Dec. 9, 1952 L. A. BOYD 2,621,038

GARAGE DOOR OPERATOR

Filed Aug. 31, 1951 2 SHEETS—SHEET 1

Fig. 1

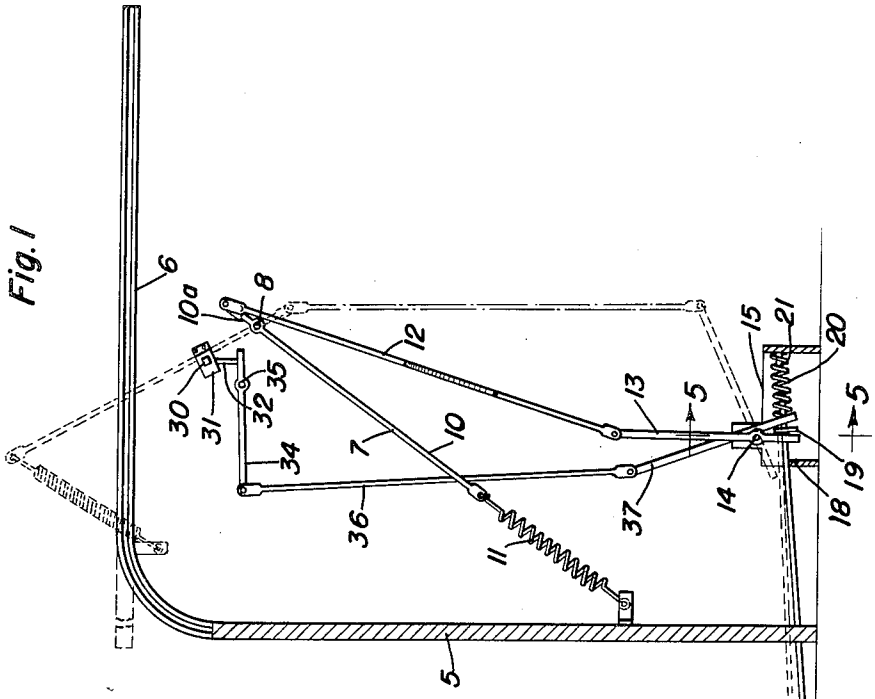


Fig. 7

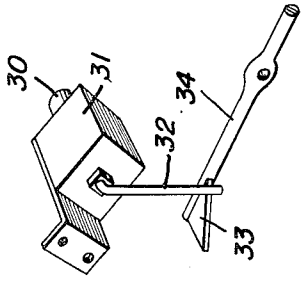
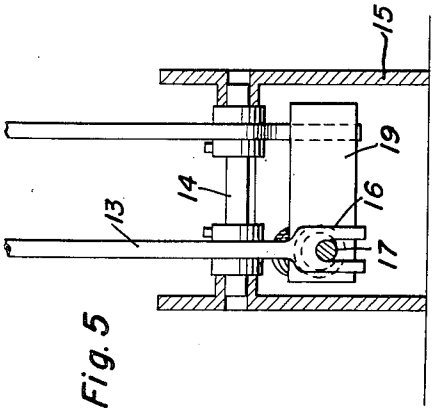
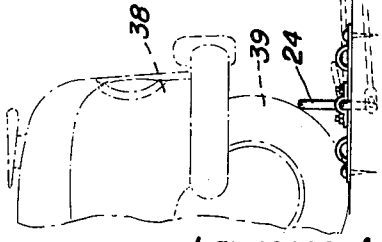


Fig. 5





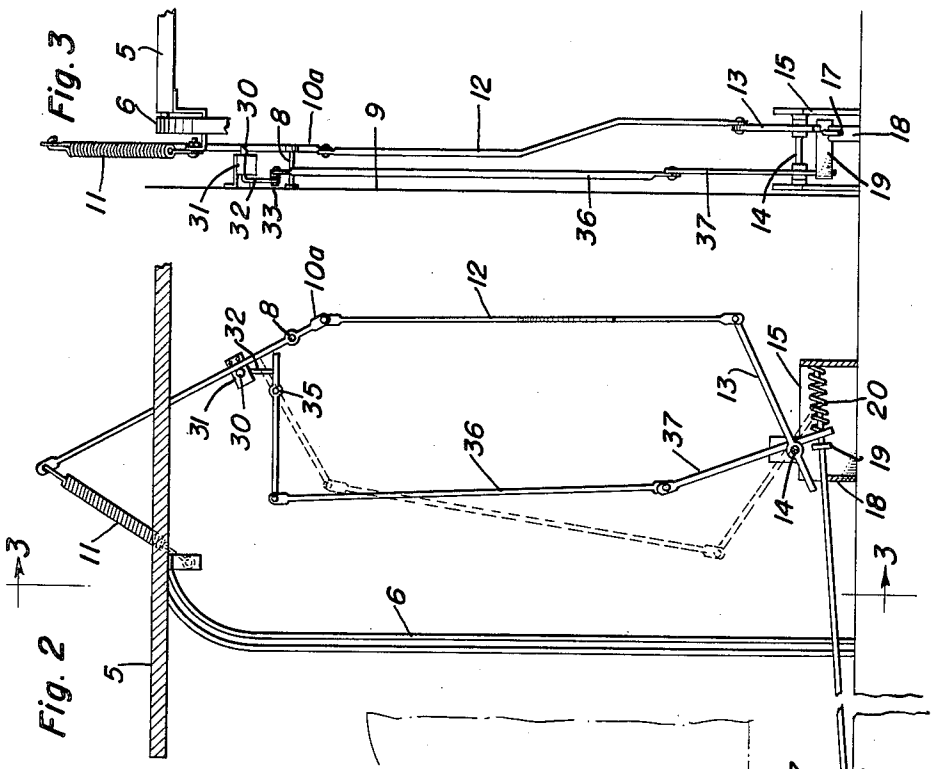
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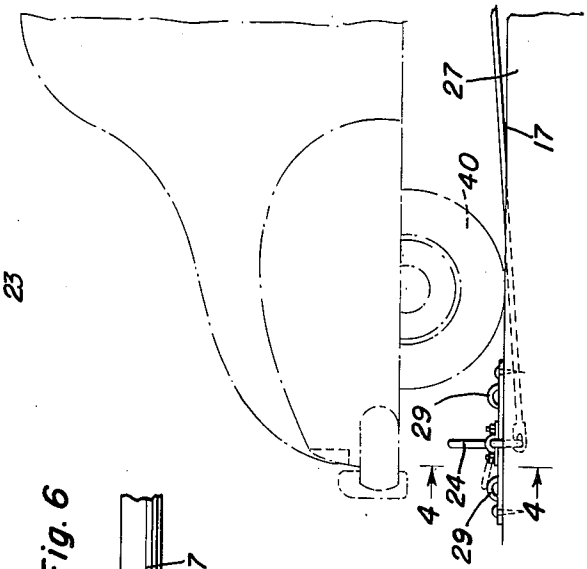
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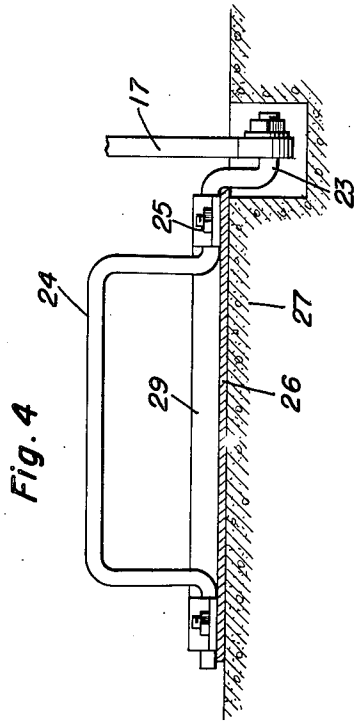
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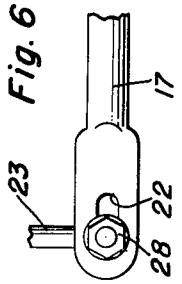
GARAGE DOOR OPERATOR

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GARAGE DOOR OPERATOR

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3 Claims. (Cl. 268—42)

1

The present invention relates to new and useful improvements in garage door operators and more particularly to a vehicle operated trip mechanism for an overhead door to open the door when the vehicle approaches the garage and to close the door when the vehicle leaves the garage.

An important object of the invention is to provide a single trip member positioned in a driveway in front of the garage and swingable in opposite directions by contact by the vehicle in entering and leaving the garage, the vehicle swinging the trip member in one direction as it approaches the garage to open the garage door, which is held in its raised open position by catch means, and the vehicle swinging the trip member in an opposite direction as it leaves the garage to release the catch means to permit the door to close.

Another object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purpose for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a view in elevation of the door operator showing the door in its open position in dotted lines;

Figure 2 is a view in elevation of the catch releasing mechanism;

Figure 3 is a vertical sectional view taken on a line 3—3 of Figure 2;

Figure 4 is an enlarged sectional view taken on a line 4—4 of Figure 2;

Figure 5 is an enlarged vertical sectional view taken on a line 5—5 of Figure 1;

Figure 6 is an enlarged fragmentary side elevational view of the connection for the door opening and catch releasing rod with the trip member; and

Figure 7 is an enlarged perspective view of the catch.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of my invention, the numeral 5 designates a vertically slidable garage door traveling in a track 6 for movement from a vertical closed position to an overhead horizontal open position.

2

An upper door lifting lever 7 is pivoted adjacent one end to a pin 8 on a suitable supporting structure inside a garage 9 and the longer end 10 of the lever is attached to one end of counterbalancing coil spring 11 which has its other end attached to the lower portion of the garage door 5, the lever being inclined upwardly from the door when the latter is closed, as shown by full lines in Figure 1.

A link 12 is attached at one end to the upper shorter end 10a of lever 7 and extends downwardly therefrom at an acute angle with respect to the lever and is pivotally connected at its lower end to the upper end of a lower lever 13 which is pivoted adjacent its lower end on a horizontal pin 14 supported in a pair of upstanding supports or bracket structures 15 on the garage floor. The lower end of lever 13 is formed with a yoke 16 straddling a push and pull rod 17 which is slidable in a guide 18 carried by bracket 15 and a cross bar 19 is fixed to rod 17 behind yoke 16. The rear end of rod 17 enters the front end of a coil spring 20 which is supported at its rear end on a pin 21 fixed to bracket 15.

Rod 17 extends forwardly of the garage and is formed at its front end with a slot 22 to pivotally and slidably receive a crank arm 23 at one end of a U-shaped trip bar 24 which is journaled at its ends in an inverted or upstanding position in bearings 25 on a plate 26 which is anchored to a driveway 27 in front of the garage. Crank arm 23 is secured in position in slot 22 by a nut 28 threaded on the crank arm.

A pair of semi-cylindrical stop ribs 29 are welded to plate 26 parallel to trip bar 24 and in front of and behind the latter and on which the trip bar rests when it is swung downwardly in either direction by the wheel of a vehicle entering or leaving the garage.

In its door opening movement, upper lever 7 swings upwardly and passes behind a spring projected beveled catch 30, which is slidable in a housing 31 secured to an adjacent side of the garage, to lock the door in a raised or open position, as shown by dotted lines in Figure 1. Catch 30 is formed with right angle arm 32 which extends in a downward direction and engaged by a cam 33 at the rear end of an upper catch releasing lever 34 which is pivoted on a supporting pin 35 and pivoted at its front end to the upper end of a link 36 having its lower end pivoted to the upper end of a lower catch releasing lever 37 which is also pivoted on pin 14. The lower end of lever 27 is positioned behind cross bar 19.

In the operation of the device, as a car 38 approaches the garage and front wheels 39 strike trip bar 24, the latter is swung downwardly, rearwardly or toward the door of the garage, as shown by dotted lines in Figure 1, and pulls rod 17 forwardly. Cross bar 19 at the rear of rod 17 being behind yoke 16 of lower lever 13 swings the upper end of lever 13 rearwardly and pulls downwardly on link 12 to swing the upper lever 7 upwardly and raise the door 5. As lever 7 passes catch 30 the lever is held thereby in its raised position to lock the door in its open overhead position.

The catch may be manually released to close the door after the vehicle has entered the garage and the door may also be raised manually without interference by the vehicle actuated mechanism.

When the vehicle is backed from the garage, as indicated in Figure 2, the rear wheels 40 will swing the trip bar 24 downwardly in a forward direction to push rod 17 rearwardly and cross bar 19 will swing lower catch releasing lever 37 forwardly, as shown by dotted lines in Figure 2, to pull link 36 downwardly and swing upper catch releasing lever 34 in a direction to slide cam 33 against catch arm 32 to retract the catch and release upper door raising lever 7. The usual counter-balancing means (not shown) provided for the door will then close the same and spring 11 may also be used to aid this closing movement and yoke 16 slides cross bar 19 and rod 17 rearwardly to hold the trip bar 24 in its raised position.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A closure operator comprising the combination of a vertically swingable closure, mechanism connected to the closure to raise the latter and including a pivoted lever, catch means locking the closure in its raised position, releasing means for the catch means and also including a pivoted lever, a forwardly and rearwardly swingable trip bar, a push and pull rod actuated by the trip bar, and means carried by the push and pull rod and engaging both levers to oppositely actuate the levers upon reverse movements of the rod.

2. A closure operator comprising the combination of a vertically swingable closure, mechanism connected to the closure to raise the latter and including a pivoted lever, catch means locking the closure in its raised position, releasing means for the catch means and also including a pivoted lever, a forwardly and rearwardly swingable trip bar, a push and pull rod actuated by the trip bar, and a cross bar on the push and pull rod and positioned transversely in front of one lever and behind the other of said levers to oppositely actuate the levers upon reverse movement of the rod.

3. A closure operator comprising the combination of a vertically swingable closure, mechanism connected to the closure to raise the latter and including upper and lower pivoted levers and a link connecting the levers to each other, catch means engaging the upper lever to lock the closure in its raised position, catch releasing means including upper and lower pivoted levers and a link connecting said last named upper and lower levers to each other, said upper catch releasing lever engaging the catch means, a vertically swingable trip bar, a push and pull rod connected to the trip bar, and a cross bar on the push and pull rod and engaging both of said lower levers to actuate the closure raising mechanism upon a movement of the push and pull rod in one direction and to actuate the catch releasing means upon a movement of the push and pull rod in an opposite direction.

LAWRENCE A. BOYD.

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