June 27, 1950 C. D. QUEEN 2,512,776

REMOTE CONTROL LATCH

Filed Nov. 1, 1946

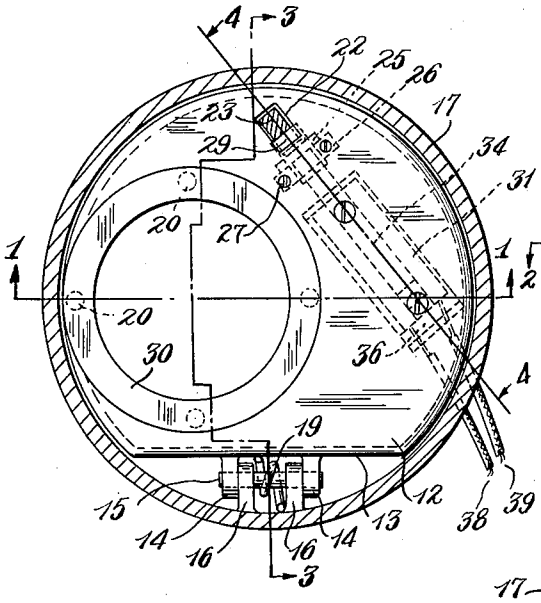


FIG. 2

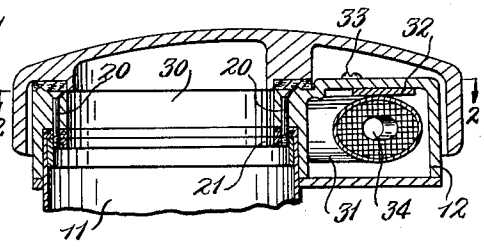


FIG. 1

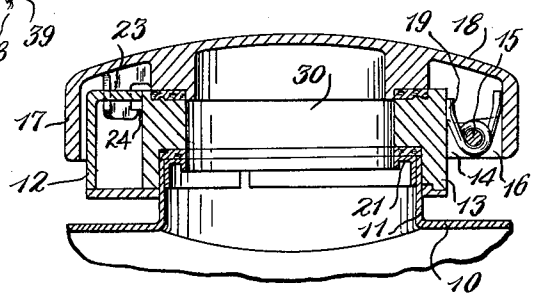


FIG. 3

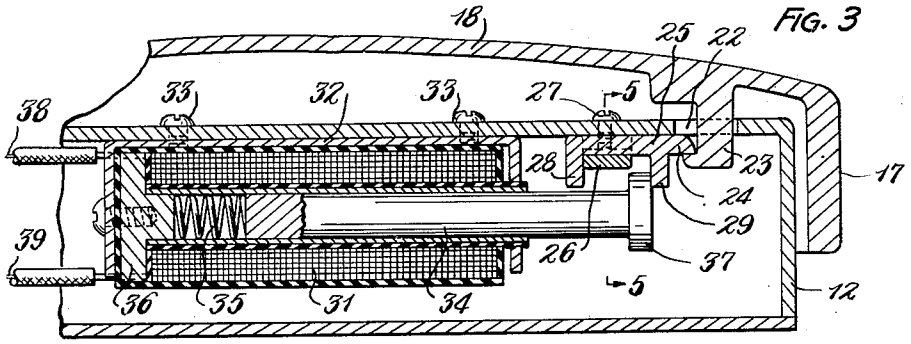


FIG. 4

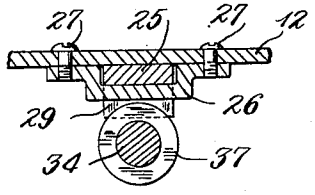


FIG. 5

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REMOTE-CONTROL LATCH

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3 Claims. (Cl. 292—144)

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This invention relates to improvements in remote control latches for hinged closures. The device is designed primarily for latching down a hinged cap on the filler neck of an automobile fuel tank, and may be termed a lock inasmuch as the switch which controls the circuit that releases the latch may be located upon the instrument board of the automobile which is inaccessible to unauthorized persons when the doors of the automobile are locked.

One of the objects of the invention is the provision of means of extreme simplicity for effecting the release of the latch electromagnetically and in a positive manner with an electromagnet of relatively small size and capacity.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawing, in which

Fig. 1 is a central vertical sectional view through a cap assembly that may be used in carrying out the invention, the view being taken substantially on the line 1—1 of Fig. 2.

Fig. 2 is a horizontal sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view substantially at right angles to that of Fig. 1 and taken approximately on the line 3—3 of Fig. 2.

Fig. 4 is a fragmental sectional view on a larger scale, the view being taken substantially on the line 4—4 of Fig. 2, and

Fig. 5 is a detail sectional view taken substantially on the line 5—5 of Fig. 4.

In the drawing, see Fig. 3, an automobile gasoline tank is indicated at 10. It has a filler neck 11 upon which I mount a casing 12, preferably circular in plan except for one short straight wall 13. From the latter wall there extend two ears 14 which receive a hinge pin 15. A pair of ears 16 interposed between the ears 14 are journaled on the pin 15 and are formed integral with a depending flange 17 on a lid or cover 18, the flange 17 extending down well below the upper surface of the casing when the lid is closed. A spring 19 tends to raise the lid to open position when the latch is released.

The casing 12 has an eccentric opening in its lower side to fit over the neck 11. The casing may be secured to the neck by any suitable means, as for example by screws 20 threaded into nuts disposed beneath an inwardly extending flange 21 that is attached to the upper end of the neck 11. When the lid is closed the screws 20 are of course inaccessible.

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At the side of the casing opposite the hinge there is an opening 22 through which a hook 23 integral with the lid extends downwardly when the lid is closed. This hook is normally engaged by a latch 24 which constitutes part of a slide 25 that is held against the upper wall of the casing by a guide bracket 26 which may be attached to the casing by screws 27 or the like. Slide 25 carries two spaced depending lugs 28 and 29. The hook and the latch have cam surfaces which engage and deflect the slide when the lid is swung to closed position.

In the hollow portion of the casing 12 provided by the eccentric positioning of the wall 30 I mount a solenoid 31 so disposed that its axis is parallel with the direction of movement of slide 25. A convenient mounting for the solenoid is shown in Fig. 4, where a bracket 32 of copper or other non-magnetic material attached by suitable means to the ends of the solenoid is secured to the upper wall of the casing 12 by means of screws 33.

An armature 34 slides within the solenoid, being biased outwardly by a coil spring 35 which bears at the rear end of the solenoid against an iron plug 36 which closes that end and contributes to the strength of the pull of the solenoid at the end of the stroke of the armature. That end of the armature 34 which projects from the solenoid is provided with a head 37 that extends into the path of movement of the two lugs 28 and 29. Current for energizing the solenoid may be supplied by conductors 38 and 39 which in the present case would be connected with a storage battery. The circuit would be broken ordinarily but would be arranged to be closed by a push button switch located on the instrument board of the automobile.

In the operation of the device, assuming that current is caused to flow through the conductors 38 and 39, the armature will be moved toward the left from the position illustrated in Fig. 4. Its motion will be accelerated as inertia is overcome, and by the time it reaches lug 28 it will be moving very rapidly and will deliver a hammer blow to that lug and hence to the slide 25 which will overcome the friction between the latch 24 and hook 23 and whatever friction exists between the slide and its guide, thereby unlatching the hook. The lid will then swing to open position under the influence of spring 19. As soon as the operator releases the push button switch and the solenoid is de-energized spring 35 will function to force armature 34 to the right. After taking up the lost motion provided by the

spacing of lugs **28**, **29**, the head **27** will strike lug **29** a blow, causing it to move rapidly until stopped by the engagement of lug **28** with guide bracket **26**. Spring **35** holds the latching slide **25** in the illustrated position, yielding when the cam faces on the hook and latch cause the slide to move slightly to the left and lug **29** to move armature **34** a corresponding amount in the same direction.

The construction may be still further simplified by forming the latch **24** as an integral part of the armature and eliminating the slide **25**, but I prefer the illustrated arrangement on account of the advantage obtained from the hammer blows delivered to the latch when lost motion is provided in the manner shown.

Having thus described my invention, I claim:

1. In a remote control latch for holding a hinged closure member against the fixed member to which it is hinged, a casing having an opening therethrough adapted to be attached to one of said members, the other member having a hook extending into said casing, a solenoid mounted in said casing with its axis in a plane intersecting said hook, an armature movable in said solenoid, a spring working against the armature in opposition to the action of said solenoid, latch means having two spaced projections one of which is adapted to be engaged by said armature under the action of said spring for causing the latch means to engage and retain said hook when said solenoid is deenergized, and the other of which is adapted to be engaged by said armature when the solenoid is energized for causing the latch means to release said hook.

2. In a remote control latch for the hinged lid of a tank cap, a casing having an opening therethrough adapted to be operatively connected with the filler neck of a tank, said lid having a depending hook extending into the casing, a latching slide on the casing having two spaced projections, said slide being adapted in one position to engage said hook for holding the closure member in closed position, a solenoid mounted in said casing with its axis parallel to the general direction of movement of said slide, an armature movable in said solenoid, a spring working against said armature in opposition to the action of said solenoid, said armature having a head adapted under the influence of said spring to strike one of said projections for causing the slide to engage and retain said hook when the solenoid is deenergized, and adapted when the solenoid is energized to strike the other of said projections for causing the slide to disengage and release said hook.

3. In a remote control latch for holding a hinged closure member against the fixed member to which it is hinged, a casing having an opening therethrough adapted to be attached to one of said members, the other member having a hook extending into said casing, a solenoid mounted in said casing, an armature movable in said solenoid, a spring working against the armature in opposition to the action of said solenoid, latch means having two spaced projections one of which is adapted to be engaged by said armature under the action of said spring for causing the latch means to engage and retain said hook when said solenoid is deenergized, and the other of which is adapted to be engaged by said armature when the solenoid is energized for causing the latch means to release said hook.

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