Oct. 15, 1940. C. E. GAFFNEY 2,218,038

ELECTRIC DOOR LATCH OPENER

Filed March 25, 1940

Fig. 1.

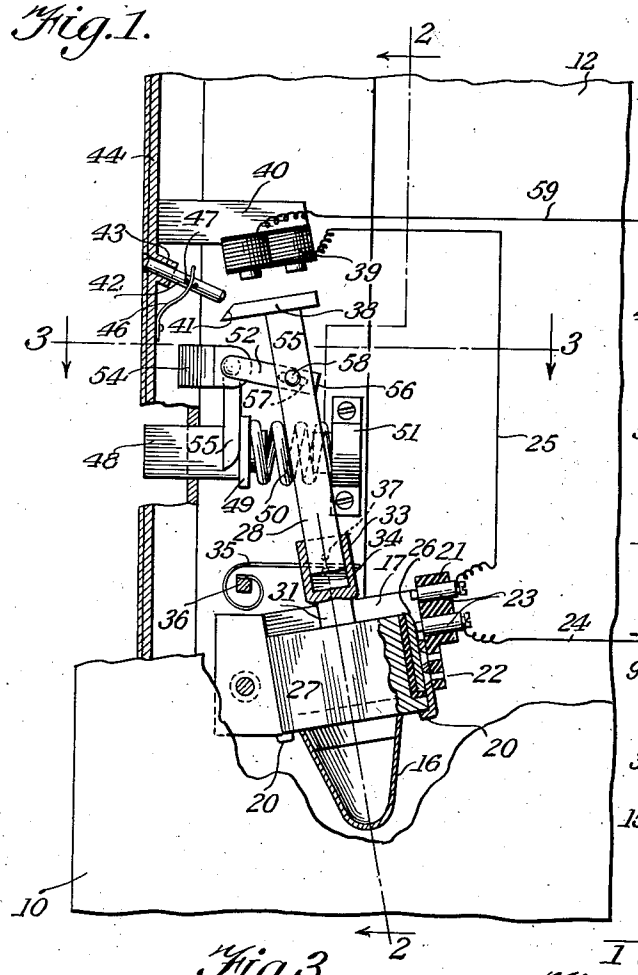


Fig. 2.

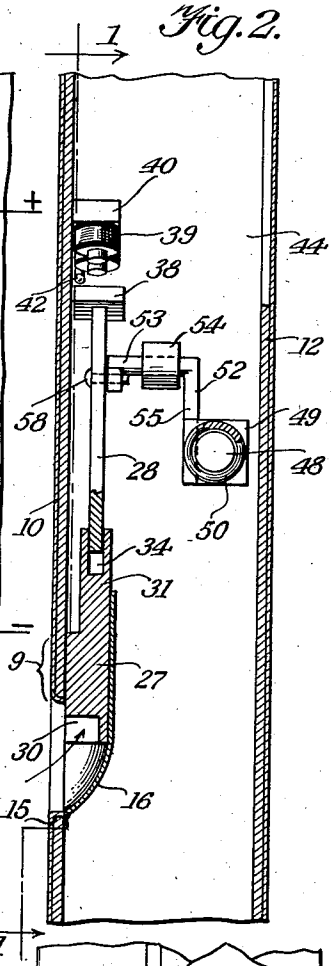


Fig. 3.

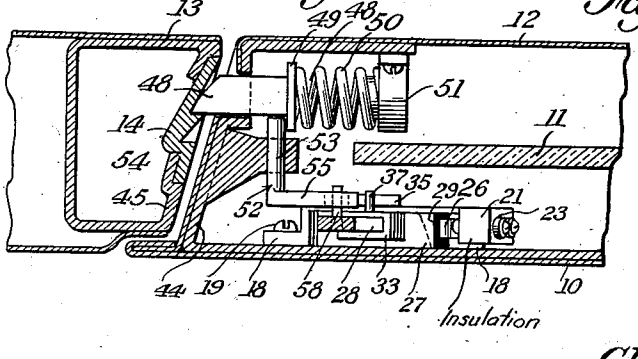
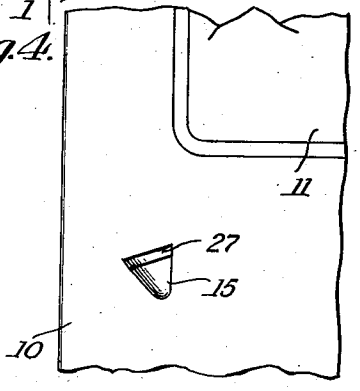


Fig. 4.



Charles E. Gaffney
INVENTOR

BY Victor J. Evans & Co.
ATTORNEYS

Patented Oct. 15, 1940 2,218,038

UNITED STATES PATENT OFFICE

2,218,038

ELECTRIC DOOR LATCH OPENER

Charles E. Gaffney, Lexington, Mass.

Application March 25, 1940, Serial No. 325,889

3 Claims. (Cl. 292—144)

This invention relates to electric door latch openers, and has for an object to provide means for actuating the latch of an automobile door to cause the release thereof by electrical means and, in the event of failure of the current, to permit manual release of the latch by merely continuing the same upward movement of the operator's fingers which actuates the circuit closer.

A further object is to provide a latch opener having a spring pressed pin which is pushed outward against the door frame after the latch has been withdrawn to initially start opening movement of the door, the operator's fingers inserted back of an area above an opening in the door wall, completing the opening movement of the unlatched door.

A further object is to provide a device of this character which will be formed of a few strong simple and durable parts, which will be inexpensive to manufacture, and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming a part of this specification:

Figure 1 is a longitudinal section, with parts in elevation, of a portion of an automobile door showing an electric door latch opener constructed in accordance with the invention applied thereto, the section being taken approximately on the line 1—1 of Figure 2.

Figure 2 is a longitudinal sectional view of the structure shown in Figure 1 taken approximately on the line 2—2 of Figure 1.

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 1, and showing the door post and keeper for the latch.

Figure 4 is a fragmentary front elevation of the door showing the opening therein for inserting the fingers to operate the device.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, 10 designates the outer wall of a hollow door of a motor vehicle, 11 the window, 12 the inside wall, 13 the door jamb or door post, and 14 the latch keeper on the door post, these parts being conventional.

In carrying out the invention an opening 15 is formed in the outer wall 10 of the door below the window 11 and adjacent the free edge of the door. The opening is substantially inverted triangular in shape and preferably has its longitudinal axis inclined upwardly and forwardly. A shell 16 is disposed back of the opening and is of substantially the same contour as the opening, as best shown in Figure 1, and forms a guide for directing the operator's fingers upwardly to operate the door latch retractor and pull open the door.

A substantially U-shaped casing 17 is provided with out-turned flanges 18 which are secured to the inner surface of the outer wall 10 of the door by screws 19 or other connectors. The casing forms a combined switch housing and push rod guide and the rear wall thereof merges with the shell 16, as best shown in Figure 2, while the end walls are provided at the bottom with inturned stop lugs 20.

A block of insulating material 21 is secured to the upper end of one of the end walls of the casing by rivets 22, or other connectors, and is provided with a pair of vertically spaced stationary switch contacts 23 which project through a cut-away portion of the end wall of the casing. One of the stationary contacts is connected by a circuit wire 24 to a source of electricity, such as the vehicle battery, and may be led through one of the door hinges in the usual manner. The other switch contact is connected by a circuit wire 25 to an electromagnet which will be presently described.

The movable switch contact 26 of the circuit closer is adapted to bridge both stationary contacts and is countersunk in one end wall of a substantially oblong presser foot 27 of a push rod 28. The movable switch contact is insulated from the presser foot by a housing 29 formed of insulating material. The presser foot 27 is slidably mounted in the switch housing 17 and is provided on its front face, at the bottom, with a recess 30, best shown in Figure 2, which is the entire width of the opening 15 and receives the tip of the operator's fingers so that the presser foot may be easily pushed upward in the direction of the arrow to engage against a grip area of the inner face of the outer wall 10 of the door above the finger opening 15, when the presser foot is moved upwardly to unobstructing position over said area which area, for the purpose of clearness, is indicated by a bracket 9. In normal position the presser foot engages against the stop lugs 20 and obstructs the grip area.

The presser foot is provided with a short upright stem 31 which terminates in a socket mem-

ber 33 in which the lower end of the push rod 28 is slidably fitted. In normal door latching position of the push rod there is a clearance 34 between the bottom of the push rod and the bottom of the socket member which permits a limited upward movement of the presser foot 27 before the push rod is actuated. During such limited upward movement the movable contact 26 of the circuit closer will have moved to bridging position across the stationary switch contacts 23 and closed the circuit to the above-mentioned electromagnet to electrically operate the push rod to retract the latch 48. For returning the presser foot 27 and circuit closer to normal door latching position after each actuation and simultaneously moving the circuit closer to open circuit position a spring 35 is secured at one end to a stationary pin 36 and at the free end is interposed between a pair of pins 37 which project from one side of the socket member 33.

The push rod 28 is equipped at the top with an armature 38 which confronts and is spaced from the poles of an electromagnet 39 which is mounted upon a stationary bracket 40. The armature is provided with a beveled front edge 41. A pin 42 is slidably mounted in a tubular inclined guide 43 which is secured to the inclined end wall 44 of the door. The pin is inclined downwardly toward the armature 38 and the lower end is rounded to ride upon the inclined edge 41 of the armature when the armature is attracted by the electromagnet so that the pin is shoved outwardly to ride upon the inclined end wall 45 of the door jamb or post and initially start opening movement of the door after the latch 48 is released by the push rod. A leaf spring 46 is secured at one end to the inclined end wall 44 of the door and is engaged at the free end between a pair of projections on the pin 42 to normally hold the pin in released or retracted position.

The door latch 48 is provided with a flange 49 against which the front end of a helical spring 50 bears, the rear end of the spring abutting a stationary stop bracket 51. The spring normally holds the latch in latching position as is customary. A bell crank lever 52 has a horizontal leg 53 journaled in a stationary bearing 54, and a downwardly extending leg 55 engaging the front side of the latch flange 49. The bell crank lever is provided with a downward inclined leg 56 which overlaps the push rod 28 and is provided with a longitudinal slot 57. A pin 58 projects from the push rod and is engaged through the slot to permit the bell crank lever to retract the latch when the push rod moves upwardly.

In operation, the fingers are inserted upwardly in the finger opening 15 of the door and a slight pressure is applied to the presser foot 27 to lift the same and move the circuit closer to close a circuit through the wire 24, wire 25, electromagnet 39 and through a wire 59 to the source of electricity. The energized electromagnet attracts the armature 38 thereby moving the push rod 28 upward to rock the bell crank lever 52 and retract the latch 48 to unlatching position. At the same time the inclined edge 41 of the armature rides against the spring pressed pin 42 and urges the pin outwardly to initially start opening movement of the door. In the meanwhile the presser foot 27 has been moved upwardly by the operator's fingers to unobstructing position above the grip area 9 on the rear surface of the front wall 10 of the door so that the operator may easily pull the door outwardly to full open position.

An important feature of the device is that in the event of current failure further upward pressure of the operator's fingers on the presser foot 27 will move the socket member 33 upward until it closes the gap below the push rod and engages the bottom of the push rod 28. Continued upward pressure on the presser foot lifts the push rod to rock the bell crank lever 52 to release the latch and to simultaneously move the armature 38 against the spring pressed pin 42 to start initial opening movement of the door.

It will be pointed out that in door latching position of the device the presser foot obstructs the grip area 9 so that the door cannot be accidentally fully opened, and the presser foot must be positively moved to unobstructing position before the door can be fully opened. Also it will be noted that when the operator's fingers are in position to move the presser foot the hand is in proper position to pull open the door.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

1. The combination with a door, of an electromagnetically operated latch, a circuit for the latch, a switch controlling the circuit, and a manually operable means connected to the latch and to the switch and movable in a rectilinear direction for first moving the switch to circuit closing position to retract the latch and subsequently releasing the latch manually in the event of current failure.

2. The combination with a door, of a spring pressed latch, a push rod connected to the latch for retracting the latch, an electromagnet for electrically operating the push rod, a switch in circuit with the electromagnet, and a manually operable presser foot spaced from the push rod and connected to the switch, initial movement of the presser foot closing the switch and continued movement actuating the push rod for releasing the latch manually in the event of current failure.

3. The combination with a door, of an electromagnetically operated latch, a circuit for the latch, a switch controlling the circuit, and a manually operable means connected to the latch for first moving the switch to circuit closing position to retract the latch and subsequently releasing the latch manually in the event of current failure.

CHARLES E. GAFFNEY.