(No Model.)

C. H. DELANO.

PUSH BUTTON.

No. 470,372. Patented Mar. 8, 1892.

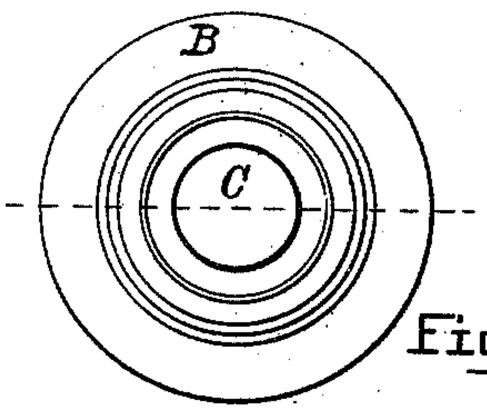

Fig: 3.

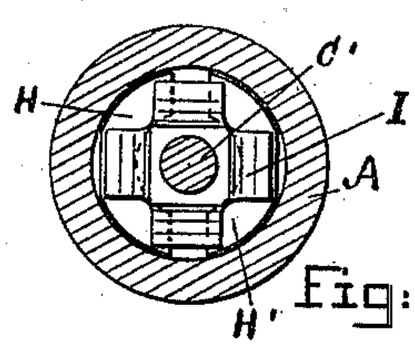

Fig: 4.

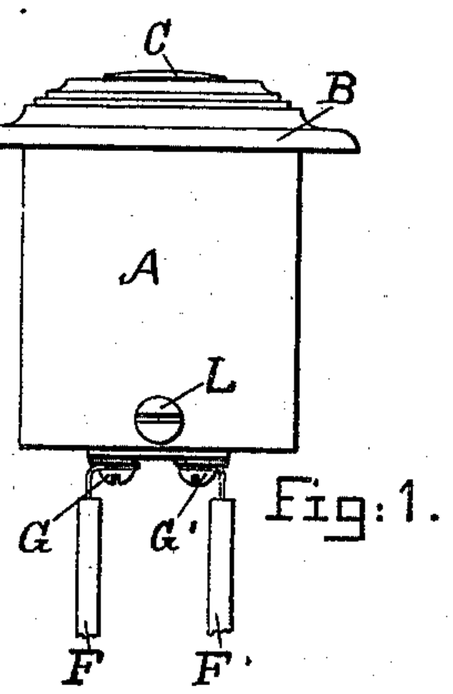

Fig: 1.

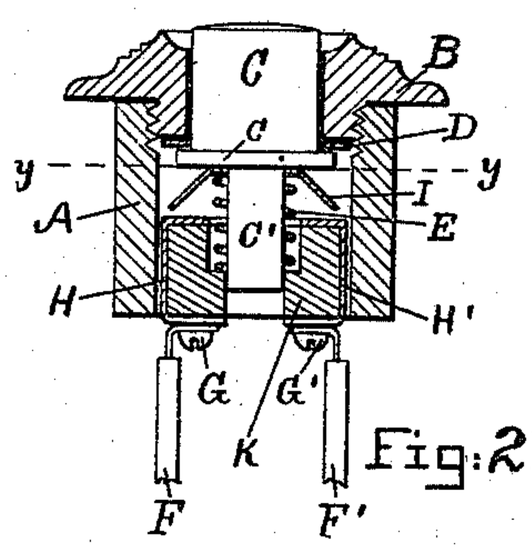

Fig: 2.

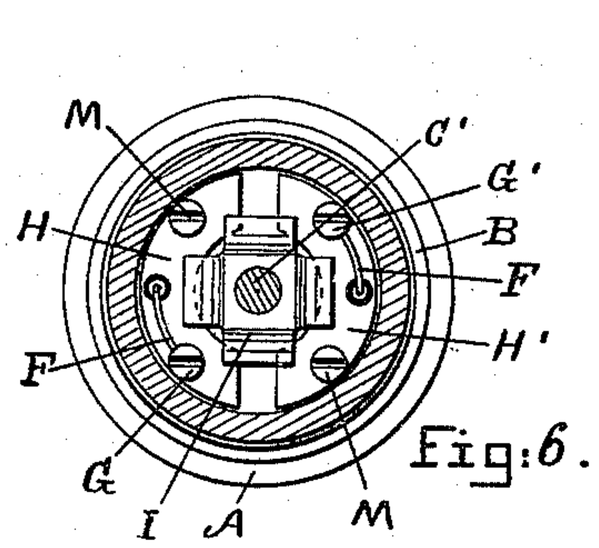

Fig: 6.

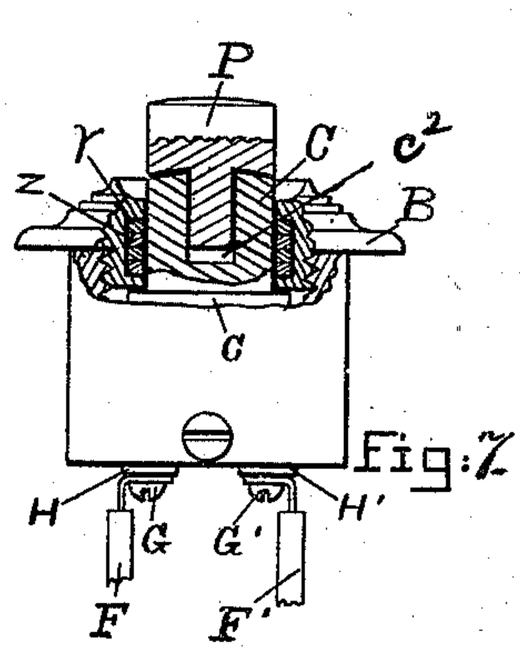

Fig: 7.

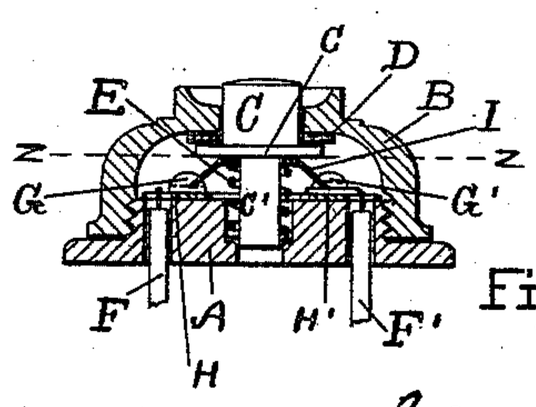

Fig: 5.

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UNITED STATES PATENT OFFICE.

CHARLES H. DELANO, OF WOBURN, MASSACHUSETTS.

PUSH-BUTTON.

SPECIFICATION forming part of Letters Patent No. 470,372, dated March 8, 1892.

Application filed June 2, 1891. Serial No. 394,853. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. DELANO, of Woburn, county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Push-Buttons for Electrical Purposes, of which the following is a specification.

A variety of push-buttons for establishing electric communication between adjacent electrical conductors have been devised and many forms of such push-buttons now are in practical use.

The object of my invention is to provide a push-button of an improved construction in which the interior parts shall be effectually sealed from the intrusion of dust and the said interior parts shall be direct and reliable in action.

My invention consists in the improved construction and arrangement which will first be described in connection with the accompanying drawings, and then be particularly pointed out in the claims at the close of this specification.

The features of my invention admit of being variously embodied in practice.

In the drawings I have shown some of the forms in which the invention may be embodied.

In the drawings, Figure 1 is a view showing in elevation one of the said forms of push-button and the ends of two wire conductors in connection therewith. Fig. 2 is a view of the same, with the parts mostly in central vertical section. Fig. 3 is a plan view thereof. Fig. 4 is a view of the same in transverse section on the dotted line *y y* in Fig. 2. Fig. 5 is a view of a modified form of push-button, showing the parts mostly in central vertical section. Fig. 6 is a view of the modification represented in Fig. 5 in transverse section on the dotted line *z z* of said Fig. 5. Fig. 7 is a view in side elevation, partly broken away, of a push-button having applied thereto a removable extension piece or pin fitted to the push-piece, whereby the push-button is adapted to be applied to the floor of a room and acted upon by a person's foot.

In each figure of the drawings, A is the body of the case of the push-button, this body being represented in Fig. 1 as of greater length than in Figs. 2 and 7. B is the cap applied to the said body and perforated centrally for the passage therethrough of the enlarged head of the push-piece.

C is the push-piece, formed with the flange *c*, which is of diameter rather greater than the upper portion of the push-piece, and with the stem *c'*.

D (except in Fig. 7) is a washer of some suitable soft material surrounding and fitting closely the enlarged head portion of the push-piece and resting on the upper surface of the flange *c*, and E is a spiral spring surrounding the stem *c'* and acting to press the flange *c* and washer D, resting thereon, against the portion of the cap B around the opening through which the push-piece passes.

F F' are conducting-wires. H H' are fixed contact-pieces, and G G' are binding-screws by which the ends of said wires F F' are held in contact with the fixed contact-pieces. Preferably the screws G G' pass through the said fixed contact-pieces, as shown, and bind the the wires F F' against the same.

I is a movable contact-piece, the same being made movable with the push-piece and contacting with a rubbing action against the fixed contact-pieces H H'.

The foregoing features, as thus far described, are common to the two forms of push-buttons shown in the different figures of the drawings. The construction of the body of the case and the cap and the arrangement within the same of the parts so far mentioned may vary as desired, although the construction of body and cap represented in Figs. 1 to 4 and 7 is preferred. In these figures the construction is such as to permit of the body of the case being inserted into an opening or hole formed in a wall or floor, the said body being chambered for the reception of the essential parts of the push-button, as will be described hereinafter, and when the said body has been inserted into the opening formed therefor in the wall or floor the cap will lie closely to the surface of the wall or floor, projecting but slightly above such surface, while preferably a portion of the rim of the cap projecting beyond the periphery of the body of the case, as shown in Figs. 1, 2, and 7, will rest against the surface of the wall or floor.

In these figures, again, the cap is formed with a screw-threaded hub entering and engaging a threaded portion of the chamber, which is formed within the body of the case.

In Figs. 5 and 6 the construction represented is one in which the push-button is intended to be applied to the surface of a wall, and in this construction the cap is chambered and is screw-threaded interiorly for engagement with an exteriorly-threaded hub on the side of the body of the case, which in this instance consists of practically a simple disk, which is axially recessed and perforated and formed with the said threaded hub and is adapted to be secured to the surface of a wall. An essential characteristic feature of the said contact-pieces is that one of them, which is made movable with the push-piece, is carried when the latter is moved inward into rubbing contact with oppositely-disposed fixed contact-pieces adapted to be maintained in electrical communication with electric wires or conductors.

The construction and arrangement of the contact-pieces are shown in Figs. 2, 4, 5, and 6. In these figures the fixed contact-pieces H H′ are approximately semicircular, the ends of one being close to the ends of the other and separated therefrom by only a slight space. The moving contact-piece I consists of a plate of flexible material capable of serving as a conductor and having the requisite spring or elasticity, the said plate being perforated to fit upon the stem *c′* of the push-piece and being cut to form wings, preferably four, as shown, intended to bear upon the fixed contact-pieces. The stem *c′* is passed through the central perforation in the plate, and the spiral spring E acts to hold the plate in contact with the under side of the enlarged portion of the push-piece. The wings are bent downward or away from the enlarged portion of the push-piece, so that when the push-piece is pressed downward or inward the free ends of the wings come into contact with the fixed contact-pieces H H′. Thereafter in the continued movement of the push-piece the wings slide outward over the surfaces of the fixed contact-pieces H H′. With the wings of the plate formed of ample width and oppositely disposed, as shown, it becomes unnecessary to exercise any particular care to maintain the movable contact-piece in any particular position circumferentially about the stem *c′*, for no matter how the plate may turn upon the stem *c′* its wings are sure to effect electrical communication between the two fixed contact-pieces whenever the push-piece is sufficiently pressed upon. The wings are to be made quite broad, in order that they may bridge the interval between the ends of the fixed contact-pieces H H′ when the parts are relatively disposed, as in Figs. 4 and 6. Two oppositely-disposed wings upon the plate would answer, if sufficiently broad, in place of the four wings shown.

In Fig. 2 I have shown the fixed contact-pieces as formed by bent plates fitting around the block K, one portion of each plate overlapping the upper side of the block and another portion thereof fitting against the under side of the block, to which the said plates are held by the screws G G′. The block K is introduced into the bore of the body of the case and secured therein by a screw L, (shown in Fig. 1,) the said block having an axial recess and perforation, the recess serving for the reception of part of the spring E, while the stem *c′* of the push-piece passes into and partly through the perforation, and the shoulder at the end of the said recess serving as an abutment for the inner end of the spring.

In Figs. 5 and 6 the fixed contact-pieces are shown held by screws M M and G G′ to the face of the hub on the disk of the case, the said disk being axially recessed and perforated in like manner as the block in Fig. 2. The wires F F′ pass through perforations in the disk, as shown.

Fig. 7 shows the manner of fitting a push-button of the same general construction as in Figs. 1 to 4 for use as a floor-button. In this figure I have shown the push-piece C as having an axial bore or hole therein at c^2 to receive the reduced stem of a removable pin P. Normally the outer surface of the push-piece stands flush with the face of the cap B and is protected thereby. This will be seen from inspection of the various figures of the drawings. This guards the push-piece from being accidentally pressed inward or from being struck and injured. Therefore when the push-button is inserted into a floor it may be trod upon without effect; but when the removable pin P is put in place, as in Fig. 7, the application of the foot will effect the desired movement of the push-piece. The said pin P may be removed after the necessity for the use of the push-button has ceased. The washer D constitutes a packing by which the interior of the push-button is practically kept sealed against the admission of dust.

Another arrangement of packing is represented in Fig. 7, in which suitable material Y is shown placed in a groove or recess Z, formed in the interior of the cap, while in Figs 2, 6, and 8 I have shown the hole through cap B lined with rubber. The contact-pieces are so arranged in each of the modifications shown as to provide for a rubbing action of the movable contact-piece against the fixed contact-pieces whenever the push-piece is pressed inward, thereby insuring proper contact and preventing the surfaces from being kept out of contact by any small particle interposed between them, as might be the case were the movable contact-piece moved directly against the fixed contact-pieces without the sliding and rubbing action. The flange *c* serves to prevent the push-piece from passing too far out of the case. The spiral spring E acts upon the push-piece to press it outward in a proper manner without any tendency to occasion lateral deflection thereof.

I claim as my invention—

1. The combination, with the case and fixed contact-pieces applied thereto, of the push-piece, a contact-plate applied thereto having oppositely-disposed inclined wings for sliding or rubbing engagement with the fixed contact-pieces, and a spring acting to press the push-piece outward, substantially as described.

2. The combination, with the case and fixed contact-pieces applied thereto, of the push-piece having the flange, packing surrounding the push-pin to exclude dust from the interior of the case, the spiral spring surrounding the stem of the push-piece and acting to press the push-piece outward, and a contact-piece movable with the push-piece and having oppositely-disposed inclined wings for rubbing or sliding engagement with the fixed contact-pieces, substantially as described.

3. The combination, with the case and fixed contact-pieces applied thereto, of the push-piece having the flange, the washer surrounding the push-piece and resting against the flange, the spiral spring surrounding the stem of the push-piece and acting to press the push-piece outward, and a contact-piece movable with the push-piece and having oppositely-disposed inclined wings for rubbing or sliding engagement with the fixed contact-pieces, substantially as described.

CHARLES H. DELANO.

Witnesses:
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