March 1, 1927. 1,618,967

H. E. ADAMS

RHEOSTAT

Filed Sept. 14, 1925

Fig 1

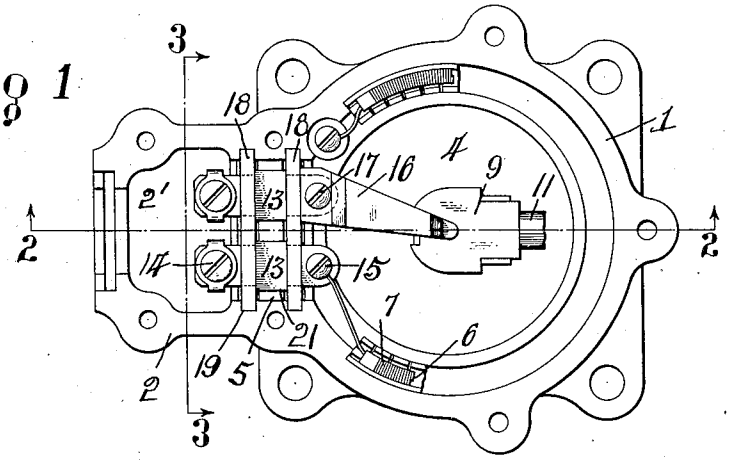


Fig 2

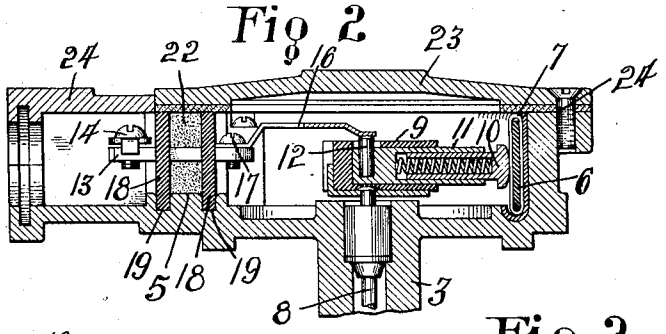


Fig 4

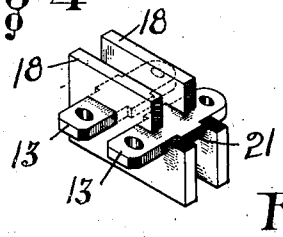


Fig 3

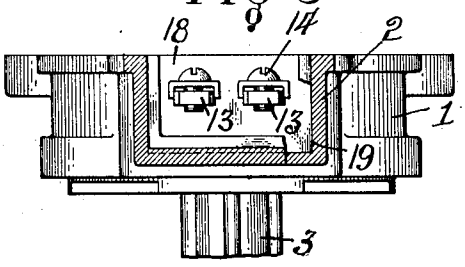


Fig 6

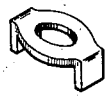


Fig 5

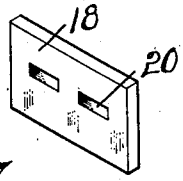
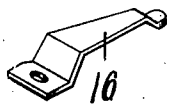


Fig 7



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Patented Mar. 1, 1927. 1,618,967

UNITED STATES PATENT OFFICE.

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RHEOSTAT.

Application filed September 14, 1925. Serial No. 56,114.

This invention relates to electrical equipment and particularly to rheostat units.

In the use of units of this character in connection, for instance, with instruments for indicating the level of liquids it is important to tightly seal the chamber containing the rheostat contacting parts, and in doing so the leads from the outside terminal wires must be brought into the chamber in a sealed manner to prevent leakage therearound.

It is the object of this invention to provide a chamber means for this purpose, which is easy and quick to install, is inexpensive to manufacture and composed of few parts.

The invention is fully described in the following specification, and while in its broader aspect it is capable of embodiment in numerous forms and in different connections, a preferred embodiment thereof in connection with a rheostat unit is illustrated in the accompanying drawings, in which,—

Figure 1 is a top plan view of such unit with the covers removed and the parts broken away. Fig. 2 is a section on the line 2—2 in Fig. 1. Fig. 3 is a section on the line 3—3 in Fig. 1. Fig. 4 is a perspective view of the lead connections and carrying strips therefor in assembled relation and with parts of the strips broken away. Fig. 5 is a perspective view of one of the strips. Fig. 6 is a perspective view of one of the terminal clamping members, and Fig. 7 is a perspective view of the spring lead finger extending from one of the lead connections to the swinging contact arm of the rheostat.

Referring to the drawings, 1 designates a shallow casing or frame of substantially cylindrical form, in the present instance, and having a hollow extension 2 at one side and a shank or arm 3 projecting from its bottom substantially axially of the body part 1. The part 1 is hollow to form an open top chamber 4, which is circular in form and in communication through an open neck 5 with the hollow of the extension 2. A segmental resistance unit 6 is mounted concentrically in the chamber 4 with the opening between its ends in register with the neck opening 5 and having any suitable arrangement of spaced contacts, which, in the present instance, constitute the successively spaced convolutions of the resistance wire 7.

A shaft 8 is journaled in the casing extension 3 and carries within the chamber 4 a swinging arm 9 having, in the present instance, a contact plunger 10 in sliding outward spring-thrust engagement with the inner periphery of the resistance coil 7. The plunger 10 has sliding radial movement in a socketed conductor part 11 of the arm 9 and this part has a stud 12 projecting therefrom in exposed position axially of the swinging axis of the arm and at the side thereof exposed to the shaft 8. If the rheostat unit is used in connection with a liquid level indicating instrument, the shaft 8 may be connected to and actuated by the movement of a float riding on the liquid, the level of which is to be determined. The manner of actuating the swinging contact arm, however, forms no part of the present invention and is, therefore, not shown.

Lead wires for the rheostat control circuit are intended to enter the outer open end of the extension 2 and to be engaged to lead connecting bars 13—13 by terminal clamping screws 14, said lead bars being projected through the neck opening 5 and into the chamber 4 of the casing, and one being connected to one terminal end of the resistance coil 7 by binding screw 15, while the other has a spring lead finger 16 mounted on its inner end by a binding screw 17. The free end of the finger 16 bears on and makes electrical contact with the outer end of the stud 12, which projects axially from the swinging contact arm of the rheostat.

The two connecting bars are carried in parallel spaced relation by the two laterally spaced partition members 18 of insulating material. These partition members preferably comprise strips of vulcanized fibre which fit at their ends and lower bottom edges into recesses 19 provided therefor in the side and bottom walls of the neck opening 5, the strips 18 being adapted to be slidingly placed into said recesses, as shown in Figs. 1 and 2. The connecting bars 13 are projected through respective openings 20 provided through the strips 18, such openings being of suitable size and shape to fit the end portions of the bars projected therethrough. The bars are prevented from endwise movement with respect to the carrying strips 18 when in assembled relation thereto by said enlargements 21 provided on the edges of the central portions of the bars 13 and shouldering at their ends against the strips 18, as best shown in Fig. 4.

When a set of bars 13 and insulated carrying strips or members 18 have been assembled in proper relation, as shown in Fig. 4, they are inserted as a unit into the neck portion 5 of the case 1 with the ends and bottom edges of the strips fitting into the recesses 19 of the case. This having been done, the pocket or space between the insulating strips 18 and around the central interposed portions of the connecting bars 13 is filled with a material 22 (Fig. 2) which is of an electrical insulating nature and sufficiently fluid when applied to completely fill said space and to enter any crevices, cracks or openings therein so as to cooperate with the strips 18 and bars 13 to form an hermetic seal between the rheostat chamber 4 and the wire terminal receiving chamber 2′ in the extension 2. The material 22 should preferably be of such a nature as to become at least partially set so as to maintain its shape after being applied. This material should also be of a nature to prevent being attacked or disintegrated by or to render it insoluble in the liquid, the level of which is being determined, as in most applications the casing 1 would be mounted in an opening in the container and the extension 3 thereof projected into the container, thereby rendering it possible in some cases for the liquid in the container entering the chamber 4. In some cases air pressure is applied to the liquid within the container to force it to a point of use, and this pressure sometimes might enter the chamber 4, and it is, therefore, one of the purposes of the seal between such chamber and the wire terminal chamber 2′ to prevent the leakage of such pressure therebetween. In some cases an insulating shellac may be employed as the material 22, and in other cases where gasoline or other hydrocarbon liquid is to be gauged a compound composed of glycerine and corn starch in substantially the proportion of two pounds of the former to four ounces of the latter, thinned with water and boiled to a jelly-like consistency has been found suitable for use. This latter material forms the subject-matter of a copending application and is, therefore, not claimed herein.

The tops of the chambers 4 and 2′ are closed by covers 23 and 24, respectively, secured to the casing top by screws 24 or in any other suitable manner. The cover 23 has a sealing or gasket tight fit on the top of the casing and also coacts with the upper edges of the insulating strips 18 and with the top of the material 22 to seal the space therebetween.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a rheostat, a casing forming an open top casing, a cylindrical chamber for receiving rheostat contact parts and having a side opening therefrom, a pair of spaced parallel insulating strips mounted in said opening to close the same, electrical connecting member extending through said strips and the space therebetween, sealing material filling the space between said strips and closely enveloping the contact members, and closure means mounted over said chamber and strips.

2. In a rheostat, a casing having a cylindrical chamber for receiving rheostat contact parts, and a terminal receiving chamber at one side of said first chamber with a communicating opening therebetween, said opening having recessed side-walls, insulating strips slidingly mounted in said recesses to form a double closure for the opening with a pocket therebetween, electrical connecting members extending through said strips and pocket, a sealing material disposed in said pocket and closely enveloping the connecting members, and removable cover means for said chambers and opening.

3. In combination, a casing forming a chamber for containing electrical parts and having a side opening leading therefrom with spaced recesses in the opening wall, insulating strips slidably mounted in said recesses and forming transversely spaced closure members for the opening, said strips having opening therethrough, a terminal connecting lead bar projected through said strip openings and substantially filling the same and having an enlarged portion in the space between the strips for shouldering against the strips, and a sealing material of flowing consistency when originally applied disposed in and completely filling the space between said strips around said lead.

In testimony whereof I have hereunto signed by name to this specification.

HARRY E. ADAMS.