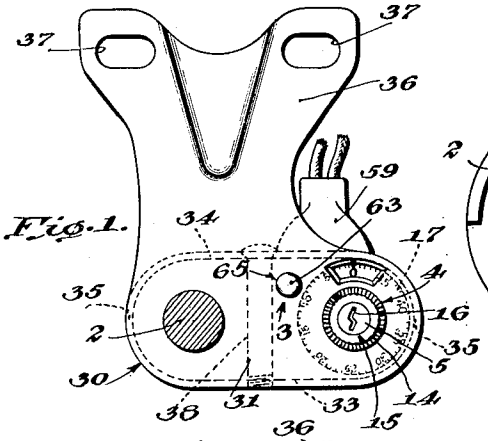
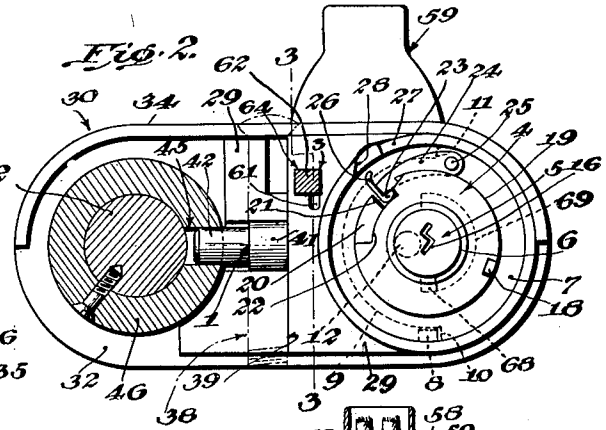
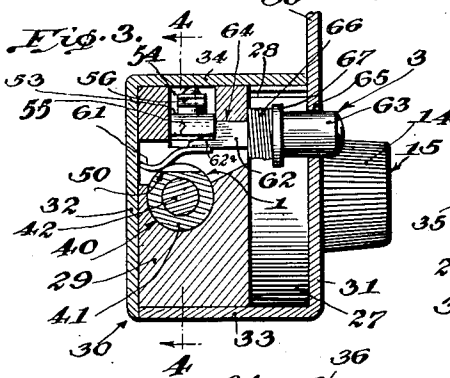
Feb. 6, 1934. V. L. GILPIN 1,945,527

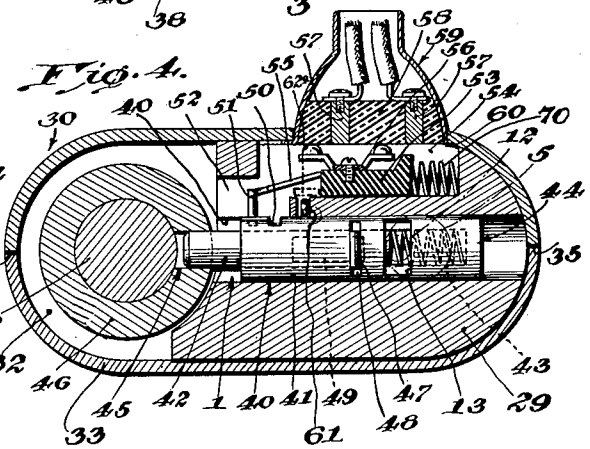
IGNITION CIRCUIT AND OTHER LOCK

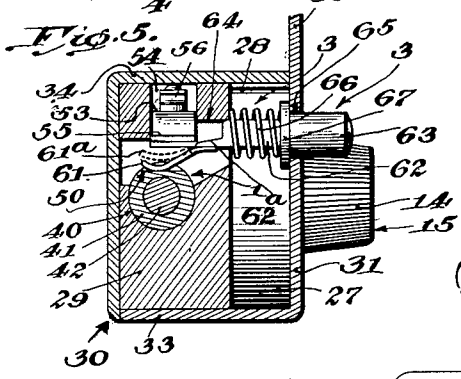
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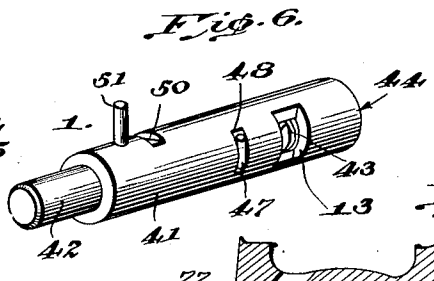


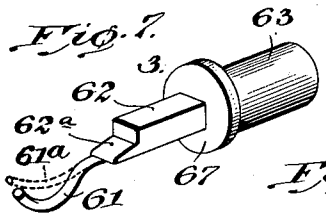


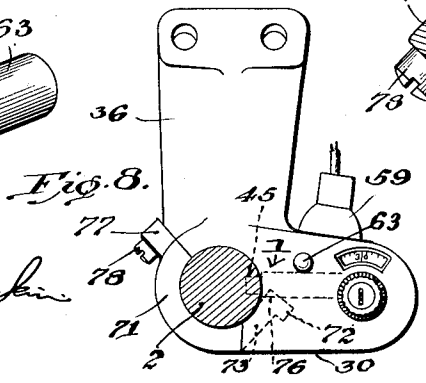


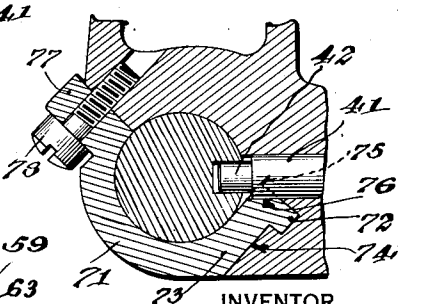












WITNESSES

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Patented Feb. 6, 1934 1,945,527

UNITED STATES PATENT OFFICE

1,945,527

IGNITION CIRCUIT AND OTHER LOCK

Victor L. Gilpin, Baltimore, Md.

Application October 20, 1931. Serial No. 569,970

15 Claims. (Cl. 70—127)

This invention relates to improvements in locks, especially of the type disclosed in Patent 1,828,-562 of October 20, 1931 to Victor L. Gilpin and it consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide a lock of the foregoing type with a latch arrangement supplemental to the combination or key cylinder mechanism, which mechanism is for throwing the bolt to the locking and unlocking positions, said latch arrangement normally holding the bolt retracted or unlocked thereby keeping the ignition circuit closed, and being made in such a way as to necessitate the simultaneous use of both hands of the operator, one to press the latch and release the bolt, the other to manipulate said mechanism and thus cause the projection of the bolt to the locking position, said depression of the latch automatically opening the ignition circuit prior to the projection of the bolt.

Another object of the invention is to enable the use of said latch arrangement for an emergency opening of the ignition circuit, this without necessitating the turning of the combination knob or key which would produce a projection of the bolt to the locking position.

Another object of the invention is to make it impossible to throw the bolt to the locking position against the steering post and to open the ignition circuit with one hand, thus compelling the operator to bring the vehicle to a standstill for the release of both hands from the steering wheel so that the latch arrangement can be released with one hand while the locking bolt and ignition switch mechanism is actuated with the other hand.

A further object of the invention is to provide a latch arrangement for holding the bolt in the retracted position and at the same time holding the ignition switch in the closed position as long as the steering post is supposed to remain unlocked, thus preventing any accidental locking or unintentional possibility of the steering post becoming locked while the vehicle is in motion.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawing in which

Figure 1 is a plan view of the improved lock, the steering post being shown in section.

Figure 2 is a partially elevational and sectional view of the lock, the bolt being in the locking position in respect to the steering post.

Figure 3 is a cross section taken on the line 3—3 of Figure 2, the latch button being shown depressed preparatory to shifting the bolt from the unlocking position.

Figure 4 is a section taken on the line 4—4 of Figure 3, this being on a plane lower than that on which Figure 2 is taken, parts being shown in elevation.

Figure 5 is a view similar to Figure 3, illustrating how the latch arrangement holds the bolt in the retracted position.

Figure 6 is a detail perspective view of the bolt.

Figure 7 is a detail persective view of the latch arrangement.

Figure 8 is a plan view of a modified form showing a slightly different arrangement of casing but particularly a split collar which facilitates the application of the casing to the steering post.

Figure 9 is a detail horizontal section showing how the bolt locks the split collar when in the locked position, thus preventing the removal of the casing in order to circumvent the lock.

The intention of the instant improvement is to normally hold the bolt 1 (Fig. 6) retracted as long as the steering post 2 is supposed to be free for rotation as in the steering of the vehicle. The means by which the bolt 1 is thus held retracted is the latch arrangement 3 (Figs. 5 and 7). The bolt 1 is operable either by a combination mechanism 4 or key cylinder 5 (Fig. 2), but each of these devices is held inoperative to project the bolt 1 as long as the latch arrangement 3 remains in the latching position.

It thus becomes impossible to either accidentally or intentionally throw the bolt 1 to the locking position (Figs. 2 and 4) without first pressing on the latch arrangement to release it from the bolt 1 (Fig. 3) so that either the combination mechanism 4 or key cylinder 5 (Fig. 2) can be operated to throw the bolt. This means that the operator must bring his vehicle to a standstill so that he can take both hands from the steering wheel, using one to operate either the mechanism 4 or the key cylinder 5 and the other to press on the latch arrangement 3.

From this it will be understood that the purpose is to prevent the locking of the steering post 2 while the vehicle is in motion. Were it not for the provision of the latch arrangement 3, the operator might thoughtlessly reach down and actuate either the mechanism 4 or the key cylinder 5 with one hand, retaining his hold of the steering wheel with the other hand, while the vehicle is still in motion. Inasmuch as both hands are required for operation of the lock he will not be likely to permit the vehicle to keep on moving without keeping control of the steering wheel. He is thus compelled to stop the vehicle before actuating the lock, thus eliminating a dangerous possibility.

This is a brief outline of the purpose of the invention. In some respects the instant lock is similar to the lock disclosed in the foregoing copending application. A repetition here of the details of the previous lock is unnecessary for the understanding of the improvement, but a brief outline of the outstanding parts of the lock

in the co-pending application will be of assistance.

It is possible to shift the bolt 1 back and forth either by means of the combination mechanism 4 or the key cylinder 5 provided the latch arrangement 3 has been pushed in to release the bolt 1 for forward shifting to the locking position. The latch arrangement reassumes its original position while the bolt is in the locking position, springing out immediately upon its manual release after the bolt has been shifted to the locking position. For the purposes of the combination mechanism there is a sleeve 6 which is made integral with a stop disc 7, so-called because it coacts with a fixed lug or stop 8, fitting in an arcuate slot 9 on back of the disc, thus to limit the turning of the disc 7 (also of the key cylinder 5) to approximately 180°.

Taking the position in Figure 2, it is easy to understand that since the lug 8 is fixed, it is not possible to turn the disc 7 further to the right because the shoulder 10 of the slot 9 is in abutment with said lug, but it is possible to turn the disc 11 to the left, and this turning can continue until the other shoulder 11 of the slot 9 abuts the lug 8. At this point it is necessary to mention an eccentric pin 12 (Fig. 2). This pin projects from the inner or remote end of the key cylinder 5.

The eccentric pin 12 fits in a slot 13 in the side of the bolt 1 (Figs. 4 and 6). The position of the pin 12 is denoted in faint dotted lines in Figure 4. The remote or inner end of the cylinder 5 is also denoted by faint dotted lines. Ordinarily the cylinder 5 and disc 7 are locked together. The cylinder 5 contains an arrangement of tumbler pins (not shown) which locks the cylinder 5 and sleeve 6 together so as to compose a unit.

Inasmuch as the cylinder 5 and sleeve 6 are thus locked together, it stands to reason that a turn of the disc 7 to the left (Fig. 2) will sweep the eccentric pin 12 first downward and toward the right in the slot 13 (Fig. 4), and by pressure of the eccentric pin against the right side of the slot 13 the retraction of the bolt 1 must necessarily follow. On the same principle a turn of the disc 7 to the right, reading from the last position, the pin 12 will be swept to the left then upward to its resting point, at the same time bearing against the left side of the slot 13 thereby projecting the bolt 1.

Now revert to the combination mechanism 4. This is operated by a knob 14. The cylinder 5 projects through flush with the end 15 of the knob (Fig. 3) so that the key hole 16 (Fig. 1) is readily accessible. The knob has an integral actuator disc 17 (Fig. 1) with a radial slot (not shown) on the nether side to receive a pin 18 (Fig. 2) on a ring 19. There is a disc 20 beneath this ring, and both the ring and disc can turn with perfect freedom on the sleeve 6 without affecting the sleeve in the least. But when a notch 21 in the disc 20 and a cavity 22 in the ring 19 are brought into registration (Fig. 2) so that the nose 23 of a dog 24 can drop in the combined recess there will be a locking of the ring and disc to the stop disc 7 because the dog 24 is pivotally secured to the stop disc 7 as at 25 so that the sleeve 6, stop disc 7, ring 19 and disc 20 will turn as a unit, the turning being accomplished through the medium of the knob 14 and its engagement with the pin 18.

As long as the head 26 of the dog 24 stays within the confines of a rim 27 at the left side, the foregoing locking together of the ring 19 and disc 20 must endure, but when the head 26 is brought into registration with an opening 28 (Fig. 2) in the rim the shouldered ends of the cavity 28 will be enabled to push the head 26 out of the combined recess 21, 22. This destroys the combination and the bolt 1 will remain in the projected or locked position.

The entire working of the foregoing combination mechanism 4 can be superseded by inserting a proper key in the hole 16 of the cylinder 5. This key has properly arranged wards which cause the retraction of the tumbler pins (not shown) from their gripping engagement with the sleeve 6. This makes it possible to turn the cylinder 5 leaving the sleeve 6 and all of its connected parts standing. This turning sweeps the eccentric pin 12 down and to the right, retracting the bolt 1 without disturbing any part of the combination mechanism 4.

Most of the foregoing description relates to co-pending application 495,240, and while the construction has been described in a general way yet it is believed sufficiently clear to obtain an understanding of it in connection with the improvement, which improvement is as follows:—

The rim 27 is part of a block or base 29 which fits in the right end of a casing generally denoted 30 (Fig. 1). This casing is divided into halves 31, 32. The half 31 appears on top (Fig. 1), the half 32 (Fig. 2) on the bottom. These halves include flanges 33, 34 (Fig. 3) which when abutted at 35 (Fig. 1) complete the casing.

The top half 31 (Fig. 1) has an arm 36 which extends away and has holes 37 enabling bolting or riveting to an instrument board. It is from the lower edge of this half 31 that the flange 33 extends downwardly. The half 32 is nothing more than a plate formed in the shape of the casing, provided with an upstanding flange 34 which abuts the nether side of the half 31.

In place of this type of casing, a modified arrangement (Figs. 8 and 9) can be used. According to this arrangement the bolt 1 performs a function in virtually locking the casing to the steering post when the bolt is in the locking position (Fig. 9). In order to avoid a material interruption in the sequence of the description the specific construction of the modification is left for treatment later.

It is inside of either casing thus formed that most of the mechanism is housed. A screw stud 38 (Fig. 1) extends from one flange to the other, and being screwed into one of the flanges secures the halves together. This stud fits beside a shoulder 39 (Fig. 2) of the block 29 and holds the latter immovable in its right end of the casing 30.

A bore 40 in the block 29 (Figs. 3 and 4) slidably contains the bolt 1. This bolt is a two-part element, consisting of a cylinder 41 and a plunger 42. A spring 43, situated between the right end of the plunger 42 and the closed end 44 of the cylinder (Fig. 4), presses the plunger outwardly. The plunger 42 is adapted to enter a hole 45 either in the steering post 2 (Fig. 9) or in a collar 46 (Fig. 4) fixed on the steering post 2. The purpose of the spring 43 is to enable yielding of the plunger 42, and should the hole 45 not be in exact registration with the plunger when the cylinder 41 is projected either by means of the combination mechanism 4 or key cylinder 5, the plunger 42 will yield to the pressure of the eccentric pin 12 until the post 2 has been turned enough to bring the hole 45

in registration whereupon the plunger 42 will snap in.

A key 47 (Figs. 4 and 6), secured in a recess 48 in the side of the cylinder 41 enters a groove 49 (Fig. 4) in the side of the plunger 42 and limits the movements of the plunger each way. It also prevents turning of the plunger. There is a cross notch 50 on top of the cylinder 41, and adjacent to this notch there is an upstanding stud 51.

The stud 51 is movable in a passageway 52 (Fig. 4) branching off from the bore 40. The stud 51 never leaves the passageway, hence it prevents the cylinder 41 from turning. Its purpose is to move a switch block 53 (Fig. 4) to the contacting position simultaneously with the shifting of the bolt 1 to the unlocking position. The switch block is located in a chamber 54 immediately over the bore 40. For the purpose of the stud 51 the switch block 53 has a projection 55 extending in the direction of the stud and being engageable therewith.

A contactor 56, carried by the block 53, is engageable with the ignition or other circuit terminals 57. These terminals are carried by an insulator 58 contained by a guard 59. The guard is flanged at 60. The block 29 is recessed where this flange occurs, and when the block is secured in the casing 30 it follows that the guard 59 is secured also. The guard projects from the casing through a suitable opening.

The latch arrangement 3 coacts with the bolt 1 in holding it retracted. To this end said arrangement includes a resilient detent 61 (Figs. 3, 5 and 7), permanently secured to the nether side of the shank 62 of the latch button 63. The shank is square in cross section and slidably fits a corresponding hole 64 (Figs. 2 and 3) in the block 29. The button 63 works in an opening 65 in the casing half 31. A spring 66 presses against the base 29 and against a flange 67 (Figs. 3 and 5) on the button. The flange limits the extension of the button under tension of the spring.

A bevel 62ª (Fig. 7) occurs at one terminal of the shank 62. This bevel constitutes a cam. Its purpose is to ride under the projection 55 and lift it from the stud 51 to enable a spring 70 (Fig. 4) to move the switch block 53 to the left. This opens the ignition circuit. A depression of the button 63, when the bolt 1 is in the unlocking position, will cause the movement of the block 53 to the circuit-opening position, and the circuit can be thus opened regardless of whether or not the bolt 1 is shifted to the locking position. This means that the ignition circuit can be opened without shifting the bolt 1 to the locking position.

The way this happens is as follows:—The block 53 will stand in the contacting position at the right of the chamber 54 when the bolt 1 is retracted to the unlocking position. This is so because the stud 51 moves the block 53 by virtue of engaging the end of the projection 55. At the same time the button 63 will be out (Fig. 5) by virtue of the pressure of the spring 66 against the flange 67.

As long as the detent 61 remains in the notch 50 the bolt 1 will be held in the unlocking position and cannot be shifted by either the knob 14 or a key in the key hole 16. The button 63 must be pushed in before the bolt 1 can be shifted to the locking position (Fig. 4). The moment the button 63 is pushed in the cam 63ª will ride under the projection 55 and lift it away from the stud 51. Thereupon the spring 70 (Fig. 4) will move the block 53 to the left to the circuit-opening position. The operator may now turn the knob 14 or key in the key hole 16 so as to throw the bolt 1 into the locking position.

In moving to the left as stated, the projection 55 will advance to the left of the stud 51, later to be caught up by the stud as in Figure 4 when the bolt 1 is thrown into the locking position, during which act the stud 51 raises the projection 55 enough to take its position ahead of the projection as shown. After the cam 62ª has performed its lifting function and the bolt 1 has been thrown into the locking position the button 63 will be manually released. The spring 66 will return the button to the original position (Fig. 5), but since a solid part of the cylinder 41 (Fig. 4) is now under the detent 61, the latter will flex as at 61ª (Figs. 5 and 7) in riding over the cylinder.

At this point it is necessary to explain another but analogous purpose of the button 63. Assume that the vehicle is running along and that desiring to suddenly reduce the speed of the engine the operator finds the accelerator pedal stuck, or suppose that the spring in the throttle linkage suddenly becomes disconnected or breaks. All that the operator needs to do is to push the button 63 in thereby releasing the switch block 53 from the stud 51 and enabling it to spring to its circuit-opening position. The bolt 1 stays in the unlocked position inasmuch as the bolt is not shifted until either the key or knob 14 is turned.

It is next assumed that the necessary repair has been made. Either the stuck pedal has been loosened or the spring replaced or repaired. The switch block 53 is restored to the contacting position by first turning the key or knob 14 in one direction to move the bolt 1 to the locking position. This brings the stud 51 ahead of the projection 53 (Fig. 4). The key or knob 14 is then reversely turned so as to shift the bolt 1 to the unlocking position during which act the block 53 will be shifted to the right with the stud 51 to reassume the circuit-closing position.

Reference is now made to the modification in Figures 8 and 9. This modification is solely concerned with the casing 30. The internal mechanism is identical with that already described, and such parts as shown are denoted by corresponding reference characters. The modified casing is made with what is herein called a split collar 71 with an L-coupling 72. This coupling is nothing more than an L-head on one leg 73 of the collar 71.

The inner corner 75 (Fig. 9) of the L-coupling 72 has a rounded notch 76 in which the bolt cylinder 41 fits when projected to the locking position. The other leg 77 of the collar 71 is secured to the body of the casing by a machine screw 78.

Now it can be understood that when the bolt 1 is in the locking position it will be difficult to displace the split collar 71 even upon removal of the machine screw 78. It is thus difficult to remove the casing 30 and thus circumvent the lock. There is a direct combination between the lock casing 30 and the bolt 1. When the bolt is projected to the locking position in respect to the steering post 2 it at the same time locks the casing 30 to the steering post. It must be remembered that the arm 36 is either bolted or rivetted to the instrument board. In any event the arm will be made so secure that it could never be loosened without virtually wrecking the whole assemblage.

Instead of projecting the bolt 1 into a collar affixed to the steering post 2, the latter is provided with the hole 45 (formerly in the collar Fig. 4) so that when the bolt is projected to the locking position it engages the steering post directly.

The operation

of the improvement is described first. In the normal running condition of the vehicle the bolt 1 is obviously retracted in the base 29 so that there will be nothing to impede the turning of the steering post 2. The bolt is held retracted as long as the downwardly curved part of the detent 61 (Fig. 5) remains in the cross notch 50. This detent remains in this position as long as the button 63 is left extended (Fig. 5), and it is immaterial how much one might turn either the combination mechanism 4 or the key cylinder 5 yet it would be impossible to project the bolt 1 because the detent 61 remains in position in the notch 50 to prevent projection.

The operator might work the combination mechanism 4 or the key cylinder 5 with one hand with the idea of projecting the bolt 1, but unless he uses his other hand to press on the button 63 in order to displace the detent 61 from the notch 50 (Fig. 3) and thus cause opening of the ignition circuit he will be unable to project the bolt 1 in order to lock the post 2. It is manifestly impossible to turn either a key or the knob 14 and press on the button 63 at the same time with the same hand.

Thus it becomes necessary for him to take the second hand from the steering wheel in order to press on the button 63 and enable projection of the bolt 1. Since the operator is not likely to keep the vehicle going while taking both hands from the steering wheel the invention practically assures the bringing of the vehicle to a standstill before any attempt will or can be made to open the ignition circuit and at the same time lock the steering post.

In order to release the bolt 1 all that the operator needs do is to press on the button 63. This causes opening of the ignition circuit first and next enables the projection of the bolt 1 to the locking position. Opening of the ignition circuit is caused by the lifting of the projection 55 when the cam 62ª on the button 63 rides thereunder (Fig. 3). The spring 70 (Fig. 4) snaps the switch block 53 over to the circuit-opening position. Under the same circumstance the detent 61 will have been displaced from the notch 50 so that the bolt 1 is free for movement to the left. Either the combination mechanism 4 or the key cylinder 5 may now be turned to the right (having previously been turned to the left until the shoulder 11 in Figure 2 engaged the lug 8 as in retracting the bolt), thus sweeping the eccentric pin 12 upwardly in the clockwise direction and causing the projection of the bolt cylinder 41. Should the hole 45 be out of postion, the plunger 42 will yield by virtue of its spring 43, and the operator has only to slightly turn the steering post 2 in one or the other direction when he will hear the plunger 42 snap in.

Continued turning of the combination mechanism 4 destroys the combination. The key cylinder 5 can be turned only through 180°. This limited turning of the key cylinder is due to the working of a stop lug 68 (Fig. 2) on the inner end of the cylinder 5 in an arcuate passage 69 in the base 29.

Unlocking is accomplished by a left turn either of the combination mechanism 4, after finding the combination, or of the key cylinder 5. Such a turn retracts the bolt 1, whereupon the spring 66 (Fig. 5) is free to push the button 63 forwardly and cause the detent 61 to enter the notch 50 when the latter comes into registration. Here the parts will stay until the operator wishes to lock the steering post by turning either the mechanism 4 or the key cylinder 5 to the right, but before he can do either he must press on the button 63 to again release the bolt 1.

The foregoing operation is briefly and conveniently summarized as follows: Assuming the steering post 2 to be locked and the ignition switch to be open it is only necessary to either work the combination or turn the key in order to unlock the steering post and close the ignition circuit. The button 63 does not have to be touched. When the bolt 1 is retracted, the erstwhile flexed detent 61, then in the dotted line position 61ª (Fig. 5). will snap into the cross notch 50, and lock the bolt 1 in the retracted position.

To shut off the ignition, push in on the button 63. The detent 61 will ride across the notch 50 while the cam 62ª will push up on the projection 55. The spring 70 (Fig. 4) will move the switch block 53 to the circuit-opening position by virtue of the release of the projection 55 from the stud 51.

It must be borne in mind that there is enough friction in the places of contact of the cylinder 41 with the bore 40 as well as in the mechanism of the connected combination lock 4 to prevent any possibility of the spring 70 pushing the bolt 1 to the left upon disengagement of the notch 50 by the detent 61 prior to a release of the projection 55 from the stud 51. This release can be so timed as to occur before the detent 61 leaves the notch 50 entirely. In any event, the bolt 1 stays in the retracted position until manually driven to the left.

To lock the steering post after the ignition is off it is only necessary to use either the key or the combination lock, presupposing that the button 63 is still pressed in. Upon the subsequent release of the button the resilient detent 61 merely flexes over the solid part of the cylinder 41 (dotted lines 61, Fig. 5) when the button 63 returns to the original position.

To unlock the steering post 2 but have the ignition off, use is first made of either the key or the combination to retract the bolt 1 and unlock the steering post, then immediately press in on the button 63 to release the switch block 53.

I claim:—

1. A pair of switch terminals, a contactor to bridge the terminals in a circuit-closing position, actuating means connected with and operable on the contactor in one direction to move the contactor into the circuit-closing position, and a latch arrangement for controlling the actuating means, said latch arrangement having means holding the actuating means to keep the contactor in said position, and having other means to break said connection with the actuating means to enable independent movement of the contactor into a circuit-opening position.

2. A pair of switch terminals, a contactor to bridge the terminals, actuating means operable on the contactor to move it to the bridging position, a detent to engage a part of the actuating means holding said actuating means against reverse movement for shifting the contactor to a circuit-opening position, a button which is displaceable to disengage said detent from said part of the actuating means leaving said actuating means free for reverse movement, and means

shifted with the button to cause shifting of the contactor to said circuit-opening position.

3. A combined steering post lock and ignition switch comprising a bolt, means for shifting the bolt to locking and unlocking positions, circuit terminals, a contactor, connecting means between the contactor and bolt causing movement of the contactor to the circuit-closing position when shifting the bolt to the unlocking position, and means then holding the bolt in the unlocking position being subsequently operable to disengage the connecting means and cause movement of the contactor to a circuit-opening position without disturbing the bolt.

4. A fixable casing partly embracing a movable member to be locked and having a recess, a separable collar having coupling means insertible in the recess thereby bringing the collar into position around said member to complete its embrasure, means to secure the collar to the casing and so hold the collar in place, and a bolt in the casing movable to simultaneously engage said member and coupling means to prevent motion of the member or separation of the collar in the event of removal of said securing means.

5. In a lock having a bolt adapted to assume a locking position, a contactor for controlling an electrical circuit, being associated with the bolt, means to move the contactor to a circuit-opening position while the bolt assumes the locking position, means to shift the bolt to an unlocking position, means making a connection between the bolt and the contactor to simultaneously shift the contactor to a circuit-closing position; detent means then exercising a grip on the bolt to hold it in the unlocking position, and means coacting with said detent means to sever the connection of the contactor for an independent return movement thereof into the contact-opening position upon displacement of said detent means to release the bolt.

6. A lock comprising a bolt, means to move the bolt first in one direction and then in the other to assume either a locking or an unlocking position, a contactor for controlling an electrical circuit, slip connecting means between the bolt and contactor always picking up the contactor for movement with the bolt in one direction, and a device which acts to lock the bolt in one of its positions and is operable to break the slip connection and enable a movement of the contactor in the opposite direction independently of the bolt.

7. In a lock comprising a bolt and means for shifting it to locking and unlocking positions, a contactor and means tending to move it to a circuit-opening position when the bolt is in its locking position; engageable means comprising slip-connection elements on the bolt and contactor then engaging in readiness to move the contactor to a circuit-closing position when moving the bolt to an unlocking position, and release means movable to displace the respective slip element of the contactor enabling the contactor to reassume its circuit-opening position leaving the bolt in its unlocking position.

8. In a lock comprising a bolt and means for shifting it to locking and unlocking positions, a contactor and means tending to move it to a circuit-opening position when the bolt is in its locking position; engageable means comprising slip-connection elements on the bolt and contactor then engaging in readiness to move the contactor to a circuit-closing position when moving the bolt to an unlocking position, and release means movable to displace the respective slip element of the contactor enabling the contactor to reassume its circuit-opening position leaving the bolt in its unlocking position, said slip element of the contactor being resilient to enable the respective slip means of the bolt to flex it upon a subsequent return of the bolt to the locking position.

9. In a lock comprising a bolt and means for shifting it to locking and unlocking positions, a contactor and means tending to move it to a circuit-opening position when the bolt is in its locking position; engageable means comprising slip-connection elements on the bolt and contactor then engaging in readiness to move the contactor to a circuit-closing position when moving the bolt to an unlocking position, and a cam then movable to displace the respective slip element of the contactor enabling the contactor to reassume its circuit-opening position leaving the bolt in its unlocking position.

10. In a lock comprising a bolt and means for shifting it to locking and unlocking positions, a contactor and means tending to move it to a circuit-opening position when the bolt is in its locking position; a stud on the bolt, a projection on the contactor, said stud and projection engaging in readiness to move the contactor to a circuit-closing position when moving the bolt to an unlocking position, and release means movable to displace the projection enabling the contactor to reassume its circuit-opening position leaving the bolt in its unlocking position.

11. In a lock comprising a bolt and means for shifting it to locking and unlocking positions, a contactor and means tending to move it to a circuit-opening position when the bolt is in its locking position, a rigid stud on the bolt, a flexible projection on the contactor, said bolt and projection engaging in readiness to move the contactor to a circuit-closing position when moving the bolt to an unlocking position, and a cam movable to flex said projection for the release thereof from the stud, enabling the contactor to reassume its circuit-opening position leaving the bolt in its unlocking position.

12. In a lock comprising a bolt and means for shifting it to locking and unlocking positions; a detent, said bolt having a notch to receive the detent which thereby holds the bolt for movement, means for displacing the detent from the notch to a position beside the bolt enabling movement of the bolt, and means to return the detent, said detent being flexible and subject to flexure when engaging the bolt thus standing in readiness to reengage the notch upon a return movement of the bolt.

13. A pair of switch terminals, a contactor to bridge the terminals in a circuit-closing position, actuating means connected with and operable on the contactor in one direction to move the contactor into the circuit-closing position, and a latch arrangement for controlling the actuating means, said latch arrangement having means holding the actuating means to keep the contactor in said position, having other means to break said connection with the actuating means to enable independent movement of the contactor into a circuit-opening position, and means to then produce said independent movement.

14. A pair of switch terminals, a contactor to bridge the terminals, actuating means operable on the contactor to move it to the bridging position, said means including interengaging elements

respectively carried by the actuating means and by the contactor, a detent to engage a part of the actuating means holding said actuating means against reverse movement for shifting the contactor to a circuit-opening position, a button which is displaceable to disengage said detent from said part of the actuating means leaving said actuating means free for reverse movement, cam means shifted by the button to disengage the interengaging elements, and means to then cause shifting of the contactor to said circuit-opening position.

15. A fixable casing partly embracing a movable member to be locked, a separable collar mounted on said casing to complete the embrasure of said member, means to secure the collar to the casing and so hold the collar in the mounted position, and a bolt in the casing movable to simultaneously engage said member and collar to prevent motion of the member or separation of the collar in the event of removal of said securing means.

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