Feb. 27, 1945. R. P. BALLOU ET AL 2,370,515

ELECTRIC SWITCH MECHANISM

Filed July 6, 1942 3 Sheets-Sheet 1

Fig. 1

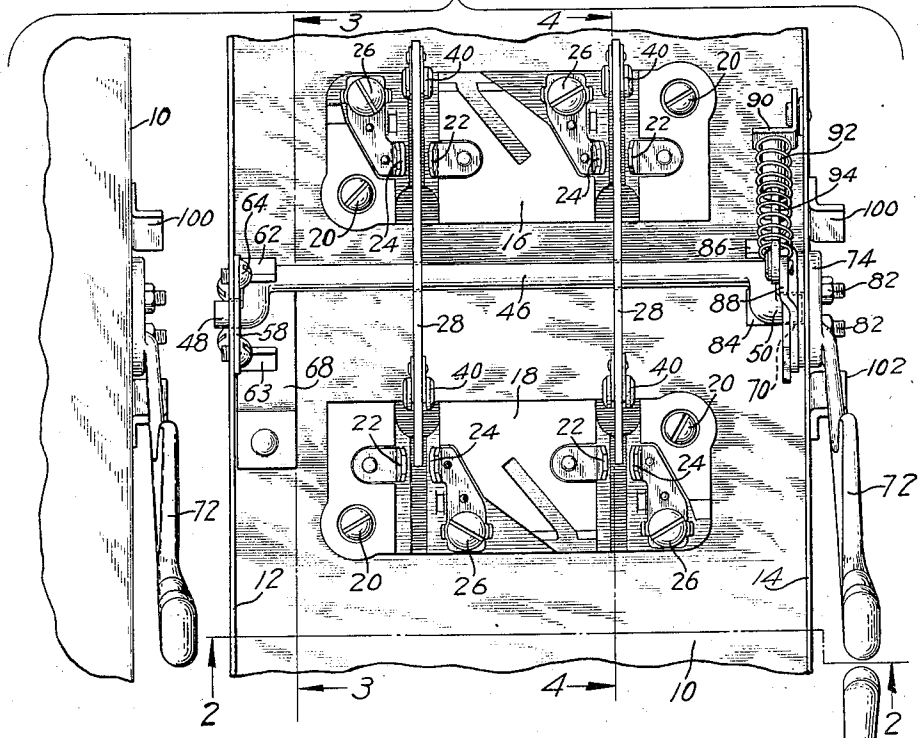
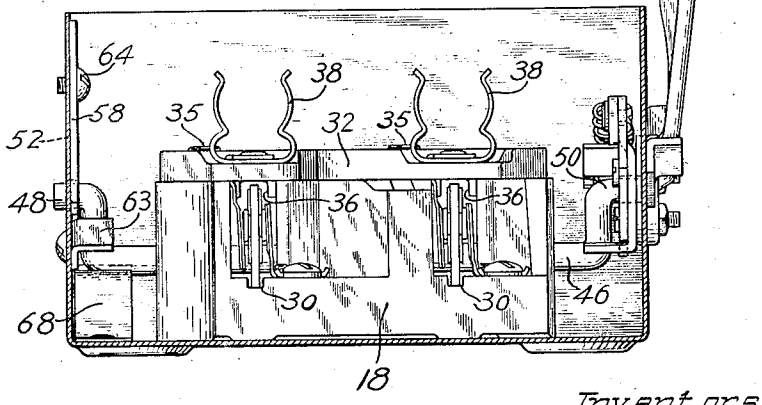


Fig. 2



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Fig. 4

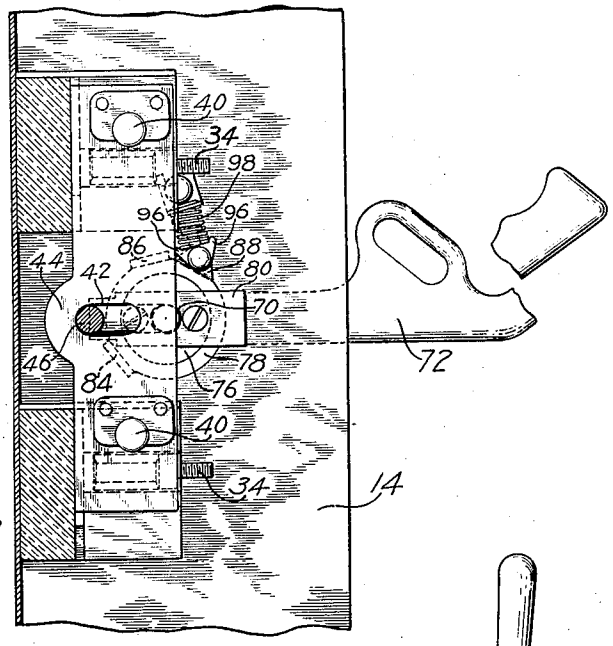


Fig. 3

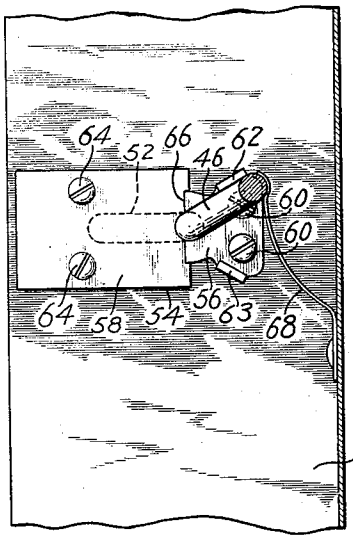
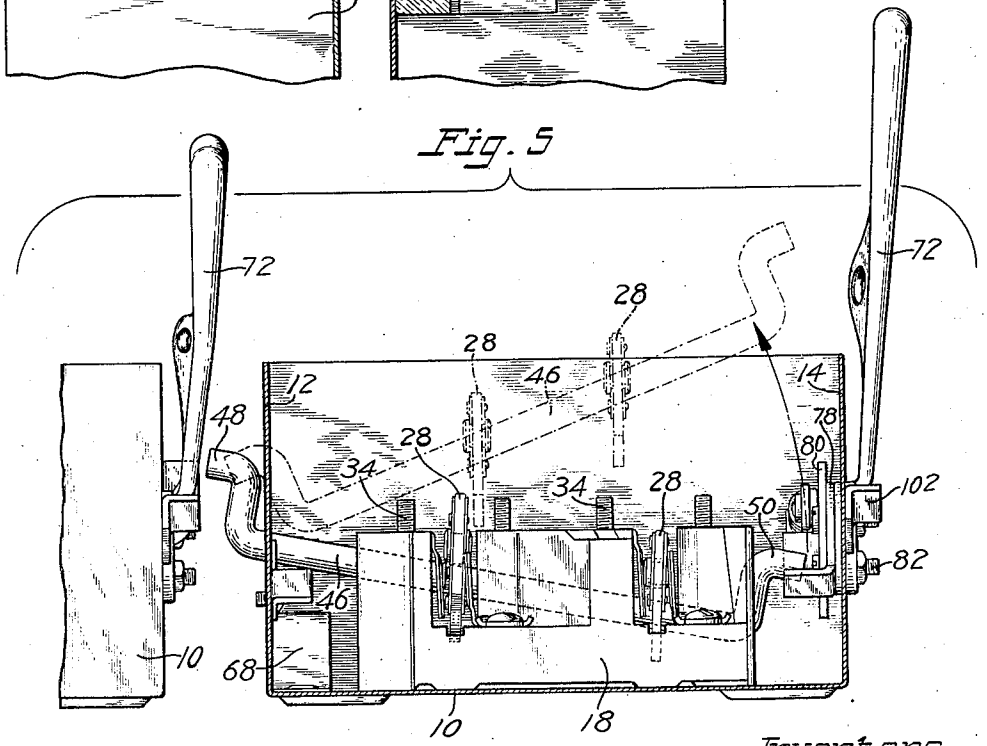


Fig. 5



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ELECTRIC SWITCH MECHANISM

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Fig. 6

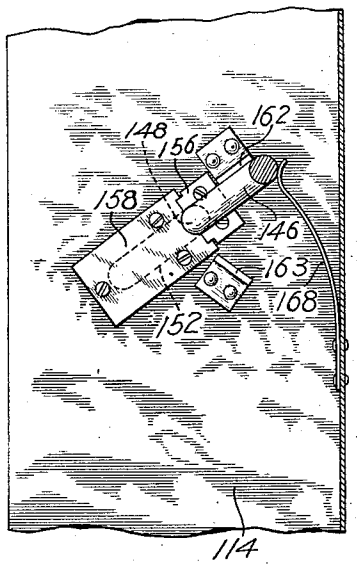


Fig. 7

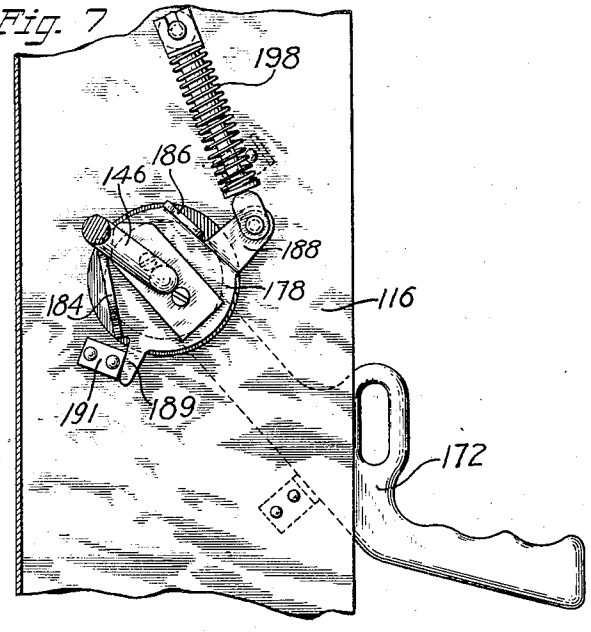
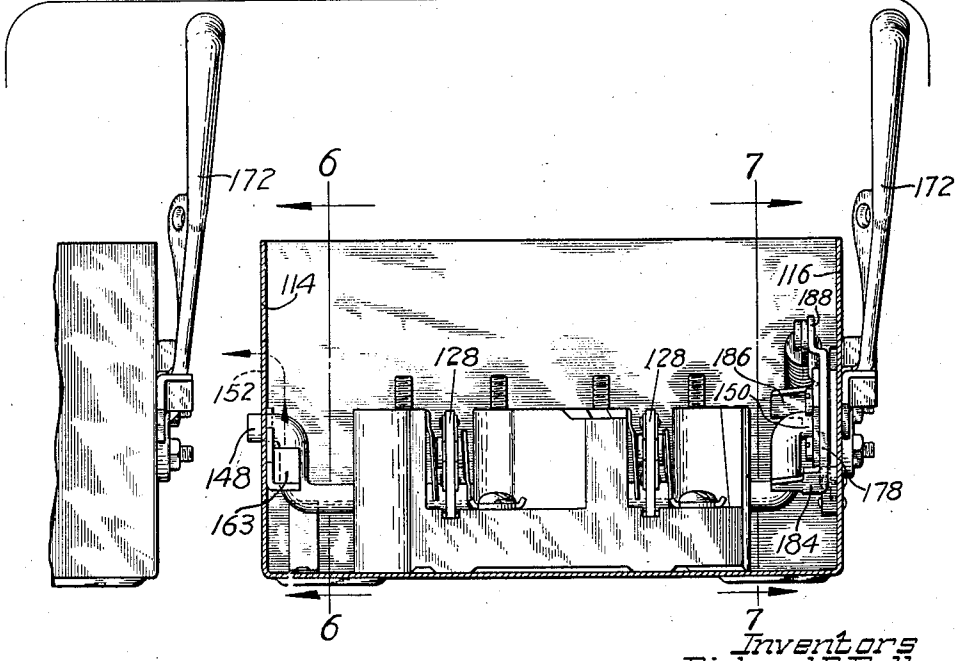


Fig. 8



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UNITED STATES PATENT OFFICE

2,370,515

ELECTRIC SWITCH MECHANISM

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Application July 6, 1942, Serial No. 449,853

7 Claims. (Cl. 200—163)

This invention relates to an electric switch mechanism and more particularly to the means in an electric switch for actuating the movable contact thereof.

One object of the invention is to provide a more durable slide than is now used in the art for carrying one or more movable contacts and in which slide a closed slot is provided for receiving an actuating bail.

Another object of the invention is to provide mounting means for a slide actuating bail, the mounting means being of such nature that the bail and the slide or slides mounted thereon may be readily removed from the casing without distortion of either the casing or bail.

A still further object of the invention is to have the bail mounting means of such nature that the bail may be removed from the casing by moving the bail in a direction longitudinally thereof a distance less than the length of the portion of the bail normally disposed between the mounting means.

Other objects and the characteristics of the invention will become apparent from considering the following specification and the drawings forming a part thereof.

The accompanying drawings show the embodiment of the invention which is deemed preferable, but it will be understood that the drawings are intended for illustrative purposes only and are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawings,

Fig. 1 is a fragmentary plan view of a switch embodying the invention, said switch being illustrated in close proximity to an adjoining switch which is illustrated fragmentarily.

Fig. 2 is a sectional end elevation taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary sectional side elevation taken on line 3—3 of Fig. 1 and shows a detail of the bail mounting means.

Fig. 4 is a fragmentary sectional side elevation taken on the line 4—4 of Fig. 1 and shows certain details of the invention.

Fig. 5 is a sectional end elevation similar to Fig. 2 and shows the bail disposed in several positions it assumes during the process of removing the bail and slides from the switch.

Fig. 6 is a fragmentary sectional side elevation similar to Fig. 3 but shows details of another embodiment of mounting means for one end of the bail.

Fig. 7 is a fragmentary sectional side elevation similar to Fig. 4 with certain parts removed, and shows other details of the embodiment of the invention illustrated in Fig. 6.

Fig. 8 is a fragmentary end elevation similar to Fig. 6 but illustrating the embodiment of the invention shown in Figs. 6 and 7.

The present invention represents an improvement over prior art devices such as illustrated in U. S. Patents 1,754,445 to Sachs dated April 15, 1930, and 2,005,686 to Sachs, dated June 18, 1935, but it will be understood that, while the invention is particularly applicable to switches of the type referred to in the aforementioned patents, it is not necessarily so limited as concerns its broader aspects.

The prior art switches utilize an elongated slide for carrying movable contacts of a bridging nature. Said slides are actuated by a pivoted bail which engages an open ended slot disposed in the slide. When necessary to replace the slide and/or movable contacts carried thereby, the cap or cover member, or members, of the switch is removed and the slide can then be readily removed from the switch since the open ended slot in the slide permits ready operation of the same from the actuating bail.

It has been found that the provision of an open ended slot in said slides has resulted in the breakage of the slide adjacent the slot due to the weakened condition of the slide after the slot is formed therein. Attempts have been made to strengthen this weakened portion by securing reenforcing members to the slide in the vicinity of the weakened area but even these attempts have not been satisfactory and, from a commercial standpoint, the added reenforcing members have increased the cost of the slides.

The present invention includes a slide having a closed slot whereby portions of the slide disposed at opposite ends of the slot serve to produce a slide which is superior to not only the open slotted slides illustrated in the above mentioned patents but also superior to the reenforced slides referred to in the foregoing.

By closing the slot however, the ready removability of the slide from the prior art bail is no longer possible. To render the slide readily removable, notwithstanding the closed slot, the present invention provides mounting means for the bail of such nature that the bail may be readily removed from the casing and the slides which are disposed on the bail are simultaneously removed therewith.

Furthermore, the mounting means for the bail

which render the bail readily and quickly detachable are also of such nature that the bail may be removed from the casing of a switch which is mounted in close proximity or juxtaposition to a number of other switches.

Such removal of the bail and slides is afforded by the provision of a slot in one side of the casing, adjacent which is mounted a split bearing for pivotally supporting one end of the bail. The other end of the bail is pivotally mounted in a bearing provided in the hub of the bail actuating handle which is pivotally mounted in the other side of the casing.

Referring to the drawings, two embodiments of the invention are shown which are respectively illustrated in Figs. 1 through 5 and 6 through 8. The embodiment shown in Figs. 1 through 5 includes a casing 10, preferably formed of sheet metal, and illustrated in Fig. 1 with the ends removed. Upstanding and substantially parallel sides or walls 12 and 14 are provided on the base or back of the casing. Insulating supporting blocks 16 and 18 are secured to the base of the casing by any suitable means such as screws 20. These blocks respectively carry spaced pairs of stationary contacts 22 and 24 which have upstanding portions adapted to be engaged by removable contacts of the switch. The stationary contacts 24 are provided with suitable terminal screws 26 to which either the line or load conduits or circuit wires may be connected.

Slides 28 formed of insulating material are disposed in the casing for movement with respect to the blocks 16 and 18, said blocks each having guideways 30 provided therein to accommodate one side of the slides. A cover or cap plate 32 of insulating material is secured to the blocks 16 and 18 by suitable means such as bolts 34 having nuts 35. The cap plate, on its underside, is provided with guideways 36 for suitably controlling the movement of the sides of the slides opposite to those disposed in guideways 30.

Fuse clips are fixed to the top surface of the cap 32 and, when the cap is secured to the blocks 16 and 18, the fuse clips are electrically connected to stationary contacts 22. While not illustrated, the fuse clips are adapted to receive fuses to respectively connect pairs of spaced stationary contacts 22 in circuit with each other.

Each of the slides 28 are provided with spaced movable contacts 40 which are illustrated as the type which pass through suitable openings provided in the slides and have contact faces disposed on opposite sides of the slides. As illustrated, the movable contacts 40 are actually bridging contacts. However, inasmuch as the present invention is not limited in its application to any particular type of stationary and movable contacts, the particular form of contacts shown in the present drawings and set forth in the claims is to be considered illustrative only and not restrictive since it is conceivable that the closed slot slides and the mounting means for the bail, to be described subsequently, may be applied to other types of stationary and movable contacts in switches having movable contacts which are not of a bridging nature such as illustrated in the present drawings.

For further details of the movable contacts 40 and the manner in which they are mounted in the slides, attention is directed to U. S. Patent 2,168,747 to Christensen dated August 8, 1939.

It will thus be seen that current travelling through the present switch enters at terminals 26, and then passes through the stationary contact 24 secured thereto, one of the movable contacts 40 engaged thereby, the engaged stationary contact 22, the fuse, the other stationary contact 22, the other movable contact 40, the stationary contact 24 engaged thereby, and finally through the other terminal 26. Should an overload occur, the fuse will blow to disrupt the circuit. When the switch is opened, the movable contacts 40 are removed from engagement with the stationary contacts 22 and 24 to disrupt the circuit.

Slides 28 are each provided with a bail receiving slot 42 which extends substantially transversely to the longitudinal axis or dimension of the slides. In order to readily adapt the slides to conventional blocks 16 and 18, an offset portion 44 is provided on the slide adjacent one end of the slot. It will be seen that the portion 44 gives strength to the side of the slide on which it is formed, whereby the slide is not materially weakened by providing the slot 42 therein. The width of slot 42 is such that a small amount of clearance is provided between the walls of the slot and the bail, to be described in the following, when the bail is disposed in the slot to prevent binding between the bail and slot.

A U-shaped slide actuating bail 46 is pivotally mounted between walls 12 and 14 of the casing of the switch, the bail having trunnions 48 and 50 provided at opposite ends thereof and offset from the main or central portion of the bail. The wall 12 is provided with an opening in the form of a slot 52 which extends substantially transversely to the length of the wall 12 and is for purposes to be described. The end of the slot 52 adjacent the base of the casing normally accommodates the trunnion 48 of the bail but this does not provide the bearing means for said trunnion in the preferred embodiment of the invention.

Wall 12 supports a split bearing 54 having a fixed and main bearing portion 56 comprising an open-sided bearing and a removable portion or member 58 which normally retains trunnion 48 in the open-sided bearing 56. The fixed portion 56 is preferably fixedly secured to the wall by suitable means such as screws 60. Said fixed portion is also provided with ears which form stops 62 and 63 for limiting the pivotal movement of the bail. The removable portion 58 of the split bearing is detachably secured to the wall 12 by readily removable screws 64. It will be observed that the removable portion 58, as well as the fixed portion 56, is disposed on the interior of the casing in the preferred embodiment and the removable portion normally closes the opening formed by the slot 52 whereby access to the interior of the casing through said slot is normally prevented. To afford proper alignment between the adjoining ends of portions 56 and 58 of the split bearing, the removable portion is provided with a recess 66 which accommodates one end of the fixed portion 56 as is clearly illustrated in Fig. 3.

In Figs. 1, 2 and 3, the bail is shown in the "off" position of the switch and, to insure that the movable contacts of the switch will not be moved accidentally to the "on" position, a leaf spring 68 is riveted or otherwise secured at one end to the base of the casing and the opposite end of the spring is suitably formed to engage the bail 46 to releasably hold the bail in "off" position.

The opposite trunnion 50 of the bail is pivotally received in a bearing aperture 70 provided in the pivotal mounting means for the handle 72. In the preferred embodiment of the invention, the bear-

ing aperture does not extend through to the exterior side of the hub portion 74 of the handle.

The handle 72 is pivotally mounted in the wall 14 of the casing by means similar to those illustrated and described in detail in U. S. Patent 1,986,221 to Sachs dated January 1, 1935. The essential elements of such mounting means will be herein described to afford an understanding of the principles thereof but for a further description, attention is directed to said patent.

A bearing aperture is provided in wall 14, said aperture having a diameter less than the diameter of the hub 74 of the handle. Said aperture rotatably supports a filler member 76, see Fig. 4, and said filler member is made of sufficient length to project into the interior of the casing sufficiently to provide a surface on which an intermediate member 78 is rotatably supported. Disposed against the inner side of filler member 76 is an operating member 80 which is of sufficient length to normally prevent the removal of the intermediate member 78 from the filler member 76. Hub 74, filler member 76, and operating member 80 are secured together by suitable means such as bolts 82 provided with conventional nuts whereby said secured members move and function under normal conditions as a unit. As is clearly shown in Fig. 1, the bearing 70 preferably extends through the filler member 76 and operating member 80.

Said intermediate member 78 is provided with a plurality of inward bent integral ears 84 and 86 which are adapted to engage and actuate the bail as will be presently explained. A lug 88 radially projects from the outer edge of intermediate member 78. An angular member 90 is pivoted to the wall 14 and carries a sleeve 92 which slidably receives a bar 94 that is pivoted at one end to lug 88. The bar 94 is provided with a pair of ears 96. A helical spring 98 is disposed around sleeve 92 and bar 94 and the opposite ends of the spring are respectively disposed against one face of angular member 90 and the ears 96 of bar 94.

Assuming the switch to be in "open" position, shown in Fig. 1, when the handle 72 is moved upward, with respect to Fig. 1, the operating member 80 is moved therewith and will engage the ear 84. Continued movement of operating member 80 will move the intermediate member 78 anti-clockwise, as viewed in Fig. 4, and, in so doing, will compress the spring 98 until such time as the pivot for the end of bar 94 moves past dead center. Following this, the spring 98 will expand automatically and quickly move the ear 86 of the intermediate member into engagement with the offset portion of the bail. Following this, continued movement of the intermediate member by the spring 98 will move the slide and removable contacts into "closed" position to establish a circuit through the switch.

When the switch is "on," movement of the handle in clockwise direction with respect to Fig. 4, will cause operating member 80 to first engage ear 86 of the intermediate member and continued movement of the handle will compress the spring 98 until it moves past dead center, following which, the spring will move the ear 84 of the intermediate member into engagement with the offset portion of the bail to move the slide and movable contacts to "open" position.

Stops 100 and 102 are provided on the exterior of wall 14 to limit the movement of the handle. When the handle is disposed against stop 100, the ear 86 is disposed against the adjacent end of operating member 80 to oppose the force of spring 98 but, under these conditions the bail may be slightly moved from engagement with the ear 86 due to a small amount of clearance which is provided before the opposite end of the bail contacts stop 62. Under these conditions, the slides are in "closed" position.

When the slides are in "open" position, one end of the bail is in abutting relation with stop 62 and the other end of the bail is engaged by ear 84 of the intermediate member to oppose the force of the spring 98 as shown in Fig. 1.

When it is desired to replace one or more of the slides, the removable portion 58 of the split bearing is removed to expose the slot 52. The handle is then moved substantially to the position shown in Fig. 4, compressing the spring 98, and also moving the ear 84 to the position shown in Fig. 4. The bail may then be manually moved until the offset portions are substantially in the position shown in Fig. 4, in which position the offset portion adjacent the slot 52 is substantially parallel thereto and said offset portion may be raised until it is in position to pass through the slot a short distance in a direction substantially longitudinal of the bail, as shown in Fig. 5. The amount of such longitudinal movement need only be such as to free the opposite end of the bail from the bearing 70 in the handle mounting means, following which, said latter end of the bail may be raised to the position shown in dot and dash lines in Fig. 5, simultaneously carrying the slides therewith as also illustrated in dot and dash lines in said figure. Continued movement of the bail and slides upward and slightly to the right, as viewed in Fig. 5, will serve to completely remove the bail and slides from the casing.

After the bail and slides have been completely removed, any slide which is to be replaced may be taken off of the bail and a new one placed thereon, following which, the bail and slides may be replaced in the switch in a manner reversed to that in which they were removed. After the bail and slides have been placed in proper position in the casing and blocks, the cap 32 may be replaced in operative position on the blocks 16 and 18 and secured thereto. The removable portion 58 of the split bearing is then secured to the wall 12 and the switch is once more in condition for operation.

One advantage inherent to the above described construction resides in the fact that the bail and slides may be expeditiously removed from the switch casing even though the casing is mounted in close juxtaposition to one or more adjoining switches as shown particularly in Fig. 5. This is due to the fact that, when removing the bail, it need only be moved in a lateral direction through the slot 52 and longitudinally of the bail a relatively short distance which is sufficient to remove the opposite end of the bail from the bearing 70.

The embodiment of the invention illustrated in Figs. 1 through 5 is preferably applicable to switches having capacities up to and including about 100 amperes. Switches having capacities in this range employ a spring 98 which is substantially weaker than springs provided in switches having capacities greater than 100 amperes and for example, capacities of 200 to 1200 amperes. The foregoing capacities are to be considered as illustrative rather than restrictive and the division between the ranges given may vary without departing from the spirit of this invention.

The embodiment of the invention illustrated in

Figs. 6 through 8 is primarily designed to use springs which are considerably stronger than the spring 98 illustrated in Figs. 1 through 5. When removing the bail from the embodiment shown in Figs. 1 through 5, the handle, as stated above, is moved substantially to the position shown in Fig. 4, against the force of the spring 98 which is compressed by such movement. The bail is removed in the manner described by holding the handle manually against the force of the spring and the associated parts are in the relative positions shown in Fig. 4 while the bail is being removed. However, in the embodiment shown in Figs. 6 through 8, the spring 198 is of such strength that it would be difficult, if at all possible, to manually hold the handle 172 in a position corresponding to that in which the handle 72 is shown in Fig. 4. Accordingly, somewhat different mounting mechanism is provided for the bail in the embodiment shown in Figs. 6 through 8 which will now be described with reference to said figures.

Wall 114 of the casing is provided with an obliquely disposed slot 152 that is normally covered by a removable portion 158 of a split bearing which includes a stationary or fixed main portion comprising an open sided bearing 156. Said bearing pivotally supports trunnion 148 of the bail 146. These portions of the bearing are similarly designed and have functions corresponding to portions 56 and 58 of the split bearing shown in Fig. 3. Stops 162 and 163 are also fixed to the wall 114 to limit the movement of bail 146. A leaf spring 168 has a corresponding function to spring 68.

The opposite end of the bail 146 has a trunnion 150 pivotally supported in a bearing provided in the mounting means for the handle 172, which bearing is similar to bearing 70 of Figs. 1 and 4. An intermediate member 178 is pivotally mounted on means secured to the handle 172 which means are similar to those shown particularly in Fig. 4 for the intermediate member 78.

The intermediate member 178 has a lug 188 which transmits the force of spring 198 to the intermediate member. Inward directed ears 184 and 186 are formed integrally with the intermediate member and are adapted to engage the bail 146 at different times during the opening and closing of the switch. The intermediate member is also provided with an additional radially extending lug 189 which is adapted to abut stop 191 secured to the wall 116 when the switch is "open." Engagement of the lug 189 against the stop 191 arrests the movement of the intermediate member 178 and opposes the force of the spring 198. The ear 184, prior to the co-engagement of lug 189 and stop 191, has engaged the bail 146 during movement of the bail to "open" position. After the switch has reached "open" position, the position of the stop 191 on wall 116 and stop 162 on wall 114 is such that the bail may be manually moved slightly out of engagement with ear 184 of the intermediate member, just prior to the engagement of the bail with stop 162. In other words, after the movement of the intermediate member 178 has been arrested by stop 191, a small amount of play or leeway is afforded the bail 146 between limits of movement fixed by ear 184 and stop 162. Said play or leeway permits ready manipulation of the bail after the removable portion 158 of the split bearing has been removed whereby the end of the bail having trunnion 148 may be moved in a direction parallel to the slot 152 to permit the adjoining offset portion of the bail to be moved through the slot in a direction substantially longitudinal of the bail, said path of movement being somewhat similar to the arrow shown in Fig. 8. After the bail has been moved through the slot 152 sufficiently to remove the trunnion 150 from its corresponding bearing, the end of the bail having trunnion 150 may be moved upwardly with respect to Fig. 8, carrying the slides 128 therewith, following which the bail and slides may be completely removed from the casing in a manner similar to that described with respect to Fig. 5.

Inasmuch as the majority of the elements of the embodiments shown in Figs. 6 through 8 correspond to similar elements in the embodiment shown in Figs. 1 through 5, only sufficient elements of the former embodiment have been described to render the same understandable. The identity of most of the corresponding elements in the two embodiments is obvious and, where certain elements of this second embodiment have not been described in detail attention is directed to the description of the corresponding elements in the first embodiment.

The essential difference between the embodiment shown in Figs. 1 through 5 and 6 through 8 comprises the fact that, when removing the bail, the bail must be moved from its oblique, "open" position before it can be removed from the embodiment shown in Figs. 1 through 5 whereas, in the embodiment shown in Figs. 6 through 8, the bail may be removed without moving the same from its oblique, "open" position. In both embodiments, the bail need only be removed through the slot in the wall of the casing a sufficient distance to free the opposite end of the bail from the bearing provided in the mounting means for the handle.

It will thus be seen that the present invention provides a slide having a closed bail receiving slot whereby the normal life of the slide will be considerably lengthened and the possibility of breakage of the slide in the vicinity of the slot will be reduced to a minimum. Notwithstanding the fact that the slide is provided with a closed bail receiving slot the slides may be readily removed from and replaced in the guideways provided for the same by mounting means provided for the bail, said mounting means permitting quick removal of the bail from the casing due to the provision of a slot in the side of the casing and a split bearing having a readily and quickly removable portion which renders the slot accessible for passing the bail therethrough during the removal operation.

In the foregoing and in the claims, the term "casing" is not to be construed as limited to an enclosure. The construction for mounting the bail would function equally as well if the switch were mounted on an open frame or bracket construction in which side members of some sort were provided with bearings of the type described in this specification and illustrated in the accompanying drawings. Such a mounting frame or bracket may but need not necessarily be mounted in a protective cabinet enclosing the same. Similarly, the term "handle" is to be regarded in the broader sense of being an operating member for moving the bail and, while the operating member may be a manually movable means as illustrated, it is not to be so restricted and it is to be understood that the operating means for the bail may include linkage or other equivalent means for rendering the operating means remote-

ly controllable and such operating means may also be moved by such means as an electromagnet, hydraulic cylinder, or other equivalent power means. Said power means may be automatically operated.

While the invention has been illustrated and described in its preferred embodiment and has included certain details, it should be understood that the invention is not to be limited to the precise details herein illustrated and described since the same may be carried out in other ways, falling within the scope of the invention as claimed.

What we claim is:

1. An electric switch comprising in combination, a casing, a plurality of stationary contacts mounted therein, a movable contact, a slide carrying said movable contact and having a closed slot therein, said slide being slidably mounted in said casing for moving said movable contact into and out of contact with said stationary contacts, bearings respectively mounted adjacent opposed walls of said casing, an actuating member extending between and pivotally mounted adjacent its ends in said bearings, said actuating member also passing through said slot in said slide, a handle pivotally mounted on one wall of said casing and operatively connected with said actuating member to pivotally move the same, said actuating member being disconnectible from said handle, and means associated with said casing and one of said bearings and adapted to permit complete removal of said actuating member from said switch by moving said actuating member in a direction substantially longitudinally of said actuating member a distance less than the length of the portion of the actuating member normally disposed between said bearings and without distorting said casing or removing said bearings from said casing.

2. An electric switch comprising in combination, a casing, a plurality of stationary contacts mounted therein, a movable contact, a slide carrying said movable contact and removably mounted in said casing for substantially rectilinear reciprocation therein, said slide being provided intermediate the ends thereof with a closed slot, an open-sided bearing and another bearing respectively mounted in juxtaposition to opposed walls of said casing, a member detachably secured in position to close the open side of said bearing, and a bail pivotally mounted in and extending between said bearings and also extending freely through said closed slot of said slide whereby said bail is adapted upon movement to reciprocate said slide and move said movable contact to and from electrical engagement with said stationary contacts, said casing being provided with means adapted to permit after previous removal of said member from its bearing closing position ready and substantially simultaneous removal from said casing of the movable contact and slide and the bail extending therethrough without distortion of said casing and also without removal of said bearings from said casing.

3. An electric switch comprising in combination, a casing having an elongated opening in one wall thereof, a plurality of stationary contacts mounted in said casing, a movable contact, a slide carrying said movable contact and removably-mounted in said casing for substantially rectilinear reciprocation therein, said slide being provided intermediate the ends thereof with a closed slot, an open-sided bearing and another bearing respectively mounted in juxtaposition to opposed walls of said casing, a member detachably secured in position to close the open side of said bearing, and a bail pivotally mounted in and extending between said bearings and also extending freely through said closed slot in said slide whereby said bail is adapted upon movement to reciprocate said slide and move said movable contact to and from electrical engagement with said stationary contacts, said movable contact and slide and the bail extending therethrough being readily and substantially simultaneously removable from said casing by partially moving said bail in one direction through said elongated opening after previous removal of said member from said open-sided bearing and then moving said bail in the opposite direction through said elongated opening to completely remove said bail and also the movable contact and slide from said casing without distortion of said casing and without removal of said bearings from said casing.

4. An electric switch comprising in combination, a casing having an elongated opening in one wall thereof, a plurality of stationary contacts mounted in said casing, a movable contact, a slide carrying said movable contact and removably mounted in said casing for substantially rectilinear reciprocation therein, said slide being provided intermediate the ends thereof with a closed slot, an open-sided bearing and another bearing respectively mounted in juxtaposition to opposed walls of said casing, a member detachably secured in position to close the open side of said bearing and also close the elongated opening when so positioned, and a bail pivotally mounted in and extending between said bearings and also extending freely through said closed slot in said slide whereby said bail is adapted upon movement to reciprocate said slide and move said movable contact to and from electrical engagement with said stationary contacts, said movable contact and slide and the bail extending therethrough being readily and substantially simultaneously removable from said casing by partially moving said bail in one direction through said elongated opening after previous removal of said member from said open-sided bearing and elongated opening and then moving said bail in the opposite direction through said elongated opening to completely remove said bail and also the movable contact and slide from said casing without distortion of said casing and without removal of said bearings from said casing.

5. An electric switch comprising in combination, a casing having an elongated opening in one wall thereof, a plurality of stationary contacts mounted in said casing, a movable contact, a slide carrying said movable contact and removably mounted in said casing for substantially rectilinear reciprocation therein, said slide being provided intermediate the ends thereof with a closed slot, an open-sided bearing and another bearing respectively mounted in juxtaposition to the inner surfaces of opposed walls of said casing, a member detachably secured in position to close the open side of said bearing and also close the elongated opening when so positioned, and a bail pivotally mounted in and extending between said bearings and also extending freely through said closed slot in said slide whereby said bail is adapted upon movement to reciprocate said slide and move said movable contact to and from electrical engagement with said stationary contacts, said movable contact and slide and the bail extending therethrough being readily and substantially simultaneously removable from said casing

by partially moving said bail in one direction through said elongated opening after previous removal of said member from said open-sided bearing and elongated opening and then moving said bail in the opposite direction through said elongated opening to completely remove said bail and also the movable contact and slide from said casing without distortion of said casing and without removal of said bearings from said casing.

6. An electric switch comprising in combination, a casing having an elongated opening in one wall thereof, a plurality of stationary contacts mounted in said casing, a movable contact, a slide carrying said movable contact and removably mounted in said casing for substantially rectilinear reciprocation therein, said slide being provided intermediate the ends thereof with a closed slot, an open-sided bearing mounted in juxtaposition to said elongated opening in said wall, a handle pivotally carried by the wall of the casing opposed to said first mentioned wall, another bearing juxtaposed to said handle, said other bearing being normally non-readily removable from said casing, a member normally and detachably secured in position to close the open side of said bearing and also cover said elongated opening when so positioned, and a bail pivotally mounted in and extending between said bearings and also extending freely through said closed slot of said slide whereby said bail is adapted upon movement to reciprocate said slide and move said movable contact to and from electrical engagement with said stationary contacts, said movable contact and slide and the bail extending therethrough all being readily and substantially simultaneously removable from said casing by first moving said bail in one direction through said elongated opening a distance less than that between said bearings to free one end of the bail from said other bearing after previous removal of said member from said open-sided bearing and elongated opening in the casing wall and then moving said bail in a direction opposite to said first mentioned direction to effect complete removal of the bail and also the slide and movable contact carried thereby from the casing.

7. A switch member adapted for rectilinear movement between stationary switch contacts in a switch and comprising in combination, an elongated planar body having a substantially uniform width, a protuberance projecting from one edge of said body and extending along said edge a relatively short distance of the entire length of the body, said body having a closed slot extending therethrough and transversely to the longitudinal axis thereof a distance equal to at least half of said uniform width of the body and located in the area of the body adjacent said protuberance, and a plurality of contact members respectively carried by said body on opposite sides of said slot.

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