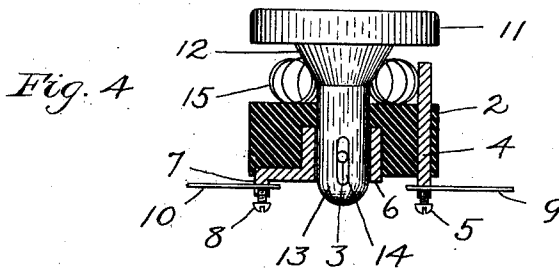
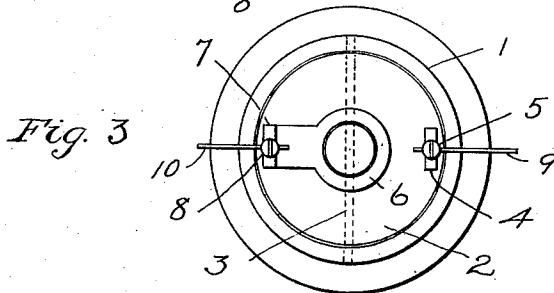
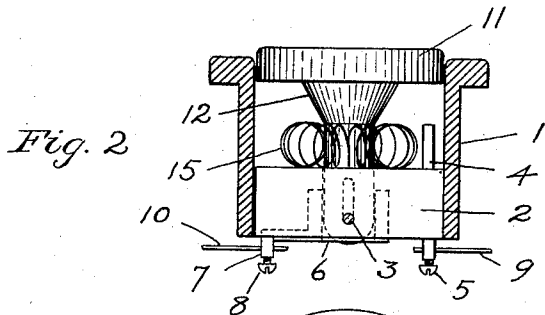
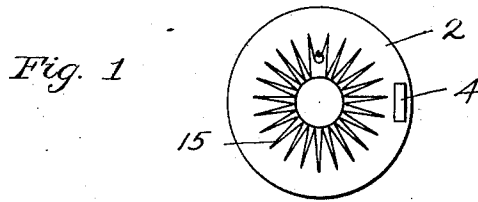


H. C. THOMSON.
PUSH BUTTON.
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1,016,589.

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UNITED STATES PATENT OFFICE.

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PUSH-BUTTON.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY C. THOMSON, citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Push-Buttons, of which the following is a specification.

My invention relates to electric circuit closers employed for the purpose of completing the electrical connection between the terminals of an electric circuit so as to close the said circuit.

More particularly my invention has reference to push buttons of the type shown and described in United States Letters Patent 959,435 for circuit closer, issued to me on May 24, 1910; which embody a diametrically distortible member, secured by a movable plunger upon a base block, and distorted by the longitudinal movement of said plunger so as to become operative as an electrical connection between circuit terminals also mounted upon said base block.

My invention resides in certain modifications in the construction of a push button of the type described in said application, for the purpose of securing a construction of the same varying in some respects from the specific forms described in such application.

In the drawings which accompany this specification and form a part of this application is shown a push button in an embodiment of the same more especially known as a desk push.

In said drawings,—Figure 1 is a top view of the base block forming a part of my desk push the plunger being removed to show the distortible member lying on the base-block in its normally inoperative or open-circuit position. Fig. 2 is an elevation, partly in section, showing a desk push embodying my invention. Fig. 3 is a bottom view of the base block forming a part of said desk push. Fig. 4 is an elevation principally in section showing the operating portions of my desk push when the same are in their operative or closed-circuit relation.

Referring to said figures the operating portions of my desk push are mounted preferably in the tubular casing 1 which may be forcibly driven, or otherwise secured, in any desired manner, in the recess in which the desk push is to be located. Said operating portions are carried upon a base block 2 preferably of insulating material which is

adapted to fit within the tubular casing 1. Said base block is preferably secured within the casing by means of a pin 3 adapted to pass diametrically through the base block 2 and to engage, at its outer ends, in the casing 1.

As more clearly appears in Fig. 4, in the base block 2 is secured the conductor bar 4, provided at one end with binding screw 5 and having its other end adapted to project for a short distance above the surface of the base block, as shown. In a longitudinal opening in said base block 2 is secured the annular bushing 6, electrically connected with a lug 7, which is provided with a binding screw 8. A conductor 9, forming one terminal of the electric circuit, is connected with conductor bar 4 by binding screw 5, while a conductor 10, forming the other circuit terminal, is secured to lug 7 by the binding screw 8. Said conductor bar and annular bushing may be collectively termed contact members.

The desk push is operated through a button 11, carried on the end of a plunger which is mounted in the base block 2 so as to be longitudinally movable with respect to the same. The said plunger embodies the preferably conical tapered portion 12 diminishing in diameter from the button 11 as the guide portion 13 is approached. Said guide portion 13 is adapted to slidingly fit within the annular bushing 6. The said plunger is preferably of electrically conductive material, and is adapted to electrically engage with said annular bushing 6. If desired, however, only a portion of said plunger, as for example the surface of the same, need be electrically conductive, the body of the same being of any other desired material. A slot 14 is provided in the guide portion of the said plunger within which the pin 3 is adapted to slide, said pin thus serving to retain said plunger in its assembled relation in the base block. On the upper surface of said base block is positioned the electrically conducting distortible circuit closing member 15. Said distortible member 15 is embodied in the form of an electrically conductive element so constructed to embody a capacity for temporary distortion or change of form, as a result of the application of the force thereto; which is adapted to produce a diametral enlargement of the same; said element, however,

embodying a resiliency by which the same is restored substantially to its original form and dimensions when the distorting force is removed. Preferably said distortible member is embodied in the form of an annular member made up of a length of helically coiled spring wire bent into a ring and having its free ends hooked together, as shown in Fig. 1, or otherwise connected, in any suitable manner.

The distortible member 15 is positioned in its operating position upon base block 2 by the plunger, which is adapted to pass through the central opening in said distortible member, the plunger operating to secure the distortible member in its assembled relation upon the base block, and being itself secured within the base block by the engagement of the pin 3 within the slot 14. The length of the helically coiled spring from which the distortible member is formed is preferably such that the said distortible member is closely contracted around the plunger, preferably adjacent the smaller end of the tapered portion of the same and is thus adapted to exert a force upon the tapered portion 12 of the plunger which is adapted to force the plunger upward and to maintain the same in its raised position as shown in Fig. 2. In such raised position of the plunger the extreme external diameter of the distortible member and the distance of the adjacent surface of said conductor bar 4 from the center of the plunger are so related that said distortible member is non-contiguous with said conductor bar 4. When said button is forcibly depressed the tapered portion 12 of the plunger is caused to enter more deeply within the inner opening of the distortible annular member; the increasing diameter of the tapered portion of the plunger thrust within the opening of said annular member as a result of the longitudinal movement of the plunger relative to the said member causing the distortion of the same and producing a diametral expansion of said distortible member which eventually operates to bring the outlying points of its convolutions lying adjacent to the conductor bar 4, into contact with the inner surface of said bar. It is evident that in such relation the distortible member operates to complete the electrical connection between the circuit terminals; current entering from one wire 9 into the conductor bar 4, passing thence through the distortible member 15 into the plunger. Traversing the same the current will pass into the annular bushing 6, which is in electrical connection with the second wire 10 of the circuit through the lug 7.

It may be here pointed out that the convolutions of distortible member 15 should preferably be sufficiently resilient so that that convolution which first comes into contact with the surface of the conductor bar 4 will

yield, as an increasing pressure is applied upon the button, until a sufficient number of the coils embodied in said distortible member are in contact with the conductor bar to insure a satisfactory electrical connection between the distortible member and the said conductor bar.

It may be further noted the spreading of the convolutions of the distortible member incident to the diametral expansion thereof tends to produce a slight rubbing between the said convolutions and the conductor bar which maintains the contacts always clean and bright, insuring perfect electrical engagement. Furthermore the movement of the plunger relative to the annular distortible member is apt to cause a slight rotation of the several convolutions about the axis of the annular member which further aids in securing the rubbing contact between said distortible member and the contact strips.

In case the distortible member becomes so fouled by dirt as to seriously impair the working of the circuit closer it is a simple and inexpensive matter to replace the distortible member by a new one.

Having described my invention I claim,

1. An electric circuit closer comprising essentially a base block, a contact member in electrical connection with one terminal of an electric circuit, a second contact member electrically insulated with respect to the first contact member and in electrical connection with the second terminal of said circuit, a distortible conducting member, a member movable with respect to said base block, said movable member being adapted to secure said distortible member in its assembled relation in the circuit closer and in one of its positions to locate the same adjacent to but normally out of contact with said first contact member, and means, rendered operative by the movement of said movable member into another position to distort said distortible member, and thereby to cause the same to electrically engage said first contact member, said distortible member and said second contact member being in electrical connection through the movable member in such other position.

2. An electric circuit closer comprising essentially a base block, a plunger having an electrically conductive surface, longitudinally movable with respect to said base block, a contact member carried on said base block and forming one terminal of an electric circuit, a second contact member carried on said base block and forming the second terminal of said electric circuit, said second contact member having a portion adapted to electrically engage the surface of said plunger, an annular distortible conducting member encircling said plunger and engaging said surface, said annular member being positioned by said plunger adjacent to said first

contact member, but in its normal undistorted condition out of contact therewith, and means rendered operative by the longitudinal movement of the plunger to diametrically enlarge said annular member so as to bring the same into electrical engagement with said first contact member.

3. An electric circuit closer comprising essentially a base block, an electrically conductive plunger longitudinally movable in said base block and embodying a tapered portion, a contact member carried on said base block and forming one terminal of an electric circuit, a second contact member carried on said base block forming the second terminal of said electric circuit, said second contact member having a portion in electric engagement with said plunger, a diametrically enlargeable conducting member normally contracted upon the plunger adjacent the smaller end of the tapered portion of the same, said member in such contracted condition being positioned by said plunger so as to lie adjacent to but out of contact with said first contact member, the longitudinal movement of the plunger being adapted to produce a diametrical enlargement of said conducting member whereby it is caused to engage with said first contact member.

4. An electric circuit closer comprising essentially a base block, an electrically conductive plunger longitudinally movable in said block and embodying a tapered portion, a contact member carried on said base block and forming one terminal of an electric circuit, a second contact member carried on said base block and forming the second terminal of said electric circuit, said second contact member having a portion in electric engagement with said plunger, a resilient diametrically expansible conducting ring supported by the base block and normally contracted about the plunger adjacent the smaller end of the tapered portion of the same, said ring in such contracted condition being positioned by the plunger so as to lie adjacent to, but out of contact with, said first contact member, the longitudinal movement of the plunger being adapted to produce a diametrical expansion of said ring sufficient to bring the same into engagement with said first contact member.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. THOMSON.

Witnesses:

NATHAN B. DAY,
CHAS. F. RANDALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."