon the horse car lines. I now regard the system as a valuable accessory in the operation of street railways, and especially to those using electric motor power."

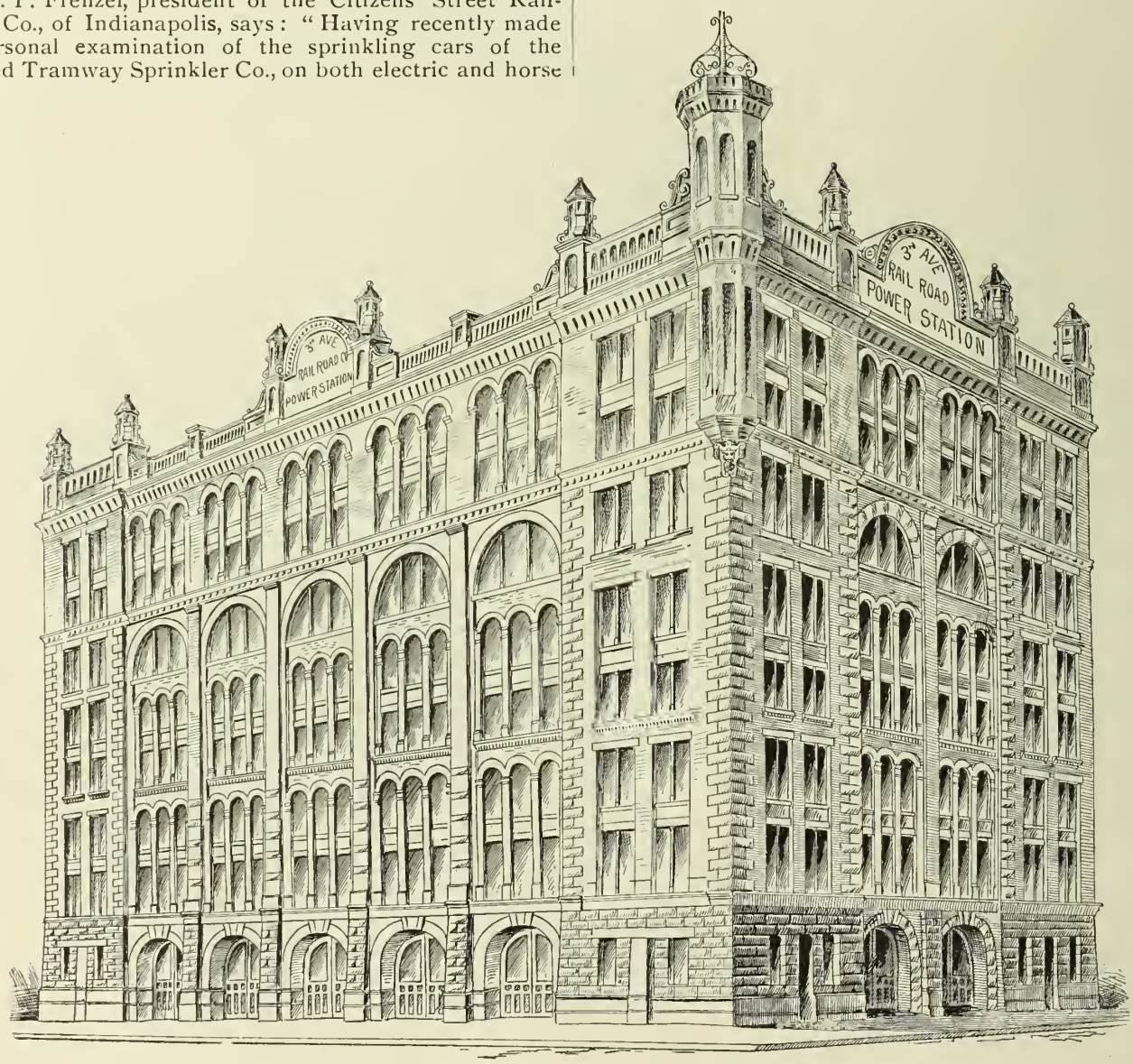
J. P. Frenzel, president of the Citizens' Street Railroad Co., of Indianapolis, says: "Having recently made a personal examination of the sprinkling cars of the United Tramway Sprinkler Co., on both electric and horse car lines in Louisville, Ky., it gives me pleasure to testify to the practicability of the system and its advantage to a railroad company. As a result this company has made a contract for the operation of these cars on all of its lines."

For further particulars interested parties should address the United Tramway Sprinkler Co., Louisville, Ky.

Downtown Power Station of the Third Avenue Road, New York.

The downtown power station of the Third Avenue Railway Co., illustrated herewith, will be located on the Bowery, corner of Bayard Street. Several buildings have been torn down to afford a site for the new structure, and workmen are now engaged in excavations for the foundations. The structure, as designed, will be of brick and granite, nine stories in height, and the upper stories will be rented for business purposes. The basement is thirty-six feet below the street, will be occupied by the cable winding machinery which was fully illustrated in our September issue. The engines, shafting and winding drums will occupy the west section. On the east side of the basement will be located the vaults for the coal storage and the tension runs.

The street floor will be utilized on the Elizabeth Street side for the sixteen boilers necessary to run the plant, the Bowery side of the floor being turned into a storeroom and repair shop. The building will have six elevators and be fitted throughout with electric lights. It will be completed in July and will cost $650,000. The architect of the building is Albert Wagner, of 67 University Place, New York, who states that the building, in arrangement and in point of equipment, will be the most complete power station in the country.



DOWNTOWN POWER STATION—THIRD AVENUE CABLE RAILWAY, NEW YORK.

Car House of the Toledo Electric Street Railway Co. Burned.

The car house of the Toledo Electric Street Railway Co. on Canton Avenue was destroyed by fire on the morning of January 19. The illustration on the next page shows the ruin accomplished. The building was a one story brick structure 100 ft. front and 150 ft. in depth. It had been carefully planned by the management so that every facility was afforded the workmen in inspecting the motor cars. The pits extended back 100 ft. from the front of the building. Three rooms in the rear were used as paint shop, carpenter shop and blacksmith shop. In the centre of the building, in what was known as the monitor or turret, was located the winding room. This was conveniently

arranged and well equipped. All materials from the ground floor were raised by a windlass.

Twenty-seven motor cars were destroyed by the fire,

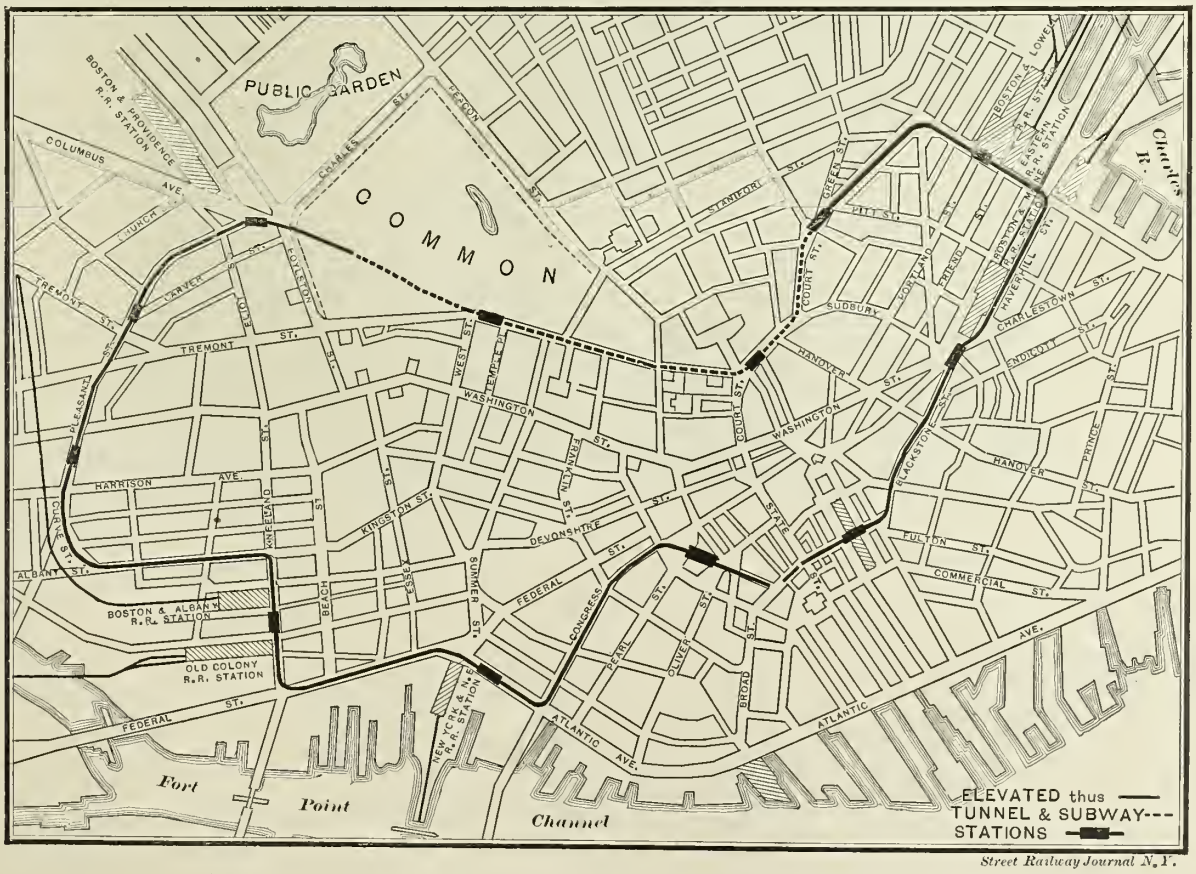
RUINS OF TOLEDO ELECTRIC STREET RAILWAY CO.'S CAR HOUSE.

and the total loss is estimated at considerably over $100,000. The insurance was $60,000.

The company was fortunate in having just completed a new car house at the corner of Ontario and Galena Streets. This building has a frontage of 125 ft. and a depth of 175 ft., and has sufficient accommodations to meet the temporary needs of the company.

Rapid Transit in Boston.

The Rapid Transit Commission, of Boston, have agreed upon a provisional route and structure for the relief of the more crowded part of the city proper. The plan contemplates a double tracked elevated and subterranean structure covering a circuit route shown in the accompanying map. As will be seen, the circuit includes the heart of the downtown portion of Boston. The portion of the railway which will be overhead is indicated in full



Street Railway Journal N.Y.

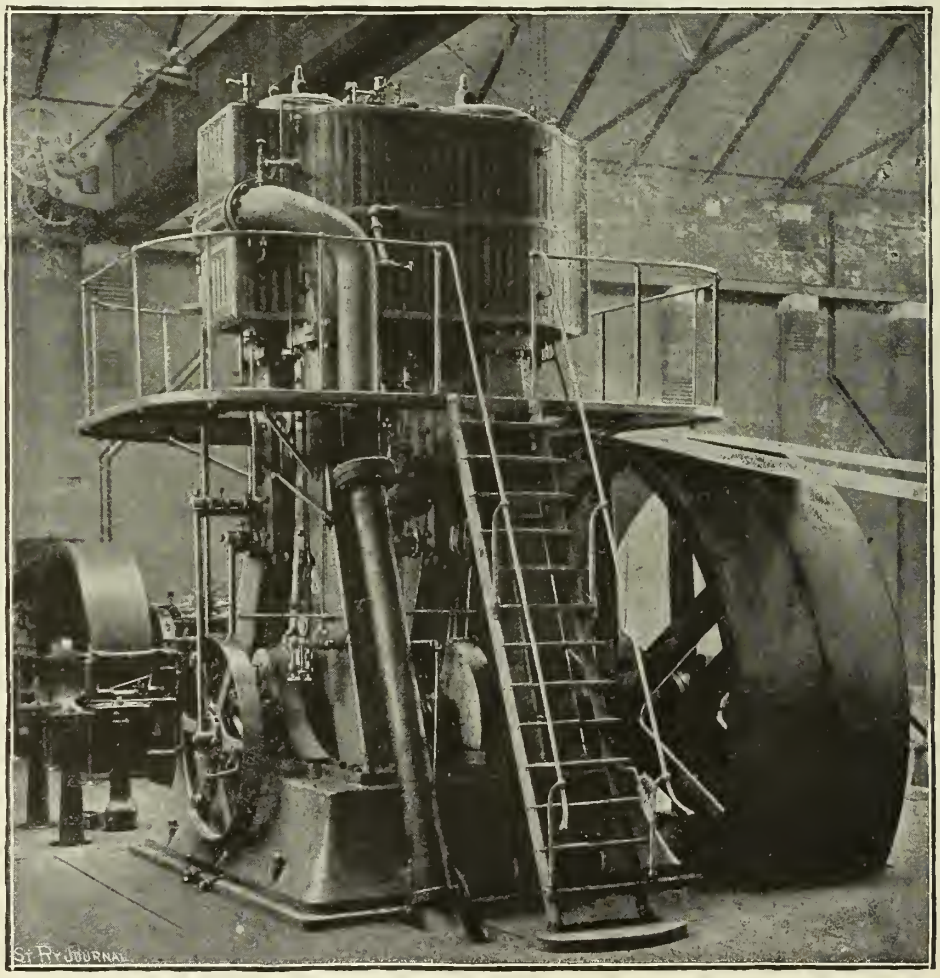
MAP SHOWING PROPOSED ROUTE OF BOSTON'S RAPID TRANSIT SYSTEM.

lines, that underground in broken lines. Twelve passenger stations for this road are proposed. These will be located at determined points most convenient for the accommodation of traffic and indicated on the map of the proposed route.

The commissioners especially state in their report that they wish it understood that this circuit route must not be taken to comprehend their entire plan and that the route for further roads may be submitted later. They have notified all persons owning property along the proposed route, and the public generally, that they are prepared to give a public hearing at their rooms, 306 Exchange Building, State Street, Boston, upon the subject of the plan as outlined. This hearing commenced on January 21 and was to be continued until all persons interested should have had an opportunity to be heard.

Electric Railway Engine of the Buffalo Railway Co.

The engine which is shown in the illustration was designed for the Buffalo Railway Co., Buffalo, N. Y., to drive their electric generators. The view was taken when the engine was in position in the power house. The general type of the engine is that of a vertical compound with two cranks at ninety degrees. The high pressure cylinder is seventeen inches in diameter; the low pressure, thirty-three and one-half inch in diameter, and the common stroke twenty-eight inches. The engine is designed for 140 revolutions per minute. This speed is midway between the Corliss and the modern high speed engines usually used for this kind of work, but the piston speed is kept at 600 ft. per minute.



VERTICAL ENGINE FOR THE BUFFALO RAILWAY CO.'S POWER PLANT.

The engine is rated at 450 H. P., with 125 lbs. initial steam pressure. It will run equally well, condensing or non-condensing. At the present time it is operated non-condensing, as the condenser house is not yet finished.

There are several new points in the design of the engine. One of the most important is the double ported steam and exhaust valves used for steam distribution. There are two steam and two exhaust valves for each cylinder, which are operated independently as in a Corliss, thus allowing different degrees of compression and cut-off. The valves, which are extremely light, are perfectly balanced, and give a large port opening with a small valve which is a noticeable feature. In most marine engines using piston valves in the high pressure cylinder, the diameter of the valve chest is often as large, if not larger than that of the high pressure cylinder itself in a triple expansion engine, and with the same style of valve used on the low pressure it becomes necessary to use two and sometimes three different valves, locating the centres on a circle whose centre is coincident with that of the low pressure cylinder. On the low pressure cylinder the admission valves have a peculiar motion, effected by means of rocker arms, which give a quick movement at the point of cut-off. The movement of the high pressure admission valve is controlled by a centrifugal shaft governor, by which the speed of the revolution of the engine is regulated. The matter of speed is, of course, very important in this class of work and the governor, which has only one weight, one spring and four pivoted joints, is extremely sensitive. The variation, it is stated, does not exceed one per cent. under extreme changes of load. Some objections have been raised as to the advisability of governing an engine of this size by means of a shaft governor, but with the type of valves employed no difficulty, it is stated, has been experienced and the engine is to-day operating very successfully.

Much care has been given to the details of construction. For instance, the piston rod and crosshead are forged in one piece and babbitted slippers are fastened to the head of the rod and set out, not by wedges but by liners only. The crosshead end of the connecting rod is forked, while the crankpin end is of the standard marine type. All bearings of the engine are babbitted. The main bearings have cast iron shells lined with babbit, in which water is caused to circulate in order that the temperature may be kept down in case of trouble. Water also circulates through the back of the guides. The engine is lubricated entirely by means of grease. This lubrication is effected automatically, the lubricant being forced through pipes running from the central reservoir to the different parts or bearings of the engine. This system is similar to that of an accumulator in a hydraulic plant, weights being placed on the piston of the accumulator, which force the grease to the respective parts of the engine, the flow of grease being controlled by stopcocks at the various bearings.

The engine has been running for some time non-condensing, as already stated, although really designed to be worked condensing. It has given perfect satisfaction, doing its work smoothly and with entire ease. There has been a notable absence of hot bearings, so common with new engines on this class of work. The engine is one of two which have been built by the Lake Erie Engineering Works of Buffalo for the Buffalo Railway Co., by direction of their engineers, the Field Engineering Co., of New York, who designed and equipped the entire railway system in Buffalo.

Liverpool (Eng.) Electric Elevated Railway.

Perhaps the most interesting engineering work in progress in Liverpool at the present time is the overhead railway which is being built along the line of the docks. The illustrations show very clearly the general design of the railway. The entire structure is carried on columns with the exception of a few hundred feet where the road runs on built-up ground enclosed by masonry walls. The total length of the line is five and three-quarters miles. The length of the standard span is fifty feet. The columns, are delivered by the manufacturers completed. They are of simple construction, being formed of two channel iron sections and plates riveted together.

One of the peculiar features of the railway will be the tilting bridges, the device of Ferdinand Huddleston who has secured a patent on the design. For all ordinary street traffic beneath the railway, the height of the structure is sufficient to permit clearance, but as marine boilers, and other large machinery have to be taken to the docks, provision was made to give all the clear headway necessary by building bridges which could be tilted. One of these is shown in Fig. 1 as closed and Fig. 2 as open.

The main principle will be apparent from the illustrations. It will be seen that two spans are opened simultaneously, the girders across being continuous. They are hinged to their intermediate pier in a manner plainly shown by the view of the open bridge. When the bridge

FIG. 1.—LIVERPOOL ELECTRIC ELEVATED RAILWAY.

is opened one end acts as a counterweight to the other, but the height of the viaduct not being great, only fourteen feet in the clear, and the opening of considerable width, one part is necessarily shorter than the other and kentledge has to be used to bring the weights more nearly to an equality. In order to increase the length of the short arm, over that which would be given simply by the height of the viaduct, a pit has been sunk as shown. The movement is affected by hydraulic power. Fig. 1 also shows a curve and a reverse curve on the line and gives a good idea of the appearance of the flooring. The rails are here laid for the bogie to run over and are not permanently in position.

It has been decided that the road will be operated by electricity. Trains will not be run out, but separate motors will be provided for each car. The road is at present nearing completion rapidly. The engineers in

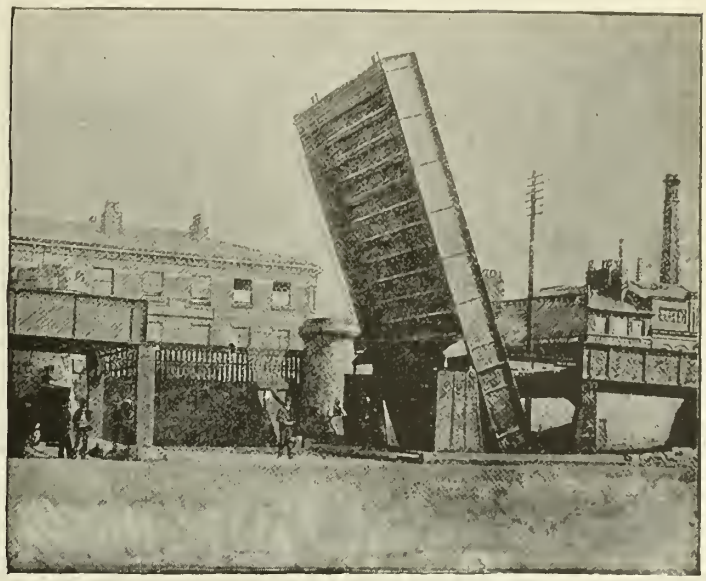


FIG. 2.—LIVERPOOL ELECTRIC ELEVATED RAILWAY.

charge of the work are Sir Douglas Fox and Mr. J. H. Greathead.

The cuts are reproduced from *Engineering*.

New Grip Cars for the Third Avenue (N. Y.) Cable Railway.

Two grip cars, one open, the other closed, samples of the large order which is being filled by the Laclede Car Co., of St. Louis, for the Third Avenue (N. Y.) cable railway, have been delivered during the last month to the railway company and are very handsome specimens of the car builder's art. The open car, No. 201, is thirty-eight feet eight inches over all, with four-foot platforms at each end, and has a seating capacity for forty-eight people and is mounted on two McGuire four wheel trucks. The car has a centre aisle, twenty-four reversible seats covered with rattan, and furnished by Hale & Kilburn, of Philadelphia, Pa., with a seating capacity of two each. The ceiling is of birdseye maple and the ventilator windows of stained glass. The interior of the car is supplied with bronze fittings and mountings; and the whole is lighted by three five burner chandeliers, burning Pintsch gas and supplied by the Safety Car Heating & Lighting Co., of New York. Four auxiliary oil lamps for emergencies are also carried, besides a headlight. The exterior of the car is very handsome, the centre panel of the body being painted a bright red with silver ornamentation and gold lettering. The lower part of the body is painted white. The dashboards are the same shade of red as the upper part of the body and bear the number of the car painted in silver. Handsome awnings, in addition to the regular storm curtains, extend the entire length of the car, and are arranged so as to shield the eyes of the passengers from the sun in summer, thus completing the car equipment.

The closed car, No. 1, has a twenty-two foot body, is thirty feet over all, and is equally handsome, the interior being fitted up in mahogany and having a birdseye maple ceiling like the open car. The four-wheel truck is the Baltimore with Third Avenue standard axle boxes, oil and dust tight, designed by W. S. G. Baker, of Baltimore. The doors have birdseye maple panels. The car is lighted with three chandeliers, burning Pintsch gas and supplied by the Safety Car Heating & Lighting Co. Dark red plush seats, four oil lamps for emergencies and bronze trimmings complete the interior equipment of the car. There are seven windows on each side of French plate. The shutters are of mahogany with bass wood blinds. The exterior of the car is painted in a way similar to the open car.

Each car is also supplied with safety extension gates manufactured by the Pitt Iron Works, 53 Reade St., New York.

An Interesting Suit at Salem, Mass.

At the Superior Court in Salem, before Judge Hammond, a case of considerable interest was decided, last month, in favor of the plaintiffs which involved quite a number of new points. The facts of the case, as accepted by both parties concerned, are that a serious accident occurred in the electric lighting station, at Lynn, at 1 : 45 A. M., October 26, 1890, by which the flywheel of a 500 H. P., compound Corliss engine burst, partially wrecking the building and also crushing in the sides of two other and adjoining buildings. A number of pulleys in the station were broken, a massive masonry pedestal of great strength, forming one of the supports of the main shaft was raised from its foundation and a fire occurred in the tower. These events followed each other with great rapidity during a very short space of time.

The point at issue in the matter was a certain question of cause and effect which involved the liability of insurance companies. In the case the Lynn Gas & Electric Light Co. was the plaintiff, and some twenty-three insurance companies, holding policies on the building and contents, were the defendants. The actual defendant was the Meriden Insurance Co., whose case was accepted as a test case.

The theory of the plaintiff was that a fire occurred among the wires in the tower of the station, probably caused by short circuits between different wires. The claim was that this produced a certain shock upon the dynamos, which, breaking their pulleys, released the load and caused the breaking of pulleys on the main shaft, a piece of which struck the governor on the engine in such a way as to knock off one of the balls and disable it so as to prevent its controlling the engine. It was also considered by the plaintiff that a large piece was driven under the flywheel in such a manner as to break it.

It was therefore claimed that the insurance companies were liable for the whole damage as resulting directly from the fire.

The insurance companies claimed that the engine escaped the control of the governor, probably because of a broken governor belt, or that it slipped on account of the failure of the lacings to hold, or the stretching of the belt. From this cause the speed of the engine was accelerated until the flywheel burst.

But it was further claimed that before this rupture of the wheel, the speed was such that the electrical machines were revolving at about four times their normal rate, on which account the regulators of the electrical apparatus failed to control the current and caused short circuits. A fire resulted, causing a damage of about $1,100, which the companies were ready to settle.

The plaintiff, however, claimed a damage of nearly $9,000, due to the wrecking of the engine, the station and other machinery.

The testimony was largely that of experts, the principal ones summoned by the Electric Light Co. being Prof. E. Wilbur Rice, Jr., Albert L. Rohrer and Isaac F. Baker of the Thomson-Houston company and Charles F. Pritchard, superintendent of the Lynn Gas & Electric Light Co. The experts summoned by the insurance companies were Charles E. Emery, of New York, C. J. H. Woodbury and Edward Winchester, of Boston.

Early in the trial of the case Judge Hammond suggested, in view of the electric and technical points involved, that the case be taken from the jury and tried before referees, but the suggestion was not agreed to.

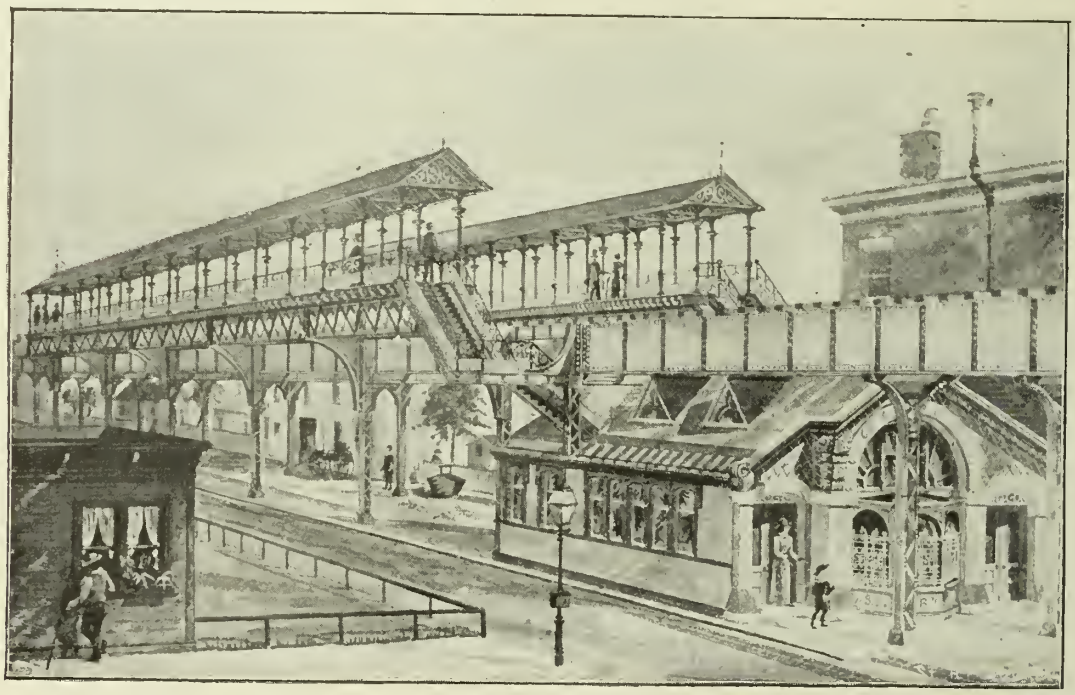


FIG 1.—STATION AT TWENTY NINTH STREET—SOUTH SIDE ELEVATED RAILROAD, CHICAGO.

Chicago Elevated Railways.

Of the multiplicity of elevated railroad projects in Chicago two have assumed tangible form. One of these is designed to give rapid transit to the south division of the city; the other was planned to perform a similar office on the West Side. Work was begun on the roads about two years ago, but for several months nothing has been done.

It is a dangerous thing to attempt to write anything in regard to these projects. It would be a marked week if a score of contradictory rumors were not published regarding them; if alleged sales of the two properties were not announced. In this brief article an attempt is made to sift the chaff from the wheat, the statements presented being based on interviews with the controlling officials of the two companies.

The failure of the two companies to meet the expectations of the public has been due to financial difficulties. It now appears, however, that there is an extreme likelihood of a resumption of work in the near future on the south side or Alley L railway. This company have already built an elevated structure from Peck Court to Thirty-seventh Street, although in this distance there are two short breaks, at points where the company failed to secure the property. The necessary agreements have,

however, been reached and but little work will be required to make the line continuous. It is proposed to extend the road to Jackson Park to carry passengers to the World's Fair grounds.

It was an occasion for considerable satisfaction when the announcement was made a few weeks ago that the line was to be extended to Thirty-ninth Street at once, and that the road would be operated from Congress Street to that street as soon as possible. When the writer called at the office of the company, the report was verified. It was stated that operations would commence by April 1. It is probably safe, however, to set a somewhat later date.

Colonel Goddard, the general manager, stated that he would order the equipment at once. The first installment will be twenty locomotives and fifty cars. They will probably be built by the Pullman Car Co., and will seat forty-eight persons, but will contain space for at least 100 passengers. When the road is put into operation trains will be run every two minutes during rush hours over the three miles and a half of completed road.

About $3,000,000 has been spent on the construction of the road up to the present time. The general character of the construction is shown in the accompanying cuts.

Col. M. H. Alberger, the principal owner of the Lake Street elevated road, is kept busy denying reports that the line has been sold, or that it will be used as an entrance of a trunk line into the city. The road has not at this time excited the interest of capitalists, and there is no immediate prospect that work will be resumed.

The road is built at the present time from Canal Street to Ada Street, about a mile and a quarter, and about $1,000,000 has been invested in the project. The ultimate terminus of the road is a point about five miles west.

The structure, is considerably wider than that of the South Side road. Provision is made for the laying of four tracks so that express trains can be operated.

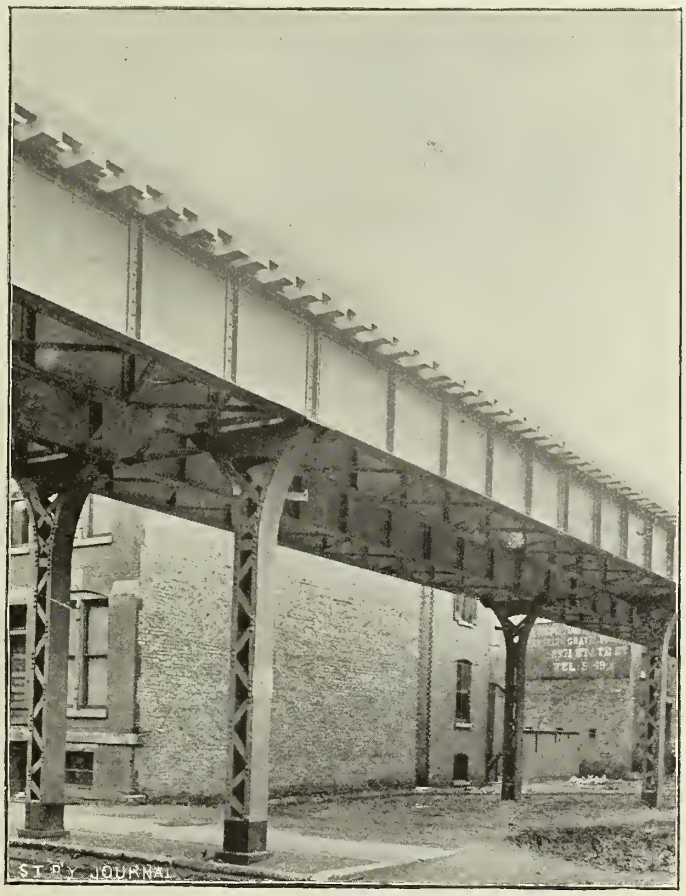


FIG. 2.—SOUTH SIDE ELEVATED ROAD, CHICAGO, AT THIRTIETH STREET.

The trains will cross the river from the West Side to the South Side by a bridge. The projectors realize that the public may live in constant dread of trains running into the river. It has already been arranged, therefore, that a system of electric signals will indicate when the bridge is open, even a mile and a half west of the bridge.

No Sunday Cars for Toronto.

The citizens of Toronto have always been opposed to the operation of the street cars in that city on Sunday, and consequently on that day the street railway system has always suspended operations. There has recently been quite a movement in favor of the establishment of a limited service on Sunday, though the innovation was advocated by only one morning newspaper, the *World*, and the question was put to popular vote. The result of the ballot was 9,952 for the running of cars on Sunday and 14,066 opposed.

Notes from the Field.

Newark N. J.

While the municipalities of New York and Brooklyn have been debating and hesitating over the adoption of some system of rapid transit the neighboring city of Newark has installed and perfected an electric railway, which, judging from results and opinions expressed to our representative upon a recent visit by him to that city, gives satisfaction to both management and public.

The Newark Passenger Railway Co., who own ninety per cent. of the street railway mileage in the city of Newark, were chartered January 23, 1890, on which date the Essex Passenger Railway Co. and the Hudson & Bergen Railway Co., were consolidated with this company. The Elizabeth Passenger Railway Co., and the Newark & Irvington Street Railway Co. were purchased July 1, 1890, by the new railway company and the property of the Rapid Transit Street Railway, of Newark, has been acquired by the same company during the last six months. The electrical equipment has been adopted at present upon about one-third of the entire railway system, though it is intended later to extend the use of electric motors over all the main lines. All of that at present equipped, amounting to seventeen and a half miles, is double track, upon about one-half of which centre poles with double brackets are employed for supporting the overhead system. All the poles upon the road are of an exceedingly tasteful design and were supplied partly by Milliken Bros., and partly by the Walworth Manufacturing Co. Every other pole carries a cluster of five incandescent lamps operated from the railway circuit for street illumination. At present sixty electric cars, all vestibuled, are in use, twenty of these being long cars.

The Irvington Division

was put in operation Oct. 4, 1890, and was constructed under the supervision of the Field Engineering Co. The electric motors upon this division are of the well known S. R. G. type, from the works of the Thomson-Houston Electric Co., the dynamos being supplied by the same company. The cars, painted wine color and yellow, with silver lettering, are handsome and very comfortable. They were supplied by the Gilbert Car Manufacturing Co. and A. L. Rogers & Co. of New York. All the long cars in use upon this road are employed on this division, and all use the Brill No. 11 maximum traction truck. Lewis & Fowler stoves and registers of the same make, complete the car equipment.

The station supplying current to this portion of the line is situated at the corner of Bedford Street and Springfield Avenue, and occupies a brick building originally intended for a projected cable railway which was to operate over very nearly the same route upon which the electric cars now run. The winding drum intended for the cable road, and used for a few months before the project was abandoned, lies buried within a few yards of the station. The boilers, of which there are four, were built by the Iowa Iron Works of Dubuque, Ia., are twenty feet long, of

the double deck pattern, with water legs on each side of the fire box. They have proved quite efficient, though of a construction which makes them rather difficult to clean, the sediment lodging and hardening in the portions of the boiler surrounding the furnace. Each boiler has a capacity of 150 H. P.

The engine equipment consists of two Ball engines of 240 H. P., each of which is belted direct to four Thomson-Houston multipolar dynamos of 100 H. P. capacity each. The belting was supplied by the Underwood Manufacing Co. and is of cotton leather. The switchboard is contained in the engine room, and is completely equipped with the necessary appliances. The station is quite small for its capacity, and is interesting to visit for that reason, showing, as it does, the small space in which a generating plant of this size can be placed. As is stated later, the management of the company is increasing the capacity of the station at Boyd Street so as to accommodate the call for increased current with an increase in the number of cars operated. The average load carried by the station just described is from 400 to 450 amperes.

The car house of the Irvington division, which is about a mile beyond the power station, at present contains the first installment of an order of twenty cars which has recently been placed with the J. G. Brill Co. of Philadelphia, for use on a new line between Newark and South Orange. These cars are very tastefully fitted up, equipped with S. R. G. motors, and mounted on the No. 13 patent, independent, rigid motor truck of the J. G. Brill Co.

The Rapid Transit Division

crosses the Irvington division at the corner of Springfield Avenue and Washington Street. The cars on this line are equipped with the Edison No. 6 motors, the car bodies being from the works of the Pullman Car Co. and A. L. Rogers & Co. They present a very handsome appearance, being painted a dark green, picked with gold. Each car is equipped with the usual number of incandescent lamps and Meaker fare registers.

Some of the grades on this line are quite severe, on West Kinney Street the ascent for a distance of one-quarter of a mile being divided in two parts, covering about half the distance, each grade being over ten per cent. But one car is allowed upon this section at a time, and the motor cars have no difficulty in making the ascent, even with a slippery track.

The power station on Boyd Street is of brick, 100 × 150 ft. and most complete in all its appointments. It was designed and built by G. E. Talcott. Work has recently been finished upon an extension of the building which has more than doubled its capacity. The boilers at present in position are seven in number, of a rated capacity of 200 H. P. each, were manufactured by the Erie City Iron Works, and were installed by Cyrus Currier & Sons, of Newark. The steam gauges were manufactured by James Beggs & Co., New York. The portion of the building devoted to the engines and dynamos adjoins the boiler room, from which it is separated by a brick wall. This wall is represented in the engraving, Fig. 1, as broken away so as to show the arrangement of the driving machinery.

The engines at present installed are two independent, horizontal, Corliss engines, built by Hewes & Phillips of Newark, N. J., and one pair of similar engines operating one flywheel. Each independent engine has a twenty-two inch cylinder and a forty-two inch stroke, and is rated at 250 H. P., though capable of developing at least 300 H. P. The diameter of the flywheel of each is sixteen feet with a face of thirty-two inches. Each of the coupled engines has the same dimensions as the independent engines, the dimensions of the flywheel being, however, eighteen feet diameter, and sixty-two inches face. All the engines are belted to one countershaft, which extends the entire length of the room and is divided into four sections connected by friction clutches. Fast and loose pulleys on the countershaft provide for starting and stopping single dynamos. The pulleys were furnished by the Robert Poole & Son Co., Baltimore, Md. The device in use for shifting the belts was invented by the engineer, G. E. Talcott, and is illustrated in Fig. 2. As will be seen, the shifter is operated by a wheel and screw and is both convenient and compact.

The belts were furnished by the Jewell Belting Co., of Hartford, Conn., and the Page Belting Co., of Concord, N. H., and give excellent satisfaction. The large belt

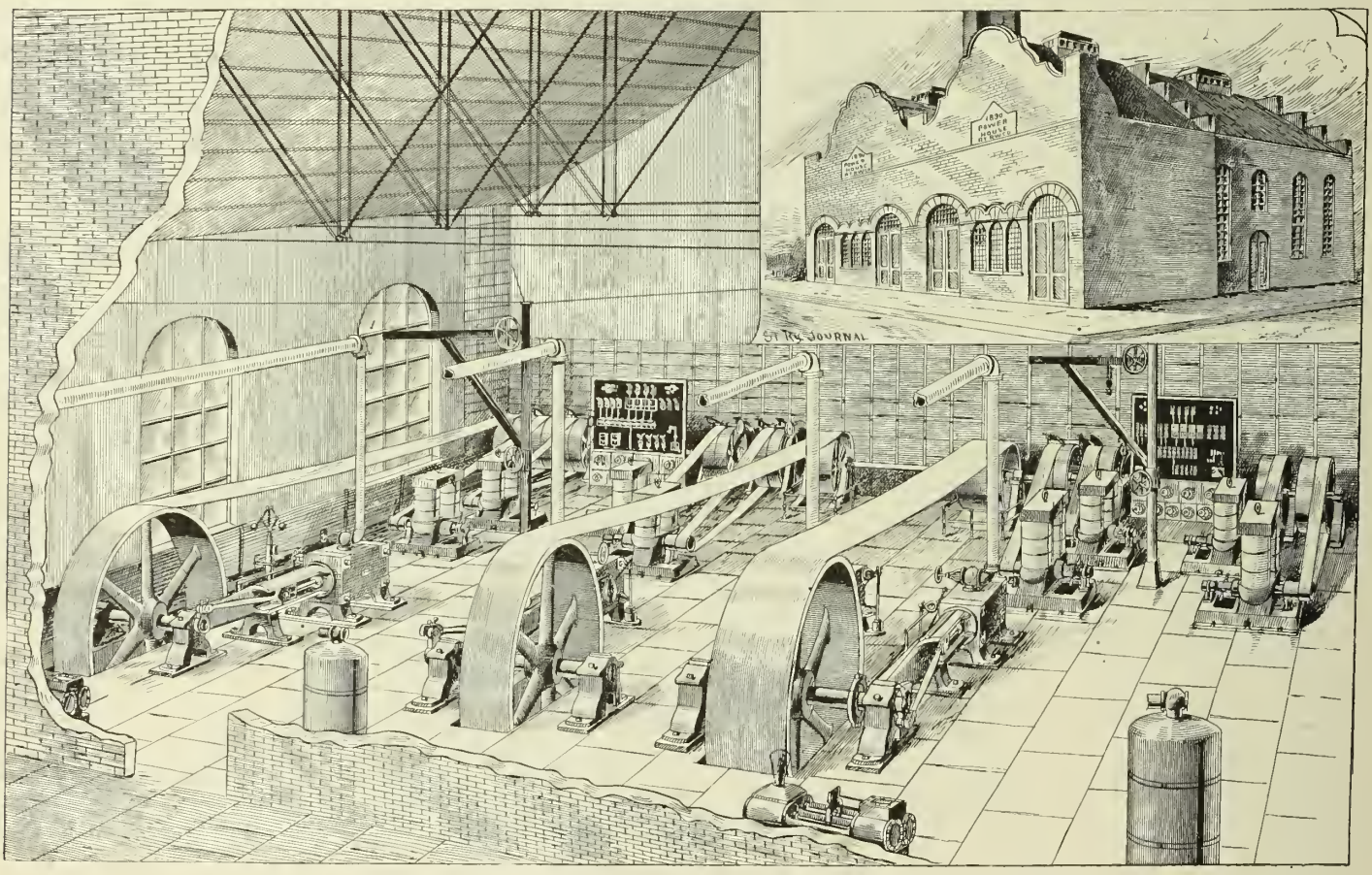


FIG. 1.—NEWARK PASSENGER RAILWAY CO.'S POWER STATION, BOYD STREET.

operated by the coupled engines and manufactured by the Jewell company, is especially noteworthy on account of its size, it being 135 feet long and sixty inches wide.

The generators are eight in number, of the Edison type, with compound winding, five being of 100 kilo-watts, and three of eighty kilo-watts capacity each. There will be two switchboards, as shown in the interior view, of slate, bound in brass. One of these is in process of construction, the other is in position and use, and from it all work done at a switchboard is being carried on. The location of both is very convenient, being near the dynamos, and they will be most completely equipped with the latest appliances. Two Berryman feedwater heaters with Smith,Vail & Co.'s duplex pumps are also located in the engine room. All the pipes in both this and the Irvington station are protected by the covering of the Magnesia Sectional Pipe Covering Co., of Ambler, Pa. Vacuum oil and Phœnix filter are used. The floor of the engine room is of Silo artificial stone.

During a visit to the offices of the company the well

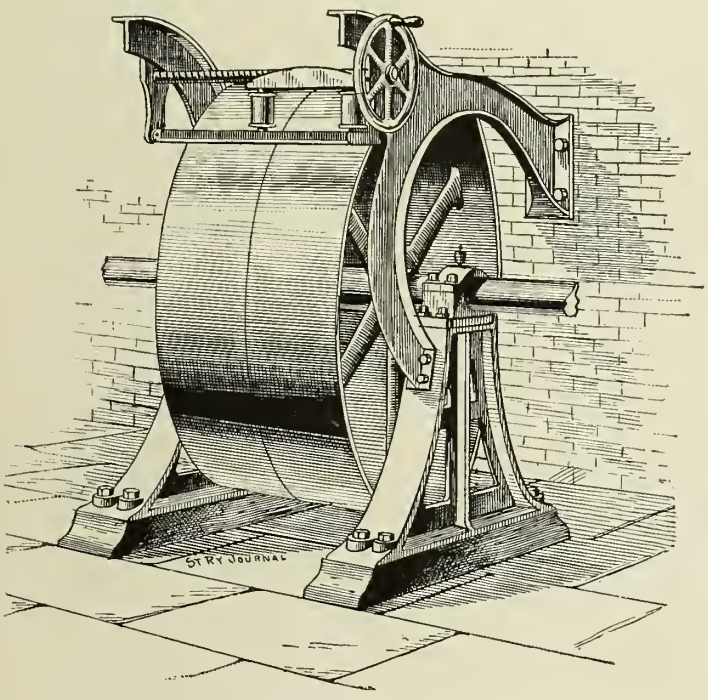


FIG. 2.—BELT SHIFTING DEVICE—NEWARK PASSENGER RAILWAY STATION.

known president of the road, Mr. Thomas C. Barr, under whose able administration the road has achieved its success in the past, expressed himself as very well pleased with the results attained with the long cars for use under the conditions presented on the Springfield Avenue line in Newark. He considers them far superior in point of convenience and safety to short cars with trailers. The long cars on this line run under a headway of from three to five minutes. In regard to rail construction, Mr. Barr stated that the recent practice of his company has been to use a sixty pound girder rail laid with chairs on ties 5×5 ins. ×7 ft. and two and a half feet centres. Upon recent work the Johnson & Tidewater rails have been employed. Experience has proven, however, that even this rail is not heavy enough for the traffic, though in other respects giving satisfaction, and for future work he will favor a girder rail at least ten inches deep and of about ninety or 100 lbs. to the yard, spiked directly to the ties. The return circuit is made by a tinned copper conductor laid in the centre of the track and with cross connections to each rail; rail bonds are also used.

The average car mileage per day on this road for the horse cars is ninety miles and for the electric cars 125 miles. An estimate of the large business done by this road can be had from the statement that the car mileage for 1891 was 4,007,742 miles. During this same time the number of passengers carried was 21,612,167. The advertising space for 154 cars on this line is controlled by Carleton & Kissam.

The Street Railway Situation in Chicago.

In the last number of the STREET RAILWAY JOURNAL appeared an article on the street railway situation in Chicago. It was stated that while the local companies were doing all in their power to meet the enormous demands made upon them, the public still believed that the transit facilities were entirely inadequate. The mayor, as it was stated, had appointed a committee composed of citizens, aldermen and representatives of the railway companies to suggest means for improving the street car service.

Perhaps the most interesting matter to come before this body since the last issue is a letter from Charles T. Yerkes, president of the North Chicago and West Chicago Street Railway companies. The writer said, by way of preface, that the communication was contributed by him not as a member of the committee but merely in his capacity as a citizen. Mr. Yerkes' letter is one of great interest. He is thoroughly conversant with the facts, and he has carefully studied the conditions and the possibilities for improvement. It will be noticed from the synopsis which follows, that in the main Mr. Yerkes' point of view is identical with that of the article contained in the last issue. At the outset he says that enlargement and improvement of present facilities are what must be provided; an immediate and complete revolution is impracticable.

The cause of the existing state of affairs is primarily the contracted business section or, as he terms it, the "heart of the town." This district is bounded by the river, the lake and Van Buren Street. He speaks of the condition as follows: "We find in this three-quarters of a mile square of territory a condition which exists nowhere else in any city of Europe or America. We have within a limited space few buildings which do not contain from fifty to 100 employes and a number in which over 1,000 are regularly employed in the various vocations of life. Besides, there is a large number of persons doing business with these establishments."

As Mr. Yerkes says, all these people desire to return to their homes at very nearly the same hour, and it would be impossible to provide them all with seats unless "every street was so lined with cars that each one touched the other preceding, and the streets were again covered with elevated railroads." If, with the existing facilities, passengers would be content to wait a short time the general comfort would be subserved; but no; the American temperament is impatient of a moment's delay. "If four trains were standing on the same track all ready to start at the same time the first train would be filled to overflowing and the last would be comparatively empty."

Mr. Yerkes next refers to the policemen who might greatly facilitate the handling of crowds but do not do so. He adds: "Any citizen may often see cars right in the heart of the city, with hundreds of anxious passengers in them, blocked for a long distance by an unloading team which might properly be placed in a different position so that the street would be cleared."

Mr. Yerkes next alludes to the possible remedies, and his main suggestion is novel and startling. It is nothing more nor less than the doing away of the Chicago River so as to provide space for the expansion of the business district. The suggestion is made in these terms:

"Here in our great city we have an uncovered culvert, reeking with filth, running through our centre, the sewerage polluting it, and this condition becoming worse and worse. To do away with it would, without doubt, cause a great revolution in present matters; but suppose it did, the change would be beneficial everywhere. The natural rendezvous for our shipping is not in the river, but along the lake front."

Coming to the question of additional facilities needed by the cable roads. Mr. Yerkes says: "I feel there is a positive necessity for extending the loop system on the South Side, as pertains to the South and West Side roads. The South Side company are greatly hampered by being compelled to run their State Street and Wabash Avenue systems into the same loop. With two loops they could

manage at least twenty-five per cent., and I think forty per cent more cars than with the present arrangement and with as much facility. The West Side road should extend their loop to State Street, thereby giving a better opportunity to accumulate cars where the people desire to have them. The space for accumulation is now so small that in case travel is interfered with for any cause during the rush hours congestion takes place immediately."

Mr. Yerkes speaks of the necessity of building cross-town lines on the West Side, and states his belief that companies should seek to provide better motive power than horses; more tunnels also are needed.

The communication concludes with this reference to elevated roads:

"While the river and its branches are open and swing bridges a necessity, elevated railroads for the North and West Sides are a fallacy. They *must end* on the South Side, thereby crossing a bridge, and any interruption to their travel makes rapid transit a delusion. The time lost by open bridges—which is, except in the winter season, about twenty-five per cent. of the whole—would so throw the schedules of the companies out that it would be impossible for them to run with any regularity when the busy hours commenced and the bridges are closed."

TAXPAYERS' RECOMMENDATIONS.

The Taxpayers' Association, of Chicago, has been investigating the street car situation, and at a recent meeting compiled some interesting figures in regard to the intramural railway question. One of the reports relating to the South Division showed that 70,000 persons residing in this section leave for their home each week-day evening between the hours of 5 P. M. and 6:30 P. M. Of this number the suburban trains carry about 13,740 persons Most of the remainder is carried by the cable and horse cars. Two hundred and ten trains running on the state and cable lines, and twenty cars running on Clark Street carry 54,700 persons. About 5,000 persons either ride in carriages or walk.

THE MAYOR'S COMMISSION.

The Commission appointed by Mayor Washburne to consider means for improving the local street railway facilities has held several sessions since the date of the last issue of the STREET RAILWAY JOURNAL. At the meeting, January 6, Mr. Yerkes was asked if the capacity of the North Side and West Side lines could be increased. He replied in the affirmative, and when asked why this was not done he said: "There are several reasons. Our employes will not allow 'trippers' to be run at any but their own prices. This, however, may be arranged hereafter. It will require an ordinance to complete our loop for the Van Buren Street tunnel. We expect to have that line completed by July next. We can then readily increase our carrying capacity sixty per cent., twenty-five per cent. of which will be on Madison Street and Milwaukee Avenue. It would help the cause a great deal if we could extend our loop on Madison Street to State. It would enlarge the loop, and we could handle more people and more cars."

President Wheeler of the South Side company, in response to a question, said the capacity of the system could be doubled if the loops were granted by the Council as desired by the company.

On January 9 the committee made a tour of investigation. At the World's Fair Grounds they inspected the movable sidewalk. Mr. Schmidt, secretary of the Multiple Speed & Traction Co., who control the patents on this means of transportation, explained the system. He claimed that the sidewalk would carry 31,680 passengers an hour past a given point at a rate of six miles an hour, and that the entire line could be operated with no more power than is necessary to propel four street cars holding thirty passengers each.

The committee then went to Pullman, where the Patton motor car is on exhibition. The committee was greatly interested in the car, and it proved extremely satisfactory in operation. The car carried the visitors to the point where the new Pullman double deck car is located. This proved of great interest to the committee. Mr. Pullman said to the committee that such a car, though costing much more than an ordinary horse car, would save any company adopting it fifty per cent., and would, besides, give better accommodation to passengers. An effort is being made to secure its adoption by the South Side company. Mr. Pullman expressed it as his positive opinion that double-decked cars could be made low enough to allow them to pass through the La Salle and Washington Street tunnels, thus making them available for every cable line in Chicago.

Street Railways in Brussels.

BY C. R. KING.

The first street railway in Brussels, Belgium, was built by an English company in 1867, and in 1871 another English firm constructed several lines in the city. It is not surprising, therefore, that the visitor to Brussels sees upon the road there a large number of foreign cars many of which are from the factory of John Stephenson Co., Ltd.

The tracks are well laid, the paving being mostly of granite, and the rails placed flush with the paving as in Paris. The Marsillon system of rail construction is in general use, as in Lille, but is giving way to the solid girder or Broca rail, since it is found that the heavy wagon traffic often crushes the two rails in the former system together, so that considerable power is lost in opening the channel by the car wheel flanges.

The principal lines in Brussels are controlled by a limited company called the Tramways Bruxellois. The value of the track belonging to this company was, in 1890, reckoned at $230,000, and in the same year the gross earnings were twenty-four cents per mile run, or $14.74 per car per day. At present the rolling stock consists of 350 cars, the estimated value of which is $395 each. In addition to these and to their omnibuses, the company have a type of vehicle different from anything in use in the United States and called a tramcar omnibus. This is intended to run on the street railway tracks, but is also adapted to operating on pavements. The wheels are of small diameter for an omnibus, are made of wood, flat tired in the ordinary way, of the regular track gauge and turn on a fixed axle with gun metal caps. The body is that of an ordinary street car, and underneath the front platform a pivoted stay or bracket carries a regular flanged wheel which is lowered when the omnibus turns off the track.

In 1890 the street cars made 2,200,000 miles, or an average of 2,760 miles per car in use.

The following are a few facts regarding the live stock of the company, with cost of maintenance. There are about 800 horses owned by the company, these being of the Flemish breed so much used for street railway service in London. The entire stock is valued at $67,500. The yearly depreciation for last year was figured at $17 each, this being a reduction over that of former years. During a period of sixteen years the average depreciation per day of the horses has been 6.2 per cent.

Taking an average for the entire year the feed allowed for horses per day is as follows:

Oats,	18 lbs	Hay,	7.60 lbs.
Maize,	2.20 "	Straw chaff	0.40 "
Bran,	0.01 "	Bread,	3.50 "
Barley grain,	0.01 "	Various,	3.50 "

The actual total is a little over thirty-two pounds per head per day, costing thirty-one and a half cents each. Under the head "various" is included barley flour, linseed, clover, etc. The cost for forage has materially declined during the past fifteen years except for oats, which, the last two years, has increased in price and now costs 1.1 cents per pound. The total cost for 1890 for forage was $98,700. At present the employes of the company are in a very satisfactory state of mind, their wages having been raised and hours of work reduced.

THE Thomson-Houston Electric Co. are at work on plans for an electric passenger locomotive of 250 H. P. and capable of developing a speed of forty miles per hour.

Transportation of Passengers in and Around the Cities of Europe.

The report of John E. Fitzgerald, a member of the committee appointed by the Boston Rapid Transit Commission to investigate the question of rapid transit in European cities, has recently been issued in pamphlet form. Below will be found some extracts from this interesting publication :

The street railway cars of Great Britain and the continent which I have seen are not brought to that perfection in style which has been attained with us. The cars are heavy and behind the times, if the horse cars of Boston be taken as a standard. There are usually seats on all cars and omnibuses outside. Six companies in Great Britain and Ireland operate over fifteen miles of double track roads. These are in Belfast, Dublin, Edinburgh Glasgow, Liverpool and London; and of these cities the lines in Glasgow and Liverpool are owned by the city and leased to a company, the company equipping and the city taking care of the lines. This double responsibility has, I am informed, been the cause of a great deal of friction between the city and the railroad company running the lines.

Herewith I give a table showing the number of passengers and the average price per passenger, together with the average profit per passenger, on eight of the largest street railways in Great Britain and Ireland for the half year ending June 30, 1891, and compiled for private circulation :

	No. Passengers.	Average Fare.	Net Profit per Passenger.
Belfast	7,754,320	1.14	0.18
Dublin	8,251,440	1.69	0.33
Edinburgh	7,398,160	1.60	0.20
Glasgow	25,746,723	1.92	0.12
Liverpool	16,592,443	1.98	0.11
London	30,527,176	1.18	0.15
London St	12,174,904	1.24	0.18
N. London	35,615,027	1.31	0.25

From this table it will be seen that the average rate of fare for every passenger who rides on the cars of these largest companies in Great Britain and Ireland does not exceed three cents per passenger, though the fares vary from two cents to eight cents, according to the distance run, which is from one to eight miles. The table given above is accurate, for it was prepared and given me by the assistant general manager of the Dublin United Tramway Co. It also shows the enormous amount of penny travel on all these roads as compared with the long distance travel. In connection with this matter I was informed by Mr. Anderson, manager of the Dublin United Tramway Co., that the penny fare system for short distances increased travel very much. He is a man of forty years' experience in the omnibus and tramway systems. He said : "We have steadily decreased fares since the institution of the tramway system in 1881; the result has been a great increase in our short distance travel. Our minimum fare in 1881 was three pence, whereas to-day it is only a penny.

"The number of passengers carried during the half year ending June, 1881, was 4,706,000, whereas the number for the corresponding period of 1891 was 8,251,000. The average fare in 1881 was 2.45 pence; in 1891, 1.69 pence. We have found that our system of low fares and no transfer tickets pays, and we reduce fares wherever we can. Our motto is, 'Cheap fares and no transfer tickets.' To give you an idea how the low fare system has increased, I give the following statistics from our road :

"In the half year ending June 1886, penny passengers carried were	2,173,000
"For the same time in 1891	3,695,000
"In the half year, June, 1886, two-penny passengers were carried	2,926,000
"Two-penny passengers for the same period in 1891	3,089,000
"No. of three-penny passengers, half year, June, 1886	1,623,000
"No. of three-penny passengers, half year, 1891	1,296,000

"It will be seen that this is a large increase in travel, owing to low rates, though our city has not increased in wealth or population during that time, but quite the contrary."

Another excellent feature which I noticed is the parcel system, by which the tramway company collect parcels at offices designated by them and deliver the same at any part of the city, or at any place one mile distant from the end of any route, at prices varying from a penny to eightpence up to fifty-six pounds. This has proved a source of revenue to the company as well as a great convenience to the citizens, especially when one considers that the express company system in vogue with us is not much copied in European countries.

On the great thoroughfares of London no horse cars are allowed, but omnibuses take their place, and as a result the blockades which are so frequent in our cities, especially in Boston, are seldom seen, though on those streets there is a regular up and down travel of omnibuses and hansom cabs as closely packed together as carriages in a public procession. They observe the laws of the road, and the uplifting of a policeman's hand is obeyed as instantaneously as the command of an officer in a well drilled military company. The Strand and Fleet Street are much like our Washington Street in width and general appearance, indeed more so than any other part of London, or any street in any city I visited.

By the Metropolitan Streets Act, which applies to the business thoroughfares of London, no person can, from ten A. M. to six P. M., remove ashes, dirt, etc., drive cattle, load or unload coal, beer, safes or heavy material, or drive through those thoroughfares any vehicle containing timber thirty-five feet in length or projecting eight feet behind. The Strand contains more theatres than any street in London, which are close to each other, and yet their system of regulation is so complete that little inconvenience is experienced.

Great Britain is under a general law known as the Tramways Act of 1870, being "an Act to facilitate the construction and to regulate the working of tramways."

The persons authorized to construct under the act are: (1) The local authorities. (2) Any person, persons, corporation or company, with the consent of the local authorities. The method by which they proceed is as follows : Application to build a horse railroad is first made to the Board of Trade, and when such application is approved the Board of Trade causes a bill to be introduced into Parliament. When such bill passes, the promoters build under the general law and are governed by it. No application shall be considered by the Board of Trade where it is proposed to build a road where, for a distance of thirty feet or upwards, a less space than nine feet six inches intervenes between the outside of the footpath on either side of the road and the nearest rail of the tramway, if one-third of the owners or occupiers of houses along the line dissent. If a city or town builds or acquires possession of a tramway it cannot run cars and charge tolls, but must lease the road to some person or corporation for a period not exceeding twenty-one years, and with the approval of the Board of Trade. Every road built must be of a gauge four feet eight and a half inches, unless otherwise allowed, and the rails must be so laid that the upper surface must be on a level with the street paving. Hence every street railroad in Great Britain does not destroy the smoothness of the road surface, as is the case too often with us. Another good provision also is, that they shall not break up continuously more than 100 yds. at a time, and must have a quarter of a mile between each break.

They are also compelled to keep in thorough repair all space between the rails and eighteen inches on the outside, and where double tracks are laid they must also keep in repair the space between the double tracks. If after a tramway is in operation for three years the city authorities or twenty tax payers complain to the Board of Trade that such road does not give proper accommodations, the Board is authorized to allow another person or corporation to run cars over the road for not less than one year or more than three years.

After any railroad has been in operation twenty-one years the city or town anthorities may buy the same, and if any disagreement as to price exists, the Board of Trade appoints a competent engineer as referee. But, as I have before said, the town authorities must re-lease, and this generally is given to the original company, as in the cases of Liverpool and Glasgow. The County Council of London has given notice to the London Street Railroad that they intend to take posesssion of that road under the Act of 1870 ; but they doubtless will re-lease it back to that company, as under the act they cannot run the cars themselves, though they will take care of the tracks. The town of Birmingham took advantage of the act, and built tramways in that town, but leased them to different companies who run by electricity, steam, cable and horse power, and soon that city will decide which of these is best for Birmingham, and compel the several companies to adopt the system decided upon by the City Council.

In Paris and Berlin the mode of street conveyance is a combination, like London, of the horse railroad and the omnibus, and the system of low fares graded from three cents to six cents prevails. In fact, the systems and the style of coaches in all three cities are very similar. I have seen nothing in any of these cities that a Bostonian might envy, so far as horse car accommodations are concerned, except the penny fares , but our long distance rides are much cheaper than in either of these cities, especially when it must be remembered that the working classes in any one of them do not earn one-half that which a mechanic receives here.

One great advantage, though, which they possess over us is that you are always sure of a seat ; for if a horse car or omnibus has its full complement the conductor admits no more, and you must wait for the next car which has room for "one more." How the system of waiting would please our rapid transit people in Boston and its suburbs is another thing. It may be worth an experiment here. In addition to all this there are the hansom cabs of London and the cabs of Paris and Berlin which seem to be omnipresent, and which transport passengers for very low fares, and are used more generally than with us. But these are not all the convenience and facility for travel which the people of London, Paris and Berlin enjoy, London and Berlin especially. They have a circular system of either underground or surface railroads, affording quick transportation from the suburbs to the city, and from any station on the line of these circular roads to any of the great railroads that go from the city throughout the country. In addition to this, the city of Berlin has a grand elevated railroad structure of four tracks running east and west and halving it, and thus solving effectually the question of rapid transit, not only for suburban but for through travel also.

The electric underground railroad of London, I must confess, though it be treason perhaps to say so, did not impress me favorably as a passenger traveling along it, and that impression was shared by nearly every person to whom I spoke in my desire to get the ordinary passengers' views about it. I went to London to inspect it, and, with a partiality rather in its favor, I rode through it a dozen times or more. By the courtesy of the officers I inspected it from a rear platform by the aid of a lamp, and the oftener I traveled over the road the less favorably it impressed me as a system for Boston. I found that the air is

fresh enough in the tunnel, with a temperature of fifty degrees; that the cars are invariably closely shut to exclude the great draught, and the air in them is not good. This keeping of windows closed is necessitated by the great draught which the single track tunnel has. Then, in addition, there is a noise like the roaring of the ocean mingling with that which electric cars usually give, making the short trip of one-quarter of an hour a very disagreeable one indeed. I asked the engineer if it were possible to do away with the sound. He answered, of course, no; but it could be lessened by lining the tunnel with some substance that absorbs sound. If such a tunnel were built in Boston the temperature in it, I am informed by our engineer would be fifty degrees—not a very inviting place for delicate persons on a summer's day, with the thermometer outside in the nineties.

As a piece of engineering I presume it is perfection, but as a mode of conveying human beings from one part of a great city to another I should much prefer some other method, and some other feeling when traveling than the buried-alive feeling which one experiences in this tunnel. The underground district railroad of London is entirely different. To be sure the odor of gas is sometimes around, but a gleam of light comes in every few minutes. It is double tracked, leaving plenty of space for air. It has open spaces wherever they can be got. It is near the surface, the temperature of the tunnel is about the same as that of the outside air, there is no intense wave sound, and one feels in riding through it much more comfortable than when traveling through the tunnel of the New York & New Haven road in the city of New York. What this underground system does for London the viaduct system of Berlin does more completely for that city By how much light is above darkness for a traveler, in the same measure is the railroad viaduct of Berlin above and beyond any of the other modes of conveyance which I have seen. But its perfection is not alone in its workmanship and its elegant stations and the fact that it is in the sunshine; but it consists also in the facilities it affords for traveling in any direction east and west, and to any part of Europe, without leaving the line of this road, thus not only giving the citizens of Berlin easy, cheap and rapid transit, but forming a direct line of communication between the great railroads of the German Empire.

The German Empire built the road I have described. I am much afraid no private corporation could afford to build such a road here, but if built, no matter by whom, nobody will deny that it would be of inestimable advantage to the people of Boston and its suburbs, and would solve a great part of the rapid transit question with which we have to deal.

Improved Dynamo Construction.

By F. A. SCHEFFLER.

Readers will discover that this short dissertation on the above subject is not a theoretical one. The object is merely to go over the ground roughly and touch upon some particular feature of dynamo construction from a layman's standpoint, which will, perhaps, be more readable to some persons than would an article involving pure theory and mathematics.

The use of dynamos has in the past few years become so general in the street railway business that a discussion involving the improvements made during the past ten years in the design of such machines will not be out of place. As there are no dynamos in use, at the present writing, of the alternating current type, for street railway work, these remarks will be confined to the direct current type. In considering the advance made in dynamo design it will be advisable to recall to mind these machines as they were designed years ago for lighting purposes. The old Edison Department for Isolated Lighting began business by introducing the sixty-light dynamos in 1881, the only practical dynamo built by the Edison company at that time. This machine weighed 2,500 lbs. The wattage output was 4,620 or 1.84 watts per pound. It was a wonderful piece of work considering the small amount of knowledge then at hand for properly designing dynamos for the new method of illumination. Mr. Edison, however, seemed to think that such small machines were of too little consequence for him to perfect, and prepared to turn his personal attention to his "Jumbo" machines, several of which were put in practical operation in the old Pearl Street station, New York City, in 1882. Each dynamo was built originally for 1,200 lights of sixteen candle power each. After they were nearly completed some changes were made, increasing their capacity to 1,600 lights. They were *coupled direct* to high speed engines (Armington & Sims and Porter-Allen were used) running at 350 revolutions per minute. Each one of these machines, without the engine, weighed not less than 30,000 lbs. This was a decided improvement over the sixty light dynamos in the output as compared with weight. The large machine produced four watts per pound, and considering the slow speed at which the armature revolved, the results were remarkable.

One can now look backward and see how completely Mr. Edison was in advance of the times when he proposed coupling dynamos direct to the prime movers.

While there has been an astonishing improvement made in the reduction of material used in the construction of dynamos of equal output in the past ten years, the improvement made in the efficiency of such machines cannot be said to have changed materially. It is surprising to note that claims and generators of ninety-five per cent. efficiency were made by the various electrical manufacturing companies as far back as 1882. These claims were founded on published detailed tests and experiments made by certain college professors who were considered the highest authority in this country on such matters. I am not aware of any higher guarantee, or even claim, being made to-day by any manufacturer for the most improved dynamos. Five per cent. loss in friction and leakage is indeed an exceptionally small amount, and this may *possibly* be reduced by the use of ball or frictionless bearings. We cannot possibly look for much improvement in the increase of efficiency in the electrical construction, for nearly the whole of the loss is in friction.

The improvements in dynamo construction have, therefore, been more in the line of reducing the quantity of, or, so to speak, *increasing the efficiency of*, the material used in manufacture, reducing the labor in such construction and at the same time producing a better machine. As usual with all commodities utilized by the public, competition alone has been the principal cause for the wonderful selling price and cost of manufacture. Of course, the manufacturers' profit has also been materially—yes, extremely—reduced. Some of us can remember when a sixty light sixteen candle power dynamo sold for $1,200. To-day the same machine can be purchased for from $300 to $400 and it will be of a more lasting quality, requiring fewer repairs, and more easily repaired when necessary.

Self-oiling bearings have become almost a necessity with customers, and nearly all of the prominent manufacturers furnish them on their dynamos. Whether the demand for such bearings has been created through positive satisfaction by their use or whether it has grown to such proportions by the mere supposition that it is a "good idea" to have them, will never be told. The truth is that there are two sides to the question. Some persons claim that oil cups, having a sight feed, and an attachment whereby the feed after it is set can be stopped and started at will, without requiring time to reset the same, are the proper devices to use for bearings, for the reason that the dynamo tender is obliged to pay strict attention to the dynamos and bearings, and there is, therefore, no possibility of their being left to take care of themselves, such as might be the case with the self-oiling bearings, because the latter are automatic.

The tendency amongst manufacturers to reduce the speed of armatures is very great, and although the decrease in speed usually means increased shop cost compared with a higher speed for the same output, such machines can be sold at a proportionally higher price, because the user can readily see that slower speed means less wear and tear, and therefore, fewer repairs and less liability of "shut down" on account of hot bearings. Certain manufacturers are building dynamos at present, with very moderate speed of armature, giving an output of seven watts per pound of gross weight (direct current machines—alternating dynamos which usually run at an excessive speed, have a much higher output per pound). Comparing this with dynamos made ten years ago the wonderful advancement can readily be discerned.

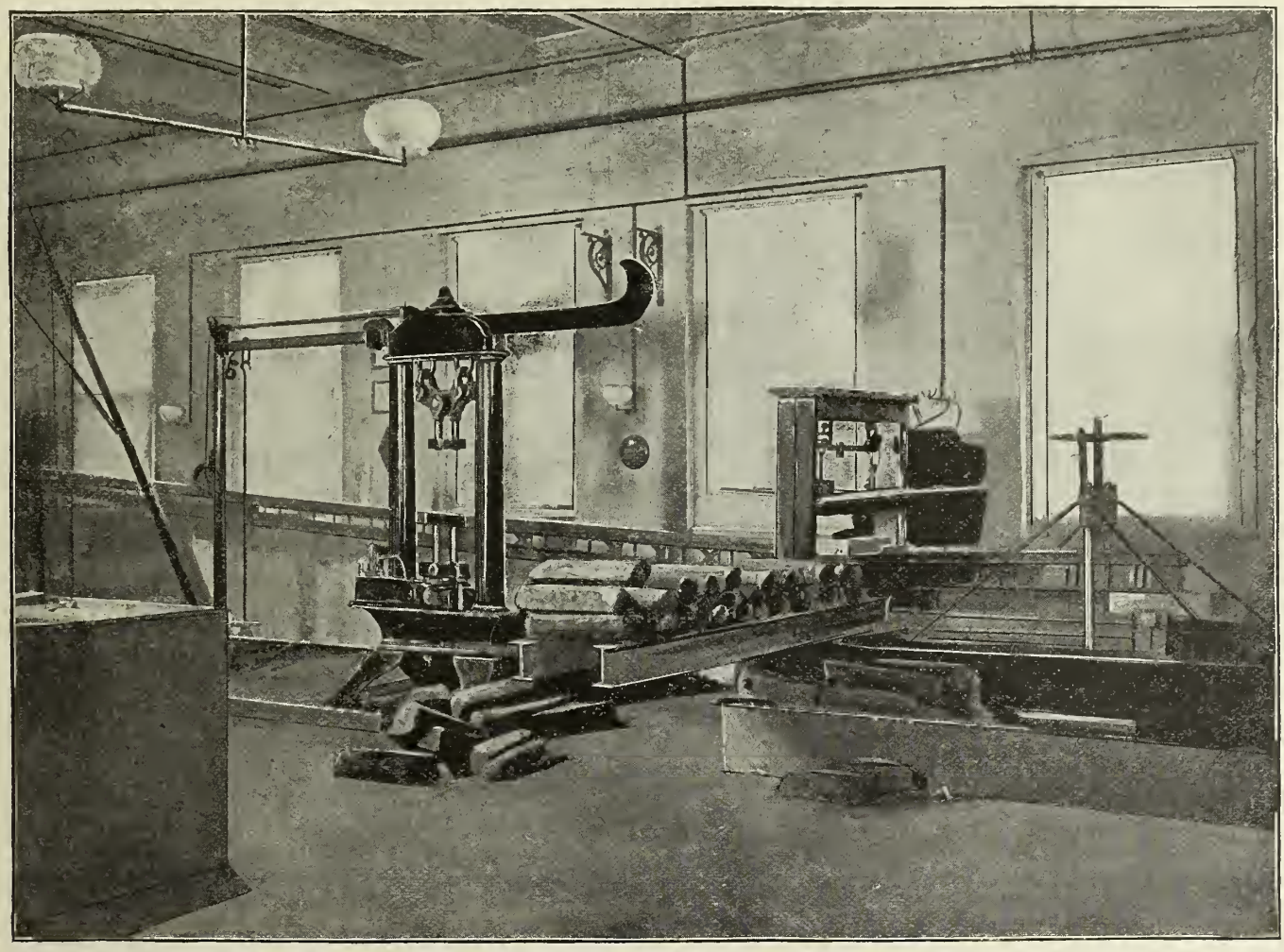
Two pole machines are still being made by the various manufacturers, but this type is used in comparatively small dynamos or generators. As the capacity of the machine is increased the number of poles is also increased, and there are numerous advantages in multipolar machines; they will occupy less floor space than any other type, weigh less for the same output, are more efficient, and when one magnet is ruptured it can be "cut out" temporarily and the machine can still be used, although it will not, of course, give its full output, but this is better than stopping altogether, such as would be the case with a two pole machine. Multipolar machines are undoubtedly more expensive to build, as to labor per pound, than any other type, and although the material used is decreased, there is not enough difference in the cost to cover the increased amount of labor. Manufacturers of such machines should, therefore, demand a higher price than would be asked for two pole machines, but competition will probably again interfere and regulate the difference. Unfortunately competition is frequently the death of some firms, although it is usually said to be the life of business. Electric machinery to-day is being sold in the form of dynamos, generators and motors at a price, in a great many cases, which is all out of proportion to the cost of manufacture. This is all very well for the purchaser, but he should look well into the kind of any article offered, when the price is much below that of other bidders. Prices for apparatus of the kind mentioned are extremely unstable at this time, and from personal experience we know that sales are too often made with no profit whatever to the manufacturers, but this has nothing to do with dynamo construction.

Since writing the above I have glanced over the latest weeklies on electrical work, and in one of them I saw a description of an entirely new design of direct current machine of the multipolar type which rather upsets one of the advantages peculiar to the multipolar machines already outlined, in regard to "cutting out" one magnet in case it is damaged, and still continue to operate with a proportionate output. This new machine has only *one* field coil, although there may be six, eight, ten or more poles. Truly, while we are spending time to-day discussing improvements, and making certain deductions therefrom, to-morrow will dawn with some new type which will cause us to re-investigate and change our comment to suit.

That the future uses of electricity will require larger units of generators no one can gainsay. These units have already attained 350 and 500 H. P. in this country, and 1,500 H. P. in Europe, with engines or prime movers coupled direct. There are not many cities in this country, however, where the demand for lighting would require such large units as the latter, but the introduction of the "juice" is coming to be of such moment for all classes of work where power is required that we predict that a unit of 1,500 H. P. will, in a few years, seem to us what 200 H. P. did four years ago, and there will be many places where such units will be in daily, if not nightly, operation, furnishing current for carrying multitudes of workmen to and from their occupations and for operating the machinery which furnishes them employment. What an Elysium it would be to reside in a city where there were not more than one, two or three immense central stations which would be capable of furnishing light, heat, power of all kinds, including rapid transit, confining all the disagreeable soot, and so called smoke consumers, to the district occupied by the station, discarding the "each-man-for-himself-and-devil-take-the-hindmost" plan now so

entirely in use in large cities particularly, where every office building, every store and factory has its own boilers, engines, and frequently electric lighting department, thus permeating the atmosphere with volumes of smoke and other gases, and defrauding us all of what is most essential for our welfare, pure air. This, no doubt, is pleasant dreaming, but who can foresee the extent or limit of possible electrical engineering? Fifteen years ago we should undoubtedly have been liable to look upon a man as a confirmed crank who could have predicted conversing with a friend separated by 200 miles, or could have foreseen going from place to place through cities and suburbs at from five to twelve miles per hour by the "broomstick" train.

If we are to judge by the "signs of the times" the World's Fair electrical exhibition will demonstrate that in all matters pertaining to the welfare and industry of the universe, there has never been such rapid advancement as has been made in the art of electrical engineering since rumors of its usefelness as a method of practical illumination were in circulation in the latter part of the "Seventies." There may be to-day, perhaps, some of the doubters, men who are intending some day to make use of electricity in their business, and are only waiting (so they say) until the new field is in a more settled condition, so that they will know positively that when they do purchase, the machine and its appurtenances will embody all the improvements possible. To such I can only say, that under these conditions you will *never* use the current; you will never know what convenience is; you will be left far behind your progressive competitors in business, because, like all arts, electrical inventions and improvements *never* will attain a "more settled condition."



STRENGTH OF POLES.—CORNELL UNIVERSITY TESTING ROOM, SHOWING FIRST POLE DURING TEST.

Strength of Poles.

Some interesting and careful tests of the strength of iron poles used in street railway work have recently been made by Profs. R. H. Thurston and R. C. Carpenter, of Cornell University, Ithaca, N. Y. The tests were made at the request of Milliken Bros. of New York, and through the courtesy of this firm we have been enabled to present below an abstract of the report submitted by Prof. Thurston.

The object of these tests was to determine the behavior of built up iron poles when subjected to a pull at the end in a direction normal to the axis of the poles and of sufficient magnitude to cause permanent deformation or "set." The poles for this test were furnished by Milliken Bros. of New York, and were five Milliken poles, which are numbered I, II, III, IV, V; three pipe poles, lettered A, B, C, and one chestnut pole. Poles I, III and IV were of special make and not standard, and were tested simply to get data so as to arrive at formulæ to enable Milliken Bros. to exactly figure poles for special work. Poles II and V were the standard side pole and pull-off pole respectively, manufactured by Milliken Bros. for street railway use, and during the tests were filled with Portland cement from the butt to a point six inches from the butt.

They differed somewhat in weight, in the arrangement of the "lacing," and in the various "gusset plates" used in the construction, as detailed in the following table:

No. of Pole.	Length Over All.	Length Unsupported.	Lacing from.	To.	Gusset-Plates between Butt and Top Plates?
II.	26 ft. 6 in.	20 ft. 7 in.	Butt Plate.	Middle Plate.	Yes.
V.	28 ft. 6 in.	22 ft. 6 in.	Butt Plate.	Middle Plate.	No.

Poles B and C were of the kind of tubular pipe or pole generally used in street railway construction as a side and pull-off pole, respectively, A being a much lighter pole. The "pipe" poles were made by uniting three sections of steam or hydraulic pipe, of different sizes, telescope fashion. The joints were made in two ways, according to the relative sizes of the pipes jointed; (*a*) by shrinking or forcing the large over the smaller, or (*b*) by driving a "liner" of proper thickness into the annular space between the two pipes. The wooden pole was a chestnut telegraph pole. Their respective dimensions are given below.

	Length of Eye.		Length of Sections (apparent). 1st.		2d.		2d.		External Diameter. 1st.	2d.	3d.	Total
No.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	in.	in.	in.	Weight.
A.	27	3	14		7	6	5	9	5½	4½	3½	368 lbs.
B.	28	5	14		7	1	7	4	6⅝	5 9-16	4½	486 "
C.	28	2½	15	3	5	9	7		6⅝	5½	4½	750 "
Ches'n't.	28	6	About 10 in. at butt									316 "

The method of making the test adopted in the case of all the iron poles, except V and C, was as follows:

The object of the test being to find the pull the pole would stand, and its deflection, the base was placed on the platform of a transverse testing machine, and a fulcrum formed by a tie rod of iron bolted to the base of a scale, as shown in the accompanying engraving. The load was applied to pull the top of the pole up. The tangent of the angle of curvature was measured by observing three points, one each side of the fulcrum and twenty five centimetres apart.

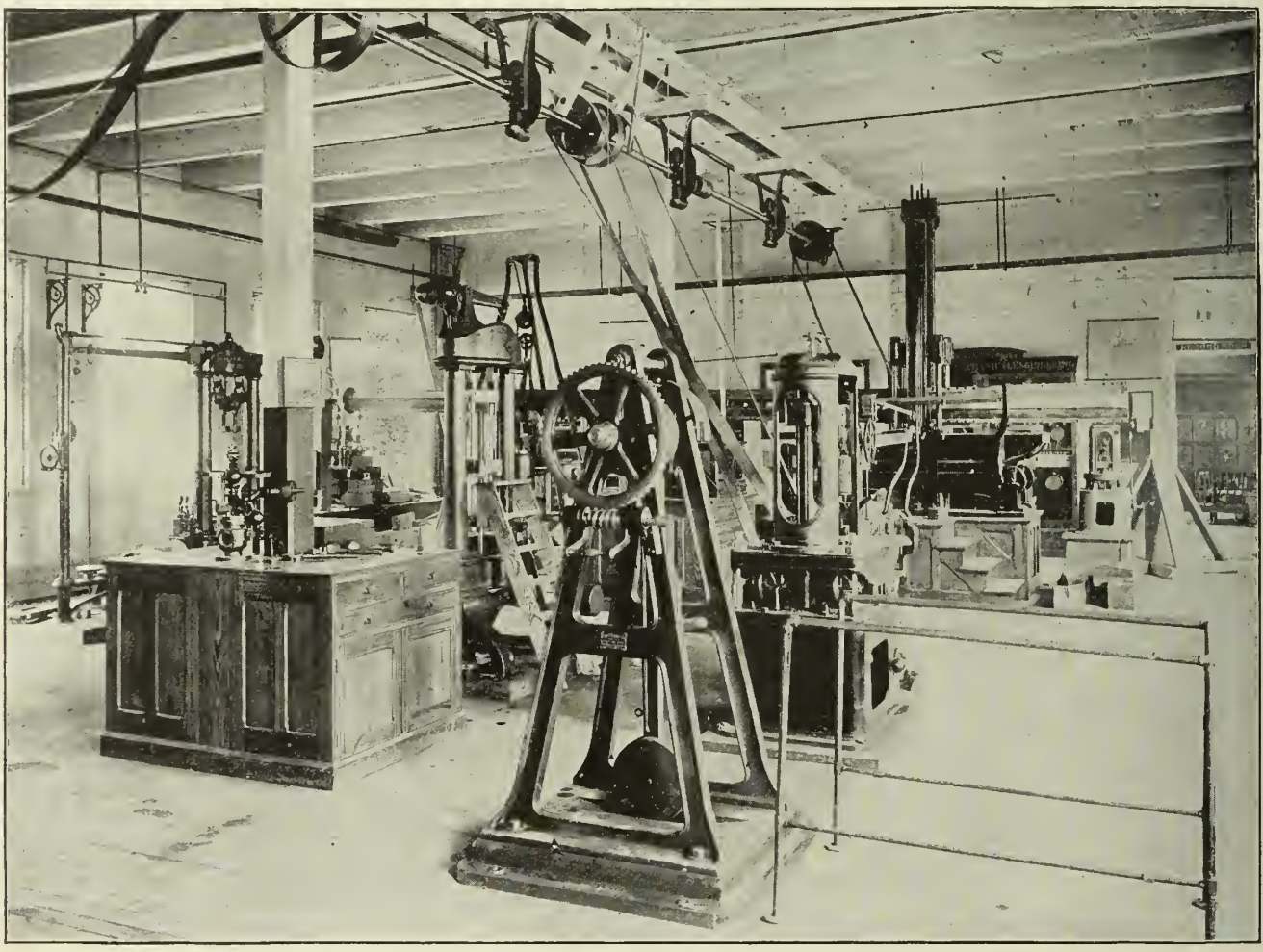
An attempt was made to test No. V in like manner, but the capacity of the chair block and that of the testing machine used as anchor were reached before permanent deformation of the pole could be pro-

duced. No. V was then placed in a larger machine as anchor, and was bent by a hydraulic jack acting against the "boss" on the cap of the pole through which the eye-bolt passes, by means of a piece of gas pipe of proper size. The jack was placed on the testing machine used in the previous tests, which thus served to weight the force exerted in bending the pole. The first attempt to bend the pole with this arrangement did not prove successful, but a slight change in the disposition of the anchor machine overcame the difficulty, and the pole was finally "set." Pole C was received while test on V was in progress, and was, as a matter of convenience, placed in the machine used to hold V, and tested in a like manner. At the conclusion of the above tests the chestnut pole was tested to rupture in the same apparatus used for V and C.

In Pole	No. II	the elastic limit was	1540 lbs.;	corresponding deflection,	10	ins.
"	" V	"	"	3340 lbs.;	"	"	14	"
"	" A	"	"	675 lbs.;	"	"	12.2	"
"	" B	"	"	920 lbs.;	"	"	16.5	"
"	" C	"	"	1420 lbs.;	"	"	13.6	"
"	" Ches'n't	"	"	960 lbs.;	"	"	37	"

When tested to destruction, Pole No. II broke by fracture of segments about 1 ft. 8 ins. in front of fulcrum. The segments were fairly pulled in two; the plane of fracture was at right angles to axis. Pole V gave a slight permanent set at fulcrum, preceded by cracking of the cement near the fulcrum. All pipe holes bent in the second joint from one foot to three feet ahead of the first joint of section of pipe. The chestnut pole yielded by opening slightly on the under side, near the fulcrum. In conclusion, Prof. Carpenter states, in referring to the Milliken standard poles:

"We now have a pole of as nearly homogeneous structure as possible, and for a given weight of iron of maximum strength. The pole is stronger than can possibly be required for any work ordinarily connected with the carrying of wires."



STRENGTH OF POLES—CORNELL UNIVERSITY TESTING ROOM, SHOWING PULL-OFF POLE DURING TEST.

THE work of changing the Williamsport Passenger Railway of Williamsport, Pa., to an electric road, commenced last May, has been accomplished. The road, at the time work was begun, had five and a half miles of centre bearing rails and nine one-horse cars. Four of these miles have been replaced and two miles of new double track laid with sixty pound Wharton girder rails. The rolling stock equipment now consists of ten sixteen foot cars with McGuire trucks and Westinghouse single reduction motors, the power being furnished by the same company's make of generators. The overhead construction was carefully done regardless of cost, to remove any municipal objection that might be made. The road will be extended in the spring.

The officers are: H. R. Rhoads, president; John Lawshe, treasurer; J. F. Starr, secretary; H. C. Young, superintendent.

Municipal Ownership and Control of Street Railways.

By R. D. FISHER.

Corporations are a creation of modern times and their career and power have been remarkable. A history of their growth would in some respects be coincident with that of rapid transit, since 100 years ago only the most primitive ideas of a corporation were in existence. But this century has been one of wonderful industrial development, and corporations have been born of necessity, since individuals could not furnish the aggregation of capital required for the numerous stupendous undertakings of the age.

The transportation problem was one with which corporations were particularly fitted to cope, owing to the immense expense involved in the construction of plants, and though some evils have undoubtedly arisen owing to the control of *quasi* public enterprises by private capital, the alleged remedy for all these troubles—that of municipal ownership—does not seem to promise the accomplishment of all the good and eradication of all the wrong in the subject, though this conclusion is often reached by socialistic thinkers.

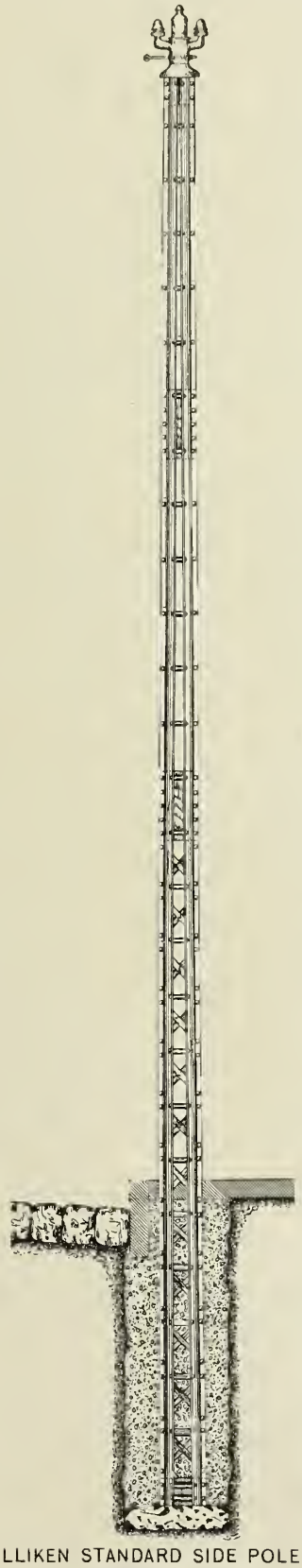
In the question whether the municipalities should own the railways another naturally arises whether the experimental record of management of enterprises on a large scale has been in its favor. It is a matter of internal history that the attempt of a few states in this country to undertake the construction and operation of railways on their own account resulted in failure, and such roads were completed by companies or abandoned. There are two short lines, one in Georgia, the other in Massachusetts which are owned by the respective states but operated by private corporations.

American cities have become accustomed to a standard of efficiency and economy in street railway service which no other country equals. Corporate management of such service is distinctively on a higher level than in similar undertakings by municipal control, and the latter is equally arbitrary and far less responsible, the economic waste, if any, falling on the people and not on the managers.

Another point which naturally suggests itself is that if street railways controlled and owned by municipalities were operated without reference to the payment of interest or profit, it would be not only a burden on the taxpayers, but a matter of outrageous favoritism as to which districts of a city should have roads for the convenience of the citizens thereof to the exclusion of other districts. If they were operated with a view to profit, they would probably be managed on, very largely, the same principles as private roads. There would, however, be less aggressiveness, less competition, and less readiness to intro-

duce the latest and most improved machinery or power; while a false economy often practised under municipal ownership and management for political effect, but which in the end proves most extravagant, would prevent the building of lines, and the establishment of street car service which would barely pay under private corporate management. Municipal ownership, therefore, cannot well avoid involving a city in a maze of absurdities.

MILLIKEN PULL-OFF POLE ON WHICH TESTS WERE MADE.



MILLIKEN STANDARD SIDE POLE ON WHICH TESTS WERE MADE.

A conclusive and weighty argument against the operation of street railways by municipal control and ownership is that it would introduce into our politics a large amount of patronage which must largely become the spoils of professional and scheming politicians. If the present matters involved in and belonging to the business of the various municipal governments cannot (as it is not) be administered with a view solely to efficiency and economy but used as a reward of skill, influence and bounty in swaying the popular vote, would not any future reformation of municipal politics be made utterly hopeless if the patronage were increased by an interest involving a matter so vast as the control of street railway corporations?

When our American politics are purified so as to exclude from them selfish ends and improper means, it may be possible to bring the street railways under municipal control without making them a source of general municipal corruption. But when such a millennial stage in human progress has been reached there will be no need of railways of any kind.

At the command of those in authority, quite likely the dominant political party, multitudes of men would be driven from their chosen vocations with each change of administration and their places given to favorites. Narrow economy would render extensions impossible, dwarf the growth of the city and check the advance of values in real estate, and instead of allowing the artizan to live in the suburbs where it might be possible for him to own his home, and with moderate expenses rear his family, it would compel him to live in the vicious tenement house near the heart of the city. Operation of a street railway system at cost, without profit or reserve, would check the march of human progress and mar the future of the city that attempts it.

Having now stated the reasons why the municipal control of street railway lines would be objectionable, let us consider whether any other remedy can be suggested for the evils which, it is claimed, sometimes arise under private ownership. The popular claims seem to be that in some cases privileges and franchises which belong to the people and grow in value from year to year with the increase of the city, have been given away to become the instruments of corporate greed and gain. If this is the only evil the remedy to apply would seem to be simple. Taxation has been tried with a fair degree of success, and license fees equitably fixed and carefully collected will preserve to the public an equitable part of the money value of a street railway franchise. Original licenses may be graded or increased on a basis of the gross income of the railway company and in keeping with the growth of the city. The tendency of the age is to place all taxes on corporations. Existing laws allow a tax to be levied on the capital stock, on the dividends, on the franchises, on the gross receipts, on the net receipts, on the cars, on the shares of stock, on the market value of the stock or on the estimated value of the corporate property or plant. In the near future it is possible that state and municipal taxes will be almost entirely raised by taxes levied on corporations owning and operating plants by virtue or franchises. There are other plans and ways whereby the street car companies, or monopolies as they have been stigmatized, are required to pay a portion of their revenue to the city or provide for the repair and paving of the streets through which they operate.

Other countries have, in a limited way, adopted municipal ownership and control of such corporations, but not with such gratifying results as to warrant American cities to attempt it. The plan advocated by some is that each city should own its own street railways, not necessarily for the purpose of operating them but for leasing them at a fair rental for short periods of time; but the thoughtful citizen has doubts about the expediency of such a plan. It would not lessen the controversies between the operators and the people nor charge for carriage, while many of the evils attached to municipal operation would be retained.

The writer confidently expects that the vague and indescribable dread and suspicion of the present aggressive corporation will pass away in time. They are the creation of the people. Their powers may be changed, their duties increased and a still greater good result to the public on account of their vast interests. Modification and regulation will render less dangerous their power, hostility will give way to encouragement, and the solution of the vexed question become satisfactory and complete.

Statement from St. Louis.

Below will be found the number of passengers carried and the number of round trips made by the St. Louis street railways in the last year, 1891.

The largest and most phenomenal increase of passenger traffic of any road in St. Louis, goes to the credit of the Lindell Railway, which, during 1890, carried but 5,549,729 passengers, while during 1891 it carried 10,945,585, an increase of 5,394,856.

ANNUAL REPORT FOR 1891.

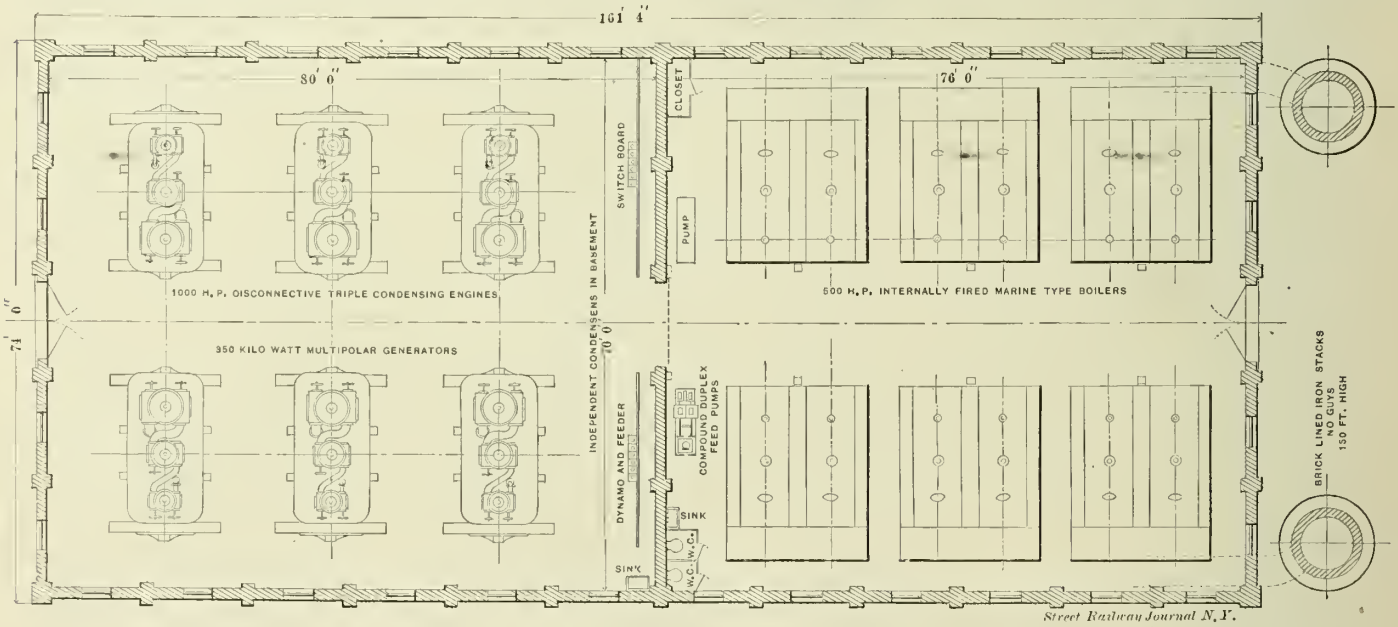
Rank 1890.	Rank 1891.	Name of Road.	Trips.	Passengers.
17	16	Baden & St. Louis	16,980	214,987
11	14	Benton & Bellefontaine	214,538	1,765,186
8	10	Cass Ave. & Fair Grounds	218,568	3,303,856
2	4	Citizens'	373,596	8,864,2 2
15	.....	Forest Park & La Clede. Included with Mo. Ry.	.....	.....
16	15	Fourth St. & Arsenal	97,442	433,723
14	12	Jefferson Ave.	1?1,470	1,838,047
5	2	Lindell	546,386	10,944,585
1	1	Missouri	1,042,814	13,551,097
10	8	Mound City	243,454	4,143,942
13	11	Northern Central	166,97?	2,207,707
6	6	People's	222,128	4,367,652
3	3	St. Louis	716,721	10,811,160
7	9	St. Louis & Suburban	102,160	4,027,888
9	7	Southern	347,588	4,270,105
12	13	Union	204,556	1,816,270
4	5	Union Depot	490,072	8,443,330
		Total	5,225,452	80,997,767
		Increase since 1890	1,011,934	12,892,206

Development in Designing Central Railway and Power Stations.

BY C. J. FIELD AND E. J. COOK, OF THE FIELD ENGINEERING CO.

There has been within the last year a marked improvement in the designs of central stations. They are more carefully planned, so that they better serve the purpose for which they were constructed. Still, there is room for advancement, and the next year will see, we believe, no little progress in this direction. The particular line of improvement to which we desire to refer at this time is the adoption of the directly connected engine and generator. By this arrangement the smallest possible amount of space is needed, and the best economy in operation is secured.

The earnings of companies are more materially increased by close attention to details in the generation of power than in any other branch of the business. In the past too little engineering skill has been given to this work. There has been an absence of harmony and plan in the general design. The engine man designed his engines ; the electric man his generators ; the boiler man his boilers ; the architect his building, but there has been no one to bring these plans into unity. The result has been that the plant was a conglomerate. It is a matter of fact that this has been the method pursued in the case of most power stations in existence to-day. On the other hand, if the matter is taken up with the fundamental idea that a station is a totality—not a loose combination of several departments—then each part is planned in accordance with this central principle and is made subordinate to the general harmonious arrangement. In such a plan a competent engineering firm may design the general plant, work with the makers of the machinery for the best apparatus, and assemble it in a station planned to conform to the machinery, in contradistinction to forcing the machinery to conform to the station. By this plan the best results may be obtained.



PLAN OF CENTRAL POWER STATION (DIRECT COUPLED) 6,000 H. P. CAPACITY—DESIGNED BY FIELD ENGINEERING CO.

A year ago our vice-president and mechanical engineer, Mr. E. F. White, was sent to Europe to ascertain the latest developments in engines of the direct connection type. We had realized that American push for standard commercial work had been so great, that the desire to achieve results in the briefest possible time had become so prominent that we, in this country, were somewhat behind in this particular line of work. Mr. White devoted several months to investigating the subject throughout Europe. He consulted the engineers and companies that had developed anything of value in this department. We were even more strongly impressed than before with the advantages attending the operation of directly connected engines when Mr. White's reports were presented. We do not believe in importing any considerable amount of apparatus, for we think American manufacturers can build as good machinery, if not better, than that designed abroad, but in the matter of directly connected engines they had to be forced by the demand to commence the work.

At the present time we are designing several stations in which this kind of machinery is used, and one of the best of these structures is illustrated in the accompanying diagrams. Engines heretofore in use in this country in power stations may be divided into three classes : First, high speed directly connected ; second, slow speed Corliss, connected to a countershaft ; third, slow speed Corliss, belted direct. Without discussing the relative advantages of these three methods we may say we believe in connecting generator and engine as closely as possible, and are opposed, consequently, to countershafting. We are convinced that, all things considered, better results can be obtained at the present time in power stations if this mode of connection is left out of the question entirely.

The style of station here shown is, in our opinion, the most desirable from every point of view for the progressive company. The engines and generators here described are now being turned out, and several stations with this kind of apparatus will be built during the present year.

The engines are being designed and built by the Lake Erie Engineering Works at Buffalo, and they are constructed with the idea of combining the advantages of the Corliss and high speed engines. They take a moderate rotative speed rather than a high speed ; but still they yield the economy obtainable by the double valve system usually shown only in the Corliss type. They operate at a speed of about 130 revolutions, and have independent steam and exhaust valves. The regulation is closer than that obtainable with the Corliss ; the centrifugal shaft governor used with the engines makes it possible to secure a regulation within one per cent., even with the low speed mentioned. With engines built for this work special attention must be paid to the matter of providing ample flywheel capacity, so that strains on the working parts may be relieved. This fact seems to be lost sight of by some of those who are preparing to build engines of this class. In the engines designed for the station described here the flywheels are placed between the cylinders. This is shown in the view of the engine and dynamo room. For direct connection the generators are attached to the end of the shaft ; when belting is used the generators are replaced by band wheels ; the main flywheels remain between the frames, as shown.

The cylinders of the engine are so connected and arranged that one or more can be disconnected and the engine be operated as a compound. This is an advantage in case of accident or for running any continual length of time on reduced capacity. The engine is also arranged to give good economy, either condensing or non-condensing. The general cylinder dimensions shown are as follows :

Diameter of high pressure cylinder			16 inches
" " intermediate	"		26 "
" " low pressure	"		40 "
Stroke			34 "

Speed, 115 revolutions.

They are built to operate under 140 or 150 lbs. condensing, or 200 lbs. non-condensing. They have a normal capacity of 1,000 H. P.

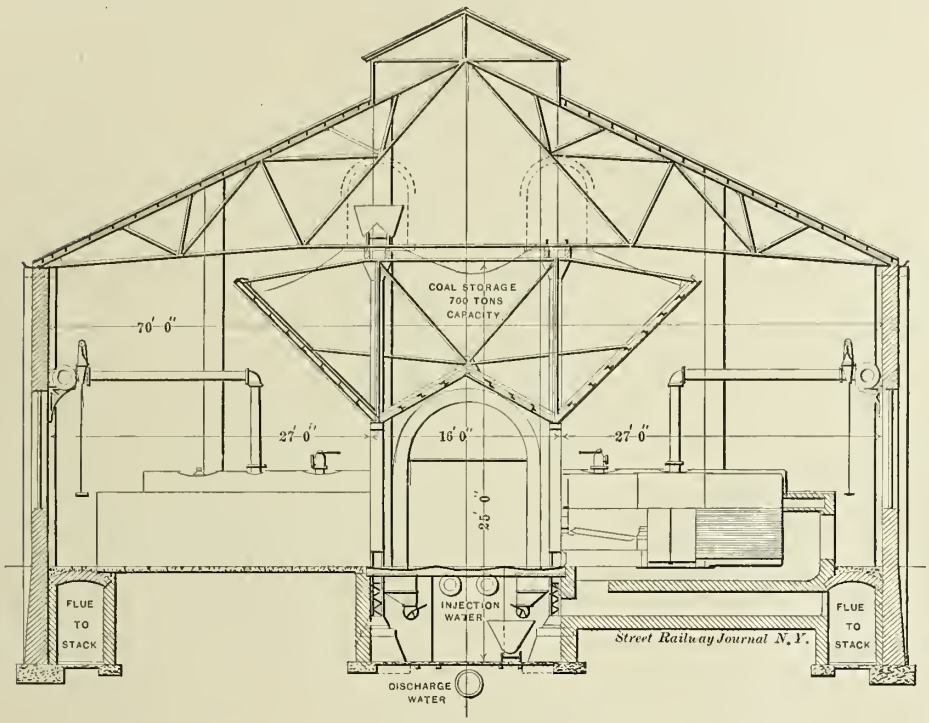
The generators designed for direct connection to the engine are multipolar. The type shown in the diagram occupies, perhaps, the smallest floor space. Generators of the general character employed are built by several of the prominent electrical manufacturing companies.

The boilers shown in the sectional view of the boiler room are a developed type of the marine boiler, designed for stationary work. These boilers are internally fired with corrugated fire box and combustion chamber, and give a very high economy. The general flue arrangements are shown in the plan. Two of the boilers, each of 500 H. P., are planned to operate one of the engines with fifteen pounds evaporation per H. P., which would be about the general economy for a plant of this kind.

In the centre of the boiler room is shown an economical arrangement for storing as well as handling the coal. The fuel is brought in on an overhead trestle by a car, or conveyor, from the boat or freight car. This method of handling coal reduces the labor item. At the same time it does not interfere with the light and ventilation of the boiler room. Too often the arrangements are such that the boiler room resembles closely the stokehole of a steamship. By the means here provided the coal is conveyed to the front of the boilers through the supporting columns of the bin proper. The columns are built of channel bars, with plate sides, riveted, and arranged with proper openings for depositing the coal on the boiler floor in front of the fire doors.

The stack which we are designing for the station is of the general type used in the steel works in Pennsylvania. It is of heavy iron and is brick lined to the top. Such a stack, while practically indestructible, is cheaper than one made of brick. The two stacks conform to the idea of duplicating all parts of the plans.

The station is planned as a brick building, with sixteen inch walls with buttresses every thirteen feet. The general dimensions of the station are 170 x 70 ft. over all; the engine room is 70 x 80 ft. Considerably more engine capacity could be provided for in the room, but for this kind of work we believe in one story buildings with ample room and without danger of crowding. In the engine room is provided a traveling crane of sufficient capacity to handle any part of the engines or generators.



SECTION OF BOILER ROOM.

The roof construction is the Fink type of iron truss riveted with Z purlins and plank or corrugated iron covering. When plank is used it is slated. A louvre extends the length of the engine and boiler rooms, with heavy ribbed glass on top.

The Rapid Transit Controversy in Detroit.

Detroit needs better transportation facilities. While electric railways are in operation in the outskirts, the great majority of citizens have to depend entirely on horses. Most cities possessing one-tenth as many inhabitants as Detroit, enjoy more rapid transit, and the result has been that the bitterest complaints have been made by citizens. No one realizes this state of things more keenly than does the largest local railway company on whose lines the majority of people daily ride to and from the business section; the preceding sentences, in fact, are almost a paraphrase of the introductory portion of a communication recently sent by the company to the City Council.

The situation has been peculiar in Detroit. The developments of the last year, with its record of strikes, public meetings and purchase by the Citizens' Railway Co. of their extensive street car system are so familiar that no summary is necessary in this place. The most serious attack on the company ensued when their franchises were called in question. City officials asserted that certain of the rights expired much sooner than appeared on the surface. The Woodward Avenue franchise, it was claimed, expired within a year. The point raised was a technical one, and it seems scarcely probable that it would be approved by the courts. That seemed to be the general impression in Detroit. Nevertheless, as threatening their very life, the company were forced to consider it important. On January 5, the company made a move for the settlement of the difficulty. They sent a communication to the Common Council, in which they agreed to convert their lines into a rapid transit system, provided that the threatened attack of the city were abandoned. The document is an interesting one. It speaks at length of the need of rapid transit in Detroit, and states that an investment of $2,000,000 will be necessary to provide the desired facilities. This sum could be readily raised were not the company the object of such bitter attack. Coming to the merits of the attack against them the company say:

"Whether this attack is justified by any reasonable doubt as to the law need not be discussed here. The fact remains that, before investing in the stock of this company, the present owners of the stock obtained the legal opinions of some of the ablest counsel in the state concerning this question, and were advised that the contention of the city had not the shadow of a basis in the law. The cases upholding our rights are numerous, clear and decisive; while not a single case has been found to the contrary, or even raising any doubt on the subject.

"Nevertheless, the attack has been continued, and it is preventing the company from putting in a rapid transit plant. Rapid transit is not possible until the question of the right to use the streets is settled, and only two ways of settling it seem to be open. These are either litigation or a recognition of the rights of the company.

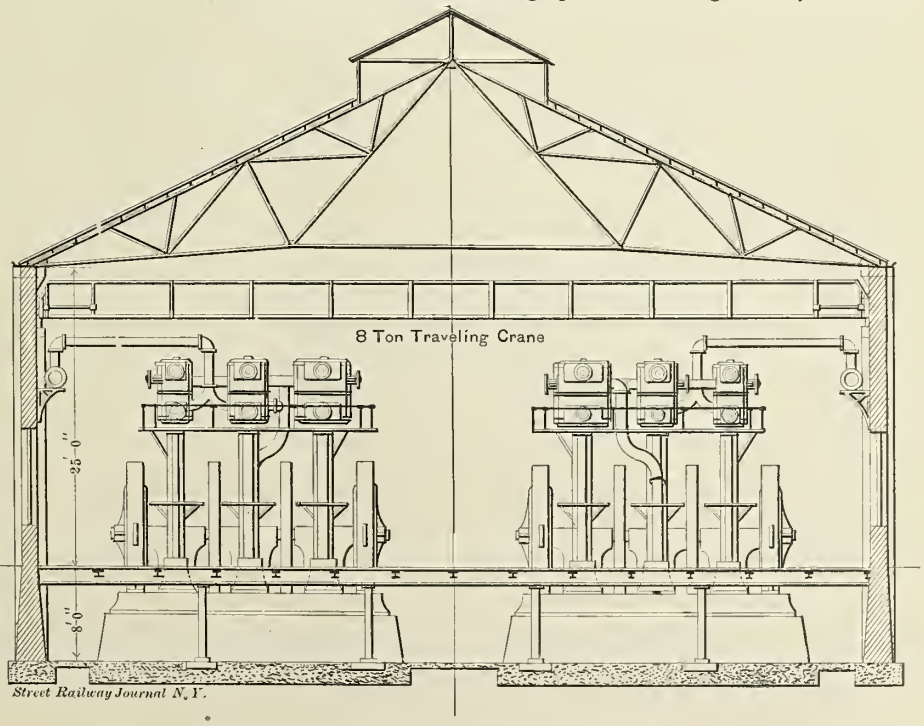
"Litigation involves expense and delay. If there is any way in which an adjudication suitable to such vast interests can be intelligently and satisfactorily obtained in a brief time it is unknown to us. Certainly we, who have made so large an investment in a property worth several millions, must exhaust every possible defense known to the law to defend our rights and interests.

"It is safe to say that, unless terminated sooner by a decision favorable to the company, no conclusion in the litigation can be reached in less than six or seven years from the commencement, thus consuming over one-third of the time which is in controversy. It is not to be expected that any decision destroying the value of this great property will be acquiesced in so long as the contest can be reasonably continued. In the meantime, rapid transit is impossible. In the midst of litigation, money cannot be raised.

"This company are ready and willing to proceed at once with the work of equipping the lines of railway with a rapid transit plant. They will do so as soon as the city reconsiders its proposed attack on the right of the company to operate their lines under the existing ordinances, and as soon as the city removes the present distrust by recognizing that those ordinances confer rights which are valid until the expiration of the time provided therein.

"This company believe that the best interests as well as the good faith of the city call for such a confirmation and, inasmuch as the work of preparation should commence at once, if anything is to be accomplished this year, the company respectfully request early action in regard to the matter.

"We make the formal proposition that, if the city officials will withdraw their opposition to our efforts for improvement and will take action in the way of acknowledging and confirming the city's contract, so that the additional investment required can be made, this company will proceed at once to the equipment of their system with a rapid transit plant."



SECTION OF ENGINE AND DYNAMO ROOM.

As far as can be judged, this proposition met the favor of the residents of the city. If it were declined, the prospect of rapid transit would be postponed indefinitely. If it were accepted under reasonable guarantees, the question which has caused so much annoyance would be settled at once.

Mayor Pingree took an entirely different view. In his annual message to the Council on January 12, he urged the city to fight the franchises. Here is the extract:

"I am pleased to note that the city, through its representatives, has joined hands with the citizens, through their committee, in determining to contest in the courts the enjoyment of these immense values, and to ascertain definitely whether they belong to the public or to private corporations. I do not think that the city owes any consideration to the street railway companies, or to the individuals who are their directors or stockholders in this matter. For many years, when the rights of the street railway companies were not in dispute, they have been importuned repeatedly and continuously by our citizens to furnish them with some means of rapid transit, and though they have promised it time and again they have never made their word good. The result is that Detroit is now practically the only city in the United States of upward of 10,000 inhabitants which is still dependent upon horses as a means of street car transit. These street car companies now assure us that if we will leave them in peaceable possession of their claim for seventeen years' exclusive rights in the streets they will furnish rapid transit at an early date. But this is the same assurance which they have been giving the public for many years, and we have no more reason to believe them now than we had years ago. I feel assured that even our enterprising citizens who own large amounts of real estate in the suburbs, will be as willing as those who live in the more densely populated portions of the city, to forego for a short time the advantages of rapid transit, if by that means they can turn into the public treasury several millions of dollars properly belonging to the public and secure a three-cent fare, all day, on every route of the city.

It is an interesting fact that the mayor in his message also declares against overhead wires so that the company would be barred from putting in an electric system.

Relative Advantages in Cable and Electric Power on Street Railways.

We frequently hear and read a great many random statements as to the relative commercial efficiency of electric and cable street railways, both as to first cost and cost of operation, and it is often heard that this engineer or manager is an advocate of the cable, while that engineer or manager is a staunch electric railway man. These expressions are as absurd as if it were said to-day that the one was an advocate of the wagon, while the other was a staunch carriage man, as each of these, like the cable and electric railway, has it proper place and part, and fulfills in its separate way the end sought and under different conditions, the one more economically and efficiently than the other.

While it is a fact well known that the conditions existing on a large majority of streets of American cities demand the electric railway, it is at the same time apparent that a number of cases exist where the cable railway is, and will be, the more economical and efficient, and it is impossible for an engineer, with the data now obtainable from electric and cable railway cost of construction and operation, to be prejudiced to that extent that he will be an advocate in all cases for the one or the other, as it is fully demonstrated by actual service that, under varying conditions of car mileage made, load, travel, grades, number and radius of curves and climatic conditions, the cable road is often the better adapted for the work at hand, and *vice versa*.

We may hear at times from laymen the expression that the electric road is cheaper for a given work because sixty per cent. of the power on a cable line is used for moving the driving machinery and cable, or, in other words, the dead load. While this is true in some cases, it is by no means true in all, from the fact that the greater the number of cars that are run on a certain length of road, the less the percentage of dead load becomes, and it is principally owing to this fact that cable railways become more economical for a given work, if that work be very large, and if the work be large enough they become more economical than electric roads.

The question of percentage of power lost in propelling the cable while a certain number of cars are stopped to take on or let off passengers (whereas in the electric railway all power not used remains in the reservoir or trolley wire), is not taken into consideration in the following comparison, except as it influences the operating expenses.

We know that the first cost of a cable railway is more than the cost of an electric railway of the same length and capacity, but this difference is, on recently built roads, much less than is shown by a Census Bulletin, No. 55, recently issued, which publishes the statement that the relative total cost of electric and cable railways is respectively $46,697.59 and 350,324.60 per mile of road, where there were selected for purposes of comparison, ten electric and ten cable roads, the above being the average cost of ten in each case.

While we do not doubt the authenticity of the above, we believe the statistician to have been unfortunate in the selection of roads for comparison, and it is to be regretted that this is so, as the Bulletin is in all other respects a valuable acquisition to street railway literature, bearing upon the practical question of cost and operation.

Managers or railway owners are not as much interested in what ten or more roads have done badly or expensively, as what one or two roads have done well, and what they themselves may naturally expect to do with the proper selection and management of a system, which, it is contemplated, shall be built and operated, and in this article, one well built and managed cable, and one electric railway have been taken for purposes of comparison as to relative first cost, efficiency and economy of operation and the two roads selected are, as nearly as possible, of the same length and operated under nearly the same conditions as to traffic, grades, curves and work performed.

COST OF CONSTRUCTION.

System.	Miles Double Track.	Cost Complete with Equipment.	
		Total.	Per Mile, Double Track.
Electric	2.6	$252,569	$97,142
Cable	3.299	353,268	107,083

OPERATING EXPENSES.

System.	Time Taken.	Passengers.	Car Miles.	Operating Expenses.			
				Total.	Per Mile, Double Track.	Per Passenger.	Per Car Mile.
Electric	12 mos.	1,124,720	287,766	$38,114	$14,659	$0.0339	$0.132
Cable	12 "	1,303,117	386,228	50,330	15,256	0.0386	0.130
Electric	If interest at 6 per ct. on the cost of construction is added to cost of operation.			53,268	20,488	0.04736	0.1851
Cable				71,526	21,681	0.05488	0.1852

If the electric railway, with the number of passengers or the same traffic, were to change its power to cable traction, if operated at the same cost per car mile as the cable railway cited, it would carry its passengers at a cost of $0.04738 apiece, or practically the same that it did when an electric railway, and the same is true as regards the cable railway, that is, the cost per passenger on these two roads is dependent on the number of passengers carried per car mile and independent of the motive power.

Referring to the valuable paper by R. J. McCarthy, published in the STREET RAILWAY JOURNAL for November, 1890, there will be found the itemized cost of motive power per car mile for an electric road having a car mileage of 233,287, as follows:

	CENTS.
Engineers and firemen	.540
Repairs of engine and machinery	.002
Oil and waste for engines	.029
Fuel for engines	.829
Water for boilers	.051
Repairs of dynamos and motors	1.223
Repairs of line and trolleys	.291
Lubricants for dynamos and motors	.113

And for a cable road having a car mileage of 802,718:

	CENTS.
Engineers, firemen and helpers	.296
Repairs of engines and machinery	.491
Oil and waste for engines	.026
Lubricants for cables and pulleys	.043
Fuel for engines	.590
Water for boilers	.057
Renewals and repairs of cables	1.425

Also that for any other car mileage of this electric road the expense for engineers and firemen, repairs of engines

and machinery, and oil and waste for engines per car mile, will be inversely proportional to the total car mileage; the total increase of cost of fuel and water will be to the increase in car mileage as two is to three, and the expense per car mile for repairs of dynamos and motors, lubricants for dynamos and motors and repairs of line and trolleys will be constant.

In the cable line the expense per car mile for engineers, firemen and helpers, repairs of engines and machinery, oil and waste for engines and lubricants for cables and pulleys will be inversely proportional to the car mileage; the increase of cost of fuel and water will vary as in the electric road, and the total cost of renewal and repairs of cables will increase with the car mileage in the proportion of two to four.

If, then, x represents any car mileage, the cost of motive power per car mile for the electric road will be,

$$\left.\begin{matrix}.540\\.002\\.029\end{matrix}\right\} \times \frac{233,287}{x} + \left.\begin{matrix}.829\\.051\end{matrix}\right\} \times \frac{233,287 + \frac{2}{3}(x - 233,287)}{x} + \begin{matrix}1.223.\\.291.\\.113.\end{matrix}$$

$$\text{or } \frac{201,637.73}{x} + 2.214 \quad . \quad . \quad . \quad (1)$$

and for the cable road

$$\left.\begin{matrix}.296\\.491\\.026\\.043\end{matrix}\right\} \times \frac{802,718}{x} + \left.\begin{matrix}.590\\.057\end{matrix}\right\} \times \frac{802,718 + \frac{2}{3}(x - 802,718)}{x} + 1.425 \Bigg\} \times \frac{802,718 + \frac{1}{2}(x - 802,718)}{x}$$

$$\text{or } \frac{1,432,202,698}{x} + 1,144 \quad . \quad (2)$$

placing these two quantities equal to each other and solving,

$$x = 1,150,000$$

That is, if the car mileage on each of these two roads had been 1,150,000, the cost of motive power per car mile would have been the same on both, and an inspection of formulæ (1) and (2) will show that for a less car mileage the electric power will be cheaper, and for a greater, the cable power.

The electric road in this comparison is using double reduction motors; whereas, had it been using a gearless motor and other improvements that are being made daily, the cost of motive power would have been so cheapened that there might have been one-tenth greater car mileage before the cable railway became more economical than the electric.

It is to be regretted that there are not sufficient data to enable the making of these formulæ more complete, so as to include all the operating expenses as well as the interest on the capital invested. Both the cable and electric lines now built, vary so widely in the cost of track, plant and equipments, that no general formulæ will give the relative value of each of these items as they enter into the total cost of operation per car mile.

In conclusion, the greater the car mileage per annum the greater will be the difference in cost of operating expenses per car mile in favor of the cable road, and contarywise, the smaller the car mileage, the greater the difference in favor of the electric road.

If grades are numerous, and over ten or twelve per cent., cable railways are better than electric. If curves are numerous, and of short radius, electric traction will be found cheaper.

It is evident that there are roads to-day, which, if re-equipped, would do much better as cable, than if they were to adopt electric traction; also that there are a great many more roads where it would be very much worse to re-equip or operate with cable, and where electric traction should be adopted.

A DISPATCH from Uniontown, Pa., says that David Richey, of Leisenring, was put off a street car for some reason, on January 14, and demanded the return of his fare, which was refused. He went to his home, got his shotgun, held up the next car, and made the conductor hand over five cents. The company have had him arrested on several charges.

Additional Power for the Tenth Avenue and 125th Street (N. Y.) Cable Line.

A new 1,200 H. P. engine has recently been installed in the cable power station at 128th Street and Tenth Avenue, rendered necessary by the recent act of the city compelling the company to operate their cars twenty-four hours per day. At present from sixty to one hundred and fifty cars are being operated. The new engine was manufactured by the Dickson Manufacturing Co., of Scranton, Pa. The cylinder is 38x60 ins., the fly wheel is nineteen feet in diameter and weighs 100,000 lbs., the rim being 14x30 ins. The original power consisted of two 350 H. P. Wright engines, which have been in continual service since August, 1885, and though they have been run at a higher speed, and required to do much more work than was originally intended, not one penny has ever been spent on them for repairs, and they are apparently in as good condition to-day as ever. This is a record which does great credit to the builders.

The problem of installing and coupling the new engine by pinion and gear to the main shaft of the power station without interrupting the operation of the cable lines has been a very interesting one and has been solved in an admirable manner. The plant is equipped with four sets of driving drums, either one or all of which may be operated at the same time, friction clutches being provided on the main shaft between each set of drums, and the original engines were geared to a countershaft and connected to the same by means of flanged couplings with cross key, and this into the main shaft. The new engine is placed on the opposite side of the main shaft from the original engine, and the gear is attached to a sleeve which embraces a portion of the main shaft, about seventeen feet of which was renewed for the purpose of attaching the sleeve. Friction clutches are also provided at one end of the sleeve through which the shaft revolves. The new shaft pinion and gear were made by the Robert Poole & Son Co., of Baltimore, the same firm having designed and built the entire original construction. The new gear and pinion are of enormous strength, being respectively 164 x 81 ins. in diameter with twenty-eight inch face. As soon as the new equipment is in operation, the present main gear is to be placed upon a sleeve and connected to main shaft by friction clutch in the same manner. This will avoid the necessity of stopping the ropes in order to connect and disconnect engines, as is now done, by means of flanged couplings. This makes the plant perfectly independent and allows of running the rope twenty-four hours a day.

The boiler equipment, which originally consisted of six return tubular boilers, has also been increased by the addition of two new boilers of the same type, 100 H. P. each, manufactured by D. M. Nichols, of New York City. The new boilers are also equipped with the McClave shaking grate. A new 1,500 H. P. Berryman heater has also been installed, and a new tapering sheet iron flue has been substituted in place of the former one to lead the smoke from the different boilers to the stack. New steam piping, both for the direct steam and exhaust, has been installed, and is one of the most interesting features of the improved plant. Fifteen inch wrought iron piping is three-eighths of an inch thick, the sections being connected together by means of cast iron flanges screwed on and held together by sixteen one-inch bolts.

Special attention has been given to cutting the threads on pipe, and in flanges this was done in a lathe having a taper turning and boring attachment, thus making the taper on the pipe and on the flange to fit so perfectly that leakage is avoided. The steam pipe is provided with a copper elbow of five feet radius to allow for expansion and contraction.

Since the plant was installed the only important changes made in the machinery have been the replacing of the original flywheels, which weighed twenty tons, with new wheels weighing twenty-five tons. Some of the arms in the old wheels were cracked by excessive increase in loads. The new wheels, though they weigh but little more than the old ones, have the metal of the

arms placed in the direction of the heaviest strains. The new wheels were manufactured by the Pennsylvania Iron Works Co. a year ago or more.

These lines, as will be remembered, are operated with duplicate cables, those of the Tenth Avenue section being 33,100 ft. long, and those of the 125th Street line 25,000 ft. in length, both being run at a speed of ten miles per hour. Solid driving drums are employed which are driven by intermediate gear, and are each twelve feet in diameter. The tension weight on each rope is 2,645 lbs. Notwithstanding the light tension employed only three laps of the cable upon the drum are employed, and no trouble from slipping has ever been experienced. The last rope which was put in service is one and five-sixteenths inches in diameter, and was manufactured by the Trenton Iron Works Co., of Trenton, N. J. A striking comment upon the advantage of feed water-heaters in connection with steam plants is illustrated in connection with the changes being made in this station, it being necessary to remove the old heaters while the new one is being installed, the exhaust has been allowed to escape directly into the atmosphere. Before this change it required only eleven or twelve tons of coal per day to operate the lines, now it requires twenty to twenty-two tons per day. Changes in the dampers and flues also affect the increased amount of coal consumed. With the new heater, which is referred to above, it is expected that even less coal than formerly will be required to operate the lines with increased power.

Possibilities of Electric Car Service for the Development of New Districts.

The announcement that the Pennsylvania Railroad Co. are interested in the construction of an electric railway between their ferry in Jersey City and certain streets in Newark, N. J., somewhat distant from any of their stations in that city, is full of significance not only to all the steam railways in the country, but to all our cities and even our towns, which might, by noting this important example, reach distant railway or steamboat stations in similar ways. Another large railway company in the West is reported to have adopted a similar plan for building an electric railway feeder to the main line from a neighboring town, and thus expects to obtain an economy of service which the construction of a regular steam railway would not permit.

Connected with this subject is a decision, just handed down by the Supreme Court of the United States, regarding a claim on the part of the people of Yakima City, State of Washington, that the Northern Pacific Railroad Co. should construct freight and passenger stations in that city in order to accommodate its people. This city had obtained a writ of mandamus from the State Supreme Court, compelling this railway company to construct such stations, but upon appeal to the United States Supreme Court, the State Court's decision was reversed, and Yakima City will not get its stations. The aggravating point to the people in this case is, that the railway company has a a station at North Yakima, a much smaller town not far away, and in consequence, North Yakima is being rapidly developed in a business way at the expense of the larger town. An opportunity presents itself here for the people of Yakima City to adopt a plan like that mentioned above, construct an electric branch between the two towns, and bring freight cars over such branch, thus obviating the need of a regular steam railway station. The construction of such a road might bring the city of its projectors into such prominence in a business way, that the railway company would before long seek to construct the stations which are now a matter of indifference.

These examples and possibilities open up a wide field in the construction of suburban electric railways, which when more carefully looked into, may result in a very large business, somewhat independent of a street car service proper, but managed and constructed upon similar plans, with the additional feature of carrying freight and obtaining high speed in country districts. One of the features of the new electric road between Jersey City and Newark above mentioned, is a test of the possibilities of the trolley system in its possibilities of speed. The tracks in this case will run across the Jersey flats which are comparatively unoccupied by buildings in consequence of their low level. As there will be no obstruction to a high rate of speed across these flats, electricians and everybody interested in the trolley system, will watch the trial with keen interest, as it will be a practical test of value between steam locomotive service and the most improved electric method. Should this trial result in any economy in favor of the trolley system, or even if the cost of operation is no more, or just a little more, than steam locomotion, the effect may greatly stimulate electric railway construction in all parts of the country.

A glance at any railway map of our country exposes enormous areas unprovided with any system of hauling either freight or passengers except it be by means of ox teams or horses ; but as these are very expensive conveyances when any particular distance over our average country roads must be traversed, the property for farming, industrial, and residence purposes, is valued at a very low figure. As far as farming is concerned, whenever the cost to the farmer of living, production, and hauling, exceeds the amount received for the produce, farming does not pay, consequently, one may see anywhere almost within an hour's ride of many of our big cities, large quantities of undeveloped or unimproved land. If these lands were connected by a feeder electric road, direct with a steam railway, for freight and passengers, the result, by reducing cost of haulage, would develop such districts precisely in the same way that any locality is developed by a good and rapid means of inter-communication.

The cost of such undertakings might be defrayed by the nearest railway company, or, where this advantage was declined by the railway on account of want of funds, those most interested in such properties could combine and build such feeders themselves. The signs of the times, however, indicate that the railways themselves will extend this kind of feeder system to their main lines which will completely fulfill all the requirements of the localities in their vicinity. Separate corporations could be organized and a large share of the stock be subscribed to by local residents, as a distinct system of locomotion would permit true estimates of cost and consequent profit, a matter which a branch utilized by the locomotives of a main line precludes, or renders so difficult that profits are not capable of being properly separated.

In these days of active research for profitable sources of industry and investment there is a large field of profit in companies organized to buy up country property and put such electric railway feeders upon it. In the long run such businesses are found to be as remunerative and possessing as little business risk as any industry in the country. In truth, profits in such undertakings, after they have started, may become almost fabulous, so long as alternate lots for habitations are retained until the towns and cities occupying the previously unoccupied districts have developed. There are a number of celebrated instances which have been developed by Englishmen in our Southern states during recent years, where the dividends upon the capital employed have been enormous. But we have no space here to describe such cases any further than a reference that they were founded upon a ready inter-communication between natural and industrial products and the people.

The instances where such electric roads can be profitably constructed in cities and towns where a steam railway touches an outskirt or some one section, leaving the other sections to rivals, are not few. It is a particular of this kind we have noted in the case of the Pennsylvania Railroad Co. Their new electric road will tap new and untouched districts having a numerous population, and entice them in the way which that railway company would have them go. J. M. B.

THE street railroad in St. Joseph and Benton Harbor is to be converted into an electric railway. W. W. Bean, president of the company, was in Chicago recently, and stated that he expected the road would be in operation with the new motive power by June 1.

Notes on the Columbian Fair.

The Patent Office will exhibit a comprehensive array of models to illustrate the progress of mechanical development.

A miniature model of the town of Pullman, 30×80 ft., will be a part of the exhibit made by the Pullman Palace Car Co.

During December 10,000,000 ft. of lumber was used upon the buildings, and 1,445,200 lbs. of iron work was placed in position. One-third of the number of ornamental pieces of "staff" required have already been cast.

A design is being prepared for an iron lift bridge between the Agricultural Building and the opposite side of the canal. This bridge is to be so constructed that it may be raised and permit the passage of boats up the main basin to the centre of the Exposition grounds.

The project of establishing a Columbian Memorial Museum, which shall be a permanent attraction and which, it is expected, will be given many thousands of curios and other objects exhibited at the Exposition, is being warmly supported by a number of Exposition officials and others.

Thomas A. Edison has applied for 35,000 ft. of space or about one-seventh of all that the Electricity Building contains. "I have it from Mr. Edison himself," said Chief John P. Barrett, "that his display at the Fair is to be the greatest achievement of his life. In talking of his application for space Mr. Edison admitted that he was asking for a large section of the building; 'but every inch will be put to good purpose,' he added. 'I shall not waste a foot of the area assigned to me, but will present a series of the most interesting electrical inventions ever produced.'"

Transportation rates on articles intended for exhibits at the World's Fair will be the regular tariff rates of the railroads, plus eight cents per 100 lbs. for switching charges at Jackson Park. This will bring the rates from the various Atlantic seaports all the way from twenty-eight to eighty-three cents per 100 lbs. according to the class of freight in which the goods fall, and the port from which they are shipped. The goods will be returned to starting point free of expense, except for the switching charges at Jackson Park. Of the eight cents per 100 lbs. switching charges, three go to the Illinois Central and five to the Exposition company. Freight charges on exceptionally fine goods, such as statuary, china, etc., and on horses and other fancy animals, will be somewhat higher than indicated above.

The two principal factors in carrying crowds to the World's Fair grounds at Jackson Park in 1893 will be the Illinois Central Railroad and the cable lines of the Chicago City Railway Co. The Illinois Central will lay two additional tracks on their right of way along the lake shore exclusively for World's Fair business. The distance to the grounds is about seven miles, and at the present time it takes the Suburban trains of the Illinois Central over thirty minutes to make the distance, but thirteen stops are made. When the World's Fair expresses are operated not over half this time will be consumed in reaching Sixty-third Street.

The South Side cable lines will be extended to the grounds. It will be necessary to pass the Illinois Central tracks, and as the trains will be passing continuously a grade crossing is out of the question. It is probable that the crossing will be made above grade.

While these lines will be the principal means for reaching the grounds, enormous crowds will come over the Baltimore & Ohio right of way. Several railroads will use these tracks. Steamers will prove a formidable competitor of the railway lines in pleasant weather. In all probability a large fleet will make Chicago headquarters during the Fair season. The authorities of the Exposition are thoroughly confident that the throngs which desire to go to the grounds can be comfortably accommodated. The Department of Promotion and Publicity made the following statement in a recent bulletin:

"Transportation to and from the Exposition, both for visitors and exhibits, will be as perfect as it is possible to make it, both in the matter of facilities and rates. Greatly reduced rates on all railroads and some of the steamship lines will prevail. Definite arrangements are yet to be perfected. Much attention is being given to the question of furnishing abundant facilities for reaching the grounds from all parts of Chicago, and it can be asserted that existing means, already extensive, will be increased so that a maximum of 400,000 a day can be carried to and from the grounds."

Overhead Wires in England.

A memorial relating to the overhead wire question, addressed to the president of the English Board of Trade, has just emanated from the London Chamber of Commerce. All electrical engineers have been requested to sign the petition. In brief, the petitioners ask that no hard and fast rule be adopted by the government. It is surprising in the present state of the art that it is found necessary to inform the government on matters which, in this country, are so thoroughly understood. For example, the petition sets forth the well recognized difference between great cities and towns, as far as overhead conductors are concerned, in these terms:

"We are aware that in the case of the metropolis and of large towns your department has already decided that overhead conductors can only be permitted as a temporary arrangement, and that all permanent conductors must be laid underground. Whilst we are of opinion that that decision may even yet have to be reconsidered in the light of subsequent experience, we are anxious to make it perfectly clear that in this communication we have no wish to question the correctness of that decision, but we desire to emphasize the fact that a marked distinction exists between undertakings which are to be carried out in the metropolis, in large cities or towns, and undertakings in small provincial towns or rural districts; and we beg leave to submit, that however cogent may be the reasons which have led your department to decide against overhead conductors in large towns, such reasons do not apply with the same force in small towns or in rural districts. The objections to overhead conductors based upon the inconvenience to traffic and the danger to life, are in the country far less serious, if not altogether absent, whilst on the other hand the advantages which such conductors afford are greater."

Coming to the question of electric traction the petition states:

"Another and almost equally important question arises out of the use of electricity for motive purposes. We are of opinion, that for the purposes of electric traction in rural districts, overhead conductors will be found to be the only mode on which long lines can be made commercially successful and that a fixed rule which forbade their use throughout the United Kingdom would seriously retard the development of electrical motive power."

Overhead electric railway systems have made such marvelous progress in the United States; they have operated so successfully; they have given the public such great satisfaction; they have solved the rapid transit problem in so many different places, that one reads with amazement that it is necessary for the English engineers to petition the government to refrain from action which will unquestionably prevent the adoption of electricity as a motive power. The petition illustrates in a very striking way the difference between the English and American methods of dealing with electrical matters.

The Lang lay rope, manufactured by George Cradock & Co., of Wakefield, Eng., recently imported and put in service on one of the lines of the North Chicago Street Railway Co., was accidentally cut after five weeks service, and being badly kinked for three or four hundred feet, was rendered too short for the line, and was consequently removed. We are informed by one of the officials of the line that, from indications, the rope was of excellent quality and that had it not been for the accident it would have had a long life. It will be again put in service on one of the shorter lines.

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We heartily invite correspondence upon all subjects of interest to street railway men. Information regarding changes of officers, new equipment, extensions, etc., will be greatly appreciated for our official directory and news columns. We especially invite the co-operation of all interested to furnish us particulars that the directory may be correct and of the greatest possible value.

Address all communications to
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The Relative Advantages of cable and electric motive power for street railways will be found to be quite fully presented elsewhere in this paper both by our correspondent, Civil Engineer, and an article with the above heading. That there is an honest difference of opinion among engineers, who have formed their judgment in regard to the matter wholly from printed statements, cannot be denied. We think, however, that if the subject is studied along the lines that we have indicated, there will soon be greater harmony of opinion. All the conditions must be known before an absolute verdict can be rendered. Some who have heretofore been studying the subject claim that the fictions are so much like the facts and the facts so much like the fictions, that, with respect to many most interesting particulars, their belief is neither given nor withheld, but remains in an uneasy and interminable state of abeyance. They know that there is truth; but they cannot exactly decide where it lies. Happily, now, the distinctions between fact and fiction are becoming marked and those who desire to know can easily inform themselves.

Wall Street Combinations or disagreements influence the value of steam railway securities in a way which has no counterpart in street railway affairs. The result of the deliberations of a few representatives of different trunk lines in New York City can affect the value of extensive railroad properties situated widely distant. The business of the street railway, on the other hand, being local, and confined to the city or the portion of the city in which it operates, is largely independent of pools and combinations, and is not so liable to be disturbed by freeze-outs, rate cutting, scalping and other causes which often reduce the profits of a railway company. Even the danger of having profits reduced by the construction of a parallel line is much less in the case of a street railway than a steam railway, if the franchise of the former is at all comprehensive and it is in the first place built on the most desirable thoroughfares for street railway purposes. To the investor, these points of difference have an important bearing. The property farthest removed from unforeseen attacks and influences impossible to predicate is the one most desirable for investment, and for this reason alone, if for no other, street railway securities should attract the attention of those having money to invest.

Centralization seems to be the goal toward which transportation companies are tending. Already nearly one-half of the entire steam mileage of the country is owned by forty corporations, while in many of our large cities we meet with instances of the genius of a few men consolidating a number of struggling street railway companies into one, bringing order out of chaos, reducing operating expenses, and at the same time increasing traffic. From this a transfer of the field of operations by a syndicate from one city to several is a logically economical step. To the socialist the advantages attending centralization, as outlined, give unmistakable proof that a unification of all business enterprises, or certainly of all possessing a public or semi-public character, as the street railways in the hands of the government, is desirable. But experience in our large cities, where much of the public work is carried on under municipal direction, has shown that the same results can not be obtained as under private enterprise, and that political services are more often made the cause of advances to places of trust than merit. The railway systems of Europe, which are under governmental direction, are notably inferior in appointments and service to those in England and America which are conducted by private individuals. The management of street railways by city governments, for which many of the *soi disant* reformers of the present day are calling, could not fail to bring equal lethargy to the service by opening the offices to political favorites and making the economy and convenience of the system a secondary consideration. While consolidation and the placing of many lines under one head very often is attended with beneficial results, the transfer of the control to municipal authorities in any city of the street railway system, with its wide opportunities for political patronage, would seem to be a step in the wrong direction.

The Tall Buildings which have been erected in Chicago during the last two or three years have had more than one effect upon the street car traffic of the city. It has been repeatedly pointed out that the inevitable result of building such high structures is to cause the congestion by which the railways are fairly overwhelmed at certain hours. There are several of these buildings in Chicago from which an army of several thousand occupants leave at about six o'clock, all bound in practically the same direction. They form a crowding, impatient throng, and each one is determined to board the first car that comes along. Such a crowd would not respect for an instant any regulation providing that only a certain number, sufficient to fill the seats, should be allowed to enter the car. Foreigners mindful of their comfort, and esteeming it of greater importance than a few moments time, are willing to wait for cars. Call it what you please, there is something in American nature which makes it impossible to brook delay in catching street cars.

It was a characteristic American who once said that he felt the loss of his leg acutely only when he found it impossible to run for a car. To relieve the congestion, Mr. Yerkes, of Chicago, has recently suggested that the Chicago River be wiped out of existence. In this event, a chance for the expansion of the business district would be made possible, and the multiplication of tall buildings would be less probable. This project we think will not be seriously entertained for years at least. The river is considered of too great importance in navigation for such an iconoclastic proposition to meet with favor, although, as Mr. Yerkes says, the docks should even now be located on the lake shore. Could the filthy, disease-breeding river with its foul odors, rivaling the famed "several and distinct" stenches of Cologne, be done away with, Chicago would be a much more desirable place of residence, viewing the matter both from an æsthetic and sanitary point of view. The tall buildings have had an effect on street car travel in another way. The construction demands enormous quantities of steel for the framework. When this material is delivered from the wagons a blockade of street cars is almost invariably caused. If the work is done in the day time there seems to be no remedy, but,without a doubt, delivery should be made at night if the great inconvenience to the public is to be averted. The street cars seem to have less right to thoroughfares in Chicago than in almost any city in the country. The freedom with which teamsters block the public conveyances is refreshing in its impudence. There is one point in Chicago at which blockades are caused with almost ridiculous frequency. This point is at the Post Office, where wagons delivering coal keep the Adams Street cars stringing out for blocks at times. The remedy for such troubles as this ought to be provided by the police power. They are minor troubles, but if overcome the betterment of the street car service would naturally follow.

The Street Railway Exhibit at the World's Columbian Exposition will prove extremely interesting and instructive. It is hoped that the demonstrations of systems which will be made on the grounds will settle many of the problems now under consideration. There are those who are sufficiently enthusiastic to predict that the question of the best means of operating street cars in cities will be definitely determined. There are manufacturers, who doubtless think the problem is even now settled, but the street car man is still open to conviction. The activity among inventors working in the street railway field is astonishing. New systems are springing up daily. Some of them involve new motive agents; others embody new modes of application. If an illustration were necessary a reference to the various plans for operating electric railways by underground conductors would serve the purpose. The number of these schemes proposed within the last year is sufficiently great to appal anyone who desires to keep track of them. Inventions designed to improve street railway service, without doubt, fall in the same classes as do those relating to any other field of industry; a few are good, more are indifferent and the great majority hopelessly bad. Every street railway man would be interested in the first class if he could only determine what belonged to it without a vast amount of discouraging and profitless work. If the sifting process were assumed by a thoroughly competent body of men he would be greatly interested in their findings. Something along this line it has been proposed to do at the World's Fair. It has been suggested that an experimental road on which would be operated motors of every kind would prove not only an interesting exhibit but extremely valuable as well. A jury, of course, would be appointed to watch the tests, of the several systems, to determine their practicability, their economy and efficiency in practical operation. They would report on the merits of the various projects, and recommend awards. The tests could be made at certain times so that all those interested could judge for themselves of the several demonstrations. The expense of such an exhibition would not fall heavily on any single company. The Exposition company could afford to provide the ground, and furnish electricity for such exhibitors as needed that power. Several companies at the present time stand willing, we believe, to build a mile of road, each mile embodying a particular style of construction. Those who desired to make exhibits could send to the grounds cars equipped for regular service. No one questions the value of such an installation. It would prove of very striking interest to the street railway man, and even to the ordinary visitor, for citizens have been waking up to the importance of the intramural transportation question within the last few years. There is a question whether the authorities would approve of such a project as has been here outlined. In the first place such an installation would require considerable space, and such grants are not looked upon with great favor. The authorities, too, might feel that such a plant would not add to the "beauty and symmetry" of the Exposition grounds. The æsthetic side appeals very keenly to the construction department. Should not the practical side be considered also?

The Censure and Abuse which of late have been heaped upon the managers of the transit lines of nearly all the large cities of this country, and in some cases against the managers of foreign lines because of lack in facilities, is in the majority of cases unwarranted. The critics seem to forget that the real cause for the present overcrowding in most cases is the splendid service the roads have already rendered. Take Chicago, for instance; its street railway lines, more than any other factor, have contributed to its phenomenal increase in population and given enormous values to its suburban property. Should not the companies, then, in all fairness, be given credit for what they have already done and be allowed the largest liberty in providing new facilities for taking care of the surplus that now makes traveling disagreeable and slow? Their experience and position will enable them to understand the situation and its needs better than others, and knowing all the conditions they are better able to provide means for meeting them. These same companies showed marvelous enterprise in instituting the present plants, and there is no reason to doubt their willingness to expend as lavishly in efforts to meet the great demands now and yet to be made upon them. Hence, the public seems to be following a policy like that of the man who killed the goose that laid the golden egg. No one could have predicted the present condition of transit affairs in our large cities, because the business has grown faster than was anticipated, and for a little engineers seem to be baffled. But the trouble is not wholly with engineers nor with capital, but chiefly with local authorities, who, moved by the public, which in turn is actuated by the suspicion that is abroad that corporations are working more for their own

interest than that of the public, withold consents, or when granted burden them with conditions which practically render proposed schemes inoperative. Perplexing as the problem is, we have no fear that human genius will be baffled either in soon discovering some means for correcting popular prejudice or for providing safe, rapid and comfortable means of transit from crowded centres for numbers far in excess of those now clamoring for rapid transit. To us it seems that elevated lines will in most cases meet the requirements. We do not mean that trunk lines should be built in all cases, but in the case of Chicago, a belt elevated line bordering the congested district would seem to be the most practical. On this line cars propelled by steam or electricity could be employed; or, better, the step platform system could be adopted. From this elevated structure the surface lines should radiate and not come within the bounded district, but deliver or receive their passengers at the point of contact. The stations on the belt line should be located at frequent intervals in order that passengers can readily reach their places of business. To make this scheme practicable all sailing craft should be prohibited from entering the river, thus enabling the elevated structures to cross the stream at a reasonable height. The same plan would doubtless suit the conditions of Boston. New York has but to enlarge her present elevated structures sufficiently to provide for four tracks, and perhaps build a double decked structure along the river fronts, when her traffic for a long time to come will be fully accommodated. So many of the Philadelphia lines cross each other at right angles, that the city has no congested district, and that surface lines when equipped with electricity or cable can satisfactorily handle all the traffic. While the problem, from a mechanical standpoint, seems simple enough, the political features and the jealousy of rival lines will doubtless prevent its consummation for many years. The failure, however cannot be charged to the want of engineering skill or the willingness of the present companies to undertake the task.

Compensation for the Use of Streets by rapid transit companies is a question which just now is agitating the people of our older cities as never before. As we survey the whole field a remarkable contrast is presented. In the Eastern cities and some of the larger Western cities, especially where new concessions are being asked, for the purpose of introducing improved methods of traction, a demand is made, based on the popular belief that the business is an exceptionally profitable one, that the operating companies be required to pay into the local treasury a large percentage of their gross receipts, while in some of the growing cities of the great West large subsidies are offered, both by local authorities and property holders, to such corporations as will build street railways or extend existing lines. Perhaps, the same cities, when they shall become large and prosperous through the direct agency of these same roads, will bemoan their generosity and seek to alter or amend the franchises granted in the days of their youth and need. All this shows the necessity of some universal method of granting concessions, one that will fit all the changing conditions of city growth. Another anomaly presents itself as we study the situation. In those localities where compensation is demanded we see the so-called "labor element" joining with the property holders in making the demand. What benefit, we ask, do the former expect to receive from the amounts, be they more less, which may be paid by the corporation into the city treasury? The property holders, of course, expect to be benefited, in the direction of decreased taxation, but the action of the other class in the matter can only be explained because of the distrust and hatred of corporations with which their minds have heretofore been filled, so that now they think they will be able to extort some rights and benefits which they imagine have heretofore been withheld from them. In nearly every instance where the battle is on between city authorities and street railways corporations, we think both parties are making grave mistakes; the former for supposing they have the right to make the demands, and for using unfair means to make the public believe that their rights are being ignored by the corporations, while the corporations by making a compromise for the sake of harmony are crippling their means for giving an efficient service. The streets of a city and highways as is generally understoood, and in the laws of some states stated explicitly, are free, belonging to the rich and poor alike for the use of vehicles and pedestrians only, and no one man or number of men can use or control them for any other purpose than the free use of the whole public alike. How then can municipal authorities rent or sell the franchise and use the proceeds to pay a part of the taxes of the rich? A better plan would seem to be to provide that corporations be permitted to operate their rapid transit lines under the direction and control of commissioners elected by the people, who should allow the operating company to earn a fair and just percentage on the capital invested, and when the earnings of the road exceeded the percentage allowed, after keeping in good repair a portion of the streets on which they operated, the public should have the benefit by a reduction in fare. By this means the great laboring classes and the poor would be greatly benefited, but by collecting a large annual rent from street railway companies and applying it to meet city expenses, the money goes directly and only to the benefit of the property owner by reducing his taxes.

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There seems to be a disposition in some localities on the part of street railway companies, which have secured exceptional privileges, to oppose any agitation of this subject, for the reason that in the present divided state of public opinion, there is little hope of adjusting matters in a manner that will benefit them or insure their remaining undisturbed in their chartered rights, but it is bound to come, and those who are now most secure will be hurt the most. There are those who advocate municipal control of transit facilities as a solution of the difficulty, but this, we believe, is opposed to the spirit of our institutions, and where tried it has not succeeded to the satisfaction even of those who advocated it. The STREET RAILWAY JOURNAL will be glad to receive and publish any suggestions that may aid in solving the difficulty.

Electricity and the Trolley System have won another signal victory in the events that have recently transpired in the city of Brooklyn, N. Y. This matter is one of great moment, not only to street railway men but also to all persons interested in the question of improved transit. The importance of the location, the vigor and stubbornness of the remonstrants and the weight and value of the testimony produced by the petitioners, conspired to make this one of the most striking victories that has been won by street railway men anywhere in their

efforts to give the public an improved service in the face of popular prejudice. Among the complications which delayed the final result, was the fact that after the ordinance, granting the trolley rights, had passed the Board of Aldermen and come before the then mayor, for consideration, his term of office expired before he acted upon it. It is not difficult to see that a hotly contested question of this sort was an awkward legacy for his successor, and that, therefore, that gentleman found himself between the horns of an unpleasant dilemma. On the one hand the legal term (ten days) for considering the matter was so short that he did not have time to study the merits of the ordinance; on the other, he was besieged by the hue and cry of the remonstrants. He did what a good many conservative men would have done under the circumstances, he vetoed the measure. If he had rested his action entirely upon the fact that he did not have time to fully examine the matter, he would have taken a pretty strong and prudent position, but, curiously enough, he felt called upon to give other reasons for his veto, two of which show how little knowledge the ordinary man has on the trolley system. One of these reasons was the fact that he could not learn that the system had been in successful operation in any city of the size of Brooklyn, and the inference from this is that he concluded that the size of the city had something to do with the success of the system. All persons who know anything about the subject, will read this with a smile. Size, as size, has nothing to do with the case; it is as practicable to operate the trolley in a city of a million people as it is in a city of a thousand people. *Configuration* does have something to do with it. Narrow, tortuous and crowded streets, heavy grades complicated with sharp curves, might become factors for serious consideration, but granting all these, the success of the trolley in the intricate streets of Boston, where these various features combine, had proved its fitness even under such trying circumstances.

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Another reason given by the Mayor was the risk of injury to citizens following the introduction of the system. This is only interesting as showing how persistently a false idea may linger, long after it has been disapproved. The trolley wires for years have been suspended over the heads of millions of people; the trolley cars for years have carried in safety and comfort, billions of passengers. and during all that time not a single human being has been seriously injured by the current on trolley street car circuits. In spite of all this, which was clearly proved to the Brooklyn people, the danger spook was paraded to an amusing extent. The hearings were haunted by the ghosts of victims who had never been slain and echoed with accounts of casualties that had never happened, and in the end we find an intelligent gentleman and conscientious official gravely assigning this delusion as one of the reasons for his veto. Absurd as this may seem to those who know the facts, it is, perhaps, not surprising that the general public and even some of its prominent representatives should take this position. On the face of it, it naturally appears to those who have not studied the question and learned the difference between high and low pressure circuits, that if a current of electricity were strong enough to pull a car, it would be strong enough to kill a man. But it is surprising that the great press of New York City, that has every facility on earth for learning all that there is to be learned on any subject should have tumbled head and shoulders into the same error. During the progress of the Brooklyn matter the press of New York frantically shrieked and screamed in utterances of dense ignorance and misconception on the whole danger question. Ordinarily, New York papers treat public themes with great dignity and fairness, but when it comes to the trolley they lose their heads and become hysterical.

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After the veto of the first ordinance a second measure of similar character was introduced and carried by a vote of fifteen to four. The Mayor now having time for more mature consideration, treated the subject with great fairness and instituted inquiries among many of the cities where the trolley had been in operation. Some of the replies to his questions are given in another column, but his final conclusions as quoted by the *Brooklyn Eagle* of January 23, are worth careful reading.

"I do not consider it my duty to take any further action in the matter. I have once vetoed the resolutions, and they have been practically passed over the veto with only two dissenting votes, I think. Since they came before me the second time I have used all the means at my command to ascertain the workings of the system in other cities, and to learn the wishes of our own citizens. Such information as I have gained has thrown no new light of importance on the subject, and no new reason for action has appeared, so far as I am able to see. The fact that the question really rests with the State Commissioners is an important factor in the consideration of the subject. Another veto of the resolutions might easily be regarded as simply a needless obstruction to what is inevitable. Therefore, I have come to the conclusion that there is nothing left for me to do beyond what I have already done in the premises."

We recommend the force of the word "inevitable," as used by him, to the attention of any other Mayor who may be placed in a similar position.

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One fact of the utmost importance during this whole controversy was clearly shown, namely, that the opposition to the trolley system did not come to any extent from the persons who patronize the cars and to whom they are a great and growing necessity of daily life, but from over sensitive asthetics or unduly anxious property owners. The great popular vote of the masses is for the trolley; the opposition comes chiefly from the un-American class and caste faction.

*** *** ***

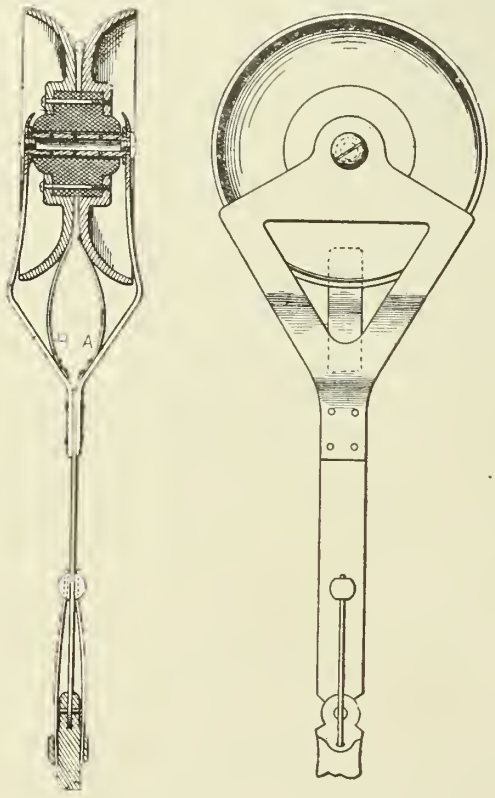
In conclusion we congratulate the aldermen of Brooklyn upon their foresight for the public good in passing this measure in the face of so much unreasoning prejudice. We congratulate the Mayor upon his wisdom in finally withdrawing from any further trifling with the hands of a clock that were sure to turn ahead. We congratulate General Slocum, Mr. Lewis, Colonel Partridge and Messrs. Richardson, father and son, upon the courage, tenacity and intelligence with which they have conducted this matter to a successful issue; and finally, and above all, we congratulate the people of Brooklyn upon the the prospect of soon enjoying the benefits of an improved system of rapid transit.

Cable Cars for Broadway.

Just as the STREET RAILWAY JOURNAL is going to press, the information has been received that Mr. D. W. Pugh, of the John Stephenson Co. has secured an order for 100 cars to be used on Broadway. The cars will be exceedingly handsome in design, and will embody the latest improvements. The road is one of such magnitude that the operation of these cars, forming part of the new equipment, will be watched with great interest by railway men.

A New Trolley.

At the present time considerable attention is being paid to the improvements in the details of electric car equipments, and of late many new trolleys have been introduced. The device shown in the cuts was designed to provide a better electrical contact from the wire to the motor. To the top of the trolley arm is a steel extension which is attached to the latter by a hinge or knuckle joint. The extension is a flat steel bar which has considerable flexibility in a lateral direction, but is rigid under a



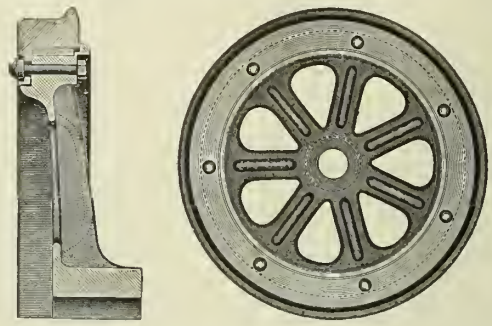
forward or backward pressure. On either side of the bar are bearing springs, which engage in guides, as shown in the illustration, and which hold the extension in position.

The contact springs *A* and *B*, take the current from the trolley wheel, a method which the inventor considers superior to the ordinary means, inasmuch as the heating of the shaft of the latter is prevented. It will be noticed that the two disks constituting the trolley wheel are so joined that they form a flare, the lower portion of which is narrower than the wire. This causes a "scouring" effect, which the patentee thinks advantageous. The construction of the contact wheel makes it light, and the lignum vitæ hub revolving on a fixed shaft reduces the friction, it is claimed, very materially. The trolley is the invention of John Kuehnle, of Detroit.

A Cushioned Car Wheel.

The accompanying illustration shows a half section and plan of a cushioned car wheel which has been used with very successful results in both steam and street railway practice. The centre is made either of cast iron or steel, preferably the latter, and in either plate or spoke form. When once on the axle it is not intended that it should be removed for ordinary repairs, all that is necessary being to remove the tire from the centre. The former has a flange on its outer face through which it is bolted to the centre, the latter having also a flange projecting so as to engage the inner face of the tire. To attain the cushioned effect a rubber strip of three-eighths inch thickness is placed between the tire and centre. In order to press the tire on over this cushion without injury to the rubber, the latter is covered with a shield in the shape of a steel band one thirty-second of an inch thick. The tire is so securely bolted to the centre that there is very little danger should the tire be broken since the various parts would be retained in place.

The claims made in support of this cushioning device are that its use makes the wheel practically noiseless, absorbing the vibration caused by uneven tracks, thus relieving the rails from pounding; also, that the cushion greatly reduces the vibration of the wheel centre and axle, therefore, by preventing all tendency of crystallization, is practically indestructible.



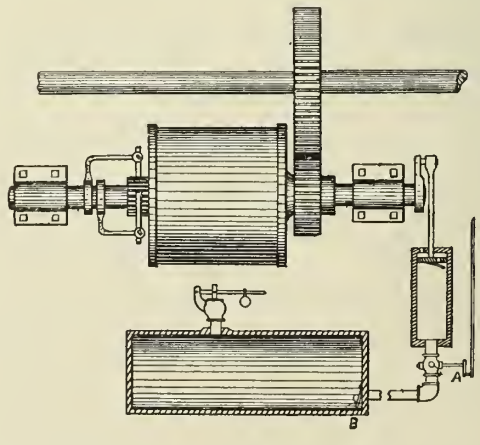
Some remarkable records have been made in the use of this wheel. On the Indianapolis, Decatur Western Railroad one wheel made over 45,000 miles, during which time the thickness of the tire was reduced only one-thirty-second of an inch. Two others made over 72,000 miles each, one wheel having a tire was worn three thirty-seconds of an inch, and in the other the tire was worn a little over one-sixteenth. Practice has shown that the average wear is about one thirty-second of an inch for every 25,000 miles run. Among the electric roads using this wheel is the Calumet Electric Street Railway Co., of Chicago, Ill., who speak of it in the highest terms.

The wheel is manufactured by the Cushion Car Wheel Co. of Indianapolis.

Continuous Running Electric Railway Motor.

It is well known that the efficiency of an electric motor depends upon the ratio between the counter electro-motive force developed and the initial electro-motive force, and a number of plans have been devised by which the motor on a car can be kept in continuous operation whether the car be in motion or not. One of the devices recently proposed for accomplishing this purpose is shown in the accompanying engraving.

The motor armature is connected directly with the car axle, and the field magnets are so sleeved on the armature shaft that both magnets and armature are free to revolve in opposite directions, and, as an approximately constant speed is maintained between the armature and fields when in operation, as the rotations of one increase

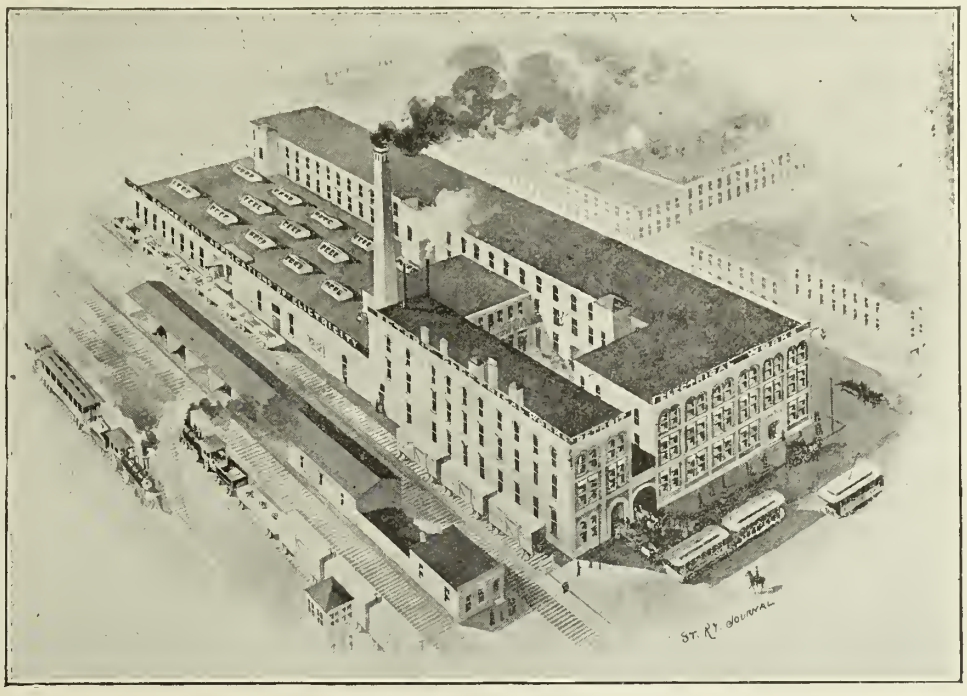


those of the other decrease. The connections are so arranged that the rotation of the field magnets will operate the air pump or compressor shown in the cut, the latter having a valve at A which is under the control of the motorman. This compressor is connected with an air reservoir under the car, which is provided with a safety valve, so that the air pressure cannot increase beyond a certain amount.

The operation of the motor is then as follows: Assuming that the car and motor are at rest with the air reser-

voir empty upon admission of the current, that part of the motor without any load—in the present instance the field magnets and shaft—immediately commence to rotate, and soon assume their maximum rate of speed, the valve A being open. Under these conditions no resistance is offered to the plunger of the compressor, no air passing into the reservoir, and the motor takes only enough current to overcome the friction of the apparatus. To start the car the valve A is turned on so as to make connection between the compressor and the reservoir, either partially or entirely depending upon whether a sudden or gradual start is desired. As resistance to the rotation of the field magnets is created by the pressure in the reservoir, the movement of the armature shaft is commenced and increases correspondingly to the retardation of the field shaft. To check the car the vent valve is opened, the check valve at B at once closing to prevent the reduction of pressure in the reservoir, and the field magnets are left free to rapidly increase their rotation, while the armature shaft is correspondingly reduced in speed.

The mechanism described is devised for the use of air, but fluids, such as glycerine or oil, may be employed to create resistance with equally good results, the only essential being that such fluid as escapes by way of the vent valve should be returned to the system or fresh liquid be supplied. The device is the invention of John H. Palmer, of Boston.



NEW FACTORY OF THE DETROIT ELECTRICAL WORKS.

The Detroit Electrical Works New Factory.

The railway business of the Detroit Electrical Works has become so extensive that the company have decided to build a new factory as an addition to their present plant on Woodward Avenue. The main extension will be constructed in the rear of the present building, and will be three stories in height. This addition will fill up the block in which the present structure is situated. That portion of the present plant which is one story high will be built up to three stories. The new machinery will be of the latest type. It will be divided into three sections, power for each of which will be furnished by an electric motor. Current will be generated by a 500 volt machine, located in the engine room. The changes here outlined will enable the company to treble their capacity for manufacturing street railway apparatus. The factory will be completed and equipped with machinery by May 1.

Car Heating by Steam.

The success attained in heating steam railway cars by steam, and its wide adoption by many of the leading transportation companies, has attracted the attention of many street railway managers, and has called forth a number of devices in which steam as a heating agent is made applicable to the conditions presented in street railway service. In connection with their new cable cars, described on another page, the Third Avenue Railway Co. of New York are making practical test of the desirability of heating cars by steam. One of the systems being tried with a view of adoption that owned by the Gold Car Heating Co. of New York City, and the same, with the exception of a few minor changes, as that adopted upon many prominent steam railways, among which are the Delaware, Lackawanna & Western Railroad, the Manhattan Elevated Railroad of New York and the Suburban Rapid Transit (elevated) of New York.

In the system, being installed on the car of the Third Avenue Railroad Co., two large pipes, five inches in diameter, are carried under the seats of the car and are connected by cross pipes of smaller diameter at each end. Within each large pipe is a hermetically closed cylinder filled to seven-eighths of its capacity with brine. This cylinder is sufficiently smaller and shorter than the pipe to admit of variations in the size of each through expansion and contraction. Gas burners, consuming about ten cubic feet of gas per hour each, are located at the centre of the car, one under each longitudinal pipe. These burners are supplied with gas from reservoirs under the car, which also supply gas for illumination. Some time before leaving the car house the steam couplings of the car pipes are connected with stationary steam boilers, so that the pipe system is charged with steam, the interior cylinders containing brine acting as reservoirs for the heat. While the car is in operation it is found that by lighting the burners under each pipe, sufficient heat is produced to keep the car warm indefinitely. The pipes are bent at the centre so that the condensed steam in running to the lowest point will be directly above the burner.

For street cars which are not lighted by gas and in which, consequently, it might be found inconvenient to carry a reservoir of gas, it is found that sufficient heat is stored from the first charging of boilers to keep the car warm for at least three hours.

As will be seen, this method of heating cars has a number of important advantages; the heaters take up no valuable space in the cars, and require no fuel or attention; the heat is a pleasant hot water heat and is radiated equally the entire length of the car. There is no smoke, dust or unpleasantness, and in wet weather the floor of the car is always dry. The cost of heating a car by this system, if a gas burner is used, is reckoned at twenty-five cents per day. If the cars are charged from central stations, which is the best plan when trips made are not more than three hours, the cost is only about ten cents per day. The manufacturers are also fitting with their system one of the new Pullman double deck cars and will furnish further particulars on request.

THE magnitude of the building operations now going on at Jackson Park can be surmised from the fact that an average of from thirty-five to forty car loads of construction material arrives daily. The Exposition buildings are rising with wonderful rapidity. More than 1,500,000 lbs. of steel and iron will enter into the construction of the Mines and Mining Building.

Correspondence.

Communications on all subjects of interest to street railway managers are solicited. Names of correspondents may be withheld from publication if desired, but must be known to the editors. The correspondent alone is responsible for his statements and opinions, not the editors.

Cable and Electric Motive Power on Street Railroads Compared.

EDITORS STREET RAILWAY JOURNAL:—

The management of the principal street railroads in Brooklyn, has determined to substitute electric for horse power on the several lines; it would be interesting to know what reasoning finally induced the clear and hard headed men who control these properties to come to this decision.

Few street railroads in the country operated by horse power, have to move more cars and up steeper grades, than is done over parts of some of the trunk lines in Brooklyn; surely, no street railroad using electric power, has to haul so many cars up a steep slope, and consequently, at these points, the proposed substitution must be largely experimental. Whether by any electric system yet introduced, the heavy traffic up Fulton, Washington and Adams Streets, on moist or wet days, when the rails are coated with liquid mud or slush, can be handled without vexatious delays, interruptions and stoppage, is quite uncertain.

"Rainbow hunting" is not confined to the political world. Judging from the public utterances of the promoters of some of the electric systems, the hope of better things to come, in unquestioning faith, is taken as materialized and in hand. Electric motors have been from time to time offered for sale as being perfect in every detail and then in a brief period, presumably from an unfavorable experience gained in that interval from their operation, they are replaced by other and improved designs, also perfect. That these frequent changes are not made in a "missionary spirit," is evident from the fact that such often involve a large expenditure of money and effort.

The wag, who offered to the throng passing over London Bridge, golden sovereigns for silver crowns and sold not one, because the people would not believe what he quietly proclaimed, won his wager; had he advertised sufficiently, the British mint could not have satisfied the demand he created; contrarywise, by skillful, persistent and nervy iteration, the venture of a crown piece, may and often does bring back the sovereign in return.

Upon what grounds in this instance is electric power chosen instead of cable? The promoters of the former will say because it is better and cheaper. That an electric system, when intelligently applied and faithfully operated, on many street railroads may and often does, serve the passengers excellently well, is conceded. The managers generally, quickened perhaps in some way by the subtile agent which rotates their wheels, exhibit an alacrity and purpose in meeting popular demands, which with profit, in a degree at least, might be copied by the "horse men" who with more or less unwisdom operate many of the older or competing lines. On most electric railroads the best cars are run, and at such short intervals that each passenger may be seated. All this and more, however, is possible on a cable road, and therefore cannot be claimed as incidental to the motive power employed.

Also it is urged, that when the cable stops so do all the cars hauled by it come to a stand; but when from any cause the electric current is not applied, all the cars on that circuit are unable to move. The electric system may be worked in sections; true, but so may the cable if the power houses are well located, and if the cable is duplicated, in case one fails the other is at hand and ready for use.

Again it is asserted, that when delays occur, lost time may be made up by running at higher than the usual speed; quite true, but if the maximum speed is limited, as it should be on city streets, and the cable is run at that speed, what advantage in this respect has one system over the other?

Hence, so far as relates to the public service, it is doubtful whether for either system superiority can justly be claimed.

The promoters further say that electric power is cheaper than cable power, surely in first cost and *perhaps* in operation. Is this entirely correct? Given two railroads, each of the same length and grades, running the same number of cars and carrying the same large number of passengers, one operated by electricity and the other by cable, continuously for a term long enough to establish what for each is the cost of operation and repairs, and also what sums shall be set apart from the earnings for renewals when the tracks, equipments and plants are worn out; the question is, which if so managed, will pay the larger regular dividends on the permanent investments. That an electric railroad, with overhead conducting wires, *may* be built at a less cost than a cable railroad is acknowledged; but if the two are to perform each as large a service as required on most of the Brooklyn lines, and are alike faithfully constructed and equipped, the electric may nearly or quite equal the cable in first cost.

Thus, the track system for the first must be as heavy and strong as for a well constructed steam railway; while for the second, that of an ordinary horse railroad will serve. The cars of the first must be heavy enough to ensure sufficient track adhesion, to enable the motors to haul the cars; while for the second, they may be the lightest that will carry the passengers. The electric motor, one to each car, will cost as much to make as several cable grips and there will be a like dispartiy in their maintenance and repairs. The first cost of the electric plant will be somewhat greater than that of the cable plant; the cost of operation, to supply the power, for each to transport an equal number of passengers will be far greater for the electric plant, which has to move much the larger dead weight of cars per passenger, than for the cable plant; and this, exclusive of consideration of the losses from imperfect conductivity and insulation as well as the undue resistances of application, peculiar to electric power. It is understood that with electric power, these losses and resistances increase *more* rapidly, while with cable power, the resistances increase *much less* rapidly than the quantity of useful work done.

So far in this comparison, the excess of cost is against electric power. For the remaining item, the wiring system, including the supports and connections from the plant to the cars on the tracks, will generally cost less at first than the cables, their pulleys and the conduits which contain them; the best overhead electric practice, however, is to increase the efficiency of this system, by stringing wires of larger diameters, using better insulating material and setting more durable supports, all at an additional first cost. If the conducting wires were put in conduits as they should be, the difference in this item between the two motive powers, would be much diminished and possibly might disappear.

The comparison thus made shows that, except in one item, the electric is not superior to the cable power for large traffic, on street railroads; and that in this item, if the two railroads compared are alike in their important features, the first may cost nearly as much as the latter. For fair comparison, however, the conditions governing the railroads compared, should be similar in quality of construction and ease of operation; this generally is not observed when the two systems are contrasted; cheap work and restricted investment should not be compared with expensive construction and liberal expenditure, particularly when the one may entail larger and more frequent outgoes for repairs and renewals than the other.

Parenthetically, it may be said, the design and construction of cable railroads, often is put in charge of managers unfamiliar with this special department of engineering; the result being that valuable experience gained in the operation of such railroads is ignored and new and untried devices are sometimes embodied in the plans, in place of others which have been fully tested and found most suitable for their purpose. Again, the capitalist, to lessen first cost, may and often does prescribe conditions

which entail continued and burdensome expense in operation.

The writer for years has been familiar with the design and management of cable railroads; he has watched with questioning interest the application and development of electric power and he would gladly, if it were possible, exhibit in parallel columns, the items of cost of construction, operation, repairs and renewals of two railroads as instanced, one using electric and the other cable power, so that the separate totals would prove or disprove the correctness of the position herein taken. For cable power this might readily be done, but for electric power, after diligent enquiry and investigation for considerable time, the best that may be stated is to quote what was written by one in a position to know, in reference to a leading electric railroad: "So far the operating cost, as summed up, is not greater than with horses, and several items are yet to be entered in the account." Since this was said, it is understood that radical changes in the plant and equipment of the railroad, involving large expenditures have been determined on.

It is left to the candid observer to explain, if he can, what is the cause of the singular reticence of those promoting or managing electric railroads regarding the several items of cost; sooner or later, dividends if paid, will be from net earnings and then these items must be published and the result will lead innocent shareholders to award praise or condemnation as may be justly due.

But little reference has been made to the interest of the public at large in the choice of a motive power on railroads, in streets so narrow and crowded at times, as some of those are, which will be occupied in Brooklyn. It is stated that in 1890 more persons were killed and injured on the streets of London than on all the steam railways in the United States. The strongest reasons are required to justify any increase in the danger which now menace life and limb on thronged city streets. Municipal authorities, charged with much that affects the well being of citizens, should consider well how far, to secure an uncertain and imperfect improvement in street transit, they may wisely add other and grave risks to persons and property, by an additional circulation on the public thoroughfares of an agent, which without warning may maim or kill the unsuspecting wayfarer or consume valuable structures.

As a requirement, contingent upon granting the privleges asked for by the management of Brooklyn street railroads of the municipal government, it would have been a just and wise measure to have, at least, stipulated that the introduction of electric power on these railroads should be in accordance with specifications prepared by and executed under the supervision of competent and disinterested experts, thoroughly familiar in all its details, with the work to be done and clothed with sufficient authority to enforce all of the conditions imposed to fully protect the public interests. CIVIL ENGINEER.

January 21, 1892.

The Elevated Road Projects in Chicago.

It would be an unusual day that did not bring to light some new railway project in Chicago. The number now under consideration is legion. They are of all kinds, good, bad and indifferent. The birth of most of these schemes is heralded with a flourish of trumpets, but as the great majority of the projects are either chimerical or insufficiently backed, they soon sink out of sight. There have been, for example, a great variety of underground schemes proposed, but at the present time, in spite of the extraordinary agitation of the intramural transportation question, not one of these comprehensive plans is considered. Still, additional facilities are demanded, and the projects formed to meet the demrnds are filling the colu mns of the local press.

At a recent meeting of the City Council an ordinance was presented extending a franchise to the Chicago & South Park Elevated Railway Co. The company want the right to operate from the World's Fair grounds over Sixty-seventh Street. The ordinance was accompanied by a majority petition. The matter was referred.

The company propose to use the Day elevated suspension system described in our last issue, and the motive power will be either electricity or steam. Two miles of road are to be completed by May, 1893. Two downtown routes are spoken of. It is said it may be built on Halsted Street from Lake Street. An L road over the Rock Island tracks is spoken of as a connection of the road.

The West Side Rapid Transit Co. are the successors of the West Chicago Rapid Transit Co., which once had a franchise for Randolph Street and Ogden Avenue. It was declared invalid, however, because it had failed to secure the necessary frontages. The company propose, if granted a franchise, to build a road on the Boynton bicycle system and propose to make the construction as light as is consistent with safety. The road will be operated by electric motors. The managers claim that as soon as a fair franchise can be obtained from the City Council the money will be immediately forthcoming to build and equip the road.

Resolutions of Respect.

At the monthly meeting of the Third Avenue Railroad Employes' Mutual Relief Association of New York, November 27, the following preamble and resolutions were unanimously adopted. The original was handsomely engrossed and was bound in the form of an album covered with seal leather, mounted in silver and presented to Mrs. Lyon.

Whereas, We have learned with deep regret of the death of our honored member, LEWIS LYON, President of the Third Avenue Railroad Co., who departed this life on Thursday, October 29, 1891, therefore be it

Resolved, That in the death of LEWIS LYON, this Association recognizes the loss of a member who had at all times the interest and welfare of this Association at heart, a true and generous friend, a man of sterling integrity and untiring energy, whose genial manner endeared him to every member of this Association. And be it further

Resolved, That we deeply sympathize with his bereaved family in their great loss; and that the resolutions be spread upon the minutes of this Association and a copy suitably engrossed be presented to the family.

J. H. ROBERTSON, President.
JOHN BROLLES, Vice-President.
WILLIAM G. ROCK, Secretary.
JOHN BEAVER, Treasurer.

How They Do It Abroad.

We are in receipt of a handsomely printed programme containing an illuminated address to the general manager of the North Metropolitan Tramways Co., of London, and an invitation to attend an entertainment tendered by the directors to the employes of the company, an account of which we quote as follows from the London *Daily News*:

At the Foresters' Hall, Clerkenwell Road, last night, the directors of the North Metropolitan Tramways Co. gave a smoking concert to a large number of their employes, on the occasion of the presentation by the employes of an illuminated address and testimonial to Mr. R. L. Adamson, general manager of the company. Mr. George Richardson, chairman of the directors, presided. After the principal portion of an excellent programme had been listened to with much pleasure, the chairman called upon Mr. A. Hume, secretary of the presentation committee, to read the illuminated address. The address stated the various benefits in the way of shortened hours of labor and other improved conditions of service which had been conferred upon the men through the efforts of Mr. Adamson, who, the men said, had elevated their position above that of others similarly employed in the metropolis. The address was signed on behalf of subscribers numbering 1,437 employes, and the testimonial took the form of a silver tea and coffee service, weighing 200 ozs.

The Chairman, in making the presentation, said the company had always been ready to meet the just demands of their employes and they had succeeded in doing so to the satisfaction of the shareholders and also of the men. During the late omnibus strike trouble was averted on their lines by the careful and just consideration of the men's wishes and the valuable service of the general manager. The directors had no objection to unions, and gladly gave help to the men's provident fund, an excellent union which existed among the employes. Mr. Adamson suitably responded, and at the conclusion of the concert a vote of thanks was given to the chairman for presiding.

Trolley Literature.

The amount of matter that has appeared in the Brooklyn papers for and against the merits of electric traction would, if collected, constitute a large volume. It has served its purpose well; for by it the mayor has learned that the mass of the people desire this method of traction. The people have learned that wherever it is in operation it is in favor with the public. All have learned that evidence is wanting to sustain the charge that it is dangerous to human life.

Mayor Boody, after vetoing the Aldermanic resolutions in the trolley case, which were afterwards again passed with some modifications, as explained in our editorial columns, in order to inform himself on the system, addressed a note to the mayors of a number of cities, asking for information on the subject. The following are some of the replies, all of which are favorable except the one from Chicago, and this because the authorities of this city have had no means of learning of its practical value, and are yet to be convinced by the same means that has worked a change of attitude with so many others.

The Mayor of Buffalo, N. Y., wrote: "There was considerable prejudice against the system previous to its introduction, but it is wearing away, and I believe it is regarded more favorably every day. There have been a number of accidents, but they are due more to the carelessness or ignorance of employes than to the trolley itself. Has the result of its use been satisfactory thus far? Generally, yes, though there have been some complaints about the irregular running of cars, which might be expected of any new system. The system has been in operation here about six months. The views which I had when the substitution of the trolley for horse power was proposed have been materially changed. There is still room for improvement, but I believe, when properly managed, it is an excellent system."

W. H. Miller, mayor of Akron, O., wrote: "There is no opposition here to the trolley (at least not expressed). There is no doubt that if some other system were devised dispensing with the overhead wires it would be safer and allay the apprehension which may exist. No person has been injured. Several horses have been killed and injured, the cause being indirectly the overhead wires. Thus far the trolley system has been very satisfactory. My views are very much in favor of the system. In fact, there is hardly such a thing as a comparison to be made between the old method and the present. The trolley is much superior in service and is proportionately better patronized. This has been my observation here. I do not think there is any probability that the approval of the change herein suggested could result in other than public favor. While there will no doubt improvements follow the present motive power systems, I firmly believe that the electric power has come to stay and will be the great factor to furnish the motive power for street railways. I am not either directly or indirectly interested in electric street cars."

Mayor William G. Rose, of Cleveland, O., wrote: "The public is satisfied that the trolley system is a vast improvement over horse cars, being more rapid, cleanly and affording greater facilities for moving large crowds. Two or three horses have been killed. The result of the system has in the main been satisfactory." He advised that whatever the system, great care should be taken in regulating the speed, proper signals and close watchfulness.

C. S. Clark, Mayor of Erie, Pa., wrote: "Our people are pleased with the working of the trolley. There have been several accidents, but none directly attributable to the trolley—several parties run over. The result of its use has been very satisfactory. It has been in operation for four years."

Mayor H. I. Gourley, of Pittsburgh, Pa., wrote: "It is, up to the present time, more feasible than the underground system for electric traction, and much better than the old horse car mode of traction. In a couple of instances a dead wire falling across the trolley and touching the ground, had been the means of killing two horses. No human beings were killed by the trolley. In icy weather, on steep grades, there is occasional trouble, but attention by way of sweepers in keeping tracks clean obviate this."

Mayor George B. Guild, of Nashville, Tenn., wrote that all kinds of transportation had been used in that city except the cable, and now an electric system was in use, and that it gave general satisfaction. There had been a few accidents as the result of the system; five horses, but no men, had been killed. The system had been in use for four years. "At first," he writes, "we were a little apprehensive, and the proposition was not favored, but I am now satisfied that our people have changed their opinion and are well satisfied."

The Mayor of Columbus, O., wrote that the people of that city were satisfied with the trolley system. He says accidents have occurred, but does not go into any particulars. The result of the operating of the system has been so far satisfactory, although it has been in use but four months. He would not exchange the new system for the old horse cars.

Mayor Washburne of Chicago referred Mayor Boody's circular letter to J. P. Barrett, superintendent of the fire telegraph bureau of that city, and Mr. Barrett, in replying thereto, wrote: "The trolley system is not in use within the old city limits of Chicago. The system is now used in two of the annexed districts of the city, built through a sparsely settled part of the city. I have heard of no particular objections to them there, and have heard of no accidents. The public feeling of Chicago is against overhead construction of any kind, whether it is telegraph, telephone or electric light, and especially against the trolley system. We are now constructing a subway system in the northern part of the city for the purpose of experimenting with electrical conductors underground for the purpose of moving cars. This is not sufficiently advanced to justify an opinion as yet, but I believe it is the coming system."

We append the text of Mayor Boody's veto:

Jan. 2, 1892.

To the Honorable the Common Council:

Gentlemen,—I am constrained to return to your honorable body, without my approval, the resolution attached to the report of the Committee on Railroads, known as Resolution No. 32, A, B, C, D, E, F, G, H, I, referring to the application of the Brooklyn City Railroad Co.; the Atlantic Avenue Railroad Co. (Resolution No. 33); the Coney Island & Brooklyn Railroad Co. (Resolution No. 34); the Brooklyn City & Newtown Railroad Co. (Resolution No. 35), for the consent of the local authorities for a change of motive power from horse power to overhead single trolley system, passed by your honorable body on December 21, 1891.

As two days only have elapsed since I entered upon my official duties, no time has been afforded me to give the resolutions that consideration which their importance demands.

The fact that my predecessor in office, with his large knowledge of the results which would follow their adoption, did not affix his signature to the same, may well increase my appreciation of their importance and my doubt concerning their beneficial effect.

It certainly is our duty to encourage those enterprises which will increase the comfort and convenience of our fellow citizens, and promote the prosperity of our city, but there are features of a grave character connected with the privilege which the said resolutions grant:

First—While it may be shown that the proposed method for propelling street cars is in successful operation in certain cities of the country, it cannot be said that any city of the size of the city of Brooklyn has felt justified in adopting that system.

Second—The resolutions grant important privileges, which impose new conditions on our citizens, but for which the city receives no equivalent.

Third—It is claimed that the proposed system is dangerous to life. While it is true that we are called upon to yield many of our personal conveniences for the public good, no citizen in time of peace can be justly asked to hazard the loss of life or limb. No amount of material benefit can compensate for the loss of one life.

Without further discussing the subject at this time, I am clearly of the opinion that it is my duty to return the resolutions for the further consideration of your honorable body.

Respectfully, DAVID A. BOODY, Mayor.

Legal Intelligence.

HOUSE MOVING—INJUNCTION—JURISDICTION OF COURT—DESTRUCTION OF PROPERTY—INTERRUPTED TRAFFIC. The evidence in the record of this case showed that a church congregation, of Elkhart, Ind., sought to move its edifice, and contracted with the appellant to do the job. The appellee street railway company had an electric line on one of the streets appellant wished to take the building across, and the structure was so high that it would have necessitated the cutting of the overhead wires in taking it across the track. To this the appellee objected and got out an injunction in the Circuit Court to stop the moving or cutting of wires. The contractor and church people claimed that the court had no jurisdiction; that the City Council only had the right to exercise authority over the streets. There was a further claim that the company had forfeited its charter since it had constructed an electric road, the charter giving it no specific right to use electricity as a motive power. The trial court decided in favor of the company, and the contractor by the aid of the church people appealed.

Held, 1. That the act for the incorporation of cities neither takes nor means to take from the courts the authority to decide legal controversies concerning personal or property rights, and vest in common council of cities the power to determine such controversies.

2. That a failure or refusal of the common council of a city to take steps to prevent the injury or destruction of a line of electric railway does not preclude the owner from seeking redress in the courts of the state.

3. That no individual can insist that the corporate existence of a company has terminated, or that he may at pleasure confiscate or destroy its property in order to move a house across its track. Citizens have the right to

the ordinary use of the streets, but they cannot interrupt traffic and discommode the public by tearing down a car line. It would be strange if buildings could be moved along streets without control or restriction. The injunction of the lower court sustained.

Williams et al. v. *Citizens' Street Ry. Co. of Elkhart.* Ind. S. C., Dec. 18, 1891.

Conditions—Pavement—Right to Determine. In an action brought to enforce payment of the cost of repaving a street, with interest thereon, the court *Held:*

1. That a city (Philadelphia) may impose conditions in giving use of streets to railway companies, and that the city has a right to determine when streets should be paved and what kind of pavement should be used.

2. That the city (Philadelphia) has the right to refuse its consent to the construction of a passenger railway upon its streets; it has also the right to prescribe the terms upon which its consent will be given, and it may, therefore, require, as a condition precedent, that the company shall enter into an agreement to be subject to all ordinances in relation to passenger railway companies, then in force or thereafter to be passed.

3. And the defendant company having been formed by the merger of three other corporations, is subject to the duties and obligations which originally devolved upon them. As to so much of its route as belonged to the College Passenger Railway Co., the charter of the latter corporation, contained in the Act of April 15, 1858, which expressly declares that the franchise granted by it shall be subject to the city ordinance of July 7, 1851. imposing upon the defendant company the duty of paving all streets occupied by it, and of repairing or maintaining the pavements thereon.

4. That this requirement applies to the whole roadway between the curbs, and not merely that part of it which lies between the tracks.

5. That when a passenger railway company is under an obligation to pave and repave a street, all questions as to the necessity of doing the work and of the kind of material to employ, are to be determined by the municipal authorities. There is no implied provision that no kind of pavement, except that in use when the obligation was entered into, shall be required.

City of Philadelphia v. *Ridge Ave. Street Ry. Co.* Penna. S. C., Oct. 15, 1891.

Notes on the Short Railway System.

It appears to be a curious and interesting feature of the Short gearless motor that it will operate excellently during snow storms, maintaining the schedule time where other motors fall rapidly behind. The only reasonable explanation of this is found in the fact that the weight of the motor is centered directly over the axle, so that maximum traction is attained. In support of this theory, it is noticed that the wheels of the gearless motor rarely or never slip even under the worst conditions of track. Another reason is probably found in the special controlling device used by the Short company, which prevents a sudden rush of current through the motors, which frequently causes the wheels to slip and prevents them from taking a good grip on the rail. That this latter experience has some weight, is proven by the fact that on several occasions the Short double reduction motors have operated during the past month under conditions of track and weather where other motors of the same type have completely failed.

The two fifteen H. P. short gearless motors which operated a car at the Pittsburgh convention were sent to St. Louis, Mo., immediately after the convention and attached to a thirty foot double truck car, which was placed in regular service on the road. During the time which has elapsed since, there has not been a single trip lost through mechanical or electrical defects in the motive apparatus. The motors run almost cold, showing that there is no waste of energy. The car is the fastest on the line, especially on grade work. The traction is remarkably high, the car is noiseless, and upon all sides come the most flattering reports of the motors. The Lindell Railway Co., of St. Louis, on December 30, made a test of the power consumption of the gearless motor car, the results of which are given below:

At 4:26 P. M., the car started from the barns on its regular trip, which was one of the heaviest of the day. On the outbound trip it carried twenty-five passengers, and on the inward trip ninety passengers. One-quarter minute readings were made of both current and voltage on the car. On the outward trip the gearless motors took an average of $17\frac{49}{100}$ amperes, 459 volts, or $10\frac{76}{100}$ H. P.; and made the half trip in $29\frac{3}{4}$ minutes, or two and three-quarter minutes less than the time usually taken by the other cars. On the inward trip the motors took an average of $28\frac{32}{100}$ amperes, 448 volts or $17\frac{1}{100}$ H. P., and made the half trip in $37\frac{1}{4}$ minutes, or $1\frac{1}{4}$ minutes less than the usual time. The average horse power required for the round trip will thus be seen to have been $14\frac{19}{100}$, which was $1\frac{46}{100}$ less than that taken by a similar car equipped with double reduction motors.

Between November 11 and December 15, Col. Lewis Perrine, president of the Trenton Passenger Railway Co., of Trenton, N. J., laid fourteen miles of track, besides putting up 700 poles, complete with all necessary wire construction. Those who know the energetic colonel will not be at all surprised at this result. He has given personal supervision day and night to even the smallest details of all of his construction, and during part of the time has had as many as 800 men at work. Those who have seen the work as thus far finished, say that Colonel Perrine will have one of the finest street railway properties in the country. The road will be equipped throughout with Short single reduction motors, and the station with the new type of multipolar Short generators. Colonel Perrine expects to have his plant complete and ready to start in operation on or about February 1.

The Short Electric Railway Co. have been fortunate in securing from the Minneapolis Street Railway Co. an order for the entire spring requirements for that road, which, it will be remembered, is one of the largest in the country; 120 motors will be used in all, and the Short gearless has been selected. The motors are to be in operation by April.

The Consolidated Street Railway Co., of Grand Rapids, Mich., have just placed an order with the Short Electric Railway Co. for twenty, forty H. P. gearless equipments, to be used on their lines, which are being changed over to electricity. This contract was made after very careful personal investigation of all the leading systems by the general manager of the company, Mr. J. R. Chapman.

Co-operative Electric Railway Plan For the World's Fair.

In the last number of The Street Railway Journal it was stated that five miles of railway would be built in the World's Fair grounds at Jackson Park. A suggestion was made recently of a plan by which the Exposition company could secure the road without cost. E. E. Higgins, general manager of the Short Electric Railway Co. and Alex. Kempt, Western agent of the Brush Electric Co., called at the Electricity Department and suggested the possibility of the Fair managers inducing the several electric railway companies to enter into a co-operative plan by which each would agree to equip a mile of line as an exhibit, the Exposition company to furnish the current. It was at first stated that such a plan would necessitate a change of cars at each mile, which certainly would be objectionable. It would seem easy enough to avoid such a contingency. Certainly, to provide for the crowds wishing to ride it will be necessary to run cars in trains. The first cars, then, could be changed every mile and the trailers could be through coaches. This suggestion is an interesting one, but there is no probability that it will be adopted. It is stated, on what should be excellent authority, that the Exposition authorities propose to operate the intramural road themselves.

Street Railway News.

Akron, O.—Ira M. Miller has been elected vice-president of the Akron Street Railway Co., vice, J. S. Casement.

Allentown, Pa.—Since the completion of the Allentown & Bethlehem electric railway, it has been found that the railway circuit often throws out of action the electric train signals of the Lehigh Valley Railway Co. In some cases it was found that by reversing the batteries used to operate the railway signals the trouble was removed; in other cases more batteries were required. A singular point stated is with batteries on different instruments not one mile apart one would require zinc to ground, the other copper.

Amsterdam, N. Y.—The Amsterdam Street Railway Co., since January 1, have combined the offices of secretary and treasurer with that of general manager. Mr. H. K. McCay has resigned from the company.

Atlanta, Ga.—The Atlanta, West End & McPherson Barracks Street Railway and the Grant Park Electric Street Railway, two of the leading lines in the city, have been consolidated under the title of the Atlanta Traction Co. The officers of the Consolidated company are: George E. Hoppie, president; J. H. Mountain, vice-president and general manager; H. L. Woodward, secretary; Henry Lanier, treasurer.

THE Grant Park Electric Railway a new line has been recently completed.

THE motormen and conductors on the line of the Consolidated Street Railway Co. want their pay advanced from fifteen cents per hour to twenty. A strike was declared and was lost.

THE Atlanta & Chattahoochee Electric Railway is under contract with the Short Electric Railway Co., of Cleveland, O., and is to be in operation by February 15, by which time, it is expected, fifteen miles of track will be completed. Ten cars—four closed and six open—will be supplied by the J. G. Brill Co., of Philadelphia.

Austin, Tex.—Mr. M. M. Shipe has tendered his resignation as superintendent and manager of the Austin Rapid Transit Co. Mr. J. K. Urie will succeed him.

Baltimore, Md.—A dispute has arisen between the Baltimore City Passenger Railway Co. and the new Baltimore & Curtis Bay Electric Railway Co. Both roads claim the right of way from the end of Light Street to Light Street Bridge via the road which runs along Spring Gardens; and both companies have laid tracks thereon. The tracks of the two roads in many places are not more than six inches apart, and it will be utterly impossible for cars to run on either line if both companies try to operate.

UNDER the superintendency of Frank H. Humbleton, of the Traction company, the Epworth Methodist Episcopal Church is being transferred into a cable power house.

THE Hon. Oden Bowie was, at the annual meeting, re-elected president of the Baltimore City Passenger Railway Co. for a nineteenth term. The directors also re-elected S. L. Bridge, secretary and Joseph W. Clarke, treasurer. George R. Gott, the architect of the proposed power houses for the cable lines, submitted the plans of the same.

THE contract for constructing the electric railway from Light Street Bridge to Curtis' Bay, has been awarded to Rutherford & Seddon.

Barnum, Colo.—The Denver, Lakewood & Golden Railroad have given a bond to complete their electric lines, which will enter Barnum, by April 1. A ten minute service is promised. The cars will enter Denver at Fifteenth and Arapahoe Streets over a third rail placed by the Tramway company.

Beaver Falls, Pa.—H. N. Brooks of Erie, Pa., has been appointed to the general superintendency of the Beaver Valley Traction Co. in place of E. N. Bliss, resigned.

Belleville, Ill.—At the meeting of the City Council, January 4, a letter was read from James Atterbury in which he declined the franchise recently passed by the Aldermen. It was so loaded down with conditions that Mr. Atterbury asserted he could not accept it.

Beverly, Mass.—Beverly Selectmen have named such stringent conditions to the Naumkeag Street Railway Co. that there seems to be no more chance for electric cars in that town than before the Selectmen voted to allow them to run through Rantoul Street.

Birmingham, Ala.—Fifty out of fifty-three of the conductors on the electric cars here struck on January 4. They had been getting twelve and a half cents an hour and demanded fifteen. The strike resulted in the tying up of the whole system. The strikers at once organized a hack company to run parallel to and in opposition to the electric cars. They had twenty-five hacks and charged a five cent fare.

Bloomington, Ill.—The street railroad company and the City Council are engaged in a war concerning the T rail. The company will not lay any other on several streets and the Council steadfastly refuse to give their consent thereto.

Boston, Mass.—The West End company have contracted with the Pullman Car Co. for two more double deck cars.

THE plant formerly belonging to the New England Glass Works at East Cambridge, recently bought by the West End Street Railway Co., has been made into a mammoth power station. The main building is 100×125 ft. The plant consists at present of three engines, two of 100 H. P. each. One engine, ready for use January 1, will furnish the power for operating twenty dynamos of 110 H. P. each. These twenty are only temporary ones, as the Thomson-Houston company are at work on ten 500 H. P. dynamos, which will supplant the smaller ones just as soon as they can be constructed.

ON MOTION of Mr. Everett of Ward 9, the president and two members of the Council are to appear before the Legislature and oppose the use of any part of the Common in the manner suggested by the Rapid Transit Commission.

MR. F. S. PIERSON, in a recent interview published in the Boston *Journal*, makes some interesting statements in regard to heating by electricity. The West End Street Railway Co., are now making an experiment of heating cars by this agency, and have introduced it into twenty cars. He also stated that when the power station of the West End road should be in operation the cost for electric power would be probably reduced about one-half.

Braddock, Pa.—The Braddock & Turtle Creek Street Railway Co. have elected the following officers: President, William Yost; vice-president, John Rinard; secretary, Fred. W. Edwards; treasurer, G. L. E. Stamates; superintendent, G. T. E. Stamates.

THE Braddock Electric Street Railway was put in operation January 13, and carries passengers between Bessemer and Hawkins. This company have the right of way to Wilkinsburg through Hawkins. It is said that if an attempt is made to lay tracks in Hawkins, Congressman John Dalzell, Judge Hawkins and R. P. Duff will oppose the undertaking.

Bristol, Tenn.—The new electric cars for the Bristol Belt Line have arrived, and three of them will be put in at once. S. N. Nicholson, the superintendent, it is said, will, after February 1, no longer be connected with the concern. He will go to the City of Philadelphia, where he will pursue his profession as an electrician. It will cost the company several thousand dollars to put their road in as fine shape as it was before the great fire, which lately burned the stables and five electric cars. The loss was $20,000; partially insured.

Brockton, Mass.—The Brockton Street Railway Co. are enlarging the power station at Montello, and two more engines and two more boilers will be added. The overhead wire from Randolph to the Brockton line has been put up, and the Brockton portion of the work will be shortly completed. The Belmont car stables have been turned into a workshop, and the cars are being equipped with motors. It is the intention of the company to put on some of the big cars, similar to those in use on the West End road for service on the Whitman and Randolph extensions. The Brockton road conveyed 2,320,500 passengers last year, and the East Side and Whitman roads 458,979.

Brooklyn, N. Y.—The Brooklyn Heights Railroad Co. have applied in the City Court for an injunction restraining the city from interfering with their constructing a track from the Wall Street Ferry along Furman and up State Street to their power house.

THE new Mayor vetoed the aldermanic resolutions empowering the Brooklyn City Railroad Co. to equip their line with the overhead electric system. The Aldermen, however, promptly re adopted the resolutions and the Mayor, seeing that further opposition would not avail, did not veto them. He wrote to the mayors of other cities in order to ascertain how the trolley worked there, and asked that all opponents of the system call to see him. A full discussion of this matter, together with abstracts of letters received by the Mayor, will be found in another column.

AT the annual meeting of the Brooklyn City Railway Co., the only changes in officials were the selection of Secretary Thompson as treasurer, and the election of Crowell Hadden as auditor. Mr. Thompson will also retain the position of secretary. The road, it is stated, contemplate the extension of their electric system to Fort Hamilton.

UPON the third application of President Slocum of the Coney Island & Brooklyn Railroad Co., the Board of Railroad Commsioners have granted permission for a change from horse power to electricity on that portion of the line extending from the circle in Flatbush to the corner of Ninth Avenue and Ninth Street in Brooklyn. One of the conditions imposed is that every car shall be provided with wheel guards, and shall have not less than two men to operate it.

Buffalo, N. Y.—The report of the committee appointed by the mayor to investigate the proposition of the Buffalo Railway Co. in regard to establishing a free transfer system and granting other privileges in return for release of paying percentages on the earnings of certain lines to the city as at present was presented last month and was most exhaustive. The equivalent proposed by the committee in behalf of the city for the establishment of a free transfer system was the relinquishment by the city of the statutory percentages payable by the street railway companies, that is, the three per cent. which the Crosstown and West Side companies are required to pay annually by the Act of 1890 for the first five years, and the five per cent. thereafter, to the city together with a portion of the Elmwood Avenue percentage. In regard to the contract percentage payable by the Crosstown lines of eleven and three-quarters per cent. and that payable by the Elmwood Avenue line of thirty-six per cent. which the railway company showed could not be paid without operating these lines at a loss, the committee proposed the substitution of a percentage, payable to the city on the gross earnings of all the lines, as follows: Two per cent. of the annual gross earnings up to $1,500,000; two and a half per cent. of the annual gross earnings when under $2,000,000 and over $1,500,000; three per cent. of the annual gross earnings when over $2,000,000. These amounts to be paid annually. The proposed concessions to the police and fire departments were not discussed as being deemed of little importance compared with the main question. That of selling eleven tickets for fifty cents was not demanded. The committee also recommended the extension of the time allowed the Crosstown line to complete their system, three years. The report was accepted by the street railway companies and municipal authorities as the best measures

under the circumstances. A satisfactory contract has been made and signed by the Mayor and the three companies.

TONAWANDA has been connected with Buffalo by the electric road which was opened January 1. The opening was a decided success.

THE Elk Street electric line is now in full operation.

Charlotte, Va.—The Charlotte Consolidated Construction Co. have sold their interest in the Charlotte street railway to the Charlotte Street Railway Co. The railroad company have issued 100 bonds of $1,000 each to the Mercantile Trust & Deposit Co., of Baltimore.

Chester, Pa.—AT the Chester Street Railway Co.'s annual meeting Col. Samuel A. Dyer was elected president and Richard Peters, Jr., vice-president.

THE Union Railway Co. elected Richard Peters, Jr., as president.

Chicago, Ill.—The West Chicago Street Railway Co. will not accept the franchise for the extension of West Lake Street line, because of a provision that letter carriers must be carried free.

THE Chicago & Evanston electric railroad is meeting much opposition from the "committee of property owners on Southport Avenue." It is asserted that the merchants along the street have been threatened with a boycott if they sign a petition for a franchise. The outlook for the new road is somewhat gloomy.

ONE of the local papers has made an attack on the Carette line. It claims that the horses are overworked, and are poorly cared for. The horses draw the carettes twelve miles a day, and it is claimed that drawing the heavily loaded vehicles up the steep grades at the bridges constitutes cruelty.

A BLUE Island Avenue night car was stopped recently about two o'clock A. M., at the corner of Ward and Lincoln Streets, by three men, who attempted to rob the conductor. The cries of the latter and the driver brought two policemen to the spot, and they succeeded in arresting two of the highwaymen. They were fined twenty-five dollars on their statement that they did not intend robbery, and on the failure of the employes to identify either of them as the one who actually tried to secure the conductor's cash.

JUDGE HORTON has refused to issue an injunction in the case of Charles W. Rigdon against the Chicago City Railway Co. The suit was brought to restrain the defendants from increasing their capital stock and investing it in the bonds of the Alley L road. The plaintiff is the owner of eight of the 60,000 shares of the City Railway Co. The bill showed that the company owned more than one-half the stock and $500,000 worth of the bonds of the elevated road. The court in his decision held that the act of the defendants in purchasing the stock was illegal, but not so as to the bonds. The defendants had no right to invest their assets in such stock, and to do so might result in serious loss to the stockholders, which would entitle them to an injunction. The stock in the Alley L, now held by the Chicago City Railway Co., was purchased prior to the purchase by Rigdon of his stock, therefore he will be considered as stopped from making complaint in regard to that stock. Rigdon alleged that the directors proposed to invest the $1,000,000 in the treasury in stock and bonds of the Alley L, and that negotiations to that effect were now pending. A court of equity, said the judge, could not restrain mere negotiations. The case came up on a demurrer, which was sustained, and the motion for an injunction was denied.

Cleveland, O.—The East Cleveland Street Railway have put a new car on their line from their own shops. It is thirty-eight feet long, built after the Pullman fashion and very ornamental. It is four feet longer than any other car on the road.

AT the annual meeting of the East Cleveland Railroad Co., held last month, A. Everett was elected president, C. W. Wason, vice-president, H. A. Everett secretary and treasurer, L. E. Beilstein assistant secretary and assistant treasurer, Edwin Duty, superintendent.

WORK on the electric equipment of the Woodland Avenue & West Side Street Railway Co. has been pushed during the last few months. Six miles of new rails have been laid of eighty pound girder on oak ties, which are two feet between centres. The ties are 5×8 ins. ×7 ft. in length, and the joint ties 5×10 ins. of the same length. A tie is placed on each side of the joint within six inches. The tie rods are placed every six feet. Five difficult curves have already been laid of the same eighty pound girder rail. The track wiring is done with No. 00 galvanized iron wire, two bonds, one inside and one outside of the rail being used at each joint, with necessary cross connections.

Columbus, Ga.—The electric railway in this city was formally opened on December 22.

Columbus, O.—Before next April horse cars will be things of the past in this city, the Consolidated company having entered into contracts with the Thomson-Houston Electric Co. and the Buckeye Engine Co. of Salem for the necessary equipments for the electric system they will put in.

BY an ordinance just passed, the Glenwood & Greenlawn Street Railroad cars may not be run in the more crowded parts at a greater speed than eight miles an hour, and in the outlying parts not exceeding fourteen.

Covington, Ky.—Superintendent Jenkins of the South Covington & Cincinnati Street Railroad, in company with a number of directors of the road, recently gave a trial to a lately invented air brake that he proposes to attach to each of the cars in his charge.

Denver, Colo.—The new Stout Street electric line began operations January 1. The track which formerly connected the Stout and Curtis Street lines on Twenty-eighth Street has been cut off and will be removed.

MR. A. L. PERRY, the former superintendent of the West End Electric Railway, has resigned his position with that company.

DuBois, Pa.—The DuBois Traction Passenger Railway Co. have chosen the following officers for the year: President, M. D. Wayman of Ford City; vice-president, A. C. Balley of Ford City; treasurer, G. E. Grier of DuBois; secretary and superintendent, C. E. Bostwick.

Duluth, Minn.—Judge Hart recently decided that street railway companies have the right to condemn private property in order to extend their lines. It is the first case of the kind ever brought into court in this state.

REPRESENTATIVES of several electric companies have lately been here looking for the contract for the new street railway machinery to be purchased soon.

East Liverpool, O.—The popularity of the new electric line is greater than was expected, and the receipts therefrom reach $1,000 per week from fares alone.

Easton, Pa.—At the annual meeting of the Easton, South Easton & West End Passenger Railway Co. H. A. Sage was elected president, H. W. Cooley, secretary and treasurer, and H. A. Sage, Jr., superintendent.

Fairhaven, Wash.—The Fairhaven & New Whatcom Street Railway Co. have an electric street railway in operation from Ocean dock, Fairhaven, to Lake Whatcom.

Fredonia, N. Y.—Superintendent Crawford of the Dunkirk & Fredonia Railway Co. has handed in his resignation. His successor is A. T. Marsh, of Jamestown. It is understood that Mr. Marsh will adopt new rules in the government of employes, and a general change in the running of cars will be brought about under his administration.

Galveston, Tex.—On February 6 last year the first electric car of the new electric equipment left the motor house of the Galveston City Railroad Co. The company have entirely rebuilt twenty-six miles of track. The remainder of the lines will be completed by May, 1892, when the total mileage operated electrically will be forty, all within the city limits. Twenty additional motor cars are to be delivered on or before May 1, 1892.

Griffin, Ga.—The Griffin Street Railroad Co. at their regular annual meeting re-elected their officers. The first report of the secretary and treasurer, showed the road to have been well managed, with much valuable property and a handsome surplus made over running expenses up to date, during the eight months it has been in in operation. The company have a school rate of two cents.

Hamilton, Ont.—The projectors of the new Hamilton, Grimsby & Beamsville railway propose to have the terminus in Hamilton either on the south side of the Gore Park, on Main Street opposite the Court House or on King William Street at James Street. The directors are threatened with strong opposition from the street railway in their efforts to gain entrance to the city.

Hartford, Conn.—The annual meeting of the East Hartford & Glastonbury Horse Railroad Co. was held January 1. The directors elected for president, Daniel R. Howe; vice-president, Isaac Brodhead; secretary, George D. Curtis; treasurer, Elmer M. White; general manger. E. S. Goodrich.

Helena, Mont.—The work of equipping the road of the Helena Rapid Transit Co. with electric power is progressing rapidly, and it was expected that twelve miles of track would be in operation by the 1st of February. The electrical equipment was furnished by the Thomson-Houston Electric Co., and the cars by the Northern Car Co. of Minneapolis. The steam plant has a capacity of 375 H. P. The Helena Rapid Transit Co. also operate the road of the Helena, Hot Springs & Smelter Railway Co, and the Union Electric Railway Co.

Indianapolis, Ind.—In the early part of last month the eighteen lines of the Citizens' Street Railroad Co. were tied up by a strike of the drivers, conductors and motormen. The cause of the strike was an order withdrawing the badges which gave the employes the freedom of the cars when off duty, and even going to and from work. The trouble was, however, referred to arbitration and the lines put in operation.

Jersey City, N. J.—The officers of the Jersey City & Bergen Railway Co. do not think the recent decision of Supreme Court Justice Reed in the Newark trolley road case will affect them, and work is being vigorously prosecuted to get the Jersey City roads equipped by spring. It is claimed that Justice Reed's decision, which declares that the law of 1886, empowering railroads to use electricity, did not contemplate the adoption of the trolley system, will be carried to the Court of Appeals, where it will be shown that the trolley was actively experimented with in 1886, and was as well known as any other system at that time. The decision also holds that the Newark Council should have given the street car companies their new powers by ordinance instead of resolution, and that the failure to do so is a vital defect. The doubt is also raised whether the Council could grant permission for the obstruction of streets with trolley poles. The officials of the Jersey City company claim that none of these points apply to them. The authority to adopt the trolley system was secured by ordinance from the Aldermen, and later from the Street Commissioners. Permission was obtained from abutting property owners for every pole erected.

Kansas City, Mo.—L. E. Simmons, formerly superintendent of the Eighteenth Street line of the Metropolitan Street Railway Co. has been appointed general superintendent of all the lines of the road, the old system of separate superintendents being discontinued. L. V. Barnes formerly superintendent of the Twelfth Street line, leaves the service of the company.

THE sale of all the assets of the Union Cable Railway, which was to have taken place last month, was by agreement of all interested parties postponed until February 15.

Kokomo, Ind.—The electric railroad is finished.

Lancaster, Pa.—The annual report of the Lancaster City Electric Railway and West End Passenger Railway companies presented last month shows that 1,249,250 passengers were carried during 1891. It is only a few years ago that horse car lines were introduced here, and financially they were not a success. The last year that the horse car lines were used, 183,000 passengers were carried, and the first year of the electric system the number was 426,000. These companies have now fifteen miles of track, and during the summer they will build belt lines in all sections of the city. During the past year the companies paid five per cent. interest on their bonded debt and put aside a large reserve fund for future improvements.

Lawrence, Mass.—The electric line officials have taken the precaution this year to construct catch basins, between the tracks, and connected with the nearest cesspools, to carry off the water formed by the melting of snow, a nuisance that, last year, gave them much trouble.

Leavenworth, Kan.—Rumor has it that outside parties are negotiating for the purchase of the Rapid Transit line, running through this city and connecting Leavenworth and the Soldiers' Home. It is said that in the latter event the road will be transformed into an electric road.

Little Rock, Ark.—The City Electric Street Railway Co. accepted their road December 23, the day upon which the thirty-day trial period expired. The road operated without a hitch or delay of any consequence during the entire thirty-day trial period.

Lynchburgh, Va.—The electric street railway is now completed and in working order from the hotels at Baltimore wharf, Old Point, to West Hampton, a distance of over three miles.

Lynn, Mass.—The directors of the Belt Line Street Railway Co., at their last annual meeting organized as follows: President, O. A. Towns; treasurer, William B. Littlefield; clerk, Frank W. Jones; auditor, A. B. Martin. The office of auditor was created at the meeting. It was voted to purchase a new generator for the power house.

Macon, Ga.—Receiver Winters has filed a petition in the Superior Court asking to sell or be allowed to issue receiver's certificates to the amount of $55,000 for the purpose of erecting a power station at a cost of $25,000. and to further extend and improve the road at a cost of $30,000. He says the road suffers from a lack of power, owing to which the armatures of both dynamos and motors have been burned out at a loss of $4,000.

McKeesport, Pa.—The McKeesport & Reynoldton electric railway is now in full operation.

Memphis, Tenn.—An order restraining the Citizens' Street Railway Co. from laying T rails on Poplar Boulevard was issued by Judge Galloway, but was soon afterwards withdrawn, the matter having been amicably settled, and now the extension to McLean Avenue will continue without interruption.

ELECTRIC cars will probably be put on the East End dummy line soon. The City & Suburban line is in good condition, and in time, instead of stopping on certain streets, these cars, along with electric cars on the East End dummy line, will go through the city and over the most prominent streets.

Middleton, Del.—Some strong opposition has been shown by the road commissioners and a number of the citizens to the building of the Odessa & Middleton Electric Railway along the public road.

Milwaukee, Wis.—The National Avenue & Walnut Street line was operated by electricity for the first time January 1. A car was also run over the Third Street line. The opening of the road was attended with the usual jubilations, and was a great success. The Third Street & Chestnut Street lines were operated by electricity a few days later.

Minneapolis, Minn.—The first "made over" motor car to be turned out of the Northern Car Co's. shops has been put in service here. The body is twenty-two feet long, and the length over all thirty feet. It is the result of joining two sixteen foot Stephenson horse cars from St. Paul. Others of the same pattern will be completed as fast as the company can turn them out, and they will be the most commodious ones upon the line.

Nantucket, Mass.—The Selectmen of Nantucket have refused the petition of the Nantucket Beach Street Railway Co. to extend their tracks to Siasconset, the route through the town being the objectionable feature, and have proposed the Water Street route, which probably will be accepted by the company.

New Castle, Pa.—The Street Committee Council have recommended an ordinance to the City Councils requiring the street cars to not exceed seven miles on the streets or more than four miles on the bridges.

New Orleans, La.—At the annual meeting of the Board of Directors of the New Orleans, City & Lake Railroad Co. an election of directors for 1892, took place in the office of the company. The president showed the road to be in excellent condition. A summary of the financial report is as follows: Cash on hand November 30, 1890, $49,519.56; receipts for fares for the year 1891, $701,649.45; rents dividends and sundry revenues, $18,401.25; making a total of $769,570.26. Less expenditures as follows: Paid for general expenses, including taxes and licenses, purchase of mules and extraordinary expenditures on tracks, $504,936.01; paid for retirement of bonds and coupons, $60,596; miscellaneous $29,800; paid for dividends, $102,446.50; total $697,778.51, leaving a cash balance on hand of $71,791.75; total $769,570.26.

New York, N. Y.—The principal stockholders of the Broadway surface road have had meetings lately with a view of studying methods for pushing the work by which cable cars are to be introduced on that line.

Newark, N. J.—The running of the electric cars to Orange will not begin until February 1 or later. The Newark Passenger Co. have obtained from the East Orange Township Committee an extension of time by representing that they had been delayed in getting cars for the line.

Newark, O.—At the annual meeting of the Newark & Granville Electric Railway held last month, the directors elected officers for the ensuing year as follows: President, R. Scheidler; vice-president, J. A. Flory; secretary, W. C. Christian; treasurer, F. A. Crane.

Newport, Ky.—Hon. Harvey Myers has introduced in the Legislature a bill entitled: "An act to regulate the operation of street cars and street car lines, and companies in cities of the second class, and to fix a maximum rate of charges for the transportation of passengers for such railways. It fixes the fares at five cents and applies to Covington, Newport and Lexington.

Newton, Mass.—Geo. W. Morse has resigned the presidency of the Newton Street Railway Co. That the town has a street railway at all is largely due to Mr. Morse's efforts and he retires with the good will of all.

Norristown, Pa.—The Norristown Passenger Railway Co. have re-elected their former officers, with the exception of the president; Hugh McInnes takes the place of H. M. Lutz, resigned. The retiring president stated in his report that electricity must ultimately supersede the present system of horse power.

THE Citizens' Passenger Railway Co. have re-elected their former officers.

Norwich, Conn.—The following gentlemen have been elected officers of the Norwich Street Railway Co.: C. P. Cogswell, president and E. P. Shaw, Jr., superintendent and treasurer. The popular superintendent, E P. Shaw, Jr., was last month presented with a gold watch as a testimonial of regard from the stockholders of the company. This is the result of his efficient management of the street railway company's affairs in Norwich, and a well earned recognition of his ability.

Oakland, Cal.—The City Council have passed an ordinance regulating municipal licenses so that ten dollars per annum shall be paid for every street railroad passenger car drawn or propelled by any kind of motive power, said license to be paid on the first days of January, April, July or October of each year.

AT a recent meeting of the directors of the Haywards electric road it was stated that the work, such as laying rails and building bridges, had begun in earnest, and would be prosecuted to an early completion. It was decided to complete the road, if possible, by April 1, 1892.

THE Oakland Consolidated Street Railway Co., the corporate name of the Berkeley electric road, have elected the following officers: G.W. McNear, president; J. E. McElrath, vice-president; First National Bank, treasurer; R. C. Beggs, secretary. The rumor that the Southern Pacific Railroad Co. have obtained control of this road is officially denied.

Omaha, Neb.—The officers of the Omaha Street Railway Co. were re-elected at the recent annual meeting.

Ottawa, Ont.—The recent heavy snow storms had but little effect on the running of the electric cars.

Owosso, Mich.—Saginaw and Detroit capitalists have purchased the Owosso & Corunna Street Railway. The property is very valuable, and the deal is sure to prove a financial success. The road is four and a half miles in length, runs through the principal streets of both Owosso and Corunna, passes several railway depots. It is well constructed, and has a fine and well appointed station and car house between the two cities.

Parkersburg, W. Va.—The Parkersburg street car company's stables, together with fifty tons of hay, waiting room, blacksmith shop, one car and a lot of feed, harness, etc., were burned January 1. The loss was $3,500; insured.

Paterson, N. J.—The electric road from Paterson to Passaic is completed into the heart of Paterson and cars are now running between the two cities at fifteen minute intervals.

Philadelphia, Pa.—It is reported that negotiations between the Traction Co. and the People's Passenger Railway Co., which have been pending for some time, were brought to a successful conclusion by the People's line being leased to the Traction for a long term of years. But it turned out afterwards that the lease was not ratified. The People's line is one of the most valuable street car properties in the city, and one of the Traction Co's. most formidable competitors. It owns or controls forty-five miles of road, The capital stock is $2,075,000, and the bonded debt $750,000. It is said that the Traction Co. have concluded negotiations for leasing the Citizens' (Tenth and Eleventh Streets) Passenger Railway, and that they will soon take possession of the road. Also that the Hestonville system is about to come under their control.

AT the annual meeting of the stockholders of the Thirteenth & Fifteenth Streets Passenger Railway Co. lately held, it was decided to decided to lease the company's line to the Traction Co. Some little opposition was developed, but it was overcome.

Pittsburgh, Pa.—The Duquesne Traction Co. and the Pittsburgh, Allegheny & Manchester Co. have lately made some radical changes in the running of their power stations. At the Duquesne the former chief engineer has been succeeded by Wm. Gorman, a relative of Robert Wetherill, the engine builder of Chester, and an expert from those works which constructed the great Corliss engines used in the power house.

THE Pittsburgh, Allegheny & Manchester Co. have also employed one of Wetherill's expert engineers, who can not only run their engines, but give them the necessary overhauling after they have run any length of time. George Ross of Allegheny is their new chief. New generators will be added to their present motive power, so that additional cars, which the increased traffic demands, can be put on the road. Two of the largest of the Thomson-Houston generators will be added to their power.

COMPLAINT has been made that the Duquesne Traction Co., which bought out the East Liberty & Wilkinsburg Street Railway Co., have recently laid tracks over the railroad bridge and extended them down as far as Shady Lane without authority, as the East Liberty & Wilkinsburg franchise only gave that company the right to come as far as the bridge.

THE Pittsburgh Traction and the Duquesne Traction companies were consolidated on January 1. The consolidation is distasteful to the employes of the Duquesne, who are Knights of Labor, and threaten a strike.

THE stockholders of the Pleasant Valley Traction Co. held their annual meeting last month, heard reports of the president and treasurer and re-elected officers for 1892. George Gorman presided and Jas. E. Rogers was secretary. Passengers carried during the year, 7,770,108; miles run, 1,345,149, against 6,612,913 passengers carried in 1890 and 1,223,600 miles run. President Henry congratulated the stockholders on the fact that in two years their lines had carried over 14,000,000 people and their cars had run 2,500,000 miles without hurting a single passenger on a car.

THE Allegheny & Manchester Traction Co's. line was tied up January 15, by a strike of the conductors and motormen.

Portland, Ore.—The work of electrically equipping the Third Street car system is being pushed as vigorously as possible, but the weather has been so bad that operations progress rather slowly.

Providence, R. I.—The use of electric cars has been successfully inaugurated here. The Inter-state Street Railway Co. have completed their surveys, and by December of the present year the entire system will be in operation. Their lines from the Attleboros to Pawtucket are nearly completed, so far as the laying of rails is concerned. The two Attleboro lines will be in operation by the first of next April, the line to Cumberland Hill will be completed so that cars will be run upon it next winter, the line to Providence will be running by the middle of the summer, the loop line in Pawtucket will also be in running order by that time, and it is intended to have the Bullock's Point line to the various shore resorts in operation by Memorial Day next, May 30. It will take about 4,000 H. P. to run the system, and the company are now negotiating for the purchase of the plant of the Richmond Paper Co. at Rumford, in East Providence, to use as a power station. The electric line to Pawtuxet is carrying large numbers of passengers.

THE design for the transfer table which is being installed by the Union Railway Co. of Providence, R. I., for moving twenty-five foot electric cars, was furnished by M. Rounds of Boston, Mass. The same gentleman has furnished a design for an electric snow plow which is being built for the Union Road.

Reading, Pa.—The Reading & Southwestern Railway Co. have awarded the contract to furnish four twenty H. P. motors to the Edison General Electric Co.

Redlands, Cal.—The Redlands Street Railway Co., at their annual meeting, chose the following officers: A. E. Sterling, president; S. J. Hayes, vice-president; E. W. Wilmot, secretary; First National Bank, treasurer. It was decided to procure a new car, and a committee was appointed to purchase the same.

Rockford, Ill.—At the annual meeting of the Rockford Electric Manufacturing Co. the following officers were elected: President, C. M. Haven; vice-president, G. E. Knight; secretary, treasurer and general manager, W. B. Roberts; superintendent and electrician, George A. Mayo.

Rome, Ga.—The Rome street railway is now being operated under the management of Washington capitalists who will soon put in an electric system.

Sacramento, Cal.—The German Savings & Loan Society have brought suit in the Superior Court of San Francisco against the Central Electric Railway Co. and Sacramento Railway & Improvement Co. of Sacramento, to secure the payment of a bonded debt, and to restrain the Central Electric Railway Co. from surrendering the franchise and taking up the track and removing the rolling stock of the street railroad on O Street.

St. John, N. B.—The Eastern Electric Co., of St. John, N. B., the officers of which company own the St. John Street Railway, have absorbed the New Brunswick Electric Light Co., of St. John, N. B., and are transferring the plant of the latter to that of the Eastern company.

St. Joseph, Mo.—The People's Street Railway Co. are rebuilding upon the site of the old Union line shops at St. Joseph Avenue and Fillmore Street. The first building to be put up will be a combined carpenter and paint shop, twenty-four feet wide and 110 ft. long. As soon as this is completed a car house eighty feet wide and 200 ft. long will be erected. Sixteen new motor cars have arrived from Minneapolis.

AN injunction restraining the People's Street Railway Co. from stringing wires along the Messanie Street line underneath the telephone company's wires has been issued at the instance of Manager Stockwell of the St. Joseph Exchange.

THE new motor of the Westinghouse pattern, which Manager Van Brunt of the People's electric railway lately brought to this city for the purpose of giving a test, was tried and run over the principal lines of the city. It was run on the Union line, and given a thorough test. The officers were well pleased with the performance.

St. Louis, Mo.—The directory of the St. Louis County Street Railway Co. held their annual meeting last month. This road will extend from the city limits to St. Charles, on the St. Charles rock road, and will connect with either the Citizens' or Lindell Railway, and become a rival of the St. Louis & Suburban in the section from Fourth Street to Normandy. It is stated, however, that the success of the enterprise depended entirely upon whether the citizens of St. Charles succeeded in putting up another bridge over the Missouri.

Salem, Mass.—At the Salem Electric Street Railway Co.'s annual meeting the new board of directors chose Milton Davis as president and treasurer; E. Whildey, superintendent; J. W. Northrop, vice-president; William Whildey, secretary and general manager. By the annual statement of the amount of business transacted by the company during the past year, it was shown that 218,936 passengers had been carried.

San Antonio, Tex.—The San Antonio Street Railway Co. have just added to their power block on Tenth Street two Thomson-Houston multipolar dynamos, the only two of the kind in Texas.

San Bernardino, Cal.—The Supreme Court rendered a decision against the City Street Railway Co. holding that the city has a lien against the company to pave their track and two feet on each side thereof, and that the company have no right to abandon the franchise pending the proceedings to pave the streets.

San Francisco, Cal.—Good progress is being made in the way of extending the cable line of the Union Street railroad westerly from its present terminus at Steiner Street to Baker Street.

THE Metropolitan Electric Railroad Co. have begun the construction of their power house just south of the Park, and are laying track in that neighborhood. The officers promise to have the road constructed between the Park and the terminus at Mason and Turk within three or four months.

THE North Beach & Mission company are converting a portion of the road into an electric line. The electric road will run from the ferry out Folsom Street, which is now traversed by street cars. The branch lines of the company on Montgomery, Kearny, Stockton, Fourth, etc., will continue to be operated by horse power.

THE Southern Pacific Railway Co., who control the franchise from Sixth and Market to the Potrero and South San Francisco district, via Eighth Street, announce that workmen will be put on as soon as the grading of the streets on the route has been done.

THE Southern Pacific, who also control the McAllister Street cable road have extended the line out Fulton to Seventh Avenue.

San Leandro, Cal.—Work is being pushed rapidly on the electric railroad and the officers of the company say that the road will be in operation as far as San Leandro by April 1.

Sandusky, O.—The Sandusky Electric Street Railway Co. held their annual meeting last month and re-elected their officers with the exception of superintendent, Emil G. Schmidt being chosen in place of Clark Rude. The report of the secretary showed the affairs of the company to be in a very satisfactory condition.

Savannah, Ga.—Work is in progress on the West Broad Street line of the Electric Railway. It is to be completed in thirty days. Work has also been commenced on the Waters road connection between the Isle of Hope railroad and the electric railway. W. D. Thomas has the contract, and the connection will be made soon.

Searcy, Ark.—Work on the street railway is in progress.

Sherman, Tex.—The stockholders of the Sherman Rapid Transit Railway Co. have elected the following officers: J. M. Cullers, president; J. R. Cole, vice-president; J. P. Harrison, treasurer; C. W. Lewis, secretary and H. C. Morrow, superintendent and general manager. Reports from the secretary of the company showed that the enterprise is in a first-class condition. A large amount of money has been expended on the track, and still there is a balance in the treasury.

Sioux City, Ia.—The Haakinson Street Railway was expected to be in operation by January 30. The connection with the elevated road has been made and the service will be half hourly. The storage battery car of the Bradbury pattern will be put on and given a thorough test.

THE Sioux City Street Railway Co. have received three new double motor cars. They were purchased some time since, and the motors are of the Thomson-Houston pattern.

Springfield, Mass,—The Street Railway company have recently received the last of the six motor snow plows built for them by the Ellis Car Co. of Amesbury, and are now prepared for any emergency. The plows weigh nine tons, and are nineteen and a half feet in length.

Springfield, Mo.—The annual report of the Metropolitan Electric Street Railway filed for record in the office of the county recorder, shows that the resources of the corporation exceed $1,000,000.

Steelton, Pa.—The Steelton, Highspire & Middletown Electric Passenger Railway Co. have nearly finished their new line. The company propose to have the new line completed to Highspire, and cars running between this place and Highspire by February. They have

made a contract with the East Harrisburgh Passenger Railway Co. to furnish the power until their new electric plant is completed. The electric plant will be erected east of Highspire.

Stockton, Cal.—The Stockton Street Railroad Co. have sold their rolling stock, motive power, franchise and the outside property known as Goodwater Grove to a company of Stockton capitalists, who have assumed control. It is understood that the consideration for the transfer was $55,000. The general plans of the new company have been outlined. The road is to be rebuilt and extended as an electric road.

Tacoma, Wash.—The Tacoma Railway & Motor Co. were notified last month that their franchise would be forfeited unless cars were put on K Street south of Eleventh. The notice did not have the desired effect on the company, and in view of the fact an ordinance was introduced in the Council revoking the franchise on K Street south of Eleventh.

Toledo, O.—A fire, January 19, destroyed the car house of the Toledo Electric Street Railway Co. on Canton Avenue, and between twenty-five and thirty electric motor cars. The loss on the building and cars will reach at least $100,000, with an insurance of about 80,000. This is described more fully in another column.

ARTICLES of agreement were signed January 19 between the Robison Electric Railway Co. and the Consolidated, whereby they dismiss all wire suits and join in the construction of all overhead material. The two companies will connect so that both roads can use the same wires jointly, one party feeding one curve and *vice versa*.

Topeka, Kan.—It is said that unless some deals now in progress materialize within the next six months the Rapid Transit system will be sold under the hammer in June next. The road has been in the hands of Receiver J. M. Patten for several months and foreclosure proceedings have been brought by the Metropolitan Trust Co., of New York.

Toronto, Ont.—Since the new company took over the railway, several changes have been made in the routes. A belt line has been put in operation around the central portion of the city, embracing King, Sherbourne, Spadina and Bloor Streets, and it has given good satisfaction and been well patronized. The King Street cars run from Lee Avenue through to Dufferin Street, a distance of seven miles, and several of the uptown lines have been tied together, so that passengers can get from the extreme east to the extreme west end of the city without transfer. In this way a better service has been effected with a good saving in horse flesh. Single fares are five cents, six tickets for twenty-five cents, twenty-five tickets for $1.00; school tickets good from 8 A. M. to 5 P. M., except on Saturdays, ten for twenty-five cents; another class of tickets, good from 5:30 to 8 A. M. and from 5 to 6:30 P. M., eight for twenty-five cents. In addition to this, free transfers are given to any part of the city, and the company are now transferring from 10,000 to 12,000 people daily, but notwithstanding all these things the earnings for the month of December were $14,514.10 in excess of the same month the year previous. The total car miles for the same month was 409,586 and the average daily mileage per horse, as per the horse ledger was 16.2; for those in good condition 17.7. After an extensive tour through the States, the city engineer, Mr. Granville C. Cunningham, presented a report to the City Council early in December, recommending the adoption of the trolley system, but the Council has not yet endorsed this recommendation. It is proposed to convert about twenty-seven miles to electric this season.

Trenton, N. J.—In the Supreme Court Justice Reed filed an opinion in the Newark and Trenton Electric Railway cases, in which property owners along the lines of the proposed roads seek to prevent the erecting of poles and wires, and the operation of the overhead trolley system. In the Newark Case, where the authority of Common Council was given by resolution, Judge Reed holds that an ordinance is necessary. In Trenton the ordinance was set aside on the ground that the law authorizing municipal authorities to grant privileges to railway companies, does not legalize the erection of poles and the stretching of wires in a public street.

Uniontown, Pa.—In the early morning of January 12, the power house of the electric street railway was destroyed and three cars were burned. The loss on building and contents is estimated at from $25,000 to $30,000, on which there is no insurance.

THE contract for rebuilding the electric plant destroyed, has been let to the Edison General Electric Co., and is to be finished in March. Five cars will be put on in place of three as heretofore.

Vancouver, B. C.—The National Electric Tramway & Lighting Co. expected to have their cars running on the Pandora Street extension before the end of last month. Only one car will be put on the line at present.

MESSRS. C. LEONARD & SONS write to say that the Ball compound engines in the New Westminster Street Railway plant are developing far beyond the guarantced horse power. They have been running steadily for the past three months, eighteen hours per day.

A SYNDICATE of the shareholders of the Vancouver Electric Light & Street Railway Co. has offered to lease the whole plant from the corporation for a period of ten years from the date of purchase, at a yearly rental of four and a half per cent. on the amount paid by the corporation for such a plant, the corporation making all required extensions, getting same rate on their cost, the lessees undertaking to keep the whole plant in working order.

IT has been decided that the city shall purchase the plant, etc., of the Vanconver Electric Light & Tramway Co. A telegram was sent to Hanson Bros., Montreal, in connection with the financial part of the arrangement.

Washington, D. C.—The Glen Echo Electric Road is to be put into first class condition, so that the Chautauqua of 1892 will have better accommodations and better facilities than it did last year.

THE Anacostia & Potomac River Railroad Co. have made their annual report to Congress. The report shows that the traffic for the year amounted to $45,090.44, the road having carried 1,097,730 passengers. The total receipts for the year were $182,679.40, The total expenditures were $179,397.95.

THE annual meeting of the stockholders of the Washington & Georgetown Railroad Co. was held January 15. President Hurt, in his annual report, said the work of track construction was begun on May 11, and all the tracks are now completed with the exception of the terminals and a short spur. The company have made contracts for 250 cars, seventy grip cars, sixty coaches and 120 open cars, at a cost of $204,865, and are putting in power for 400 cars and will have house room for 600.

IN the case of the National Bank of the Republic of New York against the Judson Pneumatic Railroad Co., a decree was recently signed for the sale of defendant's patent rights.

Wellsville, O.—The electric line owned by Mr. A. L. Johnson and recently put in operation, has been most successful. The cars are not expected to carry over twenty-five people but have frequently been obliged to transport 150 passengers, while an average load at some portions of the day is as much as 100 persons. The receipts are said to be $1,000 per week.

West Superior, Wis.—The electric railway company want to cross the tracks of the Northern Pacific and the Great Northern roads, and the latter will not consent. Several collisions have occurred in consequence, and some arrests have been made.

Westbrook, Me.—At a special meeting of the Westbrook City Council it was ordained that permission be granted to the Portland Railroad Co. to locate their tracks and run their cars by electric power in the City of Westbrook.

Williamsport, Pa.—The Williamsport Electric Street Railway Co. have received two new cars from the Lamokin Car Works, which will be added at once to those already in use on the Third and Fourth Street lines. The new addition will increase the company's facilities to a considerable extent.

Wilmington, Del.—The Wilmington City Railway Co. have received an electric sweeper from the Lewis & Fowler Manufacturing Co. of Brooklyn, N. Y. The sweeper is of the kind already described in this paper.

THE new Fourth Street line is completed, and as soon as Maryland Avenue is brought to grade and the proposed sewer is laid, the road will be extended along Maryland Avenue to a point near the toll gate.

Winona, Minn.—The Street Railway Co. have closed negotiations with the Indurated Fibre Works to furnish the power for the operation of their street railway. The generator is now put in place and the road is in operation.

Youngstown, O.—Judge Phillips recently handed down an opinion to the effect that a street railway company is not liable for injuries or damages sustained in runaways caused by horses taking fright at street cars running through streets over which they have secured rights of way.

IN compliance with a provision of the by-law granting them a franchise for an electric street railway, Messrs. Ross and McKensie have paid to the City treasurer $10,000, which is the security bond for the proper fulfilment of the contract.

Extensions and Improvements.

Albany, N. Y.—The Albany Railway Co. have received ten new cars, one of which is a special car for the use of the directors.

Altoona, Pa.—At the annual meeting of the stockholders of the City Passenger Railway Co., lately, it was decided to put several additional cars on the main line and an additional one on the Broad Street extension. It is expected to have these additional cars running by February 1.

THE City Passenger Railway stockholders held their annual meeting at the Logan House last month. It was decided to put additional cars on the main line and also on the Broad Avenue extension.

Anniston, Ala.—The franchise of the Anniston City Street Railway, now operated with mules, has been transferred to the Anniston Electric Railway Co., and sufficient bonds have been placed to equip and operate the line, which is seven miles long, with electricity. This will give Anniston two electric lines, aggregating sixteen miles.

Aurora, Ill.—The electric street railway will probably be extended to Geneva in the spring.

Baltimore, Md.—The directors of the City Passenger Railway Co. have adopted plans for a power house for the new cable system.

Beatrice, Neb.—The Beatrice Rapid Transit & Power Co. will at once extend their electric road to all parts of the city. They have completed arrangements for an extensive electric light plant sufficient to supply the needs of the entire city.

Boston, Mass.—Failing to secure the co-operation of the Board of Aldermen in the matter of the best type of fenders to select for electric cars, President Whitney has selected a commission and requested them to experiment and investigate in regard to the matter,

Its members are Mr. W. B. Clark, the engineer of the West End. Prof. George F. Swaine of the school of technology and bridge engineer of the railroad commission, and Mr. C. E. A. Barrett, treasurer of the Boston & Lowell road. The committee have advertised for proposals from companies supplying fenders, and their report is expected about Feb. 1.

Bowling Green, Ky.—The Park City Railway Co. expect to make an extension of their line in the spring.

Bridgeport, Conn.—The Board of Trade have passed resolutions recommending the adoption of electric power on the street railway here.

Brigham City, Utah.—There is a prospect that the motor line running from Ogden City limits will be extended to this place.

Bristol, Tenn.—The Bristol Street Railway Co. have been granted privilege to lay an extension on Ninth Street.

Brockton, Mass.—In a short time every street car in Brockton will be run by electricity. This is one of the results of the recent consolidation of the two local lines of street railway, one of which has been operated by electricity since it was built, while the other has horses for motive power. The total number of miles to be equipped by electricity will be about fifteen, connecting Brockton with Whitman, Randolph and Avon. The syndicate controlling the consolidated roads intends next spring to extend the system to Holbrook, Easton and Stoughton.

Brunswick, Ga.—Rumors of a deal between the Northern capitalists and owners of the Brunswick Street Railroad for the purchase of the railroad property are general. Col. W. E. Kay stated that if the deal was consummated the electric power would be adopted.

Buffalo, N. Y.—To relieve the Niagara South line the street railway company propose to build a line on Prospect Avenue. When the Crosstown company purchased their franchise from the city there was included the right to lay a track on Prospect Avenue from Huron Street to Pennsylvania, then to Fargo Avenue and then to Vermont Street. But the consents of the property owners were requisite and were not given. The street railway managers have, therefore, made application to the general term of the Supreme Court for the appointment of three commissioners to determine whether the road ought to be constructed in spite of the remonstrances of the property owners.

Butte, Mont.—A new cable has been ordered for the Walkerville cable line which will cost $4,500 laid down. It is three miles long. One of the new electric heaters has arrived and has been put in car No. 4. If it is a success the other cars will be provided with them.

Chicago, Ill.—According to President Goddard of the South Side Alley L road, a majority of the frontages has been secured in the alley between Prairie and Calumet Avenues as far as Sixty-third Street and Stoney Island Avenue, and there is now no obstacle in the way of the speedy completion of the road. More than half the issue of bonds to the par value of $7,500,000 has been placed. The Baldwin Locomotive Works are building the engines, while a New York house has the contract for the cars. There will be no downtown loop at Harrison Street, but the terminus will be at Congress Street, with a system of stub tracks. Thirty-ninth Street will be arranged with a similar system.

THE West Chicago Street Railway Co, have bought the northwest corner of Twelfth Street and Ogden Avenue for $35,000. It is probable that this will be the site for a power house, as it is likely that Ogden Avenue will be cabled soon.

THE officers of the West Side Transit Co. state that Chicago will soon have twelve miles of elevated road on Ogden Avenue. This company propose to use the Boynton bicycle system. Petitions for frontages on Ogden Avenue from the city limits to Union Park and thence to Randolph Street are circulating. Nothing definite is yet stated in regard to a downtown terminus. The statement is made that a market has been found for the bonds which will yield the company cash sufficient to press the work rapidly forward.

Cleveland, O.—The Columbus Consolidated Railway Co. have been granted permission to extend on Fourth Street.

Clinton, Mass.—The North End Street Railway Co., of Worcester, have asked the selectmen of that place for permission to operate a road in this place.

Columbia, S. C.—The electric light and street railway companies here have consolidated with a capital of $150,000. A large power house will probably be constructed soon.

Duluth, Minn.—The street railway company will probably, during the coming season, extend their East Fourth Street line from Sixth Avenue, a distance of eleven blocks, to a connection with the incline. Nearly three-quarters of a mile will also be added to the line at its northern end, the Motor company guaranteeing the street railway company against any loss in operation. A mile or two of line will also be built at the head of the incline. The 500 H. P. at the electric power house will be trebled, the company being in the market now for a 1,000 H. P. engine, which will probably be built either by the Iron Bay Works, the Marinette company or the E. P. Allis company. Considerable new track may also be laid.

Fall River, Mass.—The transfer of the Globe Street Railway to a syndicate which proposes to operate an electric road, has been completed. Among the representatives present were Messrs. A. G. Yates and J. N. Beckley, of Rochester, and Thomas Murray, of New York. The new owners announced that steps were being rapidly taken to change to an electric road, and they promised that electric cars would be running on the road by the middle of July or the first of August.

Galesburg, Ill.—The College City Street Railway Co. are considering a change from horse to electric power, and are investigating different motors with a view to purchasing. They have six miles of track, and report that they have just finished the best year in their history, and that their patronage is increasing every day.

Denver, Colo.—The Tramway company will probably extend in the Spring to Elyria. It has also been reported that this company will extent the use of electric power over all of their lines and build a large station on Gilpin street.

IN order to afford an entrance to the Santa Fe railway into this city it is rumored that the tracks of the Lakewood & Golden Electric Railway Co. will be used. If this is done an electric locomotive will have to be employed to draw the trains within the city limits as the Golden franchise does not permit the use of steam.

Detroit, Mich.—The directors of the Detroit Citizens' Street Railway Co. filed a proposition with the aldermen January 5, stating their willingness to install an electric system just so soon as satisfactory assurances should be received from the city that the property rights of the street railway company would be respected and that their proposed investment would be reasonably secure from hostile legislation.

Gloversville, N. Y.—It is reported that the Johnstown, Gloversville & Kingsboro Horse Railroad Co. will substitute electricity for horses.

Hamilton, Ont.—The Hamilton Street Railway Co. will shortly apply to the City Council for an extension of their franchise on the understanding that electric cars will be introduced promptly, and that the city shall receive forthwith a certain mileage rental for the use of the tracks as well as a portion of the earnings.

Houston, Tex.—The Houston City Street Railway Co. propose the laying of twelve or fourteen miles of new track, the rails to be forty-five pounds to the yard. The roadbed is also being considerably strengthened in many places and the capacity of the generating machinery in the power house will be doubled.

Jersey City, N. J.—The directors of the Jersey City & Bergen Railroad have adopted plans to equip all the company's lines with electricity. The Thomson-Houston system has been adopted. It is calculated that the cost to change the road will be $150,000, for which bonds will be issued. The committee to select the site for the new power Station have chosen the old ball ground on Grand Street. The electrical and other machinery has been ordered, and it is believed that the work can be finished in three or four months.

Lancaster, Pa.—The electric railway company propose the establishment of a number of belt lines. That which will be built first is said to be on East King and Chestnut Streets.

Lowell, Mass.—The Lowell & Suburban Street Railway Co. propose to have in Middlesex Village one of the best equipped electric power buildings in the country. It is 180 ft. long and 130 ft. wide. A plant to generate 1,500 H. P. will be installed.

Macon, Ga.—At the present Macon Street car system is supplied with power by the Gas Light & Water Co. As the power is insufficient, the street car company may install a plant of their own.

New Castle, Pa.—The New Castle Electric Street Railway will probably be extended to reach the large tract of land purchased recently by M. S. Marquis.

New Orleans, La.—The mayor last month placed his official signature to the ordinance granting to the New Orleans & Carrollton Railroad Co. the right to use electricity as a motive power for the propulsion of their cars.

Newark, N. J.—The Newark Passenger Railway, it is said contemplate restoring the electric system on their Bloomfield division at an early date.

Newark, O.—The Newark City Railway Co. have been granted permission to operate an electric line on Granville Street.

W. C. CHRISTIAN, secretary of the Newark & Granville Electric Railway in his annual report recommended the purchase of three open trailers, one closed car, and another 125 H. P. dynamo.

Norwich, Conn.—The Norwich Street Railway Co. have been empowered to use electric power under certain conditions which have been agreed to by them.

Oakland, Cal.—The Piedmont Consolidated Cable Co. have been granted a franchise to construct a street railroad on Piedmont Avenue from the city line to Mountain View Cemetery. The franchise gives them the right to put in either a cable or an electric road.

THE Oakland Railroad Co. have petitioned the Board of Supervisors for permission to substitute electric power for horses and steam motors in operating their cars along Telegraph and Humboldt Avenues in Oakland township.

Olympia, Wash.—The Olympia Light & Power Co. have successfully negotiated a loan of $250,000 in the East, and will now commence the construction of an electric line on Main and Fourth Streets, and will extend their line to Tumwater if sufficient inducements are offered.

Omaha, Neb.—The directors of the Omaha Street Railway Co. at their last annual meeting authorized the general manager of the road to expend as much as $200,000 if the demands of the public required it in giving the people a better service, No definite plans were decided upon, as it was considered too early in the season to map out the work to be executed,

Ottawa, Ont.—The Electric Railway Co. of this city follow up their recent acquisition of the old horse car company, by a notice of their intention to apply to Parliament for permission to extend the line across the Suspension bridge to Hull and to use electricity.

Philadelphia, Pa.—The Philadelphia Traction Co. propose trying a Pullman double decker on Market Street. If it is a success a large number of these cars will probably be ordered.

THE Traction company, it is reported, in the coming spring will probably avail themselves of the right already granted to erect the trolley wires on Woodland Avenue, Market Street, and in other parts of West Philadelphia, as well as out Germantown Avenue to Chestnut Hill if they acquire the franchise of the People's company.

THE Traction company recently declared that they proposed to give Philadelphia the finest system of street railway service in the country, and as a preliminary to proposed changes have had Thomas C. Nash, of Chicago, a cable expert, in the city for several weeks, making a thorough examination of the present cable system of the company.

Pittsburgh, Pa.—Two through electric roads from Pittsburgh to McKeesport are said to be probable. Both the Pittsburgh & Birmingham and the Second Avenue Traction companies are going to run lines to Homestead and it is reported that both contemplate extending to McKeesport.

TWENTY small cars of the Pittsburgh & Birmingham Traction Co. are being fitted up in their car shops. The cars are sixteen feet long and being very light, will make better time on the road. When they are all turned out the company will have fifty electric cars altogether. They are being equipped with the Short motor.

AT a recent meeting of the directors of the West End Passenger Railway Co. it was decided to adopt electricity as a motive powerr Right of way will be granted over the Point Bridge, and electric cars will probably be running by July.

THE Suburban Rapid Transit Co. are contemplating extensive improvements. It was stated at the recent annual meeting, to the stockholders, that the bonds of the company have been sold, and the contract for putting the tracks in first-class condition has been let to the Johnson Co., of Johnstown.

THE Mt. Oliver inclined plane was closed January 10 for six weeks. Extensive improvements will be made.

Portland, Me.—The Westbrook City Council has been considering an ordinance permitting the Portland Railroad Co. to lay tracks on certain streets in the city.

Richmond, Va.—The Richmond & Manchester Railway & Improvement Co. have asked for an additional franchise on Hull Street.

Roanoke, Va.—The partly completed line of the Crystal Spring Railway Co. will probably be finished this spring.

Rockford, Ill.—The West End Street Railway Co. have increased their capital stock to $75,000 and will extend their road over the Winnebago Street viaduct, in Walnut Street and in other directions.

Rome, Ga.—The sale and transfer of the Rome street railway to Washington (D. C.) capitalists has finally been consummated, and it will be converted into an electric line.

St. Louis, Mo.—There is before the Council a bill authorizing the Cass Avenue & Fair Grounds Railway to absorb the Northern Central and Union Railways, all to be run by electricity, whereupon the Railroad Committee have had a disagreement as to what shall be paid into the City Treasury in consideration for the franchise. It is possible that two reports will be made to the Council, one recommending a payment of one per cent. of gross earnings for each six months down to January 1, 1900, one and a half per cent. to 1910, two per cent. to 1920 and two and a half per cent. to 1930. Another, a larger percentage of the gross earnings, the increase being about one per cent. on each decade.

Sacramento, Cal.—J. H. Henry of the Central Street Railway Co., has asked for a franchise to build a road on P Street.

San Franciso, Cal.—The North Beach & Mission Co. will soon begin the work of constructing an electric line on Folsom Street.

GOOD progress is being made in extending the Union Street cable line westerly from Steiner Street to Baker. Excavations have been made, and several blocks are ready to receive yokes and cementing. Within a few months the steam dummies will cease to run out Point Lobos Avenue, and the Geary Street cable extension will have been completed. The company have selected a site for the engine and car house at First and Point Lobos Avenues.

Salt Lake City, Utah.—The West Side Rapid Transit Co. have a petition before the County Court asking for an extension of their franchise to the shore of Salt Lake, the intention being to strike the beach about a mile this side of Garfield, and the purpose being to put on a complete and ample electric plant to carry on a perfect service.

Saratoga Springs, N. Y.—The Union Electric Railway will be extended at the village terminus to the Grand Union Hotel on Broadway. From this point a new line will be built to the race track and Saratoga Lake. It is said $200,000 will be expended. The railway is now owned by a new company composed of residents of Albany, the officers of which are Charles E. Arnold, president; Edward J. Slattery, treasurer; Myer Nussbaum, secretary.

Scottdale, Pa.—The Citizens' Street Railway Co. have decided to build the road between here and Bradford at a cost of $50,000,

Spokane, Wash.—The Spokane Street Railway Co. have purchased the franchise and tracks of the City Park Transit Co. on East Sprague Street from Division Street east to the east city limits and will soon commence some extensions in this portion of the city and lay double tracks.

Springfield, Mass.—A big petition has been presented to the Springfield Street Railway Co. to continue their line from its present terminus near the Springfield hospital into Chicopee Centre to meet the regular line on Front Street and form a direct line to the Falls. The majority of the directors of the railroad company are said to favor the idea.

THE directors are also considering the advisability of raising their car house on Bond Street in order that it may be used for storing electric cars. The building is of brick, three stories high. Two or three new cars are also to be added to the Maple Street and other lines.

Terre Haute, Ind.—The street railway company have petitioned for right of way to extend their line on Thirteenth Street.

Toledo, O.—An ordinance has been passed granting the Consolidated Street Railway Co. the right of way for a single track extension on Central Avenue from Cherry Street to the westerly city limits. The line must be in operation by September 1.

Washington, D. C.—Mr. Sawyer, in the Senate, has introduced a bill providing for the extension of the line of the Columbian Railway.

Wheeling, W. Va.—New friction clutches, a new generator and new engine will be added to the power station of the electric railway here.

Wilmington, N. C.—The street railway here has been purchased by a Northern syndicate who will put in an electric plant. John H. Barnard formerly connected with the Edison General Electric Co. is interested in the new organization.

Zanesville, O.—The street railway company propose to make a number of extensions in the spring.

New Roads.

Alexandria, Va.—The City Council on January 12, voted to extend ninety days, the date at which the Alexandria & Fairfax Passenger Railway Co. are obliged by ordinance to commence the building of their railway.

Atlanta, Ga.—The Georgia Electric Light Co. have been granted the right to build an electric railway.

Anoka, Minn.—There is talk of connecting this place with Minneapolis by a motor line. The distance is fifteen miles.

Aurora, Ill.—An electric railway company known as the Aurora & Chicago Inter-Urban Railway Co. have been incorporated, with a capital stock of $1,000,000. The first board of directors are: Wm. M. Van Northwick, Batavia; Henry H. Evans, Aurora; Wm. J. Manning, Warrenville; W. B. Miller, Aurora; J. W. Eddy, Aurora; John Meredith, Aurora; John J. Luck, Aurora. The railway will run from Aurora to Chicago, by way of Warrenville, with branches to Batavia and other points, and will connect with the Northern Pacific entering the city over their lines.

Austin, Tex.—John W. Hoyt and others have asked for right of way for a dummy line connecting Austin with South Austin.

Beaver, Pa.—It is rumored that New Brighton capitalists are contemplating building an electric road from New Brighton to Rochester.

Canisteo, N. Y.—A company with $20,000 capital is being organized to build an electric street railroad. The name of the company is the Canisteo Valley Electric Railway Co.

Cape May.—Arrangements have practically been completed for the construction of an electric railway along the beach front, extending a distance of seven miles. The right of way in the city has been requested. The road will cost between $150,000 and $200,000, and will be controlled by Philadelphia and New York capitalists. It is expected that work will be begun about February 15. J. Henry Edmunds is interested.

Chambersburgh, Pa.—An application for right of way for an electric railway has been presented by Alfred E. Hay, of Philadelphia, to the City Council. Mr. Hay has agreed, if the franchise be granted in time and the ground be in condition, to begin work by April 1 and complete the road by May 15.

Chicago, Ill.—Members of the Seventy-fifth Street Improvement Club are endeavoring to secure the construction of a street railway line on Seventy-fifth Street and are raising a bonus with that object in view.

AN ordinance has been presented to the City Council, and favorably referred, for an elevated railroad over Sixty-seventh Street. It was accompanied by a petition signed by a majority of the property owners. The line is to begin at Stony Island Avenue and Sixty-seventh Street running west in Sixty-seventh to the west line of State Street, and the company will extend their lines westward, northward and southward as fast as practicable. Two miles of the road are to be constructed before May, 1893, and a guarantee deposit of $25,000 is provided for.

BY a vote of forty-one to eighteen the City Council have passed the Calumet Electric Railway ordinance. It is one of the most extensive franchises ever granted by the City Council. Miles of territory are covered by the franchise, and it brings into close connection the suburban towns of Pullman, Grand Crossing and South Chicago. The Cottage Grove Avenue, Michigan Avenue, Madison Avenue and South

Chicago Avenue lines are to be completed and in operation one year from date. Two years are given for the building and operating of the remaining tracks. Single tracks are all the franchise calls for. The usual provisions for the protection of the city are embodied, and the company are directed to file a $25,000 bond with the city comptroller.

Columbus, Miss.—The Columbus Street Railway & Power Co. have let the contract to grade and equip their street railway, work to commence February 1, 1892. N. M. Brandon of Meridian, Miss., will have immediate charge of the construction. The line will be used for both freight and passenger traffic.

Connellsville, Pa.—The Connellsville Electric Railway Co. have been organized. Capital $100,000.

Creston, Ia.—Articles of incorporation have been filed by the Creston Street Railway Co. The capital is $50,000. The work on the city's first line of street railroad will commence in the spring.

Fort Howard, Wis.—An ordinance has been introduced before the Council to grant a franchise to Charles H. Holmes and L. G. McNair to build a street railway in this city. The road will commence at the intersection of Broadway and Dousman Street, and run east across the lower bridge to Green Bay; also from same intersection of streets to run south on Broadway to intersection of Third Avenue and Second Street, thence east on Second Street to and across the south side bridge to Green Bay.

Fort Worth, Tex.—The Fort Worth & Dallas Rapid Transit Co. have been organized. The incorporators include several New York capitalists as well as the following residents of Fort Worth: A. M. Carter, L. D. Hall, Max Elser, L. J. Boaz. The charter provides for the construction of a standard gauge, sixty pound steel rail tracked railroad between the cities of Fort Worth and Dallas, a distance of about thirty-two miles. Electricity may be used.

Fredericksburg, Va.—The Chamber of Commerce is mooting the subject of a street railway here and have appointed a committee to report on the subject. H. von Schon is interested.

Galion, O.—The Suburban Electric Railway Co. have made application to the Common Council for permission to construct and operate a street railway on Main and South Market Streets. The franchise is asked for twenty years.

Green Bay, Wis.—Two applications for electric street railway franchises were presented to the Green Bay City Council last month by C. H. Higgins, who owns the street railway, gas works and electric light plant at Marinette, and by Holmes and McNair, of St. Louis.

Hamilton, Ont.—The Hamilton, Beamville & Grimsby Electric Railway Co. have applied to the townships of Barton, Saltfleet and Grimsby for the privilege of running on the stone road. If this is granted, and the County Council shows itself favorable to the scheme, the line will be commenced in the spring.

Harrisburgh, Pa.—The Citizen's Electric Passenger Railway Co. being organized, have sent in a special request to the Borough Council asking permission to put down tracks on Chambers, Second Pine and Harrisburgh Streets, in the borough. Outside the borough the tracks will be laid on Harrisburgh, Berryhill, Cameron, Paxton, Market and other streets. The capital stock of the company will be $125,000. The residents of Oberlin alone have taken $20,000 worth of stock, which will nearly construct that part of the new line.

Hornellsville, N. Y.—The Hornellsville Electric Street Railway Co., Francis G. Babcock, president; capital $50,000, has been organized.

Janesville, Wis.—Everything has been satisfactorily arranged for the building of the new electric street car line. Haines Bros. have filed a bond of $2,000 as a guarantee that the road will be in operation on or before July 1, 1892.

Jersey City, N. J.—The proposed plan for connecting Newark with this city by means of an electric railway is being rapidly put into operation. The Plank Road Co. of Jersey City, of which C. B. Thurston is president, are undertaking the construction of the line as far as their property extends. When they have completed the road to the city lines of Newark and Jersey City they will form an alliance with the Newark Passenger Co. on one end and with the Jersey City & Bergen Railroad Co. on the other end. The negotiations have been so far completed, it is reported, as to render it absolutely certain that the Plank road line will become part of the system of the Newark Passenger Co. The overhead system will be used throughout. The Pennsylvania Railroad Co. it is reported, will make the electric road act as a relief for their regular line, and when the electric railway is completed cease running trains through Newark, and will only use the tracks through the city for local trains. The through trains will be run on the short line across the meadows by means of the new branch known as the Passaic & Waverly Railroad.

Kankakee, Ill.—Kankakee, Waldron & Momence Street Railway Co. have been incorporated with a capital stock of $175,000, by W. R. Hunter, W. W. Hatch and John Lanfesty.

Kansas City, Mo.—Mr. J. L. Brown of the Eureka Transportation Co. is authority for the statement that the Citizens' Electric Railway Co., recently organized, will build a road over the old Thayer-Enright franchise, connecting Kansas City and Riverside. The road will be built in the coming spring.

Kingston, Can.—B. W. Folger states that if an electric street railway would not cost more than $75,000 he will have one in the city next year.

Lancaster, Pa.—A charter has been granted to the Lancaster & New Holland Electric Railway Co. The capital stock of the company is $300,000 and the directors are: C. A. Fon Dersmith, president; B. Frank Eshleman, John Hertzler, J. P. Shirk, David Bair Shenk and Thomas C. Wiley. It is the intention of the company to commence operations on the road at as early a date as possible, in order to have the road in running order by next summer. The route will be along the Lancaster and New Holland turnpike, and the length of the proposed road will be thirteen miles.

Little Rock, Ark.—The petition of the Little Rock & Argenta Street Railway Co. for franchises on a number of streets has been granted.

Macon, Ga.—The route of the proposed Macon & Indian Springs Electrical Railroad is being surveyed, T. J. Carling is interested in the road.

Massillon, O.—The franchise for the proposed electric road has not yet been awarded by the City Council, but will probably be given out before February 1. According to the conditions advertised, each bid for the franchise must be accompanied by a bond in the sum of $5,000, conditioned that if the bid is accepted the said street railroad will be in operation on or before July 1, 1892.

New Holland, Pa.—Arrangements are about being made for an electric road from Joanna station on the W. & N. R. R. to Morgantown, thence to Goodville and New Holland in Lancaster County. Should the road end at New Holland the distance will be about fifteen or twenty miles. President H. A. Dupont of the W. & N. R. R. is interested.

New Orleans, La.—On March 28, 1892, the city will sell at auction to the highest responsible bidder, the right of way for twenty-five years for street railway purposes over a number of streets including Canal, Carondelet, Clio, Constance, Camp, Henry Clay, Coliseum, Laurel and Louisiana Avenue, including right of way over part of the tracks of the Canal & Claiborne and Crescent City street railway companies.

Newton, Mass.—The petition of the Newton & Boston Street Railway Co. for a location on Walnut and Homer Streets to Newton Centre has been granted by the Board of Aldermen. The cars must be in operation within nine months. The overhead system is to be used.

Norfolk, Va.—The Rapid Transit Co. of Norfolk and the Port Norfolk Street Railway Co. have recently been incorporated. S. M. Cooper, of Cincinnati, O., is president of the latter company, and M. W. Mason is secretary.

Norwalk, O.—Esbon Blackmar of Toledo has accepted the conditions proposed by the Common Council of Norwalk, governing an electric street railway franchise, and the road will probably soon be built. The franchise provides for the commencement of work within six months and its completion within two years.

Olympia, Wash.—The Everett Street Railway Co., with a capital of $50,000, have been organized.

Ottawa, Ill.—Articles of incorporation have been issued to the Ottawa, Starved Rock & Western Electric Railway & Power Co. The principal stockholders are: Ferdinand Walther, Harris W. Huell, Chicago, W. L. Phillips, Chas. F. Wilson and Charles S. Cullen, Ottawa. The capital stock is $150,000. The railway will run west on Madison Street to the Egan farm and Starved Rock. A branch will be run over to Twin Bluffs and another to Utica.

Paris, Tex.—The Paris Electric Light & Railway Co., with a capital of $800,000, have been incorporated. J. J. Walsh, S. J. Wright and John Martin are interested.

Peterboro, Ont.—The Town Council has passed a by-law granting the franchise of the streets of Peterboro for twenty years for an electric street railway to the Edison syndicate, composed of John Kreusi, H. M. Francis, John Langton and M. D. Barr.

THE Edison Electric Co. have secured a franchise for an electric railway here.

Philadelphia, Pa.—The Board of Surveyors last month approved an ordinance authorizing the Holmesburg, Tacony & Frankford Electric Railway Co. to lay tracks in the Twenty-third and Thirty-fifth Wards. No cars are to be run by overhead wires unless specific provision be granted. The laying of tracks is to be commenced within one year and completed within two years. The incorporators are William Miller, H. A. Mullen, Percival E. Bell, David Martin and John K. Andre.

Pittsburgh, Pa.—The Grandview Traction Co. have been organized with a capital of $15,000. The directors are: W. B. Lufton, Charles H. Humbert, J. A. McCormick, Samuel McCombe and Thomas S. Kerr, of Pittsburgh.

Poland, O.—The construction of an electric line from Youngstown to this place is under consideration. The building of the line is said to be probable.

Port Huron, Mich.—A local syndicate have stated the terms on which they will agree to construct an electric railway line from the end of the existing Fort Gratiot line to the depot at the new tunnel. The proposed route is along Griswold Street, from the corner of Military and down Tenth and Bancroft.

Raleigh, N. C.—The Street Railway Co. will build a line to the new depot which will be opened about April 1.

St. Louis, Mo.—The St. Louis & Kirkwood Rapid Transit Co. have a franchise for an electric railway between St. Louis, Benton and Kirkwood by way of Webster Groves upon certain conditions which include one that the company will commence the construction within two years from date of receiving the franchise, complete and run cars

upon one track within three years and lay a double track within ten years.

San Francisco, Cal.—Articles of incorporation have been filed for a new company to construct the second section of the San Francisco & San Mateo electric railway from Baden to Redwood City. The railway company of which Behrend Joost is president and J. W. Hartzell is secretary and general manager have the franchise over the entire line, but the new corporation which is now being organized will attend to the work of construction. It will be a sort of offshot, however, of the main company. General Manager Hartzell says that by February 15 cars will be running from the city terminus of the road at Market and Steuart Streets to Holy Cross Cemetery.

Shelbyville, Ind.—George M. Ray has filed articles of incorporation of the Shelbyville Electric Street Railway Co. The capital stock is placed at $100,000, and the line will be six to seven miles long. It is to be completed by August 1.

Sioux City, Ia.—Work has been begun on the electric road of the Sioux City & Leeds Electric Railway Co.

Steelton, Pa.—Another street railway company are asking permission to occupy the streets of this borough. The Citizens' Passenger Railway Co. propose to lay track on Second, Pine, Harrisburgh and other streets. It is claimed that over $20,000 has already been subscribed.

Stockton, Cal.—The articles of incorporation of the Stockton Electric Railway Co. were filed last month by Hon. S. D. Woods, one of the directors of the new company. The officers are: I. S. Bostwick, president; Joseph Fyfe, vice-president and secretary; E. R. Hedges, treasurer. The capital stock is $500,000. The estimated length of the railroads for which franchises have been granted is eight miles.

Toledo, O.—It looks as if the long agitated scheme to build a street railway between this city and the villages of Perrysburg and Maumee would be accomplished soon. An ordinance has passed the Perrysburg Council giving a franchise to John W. Barton to build a street railroad on Front Street, Perrysburg. The cars are to be propelled by electricity, compressed air or any other power except horse power, The ordinance provides that the construction of the road shall be begun "on or before the first day of July, 1892, and the same be completed within two years from the date of the passage of this ordinance." The franchise is granted for twenty-five years from the passage of the ordinance.

Waltham, Mass.—Francis Buttrick, Thomas P. Smith and other local capitalists are considering the construction of a road from this city to Watertown.

Washington, D. C.—A bill has been introduced in the House to incorporate the Zoo Street Railway Co., with John Joy Edson, E. L. McClelland, A. A. Bigelow, Henry H. Smith and Lawrence Gardner as incorporators. The route is to be from Fifteenth and B Streets northwest, along several streets to the boundary of the "Zoo," and through the park to the principal animal house. The capital stock is to be $100,000 and may be increased to $300,000. The line is to be completed within one year after the approval of the act or the charter is to be forfeited.

THE Washington & Brookland Street Railway Co. seek incorporation. Among those interested are: Harry Barton, T. C. Daniel, Jere Johnson and Charles H. Stanley. A double track railway beginning at the corner of Pennsylvania Avenue and Sixth Street and extending to Brookland is proposed. In lieu of personal tax the company are required to pay a tax of four per cent. on their net earnings from all sources. The bill requires work on the construction of the road to begin within one year, and to be opened for traffic within two years from the passage of the act. The capital stock is not to exceed $1,000,000.

THE Washington, Fairfax & Alexandria Railroad have been incorporated, with M. B. Harlon, Frank Hume and N. Dumont among the incorporators.

INCORPORATION has also been asked for the Washington Northeastern Street Railway Co., with the following among the incorporators: G. P. Davis, L. C. Loomis and Ira J. Baker.

SENATOR STOCKBRIDGE has introduced a bill in the United States Senate, incorporating the Cross Town Railroad, of the District of Columbia. The bill names among the incorporators: H. D. Cooke, D.R. McKee, Harry L. Earle and C. P. Janney and provides that the motor power of the cars shall be any mechanical power but steam that may be approved by the District Commissioners. The railway is to be commenced within six months and be opened within two years of the passage of the act. The capital of this company shall not exceed $1,000,000.

IN the House a bill has been introduced by Representative Belmont, of Arkansas, incorporating the Washington & Bladensburg Street Railway Co., with John H. Oberley, Clif D. Maxwell and Robert L. Miller among incorporators. The motive power is to be electricity or any other system approved by the District Commissioners. The capital stock is not to be less than $200,000 nor more than $500,000, in shares of fifty dollars each.

Waterloo, Ia.—A proposition to connect Waterloo and Cedar Falls by electric cars is being agitated by D. B. Lyons and other Des Moines capitalists.

Wellsville, O.—A. L. Johnson, of Cleveland, proposes to construct an electric railway from this city to New Lisbon. The distance is fifteen miles.

Worcester, Mass.—Civil engineers engaged by the North End Street Railway Co. have begun preliminary surveys for the proposed electric railway between this city and Clinton. The route being surveyed is from the terminus of the present north end tracks, through West Boylston and East Clinton to Clinton.

Annual Report of Chicago Street Railways.

WEST CHICAGO STREET RAILROAD CO.

The annual meeting of the West Chicago Street Railroad Co. was held on January 12. In the annual report of President Charles T. Yerkes the following reference to the year's business was made:

"It is with pleasure that I review the business of the last year, showing, as it does, most satisfactory results. We have not only increased our receipts, but we have greatly increased our facilities for transacting business. While the percentage of operating expenses is still somewhat larger than it will, in all probability, be the coming year, yet we have the satisfaction of knowing that the money has been well spent in our endeavor to accommodate the public.

"The large increase in the number of cars, together with the increase of the mileage, shows that, notwithstanding the fact that there are still complaints, we have removed a great many causes. It is a fact that a street railway company can never entirely suit the people, but it can give such transportation facilities as will satisfy ordinary citizens. This, in my opinion, the West Chicago Street Railway does.

"The management has been experimenting quite extensively with motors and has given the subject a great deal of attention. We now think we have arrived at a point where we can say we are nearing the time when the proper motor will be obtained, such a one as we feel we can adopt. It is only a question of time when horse cars will be a thing of the past."

The annual report of the treasurer presented these figures:

		Increase.
Gross receipts	$4,169,200	$505,819
Operating expenses	2,468,179	265,411
Net receipts	$1,701,021	$240,408
Fixed charges, leased roads, interest, taxes	$832,341	$76,592
Balance applicable to dividends	$868,680	$163,816
Dividends paid	600,000	
Balance to surplus	$268,680	

The operating expenses were 59.20 per cent. of the gross receipts. The number of trips were 1,774,235; the number of miles run, 14,638,414; the number of passengers carried, 85,613,004. The number of passengers carried in 1890 was 75,152,694. Other details were as follows:

Gross receipts, horse railways	$2,464,759
Gross receipts, cable railway	1,704,441
Operating expenses, horse railroad	1,742,119
Operating expenses, cable railway	726,059
Miles run by horses	8,785,242
Miles run by cable	5,853,172
Number of horses on hand	5,709
Average number of miles per horse per day	12.98

The gross receipts showed an increase over 1890 of 13.81 per cent. The increase of 1890 over 1889 was almost exactly the same, being 13.82 per cent. The average number of cars was 614; maximum number passing through the tunnel per hour 171, the minimum 113; the maximum number passing over the bridges per hour 239, minimum 130. The increase in the cars has been about 25 per cent., while the increase in the passengers has been about 14 per cent.

The directors were elected as follows: Charles T. Yerkes, Norman D. Frazer, John B. Parsons, William L. Elkins, and R. C. Crawford.

NORTH CHICAGO RAILROAD CO.

The meeting of the North Chicago Railroad Co. was held on the same day. In the absence of President Yerkes, his annual report was read by Vice-President Furbeck.

The report showed that the road last year carried 44,345,905 passengers. The operating expenses have increased, owing to the fact that many more cars have been put on the road. The year's operations resulted as follows:

Gross earnings	$2,217,440
Operating expenses	1,221,408
Net	$996,332

The operating expenses were 55 per cent. of the gross earnings, which are said to be the lowest average of any year. Operating expenses in 1890 were 55.9. The average number of passengers to every mile a car traveled was 5.71, which is much less than when the road was running horse cars. Then the average was about seven passengers to a car each mile, showing that passengers are not crowded as much now as when horse cars were run.

Fifty new cars and 250 new horses had been added to the equipment, and a new paint shop had been constructed at a cost of $50,000.

The report entered into the system of life insurance for the employes. Sick men received one-third of their wages when off duty. Two hundred and forty had received such benefit during the year, and the amount so expended was $9,141.

The profits for the year were equal to 12¼ per cent., as follows:

Profits	$ 613,450
Balance carried to income January 1, 1891	416,406
Total	$1,029,856
Dividends	400,000
Balance carried to income account January 1, 1892	$ 628,856

Out of this there has already been paid the January 15 dividend amounting to $225,000, leaving the balance in the income account $404,864.

The following directors were re-elected: Charles T. Yerkes, Charles Henrotin, Charles A. Spring, Jr., William L. Elkins and W. D. Meeker.

CHICAGO CITY RAILWAY CO.

The meeting of the Chicago City Railway Co. was held January 15. The treasurer's report showed the following figures:

RECEIPTS.

Cash on hand Jan. 1, 1891	$ 438,776
Increase of stock	1,001,700
Sale of bonds in 1891	120,000
Earnings	3,873,198
Increase in liabilities	458,662
Total	$5,892,336

EXPENSES.

Operating expenses 1891	$2,534,315
Interest paid	216,585
Dividends paid	750,000
Maintenance of track	31,475
Maintenance of cable machinery	11,617
Increase in assets	2,155,042
Cash on hand Dec. 31, 1891	193,302
Total	$5,892,336

The net earniugs were, from cable $1,246,914 and from horses $91,968, a total of $1,338,882. Interest, dividends maintenance of track and cable cost $1,009,677, leaving a surplus of $329,205. The net earnings applicable to the stock were $1,079,205, equal to 17.27 per cent. on the capital stock.

The principal items in President Wheeler's report are as follows:

Receipts	$3,436,748
Operating expenses	2,297,651
Net	$1,139,097
Dividends	600,000
Interest	220,270
Maintenance track	.....
Maintenance cable	.....
	$820,270
Surplus	318,827
Net earnings, per cent	18.37
Passengers, No	68,734,969
Miles run	17,599,680
Average earnings per day	$9,415

The revenue from the cable lines was $2,591,996, and from the horse lines $1,281,202. The comparative unprofitableness of the horse lines is shown by the fact that the net receipts from the cable were $1,246,914, while from the horse lines they were only $91,968.

The cost of operating per mile per car was as follows:

	1890.	1891.
Cable	9.650 cents	9.369 cents
Horse	21.985 cents	23.334 cents
All lines	.....	13.055 cents
Per cent expenses to earnings	68.55 per ct.	65.43 per ct.

The expenses per passenger on the cable were 2.60 cents, on the horse lines 4.64 cents, and the average on all was 3.35 cents. The engine service has been increased, so there is now from 1,700 to 1,900 H. P. in service and the same amount in reserve. A new engine room was built at Thirty-ninth street and Wallace Avenue, another on Archer Avenue, and a new office on State Street. The company built 100 open cars at $724 each, 100 grip cars at $661 each, and 25 box cars at $1,251 each, a total expenditure of $169,775.

The equipment of the road now consists of 1,474 cars, with a seating capacity of 51,474. Of these 322 are grip cars, with a seating capacity of 6,440. Twenty-five new box cars and 100 open cars are now being built. The company has on hand 2,549 horses against 2,508 a year ago. Three hundred and twenty-five were purchased at an average cost of $125, 193 were sold at $40.75 each, and 112 died. It cost fifty-five cents a day to feed the horses. The feed cost $84,097 more than the year before.

The only new track constructed was three-fourths of a mile on Thirty-ninth Street, between Wentworth Avenue and Halsted. Damages amounted to $57,156, an increase over the previous year of $26,346.

Personal.

Mr. P. M. Kling, general manager of the St. Louis Car Co., has been in the East for some time.

Mr. J. H. Shay, of the Charles Munson Belting Co., Chicago, called at the JOURNAL office recently.

Mr. William Sutton, president of the American Car Co., of St. Louis, recently came to New York on a business trip.

Mr. George E. Kimball, one of the directors of the Reliable Manufacturing Co., of Boston, Mass., died from pneumonia last month.

Mr. Elmer P. Morris, of the supply department of the Thomson-Houston Electric Co., of Boston, paid us a visit last month. He reported a large call for the electric railway supplies manufactured by his company.

Mr. Robert Gillham, C. E., of Kansas City, has recently completed seven miles of cable line for the Denver City Cable Railway Co., making thirty-three miles of cable line operated from one central power station.

Mr. W. T. Robinson, of the Electric Truck & Supply Co., of Boston, called on us a few days ago and spoke encouragingly of the future of the radial truck and stated that the demand for them was constantly increasing.

Mr. Frank B. Rae, formerly of the Detroit Electrical Works, has opened an office in Detroit, as a consulting electrical engineer. His patents on electric railway and other work have been assigned to the Detroit Electrical Works.

Mr. C. W. Cushing has been appointed general superintendent of the American Steel Wheel Co., *vice* Mr. W. G. Richards. Mr. J. W. Rampe was appointed acting superintendent of the works of the same company at South Boston.

Mr. Merle J. Wightman, of the Wightman Electric Manufacturing Co., of Scranton, Pa., while in the city recently called at our office. He reports his company as doing a very thriving business, taxing to the utmost the force employed.

Mr. R. G. Brown, a gentleman well known in electrical circles and connected with the Interior Conduit & Insulation Co., of this city, was married on Tuesday, December 29, 1891, to Dr. Lucy M. Hall, of Brooklyn, N Y. The marriage took place in Washington.

Mr. L. E. Myers, formerly of the Edison General Electric Co., has been appointed Chicago agent for the Detroit Electrical Works, with office at 83 Kinzie Street. Mr. F. J. Stone has been appointed agent for the company for Tennessee, Georgia, Alabama and Mississippi, with headquarters at Chattanooga.

Mr. E. Saxton, cable railway contractor, has been spending some time recently in New York, inspecting the cable constructions on Broadway and Third Avenue, and while in the city spent some time in our office. He reports his work on the cable lines of the Washington & Georgetown company as now nearly completed.

Mr. S. Ashton Hand, who has been connected with the Equitable Engineering & Construction Co., of Philadelphia, has accepted the position of superintendent of the Detroit Electrical Works. Mr. Hand has had a comprehensive experience which well qualifies him to discharge, satisfactorily, the responsible duties of his new post.

Mr. E. J. Lawless, manager of the Paterson Railway Co., of Paterson, N. J., called at our office recently. Mr. Lawless is enthusiastic over the success being had with electricity on the Paterson lines. Although heretofore prominently identified with the cable railway interests, he is a firm believer in the future of electric traction where the conditions are favorable.

Mr. Charles J. Van Depoele, one of the most successful pioneers in the history of electric railways, has been very sick during the month of January, and for some time his condition was regarded as critical. At the time of our going to press he was considerably better. His wide circle of friends sympathize with him in his sickness and hope that it will not be long before his complete recovery will be announced.

Mr. M. W. Conway, street railway contractor of Brooklyn, sailed last month for St. Augustine, Fla., where he will spend some weeks, in company with contractors A. J. Hutchinson and Wm. P. Craig. These parties own a franchise, and will build three miles of street railway in St. Augustine during the present winter. The line is to be operated for the present with animal power, but the rails will be wired with a view of equipping with electric power in the near future.

Mr. John A. Beeler, construction engineer of the Denver Tramway Co., Denver, Colo., is spending some weeks with friends in the East, and while in New York recently called at the JOURNAL office. Mr. Beeler gave us many interesting facts in regard to the early history of cable roads in Denver and of the marvelous development of street railway interests in that new city. The development of rapid transit, both by electricity and cable, continues with unabated interest.

Mr. David W. Guernsey, president of the St. Louis Power Co., called at our office during January. Mr. Guernsey was formerly agent for the Sprague Electric Railway & Motor Co., in Missouri, and was largely instrumental in installing the extensive electric railway systems in St. Joseph and other cities in Missouri. He was also the founder of one of the first electric stations operated exclusively for power purposes and from this station on Lucas Ave., St. Louis, is distributed at present electric current to 128 stationary electric motors, operating a large variety of industries.

Mr. George Beadle, proprietor of the Petersburg (Va.) Street Railway, is spending some time in New York, and in conversation with him we learn that steps are being taken to change the street car line of Petersburg from mule power to electricity. The present line, which is three and a half miles, will be extended, and a dummy line will also be equipped with electric power. The line is now operated with forty mules, and Mr. Beadle states that during the eight years he has owned the franchise he has lost only four mules by death, although upon an average the animals make nineteen miles a day. The mules are re-

quired to work two hours at a time, when they are allowed to rest four hours. To this alternating of work and rest Mr. Beadle attributes the long life of the animals.

Mr. M. H. Bronsdon, superintendent of the Providence Cable Tramway Co., while in our office recently, stated that they were now operating their line with one of the long lay ropes manufactured by Thomas & William Smith, of Newcastle-on-Tyne, England; that the rope does not show much wear after four months' service, and that it will apparently outlast any rope previously tried on this line. Some difficulty, however, has been experienced with the splice, as the strands in the forward end of the tuck have a tendency to pull out. This type of rope has given excellent satisfaction on roads in Australia and other foreign lines, and we expect to see equally good results from their use in this country.

New Publications.

"Edisonia, a Survey of the Edison Light and Power Industries," by T. C. Martin. This is a beautiful brochure, handsomely illustrated and printed and tastefully bound. One can learn thoroughly of the magnitude of the Edison interests by glancing at the volume. It is an artistic little publication, which all interested in electrical work will be glad to preserve.

Catalogue No. 2 of the Weir Frog Co., Cincinnati, O. In their catalogue for 1892, which has been received during the past month, the Weir Frog Co. of Cincinnati, O., present a large number of illustrations of the various crossings, switches, frogs and other appliances manufactured by them. In glancing over this very comprehensive list of track devices we find that a large part of the extensive business carried on by this company is in devices especially applicable to street railways, and that in this line their patterns are of the latest and most approved forms. In the latter part of the catalogue are included some simple rules for laying out turnouts, etc., as well as a number of useful construction tables. The catalogue contains 190 pages.

The Minneapolis Tribune, Annual Number for 1892. This twelve page issue of the *Tribune* has a handsome cover printed in three colors. On the front cover the city of Minneapolis is represented as a handsome woman standing on the continent of North America, holding in one hand several blades of cereals and the other a banner on which are inscribed the claims of Minneapolis for pre-eminence. A glance over the statistics of the city shows that with a population of 177,083, Minneapolis has 117 miles of electric road, more than any other city in the world and that the number of passengers carried by the street railway cars during 1891 was 26,500,000. Altogether the record is one of which a citizen of that city may well be proud and shows a prosperous and rapidly growing city.

The Woodbury High Speed Steam Engine; issued by the Stearns Manufacturing Co. of Erie, Pa. The special claims made for their engine by the Stearns Manufacturing Co. are economy, durability, superior regulation and cool running. The steam valve, owing to the method of construction, is balanced and adjustable, insuring the maintenance of steam tightness and reducing the necessary wear to a minimum. The governor is of that class in which the point of cut-off, or valve closure, is effected by moving the eccentric across the shaft. The movement of the eccentric is operated by centrifugal weights on the flywheel, the centripetal force being furnished by a single spiral spring, the outer end of which is secured to the rim of the wheel in such a manner as to permit of its lateral adjustment along the latter. These and other important points in the construction of the machine are fully described and illustrated in the pamphlet, which also contains a number of sample indicator diagrams. These engines are built in sizes of from fifteen to 200 H. P., and designs for larger sizes are being prepared.

The Third Annual Report of the Inter-state Commerce Commission on the "Statistics of Railways in the United States."—This report gives comprehensive statistics covering the operations of railways for the year ending June 30, 1890, and a statement of earnings from passenger and freight service, together with operating expenses and fixed charges, for the nine months ending March 31, 1891. The railway mileage in the United States on June 30, 1890, was 163,597.05 miles. The number of railway corporations at that time was 1,797. Forty railway corporations operate 77,872.63 miles of line, or 47.51 per cent. of total mileage. The average length of line for these forty roads is nearly 2,000 miles. The total number of locomotives in the United States is 29,928, of which 8.384 are passenger locomotives and 16,140 are freight locomotives. This shows ten freight locomotives and five passenger locomotives for each 100 miles of operated line. The number of cars used on the railways of the United States is 1,164,188, of which 26,511 are in the passenger service. The total number of men employed is 749,301, being an increase of 44,558 over 1889. The average number of men employed per 100 miles of line on all roads is 479. The 156,404.06 miles of line, which is made the basis of statistics in this report, is represented by railway capital to the amount of $9,437,353,372, which is equivalent to $60,340 per mile of line. Assuming that the remaining mileage is capitalized at the same rate, the total capitalization of railway property in the United States would be $9,871,378,389. The number of passengers carried during the year was 492,430,865. The number of tons of freight carried during the year was 636,541,617; the number of tons carried one mile was 76,207,047,298. Freight train mileage was 435,170,812 showing the average number of tons per train to have been 175.12. The revenue per passenger per mile of line for all the railways was 2.167 cents; the average cost of carrying one passenger one mile was 1.917 cents. The revenue for carrying a ton of freight one mile was .914 cent, the cost of carrying a ton of freight one mile was .604 cent. The total number of persons reported by railways as killed during the year was 6,334, and the total number reported as injured was 29,025. Of the total number killed 2,451 were employes, 286 passengers, and 3,597 were classed as "Other persons." In this latter figure are included the large number of suicides.

The Patent on Rail Bonds.

Judge Blodgett, of Chicago, delivered a decision on January 4, 1892, in the case of Charles A. Lieb *vs.* The Electric Merchandise Co., *et al.*, in which the complainant sued the defendants for an alleged infringement of patent No. 434,087, covering a type of rail bond used in electric railway construction for electrically connecting adjoining rails. Briefly, the patent claimed the right to a bond or connector consisting of a rod or wire each end of which is passed through the head of a bolt or rivet, the latter to be inserted in holes drilled into the rails to be connected. The chief claim made in defense was that the device was old, and a number of earlier patents on wire connectors were produced in evidence.

In his decision, which was in favor of the defendants, Judge Blodgett says: "I think the proof shows that the complainant's form of construction for a rail connector when one is used, is more simple and less expensive than any of the previous forms shown, unless it be that shown by Westinghouse. But the changes which the complainant made are only mechanical changes and do not introduce any new principles. After Gassett and Fisher [earlier inventors] had shown their device for making a connector from rail to rail by means of wire wound round the head of the stud driven into holes drilled in the rail, they would have undoubtedly had the right in practice to have fastened their connecting wire to the stud, by inserting it into holes made in the head of stud, as an equivalent for their coil, because the hole through the head of the stud was but another mode of fastening the wire and the stud in close metallic contact. And the coil which passed around the head of the stud, was in all respects, the same as the hole made in the head of the stud into which the coil was inserted, so far as the principle of operation was concerned."

Success of Liability Insurance.

We learn from Mr. John G. Dorrance, representing the Guarantee & Accident Lloyds, of this city, that this company are issuing a large number of policies to street railway companies, insuring them against liability arising from accidents to persons or property. The company hav recently settled claims with the Metropolitan Street Railway Co., Portland, Ore.; Denver Cable Railway Co.; Cleveland City Railway Co.; Union Railway of Providence, R. I.; Metropolitan Crosstown and the Houston & West Street Railway companies of New York. Over forty-five companies are now holding policies written by this company. Mr. Dorrance has recently returned from a trip to Portland, Ore., where he has been in the interests of the company, and reports that a large number of roads in the Northwest have taken advantage of the offers made by his company. The following letters, which have been received without solicitation, indicate in a striking manner the esteem in which the insurance company is held by their patrons:

OFFICE OF
THE DENVER CITY CABLE RAILWAY COMPANY.

DENVER, COLO., Jan. 2, 1892.

JOHN G. DORRANCE, ESQ.,
Guarantee & Accident Lloyds, New York City.

Dear Sir:—Very nearly a year has now passed since you insured us against accidents to the public.

The manner in which you have conducted the business, the promptness with which you have settled proper claims, and your liberality in all matters connected with the policy have been very gratifying.

Wishing you success in the coming year, I am yours truly,

GEORGE E. RANDOLPH, General Manager.

METROPOLITAN RAILWAY COMPANY.

PORTLAND, ORE., Dec. 12th, 1891.

JOHN G. DORRANCE, ESQ.,
Guarantee & Accident Lloyds, New York City.

Dear Sir:—Please allow me to return you our most sincere thanks for the prompt and satisfactory manner you have settled all reasonable demands for injuries received by passengers that were on Car No. 20 at the time of the deplorable accident on our road on the 16th of October.

We commend your company to the favorable consideration of all desiring insurance of the kind you furnish. If you need any reference in this part of the country, you may use our name with pleasure.

Yours, very truly,

G. A. STEEL, President.

A New Home.

The new building recently erected on Walworth Street, Brooklyn, for the use of the Lewis & Fowler Manufacturing Co., and the Lewis & Fowler Girder Rail Co., is now occupied and affords considerable additional space, made imperative by the constant increase in the already extensive business of these leading concerns. The building on the west side of Walworth Street, which was temporarily occupied by the offices of these companies, is now utilized as a pattern shop.

The lower floor of the new building is fitted up as a machine shop and is filled with lathes, planers and other accompaniments of a room devoted to that purpose. The offices are on the second floor and are roomy, light and attractive. On the right of the entrance are the accountants' and bookkeepers' departments, separated from the rest of the room by the usual railing and lattices. On the left is the general reception room, upon each side of which are the private offices of the president, Mr. John W. Fowler, and the secretary, Mr. A. H. Dollard. From the windows of this room can be seen the extensive building devoted to car construction, which extends the length of an entire block, the foundry and other portions of the Lewis & Fowler works. The upper stories of the new building are devoted to the extensive register and stove departments of the Lewis & Fowler Manufacturing Co. While not entirely settled in their new quarters yet, the officials appear quite comfortable, and, as heretofore, have always a hearty welcome ready for any visiting member of the street railway fraternity.

The Robinson Radial Truck.

The following extract from a circular recently published by the Robinson Electric Truck & Supply Co., of Boston, gives a comparison between the earning capacity of a Robinson radial open car and an ordinary eight-wheeled open car:

The cars used for this comparison were one of a number of Robinson radial open cars in operation on the Union Street Railway, Dover, N. H.. and one of the largest open electric cars, having two ordinary four-wheeled swiveling trucks, in service on the West End Street Railway, Boston. Both cars have similar boxes and gear, and both are equipped with two 15 H. P. Thomson-Houston motors. The weight of the eight-wheeled car is 18,650 lbs.. and it seats fifty passengers. The weight of the Robinson radial is 17,650 lbs., and its seating capacity is seventy passengers. That is, the radial, weighing 1,000 lbs. less, seats forty per cent. more passengers than the eight wheeled car. The dead weight in the Robinson per passenger seated is 252 lbs ; that of the eight-wheeled car 373 lbs.

If we equalize the weights of the two cars by allowing 1,000 lbs. additional weight to the radial, this at 250 lbs., the dead weight to the passenger, will give the radial an additional seating capacity of four more passengers, or eight per cent. more. That is, the radial seats forty-eight per cent. more passengers than the eight-wheeled car, weight for weight.

To get at the average comparative earning capacity, assume that each car makes six round trips per day, taking one full load of seated passengers each straight trip, but not changing passengers *en route*, and running 365 days in the year—as a full equipment of cars will keep up this average—and it is found that, the weights of the cars being equalized, the Robinson earns more than $5,000 per annum in excess of the other. Furthermore, it has been shown on various occasions that the average power required to propel the radial is scarcely two-thirds of that required to propel an eight-wheeled car of the same weight, so that the grand total gain of the radial over the eight-wheeled car on straight track is eighty-one per cent. This is equivalent to an excess in earnings per annum of $5,256, not taking into account the saving in power effected.

The mammoth radial used in the above comparison seats seventy passengers, but has carried 210 people at one time.

Proposed Thomson-Houston Factory at Pullman, Ill.

The announcement made a few weeks ago that the Thomson-Houston Electric Co. proposed to establish a factory at Pullman, Ill., was at first received with incredulity. So many of such projects have been reported and the rumors have so uniformly proved without foundation that the last report was assumed to belong to the same class. Investigation shows that the announcement was generally correct though details have not been settled fully. This statement is authorized by B. E. Sunny, Chicago manager of the company. It is stated very emphatically by Mr. Sunny that his company will have no relations with the Pullman company beyond buying a site of the latter corporation.

The primary idea in building a factory near Chicago is to save freight in shipping goods to Western points. The new plant will probably be devoted to the manufacture of electric railway supplies, lights, motors, stationary engines, and other kinds of electrical goods manufactured by the company. The Pullman plant is designed to relieve the Eastern factories of their surplus work and was made necessary by the large amount of Western business being performed by the company.

Equipment Notes.

The Robinson Electric Truck & Supply Co., of Boston, have ready for delivery twelve Robinson radial trucks for the Metropolitan Street Railway, of San Francisco.

V. H. Blackington & Co., of Attleboro Falls, Mass., manufacturers of number badges, handle a large line of goods in their specialties and include many prominent railroad companies among their customers.

The Perfection Oil Purifier Co., 136 Liberty Street, New York, will ship to responsible persons their oil-purifying device for free trial in order that the latter may test it thoroughly and ascertain if the claims made for it are reliable.

The Newburyport Car Manufacturing Co., of Newburyport, Mass., advise us that their works are very busy at present, and that they are employing more men than ever before. The calls on this company are constantly increasing.

Haines Bros., of Kinderhook, N Y., inform us that they were the contractors for the Owosso & Corunna (Mich.) Street Railway, four and a half miles in length. This same firm have bought the Janesville (Wis.) Street Railway and will equip this with the Short electric system.

Clay, Pepper & Register of Philadelphia, manufacturing and contracting electrical engineers, dissolved January 15 by mutual consent, Mr. Clay retiring from the firm. The business will be carried on as heretofore by the remaining partners, under the firm name of Pepper & Register.

The Purity Oil Filter Manufacturing Co. of Pittsburgh, report a large number of recent orders, and among others, from the following companies: Vacuum Oil Co., New York; Monongahela Electric Light Co., Homestead, Pa.; Edison Electric Illuminating Co., Cincinnati, O.; Central Traction Railway Co., Pittsburgh, Pa.

Queen & Co., of Philadelphia, have recently moved into their new quarters at 1,010 Chestnut Street, and are very comfortably situated. They have recently brought out a number of new electric appliances to which they call the attention of engineers to whom they extend a cordial invitation to visit their new home.

Alfred F. Moore, manufacturer of insulated electric wire and cables, No. 200 N. 3d Street, Philadelphia, has withdrawn his agency in Chicago, lately controlled by Mr. G. A. Harmount, Monitor Electric Co., 149 Wabash Avenue. Until further notice all communications or orders should be addressed direct to the head office.

The Pennsylvania Iron Works Co., of Philadelphia, were the successful bidders and have received the contract for the complete power house, including engines, boilers and machinery, erecting and placing in operation for the West Chicago Street Railway Co., at the corner of Twelfth Street and Blue Island Avenue, Chicago.

Mr. James F. Shaw, of Boston, representing the Newburyport Car Manufacturing Co., has recently equipped the Union Railway, of Providence, and the Lynn & Boston Railway, of Lynn, Mass., with Dorner & Dutton scrapers. He has also taken an order from the Lynn Belt Line and the Merrimac Valley Railway Co. for a number of Reliable sand boxes.

The Benedict & Burnham Manufacturing Co. of Waterbury, Conn., have recently placed on the market their new weather proof wire named the "Benedict," for which high insulation is claimed. The manufacturers state that a number of severe tests have been made of the insulation of this wire with most successful results, and that wherever the wire has been introduced it has given the best of satisfaction.

The Lieb Machine Works, of New York, are getting out a new line of overhead appliances for electric railways, combining a number of important improvements. They also report a large call for their new trolley pole, and state that they have appealed from the recent decision of Judge Blodgett, of Chicago, in a patent case covering rail bonds, in which they were plaintiffs and in which judgment was given to the defendants.

W. R. Fleming & Co., of New York, have installed during the last month two 55 H. P. Ideal self-oiling automatic engines in the handsome private hotel building known as the "St. Lawrence," near Madison Avenue, New York. The absolutely smooth and noiseless running of these engines commended them for this work. There are now about twenty of these engines running in New York City, and all are among concerns of the highest standing in the community.

The Eddy Electric Manufacturing Co., of Windsor, Conn., report a large business in their electric apparatus. They have recently installed a power plant of 385 H. P. in the factory of the Encaustic Tiling Co., Zanesville O. They have also installed a 50 H. P. generator and seven motors for driving the Blackman ventilating fans in the New York State Capitol, Albany, N. Y., and a central power station at Kalamazoo, Mich., consisting of 60 H. P. generators and 80 H. P. motors.

The Field Engineering Co., of New York, who take charge of the entire equipment of power stations, supervising all details of the entire installing, are planning a number of stations on designs which embody changes calculated to increase the economical operation. Central station owners and railway companies having power stations in contemplation this season, or thinking of overhauling or making changes in old plants, would find it to their advantage to communicate with the Field Engineering Co.

Alexander, Barney & Chapin, of New York, have sent to their numerous friends and customers a new year's greeting in the form of a four page folder printed in two colors. On the front and back pages are handsome designs bearing the initial letters of the firm, A B C, and representing gnomes and other figures. The interior pages contain

the wish to their friends (and they are many) of "health, happiness and prosperity" and to their enemies (and they are few) of "enlightenment, liberality and magnanimity" which should be sufficient to turn them into friends.

The Reliable Manufacturing Co. of Boston, Mass., have just shipped to the Thomson-Houston Electric Co., San Francisco, several sets of sand boxes, to be put on the new cars this company are equipping for several street railway companies in California. The Norwich Street Railway Co. have adopted the Reliable sand box, and are applying the same to their cars. The Lynn & Boston Street Railway Co. have also given an order to this company to equip their entire road with the Reliable sand boxes. This order was given after the road had thoroughly tested the use of these boxes on some of their cars during the past year.

The Stearns Manufacturing Co., of Erie, Pa., propose to make the Woodbury engines in sizes to meet the demands of all companies. Their facilities for manufacturing are among the best. Their commodious shops give ample room in the galleries for the construction of engines, and the company have recently installed $18,000 worth of new machinery for engine building. The first 100 H. P. engine will soon be ready and will be operated in the company's shops, so that it may be thoroughly tested. Engines will be constructed up to 500 H. P. The company propose to construct a building for testing engines, which, they think, will be the most complete plant of its kind in the country.

The Berlin Iron Bridge Co. of East Berlin, Conn., are just completing a new machine shop for the Bridgeport Machine Tool Co., at Bridgeport, Conn. The building is made entirely of brick and iron, divided into two parts, each forty feet wide, the total length being ninety-six feet. One portion is two stories high, the roof and floor being designed for light work, while the opposite half of the building is of the same height, but the second floor is omitted, so that it may be used as an erecting shop. The erecting shop is controlled by a traveling crane. The building, when completed, will, it is claimed, be one of the most perfect and best designed machine shops in the New England States.

The Ball Engine Co., of Erie, Pa., are now preparing to put on the market some new sizes of engines which will interest street railway men. Their new shops are splendidly equipped and they are making engines of a very high grade. Inquiries are being received from all points where electrical plants are to be put in. Their engines are well appreciated where they are known. They have received an order for a 400 H. P. compound condensing engine from the Erie Electric Motor Co., who operate the local electrtc railway. They will furnish the Braddock Street Railway a 200 H. P. single cylinder engine. The company expect a large demand for engines for street railway work in the spring.

The Boston Bridge Works, of Boston, Mass., are constructing the roof of a large power station in Lynn, Mass., for the Lynn & Boston Railway, of which the trusses and purlins are of iron. The building is about seventy feet wide by 250 ft. long. They are also building the roof for a boiler house for J. P. Squire's packing and provision company, in East Cambridge, Mass. The trusses of this roof are of iron and the covering is of corrugated iron, resting directly upon the rafters. There is a ventilator running the entire length of the building, which is also made entirely of iron. Besides this they have under construction the roof trusses for a machine room for the Otis Falls Pulp Co., at Livermore Falls, Me., and other buildings.

H. Ward Leonard & Co., electrical engineers, New York, write us that among the prominent buildings in which they are at present installing electric plants as contractors are the following: Graham Hotel, Fifth Avenue Theatre, Mr. John H. Inman's residence, *Mail and Express* building, Catherine Bradley building, Germania Insurance building, and F. O. Du Lous building, all of New York; the Franklin Trust building, and Columbia Theatre, Brooklyn. Among the leading concerns for whom they are acting as consulting engineers are the following: Otis Elevator Co., New York City; Wm. Sellers & Co., Philadelphia; Ingersoll-Sergeant Drill Co., New York City; Eastern Electric Co., Limited, St. Johns, N. B.; Providence Journal Co., Providence, R. I.; and Rock Hill Electric Light Co., Rock Hill, S. C.

The Thomson-Houston Electric Co. advise us that their supply department are doing a large business and have received a number of letters from their customers complimenting them upon the quick delivery of goods. This department have secured during the past month some very large orders for their various patented articles and find that the railway companies regard their supplies with great favor. The high quality, good workmanship, and low prices of these goods are the essential points which commend them. The Pittsburgh office of the Thomson-Houston Electric Co., is about to be moved into commodious quarters in the building 414 Wood Street, where a large stock of electric light and railway supplies will be carried. E. G. Waters will be in charge of the lighting department, and Howard Wheeler will be in charge of the railway department.

The Edison General Electric Co. have enlarged the scope of their wideawake *Monthly Record*, which is in charge of C. W. Dever, of the contracting department, and will publish therein items in regard to all the departments of the Edison company. The Southern district of the Edison company has been abolished, the portion of the country in charge of this district being divided between the Eastern and Central districts. A slight change has also been made in the territory covered by the New England and Eastern districts. The Edison General Electric Co. have established a supply depot in Pittsburgh, Pa., made necessary by the many calls for general supplies which they have received from the region in the neighborhood of that city. The extensive business of the company is constantly growing, new orders being taken in all sections of the country.

The Robinson Machine Co., with general offices at Altoona, and Works at Bellwood, Pa. have been most successful in placing on the market a truck often wished for by street railway companies, *i. e.*, one that combines durability, lightness and simplicity with completeness, as their many orders and testimonials prove. Apparently with a view to strengthening their company, we note that they have elected their former general agent to the presidency. This will certainly have a very beneficial effect, for Mr. Hay, during the many years devoted by him to the railway business, has acquired a reputation for ability, energy and courtesy. We are advised that after passing successfully the trying ordeal of a close criticism and inspection by Pennsylvania Railroad experts, Robinson Machine Co were given the order for the additional trucks required by the Altoona railway.

The Jewell Belting Co., of Hartford, Conn., have recently installed in the Boyd Street station of the Newark Passenger Railway Co., a very handsome sixty inch double belt, which is mentioned in another part of this issue. The company have also entered on their books during the past month orders for eighteen belts, double and three-ply, a large proportion of which are destined for electric light and power work. Among these orders are the following: 100 ft. belt, fourty-two inch, double; 190 ft. belt, thirty-two inch, double; sixty-nine foot belt, thirty inch, double; seventy-nine foot belt, thirty inch, double; 115 ft. belt, thity inch, double, and a 103 ft. belt, fourty-eight inch, three-ply. The Jewell belting has achieved an excellent reputation in the past, and the company are now better equipped than ever to turn out the best of work in the shortest possible space of time.

The Ball Engine Co. of Erie, Pa., have sent us a list of their recent orders, which include the following: Thomson-Houston Co., Boston, Mass, one 100 H. P. and one eighty H. P. single engine; Newark Electric Light Co. Newark, N. J., one 300 H. P. cross compound engine; Kittanning Electric Light, Heat & Power Co., Kittanning, Pa., one 150 H. P. cross compound engine; Columbia Electric Light Co., Philadelphia, Pa., one 200 H. P. cross compound engine; Osage Electric Light Co., Osage, Ia., one fifty H. P. cross compound engine; Edison Light & Power Co., Minneapolis, Minn., one 300 H. P. cross compound engine; Central District Telegraph & Telephone Co., Bldg., Pittsburgh, Pa., two fifty H. P. cross compound engines; Industrial Improvement Co., Brockton, Mass., one 300 H. P. and one 200 H. P. cross compound engine; Electric Improvement Co., San Francisco, Cal., one 100 H. P. tandem compound engine; Edison General Electric Co., Portland, Ore., three 150 H. P. tandem compound engines.

The John Stephenson Co. Ltd., of New York, are turning out a large number of cars from their shops on Twenty-eighth Street, New York City. Among the recent companies from whom they have received orders for cars are the New York & Harlem Railway, New York City, for twenty cars, the Salt Lake City Rapid Transit Co., of Salt Lake City and the New Haven & Centreville Street Railway Co., New Haven. In their shops are several handsome grip cars which immediately attract the attention of a visitor and which are destined, as already mentioned, for the Washington & Georgetown road of Washington, D. C. These cars have monitor roofs with quartered oak ceilings and impress the observer with their general substantial and handsome appearance. This company have recently received a letter from Mr. James D. Callery, President of the Second Avenue Passenger Railway Co., of Pittsburgh, Pa., in which he refers to some recent cars manufactured by the Stephenson company for that line, in the following terms: "We are much pleased with these cars and claim them to be the finest in the city."

J. W. Parker & Co., of Philadelphia, are agents for the Ball engine, and do a large business in installing complete steam plants for electric light and electric railway uses. They write us that they are building at present a number of engines for street railway service, among which they include one 250 H. P. cross compound railway engine for the Rock Creek Railroad, of Washington, D. C.; this engine is to be delivered as soon as the railway power station can be completed. They are also building a similar engine for the Industrial Improvement Co., of Boston, Mass., for use at Brockton, Mass., and delivered a single cylinder 150 H. P. engine to the Lynchburg Street Railway, of Lynchburg, Va., this being the third Ball engine to be put in use by this railway company. Messrs. Parker & Co. express as their opinion that 1892 will be an important year in street railway improvement, and the extent of their own business seems to justify this prediction. They say that they have never had a greater number of inquiries for engines than at present for street railway service, and this in spite of the general complaint of dullness in other business lines.

The Burton Electric Co., of Richmond, Va., are now doing a prosperous business. Electric heating is meeting with favor among street railway companies. It is stated that at the present time there are 100 street railways using Burton electric heaters. Beyond all question a great many other companies would adopt the system at once were it not for the reason that they fear the cost of current will be too great. Mr. W. R. Mason, President of the Burton Electric Co., recently furnished the STREET RAILWAY JOURNAL a statement which shows that the cost of operation is not great. He estimates that in all ordinary cases the cost of the current required for heating a car will not be over fifteen cents per day. This, he thinks, is a fair estimate; but it is considerably less than that furnished by street railways, which has in some cases been as high as seventy-five cents and one dollar. The current required per set of 4 heaters, 2 H. P.; coal, per H. P. 4 lbs.; coal, 18 hour car day 144 lbs; 1 lb. coal worth .00087 cent; 144 lbs. coal worth 12¾ cents. The figure of 12¾ cents was determined by a recent test made on a large railway which uses the Burton heater.

The Lamokin Car Works, of Philadelphia, have recently delivered to the Williamsport Passenger Railway Co., of Williamsport, Pa.,

two palace finish vestibule car bodies. These cars are finished in solid mahogany, with mahogany ceilings, the seats and backs are covered with Wilton carpet and the equipment includes solid bronze trimmings, safety gates, radial bars and ratchet brakes. A novel feature about the cars is the observation skylight in the roof of the vestibule, which affords a view of the trolley and enables the motor man to readjust the trolley without leaning out of the front window. This order makes a total of ten cars delivered to this railway company. The Lamokin Works have at their factory in course of construction two palace vestibule cars for the Altoona City Passenger Railway Co., Altoona, Pa. These bodies are to be mounted upon the Robinson electric motor truck, which are manufactured by the Robinson Machine Co., Altoona, Pa. They also have an order for six double truck cars, from the Rock Creek Railway Co., of Washington, D. C., and six open cars for the same road upon which they expect immediately to start work.

The Electric Mutual Insurance Co., of Boston, have issued a circular letter to policy holders and others, stating that an arrangement has been made between that company and the Home Insurance Co., of New York, whereby the entire liabilities under outstanding policies of the former company have been assumed by the latter company. The reasons for making this arrangement are given in the circular, and are, principally, the severe losses sustained by the insurance company during the past year and the feeling on the part of the Electric Mutual Insurance Co. that the interests of their policy holders would be best subserved by a transfer of the risks to a company having a larger paid up cash capital than their own. Mr. S. E. Barton will have charge of the electric insurance department of the Home Insurance Co. For the time being business will be conducted at the present office of the Electric Mutual, but in the near future it will doubtless be found advisable to locate the office in New York City. The present status of the Electric Mutual will remain unchanged until all of its policies have expired, and any indorsements, consents or other required changes will be promptly made as heretofore by communicating with the company.

The Engineering Equipment Co., of New York, have made a large number of sales recently of the Underwood cotton leather belting in various widths, ranging chiefly between two inches and twenty-four inches, and this department forms an important branch of their business. The Edison central stations, of New York and Brooklyn, have adopted the Underwood cotton leather belts, having tried them two years with satisfactory results. Two twenty-one inch and three fifteen inch Underwood cotton leather belts have recently been put in at the Edison Twenty-sixth Street station. At the Brooklyn station there are now running eighteen of the Underwood cotton leather belts, each sixteen inches wide. The Edison company, Paterson, N. J., have recently added five sixteen inch cotton leather belts to their plant. In Buffalo the Buffalo Street Railway Co. have added two of these belts, each twenty-four inches wide. The Rochester Electric Light Co., United States system, have added about 200 ft. of twenty-one inch cotton leather belting and People's Electric Light Co. (Thomson-Houston system), Oswego, about 100 ft. of thirty inch cotton leather. All of these belts are running finely. This looks well for cotton leather, despite the assertions of those who claim, for business purposes, that the Underwood belting is not what it is. There are enough of witnesses to show that it is true that the cotton leather belting, made solely by the Underwood Manufacturing Co., is steadily, and in some directions rapidly, growing in favor with the users of belting. The present product of the Underwood factory is all that could be desired in point of excellence of material and manufacture. The significant sales given indicate the value of this belting and suggest its use to those who have not tried it recently.

WESTERN NOTES.

The Shultz Belting Co., of St. Louis, have issued a handsome colored calendar for 1892, which they are sending to their many customers.

The American Car Co., of St. Louis has sold to the West Chicago Railroad Co. 150 street cars, and fifty cars to the North Chicago Railroad Co.

Dorner & Dutton, of Cleveland, O., report that they are kept busy in supplying the demand for their motor trucks. Several excellent orders have lately been received.

Ramsay & Kenyon, of St. Paul, Minn., have been appointed Northwestern agents for the Morden Frog & Crossing Works of Chicago, Ill., the Tudor Iron Works, of St. Louis, Mo., and the Belleville Steel Co., of St. Louis, Mo. Their headquarters are at 109 Endicott Arcade.

The Indianapolis Frog & Switch Co., of Indianapolis, Ind., have recently closed a contract with the Baltimore City Passenger Railway Co. for all the crossings for the new cable road being built by that railway company. The appliances of this company are meeting with well merited favor throughout the country.

The Central Electric Co., of Chicago, have just taken the agency for Illinois, Missouri, Nebraska and Indiana, for the Interior Conduit & Insulation Co., of New York, and will carry in stock at Chicago, St. Louis, Kansas City and Omaha, a large supply of tubing. This company also report a large increase in their lamp orders, and the extensive supply of these goods which are kept on hand insures the filling of orders of this kind.

The Pond Engineering Co., from their Chicago office have recently installed at the Chicago Arc Light & Power Station, a 250 H. P. Armington & Sims engine. It is an interesting fact in connection with this order, as showing the facilities this company have for supplying orders promptly, that the engine was shipped complete from St. Louis within a day after it was received, and the Power company received it in Chicago six days afterwards, and within three days from that time the engine was ready for operation in the plant of the company.

Mark & Sterling, of Cleveland, manufacturers of rail joints, rail chairs, etc., used in street railway construction, write us that the call for their appliances has been so great that they expect to enlarge their business considerably during the next few months and wish to establish a few good agencies. Correspondence on this subject should be addressed to the office of the firm at Society for Savings Building, Cleveland, O. They also write that they have had remarkable success in their business so far and have a good outlook for the coming spring trade. Their rail joint which was described in a recent issue of this paper is attracting special attention.

The Western Electric Co., of Chicago, have purchased the grounds and buildings at 261 to 277 South Clinton Street for $320,000. The ground adjoins the present factory of the company and the purchase is made presumably for an extensive addition to the company's large factory. Possession is not to be given for some time yet. It will be remembered that the company already control quite an expanse of frontage on Clinton Street, on which they erected, about six years ago, a magnificent six-story building, which at that time and for some time after was considered equal to the company's business, but it was only a short time till they found that more space was needed and a large addition was built as well as additional stories put on the first structure which they erected.

Alfred G. Hathaway, of the Case Building, Cleveland, finds an active demand for his specialties. He has recently sold a twenty-four foot transfer table to the Pittsburgh, Allegheny & Manchester Traction Co. of Allegheny, Pa. The Washington & Georgetown company, of Washington, D. C., have given Mr. Hathaway an order to equip all their car houses with transfer tables. The main car house will have six tables, four on the main floor and two on the second floor. The tables are now made so shallow, that when put in position it is not necessary to cut into the joists. An order was recently received for two ten foot tables from the Buffalo Railway Co., who have already sent several orders to Mr. Hathaway. The outlook for the spring is very promising, as Mr. Hathaway has received orders for equipping some of the largest car houses in the country.

The Crossley Friction Brake Co., of Cleveland, O., have applied a numbnr of their brakes to cars of the Broadway & Newburgh Street Railway Co., which are giving entire satisfaction. The motormen are greatly pleased with them and state that they can control their cars with great nicety by means of this appliance. The brake is of the momentum type. By the use of a lever or an ordinary crank, a rope is tightened around a spool on the axle. The stop is effected as quickly as may be desired. An inch and a quarter rope is used and it might be thought that wear would soon destroy its usefulness. This does not seem to be the case. The rope wears for months and then may be replaced at the cost of twenty-five cents. Horace E. Andrews of the Broadway road, has written a letter to the company in which he speaks of the brake in the highest terms. The great points argued in behalf of the brake are its extreme simplicity and its cheapness.

The Brownell Car Co, of St. Louis, write us that the car "Accelerator" which attracted so much attention at the late Pittsburgh Convention, will soon be in New York City, where it will be inspected by the managers of the Broadway cable road. It has been in service in Chicago for a considerable time and has proved so satisfactory in that city that the right to use the patent has been purchased by the North Chicago Railway Co. and also the West Chicago Railway Co. Mr. Yerkes, president of these lines, is quoted as speaking in the highest terms of the car, and especially of its efficiency in carrying large loads with comfort to passengers. In view of the agitation in many cities of the rapid transit question, any device which tends to facilitate the receipt and discharge of passengers, and so shorten the time required for stops is of great importance, and this car seems to accomplish these important results.

The Electric Merchandise Co. of Chicago, with characteristic enterprise have arranged recently to handle the entire produc of certain large mica mines. The mica of excellent quality and is prepared in all desired sizes. The terms of the arrnagement make it possible for the company to quote attractive prices. Already large sales have been made and great satisfaction expressed by consumers. The winter weather bring in orders for the well-known Burton electric heaters, and Brand's steel wire track brooms with Wardwell's adjustable track broom holder. The diploma for efficiency has lately been awarded the Burton electric heater by the committee of judges of the Canadian Electrical Exposition, at Ottawa, Can., where the heaters were thoroughly tested. A change has occurred in the office of secretary and treasurer of this company, Mr. W. L. Adams, of Chicago, having been appointed to that place to succeed Mr. A. L. England, resigned. This company have recently received an order for 3,000 lbs. of their black tape. The frequency of similar orders speaks well for the goods manufactured by this company.

The Electrical Supply Co., of Chicago, moved a few months ago into new quarters at the corner of Michigan Avenue and Randolph Street. Here they have over 3,500 sq. ft. of floor space, but already find themselves crowded for want of room to such an extent that outside storage had recently to be arranged for, since this company carry a large amount of Shield Brand "moisture proof" and Habirshaw rubber covered wires in stock. Business at this season of the year, they report, has never been better than now, and the outlook for Spring is extremely encouraging. This is especially true of their extensive and growing railway department. They are fortunately situated in respect to the larger amount of specialties in this work. Making them in their own factory, they are enabled to closely govern the

quality of material entering into the composition of the goods. This, in connection with their rigid inspection of the finished article, has been an important factor in establishing their reputation in this field. The magnet wires which they manufacture and which they have been careful to have perfectly uniform in gauge and insulation, are extensively used by all electric roads in the repairs of motor and generator coils and armatures. Another article for which they are finding a rapidly increasing sale is their rawhide pinions. The company evidently believe in the maxim that "whatever is worth doing, is worth doing well," and certainly the nicety of workmanship observed with these and all their other supplies would seem to corroborate this view. Divided into many departments, each under the care of an experienced and capable head, the business goes forward with the unity and harmony of a well constructed mechanism.

The Detroit Electrical Works have sent us a copy of a letter recently received by them from J. T. Voss, general manager of the Athens Railway Co., of Athens, Ga., who have recently installed the Standard Electric Railway system of the Detroit company. Mr. Voss' letter describes the success attained with the Standard system, and is in part given herewith: "We have had (in Athens) very little trouble or expense with the bevel gear supplied by you; in fact there is no trouble with it when the friction collars are kept well adjusted, which is very easily done. And as to the dynamo, it has not caused us one minute delay or one cent of expense. As to the whole equipment, we find it to be the simplest and easiest to keep in repair of any of the systems that I have ever inspected. I have a son, nineteen years old, who has charge of all the cars and motors, and he keeps them in thorough repair; we have never lost as much as a day's service with any one motor, and all the experience he has ever had in electrical work was with your men while here setting up our machinery, while with other systems it is considered by many necessary to keep a high salaried expert to keep the machinery in order. I claim that we have the best equipped road anywhere to my knowledge. Our cars make less noise and run smoother than those of any other system that I have ever inspected. I have been in the street railway business for some twelve years, and last year, before we began to make any change in our line here, I made a tour of inspection of the different systems and became utterly dissatisfied with two motors to one car, especially in the item of repairs. The single motor geared direct to each axle cannot be beaten anywhere, and that is what we have. We would be glad at any time to show anyone our system here." This company have lately sold five additional thirty H. P. equipments to the People's Electric Street Railway Co., of Springfield, Ill. Three motors of the same capacity have been sold to the Jacksonville Railway Co., of Jacksonville, Ill. This company are changing from horses to electricity, and the road will be ready for operation with the new power March 1. The Detroit company have received an order for five equipments for the City Street Railway Co. of Kokomo, Ind.

The Fulton Foundry Co., of Cleveland, O., have improved their electric truck, and have facilities for manufacturing these in as large quantities as may be desired. Orders can be filled with dispatch. The truck, which has been illustrated in the STREET RAILWAY JOURNAL, is built in the main of wood; for this reason the bolts do not become easily loosened from the constant vibration. Great rigidity and strength are claimed for it, while, owing to the wooden construction, it is very light. It has a brake of a new design which admits of a tremendous leverage. When the brakes are off they are entirely free from the wheels, and it is never necessary to change the turnbuckles, it is stated, whether the brakes are new or nearly worn out. The company have furnished twenty-two of the trucks to the East Cleveland Street Railway Co. They have not cost the latter anything for repairs, although the first one was put into service fifteen months ago. Trucks are being furnished to many of the electric railway companies, and they are giving great satisfaction. One point has been particularly remarked: The wheels and axle always keep in line, so that the wear is even. The company have designed a new chilled cast wheel for electric railway service, embodying a new feature which will, it is thought, double and, perhaps, treble, the life of the wheel. The new principle is very simple, but it is thought its introduction will greatly interest street railway men. The company will now answer any inquiries which are sent to them regarding it. The company's steel tired wheels are gaining favor with street railway companies and large numbers of them are selling. The drawbars for electric cars have been found to give entire satisfaction. The East Cleveland company have adopted them on all their cars—225 in number. The device makes possible a tight coupling so that there is always tension on the rear car. The strain is much less, therefore, on the gears and pinions than when link and pin are used. As there is no slack in the connection, there is an absence of noise. The transfer tables constructed by the company are made for four, six, or eight wheel cars of any wheel base. They are made very substantial and are so constructed that one man can handle a car on it. Large numbers of these tables have been sold throughout the country. The company's turntables are well known throughout the country. These are made on short notice, though the sizes usually desired are kept on hand. Large numbers of railroad crossings, which are giving entire satisfaction, are being sold by the company.

WM. WHARTON, JR., of Philadelphia, calls our attention to an error which crept into the description of the Missouri Railway Co., of St. Louis, in our last issue. The manufacture of the rails used on the Tower Grove Park division and the Forest Park division from Fourth Street to Tower Park should have been credited to Messrs. Wharton & Co., the weights of rails used being fifty-seven pounds on the Tower Grove Park division, and a seventy-eight pound rail on the Forest Park division. The mistake was due to erroneous information given to our correspondent.

List of Street Railway Patents

ISSUED BY THE U. S. PATENT OFFICE, DECEMBER 29, 1891, TO JANUARY 19, 1892, INCLUSIVE.

DECEMBER 29.

Electric Railway, Julius Emmer, Jr., Washington, D. C. 465,844
Electric Railway, Henry S. Pruyn, Hoosick Falls, N. Y. 465,886
Railroad Fish Plate, Moses G. Hubbard, Chicago, Ill. 465,985
Motor Car, Thomas C. Oakman, Aurora, Ill. 466,009
Rail Joint, Clark Fisher, Trenton, N. J. 466,095
Electric Railway Switch, Max Kerstein, Boston, Mass. 466,101
Safety Guard for Cars, Andrew J. Brown, Chicago, Ill. 466,115
Indicator for Railways, Edward G. Rowen, Boston, Mass. 466,141
Electrically Driven Locomotive, Everard H. Morgan, Dover, Eng. 466,180
Electric Railway Trolley and Support, Wilbur A. Stevens, Kansas City, Mo. 466,196
Electric Car Brake, La Motte C. Atwood, St. Louis, Mo. 466,212
Railway Tie and Chair, Theodore S. Brooks, Garrison's, N. Y. 466,218
Car Seat, Fred. H. Henry, Wakefield, Mass. 466,302

JANUARY 5.

Self Acting Safety Brake, David Mathias Gerhard, Minneapolis, Minn. 466,339
Cable Car, Augustin Martinez, Philadelphia, Pa. 466 355
Electric Railway Crossing, William Osner, Chicago, Ill. 466,362
Elevated Street Railway Car and Truck, Howe Paige, Minneapolis, Minn., 466,364
System of Electric Distribution, for railways, Nelson W. Perry, Cincinnati, O. 466,367
System of Electric Distribution for moving Translating Devices, Nelson W. Perry, Cincinnati, O. 466,368
Propulsion of Street, Tramway, or other Railway Cars or Carriages, John Hughes, Chester, England 466,415
Extensible Electrical Conductor, Benton C. Rowell, Boston, Mass. 466,427
Underground Conduit for Electric Railways, Charles P. Tatro, Spokane, Wash 466,471
Car Truck for Electric Railway Cars, Peter M. Kling, St. Louis, Mo. 466 539
Car Truck, John H. Bickford, Salem, Mass. 466,595
Means for Operating the Switches of Street Railways, William H. Farmer and Thomas White, Saginaw, Mich. 466,302
Hydraulic Variable Speed Gear, Louis Duncan, Baltimore, Md. 466 660
Hydraulic Variable Speed Gear, Louis Duncan, Baltimore, Md. 466,661
Hydraulic Variable Speed Gear, Louis Duncan, Baltimore, Md. 666,662
Lubricator for Trolleys, Edwin M. Doig, Denver, Colo. 466,737

JANUARY 12.

Fare Box, Henry C. McEnery, New Orleans, La. 466,797
Wire Support for Electric Railways, William Q. Prewitt, Lexington, Ky. 466,800
Electric Trolley, Elmer A. Sperry, Chicago, Ill. 4 6,807
Truck for Vehicles, Elmer A. Sperry, Chicago, Ill. 466,808
Clip for Rope Tramways, Andrew S. Hallidie, San Francisco, Cal. 466,880
Railway Electric Motor, Charles F. Winkler, Troy, N. Y. 466,914
Bracket for Trolley Wire Supports, Edward P. Russell, Newburyport, Mass. 466 956
Trolley for Electric Railways, John Kuehnle, Detroit, Mich. 466,981
Cable Tramway, William E Wilby and William M. Wilby, Birmingham, Eng. 466,987
Car Wheel, James T. Bridges, Hagerstown, Md. 466,988
Electric Motor, John H. Palmer, Boston, Mass. 467,048
Electrically Controlled Car Switch, Burt I. Potter, Boston, Mass. 467,050

JANUARY 19.

Air Circulating Mechanism for Railway Cars, Geo. R. Perry and William H. Perry, Concord, N. H. 467,195
Electro Magnetic Brake, Henry E. Walter, London, England, ... 467,243
Trolley for Electric Railways, Edwin R. Harding, Winthrop, Mass. 467,250
Car Brake, James McArthur, Rochester, N. Y. 467,257
Electric Railway Brake, Edmond Verstraete, St. Louis, Mo. 467,259
Street Car, George W. Baumhoff and August H. Hagemeier, St. Louis, Mo., 467,392
Metallic Railway Support, James M. Price, Philadelphia, Pa. 467,432
Electric Railway, Charles J. Van Depoele, Chicago, Ill. 467,448
Transferring Cable Cars from one line to a crossing line, James E. Morris, Chester, Pa. 467,457
Electric Railway Signal William F. Z. Desant, New York, N. Y. 467,476
Pull Gong for Street or other Cars, Ezra W. Vanduzen, Newport, Ky. 467,488

We will send copies of specifications and drawings complete of any of the above patents to any address upon receipt of twenty-five cents. Give date and number of patent desired. STREET RAILWAY PUBLISHING COMPANY, WORLD BUILDING, NEW YORK.

The Roundhay Electric Tramway.

146 ROUNDHAY ROAD, LEEDS, ENGLAND.

JANUARY 16, 1892.

MESSRS. CHAS. A. SCHIEREN & CO., 47 Ferry St., New York, U. S. A.:

GENTLEMEN—We are ordering to-day from you a supply of your electric belt stuffing, also a supply of your belt cement.

Will you kindly send us full instructions for splicing your perforated belts? It may interest you to know that the two belts furnished by you for this plant are giving every satisfaction, and have elicited considerable admiration from English engineers.

Yours truly, THE ROUNDHAY ELECTRIC TRAMWAY,
J. E. WINSLOW, Manager.

QUOTATIONS OF STREET RAILWAY STOCKS.

BOSTON STOCKS.—Corrected by R. L. DAY & Co., 7 Exchange Place, Members of Boston Stock Exchange. Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
West End Pref	50	$6,406,000	J. & J.	4	1887	84½	85
West End Com'n	50	$7,150,000	J. & J.	5	1890-1891	72	72½

PROVIDENCE STOCKS.—Corrected by CHACE & BUTTS, Bankers, Providence, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
Pawtucket St. Ry. Co	100	$270,000	New.	...	Oct., 1887	94	95
Union R. R. Co., Prov	100	2,000,000	Q.—J.	2	1862-1863	185	190
Providence Cable Tramway ..	100	300,000	Owned by Union Railroad Co.				

HOLYOKE STOCKS.—Corrected by J. G. MACKINTOSH & Co., Bankers, Holyoke, Mass. Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
Springfield Street R. R. Co	100	$300,000	J. & J.	4		200	225
Holyoke Street R. R	100	150,000	J. & J.	3		170	175
Northampton Street R. R	100	50,000		...		25	50

CHARLESTON STOCKS AND BONDS.—Corrected by A. C. KAUFMAN, Charleston, S. C., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Charleston City Ry. Co	50	$100,000	J. & J.	3			65
Enterprise Ry. Co	25	250,000		...			8

BONDS.	Date of Issue	Amo'nt Outstanding.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Charleston City Ry. Co		100,000	J. & J.	6	1915		
Enterprise Ry. Co		50,000	J. & J.	5	1906		

NEW ORLEANS STOCKS AND BONDS.—Corrected by GEORGE LE-SASSIER, 174 Common Street, New Orleans, La., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Carrollton R. R. Co	100	800,000	Quart.	1½	1867	118	122
Crescent City R. Co	100	1,150,000	"	1¾	1866	87	87½
Canal & Claiborne R. R. Co..	40	240,000			1888	22½	25
New Orleans City & Lake Co.	100	1,500,000	Quart.	1¾	1860	127	130
Orleans R. R. Co	50	185,000	"	2	1868	70	75
St. Charles Street R. R. Co ..	50	600,000	"	1½	1866	86	89

Bonds.	Date of Issue	Amount Outstanding.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Canal & Claiborne Sts. R. R.	1879	150,000	A & O	6	1887	100½	
Crescent City R. R. 1st Mort.	1883	100,000	M & N	6	'93-'99		
do do new	1886	40,000	M & N	6	1896		
N. O. City R. R. Co	1879	495,200	J & D	6	1903	118	
N. O. & Carrollton R. R. Co..	1882	300,000	F & A	6	'92-'06	113½	
St. Charles Street R. R. Co...	1881	165,000	J & D	6	'89-'01		

NEW HAVEN STOCKS AND BONDS.—Corrected by H. C. WARREN & Co., Bankers and Brokers, New Haven, Conn. Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
F. Haven & Westville R. R. Co.	25	$300,000	J. & J.	4		140	
State Street Horse R. R. Co....	25	23,000	J. & J.	3		100	
New Haven & W. Haven R. R. Co	25			...		20	
New Haven & Centville H. R. Co.				...			
Whitney Ave. Ry. Co	50	25,000		...		7	
Bridgeport Horse R. R. Co	100	140,000		...			
Hartford & Westfield Horse R. R. Co	100	200,000	J. & J.	3		125	

BONDS.	Date of Issue	Amo'nt Outstanding.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
State Street Horse R. R. Co...	1874	22,000	J. & J.	7	Jan., 1894	105	
New Haven & W. Haven R. R. Co	1889	50,000	J. & J.	5	July, 1899	100	
Bridgeport Horse R. R. Co		50,000		6			
Hartford & Wethersfield Horse R. R. Co., Deb. Series A	1888	100,000	M. & S.	5	Sept., 1908		
Hartford & Wethersfield Horse R. R. Co., Deb. Series B	1890	100,000	M. & N.	5	May, 1910		
Hartford & Wethersfield Horse R. R. Co., Deb. Series C. (Not yet issued)		100,000	M. & N.	5	May, 1910		

BROOKLYN STOCKS AND BONDS.—Corrected by C. E. STAPLES & Co., 215 Montague Street, Brooklyn, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Atlantic Avenue R. R. Co	50	1,250,000	Q.—J.	1½		104	106
Broadway R. R. Co	100	525,000	Q.—F.	2		185	
Brooklyn City R. R. Co	10	6,000,000	Q.—J.	2		170	
Coney Island & Brooklyn R. R. Co	100	500,000		...		120	

BONDS.	Date of Issue	Amount Outstanding.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Atlantic Ave. R. R. Co., 1st mort		140,500	M. & N.	7	May, 1894	104	
Atlantic Ave. R. R. Co. Cons.		900,000	A. & O.	5	Oct., 1909		106
Broadway R. R. Co		350,000	J. & J.	5	6 m. notice	100	
Coney Island & Brooklyn R. R. Co., 1st bonds		300 000	J. & J.	5	Jan., 1909		103
Coney Island & Brooklyn R. R. Co., certificates		300,000	J. & J.	6	July, 1894	100	
South Brooklyn Central R. R. Co., 1st		125,000	F. & A.	7	Aug. 1897	107	
South Brooklyn Central R. R. Co., 2d		150,000	F. & A.	6	July, 1941	103	
Brooklyn City R. R. Co., 1st		3,000,000	J. & J.	5	July, 1916	104	106

ALBANY STOCKS AND BONDS.—Corrected by SPENCER TRASK & Co., Bankers and Brokers, corner State and James Streets, Albany, N. Y., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Albany R. R. Co	100	750,000	Q Aug.	1½	1890	107	108
Watervleit Turnpike & R. R. Co	100	240,000		...	1863	10	15

BONDS.*	Date of Issue	Amount Outstanding.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Albany R. R. Co., 1st Mort	1865	40,000	J. & J.	5	1905	103	
" " " 2d Mort	1873	20,000	M. & N.	7	1893	102	
" " " 3d Mort	1875	28,500	J. & J.	7	1895	105	
" " " 4th Mort	1880	11,500	M. & S.	6	1905	103	
" " " 5th Mort	1888	50,000	M. & S.	5	1913	105	
" " " Consol Mtg	1890	350,000	J. & J.	5	1930	103	104
" " " Debenture	1891	200,000	M. & N.	6	1901	109	111
Watervliet Turnpike & R. R., 1st Mort	1889	350,000	M. & N.	6	1919	95	98
Watervliet Turnpike & R. R., 2d Mort	1889	150,000	M. & N.	6	1919		70

*In bonds buyer pays accrued interest.

NEW YORK STOCKS AND BONDS.—Corrected by H. L. GRANT, 26 Broad St., New York, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Bleecker St. & Fulton Ferry	100	900,000	J. & J.	¾		25	27
Broadway & Seventh Avenue..	100	2,100,000	Q.—J.	2		205	205
Brooklyn City	10	2,000,000	Q.—F.	2		165	170
Brooklyn Crosstown	100	500,000	A. & O.	4			
Cen'l Park, North & East River	100	1,800,000	Q.—J.	2		104	108
Christopher & Tenth	100	650,000	F. & A.	1¾		115	116
Central Crosstown	100	600,000	Q.—F.	1¾		125	130
Dry Dock, E. B'way & Battery.	100	1,200,000	Q.—F.	2		125	135
42d & Grand St. Ferry	100	748,000	Q.—F.	3		230	240
42d St., Manhat. & St. Nich. Av.	100	2,500,000				37	40
Eighth Avenue	100	1,600,000	Q.—J.	2		105	110
Houston, W. St. & Pav. Ferry. Leased to B'way & 7 ave	100	1,000,000	Q—F.	2		160	
Second Avenue	100	1,862,000	J. & J.	5		95	100
Sixth Avenue	100	1,500,000	M. & S.	3		130	150
Third Avenue	100	2,000,000	M. & N.	4		290	305
23d St	100	600,000	Q.—F.	2½		220	230
Ninth Avenue	100	800,000		3		90	95

Bonds.	Date of Issue	Amount.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Bleecker St. & Fulton Ferry		700,000	J. & J.	7	July, 1900	110	
B'way & 7th Ave., 1st mort		1,500,000	J. & D.	5	June, 1904	105	107
2d mort		500,000	J. & J.	5	July, 1914	105	106
Broadway Surface Guaranteed		1,500,000	J. & J.	6	July, 1924	106	107
Additional		1,000,000	J. & J.	5	July, 1905	93	95
Brooklyn City		200.000	J. & J.	5	Jan., 1902	105½	107½
Brooklyn Crosstown		200,000		5	1902	107	109
Cen'l Park, North & East River		1,200,000	J. & D.	7	Dec., 1902	114	116
Christopher & Tenth		250,000	A. & O.	7	Oct., 1898	112	114
Central Crosstown		250,000	M. & N.	6	Nov., 1922	118	120
Dry Dock, E. B'way & Battery. 1st mort		840,000	J. & D.	7	June, 1893	104	106
Scrip		1,200,000	F. & A.	6	Aug. 1914	98	100
42d & Grand St. Ferry		236,000	A. & O.	7	April, 1893	110	112
42d St. Manhat. & St. Nich. Av 1st mort		1,200,000	M & S.	6	Sept., 1910	112	114
2d mort		1,200,000	J. & J.	6	1915	38	39
Eighth Ave., Scrip		1,000,000	F. & A.	6	Aug., 1914	105	110
Houston, W. St. & Pav. Ferry.		250,000	J. & J.	7	July, 1894	109	111
Second Avenue		1,600,000	M. & N.	5	Nov., 1909	102	103
Third Avenue		5,000,000	J. & J.	5	Jan., 1937	110	115
23d St		250,000	M. & N.	7	May, 1893	108	110

MONTREAL STOCKS AND BONDS.—Corrected by GORDON STRATHY & Co., Members Montreal Stock Exchange, 9 St. Sacrament Street, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Montreal St. Ry. (p'd up sh.)	50	$600,000	M. & N.	4	May, '91.	186	190
Ditto new shares (100% paid	50	300,000	.....	...	.....	185½	190
BONDS.	Date of Issue	Amount Out-standing.	Inter-est Period.	%	Principal Due.	Bid.	Ask'd
Montreal St. Ry.....	1885	£60,000	.....	5	1905	.....	.....

LOUISVILLE STOCKS AND BONDS.—Corrected by ALMSTEDT BROS. Stock and Bond Brokers, 510 West Main Street, Louisville, Ky., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Louisville St. Ry, Co., pref...	100	$1,000,000	A. & O.	5	Jan. 1891	68	70
Louisville St. Ry. Co., com....	100	5,000,000	.....	...	Jan. 1891	18	19
BONDS.	Date of Issue	Amount Out-stand-ing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Louisville St. Ry. Co., 1st mort	1890	6,000,000	J. & J.	5	1930	94	95
Louisville City Ry. Co. Cons.	1884	1,000,000	J. & J.	6	1909	112	113
Central Passenger Ry. Co....	1888	400,000	M. & N.	6	1908	112	113
New Albany St. Ry. 1st Mort.	1888	150,000	J. & J.	6	1913	95	100

CHICAGO STOCKS AND BONDS.—Corrected by WILLIAM B. WRENN, 82 Washington Street, Chicago, Ill., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Chicago City.....	100	$7,000,000	Q.—J.	3	.....	310	315
Chicago Passenger.....	100	1,000,000	A. & O.	2½	.....	....	96
North Chicago City.....	100	500,000	Q.—J.	7½	.....	500	.....
North Chicago Street.....	100	5,000,000	J. & J.	4	.....	177	177½
West Division City.....	100	1,250,000	Q.—J.	8¾	.....	635	.....
West Chicago Street.....	100	10,000,000	Q.—F.	1½	.....	133	133¼
BONDS.	Date of Issue	Amount Out-stand-ing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Chicago City.....	.....	4,000,000	J. & J.	4½	.....	97½	98½
Chicago Passenger.....	1883	400,000	F. & A.	6	1903	105	109
North Chicago City, 1st mort.	.....	500,000	M. & N.	6	1900	.....	112
" " "	.....	1,640,000	M. & N.	4½	1927	93¾	94
North Chicago Street 1st mort	.....	2,350,000	J. & J.	5	1906	.....	99
West Division Railway.....	.....	3,790,000	J. & J.	5	.....	101	101½
" " " Ext....	.....	250,000	J. & D.	6	.....	100	100¼
West Chicago Street.....	.....	4,160,000	M. & N.	5	.....	101	101½
West Chicago Street, Tunnel.	.....	1,500,000	F. & A.	5	.....	.....	98

PITTSBURGH STOCKS AND BONDS.—Corrected by REA BROS. & Co., 115 Fourth Avenue, Pittsburgh, Pa., Members of New York, Philadelphia and Pittsburgh Stock Exchanges, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Central Traction R. R. Co ...	50	1,500,000	.....	..	.....	24	24¾
Citizens' Traction R. R. Co..	50	3,000,000	J. & J.	3	.....	61⅜	62
Pitts. & Birmingham R. R. Co	50	3,000,000	.....	...	.....	18⅜	18½
Pittsburgh Traction R. R. Co.	25	2,500,000	J. & J.	...	.....	....	50
Federal St. & Pleasant Valley	50	1,300,000	J. & J.	3	.....	22¾	23
Pittsburgh, Allegheny & Man	50	3,000,000	....	...	.....	36	37
West End R. R. Co.....	50	200,000	J. & J.	...	.....	70	.....
Second Avenue R. R. Co.....	50	300,000	J. & J.	3	.....	48	52½
Penn Incline Plane Co.....	50	250,000	.....	.....	.....	.....	.....
Monongahela Incline Plane Co	50	140,000	F. & A.	...	.....	.....	.....
Fort Pitt Incline Plane Co...	50	60,000	.....	...	.....	....	20
Mount Oliver Incline Plane Co	50	100,000	.....	...	.....	40	.....
Pittsburgh Incline Co.....	100	150,000	.....	...	.....	115	.....
BONDS.	Date of Issue	Amount Out-standing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Citizens' Traction R. R. Co ..	1887	1,250,000	A. & O	5	1927	107	108
Pitts. & Birmingham Traction Co.....	1889	1,500,000	M. & N.	5	1929	95	95½
Pittsburgh Traction R. R. Co.	1887	750,000	A. & O.	5	1937	.. .	104
Pleasant Valley R. R. Co.....	1891	300,000	J. & J.	5	1919	.....	.....
P., A. & M. R. R. Co.....	1891	1,500 000	J. & J.	5	1931	102	109½
Duquesne Traction Co.....	1890	1,500,000	J. & J.	5	1930	.....	98
Second Ave. Electric R. R. Co	1889	1,500,000	J. & J.	5	1909	.....	.....
Central Traction Co.....	1889	375,000	J. & J.	5	1919	.....	.....
Pleasant Valley R. R. Co.....	1873	75,000	J. & J.	6	1903	.....	.....
Union R. R. Co.....	1881	100,000	A. & O.	5	1901	.....	.....
West End R. R. Co.....	1887	75,000	J. & J.	5	1907	.....	.....
Fort Pitt Incline Plane Co...	1881	30,000	.. ...	6	1901	....	.....
Mount Oliver Incline Plane Co	1871	44,500	M. & N.	6	1901	.....	.....
Penn Incline Plane Co. 1st Mort.....	1883	125,000	.....	6	1903	.....	.....
Monongahela Incline Plane Co	1887	50,000	A. & O.	5	1892	....	.....
Monongahela Inc'e Plane Co.	1887	50,000	A. & O.	5	1897	.....	.....
Pittsburgh Incline Co.....	1889	250,000	J. & J.	6	1919	.....	.....

SAN FRANCISCO STOCKS AND BONDS.—Corrected by PHILIP BARTH, Broker, 440 California Street, San Francisco, Cal., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
City R. R. Co	100	800,000	.....	...	.....	.....	100
California St. Cable Co.....	100	1,000,000	Monthly	5	....	115½	118
Central R. R. Co.....	100	1,000,000	.....	...	.....	.....	12
Geary St., Park & Ocean R.R. Co	100	1,000,000	.....	1	.....	90	110
North Beach & Mission Ry. Co	100	1,000,000	.....	...	.....	45½	53
Ferries & Cliff House R. R. Co.	100	2,500,000	.....	...	.....	37	40
Omnibus Cable Co.....	100	2,000,000	Monthly	4	.....	65	70
Presidio & Ferries R. R. Co....	100	1,000,000	.....	...	.....	20	.....
Bonds.	Date of Issue	Am't Out-stand-ing.	Interest Paid.	%	Principal Due.	Bid.	Ask'd
Ferries & Cliff House.....	.....	650,000	M. & S.	6	1914	102	104
Market Street R. R.....	.....	3,000,000	J. & J.	6	1913	119½	120¼
Omnibus R. R.....	.....	2,000,000	A. & O.	6	1918	114	114¾
Powell Street R. R.....	.....	700.000	M. & S.	6	1912	111½	115
Park & Ocean R. R.....	.....	250,000	J. & J.	6	1914	110	115
Park & Cliff House R. R.....	.....	350,000	J. & J.	6	.....	93½	97½
Cal. St. Bds. R. R.....	.....	.....	.....	.....	.....	101⅜	102

ST. LOUIS STOCKS AND BONDS.—Corrected by JAMES CAMPBELL, Banker & Broker, 307 Pine st., St. Louis, Mo., Jan. 18.

Company.	Par.	Capital Issued.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Benton-Bellefontaine.....	100	$324,000	Q.—J.	3	1864	100	.....
Cass Ave. & Fair Grounds.....	50	300,000	.....	...	1876	44	50
Citizens'	100	1,500,000	A. & O.	1¼	1887	100	105
Jefferson Avenue.....	100	112,000	.....	..	1885	200	300
Lindell.....	100	2,500,000	Q.—J.	...	1890	56	60
Missouri.....	100	2,000,000	Q.—J.	2	1891	225	250
Mound City.....	100	1,000,000	.....	..	1890	190	200
Northern Central.....	100	200,000	.....	...	1884	100	105
People's.....	50	1,000,000	M. & S.	6	1889	40	45
St. Louis.....	100	1,000,000	J. & J.	6	1890	250	275
4th Street & Arsenal.....	50	150,000	Jan.	.50	1872	15	25
Union.....	50	600,000	.....	...	1870	20	25
Union Depot.....	100	1,200,000	.....	...	1790	200	250
St. Louis & Suburban.....	100	1,000,000	... .	...	1891	10	15
BONDS.	Date of Issue	Amount Out-stand-ing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Benton-Bellefontaine.....	1880	$500,000	F. & A.	6	1900	102	102½
Cass Avenue.....	1886	200,000	F. & A.	6	1906	100	101
Citizens' Cable.....	1887	1,500,000	J. & J.	6	1907	106	107
Lindell.....	1890	1,500,000	J. & J.	5	1895-1910	99	100
Mound City.....	1890	525,000	A. & O.	6	1900-1910	104	105
Missouri Cable.....	1887	500,000	M. & S.	6	1907	102	105
People's 1st mort.....	1882	125,000	J. & D.	6	1902	102	105
" 2d mort.....	1886	75,000	M. & N.	7	1902	104	105
People's Cable.....	1889	800,000	J. & J.	6	1889-1914	97½	100
Northern Central.....	1884	200,000	J. & J.	6	1904	100	101
St. Louis Cable.....	1890	1,500,000	M. & N.	5	1900-1910	97½	98
Union.....	1885	150,000	M. & N.	6	1895-1915	102	103
Union Depot.....	1890	1,600,000	A. & O.	6	1900-1910	104	105

PHILADELPHIA STOCKS AND BONDS.—Corrected by ROBERT GLENDINNING & Co., 143 So. Fourth st. (Bullitt Building), Philadelphia, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS							
Citizens'.....	50	$500,000	Q.—J.	4	1858	250	.....
Continental.....	50	1,000,000	J.—J.	6	1873	120	122
Frankford & Southwark.....	50	1,250,000	Q.—J.	6	1854	196	200
Germantown.....	50	1,500,000	Q.—J.	...	1858	97½	98
Green & Coates...	50	500,000	Q.—J.	3	1858	118	120
Hestonville...	50	2,050,000	.....	...	1859	30	34
Lombard & South.....	25	500,000	A.—O.	8	1861	60	62
People's Common.....	25	1,500,000	M.—S.	2½	1873	42	43
" Preferred.....	25	750,000	M.—S.	2½	.....	43	.....
Philadelphia City.....	50	1,000,000	J.—J.	7½	1859	145	146
Philadelphia & Gray's Ferry..	50	617,500	J.—J.	3½	1858	67	.....
Philadelphia Traction.....	50	5,000,000	M.—N.	3	1883	56	58
Ridge Avenue.....	50	750,000	Q.—J.	5	1872	200	205
Second & Third.....	50	1,060,200	Q.—J.	4½	1853	145	150
Thirteenth & Fifteenth.....	50	1,000,000	J.—J.	9	1858	190	192
Union.....	50	1,250,000	J.—J.	9½	1864	170	171
West Philadelphia.....	50	750,000	J.—J.	10	1857	175	176
Metropolitan (N.Y.) Traction	100	20,000,000	Q.—F.	1	.....	84	84½
Baltimore Traction.....	25	5,000,000	.....	...	1889	19	19¼
Buffalo (N. Y.) Railway.....	100	6,000,000	.....	...	.....	25	30
Newark (N. J.) Passenger....	100	6,000,000	.....	...	.....	15	20
BONDS.	Date of Issue	Amount Out-stand-ing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Baltimore Traction 1st Mort.	1889	1,500,000	M.—N.	5	1929	106½	.....
" " Imp.	1892	1,250,000	M.—S.	6	1901	102½	.....
Germantown, 1st mort.....	.....	67,000	J.—D.	5	1904	103	.....
" 2d mort.....	.....	160,000	A.—O.	5	1899	103	.....
Hestonville, 1st mort.....	.....	300,000	M.—N.	6	1895	104	.....
" " "	.....	124,500	J.—J.	6	1901	105	.....
" 2d mort..... ...	.....	75,000	M.—S.	6	1902	105	.....
People's, 1st mort.....	.....	219,000	J.—J.	7	1905	115	.....
" " "	.....	285,000	J.—J.	5	1911	100	.....
" Cons. mort.....	.....	247,000	M.—S.	5	1912	95	.....
West Philadelphia, 1st mort..	.....	246,000	A.—O.	6	1906	117	.....

OMAHA STOCKS AND BONDS.—Corrected by RICHARD C. PATTERSON Banker and Broker, 907 N. Y. Life Building, Omaha, Neb., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Omaha St. Ry. Co	100	5,000,000	M. & N.	....	Jan. 1, '89	60	.....
BONDS.	Date of Issue	Am't Out-standing.	Inter'st Paid.	%	Principal Due.	Bid.	Ask'd
Omaha St. Ry. Co	1889	2,500,000	M. & N.	5	M'y 1, 1914	95	98

CINCINNATI STOCKS AND BONDS.—Corrected by GEO. EUSTIS & CO., Bankers and Brokers, 26 West Third Street, Cincinnati, Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Cincinnati	50	$6,000,000	Q.—J.	5	.....	108¾	109
Mt. Adams & Eden Park	50	1,400,000	Q.—J.	5	.....	109	109½
S. Covington & Cincinnati	50	275,000	J. & D.	6	.....	120	123½
Mt. Auburn Cable	100	300,000	.....	...	.....	47½	50
Cin. Inclined Plane Ry	100	500,000	.....	...	.....	52	55
" " " Pref.	100	100,000	.....	6	.....	90	92½
BONDS.	Date of Issue	Amount Out-standing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Cincinnati Street	.....	50,000	J. & J.	7	July, 1892	100½	102½
" "	.....	50,000	J. & J.	7	July, 1893	102	.....
" "	.....	50,000	J. & J.	7	July, 1894	104	.....
" "	.....	50,000	J. & J.	7	July, 1895	.....	110
" "	.....	50,000	J. & J.	7	July, 1896	108	112
" " extended	.....	100,000	J. & J.	4	July, 1896	.....	101
	.....	50,000	J. & J.	5	July, '96	103½	.....
Mt. Adams & Eden Park	.....	50,000	A. & O.	6	July, 1895	.....	.....
" " "	.....	50,000	A. & O.	6	July, 1900	104½	.....
" " "	.....	100,000	A. & O.	6	July, 1905	.....	.....
" " 10-20's	.....	200,000	J. & D.	6	Je. '94-1924	105½	.....
" " Cable	.....	280,000	M. & S.	5	Mar. 1906	104	105
Cin. Inclined Plane Ry	.....	125,000	J. & J.	7	July, 1899	107½	115
" " " "	.....	300,000	J. & J.	6	Jan. 1914	104	105
Mt. Auburn Cable	.....	200,000	J. & D.	5	June, 1907	90	92½
" " 5-20's 2d	.....	100,000	A. & O.	7	Ap. '93-1908	100	103
S. Covington & Cincinnati	.....	250,000	M. & S.	6	Mar. 1912	110	114

BALTIMORE STOCKS AND BONDS.—Corrected by HAMBLETON & CO., Bankers, 9 South Street, Baltimore, Md., Jan. 19.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Balto. City Pass. Ry. Co	25	1,000,000	Quart.	3	.....	60	65
Union Pass. Ry. Co	50	750,000	.....	...	.....	.....	.....
Highlandtown & Point Breeze Ry. Co	50	189 000	.....	...	.....	.....	.....
Balto. Traction Co. (Cable)	25	5,000,000	Quart.	1	.....	19	19½
North Balto. Pass. Ry	25	600,000	Sem an	3	.....	31	32
BONDS.	Date of Issue	Amount Out-standing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask,d
Central Pass. Ry	1882	250,000	J. & J.	6	1912	110	112
Union Ry. Co. 1st mort	.....	50,000	M. & N.	6	.....	105	.....
" " cons. mort	.....	1,500,000	.....	5	.....	93	100
Balto. Traction Co. (Cable)	1889	1,500,000	M. & N.	5	1929	106	106½
City Pass. R. R. Co	1891	2,000,000	"	5	1911	107½	108

WASHINGTON STOCKS AND BONDS.—Corrected by CRANE, PARRIS & CO., Bankers, 1344 F Street, N.W., Washington, D. C., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Wash'ton & Georgetown R.R.	50	500,000	Q. F.	...	1863	235	250
Metropolitan R. R.	50	750,000	Q. J.	...	1864	95	104
Columbia R. R.	50	400,000	Q. M.	...	1870	63	70
Capitol & North O St. R. R.	50	500,000	Q. J.	...	1875	41	42¼
Eckington & Soldiers' Home	50	352,000	.....	...	.....	31	40
Georgetown & Tenallytown	50	200,000	.....	...	.....	48¾	52
Rock Creek R. R.	100	401,700	.....	...	.....	100	.....
Glen Echo R. R.	50	100,000	.....	...	.....	.....	.....
BONDS.	Date of Issue	Amount Out-standing.	Inter-est Paid.	%	Principal Due.	Bid.	Ask'd
Washington & Georgetown	1883	500,000	J. & J.	6	1893-1923	101½	104
do. do. convert.	'83-'91	2.000,000	J. & J.	6	1899-1929	149	155
Eckington & Soldiers' Home	.....	100,000	J. & D.	6	1896-1911	93	.....
Capitol & North O St. R. R.	1891	250,000	J. & J.	5	1921	103½	114
Metropolitan R. R. convert.	1891	200,000	J. & J.	6	1901	115	117

CLEVELAND STOCKS.—Corrected by W. J. HAYES & SONS, Bankers, Cleveland, O., Jan. 18.

Company.	Par.	Capital.	Period.	% last div.	Date of Issue.	Bid.	Ask'd
STOCKS.							
Broadway & Newburgh R. R.	100	1,000,000	.....	....	.....	106	110
Brooklyn St. R. R.	100	310,000	.....	2	.....	170	175
Cleveland City Cable, common	100	4,000,000	.....	....	.....	22½	25
" " pref'd	100		.....	....	.....	95	105
East Cleveland R. R.	50	2,000,000	Quart.	1½	.....	75	78
Woodlawn Ave. & West Side	100	1,100,000	Quart.	1½	.....	145	150

The Street Railway Stock Market.

While there are four of our City street railway stocks, and one Brooklyn street railway stock, besides the Manhattan Elevated Road, listed on the New York Stock Exchange, with the exception of the Manhattan securities, which are always active, no quotations upon the others have been made on the floor of the Stock Exchange for a long time; so long, in fact, that one of the largest dealers in street railway securities recently said he could not recall a sale in the Exchange for several years.

This state of affairs shows that, up to date, street railway stocks are a class of securities to be dealt in privately, and in each case when a sale is attempted, by indvidual explanations not well understood by the investing public generally; which means, that this class of stocks and bonds costs more labor and talk to sell them than those of the steam railways most active on the Exchange. Such a condition of things tends to keep street railway stock values lower than would be the case if all investors were fully acquainted with them.

Because of this keeping in the background, which may be due to the horse car system as a slower means of street railway communication, the general state of the street railway stock market is almost wholly dependent upon the condition of the general market for all securities, as is shown in the purchases and sales upon all of the exchanges in the country. That is, up to date, street railway securities are more or less regulated by outside active values than by their intrinsic merit. Now, this, in view of the rapid changes taking place in all parts of the country through the introduction of the electric and cable systems, and the necessity to obtain with greater facility the large sums of money required for their establishment, may at an early day alter the prevailing condition of things through the adoption of stock exchange methods to make such securities better known, to the end that street railway shares may be bought and sold for what they are worth, regardless of the relation of other securities.

But as it is now our business to record matters as they are rather than what they ought to be or may become, it is interesting to note that the general state of the stock market during the last month has been on the whole firm, to rising. And it is safe to forecast a continuance of this state of affairs, provided no unforeseen catastrophe occurs, such as a large failure or series of small ones, or some stoppage arises to the prevailing tendency towards larger purchases of all good securities. Of course these "provideds" are numerous enough, as they cover all misfortunes sufficiently large to affect the general market, but we can safely say that the present is the best time we have had for nearly two years to float new street railway companies, securities. The greatest argument in favor of a bull market we have had since our last issue is, the dispatches from France that that country is becoming an active buyer of our securities. This information is of momentous consequence; so large in fact that few people, if any, are able to calculate the large benefits our commercial prosperity is likely to get out of it. We have no space here to explain the details of this significant movement, but feel safe in saying that if the French are not defrauded by some of our wildcat affairs before they learn of the solid merit of our good securities, that Nation alone is competent to offset many another ill, which without its aid might prove most disastrous.

Our steam railway earnings—gross—for December,

went ahead of any figures for the year, or about eight per cent. in excess of the same month in 1890; this large matter added to the increased purchases of our stocks in England, the heavy crop transportation movement from the interior to our seaboard, the fair condition of trade throughout the country, and the recent increased demand for bonds on our Exchange, puts an altogether promising outlook upon all stock transactions. Gross railway earnings for January show a slight falling off in the rate of increase shown in the December figures, which is as much due to snow blockades and severe winter weather as any other cause, for there yet remains more grain to be hauled than the railways can take care of; at the same time January's figures are somewhat larger than a year ago. Money has been decidedly easier during the past month, and to such an extent that the savings banks and big insurance companies have been obliged to buy railway securities in order to keep their money moving. This fact is likely to affect the general market in a favorable way, as all additional buyers tend to put up prices.

It is an open question with some financiers whether the prevailing quotations of stocks have not already risen during the past year as much as the increased railway earnings and other favorable conditions warrant; for such advance is shown to be an average of twenty per cent. among the more active stocks, while the increase in actual dividends would warrant only about a seven per cent. rise. At the same time the abnormally low prices at January 1, 1891, must be taken into the calculation. J. M. B.

Financial.

THE Georgetown (Ky.) Street Railway Co. have declared a semi-annual dividend of four per cent.

$ $ $

THE Springfield (Ill.) Electric Railway Co. have certified to an increase of capital stock from $50,000 to $100,000.

$ $ $

THE directors of the Jersey City (N. J.) & Bergen Railroad have declared a semi-annual dividend of five per cent.

$ $ $

THE Union Street Railroad Co. of New Bedford, Mass., declared a quarterly dividend of two per cent. on January 14.

$ $ $

THE Murphysboro (Mo.) Street Railway Co. have filed a certificate of decrease of capital stock from $25,000 to $11,000.

$ $ $

THE stockholders of the Erie (Pa.) Motor Co. have voted to increase the bonded indebtedness of the company $150,000.

$ $ $

THE City Passenger Railway Co., of Wilmington, Del., have declared a semi-annual dividend of two and a half per cent.

$ $ $

THE stockholders of the Redlands (Cal.) Street Railway Co. propose to increase the capital stock of that company from $50,000 to $75,000.

$ $ $

THE West End Street Railway Co. of Rockford, Ill., have filed a certificate of the increase of their capital stock from $30,000 to $75,000.

$ $ $

THE earnings of the Atlanta (Ga.) Consolidated Street Railway Co. for November were $28,400, as against $24,290 for the corresponding period last year.

$ $ $

AT the annual meeting of the Johnstown (N. Y,) Gloversville & Kingsboro Street Railroad Co. a dividend of three per cent. on the capital stock was declared.

$ $ $

THE gross earnings of the Galveston (Tex.) City Railway Co. for 1891 reached $156,000, which represents 3,120,000 passengers carried, or an increase in earnings of about $23,000 over last year.

$ $ $

THE United Electric Railway Co., of Nashville, Tenn., will issue $200,000 of second mortgage income bonds. The Nashville Trust Co. are trustees. The coupons are payable in cash or in tickets.

$ $ $

STOCKHOLDERS of the Green Lake Electric Railway Co. of Seattle, Wash., have bonded the road for $50,000. The bonds will be of $500 denomination, running twenty years and drawing six per cent. interest.

$ $ $

THE Metropolitan Street Railway Co., of Springfield, O., have voted to increase their stocks from $500,000 to $600,000 and to issue $50,000 more in bonds. The money to be thus obtained is to be used in extensions.

THE Lynn Belt Line Street Railway Co., for 1891, show cash and cash assets of $10,450.64, a surplus of $9,357.84. This income was $62,432.90, including $6,368.01 balance from last year. The passenger earnings were $54,139.40. The cost of construction was $185,200.

$ $ $

THE Newton (Mass.) Street Railway Co. have received authority from the State Railroad Commissioners to increase their capital stock from $100,000 to $135,000. The proceeds of the new stock will be used for improving the road's equipment, and probably also for the extension of the line to Auburndale.

$ $ $

NOAH HARDING, of the Fort Worth National Bank, was appointed last month by Judge Beckman as receiver of the North Side Street Railway Co. A bond of $50,000 was executed. with K. M. Van Zandt J. B. Ellison and J. J. Jarvis as sureties. The receiver was appointed at the request of Thomas Worthington.

$ $ $

THE annual report of the Concord (N. H.) Street Railway Co. showed the number of passengers carried from February 1 to December 31, 1891, 331,386; earnings for same time, $26,179.14; number of miles run, 95,822; addition to buildings and steam plant, $7,964,65; addition to rolling stock and cars, $9,374.87.

$ $ $

THE Metropolitan Street Railway Co., of Springfield, Mo., have voted to increase their capital stock from $500,000 to $600,000 and their bonded debt from $500,000 to $550,000, and to issue an entirely new series of bonds of the amount of $550.000, bearing five per cent. interest per annum, payable semi-annually in gold.

$ $ $

THE Lowell (Mass.) & Suburban Street Railway Co. have filed a mortgage of their property for $1,000,000 to the American Loan & Trust Co., of Boston. The bonds are to be $1,000 each, running twenty years at five per cent. The money will be used for extensions and for equipping the road with electric power.

$ $ $

THE Portland (Me.) Street Railroad Co. show as their gross passenger earnings of the year, $148,555.67; total earnings, $149,399.13; operating expenses, $127,880.09; taxes, $2,821.30; net income, $15,295.96; present surplus, $3,295.96. The total number of passengers carried during the year was 2,976,225, an increase over the previous year of 193,439.

$ $ $

"THE West End Street Railway's Stock," says the Boston *Advertiser*, "at seventy two and a fourth looks cheap, and we have no doubt that investors will soon begin to look at it in that way. Cambridge people seem very much enamored over the double deck cars that have been put on that line. They are said to run perfectly and be practically noiseless, producing no grinding or whistling sound."

$ $ $

THE Dubuque (Ia.) Electric Railway Light & Power Co. have filed with the county recorder a mortgage to Joe R. Lane of Davenport, trustee, to secure $200,000 of six per cent. bonds of $500 each, running until 1897. $50,000 of the proceeds of the sale of these bonds is to be applied to the redemption of the former issue, and $150,000 to the extension of the plant. The mortgage is not a first mortgage.

$ $ $

THE last annual report of the Reading, (Pa.,) City passenger Co. showed that the total receipts last year were $289,435.04. The operating expenses were $120,518.90. There was expended for new construction $45,897.04, and for increased equipment $10,300, making total expenditures of $281,424.66, leaving an actual cash balance of $8,010.38. The capital stock was increased from $300,000 to $400,000. The company carried 3,527,920 passengers.

$ $ $

THE report of the North Chicago Railroad Co. for the year 1891, was presented to the stockholders on Jan 11 by President Yerkes. During the year the receipts from passengers were $2,217,440. Operating expenses were $1,221,408, leaving a gross profit of $696,032, an increase of $245,267. There were 44,343,905 passengers carried, and 7,762,366 miles of road covered. The net profit is $613,458, which gives a dividend of 12¼ per cent. on the capital stock.

$ $ $

BROOKLYN (N. Y.) City & Newtown Railway Co. have made the following report for the last quarter of 1891: Gross earnings, $107,685; operating expenses, $78,642; fixed charges, $18,461; net income, $10,581; profit and loss, surplus, $55,070. Van Brunt Street & Erie Basin Railway Co. have made the following report for the same period: Gross earnings, $9,512; operating expenses, $6,544: fixed charges, $615; net income, $2,352; profit and loss, surplus, $25,138.

$ $ $

THE annual reports of the East Reading Electric and Reading & Southwestern Street Railway companies, operating suburban lines, also showed them to be in a flourishing condition. The latter company, in existence only four months, declared last month a dividend of two and a half per cent. They have five and a half miles of road, and the total cost of construction and equipment amounted to $124,581.63. The road has been earning money every day since it was opened to travel, and was built free of bonded indebtedness.

$ $ $

THE annual report of the Newark, (O.) & Granville Electric Railway Co. for the last fiscal year showed receipts for the year as follows: Cash car fare, $13,374.65; tickets collected $5,801.85; freight, $924,-

87; U. S. Express, 414.07; U. S. Mail, $357.29; total, $20,872.73; total expenditures, $20,039.86; balance $832.87. The increase in business over last year was $10,612.22, or more than double. Although no dividends as yet have been paid to the stockholders, the prospects are that they will realize from their investments in the near future.

$ $ $

THE Harvey (Ill.) Transit Co. have given to the Atlantic Trust Co., of New York, a mortgage to secure payment on an issue of $150,000 bonds running twenty years at six per cent., the interest payable semi-annually. The bonds are divided into 115 bonds in denomination of $1,000 and seventy bonds of $500 each. Of these $35,000 are to be held in trust to be delivered to the company upon the extension of the works to the amount of at least 100 per cent. of the bonds to be issued and that the income from these extensions amounts to at least six per cent. upon the bonds to be thus issued.

$ $ $

THE People's Passenger Railway Co. of Philadelphia, Pa., held their annual meeting January 12, The annual report stated that the past year had been a most prosperous one, notwithstanding that grain and all other commodities have been unusually high. The increased cost of grain alone was $35,000. The total number of passengers carried was 34,210,823; total income, $1,233,939; cost of operation, $757,750; net income, $476.239. Of this $259,884 has been paid in interest and fixed charges, and two dividends at $1.25 per share on 83,000 shares, amounting to $207.500 were paid, leaving a net surplus of $8,555.54.

$ $ $

DURING December the receipts on the Brooklyn Bridge from the carriage way were $7,145.67, and from the railway $98,472.90, a total of $105,618.57. The expenditures were $295,748.34. At the end of the month the cash in bank and on hand amounted to $163,180.32. The number of passengers carried on the railway during the month was 3,590,640, a daily average of 115,827 as compared with a daily average for November of 114,323. The cash fares very nearly equal the number of tickets sold in bunches, and, according to the directors, are increasing more rapidly than the sale of tickets in bunches.

$ $ $

DURING the last week of December a sharp rise took place in Chicago City Railway stock, the price going from 280 to 300. The demand was occasioned by a rumor that a large block of Alley elevated stock was to be divided among the city railway stockholders in the shape of an extra dividend. A pro rata division of the elevated stock held by the City Railway would, it is said, give to every holder of 100 shares of the City Railway stock nearly thirty-six shares of elevated railway stock. The capital stock of the elevated road is $7,500,000 and its mortgage authorizes an issue of an equal amount of bonds.

$ $ $

THE Financial statement of the West End Street Railway Co. of Boston for the quarter ending Dec. 31, 1891, the first quarter of the fiscal year, shows in comparison with the corresponding period for the preceding year as follows: Oct 1 to Dec. 31, 1891, $1,549,496; 1890. $1,493,584; increase, $55,913. Expenses and charges—1891, $1,270,249; 1890, $1.330,526; decrease, $60,276. Balance, 1891, $279,147; 1890, $163,058; increase $116,189. As will be seen, the road did not maintain its average gross increase of $1,000 per day, but the savings from operations and charges made the net gain $1,262 per day, including Sundays.

$ $ $

A DISAGREEMENT occurred last month between the governing committee of the Baltimore Stock Exchange and the Baltimore City Passenger Railway Co. in regard to the transfer of certain certificates of the latter company, and upon the refusal of the management of the company to comply with the demands of the Exchange committee, the latter caused the stock to be stricken from the Exchange list. Their action created considerable talk and unfavorable comment in financial circles. The stock will probably be listed again, but the approval of the Board of Governors of the Exchange will be required, and a deposit of twenty-five cents a share, besides the commission on the sales, demanded by the by-laws. No agreement has yet been reached.

$ $ $

IN regard to the stocks and bonds of the Chicago street railway companies generally the financial writer of the *Times* says in his review of the year: "All of the street railway companies are making money rapidly, and it is no wonder that their stocks and bonds find such great favor with the investing and speculating public. They have always had a monopoly in carrying passengers, and even when the elevated railways are in operation they will still have all they can attend to, for the city is growing wonderfully. Already they have reached the point where they are unable to do the vast work required of them promptly. The cable lines have proved to be inadequate to meet the heavy demands made on them, and their managers are lying awake nights trying to devise some means for prompt transit, without the constant breakdowns and delays that now annoy passengers. The coming World's Fair will involve the carrying of vast numbers of people, and after the necessary expenditures are made for cars and other equipment the companies will be in a position to make money at a rate never known before. Higher dividends will be paid and shares of all the lines will doubtless sell during this and next year above all former records.

The Syracuse Poles.

Those who expect to buy metal poles for electric railway construction, will be interested to know that the Syracuse Tube Works have, during January, doubled the capacity of their metal pole department. This company have also just made a contract with the Engineering Equipment Co., of 143 Liberty Street, New York, for the exclusive sale of the Syracuse pole in the Atlantic seaboard states. Already some large orders have been taken by the Engineering Equipment Co. and satisfactorily filled by the Syracuse Works. A very large number of the most approved patterns of tubular poles can be turned out weekly, so that contracts will be taken for the delivery of any given number of poles at a certain date under guarantee as to shipments. In this number of the JOURNAL will be found an illuminated advertisement of the poles. The manner of swaging the joints and strengthening the tubes is peculiar to this pole, and the tests under strain for deflections, have proven eminently satisfactory. The poles can be seen, erected, along some of the largest electric railway lines in the East, among them being, for instance, the Paterson and Trenton street railways.

What the Papers Say About It.

This road has long been noted for the beauty of its scenery, the elegance and comfort of its equipment, and as the greatest through car line on the American continent.

The main line is 450 miles in length and connects the cities of Chicago and Buffalo, with branch lines to the oil regions of Pennsylvania, Fort Wayne, Ind., and to the flourishing cities of Detroit, Jackson, Lansing, Kalamazoo, and Grand Rapids in Michigan. The main line passes through such important cities as Dunkirk, N. Y., Erie, Pa., Cleveland, Sandusky and Toledo, O., Adrian, Hillsdale, Mich.; and Goshen, Elkhart, South Bend and La Porte, Ind.

The roadbed is unsurpassed by any line in the country, and under the great improvements made during the past two years in the way of reducing curves and grades, the Lake Shore is to-day a line practically without a grade or a curve, a thoroughly constructed double-track railway, facts which give increased popularity and which have made it the favorite passenger line between the East and West, standing in the front rank among the great transportation companies of the world, a shining example of the careful, considerate, and progressive policy of its management, the double tracks permitting of a high rate of speed with entire safety, the perfect roadway giving ease and comfort to its patrons.

The equipment of its trains is, indeed, of a very high order of excellence. The sleeping, drawing-room and dining cars are of Wagner build, and nothing which the ingenuity of man could suggest for the comfort and welfare of passengers is omitted in their make-up.

The Lake Shore enjoys the distinction of being the line selected by the United States Government as the route of the fast mail trains—three daily trains being devoted almost exclusively to this branch of business—and forms in connection with the New York Central & Hudson River Railroad the greatest through mail line in the world, the line between New York and Chicago. No higher compliment could be paid to its management, and the road certainly merits the trademark it has adopted—the mail pouch.

The country traversed by it represents the richest portion of the Middle States. Its connections with other railways being made in almost every case in Union passenger stations of necessity calls to its line the people from a large territory tributary to its own immediate neighborhood. Its universally recognized excellent through train service between the cities of New York, Boston and Chicago, which has recently been increased by the addition of two new trains making thirteen through trains between the cities mentioned, ten of which are daily, has attracted the attention of people throughout the Eastern country and in Europe.

The magnificent passenger station on Van Buren Street, occupies a central position in the city of Chicago, convenient to all hotels, banks, postoffice and street railway lines, and secures to travelers immunity from the annoyance of of a long transfer across the city.

Another cause of the Lake Shore's popularity is the fact that it is the only line conveying passengers over the four track New York Central into the City of New York without a ferry transfer.

SPECIAL NOTICES.

FOR SALE.

FOR SALE.—38 lb. girder steel rails (side bearing) for relaying. S. P. S. Ellis, Penn Building, Pittsburgh, Pa.

FOR SALE.—30 twelve-foot cars, one-end type, with one fare box; in fair order. Gauge 4 ft. 8½ in. For all particulars apply to METROPOLITAN RAILROAD CO., Washington, D. C.

FOR SALE.—11 standard gauge, very light, double end Street Cars, seating 12, repaired and repainted by us in excellent manner. Very suitable for trail cars. Payment cash or on car trust. HUMPHREYS & SAYCE, 10 Wall Street, New York. 1t

FOR SALE—STREET CARS.—On account of increase of business calling for larger cars, we have for sale 9 twelve-foot double-end, box cars, with fare box in each end. Gauge 4 feet 8½ inches. Apply to UNION STREET RAILWAY Co., New Bedford, Mass.

HELP WANTED.

WANTED.—A thoroughly experienced superintendent to take charge of a street (horse) railway. No attention paid to applications unless name, salary expected, and other full particulars are given. Address "RICHARDSON," care of STREET RAILWAY JOURNAL. 1t

POSITIONS WANTED.

WANTED.—Position as trackmaster, 25 years' experience, 11 years with last company. Address "TRACK," care of STREET RAILWAY JOURNAL. 1t

WANTED.—A young practical railroad man, of twelve years' experience, desires the management of a road. Address "K," care of STREET RAILWAY JOURNAL. 1t

WANTED.—An active, practical young man, 12 years' railroad experience, desires to purchase an interest in a property which he can manage. Address "BUYER," care of STREET RAILWAY JOURNAL 1t

WANTED.—S. P. S. Ellis, Penn Building, Pittsburgh, Pa., representing Johnson Company of Johnstown, Pa., invites correspondence with manufacturers desiring to be represented in Pittsburgh and vicinity.

WANTED.—A first class cable road ropeman, capable of making the inlaid splice and doing all work connected with cables. Must come well recommended for steadiness and sobriety. Address, stating experience and salary expected, "SPLICER," care of STREET RAILWAY JOURNAL, New York. 1t

WANTED.—A man with over 10 years' experience, desires a position to take charge of the inspection and detective department of a street railway company in any part of the country. Can furnish the best of references regarding ability, etc. Address "W. F. G.," care of STREET RAILWAY JOURNAL. 4t

WANTED.—By a thoroughly practical mechanical and electrical engineer a position as superintendent or manager of an electric road. To any company about changing from horse to electric power, I will guarantee a great saving. Am competent to purchase and install both steam or electric plants of the best for the least money. Can furnish 15 years' references, which will include my record as an occasional manager and a reliable man whose whole time is given to the interests of any company by whom I am employed. Address "ECONOMICAL MANAGER," care of STREET RAILWAY JOURNAL. 3

WANTED RAILS.

We are in the market for 40 tons of either T or tram rails of not more than 25 lbs. nor less than 20 lbs. per yard. Purchase to be made in February. Parties having rails of the above description will please let us hear from them stating terms, condition of rails, etc. Address CENTRALIA AND CENTRAL CITY ST. RY. CO. S. N. PIERCE, President, Centralia, Ills. 1t

WITHDRAWAL OF AGENCY.

Until further notice we have withdrawn our agency in Chicago, lately controlled by Mr. G. A. Harmount, Monitor Electric Company, No. 149 Wabash Avenue.

All communications or orders to be addressed direct to Alfred F. Moore, Manufacturer of Insulated Electric Wire and Cables, Office and Works, No. 200 N. 3d Street, Philadelphia, Pa.

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