March 20, 1962 C. C. DAVIS ETAL 3,026,385

PUSH-BUTTON OPERATOR WITH LOCKING MEANS

Filed Oct. 23, 1959 3 Sheets-Sheet 1

Fig. 1

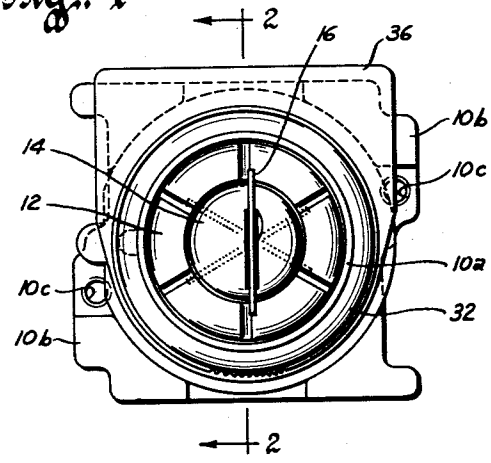


Fig. 2

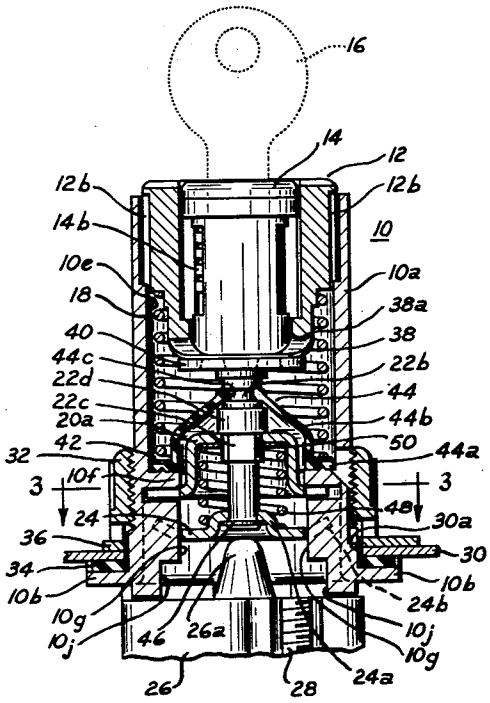


Fig. 4

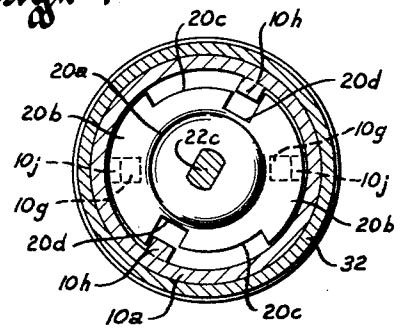


Fig. 3

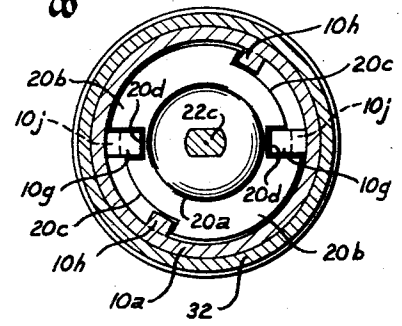
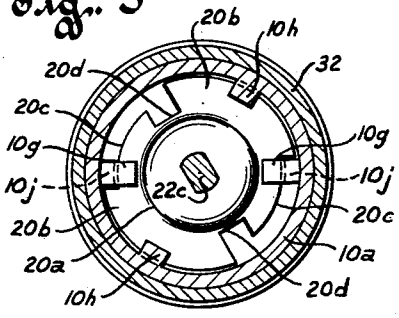


Fig. 5



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PUSH-BUTTON OPERATOR WITH LOCKING MEANS

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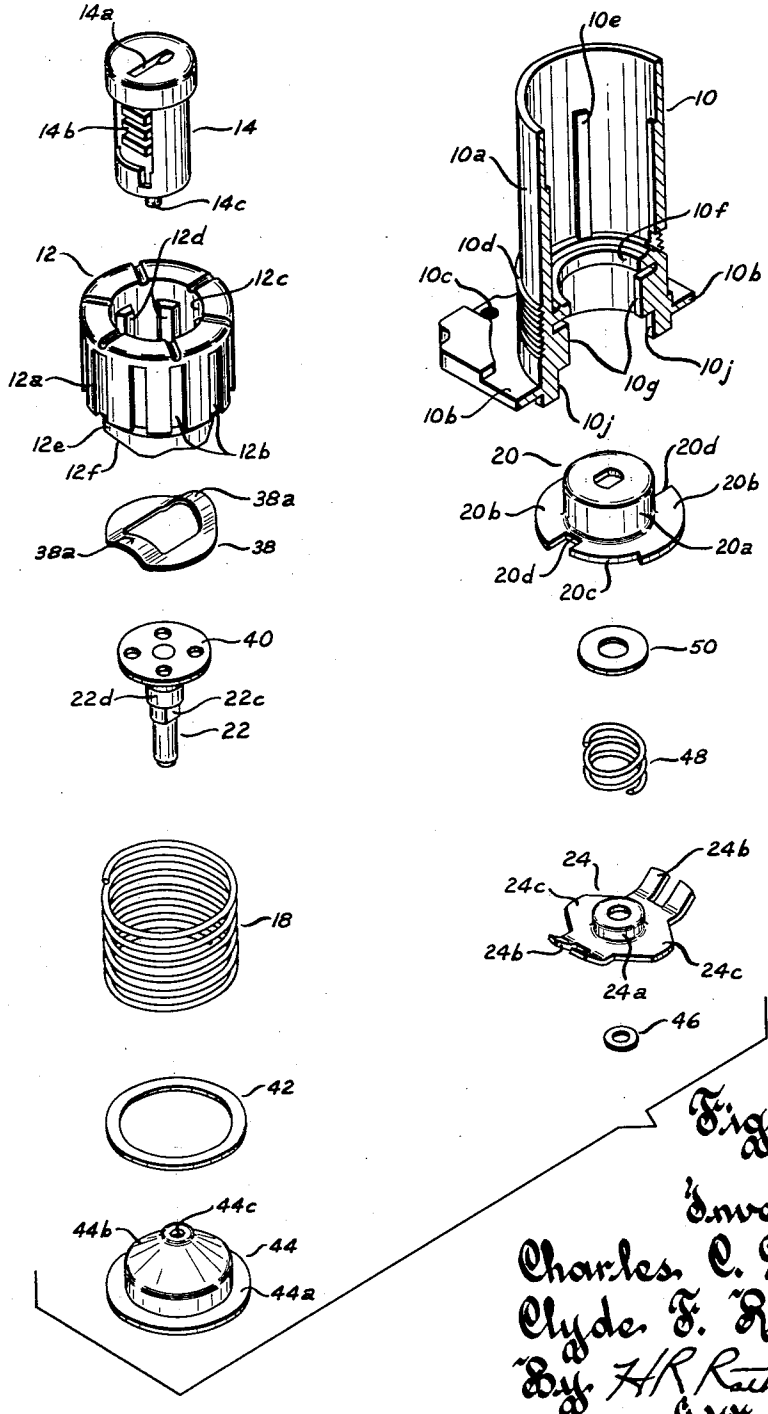


Fig. 6

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PUSH-BUTTON OPERATOR WITH LOCKING MEANS

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Fig. 7

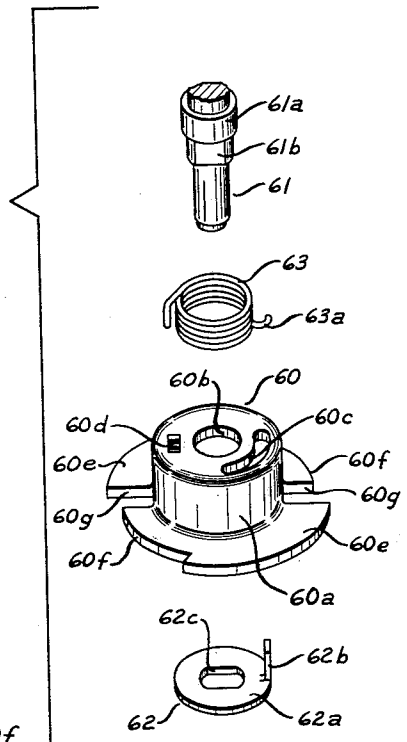


Fig. 8

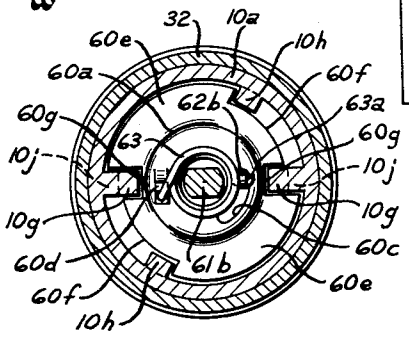


Fig. 9

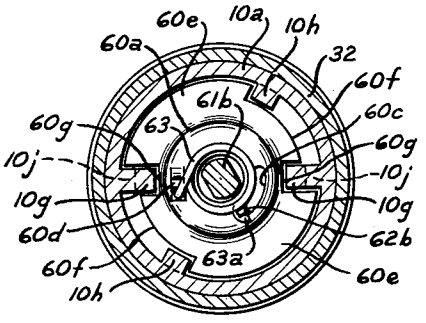
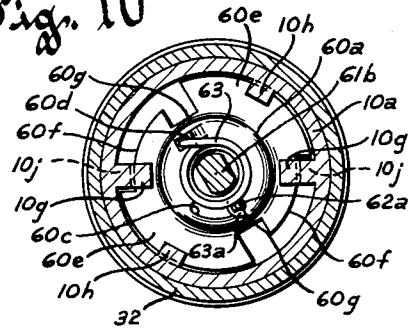


Fig. 10



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3,026,385
PUSH-BUTTON OPERATOR WITH LOCKING MEANS

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Filed Oct. 23, 1959, Ser. No. 848,244
10 Claims. (Cl. 200—44)

The present invention relates to an improved push-button operator with locking means.

It is an object of the present invention to provide an improved push-button operator which may be key-turn locked in either extended, depressed, or both of such operating positions.

Another object is to provide an embodiment of the foregoing wherein the operator can be key-turn preset in extended position to automatically lock in depressed position following movement into the latter position.

And a further object is to provide a locking mechanism of the foregoing types which by simple changes in a few parts can be modified to provide any or all of the foregoing type of locking operations.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate preferred embodiments of the invention which will now be described, it being understood that the embodiments illustrated are susceptible of modification in respect of details without departing from the scope of the appended claims.

In the drawings;

FIGURE 1 is a top plan view of a push-button operator incorporating the improved locking means of this invention;

FIG. 2 is an elevation sectional view taken along the line 2—2 of FIG. 1 illustrating the push-button operator mounted on a panel and having an electric switch operatively associated therewith;

FIG. 3 is a transverse sectional view taken along the line 3—3 of FIG. 2 illustrating the working relation of certain parts of the locking mechanism in unlocked extended position of the push-button operator;

FIG. 4 is like FIG. 3 but shows the operative relation of the aforementioned parts of the locking mechanism in extended, locked position;

FIG. 5 is like FIGS. 3 and 4, but shows the operative relation of the aforementioned parts of the locking mechanism in depressed, locked position;

FIG. 6 is an exploded view in perspective of parts of the locking mechanism illustrated in FIGS. 1 to 5;

FIG. 7 is an exploded view in perspective of a modified subassembly of the locking mechanism affording automatic locking in depressed position;

FIG. 8 is a view similar to FIG. 3 but shows the operative position of the modified form of locking mechanism shown in FIG. 7 with the push-button operator in unlocked extended position;

FIG. 9 is like FIG. 8 but shows the aforementioned portion of the modified locking mechanism in key-turn preset position; and

FIG. 10 is like FIGS. 8 and 9 but illustrates the aforementioned portion of the modified form of locking mechanism attained following depression of the push-button operator.

As shown in FIGS. 1 and 2, one form of push-button operator constructed in accordance with this invention comprises a housing **10**, a push-button **12**, reciprocally movable within a cylindrical barrel portion **10***a* of a housing **10**, a lock barrel **14** which is rotatable upon insertion of a key **16** into a slot in the outer end thereof, a compression spring **18** which biases push-button operator outwardly of the barrel **10***a*, a latch plate **20** non-rotatably secured to a shaft **22**, which in turn is non-rotatably secured to the end of lock barrel **14**, and a push-plate **24** rotatably mounted on shaft **22** adjacent the lower end of the latter. Housing **10** has an integral flange portion **10***b* extending transversely of barrel portion **10***a* at one end thereof and an electric switch **26** is secured thereto by screws **28** taking into threaded openings **10***c* in the flange portion. While not limited to any particular form, the switch **26** in one preferred form is of the type disclosed in the Nolden and Robbins Patent No. 2,930,-859, issued March 29, 1960. The push-button operator of the present invention with the electric switch **26** may be secured to a panel, such as a panel **30**, by the barrel portion **10***a* projecting through a suitable clearance aperature **30***a* formed in panel **30** and a retaining nut **32** being taken down on the outer threaded portion **10***d* of the housing **10**. As depicted, a suitable gasket washer **34** is interposed between the flange portion **10***b* and one side of the panel **30** and a portion of a flat name or indicia plate **36** is disposed between the undersurface of the retaining nut **32** and the outer side of the panel **30**.

As best shown in FIG. 6, push-button **12** comprises an upper cylindrical portion **12***a* having twelve vertically extending recesses **12***b* formed at equally spaced rotary angles of 30° in the outer surface thereof. Six of the recesses **12***b* accommodate and fit about a like number of inwardly projecting, longitudinal ribs **10***e* formed at equally spaced rotary angles of 60° on the inner surface of the barrel portion **10***a* of housing **10**. This interfit prevents any substantial rotary movement of the push-button within the barrel **10***a* and engagement with the upper end of a recess **12***b* with the upper end of a rib **10***e*, limits the degree of inward movement the push-button is permitted in the barrel **10***a*. In the inner bore **12***c* of the push-button are formed six inwardly projecting, longitudinal ribs **12***d* which are spaced at rotary angles of 60°. When no key is inserted in the lock barrel **14**, lock plungers **14***b* thereof are adapted to extend in the spaces between pairs of the ribs **12***b* and hold the lock barrel in a given rotary position in push-button **12**. As will be understood, the insertion of the key **16** into key slot **14***a* affords retraction of the lock plungers **14***b* whereupon the lock barrel may be rotated by turning of the key to a different rotary position.

Adjacent to its lower end, the push-button **12** is provided with an end portion of reduced diameter **12***e* which at its extreme end is provided with a saw-toothed surface **12***f*. Lock barrel **14**, at its inner end is provided with four downwardly projecting cylindrical studs **14***c* which extend through a rectangular opening formed in a detent spring disk **38**. Spring disk **38** is provided with transversely extending convex portion **38***a* which is adapted to seat on its outer surface within the trough of the saw-toothed surface **12***f* in the end of the portion **12***e* of the push-button **12**. The studs **14***c* extend through suitable clearance openings formed in a circular plate **40** to which the shaft **22** is non-rotatably secured at one end thereof. The studs **14***c* are upset against the opposite surface of the plate **40** to hold lock barrel **14**, plate **40**, shaft **22**, and spring **38** in non-rotatable assembled relation to each other. Spring disk **38**, in its interfitting relation with the surface **12***f*, affords a positive rotary feel of change and attainment of position when a key **16** is inserted in the lock barrel **14** and rotated from one operating position to another.

Compression spring **18** seats at one end against a shoulder formed at the juncture between the portion **12***a* and **12***e* of push-button **12** and at its other end seats against an annular steel washer **42** disposed about the upper surface of a flanged base portion **44***a* of a rubber sealing diaphragm **44** which has a conical portion **44***b*. The conical portion **44***b* has a central aperture **44***c* formed

therein and edge portions of the diaphragm surrounding such aperture elastically fit in an annular recess 22*b* formed in the shaft 22. On its lower surface the flange portion 44*a* of diaphragm 44 seats against a radially inwardly extending shoulder 10*f* formed in barrel 10*a*. In the assembled relation shown, diaphragm 44 seals against the entry of oil, moisture, and dirt therebelow.

As best shown in FIG. 2, shaft 22 is provided with a portion 22*c* which has two parallel flat surfaces and the upper end of the cup portion 20*a* of latch plate 20 has an opening complementary thereto which non-rotatably accommodates the portion 22*c*. Adjacent to its lower end, shaft 22 is upset over the lower surface of a central boss portion 24*a* of the push-plate 24 and a washer 46 is disposed between the upset end portion of the shaft 22 and the portion 24*a*. A compression spring 48 is disposed at one end about the circular boss portion 24*a* of push-plate 24 and at its upper end seats against a washer 50 which is disposed about shaft 22 and seats on the inner surface of the cup portion 20*a* of latch plate 20. Spring 48 serves to resiliently space apart the latch plate 20 and the push-plate 24 on the shaft 20. The upper surface of the portion 20*a* seats against a shoulder formed by the juncture of the aforementioned portion 22*c* and a cylindrical portion of greater diameter 22*d*. Push-plate 24 on its lower surface is provided with oppositely disposed, outwardly and upwardly extending pairs of bifurcated limbs 24*b*. On each side thereof, displaced at right angles to said pairs of bifurcated limbs the push-plate is provided with the wedgeshaped portions 24*c* which on the lower surfaces thereof are adapted to engage with switch operating members, such as the plungers 26*a* of electric switch 26. Each pair of bifurcated limbs 24*b* is disposed on opposite sides of the longitudinally extending ribs 10*g* formed in the lower inner surface of barrel portion 10*a* to non-rotatably guide push-plate 24 in barrel 10*a*.

Referring to FIGS. 3 to 6, it will be seen that the latch plate 20 is provided with an integral flanged portion 20*b*. Portion 20*b* is provided with radially inwardly extending notches 20*c* which lie diametrically opposite the central axis of plate 20. Deeper, but narrower, notches 20*d* which communicate with the notches 20*c* also are disposed diametrically opposite the central axis of plate 20. In the operating position of the key-turn lock barrel depicted in FIGS. 1, 2 and 3, latch plate 20 (see FIG. 3) is positioned so that the notches 20*d* are alined to afford clearance therein for the ribs 10*g*. Accordingly, as push-button 12 is depressed inwardly of the barrel portion 10*a*, shaft 22, latch plate 20, and push-plate 24 will freely move downwardly with push-plate 24 moving switch operator 26*a* inwardly of the switch 26. When push-button 12 has reached the limit of its travel inwardly of barrel portion 10*a*, bifurcated portions 24*b* will move below the lower end of ribs 10*g*. Portions adjacent the extreme ends of portions 24*b* will straddle the ribs 10*j* which merge at their upper ends at a shoulder with the ribs 10*g*. Thus with the portions 24*b* either straddling the ribs 10*j* or 10*g*, the latter is restrained against any rotary movement. If switch operator 26*a* reaches its limit of travel inwardly of switch before push-button 12 reaches its limit of inward travel, spring 48 will compress to afford over-travel protection.

Let it be assumed that initially the lock barrel 14 is in the position depicted in FIG. 1 and that push-button 12 is in its normal extended position depicted in FIG. 2. Now if key 16 is turned counterclockwise 60° as viewed in FIG. 1, lock barrel 14, shaft 22, and consequently latch plate 20 will be rotated counterclockwise therewith. Latch plate 20 will then rotate until the flange 20*b* forming one margin of the notches 20*d* engage the other side of the stop ribs 10*h*. It will then assume the position depicted in FIG. 4. It will be seen that in this position, portions of the flange 20*b* overlie the upper ends of the ribs 10*g*. If key 16 is then removed from the lock barrel 14, it will not be possible to move the push-button 12 inwardly to operate switch 26. As the lock plungers 14*b* will then be engaged between adjacent pairs of ribs 12*d* in push-button 12, latch plate 20 will be retained in that position until key 16 is again inserted and the lock barrel moved clockwise. The operating position thus attained is termed the "locked-up" position.

Now let it be assumed that the push-button operator is in the initial operating positions depicted in FIGS. 1 and 2 and that push-button 12 is pushed inwardly to its extreme limit. Then let it be assumed that in such extreme limit of push-button 12, key 16 is turned clockwise 60° to its extreme limit. Lock barrel 14, shaft 22, and latch plate 20 will thus be roated in a clockwise direction. Latch plate 20 in so turning in the clockwise direction will have unnotched parts of its flange 20*b* rotated in position under the lower edge of the ribs 10*g*. In such position the operator 26*a* will be held in its inward position in switch 26 and push-button 12 will also be held in an extreme inward position in the barrel 10*a*. This position is termed the "locked-down" position of the push-button operator. If key 16 is subsequently rotated counterclockwise to the position depicted in FIG. 1, latch plate 20 will assume the operating position depicted in FIG. 3 and push-button 12, under the bias of compression spring 18, will be returned to the normal extended operating position depicted in FIG. 2.

As will be noted from the foregoing, the embodiment depicted in FIGS. 1 to 6 affords; (*a*) unlocked normal momentary type of operation, (*b*) locked in extended position affording prevention of operation of the push-button inwardly, and (*c*) locked-down in operated position to hold a switch in a given operating condition continuously.

FIG. 7 shows a modified lock plate and shaft assembly which affords automatic locking in the inner push-button position following key-turn preset in extended position of the push-button 12. In this modified version a latch plate 60, having a cup-shaped portion 60*a* in which is formed a central circular opening 60*b*, is disposed about a shaft 61, the cylindrical portion 61*b* thereof rotatably penetrating the opening 60*b*. As will be understood, without more, latch plate 60 would be freely rotatable on shaft 61. A clutch plate 62, having an annular portion 62*a* and an integral right angle lug portion 62*b*, is disposed about shaft 61 so that a substantially rectangular opening 62*c* is disposed about in non-rotatable relation, a complementally formed portion 61*b* on the shaft 61. The lug 62*b* extends through an arcuate slot 60*c* formed in the end of portion 60*a* of latch plate 60. A torsion spring 63 is disposed about shaft 61 and one end thereof is anchored about a struck-up portion 60*d* in the upper surface of the cup portion 60*a* of latch plate 60. The opposite end of the torsion spring 63 is anchored about the upstanding lug 62*b* of clutch plate 62. The flange portion 60*e* is formed with pairs of diametrically opposed notches 60*f* and 60*g* which correspond identically with the notches 20*c* and 20*d* of latch plate 20 of the form aforedisclosed in connection with FIGS. 1 to 6. It may also be assumed, that except for the modification just described, the modified push-button operator is in other respects like that disclosed in connection with FIGS. 1 to 6.

Let it be assumed that the modified push-button operator is in the position depicted in FIGS. 1 and 2. Shaft 61 and plate 62 will assume the rotary position in barrel 10*a* depicted in FIG. 8 wherein notches 60*g* are disposed about the ribs 10*g* to permit free inward movement of latch plate 60, shaft 61 and push-button 12. Now let it be assumed that in such position the key 16 is rotated 60° in the clockwise direction. Lock barrel 14 and shaft 61 will thus be rotated in the clockwise direction. Due to the rotatable clearance afforded by the opening 60*b* in latch plate 60 in relation to the portion 61*b* of shaft 61, latch plate 60 would not be directly rotated. However, as clutch plate 62 is non-rotatably mounted on shaft 61,

it is caused to rotate with it in the clockwise direction to tighten the turns of coil torsion spring **63**, with the right-hand end **63***a* thereof being moved from the position depicted in FIG. 8 to that depicted in FIG. 9. With spring **63** coiled more tightly, it would tend to rotate latch plate **60** in the clockwise direction. However, as ends of the notches **60***f* engage with the ribs **10***g* in barrel portion **10***a*, latch plate **60** is prevented from any appreciable clockwise rotation.

Now let it be assumed that after key **16** has been turned to its clockwise extreme position to afford the cocking of torsion spring **63** aforedescribed, it is removed from lock barrel **14**, thereby allowing plungers **14***a* to reengage between adjacent ribs **12***d* formed in the inner surface of push-button **12**. With lock plungers so engaged, lock barrel **14**, and consequently shaft **61** and clutch plate **62**, are prevented from moving in the counterclockwise direction under the bias of the tightened torsion spring **63**.

If push-button **12** is moved inwardly to its extreme limit wherein the upper surface of the flange portion **60***c* is moved below the lower end of the ribs **10***g*, latch plate **60** will be rotated in the clockwise direction from the position depicted in FIG. 9, to the position depicted in FIG. 10, under the bias of torsion spring **63**. In the position depicted in FIG. 10, parts of the flange **60***e* underlie the lower ends of the ribs **10***g* and thus latch plate **60**, shaft **61**, lock barrel **14**, and push-button **12** will be restrained from movement outwardly relative to lock barrel portion **10***a*. Consequently push-plate **24** will be held in the inward position to hold switch operator **26***a* in its inward position in switch **26**.

With latch plate **60** in the position depicted in FIG. 10, let it be assumed that key **16** is again inserted in lock barrel **14** and the latter is rotated 60° in the counterclockwise position to that position depicted in FIG. 1. As the lug **62***b* will be engaged in the right-hand end of the arcuate slot **60***c* of latch plate **60**, the turning of the lock barrel **14** in the counterclockwise direction will effect rotation of shaft **61**, clutch plate **62** and latch plate **60** in the counterclockwise direction to the position depicted in FIG. 8 wherein push-button **12**, lock barrel **14**, shaft **61**, latch plate **60** and push-plate **24** can return to extended unlocked position under the bias of compression spring **18**.

Assuming that latch plate **60** is in the rotary position depicted in FIG. 8 and key **16** is turned counterclockwise, it will be seen that as lug **62***b* engages the upper end of slot **62***c*, latch plate **60** will be rotated in unison with lock barrel **14**, shaft **22**, and clutch plate **62** to afford a "locked-up" position of push-button **12** similar to that afforded by the embodiment illustrated in FIGS. 1 through 6.

If desired, one or the other of the "locked-up" or "locked-down" operating positions can be omitted. By extending the ribs **10***g* upward to meet the shoulder **10***f* in barrel portion **10***a*, the notches **10***j* will be eliminated, thereby preventing any rotary movement of latch plates **20** or **60** in the outer extended position of push-button **12**. In the embodiment of FIGS. 1 to 6, by extending ribs **10***g* to the lower end of barrel portion **10***a*, rotation of latch plate **20** in the inner extreme position of push-button **12** will be prevented.

Where a plurality of push-button operators are mounted on a panel, a particular alinement of the switches secured to the operator housings **10** on the rear side of the panel may be desired. Normally the desired alinement of the switches would be either horizontal, parallel with the top and bottom edges of the panel, or vertical, parallel with the side edges of the panel. Depending upon the desired alinement and whether the switches run in one direction or 180° reversed to such direction in the desired alinement, the housing **10** of a given push-button operator could have four different 90° rotary spaced mounted positions on the panel. For the assembled relation of the operation depicted in FIGS. 1 to 6, this would mean that the key slot **14***a* in lock barrel in normal unlocked position could be, as shown in FIG. 1, inverted 180° or run horizontally either right or left. Normally it is desirable to have the center position of the key slot run vertically or parallel with the side edges of the panel and so the notched edge of the key when inserted is lowermost. The construction of the present push-button operator permits this to be readily provided in assembly of the operators as will now be described.

Assume that for a desired alinement of switches on the rear of the panel, that housing **10** would have to be rotated 90° counterclockwise from that depicted in FIG. 1. To provide for vertical alinement of key slot **14***a* in center position, lock barrel **14** would have to be rotated 90° clockwise in push-button **12**. However, if lock barrel **14** is so rotated the tumblers would aline with one of the ribs **12***d* in push-button **12** as the spaces between the ribs are 60° apart and could not be locked so that the key slot **14***a* would be in the desired vertical relation; it would be at an angle of 30° to the vertical. Now assuming that the foregoing rotations have been made, if push-button **12** is rotated 30° one way or the other in barrel portion **10***a*, the lock plungers **14***b* will then fall in a space between adjacent ribs **12***d* in push-button **12** to provide the desired vertical alinement of key slot **14***a* in center position of the lock barrel. It will also be apparent that if housing **10***a* is rotated 90° counterclockwise, and lock barrel **14** is rotated 90° clockwise, as aforedescribed, that the assembly comprising latch plate **20**, shaft **22** and plate **40**, will have to be rotated 90° counterclockwise before being secured to lock barrel **14** to insure the proper relationship of latch plate **20** to the ribs **10***g* and **10***i* of the barrel portion **10***a*. It will be apparent that the same considerations will hold when housing **10** is rotated in the opposite direction, or 180° instead of 90°, and that the reverse rotation of lock barrel **14** and corresponding rotation of latch plate **20**, shaft **22** and plate **40** wil be commensurate therewith while the correcting rotation of push-button **12** will only have to be 30° in either direction to desired normal vertical relation of the key slot **14***a*.

We claim:

1. A lockable push-button operating mechanism comprising, in combination, a tubular casing, a push-button mounted in said casing for reciprocal movement therewithin, a lock barrel mounted in the outer end of said push-button and rotatable within the latter upon insertion of key from a given position to at least one other position rotarily spaced therefrom and vice versa, a shaft disposed within said casing and secured to said lock barrel for rotation by the latter, an operating member mounted on said shaft and movable axially in said casing by corresponding movement of said push-button, and a latch member disposed in said casing and mounted on said shaft for rotary movement corresponding to that of said lock barrel, said latch member and the interior of said casing being formed so that in said given position of said lock barrel said latch, said operating member and said shaft are free to be reciprocably moved in said casing by corresponding movement of said push-button, while in said one other position of said lock barrel a portion of said latch plate when said push-button is in a given extreme position axially of said casing engages with a portion formed on the interior of said casing to prevent axial movement of said latch, said shaft, said operating member, and said push-button in one direction.

2. The combination according to claim 1, wherein said lock barrel is rotatable to said other position when said push-button is in its outwardly extended position in said casing and is also rotatable to a third rotary spaced position from said given position when said push-button is depressed inwardly a predetermined amount to rotate said latch member to a corresponding position wherein

a certain other portion thereof engages with said portion formed on the interior of said casing to hold said push-button, said shaft and said operating member in an inward operating position in said casing.

3. The combination according to claim 1, wherein said portion formed on the interior of said casing comprises at least one inwardly projecting rib and said portion of said latch member comprises a circular disc having at least one radial notch for clearance alinement with said rib in said given rotary position of said lock barrel and wherein a portion of the disc web engages with one end of said rib in said one other position of said lock barrel.

4. The combination according to claim 2, wherein said latch member has a torsion spring, lost motion driving connection with said shaft whereby said lock barrel may be rotated upon insertion of said key in extended position of said push-button to said third position to stress torsion spring to afford automatic rotation of said latch plate to said corresponding position following depression of said push-button inwardly said predetermined amount.

5. A lockable push-button operating mechanism comprising, in combination, a cylindrical casing, a cylindrical push-button mounted for reciprocal, non-rotatable movement in the bore of said casing, a lock barrel mounted in the bore of said push-button and which upon insertion of a key is rotatable from a first to a second and third rotary spaced positions and vice versa for locking in any of such positions by removal of the key, a spring disposed in said casing and biasing said push-button to an outwardly extended position in said casing, a shaft axially disposed in said casing and non-rotatably secured to said lock barrel, an operating member rotatably mounted on said shaft and non-rotatably guided in said casing for reciprocal movement by corresponding movement of said push-button, and a latch member mounted on said shaft for rotation thereby in response to the aforementioned rotation of said lock barrel, said latch member and the interior of said casing being so formed that in said first position of said lock barrel said push-button is freely reciprocably movable in said casing to afford corresponding movement of said operating member, that in said second position of said lock barrel a portion of said latch member engages with a portion on the interior of said casing to prevent movement of said push-button inwardly of said casing, and that in said third position of said lock barrel attained following movement of said push-button inwardly of said casing another portion of said latch member engages with said portion of the interior of said casing to prevent outward movement of said push-button under the bias of said spring.

6. The combination according to claim 5, wherein said push-button is saw-toothed at the inner end thereof and a detent spring is non-rotatably mounted with said shaft and said lock barrel is adapted to yield as it rides over the saw teeth and snap into place in the intermediate notches between saw teeth when said lock barrel reaches one of said first second or third rotary positions to provide positioning and attaining feel.

7. The combination according to claim 6, together with an elastic diaphragm having a central aperture through

which said shaft extends in elastic sealed engagement and a peripheral flange held in sealing engagement with an annular shoulder formed in the interior of said casing by the inner end of said compression spring bearing thereagainst.

8. The combination according to claim 7, together with a second coiled compression spring disposed about said shaft and bearing at its opposite ends against said latch member and said operating member to afford yielding axial movement of the latter on said shaft when the opposing force on said operating member exceeds that of the last mentioned spring.

9. The combination according to claim 8, wherein said operating member is non-rotatably guided in said casing by oppositely disposed bifurcated arms straddling said inward extending ribs.

10. A lockable push-button switch comprising, in combination, a casing having a cylindrical barrel and an integral laterally extending flange at one end of said barrel for abutting on the inside of an apertured panel, a retaining nut taking down on an outer threaded portion of said barrel to secure said casing to the panel, an electric switch mounted on said flange and having an external operator extending into said barrel, a push-button mounted for axial movement in said barrel, a lock barrel mounted in said push-button wherein it is rotatable upon insertion of a key between first and second spaced rotary positions wherein it may be locked upon removal of the key, a shaft non-rotatably secured to said lock barrel, a latch plate mounted on said shaft for rotary movement corresponding to that of said lock barrel, said latch plate and the interior of said barrel being formed so that in the first position of said lock barrel said push-button, said shaft and said latch plate are freely movable axially in said barrel in reverse directions and so that in said second position of said lock barrel attained following movement of said push-button to one axial extreme position said portion of said latch plate engages with a portion on the interior of said barrel to prevent movement of said push-button, said shaft and said latch plate in one axial direction, an operating member engaging with the switch operator and rotatably mounted on said shaft and non-rotatably guided in the interior of said barrel, and a compression spring disposed about said shaft between said latch plate and said operating member to hold the same in a spaced relation and afford relative axial movement between said shaft and said operating member.

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