

APPLICATION FILED DEC. 14, 1908.

4 SHEETS—SHEET 1.

FIG. 1

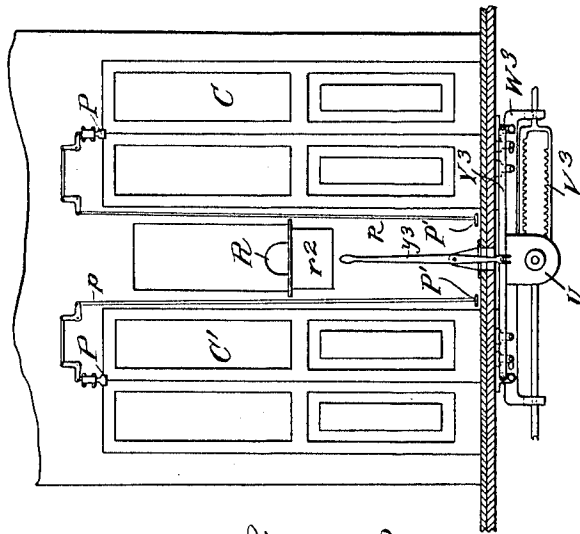


FIG. 2

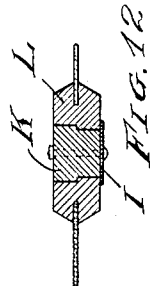


FIG 12

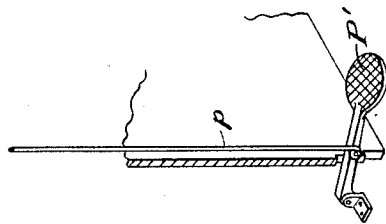


FIG. 3

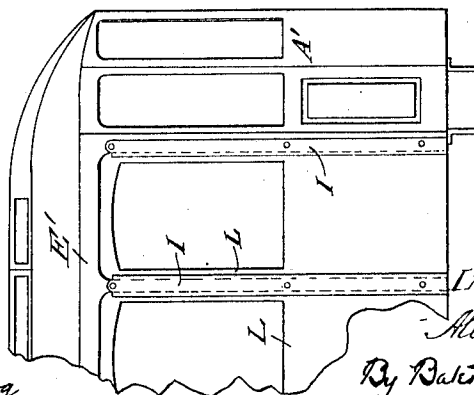


FIG. 11.

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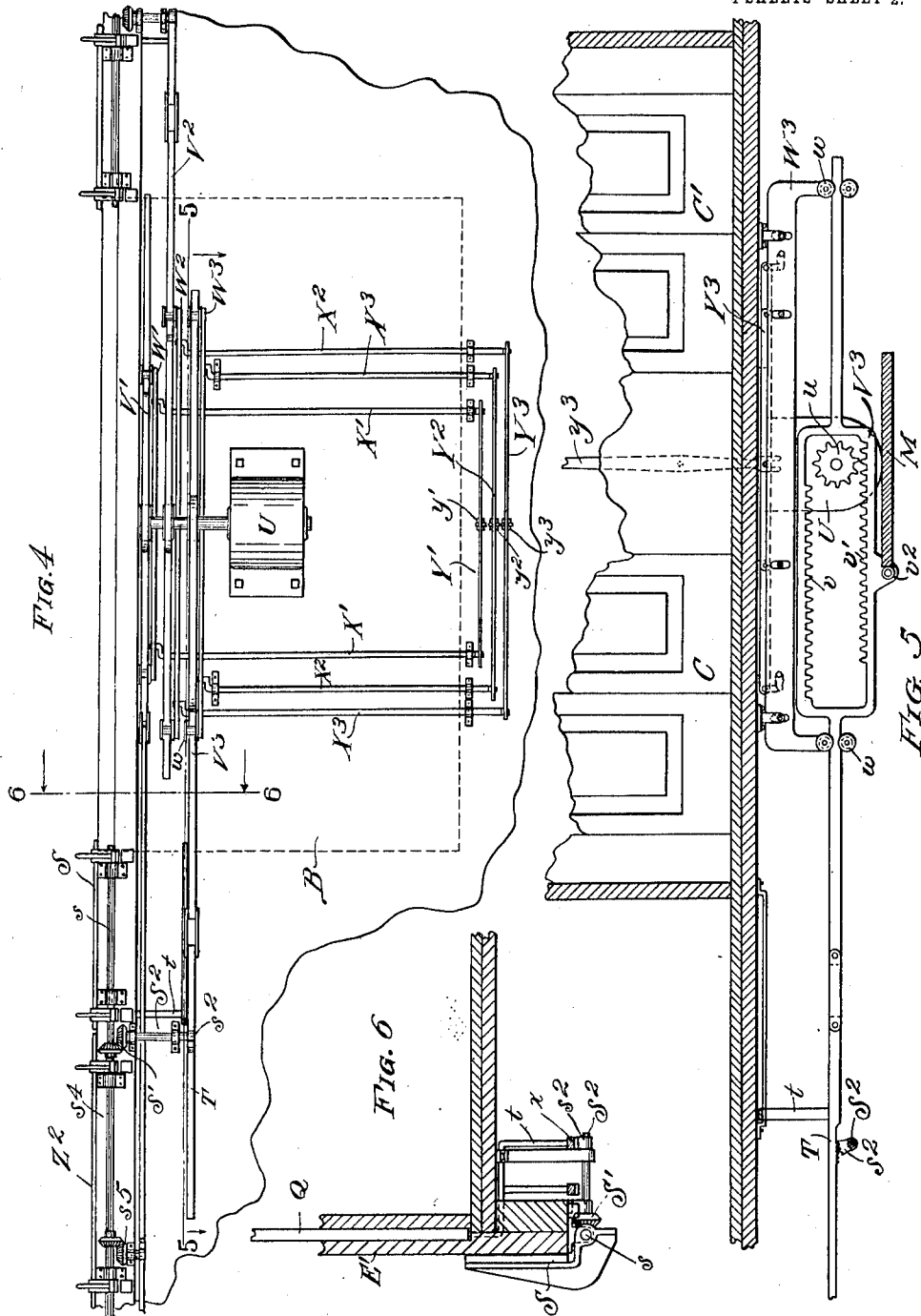
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STREET CAR.

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1,020,017.

Patented Mar. 12, 1912.

4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

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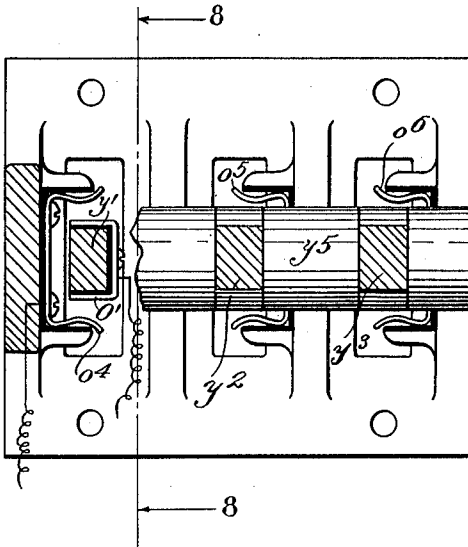


FIG. 7

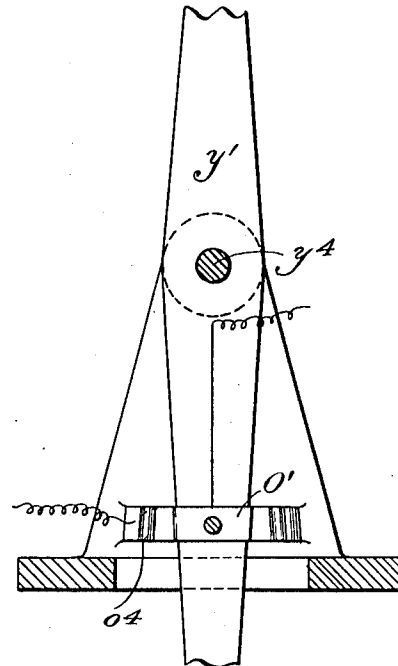


FIG. 8

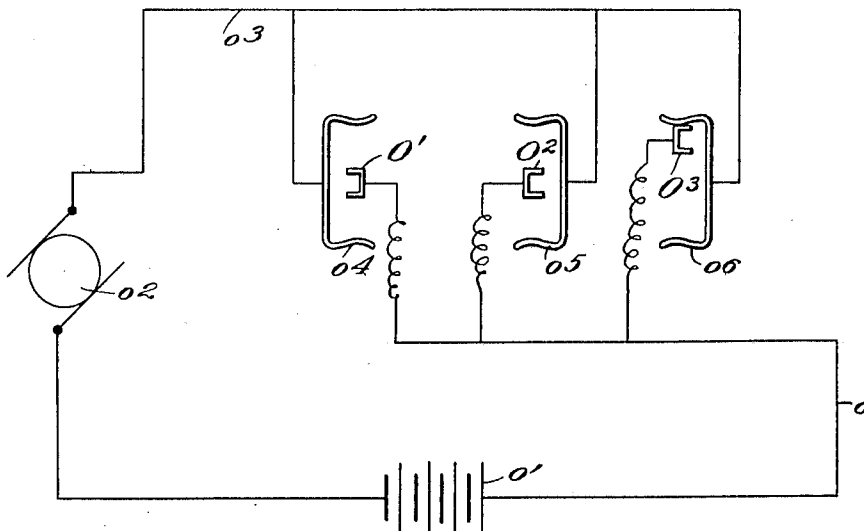


FIG. 9

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4 SHEETS—SHEET 4.

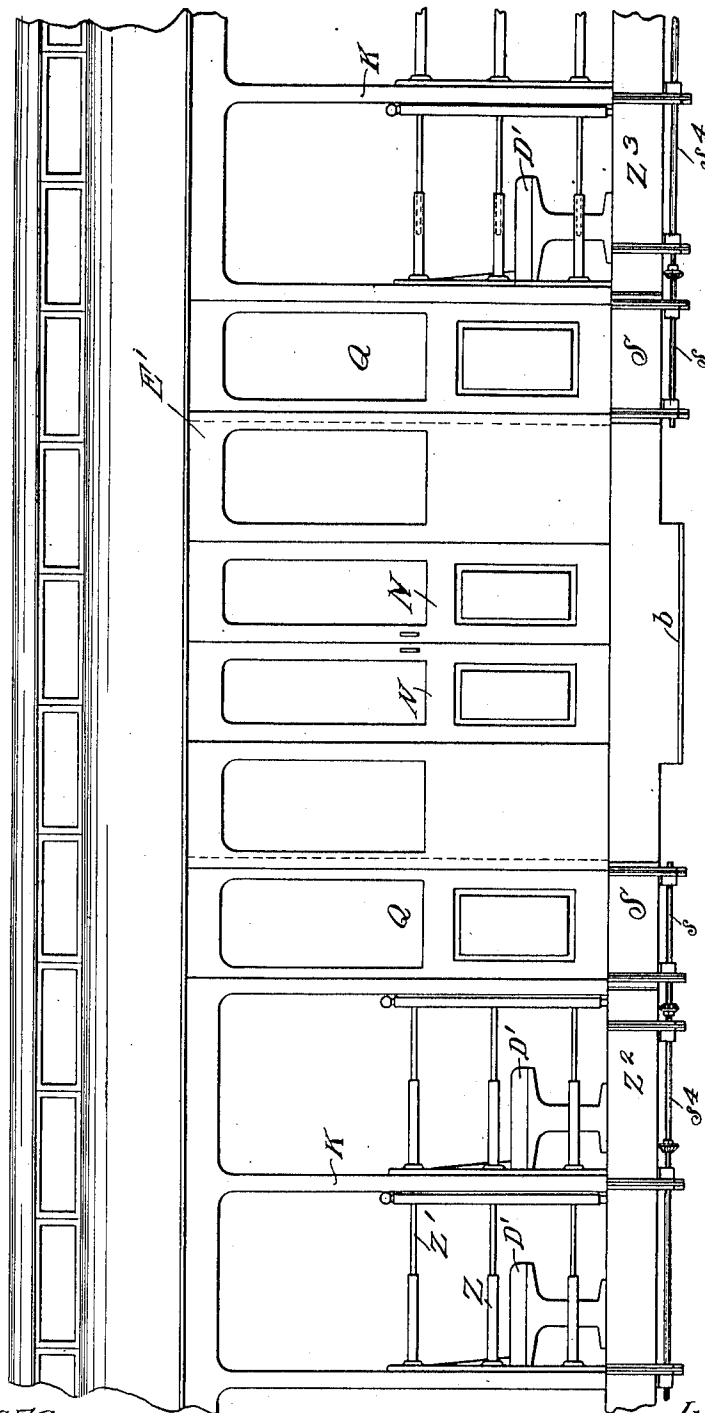


FIG. 10.

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STREET-CAR.

1,020,017.

Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed December 14, 1908. Serial No. 467,441.

To all whom it may concern:

Be it known that I, ALBERT H. BATES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Street-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a very efficient street car.

Among the features accomplished by the invention are rapidity of loading and unloading, commodiousness in the car, convertibility of the car for either summer or winter use, operation of the car as a pay-as-you-enter, either closed or with the side open, convenient location and ventilation of smoking compartment, convenient operation of doors and gates, etc.

The invention may be best summarized as comprising the car, its coöperative parts and mechanism, and the combinations of such parts and mechanism, as hereinafter more fully explained and as set out in the claims.

In the drawings, Figure 1 is a sectional plan of the car, showing the seating arrangement, a portion of the car being broken away to enable it to be portrayed in larger scale; Fig. 2 is an enlarged side view of the interior doors looking from within the car; Fig. 3 is a perspective of the door-releasing mechanism; Fig. 4 is a bottom plan of the portion of a car beneath the entrance vestibule, the position of the vestibule being shown in dotted lines; Fig. 5 is a sectional side elevation of the corresponding portion of the car, being taken on the line 5—5 of Fig. 4 and looking toward the inner part of the car; Fig. 6 is a transverse section on the line 6—6 of Fig. 4 and looking toward the left hand of that figure; Fig. 7 is a horizontal section through the levers which control the door-operating mechanism; Fig. 8 is a partial side elevation of one of the levers, being a vertical section on the line 8—8 of Fig. 7; Fig. 9 is a diagram illustrating the circuits of the door-closing mechanism; Fig. 10 is a side elevation of an intermediate portion of the car showing various doors and gates; Figs. 11 and 12 are views illustrating the removable side panel.

Referring to the drawings, Fig. 1 shows the car divided into three compartments, the main compartment A, the motorman's com-

partment A', and a rear or smoking compartment A². Within the main compartment or body of the car is an entrance vestibule B. The entrance to the car is from the side by means of a step b into this vestibule, and from the vestibule there are entrances into the car, two being shown, each closed by a pair of swinging doors C and C'. A very convenient arrangement of the seats is shown in Fig. 1, wherein there is a long seat D extending from end to end of the car proper on the non-entrance or closed side E thereof, while in front of and behind the vestibule B are transverse seats D' which are adjacent to that side of the car E' which I call the entrance side. Between the transverse seats and the longitudinal seat is shown a longitudinal aisle F leading from one end to the other of the car body. The motorman's compartment A' connects with the front end of this aisle by a door G, which may be slidable in a partition G', while at the rear end the compartment A² is separated by a similar bulkhead H' with a sliding door H.

By having the long bench D along the closed side of the car and the entrance vestibule narrow enough to allow an aisle between it and the bench, not only is greater aisle space provided, but the seating capacity is also increased. Moreover, this arrangement preserves as one compartment the interior of the car proper (that is the part between the two end platform portions) instead of dividing it into two compartments, and this enables the car to carry more standing passengers, provides easier movement within the car, and does not separate parties when the seats are nearly all taken.

The compartment A² is preferably for smoking. Its two sides and rear are surrounded by walls having windows and it may very conveniently have a seat J extending on both sides and around the rear end. The motorman's compartment and the smoking compartment are arranged to take the place of the usual vestibules or platforms and overhang the trucks a considerable distance. By narrowing the sides of the smoking compartment, I am able to build a considerable sized compartment on existing cars in place of the present rear platform, without causing undue side projection on going around curves.

Opposite the ends of the transverse seats D' are posts K, and between these posts are suitable closures L, which are preferably panels carrying windows. These panels fit
 5 sufficiently tight to enable the car to be used in the winter time. They are furthermore removable (either by being taken off entirely from the car, or shoved into the roof or floor) so as to convert the car into an open
 10 car. During the winter time there is preferably no step opposite the panels L, such step being provided when the car is open.

Between the vestibule B and the outer side of the car I preferably provide a closure for
 15 the doorway. This is shown as made by two sliding doors N, which may slide into pockets b' of the vestibule. By this means waste of heat may be prevented in the winter time. At crowded points, where there is rapid
 20 loading, for example, the doors N may be kept open.

By having the smoking compartment at the rear of the car, the air in the car is not contaminated when the door H is open. At
 25 the same time, the whole car may be well ventilated by opening this door and the windows at the rear of the smoking compartment.

My car is well adapted for use either
 30 summer or winter, whatever method of collecting fares is employed. It is moreover especially advantageous where the car is used as a pay-enter. In this case the conductor may stand either in the vestibule B
 35 or in the car adjacent to the vestibule; in the latter case, for example, between the doors C and C', and in that case he may receive money and make change, or supervise the deposit of the money into the fare-box, through a suitable window designated
 40 R. This is shown in the drawings as a cashier's window having a suitable platform r. Through this platform is shown a slot r' leading to the fare-box r² below the platform. This construction may be arranged
 45 otherwise if desired.

When the car is a pay-enter, it is desirable that the conductor have control of the doors C and C', and for this purpose I provide
 50 latches which are preferably operated by the conductor's foot. These latches are shown in Fig. 2, designated P. They are controlled by the pedals P' through suitable connecting mechanism illustrated by the links and
 55 bell cranks p.

The facility of unloading the car is increased by providing special exit doors, which are also of particular use when the car
 60 is used as a pay-enter. These doors are indicated by Q. They are located at the ends of the transverse aisles between the ends of the vestibule B and the immediately adjacent transverse seats D'. These doors may
 65 conveniently slide into the two pockets b' in the vestibule wall. When they do so slide,

they operate to turn down normally idle steps S. This may be accomplished by a simple system of gearing illustrated in Fig. 6. Here a gate or door is shown which may
 be considered as the door Q and a step is
 70 shown designated S. This step is pivoted at s to a suitable bracket carried by the car sill. The step is provided adjacent to this pivot with a segment of a bevel gear which meshes
 75 with a corresponding segment S' on a shaft S². This shaft carries a segment of a pinion s² with which connects a suitable rack T connected by suitable means, as the brace t, with the door. The result is that whenever
 80 the door is open the step is turned down and when the door is closed the step is turned up.

The two doors Q are conveniently located for exit from the car. The position of the conductor is such that he can easily prevent
 85 any entrance through these doors. Such entrance, however, is impracticable by reason of the folding step, by reason of there being no handle on the outside of the door, and it may be further prevented by suitable locks
 90 on the doors controlled by the conductor. Without such locks the car provides very efficient means for enabling an entrance only through the vestibule past the conductor, and exits only independently of the vestibule
 95 but still near the conductor, so that surreptitious entrance is prevented.

In many cases it may be desirable to provide means whereby the conductor can open
 100 or close and hold closed the doors Q without leaving his position adjacent to the fare-box or cashier's point. Furthermore, when the car is used as an open car, it is desirable to provide gates for the cross aisle spaces and means whereby the conductor may operate
 105 them. I have provided mechanism for accomplishing both of these results, which will now be described.

To operate the doors and gates under the control of the conductor without subjecting
 110 him to too much manual work, I prefer to provide an electric motor and mechanism operated by it for moving the doors and gates. This is shown more particularly in
 115 Figs. 4 to 9. In Fig. 4, which is a bottom plan of the car, U represents the motor. This motor has on it, or driven by it, a series of pinions u. Loosely surrounding these pinions are a series of yokes V', V² and V³. Each of these yokes has two reaches of internal
 120 teeth v and v', one above the pinion and one below it. The motor is designed to operate in one direction. Accordingly, if the yoke be shifted to bring the lower reach
 125 of teeth into engagement with the under side of the pinion, the yoke is shifted in one direction, whereas if the yoke be lowered to bring the upper reach of teeth into engagement with the upper side of the pinion, the yoke is shifted in the opposite direction.
 130 Thus the rotation of the motor in one direc-

tion may operate to move the door or gate in either direction, as desired. To raise or lower the yokes to effect such movement, I provide suitable mechanism which is shown as a series of bars W' , W^2 and W^3 , one for each yoke, and each having four rollers w to engage on opposite sides of the extensions of the yoke. These bars are capable of up and down movement, which may be caused by rock arms on rock shafts X , X' and X^2 engaging in slots in the bars. These rock shafts have other rock arms with which connect links Y' , Y^2 and Y^3 . The rock shafts are arranged in pairs and each link connects two rock shafts of a pair, and intermediately the link is connected with operating levers y' , y^2 , y^3 .

Accordingly, when the lever is shifted in one direction or the other, the corresponding bar W' , W^2 , W^3 is raised or lowered and the corresponding yoke is brought into engagement with the corresponding pinion. At the same time, the circuit is automatically closed through the motor, so that the revolution of the motor shifts the yoke in the desired direction. The yoke is connected with the rack bar T heretofore referred to, which connects by a bracket or brace t or otherwise with the doors and gates. In the arrangement shown, there are three yoke bars, one of which is adapted to operate all of the gates for the rear bank of seats D' . Another of the yokes operates the gates for the front bank of seats D' and also for the forward one of the doors Q which, like the gates, moves rearwardly to open. The third yoke may operate simply the rear one of the two doors Q which, unlike the others, moves forwardly to open. The gates for the individual aisle spaces used in the summer time may be of any convenient form. That shown in Fig. 10 is very satisfactory, comprising stationary horizontal tubes Z opposite the end of the seat and a movable member Z' having tubes telescoping into the stationary member, the movable member standing normally opposite the aisle space. The lower end of this movable member is connected with the corresponding bar T .

To enable the simple throwing of the lever Y' , Y^2 or Y^3 to not only operate the corresponding yoke but connect the motor, I provide mechanism illustrated in Figs. 7, 8 and 9. Here the three levers are shown as mounted on a suitable shaft y^4 separated by distance sleeves y^5 . The three levers carry, by means of suitable insulation, in double terminal contact plates O' , O^2 and O^3 respectively, one of which is shown in Fig. 7 and all of which are shown in diagram in Fig. 9. All these terminals are connected in multiple with the line o which leads through the source of current o' and to the motor o^2 . From the other side of the motor leads a line o^3 which branches and passes to

the three double terminals o^4 , o^5 and o^6 which are stationarily carried and are adapted to be engaged by a corresponding arm of the double terminal O' , O^2 and O^3 in either extreme position. Accordingly, when its lever is operated to raise its yoke, the motor is actuated.

To form an efficient lock on the door-operating mechanism, preventing the door or gate being opened against the will of the conductor, and also to insure the door or gate being completely opened or closed, when such movement starts, I provide on each of the yokes V' , V^2 and V^3 a roller v^2 , which stands normally opposite the end of a stationary bar M . This bar may be a flange on an angle plate carried by bars depending from the car floor. There is one of these bars M for each yoke. The result is that each yoke is normally blocked and the door or gates, or door and gates, as the case may be, locked. As soon, however, as the conductor raises or lowers the yoke, the same becomes free from the bar M and operates to close or open the door or gate. During such movement the roller v^2 rides along the bar M and maintains the yoke in engagement with the motor pinion, so that a complete stroke is insured. At the end of the stroke the door or gate becomes locked in the other position, if the lever is operated only to the intermediate position. The conductor is thus able to lock the doors and gates, closed or open, as desired, as well as to shift them in either direction.

Fig. 10 shows the car as an open car, with gates $z z'$ at the end of each cross aisle. One step z^2 is preferably provided for all of the cross aisles having these gates at the rear of the vestibule, and another step z^3 for the gated aisles in front of the vestibule. These steps are operated by rock shafts s^4 , through gearing s^5 , by the longitudinally moving racks T similar to the step S already described. In Converting such car into a winter car, the gates $z z'$ and the steps z^2 and z^3 are removed and the side panels L substituted. These panels may be entirely removable, and, when in use, held in place by cleats I secured to the outer sides of the posts K , the panels bearing against suitable stops on the posts. This is illustrated in Figs. 11 and 12. Other construction may be employed if desired, and I do not intend to limit myself to any particular manner of obtaining the removability, even in those claims which specify removable panels. Numerous other changes may be made without departing from my invention.

Having thus described my invention, what I claim is:

1. In a street car, the combination of one permanently closed side, a long bench extending along the same within the car, a longitudinal aisle in front of said bench, a

- vestibule between said aisle and the other side of the car at an intermediate position, transverse seats in front of and behind said vestibule and between said aisle and the entrance side of the car, whereby a single seating compartment is provided throughout the main body of the car, a doorway from the inner side of the vestibule into such aisle, and two doorways in the outer side of the car leading to transverse spaces in front of and at the rear of said vestibule respectively.
2. In a car, the combination of a vestibule adjacent to one side at an intermediate position, a step leading from the outside into such vestibule, a door for closing the entrance from the step into the vestibule, a door for closing the entrance from the vestibule into the car, and transverse seats in front of the vestibule and behind it, aisles between the two groups of transverse seats and the front and rear walls of the vestibule respectively, direct exits from said aisles independent of the vestibule, and means controlling said exits.
3. In a car, the combination of a vestibule located within the car adjacent to the side, a doorway controlling the entrance from outside of the car into the vestibule, and a doorway for closing an exit from the car independently of the vestibule, such two doors being arranged to slide past each other into the same closing pocket in the vestibule wall.
4. In a car, the combination of a vestibule located in an intermediate portion of the car and having an outside entrance, and two passageways from the vestibule into the car located in the wall of the vestibule parallel with the outer side of the car.
5. In a car, the combination of a vestibule located in an intermediate portion of the car and having an outside entrance, two passageways from the vestibule into the car located in the wall of the vestibule parallel with the outer side of the car, and a cashier's window through such wall between such passageways.
6. In a street car, the combination of one permanently closed side, a long bench extending along the same within the car, a longitudinal aisle in front of said bench, a vestibule between said aisle and the other side of the car at an intermediate position, transverse seats in front of and behind said vestibule and between said aisle and the last-mentioned side of the car, and a compartment at the rear of the car closed by windows and having seats and having a doorway connecting it with said longitudinal aisle.
7. In a car, the combination of one permanently closed side having windows, of a long seat extending along such side, a long aisle in front of such seat, a side entrance vestibule located at an intermediate portion of the car, transverse seats in front of said vestibule and behind it, and removable panels having windows for closing the transverse aisle spaces, whereby the car is rendered convertible.
8. In a car, the combination of an entrance vestibule, two doors from the vestibule into the car, a conductor's position between the doors, and pedally operated means for latching or unlatching the doors.
9. In a car, the combination with the body of the car and the step, of an intermediate entrance position, two doorways connecting such position with the body of the car, and a cashier's window between such doorways.
10. The combination, in a car, of a vestibule adjacent to one side thereof and not extending across the car, a longitudinal aisle extending along the inner side of such vestibule from one end of the car to the other, a longitudinal seat on the far side of said aisle, transverse seats between said aisle and the entrance side of the car, a motorman's compartment at the front end of the car connected by a doorway with said aisle, and a smoking compartment at the rear end of the car connected by a doorway with said aisle.
11. In a car, the combination of a vestibule adjacent to one side and having an entrance from the outside of the car and an entrance into the car, seats in front of and behind such vestibule, the seats on the vestibule side of the car being transverse, means opposite the ends of the cross aisles between the seats for closing such side of the car, there being a longitudinal aisle in the car, and a smoking compartment at the rear end of the car separated therefrom by a suitable partition having a door opposite the end of such aisle.
12. In a car, the combination of a vestibule adjacent to one side and having an entrance from the outside of the car and an entrance into the car, seats in front of and behind such vestibule, the seats on the vestibule side of the car being transverse, means opposite the ends of the cross aisles between the seats for closing such side of the car, such means being movable to convert the car into an open car, skeleton gates for closing the transverse aisles when the car is an open car, and means for locking such gates controllable by the conductor when the car is an open pay-enter.
13. The combination, with a car having a side entrance intermediately located and a longitudinal aisle, of a closed smoking compartment at the extreme rear end of the car, a partition separating the same from the car, and a doorway in such partition opposite such aisle.
14. The combination of a car having a permanently closed side, a longitudinal seat

along the same, a longitudinal aisle, transverse seats on the other side thereof, a side entrance to the car intermediately located, a barrier preventing free access to the car
5 from such entrance whereby the car may be used as a pay-enter, removable means for closing the ends of the transverse aisles whereby the car may be used winter or summer, and gates for controlling such trans-

verse aisles when the car is used as an open 10 pay-enter.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ALBERT H. BATES.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
