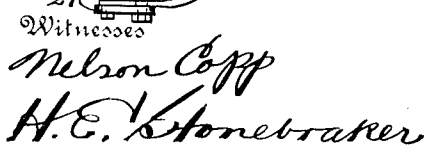


1,040,880.

3 SHEETS-SHEET 1.



By

Church & Dick

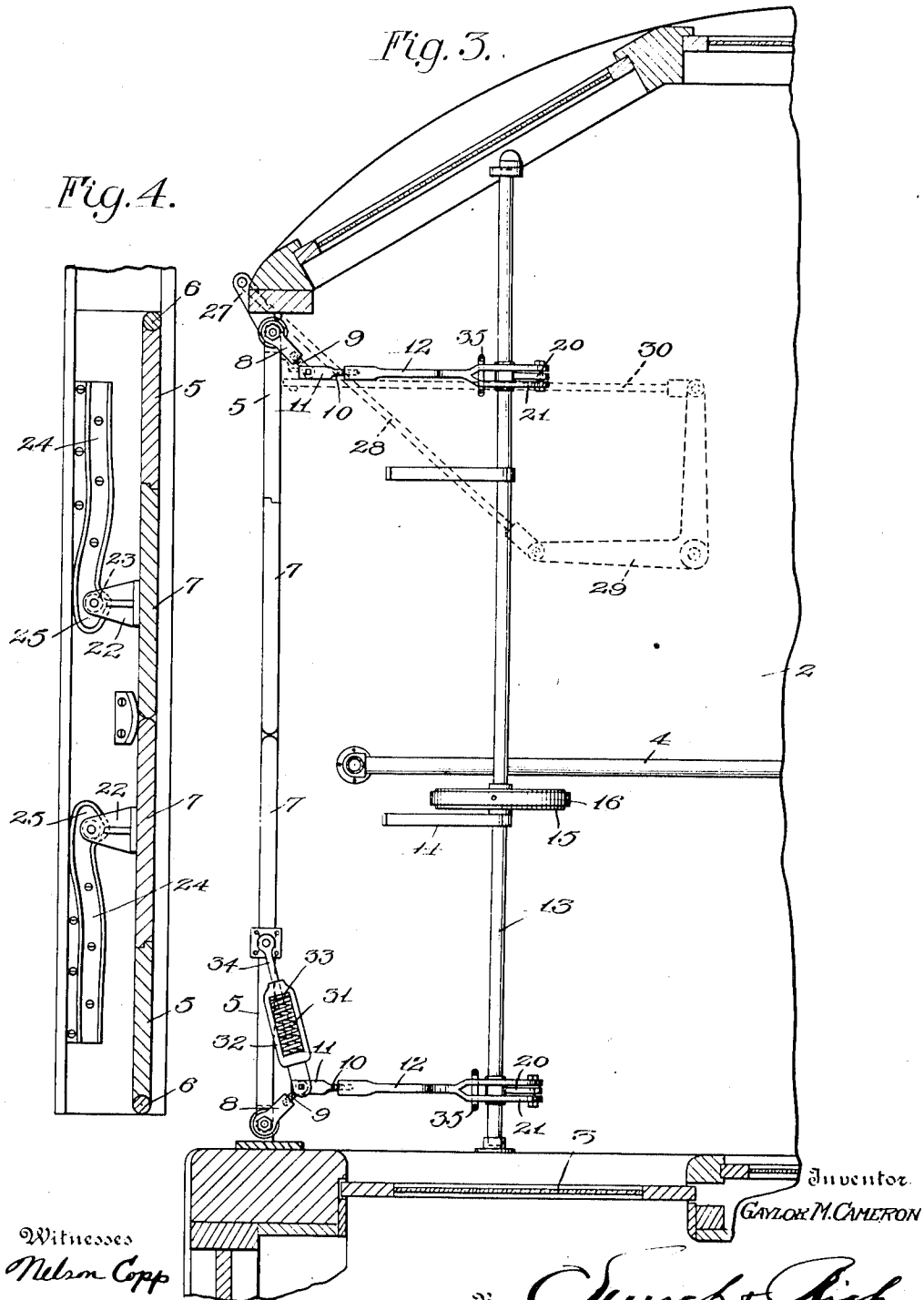
his Attorneys

G. M. CAMERON.
DOOR OPERATING MECHANISM.
APPLICATION FILED MAY 18, 1911.

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Patented Oct. 8, 1912.

3 SHEETS—SHEET 2.

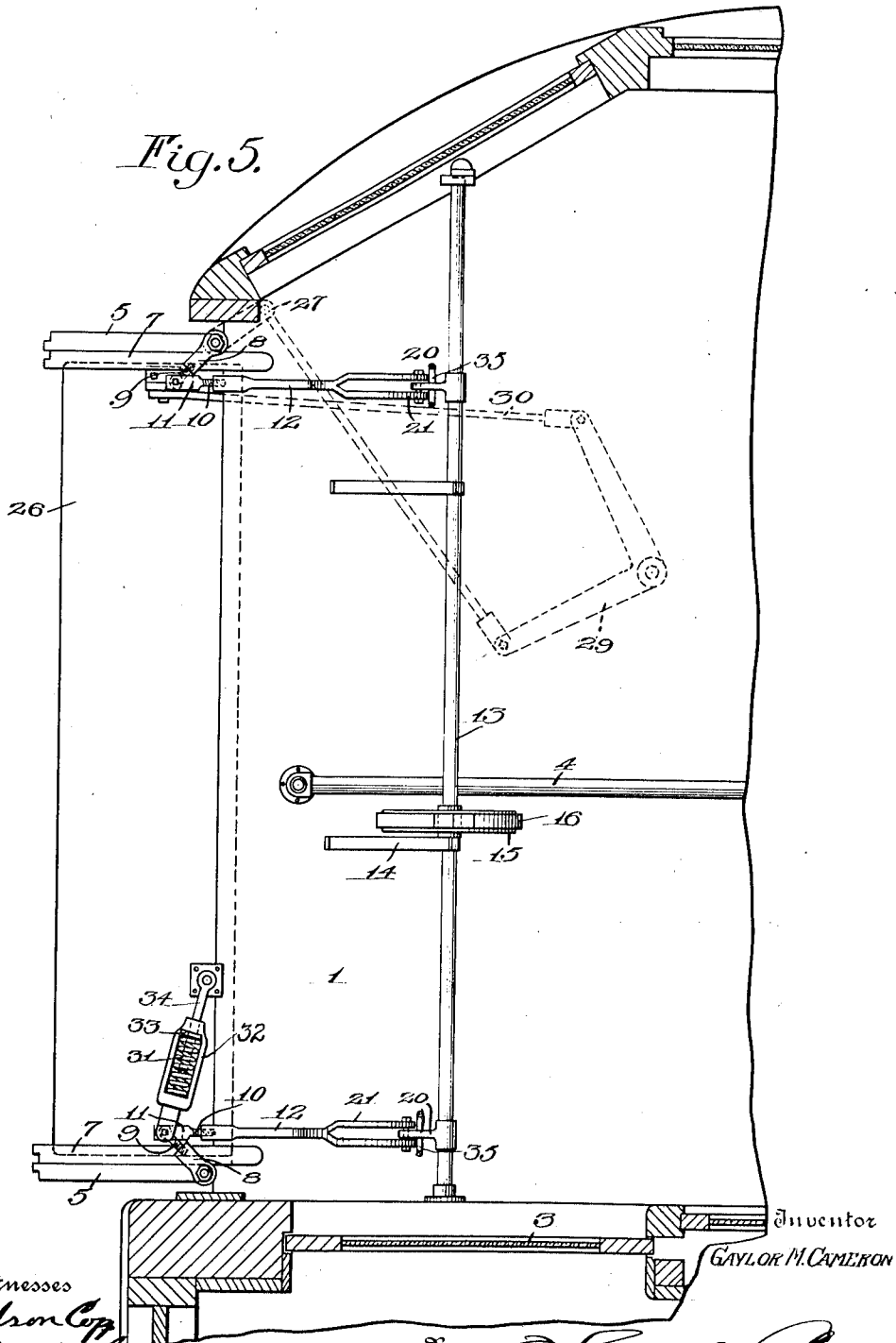


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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

GAYLOR M. CAMERON, OF ROCHESTER, NEW YORK.

DOOR-OPERATING MECHANISM.

1,040,880.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed May 18, 1911. Serial No. 628,058.

To all whom it may concern:

Be it known that I, GAYLOR M. CAMERON, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Door-Operating Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to door operating mechanisms, and is particularly adapted to that class of devices used in connection with the doors of cars, and it has for its object to provide a simple and improved mechanism which may be readily operated by the attendant or conductor, to effect a quick opening and closing of the doors by a positive action.

A further object of my invention is to so adapt the same when used in connection with cars, as to protect the operating parts from exposure to the elements, and so obviate the possibility of breaking or disarranging the mechanism.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a transverse, vertical section taken through the rear platform of a car, parts being broken away, showing portions of the door operating mechanism in elevation, the doors appearing closed; Fig. 2 is a similar view, showing the doors in open position; Fig. 3 is a horizontal section taken near the top of the rear portion of the car, with parts broken away, and showing the door operating mechanism in plan, the doors appearing in closed position; Fig. 4 is a detailed view in plan, partly in section, showing the doors, and the cooperating guideways for directing the movement thereof, and Fig. 5 is a view, similar to Fig. 3, the doors appearing in open position.

Similar reference numerals throughout the several figures indicate the same parts.

The invention is susceptible of numerous applications, where there may be involved single or double doors, slidingly or swingingly mounted, and in the present case, I have shown a convenient embodiment illus-

trating it in connection with a street car of the so-called pre-pay, or pay-as-you-enter type, and in which 1 designates the floor of the car, the platform, or vestibule, being designated generally at 2. A sliding door 3 separates the platform from the interior of the car and affords an exit from the interior to the platform as usual in cars of this type, the platform being divided by the horizontally extending bar 4 which affords a space for the conductor, who stands behind said bar and collects the fares, as passengers enter the car through the vestibule.

In order to close the vestibule while the car is in motion there are provided the doors 5 which are fixedly mounted on the rotatable posts 6, and have hinged thereto the supplemental doors 7, the latter being of greater width than the doors 5 for a purpose that will appear presently. Carried by the posts 6 are levers 8, said levers, in the present embodiment, comprising threaded sleeves adapted to be engaged by threaded stems 9 which are pivotally connected to the posts 10 by means of the yokes 11, the posts 10 being in turn threaded into the connecting rods 12.

The connecting rods 12 may be operated in any convenient manner, and to this end, in the present embodiment, I provide a controlling member, comprising a rotary shaft 13 arranged near the top of the car and supported in any suitable manner, as by means of the bracket standards 14 attached to the car. Fast on the shaft 13 is mounted the pulley 15 which is preferably arranged within a guide or keeper 16, suitably secured to the top of the car, and having at its lower ends the inwardly projecting flanges 17 which are slotted to receive a belt, strap, or other suitable flexible member 18, attached to the pulley 15 and carrying hand pieces 19 at its ends. The controlling member may be operatively connected to the levers 8 in any convenient manner, and to this end, in the present embodiment, the shaft 13 is provided with the crank arms 20 which are pivoted to the yoked portions 21 of the connecting-rods 12, said yoked portions being curved or rounded, as shown in Figs. 1 and 2, so as to enable the levers to assume their extreme positions without interference from the shaft 13, in order to lock the parts when the doors are closed by throwing the levers 12 past their longitudinal central positions with respect to the con-

trolling member 13. It will be noted that as the levers 12 are moved to open or close the doors, they are raised partially by reason of the turning of the crank arms 20, and such raising action is taken care of by the threaded stems 9, which may rotate in the sleeves 8, so as to prevent any binding or jamming and allow a double movement of the parts. When the doors are open, the levers are held in locking position by means of a bracket 35, attached to the frame of the car and arranged to engage one of the crank arms 20.

Attached to the doors 7 are standards 22 on which are mounted the guides, shown in the present embodiment in the form of rollers 23 which are arranged to engage the guideways 24, the latter being attached to a portion of the frame work at the top of the car. The guideways 24 are of just sufficient width to receive the guides, or rollers 23, so that when the doors are open, and the guides are at the outer ends of the guideways, no lateral movement of the guides is permitted, and they are held rigidly between the walls of the guideways, thereby preventing any jarring or loose movement of the doors. The guideways are curved relatively to the doors from their outer to their inner ends and terminate in enlarged portions or recesses 25 which are provided to allow for the initial movement of the guides or rollers as the doors are opened. When opened, the doors assume the position shown in Fig. 5, the overlapping portion of the wider doors projecting inwardly of the car, and so presenting a neat appearance and affording no unnecessary outwardly projecting obstruction, and the guideways are so formed that the doors move from closed to open position with absolute regularity and certainty, the resistance offered to the movement being constant throughout the path, owing to the curvature of the guideways and the fact that the guides or rollers are in engagement with the opposite walls of the guides at all times during such movement.

The operation of the mechanism is as follows: Assuming the doors to be closed, as shown in Figs. 1 and 3, the operator or conductor, by pulling on the left hand strap 19 moves the operating member 18 downwardly to rotate the pulley and with it the shaft 13, the turning of which operates the connecting rods 12 through the crank arms 20, causing an outward movement of the levers 8 and consequent turning of the posts 6 which carry the doors 5. The latter are thus swung outwardly, the doors 7 at the same time being moved with relation to the doors 5, by means of the guideways 24, until they have taken the position shown in Figs. 2 and 5.

A movable step 26 may be provided, and

arranged for raising and lowering simultaneously with the movement of the doors, this being effected in the present embodiment by means of a crank arm 27 mounted on one of the posts 6, and pivoted to a link 28, the latter being connected to one arm of the bell crank 29, the opposite arm of which operates the step through a connecting rod 30.

In order to hold the doors in open or closed positions, suitable means may be provided for retaining the levers 12 at their extreme limits of movement where they are locked, and to this end, in the present embodiment, there is provided a spring controlled means comprising a spring 31 mounted within the housing 32 which is pivotally connected with one of the posts 10. A spring engaging plate 33 is provided on the end of the rod 34, the latter being pivotally secured to a portion of the frame of the car. It will be seen that as the operating mechanism is actuated to move the doors from closed to open position, or vice versa, the spring 31 will be contracted a considerable amount as the parts move through the intermediate position, offering a certain resistance which serves to insure the movement of the doors to their extreme positions at which point the locking means is brought into play to hold them either open or closed.

While I have disclosed my invention in a particular embodiment, as applied to a specific form of car, it is to be understood that I do not limit myself to the exact structure or embodiment herein shown and described, but desire to cover by the present application any modification coming within the scope of this improvement, and involving the operation of movable doors either singly or in pairs, as, for instance, where the doors may be controlled from any part of the car by an operating member extending through the car.

I claim as my invention:

1. In a door operating mechanism, the combination with a door pivotally mounted for swinging movement, of a shaft rotatably mounted in spaced relation to the door and arranged parallel to the top of the latter when closed, a lever fixedly mounted on the door, and operating connections between the lever and the rotary shaft arranged near the top of the door.

2. In a door operating mechanism, the combination with a door, of a shaft rotatably mounted in spaced relation to the door, a lever fixedly mounted on the door, a connecting rod having a swiveled connection at one end with the lever, an arm mounted on the shaft and pivoted to the opposite end of the aforesaid connecting rod, and an operating member secured to the shaft.

3. In a door operating mechanism, the combination with a door, of a shaft rotatably

mounted in spaced relation to the door, a lever fixedly mounted on the door, a connecting rod having a swiveled connection at one end with the lever and a curved portion adjacent to its opposite end, an arm mounted on the shaft, the connecting rod having pivotal connection with the arm at its end adjacent to the curved portion, a pulley fast on the shaft, and an operating member attached to the pulley.

4. In a door operating mechanism, the combination with a door frame, of a pair of doors pivotally mounted in the frame, a second pair of doors hinged to the first named doors, a door controlling member arranged in parallelism to the doors when closed, connections between the doors and the door controlling member, and spring actuated means for controlling the movement of the doors to open or closed positions.

5. In a door operating mechanism, the combination with a swingingly mounted door, of a door controlling member arranged in parallelism to the door when closed, operative connections between the door and the door controlling member, and spring actuated means for controlling the movement of the door to open or closed positions.

6. In a door operating mechanism, the combination with a swingingly mounted door, of a door controlling member arranged near the top of the door, connections between the door controlling member and the door, and spring actuated means for controlling the movement of the door to open or closed position.

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Witnesses:

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H. E. STONEBRAKER.