March 26, 1929. G. W. ELMWALL 1,706,570

RHEOSTAT

Filed May 1, 1926

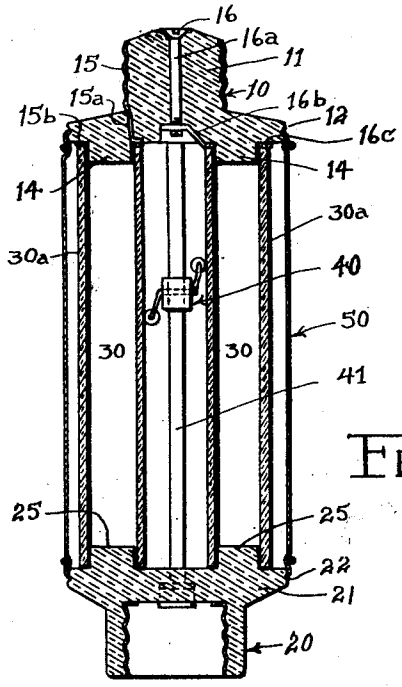


FIG 3

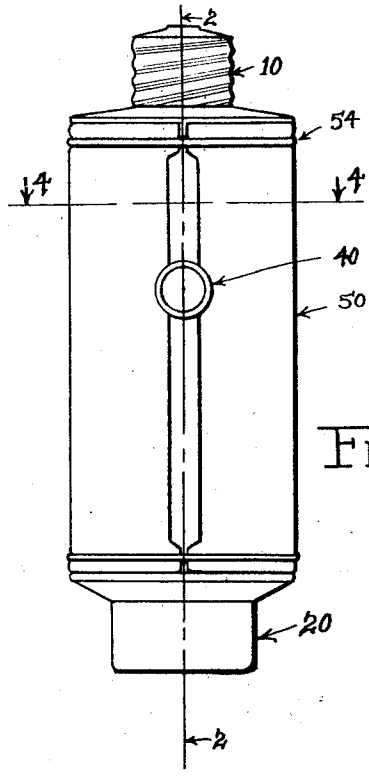


FIG 1

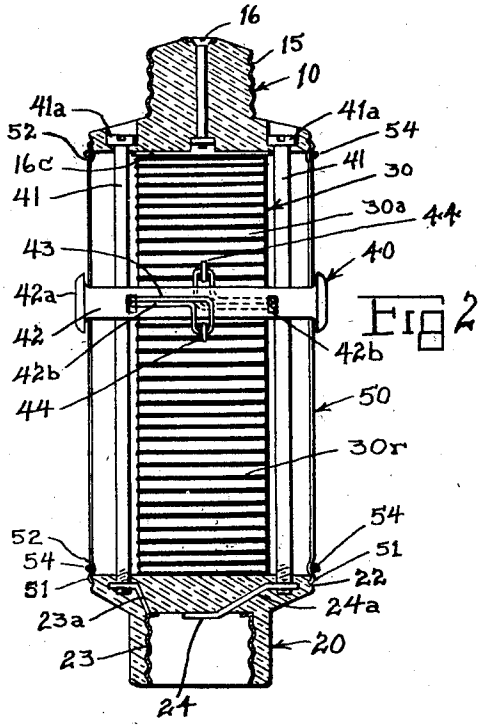


FIG 2

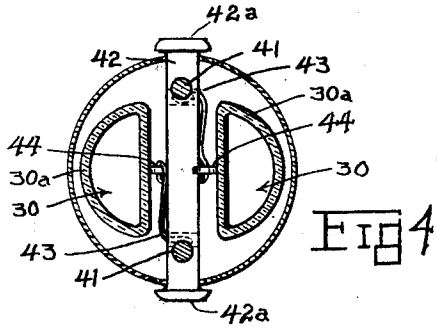


FIG 4

INVENTOR

Gustave Walfrid Elmwall

By M. P. Laughlin.

ATTORNEY

Patented Mar. 26, 1929. 1,706,570

UNITED STATES PATENT OFFICE.

GUSTAVE WALFRID ELMWALL, OF NEW YORK, N. Y.

RHEOSTAT.

Application filed May 1, 1926. Serial No. 105,973.

This invention relates to electrical apparatus and more especially to rheostats.

It is the primary object of this invention to provide means whereby the regulation of lamps, motors, medical and other appliances commonly attached to standard electrical lamp sockets and plugging outlets, may be accomplished with added facility and improved simplicity.

Appliances operated by electricity, particularly those of the portable or household type, are commonly supplied with current from a convenient lamp socket or from plugging receptacles mounted in the walls or floor. Sockets and receptacles of this character are generally supplied with either a simple switch or connected directly across the supply wires without a control device of any sort in their circuit thus appliances used were heretofore generally thrown directly on at full voltage and have so operated until altogether cut off. In the case of fans and some other devices cumbersome rheostats have been mounted in the machine base but the need of meeting lower prices of competitors has led to this practice being neglected even in these particular instances while naturally such rheostats helped not at all to control other appliances used by the same owner. It is the particular purpose of this invention to provide a control device capable of being readily attached to sockets and receptacles of the character described in such manner that it will be interposed in the circuit supplying the appliance being used and can be manipulated to control the connected appliance with any desired degree of accuracy or latitude.

Another purpose of the herein disclosed invention lies in the provision of a control device capable of being used after the manner described above and also having such simplicity of structure and accessibility of parts that its operation and repair will be at once easy and quick so that the device may serve promptly and for a maximum portion of its entire life without wasted time awaiting repairs and adjustments.

It is also the purpose of this invention to furnish a control device for the purposes described above having means as a part thereof for engaging both the socket or receptacle from which the electricity is to be drawn and the connection device of the appliance to be operated by the current supplied so that it may be interchangeably used without tools or specialized knowledge on the part of the user.

The device herein used to illustrate an embodiment of my invention is most particularly suited to form a part of the controls for medical apparatus of the character described in Patent Number 1,545,413 issued July 7, 1925, and entitled "Electrotherapeutic glove" and for other apparatus of like character being suited to obtain the close regulation and accurate easy control essential to treatments of the human body and of like delicate character operations.

A further object of my invention lies in so embodying my invention that the parts cooperating to provide the whole unitary means may be readily replaced when worn or when it is desired to obtain other current capacities, degrees or ranges of control.

Referring to the drawings and to the embodiment of my invention shown therein for purposes of illustration:

Fig. 1 is a front elevation of the complete device.

Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a vertical cross section of the device shown in the preceding figures but taken in a plane at right angles to that of Fig. 2.

Fig. 4 is also cross sectional of the device shown and is taken on line 4—4 of Fig. 1 looking downward as indicated by the arrows.

In the main the device shown consists of an attachment plug or top portion 10, an attachment socket or receptacle for the appliance to be controlled as shown in bottom portion 20, resistance units 30, a control slider 40, and a protective casing or shield 50.

In detail; The top portion 10 consists of a moulded insulating body 11 having an enlarged grooved rim 12, the resistance unit holding lugs 14 and suitable recesses and openings for the threaded contact 15 which has a downwardly extending connection 15^a joining it with the resistance unit connection ring 15^b and for the central contact 16 held by the screw 16^a and joined by the connection 16^b to the other resistance unit connection ring 16^c. Portion 10 is also recessed and bored to receive the heads 41^a of the slider rods 41 which will be further described.

The bottom portion 20 consists also of an

insulating body 21 having a rim grooved at 22 in a similar fashion to the rim on the upper portion. Portion 20 is recessed and bored to hold socket contact or shell 23 provided with a threaded extension 23^a into which one of slider rods 41 screws, while the central contact 24 and its threaded extension 24^a engage the other slider rod and are likewise held and supported by the body 21.

The resistance units shown consist of an insulating tube 30^a upon the surface of which is wound resistance wire 30^r. The units here shown are of semi-circular cross section having a flattened side but it will be understood that rectangular or round resistance tubes such as are well known to those skilled in the art, may be employed and that all of these may be held by lugs 14 on portion 11 and lugs 25 on portion 20 when in place. The terminals of resistance wire 30^r are preferably led outward at the tube ends and contact with rings 15^b and 16^c so that connection is made through the attachment portion contacts with the current supply source. The resistance wires are thus normally connected one to each of the supply wires but are insulated from each other and from appliance connections by bodies 11 and 21. It will be understood that for certain purposes the outer ends of the resistance coils may be joined together to form a potentiometer or the like well known to the art.

The slider 40 consists of a cross bar of insulating material 42 terminating in finger pieces 42^a and bored to slide over slider rods 41; cross bar 42 is also provided with openings 42^b through which spring wire contacts 43 extend to serve as brush contacts with rods 41 and at the outer ends to serve as mountings for contact wheels 44 riding over and making contact with resistance wires 30^r of the resistance units 30 already described. Thus it will be seen that contact wires 43 serve to carry the current from the resistance units to the contact rods 41 which in turn conduct it to the two contacts in the appliance connection socket through extensions 23^a and 24^a previously mentioned. It will be noted that as slider 40 is moved downward and contact made farther down the resistance units more resistance will be introduced into the circuit and the current supplied to the appliance will be further reduced, while as the slider is moved upward so will the current be increased and, if the appliance controlled be a lamp, so will the illumination increase.

The shield 50 consists of two semi-cylindrical sections preferably of heavy screen or perforated metal and having their upper and lower edges turned inward at the ends as at 51 to engage the grooved rims of portions 10 and 20 for support. Adjacent these turned in edge an indentation or groove 52 serves to seat and position clamping rings 54 of spring wire or the like which securely clamp the parts of the shield in place so that it forms a protection against accidental contact with any of the live parts or with the hot resistance wires.

The operation of the device has already been indicated while the rigidity of the whole; seeing that resistance units 30 are securely held clamped by, and in turn support and space, the end portions held against separation by slider rods 41; will be manifest. It will be clear that the device is capable of a large variety of uses and that while connection devices of the so called Edison type have been shown, knife or other type connectors may also be used and that many other such modifications are well within the skill of persons familiar with electrical apparatus of the type set forth. Manifestly many such changes and modifications are well within the scope of my invention and the spirit of the appended claims.

What I claim is:

1. In a current regulating device, moulded end members provided with lugs and with terminal and terminal conductor recesses, resistance units of half circuar cross section provided with end recesses adapted to engage said lugs and with a resistance conductor having terminals projecting thereon to engage certain of the terminal conductors mounted in said end member recesses, a resistance contact slider provided with means adjustably engaging the flat side of said resistance units and the resistance conductor thereon, clamp rods engaging said end members and terminal conductors mounted in said end member recesses, and a two part guard shield engaging the exterior of said end members and clamp rings for securing the same thereon, said end members supported thereby and therethrough spaced from said units and conducting parts.

2. In rheostats of the socket attachment type, moulded insulating end members having male and female socket and plug engagement elements mounted therein and thereon, said members also provided with mounting elements capable of simultaneous engagement with the two ends of a resistance mounting and insulating tube and with the resistance wire thereon, a plurality of metallic conductors mounted in and on said insulating members to form electrical connection means thereover and therethrough while at the same time providing connection and mounting for rods extending between said insulating members to secure the same upon the ends of removable and interchangeable resistance units mounted therebetween, said insulating members providing mounting for a guard shield clamped thereon, said resistance units having resistance wire wound thereupon and having externally exposed portions thereof on their outer surface, a connection slider mounted upon said rods, sliding thereover and projecting between said resistance units, said

slider having spring pressed connection members projecting at its sides engaged with said rods and contacting with the exposed portion of the resistance wire on a flattened portion of said interchangeable resistance units when mounted in the rheostat, said rods and shield removable to permit removal and exchange of said resistance units when desired.

3. In rheostats of the socket attachment type, an upper insulating member mounting a male attachment plug projecting from the upper face thereof and resistance connection pin connectors projecting from the under surface thereof, a lower insulating member mounting upon its lower surface, a female attachment plug receptacle and upon its upper surface resistance pin connectors electrically joined to the contact surfaces of said attachment plug receptacle, interchangeable resistance units having recesses in their ends so that said units may be inserted between said insulating members and upon said pins and by said insertion will be electrically connected thereto and mechanically joined therewith so that insertion and affixing of slider rods will join the whole in self supporting structure, a plurality of slider rods extending between the said insulating members for the purposes set forth and to mount an adjustment slider contacting with the surfaces of resistance units, and a guard shield clamping over the said members and supported thereby to insulate the same against accidental contact from without.

Signed this 3rd day of April, 1926, at New York, N. Y.

GUSTAVE WALFRID ELMWALL.