No. 730,567. PATENTED JUNE 9, 1903.

A. W. PLASSMANN.

ELECTRIC PUSH BUTTON.

APPLICATION FILED JAN. 29, 1902.

NO MODEL.

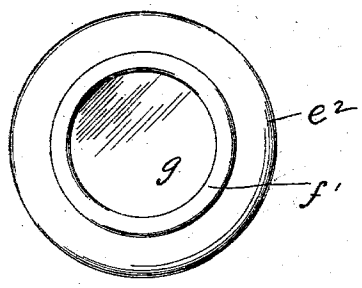


Fig 1

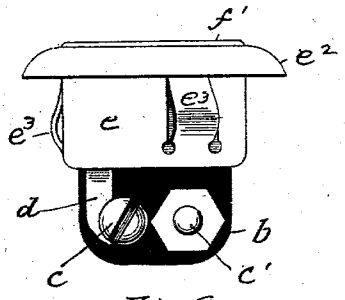


Fig 2

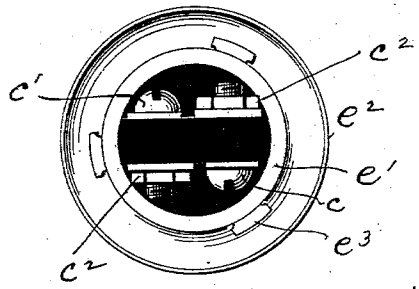


Fig 3

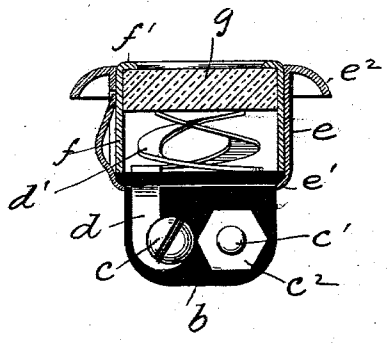


Fig 4

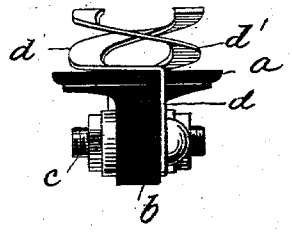


Fig 5

Witnesses
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No. 730,567. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

AUGUST W. PLASSMANN, OF NEW YORK, N. Y., ASSIGNOR TO RICHMOND ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC PUSH-BUTTON.

SPECIFICATION forming part of Letters Patent No. 730,567, dated June 9, 1903.

Application filed January 29, 1902. Serial No. 91,668. (No model.)

To all whom it may concern:

Be it known that I, AUGUST W. PLASSMANN, a citizen of the United States, residing at the city of New York, in the borough of Bronx and State of New York, have invented certain new and useful Improvements in Electric Push-Buttons, of which the following is a full, clear, and exact description.

This invention relates to electric push-buttons of that class which are adapted to fit into a circular opening in a desk or plate, leaving exposed only the button at the front, which is substantially flush with the surface of the body in which it is set.

The object of this invention is to provide a push-button of this character which shall be simple and cheap to construct, which shall afford good contact at all times, and protect the contacts from dust and moisture.

The invention consists of the construction and combinations hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a face view of the improved button. Fig. 2 is a side elevation of the same. Fig. 3 is a view of the back of the button. Fig. 4 is a central section of the casing containing the contacts and button, showing the mounting of the binding-screws in side elevation, and Fig. 5 is a side elevation of the insulating block or frame to which the contact and connecting portions are attached.

The binding-screws and contacts are permanently attached to a block of insulating material consisting of a disk-like portion *a* and an oblong projection *b*, preferably in one piece with the disk, this part being constructed either of hard rubber, fiber, or any other suitable non-conducting material. The binding devices for the line-wires are connected to the part *b* by means of the two bolts *c* and *c'* passing laterally through said projection, the head of one bolt being on one side of the projection, while the head of the other is on the opposite side, thus making the clamping-nuts c^2, which secure the ends of the wires on opposite sides of the said projection *b*. The ends of the wires are thus kept separated, and the work of securing them to the button is facilitated. Under the head of each bolt is secured the end of a flat strip of spring metal *d* and *d'*. The strip passes upward along the face of the projection *b* and through a slit in the disk *a* to the upper surface of the latter, where it is bent at right angles and terminates in a spiral about one complete convolution in length and rising from said surface. The two spirals are alternately disposed with respect to each other and are concentric and of the same diameter, so that when a downward pressure is exerted against them they will be brought into contact throughout nearly their entire length. If desired, the spirals might be elongated into two or more convolutions, alternating with each other in order to obtain large contact-surface and great resiliency of the springs. With contacts of this character particles of dust here and there over the contacting surfaces will not interfere with the closing of the circuit, inasmuch as the surfaces are so large that ample connection will always be made to carry the current. This is considered a vast improvement over all forms of contacts where only the ends of the spring-pieces come together.

e is a cylindrical shell into the bottom of which the disk *a* is inserted with the projection *b* extending rearward. The rearward edge of this cylinder is provided with an inwardly-turned flange *e'* to retain the disk *a*. The forward edge of the cylinder is provided with a curved outwardly-turned flange e^2, furnishing an ornamental finish for the button and preventing its being forced too far into the socket or cavity in which it is placed. This cylinder is also provided with integral spring-tongues e^3, which furnish frictional connection between the cylinder and the wall of the cavity in which it is confined and preventing its being removed therefrom without exercising considerable force. Inside of the cylinder *e* is a second cylinder or shell *f* of such diameter as to fit friction-tight within the cylinder *e*. Its inner edge rests upon the rim of disk *a* and confines that member in place. Its outer edge is provided with an inwardly-turned flange *f'*, between which and the outer terminals of the spiral contacts is located a button *g*, of ivory, rubber, or other similar material, normally held outward against the flange *f'* by the springs and

adapted to be forced inward by pressure of the thumb or finger to cause the spirals *d* and *d'* to make contact with each other. This inner shell *f* furnishes a dust-proof casing for the contacts, since it excludes dust that might otherwise enter through the openings caused by the springs e^3. The inwardly-turned flange f^3 also furnishes a second ornamental finish for the front of the button.

The merits of this button are its cheapness of construction, the ease with which the line-wires may be attached thereto and the separation thereof, protection for the contacts, elongated contacting surface, and pleasing appearance.

Having described my invention, I claim—

1. The combination of two electric terminals, consisting of concentric spiral springs whose convolutions alternate with each other and are normally out of contact, and means for forcing the convolutions into contact.

2. A pair of electrical contacts consisting of two spiral springs, arranged with their convolutions alternating with each other, and means for forcing the convolutions into and out of contact with each other, substantially as described.

3. A push-button consisting of a cylindrical shell, a non-conducting disk closing the rear end of the shell, and having a rearward non-conducting projection, contact-strips secured to said rearward projection extending through said disk and arranged opposite each other on the inside of said disk, and a button in the shell, substantially as described.

4. A push-button consisting of a cylindrical shell, a disk of insulating material closing one end and to which the electrical contacts are fixed, a second cylindrical shell fitting into the first and a button confined in the second shell, substantially as described.

5. A push-button consisting of a cylindrical shell, having integral spring-tongues adapted to hold it in place, a disk of insulating material closing one end and to which the electrical contacts are fixed, a second cylindrical shell fitting into the first and a button confined in the second shell, substantially as described.

6. In a circuit-closer, a plate of insulating material, having a projection of similar material, from one face, two metallic strips secured to the opposite faces of said projection and leading through the plate to its opposite side where they are disposed opposite each other, for the purpose set forth.

7. A push-button consisting of a cylindrical shell adapted to fit into an opening in a supporting-body and provided with a flange limiting its position in said body, and a second cylindrical shell fitting into the first and inclosing electrical contacts and a button, and having an inwardly-turned flange to retain said button, substantially as described.

8. An electric push-button comprising a suitable thimble or casing, a body of insulating material supported therein, contacts and terminals mounted upon said insulating-body, a contact-controlling button movably mounted in said thimble or casing, and a retaining collar or thimble fitting snugly in said casing and confining the insulating-body and movable button, substantially as set forth.

9. An electric push-button comprising an outer thimble or casing formed with an inturned base-flange, a body of insulating material supported in said thimble upon said base-flange, contacts and terminals mounted upon said insulating-body, a contact-controlling button movably mounted in said thimble or casing, and a retaining collar or thimble formed with an inner flange and fitting snugly in said outer casing, said retaining collar or thimble engaging the insulating-body for securing it in said casing, and the flange of said retaining collar or thimble engaging said button for confining it, substantially as set forth.

10. In a push-button, the combination of an insulating-body and suitable electric terminals mounted thereon, with the overlapping spiral-spring contact-arms electrically connected with said terminals and separated from each other, and means adapted to force said contact-arms into engagement at a plurality of points, substantially as set forth.

11. In an electric push-button, the combination of a suitable body of insulating material, and electric terminals mounted thereon, with the overlapping spiral-spring contact-arms formed of sheet metal electrically connected with said terminals and separated from each other, and a movable button adapted to force said contact-arms into engagement at a plurality of points, substantially as set forth.

12. In an electric push-button, the combination of a suitable casing with a body of insulating material mounted therein and formed of approximately T shape in longitudinal section, electrical terminals secured to the stem of said T-shaped body, contacts mounted upon the head of said T-shaped body, and electrically connected with said terminals, and an operating-button movably supported in said casing, substantially as set forth.

13. In an electric push-button, the combination of an outer thimble or casing and body of insulating material mounted therein and comprising a plate or web and flanges projecting laterally therefrom at one end to form an insulating-base, electric terminals secured to said plate or web, contacts mounted upon said base and electrically connected with said terminals, and an operating-button movably supported in said casing, substantially as set forth.

14. In an electric push-button, the combination of an outer thimble or casing, having an inturned base-flange, a body of insulating material mounted therein and comprising a plate or web and flanges projecting laterally therefrom at one end to form an insulating-base, said base resting upon the inturned base-flange of the casing, electric terminals secured

to said plate or web, contacts mounted upon said base and electrically connected with said terminals, and an operating-button movably supported in said casing, substantially as set forth.

15. In an electric push-button, the combination of an outer casing formed with an inturned base-flange, a body of insulating material formed with an approximately circular base or head and a web projecting therefrom, electric terminals secured to said web, contacts mounted upon said base and electrically connected with said terminals, and an operating-button movably supported in said casing, substantially as set forth.

16. In an electric push-button, the combination of an outer thimble or casing formed with an inturned base-flange, a body of insulating material having an approximately circular base or head and a web projecting therefrom, said base or head resting within the outer thimble or casing upon said base-flange, terminals secured to said web, contacts mounted upon said base or head and electrically connected with said terminals, an operating-button movably supported in the thimble or casing, and an inner thimble or collar fitting tightly in said outer thimble or casing and engaging said insulating-body and the movable button for confining them in the casing, substantially as set forth.

In witness whereof I subscribe my signature in presence of two witnesses.

AUG. W. PLASSMANN.

Witnesses:
WM. A. ROSENBAUM,
WALDO M. CHAPIN.