Sept. 24, 1940. J. C. STEARNS 2,216,054

RHEOSTAT

Filed May 11, 1937

Fig. 1.

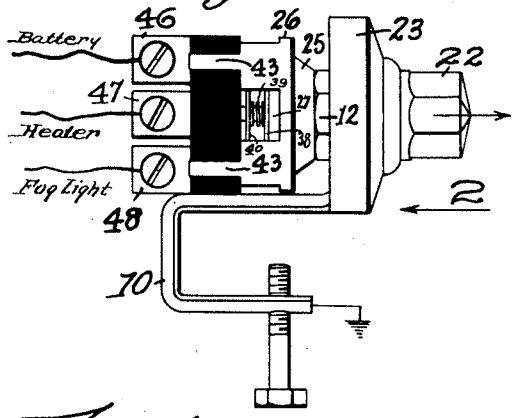


Fig. 2.

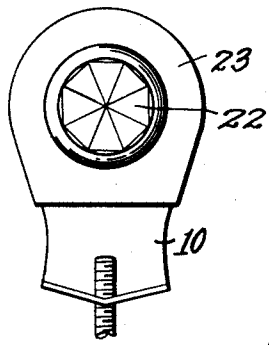


Fig. 3.

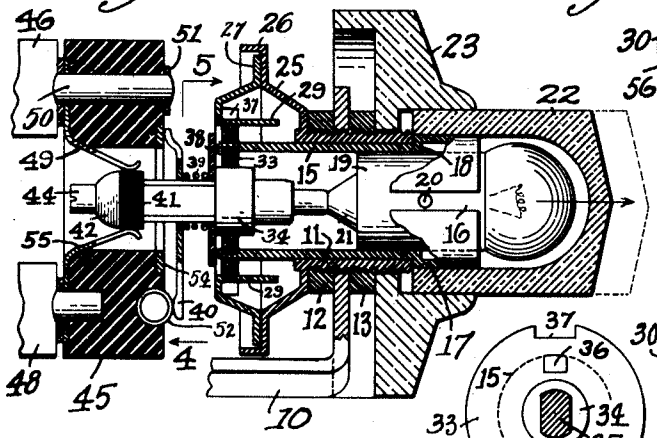


Fig. 5.

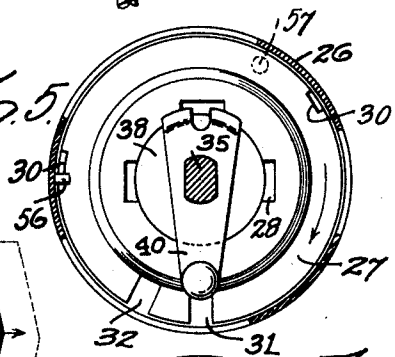


Fig. 7.

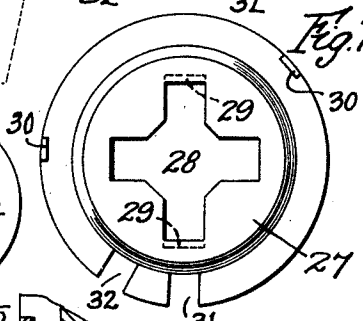
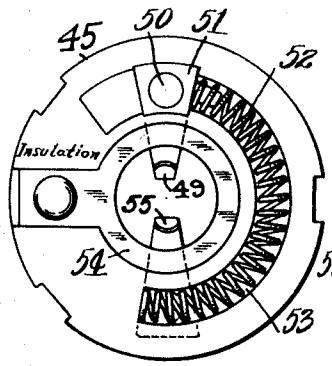


Fig. 8.

Fig. 4.



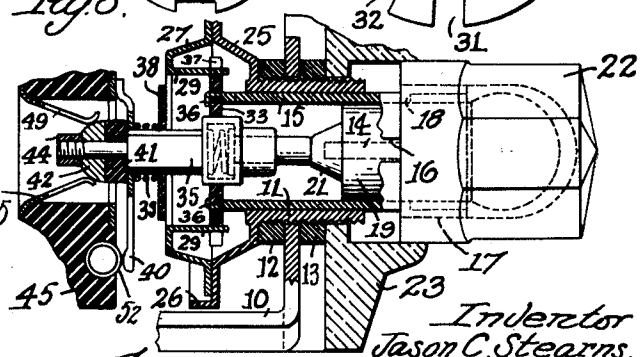


Fig. 6.

Inventor
Jason C. Stearns.
By attorney

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UNITED STATES PATENT OFFICE

2,216,054

RHEOSTAT

Jason C. Stearns, Worcester, Mass.

Application May 11, 1937, Serial No. 141,964

3 Claims. (Cl. 201—48)

This invention relates to that class of electric rheostat or the like device in which a translucent knob, having a light behind it, can be employed, while in one position to connect the battery with a car heater or the like and, when in that position, can be turned to change the amount of current going to the heater and, when in another position longitudinally can, without disconnecting the heater, also connect the battery with an electrically operated device, such as a fog light, for example.

The principal objects of the invention are to provide simple and inexpensive means inside the device by which the knob can be made to both turn and reciprocate a shaft for the purpose of connecting and disconnecting the circuits; to provide a lamp socket, adapted itself to be moved longitudinally and turned, with means for transmitting this motion to a shaft which controls the connection of the battery with electrical devices, and to provide this socket inside the device where it is out of the way of dust, rain and the like and therefore is protected from all ordinary accidents.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a side elevation of a device constructed in accordance with this invention;

Fig. 2 is an end view as indicated by the arrow 2 in Fig. 1;

Fig. 3 is a diametrical, longitudinal sectional view of the entire device on enlarged scale;

Fig. 4 is an elevation of a part of it as indicated by the arrow 4 in Fig. 3;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a view with parts omitted corresponding with Fig. 3 except that the operating knob is pulled out instead of being pushed in;

Fig. 7 is an elevation of the carrier plate, and

Fig. 8 is an elevation of the fibre washer through which the motion of the knob is transmitted to the line making and breaking shaft.

Many of the parts shown in the drawing are old and well known but they will be described in connection with the features of the invention itself.

The device is shown as mounted on a bracket 10 which, of course, is fixed in a definite position. This bracket has a plane end which is fixed on a hollow nut 11 by means of two nuts 12 and 13 screwed up on the nut 11 toward each other to grip the end of the bracket. These parts, therefore, are stationary. Inside the nut 11 is a lamp socket 15 in the form of a hollow tube of metal provided with an open slot 16 extending from one end to the other and an opposite longitudinal groove 14. On one end of this socket there is an enlargement 17 and inside is a shoulder 18 so that the inside of the socket is of two different diameters. In this socket the base 19 of the lamp is placed. This base has the usual radial pins 20 for being received in the slot 16 and groove 14 and it also has a terminal projection 21 for engagement with a spring pressed conducting plunger.

The nut 11 abuts against the outside of the shoulder 18 which, in the normal position of the lamp, holds the position of that shoulder. The lamp is located in a hollow space in the interior of a translucent operating member or knob 22 which is provided with such a shape outside that it can be used for turning the parts as well as for moving them longitudinally. This knob extends with a frictional fit into a recess in a translucent face plate 23 which is mounted on the threads of the nut 11, held from rotation by engagement with the bracket 10. It covers the inner end of the knob. These two parts, both being made of similar translucent material, constitute an ornamental and continuous appearing front for the switch.

Fixed to the end of the nut 11 is a dished metal plate 25 having a cylindrical flange 26 at one end. Being mounted on the nut 11 this plate 25 is stationary. It will be seen that the cylinder 15, which carries the lamp socket 19, extends through the nut 11 and through the plate 25.

Inside the flange 26 is located a swingingly oscillatable dished carrier plate 27. It has a cross-shaped opening 28 therethrough with a pair of integral guides 29 projecting from its face longitudinally. This plate is made from metal and aside from the features so far described is provided with a pair of stops 30 on the circumference on the other side for engagement with a stop pin 56 on the stationary disc 25. A pair of radial slots 31 and 32 extend through it.

Inside the carrier plate is an insulating disc 33 which is fixed on a hub 34 carried by the operating shaft 35. This disc is provided with perforations therethrough for receiving headed over projections 36 on the end of the cylinder 15 for fastening the two parts together. The disc 33 also is provided in its outer circumference with two opposite slots 37 for receiving the guides 29. In this way it will be seen that the hollow cylinder 15 is fixed, as far as turning is con-

cerned, with respect to the carrier plate 27 but that it is adapted to slide longitudinally with respect to the other along these guides 29.

On the outside of the carrier plate is located a loose insulating disc 38 against which bears the end of a coil spring 39 located on the shaft. The other end of this spring bears on an arm 40. This arm is provided with a non-circular perforation to cause it to turn with the non-circular shaft 35 on which it is slidingly mounted. Beyond this arm and fixed to the shaft is an insulating or fibre collar 41 and a metallic conducting collar 42, both held in position by a nut 44 which is located on the screw-threaded end of this shaft and serves to tighten up the collars 41 and 42.

At the end of the device is an insulating disc 45 which is held in place by longitudinal arms 43 on the metal disc 25. This disc 45 is provided with three terminals, a battery terminal 46, a heater terminal 47 and a terminal 48 for a fog light or other electrical instrument. The battery terminal is provided with a contact 49 extending down into the center of this hollow disc 45 and also with a rivet 50, which also constitutes a connecting member to a plate 51. This plate 51 is connected with an arcuate resistance coil 52 which extends around part of the circumference of the disc in a recess 53 placed therein for that purpose. The plate 51 is small and is located at one end of the spring, of course, and the arm 40 is capable of being turned around in contact with this resistance to connect the heater with the battery and vary the resistance and therefore the temperature and the amount of current consumed.

The arm 40, when located on the plate 51, gives full force to the heater and when moved beyond it engages the non-conducting surface of the disc so that the heater is disconnected. This action takes place in either position of the knob 22, that is, whether it is pushed in as shown in Fig. 3, or pulled out, as shown in Fig. 6. The arm 40 rests at its rear end all the time on a metallic conducting circle 54, connected to the heater terminal 47.

When the knob is pushed in, as shown in Fig. 3, the terminal 49 and a terminal 55, from the fog light or other electrical instrument, rest on the fibre or insulating collar 41 and the current is not conducted to this instrument. When the knob 22 is pulled out, as shown in Fig. 6, these two terminals 49 and 55 engage the metal collar 42 and the current is conducted from the battery to the fog light or the like. This, in spite of the fact that the current is also conducted to the heater or such other instrument as may be substituted for it. Turning the knob 22 does not affect this connection.

The turning of the knob results, of course, in the turning of the arm 40 and the rectilinear reciprocation of the knob results in the connection or disconnection of the battery with the fog light or other instrument. The heater is connected up all the time unless the arm 40 is turned beyond the plate 51.

The flat flanges of the discs 25 and 27 bear on each other. There is a slight beveled edge protuberance 57 on the contacting surface of the disc 25 which snaps into and out of the slots 31 and 32 in the carrier plate to show, by the feeling or by producing a clicking sound, when the current is turned on or off the heater as the protuberance enters or leaves the slots.

It will be seen, therefore, that by the use of the hollow cylinder 15 and its connection with the insulating disc 33 the construction of such a device is simplified, its cost reduced, and its protection from the elements assured.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In an electric device, the combination of a supporting bracket, a nut, means for fixing the nut in stationary position on the bracket, a disc fixed with respect to the nut, a rotatably oscillatable carrier plate located in contact with said disc, a hollow lamp socket movably mounted within the nut, an insulating disc fixed to the lamp socket, a shaft to which said insulating disc is fixed, means carried by said shaft for conducting a current from a source of power to one of two electric appliances in accordance with the longitudinal position of the shaft, and means carried by the shaft for varying the current to the one of them which is in circuit when the shaft is in either one of its longitudinal positions.

2. In an electric device, the combination of a nut, means for fixing the nut in stationary position, a dished disc fixed with respect to the nut, a dished carrier plate located mostly within and in contact with said disc, said carrier plate having longitudinal guides, a hollow lamp socket movably mounted within the nut, an insulating disc fixed to the lamp socket, a shaft to which said insulating disc is fixed, means on said disc for guiding it longitudinally by means of said guide, means for moving the lamp socket longitudinally and for rotating it, means carried by said shaft for conducting a current from a source of power to one of two electric appliances in accordance with the longitudinal position of the shaft, and means carried by the carrier plate for varying the current to one of them.

3. As an article of manufacture, an electric device having a battery terminal and two other terminals, a shaft having an insulating ring and a metallic ring fixed thereon for connecting or disconnecting the battery terminal with respect to one of the other terminals, a hand knob movable longitudinally, a metallic lamp socket within and supporting the knob and projecting therefrom in the device, comprising a conducting sleeve, said lamp socket being in the electrical circuit at all times, an insulating disc movable with the sleeve, a metallic carrier plate connected with the insulating disc to turn therewith but not to move longitudinally therewith and having guides for the insulating disc, and a metal plate in fixed position and in contact with the carrier plate and otherwise spaced therefrom to furnish a protected space for said guides.

JASON C. STEARNS.