United States Patent

Sadogierski

[15] **3,671,686**

[45] **June 20, 1972**

[54] PUSH BUTTON SWITCH ASSEMBLY WITH IMPROVED DISCRETE AND IDENTICAL GEOMETRIC SHAPED INTERLOCKING SLIDER MEANS

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[73] Assignee: **Guardian Electric Manufacturing Company**

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[21] Appl. No.: **88,018**

[52] **U.S. Cl.** ..... **200/5 EA, 74/483 PB**

[51] **Int. Cl.** **H01h 9/26, G05g 11/00**

[58] **Field of Search** ..... 200/5 E, 5 EA, 5 R; 74/483 PB

[56] **References Cited**

UNITED STATES PATENTS

3,281,544 10/1966 Bailey et al. ..... 200/5 EA

Primary Examiner—J. R. Scott

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[57] **ABSTRACT**

An improved push button switch includes a single body plate with assembled push rods or actuators fastened to the single body plate and cooperable with moving disc members, a ratchet and spring, or biasing means. The disc members are held in position by a bracket, the bracket also being fastened to the single body plate. Contact blocks are fastened to the outside of the bracket and cooperate with assembled contact cam block members of the push rods or actuators. Biasing leaf springs of the contact blocks cooperate with the actuators to facilitate switching action. A push button fastens to the end of the actuators to secure alignment of the actuators through a front plate of the switch and provide a manual interface to the operator.

23 Claims, 15 Drawing Figures

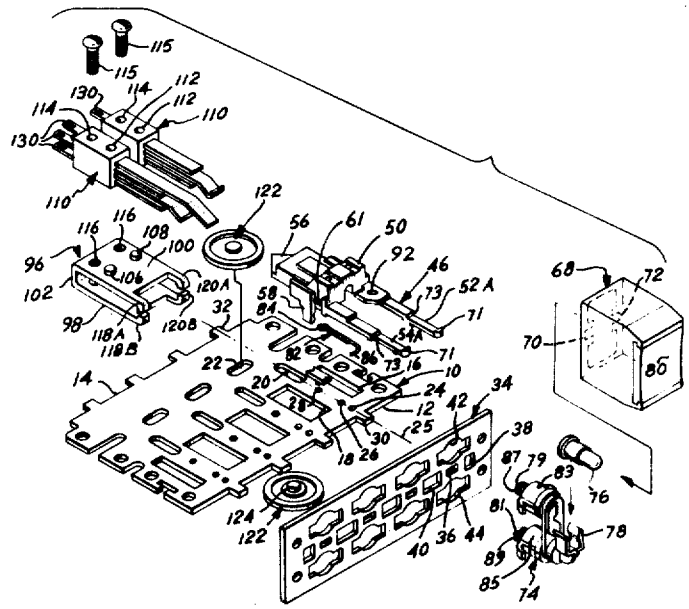


Fig. 1

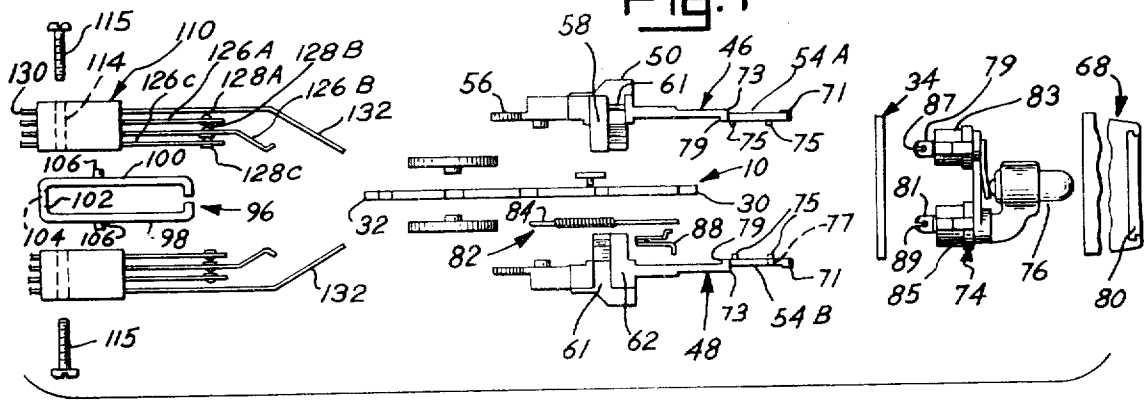


Fig. 2

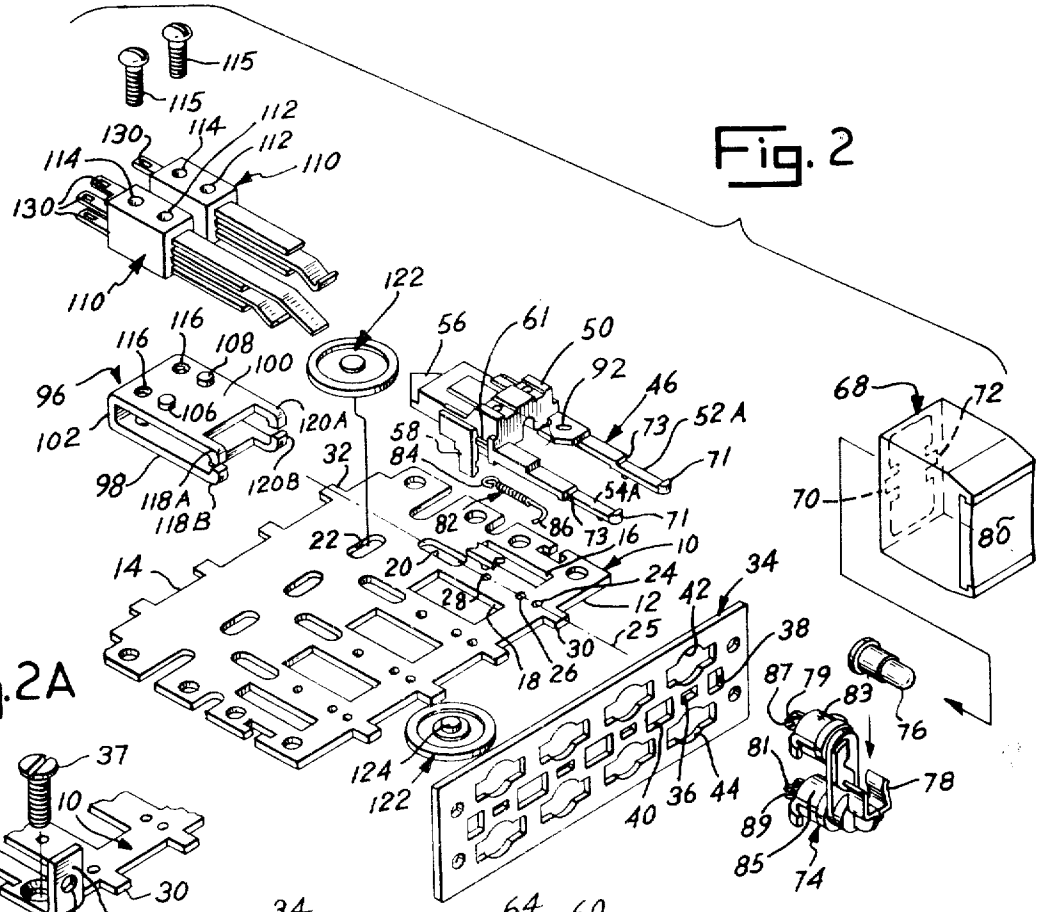
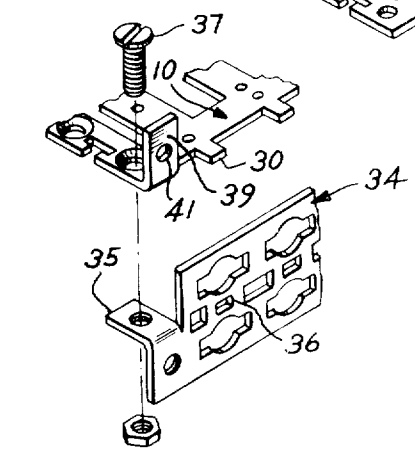
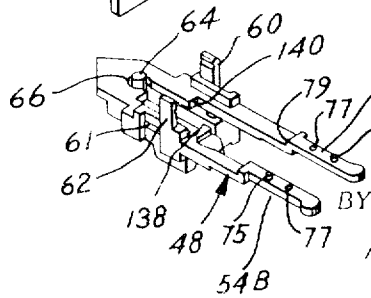


Fig. 2A





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Fig. 3

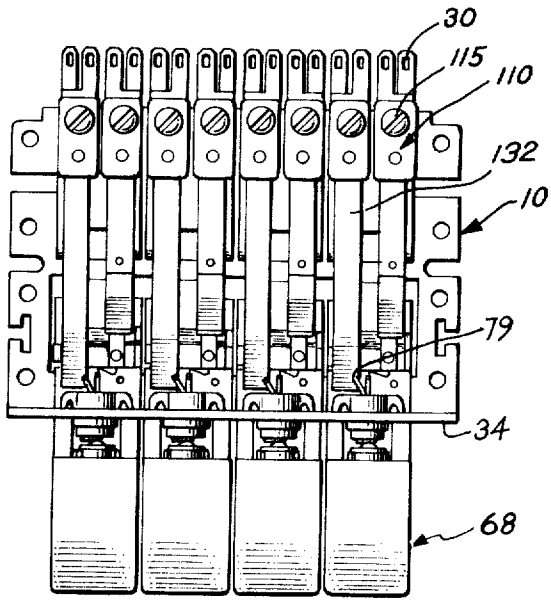
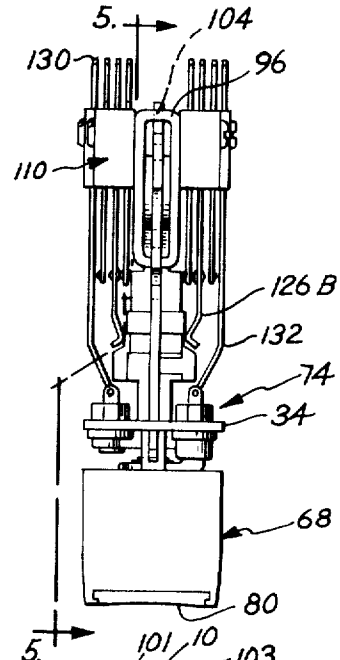


Fig. 4



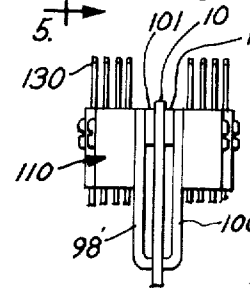
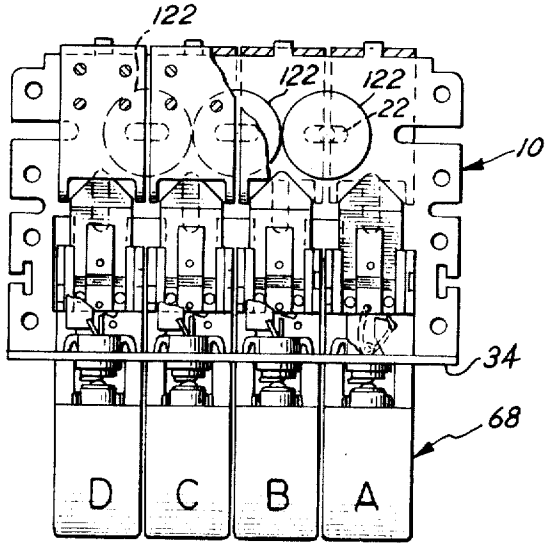


Fig. 4A

Fig. 5



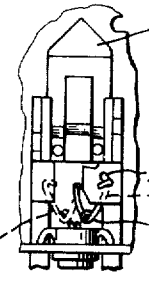
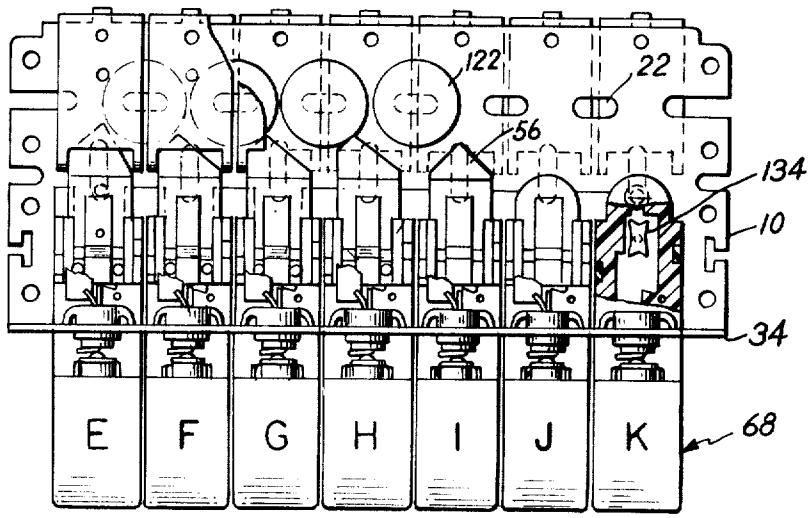


Fig. 6

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Fig. 7



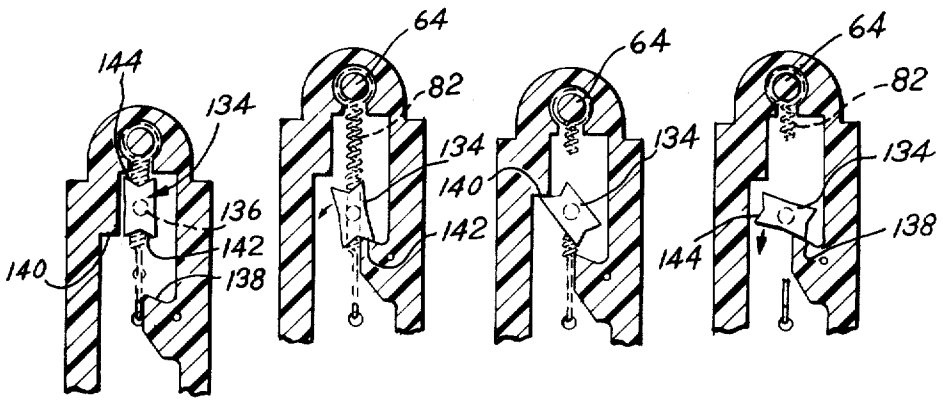


Fig. 9 Fig. 10 Fig. 11 Fig. 12

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Fig. 8R

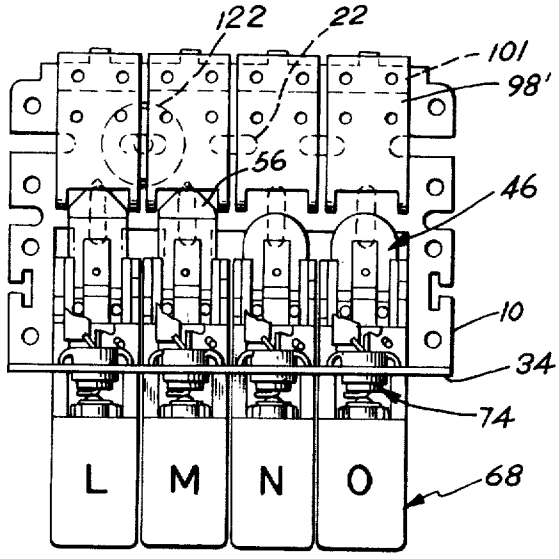
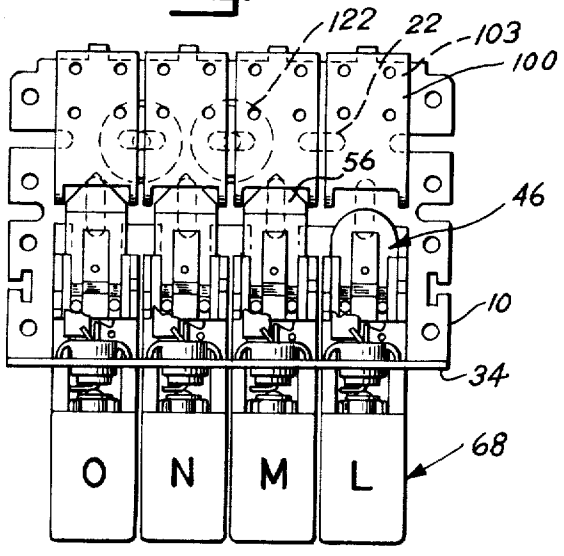


Fig. 8L



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PUSH BUTTON SWITCH ASSEMBLY WITH IMPROVED DISCRETE AND IDENTICAL GEOMETRIC SHAPED INTERLOCKING SLIDER MEANS

BACKGROUND OF THE INVENTION

This invention relates to an improved push button switch and, more particularly, to a construction for a push button switch which provides a substantial advance over the prior art push button switches of this class. Bailey et al. in U.S. Pat. No. 3,281,544 issued Oct. 25, 1966, describes a push button switch of the type which provides for interlocking action of various push buttons. In addition, Bailey provides for accumulative interlocking action. That is, a number of push buttons may be depressed and then a master push button may be operated to release the previously depressed push buttons. Other arrangements in push button switches have also provided for these interlocking and accumulative locking types of switching.

However, typically Bailey and others provided for a pair of mounting plates for a frame. Various switch components comprising the switch are then mounted between the plates or on the plates to provide a completed switch. In the event there is failure of a component such as spring or cam or even a contact leaf of the switch, the plates comprising the frame must be separated and the entire switch must be taken apart and ultimately reconstructed. This leads to substantial loss of time and difficulty when attempting to locate a broken component of a switch, repairing and replacing the component and reassembling the entire switch. An embodiment of the present invention avoids such problems. Other advantages are more fully described below.

SUMMARY OF THE INVENTION

In a principal aspect, the present invention comprises a push button switch which is mounted on or integral with a single body plate. A pair of push rods or actuators which include an integral contact cam block member and longitudinal push button members are fastened together through the single body plate. The longitudinal push button members extend through a mounting plate and are held together by the actuator of a push button. A mounting plate fits over the front portion of the push button and secures the actuator in proper alignment on the single body plate. Contact blocks are fastened on the bracket. Various types of switching action other than a push-release action may be obtained by means of interlocking switching discs placed between the bracket and the single body plate.

It is thus an object of the present invention to provide a push button switch of unique and simplified construction as compared to prior art push buttons switches.

It is a further object of the present invention to provide a push button switch which can be utilized for interlocking action, series release action and momentary action or push-release action among others.

It is a further object of the present invention to provide a push button switching device which may be mounted on or integral with a single body plate.

One further object of the present invention is to provide a push button switch wherein the push rods or actuators of the switch may be easily fabricated from a molded plastic material to provide a plurality of functions for the switching action of the switch.

Another object of the invention is to provide a push button switch having a pair of actuators associated with each push button, each actuator being cooperable with a separate one of a pair of disc members to provide for additional multiple switching functions.

These and other objects, advantages and features of the present invention will be set forth in greater detail in the description which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

In the detailed description which follows, reference will be made to the drawing comprised of the following FIGURES:

FIG. 1 is an exploded end view of the improved push button switch of the present invention;

FIG. 2 is an exploded perspective view of the improved push button switch of the present invention;

FIG. 2A illustrates in perspective an alternative construction for interconnection of the single body plate and front plate for the switch of the present invention;

FIG. 3 is a top view of the push button switch of the present invention in an assembled configuration;

FIG. 4 is an end view of the assembled push button switch;

FIG. 4A illustrates in perspective an alternate construction for the contact block bracket utilized in the switch of the present invention;

FIG. 5 is another top view of the push button switch taken substantially along the line 5—5 of FIG. 4;

FIG. 6 is a partial view of a biasing means or over center acting spring for a push button switch of the present invention;

FIG. 7 is a cut-away side view of the switch of the present invention showing various types of switching action for which the switch of the present invention may be utilized;

FIGS. 8R and 8L illustrate opposite cut-away side views of the invention and demonstrate still further types of switching action possible with the present invention; and

FIGS. 9 and 12 are a series of four figures showing the momentary switching action which may be provided as part of a switch of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the following description, a single push button switch is described in detail. Then, the features of a plurality of such switches cooperating to provide interrelated switching actions are described.

Referring first to FIGS. 1, 2, 2A, 3, 4, 4A and 6 and FIGS. 1 and 2 in particular, a single body plate 10 includes a front edge 12 and a parallel rear edge 14. Longitudinal push rod or actuator slots 16 and 18 are cut through the single body plate 10. A push rod or actuator guide slot 20 is also provided through the single body plate 10. A disc guide slot 22 is also provided through the single body plate 10. The push rod or actuator guide slot 20 as well as the longitudinal slots 16 and 18 are perpendicular to the front edge 12 and rear edge 14 of the single body plate 10 or parallel to a centerline push rod or actuator axis 25. The disc guide slot 22 is parallel to the front edge 12 and rear edge 14.

Openings 24, 26 and 28 through the single body plate 10 lie on the axis 25 which is perpendicular to the front edge 12. The openings 24 and 26 are provided to receive springs as will be described later. Opening 28 is provided to receive a ratchet which provides for push to lock, push to release switching action of a switch. The openings 24, 26 and 28 and the slot 20 all lie on the same perpendicular axis 25. That axis 25 is substantially the centerline axis of a pair of push rods or actuators as will be defined later.

Extending from the front edge 12 and rear edge 14 of the single body plate 10 on the axis defined by the various openings described above is a front projection 30 and a rear projection 32. The functions of these projections 30 and 32 will be set forth in detail below.

A planar front plate or mounting plate 34 is attached perpendicular to the single body plate 10. The front plate 34 includes openings 36 to receive the front projections 30. The projection 30 serves as an alignment guide as well as a means to secure the mounting plate 34 to the single body plate. The front plate 34 can thus be staked to the single body plate 10 by means of a simple automatic machine operation.

Adjacent the front projection openings 36 and on both sides thereof are push rod or actuator longitudinal end piece openings 38 and 40. The end piece openings 38 and 40 are cut through the front plate 34 to extend on both sides of the body plate 10 when the front plate 34 is fastened to the body plate 10. That is, when the single body plate 10 and front plate 34 are fastened together, there appear to be four openings through the front plate which openings comprise push rod or

actuator end piece openings. Positioned above and below the front projection opening **36** are light connector openings **42** and **44**. These openings **42** and **44** receive the light connector and contacts for a light for the push button of the push button switch as will be described later.

FIG. **2A** discloses an alternative construction for the connection of front plate **34** to single body plate **10**. That is, front plate **34** includes a perpendicular tab **35** which permits the plate **34** to be fastened to plate **10** by means of a bolt or fastener **37**. Thus, the projections **30** need not be staked, but may still serve for purposes of alignment. Note that the body plate **10** is provided with a tab **39** which includes an opening **41** for fastening the entire switch assembly to a frame or the like. The opening **41** replaces a similar opening found in the front plate **34** as disclosed in FIG. **2**.

The next major component of the push button switch of the present invention is the push rod or actuator assembly. The push rod or actuator assembly is comprised of a first push rod or actuator **46** and a second push rod or actuator **48**. The push rod or actuator **46** is the same or identical to the push rod or actuator **48**. Consequently, the numeration for the push rods or actuators will be the same with the understanding that two actuators are positioned back to back to provide the final push button assembly.

The push rods or actuators **46** and **48** are positioned on opposite sides of the single body plate **10**. Further discussion will be directed primarily to the push rod or actuator **46**. Push rod or actuator **46** includes an integral contact cam block member **50**. The push rod or actuator **46** is made of a non-conductive plastic material and permits molding the actuating surface of the member **50** as an integral part of the push rod or actuator **46**. Typically, the push rod or actuator **46** is fabricated from the material sold under the tradename DELRIN **570X**. Push rod or actuator **46** also includes first and second longitudinal end pieces **52** and **54** respectively. At the opposite end of push rod or actuator **46** is the front end portion **56** of the push rod or actuator **46**.

On each side of the contact block **50** of the push rod or actuator **46** is a locking arm **58** extending toward and through the single body plate **10**. The locking arms for the push rod or actuator **48** are denoted as locking arms **60** and **62**. The locking arms **58**, **60**, **62** extend through the longitudinal slots **16** and **18** and grip over appropriate lugs **61** of the push rod or actuator on the opposite side of the single body plate **10**. An integral guide rod **64** for push rod or actuator **48** is defined on the inside surface. Rod **64** is surrounded by an annular channel **65**. Rod **64** fits into the push rod or actuator guide slot **20** and maintains the push rod or actuator **48** and likewise actuator **46** in proper alignment for movement along the axis **25**. The end pieces **52** and **54** fit through end piece openings **38** and **40**.

Quite importantly, after the end pieces **52A** and **52B**, **54A** and **54B** from both of the actuators **46** and **48** are positioned through the openings **38** and **40**, a push button **68** fastens to the end pieces **52A**, **52B**, **54A**, **54B** to secure them together. Thus, the push button **68** includes a pair of notches **70** and **72** that fit over and engage the end pieces **52A**, **52B** and **54A**, **54B** respectively of actuators **46** and **48**. The notches **70** and **72** secure the actuators **46** and **48** together.

To be more specific, the notches **70** and **72** compress or slightly bend the pieces **52** and **54** toward each other. The pieces are thus held firmly by the button **68**. The pieces **52** and **54** include an end flange **71** which prevents the button **68** from slipping. In addition, a second flange **73** is provided to limit the travel of button **68**. Each piece **52** and **54** includes a mating protrusion **75** and opening hole **77** that engage respectively with the hole **77** and protrusion **75** of the opposite pieces thereby fastening the pieces **52A** and **52B** together as well as pieces **54A** and **54B**.

Pieces **52A** and **52B** as well as **54A** and **54B** are also offset toward each other. The amount of offset is approximately one-half the thickness of the single body plate **10**. Thus, a surface **79** which defines the offset, limits the travel of the push rods **46** and **48** when the rods are depressed.

A light connector assembly **74** includes insulating projections **83** and **85** which fit through the light connector openings **42** and **44** respectively. A light bulb **76** fits into a socket or clip **78** provided in the assembly **74**. The push button **68** fits over the assembly **74**. A translucent or transparent face plate **80**, which is removable from the push button **68**, is provided for the front of button **68**. The assembly **74** includes terminal members **79** and **81** extending along the outside surface of each projection **83** and **85**, the terminal members providing an electrical path from socket **78** to leads connected to the terminals **79** and **81**. The terminals each include a slot **87** and **89** respectively which provides for secure electrical and mechanical connection between a contact leaf or blade as at **132** in FIG. **2** and the terminals **79** and **81**. Note that the width of slots **87** and **89** may be mechanically adjusted to provide for the best and most secure contact and grasp of leaf blade **132**.

Referring again to FIG. **2** and the relation of the actuators **46** and **47** to the switch, a spiral spring **82** includes a circular end **84** which fits over the guide rod **64**. A hooked end **86** of spring **82** fits into one of the spring openings **24**. The alternative biasing means for the invention is illustrated in FIG. **6** An over center acting spring **88** includes a circular loop **90** at one end and hooks at its opposite ends adapted to engage opening **26** on the single body plate **10** and a slot opening **92** of an actuator **46**. The over center acting spring **88** operates to keep the push rod in a depressed position or in a released position. The spring **88** thus is an over-the-center position type spring, whereas the spiral spring **82** always acts to release the push rod and bias the push button along axis **25** and away from the rear edge **14**.

A bracket **96** includes parallel sides **98** and **100**. In one embodiment shown in FIGS. **1** and **2**, sides **98** and **100** are joined by a connecting portion **102** which includes an opening as at **104** in FIG. **4** therethrough corresponding to the opening **36** in the front plate. Opening **104** cooperates with rear projection **32** which may be staked to hold the bracket onto the body plate **10**.

Alternatively as shown in FIG. **4A**, sides **98'** and **100'** may be separated from single body plate **10** by spacing strips **101** and **103**. The sides **98'** and **100'** are then attached to the plate **10** by the fastening means **115** described below in relation to blocks **110**. The ease of replacement and repair of the switch utilizing such a construction is apparent.

Each side **98** and **100** includes a pair of key ferrules or half punches or bosses **106** and **108** which cooperate with a contact leaf block **110** to align an opening **112** of the contact leaf block properly on the bracket **96**. A screw **115** fits through another opening **114** and is screwed through a threaded opening **116** in the bracket **96** to hold the contact leaf block **110** onto the bracket **96**.

Each side **98** and **100** of the front edge of the bracket **96** also includes first and second outside extensions **118** and **120** respectively which extend in a forward direction and downwardly so that opposite extensions **118A**, **118B** and **120A**, **120B** are separated only by the thickness of the single body plate **10**. This serves to provide proper clearance between the bracket **96** and the single body plate **10**. Furthermore, the extensions **118** and **120** are spaced from one another to permit the actuator as at **46** to move between the extensions **118** and **120**. The front portion **56** of the actuator **46**, however, is of a thickness which fits between the side **100** and the single body plate **10**. Thus, the bracket **96** also serves to align the actuator **46** as well as to hold the actuator **46** in intimate contact against the body plate **10** by virtue of the extension of the front portion **56** under the side **100**.

Also positioned between the side **100** and the single body plate **10** and adjacent the front portion **56** is a disc or discs **122**. The disc **122** includes a center projection or rod **124** adapted to engage and extend approximately halfway through the slot **22**. Thus, the disc **122** can be translated between the side **100** and the single body plate **10** along an axis defined by the slot **22**. The front portion **56** is adapted to engage the disc **122** and thereby cause translational movement of the disc **122**. It should be noted that the bracket **96** acts to hold the

disc 122 in appropriate position against the single body plate 10.

The contact leaf block 110 also includes a plurality of contact blades as at 126 in FIG. 1 having mounted thereon contacts as at 128 in FIG. 1. The center blade 126B is adapted to be moved by the block 50 causing contact 128B to engage contact 128A and break contact with contact 128C. This provides for the appropriate switching action by the push button switch. Of course, the contact block 110 includes connectors as at 130 to which electrical wires or the like may be connected to effect control by means of switch operation. Also, a blade 132 is connected to leads on the light connector assembly 74 to provide for power operation of the light 76.

There has been described above the operation and construction of a single push button assembly. Of course, a plurality of identical such push button switches may be provided and when such a plurality of switches are provided in a side-by-side array, various interactions between adjacent and non-adjacent switches are possible, much in the same manner as disclosed in the previously cited Bailey reference and other prior art references. Moreover, and quite importantly, the present invention permits switching interactions not heretofore possible. Such interactions arise because the actuators 46 and 48 associated with each push button 48 may be of differing front portion 56 shape and may be associated with different disc positions on the opposite sides of single body plate 10. For example, referring to FIG. 5, there can be seen a shape of the front portion 56 which provides for interlocking action. That is, a plurality of three discs 122 are positioned to be engaged by symmetrical front portions 56. Thus, depression of one of the switches, say switch A in FIG. 5, will result in switch A being pushed to the inward position and movement of the disc 122 to the left thereby causing any switch that was previously engaged to be pushed outwardly to a switch release position.

In FIG. 7, additional switch functions are illustrated. In FIG. 7, the switch labeled E provides for a series release switch lock function. That is, switches F, G and H may be depressed without causing any of the other switches to be released from the depressed position. However, upon depression of switch E, the other switches will simultaneously be released. Such operation occurs by virtue of the shape of the front portion 56 of the actuators.

Switch J merely illustrates a type of switch in which the front portion 56 is not controlled by movement of discs 122. Such a switch may be a two-position switch for example, when an over the center spring 88 is used, or it may be a simple release switch when a coil type spring 82 is used.

A very important advantage of the present invention results because discs 122 may be provided on both sides of the single body plate 10 for actuation by the front portion 56 of actuators 46 and 48. That is, a single push button assembly may have actuators 46 and 48 with differently shaped front portions 56. Thus, numerous switching combinations not possible with prior art switches are now possible. Examination of FIGS. 8L and 8R will demonstrate more clearly an example of the above statements.

FIGS. 8L and 8R are opposite side views of the same set of push button switches designated switches L, M, N and O. The front portions 56 of the actuators 46 for switches N and O in FIG. 8R are symmetrical and a disc 122 is provided in the appropriate slots to cooperate with the front portions 56 of switches N and O in FIG. 8R. Front portion 56 of switch M is not cooperable with any disc. Front portion 56 of switch L is also not cooperable with any disc 122.

On the opposite side in FIG. 8L, switches L, M and N have an interlocking relationship because of the symmetrical front portions 56 as well as the two cooperating discs 122. Switch O in FIG. 8L does not include an active front portion 56, i.e. a front portion which provides for some sort of switch action.

As a result of this configuration, switches L, M and N provide an interlocking relationship. Switches N and O are interlocked, but switches L and O and M and O are not interlocked. In the prior art, if switches L and M were interlocked and M and N were interlocked, then L and N were necessarily interlocked.

Numerous other switch interactions are also now possible. For example, in a series of ten switches, the first and last switch can be provided with an interlock function in cooperation with nine discs positioned one one on of the body plate. The interposed switches can then have interacting relationships as provided by the discs and actuators on the opposite side of the body plate.

Another possibility permits two or more series of adjacent switches to provide interlocking action in each series while no connection is provided between each series due to omission of discs for example. Such switching action is provided on a first side of a body plate. On the opposite side, all of the switches can be cooperative with discs to provide for accumulative interlock action, i.e. all except one of the switches may be depressed. However, depression of the one switch will cause all the other switches to be released. Such construction is possible by providing a front portion and disc relationship as shown for switches E, F and G in FIG. 7.

It should be noted that the numerous switching actions can be varied in two distinct ways: (1) The discs 122 may be omitted in certain instances, and (2) The shape of the front portion 56 of each actuator may be varied. These two variables permit the extensive switching actions possible with the present invention. Thus, advantages and switching functions not previously available are now possible with the present invention.

Referring again to FIG. 7 and the sequence of FIGS. 9 through 12, there is shown a momentary action or push to lock, push to release action of a switch having a ratchet. FIGS. 9–12 illustrate an enlarged cutaway of the switch K of FIG. 7. In FIG. 9, the single body plate 10 is shown with the spiral spring 82 connected between the single body plate 10 and the rod 64. The spring 82 is shown in phantom since it is on the opposite side of the single body plate 10 and connects the single body plate 10 with the rod 64 on the opposite side of single body plate 10. A lock cam or ratchet 134 is positioned on the front side of the single body plate 10 in FIGS. 9–12. Cam or ratchet 134 includes a center post 136 which extends through opening 28 of single body plate 10. At opposite ends of the cam or ratchet 134 are actuating surfaces which cooperate with surfaces 138 and 140 defined in the hollowed-out actuator 46. The cam or ratchet 134 may be magnetized to enhance operation of the switch by locking the ratchet 134 against the metal single body frame 10 and thereby retain the last operating position of the ratchet 134.

In FIG. 9, the push rod assembly is illustrated as being biased in the outward or release position. In FIG. 10, the push rod assembly is depressed so that surface 138 engages end surface 142 of cam or ratchet 134. This causes cam or ratchet 134 to rotate in counterclockwise direction. Upon release of the push button, cam surface 144 of the ratchet 134 holds the push button assembly in a depressed position. To release the actuator assembly, the push button is depressed causing the cam or ratchet 134 to be engaged by surface 138, thus to rotate in a further counterclockwise direction. Ultimately, surface 140 engages the cam or ratchet 134 to cause it to be driven in a further counterclockwise direction as shown in FIG. 12 and ultimately to that position shown in FIG. 9. A non-magnetic structure of this type is shown in the patent to Allison U.S. Pat. No. 2,691,702 issued Oct. 12, 1964.

In the previous description a pair of push rods or actuators were disclosed, each push rod or actuator being possibly cooperable with a disc 122. Note, however, that only one disc is required for operation. Also note that utilization of two discs and two push rods permits an actuation to the right in a series of switches which is different from the action to the left. Finally, the front portion of each actuator may have any desired shape depending upon the desired switching action. That is, the front portion may be symmetrical and thus provided for interlock action. The front portion may be

eliminated to provide momentary, or other non-interacting switching actions. The front portion may be non-symmetrical to provide for accumulative interlock or series release actions.

The convenience of repair and replacement of parts is also clear from the above description. Each switch is a separate unit which may be replaced easily in whole or part on the single body plate **10**. Thus, switching actions may be altered easily or repaired with a minimum of inconvenience.

What is claimed is:

1. A push button switch comprising, in combination,

a single planar body plate having a front edge and a rear edge parallel to said front edge; a mounting plate attached to the front edge of said single body plate perpendicular to said single body plate and extending in opposite directions from said front edge; said single body plate including a pair of parallel actuator slots therethrough extending in a direction substantially perpendicular to said front edge, said mounting plate including at least one actuator opening therethrough; pairs of first and second actuators, each one of said pair of said actuators including a substantially flat surface positioned against said single body plate, each one of said pair of said actuators being mounted on opposite sides of said single body plate, each pair of said actuators including at least one longitudinal member extending through said actuator openings in said mounting plate, at least one of each pair of said actuators also including at least one fastening member extending through one of said actuator slots in said single body plate and connected with said actuator on the opposite side of said single body plate, at least one of each pair of said actuators also including a substantially planar front portion, and at least one of each pair of said actuators including an integral contact cam block member on the side away from said body plate; a bracket having parallel plate sections, and means for connecting said plate sections to space said plates of said bracket a distance at least greater than the sum total thickness of said body plate and the thickness of the front portions of said actuators, said bracket connected to said single body plate so said plate sections overlap said front portions of said actuators and are parallel to said body plate; a push button fastened to each pair of said actuators onto said longitudinal members; a contact block fastened to said bracket and including contact leaf members positioned for movement by said integral contact cam block member upon motion of said actuator; biasing means for holding said actuators in a first position; and at least one disc element on each side of said body plate positioned between the plate section of said bracket and said body plate intermediate adjacent front portions of said actuators, said disc mounted for translational movement parallel to said front edge of said single body plate, the front portion of said actuators being constructed to contact said disc and move in response to movement of said disc during a switching action, separate types of switching actions being provided by interaction of actuators and discs on one side of said body plate from the switching action of said actuators and discs on the other side of said plate.

2. The switch of claim **1** wherein said biasing means comprise a coil spring connecting said single body plate and at least one of pair of said actuators to bias said switch in a button release positioned.

3. The switch of claim **1** wherein said biasing means comprises an over center acting spring connected between said single body plate and one of said pair of actuators to bias and hold said actuator into said first position or a second position depending upon whether said push button is manually depressed or released.

4. The switch of claim **1** wherein said front portion of at least two of said actuators is symmetrical to provide for an interlocking switch action.

5. The switch of claim **1** wherein the front portion of at least two of said actuators is skewed to provide a series release switching action.

6. The switch of claim **1** wherein said bracket includes projection means extending outwardly from said plate sections for engaging said contact block and aligning said contact block on said bracket.

7. The switch of claim **1** wherein an actuator has a depression on its inside surface having an upper cam surface and a lower cam surface, said switch also including a rotating ratchet rotatable about an axis perpendicular to said single body plate and within said hollow portion of said actuator, said ratchet being rotated by said upper and lower cam surfaces to provide for momentary switching action.

8. The switch of claim **7** wherein said ratchet is magnetically attracted to said single body plate.

9. The switch of claim **1** including a light socket assembly positioned in said front plate intermediate said front plate and said push button.

10. The switch of claim **9** wherein said socket assembly includes terminals extending through said front plate, said terminals including a slot for receiving a contact blade for provided power to said assembly.

11. The push button switch of claim **1** wherein said body plate includes an extension in the plane of said mounting plate, and said mounting plate includes an extension a plane parallel to said body plate, said mounting plate extension being removably fastened to said body plate to thereby removably hold said plates at substantially right angle positions.

12. The push button switch of claim **1** wherein said bracket is comprised of a spacer element fastened to each side of said body plate and a bracket plate removably fastened to the outside of each of said spacer elements, said bracket plates being spaced from said single body plate to permit said disc elements to be slidably positioned between said bracket plates and said single body plate.

13. The push button switch of claim **3** wherein a single over center acting spring connects each one of said pair of actuators to said single body plate, said two springs connected to move in opposite directions on opposite sides of said body plate at any time.

14. A push button switch assembly comprising, in combination:

a single planar body plate having a front edge and a rear edge,

pairs of actuators positioned on opposite sides of said single body plate, said actuators being interconnected for substantially simultaneous translational movement on said single body plate by means including push button means attached to one end of said pair of actuators and biasing means attached to said actuators, each actuator including a front cam surface portion; and

a plurality of movable switching elements mounted on opposite sides of said body plate, each one of said switching elements positioned for engagement with the front portions of two adjacent actuators on one side of said plate to provide for various switching actions by said push button switch, separate types of switching actions being provided by interaction of front portions of actuators and switching elements on one side of said plate from the switching action of said front portions of actuators and switching elements on the other side of said plate.

15. The push button switch assembly of claim **14** including contact members mounted on said single body plate and cooperable with said actuators to provide electrical switching operations.

16. The push button switch assembly of claim **15** including cam block means integral with said actuators for actuation of said contact members to provide electrical switching operation.

17. The push button switch assembly of claim **14** including bracket means for holding said switching elements in position on said single body plate.

18. The push button switch assembly of claim **17** including contact members mounted on said bracket means, said contact members cooperable with actuators to provide electrical switching operations.

19. The push button switch assembly of claim 14 including a rotatable ratchet mounted for rotation on said single body plate and engageable by one of said actuators to provide for momentary switching action.

20. The push button switch assembly of claim 14 wherein said biasing means comprise unidirectional biasing means.

21. The push button switch assembly of claim 14 wherein said biasing means comprise bidirectional biasing means, the direction said actuators are biased depending upon the position of said actuators along the path of translational movement.

22. The push button switch of claim 17 wherein said bracket is comprised of a spacer element fastened to said plate and a bracket plate removably fastened to the outside of said spacer element, said bracket element being spaced from said body plate to permit said switching element to be slidably positioned between said bracket element and said plate.

23. The push button switch assembly of claim 14 wherein said switching elements are discs mounted for movement in a direction perpendicular to said translational movement of said actuators.

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