

Dec. 30, 1969

G. J. SHEA

3,487,177

MULTIPLE SWITCH

Filed April 4, 1968

2 Sheets-Sheet 1

FIG. 1

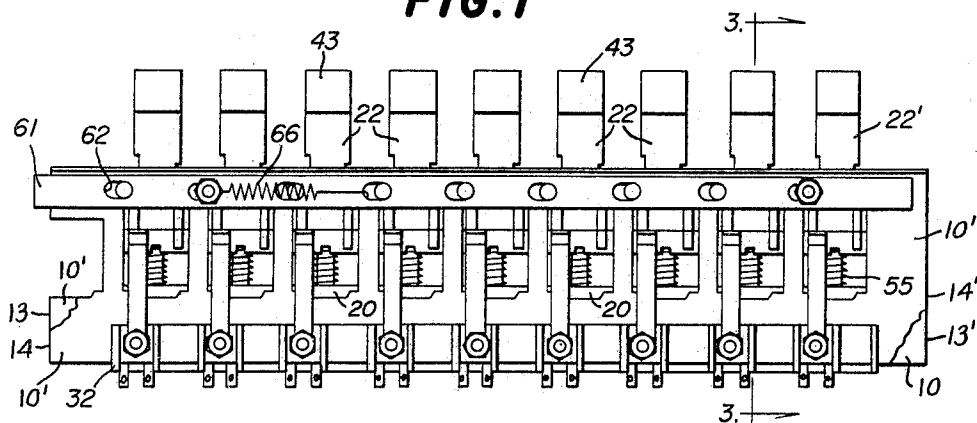
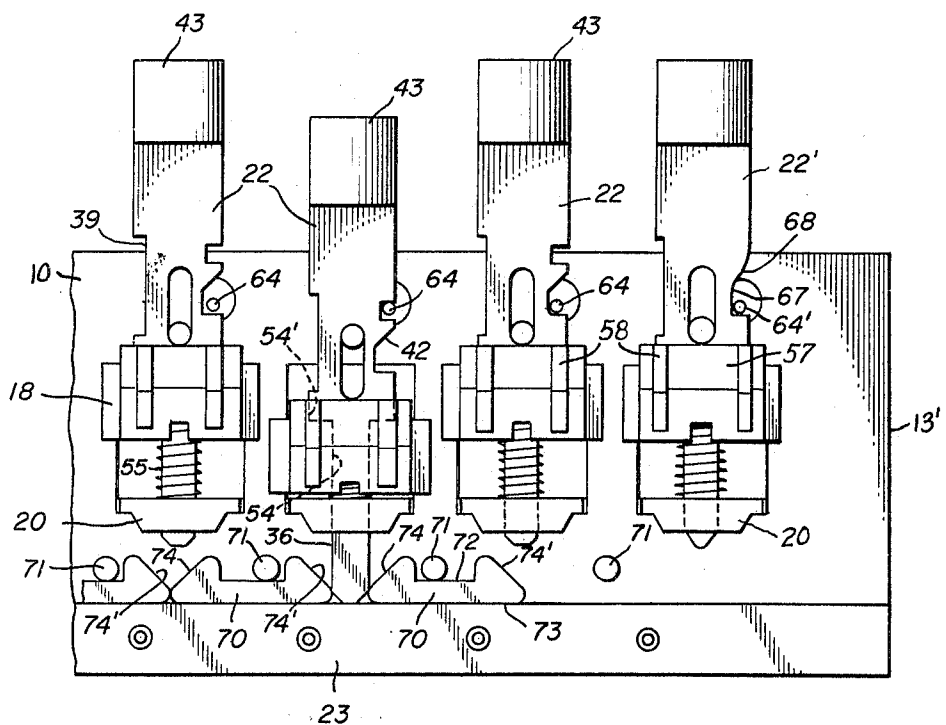


FIG. 2



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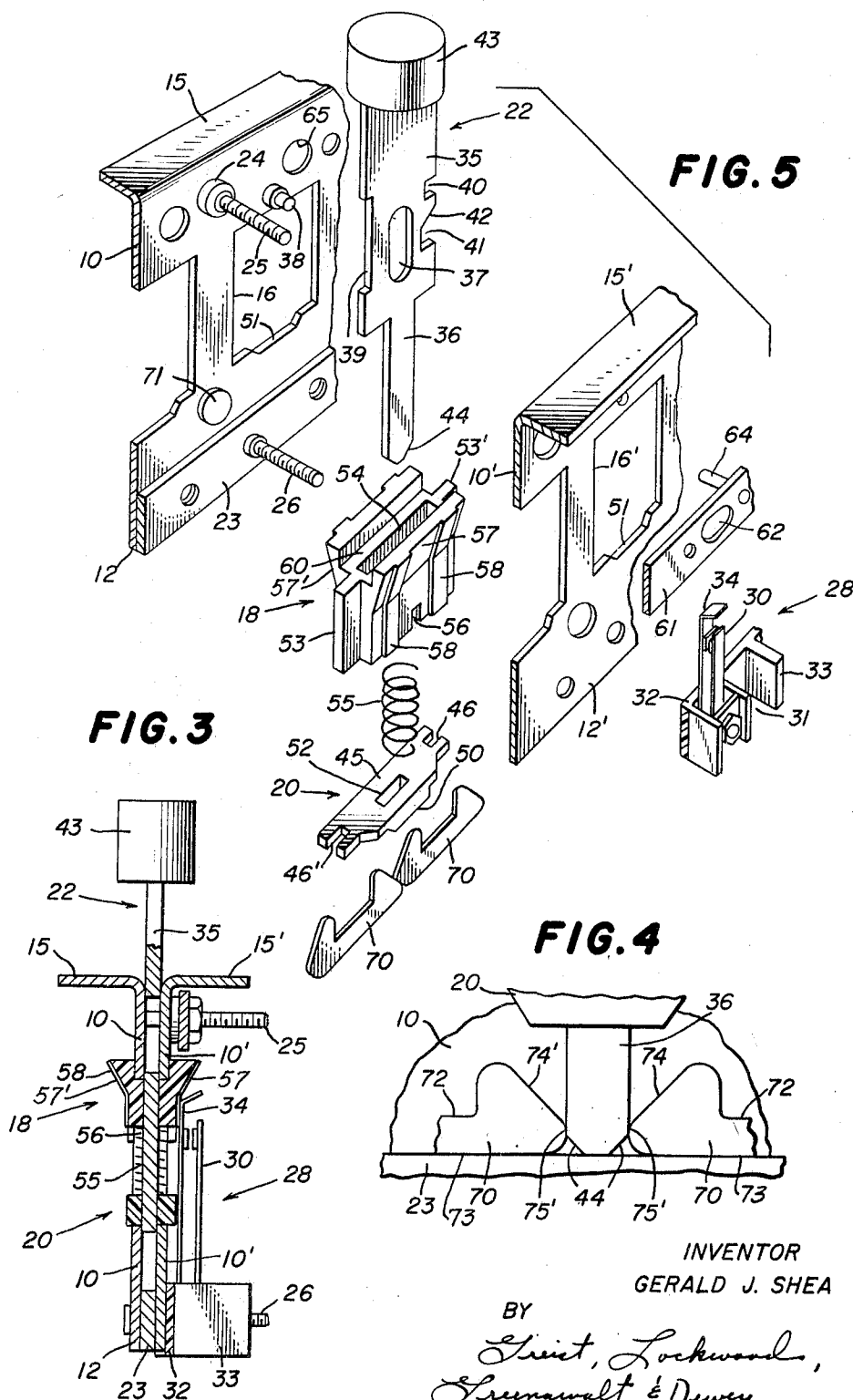
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2 Sheets-Sheet 2



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3,487,177

MULTIPLE SWITCH

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11 Claims

ABSTRACT OF THE DISCLOSURE

A multiple switch assembly for controlling a plurality of circuits which is characterized by a number of plungers slidable in guideways between a pair of spaced frame plates and each carrying an actuator for operating an associated spring contact switch mounted in the path thereof. The plungers have notched side edges for cooperation with latching members which operate to hold the plungers in depressed position against the force of a return spring. A slidably mounted latch bar is provided for operation by one of the plungers so that upon depressing the latch bar release plunger the latching member is moved out of engagement with the plunger which has been depressed and the same is returned to raised non-switch actuating position.

This invention relates to electrical switch assemblies and is more particularly concerned with improvements in a multi-station switch of the type in which only one switch at a time can be actuated.

Switch assemblies have heretofore been developed of the multi-station type for operating a plurality of circuits where it is desired to control a number of operations or a sequence of operations through such circuits. Such switches are employed in electric ranges, washing machines, air-conditioners and other home appliances. They are also employed in more complex electrical equipment including communication instruments, computer and office equipment, and the like, where multiple circuits are necessary. Various arrangements have been provided to enable a plurality of switches to be incorporated in a single unit with individual switch actuators and mechanism for controlling the operation of the same so that one or more of the switches can be actuated and the circuits maintained as desired. In this type of device it is desirable to provide apparatus which results in smooth operation, easy maintenance, ready repair and a high degree of flexibility and versatility. It is, therefore, an object of the present invention to provide an improved switch assembly of the multiple push button type which is of relatively simple construction, with a minimum of parts, which will operate efficiently and smoothly over a long period and with little attention, which may be readily manufactured at a relatively low cost, which is easily installed and which has other desirable characteristics and advantages.

A more specific object of the invention is to provide an improved multi-station switch which includes a supporting frame in which there is mounted a plurality of reciprocable switch actuating push rod members and associated guide members which provide smooth operation, with the actuating members having an associated latching means or locking arrangement which will positively retain the members in switch operating position until the latching means is operated to release the switch actuating members for return to non-operating position.

Another object of the invention is to provide an improved multiple push button switch having a plurality of push rod type switch actuating members and a latch bar mounted for reciprocation in a path which extends

across the path of movement of the push rods and having pins cooperating with camming and latching surfaces on the push rods so as to lock the individual push rods in switch actuating position and a means for reciprocating the latch bar so as to release the push rods for return to non-actuating position.

A further object of the invention is to provide in a gang switch having a plurality of switch actuating members, a common latch bar with spaced pins thereon for cooperation with camming and latching surfaces on the switch actuating members so as to lock individual switch actuating members in switch actuating position when they are depressed and to enable automatic release of a depressed and latched actuating member when the latch bar is reciprocated.

A still further object of the invention is to provide a multiple push rod switch assembly having a lockout feature which comprises individual lockout slugs for cooperation with specially designed cam surfaces on the push rods so as to provide for a positive lock against depression of the push rods when the lockout slugs are in predetermined position.

Another object of the invention is to provide a multiple push rod or multiple plunger type switch assembly wherein lockout slugs are provided for cooperation with each push rod so as to act as a positive stop, when in predetermined position, and prevent lateral movement of the lockout slugs when there is a plunger in a depressed position and blocking the lockout track.

Still another object of the invention is to provide a multiple push rod switch assembly having a plurality of switch actuating push rods and cooperating lockout slugs confined in a laterally extending track with cam and follower surfaces on the interengaged ends of the push rod and the associated locking slugs which result in lateral force only being applied to the plunger end when the plunger is in the down position.

A still further object of the invention is to provide in a multiple switch assembly of the push rod type cooperating lockout features which insure that when a push rod is depressed it cannot be released for return movement by downward pressure on any of the like push rods in the assembly.

These and other objects and advantages of the invention will be apparent from a consideration of the push button switch structure shown by way of illustration in the accompanying drawings wherein:

FIGURE 1 is a side elevation, with portions broken away, of a multiple push button switch assembly of the "one only" or "single select" type which embodies the principles of the invention;

FIGURE 2 is a partial side elevation, with portions broken away, of the switch assembly of FIGURE 1, the view being to an enlarged scale, and one of the plungers being depressed;

FIGURE 3 is a cross section taken on the line 3—3 of FIGURE 1 to an enlarged scale;

FIGURE 4 is a fragmentary elevation showing a part of FIGURE 2 to a still larger scale; and

FIGURE 5 is an exploded perspective view illustrating the assembly of the plunger and associated elements of the switch assembly.

The switch assembly which is illustrated in the drawings is designed to control a plurality of circuits, a separate switch being provided on the assembly for each of the circuits. It includes multiple push button rods or plungers, only one of which may be depressed from a normal inoperative position to operative switch actuating position where it is held until released by actuation of a common latch bar, the latter being actuated manually through operation of a momentary push rod which is provided for cooperation with the latch bar.

Referring to the drawings there is illustrated a push button switch assembly comprising two frame plates 10 and 10' which have substantially identical construction except for being rights and lefts. The plates 10 and 10' are of suitable rigid material such as sheet steel and may be stamped or otherwise formed in any desired lengths. The plates 10, 10' include rectangular body portions with bottom edges 12, 12' end edges 13, 13' and 14, 14' and top flanges 15, 15'. When the plates 10, 10' are assembled to form a supporting frame for the switch elements, they are positioned in face to face relation with the flange 15, 15' extending in opposite directions. The flanges 15, 15' may have any desired widths and may be provided with suitable apertures for mounting the entire structure in a panel or the like. The body of each of the plates 10 and 10' is provided with a series of closely spaced generally rectangular apertures 16 and 16'. The apertures 16 are aligned in paired relation with the apertures 16' when the plates are assembled so as to form guideways for receiving contact actuators 18 and plunger guides 20 associated with plunger or push rod members 22. When assembled, the plates 10 and 10' are held in spaced relation at the bottom by a spacer bar 23 and at the top by small spacer sleeves 24 carried on spaced clamping bolts 25 which are disposed along the margin of the body of plate 10, the latter constituting the main support plate. The spacing between the plate bodies is slightly greater than the thickness of the plunger members 22 so as to permit movement of the plunger members 22 in a vertical direction when the frame is disposed with the flanges 15, 15' generally horizontal. The frame spacer 23 is apertured to accommodate a series of spaced clamping bolts 26 on which leaf spring contact switch point assemblies 28 are mounted on the outside face of the body portion of the frame 10'. Each leaf spring assembly 28 comprises a plurality of sets of stacked contact blades 30 seated in pockets 31 which are formed on an elongate insulating bar 32 by longitudinally spaced partition members 33, with the spaces forming the pockets 31 having a width determined according to the spacing of the bolts 26 each of which is located below a lower corner of an aperture 16 so that when the contact switch assembly is positioned in a pocket 31 the switch blades 30 extend upwardly along the one side of an aperture 16 with the innermost blade 34 positioned for engagement by the contact actuator 18 which is carried on the plunger 22. The insulating bar 32 and associated partition members 33 may be formed of a suitable rigid plastic having electrical insulating characteristics.

The switch actuating plunger 22 is in the form of a flat plate of rigid material, for example, metal cut from a rectangular strip, so as to provide a relatively wide top portion 35 and a narrower spear-like portion 36 extending from the bottom thereof. An elongated aperture 37 is provided in the top portion 35 near the bottom thereof which extends on the vertical axis and is adapted to receive a guide pin 38 extending from the innermost face of the main support plate 10, with the latter centered at the top of the aperture 16. The top portion 35 of the plunger 22 is notched out at 39 along the one side edge to provide a relatively long clearance slot when positioned in an aperture 16 adjacent the separating collar 24. The opposite vertical margin of the plunger top portion 35 is notched at 40 to provide a latching slot and at 41 to provide an outwardly and upwardly inclined cam edge 42 for cooperation with a latching pin on a latch bar as hereinafter described. The top portion 35 of the plunger 22 is provided with an operating button 43 on the top surface of which identifying indicia may be placed. The bottom spear-like or bayonet-like portion 36 of the plunger 22 has tapered edges 44 which converge to a somewhat rounded point for cooperation with a lockout mechanism which will be described.

A guide member 20 is associated with each of the plungers 22 which is in the form of a generally rectangular

block of a molded plastic material having the necessary dimensional stability. The plunger guide 20 is provided with a flat top surface 45 and the end portions are bifurcated or slotted at 46 and 46', with the slots 46, 46' being of slightly greater width than the thickness of the material in the plate 10 and the distance between the inner ends of the slots being slightly less than the width of the aperture 16. The center portion of the guide 20 is thickened somewhat at 50 and this thickened center portion seats in a notched out portion 51 in the bottom edge of the apertures 16, 16' which is of complementary shape. The guide 20 is adapted for assembly with the base forming main frame plate 10 by positioning the same diagonally in an aperture 16 and engaging opposite edges defining the aperture 16 in the slots 46 and 46' at the ends of the guide member. A vertically disposed aperture 52 is provided in the center of the guide member 20 which is adapted to receive in free sliding relation the bottom portion 36 of a plunger 22. The relative dimensions of the aperture 52 and the plunger portion 36 are such that the plunger portion 36 may be canted therein slightly during assembly and disassembly of the plunger with the plate 10 so as to free the slot 37 of the pin 38 and permit the plunger 22 and associated actuator 18 to be maneuvered into or out of the proper assembled relation with the base plate 10.

The contact actuator 18 is in the form of a block which is preferably molded from a rigid plastic material having the necessary dimensional stability. It has a vertical dimension which is substantially less than the corresponding dimension of the aperture 16 so that it may have a limited vertical movement when installed in the aperture 16. The overall length of the actuator 18 is greater than the width of the aperture 16 in the plate 10 and the end portions are reduced in width and thickness so as to provide flange like extensions 53 and 53' for positioning between marginal plate portions defining the vertical sides of the apertures 16 and 16' in the plates 10 and 10' with the latter forming tracks for guiding the actuator 18 in its vertical path of movement. A vertically disposed slot 54 of rectangular cross section extends through the actuator 18 and receives in sliding relation the bottom portion 36 of the plunger 22. The slot 54 which is aligned with the space between the plates is centered so as to receive the plunger portion 36 and has a widened portion 54' at the top in which the bottom edge of the plunger portion 35 is adapted to seat. The bottom face of the actuator 18 is plain and is adapted to abut the top face 45 of the plunger guide 20 when the plunger 22 is depressed to its lowermost position. A return spring 55 has its uppermost end seated in a pocket 56 (FIGURE 5) which is provided in the bottom face of the actuator 18. The spring 55 is carried on the plunger portion 36 and serves to urge the actuator 18 in the direction of its uppermost position. The actuator 18 is widened at the top margin so as to provide upwardly and outwardly inclined surfaces 57 and 57' along the top margins and spaced rib formations 58 are provided on the side faces which project outwardly of the surface and which extend near the vertical edges in a position for engagement by the innermost face of the innermost leg spring 34 in the stack 30 of each spring contact switch assembly 28. The top face of each actuator 18 is cut away to provide a relative shallow recess or slot 60 which is of a width sufficient to seat therein the marginal portions of the frame plate 10 and 10' at the top of the slots 16 and 16' when the actuator 18 is in its uppermost position.

A latch bar 61 having a series of longitudinally spaced elongate apertures 62 is mounted in sliding relation on the bolts 25 on the outside face of the frame plate 10'. The apertures 62 are spaced to permit limited sliding movement on the spacer sleeve members 24 on the bolts 25. Latch pins 64 extend from the latch bar 61 and project through apertures 65 provided in the main frame plate 10 so as to engage in the notches 41 in the plungers 22 when the latch bar is in its normal operative position and the plungers 22 are at the uppermost end of their path. The latch bar 61 is held

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in the position shown in FIGURE 1 by a return spring 66 which is attached at one end to one of the bolts 25 and has a hooked portion on the other end engaging the edge of a slot 62 so as to normally hold the latch bar in operative position with the pins engaged in slots 40 or 41. When a plunger 22 is initially depressed the inclined surface 42 at the top of the notch 41 engages the latch bar pin 64 and moves the latch bar 61 to inoperative position so that all the plungers 22 will be free to move downwardly insofar as the latch bar is concerned. When the plunger 22 is fully depressed as shown in FIGURE 2 latching notch 40 is positioned to receive the latch bar pin 64 which permits the latch bar 61 to be returned to a latching position by the return spring 66.

In the normal position of the latch bar 61, with all the plungers in non switch operating position, the latch pins 64 are seated in the notches 41 below the cam surfaces 42 and depressing a plunger 22 will reciprocate the latch bar 61 so as to move all the pins 64 to the right as viewed in FIGURE 2. The latch bar is reciprocated by a special momentary push rod or plunger, indicated at 22' in FIGURE 2, which may be similar to the rest of the push rods 22 but is provided with a single edge notch 67 having cam surface 68 adapted for engagement with the pin 64' so as to force the latch bar 61 to the right, as viewed in FIGURE 2, against the force of the spring 66. This moves the latch pins 64 out of engagement with the plungers 22 and releases any of the latter which may be held depressed by engagement of a latch pin 64 in the latching notch 40.

The assembly is provided with a series of lock out slugs 70 which cooperate with the spear-like bottom portions 36 of the plungers 22. The base or main plate 10 is provided along its lower margin with a series of equally spaced buttons or protrusions 71 which extend inwardly of the innermost face thereof and are centered between the apertures 16. The buttons 71 cooperate with the lock out slugs 70, which are formed from generally rectangular strips of rigid plate material of a thickness somewhat less than the spacing between the plates 10 and 10', so as to be received in loosely sliding relation in the bottom of the frame, as shown in FIGURE 2, with the stop buttons 71 received in a U-shaped slot or recess 72 in the top margin of each slug 70. The straight bottom edge 73 of each slug 70 rides on the top edge of the spacer bar 23. The end edges of each slug 70 are slanted or tapered in converging planes at 74 and 74' with the taper corresponding approximately to the taper 44 on the bottom ends of the plungers 22. The lock out slugs 70 are positioned so that adjacent ends about each other and the tapered surfaces are disposed below the plungers 22. When a plunger is depressed fully the slugs below the same will be forced apart provided they are not blocked against movement. The tapered surfaces 74 and 74' do not extend to the bottom edges 73 of the slugs but merge into a vertical end edge 75, 75' which extends high enough to engage vertical side edge portions of the plunger portion 36 (FIGURE 4) when the plunger is fully depressed so as to exert only lateral pressure on the plunger portion 36. This locks the slugs against lateral displacement when one of the plungers is depressed so that none of the remaining plungers can be depressed until the depressed plunger is released by operation of the latch release bar and allowed to move to non-switch actuating position. That is, not more than one of the switch actuating plungers 22 can be depressed to switch actuating position at any one time.

The operation of the illustrated switch will be obvious from the foregoing description. When a single plunger 22 is depressed the tapered bottom end edge surfaces 44 engage the surfaces 74 of the lock-out slugs 70 and move the same apart. With a plunger 22 in fully depressed position the latch pin 64 is seated in the slot 40 and the plunger cannot be raised until the latch bar 61 is moved to release position. When downward force is applied to another plunger the bottom end will strike a lock-out

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slug before cam surface 42 engages latch bar pin 64 and will not move the lock-out slug aside because it is locked against lateral movement, due to the engagement with the bottom end of the plunger 23 which has been previously depressed, of the associated lock-out slugs. In order to release the previously depressed plunger 22 the momentary plunger 22' is depressed. The cam edge 68 strikes the pin 64' on the release bar and moves the latter to unlatching position which releases the plunger 22 and also frees the lugs 70 for movement when the bottom end edge 44 engages the slug edge 74' (FIGURE 2) at the end of the line of slugs 70.

While particular materials and specific details of construction have been referred to in describing the switch assembly which is illustrated it will be understood that other materials and equivalent structural details may be resorted to within the spirit of the invention.

I claim:

1. A multiple station switch assembly having a supporting frame with means thereon forming guide tracks which are in spaced side-by-side relation, switch actuators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plate-like plunger members supporting said switch actuators for movement between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted on said guide tracks in spaced relation below said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a latch bar reciprocably mounted on said supporting frame for movement in a path extending transversely of the path of said plunger members and in a plane parallel to the plane of said plate-like plunger members, latch elements spaced on said latch bar, means for resiliently urging said latch bar in a direction to position said latch elements in notches in the side edges of said plunger members so as to releasably hold each said plunger member when said plunger member is depressed to switch actuating position, means to move said latch bar to withdraw said latch elements from said notches, and plate-like lockout means having cam surfaces co-operating with cam surfaces on said plunger members when one of said plunger members has been depressed to switch actuating position to block the movement of the remaining plunger members to depressed switch actuating positions until said previously depressed plunger member is released by withdrawal of the associated latch member from the notch in the side edge thereof and said plunger member returns to non-actuating position.

2. A multiple station switch assembly having a supporting frame with means thereon forming guide tracks which are in spaced side-by-side relation, switch actuators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plate-like plunger members for carrying said switch actuators between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation below said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a latch bar reciprocably mounted for movement in a path extending transversely of the path of said plunger members, latch elements spaced on said latch bar, means for resiliently urging said latch bar in a direction to position said latch elements in notches in the side edges of said plunger members so as to releasably hold each said plunger member when said plunger member is depressed to switch actuating position, means to move said latch bar to withdraw

said latch elements from said notches, and means co-operating with said plunger members when one of said plunger members has been depressed to switch actuating position to block the movement of the remaining plunger members to depressed switch actuating positions until said previously depressed plunger member is released by withdrawal of the associated latch member from the notch in the side edge thereof and said plunger member returns to non-actuating position, and the means to move said latch bar in a direction to withdraw said latch members from said notches comprising a reciprocally mounted momentary release plunger and cooperating interengaging means on said latch bar and said momentary release plunger for moving said latch bar in response to movement of said release plunger.

3. A multiple station switch assembly having a supporting frame with means thereon forming guide tracks which are in spaced side-by-side relation, switch actuators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plate-like plunger members for carrying said switch actuators between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation below said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a latch bar reciprocally mounted for movement in a path extending transversely of the path of said plunger members, latch elements spaced on said latch bar, means for resiliently urging said latch bar in a direction to position said latch elements in notches in the side edges of said plunger members so as to releasably hold each said plunger member when said plunger member is depressed to switch actuating position, means to move said latch bar to withdraw said latch elements from said notches, and means co-operating with said plunger members when one of said plunger members has been depressed to switch actuating position to block the movement of the remaining plunger members to depressed switch actuating positions until said previously depressed plunger member is released by withdrawal of the associated latch member from the notch in the side edge thereof and said plunger member returns to nonactuating position, and the means for blocking the movement of said remaining plunger members comprising lockout slugs associated with the bottom ends of said plunger members, said lockout slugs being confined in a guide recess extending below the bottom end of said plunger members and being moved apart in said recess when one of said plunger members is depressed to the point where the lowermost end of said plunger member engages between a pair of said lockout slugs and movement of said lockout slugs is blocked by said plunger member end.

4. A multiple station switch assembly as set forth in claim 3 and said plunger members having on their bottom ends tapered cam edge portions for cooperation with complementary cam edge portions on said lock-out slugs so as to force said lock-out slugs apart when the lower end of a plunger member is forced downwardly between adjacent end edges of a pair of said lock-out slugs.

5. A multiple station switch assembly as set forth in claim 4 and the cam edge portions on the ends of said plunger members and the ends of said lock-out slugs having a configuration which results in the lock-out slugs transmitting a horizontal component of force only on the end of a plunger member which is substantially fully seated between the adjacent ends of a pair of said lock-out slugs.

6. A multiple station switch assembly comprising a supporting frame having means thereon forming guide tracks which are in spaced, side-by-side relation, switch actuators mounted on said guide tracks for reciprocable

movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plate-like plunger members connected to said switch actuators for moving the same between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation to said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a plunger latching bar reciprocally mounted on said supporting frame for movement in a path extending transversely of the path of said plunger members, latch pins on said plunger latching bar positioned to engage in notches in the side edges of said plunger members in the operative position of said plunger latching bar so as to releasably hold said plunger members when depressed to switch actuating position, resilient means biasing said plunger latching bar into operative position, means to move said plunger latching bar to an inoperative position so as to release a depressed plunger, and means disposed in the path of said plunger members which is operative, when one of said plunger members has been depressed to switch actuating position, to block movement of the remaining plunger members to depressed switch actuating position until said previously depressed plunger member is released and returns to non-actuating position, and the means to move said plunger latching bar to an inoperative position being operative to simultaneously move the means for blocking the movement of the remaining plungers to a non-blocking position.

7. A multiple station switch assembly comprising a supporting frame having means thereon forming guide tracks which are in spaced, side-by-side relation, switch actuators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plate-like plunger members connected to said switch actuators for moving the same between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation to said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a plunger latching bar reciprocally mounted on said supporting frame for movement in a path extending transversely of the path of said plunger members, latch pins on said plunger latching bar positioned to engage in notches in the side edges of said plunger members in the operative position of said plunger latching bar so as to releasably hold said plunger members when depressed to switch actuating position, resilient means biasing said plunger latching bar into operative position, means to move said plunger latching bar to an inoperative position so as to release a depressed plunger, and means disposed in the path of said plunger members which is operative, when one of said plunger members has been depressed to switch actuating position, to block movement of the remaining plunger members to depressed switch actuating position until said previously depressed plunger member is released and returns to non-actuating position, said means for blocking the movement of the remaining plunger members comprising lock-out slugs slidably mounted in a transverse guideway below said plunger members and having tapered end edge portions which adjoin each other and which are adapted for engagement by said plunger members when said plunger members are depressed so as to move the lock-out slugs laterally and said lock-out slugs being arranged to block the movement of the remaining plunger members when one of the plunger members is in fully depressed position.

8. A multiple station switch assembly having a supporting frame with means thereon forming guide tracks which are in spaced, side-by-side relation, switch actu-

ators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plunger members connected to said switch actuators for moving said switch actuators between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation below said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a latch bar reciprocally mounted for movement in a path extending transversely of the path of said plunger members, latch elements associated with said plunger members and said latch bar, means for resiliently urging said latch bar in a direction to enable said latch elements to engage in notches in the side edges of said plunger members so as to releasably hold each said plunger member when said plunger member is depressed to switch actuating position, means to move said latch bar to withdraw said latch elements from said notches, and means co-operating with said plunger members when one of said plunger members has been depressed to switch actuating position to block the movement of the remaining plunger members to depressed switch actuating positions until said previously depressed plunger member is released for return to non-actuating position by disengagement of the associated latch member from the notch in the side edge thereof, and the means to move said latch bar in a direction to withdraw said latch elements from engagement in said notches comprising a momentary release plunger reciprocally mounted on said supporting frame and co-operating cam means on said latch bar and said momentary release plunger which is operative when said momentary release plunger is depressed.

9. A multiple station switch assembly having a supporting frame with means thereon forming guide tracks which are in spaced, side-by-side relation, switch actuators mounted on said guide tracks for reciprocable movement between switch actuating and non-actuating positions, switch means mounted on said supporting frame and disposed in the path of said actuators for operation by the same, plunger members connected to said switch actuators for moving said switch actuators between a normal non-actuating position and a depressed switch actuating position, guides for said plunger members mounted in spaced relation below said switch actuators, resilient means urging said switch actuators toward a non-actuating position, said plunger members having notches in their side edges, a latch bar reciprocally mounted for movement in a path extending transversely of the path of said plunger members, latch elements associated with said plunger members and said latch bar, means for resiliently urging said latch bar in a direction to enable

said latch elements to engage in notches in the side edges of said plunger members so as to releasably hold each said plunger member when said plunger member is depressed to switch actuating position, means to move said latch bar to withdraw said latch elements from said notches, and means co-operating with said plunger members when one of said plunger members has been depressed to switch actuating position to block the movement of the remaining plunger members to depressed switch actuating positions until said previously depressed plunger member is released for return to non-actuating position by disengagement of the associated latch member from the notch in the side edge thereof, said means for blocking the movement of said remaining plunger members comprising lockout slugs associated with the bottom ends of said plunger members, said lockout slugs being confined in end-to-end relation in a guide recess extending below the bottom ends of said plunger members and said lockout slugs being moved in said recess when one of said plunger members is depressed to the point where the lowermost end of said plunger member engages between a pair of said lockout slugs, and further movement of said lockout slugs is prevented by said plunger member end.

10. A multiple station switch assembly as set forth in claim 9 and said plunger members having on their bottom ends tapered cam forming edge portions for co-operation with complementary cam forming edge portions on said lock-out slugs so that when the lower end of a plunger member is forced downwardly between adjacent end edges of a pair of said lock-out slugs the remaining lock-out slugs are moved into position to block downward movement of the associated plunger members.

11. A multiple station switch assembly as set forth in claim 10 and the cooperating cam edge portions of said plunger members and on said lock-out slugs terminating at vertically disposed edge portions which are in abutting relation when the depressed plunger member is at the lowest point in its path with the bottom end thereof seated between the confronting ends of a pair of lock-out slugs, which results in the lock-out slugs being locked in position and transmitting a horizontal component of force only on the bottom end of the plunger member.

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U.S. Cl. X.R.

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