Mar. 27, 1923. 1,449,725.

F. R. BECKERT.

ELECTRICAL APPARATUS.

FILED OCT. 18, 1921.

Fig. 1.

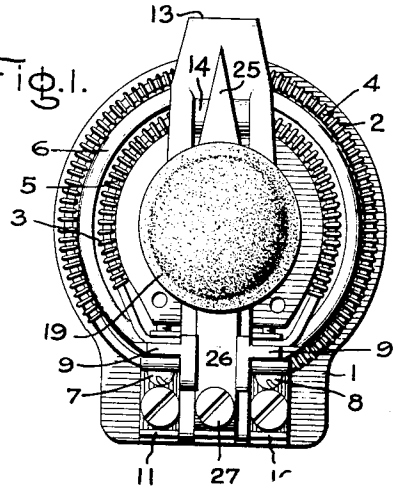


Fig. 2.

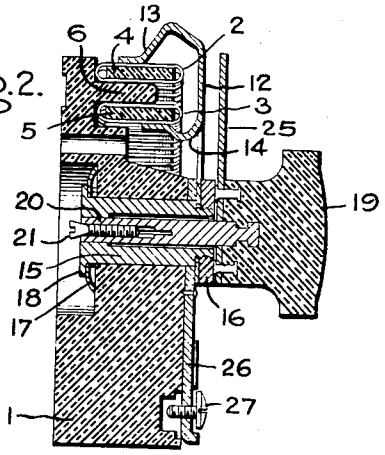


Fig. 3.

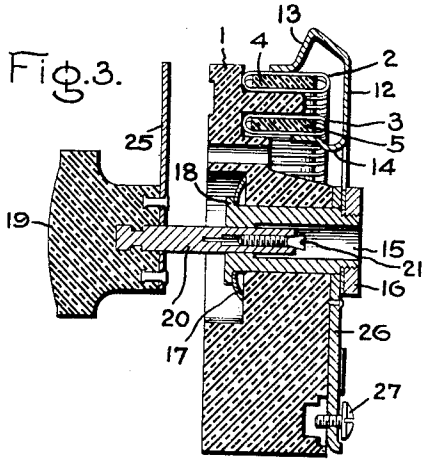
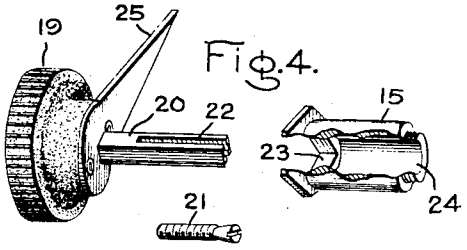


Fig. 4.



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Patented Mar. 27, 1923. 1,449,725

UNITED STATES PATENT OFFICE.

FRANK R. BECKERT, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRICAL APPARATUS.

Application filed October 18, 1921. Serial No. 508,481.

To all whom it may concern:

Be it known that I, FRANK R. BECKERT, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Electrical Apparatus, of which the following is a specification

My present invention relates to electrical apparatus and more particularly to variable resistance devices.

The object of my invention is to provide a simple and efficient construction for a rheostat or potentiometer whereby the device may be mounted as desired upon either side of a support such as a switchboard, and the handle whereby the device is operated may be quickly adjusted to permit of the convenient operation of the device in either position in which it may be mounted.

The novel features which I believe to be characteristic of my invention are set forth in the appended claims. My invention itself, however, both as to its organization and method of operation will best be understood by reference to the following description taken in connection with the accompanying drawing in which Fig. 1 is a plan view of a potentiometer or rheostat constructed in accordance with my invention; Fig. 2 is a cross-section illustrating the manner in which the handle is secured to the device when the device is mounted on the front of a switchboard; Fig. 3 is a similar cross-section illustrating the manner in which the handle is secured to the device when the device is mounted on the back of a switchboard and the handle projects through the board to the front, and Fig. 4 is a detail view of the essential parts whereby the handle is secured to the device in the desired manner.

As indicated in the drawing, the device comprises a base 1, which is preferably of insulating material and which serves as a support for two resistance elements 2, 3. These resistance elements are in the form of flattened coils of wire having suitable resistance characteristics for the purpose desired, these coils being supported by flat strips 4, 5 of insulating material which are bent in circular form. The two coils are separated by a circular rib 6 on the base 1 and the elements are secured to the base by means of the fastening screws 7, 8, which pass through an upwardly projecting portion 9 of the base member, and also through the terminal members 10 and 11. One end of the coil 2 is secured to the terminal 10 by means of the screw 8 and a corresponding end of the coil 3 is secured to the terminal 11 by means of the screw 7. A contact member 12 bridges the two resistance elements 2 and 3, making contact therewith along the sides of the supporting strips 4 and 5. One arm of this contact member 13, which is formed by bending the end downwardly and outwardly as indicated, provides a spring contact with the outer side of resistance element 2 and a second portion 14 of the contact member, which is formed by punching out and bending downwardly the central portion of the contact member makes a spring contact with the inner side of coil 3.

The contact member 12 is carried by a sleeve 15 extending through the base member 1, being secured to the end of the sleeve by means of the nut 16. A spring washer 17 interposed between the head 18 of this sleeve and the base 1 prevents longitudinal movement of the sleeve in the base and at the same time permits it to be readily rotated. Rotation of the sleeve 15 and the contact member 12 may be accomplished by means of an operating knob 19 having embedded therein one end of a shaft 20. The end of this shaft remote from the knob 19 is tapped for a screw 21 and split at 22 so that when the screw 21 is inserted the shaft 20 will be expanded. The sleeve 15 has a longitudinal opening therethrough, the portion 23 of which is of substantially the same cross sectional area as the shaft 20, while the portion 24 is of considerably larger cross section. The knob 19 also carries a pointer 25.

When the device is to be mounted on the front of a switchboard the shaft 20 is inserted in the opening 23 in the manner indicated in Fig. 2. When the screw 21 is tightened the shaft 20 will expand and be securely attached to the sleeve 15. When on the other hand it is desired to mount the device on the back of a switchboard it is mounted without the operating knob 19 and the shaft 20 is then inserted through a suitable opening in the switchboard and secured in the sleeve 15 in the manner indicated in Fig. 3. The larger portion 24 of the open-

ing through sleeve 15 readily permits of the insertion of a screwdriver for tightening the screw 21 in this case.

The contact member 12 is in intimate contact with the terminal member 26 having at the end thereof a binding screw 27. By varying the connection of the controlled apparatus to the terminal members 10, 11 and 26 the resistance inserted in the circuit by the device described may comprise all or a portion of either one of the resistance elements 2 and 3 singly, all or a portion of the resistance of the two elements in parallel, or all or a portion of the combined resistance of the two elements in series.

While I have illustrated and described a preferred embodiment of my invention, it will be apparent that it is by no means limited to the specific apparatus described, but that many modifications in the form of the apparatus as well as in the manner of construction thereof may be made without departing from the scope of my invention as set forth in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. The combination in an electrical apparatus of a base member, a rotatable sleeve extending through said base member, an operating handle having a shaft secured thereto, the end of said shaft remote from said handle being tapped and split, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross-sectional area as the split end of said shaft and the remaining portion of said opening being of large cross section, and screw means for expanding the end of said shaft to secure the shaft in the opening through said sleeve.

2. The combination in an electrical apparatus of a base member, a rotatable sleeve extending through said base member, an operating handle having a shaft secured thereto, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross sectional area as the end of said shaft and the remaining portion of said opening being of larger cross section, and means for expanding said shaft to secure it in the opening through said sleeve.

3. The combination in an electrical apparatus of a base member, a rotatable sleeve extending through said base member, an operating handle having a shaft secured thereto, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross sectional area as the end of said shaft and the remaining portion of said opening being of larger cross section, and means capable of being operated from either end of said sleeve for expanding said shaft to secure it in the opening through said sleeve with the handle projecting from either end of said sleeve.

4. The combination in an electrical apparatus of a base member, a resistance element supported on said base consisting of a flattened coil supported by a flat strip of insulating material, a rotatable sleeve extending through said base member and having secured thereto a contact member which contacts with said coil along the side of said strip, an operating handle having a shaft secured thereto, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross sectional area as the end of said shaft and the remaining portion of said opening being of larger cross section, and means for expanding said shaft to secure it in the opening through said sleeve.

5. The combination in an electrical apparatus of a base member, a pair of resistance elements supported on said base each consisting of a flattened coil supported by a flat strip of insulating material, a rotatable sleeve extending through said base member, and having secured thereto a contact member forming a bridge between said resistance elements, an operating handle having a shaft secured thereto, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross sectional area as the end of said shaft and the remaining portions of said opening being of larger cross section and means for expanding said shaft to secure it in the opening through said sleeve.

6. The combination in an electrical apparatus of a base member, a pair of resistance elements supported on said base each consisting of a flattened coil supported by a flat strip of insulating material, a rotatable sleeve extending through said base member and having secured thereto a contact member forming a bridge between said resistance elements and contacting with said coils along opposite sides of the two strips, an operating handle having a shaft secured thereto, said sleeve having a longitudinal opening therethrough, a portion of said opening being of substantially the same cross sectional area as the end of said shaft and the remaining portion of said opening being of larger cross section, and means for expanding said shaft to secure it in the opening through the sleeve.

In witness whereof, I have hereunto set my hand this 17th day of October, 1921.

FRANK R. BECKERT.