March 27, 1956 M. BALDASARE 2,740,004

MULTIPLE SWITCH

Filed June 17, 1954

2 Sheets-Sheet 1

Fig. 1.

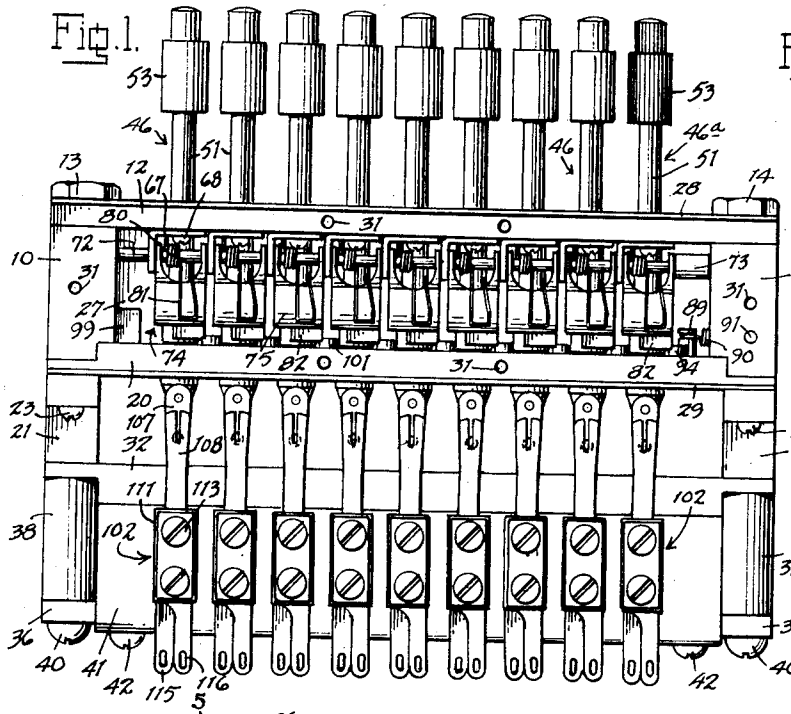


Fig. 2.

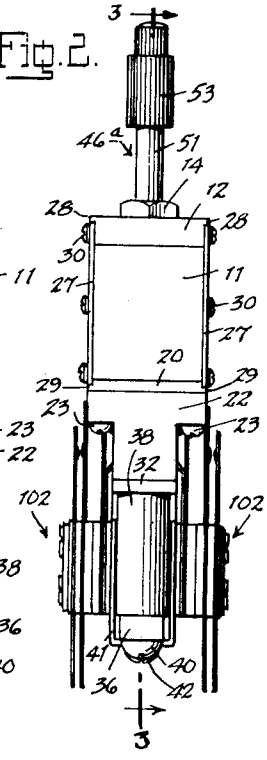


Fig. 3.

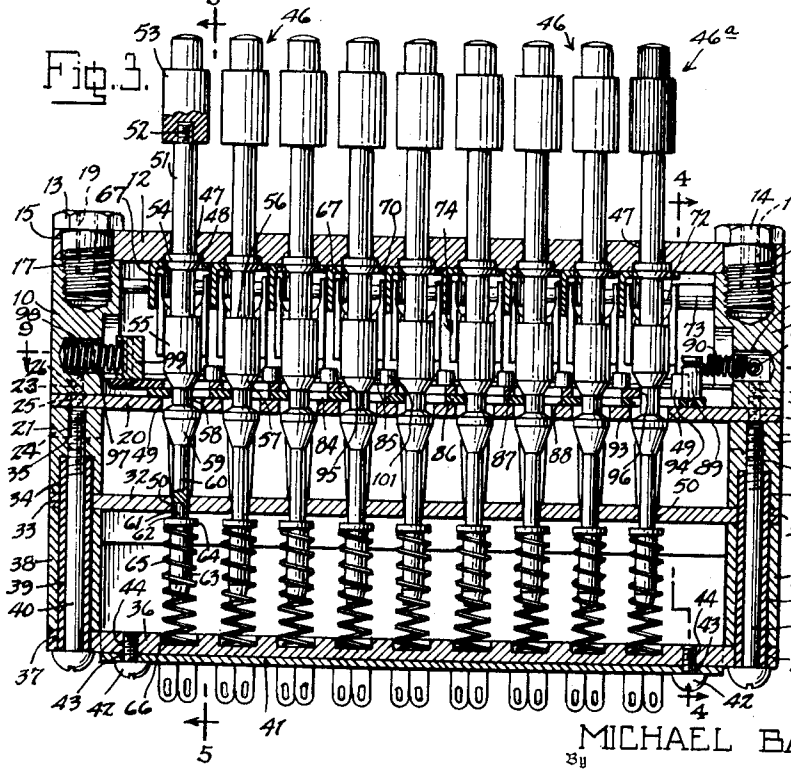
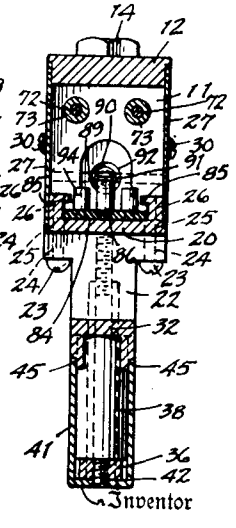


Fig. 4.



Inventor

MICHAEL BALDASARE

By

Attorney

March 27, 1956 M. BALDASARE 2,740,004

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Filed June 17, 1954 2 Sheets-Sheet 2

Fig. 5.

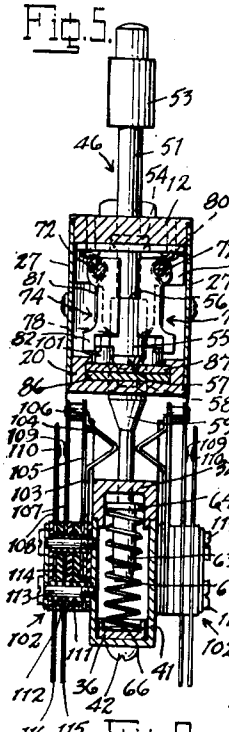


Fig. 6.

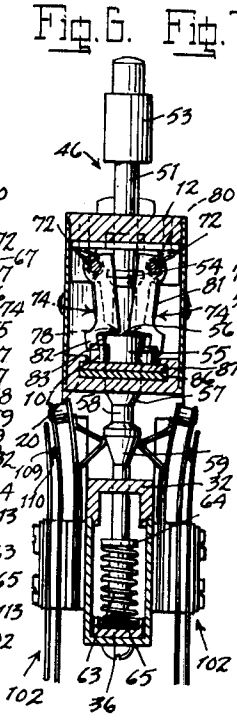


Fig. 7.

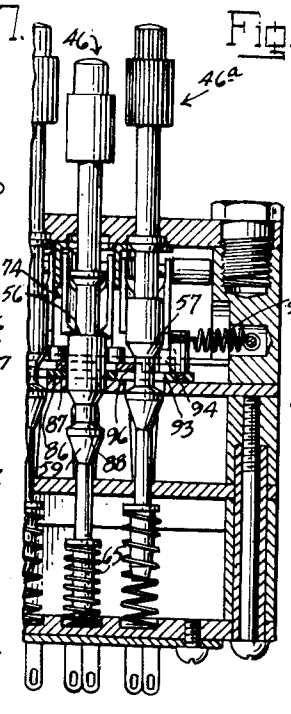


Fig. 8.

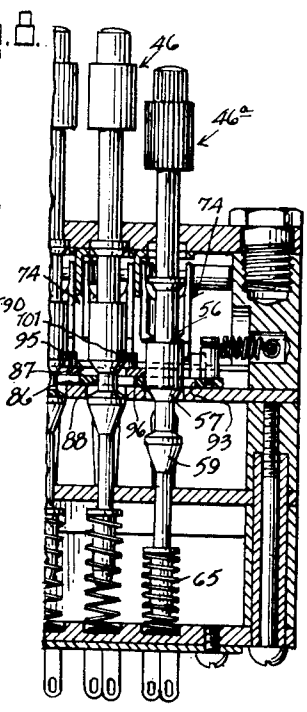


Fig. 9.

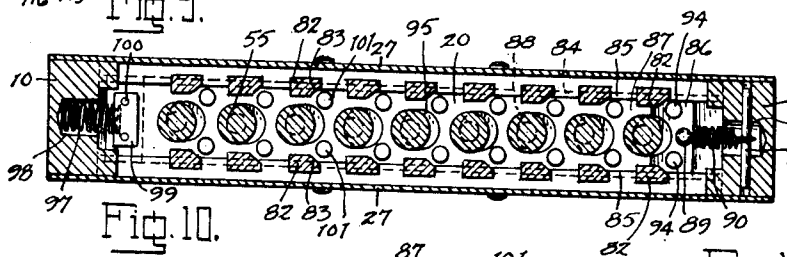


Fig. 10.

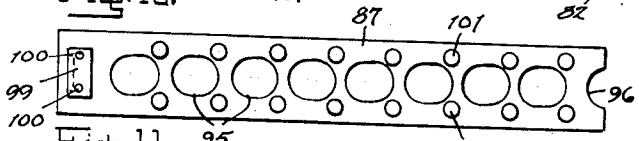


Fig. 11.

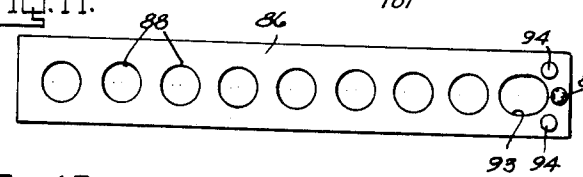


Fig. 12.

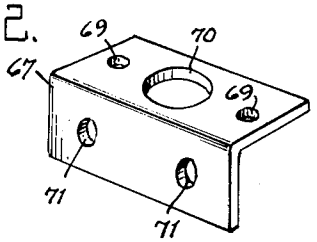


Fig. 13.

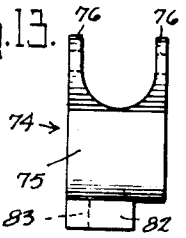


Fig. 14.

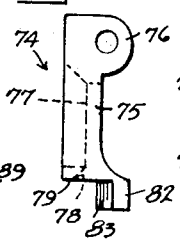


Fig. 15.

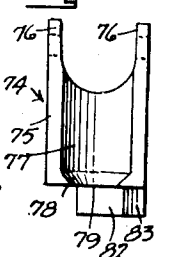
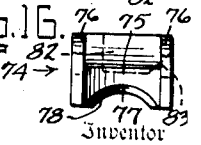


Fig. 16.



Inventor

MICHAEL BALDASARE

By

Attorney

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2,740,004

MULTIPLE SWITCH

Michael Baldasare, Danbury, Conn., assignor to The Capitol Machine Company, Danbury, Conn., a corporation of Connecticut

Application June 17, 1954, Serial No. 437,311

5 Claims. (Cl. 200—5)

The present invention relates to a multiple switch, particularly of the accumulative lock-up type, such switch comprising a plurality of switch units each having a depressible plunger or similar contact actuating means, each such unit representing a position of the multiple switch, and there being a further release position which may, itself, be a switch unit. Each position is adapted to lock independently in its contact actuating position, and one or more of such positions is adapted to be released upon depression of the plunger or other actuating means of the release position, the releasing unit being adapted to be locked in its releasing position upon being actuated to release the previously actuated switch units, and itself adapted to be released upon actuation of any one of the switch units.

Switches of this type are employed in intercommunication and fire control systems, for instance in ships and aircraft, and are also used in the control panels of radio and television studios, normally operating relays. In such use, particularly in the military, such switches are subjected to extreme shock and vibration, as well as contact with the elements, and it is an object of the invention to provide a switch structure which will function mechanically and electrically under extreme conditions of shock and vibration, and in which the parts are so protected and arranged as to effectually withstand salt spray and other deteriorating conditions to a high degree.

A further object is to provide a switch of this character in which a relatively large number of positions may be provided within a very limited space, and which embodies a structure lending itself to the convenient increase in the number of positions simply by increasing the length of certain parts of the frame to thereby accommodate additional switch units.

A further object is to provide a switch mechanism which will permit of the simultaneous operation of two or more of the switch positions, and also which will not jam or otherwise mal-function in the event that both a switch position and the release position are simultaneously operated.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein satisfactory embodiments of the invention are shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a front elevation of a multiple switch, according to the illustrated exemplary embodiment of the invention, a cover plate at the forward side being removed to disclose the normally concealed mechanism;

Fig. 2 is an end elevation, the cover plate which is removed in Fig. 1 being in place in Fig. 2;

Fig. 3 is a longitudinal vertical sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a transverse vertical sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is a transverse vertical sectional view taken along the line 5—5 of Fig. 3;

Fig. 6 is a view similar to Fig. 5 and showing a switch unit depressed to its contact actuating position;

Fig. 7 is a fragmentary longitudinal vertical sectional view showing the release position and the adjacent switch unit, the latter being shown in its depressed contact actuation position;

Fig. 8 is a similar view and showing the release position depressed to release the switch unit shown depressed in Fig. 7;

Fig. 9 is a horizontal sectional view taken along the line 9—9 of Fig. 3, wherein all of the switch units and the release position unit are in their normal raised inoperative positions;

Fig. 10 is a plan view of the cam slide which is adapted for actuation by the release position unit for releasing the switch units;

Fig. 11 is a plan view of the cam slide which is adapted to be actuated through the actuation of any one of the switch units to release the release position unit;

Fig. 12 is a perspective view, on an enlarged scale, of one of the brackets employed in the switch unit assembly;

Fig. 13 is a front elevation, on an enlarged scale, of one of the pivoted latch members employed in the switch unit assembly;

Fig. 14 is an end view thereof;

Fig. 15 is a rear elevation; and

Fig. 16 is a top plan view.

Referring to the drawings the multiple switch, according to the exemplary embodiment of the invention illustrated therein, comprises a rigid frame structure consisting of an upper frame part in which the locking and releasing mechanism is enclosed, and a lower frame part having mounted upon the respective sides thereof a plurality of spring blade contact units for respective engagement and operation by the respective actuating plungers of the switch units, a longitudinal space being provided between the upper and lower frame parts in which the engagement between the actuating plungers and the contact units takes place.

The upper frame part is of generally rectangular form and comprises a pair of vertically disposed end block members 10 and 11 of substantially similar form, to the upper ends of which there are secured the ends of a longitudinally extending guide bar member 12 secured by a pair of cap screws 13 and 14, respectively engaged through holes 15 and 16 in the ends of the bar 12 and screwed into threaded pockets 17 and 18 in the respective upper ends of the block members 10 and 11. The cap screws 13 and 14 have threaded holes 19 extending downwardly therein from their upper ends for the engagement therewith of mounting screws for attaching the switch to a suitable supporting structure.

To the lower ends of the end block members 10 and 11 there are secured the ends of a cam slide mounting bar 20, which has end ear portions disposed between the lower ends of the block members 10 and 11 and the upper ends of a pair of spacer block members 21 and 22 of substantially T-shape. Attaching screws 23 are provided at each side of each of the spacer block members which extend upwardly through holes 24 in the end portions of the top of the T-formation, and registering holes 25 in the end ear portions of the bar 20, and which are screwed into threaded holes 26 in the lower ends of the block members 10 and 11.

Rectangular cover plates 27—27 are mounted upon each side of the upper frame part in recessed formations provided by projecting ribs 28 along each of the upper longi-

tudinal side edges of the bar **12** and similar projecting ribs **29** along each of the lower longitudinal side edges of the bar **20**. The side plates are secured by screws **30** engaged through suitable holes in the side plates and screwed into threaded holes **31** provided in the side faces of the end block members **10** and **11** and of the longitudinal bars **12** and **20**.

The lower frame part comprises an upper longitudinal guide bar **32** of inverted U-shape in cross-section, having end ear portions engaged beneath the lower ends of the respective spacer blocks **21** and **22**. These end ear portions each have a vertically disposed hole **33** which is in register with a corresponding diameter cylindrical pocket **34** in the lower end of each of the respective block members **21** and **22**, and from the upper end of which a threaded screw receiving hole **35** extends upwardly. A lower longitudinally extending spring supporting bar **36** also has end ear portions provided with vertically extending holes **37** in vertical register with the holes **33** of the bar **32**, and between the bars **32** and **36** there is provided at each end a cylindrical tubular spacer sleeve **38** having an internal diameter corresponding to the diameters of the holes **33** and **37** and the pocket **34**.

A tubular bushing **39** is engaged in the bore of the sleeve **38** and in the registering holes **37** and **33**, with its upper end engaged in the pocket **34**, this sleeve serving to impart rigidity to the assembly of the lower frame part and the spacer blocks. Elongated headed screws **40—40** are engaged upwardly through the respective bushings **39** and screwed into the threaded holes **35** in the spacer block members **21** and **22**. The heads of the screws **40** are of larger diameter than the bushing **39** so that they bear upon the lower side of the bar **36**, the length of the bushing **39** providing sufficient clearance to permit these screws to be tightened up to draw the parts into rigidly assembled relation.

Upon the lower frame part there is removably secured a cover member **41** of U-shape in cross-section, having its lower side engaged with the under side of the spring supporting bar **36**, and secured thereto by a pair of set screws **42**, respectively engaged through holes **43** in the base of the cover member and screwed into threaded holes **44** in the spring supporting bar, the vertical sides of the cover member extending across the space between the spring supporting bar **36** and the guide bar **32** and having their upper edges engaged in longitudinal recesses **45** respectively provided along the lower outside edges of the bar **32**. This cover member is adapted, as will hereinafter more fully appear, to have mounted upon its two sides a plurality of spring blade contact units adapted to be actuated by the respective plungers.

The switch, as illustrated, is provided with nine stations, eight of which are adapted to be independently operated to locked position and the other of which is a release station, which upon actuation releases any or all of the other stations which have been previously locked, this station being locked when it is moved to its released position and adapted to be released upon actuation of any of the other stations. The construction of each of the eight stations is identical and the structure of the release station is identical except for a dimensional variation in a cam part thereof, as will hereinafter more fully appear, so that a description of one station will suffice for a description of all of them, except for a further description of the variation in the release station.

Each station comprises a push button type depressible contact actuating cam plunger, indicated generally as **46** for the eight stations, and as **46*a*** for the release station. The upper guide bar **12** is provided with a series of cylindrical guide passages **47** for guiding the plungers, each having at its lower end a countersunk recess **48**. The bar **20** is provided with a series of circular openings **49** for receiving the intermediate portions of the plungers, and the guide bar **32** is provided with a series of cylindrical passages **50** for guiding the lower ends of the plungers.

Each plunger comprises an upper cylindrical stem portion **51** having a threaded stud **52** at its upper end upon which a push button **53** is screwed, a stop shoulder **54** being provided upon the stem portion to normally seat in the countersunk recess **48**. In spaced relation, below the stop portion **54**, there is provided a locking cam portion consisting of a cylindrical upper part **55** having a flat annular locking shoulder **56** at its upper end and a lower tapered annular cam part **57** which is adapted, as will presently more fully appear, to actuate a releasing slide plate, hereinafter more fully referred to, the diameter of the cylindrical part **55** being such that in the downwardly moved contact actuating position of the plunger it slidingly fits within the opening **49**.

Immediately below the cam portion **57** there is provided a cylindrical neck portion **58**, and below the neck portion **58** there is provided a contact actuating cam portion **59** in the form of an inverted truncated cone, this portion being disposed within the space between the upper and lower frame parts for cooperation with the spring blade contact units, as will hereinafter more fully appear. A cylindrical stem portion **60** extends below the cam portion **59** and is slidingly fitted in the guide hole **50** of the bar **32**.

A pocket **61** is provided in the lower end of the stem portion **60** which is engaged by a pin **62** of a spring holder **63** engaged upon the lower end of the plunger, this spring holder having an annular shoulder **64** at its upper end and against which is engaged the upper end of a helical spring **65** disposed about the holder **63** and having its lower end seated in one of a series of positioning pockets **66** in the upper side of the bar **36**. This spring serves to normally press the plunger upwardly to the normal position as shown in Fig. 3, and further serves to automatically move the plunger from its locked position to its normal position when it is released from its locked position, as will presently more fully appear.

An angle bracket **67**, shown in detail in Fig. 12, is secured to the underside of the bar **12** by a pair of screws **68** engaged through holes **69** in the upper horizontal part of the bracket, a circular hole **70** being also provided therein which registers with the countersunk recess **47** to provide a guide opening through which the stop shoulder **54** moves. The vertical part of the bracket is provided with a pair of holes **71** respectively at each side of the plunger and through which are extended a pair of rods **72** for hingedly supporting the latch members for locking the plungers, these rods being common to the plungers of the several stations, and being restrained from longitudinal displacement by engagement of the left hand ends of the rods with the end block member **10** and by engagement of their right hand ends with the end block member **11**, a spacer sleeve **73** being provided upon the right hand end of each rod to position the latch members of plunger **46*a*** of the right hand or release station, as will hereinafter more fully appear.

Upon the rods **72—72** at opposite sides of the plunger there are hingedly mounted two latch members **74—74**, these being of identical but opposite form, i. e., one is a mirror image of the other. The right hand latch member **74**, as seen in Fig. 5, is illustrated in detail in Figs. 13–16 and comprises a vertically disposed body portion **75** provided at its upper end with a pair of apertured ears **76—76** which are hingedly engaged by the supporting rod **72**, the body portion being substantially flat at its outer face and provided at its inner face with a cylindrical recess **77** terminating at its lower end in a bevelled inwardly extending lip **78** having a flat bottom surface **79**.

The radius of the inner edge of the lip is substantially the radius of the cylindrical locking cam portion **55** of the plunger, so that in the raised position of the plunger, as seen in Fig. 5, the said inner edge substantially conforms to the cylindrical surface of the portion **55**, being yieldably pressed thereagainst by means of a spring **80** coiled about the rod **72** between the ears **76**. One leg

of the spring extends outwardly and abuts the under side of the upper portion of the bracket **67**, while the other leg **81**, which is bent into substantially U-form, engages with the outer flat face of the body portion **75**. Thus the latch member is spring loaded to normally swing inwardly, and upon depression of the plunger to a point where the flat annular shoulder **56** of the portion **55** is below the lip **78**, the latch member swings inwardly against the stem portion **51** of the plunger so that when the finger is removed from the plunger, following its depression, the plunger spring **65** forces the plunger upwardly to bring the annular shoulder **56** against the under side of the lip **78**, thereby locking the plunger in its depressed position.

Inasmuch as the latch members are provided at opposite sides of the plunger, it is effectually and uniformly held at opposite sides, so that in the event that the switch is subjected to a severe shock from either side, the effect of such shock will be to force the latch member at one side toward its latching position, if the shock is such that it tends to force the latch at the other side away from its latching position.

Upon the lower end of the body portion, in outwardly offset relation, there is provided a cam block **82** having a bevelled cam surface **83** disposed transversely to the length of the switch and which is adapted to be engaged by releasing means, presently to be more fully described, to release the plunger from its locked position.

The cam slide mounting bar **20** is provided in its upper side with a longitudinal channel **84** provided at the inner sides of the upper edges of its side walls with inwardly extending retaining ribs **85**, and within this channel there are slidably engaged in superimposed relation a lower longitudinal cam slide plate **86** and an upper longitudinal cam slide plate **87**. The plate **86** is provided with a series of circular holes **88**, one for each of the eight switch unit stations, and which are of corresponding diameter to the holes **49** in the bar **20** so as to slidably receive the stop cam portion **55** of the plunger in its depressed position.

At the right hand end of the plate **86** there is provided a post **89** connected by a helical compression spring **90** to a transversely disposed pin **91** provided within a pocket **92** in the end block member **11**, and which spring normally pulls the plate **86** to the right, as seen in Fig. 3, to engage the left hand sides of the holes **88** with the cylindrical neck portions **58** of the plungers directly below the cam portions **57**. An additional hole **93** is provided in the plate for engagement therein of the plunger of the release station, this hole being of elongated or substantially oval form, so that in the normal position of the slide plate, as seen in Fig. 3, its left hand edge is in register with the hole **49** in the bar **20**, so that while depression of any one of the eight switch unit station plungers **46** will, through engagement of the cam portion **57** of the plunger with the left hand edge of the circular hole **88**, cause the slide plate to be actuated to the left, depression of the release plunger **46***a* will not cause actuation of the slide.

Upon the right hand end of the cam slide plate **86** there are provided two studs **94—94** disposed in longitudinal line with the cam portions **82** of the latch members **74** of the release plunger **46***a*. Should the release plunger **46***a* be in its depressed locked position, these studs are adapted upon actuation of the plate to the left, i. e., from the position as shown in Fig. 3 to the position as shown in Fig. 7, affected through depression of any one of the switch unit plungers **46** to its locked position, to engage the cam portions **82** causing the latch members to swing outwardly from engagement with the stop shoulder **56** of the release plunger **46***a*, thereby releasing it from its locked position. In the shifted position of the slide plate **86**, as seen in Fig. 7, the right hand end of the hole **93** is in register with the hole **49** of the bar **20**, thus permitting depression of the release plunger **46***a* without obstruction by the slide plate **86**.

The slide plate **87** is provided with a series of substantially oval or elongated holes **95**, one for each of the eight switch unit stations, and which in the normal position of the switch, as seen in Fig. 3, have their left hand edges in register with the holes **49** so that depression of any one of the eight switch unit plungers **46** will not affect movement of the slide plate. At the right hand end of the plate there is provided a semi-circular notch **96** of corresponding radius to the hole **49**, which in said normal position is engaged with the neck portion **58** of the release plunger **46***a* directly below the cam portion **57** thereof, it being noted that this cam portion is upwardly offset with respect to the cam portions **57** of the switch unit plungers **46** by a distance corresponding to the thickness of the slide plate **87**, so that the same operative relationship exists between the plunger **46***a* and the plate **87** as exists between the plungers **46** and the plate **86**.

The plate **87** is normally urged to the right to press the notch **96** into engagement with the neck portion **58** of the plunger **46***a* by means of a helical expansion spring **97** disposed in a pocket **98** in the block member **10** and pressing against a recessed block **99** secured upon the upper side of the left hand end of the plate **87** by means of pins **100**. Adjacent each of the holes **97** at the right hand side thereof, there are provided two studs **101—101** disposed in the longitudinal line of the cam portions **82** of the latch members **74** of the eight plungers **46** of the switch units, and which are adapted, upon movement of the slide plate **87** to the left, from the position as seen in Fig. 3 to the position as seen in Fig. 8, to engage the cam portions **82** of any of the latch members which may be in plunger locking position, such locked position being shown in Fig. 7.

This releasing movement of the slide **87** is effected by depression of the releasing plunger **46***a* to the position as shown in Fig. 8, the cam portion **57** engaging the notch **96** and forcing the slide plate to the left as the plunger is depressed to its locked position where the latch members **74** swing into locking position above the annular locking shoulder **56**, as shown in Fig. 8. It will be noted that in the left hand position of the slide **87**, the right hand edges of the holes **95** are in register with the holes **49** of the bar **20**, thus permitting depression of any one of the plungers **46** without obstruction by the slide plate **87**.

As the slide plate **87** will not, in either of its positions, be actuated by or obstruct movement of the plungers **46**, and the latch plate **86** will not, in either of its positions, be actuated by or obstruct the movement of the release plunger **46***a*, simultaneous depression of both the release plunger **46***a* and one or more of the switch unit plungers **46** will not result in any jamming of the mechanism. On the other hand, the depressed plungers will all return to their raised positions upon disengagement of finger pressure therefrom, as both slides **86** and **87** will have been moved to their latch releasing position, thus holding all of the latches in their releasing positions.

The contact units **102**, which are adapted to be actuated by the plungers, are of conventional form and are mounted at each side of the switch upon the sides of the cover member **41**, a contact unit being provided at each side of each plunger so that each plunger is adapted to operate two contact units. Obviously only one such contact unit may be provided, if desired, or, depending upon the installation, certain of the plungers may have no contact units associated with them, thus providing reserve stations for the attachment of contact units when and if required.

Each contact unit consists of an actuating blade **103** provided with a V-shaped upper end portion **104** extending within the space between the upper and lower parts of the frame and disposed in the path of the cam portion

59 of the plunger, so that in the raised position of the plunger, as seen in Fig. 5, the actuating blade is in an inwardly moved position, and in the depressed position of the plunger, as seen in Fig. 6, the actuating blade is forced outwardly to operate the contact unit. This operation may be of various kinds, i. e., it may consist in closing one or more circuits, opening one or more circuits, or combinations of these operations, depending upon the particular make-up of the contact unit.

In the illustrated type of unit, the operation closes the circuit. For this purpose, this unit is provided with a spring blade member 105 which backs up the actuating blade 103, and which is engaged at its upper end with an insulating block 106 secured upon the upper end of one contact blade 107, the other contact blade 108 being spaced from the blade 107. The respective contacts 109 and 110 of these blades, which are normally spaced apart as seen in Fig. 5, are adapted to be engaged upon outward movement of the actuating blade, as seen in Fig. 6.

The several blades are mounted in an insulating block 111 consisting of a plurality of spacers or laminations of insulating material which insulate the blades from the body of the switch, i. e., from the cover member 41, insulate the actuating blade 103 and the spring blade 105 from the contact blades, and insulate the contact blades from each other. Each of the blades is apertured to receive insulating tubes 112 extending through holes in the insulating layers, and through which tubes mounting screws 113 are engaged, these screws being screwed into threaded holes 114 provided in the side walls of the cover member 41. The contact blades have apertured extensions 115—116 extending below the insulating block for the attachment of conductor wires thereto, these usually extending to suitable relays of the communication or other system to be controlled by the switch mechanism.

What is claimed is:

1. A multiple switch comprising a plurality of vertically depressible contact actuating plungers and a vertically depressible release plunger, a frame supporting said plungers in side-by-side relation in a horizontal longitudinally extending row, spring means biasing said plungers upwardly, a latch portion carried by each of said plungers, a plurality of latch means movably mounted in said frame and respectively associated with said plurality of plungers, spring means biasing said latch means in latching direction whereby upon depression of the associated plunger each said latch means moves into latching relation with said latch portion thereof, a horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in one direction in said frame, release means carried by said slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said release plunger to move said latch means in unlatching direction, cam means carried by each of said contact actuating plungers adapted upon individual depression thereof to move said slide plate in opposite direction to its spring biased movement, a second horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in the same direction as the spring-biased movement of said first slide plate, a plurality of release means carried by said second slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said plurality of contact actuating plungers to move said latch means in unlatching direction, and cam means carried by said release plunger adapted upon depression thereof to move said second slide plate in said opposite direction to its spring biased movement.

2. A multiple switch comprising a plurality of vertically depressible contact actuating plungers and a vertically depressible release plunger, a frame supporting said plungers in side-by-side relation in a horizontal longitudinally extending row, spring means biasing said plungers upwardly, an annular latch shoulder carried by each of said plungers, a plurality of latch means movably mounted in said frame and respectively associated with said plurality of plungers, each said latch means comprising a pair of latch members hingedly mounted for swinging movement about horizontal longitudinally extending hinge axes at opposite sides of the associated plunger and each including a lip portion normally engaging said plunger below said shoulder, and a cam portion below said lip portion, spring means biasing said latch members inwardly in latching direction whereby upon depression of the associated plunger each said pair of latch members moves into latching relation with said shoulder thereof, a horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in one direction in said frame, release means carried by said slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said cam portions of said pair of latch members of said release plunger to move said latch members in unlatching direction, cam means carried by each of said contact actuating plungers adapted upon individual depression thereof to move said slide plate in opposite direction to its spring biased movement, a second horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in the same direction as the spring-biased movement of said first slide plate, a plurality of release means carried by said second slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said cam portions of said pairs of latch members of said plurality of contact actuating plungers to move said latch members in unlatching direction, and cam means carried by said release plunger adapted upon depression thereof to move said second slide plate in said opposite direction to its spring biased movement.

3. A multiple switch comprising a plurality of vertically depressible contact actuating plungers and a vertically depressible release plunger, a frame supporting said plungers in side-by-side relation in a horizontal longitudinally extending row, spring means biasing said plungers upwardly, a latch portion carried by each of said plungers, a plurality of latch means movably mounted in said frame and respectively associated with said plurality of plungers, spring means biasing said latch means in latching direction whereby upon depression of the associated plunger each said latch means moves into latching relation with said latch portion thereof, a horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in one direction in said frame, said slide plate having a plurality of holes in which said contact actuating plungers are respectively engaged, release means carried by said slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said release plunger to move said latch means in unlatching direction, cam means carried by each of said contact actuating plungers normally above said slide plate and adapted upon individual depression thereof to enter the hole of said slide plate engaged by said plunger to move said slide plate in opposite direction to its spring biased movement, a second horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in the same direction as the spring-biased movement of said first slide plate, a plurality of release means carried by said second slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said plurality of contact actuating plungers to move said latch means in unlatching direction, and cam means carried by said release plunger adapted upon depression thereof to move said second slide plate in said opposite direction to its spring-biased movement.

4. A multiple switch comprising a plurality of verti-

cally depressible contact actuating plungers and a vertically depressible release plunger, a frame supporting said plungers in side-by-side relation in a horizontal longitudinally extending row, spring means biasing said plungers upwardly, a latch portion carried by each of said plungers, a plurality of latch means movably mounted in said frame and respectively associated with said plurality of plungers, spring means biasing said latch means in latching direction whereby upon depression of the associated plunger each said latch means moves into latching relation with said latch portion thereof, a horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in one direction in said frame, said slide plate having a plurality of holes in which said contact actuating plungers are respectively engaged, release means carried by said slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said release plunger to move said latch means in unlatching direction, cam means carried by each of said contact actuating plungers normally above said slide plate and adapted upon individual depression thereof to enter the hole of said slide plate engaged by said plunger to move said slide plate in opposite direction to its spring-biased movement, a second horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in the same direction as the spring-biased movement of said first slide plate, said second slide plate being superimposed on said first slide plate and having a plurality of holes in which said contact actuating plungers are respectively engaged and through which said cam means thereof are freely movable without imparting movement to said second slide plate, a plurality of release means carried by said second slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said latch means of said plurality of contact actuating plungers to move said latch means in unlatching direction, and cam means carried by said release plunger adapted upon depression thereof to move said second slide plate in said opposite direction to its spring-biased movement.

5. A multiple switch comprising a plurality of vertically depressible contact actuating plungers and a vertically depressible release plunger, a frame supporting said plungers in side-by-side relation in a horizontal longitudinally extending row, spring means biasing said plungers upwardly, an annular latch shoulder carried by each of said plungers, a plurality of latch means movably mounted in said frame and respectively associated with said plurality of plungers, each said latch means comprising a pair of latch members hingedly mounted for swinging movement about horizontal longitudinally extending hinge axes at opposite sides of the associated plunger and each including a lip portion normally engaging said plunger below said shoulder, and a cam portion below said lip portion, spring means biasing said latch members inwardly in latching direction whereby upon depression of the associated plunger each said pair of latch members moves into latching relation with said shoulder thereof, a horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in one direction in said frame, said slide plate having a plurality of holes in which said contact actuating plungers are respectively engaged, release means carried by said slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said cam portion of said pair of latch members of said release plunger to move said latch members in unlatching direction, cam means carried by each of said contact actuating plungers normally above said slide plate and adapted upon individual depression thereof to enter the hole of said slide plate engaged by said plunger to move said slide plate in opposite direction to its spring biased movement, a second horizontal slide plate common to said plurality of contact actuating plungers spring-biased for longitudinal movement in the same direction as the spring-biased movement of said first slide plate, said second slide plate being superimposed on said first slide plate and having a plurality of holes in which said contact actuating plungers are respectively engaged and through which said cam means thereof are freely movable without imparting movement to said second slide plate, a plurality of release means carried by said second slide plate adapted upon movement thereof in the opposite direction to its spring-biased movement to engage said cam portions of said pairs of latch members of said plurality of contact actuating plungers to move said latch members in unlatching direction, and cam means carried by said release plunger adapted upon depression thereof to move said second slide plate in said opposite direction to its spring-biased movement.

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