D. S. BREITENBACH.

RHEOSTAT.

APPLICATION FILED JAN. 21, 1920.

1,386,150. Patented Aug. 2, 1921.

Fig. 1.

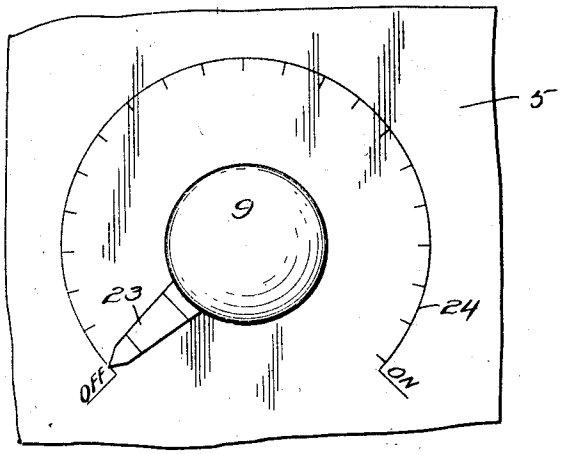


Fig. 2.

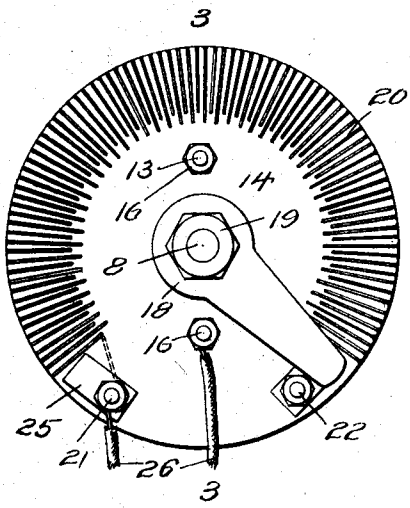


Fig. 3.

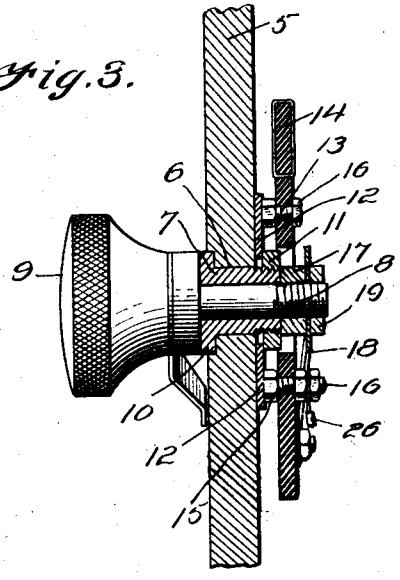
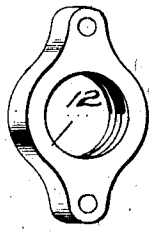


Fig. 4.



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RHEOSTAT.

1,386,150. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed January 21, 1920. Serial No. 353,081.

To all whom it may concern:

Be it known that I, DEREK S. BREITENBACH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to improvements in rheostats of the type wherein a contact arm is mounted to swing in sliding contact with a coil possessing adequate electro resisting quality and one of the objects of the present improvement is to so mount the coil upon a support as to present maximum area thereof to the air for radiating the heat and thereby preventing overheating of the coil.

A further advantage in the novel arrangement of the coil resides in the high degree of compactness procured and exceptional rigidity and strength of the device.

A further object is to provide an improved mounting for the rheostat whereby the entire structure is rigidly supported from a single point of support thereby eliminating the necessity of employing the usual number of screws or bolts in applying or attaching the rheostat to an object and consequently minimizing defacement of such object.

With these and other objects in view as will appear as the description proceeds the invention comprises the novel features of construction, combination and arrangement of parts as will be hereinafter fully described in the following specification and set forth with particularity in the claims appended hereto.

Figure 1 represents a front elevation of the improved rheostat.

Fig. 2 represents a rear elevation thereof.

Fig. 3 represents a diametrical sectional view on the line 3—3 of Fig. 2, and,

Fig. 4 represents a plan view of the supporting plate detached.

Referring to the drawing in detail, wherein similar reference numerals designate corresponding parts throughout the several views, the numeral 5 indicates a wood panel or other support which, to facilitate attachment of the improved rheostat thereto, requires simply the provision therein of a single opening 6 for the reception of the sleeve 7 constituting a bearing or bushing for the stem 8 of the knob or handle 9. One terminal of the sleeve 6 is provided with an external flange 10 preferably of annular form whereas the opposite end thereof is provided with external screw threads on which is fitted a nut 11. The threaded extremity of the sleeve is inserted in the aperture 6 in the main support 5 and the nut 11 is advanced upon the threaded terminal thereof until the support 5 is clamped with an adequate degree of pressure to rigidly maintain the sleeve in position.

A supporting plate 12 is clamped between the support 5 and the nut 11 and is provided with opposed extensions carrying laterally projecting threaded stems 13 which are positioned and support the insulating disk 14. spacing elements 15 being interposed between the plate 12 and the disk whereby the latter is maintained in spaced relation to the plate and support 5 and nuts 16 being threaded upon the extremities of the stems to prevent displacement of the disk.

The stem 8 projects beyond the terminal of the sleeve 6 and is provided with external screw threads coacting with a nut 17 whereby the axial movement of the stem with relation to the sleeve is limited and the relatively large apertured terminal of a contact arm 18 is positioned over the terminal of the stem 8 outwardly of and in engagement with the nut 17. A second nut 19 is fitted upon the extreme terminal of the stem 8 and is engaged with the contact arm 18 to rigidly secure the latter in position and maintain adjustment of the inner nut 17.

The disk 14 is provided with a circular staggered series of apertures receiving the convolutions of a coil 20 which latter, as will be understood, is constructed of wire possessing the desired degree of electrical resistance and which is electrically connected at one terminal with a binding post 21 secured in a portion of the disk 14 adjacent one terminal of the coil 20.

The post 21 constitutes a stop or abutment for limiting the movement of the contact arm 18 in one direction whereas the movement of the arm in the opposite direction is limited by a post 22 secured to the disk 14 in spaced relation to the post 21. The terminal of the coil 20 opposite the post 21 is adequately secured to the disk 14, and as will be understood, the tip of the arm is in slidable contact with the exposed portions of the convolutions of the coil 20 except

when moved into engagement with the posts 21 and 22 at the opposite limits of its movement.

An indicating arm 23 is preferably secured to the knob 9 and is movable over a circular graduated scale 24 marked upon the support 5 to assist in determining the position of the contact arm 18 with relation to the convolutions of the coil 20 whereby the resistance offered to the electrical current thereto may be approximated.

The wires of the circuit in which it is desired to interpose the rheostat are indicated by the numerals 26 and are connected, respectively, with the binding posts 16 and 21 and, the post 16 being electrically connected through the metallic parts of the rheostat to the contact arm 18 the electrical current is conducted thereto and passes therefrom into the convolutions of the coil 21, except when the rheostat is in "off" or "on" position. When the switch arm is moved to "on" position, it contacts directly with a contact plate 25 electrically connected with the post 21 whereby the resistance coil 20 is cut out and the current flows directly from the contact arm 18 into the post 21. However, as the contact arm is moved away from the post 21 and successively engages with the several convolutions of the coil 20, the resistance to the passage for the electrical current is increased according to the degree of resistance of the material from which the coil is constructed and consequently any desired degree of resistance may be readily attained by proper adjustment of the arm 18. When the arm 18 is moved to "off" position it disengages the last convolution of the coil 20 thereby breaking the circuit.

From the foregoing it is clearly evident that due to the novel arrangement of the several parts of the rheostat with relation to the sleeve 6, the entire structure may be rigidly supported thereby necessitating merely the provision of an aperture in the supporting panel to facilitate application of the rheostat thereto. Furthermore, due to the simple arrangement of the resistance coil 20, maximum area of the latter is presented to the atmosphere for radiating the heat generated incident to the passage of an electrical current therethrough thus insuring effective cooling of such resistance coil.

As will be readily apparent, the nut 11 may be dispensed with and in lieu thereof, the plate 12 may be formed of adequate thickness to permit internal threading thereof, as suggested in Fig. 4 whereby the plate may be fitted directly on the terminal of the sleeve 6.

What I claim is:

1. In a rheostat, an externally threaded supporting sleeve, a stem journaled in said sleeve, a nut threaded thereon, a supporting plate clamped between said nut and a support, opposed extensions formed on said supporting plate, laterally projecting threaded stems on said extensions, an insulated disk supported by said stems, spacing elements between said supporting plate and disk, a contact arm and a retaining nut positioned over the terminal of said stem, said disk having a circular, staggered series of apertures receiving the convolutions of a conductor, binding posts carried by said disk and a knob for turning said stem and contact arm on said disk and over the conductor.

2. In a rheostat, a supporting sleeve, a stem journaled in said sleeve, a nut threaded thereon, a supporting plate clamped between said nut and a support, threaded stems on said extensions, an insulated disk supported by said stems and spaced from said supporting plate, a contact arm carried by said stem, said disk having a series of apertures receiving the convolutions of a conductor, binding posts carried by said disk and a knob for turning said contact arm on said disk and over said conductor.

3. In a rheostat, a supporting sleeve, a stem journaled in said sleeve, a clamping nut threaded thereon, a supporting plate having apertured, opposed extensions formed on said plate, screw threaded stems in said apertured extensions, an insulated disk rigidly supported on said stems, spacing elements carried by said stems between said supporting plate and disk, a contact arm movable with and on the outer extremity of said stem, said disk having a series of staggered apertures receiving the convolutions of a conductor, binding posts on said disk and a knob for turning said stem and contact arm on said disk and over said conductor.

In testimony whereof I affix my signature hereto.

DEREK S. BREITENBACH.