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J. V. FRANCESCO

COMBINED RHEOSTAT AND SWITCH

Filed Dec. 10, 1924

Fig. 1.

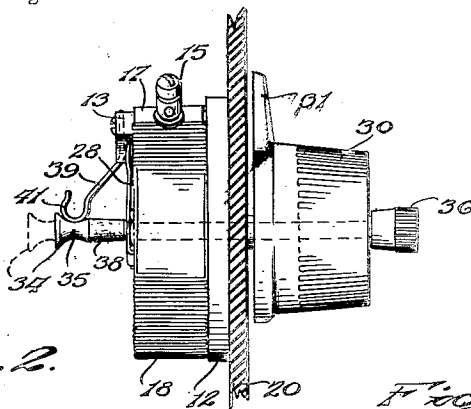


Fig. 2.

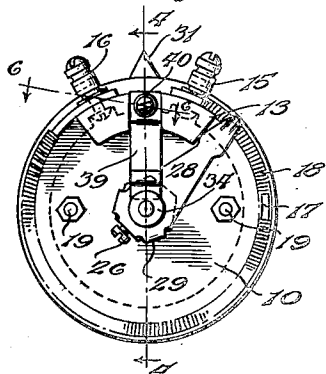


Fig. 3.

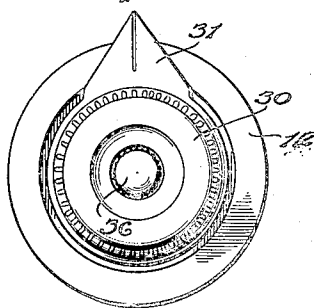


Fig. 4.

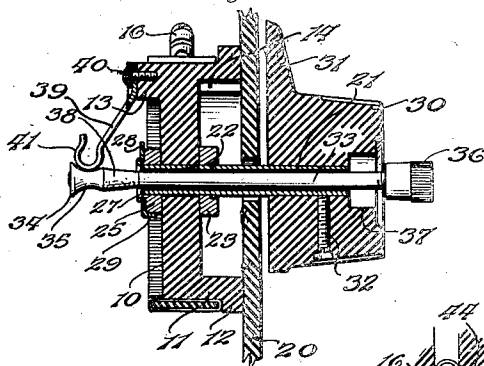


Fig. 5.

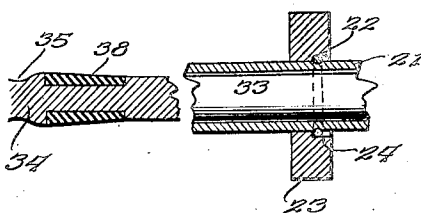
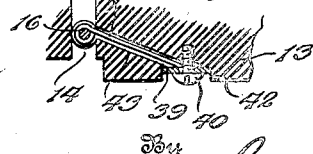


Fig. 6.



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UNITED STATES PATENT OFFICE.

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COMBINED RHEOSTAT AND SWITCH.

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To all whom it may concern:

Be it known that I, JOHN V. FRANCESCO, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Combined Rheostats and Switches, of which the following is a specification.

This invention relates to a combined rheostat and switch particularly designed for use in connection with radio thermionic tubes and seeks, among other objects, to provide a device of this character which, while being adjustable to slowly increase or decrease the current flow, may also be manipulated to quickly make or break the circuit through the device.

The invention seeks, as a further object, to provide a rheostat embodying a switch which may be independently operated to make or break the circuit through the rheostat, thereby eliminating the necessity of tediously turning the rheostat shaft to accomplish the result sought.

And the invention seeks, as a still further object, to provide a device which will be simple in construction, which may be readily manufactured and assembled, and which, in use, will prove efficient and convenient.

Other and incidental objects will appear hereinafter.

In the accompanying drawings:

Figure 1 is a side elevation showing my improved device mounted upon a conventional panel, the switch of the device being shown closed.

Figure 2 is an elevation looking at the inner end of the device.

Figure 3 is an elevation looking at the outer end of the device.

Figure 4 is a vertical sectional view on the line 4—4 of Figure 2, looking in the direction indicated by the arrows.

Figure 5 is an enlarged detail sectional view particularly showing the switch rod and rheostat shaft.

Figure 6 is a detail sectional view on the line 6—6 of Figure 2, looking in the direction indicated by the arrows.

In carrying the invention into effect, I employ a body or disc 10 of suitable insulating material. This disc is formed with an annular flange 11 from which projects an annular lip 12, and formed on the disc at its forward side is a boss 13. Near op-

posite ends of the boss, the flange 11 of the disc is provided at its inner side with spaced grooves 14 and extending through the flange into said grooves are binding posts indicated for convenience at 15 and 16, respectively. Snugly fitting around the flange 11 of the disc is an insulating strip 17 and wrapped around said strip is a suitable resistor 18, one end of which is connected to the binding post 15.

As brought out in Figure 2, the disc 10 is apertured to receive spaced bolts 19 for connecting the device with a panel, as conventionally illustrated at 20, and journaled through the disc axially thereof is a tubular shaft 21, of a length to extend through the panel. The panel is, of course, apertured to accommodate the bolts 19 as well as to freely accommodate the shaft. Near its inner end the shaft is, as shown in detail in Figure 5, provided with an external annular groove and tightly fitting in said groove is a split stop ring 22 gripping the shaft. Fitted over the shaft from the inner end thereof is a stop collar 23 provided at one side with an annular recess 24 accommodating the ring 22. Thus, the ring will limit the collar against outward movement along the shaft and, in this connection, it is to be noted that by employing a separate stop ring and collar, I eliminate the necessity for turning the shaft 21 to produce a stop flange or collar thereon. Furthermore, in the present arrangement, the parts may be readily assembled. The collar 23 is disposed to confront the rear side of the disc 10 and fitting over the inner end of the shaft to confront the forward side of said disc is a collar 25 secured to the shaft by a set screw 26. The collar 25 thus serves to connect the shaft with the disc and cooperates with the collar 23 for limiting the shaft against endwise movement. As best shown in Figure 4, the collar 25 is formed at its outer side with an annular flange 27 and pressed over said flange is a spring contact arm 28, the free end of which is disposed to yieldably cooperate with the turns of the resistor 18 at the outer edge of the strip 17. The flange 27 of the collar 25 is upset for rigidly connecting the arm 28 with the collar but to obviate the possibility of the collar turning independently of the arm, the inner end of the arm is formed with spaced lugs 29 which are bent down to overlap flat faces provided on the collar, locking

the collar and arm to turn in unison. Removably fitting over the outer end of the shaft 21 is a knob 30, which is preferably provided with a pointer 31 and screwed through the knob to impinge the shaft is a radial set screw 32 locking the knob upon the shaft. Thus, the knob may be grasped and turned for rotating the shaft and swinging the arm 28 to either increase or decrease the current flow across the binding posts 15 and 16.

Slidably fitting through the shaft 21 is a switch rod 33 provided at its inner end with a flared head 34, the peripheral face of which is formed with a concave groove 35, and screwed upon the inner end of the rod is a knob 36 limiting the rod against forward endwise displacement. Formed in the outer end of the knob 30 to freely accommodate the knob 36 is an annular recess 37. At the base of the head 34, the rod 33 is, as shown in detail in Figure 5, provided with an annular channel and fixed in said channel is a sleeve 38 of suitable insulating material, the sleeve lying flush with the peripheral surface of the rod. Fixed at one end to the boss 13 at the forward side of the disc 10 is a downwardly and forwardly inclined spring contact 39 secured to said boss by a screw 40. At its opposite end, the contact is bent to form a spring bow 41 to cooperate with the head 34 of the switch rod 33 and, as will be observed upon reference to Figure 4, the length and inclination of the contact is such that the bow will be yieldably pressed against said head. As shown in Figure 6, the upper end of the contact 39 is accommodated in a groove 42 in the outer face of the boss 13, and formed in said boss is an opening 43 which leads from the base of the groove 43 into that one of the grooves 14 associated with the binding post 16. Extending through said opening is a wire 44 secured at one end by said binding post and at its opposite end by the screw 40. Thus, the contact 39 is connected in circuit with said binding post.

As will now be seen in view of the foregoing, when the switch rod 33 is drawn outwardly, the bow 41 of the contact 39 will seat in the groove 35 of the head 34 of said rod for closing the circuit through the resistor 18 across the binding posts 15 and 16 so that the knob 30 may be turned, as previously noted, for varying the current flow through the resistor. However, should it be desired to break the circuit across the binding posts 15 and 16, the switch rod 33 is, as shown in dotted lines in Figure 1, pushed inwardly, when the bow 41 of the contact 39 will ride out of the groove 35 of the head 34 of the switch rod onto the insulating sleeve 38. Thus, assuming that the device is connected with a thermionic tube, the circuit through the tube will be im-

mediately broken and the tube extinguished without the necessity of counterrotating the knob 30 or disturbing the adjustment of the rheostat. I accordingly provide a particularly simple and efficient device for the purpose set forth and a device which will dispense with the necessity for the use, in a radio set, of a separate filament control switch.

Having thus described the invention, what I claim is:

1. In a variable resistance unit, a body, terminals carried thereby, a resistor connected to one of said terminals, a tubular shaft journaled through the body and provided with an arm to cooperate with said resistor, a switch contact electrically connected with the other of said terminals, and a switch rod slidable through said shaft and movable to one position engaged by said contact closing a circuit through the resistor across said terminals and to another position breaking said circuit.

2. In a variable resistance unit, a body, terminals carried by the body, a resistor connected to one of said terminals, a tubular shaft journaled through the body and provided with a contact arm to cooperate with the resistor, a switch contact electrically connected with the other of said terminals, a switch rod slidable through said shaft and provided at its inner end with a head normally engaged by said contact for closing a circuit through the resistor across said terminals, and an insulator carried by the rod, the rod being movable to dispose said insulator for engagement by the switch contact breaking said circuit.

3. In a variable resistance unit, a body, a resistor carried thereby, a rotatable tubular shaft having a contact arm to cooperate with the resistor, a resilient switch contact mounted at one end upon the body, and a switch rod slidable through said shaft and normally engaged with the opposite end of said contact closing a circuit through the resistor, the rod being shiftable for breaking said circuit.

4. In a variable resistance unit, a resistor, a rotatable tubular shaft, an arm carried by said shaft to cooperate with the resistor and movable by the shaft for varying the effective resistance of said resistor, and a switch rod slidable through the shaft and movable for breaking a circuit through said resistor and through said rod.

5. In a variable resistance unit, a resistor, resistance varying means associated therewith and including a shaft rotatable for varying the effective resistance of said resistor, and means reciprocable independently of said shaft for breaking a circuit through the resistor and through the latter means.

6. In a variable resistance unit, a resistor, resistance varying means associated there-

with and including a shaft rotatable for varying the effective resistance of said resistor, and a switch including a manually reciprocable element operable independently of said shaft for breaking a circuit through the resistor and through said element. resistor, a rotatable shaft mounting said arm, and a switch electrically connecting said arm with the other of said terminals and including an element reciprocable independently of said shaft to break a circuit through said element across said terminals.

7. In a variable resistance unit, terminals, a resistor in circuit with one of said terminals, a contact arm to cooperate with the

In testimony whereof I affix my signature.

JOHN V. FRANCESCO.