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J. BIERENFELD

2,052,691

PUSH BUTTON CONSTRUCTION

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Fig. 1

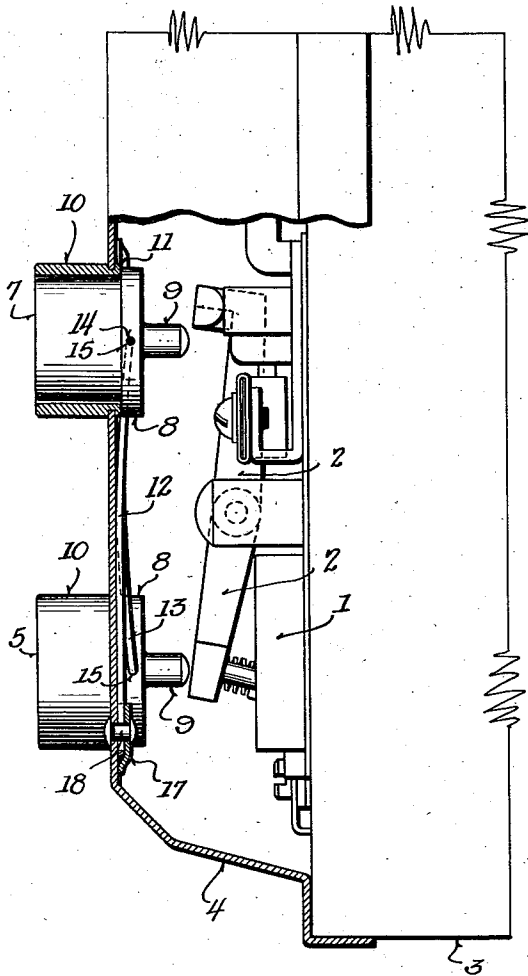


Fig. 2

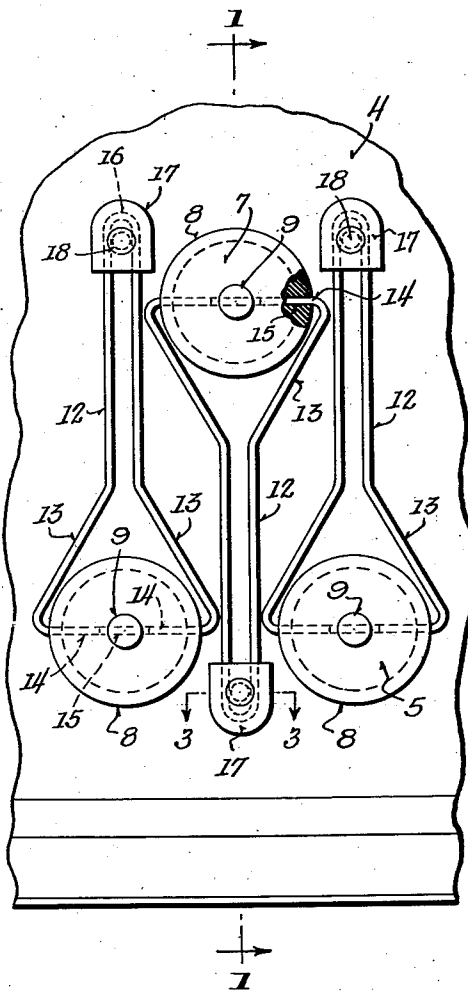


Fig. 3

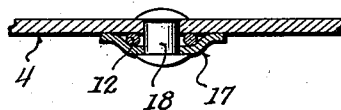
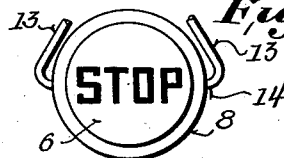


Fig. 4



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PUSH BUTTON CONSTRUCTION

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5 Claims. (Cl. 200—159)

This invention relates to push button mounting for starters, and is directed to a push button construction adapted for use in starter constructions such as shown in the Patent No. 2,013,013 of September 3, 1935 of Hermon L. Van Valkenburg for Automatic starter.

In starter construction it is desirable to keep the depth of the starter as small as possible, so that the total amount or distance that the starter projects outwardly from a wall upon which it is mounted, for instance, may be kept as small as possible. Further, it is desirable to be able to freely open and close the cover without hindrance from the push buttons and without disturbing the starter.

This invention has for its objects the provision of a push button construction and mounting which is very compact and shallow or of small depth, which is carried wholly by the cover of the housing for the starter, which is unattached to the starter, though it controls and operates the starter, and which, therefore, permits the opening of the cover outwardly without hindrance from the push buttons and without interference with the starter.

Further objects are to provide a novel type of spring support for each push button which not only returns the push button after depression, but also holds the push button in its correct position and permits the quick assembling of the device, the spring being easily applied to the push button during assembly and constituting the sole retaining means for holding the push button in place.

Further objects are to provide a construction which permits the close grouping of a plurality of push buttons as, for instance, the start, stop and reset buttons of a motor starter, which is very cheap to make and which has a minimum number of parts, thus materially reducing the cost of construction both as regards the number of parts and the number of operations in assembling.

A further object is to provide a construction in which the springs hold the buttons against rotation, so that if they carry insignia, as they usually do, it will always be correctly presented.

An embodiment of the invention is shown in the accompanying drawing, in which:—

Figure 1 is a fragmentary side elevation of a starter for electric motors, with parts broken away and in section to show the push button construction, such view corresponding to a section on the line I—I of Figure 2.

Figure 2 is a fragmentary view from the under side of the housing cover shown in Figure 1.

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 2.

Figure 4 is a face view of one of the buttons.

Referring to the drawing, it will be seen that a starter for an electric motor has been shown and is indicated generally by the reference character 1. It may be provided with operating parts such as the levers 2, by means of which it is controlled, and is mounted within a box or housing 3 provided with a hinged or otherwise mounted cover 4. The cover 4 is adapted to swing or move outwardly from the body portion of the housing 3.

The start, stop and reset buttons are indicated by the reference characters 5, 6, and 7. They may be formed of insulating material, such as Bakelite, or other suitable material, and are preferably provided with a cylindrical body portion and with a limiting or stop flange 8, in each instance. Each button is also preferably provided with an inwardly projecting operating pin 9 for operating the appropriate part of the starter.

The metal cover 4 is provided with a plurality of cylindrical guiding sleeves which have reduced and shouldered lower portions passing through apertures in the cover and locked rigidly in place by spinning over a portion as indicated at 11. These sleeves slidably receive and guide the cylindrical portions of the push buttons.

The push buttons are assembled by slipping them into the sleeves from the inner side of the cover, the flanges contacting with the inner portion of the cover or the inner portion of the sleeves, as shown in Figure 1, and thus limiting the outward motion of the buttons.

The springs are each substantially U-shaped with parallel, closely spaced arms 12, divergent or flaring portions 13, and coaxial, opposed in-turned arms or pins 14. These ends 14 are received within a diametrically located hole 15 passing through the flanges.

The looped or rounded part 16 of each spring is clamped between the under side of the cover 4 and a slightly dished clip or fastening member 17. These members or clips 17 are each drawn into binding engagement with the looped end of the spring by means of a rivet 18 which passes through the clip 17 and the cover, and through the looped portion of the spring.

The slight dishing of the clips, as may be seen from Figures 1 and 3, provides flanges on three sides, the rivet additionally holding the spring

from being pulled outwardly from beneath the clip, even if the springs are not in engagement with the push buttons. However, the springs are tightly clamped in place by the construction described.

The spring may be slightly bowed before assembly, if desired, to increase the spring pressure, or restoring force exerted upon the push buttons. They may be slightly sprung apart at their free ends and slipped into place in the holes 15 through the flanges of the push buttons.

It is apparent from Figure 2 that due to the shape of the springs, the push buttons may be arranged as compactly as desired. Further, from reference to Figure 1, it is clear that the construction is very shallow and adds very little depth or thickness to the starter.

These buttons usually bear insignia such as "Start", "Stop", "Reset", etc., the face of the "Stop" button being shown for illustration in Figure 4. A further additional advantage is that the springs prevent rotation of the buttons and always hold the buttons so that their insignia is correctly presented.

It will be seen that a push button construction has been provided for electric starters which is very shallow and does not add an appreciable depth to the starter box or housing, and that the spring means serves the double function of holding the push buttons in assembled position and of returning a push button after it has been depressed.

Although this invention has been described in considerable detail it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. In a starter, a housing, switch means within said housing, a cover for said housing, a cylindrical push button slidable through and carried by said cover for actuating said switch means, and spring means attached to said cover and to said push button for returning said push button to its normal position after depression, said spring means constituting the sole means for preventing axial rotation of said push button, said switch means being an independent unit separate and distinct from said spring means or said push button.

2. In a switch construction, a housing, switch means located within said housing, a removable cover for said housing, a push button carried by said cover and slidable therethrough for operating said switch means, and spring means con-

stituting the sole retaining means for said push button, said spring means being attached to said cover, and said spring means consisting of a substantially U-shaped resilient member attached at one end to the cover and having inwardly turned fingers attached to the push button and constituting the sole means for preventing axial rotation of said button.

3. A push button mounting comprising a housing, a cylindrical guide member carried by said housing, a cylindrical push button slidably mounted within said guide member and having opposed openings extending laterally with respect to the axis of the push button, and spring means for returning the push button to its normal position after depression, said spring means consisting of a substantially U-shaped member having the yoke portion of the U attached to the cover and having the free ends inturned and fitted within the said openings, whereby the push button is prevented from axial rotation and is held in place solely by said spring means.

4. A push button mounting for switches, comprising a housing having a cover, a cylindrical guiding member carried by said cover, a cylindrical push button slidably mounted within said guiding member and having an inner flange to limit the outward motion of said push button, and spring means for said push button, said spring means consisting of a U-shaped member having the U portion of said member attached to the said cover and having inwardly turned fingers at the outer ends of the arms of the U-shaped member, said fingers being pivotally mounted within the flange of the push button.

5. A push button mounting for switches, comprising a housing having a cover, a guide member carried by said cover, a push button slidably mounted within said guide member and having an inner flange to limit the outward motion of the push button, said flange having diametrically opposed openings therein, spring means for said push button, said spring means consisting of a substantially U-shaped member, and securing means for locking the U portion of said spring means to said cover, said securing means comprising a cap enclosing the U portion of said spring means and extending over opposite sides of said spring means, and fastening means extending through said cap and cover and locking said cap and the U portion of said spring means to said cover, the outer ends of said spring means having inturned fingers fitted within the said openings.

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