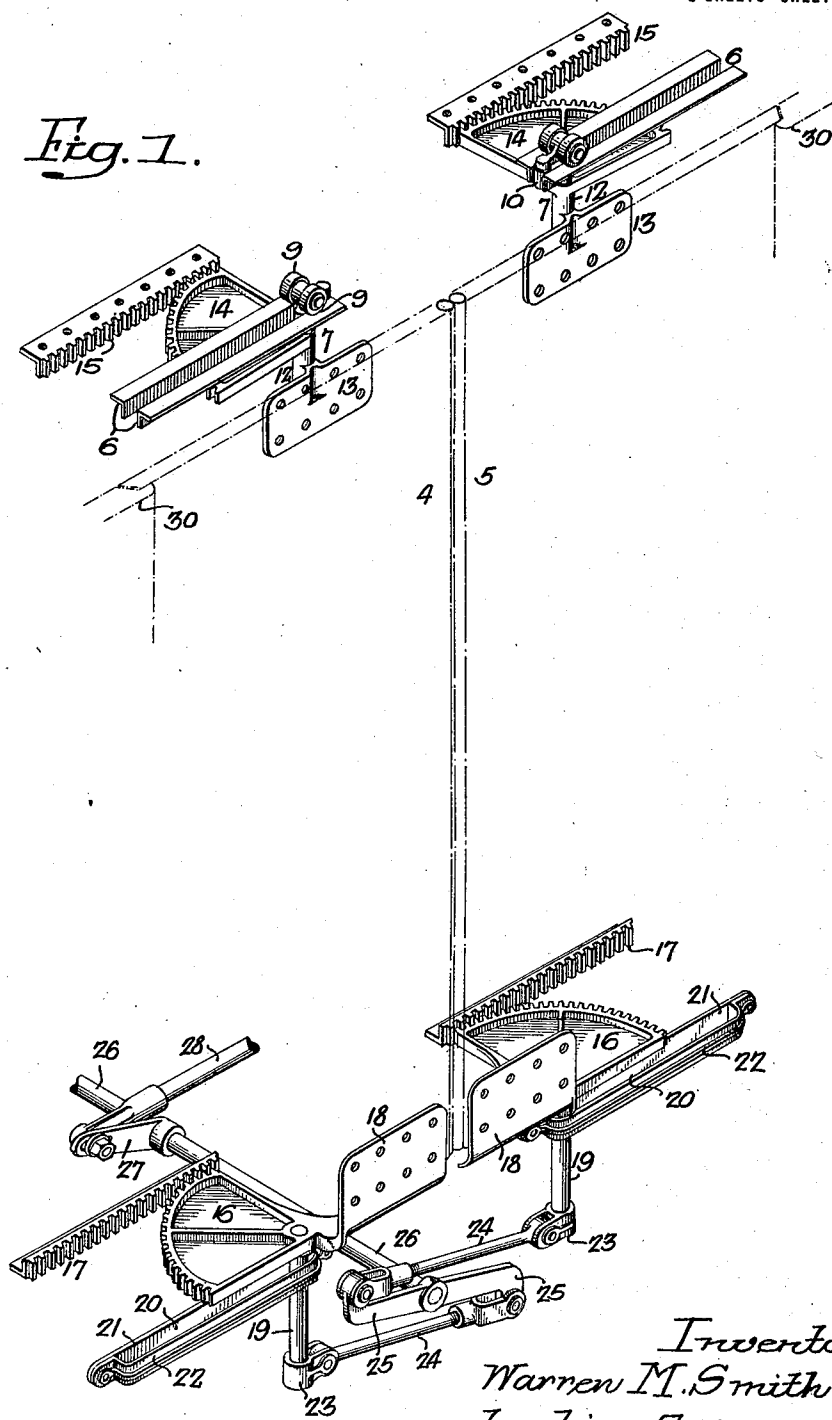


1,276,431.

W. M. SMITH.
DOOR OPERATING MEANS.
APPLICATION FILED OCT. 4, 1916.

Patented Aug. 20, 1918.
3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 3.

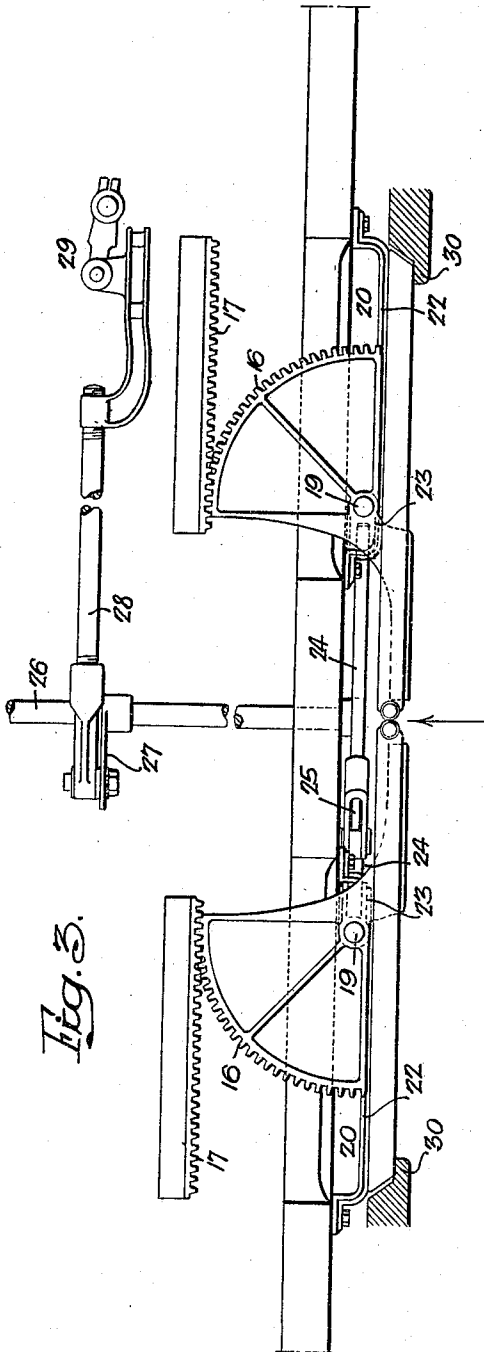
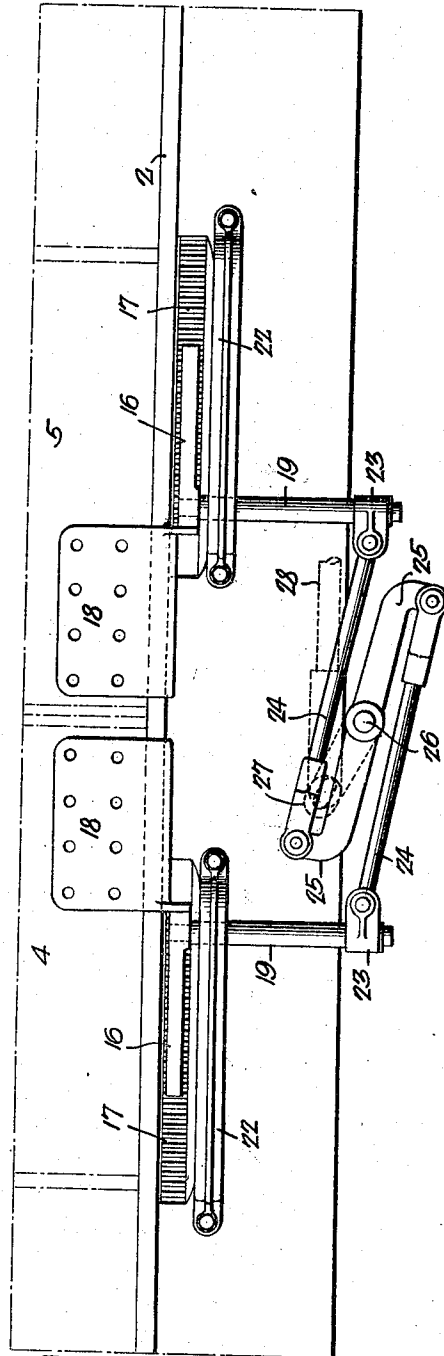


Fig. 3.

Fig. 4.



*Inventor—Warren H. Smith
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UNITED STATES PATENT OFFICE.

WARREN M. SMITH, OF MOORES, PENNSYLVANIA, ASSIGNOR TO THE J. G. BRILL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DOOR-OPERATING MEANS.

1,276,431.

Specification of Letters Patent. Patented Aug. 20, 1918.

Application filed October 4, 1916. Serial No. 123,690.

To all whom it may concern:

Be it known that I, WARREN M. SMITH, a citizen of the United States, and a resident of Moores, county of Delaware, State of Pennsylvania, have invented certain Improvements in Door-Operating Means, of which the following is a specification.

My invention relates to certain improvements in means for operating hinged doors, especially those of passenger cars of the city and suburban type.

One object of my invention is to provide means for positively turning the doors and at the same time allowing them to slide into the open or the closed positions.

A further object of the invention is to provide means for positively moving the upper end of the door with the lower end and connecting the operating mechanism only at one end of the doors.

A still further object of the invention is to provide means for suspending the doors at the upper end, the operating mechanism being attached to the lower end of the doors.

In the accompanying drawings:

Figure 1 is a perspective view showing the operating mechanism for the doors, the doors being indicated by dotted lines;

Fig. 2 is a transverse sectional view through a portion of a car illustrating the door operating mechanism, the doors being in the closed position;

Fig. 3 is a plan view of the lower operating mechanism, the doors being in the closed position;

Fig. 4 is a side view looking in the direction of the arrow, Fig. 3, showing the doors in dotted lines; and

Fig. 5 is a perspective view of the hanger.

Referring to the drawings, 1 is the body of the car. 2 is a platform in the present instance. 3 is the heading and 4 and 5 are the two doors. Mounted on the heading are two sets of rails 6 running parallel with the sides of the car. These rails, in the present instance, are formed of angle irons and act as supports for the trolleys 7 which have a spindle 8 on which the hub 12 is mounted, the hub having flanges 13 which are secured to the upper edges of the doors.

The trolleys have wheels 9 which travel on the rails and carry a vertically arranged guide roller 10 which travels in the slot between the two rails 6 and is preferably provided with a flange, as at 11, so as to hold the

trolley in the proper position. On each hub 12 is a toothed segment 14, which meshes with a rack 15 secured in the heading 3 so that as the doors are turned to the open position the racks move the doors bodily apart in order that each door may have two movements—one on the pivot and one longitudinally. At the lower end of the doors is the controlling mechanism, similar to that at the upper end. A toothed segment 16 meshes with a rack 17 and has a flanged extension 18 which is secured to the door. There is one of these mechanisms for each door. The pivot shafts 19 to which the segments 16 are attached are in line with the spindle 8 of the trolleys 7 and they are adapted to grooves 20 formed by the two plates 21 and 22, in the present instance, so that as the shafts 19 are turned the segments 16 will travel on the rack 17. At the lower end of each pivot shaft 19 is a swiveled head 23 which is connected by rods 24 to arms 25 on a transverse shaft 26 located under the platform 2, as clearly shown in Fig. 2, and on this shaft 26 is an arm 27 attached to a rod 28 which is connected to any suitable operating mechanism, such as 29, under the control of the motorman or conductor whose duty it is to open or close the doors. When the shaft 26 is turned in one direction the pivot shafts 19 are moved so as to open the doors and as the shafts 19 move in the grooves 20 they are turned by the segments 16 engaging the racks. On reversing the movement of the shaft 26 the doors are closed and are turned in closing in the reverse direction.

The invention is particularly adapted for use in controlling a pair of doors of a city or suburban railway car, but it will be understood that it can be used for controlling other doors, if desired. It is essential that these doors shall be mounted so that they can be readily manipulated by the operator and quickly moved either to the open or the closed position.

Furthermore, it is essential to provide a door which will close a comparatively large opening and in which the doors will not project beyond the body of the car when in the open position. This I accomplish by connecting the pivots to the doors at a point between the center of each door and the meeting edge and arranging the mechanism so that the doors will not only turn on their

pivots, but will also slide back toward each side of the doorway so that when a door is open it will not project beyond the side of the car.

5 By constructing the doors in this manner the inner edges of each door are located back of a strip 30, forming part of the door frame and these strips act as stops for the doors when in the closed position.

10 I claim:

1. The combination in car door operating mechanism, of a platform; two doors at one side of the platform; means pivotally suspending the doors; a transverse shaft located 15 under the platform and connected to the lower portions of the doors on a line with the pivots so that on turning the shaft the doors will be moved toward or from each other; fixed racks extending parallel with the 20 doors, when in the closed position; and a segment on each door engaging the racks and acting to turn the doors as they are moved by the shaft toward or from each other.

25 2. The combination in means for operating car doors, of a platform; two doors located at one edge of the platform and arranged edge to edge, when closed; a frame; fixed rails on the frame above the doors; a 30 trolley adapted to travel on each rail; means for pivotally connecting the trolleys to the upper portion of the doors; guides located below the platform and extending parallel with the rails; pivot shafts in line with the 35 pivots of the trolleys and located at the lower portions of the doors and adapted to the guides; a transverse shaft located under the platform; arms on said shaft; rods connecting the arms with the shafts; and means 40 for turning the doors on their pivots as the doors are moved toward or from each other so that, when the doors are open, they are in a position at right angles to the side of the platform.

45 3. The combination in car door operating mechanism, of a car frame having a doorway therein; a heading; two rails mounted on the heading parallel with the sides of the car; a trolley mounted on each rail and hav- 50 ing a vertical spindle; a toothed segment

mounted on the spindle; fixed racks meshing with the segments; two doors, one door being secured to one segment and the other door being secured to the other segment; 55 and means for moving the doors toward and from each other, whereby they will be turned on their pivots by the racks and pinions.

4. The combination of a frame having a doorway therein; a heading; two doors ar- 60 ranged to be opened and closed; rails in the heading extending parallel with the doors when in the closed position; a trolley mounted on each rail and from which the doors are pivotally suspended; guides at the lower 65 ends of the doors; pivot shafts attached to the doors and adapted to the guides; said pivot shafts being on a line with the trolleys; segments attached to the doors; a fixed rack with which the segments mesh; a trans- 70 verse shaft; arms on the shaft; a swiveled head on each pivot shaft; and rods connecting the arms with the swiveled heads so that on turning the shaft the doors will be moved toward and from each other and will turn 75 on their pivots.

5. The combination of the frame of a car having a doorway therein; a heading above the doorway; two doors located edge to edge 80 when in the closed position and closing the doorway; rails in the heading extending parallel with the doors when in the closed position; a trolley mounted on each rail, each trolley having a stem; a hub pivotally 85 mounted on each stem, each hub being secured to the upper portion of a door and having a toothed segment; a fixed rack with which the teeth of each segment engage; guides at the lower ends of the doors extend- 90 ing parallel with the rails; a pivoted shaft attached to each door and adapted to the guides; a segment on each pivot shaft; fixed rails with which said segments engage; and means connected with said pivot shafts and 95 located under the platform of the car for moving the doors toward and from each other, whereby they will be turned on their pivots by the racks and pinions.

WARREN M. SMITH.

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