

June 3, 1930.

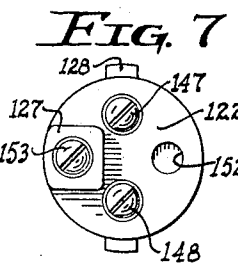
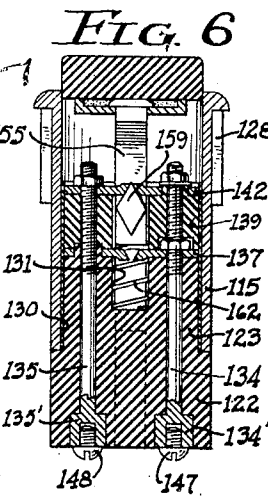
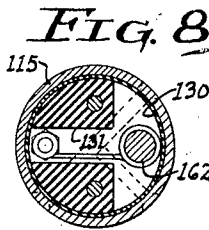
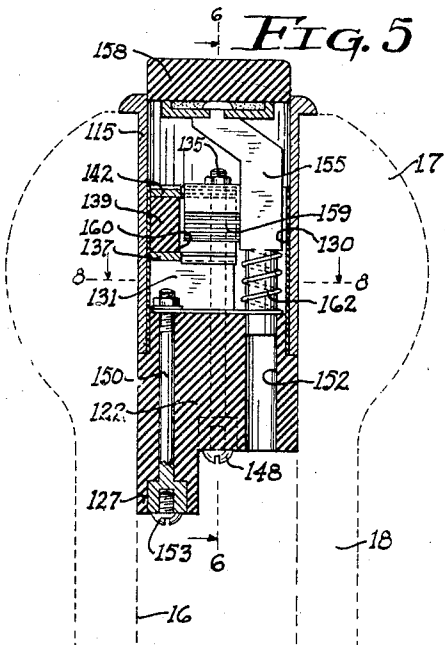
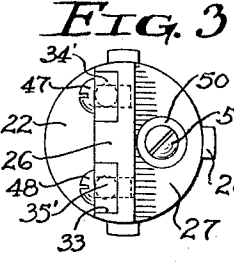
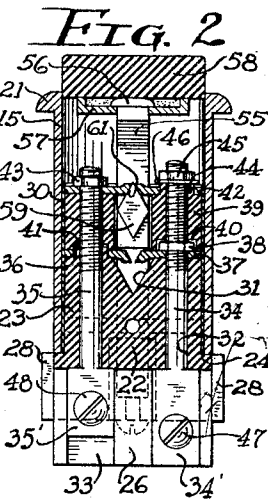
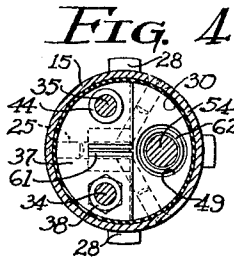
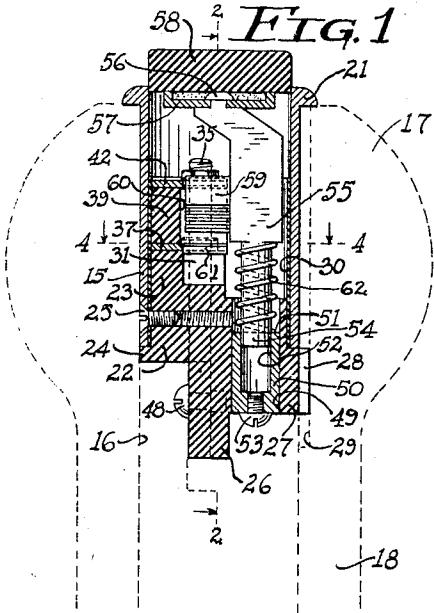
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1,761,867

PUSH BUTTON

Filed April 4, 1928

2 Sheets-Sheet 1



WITNESSES

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FIG. 9

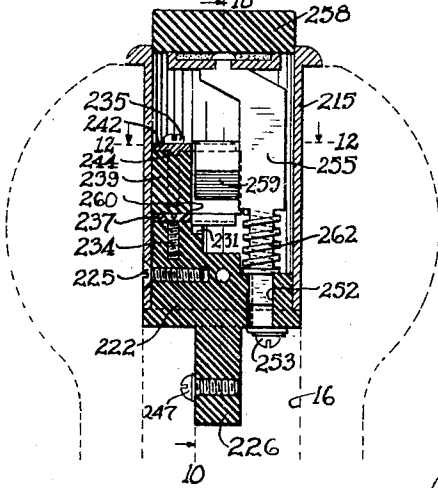


FIG. 10

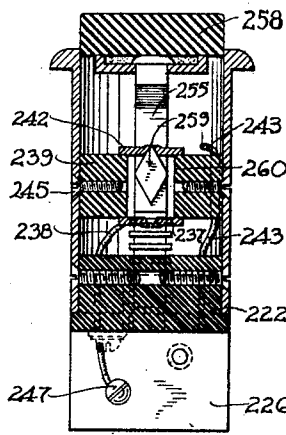


FIG. 12

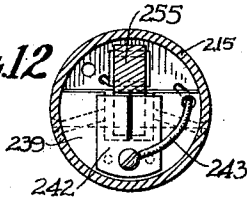


FIG. 11

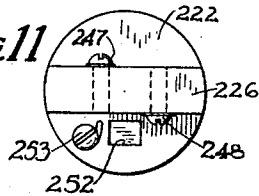
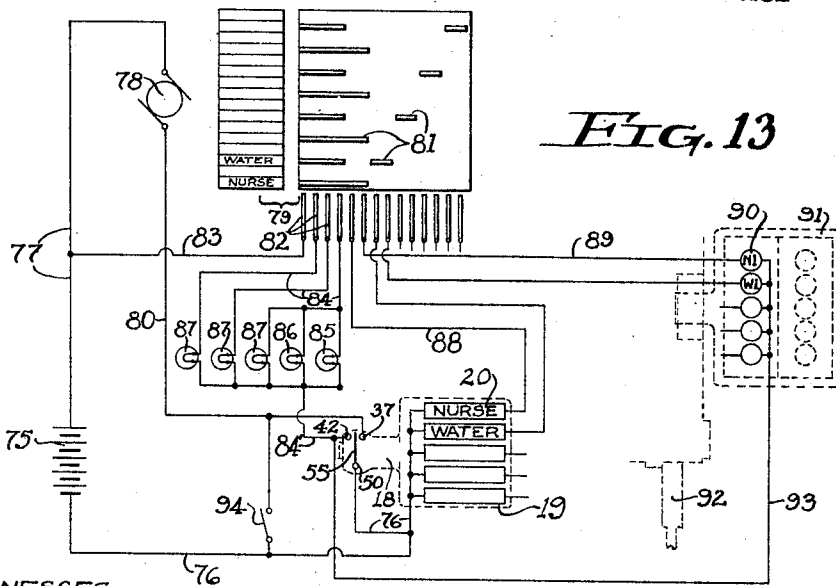


FIG. 13



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# UNITED STATES PATENT OFFICE

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## PUSH BUTTON

Application filed April 4, 1923. Serial No. 287,454.

The invention relates to circuit-closers and more particularly to circuit-closers of the push-button type.

An object of the invention is to provide a push-button for use in the indicator-controlling circuits of a hospital signalling system, and of such construction that the actuation of the push-button will effect the operation of switching means movable to successive switching positions and simultaneously disable an indicating means connected in circuit with the switching means, and that the release of the push-button when the switching means reaches its desired switching position will effect the operation of the indicating means.

Another object of the invention is to provide a push-button for this purpose including a spring-urged contact-establishing member alternatively engageable with different contacts, and of such character as to facilitate and simplify manufacture and assembly.

A further object is to provide a push-button including a plurality of stationary contacts assembled in insulated relation by co-operating attaching members which also form separate terminals for the contacts.

A further object of the invention is to perfect details of construction generally.

The invention further consists in the several features hereinafter set forth and more particularly defined by the annexed claims.

In the accompanying drawings, Fig. 1 is a longitudinal sectional view of a push-button embodying the invention;

Fig. 2 is a similar view taken on the line 2—2 of Fig. 1;

Fig. 3 is an end view of the push-button of Fig. 1;

Fig. 4 is a transverse sectional view of the push-button of Fig. 1 taken on the line 4—4 of Fig. 1;

Fig. 5 is a longitudinal sectional view of another form of push-button embodying the invention;

Fig. 6 is a similar view taken on the line 6—6 of Fig. 5;

Fig. 7 is an end view of the push-button of Fig. 5;

Fig. 8 is a transverse sectional view of the push-button of Fig. 5 taken on the line 8—8 of Fig. 5;

Fig. 9 is a longitudinal sectional view of a third form of push-button embodying the invention;

Fig. 10 is a similar view taken on the line 10—10 of Fig. 9;

Fig. 11 is an end view of the push-button of Fig. 9;

Fig. 12 is a transverse sectional view of the push-button of Fig. 9 taken on the line 12—12 of Fig. 9; and

Fig. 13 is a schematic wiring diagram of a signalling system including the push-button of this invention.

In that embodiment of the invention shown in Fig. 1, the numeral 15 designates a cylindrical tubular metal casing, which is adapted to fit closely within a bore 16 formed axially through the pear-shaped end portion 17 of a push-button holder 18, which latter is illustrated in dotted outline in Fig. 13 and includes a flat indicating portion 19 containing a plurality of indicating lamps 20. The push-button holder 18 may be of the general type disclosed in United States Patent No. 1,367,583, issued to me on February 8, 1921. The cylindrical casing 15 is secured within the push-button holder 18 in any suitable manner, as by means of a tight fit in the bore 16, and is provided with a flange 21 at its outer end engaging the end face of the holder.

An insulating member 22 has a generally circular portion 23 disposed within the inner end portion of the cylindrical casing 15 and is provided with a flanged end 24 which abuts against the inner end of the casing. The insulating member 22 is held in the casing 15 in any suitable manner, as by means of several screws 25 passing through openings in the casing and threaded radially into the portion 23 of the insulating member. The insulating member 22 is provided with a flange 26 at its inner or lower end extending substantially diametrically of the insulating member, and a boss 27 is formed on the insulating member at one side of the flange 26. The boss 27 has an arcuate exterior fitting

within the bore 16 in the push-button holder and is provided with longitudinally-extending key projections 28 which fit within keyways 29 formed in the bore 16 to prevent relative rotation of the insulating member and its attached casing 15 with respect to the push-button holder. The cylindrical portion 23 of the insulating member 22 within the casing 15 is slightly smaller in diameter than the interior of the casing and is surrounded by an insulating sleeve 30, which projects beyond the forward end of the insulating member towards the outer end of the casing. One side portion of the insulating member 22 within the casing 15 is offset to provide a forwardly or upwardly projecting portion having a flat face lying in a plane normal to the axis of the casing, and a V-shaped notch 31 is formed at an intermediate portion of this face adjacent the inner side of the offset portion, the offset portion being disposed on the opposite side of the axis of the insulating member from the boss 27. A pair of longitudinally-extending bores 32 are formed through the insulating member 22 on opposite sides of the notch 31 and terminate at their lower ends in channels 33 which open at the rearward or lower ends of the flange 26 and at the side of the flange opposite the boss 27. Bolts 34 and 35 are placed in respective bores 32 and have flat rectangular heads 34' and 35' respectively, which fit within the channels 33 in the flange 26 and abut against the flanged portion 24 of the insulating member. The threaded upper or forward ends of the bolts 34 and 35 project beyond the forward or upper notched face of the insulating member 22, and the bolt 35 is surrounded by a boss 36 formed on the forward or upper end of the insulating member 22.

A segmentally-shaped contact member 37 of flat resilient metal is apertured to receive the bolts 34 and 35 and is disposed against the upper or forward end of the insulating member within the casing, against which face the contact member is held at one side by a nut 38 threaded on the bolt 34 and also forming an electrical connection between the bolt 34 and contact member. At the other side of the insulating member 22 the apertured contact member 37 fits about the boss 36 to properly position the contact member and to insulate it from the bolt 35.

A U-shaped insulating member 39 of segmental contour has an arcuate exterior fitting within the insulating sleeve 30 and is apertured to receive therethrough the bolts 34 and 35, the lower or rearward face of the insulating member 39 being provided with recesses 40 and 41 to receive and provide clearance for the nut 38 and boss 36.

A second segmentally-shaped contact member 42, which may be identical with the contact member 37, surmounts the insulating

member 39 and is apertured to receive therethrough the bolts 34 and 35. The contact member 42 is held against the insulating member 39 at one side by a nut 43 threaded onto the bolt 35, which nut also forms an electrical connection between the bolt 35 and the contact member 42. At the other side of the insulating member 39 the apertured contact member 42 fits about a boss 44 on the insulating member to properly position the contact member and to insulate it from the bolt 34. A nut 45 on the upper and forward end of the bolt 34 bears on an insulating washer 46 which engages the contact member 42 to clamp the contact member into position.

By means of the construction above described, the contact members 37 and 42 are accurately and conveniently assembled and firmly held in spaced relation within the casing 15, and are also connected in electrical contact with the bolts 34 and 35 respectively. A terminal screw 47 is threaded laterally into the head of the bolt 34, and another terminal screw 48 is threaded laterally into the head of the bolt 35, suitable clearance spaces being left within the flange 26 to receive the ends of the screws.

A bore 49 is formed in the insulating member 22 to extend in parallel relation to the axis and passes through the boss 27. A metal bushing 50 is pressed into the bore 49 and terminates short of the upper or forward end of the bore to form a shoulder 51 within the bore. A bore 52 is formed co-axially in the upper or forward portions of the bushing 50, and a terminal screw 53 is threaded into the rearward or lower end of the bushing.

The bore 52 in the bushing 50 slidably receives therein the reduced cylindrical end portion 54 of a plunger stem 55. The major portion of the plunger stem 55 is arranged in parallel relation to the axis of the casing 15 and lies adjacent the wall of the casing. The outer or forward end of the plunger stem 55 has a portion disposed at the axis of the casing 15 and is provided with a reduced projection 56 which is riveted centrally of the bottom portion of a shallow metal cup 57. A circular button 58, preferably of insulating material, is cemented or otherwise secured to the cup 57 and slidably fits within the outer end portion of the cylindrical casing 15.

The plunger stem 55 is provided with a laterally disposed projection 59 of diamond-shaped cross-section extending into a channel or slot 60 formed centrally through the insulating member 39 in a direction parallel to the axis of the casing 15. The contact members 37 and 42 close opposite ends of the channel 60 and each is provided with a slit 61 extending diametrically with respect to the casing 15, the slits in the contact members being arranged to lie in the same plane.

A V-shaped groove is formed on the inner side of each contact member along the slit 61 to provide V-shaped contact surfaces with which the opposite knife-edges of the diamond-shaped contact projection 59 are alternatively engageable. The slitting of the contact members provides a degree of resiliency adjacent the contact surfaces in order to insure good electrical contact with the contact projection 59 on the plunger stem.

A coiled spring 62 surrounds the reduced portion 54 of the plunger stem to enter at one end into the bore 49 formed in the insulating member 22 where the spring engages the end of the metal bushing 50, and the other end of the spring engages a shoulder formed on the plunger stem to urge the plunger outwardly and cause the diamond-shaped projection 59 to firmly engage the slit portion of the contact member 42. The spring 62 also serves to establish an electrical connection between the plunger stem 55 and the metal bushing 50, which latter is provided with the terminal screw 53. The depression of the button 58 by the finger will move the contact projection 59 within the channel 60 against the action of the coiled spring 62 and effect the engagement of the contact projection with the slit portions of the contact member 37.

In assembling the push-button, the metal bushing 50 is pressed into the bore 49 of the insulating member 22 and is equipped with the terminal screw 53. As an alternative, the bushing may obviously be molded in place in the insulating member. The bolts 34 and 35 are then inserted into their respective openings in the insulating member with the flat elongated heads of these bolts lying in the channels 33 in the flange 26. It is obvious, however, that as an alternative, these bolts may be molded directly into the insulating member. The apertured contact member 37 is then passed over the threaded ends of the bolts 34 and 35, and the nut 38 is threaded onto the bolt 34 to hold this contact member in place. The insulating member 39 is then mounted in place on the bolts 34 and 35 to engage the contact member 37, and the insulating sleeve 30 is fitted over the insulating member 22. The coiled spring 62 is then inserted into the bore 49 of the insulating member and the reduced shank 54 of the plunger stem is passed through the spring to enter the bore 52 in the bushing 50, the contact projection 59 on the plunger stem simultaneously entering the channel 60 in the insulating member 39. The contact member 42 is then passed over the bolts 34 and 35, and the nuts 43 and 44 are threaded onto the bolts to effect the engagement of the contact member with the insulating member 39 against the action of the coiled spring 62. The spring 62 is thereby placed under compression for normally retaining the contact projection 59 against the contact member 42.

The resultant assembly is then introduced into the tubular casing 15 from the rear end thereof and the screws 25 are mounted in place to secure the insulating member 22 within the casing.

In the schematic wiring diagram of Fig. 13, a battery 75 or other source of current is connected by a conductor 76 to the metal bushing 50 receiving the plunger stem 55 of the push button, the conductor 76 also forming a common return for the lamps 20 in the push-button holder. The other terminal of the battery 75 is connected by a conductor 77 leading to one terminal of an electrical motor 78 which drives a rotary annunciator drum switch 79, and the other terminal of the motor 78 is connected by a conductor 80 leading to that bolt on the push-button which is electrically connected to the contact member 37.

The depression of the push-button by the patient effects the engagement of the contact 59 of the plunger stem 55 with the contact member 37 and serves to establish a motor circuit as follows: From one terminal of the battery 75, through the conductor 77, electric motor 78, conductor 80, contact member 37 in the push-button, plunger contact 55, conductor 76 and back to the battery, thus operating the motor 78 to revolve the rotor of the annunciator drum switch 79.

The rotor of the drum switch includes contact ribs 81 which engage with contactors 82 during the rotation of the rotor to establish indicating circuits as hereinafter described. A conductor 83 connects one terminal of the battery 75 with one of the contactors 82, and others of the contactors are connected by conductors 84 leading to indicating lamps 85, 86 and 87 placed in various parts of the building, one of these lamps being placed at the bedside of the patient using the push-button holder. These lamps are connected in common with a conductor 84' connected to the contact member 42 of the push-button. The remaining contactors 82 are arranged in pairs, one of each pair being connected by a conductor 88 leading to a respective lamp 20 in the push-button holder 18, and the other of each pair being connected by a conductor 89 leading to a corresponding lamp 90 in an indicator 91. The indicator 91 is placed above the door 92 of the room occupied by the patient to be visible along the corridor on which the door opens. The lamps 90 in the over-door indicator are connected by a common conductor 93 which leads to that bolt of the push-button holder to which the contact member 42 is connected.

The motor 78 will continue to rotate as long as the push-button is held depressed by the patient, and in its rotation, the annunciator drum switch 79 is revolved, preferably in an intermittent manner, to successive switching

positions. In these switching positions successive circuits are established including the conductors 88 and indicating lamps 20 in the push-button holder 18, causing the different lamps 20 to be successively illuminated, and preferably in an order in which a "Nurse" indication is given alternately with every other indication. The successive illumination of the lamps 20 in the push-button holder indicates to the patient the corresponding switching position of the annunciator drum switch, and when the desired switching position is reached, the push-button is released which stops the motor 78 and causes the drum switch to remain in its selected switching position. The release of the push-button effects the engagement of the plunger stem 55 with the contact member 42, thus establishing a circuit including the battery 75, conductors 77 and 83, connected contactor 82, contact ribs 81, others of the contactors 82 connected to the conductors 84, through these conductors and the lamps 85, 86 and 87, conductor 84' and connected contact member 42 in the push-button, plunger 55, and conductor 76 back to the battery. Lamps 85, 86 and 87 will then become illuminated, one of these lamps being at the annunciator and another being in the same room with the push-button holder. At the same time another circuit will be established including that contactor 82 which is one of the pair of contactors connected to the active conductor 88, through the conductor 89, lamp 90 in the over-door indicator effecting the same indication as that present in the push-button holder, conductor 93, contact member 42 in the push-button, plunger 55, and conductor 76 back to the battery, thus illuminating that lamp 90 in the over-door indicator which corresponds to the lighted lamp 20 in the push-button holder. The nurse on duty in the corridor will observe the lighted indicating lamp 90 in the over-door indicator and thereupon attend to the wants of the patient. When the nurse responds to the signal she depresses another push-button 94 placed in the room near the patient's bedside, which operation serves to momentarily establish a motor circuit causing the motor 78 to operate and return the annunciator drum switch to its succeeding blank position, where no indicating circuits are closed.

By reason of the back contact 42 in the push-button, it will be seen that all lamp circuits including those in the over-door indicator, and excepting only those including the lamps 20 in the push-button holder, are broken as long as the push-button is held depressed, so that all indicating lamps with the exception of those in the push-button holder will remain dark until the patient releases the push-button upon the arrival of the desired signal in the succession. In this way, unnecessary and undesirable flashing of light

in the corridor, on the annunciator board and elsewhere, will be avoided.

In the modified form of push-button shown in Figs. 5 to 8 inclusive, a flanged cylindrical casing 115 is generally similar to the casing 15 of the Fig. 1 device and includes key-projections 128 corresponding in function to the projections 28 on the insulating member 22 of the Fig. 1 device. An insulating member 122, generally similar to the insulating member 22 of the Fig. 1 device, is introduced into the casing 115 and is secured therein in a similar manner. An insulating sleeve 130, similar to the insulating sleeve 30, of the Fig. 1 device, is interposed between the insulating member and the casing. The portion of the insulating member 122 projecting into the casing includes an offset portion which is divided centrally by a radially-extending slot 131. A pair of spaced parallel bolts 134 and 135 generally similar in character and disposition to the bolts 34 and 35 of the Fig. 1 device, extend through the insulating member on opposite sides of the slot 131 and include head portions 134' and 135', respectively, which fit within recesses in the insulating member. Terminal screws 147 and 148 are threaded axially into these bolt heads. The upper threaded portions of the bolts 134 and 135 pass through contact members 137 and 142 and an interposed insulating member 139. These latter parts are generally similar to the parts 37, 42 and 39 of the Fig. 1 device, and are assembled on the bolts 134 and 135 in a substantially identical manner.

A bore 152, corresponding in function and position to the bore 52 of the Fig. 1 device, is formed in the insulating member 122 and slidably receives therein the reduced cylindrical end portion of a plunger stem 155 which is substantially identical in construction and disposition with the plunger stem 55 of the Fig. 1 device. The plunger stem 155 has secured thereto a circular button 158 which may be identical in character and disposition with the button 58 of the Fig. 1 device.

The plunger stem 155 is provided with a contact projection 159 of diamond-shaped cross-section extending into a channel or slot 160 formed in the insulating member 139 to be placed in alternative engagement with the contact members 137 and 142 in a relation similar to that in the Fig. 1 device.

A coiled spring 162 similar in function to the coiled spring 62 of the Fig. 1 device surrounds the reduced portion of the plunger stem and includes a part extending into the slot 131 where it is secured to the threaded end portion of a bolt 150 which extends through the insulating member 122 near the outer edge thereof in parallel relation to the axis of the insulating member. The outer end of the insulating bolt 150 extends through a boss 127 projecting from the end of the insulating member to provide ample separation

between the head of the bolt 150 and the terminal screws 147 and 148 of the bolts 134 and 135. The head of the bolt 150 is disposed within a recess in the end of the boss 127 and is provided with a terminal screw 153.

In assembling the push-button, the sequence of operation is generally the same as that employed in the assembly of the push-button of Fig. 1. The bolts 134, 135 and 150 may either be introduced through bores in the insulating member 122 or they may be molded directly into the insulating member.

In the modified form of push-button shown in Figs. 9 to 12 inclusive, the numeral 215 designates a cylindrical tubular metal casing generally similar to the casing 15 of the Fig. 1 device, secured within the bore 16 in the pear-shaped end of the push-button holder in any suitable manner. A U-shaped insulating member 239 generally similar to the insulating member 39 of the Fig. 1 device is secured within the casing 215 at an intermediate portion thereof by means of screws 245. The contact member 242 is secured to the upper face of this insulating member by means of a screw 235 and is held in its proper position by means of lugs 244 entering recesses in the insulating member.

An insulating member 222, generally similar to the insulating member 22 of the Fig. 1 device, fits within the cylindrical casing 215 and is held therein by means of screws 225. A contact member 237 is secured to the upper face of the insulating member 222 by means of a screw 234, and a notch 231 is formed in the upper face of the insulating member to provide clearance for portions of the contact member 237. The contact members 237 and 242 are slit in a manner similar to the contact members 37 and 42 of the Fig. 1 device to provide V-shaped contact surfaces.

A guide opening 252, corresponding in function and position to the bore 52 of the Fig. 1 device, is formed in the insulating member 222 and slidably receives therein the reduced end portion of a plunger stem 255 which is generally similar in construction and disposition to the plunger stem 55 of the Fig. 1 device. The plunger stem 255 has secured thereto a circular button 258 which may be identical in character and disposition to the button 58 in the Fig. 1 device.

The plunger stem 255 is provided with a contact projection 259 of diamond-shaped cross-section extending into a channel or slot 260 formed in the insulating member 239 to be placed in alternative engagement with the contact members 237 and 242 in a relation similar to that in the Fig. 1 device.

A coiled spring 262 similar in function to the coiled spring 62 of the Fig. 1 device surrounds the reduced portion of the plunger stem and includes a part extending through the insulating member 222 and secured to a terminal screw 253 threaded into the insu-

lating member. The spring thus serves to establish an electrical connection between the plunger stem and this terminal screw. The contact portion 259 of the plunger stem is urged by the spring into engagement with the contact member 242 and the depression of the button 258 by the finger will move the contact projection 259 against the action of a spring to effect the engagement of the contact projection with the contact member 237.

The insulating member 222 is provided with a flange 226 at its inner or lower end extending substantially diametrically of the insulating member. Terminal screws 247 and 248 are threaded into opposite sides of the flange 226 and are connected respectively with the contact members 242 and 237 by means of conductors 238 and 243.

In assembling the push-button of Fig. 9, the insulating member 239 with its attached contact member 242 is secured within the casing 215 by means of the screws 245. The plunger stem is then introduced into the casing from above and turned sufficiently to permit the contact projection to pass the contact member 242 subsequent to which the contact projection 259 is introduced into the channel or slot 260. The insulating member 222 with its attached member 237 and spring 262 is then introduced into the inner end of the casing and is secured therein by the screws 225. In this assembly operation, the coiled spring 262 is passed over the reduced end portion of the plunger stem 255 and the spring is placed under compression to urge the contact projection 259 in firm engagement with the contact member 242. The contact member 237 lies in close relation to the insulating member 239 and is placed in proper position to be engaged by the contact projection 259 when the plunger stem 255 is depressed.

The invention provides a push-button of simple, compact and durable construction capable of inexpensive manufacture and well adapted for its intended purpose.

What I claim as new and desire to secure by Letters Patent is:

1. In a push-button, the combination of a casing, an insulating member mounted within the casing, a pair of contacts disposed on opposite sides of said insulating member and spaced axially within the casing, a contactor movable between said contacts into selective engagement therewith and normally spring-urged into engagement with one of said contacts, said contactor having an actuating part at one end of said casing, and a second insulating member carried at the other end of the casing and having a recess in which said contactor is slidably guided.

2. In a push-button, the combination of a pair of spaced contacts insulated from each other, supporting means for said contacts in-

- cluding a separable insulating member interposed therebetween, attaching members for securing said contacts to said insulating member and respectively having electrical connections with said contacts, a contactor including a portion interposed between said contacts for selective engagement therewith and being normally spring-urged into engagement with one of said contacts, and means for movably supporting said contactor.
3. In a push-button, the combination of an insulating member, contacts disposed on opposite sides of said insulating member in insulated relation, a second insulating member, attaching members mounted in said second insulating member and passing through said contacts and the first-named interposed insulating member to secure said contacts in position and to form respective electrical connections with said contacts, and a contactor slidably guided in said second-named insulating member and having a portion interposed between said contacts for selective engagement therewith and being normally spring-urged into engagement with one of said contacts.
4. In a push-button, the combination of an apertured insulating member, a pair of apertured contacts disposed on opposite sides of said insulating member in insulated relation with the apertured portions of said contacts and insulating member in register, a second insulating member, a pair of attaching members mounted in said second-named insulating member to project therethrough and having their projecting portions passing through said contacts and the first-named interposed insulating member for holding said contacts in insulated assembled relation, and a contactor slidably mounted in said second-named insulating member having a portion interposed between said contact members for selective engagement therewith and being normally spring-urged into engagement with one of said contact members.
5. In a push-button, the combination of an apertured insulating member, a pair of apertured contacts disposed on opposite sides of said insulating member in insulated relation with the apertured portions of said contacts and insulating member in register, a second insulating member, a pair of attaching members mounted in said second-named insulating member to project therefrom and having their projecting portions passing through said contacts and the first-named interposed insulating member for holding said contacts in insulated assembled relation, a shouldered contactor slidably mounted in said second-named insulator member and having a portion interposed between the contacts for selective engagement therewith, and a spring interposed between said second-named insulating member and the shouldered portion of said contactor for normally urging said contactor into engagement with the contact more remote from said second-named insulating member.
6. In a push-button, the combination, with a hollow casing, of an insulating member adapted to be introduced into said casing, a pair of insulated contact members spaced axially within said casing, attaching members securing said contacts to said insulating member and forming terminals therefor, a plunger movably mounted in said insulating member and spring-urged outwardly therefrom, said plunger including a laterally-projecting contact portion interposed between said contacts for selective engagement therewith and normally urged into engagement with one of said contacts, an actuating member for said plunger movable within the outer end of said casing, and terminal means for said plunger carried by said insulating member.
7. In a push-button, the combination, with supporting members, of a pair of recessed sheet metal contacts disposed in substantially parallel spaced relation and presenting aligned contact surfaces at their recessed portions, a manually-displaceable contactor interposed between said contacts for selective engagement therewith and including opposite contact edges adapted to enter said recessed portions, means for movably supporting said contactor in its operative position, and spring means for normally urging said contactor into engagement with one of said contacts.
8. In a push-button, the combination, with a casing, of an insulating member projecting into said casing and having an exterior flanged portion, attaching members secured within said insulating member and including terminal portions within said flanged portion of the insulating member and projecting portions at the opposite side of said insulating member, a pair of contacts secured in insulating spaced relation on the projecting ends of said attaching members, a manually displaceable contactor movably mounted on said insulating member and including a portion interposed between said contacts for selective engagement therewith, and spring means normally urging said contactor into engagement with one of said contacts.
9. In a push-button, the combination of a support, a sheet metal contact plate mounted on said support and having a slit presenting contact surfaces therealong, and a movably mounted contactor including a portion adapted to enter said slit and engage said contact surfaces.
10. In a push-button, the combination of a support, a resilient sheet metal contact plate mounted on said support and having a slit forming spaced resilient lips presenting contact surfaces therealong, and a movably mounted contactor having wedge por-



tions adapted to enter said slit and engage said resilient lips.

5 11. In a push-button, the combination of an insulating member, a metal plate secured to said insulating member and having a slit forming a pair of contact surfaces therealong, and a movably mounted contactor having a wedge-shaped portion adapted to enter said slit and engage said contact surfaces.

10 12. In a push-button, the combination of an insulating member having opposite faces and a recess extending between said faces, contact plates mounted on the opposite faces of said insulating member and presenting  
15 contact portions in alignment with said recess, and a movably mounted contactor disposed within said recess and selectively engageable with the contact surfaces at the opposite ends of said recess.

20 In testimony whereof, I affix my signature.  
BORNETT L. BOBROFF.

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