

March 23, 1926.

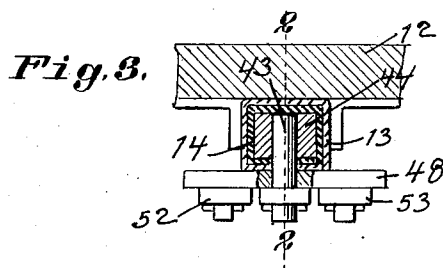
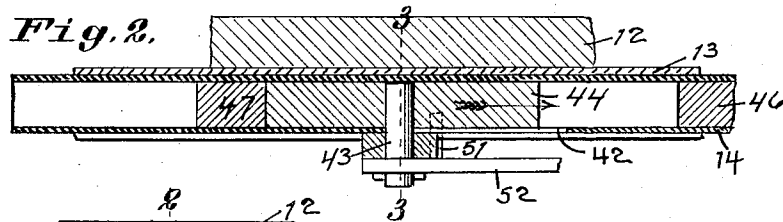
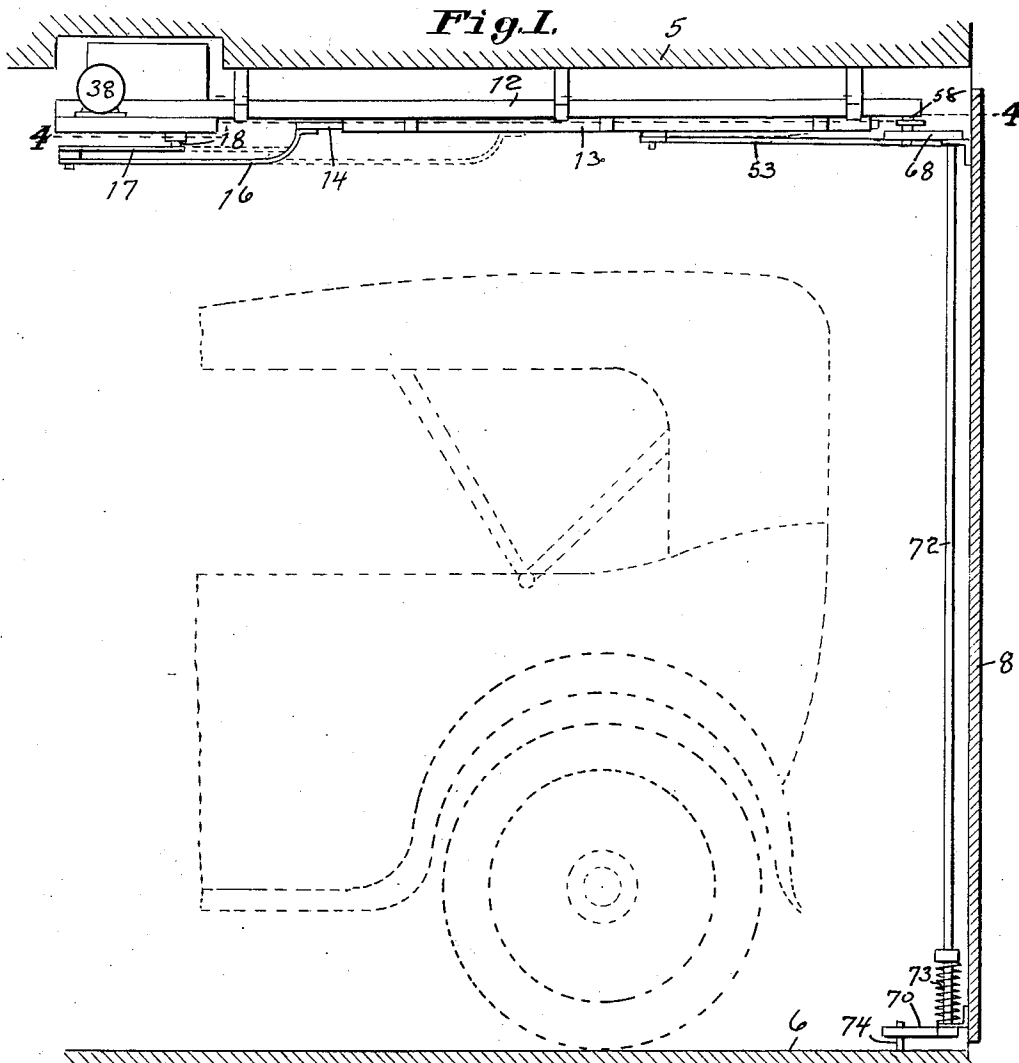
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A. J. SCHRADE ET AL

GARAGE DOOR OPENING DEVICE

Filed Sept. 25, 1925

3 Sheets-Sheet 1



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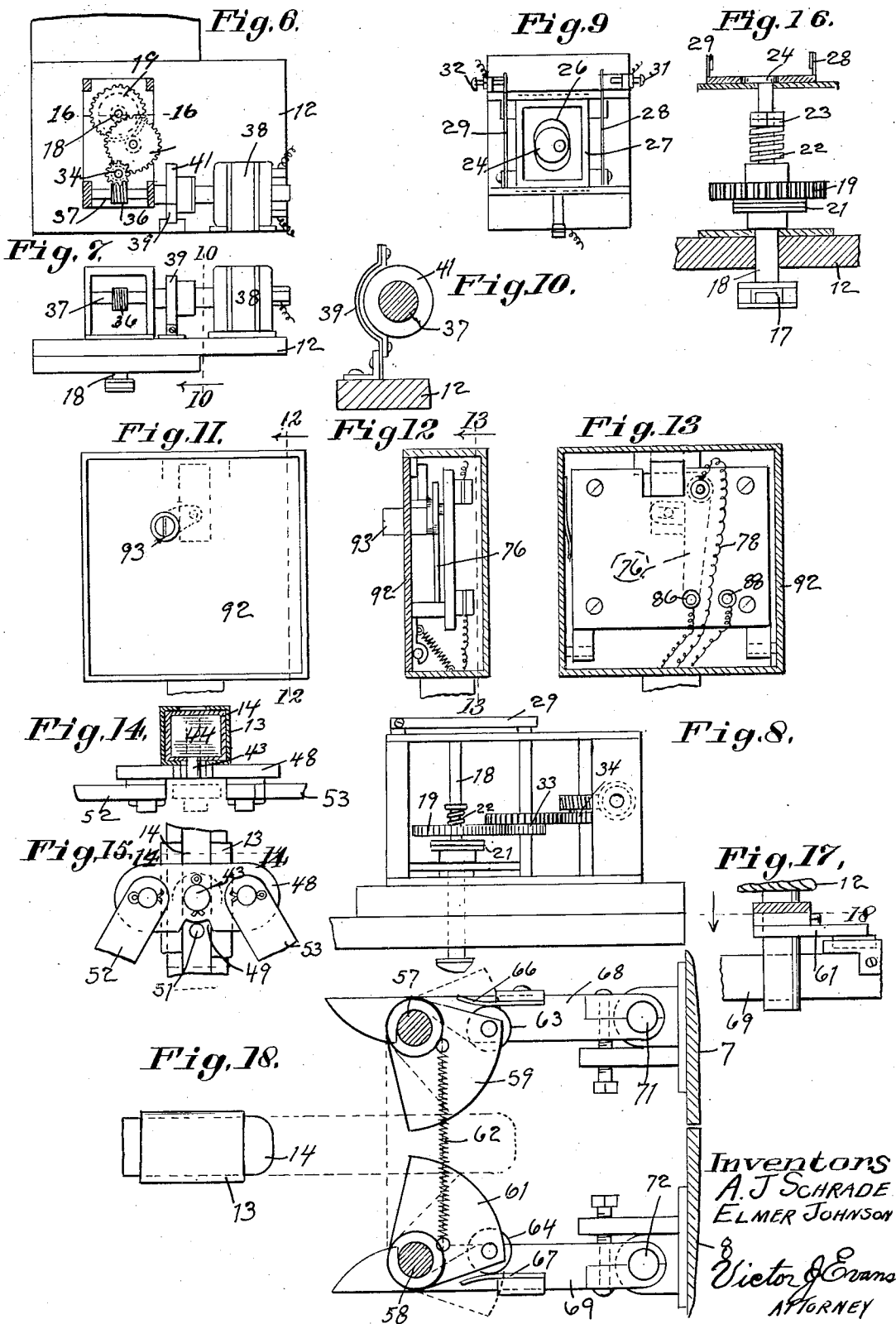
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UNITED STATES PATENT OFFICE.

ANDREW J. SCHRADE AND ELMER JOHNSON, OF SAN FRANCISCO, CALIFORNIA.

GARAGE-DOOR-OPENING DEVICE.

Application filed September 25, 1925. Serial No. 58,664.

To all whom it may concern:

Be it known that we, ANDREW J. SCHRADE and ELMER JOHNSON, citizens of the United States, residing at San Francisco, in the county of San Francisco, and State of California, have invented new and useful Improvements in Garage-Door-Opening Devices, of which the following is a specification.

This invention relates to means for opening and closing garage doors, and has particular reference to automatic means controlled from a remote point thus enabling the driver of an automobile to open the doors of the garage while some distance away from the same.

Another object is to produce a device of this character which will take up a minimum amount of space at a point out of the way and therefore it will not be subject to disarrangement.

A further object is to provide a device of this character which may be attached to any standard form of swinging door without altering the construction of the garage or doors.

A still further object is to provide means whereby if for any reason the doors become jammed so as not to operate, the parts will give in such a manner that no damage will occur.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of our device as applied to a garage shown in vertical cross section,

Figure 2 is a cross section taken on the line 2—2 of Figure 3 and showing the operating bar construction,

Figure 3 is a cross section taken on the line 3—3 of Figure 2,

Figure 4 is a top plan view of our device taken on the line 4—4 of Figure 1,

Figure 5 is a diagrammatic illustration of the wiring mechanism,

Figure 6 is a top plan view of the driving motor and gearing arrangement,

Figure 7 is an end elevation of the driving motor and gearing arrangement,

Figure 8 is a side elevation of the gearing arrangement,

Figure 9 is a top plan view of the motor circuit breaker,

Figure 10 is a fragmentary detail view showing the motor brake,

Figure 11 is a front elevation of the control box,

Figure 12 is a cross section taken on the line 12—12 of Figure 11,

Figure 13 is a cross sectional view taken on the line 13—13 of Figure 12,

Figure 14 is a cross section taken on the line 14—14 of Figure 15,

Figure 15 is a bottom plan view of Figure 14,

Figure 16 is an enlarged fragmentary detail view taken on the line 16—16 of Figure 6, showing the clutch mechanism,

Figure 17 is a fragmentary side elevation of the latch releasing mechanism, and

Figure 18 is an enlarged detail fragmentary top plan view of the latch releasing mechanism.

In providing means for opening a garage door we have endeavored to produce a device which may be operated from a remote point so that a person may drive up to the garage, reach out and turn a switch in the driveway which will cause the doors to open and after driving in the doors may be closed from a point within the garage if desired. In accomplishing this object we have endeavored to eliminate a complicated structure and have produced a device which is simple, compact and mechanically designed.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of our invention the numeral 5 designates the ceiling of a garage, the numeral 6 the floor thereof and the numerals 7 and 8 the doors of the garage.

These doors are hinged at 9 and 11, respectively as is customary with doors of this type. Secured to the ceiling and suspended therefrom is a platform 12 upon the under side of which we mount a tubular track 13. Within this tubular track we place a tubular rod 14. To one end of this rod we connect a link 16, and to the opposite end is attached a crank 17 which is keyed to a vertically disposed driving shaft 18. This shaft extends through the platform 12 and has freely rotatable thereon a gear 19. The side of this gear contacts a friction disc 21 and is held in contact therewith by a spring 22 impressed between the opposite side of the gear 19 from the friction disc 21, and

bears against a collar 23 pinned to the shaft 18.

On the upper extremity of this shaft we provide an eccentric disc 24 which is adapted to rotate within an elliptical opening 26 formed in a sliding frame 27. This frame carries extreme contact arms 28 and 29 which are adapted to engage contacts 31 and 32, respectively, when the frame 27 is moved from side to side.

The gear 19 is rotated through a train of gears 33 and 34 so as to derive power from a worm 36, carried on the motor shaft 37. This motor shaft is rotated by the motor 38. A brake 39 contacting a friction wheel 41 prevents the motor from racing after the current has been shut off.

Again referring to Figures 1, 2, 3, 4, 14 and 15, it will be noted that the tubular rod 14 is slotted as shown at 42, through which a pin 43 passes. This pin enters a block 44 slidably positioned within the tubular rod 14. This block 44 is adapted to contact stops 46 and 47, as will be later described.

The pin 43 has secured to its lower extremity a rocker arm 48 which has a cut-away portion 49 (see Figure 15). Within this cut-away portion is positioned a pin 51 which enters the block 44. This pin prevents undue rocking action of the rocker arm as will be later seen.

Secured to the outer extremities of this rocker arm 48 are links 52 and 53, the opposite ends of which are connected as shown at 54 and 56, respectively, to the doors 7 and 8, respectively.

Referring now to Figure 18 it will be noted that the end of the tubular bar 14 is adapted to be moved into contact with the latch mechanism as shown in dotted lines. This latch mechanism comprises a pair of downwardly extending pins 57 and 58, which are carried in the platform 12 and have positioned thereon segmental members 59 and 61, respectively, which are normally held in position as shown in full lines of Figure 18, by a spring 62. These segmental members are in such a position as to be contacted by the end of the tubular rod 14.

Each segmental member has secured to one corner thereof a roller as shown at 63 and 64, respectively, which rollers are adapted to contact tracks 66 and 67. These tracks are each mounted upon a swinging latch 68 and 69. The latch 68 is clamped to a rod 71 which is attached to the door 7, while the latch 69 is clamped to a rod 72 which is adapted to be attached to the door 8. A spring as shown at 73 is secured to each rod and serves to hold the same in proper alignment so that the latches 68 and 69 engage the pins 57 and 58. Similar pins 74 are placed on the floor of the garage so as to be engaged by similar latches secured to the lower extremity of the rods 71 and 72.

In order to operate the motor 38, we have provided switches 76 and 77. The switch 76 is connected by a wire 78 to one side of the motor, while the opposite side of the motor is connected by a wire 79 to the line.

The opposite side of the line is connected by a wire 81 to the frame 27, and assuming that the frame 27 is in contact with the contact 31, current will flow through the wire 82 to contact 83, thence through switch 77 to wire 84, contact 86 and switch arm 76, thus completing the circuit.

Should the frame 27 be in contact with the contact 32, the current will flow from the frame through the contact and by wire 87 to the contact 88 of the switch 76. As the eccentric 24 never makes but a half revolution, it will be readily seen that by throwing the switch lever 76 to either contacts 86 or 88, the motor may be started. Through a connection 89, contact 91 from the wire 87 to the switch 77 an independent control of the motor may be obtained thereby permitting the motor to be operated from two points.

Referring now to Figures 11, 12 and 13, the numeral 92 refers to a control box positioned upon a post at a point remote from the garage doors. Within this control box is located the switch 76 which is operated by inserting a key in the slot 93 and rotating the same. This moves the switch arm to either the contact 86 or 88, as the case may be.

The operation of our device is as follows:—

Assuming that the doors are closed and the driver inserts the key in the control box and turns the same, he throws the switch lever with the contact 88 of Figure 5, to the contact 86, which delivers current to the circuit before described to the motor 38.

Rotation of the motor then imparts motion to the gear 19 and through the friction disc 21 and the shaft 18. This causes the crank 17 to move pushing the link 16 and thus moving the tubular rod 14 toward the doors. Previous to this time the block 44 is in contact with the stop 46. When the tubular rod 14 moves forwardly and as the end comes in contact with the segmental members 59 and 61 the same are swung to the dotted line position of Figure 18 with the result that the rollers 63 and 64 contact the tracks 66 and 67, pushing the latches 68 and 69 out of engagement with the lower extremities of the pins 57 and 58. At the same time the rods 71 and 72 are rotated so as to disengage the lower latches 70 from their pins 74 (see Figure 1).

During this movement of the tubular rod 14 the stop 47 has been approaching the block 44 and now engages the same. As soon as this occurs, movement is transmitted through the pin 43 to the rocking arm 48 and to the links 52 and 53. Continued move-

ment of this tubular rod 14 causes the doors to swing to an open position as shown in dotted lines of Figure 1.

As soon as the crank shaft has made a half revolution, the eccentric 24 will have moved the frame 27 so as to break contact with the contact 31 and to establish contact with the contact 32.

In closing the doors, either the switch 76 or 77 will be moved with the result that current will again be transmitted to the motor which will rotate the mechanism as before described with the exception that the link 16 will be moved from its dotted line position of Figure 1 back to its full line position of this figure. The first part of this movement results in the retracting of the tubular member 14 until the block 46 contacts the block 44 after which the doors will be closed and the latches will again engage the pins 57 and 58 leaving the doors in a closed and locked position, the motor cutting itself off as before described.

Should one of the doors stick for some reason so as to close after the other door, this action will be permitted through the pivotal connection with the rocker arm 48. The amount of the pivotal connection is limited by the pin 51.

Should the doors become jammed so that they will not close at all, the motor will simply rotate the gear 19, the friction disc 21 permitting slippage which will save the mechanism from damage, and as the shaft 18 will not be revolving, the eccentric 24 will not move with the result that the motor will keep running until the door is released, or the current interrupted. As soon as the doors are released, the same will close, the eccentric 24 rotating on until it is in a position to break the circuit, it being understood that the shaft 18 makes a half revolution to open the doors and a further half revolution to close the doors.

It will thus be seen that we have provided a very simple device which accomplishes all the objects above set forth in an efficient manner.

It is to be understood that the form of our invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described our invention, we claim:—

1. In a door closing mechanism adapted to be attached to a pair of swinging doors,

a platform positioned in horizontal alignment with said doors, a tubular sliding rod supported from said platform, a gear mechanism positioned on said platform, means for rotating said gear mechanism, a shaft extending downwardly from said gear mechanism, a crank secured to said shaft, a link pivotally connected to said crank, the opposite end of said link being attached to said sliding rod, said sliding rod having a slot formed therein, a block positioned within said sliding rod, stops positioned within said sliding rod and adapted to be intermittently contacted by said block, a pin extending through said slot and engaging said block, a rocker arm secured to said pin, a pair of diverging links secured to said rocker arm, and having their opposite ends pivotally engaging said doors for the purpose of moving said doors in one direction when said sliding rod is moved forwardly, and for moving said doors in a reversed direction when said sliding rod is moved in a reversed direction.

2. In a door closing mechanism adapted to be attached to a pair of swinging doors, a platform positioned in horizontal alignment with said doors, a tubular sliding rod supported from said platform, a gear mechanism positioned on said platform, means including a motor for rotating said gear mechanism, a shaft extending downwardly from said gear mechanism, a crank secured to said shaft, a link pivotally connected to said crank, the opposite end of said link being attached to said sliding rod, said sliding rod having a slot formed therein, a block positioned within said sliding rod, stops positioned within said sliding rod and adapted to be intermittently contacted by said block, a pin extending through said slot and engaging said block, a rocker arm secured to said pin, a pair of diverging links secured to said rocker arm, and having their opposite ends pivotally engaging said doors, pins extending downwardly from said platform, latches positioned on said doors and adapted to engage said pins, tracks on said latches, a segmental plate mounted on said pins and adapted to contact said tracks for the purpose of releasing said latches when said segmental members are engaged by the forward movement of said sliding rod, and a switch adapted to control the operation of said motor from a remote point.

In testimony whereof we affix our signatures.

ANDREW J. SCHRADE.
ELMER JOHNSON.