

March 17, 1936.

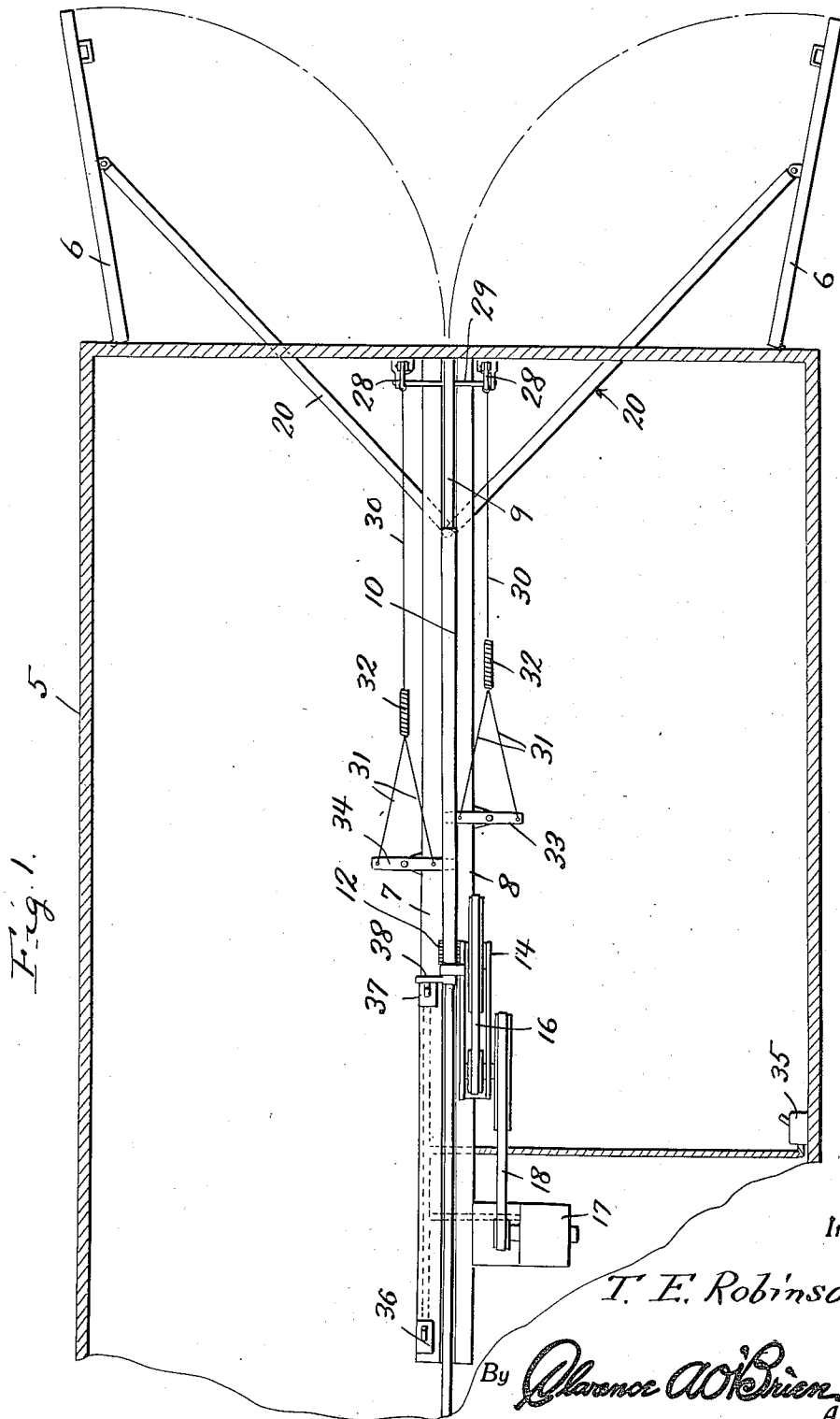
T. E. ROBINSON

2,034,445

CLOSURE OPERATOR

Original Filed Oct. 2, 1933

3 Sheets-Sheet 1



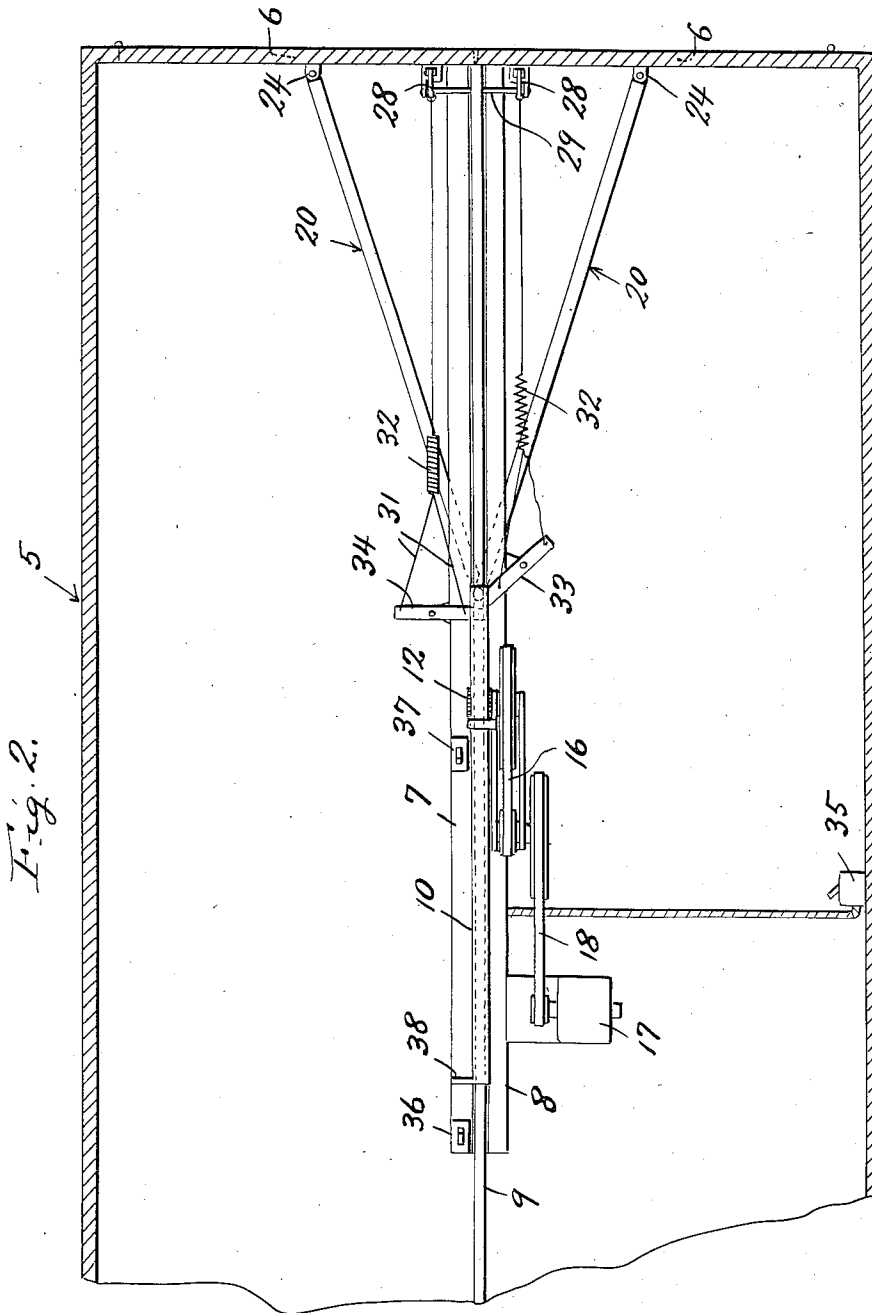
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Fig. 3.

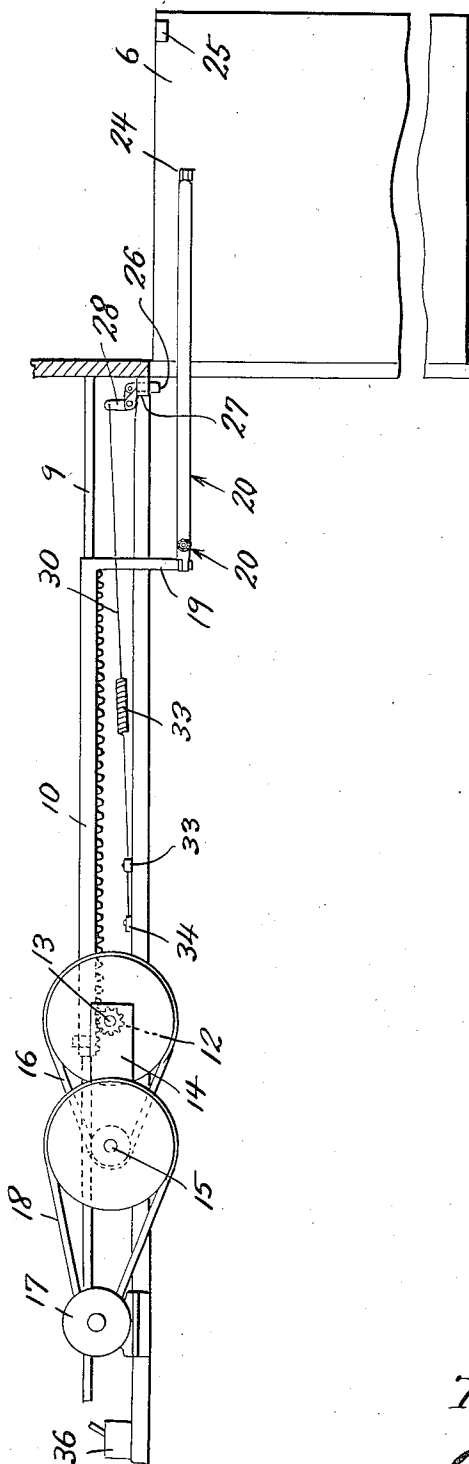
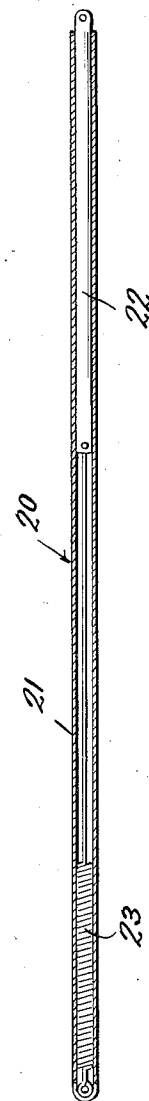


Fig. 4.



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## UNITED STATES PATENT OFFICE

2,034,445

## CLOSURE OPERATOR

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Application October 2, 1933, Serial No. 691,861  
Renewed August 19, 1935

2 Claims. (Cl. 268-63)

This invention relates to the class of closure operators and has as its object the provision of an improved mechanism for opening and closing garage doors, and for locking the doors incident to a closing thereof, and unlocking the doors incident to an opening thereof.

It is still a further object of the invention to provide a mechanism of the character above mentioned which is composed of comparatively few parts, is inexpensive to install, and thoroughly efficient in operation.

The invention together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a top plan view of the mechanism showing the parts of the doors in open position.

Figure 2 is a view similar to Figure 1 with the doors in closed position.

Figure 3 is a side elevational view of the mechanism,

Figure 4 is a sectional view through one of the links.

Referring to the drawings by reference numerals it will be seen that 5 indicates generally a garage and 6 the doors of the garage.

In accordance with the present invention there is mounted longitudinally in the top part of the garage a pair of spaced parallel guide rails 7 and 8 and extending between the guide rails in parallelism thereto is a fixed guide rod 9. A tubular member 10 is slidably engaged with the guide rod 9. The member 10 on the bottom side thereof is provided with a rack bar 11 that is in constant mesh with a rack gear 12 on one end of a shaft 13 journaled transversely of a supporting frame 14 that is mounted on one of the guide bars in the present instance the guide bar 8. Also journaled transversely of the bracket 14 is a shaft 15 and shafts 13 and 15 have a belt and pulley drive connection as indicated at 16. Also mounted on the guide bar 8 is a bracket on which is supported an electric motor 17 that has a belt and pulley drive connection 18 with the shaft 15. Obviously power is transmitted from the motor 17 to the shaft 15, and from the shaft 15 to the shaft 13 so that the rod 10 is reciprocated along the guide rod 9 when the motor 17 is in operation.

At its forward end the rod 10 is provided with a depending extension 19 to which are pivoted at one end links 20.

As shown in Figure 4 each of the links 20 includes an outer tubular rod 21 that is pivoted at one end to the depending extension 19 of the slide member 10. Slidable within the rod 21 is a rod

22 that is normally urged inwardly of the rod 21 through the medium of a suitable spring 23. The outer or free end of the rod 22 is pivoted to one of the doors 6 as at 24.

From the above it will be apparent that when the rod 10 moves forwardly or toward the right in Figure 2 the doors 6 will swing from the closed position shown in Figure 2 to the open position shown in Figure 1; and upon reverse movement of the member 10 the doors will swing from the open position shown in Figure 1 to the closed position shown in Figure 2.

The doors 6 are provided with keepers 25 with which are engaged latches 26 operating in guides 27 provided therefor on the inner side of the front wall of the garage 5. These latches 26 are pivotally connected with bell cranks 28 that are rotatably supported on a horizontal shaft 29.

Connected to each bell crank 28 is a cable 30 which in turn is connected to the front ends of a pair of cables 31 by a coil spring 32. The rear ends of the pair of cables 31 are connected to opposite ends of a lever 33 pivotally mounted intermediate its ends on a bracket projecting laterally from the guide bar 8 while the other set of cables 31 are connected to a similar lever 34 pivoted intermediate its ends on a bracket projecting laterally from the guide bar 7. The lever 34 is arranged in advance of the lever 33, and the inner ends of these levers are normally arranged in the path of the depending extension 19 of the slide 10.

From the above it will be apparent that when the doors 6 are being swung to a closed position, just before said doors reach their fully closed position the extension 19 will engage the inner end of the lever 33 rocking the latter in an anti-clockwise direction as shown in Figure 2 thus causing the cables to rock one of the bell cranks 28 to raise one of the latches 26 so that the door associated with said latch can close and then upon further movement of the member 10, the part 19 will strike the other lever 34 to raise the other latch 26 to permit the second door to close and then, as the member 19 moves past the lever 34, the second latch will move downwardly and engage the keeper 25, the other latch moving into engagement with its keeper when the member 19 passes the lever 33. When the member 10 is moved forwardly, the part 19, engaging the lever 34, will raise the latch 26 of the last door to be closed, so that this door can start to open before the latch of the other door is released and then when the part 19 engages the lever 33, the second latch will be moved upwardly and the second

door will start to move to open position. This arrangement is provided where one of the doors is provided with a parting strip which overlaps the other door, so that in this case, it is necessary to close the door having the parting strip thereon after the other door has been closed and to open the door having the parting strip thereon before the other door is opened.

The electric motor 17 is arranged in circuit with a suitable manually operable switch 35 which may be mounted in any convenient location, and cut out switches 36, 37 mounted on the guide bar 8 and adapted to be automatically operated through the medium of a lateral arm or extension 38 provided on the rear end of the slide 10.

It will thus be seen that when the doors are closed and it is desired to open the doors the switch 35 is closed for closing the circuit to the motor so that drive is transmitted from the motor to the slide 10 through the mechanism hereinbefore described for moving the slide 10 from the left to the right. Just as the slide 10 completes its forward movement the arm 38 thereof will engage the switch 37 tripping the switch and thus opening the circuit to the motor 17.

When it is desired to close the doors the control switch 35 is again operated for closing the circuit to the motor so that the drive is transmitted from the motor to the slide 10 for sliding the same from the position shown in Figure 1 to the position shown in Figure 2. Just as the slide 10 reaches the limit of its rearward or door closing movement the arm 38 thereof engages the switch 36 and trips the latter for again opening the circuit to the motor 17.

Having thus described my invention, what I claim as new is:

1. In combination with a pair of hinged doors, a reciprocatory member, means for reciprocating the same, a telescopic link having one member thereof pivoted to each door and the other member to the reciprocatory member, a spring connecting the telescopic members together and tending to move one member into the other, latch means for holding each door in closed position, a pair of levers arranged one in advance of the other with their inner ends located in the path of movement of a part of the reciprocatory member, and means operated by rocking movement of the levers for moving the latch means to releasing position.

2. Means for opening and closing a pair of hinged doors comprising a supporting structure, including a rod, a tubular rack bar slidably arranged on the rod and having a depending part at its forward end, a pair of telescopic links connecting said depending part to the doors, a spring means for connecting the two members of each link together, a shaft, a gear thereon engaging the teeth of the rack bar, an electric motor for rotating the shaft, manually operated means for closing the circuit to the motor, means operated by the rack bar for breaking the circuit to the motor as the same nears each limit of its reciprocatory movement, latch means for holding the doors closed, and means operated by the movement of the rack bar for releasing said latch means, such means including a lever located in the path of movement of the projecting part of the rack bar, and flexible means including a spring for connecting the lever with the latch means.

THOMAS E. ROBINSON.