C. W. DUNHAM.

RHEOSTAT.

APPLICATION FILED FEB. 17, 1917

1,225,227. Patented May 8, 1917.

FIG. 2

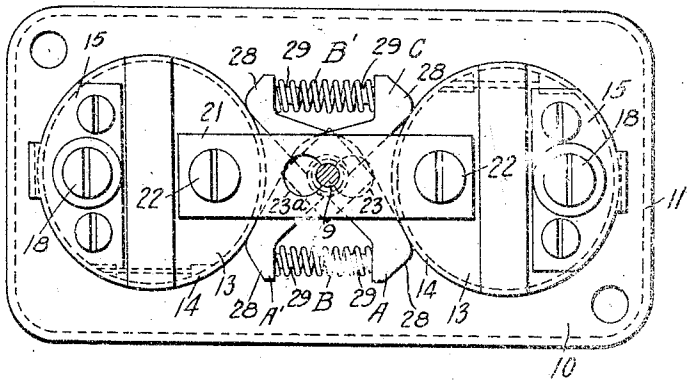
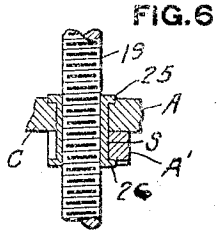


FIG. 6



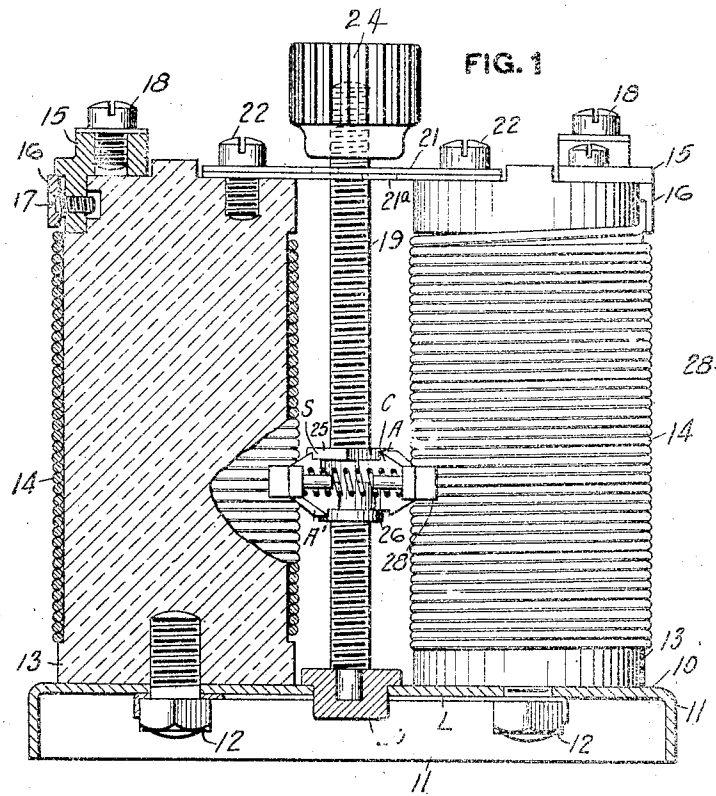


FIG. 1

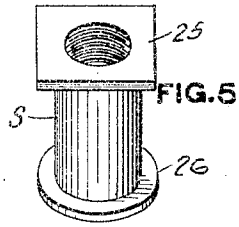


FIG. 5

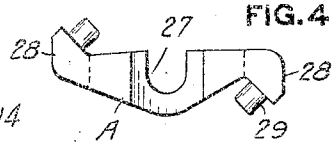


FIG. 4

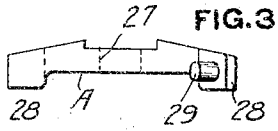


FIG. 3

WITNESSES

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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

1,225,227. Specification of Letters Patent. Patented May 8, 1917.

Application filed February 17, 1917. Serial No. 149,232.

To all whom it may concern:

Be it known that I, CHARLES W. DUNHAM, a citizen of the United States, residing at Edgewood Borough, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to rheostats.

One feature of this invention resides in the provision of a rheostat including a biased bridging contact member of such a character that when traversed by current, the biasing means for the member will be unaffected by such current, thereby insuring the proper functioning of the biasing means.

I will now describe one form of rheostat embodying my invention and will then point out the novel features thereof in claims.

In the drawings, Figure 1 is a view showing in elevation and partly in section one form of rheostat embodying my invention. Fig. 2 is a top plan view of the rheostat shown in Fig. 1. Fig. 3 is a view showing in side elevation one of the arms of the bridging contact member shown in the preceding figures. Fig. 4 is a top plan view of the arm shown in Fig. 3. Fig. 5 is a detail perspective view of the sleeve shown in Figs. 1 and 2. Fig. 6 is a fragmentary view showing in vertical section the manner in which the sleeve and the contact arms are associated with the operating screw.

Similar reference characters refer to similar parts in each of the several views.

Referring to the drawings in detail, the rheostat in the form here shown comprises a metallic base 10 having a depending supporting flange 11 for maintaining the base elevated. Secured upon the base 10 by means of screws 12, 12, are a pair of vertically disposed porcelain spools 13, 13, such screws being locked by means of a bar L. These spools, as shown, are spaced apart and are of the same diameter and length. Coiled about the periphery of each of the spools 13, 13 is a continuous resistance unit 14, which, as here shown, is in the form of a helix.

The upper ends of the resistance units 14, 14 are adapted to be connected to the terminals of an external circuit by means of angle plates 15, 15, secured in recessed portions of the spools 13, 13. The vertical portion of each plate 15 is provided with a clamping plate 16 and a screw 17 by means of which the upper end of the resistance unit is connected to the angle plate. The horizontal portion of each angle plate is provided with a binding post 18 for connecting the terminals of an external circuit to the rheostat. Rotatably mounted between the spools 13, 13 is a vertically arranged operating screw 19, the lower end of which is journaled in a porcelain bearing 20 formed in the base 10. The upper end of the operating screw 19 extends through a pair of locking bars 21 and 21ª which span the upper ends of the spools, as shown. These locking bars are designed to removably secure the operating screw in vertical position between spools 13 and as here shown are clamped together in superimposed relation upon the spools by means of screws 22, 22.

The bars 21, 21ª are formed at their medial portions with reversely tapered openings 23, 23ª for receiving the operating screw 19. The operating screw is not provided with threads at the point at which it intersects the locking bars to permit free rotation of the screw within the bars. The operating screw is, however, locked against longitudinal movement by means of the locking bars. With the locking bars and operating screw in the positions shown in Fig. 1, the openings 23, 23ª have their small ends registering with each other, the walls of such openings engaging the unthreaded portions of the operating screw whereby removal of the operating screw will be prevented. When it is desired to remove the operating screw, the screws 22 are first removed, then the locking bars are moved toward each other in opposite directions, thereby causing the larger ends of the openings 23 and 23ª to register with each other. As the larger ends of the openings are of a greater width than the diameter of the operating screw, it is obvious that the operating screw may now be removed.

The operating screw is adapted to be manually rotated in either direction by means of a handle 24 to impart rectilinear movements to a bridging contact member designated generally at C. This bridging contact member is designed to electrically connect the resistance units 14, 14 at any point within their lengths to vary the re-

sistance of an external circuit as is well understood in the art. As here shown, the member C is adapted to be moved by the operating screw 19 through the medium of an internally threaded sleeve S surrounding the operating screw and having the threads thereof co-acting with the threads of the operating screw to move vertically upon the operating screw when the latter is rotated. The opposite ends of the sleeve S are formed with annular flanges 25 and 26 respectively between which is mounted the bridging contact member, as will be hereinafter described.

The bridging contact member C comprises in this instance a pair of arms A and A′ formed of electro-conducting material of low resistivity for electrically connecting the resistance units 14, 14, and a pair of biasing members B and B′ formed of electro-conductive material of relatively high resitivity for forcing the arms into engagement with both of the resistance units. The arms A and A′ as shown in Figs. 1 and 2, are arranged in superimposed relation upon the sleeve S between the flanges 25 and 26 and are mounted for swinging movement thereon. These arms are of identical construction and as shown in Figs. 3 and 4 each arm comprises a single length of material recessed at the medial portion thereof as at 27, to receive the sleeve S. The opposite ends of each arm are offset in the same direction as best illustrated in Fig. 3 and are provided with reversely disposed contact tips 28, 28.

When the arms A and A′ are assembled upon the sleeve S they are reversely disposed to cause the contact tips 28 to lie in the same horizontal plane.

The biasing members B and B′ as here shown are in the form of coiled expansible springs, each spring being interposed between adjacent contact tips 28 of the arms to force the contact tips into engagement with the resistance units 14, 14. Lugs 29 are formed on the contact tips 28 for engaging and holding the springs between the arms. As clearly shown in Fig. 2 the opposite ends of the arms are biased in opposite directions to cause the contact tips of each arm to engage both of the resistance units thereby forming two conducting paths of low resistance for the passage of current between the resistance units. As the springs B and B′ have a relatively high resistance as compared with the arms A and A′, it is obvious that current when traversing the bridging member C will be shunted from the springs, the arms conducting the current from one resistance unit to the other and thereby preventing the current from heating the springs to destroy their resiliency.

By virtue of this construction and arrangement it will be evident that the current traversing the bridging contact member C will be ineffective to destroy the resiliency of the biasing means, thus the proper functioning of the biasing means is maintained.

Although I have shown and described only one form of rheostat embodying my invention, it is to be understood that various changes and modifications may be made without departing from the spirit and scope of the appended claims.

Having thus described my invention, what I claim is:

1. A rheostat comprising a pair of resistance units, a movable bridge connecting said units and comprising a pair of superimposed intersecting arms, and biasing means interposed between the ends of the arms for retaining the arms in contact with said units, said arms and biasing means being formed of conducting material of low and high electrical resistance respectively.

2. A rheostat comprising a pair of resistance units, a pair of movable intersecting arms, aranged tangentially with respect to said units, and biasing means interposed between said arms for maintaining the relative positions of the arms and for retaining the arms in contact with said units.

3. A rheostat comprising a pair of resistance units, a movable bridge connecting said unts and comprising a pair of crossed arms biased to engage said units, said arms being formed of conducting material, and means for moving said bridge over said units.

4. A rheostat comprising a pair of resistance units, a movable bridge connecting said units and comprising movable members, and biasing means of high electrical resistance for retaining said members in contact with said units, said members being formed of conducting material of low resistance whereby current traversing said bridge will be shunted from said biasing means.

5. A rheostat comprisng a pair of resistance units, bridging arms for electrically connecting said units, said arms being movable with relation to said units and to each other, and biasing means for retaining said arms in contact with said units, said biasing means having a higher resistance than said arms.

6. A rheostat comprising a pair of resistance units, crossed arms electrically connecting said units, said arms being movable with relation to said units and to each other, and coiled springs arranged between the ends of the arms for biasing said arms into engagement with said units.

7. A rheostat comprising a pair of resistance units, crossed arms arranged between said units and electrically connecting the same, biasing means for expanding the arms into contacting engagment with said units, said biasing means being formed of conducting material of higher resistance than said

arms, and screw threaded means for simultaneously moving said arms over said units.

8. A rheostat comprising a pair of resistance units, a screw-threaded member rotatably mounted between said units, a sleeve threadedly engaging said member, crossed conducting arms carried by said sleeve, and biasing means interposed between the opposite ends of said arms for expanding said arms into engagement with said units.

9. A rheostat comprising a pair of resistance units, crossed arms electrically connecting said units and movable thereover, and a spring for biasing said arms into engagement with said units, said spring being of a higher electrical resistance than said arms.

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

CHARLES W. DUNHAM.

Witnesses:

A. HERMAN WEGNER,

R. GEORGE RUDMAN.