Jan. 26, 1932. H. HANSEN 1,842,524

PUSH BUTTON SWITCH CONSTRUCTION

Filed Oct. 11, 1928 2 Sheets-Sheet 1

Fig. 1.

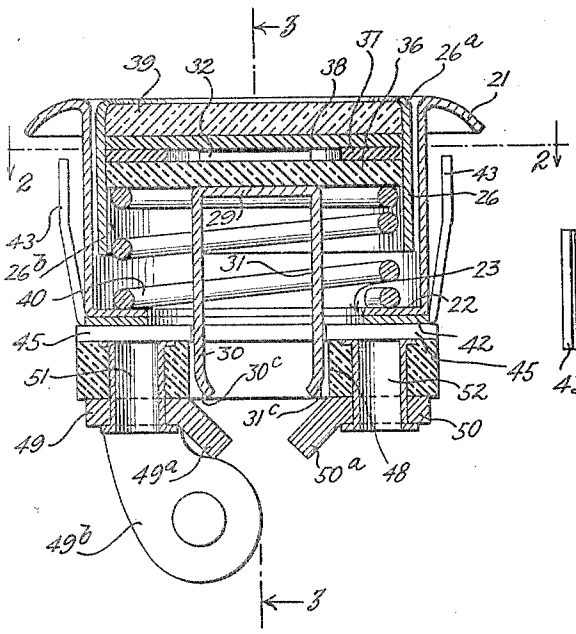


Fig. 2.

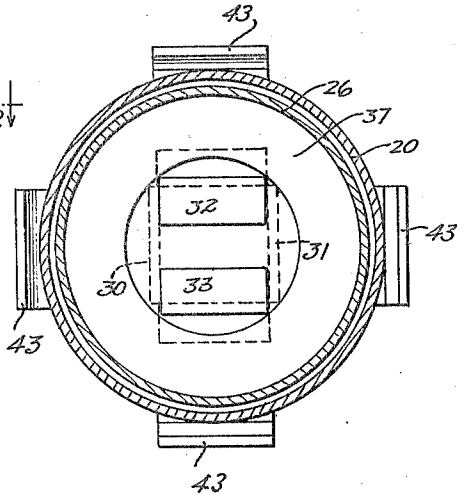


Fig. 3.

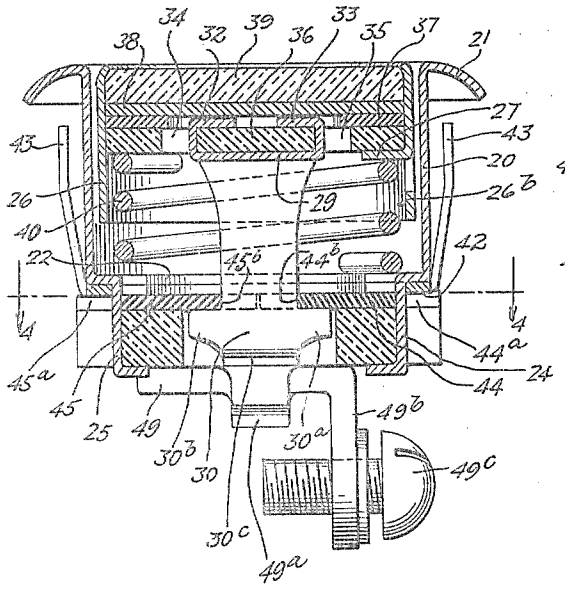
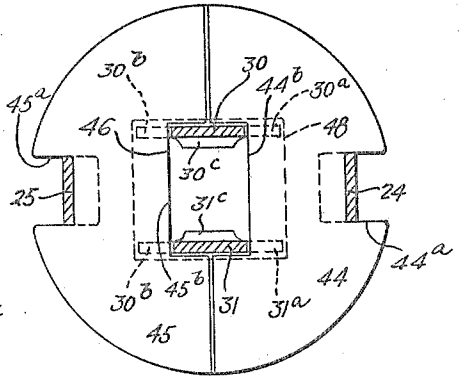


Fig. 4.



Herman Hansen
INVENTOR

BY Robert S. Blair
ATTORNEY

Jan. 26, 1932. H. HANSEN 1,842,524

PUSH BUTTON SWITCH CONSTRUCTION

Filed Oct. 11, 1928 2 Sheets-Sheet 2

Fig. 5

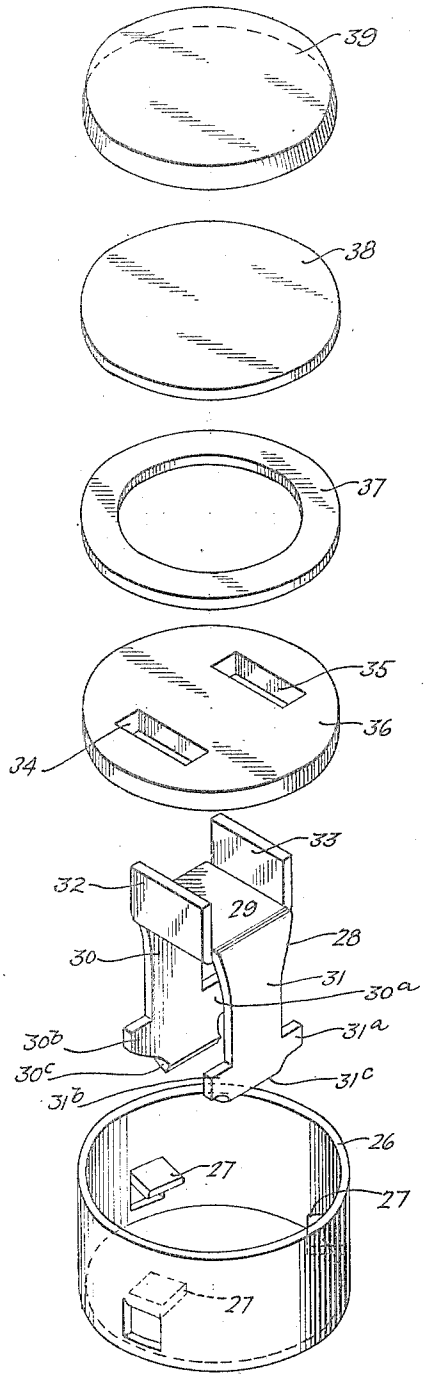
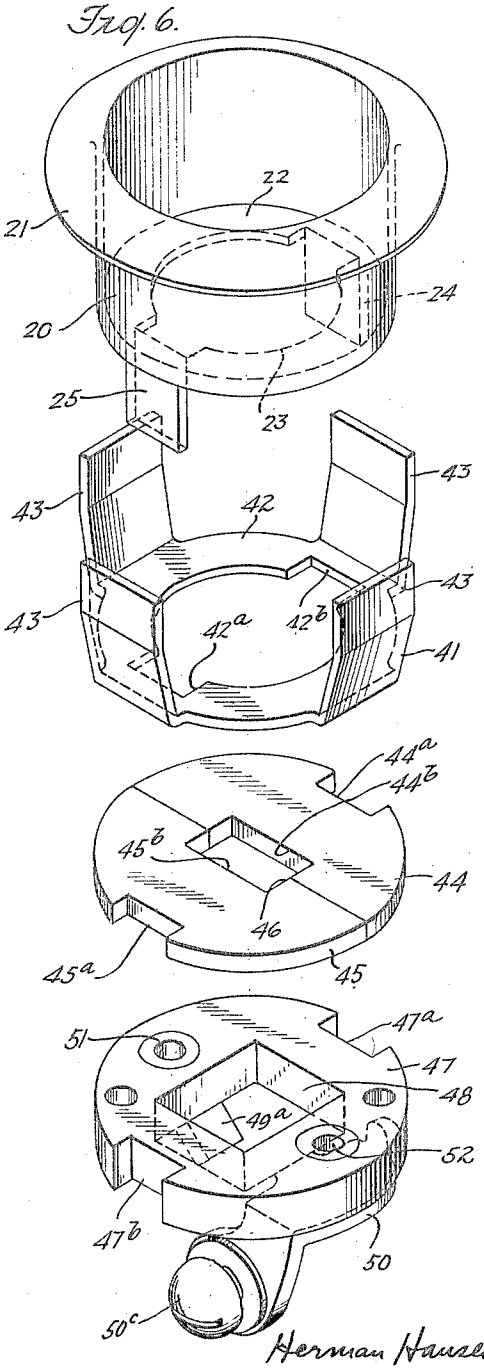


Fig. 6.



Herman Hansen
INVENTOR
BY Robert S. Blair
ATTORNEY

Patented Jan. 26, 1932 1,842,524

UNITED STATES PATENT OFFICE

HERMAN HANSEN, OF NEW YORK, N. Y., ASSIGNOR TO FRANCIS KEIL & SON, INC., A CORPORATION OF NEW YORK

PUSH BUTTON SWITCH CONSTRUCTION

Application filed October 11, 1928. Serial No. 311,752.

This invention relates to push button switches for controlling electrical circuits and more particularly to that kind of push button switch which is intended to be inserted into a recess.

One of the objects of this invention is to provide a push button switch construction capable of rapid and inexpensive manufacture, thoroughly reliable action in practical use and of durable and compact construction. Another object is to provide a push button switch construction of the above-mentioned character made up of individual parts which per se are of simple, rapid and inexpensive manufacture and adapted for rapid and dependable assembly, all while maintaining compactness of arrangement and construction and reliability of action. Another object is to provide a push button switch that will have efficient and long-lasting contact-making action. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is shown one of various possible embodiments of my invention,

Figure 1 is a central vertical sectional view of the assembled push button switch, showing the latter in readiness to be inserted into a recess in the wall, for example, and showing the parts in readiness for use;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a perspective view of the several parts that go to make up the button proper and part of the contact-making mechanism, the parts being shown detached from each other but substantially in the sequence in which they are preferably related to one another in the course of their assembly;

Figure 6 is a perspective view of the housing or shell and related parts, shown detached from one another and substantially in the sequence in which they are to be assembled.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings and particularly to Figures 1, 3 and 6, I first provide a housing or shell 20 which is preferably made of sheet metal and having a main body portion that is preferably cylindrical; at its upper end the housing 20 is provided with a peripherally extending flange 21 which limits the extent to which the housing 20 can be inserted into a preferably round hole or recess in a wall or door casing. The housing 20 has an inwardly directed flange 22 of such an extent as to provide a substantially circular opening 23 in the bottom of the casing 20. Two preferably diametrically opposed ears 24 and 25 extend downwardly below the lower edge of the housing 20, preferably from a point intermediate of the inner and outer peripheries of the flange 22.

The sheet metal housing or shell 20 may be given the above-described form and shape by suitable stamping or drawing operations, and it will be noted that these can be rapidly and inexpensively carried on.

The interior of the housing 20 is adapted to slidably guide a push button carrying circuit-controlling devices adapted to project through the bottom opening 23. These features of construction are better shown in Figure 5. I first provide a sleeve 26, preferably of sheet metal, and conveniently made of a section of sheet metal tubing. The axial length of the sleeve 26 is peculiarly proportioned with respect to the axial length of the housing 20, as will be more clearly pointed out hereinafter.

At a suitable number of points in the periphery of the sleeve 26 and intermediate its upper and lower edges, preferably about midway, I cut out and bend inwardly ears 27, shown in Figure 5 as three in number. The sleeve 26 is of such a diameter that it fits neatly inside the housing 20 and can slide relative thereto but without material tilting

of its axis out of alinement with the axis of the housing 20.

I then make, preferably of a suitable spring sheet metal of good electrical conductivity, such as spring copper, brass or bronze, what I shall hereinafter term a circuit-closing member and which I have generally indicated in Figure 5 at 28. The member 28 has a flat upper part 29 from which depend two opposed arms 30 and 31, the lower ends of which arms are of peculiar configuration for purposes more clearly described hereinafter. These arms 30 and 31 are adapted to pass downwardly through the opening 23 in the housing 20.

Extending upwardly from the part 29 of the member 28 and also opposed to each other are two ears 32 and 33. The member 28 may be readily stamped to give it the shape and form above pointed out.

The ears 32 and 33 are shaped to pass through openings 34 and 35 respectively in a disk 36 made of a suitable insulating material such as fiber, for example, the part 29 resting flatwise against the disk 36 and the ears 32 and 33 being bent over toward each other to substantially embrace that portion of the disk 36 between the two openings in the latter. The part 28 is thus securely fastened to the disk 36. The relation of these parts is clearly shown in Figure 3, and also in Figure 2.

The circuit-controlling member 28 having thus been attached to the disk 36, the latter is then inserted into the sleeve 26, resting upon the ears 27 (see also Figure 3). I then superimpose upon the disk 36 an annulus 37 made preferably of an insulating material like fiber and having a thickness substantially equal or greater than the thickness of the ears 32 and 33 of the member 28; the inside diameter of the annulus 37 is such that the bent-over ears 32 and 33 are accommodated therein (see Figures 1 and 3). In Figure 2 this relation of these parts is clearly shown.

Upon the annulus 37 is then placed a disk 38 preferably also of an insulating material like fiber and upon the disk 38 is superimposed, also within the upper end of the sleeve 26, a disk 39 of pearl or other suitable material. The upper peripheral edge of the sleeve 26 is then spun over, as at 26*a* (Figure 1) to securely confine the several superimposed parts within the sleeve 26 and between the ears 27 and the spun-over portion 26*a*.

The above described unit comprising the push button and the circuit-closing member 28 is now in readiness to be inserted into the upper end of the housing 20, but there is first inserted into the lower open end 26*b* (Figure 1 or Figure 3) a helical spring 40. Upon inserting these parts into the housing 20, the arms 30 and 31 of the member 28 project through the opening 23 in the bottom of the housing 20 and the lower end of the helical spring 40 rests upon the flange 22 of the housing 20.

As above noted, the lower ends of the arms 30 and 31 (Figure 5) are of a peculiar shape; more particularly, they are substantially in the form of an inverted T and will be seen from Figure 5 to include the laterally and oppositely projecting parts 31*a* and 31*b* on the arm 31 and substantially symmetrically disposed parts 30*a* and 30*b* projecting laterally from the arm 30. Also, the arms 30 and 31, at their extreme lower ends, are bent or curved inwardly toward each other as at 31*c* and 30*c* respectively, as is better shown in Figure 1.

A device generally indicated in Figure 6 at 41 is related to the housing 20 to hold the ultimately assembled push button in place in the hole or recess into which it is to be inserted; this device 41 comprises a ring-shaped base part 42 adapted to fit against the underside of the flange 22 and cut away as at 42*a* and 42*b* to accommodate the downwardly extending ears 24 and 25. Extending upwardly from the base part 42, the device 41 is provided with a suitable number, illustratively shown in Figure 6 as four, of spring arms 43 which, as will be clear from Figures 1 and 3, extend upwardly outside of the cylindrical side wall of the housing 20.

The device 41 is made of suitable spring sheet metal, the arms 43 (see Figures 1 and 3) tending to spring away from the housing 20 and acting to frictionally hold the assembled push button in place in its recess.

The device 41 having been positioned as above described with the base 42 against the underside of the flange 22 of the housing 20, and with the lower ends of the contact arms 30 and 31 of the device 28 projecting below the plane of the underside of the base 42, the button 39 being pushed inwardly and the spring 40 compressed to hold the parts in this relation, I now place against the bottom face of the member 42 and above the laterally projecting parts 30*a* and 30*b* of the arm 30 and 31*a* and 31*b* of the arm 31 two substantially semi-circular members 44 and 45, each made of a suitable insulating material such as fiber; the parts 44 and 45 may be stamped out of sheet fiber. The fiber member 44 is cut away at at 44*a* and the member 45 is cut away as at 45*a*, the recesses thus formed being shaped to accommodate the ears 24 and 25 respectively.

The member 44 is also cut away or recessed as at 44*b* and a similar recess 45*b* is cut out of the member 45, these two recesses being so shaped that, when the members 44 and 45 are placed edge to edge along their adjacent straight edges, the two recesses form a substantially rectangular opening generally designated at 46 (see Figure 6). Moreover, the two members 44 and 45 when thus related

to each other form a disk of a diameter commensurate with the diameter of the housing 20.

In assembling the members 44 and 45 to the construction above described, each is individually inserted in place by first positioning its diametrical edge crosswise of the two contact arms 30 and 31, but above the laterally projecting parts of the latter; each member 44 and 45 is then individually swung upwardly about this diametrical or straight line edge portion thereof so as to swing it flatwise against the underside of the part 42, the ears 24 and 25 being during this action accommodated in the respective recesses 44*a* and 45*a*. Releasing the button 34 to permit the spring 40 to expand, causes upward movement of the contact arms 30 and 31 so that the projecting parts 30*a* and 30*b* of the former and 31*a* and 31*b* of the latter are carried into contact with the underside of the members 44 and 45 (see Figure 3), these two parts being thus temporarily held in place and locking the button 30 and circuit-controlling member 28 and spring 40 in assembled relaton with respect to the housing 20.

The opening 46 formed by the recesses 44*b* and 45*b* of the members 44 and 45 respectively (see Figure 6) is, as will be clear from the foregoing, dimensioned to have a width (the shorter dimension as seen in Figure 6) sufficient to freely accommodate the width of the contact arms 30 and 31 but insufficient to permit the projecting portions 30*a* and 30*b* of the former and 31*a* and 31*b* of the latter to pass therethrough; the length of the opening 46 (that is, the longer dimension, as seen in Figure 6) is preferably commensurate with the distance between the outside faces of the arms 30 and 31, acting to limit the tendency of the arms 30 and 31 to spring away from each other while permitting freely a yielding movement of these two arms toward one another. These relations of these parts is clearly shown in Figure 4.

The assembly having proceeded thus far, there is then placed against the lower faces of the members 44 and 45 a disk 47 of insulating material, such as fiber, recessed peripherally as at 47*a* and 47*b* to accommodate therein the ears 24 and 25 of the housing 20, the latter being bent over, as is clearly shown in Figure 3, to securely clamp the parts 42, 44—45, and 47 to the underside of the housing 20.

The member 47 is provided with a substantially centrally positioned rectangular opening 48 into which the lower ends of the arms 30 and 31 project, the thickness of the member 47 being sufficient to substantially accommodate within the axial extent of the opening 48 the various projecting parts of the arms 30 and 31, such as the parts 30*a*, 30*b* and 30*c*, as will be clear from both Figures 1 and 3.

To the underside of the disk 47 are secured two plate-like members 49 and 50 (see Figures 1, 3 and 6) suitable eyelets 51 and 52, respectively, being preferably utilized in effect to rivet these parts together, the fiber members 44 and 45, however, insulating the eyelets and hence the plate members 49 and 50 from the metal parts 42, 22 etc.

The plate members 49 and 50 are positioned one on each side of the opening 48 and are provided with downwardly inclined projections 49*a* and 50*a* respectively, the latter being respectively in line with the downward movement of the inwardly curved portions 30*c* and 31*c* of the contact-making arms 30 and 31 respectively.

Each of the plate members 49 and 50 is provided with a suitable construction for attaching thereto an electrical conductor and this may comprise a downwardly extending ear 49*b* threaded to receive a connecting screw 49*c*. While this construction is shown in detail only with respect to the plate member 49, it is to be understood that a similar construction is associated with the plate member 50.

The inwardly curved portions 30*c* and 31*c* of the contact arms 30 and 31 coact, upon the latter being moved downwardly against the action of the spring 40 when the button 39 is depressed, to bridge the projecting contact members 49*a* and 50*a* and to make a rubbing contact therewith, yieldability of the arms 30 and 31 in a direction toward each other (see Figure 1) permitting this action to take place more effectively. Thus the coacting surfaces that effect the electrical interconnection or closing of the electrical circuit are effectively maintained bright, clean and electrically efficient.

As hereinbefore noted, the sleeve 26 is peculiarly proportioned as to its axial length with respect to the axial length of the cylindrical housing 20. Referring to Figure 1 (or Figure 3), it is pointed out that the sleeve 26 extends axially within the housing 20 to a sufficient extent to prevent the sleeve 26, and hence the contact arms 30 and 31, from tilting with respect to the axis of the housing 20, the coacting cylindrical surfaces of the sleeve 26 and housing 20 insuring this maintenance of alinement of the several parts with respect to each other. The possibility, when pressure is applied to the button 39 to one side of its axis, of so tilting the button 39 and the arms 30 and 31 that only one of the latter is brought into contact with its coacting electrical contact member and consequent failure to close the electrical circuit, are thus effectively avoided. It will furthermore be noted that that portion of the sleeve 26 which extends downwardly below the member 36, as seen in Figure 1, not only coacts to achieve the above-mentioned advantages but also substantially houses and holds in proper alinement the helical spring 40, it being fur-

ther noted that it is possible with this arrangement to use a spring of smaller diameter without danger of the spring flopping around with respect to the much larger interior of the housing 20.

It will thus be seen that there has been provided in this invention a push button switch construction in which the several objects hereinabove noted, as well as many thoroughly practical advantages, are achieved. It will be seen that the construction is thoroughly practical, that its individual parts are capable of rapid and inexpensive manufacture, and that the assembly of these several parts may be rapidly, efficiently and economically achieved. It will, moreover, be seen that the construction provided is highly efficient from both a mechanical and electrical viewpoint and that the mechanical features of the construction dependably coact to insure highly efficient and reliable electrical action. It will furthermore be seen that the construction is well adapted to meet the varying conditions of hard practical use.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a device of the character described, in combination, a substantially cylindrical housing adapted to be inserted into a recess in a wall, and being open-ended; a push button having substantially cylindrical side walls and adapted to slide within said housing, said side walls being of substantial axial length relative to the axial length of said housing; a pair of interconnected depending substantially T-shaped contact arms secured to said push button at a point intermediate of its axial length, the projecting portions of said contact arms extending below the lower open end of said housing; a substantially helical spring about said contact arms and extending within said downwardly extending side walls of said push button; a pair of substantially semi-circular members recessed along their straight edge to form, when placed together, an opening for receiving said contact arms above said projecting portions thereof; a pair of contact members positioned in the path of downward movement of said contact arms; and means for holding said semi-circular members against separation and adjacent the lower open end of said housing.

2. In a device of the character described, in combination, a substantially cylindrical open-ended housing having a pair of opposed ears at its lower end; a spring-retracted push button slidably mounted in said housing and having secured thereto a substantially U-shaped circuit-controlling member, the arms of which depend from said button and have portions adjacent their lower ends projecting away therefrom; a plurality of means adapted to be fitted together and to be inserted across the lower end of said housing and above said projecting portions of said depending arms to limit upward movement of the latter, said opposed ears holding said last-mentioned means fitted together and in place; and contact means for coaction with said depending arms.

3. In a device of the character described, in combination, a substantially cylindrical open-ended housing having a pair of opposed ears at its lower end; a spring-retracted push button slidably mounted in said housing and having secured thereto a substantially U-shaped circuit-controlling member, the arms of which depend from said button and have portions adjacent their lower ends projecting away therefrom; a pair of substantially semi-circular members recessed adjacent their curved periphery each to accommodate one of said ears and recessed along their linear edges so that when placed edge to edge there is formed an aperture adapted to receive said depending arms, said members being inserted in place, one on each side of said depending arms, and above said projecting portions of the latter; and means adapted to form part of an electrical circuit for coacting with said depending arms, said ears holding said pair of members in place.

4. In a device of the character described, in combination, a housing having a pair of contact members adjacent its lower end portion, said contact members being adapted to form part of an electrical circuit; a push button slidably supported by said housing and comprising a sleeve-like member having a plurality of inwardly projecting ears intermediate its two ends, insulating means resting upon said ears and having secured thereto a pair of depending contact arms adapted to coact with said contact members, the upper end of said sleeve being bent inwardly to grip said insulating means between itself and said ears; and spring means for retracting said push button.

5. In a device of the character described, in combination, a housing having a pair of contact members adjacent its lower end portion, said contact members being adapted to form part of an electrical circuit; a push button slidably supported by said housing and comprising a sleeve-like member having a plurality of inwardly projecting ears intermediate its two ends, insulating means resting upon said ears and having secured thereto a pair of depending contact arms adapted to coact with said contact members, the upper end of said sleeve being bent inwardly to grip said insulating means between itself

and said ears; and a spring for retracting said push button, at least a portion of said spring being accommodated within the lower portion of said sleeve.

6. In a device of the character described, in combination, a housing having a pair of contact members adjacent its lower end portion, said contact members being adapted to form part of an electrical circuit; a push button slidably supported by said housing and comprising a sleeve-like member having a plurality of inwardly projecting ears intermediate its two ends, an insulating member resting upon said ears, a pair of contact arms for coaction respectively with said two contact members, depending from said insulating member and having a portion thereof extending above said insulating member, insulating means superimposed upon said insulating member and covering said portion of said depending contact arms, the upper end of said sleeve being bent inwardly to hold said insulating member and insulating means against said ears; and spring means for retracting said push button.

7. In a device of the character described, in combination, a housing having a pair of contact members adjacent its lower end portion, said contact members being adapted to form part of an electrical circuit; a push button slidably supported by said housing and comprising a sleeve-like member having a plurality of inwardly projecting ears intermediate its two ends, an insulating member resting upon said ears, a pair of contact arms for coaction respectively with said two contact members, depending from said insulating member and having a portion thereof extending above said insulating member, means of substantially the same thickness as said portion of said contact arms superimposed upon said insulating member, insulating means within said sleeve and above said interposed means, the upper end of said sleeve being bent inwardly to substantially clamp said insulating member, said interposed means, and said insulating means between itself and said ears; and spring means for retracting said push button.

8. In a device of the character described, in combination, a housing having a pair of contact members adjacent its lower end portion, said contact members being adapted to form part of an electrical circuit; a push button slidably supported by said housing and comprising a sleeve-like member having a plurality of inwardly projecting ears intermediate its two ends, an insulating member resting upon said ears, a pair of contact arms for coaction respectively with said two contact members, depending from said insulating member and having a portion thereof extending above said insulating member, means of substantially the same thickness as said portion of said contact arms superimposed upon said insulating member, insulating means within said sleeve and above said interposed means, the upper end of said sleeve being bent inwardly to substantially clamp said insulating member, said interposed means, and said insulating means between itself and said ears; and a substantially helical spring about said contact arms and accommodated at least in part in that portion of said sleeve below said ears.

9. In a device of the character described, in combination, a substantially cylindrical housing; a push button slidably fitted therein, said push button comprising a substantially cylindrical sleeve closed at its upper end; contact means depending from said push button and insulated therefrom and having a lower portion of greater cross-section than an intermediate portion; and sectionalized means, the sections of which are placed in position about an intermediate portion of said contact means and are shaped to form, when assembled, an opening to prevent movement therethrough of said lower portion of said contact means; contact means carried by said housing for coaction with said depending contact means; and a spring for retracting said push button, said spring being housed at least in part within the lower portion of said sleeve.

10. In a device of the character described, in combination, a housing slidably supporting a push button; a contact member depending from said push button and having a greater cross-section adjacent its bottom portion than at an intermediate portion; spring means for retracting said push button; sectionalized means for limiting the retrograde movement of said push button, the sections of which are adapted to be placed in position about an intermediate portion of said contact member and being shaped to provide, when assembled, an opening dimensioned to prevent movement therethrough of said lower portion of said depending member; and contact means coacting with said depending contact member.

11. In a device of the character described, in combination, a housing slidably supporting a push button; a contact member depending from said push button and having a greater cross-section adjacent its bottom portion than at an intermediate portion; spring means for retracting said push button; sectionalized means for limiting the retrograde movement of said push button, the sections of which are adapted to be placed in position about an intermediate portion of said contact member and being shaped to provide, when assembled, an opening dimensioned to prevent movement therethrough of said lower portion of said depending member; insulating means carrying contact means for coaction with said depending contact member; and means for holding said section-

alized means and said insulating means in place.

12. In a device of the character described, in combination, a housing slidably supporting a push button; a contact member depending from said push button and having a greater cross-section adjacent its bottom portion than at an intermediate portion; spring means for retracting said push button; sectionalized means for limiting the retrograde movement of said push button, the sections of which are adapted to be placed in position about an intermediate portion of said contact member and being shaped to provide, when assembled, an opening dimensioned to prevent movement therethrough of said lower portion of said depending member; insulating means carrying contact means for coaction with said depending contact member, said insulating means being shaped to rest against said sectionalized means when the sections of the latter are assembled; and means securing said insulating means to said housing.

13. In a device of the character described, in combination, a substantially cylindrical shell having an inwardly directed flange adjacent its lower end; a push button slidably mounted in said shell; contact means depending from said push button; said contact means having a greater cross-section adjacent its lower end than at an intermediate portion; a spring interposed between said push button and said flange for retracting said push button; sectionalized means for limiting the retrograde movement of said push button; the sections of which are adapted to be placed in position about an intermediate portion of said contact member and being shaped to provide, when assembled, an opening dimensioned to prevent movement therethrough of said lower portion of said depending member, said sections being assembled below said flange; contact means for contacting with said depending contact means; and means for holding said sectionalized means in assembled relation below said flange.

14. In a device of the character described, in combination, a substantially cylindrical shell having an inwardly directed flange adjacent its lower end; a push button slidably mounted in said shell; contact means depending from said push button; said contact means having a greater cross-section adjacent its lower end than at an intermediate portion; a spring interposed between said push button and said flange for retracting said push button; sectionalized means for limiting the retrograde movement of said push button; the sections of which are adapted to be placed in position about an intermediate portion of said contact member and being shaped to provide, when assembled, an opening dimensioned to prevent movement therethrough of said lower portion of said depending member, said sections being assembled below said flange; contact means for contacting with said depending contact means; and means including ears forming part of said shell for clamping said sectionalized means in assembled relation against said flange.

15. In a device of the character described, in combination, a housing having slidably supported therein a push button, said push button comprising a sleeve-like member having a plurality of integrally formed means projecting inwardly thereof intermediate of the ends of said sleeve, an insulating member supported by said projecting means, a substantially U-shaped circuit-controlling device depending from said insulating member and having clamping ears extending upwardly through said insulating member and bent over thereupon, insulating means superimposed upon said insulating member and said ears, the adjacent end portion of said sleeve being bent inwardly to hold said parts between itself and said inwardly projecting means; spring means for retracting said push button; and a pair of contact members for coaction respectively with the depending arms of said U-shaped circuit-controlling member.

16. In a device of the character described, in combination, a housing having slidably supported therein a push button, said push button comprising a sleeve-like member having a plurality of integrally formed means projecting inwardly thereof intermediate of the ends of said sleeve, an insulating member supported by said projecting means, a substantially U-shaped circuit-controlling device depending from said insulating member and having clamping ears extending upwardly through said insulating member and bent over thereupon insulating means superimposed upon said insulating member and said ears, the adjacent end portion of said sleeve being bent inwardly to hold said parts between itself and said inwardly projecting means; a spring for retracting said push button, said spring extending into that portion of said sleeve that is below said inwardly projecting means; and a pair of contacts for coaction respectively with the depending arms of said U-shaped member.

17. In a device of the character described, in combination, a substantially cylindrical housing; a push button slidably fitted therein, said push button comprising a substantially cylindrical sleeve having inwardly projecting ears formed thereon intermediate its ends, insulating means supported by said ears and closing the upper end of said sleeve; contact means depending from said insulating means and having a lower portion of greater cross-section than an intermediate portion; and sectionalized means, the sec-

tions of which are placed in position about an intermediate portion of said contact means and are shaped to form, when assembled, an opening adapted to prevent movement therethrough of said lower portion of said contact means; and means for holding said sectionalized means in assembled relation.

18. In a device of the character described, in combination, a substantially cylindrical housing; a push button slidably fitted therein, said push button comprising a substantially cylindrical sleeve having inwardly projecting ears formed thereon intermediate its ends, insulating means supported by said ears and closing the upper end of said sleeve; contact means depending from said insulating means and having a lower portion of greater cross-section than an intermediate portion; and sectionalized means, the sections of which are placed in position about an intermediate portion of said contact means and are shaped to form, when assembled, an opening adapted to prevent movement therethrough of said lower portion of said contact means; means for holding said sectionalized means in assembled relation; and a spring for retracting said push button, said spring being housed at least in part within the lower portion of said sleeve.

19. In a device of the character described, in combination, a housing slidably supporting a push button; means depending from said push button and having a greater cross-section adjacent its bottom portion than at an intermediate portion; sectionalized means, the sections of which are placed in position about an intermediate portion of said depending means and are shaped to form, when assembled, an opening adapted to prevent movement therethrough of said bottom portion of said depending means; spring means acting upon said push button; and contact means carried by said housing for coaction with a part actuated by said push button.

In testimony whereof, I have signed my name to this specification this 4th day of October, 1928.

HERMAN HANSEN.