

June 20, 1939.

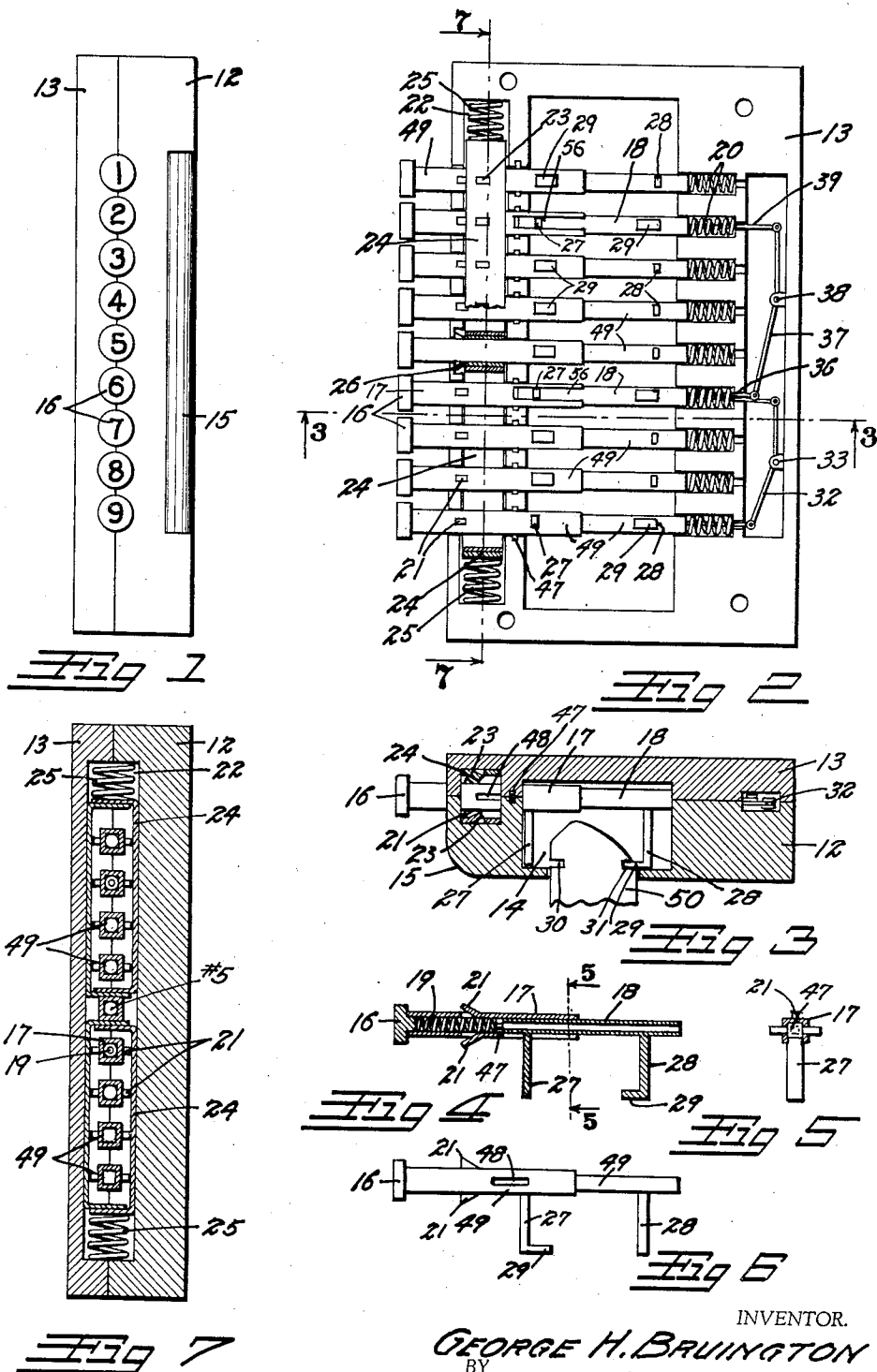
G. H. BRUINGTON

2,162,995

BUTTON OPERATED COMBINATION LOCK

Filed March 7, 1939

3 Sheets-Sheet 1



INVENTOR.
GEORGE H. BRUINGTON
BY
R. H. Gallant
ATTORNEY.

June 20, 1939.

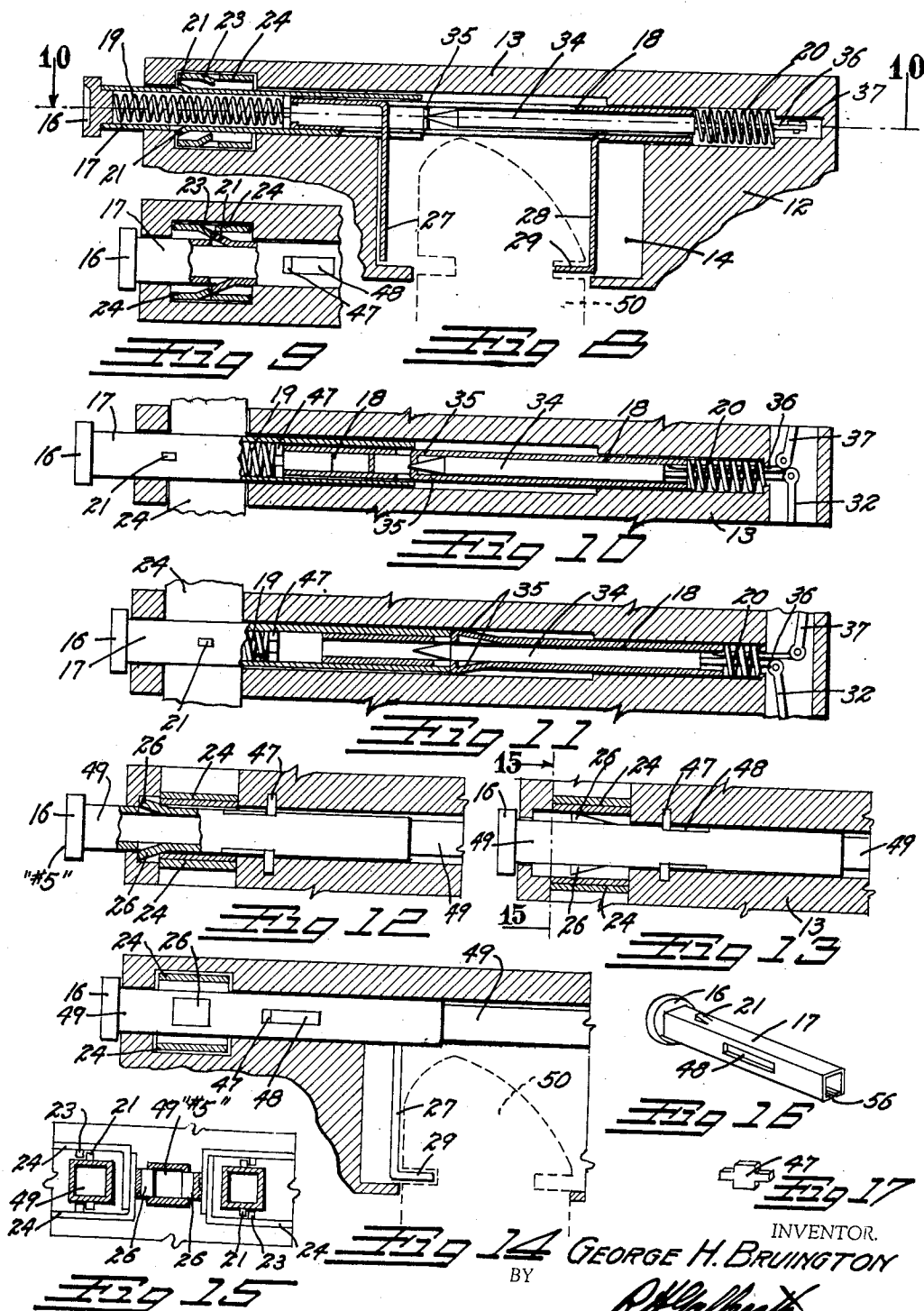
G. H. BRUINGTON

2,162,995

BUTTON OPERATED COMBINATION LOCK

Filed March 7, 1939

3 Sheets-Sheet 2



June 20, 1939.

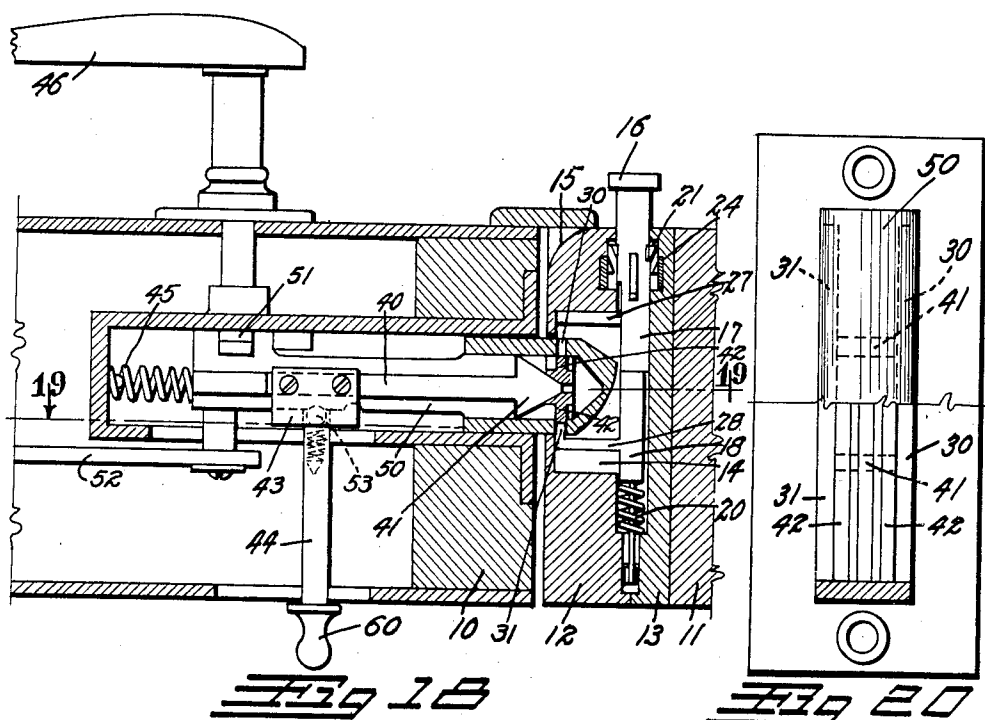
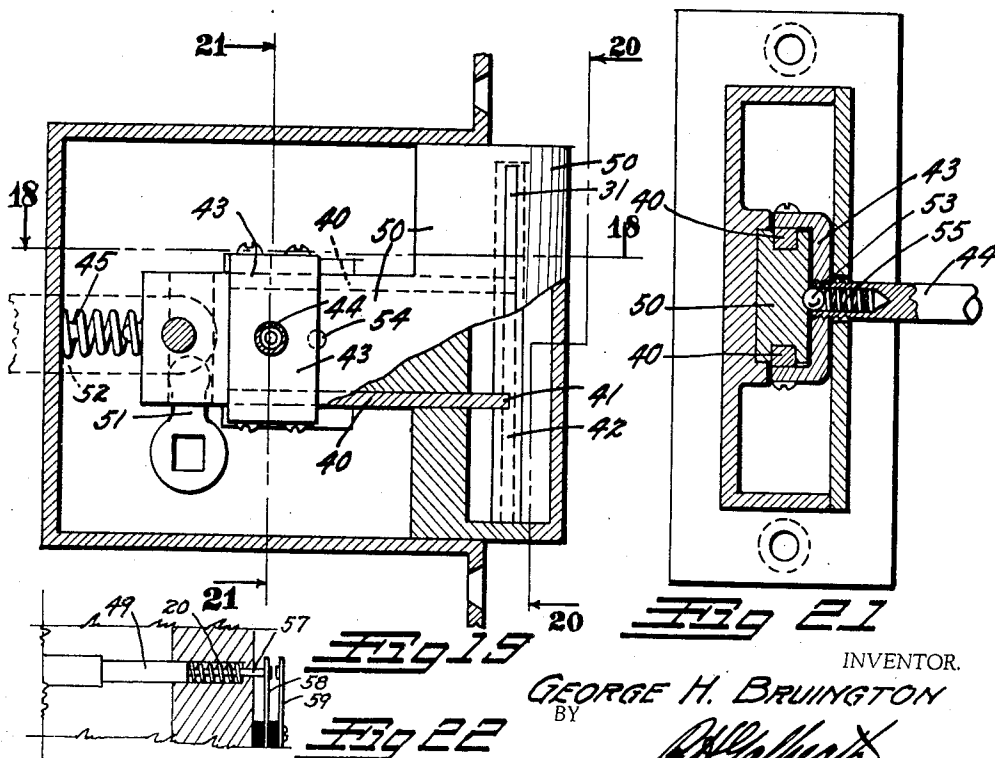
G. H. BRUINGTON

2,162,995

BUTTON OPERATED COMBINATION LOCK

Filed March 7, 1939

3 Sheets-Sheet 3



INVENTOR.

GEORGE H. BRUINGTON

BY

R. H. H. H. H.

ATTORNEY.

UNITED STATES PATENT OFFICE

2,162,995

BUTTON OPERATED COMBINATION LOCK

George H. Bruington, Santa Fe, N. Mex.

Application March 7, 1939, Serial No. 260,305

14 Claims. (Cl. 70-298)

This invention relates to a push button combination lock for any desired use. The lock especially is valuable for use on the doors on automobiles, houses, etc., but is, of course, not limited to these particular uses.

The principal object of the invention is to provide a positive, highly efficient locking device, the entire control of which is accomplished by actuation of a series of push buttons in a pre-set combination so that the use of keys is entirely eliminated.

Another object is to provide a push button combination door lock which can be instantly unlocked from one side of the door without use of the combination so as to adapt it to successful use on automotive vehicles.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

Fig. 1 illustrates that face of the improved lock which is exposed on the outer face of the door showing the combination push buttons.

Fig. 2 is a side view of one section of the lock case with the other section thereof removed.

Fig. 3 is a horizontal cross section through the lock taken on the line 3-3, Fig. 2, with both sections of the lock case in position.

Fig. 4 is a detail view illustrating a typical combination push button shaft as used in the sequence combination form of the invention.

Fig. 5 is a cross section through the shaft taken on the line 5-5, Fig. 4.

Fig. 6 is a detail view, illustrating one of the solid shaft, locking buttons as used in the invention.

Fig. 7 is a vertical section through the lock taken on the line 7-7, Fig. 2.

Fig. 8 is an enlarged detail sectional view illustrating the normal position of a push button shaft in the locked position.

Fig. 9 is a similar view illustrating the head of the shaft in the depressed, operative position.

Fig. 10 is a longitudinal section taken on the line 10-10, Fig. 8.

Fig. 11 is a similar view illustrating the combination button shaft in the depressed, operative position.

position.

Figs. 12 and 13 illustrate the shaft of the release button of the improved lock in the normal and releasing positions, respectively.

Fig. 14 illustrates a non-combination or locking button shaft in the depressed position.

Fig. 15 is a cross section through the release button shaft, taken on the line 15-15, Fig. 13, illustrating it in the releasing position.

Fig. 16 is a detail perspective view of a typical push button and its shank.

Fig. 17 is a detail view of the spring stop member employed in the push button shanks.

Fig. 18 is a horizontal section through a door edge and jamb illustrating the position of the improved lock thereon and its associated latch mechanism. The section through the latch mechanism in this view is taken on the line 18-18, Fig. 19.

Fig. 19 is a vertical longitudinal section through the latch mechanism, taken on the line 19-19, Fig. 18.

Fig. 20 is a vertical cross section through the latch mechanism, taken on the line 20-20, Fig. 19.

Fig. 21 is a similar section, taken on the line 21-21, Fig. 19.

Fig. 22 is a detail view, illustrating a method for adapting the invention to close an electric signal circuit.

The lock is designed to be placed on the jamb at the side of a door, acting as keeper for receiving and holding the door latch bolt to prevent the latter from being withdrawn from the keeper until the proper combination has been set by means of a series of press buttons.

In the drawings, the edge member of a typical automotive door is indicated at 10 and its adjacent jamb at 11. The locking portion of the invention is secured to the jamb 11 and the latch bolt mechanism is mounted on the door edge member 10.

The locking mechanism is capable of use in two alternate ways, that is, a simple combination system and a more complex sequence combination system. In the former if the chosen members are pressed in any sequence the lock will open. In the latter, the chosen members must be pressed in a predetermined sequence. The arrangement for the latter form will be first described.

The improved lock is enclosed between two case blocks 12 and 13. The block 12 serves as a striker against which the inclined side of a latch

bolt 50 strikes to force the latter back into the door. The block 12 is formed with a socket 14 into which the extremity of the bolt snaps, when the door reaches its fully closed position, and
5 with a rounded edge portion 15 against which the inclined face of the bolt strikes.

A series of parallel, square grooves are formed in the contacting faces of the two case blocks 12 and 13, which, when the two blocks are to-
10 gether, form square channels for receiving the shaft mechanisms of a series of push buttons 16.

The push buttons may be divided into three classes: First, the combination buttons which must be operated to release the lock; second, the
15 locking buttons which if depressed will engage and lock the latch bolt; and third, the release button which resets all depressed buttons. As illustrated the buttons are numbered from #1 to #9, inclusive and in the lock shown, button
20 #5 is the release button, buttons #2, #6, and #9 are the combination buttons, and the remainder are locking buttons.

In the combination shown, all of the locking buttons, the release button #5, and the button
25 #9, are mounted on solid square shafts 49. The buttons #2 and #6, however, are carried on collapsible shafts each consisting of a hollow square shank portion 17 telescopically fitted over the extremity of a square hollow staff portion 18.

30 A compression spring 20 is positioned in the bottom of each shaft channel to constantly urge the shafts 49 and the staffs 18 outwardly. In the collapsible shafts a second spring 19 is placed in each shank and acts between the button 16
35 and a stop member 47 therein to constantly urge the shanks outwardly.

The stop member is shown in detail in Fig. 16 and consists of a small disc with projecting arms which extend thru slots 48 in the sides of the
40 shanks into receiving notches in the case blocks to maintain them immovable. The movements of the shanks 17 are limited by the lengths of the slots 48.

The shafts 49 and the shanks 17 are formed
45 with side, ratchet-like, prongs 21 for holding them in their depressed positions. These prongs snap over projections 23 which extend inwardly from the sides of a pair of sliding latching frames 24 which surround the shafts and which travel in
50 a cross channel 22 in the case blocks.

The adjacent ends of the latching frames are constantly held against the opposite sides of the shaft of the release button #5 by means of compression springs 25. The shaft of this button
55 is formed with wedge-like enlargements 26 at its opposite sides (see Fig. 12) which, when the button is depressed, force the two frames 24 apart (see Fig. 13) so as to move the projections 23 to one side (see Fig. 15) to release the prongs
60 21 so as to allow all depressed buttons to snap out.

Each of the shafts and each of the staffs carries a stop arm 27 and a combination arm 23 which project into the bolt socket 14 at each side of the head of the bolt 50, the stop arms 27 being
65 toward the push button extremity. One member of each pair of the arms is turned inward at its extremity to form a locking flange 29. The flanges 29 engage in elongated notches 30 and 31 formed in the front and rear faces, respectively,
70 of the bolt head 50. The shanks 17 are notched as shown at 56 to allow them to move over the staffs past the arms 27.

On the "combination" buttons "2", "6", and
75 "9", the locking flanges 29 are formed on the inward arms 28 so that they will be normally held

in the notch 31 by the staff springs 20. All the remaining buttons have the flanges 29 formed on the outer arms 27 so that they will be pressed into the notch 31 when the buttons are depressed. If the release button #5 is pressed at any time
5 during the setting of the buttons, all will snap out to their original positions. Therefore, it is impossible to withdraw the bolt 50 until the three, and only the three, proper buttons are depressed.

Let us now assume that it is desired that the
10 combination buttons must be pressed in the sequence #9—#6—#2, before the lock will release. The shaft for the button #9, being solid throughout its length, will move as a unit against its spring 20. The shaft of this button is con-
15 nected with a rocking lever 32, pivoted at 33 in the bottom of the case block. The other extremity of the lever 32 is connected to a wedge pointed plunger 34 positioned within the staff of the button #6. The staff of this button is
20 formed with U-shaped cuts in two sides to form L-shaped expanding tongues 35 which, when the plunger is pressed into the staff will be expanded outwardly, as shown in Fig. 10, into the path of movement of the shank 17 of that button. 25

Therefore, when the button #9 is pressed, the wedge plunger 34 is pressed outward into the staff of the button #6 so that, when this button is subsequently pressed, its shank will engage the
30 tongues 35 and push the staff 18 thereof downwardly. The staff of button #6 is connected by means of a staff arm 36 with a second rocking lever 37 which extends over a pivot 38 to a plunger shaft 39 which in turn operates another wedge
35 plunger 34 in the staff of the button #2 similarly to the previously described operation in button #6. This forces the expanding tongues 35 outwardly so that when button #2 is pressed its shank will engage its staff to force its flange 29
40 to the released position.

Therefore, buttons #9—#6—#2 must be
45 pressed before the bolt can be released and they must be depressed in the above order, for if #2 is depressed before #6 or #9, its hollow shank will simply slide over the non-expanded tongues 35 on the staff without operating or moving the latter. Should any of the other buttons be
50 pressed, the flanges 29 on their stop arms will enter the notch 30 on the latch to lock the latter until the release button #5 is pressed.

In the simple combination form of the lock, where sequence is not desired, all of the button shafts are solid continuous members, similar to the shafts 49, above, and all levers and plungers are omitted. The flanges 29 are placed on the
55 combination arms of the button numbers in the combination and on the locking arms of the remaining buttons. If any number not in the combination is depressed the bolt is locked—if only the combination numbers are pressed the lock
60 bolt is released.

It is, of course, necessary to provide some means for releasing the lock from the interior of an automobile or room where the buttons are not
65 available. A construction to accomplish this is shown in Figs. 18 to 20, in which the bottoms of the two slots 30 and 31 in the latch bolt 50 are formed with false-bottom members 42 which can be forced oppositely outward by means of two sliding plungers 40 having spear-like heads
70 41. The plungers ride in grooves in the top and bottom of the latch bolt shank and are connected together by means of yoke plate 43 from which a shaft 44 extends to an unlocking button 60 in the inner face of the door. If the unlocking but- 75

ton be pressed forwardly it will force the spear heads 41 between the false bottom members 42 causing the latter to force all locking flanges 29 from the slots 30 and 31 to release the latch bolt.

5 The unlocking button moves with the movements of the bolt. The bolt 50 is constantly urged outwardly by means of a bolt spring 45 and can be drawn inwardly, when unlocked, by means of an exterior handle 46 which actuates a lever arm 10 51 in the bolt shank to withdraw the latter.

If desired, the bolt may also be withdrawn from an interior handle (not shown) by means of a connecting rod 52 connected with the bolt shank.

The unlocking button 60 is retained in its two 15 extreme positions by means of a click ball 53 which is forced into depressions 54 in the bolt shank by means of a ball spring 55.

The improved lock can, if desired, be very easily adapted in many ways for giving a warning 20 signal should an unauthorized person attempt to tamper with it. This can be accomplished by running a push rod 57 (see Fig. 22) from the shaft 49 of one of the locking buttons, or from the shaft of the resetting button #5, through 25 the end of the shaft channel. A pair of spring electric contact blades 58 and 59 are positioned in the path of the push rod so that when the button is pressed upon, a circuit will be closed between the two blades to the horn of the auto- 30 mobile or to any desired warning signal.

While the invention has been illustrated and described with the lock portion on the door jamb and the bolt portion on the door it is to be understood that the lock portion could be mounted 35 on the door if preferred.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, 40 without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

45 1. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending 50 across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking 55 indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; and manual means for depressing said shafts against the action of said spring means.

60 2. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across 65 said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the 70 combination members into engagement, and the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; a latching member for latching all of said shafts in the 75

depressed position; and releasing means for releasing said shafts from said latching member.

3. A push button combination lock comprising: a withdrawable locking bolt having a locking 5 indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in 10 said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said 15 bolt; manual means for depressing said shafts against the action of said spring means; a latching member for latching all of said shafts in the depressed position; releasing means for releasing said shafts from said latching member; and un- 20 locking means carried by said bolt for forcing said combination and locking members out of engagement therewith.

4. A push button combination lock comprising: a withdrawable locking bolt having a locking 25 indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said 30 shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and 35 the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; and means interconnecting those shafts carrying the combination members so that the latter must 40 be actuated in a pre-set sequence before they will act to withdraw the combination members from said bolt.

5. A push button combination lock comprising: a withdrawable locking bolt having a locking 45 indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts 50 for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said 55 bolt; a shank slidably mounted on the outer extremities of the shafts carrying the combination members; a push button on the outer extremity of each shank and on the outer extremity of 60 each of the remaining shafts; and means for connecting the shanks with their respective shafts, each of said latter means being operable in sequence by the actuation of a preceding shaft. 65

6. A push button combination lock comprising: a withdrawable locking bolt having a locking in- 60 dentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said 70 bolt; a locking member on others of said shafts for engaging the opposite locking indentation in 75

said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; a shank slidably mounted on the outer extremities of the shafts carrying the combination members; a push button on the outer extremity of each shank and on the outer extremity of each of the remaining shafts; expanding members in each of the shafts having a shank; a wedge member in each of said latter shafts for expanding the expanding members into the path of the shank of that shaft so the former will actuate the latter; and a lever connecting the wedge member of each shaft with a preceding shaft so that said latter shafts must be actuated in sequence.

7. A push button combination lock comprising: a horizontally withdrawable locking bolt; a vertically positioned head on said bolt, having a vertical slot in each of its sides; a lock case having a passage for the reception of said bolt head; a vertical series of parallel, horizontal, push button shafts extending across said channel ahead of said bolt; a pair of arms extending from each shaft, there being one arm on each side of said bolt; one arm of each pair being inwardly hooked to engage one of the slots in the head of said bolt, the hooked arms being arranged in opposite sides of said channel in accordance with a predetermined combination; spring means for urging said shafts outwardly to maintain one member of each pair of arms against the head of said bolt; and manual means for depressing said shafts against the action of said spring means.

8. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, with said bolt; a latching member slidable at right angles to the axis of said shafts; a projection on each shaft for engaging said latching member to hold said shafts depressed; and means for sliding said latching member to release said shafts when desired.

9. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; a latching member for latching all of said shafts in the depressed position; releasing means for releasing said shafts from said latching member; expanding members in the extremity of said bolt positioned to move outwardly in said indentations to force the locking members and the combination members therefrom; a wedge member longitudinally movable on said bolt between said expanding members to expand the latter; and manually

operated means for actuating said wedge member to release said bolt from said lock.

10. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; and signal means actuated in consequence of the depression of one of said shafts.

11. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; a latching member surrounding said shafts; a projection extending inwardly from said latching member adjacent each of said shafts; and a prong projecting outwardly from each of said shafts to engage the adjacent projection on said latching member to hold the shafts in the depressed position.

12. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; manual means for depressing said shafts against the action of said spring means; a push rod extending from one of the said shafts; and an electric contact plate secured to the extremity of said push rod and positioned to contact a second electric contact plate to close a circuit to a warning signal.

13. A push button combination lock comprising: a withdrawable locking bolt having a locking indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; a shank slidably mounted on the outer

extremities of the shafts carrying the combination members; a second spring means urging said shank outward from said shaft; a push button on the outer extremity of each shank and on the 5 outer extremity of each of the remaining shafts, each of said latter means being operable in sequence by the actuation of a preceding shaft.

14. A push button combination lock comprising: a withdrawable locking bolt having a locking 10 indentation in its opposite sides; a lock case having a passage for the reception of the extremity of said bolt; push button shafts extending across said channel adjacent the path of said bolt; a combination member on certain of 15 said shafts for engaging one of the locking indentations in said bolt; a locking member on others of said shafts for engaging the opposite

locking indentation in said bolt; spring means for urging the combination members into engagement, and the locking members out of engagement, with said bolt; a shank slidably 5 mounted on the outer extremities of the shafts carrying the combination members; a second spring means urging said shanks outward from said shafts; means for limiting the outward movement of said shanks; a push button on the 10 outer extremity of each shank and on the outer extremity of each of the remaining shafts; and means for connecting the shanks with their respective shafts, each of said latter means being operable in sequence by the actuation of a preceding shaft. 15

GEORGE H. BRINGTON.