Dec. 18, 1962 T. E. KIRK 3,069,193

MAGNETICALLY OPERATED DOOR LATCH

Filed April 12, 1960 2 Sheets-Sheet 1

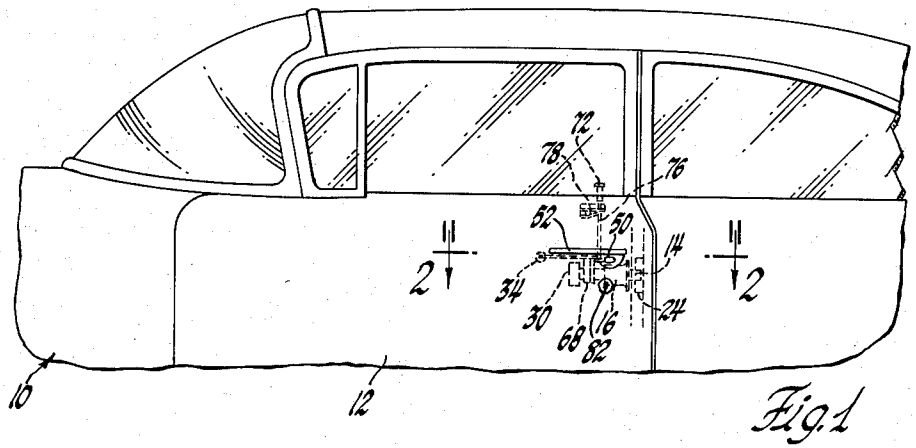


Fig. 1

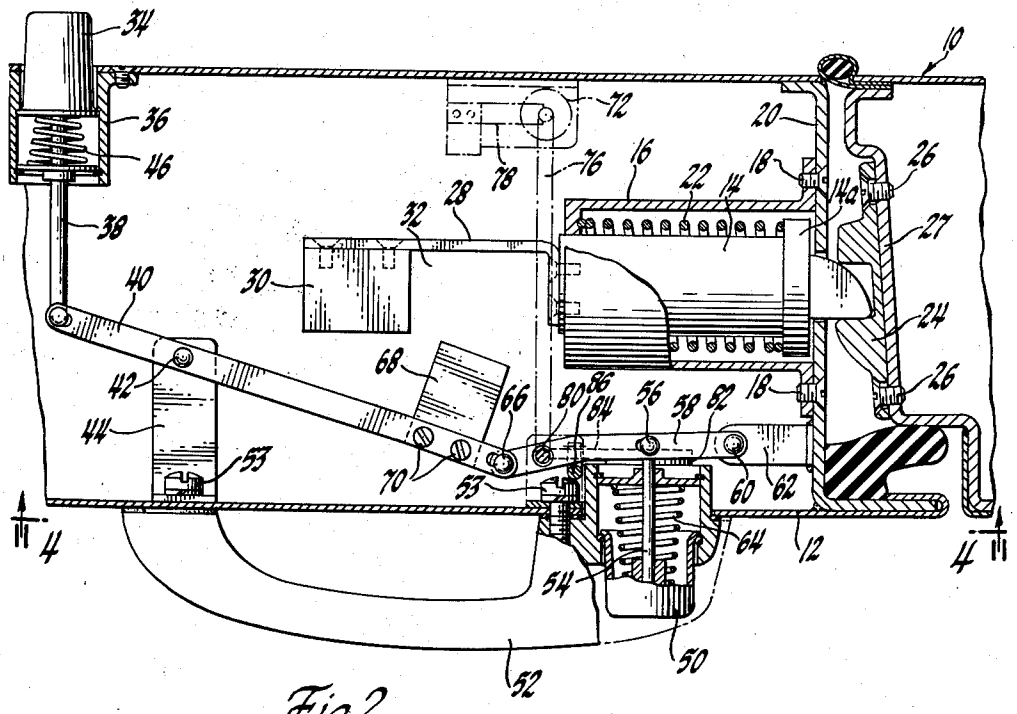


Fig. 2

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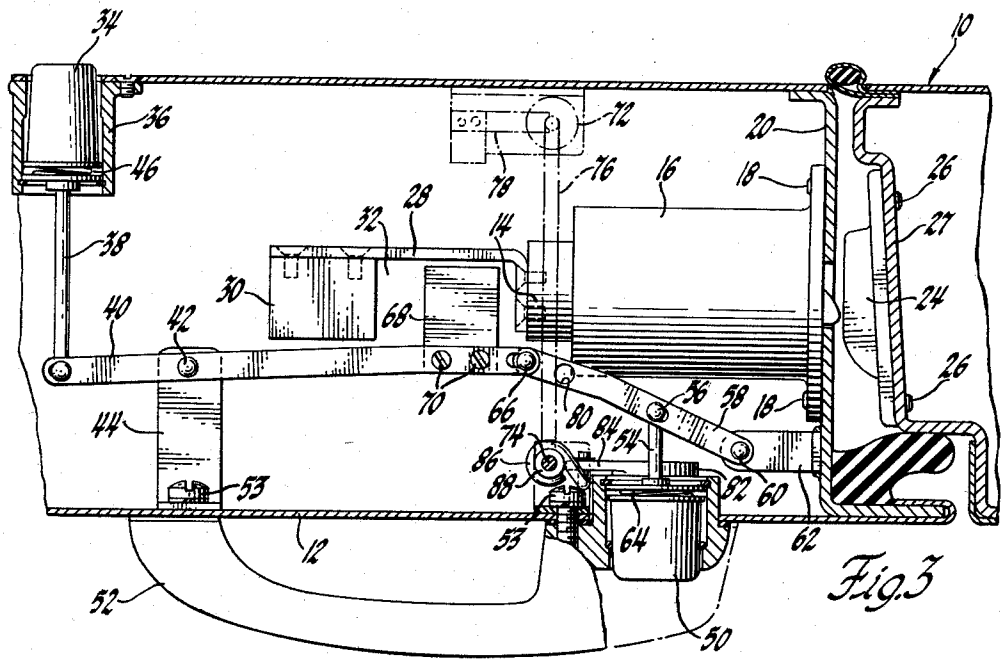


Fig. 3

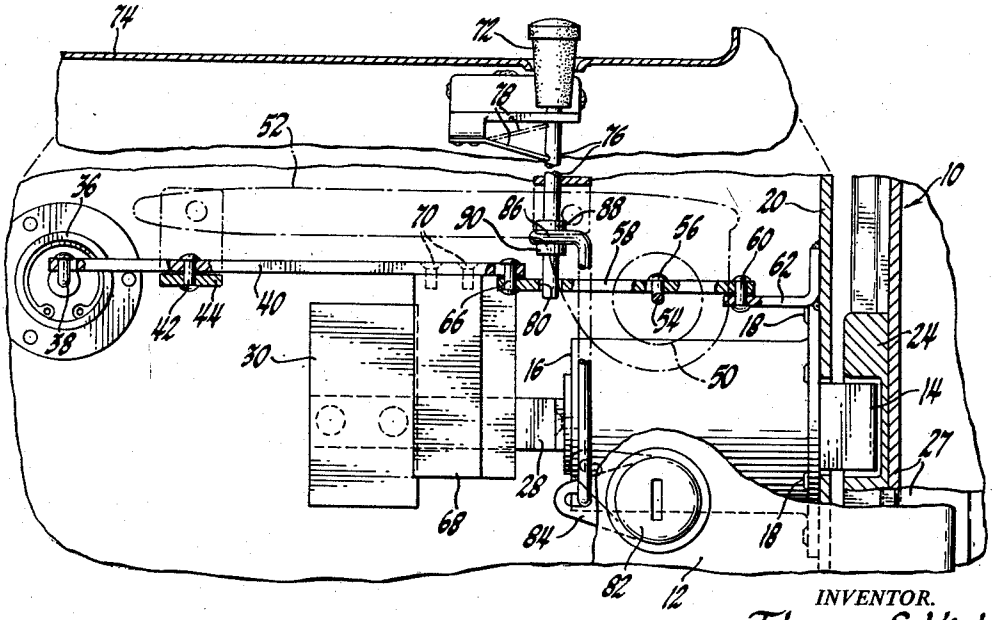


Fig. 4

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MAGNETICALLY OPERATED DOOR LATCH

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5 Claims. (Cl. 292—144)

This invention relates to a door latch, and more particularly to a magnetically operated door latch.

One feature of the invention is that it provides a bolt which is movable between latched and unlatched positions, being biased toward latched position, and a magnet on the door operator for moving the bolt from latched to unlatched position against the force of the spring.

Another feature of the invention is that the bolt mounts a first magnet and a door operator mounts a second magnet which is movable from an inoperable position remote from the first magnet to an operable position wherein a pole of the second magnet is adjacent a like pole of the first magnet where the repulsive force of the magnetic field existing between the magnets overcomes the force of the spring which biases the bolt and retracts the bolt.

A further feature of the invention is that it provides a door latch having inside and outside operators, lever means interconnecting the operators and a magnet mounted on the lever means for movement into operable position upon actuation of either of the operators.

Other features and advantages of the invention will be apparent from the following specification and drawings, in which:

FIGURE 1 is a fragmentary side elevational view of an automobile incorporating the improved magnetically operated latch;

FIGURE 2 is an enlarged fragmentary horizontal section taken along the line 2—2 of FIGURE 1, showing the parts as they are located when the bolt is in projected position;

FIGURE 3 is a view similar to FIGURE 2, but showing the parts as they are located when the bolt is in retracted position; and

FIGURE 4 is a section taken along the line 4—4 of FIGURE 2 and showing the position of the parts when in locked position.

Referring now more particularly to the drawings, an automobile designated generally as **10** has a door **12** which is hinged on the body in conventional manner at the front edge of the door and which is latched to the body at the rear edge of the door. As shown in FIGURES 2, 3 and 4, the latch comprises a bolt **14** which is slidably mounted in a bolt housing **16**. The bolt housing is secured by screws **18** to the jamb face **20** of the door **12**. A spring **22** surrounds the bolt **14** and seats against a collar **14***a* on the bolt and the base of the housing **16** to bias the bolt toward the projected or latched position shown in FIGURE 2.

When the bolt is in latched position and the door is closed, the nose of the bolt enters a latching recess in a striker **24** which is secured by screws **26** to the jamb face portion **27** of the body which face portion defines the rear edge of the door opening. When in the latched position shown in FIGURE 2, the door is held against swinging in an opening (clockwise) direction. The bolt, which preferably is formed of non-magnetic material has mounted thereon a non-magnetic bracket **28** which projects in a direction axial of the bolt from the end of the bolt opposite the latching nose. This bracket mounts a permanent magnet **30**, there being a recess **32** between the magnet **30** and the end of the bolt. If desired, the bolt itself can be a magnet having its end opposite the bolt nose forming a pole similar in polarity to the adjacent pole of the magnet **30**.

An inside push button operator **34** is slidably mounted in a casing **36** which is secured to the inner panel of the door and a push rod **38** projects into the door from the push button and is pivotally connected to one end of a lever **40** which is pivotally mounted intermediate its ends at **42** on a bracket **44** projecting into the door from the outer panel thereof. A coil spring **46** in the casing **36** biases the push button **34** toward the inoperative position shown in FIGURE 2.

An outside push button door operator **50** is slidably mounted in a gripping handle **52** which is secured by bolts **53** to the outer panel of the door **12**. The push button **50** has a push rod **54** which is pivotally connected at **56** to an intermediate point on a lever **58**, the forward end of which is pivotally mounted at **60** on a bracket **62** which extends into the door from the jamb face **20** thereof. A coil spring **64** biases the push button **50** toward the inoperative position shown in FIGURE 2. The other end of the lever **58** is pivotally connected by means of a pin and slot arrangement **66** to the end of the lever **40** so that when either the inside push button **34** or the outside push button **50** is depressed, the lever **40** will swing in a counterclockwise direction (FIGURES 2 and 3) from the inoperative position of FIGURE 2 to the operative position of FIGURE 3. A second magnet **68** is secured by screws **70** to the lever **40** at such a location on the lever that the magnet **68** will swing into the recess **32** when either the inside push button **34** or the outside push button **50** is depressed.

The magnets **30** and **68** are so arranged that like poles are adjacent each other when the magnet **68** is swung up into the recess **32** so that the repulsive force of the magnetic field existing between the magnets overcomes the force of the bolt-biasing spring **22** and causes the bolt to move from the latched or projected position of FIGURE 2 to the unlatched or retracted position of FIGURE 3. The combined force exerted by the relatively light push button biasing springs **46** and **64** is substantially less than the force exerted by the bolt-biasing spring **22** so that the manual force required to unlatch the door is substantially less than the force which would be required to overcome the spring **22** by direct manual operation. When the push buttons **34** and **50** are released they are returned to their inoperative position by the springs **46** and **64** so that the magnet **68** swings back to the position of FIGURE 2. With the parts in this position the force of the bolt biasing spring **22** overcomes any repulsive force which may exist between the magnets **30** and **68** when in the position of FIGURE 2 and the bolt is projected to its latched position by the bolt-biasing spring **22**.

Locking means are provided for blocking movement of the latch operating means to prevent the magnet **68** from being swung from its inoperable position of FIGURE 2 to its operable position of FIGURE 3. The inside locking means comprises a garnish molding button **72** which projects out of the garnish molding panel **74** on the inside of the automobile door **12**. The garnish molding button **72** is connected to a locking rod **76** which is connected to an overcenter spring **78** to hold the garnish molding button in a raised or unlocked position or, selectively, in a depressed or locked position as shown best in FIGURE 4. When the garnish molding button is depressed, the lower end of the rod **76** projects through an opening **80** in the lever **58** so that the lever arangement is blocked against swinging movement whenever the inside push button **34** or the outside push button **50** is attempted to be depressed. The door may be unlocked from the inside merely by lifting up on the garnish molding button to raise the end of the locking rod **76** up out of the opening **80** in the lever **58**.

Locking may be accomplished from the outside through a conventional key cylinder **82** which is mounted on the

outer panel of the door **12** and which carries an operating pawl **84** having a flange **86** which is received in the space between two spaced collars **88** and **90** on the locking rod. Turning a proper key in the key cylinder in one direction will move the pawl **84** upwardly to raise the locking rod **76** to its unlocked position and turning the key in the opposite direction will lower the pawl **84** to move the locking rod **76** downwardly to the locked position shown in FIGURE 4.

While I have shown and described one embodiment of my invention, it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention, as set forth in the appended claims.

I claim:

1. A door latch of the character described, including: a bolt mounted for slidable movement between projected and retracted positions; a single first magnet mounted on said bolt; spring means biasing said bolt toward projected position; movable latch operating means including an actuating member and a carrier lever connected thereto; and a second magnet mounted on said carrier lever, said second magnet being bodily movable along a curved path upon operation of said latch operating means from an inoperable position remote from said first magnet to an operable position adjacent said first magnet where the magnetic field existing between the magnets overcomes the force of said spring means and retracts the bolt.

2. A door latch of the character described, including: a bolt mounted for movement between projected and retracted positions; a first magnet mounted on said bolt; spring means biasing said bolt toward a projected position; an inside latch operator movable between inoperative and operative positions; an outside latch operator movable between inoperative and operative positions; lever means interconnecting said inside and outside operators; and a second magnet mounted on said lever means, said second magnet being movable upon operation of either of said operators from an inoperable position remote from said first magnet to an operable position adjacent said first magnet where the magnetic field existing between the magnets overcomes the force of said spring means and retracts the bolt.

3. A door latch of the character described, including: a bolt mounted for movement between projected and retracted positions; a first magnet mounted on said bolt; spring means biasing said bolt toward projected position; an inside latch operator movable between inoperative and operative positions; an outside latch operator movable between inoperative and operative positions; lever means interconnecting said inside and outside operators; spring means biasing said inside and outside operators toward inoperative positions; and a second magnet mounted on said lever means, said second magnet being movable upon operation of either of said operators from an inoperative position remote from said first magnet to an operable position wherein a pole of said second magnet is adjacent a like pole of said first magnet where the repulsive force of the magnetic field existing between the magnets overcomes force of the spring means which biases the bolt and retracts the bolt.

4. Apparatus of the character claimed in claim 3, wherein the spring means biasing the latch operators exert less force than the spring means biasing the bolt.

5. A door latch of the character described, including: a non-magnetic bolt mounted for slidable movement between projected and retracted positions; a spring biasing said bolt toward projected position; an inside push button latch operator movable between inoperative and operative positions; an outside push button latch operator movable between inoperative and operative positions; spring means biasing said inside and outside operators toward inoperative position, said spring means exerting less force than the spring which biases the bolt; lever means interconnecting said inside and outside push button operators; a second magnet mounted on said lever means, said second magnet being movable upon operation of either of said latch operators from an inoperable position remote from said first magnet to an operable position wherein a pole of said second magnet is adjacent a like pole of said first magnet where the repulsive force of the magnetic field existing between the magnets overcomes the force of the spring which biases the bolt and retracts the bolt; and inside and outside locking means selectively operable to block movement of said latch operators.

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