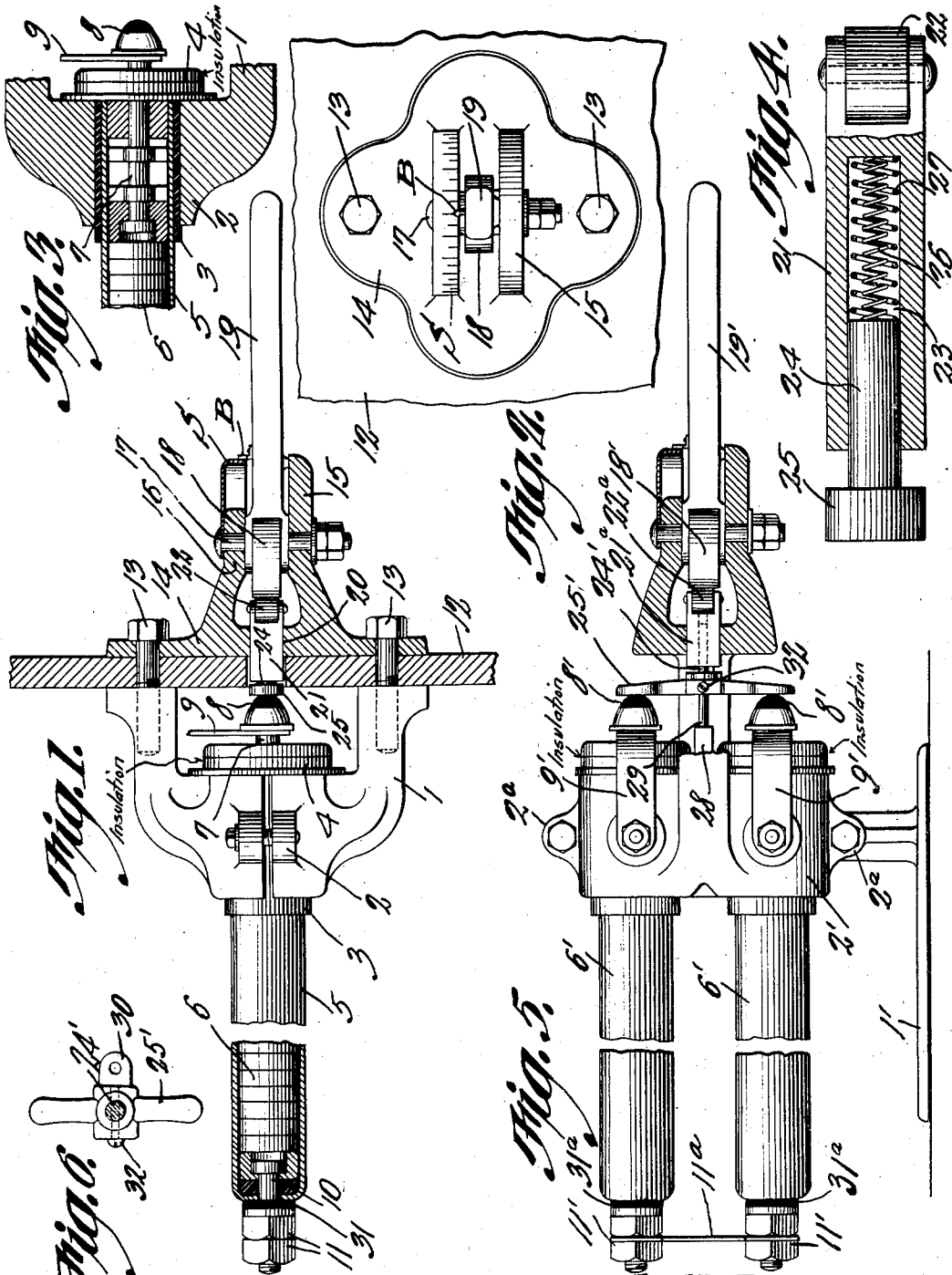


P. J. RAY.
COMPRESSION RHEOSTAT.
APPLICATION FILED JUNE 21, 1913.

1,092,952.

Patented Apr. 14, 1914.



Witnesses

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PAUL J. RAY, OF LAKEWOOD, OHIO.

COMPRESSION-RHEOSTAT.

1,092,952.

Specification of Letters Patent.

Patented Apr. 14, 1914.

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To all whom it may concern:

Be it known that I, PAUL J. RAY, a citizen of the United States, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented a new and useful Compression-Rheostat, of which the following is a specification.

The present invention relates to improvements in compression rheostats, in which the resistance medium, whose electrical conductivity is increased when it is subjected to pressure, is so mounted, that the production of air gaps between the members thereof, is prevented when the rheostat is in normal non-compressed position, there being provided manually controlled means for compressing the resistance medium, so that the resistance thereof is decreased as the rheostat is operated to permit the flow of current to the motor or other means to which the current is directed.

A further object of the present invention, is the provision of a switch board rheostat, of the compression type, which is disposed to vary the compression on the disks, which are made of carbon or of any other material that will act similarly, such disks being mounted in an insulated tube so that the operating lever of the rheostat, may be moved from the minimum to the maximum compression of the disks from an extreme position at one side to an extreme position upon the other side.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a view partly in side elevation and partly in section of a switch board type of rheostat. Fig. 2 is a front elevation of the controlling means thereof. Fig. 3 is an enlarged sectional view through the outer end of the resistance medium tube, and the rod for the compression unit thereof. Fig. 4 is an enlarged detail sectional view of the means interposed between the cam and the resistance medium compression rod. Fig. 5 is a side elevation of a floor type rheostat. Fig.

6 is an enlarged detail sectional view of the cross head operated by the cam and carried by the means as shown in Fig. 4 acting upon a plurality of compression rods.

Referring to the drawings, the numeral 1 designates a frame, provided with the clamping device 2 for the reception of the tube 5, which is insulated therefrom by the insulating sleeve 3 mounted in the insulating plug 4 disposed within the frame, as clearly shown in Figs. 1, 3 and 5.

Carried by the sleeve 3, is a tube 5 of insulation or coated internally with insulation, the same having disposed therein, a plurality of disks 6, which are preferably of carbon, or may be of any material that will operate, so that the conductivity thereof is increased due to the compression of the same. A slidable rod 7 is mounted in the outer open end of the tube 5, and carries the actuating button 8, to which is connected the flexible leaf terminal conductor 9, which constitutes one terminal of an electrical circuit. The opposite end of the tube 5 has disposed therein, a metal stud 10 insulated from the tube 5 by means of a mica washer 31, provided with the binding screws 11 for another terminal connection so that the resistance medium consisting of the disks 6 will be interposed between the conductors led to the plate 9 and from the binding post or stud 10.

As shown in Fig. 1, the rheostat is properly connected to a switch board 12, by means of the bolts or screws 13, which maintain the plate 14 in the proper relation to the frame 1, the two projecting apertured lugs 15 and 16 of the frame or plate 14, constituting a support for the operating cam 18, which is pivoted upon the pivoting bolt 17 and provided with the operating handle 19. A graduated scale S is carried by the projection 16, and coöperates with the pointer B of the lever 19, so that the operator may know at a glance the relative position of the compression units 6 when the handle 19 is manipulated.

In order to interpose a resilient connecting medium between the operating button 8 of the compression units, and the cam 18, an aperture 20 is formed in the plate 14, and has slidably mounted therein a cylindrical socketed member 21, carrying in its outer end the anti-frictional roller 22 which is normally held resiliently against the cam 18. The socket 23 of the member 21 has mounted

therein, a rod 24, whose head 25, as shown in Fig. 1 is disposed to engage the button 8 and be held in resilient contact therewith by means of the light spring 26 mounted within the socket 23, as clearly illustrated in Fig. 4. This spring is of such tension, as to normally hold the head 25 projected without any strain being placed upon the heavier spring 27, which when the lever 19 is operated to cause the cam to move the member 21 toward the resistance medium, will receive the main force of such cam action, so that the head 25 will compress the disks 6 to increase the conductivity thereof.

It will thus be seen that when the lever 19 is in zero position, that the strain upon the spring 27 will be removed, that the light resistance of the spring 26, will hold the stud 24 projected so that the disks 5 of the resistance medium will be held in contact sufficiently to prevent any air spaces or gaps therebetween. This feature is of the utmost importance, as it prevents any undue separation of the disks, and any tendency to spark or burn during the initial introduction of the current therethrough when the lever 19 is operated.

As shown in Figs. 5 and 6, a floor type rheostat is provided, and although a single resistance medium 5 is shown in Fig. 1, it is evident that a plurality of the same may be provided according to the use to which the same is to be placed. In the floor type, two resistances 6' are shown, the same being properly mounted in the clamp members 2' carried by the frame supporting base 1'. In the floor type rheostat, the contact terminals 9', which are insulated from the clamp 2', are respectively connected to the slidable rods (not shown), by means of the flexible leaf terminal conductors 9'', which provide means for connecting the rheostat in an electrical circuit. The insulating button 8' of the two slidable rods (not shown) are projected to be engaged by the respective extreme ends of a cross bar 25', said bar 25' being pivoted to the stud 24', which corresponds to the stud 24 of the device, as shown in Fig. 4, by means of the screw 32. A rod 29 is slidably mounted in the projection 30 of the cross bar 25' and is fixed to the frame 14', or this construction may be reversed, and rod 29 may be slidably mounted in the frame 14' and threaded through the projection 30. The cross bar 25' is permitted a straight line movement due to the actuation of the lever 19' and its cam 18', which bears upon the roller 22^a of the member 21^a, all of which is similar to the device, as shown in Figs. 1 and 2. In this structure, the two resistance mediums are connected by the cross connection 11^a, to the binding posts 11', and have the insulating washers 31^a all as clearly illustrated in Fig. 5. By this arrangement the resistance mediums are con-

nected in a series, but, however, the resistance mediums may be connected in parallel when a low minimum resistance is desired.

What is claimed is:

1. A compression rheostat, including a resistance medium, the conductivity of which is increased due to pressure exerted thereupon, a pivoted lever provided with a cam, and means interposed between the cam of the pivoted lever and the resistance medium whereby under normal conditions, the resistance medium is held with the members thereof in contact to prevent air gaps, and whereby when the handle is operated, the resistance medium is compressed.

2. A rheostat, including a frame, a clamp carried thereby, an internally insulated tube mounted in the clamp, a plurality of conductor disks mounted in said tube, a cam pivotally mounted in the frame, and a resilient plunger connection between the cam and the disks, whereby the disks are normally held against separation to prevent the formation of air gaps when the cam is in normal position and the disks are compressed when the cam is operated.

3. A rheostat, including a frame, a clamp carried thereby, an internally insulated tube mounted in the clamp, a plurality of conductor disks mounted in said tube, a cam pivotally mounted in the frame, a resilient plunger connection between the cam and the disks, whereby the disks are normally held against separation when the cam is in normal position and the disks are compressed when the cam is operated, said resilient connection comprising a cylindrical socket, a stud slidably mounted in said socket, and two springs of varying tension interposed in the socket between the ends of the stud, the lighter spring normally holding the stud in engagement with the disks to hold the disks against separation.

4. A rheostat, including a frame, a tube of insulation mounted in the frame, a plurality of conductor disks mounted in said tube, a lever pivoted in the frame, a cam carried thereby, and a two membered plunger mounted slidably in the frame and interposed between the cam and the disks, said members being resiliently separated and forming a resilient compression transmission agent between the cam and the disks.

5. A rheostat, including a frame, a sleeve carried thereby, an internally insulated tube mounted in the sleeve, a plurality of conductor disks mounted in said tube, a slidably mounted rod for engaging the disks and projecting exteriorly of the sleeve, a handle pivotally connected to the frame, a cam carried by said handle, a slidably mounted two part plunger carried by the frame and interposed between the cam and the rod, whereby the manipulation of the handle places the disks under compression, and a

resilient cushion between the two parts of
the plunger to hold the parts extended and
to exert sufficient pressure upon the disk to
eliminate air gaps when the disks are in
5 normal condition.

In testimony that I claim the foregoing as

my own, I have hereto affixed my signature
in the presence of two witnesses.

PAUL J. RAY.

Witnesses:

H. R. CROW,

C. B. PLANCK.
