

RESEARCH CORPORATION

405 LEXINGTON AVENUE

NEW YORK 17

ROBERT P. IRWIN
ASSOCIATE
PATENT DEVELOPMENT DIVISION

October 10, 1962

Dr. Grote Reber
Commonwealth Scientific and
Industrial Research Organization
Stowell Avenue
Hobart, Tasmania
AUSTRALIA

Dear Dr. Reber:

I am enclosing U. S. Patent No. 1,519,621 by Arthur Atwater
Kent entitled "Rheostat" that you requested I order from the
Patent Office.

Very truly yours,

Susan Peeke

Susan Peeke
Secretary to Mr. Irwin

sp

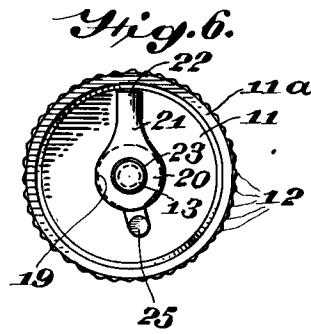
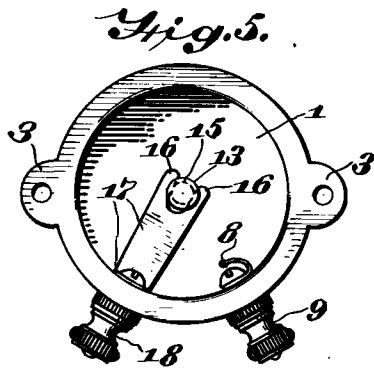
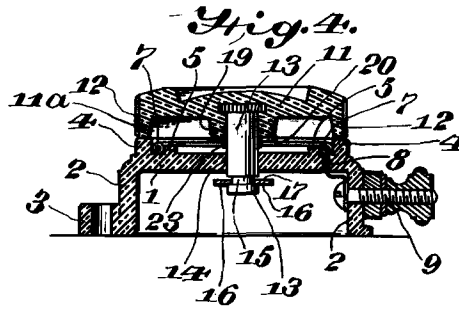
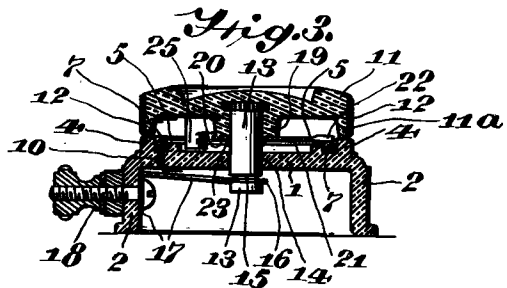
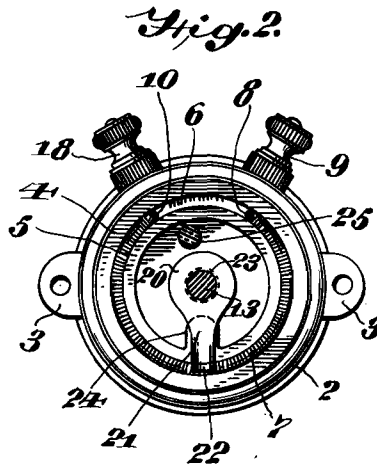
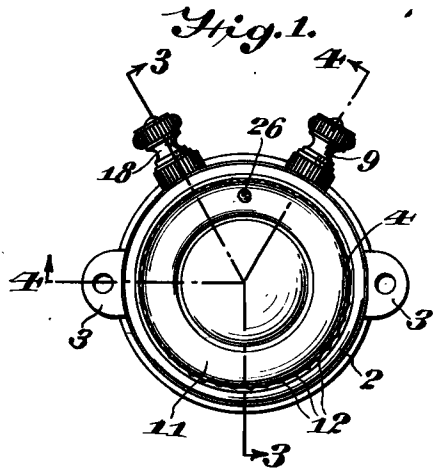
Dec. 16, 1924.

1,519,621

A. A. KENT

RHEOSTAT

Filed April 14, 1923



INVENTOR.

Arthur Atwater Kent
BY
Cornelius L. Chret
ATTORNEY.

UNITED STATES PATENT OFFICE.

ARTHUR ATWATER KENT, OF ARDMORE, PENNSYLVANIA.

RHEOSTAT.

Application filed April 14, 1923. Serial No. 631,987.

To all whom it may concern:

Be it known that I, ARTHUR ATWATER KENT, a citizen of the United States, residing at Ardmore, county of Montgomery, and State of Pennsylvania, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

My invention relates to adjustable resistances or rheostats utilized generally in the electrical arts for varying or adjusting the resistance of a circuit, and more particularly for varying the resistance of the circuit of a filament or hot cathode of an audion or other thermionic device or tube, such as utilized in the radio art.

In accordance with my invention, the rotatable handle, cap, knob or operating member of the rheostat forms with the relatively stationary structure or member a housing or casing within which are disposed the resistance conductor and the co-acting adjustable and movable contact.

In accordance with my invention, the rotatable member or structure of the rheostat is itself a cap, knob or handle within whose diametral limits are disposed the resistance conductor and the co-acting contact structure.

In accordance with my invention, in an arrangement of the character above described, the resistance conductor, co-acting contact structure and rotatable member, which last in effect houses the resistance conductor and its co-acting contact structure, are disposed on one side of a relatively fixed or base member through which extends a shaft or other bearing member for the rotatable structure, and connections made beneath such fixed member or base are effected both with the shaft or bearing member and, if suitable or desirable, a terminal of the resistance conductor.

My invention resides in rheostat structure of the character hereinafter described and claimed.

For an illustration of one of the various forms my invention may take, reference may be had to the accompanying drawing, in which:

Fig. 1 is a top plan view of structure embodying my invention.

Fig. 2 is a plan view, partly in section, of the structure shown in Fig. 1.

Fig. 3 is a vertical sectional view, parts in elevation, taken on the line 3—3 of Fig. 1.

Fig. 4 is a vertical sectional view, parts in elevation, taken on the line 4—4 of Fig. 1.

Fig. 5 is a bottom plan view of the structure shown in Fig. 1.

Fig. 6 is a view, in plan, of the inside of the cap or handle structure.

Fig. 7 is a perspective view of the rheostat contact.

Referring to the drawing, 1 is a base or relatively fixed member which, in the example illustrated, is the end closure of a casing having the side wall 2, preferably molded integral with the base 1, of any suitable insulating material, as, for example, bakelite or condensite. The members 1 and 2 in the example illustrated form a hollow base or fixed member which may be provided with the integral lugs or ears 3 for attachment to any suitable support, as by screws extending through the holes in the lugs 3.

Upstanding from the upper or outer side of the base 1 are the concentric annular ribs or flanges 4 and 5, of which the outer rib 4 is preferably the higher. Between the ribs 4 and 5 is formed the channel or annular groove 6, in which is disposed the resistance wire or conductor 7 of any suitable material, preferably bare, and in the form of a coreless helix, one end of which extends through the hole 8 in the base 1 and is connected to the binding post 9, secured to the side wall 2. The other end of the resistance wire 7 may extend through a hole 10 in the base 1 and then be bent over or otherwise secured on the under side of base 1.

The cap, handle or knob 11, preferably molded of insulating material of any suitable character, as bakelite or condensite, may have upon its periphery the grip ribs 12, the cap comprising a body portion and circumferential downwardly extending flange 11'. The diameter of the cap 11 in the example illustrated is substantially that of the annular rib 4, the side wall of the cap 11, the rib 4, the base 1 and the body of the cap 11 forming in effect a chamber a portion of the wall structure of which is the knob, handle or cap, which is rotatable.

Molded within the body of the cap 11 is the metallic insert 13 constituting in effect a bearing member or stub shaft, which extends through a hole 14 in the base 1 into the chamber beneath. Adjacent its lower end the shaft 13 is provided with the cir-

cumferential groove or notch 15, into which extend the forked ends 16 of the sheet metal connecting member 17, turned downwardly at its outer end and connected with and held
 5 by the binding post 18. The member 17 is preferably more or less resilient, exerting a downward force or bias upon the shaft 13, and therefore upon the entire movable structure or cap 11. Surrounding the shaft
 10 13 is the boss or lug 19, integral with the cap 11, and adjacent or against the boss 19 is disposed the central portion 20 of the movable contact 21, whose outer end 22 engages and rides upon the resistance wire 7. The
 15 portion 20 of the contact member 21 may have a downwardly extending flange portion 23, by which it is soldered or otherwise secured to and electrically connected with the shaft 13, the downward bias upon the
 20 shaft 13 and cap 11 exerted by the member 17 serving to press the contact end 22 firmly against the conductor 7 in all positions to which the contact member 21 may be rotated.

Upstanding from the base 1 and within
 25 the annular rib 5 is the lug 24, extending into the path of travel of the downwardly extending lug 25 molded integral with the cap 11, the members 24 and 25 serving to limit the extent of rotation which may be
 30 imparted to the cap 11 and the contact member 21.

The cap or knob may carry any suitable indicating means for informing the operator as to the relative position of the contact
 35 member 21 upon the resistance conductor 7. In the example illustrated, this indicating means is a depression 26, Fig. 1, in the cap 11, filled with any suitable material of a color differing from the color of the cap 11.

While the cap or knob 11 is preferably or substantially of the same diameter as the
 40 annular rib 4, it may be of greater or lesser diameter, and in such case the circumferential side 11^a of the cap may extend below the upper surface of the rib 4 or its equivalent.

In the example of my invention herein illustrated and described, and by preference, the peripheral flange 11^a of the cap 11 bears
 45 directly upon the fixed member, as base 1, or, as illustrated, when the upstanding flange 4 is employed, the lower end of the cap flange 11^a bears directly upon the upper face of the flange 4. The tension of the spring or resilient member 17 is such that the downward
 50 force exerted upon the stub shaft 13 causes the cap to bear upon the base 1 or flange 4, the opposing spring effect of the rheostat contact member 21 being suitably
 55 small to permit such bearing of the cap upon the fixed member and yet effect good contact with the resistance conductor 7.

While in the example herein illustrated and described the resistance conductor 7 is
 60 carried by the base structure or fixed member, and the co-acting contact 21 is carried by

the rotatable structure or cap, it will be understood that these rheostat members may be reversed as to their mountings, that is to say, the resistance conductor 7 may be fixed
 65 with respect to and carried by the cap, 70 while the co-acting contact may be carried by or secured to the fixed member or base. Such reversed arrangement of the rheostat conductor and its co-acting contact though
 75 comprehended by the appended claims is not herein specifically claimed, but is claimed in my co-pending application Ser. No. 634,450, filed April 25, 1923.

What I claim is:

1. Rheostat structure comprising relative-
 80 ly rotatable base and cap, means on one of them bearing upon the other and having within it a recess, whereby there is formed between the base and cap a substantially
 85 closed chamber, a resistance member and a co-acting relatively movable contact member disposed within said chamber, said contact member movable along said resistance member in direct contact therewith, one of said
 90 members being fixed with respect to said base and the other of said members being fixed with respect to said cap.

2. Rheostat structure comprising relative-
 95 ly rotatable base and cap, said base having an upstanding annular flange forming with said cap a chamber between said cap and base, a resistance member and a co-acting relatively rotatable contact member disposed
 100 within said chamber, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and means holding said contact and resistance members in direct contact with each other.

3. Rheostat structure comprising relative-
 105 ly rotatable base and cap, an annular member on one of them enclosing a recess and bearing upon the other, whereby a substantially closed chamber is formed between said cap and base, a resistance member and
 110 a co-acting relatively movable contact member disposed within said chamber, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and means
 115 for holding said contact and resistance members in engagement with each other.

4. Rheostat structure comprising relative-
 120 ly rotatable base and cap, said base having an upstanding annular flange, said cap having a flange extending towards said base and bearing upon said flange upon said base to form a chamber between said cap and base, means biasing said base and cap toward
 125 each other, a resistance member and a co-acting relatively rotatable contact member disposed within said chamber, one of said members being fixed with respect to said base and the other of said members being
 130 fixed with respect to said cap.

5. Rheostat structure comprising relatively rotatable base and cap, said base having an upstanding annular flange, said cap having a flange extending towards said base and disposed in end to end contact with said flange upon said base to form a chamber between said cap and base, means biasing said base and cap toward each other, a resistance member and a co-acting relatively rotatable contact member disposed within said chamber, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap.
6. Rheostat structure comprising relatively rotatable base and cap forming a chamber therebetween, a resistance member and a co-acting contact member disposed within said chamber and rotatable relatively one along the other in direct contact with each other, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, a member fixed on said cap disposed within said chamber, and a member fixed on said base co-acting with said last named member to form a stop for limiting the extent of relative rotation of cap and base.
7. Rheostat structure comprising relatively rotatable base and cap, said base having upstanding annular flanges spaced from each other to form a channel, a resistance conductor disposed in said channel between said cap and base, and a contact secured to said cap and movable along said resistance conductor.
8. Rheostat structure comprising relatively rotatable base and cap, said base having upstanding annular flanges spaced from each other to form a channel, said cap, base and outer flange forming a chamber, a resistance conductor disposed in said channel within said chamber, and a contact movable along said resistance conductor and disposed within said chamber and secured to said cap.
9. Rheostat structure comprising relatively rotatable base and cap, said base having upstanding annular flanges spaced from each other to form a channel, the outer of said flanges extending higher above said base than the other of said flanges, said base, outer flange and said cap forming a chamber, a resistance conductor disposed in said channel within said chamber, and a co-acting contact secured to said cap within said chamber and extending across said other of said flanges into engagement with said resistance conductor.
10. Rheostat structure comprising relatively rotatable base and cap forming a chamber therebetween, a bearing shaft for said cap extending through said base, a resistance member and a co-acting relatively rotatable contact member disposed within said chamber, said contact member secured to and connecting with said shaft, and means engaging the shaft on the opposite side of said base for biasing said cap and contact member toward said base and resistance member.
11. Rheostat structure comprising relatively rotatable base and cap forming a chamber therebetween, a shaft molded in said cap and extending to the opposite side of said base, a resistance conductor disposed on said base within said chamber, a co-acting contact secured to and electrically connecting with said shaft, and means on said opposite side of said base engaging said shaft and biasing said contact toward said base and said resistance conductor.
12. Rheostat structure comprising a casing having an end closure forming a base, a cap outside of said base rotatable with respect thereto, a resistance conductor disposed upon the outside of said base and enclosed by said cap, and a contact member secured to said cap and movable along said resistance conductor in direct contact therewith.
13. Rheostat structure comprising a casing having an end closure forming a base, a cap outside of said base rotatable with respect thereto, a resistance conductor disposed upon the outside of said base and enclosed by said cap, a contact member secured to said cap and movable along said resistance conductor in direct contact therewith, and connections from said resistance conductor and contact member extending through said base into said casing.
14. Rheostat structure comprising relatively rotatable base and cap, means on one of them bearing upon the other and having within it a recess, whereby there is formed between the base and cap a substantially closed chamber, a resistance member and a co-acting relatively movable contact member disposed within said chamber, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and means holding said cap and base in contact with each other at said means and holding said contact member in engagement with said resistance member.
15. Rheostat structure comprising relatively rotatable base and cap, means on one of them bearing upon the other and having within it a recess, whereby there is formed between the base and cap a substantially closed chamber, a resistance member and a co-acting relatively movable contact member disposed within said chamber, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and resilient means biasing said cap and base into engagement with each other and holding said

contact and resistance members in engagement with each other in opposition to the spring effect of their engagement.

16. Rheostat structure comprising relatively rotatable base and cap, said base having an upstanding annular flange, a resistance member disposed between said cap and base, a co-acting contact member, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and means biasing said cap into contact with said annular flange and said resistance and contact members into engagement with each other.

17. Rheostat structure comprising relatively rotatable base and cap, said base having an upstanding annular flange, said cap having a circumferential flange extending toward said annular flange, a resistance member disposed between said cap and base, a co-acting contact member, and means biasing said flanges into contact with each other and said members into engagement with each other.

18. Rheostat structure comprising relatively rotatable cap and base, one of them having an axially extending projection engaging the other, a substantially closed chamber formed between said cap, base and projection, co-acting contact and resistance members disposed within said chamber, one of said members secured to said cap and the other of them secured to said base, a shaft member for centering said cap and base with respect to each other and secured to one of them and extending loosely in an aperture in the other of them, and means for biasing said cap and base into engagement with each other at said projection.

19. Rheostat structure comprising relatively rotatable base and cap, said base and cap being unbiased with respect to each other regarding their relative rotation, means on one of them bearing upon the other and having within it a recess, whereby there is formed between the base and cap a substantially closed chamber, a resistance

member and a co-acting relatively movable contact member disposed within said chamber, said contact member movable along said resistance member in direct contact therewith, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, and means for biasing said cap and base toward each other and for holding said resistance and contact members in contact with each other.

20. Rheostat structure comprising relatively rotatable base and cap, said base having an upstanding annular flange, a resistance member disposed between said cap and base, a co-acting contact member, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap, a conducting member secured to said cap and extending through said base, one of said members electrically connected to said conducting member, and means on the side of said base opposite said cap engaging said conducting member to bias said cap into engagement with said annular flange and said resistance and contact members into contact with each other.

21. Rheostat structure comprising relatively rotatable base and cap, said base having an upstanding annular flange, said cap having a circumferential flange extending toward said annular flange, a resistance member disposed between said cap and base, a co-acting contact member, a conducting member secured to said cap and extending through said base, one of said members electrically connected to said conducting member, and means on the side of said base opposite said cap engaging said conducting member to bias said flanges into engagement with each other and said resistance and contact members into contact with each other.

In testimony whereof I have hereunto affixed my signature this 10th day of April, 1923.

ARTHUR ATWATER KENT.