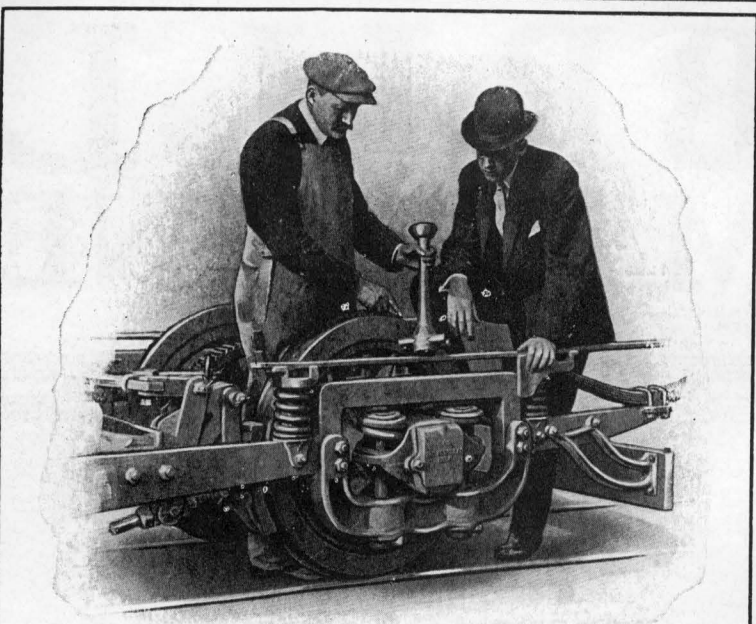


BRILL MAGAZINE



Terminal Building & Station
Indianapolis, Ind.



THE BRILL "RADIAX" TRUCK

THE long links in the Brill "Radiax" Truck permit a considerable radial movement of the axles without the links assuming an excessive inclination. The two pins at the lower end engage in grooves. The instant a movement of the links occurs, one or the other comes out of engagement with its groove, thereby setting up a powerful tendency to return to normal position. This arrangement holds the carbody steady on straight track and permits free radiation on curves. Being a Brill truck, naturally the "Radiax" has solid-forged side frames.

THE J. G. BRILL COMPANY, PHILADELPHIA

MARCH 15, 1915

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THOMAS H. TUTWILER

THOMAS H. TUTWILER, President and General Manager of the Memphis Street Railway Company, was born September 22, 1866, at Palmyra, Virginia. At the age of sixteen he joined an engineering corps of the Richmond & Allegheny R. R. (now the Chesapeake & Ohio R. R.) as rodman. After the completion of this work he was for several years engaged in the same capacity on engineer corps, surveying and constructing the Georgia, Pacific R. R. (now a part of the Southern Railway system) from Atlanta, Ga., to Greenville, Miss. In 1886 he became assistant engineer of surveys and construction, and in 1889 was appointed resident engineer in the construction of the Sunflower River bridge, in Mississippi. He was next engaged as division engineer by the Louisville, New Orleans & Texas R. R. (now a part of the Illinois Central System), in charge of surveys and construction of branch lines in Mississippi. The town of Tutwiler, Miss., was named in his honor. He entered the street railway field in 1892 as assistant engineer, and later chief engineer, of the New Orleans Traction Company, in charge of construction and maintenance, tracks and overhead lines, and remained in New Orleans till 1901. During his connection with the transportation system of the city all of the horse and steam lines were electrified and many new electric lines were built. In 1901 he became connected with the engineering firm of Ford, Bacon & Davis, and during the years 1901 to 1905 was engaged in important construction and rehabilitation street railway work in Birmingham, Ala., Kansas City, Mo., and Nashville, Tenn. In 1905 he was elected Vice-President and General Manager, and later in the same year, President and General Manager, of the Memphis Street Railway Company. Mr. Tutwiler takes great interest in details of construction, operation and maintenance. He is an advocate of publicity in public service affairs, and has pursued a liberal and expansive policy, which has resulted in the company gaining steadily in public favor. He is a member of the American Society of Civil Engineers and of the American Electric Railway Association.

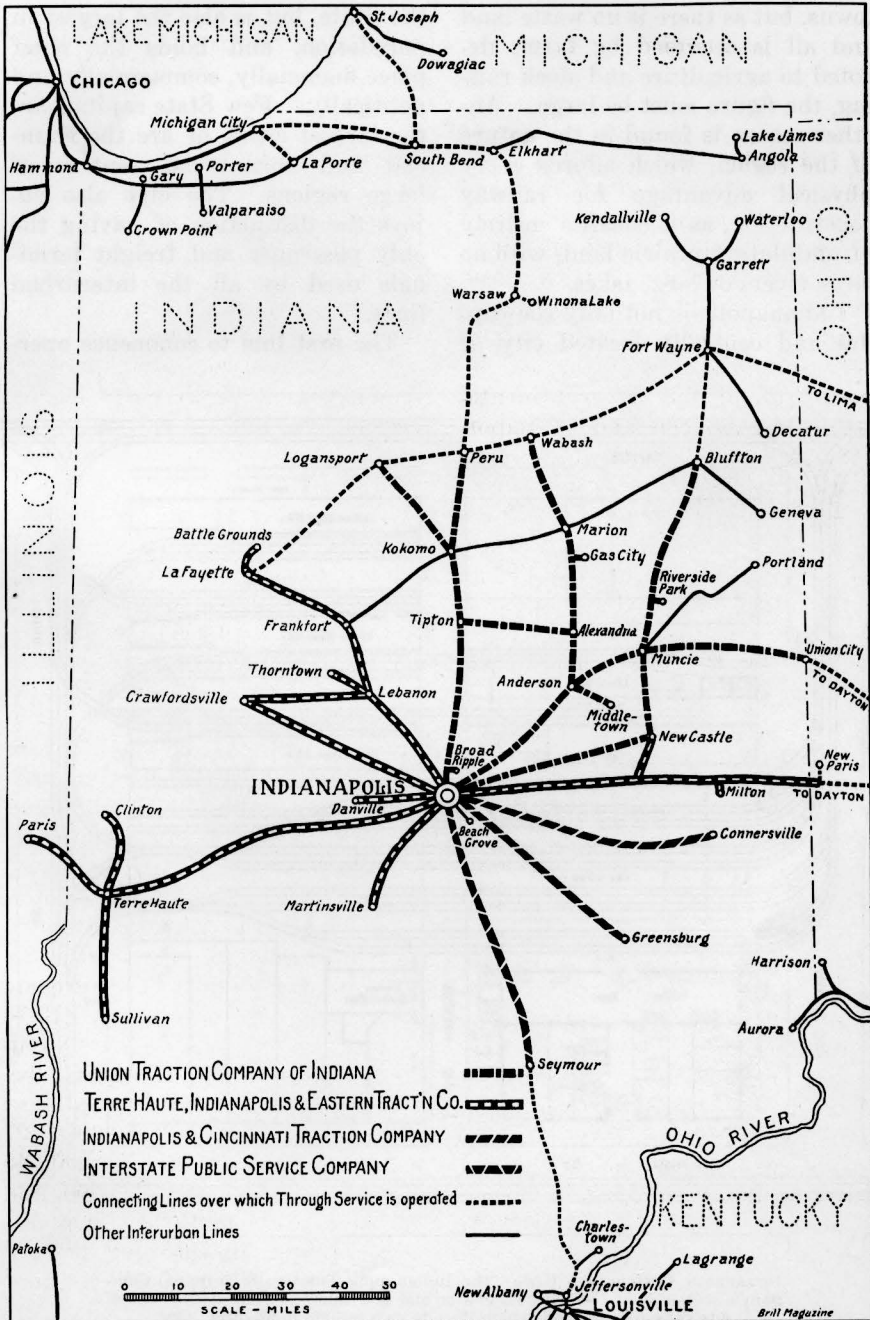
INTERURBAN CENTERS AND INTERURBAN CARS

INDIANAPOLIS

THE State of Indiana lies at the center of the great level and fertile area between the Great Lakes and the Ohio River. It is unusually well served with steam railways, which form a veritable network of tracks in every part of the State, and is traversed by nearly all of the transcontinental trunk line systems and by important north and south lines. The climate is equable, with a mean annual temperature of about 52 degrees Fahrenheit and a mean annual rainfall of about 43 inches. Agriculture is the chief industry, over 90 per cent. of the area being included in farms, of which nearly all the land is improved. The State ranks among the first in corn and wheat production, and stock raising is one of its most important industries. Immense development of the natural gas region in the east central part of the State, and the production of petroleum and coal, together with unusual shipping facilities, have made it rank high in the value, extent and producing power of its manufacturing industries. The fact that the most important manufacturing centers—Indianapolis, Terre Haute, Evansville, South Bend, Fort Wayne, Anderson, Hammond, Richmond, Muncie, Michigan City and Elwood—are in different parts of the State, instead of being confined to certain sections, has had much to do with the development of the vast scheme

of interurban railway systems throughout the State.

While the history of interurban traction only reaches back twenty years, and while many systems were in operation in other parts of the country when the first interurban car entered Indianapolis on January 1, 1900, the city quickly became the first interurban center of the world in mileage of track, and holds that precedence today. One reason for the rapid expansion of heavy traction systems centering at Indianapolis is apparent from the large number of manufacturing towns and cities and the unusual density of the rural population within the surrounding territory. Specifically, there are 174 cities and towns in Indiana which are tributary to the interurban lines converging at the metropolis, and these have a combined population of over 1,000,000; the 18 cities and towns of the neighboring States which have either direct or connecting interurban facilities with the Indianapolis terminals aggregate nearly another 1,000,000. Of these 192 cities and towns, 4 have a population of over 100,000; 3 have between 50,000 and 100,000; 23 have between 10,000 and 50,000; 27 have between 5,000 and 10,000; 48 have between 1,000 and 5,000, and 87 have less than 1,000. It is difficult to estimate the rural population of the districts which intervene between these cities and

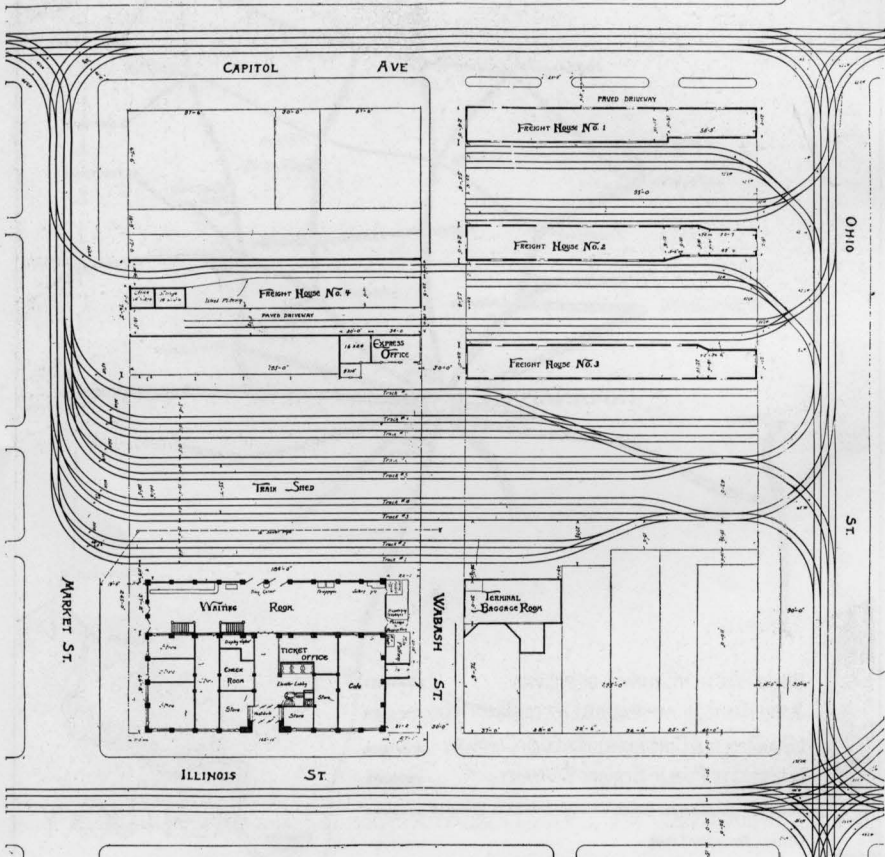


towns, but as there is no waste land and all is occupied by farms devoted to agriculture and stock raising, the figure must be large. Another reason is found in the nature of the region, which affords every physical advantage for railway construction, as it consists entirely of undulating prairie land, with no large rivers or large lakes.

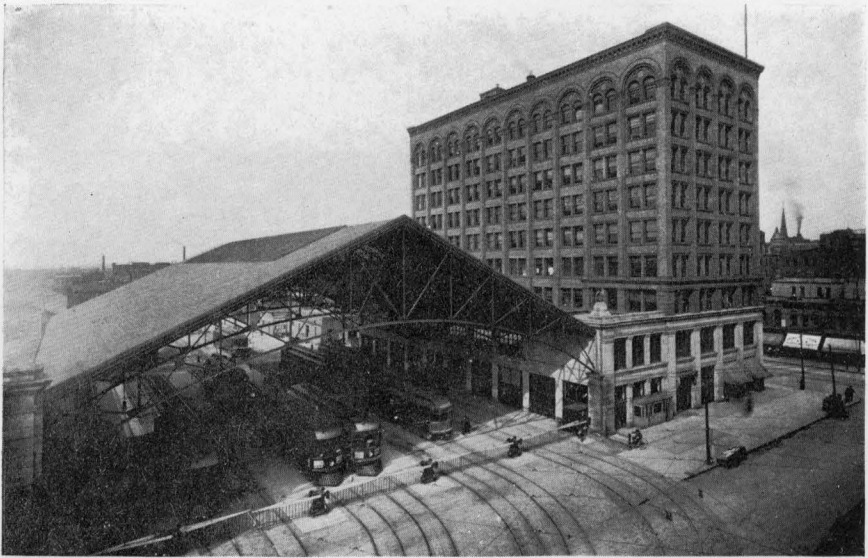
Indianapolis is not only the capital and centrally located city of

the State, but is also the largest in population, and holds the chief place financially, commercially and politically. Few State capitals are the largest cities, or are the financial and commercial centers of large regions. The city also enjoys the distinction of having the only passenger and freight terminals used by all the interurban lines.

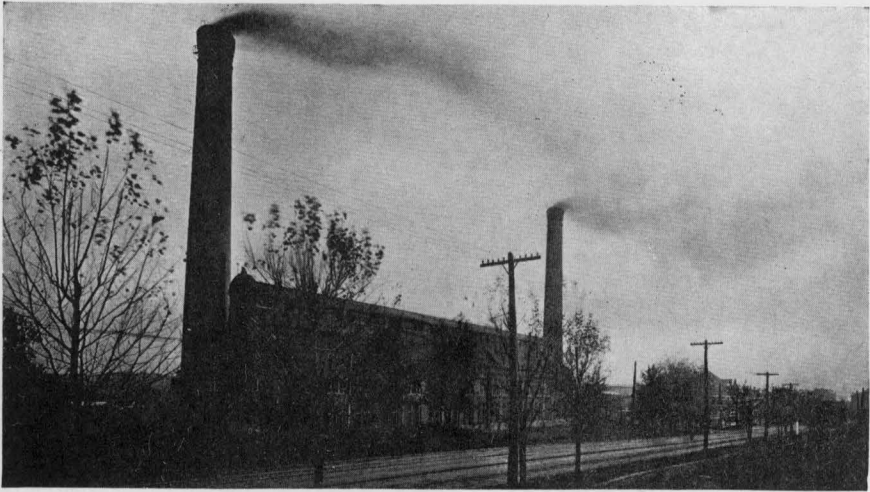
The first line to commence oper-



INTERURBAN CENTERS AND CARS. The Indianapolis Traction & Terminal Company's station is at the business center and is within one block of the central city railway loop, from which the city cars radiate in all directions.



INTERURBAN CENTERS AND CARS. Passenger and freight station of the Indianapolis Traction & Terminal Company. The four interurban systems centering at Indianapolis use the passenger and freight stations conjointly. The passenger tracks accommodate 75 passenger cars at one time.



INTERURBAN CENTERS AND CARS. Anderson Power Station of the Union Traction Company of Indiana.

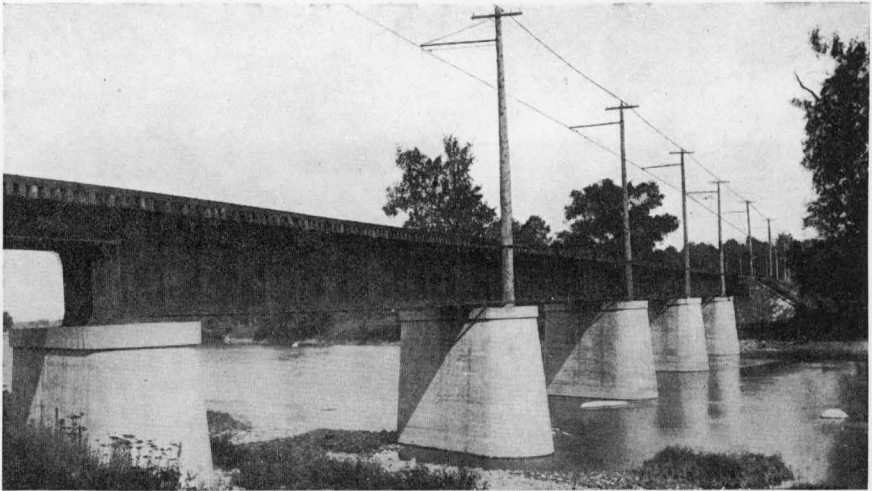
ation was the Indianapolis, Columbus & Southern Traction to Greenwood, 10 miles south of Indianapolis, January 1, 1900, and was followed a few months later by the Eastern Division of the Terre Haute, Indianapolis & Eastern to Greenfield, 21 miles. Thereafter,

and up to 1911, new lines were opened at the rate of one a year, so that at present there are 12 distinct heavy traction lines radiating in all directions. These lines are grouped into four interurban systems having a combined trackage of 1,080 miles—the Union Traction Com-

pany of Indiana, 420 miles; Terre Haute, Indianapolis & Eastern Traction, 425 miles; Indianapolis & Cincinnati Traction, 118 miles, and the Interstate Public Service, 117 miles. Five other systems over which through service is operated are the Fort Wayne & Northern Indiana Traction, with 220 miles of trackage; Winona Interurban Railway, 76 miles; Chicago, South



INTERURBAN CENTERS AND CARS. Interlocking signal station on Union Traction line north of Carmel at crossing of steam railroad.



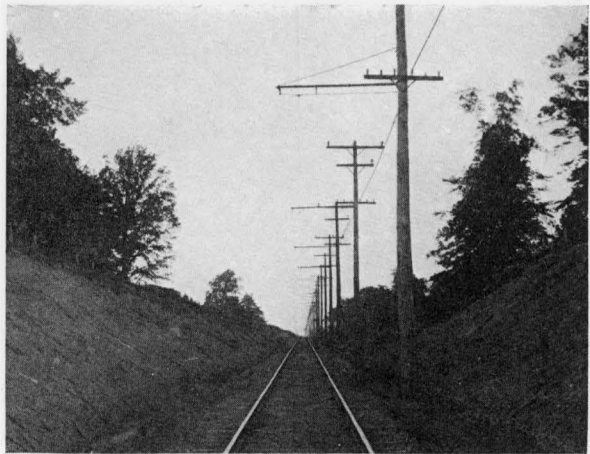
INTERURBAN CENTERS AND CARS. White River bridge at Broad Ripple on the Union Traction System.

Bend & Northern Indiana Railway, 120 miles; Southern Michigan Railway, 37 miles, and Ohio Electric Railway, 670 miles. These raise the mileage of track to 2,203, and if the connecting railways of other parts of the State and of Ohio and Michigan are included, the enormous aggregate of approximately 4,000 is totaled.

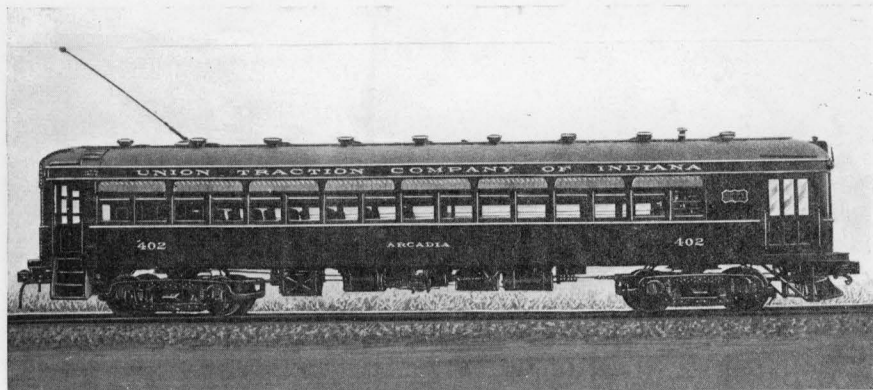
Other interesting figures which show the phenomenal expansion of the lines directly connected with Indianapolis are the passenger traffic statistics of each year. Beginning with 1900, the totals were 377,-761, 955,554, 1,523,-411, 2,347,936, 3,274,-654, 3,881,332, 4,469,-982, 5,032,677, 4,979,-371, 5,156,906, 5,736,-

272, 6,431,714, 6,524,366, 7,012,763.

The four interurban railways which enter Indianapolis have the use of the power and tracks within the city, and the passenger and freight terminals under franchises and agreements with the city and with the Indianapolis Traction &



INTERURBAN CENTERS AND CARS. A cut on the Union Traction lines north of Broad Ripple.



INTERURBAN CENTERS AND CARS. Standard combination car of the Union Traction Company of Indiana. Length over vestibules, 61 ft. 5 in.

Terminal Company, which owns the terminal property and operates the city system, comprising 140 miles of track. The passenger and freight terminals cover the larger part of a square of about four acres in extent at the center of the city, and were opened for business on September 4, 1904. Facilities are provided in the passenger trackage of the terminal for 85 pas-

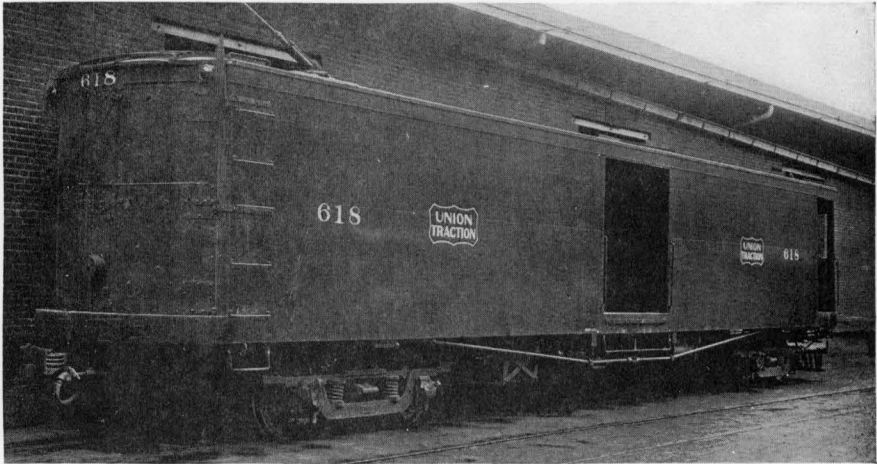
senger cars at the same time, and there are frequent occasions when the entire trackage is used.

For the year 1914, the number of interurban and suburban passenger cars arriving and departing at the terminal totaled 259,806, an average of 712 per day. The smallest number for any month was in February — 17,315; the largest number was in July—24,896. The number of freight cars arriving and departing for the same year was 25,488, an average of 70 per day. Combining the totals of passenger and freight cars gives an aggregate of 285,294 for the year, a daily average of 782.

Through limited trains are operated between Indianapolis and the following cities; the table also gives time between terminals.



INTERURBAN CENTERS AND CARS. Interior of above car. Seating capacity, 56



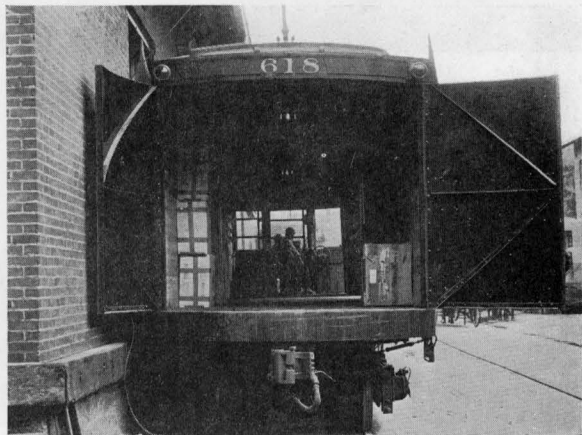
INTERURBAN CENTERS AND CARS. Freight car of the Union Traction system equipped for single-end operation.

	Miles	Time	Trains Daily Each Way
Ft. Wayne	136	4 hrs. 55 min.	10
Goshen	160	5 hrs. 27 min.	2
Louisville	117	4 hrs.	6
Terre Haute	72	2 hrs. 25 min.	7
Marion	72	2 hrs. 40 min.	2
LaFayette	70	2 hrs. 10 min.	5
Richmond	70	2 hrs. 35 min.	7
Muncie	57	1 hr. 50 min.	10
Connersville	58	1 hr. 55 min.	4
Greensburg	49	1 hr. 45 min.	6

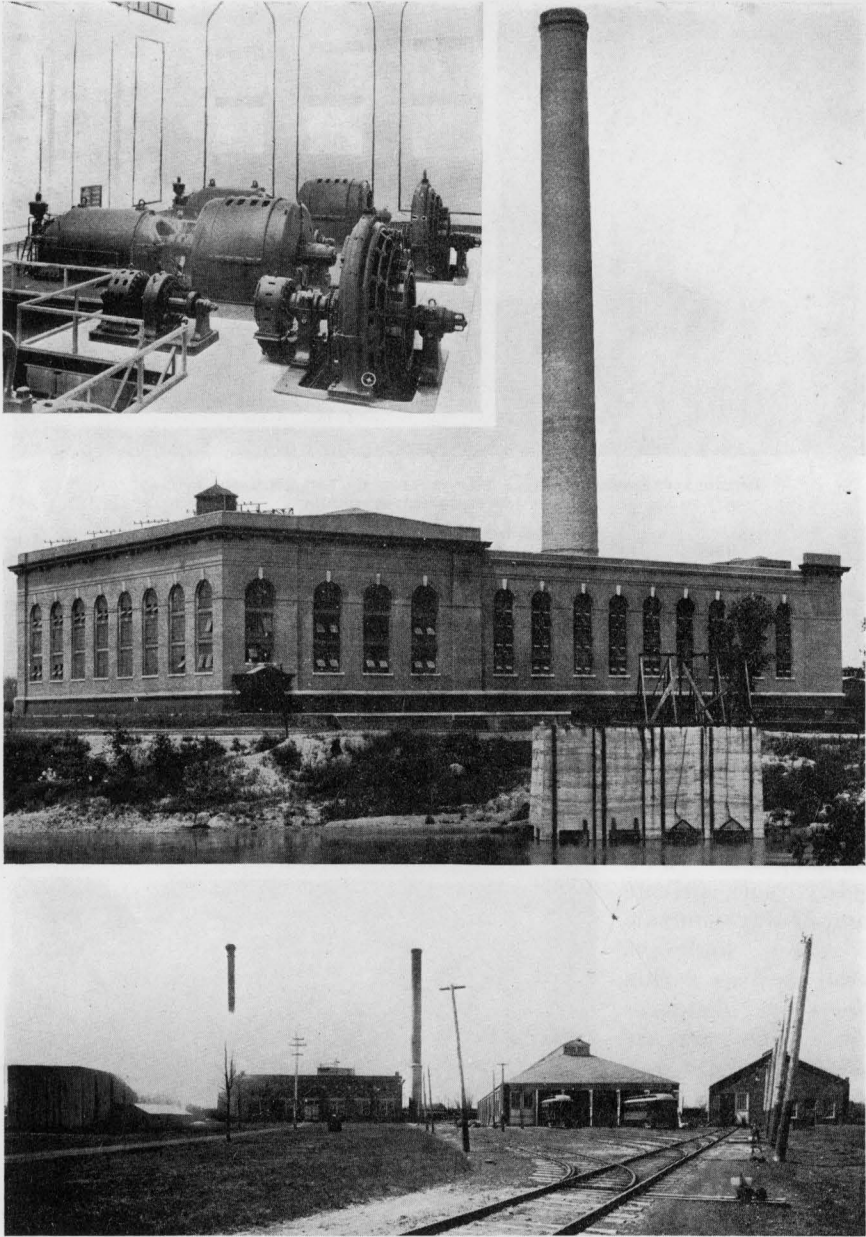
operation; four motors of 75 to 100 horse-power capacity each are used per car. The maximum speed is 60 miles per hour, and the average number of stops is about 1 1-3 per mile.

The illustrations which accompany this article are typical of all of the lines of the region, and not

All the interurban lines running out of Indianapolis are mostly on private right-of-way outside of cities, highways being used as a rule for short distances only. The cars are run both single and in trains of two, and occasionally three cars, and are equipped with multiple-unit control on all lines except one. All the lines are equipped for trolley



INTERURBAN CENTERS AND CARS. End view of car shown above. Full-width end doors enable the car to handle automobiles and bulky freight.



Indianapolis power station of the T. H. I. & E. Traction Company on White River in Indianapolis.

Power station and car barn on the Northwestern Division of the T. H. I. & E. at Lebanon.

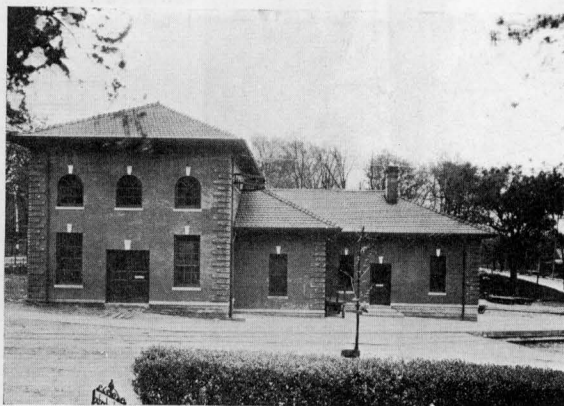
merely of the particular systems which they represent, as the district served by each system presents the same operating conditions as the others. The rails are chiefly of 72 and 80-lb. section, laid largely on oak ties, with stone ballast. All lines on private right-of-way are fenced and furnished

with suitable means at roadway crossings for preventing cattle from straying on the railway property. As nearly all of the land is level, long stretches of straight track are common to all of the systems. The curves outside of cities are generally of large radii, and grades are few and low. Large portions of some of the lines are equipped with block signals, and interlockers at steam railway crossings. Highway signals and other safety devices follow the most modern practice. The several types of bridges illustrated indicate the substantial character of this part of line construction. Concrete is largely used in both larger and smaller bridge construction and for the culverts over the many small water courses which abound in all parts of the State.

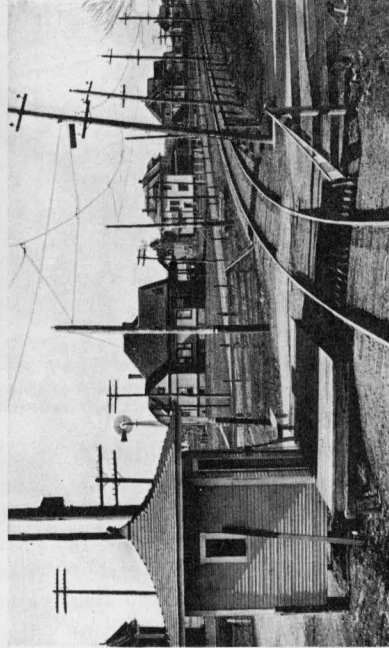
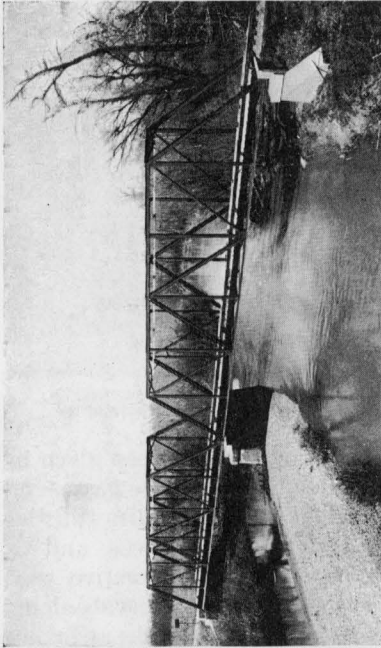


INTERURBAN CENTERS AND CARS. Joint passenger, freight and sub-station at Plainfield on the Brazil Division of the T. H. I. & E.

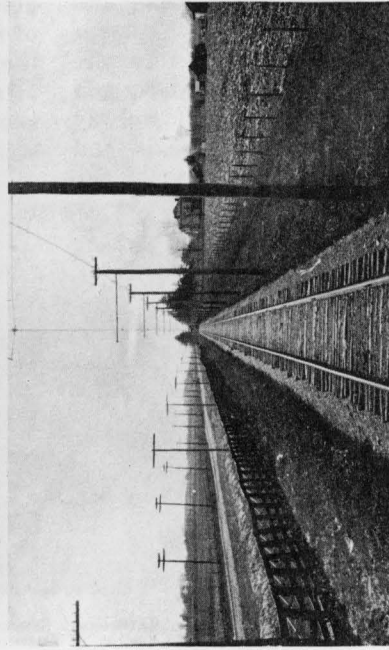
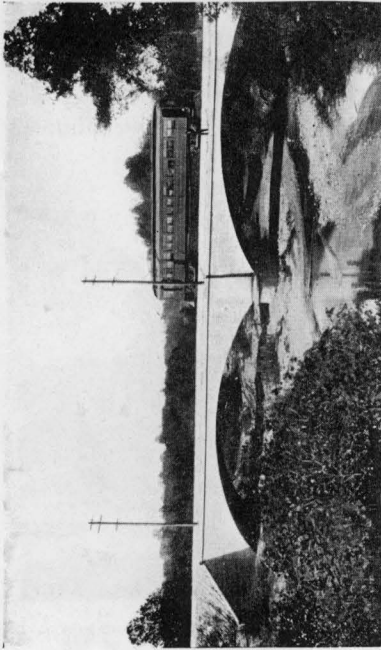
Much attention has been given to the provision of adequate passenger and freight station facilities in the cities and principal towns, and to the construction of attractive way stations at frequent intervals along the routes. Railway parks at favorable locations in relation to length of runs from populous centers have been developed and provided with attractions for stimulating excursion traffic during the summer season.



INTERURBAN CENTERS AND CARS. Joint passenger and sub-station at Greencastle on the Brazil Division of the T. H. I. & E.

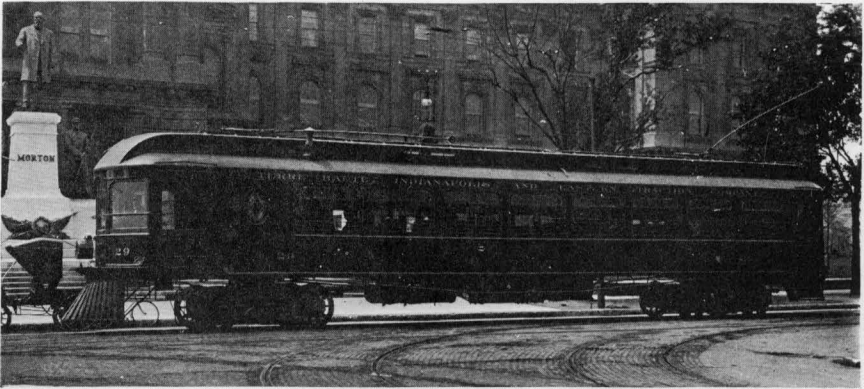


Steel bridge south of Lafayette.
Antioch, a farmers' settlement, four miles south of Frankfort.



Concrete bridge at Plainfield.
Typical track scene on the Northwestern Division.

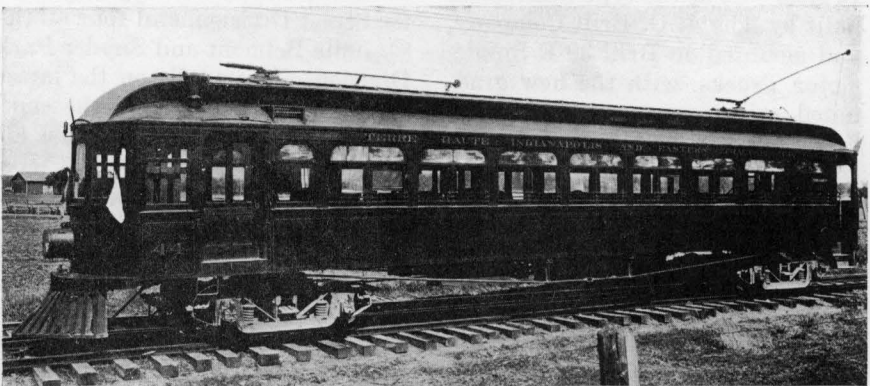
VIEWS ON THE TERRE HAUTE, INDIANAPOLIS & EASTERN LINES



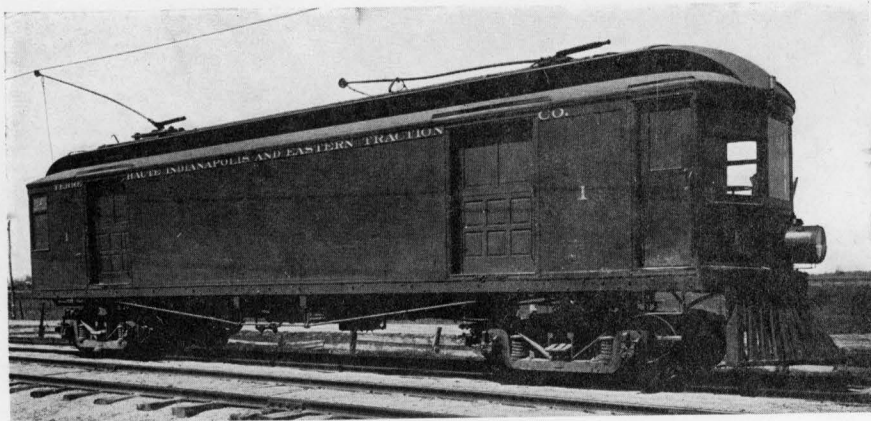
INTERURBAN CENTERS AND CARS. Combination passenger and baggage car of the T. H. I. & E. system. Length over vestibules, 60 ft. 2 in. Seating capacity, 56

A large part of the car equipment of these systems is of the three-compartment type illustrated. These are about 60 feet long, have seating capacity in the main compartment for 36, and for 20 in the smoking section. The use of a baggage compartment was long ago demonstrated to be necessary for the encouragement of traffic which would otherwise go to the steam roads. Older types of cars had but

two compartments, the baggage section, with its folding seats, being used by smokers. When the lines became longer and baggage compartment facilities for smokers became too limited and uncomfortable, long cars with commodious smoking compartments were adopted, and after the first few years became the prevailing type of rolling stock. Practically all of the cars are of wooden construction



INTERURBAN CENTERS AND CARS. Another type of combination passenger and baggage car of the T. H. I. & E. system.



INTERURBAN CENTERS AND CARS. Standard type of freight car of the T. H. I. & E. lines.

built on composite underframes, and have attractive interiors, with high-back seats, parcel racks, toilet

rooms, large windows and excellent lighting and ventilating arrangements.

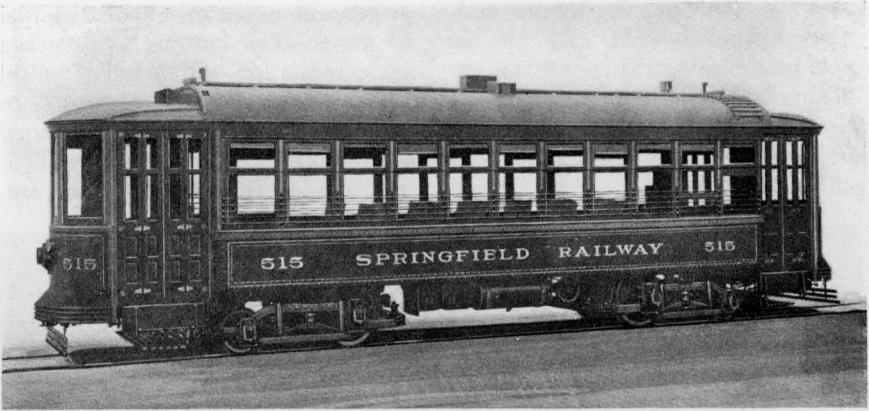
STEEL CARS FOR SPRINGFIELD, OHIO

BRILL SINGLE-MOTOR TRUCKS

THE Springfield Railway Company, of Springfield, Ohio, has added to its rolling stock 10 steel cars of the type illustrated, built by The J. G. Brill Company, and mounted on Brill 39-E Single-motor Trucks, with the new graduated spring system. These cars have the pay-within method of fare collection, which has been found well adapted to the characteristics of the Springfield lines. Prepayment methods have been in use on the city system for three years, and the present platform plan, including the entrance-exit features, are the result of careful experimentation to secure that which is best suited to local requirements.

The new cars have been divided between three divisions; four were placed on the six-mile Limestone Division, two on the 7½-mile Center Street Division, and four on the 8½-mile Belmont and Snyder Park Division. The traffic on the latter division is heavy during the summer season on account of the attractions of the magnificent city park, which lies but a few miles west of the center of Springfield, and upon which the municipality has expended large sums in beautifying and improving.

While the new cars do not differ radically from former equipment, there are a number of interesting features, to which attention is di-

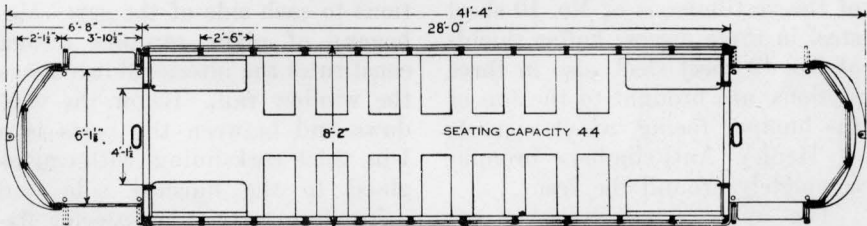


STEEL CARS FOR SPRINGFIELD, OHIO. The doors at both sides of the platforms are the same, except that those at diagonal corners are operated at conductor's position, while the others are controlled by handles in front of the motorman. All ten cars are mounted on Brill 39-E Trucks.

rected. The framing construction consists of girder sides of 3-16-in. plate reinforced at the top with flat bar, and double-riveted at the bottom to angle sills. These plates are 29 inches high, and in one piece from corner post to corner post; they are connected with the end plates, which are bent around the corner posts and brought to the bulkhead posts. End sills of deep channel section are reinforced at their connection with the side sills with extra wide $\frac{3}{8}$ -in. gusset plates. As the load is entirely borne by the side construction, the crossings are

of light channels. Cast-steel bolsters are made with extended ribs, to which the ends of the four platform channel knees are riveted. Long diagonal crossings at the center of the underframe aid to preserve the squareness of the entire structure.

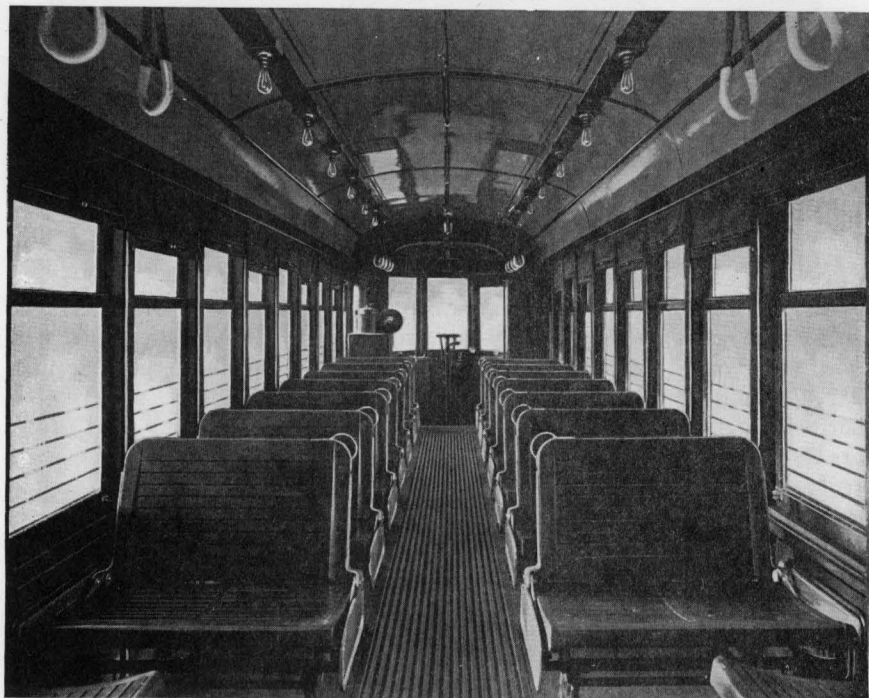
Continuous tee posts comprise the main members of the upper structure, including the corner posts. Tees are also used at the center of the vestibule, while angles are used for the vestibule door jambs and bulkhead posts. Furring blocks are fitted to the tee car-



STEEL CARS FOR SPRINGFIELD, OHIO. From track to under side of side sills, 2 ft. 8½ in.; underside of sills over trolley boards, 8 ft. 8½ in.; floor to center head-lining, 7 ft. 10½ in.; track to step, 16 in.; step to platform, 13½ in.; platform to floor, 9 in.; wheel base of trucks, 4 ft. 10 in.; diameter of wheels, 34 and 22 in.; total weight, 37,020 lb.

lines for attaching the tongue-and-grooved roof boards. As will be seen in the illustration of the exterior of the car, the curvatures of the body roof and the hoods differ to provide space for automatic bulkhead ventilators. Sheathing

posts. They are provided with No. 14 gauge steel battens to give the appearance of independent sash. The lower sashes are arranged to raise their full height, and the window openings are protected by five-bar window guards in three sec-

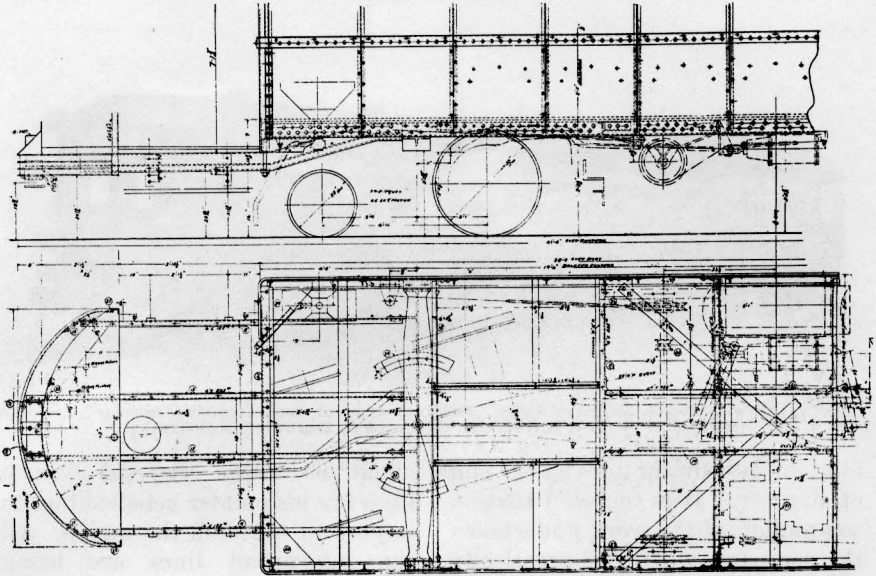


STEEL CARS FOR SPRINGFIELD, OHIO. Mahogany is used for the interior finish, with cork insulated sides below the window rails. Brill "Winner" seats are of mahogany slat construction.

of the vestibules is of No. 10 sheet steel in three pieces; buffer shields of No. 12 sheet steel, also in three sections, are brought to the top of the bumper facing, which consists of Hedley Anti-climbers brought completely around the front.

The upper window sashes are stationary, framed in a continuous piece from corner post to corner post, and securely bolted to the tee

tions to each side of the car. Mahogany of plain, sanitary design constitutes the interior finish above the window rail. Below the windows and between the posts is a 1-in. thick cork lining, with canvas glued to the finished side and painted to match the interior finish. Sheet steel, painted to match the interior finish, is employed for the vestibule lining, and is set up



STEEL CARS FOR SPRINGFIELD, OHIO. The side girders are made of 3-16 in. plate, 29 in. high, reinforced at top and bottom, and as they carry all the load, light channels are used for the crossings.

two inches from the floor. Head linings of 3-16-in. agasote, divided into three panels, complete the interior construction.

Mahogany slat seats of the Brill "Winner" reversible-back type, and corner seats of the same material, are installed in all of the cars. Three drop sashes, with single lights of glass, are used in the ves-

tibules, and double, outwardly-folding, two-leaf doors are at both sides of the vestibules, and operate in conjunction with the steps.

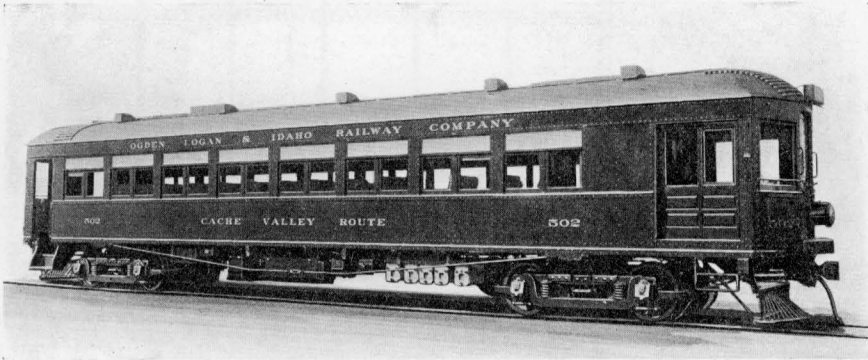
Recent improvements which have been made in connection with the Springfield Railway Company's lines are five miles of new routes, new barns, shops and a power station.

CARS FOR NEW CONSOLIDATED LINES IN SOUTHERN UTAH

STEEL COMBINATION TYPE

THE Ogden, Logan & Idaho Railway Company was organized in October, 1914, to take over the properties of the Ogden Rapid Transit Company and the

Logan Rapid Transit Company. At present the company is operating about 50 miles of interurban lines; extensions are under construction which will raise the trackage to 96

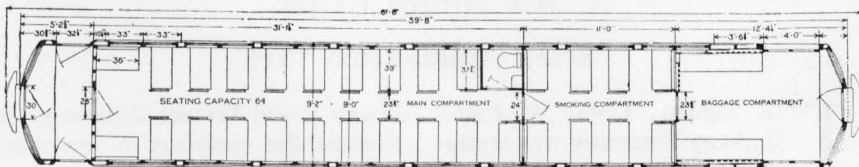


NEW CARS FOR SOUTHERN UTAH. Standard type of three compartment car adopted by the O. L. & I. system. Mounted on Brill 27-M.C.B.3X Trucks.

miles of interurban lines by the end of summer. It is reported that on completion of the work undertaken the company will have practically 135 miles of interurban track, in addition to about six miles of city lines in Logan and 40 miles in Ogden. A union station at Ogden for the use of the company and the line of the Salt Lake & Ogden Railway, which extends from Salt Lake City to Ogden, has recently been completed. The new lines will give interurban service from Preston, in Idaho, south through the towns of Smithfield, Logan, Providence and many intervening towns in the Cache Valley; from Providence in a southwesterly direction to Brigham City, thence directly south to Ogden, a distance in all of

about 65 miles. Several branch lines are also under construction to important towns in the region. All the interurban lines are being equipped with catenary overhead construction, and will be operated at 1,500 volts, direct current.

Three steel cars of the type illustrated have been delivered to the system by the American Car Company. These cars are equipped for double-end operation, multiple-unit control, and have train doors at both ends. They are mounted on Brill 27-MCB-3X trucks, with four 1,500-volt motors per car of 110 horsepower capacity each, and capable of a speed of 60 miles per hour. Fast schedules can be maintained, as the stops average one to each two miles.



NEW CARS FOR SOUTHERN UTAH. From track to underside of side sill, 3 ft. 6 1/2 in.; side sills over trolley boards, 9 ft. 8 1/4 in.; floor to center of headlining, 8 ft. 5 1/2 in.; track to step, 17 1/4 in.; risers, 11 1/2 in.; wheel base of trucks, 7 ft. 0 in.; diameter of wheels, 36 in.

The underframing of the cars is built up of 8-in. channel side sills, 8-in. I-beam center sills, 6-in. channel crossings, 8-in. I-beam trussed needle beams, and a 6-in. channel end sill trussed and reinforced. The center sills are spaced 18½ in. from center to center, and there

over the bolsters, and the lower trusses bear against 10-in. queen posts set under the ends of the needle beams. The bolsters are of truss form, composed of 12 by 1¼-in. steel top and bottom plates, with channel fillers. The framing at both ends is reinforced against

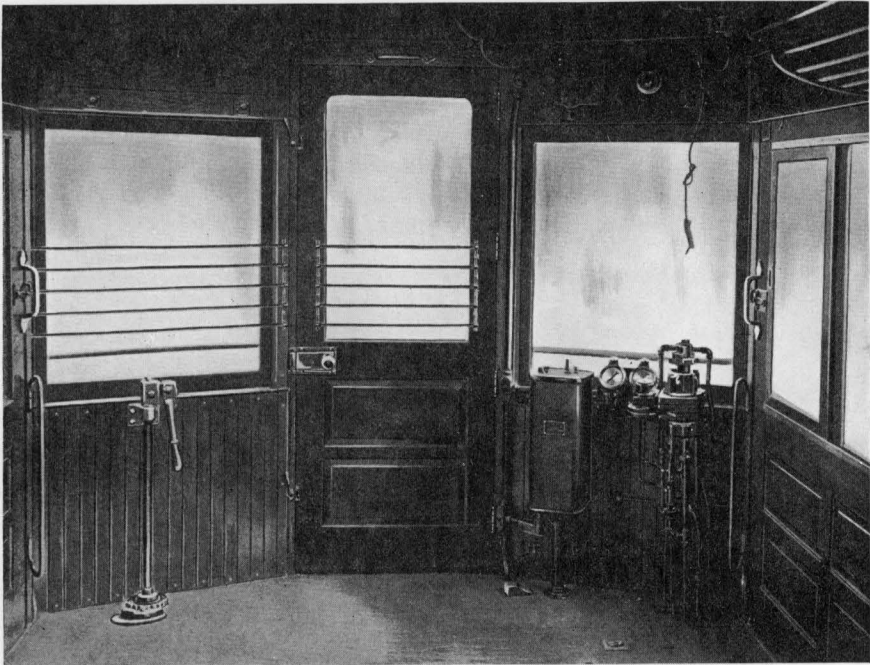


NEW CARS FOR SOUTHERN UTAH. Interior of main compartment. Bulkhead between main and smoking compartment is of steel. Interior finish, mahogany.

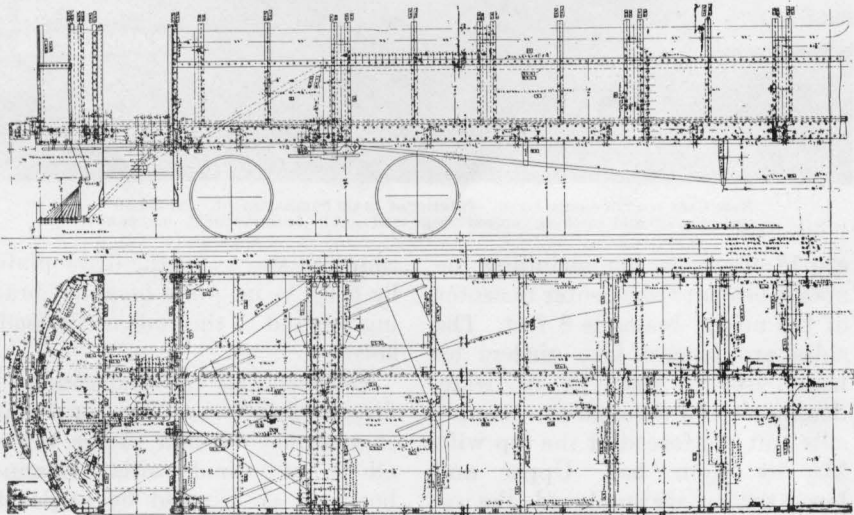
are 13 crossings, not including the needle beams; from center to center of the needle beams is 8 feet. The sides are formed into girders by using 7-64-in. steel, 37 in. wide, double riveted through the channel sills and reinforced at the top with 2½ by ½-in. bar. Upper and lower trusses are employed; the upper are supported directly under the belt rail on steel struts placed

coupling shocks on the draw plates by 6 by ¼-in. plate diagonal bracing secured to the ends of the body bolsters.

Each end of the underframe is fitted with a 25 by ¼-in. steel plate crown piece riveted to the top of all longitudinal sills. Channel bumpers are riveted by angles to all sills and fitted on the outside with radial spring buffers composed



NEW CARS FOR SOUTHERN UTAH. Interior of baggage compartment showing compactly arranged operating devices. Platform at other end has same equipment and arranged to serve as a cab.



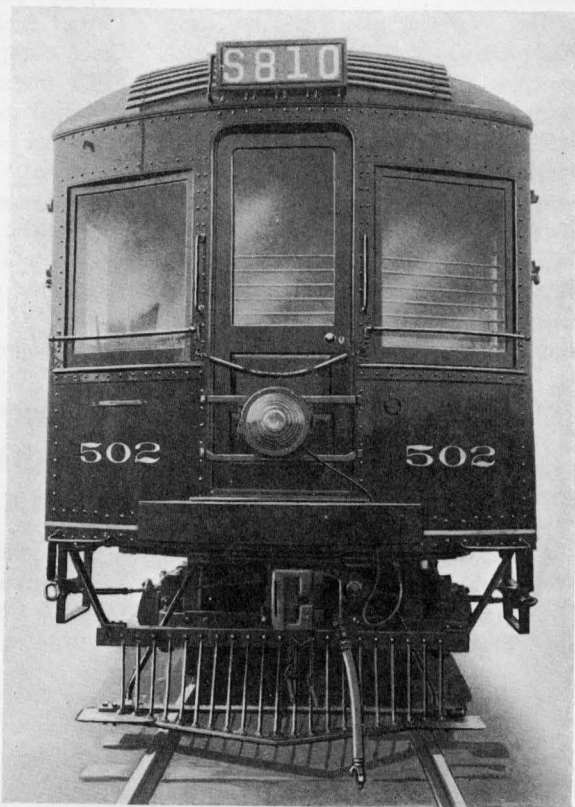
NEW CARS FOR SOUTHERN UTAH. The plate girder side construction has extra reinforcements of upper and lower trusses. Tees are used for the single and double side posts and angles for the roof rafters.

of steel channels and plates of proper curvature to suit track curves.

Steel is used for the entire upper framing. The double and single side posts are composed of $2\frac{1}{4}$ by $\frac{1}{4}$ -in. tees, with 3 by 2 by $\frac{1}{2}$ -in. angle corner posts. A substantial angle top plate secures the posts together and forms a base for the angle rafters which support the plain arch roof. The letter panel, the covering of the double posts and other sheathing of sides and vestibules are of $\frac{7}{64}$ -in. steel. Wooden carlines, 10 in. between centers, bolted to the steel rafters and set between, are used for fastening the roof sheathing of cypress and the ceiling. No. 8 canvas is employed for the roof covering, and is laid on in a single piece. The trolley boards extend full length, and roof mats protect the ends from the trolley poles in the usual way.

Tongue-and-grooved yellow pine flooring is laid in two thicknesses, with two thicknesses of water-proof building felt between; the lower floor is laid diagonally and fastened to the nailing sills bolted to the steel underframe; the top flooring is laid lengthwise. A deafening

floor is placed underneath, with a space of $1\frac{1}{2}$ in. under the double flooring packed with mineral wool. Agasote is used for the inside lining below the windows, leaving a space of $2\frac{1}{4}$ in. between the outside steel



NEW CARS FOR SOUTHERN UTAH. Cars are equipped with train doors at both ends and multiple-unit control, but will be operated singly at present

sheathing and the inside lining. Above the lower side lining, the finish and also the doors, sashes, etc., are of mahogany of natural grain, varnished and rubbed to a smooth dull finish. The agasote below the windows is painted and grained to represent mahogany;

agasote is also used for the ceiling. Pressed prism plate glass is fitted in the outside upper window sashes of the twin windows, and leaded cathedral glass in the inside, concealing the single side posts between.

Between the main and smoking compartments is a steel bulkhead, painted and grained to correspond with the interior finish, and fitted with a 24-in. glazed door and a large stationary sash on the opposite side to the toilet room, which is located in the main compartment next to the bulkhead. The partition between the baggage and smoking compartments is of solid mahogany, with a center sliding door

glazed in the upper part and furnished with a vertical roller curtain. Roomy seats, with backs 25 in. high, having head rolls, are upholstered in dark green leather, and have arm rests, including the stationary seats next the bulkhead. Parcel racks are provided for the three compartments, and, with all other metal fixtures, are of highly polished solid bronze. Lighting of the three compartments is provided by twenty-one 56-watt lamps, with shades, placed along the center of the ceiling, and 23-watt lamps are used for the signs, vestibules and toilet room. The cars are fitted with M.C.B. radial steel couplers and locomotive type of steel pilots.

MORE SEMI-CONVERTIBLE CARS FOR EASTON TRANSIT COMPANY

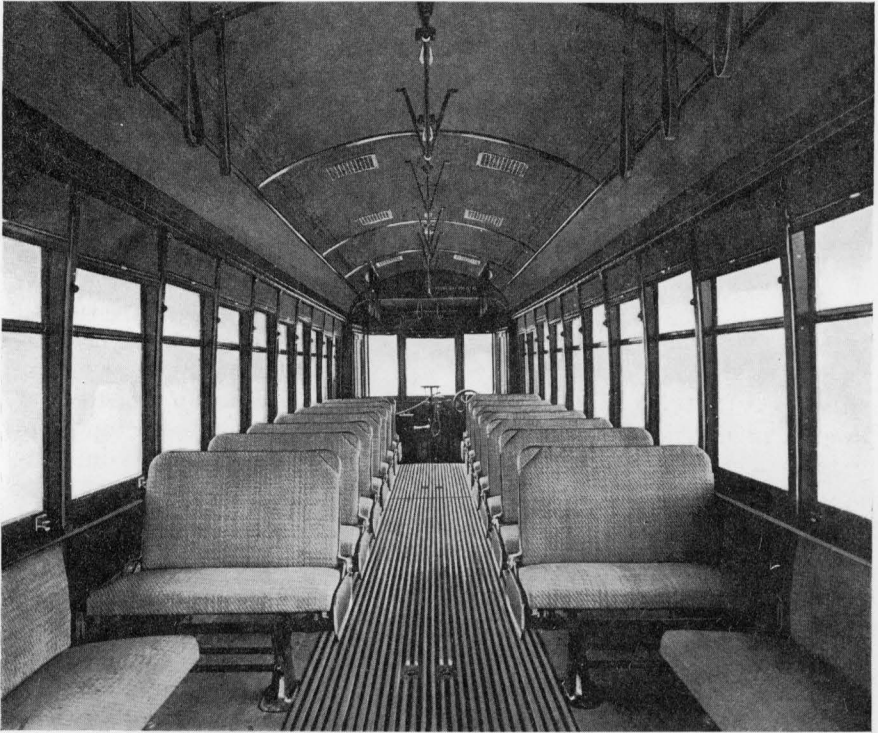
SINGLE- AND DOUBLE-TRUCK TYPES

A FEW weeks ago the Easton Transit Company, whose lines are part of the Lehigh Valley Transit system, received six

single-truck and one double-truck semi-convertible cars from The J. G. Brill Company. Brill semi-convertible cars have been used on the



SEMI-CONVERTIBLE CARS FOR EASTON. All-steel car, including steel roof, for high-speed service on the Bethlehem Division of the Easton Transit lines. Mounted on Brill 27-M.C.B.1 Trucks



SEMI-CONVERTIBLE CARS FOR EASTON. The windows are of the tandem-sash Brill Semi-convertible type. The corner seats occupy the space of two windows.

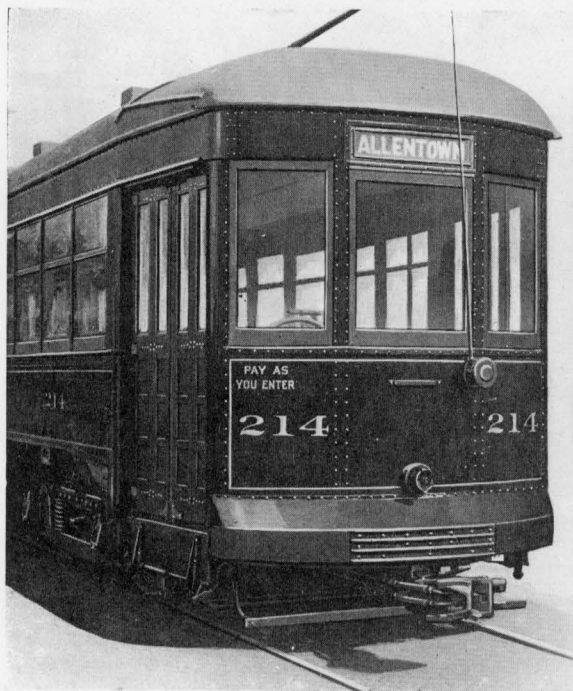
company's system since 1904. The 52 miles of trackage comprising the Easton Transit Company's system serves and connects the cities of Easton, Phillipsburg, Bethlehem, South Bethlehem and Nazareth, at the junction of the Delaware and Lehigh Rivers, 50 miles north of Philadelphia. Connections are also made with Philadelphia from South Bethlehem and Easton over the lines of the Lehigh Valley Transit Company.

The single-truck cars were put in operation on the local lines in Easton and Phillipsburg. The company operates 22 of the single truck cars in the winter and

25 in the summer; of the latter number, 18 open summer cars are put in service during the season. The larger car has been added to the equipment of the Bethlehem Division, operating in local service on a 11½-mile run, and on limited trips to Allentown, 17 miles. The Allentown trip requires 55 minutes and averages 22 stops; one grade of 8 per cent., and several of from 3 to 5 per cent., are encountered. The general traffic of all of the lines is heavier in the summer, and there is more through service on the lines to Philadelphia.

Both types have tandem-sash,

semi-convertible windows, and the structural details differ considerably from former types; both are built on steel underframes, and the longer car has steel upper structure. Brill 21-E trucks are largely used on the system, and carry the



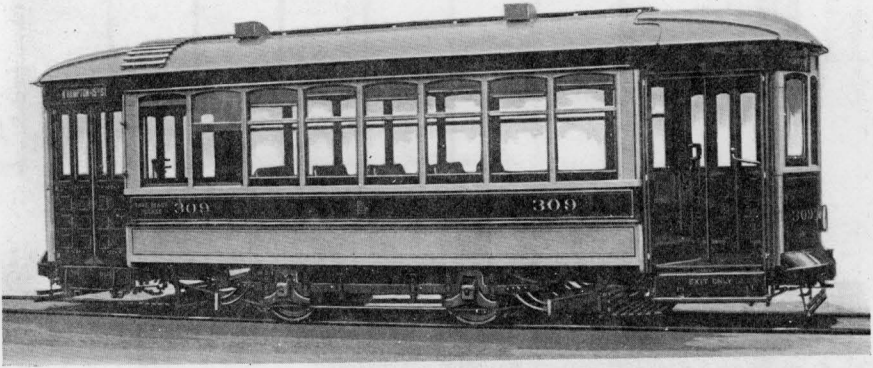
SEMI-CONVERTIBLE CARS FOR EASTON. Doors at each side of both platforms are alike and operate in conjunction with the steps. Multiple-unit control and air-brake couplers are included in the equipment.

shorter cars of the present order. They have wide-wing journal boxes, and have truss rods, which reinforce the support of the overhang at each end. The double-truck car is mounted on Brill 27-M.C.B.1 trucks, capable of a speed of 50 miles per hour.

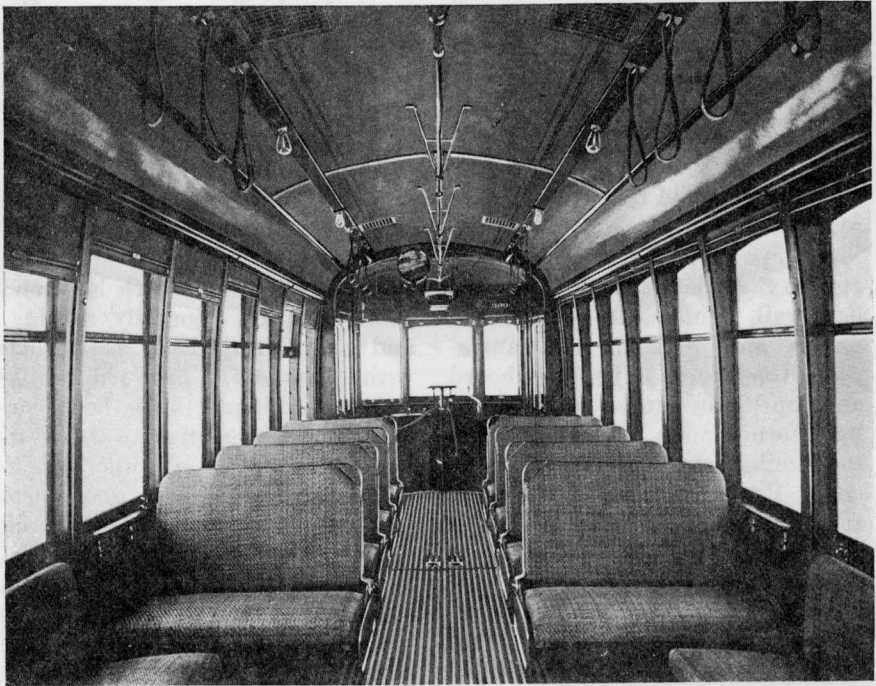
The bottom framing of the larger car is composed of 3-32-in. steel

side plates riveted at the bottom to the shorter leg of a 7 by 3½ by ½-in. angle, and reinforced at the top with a pressed plate. Web plate end sills are reinforced at top and bottom with angle, and secured to the side angles with gusset plates. The 7-in. leg of the side sill angle enables the pressed crossings to be riveted thereto without employing gusset plates. Built-up bolsters of 9 by ⅝-in. top plate and 9 by ⅞-in. bottom plate are of truss form. At each end the floor is ramped 3 in. for a distance of 3 ft. 6 in. from the end sills, to reduce the rise from the platform to 10 in. Tongue-and-grooved boards of ⅞ by 3¼-in. yellow pine compose the flooring, and are secured to strips bolted to the bottom framing; they are provided with tapered floor mats, and threshold plates and dust blocks are pro-

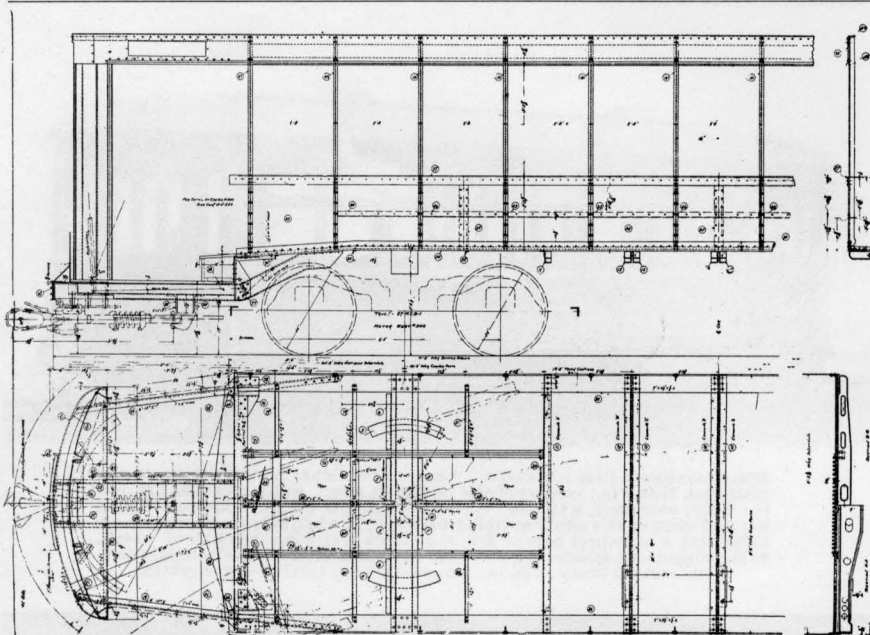
vided to facilitate sweeping. Six-inch channels are used for the platform knees and are securely riveted to the angle side sills and to gusset plates riveted to the end sill plates. Angle iron bumpers are faced with Hedley Anti-climbers, and the draw plates are attached to transverse angles attached to longitudinal channels,



SEMI-CONVERTIBLE CARS FOR EASTON. Length over corner posts, 20 ft. 8 in.; over platforms, 31 ft. 8 in.; centers of side posts, 2 ft. 5 in.; width over sills, 7 ft. 10½ in.; width over posts, 8 ft. 2 in.; extreme width, 8 ft. 5¼ in.; width of aisle, 22 in.; underside of side sills over trolley boards, 11 ft. 4 in.; floor to center of head-lining, 7 ft. 8 in.; wheel base of Brill 21-E Truck, 7 ft. 6 in.; diameter of wheels, 33 in.; weight of carbody, less electrical equipment, 12,420 lb.; electrical equipment, 940 lb.; truck, 5,800 lb.; motors, 4,770 lb.; total weight, 23,930 lb.



SEMI-CONVERTIBLE CARS FOR EASTON. Interior of car shown above. Brill Semi-Convertible cars have been used in Easton since 1904.



SEMI-CONVERTIBLE CARS FOR EASTON. Length over corner posts, 30 ft. 8 in.; over platforms, 40 ft. 8 in.; centers of side posts, 2 ft. 8 in. width over sides, 8 ft. 2 in.; extreme width, 8 ft. 4 1/4 in.; width of aisle, 24 in.; from track to underside of side sills, 2 ft. 8 3/8 in.; side sills over trolley boards, 12 ft. 4 in.; floor to center of headlining, 8 ft. 0 1/2 in.; track to step, 15 3/8 in.; step to platform, 14 1/2 in.; platform to floor, 9 in.; weight of body, less electrical equipment, 20,593 lb.; electrical and air equipment, 4,205 lb.; trucks, 16,180 lb.; motors, 11,140 lb.; total weight, 52,118 lb.

which are riveted to a 7 by 3-16-in. plate secured to the end sill.

Side posts of T-section are riveted to the side plates, pressed steel belt rail, wide steel letterboard panels and pressed steel angle-shape top plates. The letter board and top plates extend to the vestibule corner posts, and are riveted to a similar construction around the ends. Pressed steel rafters support the roof, which is made of sheet steel and covered with 1-in. cork-board insulation, protected with No. 8 cotton duck. The interior is finished in cherry stained to a mahogany color, and the sides below the window rail are lined with 1-in. pressed cork, cemented to the steel

panels and covered with buckram painted to match the interior wood-work.

The vestibules of both long and short cars are generally similar, and are equipped on both sides with two-leaf, outward-folding doors, one hinged to the body corner post and the other to the vestibule corner post. A pipe stanchion at the center of the door opening separates passengers entering and leaving at the rear; these doors are operated by the conductor from a control stand at the center of a hexagon extension of the end of the main floor. The doors at the motorman's right are operated by a handle in front of the motorman's

position, and are used for exit only. Single steps are provided at the door openings, and operated in conjunction with the doors.

The single-truck cars are also built with steel underframes, but have wooden upper framing. The side sills are composed of 14 by 3-16-in. steel plate reinforced at top and bottom by 2 by 2½ by ¼-in. angle. The end sills are of channel section secured to the side sills with forged brackets of generous dimensions. Channel crossings are gusseted to the side sills, and are supported on I-beam subsills, which are attached to the upper chords of the truck. Six-inch

channel outer knees, reinforced with angles, and 5-in. channel center knees support the platforms, which are 6 in. longer than the larger car. The side posts are 2¼ in. thick, and the corner posts 3⅝ in.; they have a sweep of 1¾ in. Ash is used for the side posts, and oak for the corner posts.

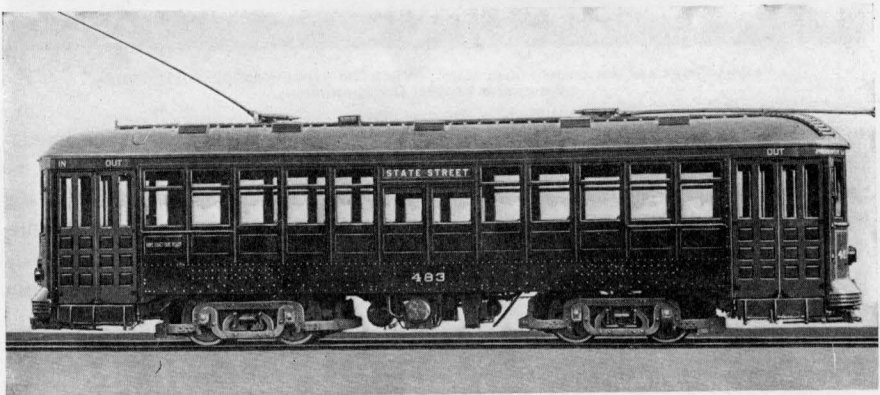
The interior finish is of cherry-stained mahogany, and the ceilings are of agasote, painted robin-egg blue and decorated with gold striping. "Winner" seats, both transverse and longitudinal, of the builder's manufacture, are provided for all of the cars, and are covered with twill-woven rattan.

CONVERTIBLE CARS FOR SPRINGFIELD, MASS.

PREPAYMENT TYPE

TEN cars of the type illustrated were built by the Wason Manufacturing Company and placed in service on the lines of the Springfield Street Railway

Company, of Springfield, Mass., in January, constituting the first prepayment equipment used on the system. The cars are in service on an important cross-town line with

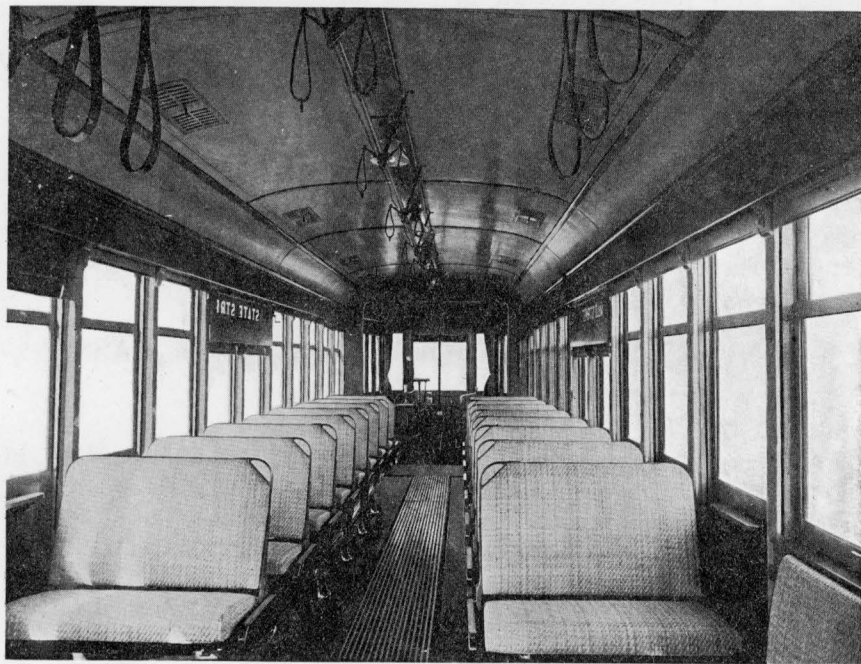


PREPAYMENT CARS FOR SPRINGFIELD, MASS. Prepayment method of fare collection is being introduced in Springfield with these ten cars of the convertible type.

a run of approximately nine miles.

As this form of convertible car has been shown repeatedly in these pages since its introduction in 1910 by the Third Avenue Railway Company, of New York, it is unnecessary to call attention to its advantages. It will be noticed that the

unusual feature of this underframe is a Z-bar end sill, with oak filler secured to the side sills with forged corner brackets. A 10-in. channel, with legs down, forms the center stringer, and, in addition to the plate crossings, there are two main cross members, composed of

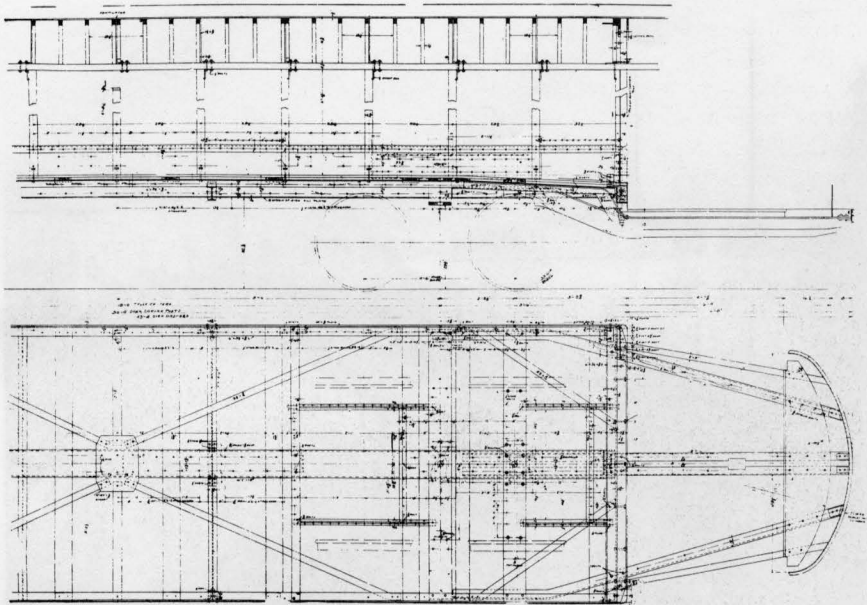


PREPAYMENT CARS FOR SPRINGFIELD, MASS. When the window panels are removed pipe guards protect the openings.

side sill plates are somewhat deeper than usual, and that the door arrangements and prepayment features are similar to those of the Springfield, Ohio, and Easton, Penna., cars shown elsewhere in this issue.

The cars are built on steel underframes made up of angle side sills with 18 by $\frac{3}{8}$ -in. steel plates, reinforced at the top with flat bar. An

I-beams, which are double bracketed to the side sills. At the center of the structure a 20 by 15 by $\frac{3}{8}$ -in. plate, riveted on top of the center stringer, serves to attach longitudinal braces of flat bar, which extend nearly to the bolsters; transverse members of flat bar are also connected to this plate. These features and the plan of bringing the platform angles along the side

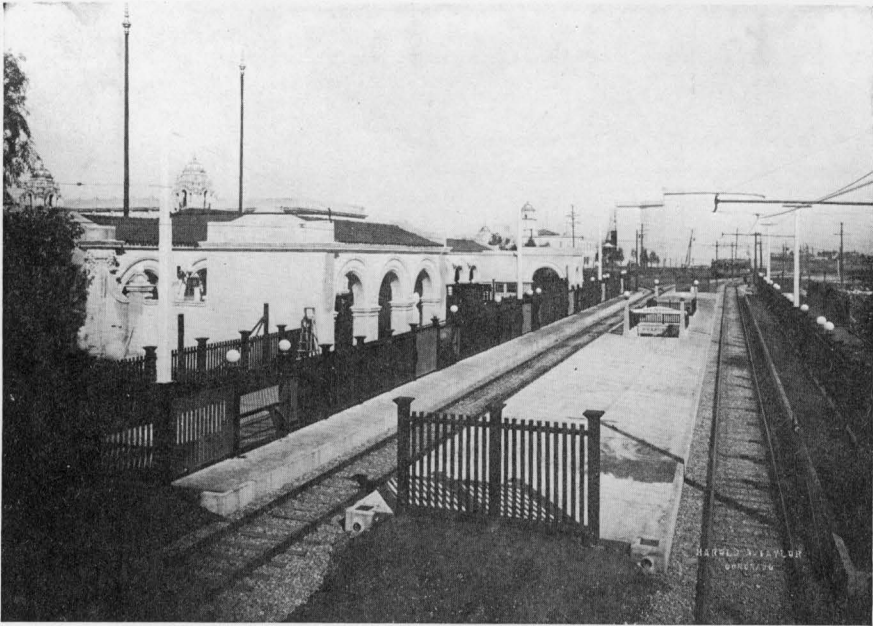


PREPAYMENT CARS FOR SPRINGFIELD, MASS. Length over corner posts, 30 ft. 0 in.; over platforms, 42 ft. 0 in.; centers of side posts, 2 ft. 5½ in.; extreme width, 8 ft. 5½ in.; width of aisle, 26½ in.; height from track to underside of side sills, 2 ft. 8½ in.; underside of side sills over trolley boards, 8 ft. 9¼ in.; floor to center of headlining, 7 ft. 8¼ in.; track to step, 15 in.; step to platform, 13 in.; platform to floor, 9 in.; seating capacity, 48; weight of body, less electrical equipment, 19,000 lb.; total weight, 46,800 lb.

sills to the bolsters will be seen in the accompanying diagram. The entire construction secures a powerful underframe and a strong support to the long platforms.

A double floor of tongue-and-grooved yellow pine is used and is ramped at the ends from the bolster to the end sill, reducing the height of the riser 2½ in. Corner posts, door posts, all intermediate posts and the vestibule posts are of white ash; the latter are double and have ½-in. rods running through the center from top of side plates to bottom of sill. The side posts are 2¾ in. thick and corner posts 4¾ in. The roof rafters are reinforced with steel carlines at each side post.

As the bulkheads are omitted at the body ends, the corner posts are stiffened by a steel plate reinforced with angles extending from end sills to false bulkhead. Mahogany is used for the interior finish, with all trimmings made of oxidized bronze. At the corners of the car the lower sashes are arranged to raise, and the vestibule sashes are furnished with pockets in the wainscoting. The side sashes, with the exception of those at the corners, are stationary, and are framed in one piece with removable panel. When the window panels are removed, window guards, consisting of four ¼-in. pipes, protect the openings.



SAN DIEGO ELECTRIC RAILWAY COMPANY'S TERMINAL STATION AT THE PANAMA-CALIFORNIA EXPOSITION

THE International Panama-California Exposition, being held throughout this entire year at San Diego, occupies about half of Balboa Park, a 1,400-acre tract, which borders the business center of San Diego. The location of San Diego, at the southwestern corner of the United States, gives it an equable climate and is distinctly advantageous to an exposition in which agriculture, floriculture and other open-air exhibits form an important part of the vast scheme. In keeping with the early history of Southern California, the buildings are of Spanish and Mexican architecture, and contain splendid exhibits of ethnology and archeology, home economy, arts and crafts, science and education, foreign arts, commerce, industry, food products, irrigation, reforestation, reclamation, etc. The exposition is intended to especially exploit the resources, opportunities for development and possibilities for immigration, colonization and commerce of the Western States of the United States. Being the first port of entry in the United States north of the Pacific end of the Panama Canal, San Diego appropriately demonstrates to the world, through this exposition, the possibilities which exist in the vast region tributary to her as a commercial seaport as well as the avenues of commerce which may be developed with the countries north and south

on the Pacific Coast and with the Orient.

San Diego has a population of 85,000, and has 71 miles of electric railways. The terminal facilities for the railways at the Exposition, shown in the accompanying photographs, are arranged on a scale and plan which will enable the crowds to be handled quickly and without confusion or discomfort. The track is constructed of 75-lb. T-rails, and has 8 inches of crushed rock ballast under the ties. The platforms are of sufficient length to discharge and load three 2-car trains at the same time. Of the large number of cars operated on the city lines, 76 are equipped with multiple-unit control, enabling the operation of trains of two or more cars. Experience up to the present has proved that two-car trains lend themselves most conveniently to operation during peak-load periods. After leaving the cars, passengers pass down stairways into subways and ascend to the inside of the grounds, passing through exit turnstiles, which prevent them from coming back to the wrong platform. There are ten turnstiles which control the passageways from the Exposition to the car platforms. An enclosure on the leading platform has a capacity for 2,000 persons, so that in case of a blockade or any serious delay to cars, crowds can be kept under control. Large red lights over the platform exit gates

are used to enable persons at any part of the platform to know when the cars are ready for loading. The side tracks and loop track provide ample space to bunch cars in pro-

viding for an outbound crowd from the Exposition. The cost of the terminal was approximately \$20,000, inclusive of tracks and roadbed.

ELECTRIC RAILWAY MAGAZINES

IN addition to the list of railway employes' magazines published in the last issue of BRILL MAGAZINE is the following: *The H. & M. Review*, published by the Hudson and Manhattan Railroad Company, New York. This magazine was begun in December, 1914, and has a circulation of 2,000 copies. Its size is 6 by 9, and has 12 pages and cover.

Among the publications issued by electric railway companies for the benefit of the public, as well as their own employes, are *Transit*, a magazine published by the Lehigh Valley Transit Company; *The Traction Bulletin*, published weekly by the Northern Ohio Trac. & Lt. Company; and during the present month the Portland Railway & Light Company, Portland, Ore., has commenced issuing a four-page folder weekly to its patrons. A prize is being offered for a name for this publication.

Any other employes' magazines or pamphlets, leaflets, etc., not mentioned above or in the last issue of BRILL MAGAZINE, will be referred to in the April issue, if the publishers will please send copies to the editor of BRILL MAGAZINE.

BRILL PUBLICATIONS

CARS

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City and Interurban Cars	207
Snow Sweepers and Plows	183
Centrifugal Sprinkling Cars	182
Steam Railway Cars and Trucks (Wason)	

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CHANGES OF ADDRESS

THOSE who receive BRILL MAGAZINE are requested to send in any change of address at the earliest opportunity. It will be more convenient in making up the mailing list if the new address is written on the envelope in which the magazine is received. Send to the Publicity Department, The J. G. Brill Company.



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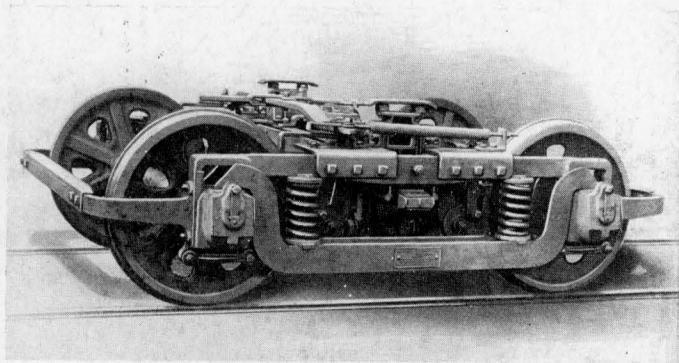
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ITALY—Giovanni Checchetti, Piazza Sicilia 1, Milan



THE BRILL 27-M.C.B. TRUCK

THIS is the Brill standard high-speed truck, and it is built in different sizes to suit all interurban loads and speeds. Although it has the "Master Car Builder's" system of equalization, it is distinctly a Brill product, because it has solid-forged side frames with low end frames, fold-over gusset plates, bulb angle transoms, double- and single-corner forged transom brackets, "Half-Ball" brake hangers, friction springs at the bottom of the bolster swing links, short bearings for the equalizing bars in pockets on the journal boxes, pressed steel pedestal wear plates or gibs, planed faces of the pedestals to give an accurate fit to the gibs, oil-retaining center bearings, and, in fact, every part of the truck, from center plate to boxes, bears the imprint of Brill experience, facilities and development.

THE J. G. BRILL COMPANY, PHILADELPHIA



T. H. Fretwiler

PRESIDENT AND GENERAL MANAGER, MEMPHIS STREET RAILWAY COMPANY

The following is from the "Employees' Bulletin," issued by the Memphis Street Railway Company:

*"The company is, in a large measure, judged by the impression which you, its representatives, make upon the public by the manner in which you handle passengers, particularly children and old persons. Let it be said that the street railway employes of Memphis are the most courteous of any in the country. ¶ It is our wish that you make and maintain such a reputation so that all may have a good word for our railway system and its men. ¶ This is the day of opportunities. Opportunities make men. Let caution be your watchword! Be always alert and alive to the duties resting upon you. Look ahead and think ahead. Train your mind so that you may be able to grasp a situation when it arises. Don't wait until something happens before realizing what you should have done. In doing this you will not only have the consciousness of feeling that you may have been the means of avoiding an accident, but you will also realize that you are training yourself for future responsibilities. * * * ¶ Observe the conditions which surround you, as with your experience you are in a position to foresee the carelessness of others and by a word or act prevent injury. Watch for your opportunity!"*