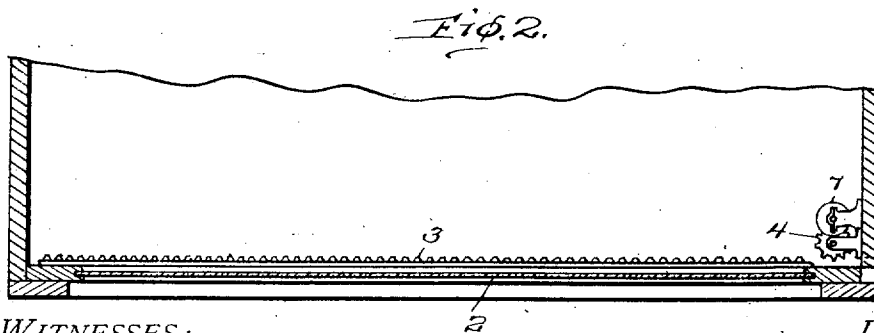
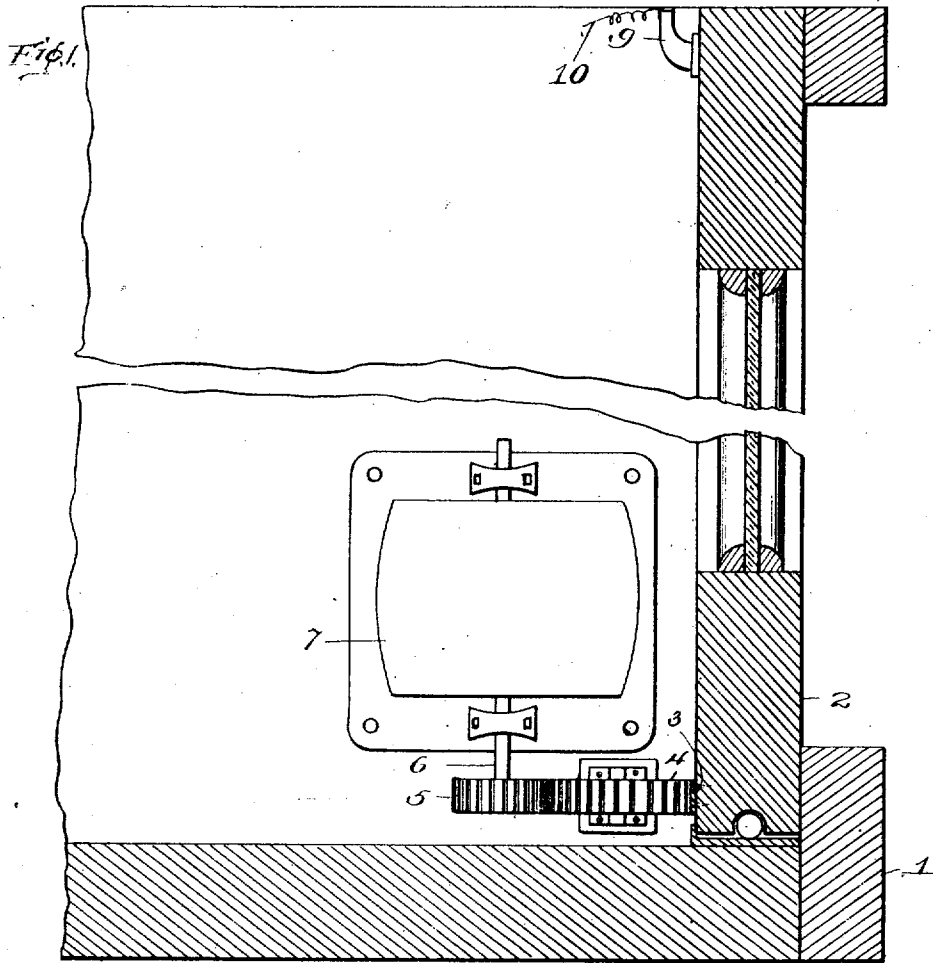


R. H. REH & Y. BURGESS.
CLOSING MEANS FOR SLIDING DOORS.
APPLICATION FILED APR. 15, 1910.

1,018,442.

Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

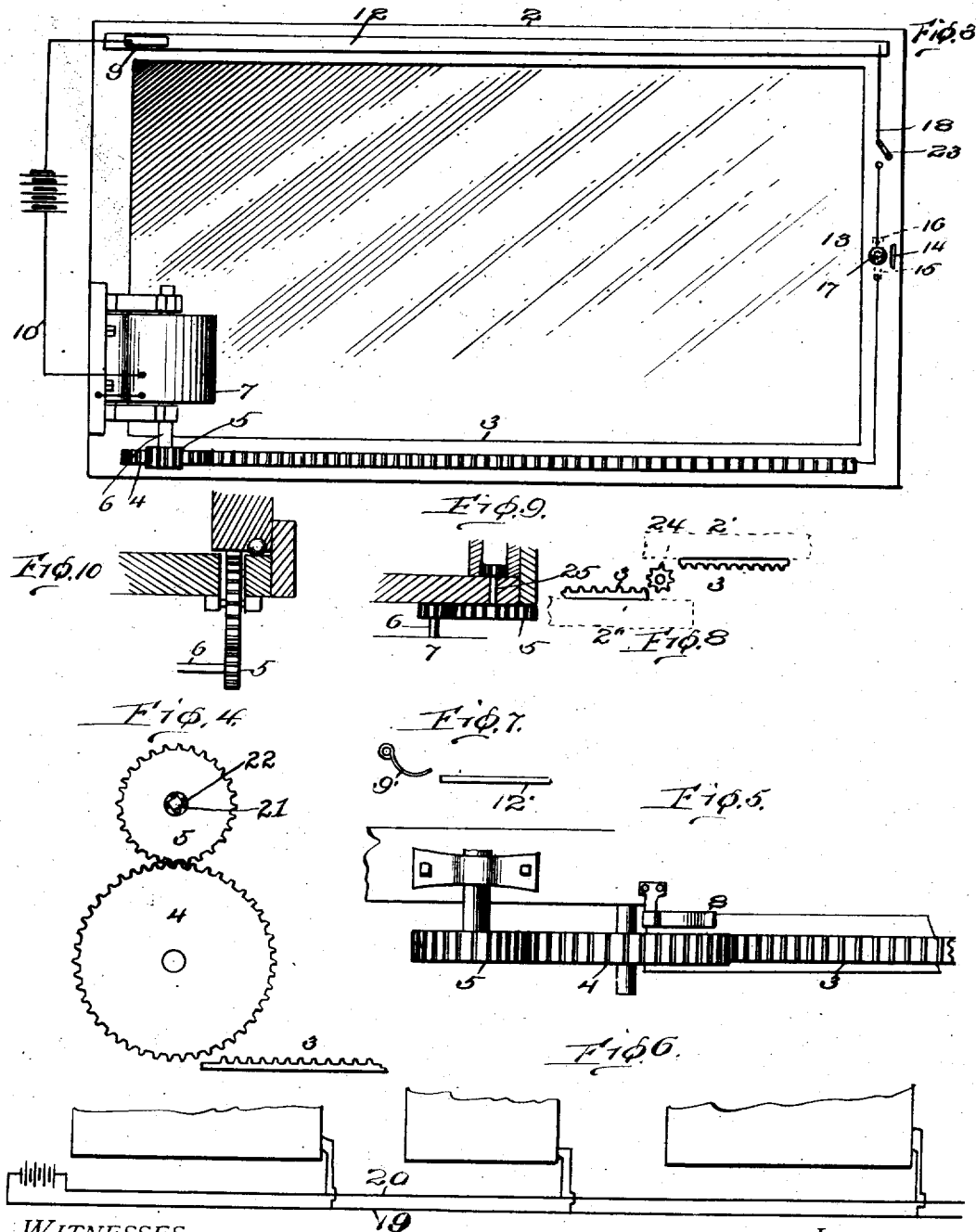
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UNITED STATES PATENT OFFICE.

RUDOLPH H. REH AND YORKE BURGESS, OF WASHINGTON, DISTRICT OF COLUMBIA.

CLOSING MEANS FOR SLIDING DOORS.

1,018,442.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed April 15, 1910. Serial No. 555,636.

To all whom it may concern:

Be it known that we, RUDOLPH H. REH and YORKE BURGESS, citizens of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Closing Means for Sliding Doors; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to closing means for sliding doors for show-cases, closets, windows and any other desired structure having a reciprocating door, and particularly to electrically operated door closures.

The invention comprises and has for an object the provision of an electrical motor, and a plurality of means associated therewith and with a show-case, whereby the door of the case is automatically closed after each opening.

Another object in view is the combination with a door, of a show-case having a rack secured thereto, of a motor provided with a gear mechanism meshing with said rack for closing the door when the motor is operated, and a circuit for the motor including a source of current automatically closed upon opening said door.

With these and other objects in view the invention comprises novel constructions, combinations and arrangements of parts as will be hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a fragmentary sectional view through a show-case with an embodiment of the invention applied. Fig. 2 is a top view of the structure shown in Fig. 1, the same being shown on a reduced scale. Fig. 3 is a side view of a show-case door with the invention applied thereto. Fig. 4 is an enlarged fragmentary view of a slightly modified form of the gear mechanism. Fig. 5 is a slightly modified form of means for grounding the motor on the rack on the show-case door. Fig. 6 is a diagrammatic view showing the wire for a plurality of show-cases. Fig. 7 is a detail, fragmentary view of a contact spring and conducting strip embodying a slightly modified form of the invention. Fig. 8 is a fragmentary view of a show-case showing the invention applied in such manner that a single motor will close a plurality of doors. Fig. 9 is a side view of the struc-

ture shown in Fig. 8. Fig. 10 is a detail, fragmentary view showing the rack arranged on the bottom of the door.

In constructing a device according to the present invention, the same is designed to operate the sliding doors, either of the vertically or horizontally movable kind. In applying the invention a metallic rack is secured along one edge thereof, and a strip of conducting material parallel thereto. The rack and the conducting strip are connected at one end by a suitable conductor which has interposed intermediate its length a switch of the push button type that normally maintains the circuit closed but opens the circuit when depressed. In order to complete the circuit a connecting conductor is provided which has movable engaging means for movably engaging the rack and the conducting strip. One of these movable engaging means is a gear mechanism meshing with the rack and driven by a motor interposed in the circuit of which the rack is a part. When the push button is depressed and the door is opened no current will flow but immediately the push button is released the circuit will be complete and the motor will begin to operate the gear mechanism connected therewith and the rack which operation will continue until the door is closed.

In order that the invention may be fully understood, an embodiment of the same is shown in the accompanying drawings in which 1 indicates a show-case of any desired kind, and 2 the door thereof. Secured to door 2 is a rack 3 which extends for substantially the full length of door 2 in order that gear 4 may completely close the same. Gear 4 is operated by a pinion 5 rigidly secured to shaft 6 of motor 7. Motor 7 is preferably grounded on rack 3 through shaft 6, pinion 5, and gear 4, though if desired it may be grounded in any other desired way as for instance by brush 8 (Fig. 5) which is secured to the motor and grounded thereon and slidably engages rack 3. Motor 7 is connected opposite the grounded side with a contact spring 9 through wire 10 which has interposed in its length a source of current as battery 11. Contact spring 9 slidably engages a metallic strip 12 which is preferably secured to the opposite side of the door to rack 3. At the end of door 2 opposite motor 7 is arranged a push button switch 13 which is preferably located in the hand-hold or

notch 14. Switch 13 is provided with contacts 15 and 16 which normally remain in contact but are adapted to be separated by the depression of button 17. Push button 13 is interposed in wire 18 which connects rack 3 and strip 12 electrically.

In installing the device the wiring may be arranged in any desired manner but preferably as shown in Fig. 6. As shown in this figure a single source of current is used with two feed wires 19 and 20 which are tapped into opposite each motor 7. In providing current ordinary primary cells are used, but if desired ordinary lighting or other current could be utilized by merely using motors wound to take the respective voltage.

In operating door 2, push button 13 is depressed and the door slid open as far as desirable. As soon as push button 13 is released the circuit will be closed and the motor will begin to operate for closing the door unless the same is held open against the action of the motor. In arranging rack 3 the same is designed to free itself from gear 4 just previous to the closing of the door. In other words, as the door is being closed the gear 4 will arrive at the end of the rack, and will cease to further move the door, but the momentum of the door will be sufficient to keep the door moving for a short distance. This will break the circuit between gear 4 and rack 3 which circuit will remain open until door 2 is opened.

In mounting a pinion on the shaft of the motor the same may be mounted as shown in Fig. 4 in which a clutch plate 21 is provided for accommodating balls or rotatable gripping members 22 which will permit a free rotation of gear 5 in a reverse direction without moving shaft 6 when the door 2 is opened, but upon the rotation of shaft 6 by the motor the balls 22 will move up the beveled ways 21 and connect the shaft 6 with gear 5 so as to convey power thereto.

Preferably in addition to interposing switch 13 intermediate the length of wire 8 a small switch 23, which normally remains open for maintaining the circuit of motor 7 open is also provided. Immediately previous to opening door 2 switch 23 is opened and the door pushed open in the usual manner. When it is desired to close the door switch 23 is manually closed which will immediately close the circuit of motor 7, and the motor will eventually close the door. If switch 23 is not opened just previous to opening the door, the circuit of motor 7 may be opened by depressing button 17, as heretofore described.

In mounting the motor 7 the same may be arranged interiorly of the show-case, as shown in Fig. 1, or beneath or above the show-case, or in any other desired location as preferred, or as may be necessary. When arranging the motor beneath the show-case

the rack 3 is located as shown in Fig. 10. When it is desired to use a single motor for closing two doors the same is arranged as shown in Figs. 8 and 9 in which the doors 2' and 2'' are provided with racks 3 in the usual manner, except that the rack 3 of door 2'' is on the outside of the door while the rack 3 of door 2' is on the interior part of the door. Arranged between doors 2' and 2'' is a propelling gear 24, which propelling gear may be made small in order not to separate the doors to any appreciable extent. The gear 24 is rigidly secured to a shaft 25, which extends through the bottom or top of the show-case and has secured thereto gear 5 which meshes as heretofore set forth with pinion 6 actuated by motor 7. By this arrangement either of the doors may be independently opened and closed, or may be opened and closed at the same time. By the arrangement of the racks 3 which fall short of reaching gear 24 the circuit is maintained opened at this point when the door is closed, but the circuit is closed when either of the doors is opened.

If desired, instead of arranging the spring 9 to remain in contact with strip 12 continuously, the same may be arranged as shown in Fig. 7 where spring 9' slips off the end of the strip 12' at the same time that the gear 5, or in case of the structure shown in Fig. 8 gear 24 disengages itself from rack 3, and in this manner the circuit will be opened automatically at two places when the door is closed.

What is claimed as new is:—

1. In a closing mechanism of the class described, a sliding element, a rack secured to said element, an electric motor, means for conveying power from said motor to said rack for actuating the rack, and a direct circuit for the driving power of said motor including said rack.

2. In a closing mechanism of the class described, a movable element, a rack secured thereto, an electrical motor, means for conveying power from said motor to said rack, a contacting strip extending substantially the full length of said movable element, a switch and a circuit for said motor including a source of current, said rack, said contacting strip and said switch.

3. In a closing mechanism of the class described, a sliding element, an electrical prime mover, a metallic rack secured to said sliding element, means for connecting said prime mover with said rack for moving the rack and said sliding element when the electrical prime mover is energized, a contact strip extending for substantially the full length of said sliding element, a contact member engaging said strip when the sliding element is in its open position, means for electrically connecting said contact member with said prime mover, a

source of electrical energy in the length of said connecting means, and means for completing the circuit between said rack and said contact strip.

5 4. In a closing mechanism of the class described, a movable element, a rack extending along one edge thereof, a conductor strip secured to said movable element parallel with said rack for substantially the
10 full length of the movable element, an electrical motor arranged with means for engaging said rack and moving the movable element when the motor is energized, means electrically connecting said conductor strip
15 and said motor, a source of electrical energy in the length of said connecting means, means grounding said motor on said rack, means electrically connecting said contact strip and said rack at the end opposite
20 said first-mentioned connecting means, and a manually controlled switch interposed in the last-mentioned connecting means.

5 5. In a closing mechanism of the class described, a movable element, a rack secured thereto, an electrical motor, a pinion carried by the shaft of said motor, means
25 interposed between said pinion and said shaft permitting the pinion to run in a reverse direction on said shaft without moving the shaft, said means connecting the
30 pinion to the shaft for delivering driving movement from the shaft to the pinion, a gear wheel meshing with said pinion and with said rack for moving said movable
35 element to a closed position, and a circuit for said motor including a source of current.

6. In a closing mechanism of the class

described, the combination of a movable element, a rack secured thereto, an electrical motor, means for conveying power from
40 said motor to said rack, a contact strip extending substantially the full length of said movable element, a circuit for said motor, including a source of current, said contact strip and said rack, and a contact spring
45 interposed in said circuit and contacting with said contact strip when said movable element is opened, but moving off of said contact strip when the movable element is entirely closed for opening the cir-
50 cuit, said rack moving out of contact with the means which connects the same with the motor at the same time that the said spring contact moves off said strip.

7. In a closing mechanism of the class
55 described, a movable element adapted to move into and out of an open position, a rack fixed to the movable element and extending in the direction of travel thereof, a conductor carried by the movable element
60 and extending substantially parallel to the line of the rack, a motor having means engaging the rack for actuating the movable element, and a circuit for the motor, including said rack and conductor, and a source
65 of current.

In testimony whereof we affix our signatures in presence of two witnesses.

RUDOLPH H. REH.
YORKE BURGESS.

Witnesses:

C. H. FESLER,
A. L. KITCHIN.