

L. AND A. G. SAWYER-SOUCY.
ELECTRIC LIGHT REGULATOR.
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1,340,795.

Patented May 18, 1920.

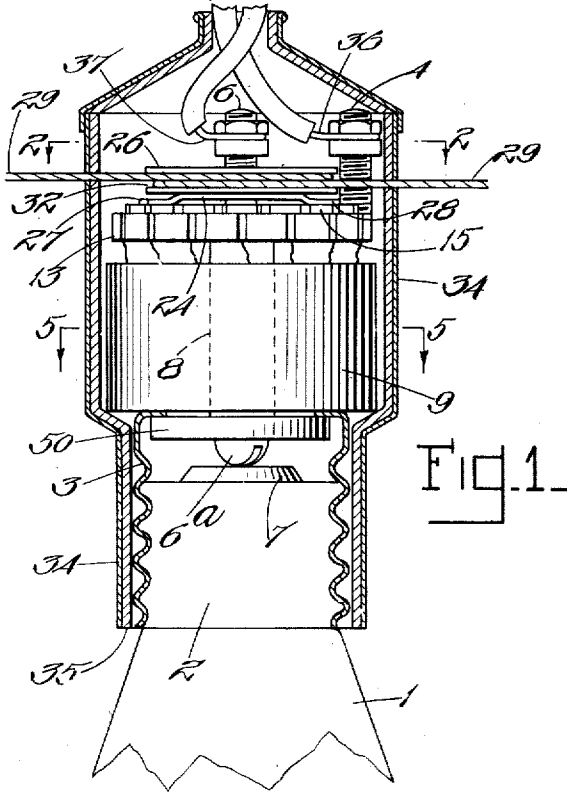


Fig. 1.

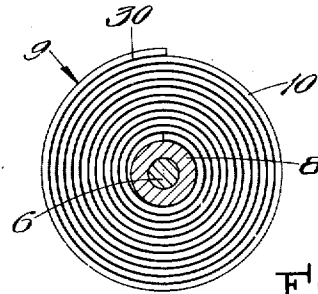


Fig. 5.

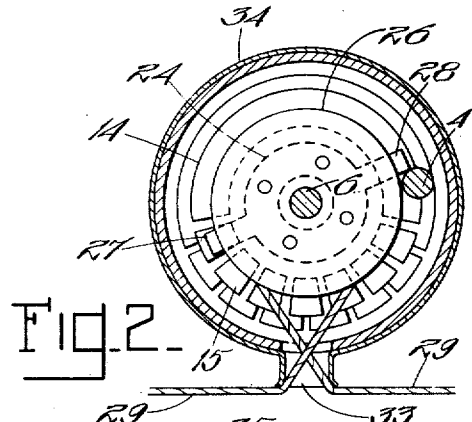


Fig. 2.

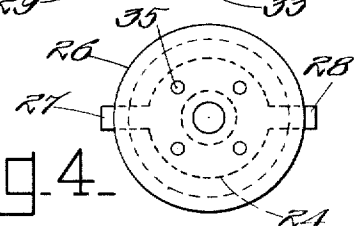


Fig. 4.

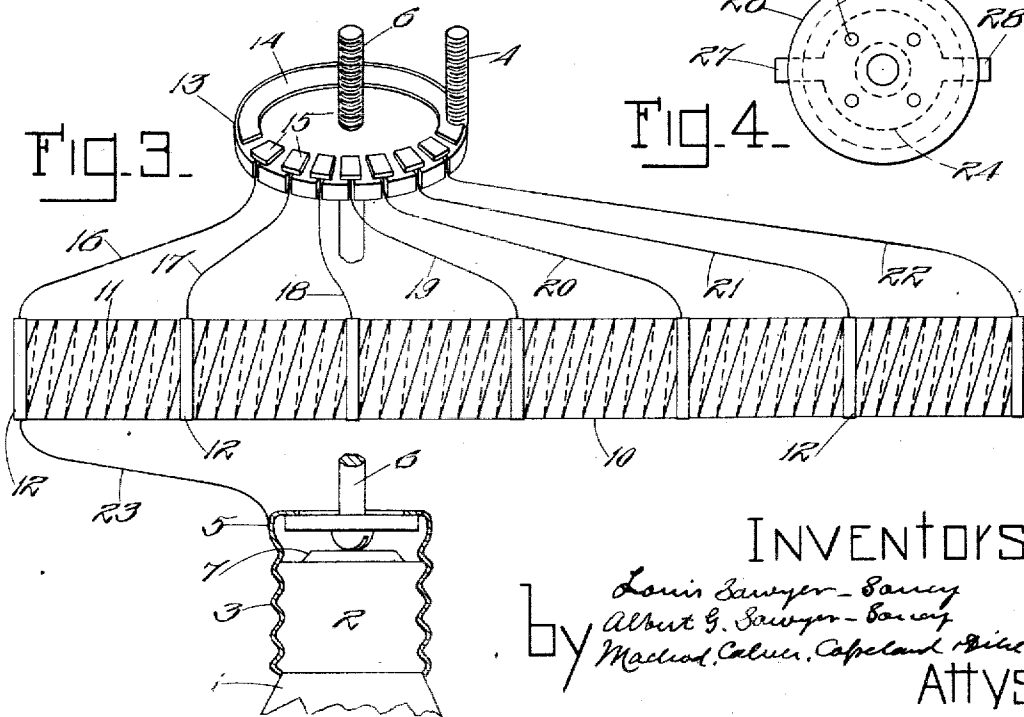


Fig. 3.

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UNITED STATES PATENT OFFICE.

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ELECTRIC-LIGHT REGULATOR.

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To all whom it may concern:

Be it known that we, LOUIS SAWYER-SOUCY and ALBERT G. SAWYER-SOUCY, both citizens of the United States, and both residing at Lynn, county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Electric-Light Regulators, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of the invention is to provide an improved means for varying the resistance so as to vary the intensity of the current and to correspondingly increase or diminish the intensity of the illumination of an electric light. One feature of the invention relates to the resistance coil. Another feature relates to the switch. Another feature of the invention relates to the construction of the rheostat in such manner as to make it readily adapted for use in connection with any ordinary design of electric lamp socket.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings, and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in elevation partly broken away, showing a portion of an electric light bulb attached to a socket equipped with a rheostat embodying the invention.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a view in diagram showing the lamp socket and rheostat in unassembled relation to each other.

Fig. 4 is a detail view of the switch member.

Fig. 5 is a section through the coil taken on line 5—5 of Fig. 1.

Referring now to the drawings, 1 represents the lamp, 2 the lamp-base, and 3 the socket of an ordinary incandescent electric light. 4 represents the positive binding post which has electrical connection with the lamp through a rheostat which will be hereinafter more fully described, said rheostat having electrical connection as indicated at 5 with the socket 3, which is in contact with the lamp-base 2. 6 represents the negative binding post which has electrical connection with the lamp through the contact member 7 carried by the lamp-base 2. The lead

wires 36 and 37 are connected with the binding posts 4 and 6 in the usual manner.

The lamp socket may be of ordinary form. The upper part of the socket contains the insulating member 50 which may be composed of disks of mica, or other suitable insulating material, and the binding post 6 which is formed with a grooved head 6^a passes up through the insulating sleeve 8 which is inclosed within the resistance coil 9, said binding post being screw-threaded at its upper end for the reception of a nut for securing the lead wire 37.

The sleeve 8 through which the binding post 6 passes forms a core for the resistance coil 9 and is composed of insulating material. The resistance coil 9 is composed of a tape 10 having wound spirally around it a fine wire 11, the tape being wound into a roll and having a layer of heat-proof or fire-resisting cement between the several laps of the roll firmly uniting them together as shown in Fig. 3. The tape employed is preferably what is known to the trade as mica tape, and consists of a thin layer of mica between two sheets of insulating material. The wire is wound around the flat mica tape before the tape is rolled up, and there is applied to the face of the tape after it is wound a coating of heat-proof or fire-resisting insulating cement 30. The cement employed is any suitable heat-proof or fire-resisting insulating cement. The tape is then wound up into a roll around the sleeve 8 as a core while the cement is sticky, and this causes the several laps of the roll to firmly adhere together. The whole makes a sort of jelly roll coil and the several laps of the roll adhere so firmly together when the cement is dry that any attempt to unroll the coil will result in practical disintegration or at least destruction of the roll, as it will be impossible to separate the different layers of the roll or to detach them from each other so as to straighten out the tape into the original flattened form. I consider this desirable as I do not desire to have the roll capable of being unrolled and in any way used again. The cement 30 will serve to insulate the several windings of the tape from each other as well as cement them together.

At intervals of a certain number of windings, preferably at intervals of about forty windings of the wire, there is introduced a

thin metal band 12 around the tape with which the wire 11 is connected, the metal bands being unions between the several sections of wire. There are preferably as many series of these sections of windings as the number of gradations in the different variations in the strength of light desired. The bands 12, however, are not absolutely essential, the principal purpose of these bands being to strengthen the tape so that it will not be cut through by the wire. The cement 30 will be laid on over the metal bands 12 as well as over the wire.

A disk 13 of fiber or other suitable insulating material is mounted fast upon the binding post 6 and serves as a switch plate. Upon this disk or switch plate there is mounted a semi-annular contact member 14 of suitable conducting material, one end of which is electrically connected with the positive binding post 4. On the surface of the disk 13 are a series of metallic contact blocks 15 spaced apart from each other and disposed in arc formation concentric with the contact member 14 to complete the circle with the contact member 14. These blocks 15, however, are insulated from each other and from the ends of the semi-annular contact member 14 by the insulating switch plate 13. In the drawings there are seven of these contact blocks 15, the apparatus being shown as arranged for seven successive variations in the light. These blocks are respectively connected with the resistance coil at regular intervals apart, these intervals preferably corresponding with the metallic bands 12, the connections being made with the metallic bands. The said various electrical connections between the blocks 15 and the bands 12 are by means of the wires 16, 17, 18, 19, 20, 21 and 22 respectively. A wire 23 makes electrical connection between the outer end or first band 12 of the resistance coil and the lamp, as shown in Fig. 3.

The switch consists of a disk member 24 of suitable conducting material, which is secured to the under side of an insulating disk 26, as for instance by means of rivets 35, and is formed with two contact fingers 27 and 28 extending from the disk diametrically opposite each other. The disk 24 of the switch member and the insulating disk 26 are formed with apertures through the center, so that the switch may be rotatably mounted upon the center binding post 6 with the switch member on the under side so that it may contact with the contact member 14 and blocks 15. One of the fingers, as 28, will always be in contact with the semi-annular contact member 14 which always has an electrical connection with the positive binding post, and the other finger 27 will always be in contact with at least one of the blocks 15. Said

switch member 24 may be rotated on the binding post 6, so that the finger 27 may be made to contact with any one of the said blocks 15 while the other finger 28 will always remain in contact with the semi-annular member 14. The binding post 4 forms a stop for the finger 27 in one position and for the finger 28 when the switch is rotated its full stroke to carry the finger 27 as far away as possible from the post 4, although the post 4 forms a stop for the finger 28 to prevent the switch from being rotated far enough to move the finger 28 out of contact with the member 14.

When the finger 27 is in contact with the left-hand block 15 shown in Fig. 3, the circuit will be from the binding post 4 through the contact 14 and switch 24 to the first block 15, thence through the wire 16, the band 12 at the end of the first section of the coil and the wire 23 to the lamp, and out through the other binding post 6, and this will take the full strength of the current.

If the switch 24 is turned so as to bring the finger 27 into contact with the second block 15, the current will then follow through the wire 17 to the resistance coil, thence back through the first section of the resistance coil to the wire 23, and thence to the lamp as before, so that the light will have been diminished in proportion to the amount of resistance of the first section of the resistance coil.

By turning the switch 24 so that the finger 27 contacts with the third block 15, the circuit will be through the wire 18 to the resistance coil, and thence back through the first two sections of the resistance coil, and then on through the wire 23. Thus by turning the switch 24, the circuit may be made through any of the wires 16, 17, 18, 19, 20, 21 and 22, increasing the resistance according to the number of sections of resistance coil through which the current has to pass, and consequently diminishing the light accordingly. It is obvious that the number of blocks 15 may be increased or diminished according to the number of gradations of variation in light desired. If the switch is rotated far enough for the finger 27 to pass beyond the last one of the series of blocks 15 toward the binding post 4, the circuit will be broken and the light will be thrown off.

The switch may be rotated in any suitable manner. The preferable method, however, is to provide the disk 26 on which the switch is mounted with a peripheral groove 32 to receive a chain 29 wound around it as shown in Fig. 1, the two ends of the chain passing out through a hole 33 in a casing 34 which incloses the rheostat. The ends of the chain may be provided with a pull ring, or other suitable grasping device, by means of which one end of the chain or the other may be pulled according to the direction in which

it is desired to rotate the switch. Within the casing 34 is a lining 35 of insulating material.

What we claim is:—

1. A rheostat coil consisting of a tape of insulating material wound with fine wire and coated on at least one face with a heat-resisting, non-conducting cement, which covers the wire as well as the tape, said wire-wound tape being rolled into a coil, the several laps of tape in the coil being adhesively united together by the said cement.
2. A rheostat coil consisting of a tape of non-conducting material wound with fine wire, a plurality of thin metallic bands around the tape, one for each series of a certain number of windings of wire, and a coating of heat-resisting, non-conducting cement over the face of the wire tape, said cement-coated tape being wound into a roll, the several laps of the wire-wound tape being adhesively bound together by the said cement.
3. A rheostat coil consisting of a tape of insulating material wound with fine wire and coated on at least one face with a heat-resisting, non-conducting cement, which covers the wire as well as the tape, said wire-wound tape being rolled into a coil, the several laps of tape in the coil being adhesively united together by the said cement, the cement between the layers being sufficiently adhesive to render the several layers inseparable from each other mechanically except by disintegration.
4. In combination with an electric light socket having an insulating disk in the base thereof, a binding post which passes centrally through said insulating disk and the base of the said socket, said binding post having a head which engages the said disk on the inside of the socket and makes contact with one of the contact points of the lamp, an insulating sleeve through which the said binding post passes after passing through said disk, a switch plate disk of insulating material through which the said binding post and sleeve pass, a semi-annular contact member secured to the face of said switch plate disk co-axial with said binding post, a second binding post which is mounted on said switch plate disk and has electrical connection with one end of said semi-annular contact member, said two binding posts being respectively provided with means for electrical connection with the leading-in wires of an electric circuit, a plurality of contact points mounted on said switch plate disk disposed in an arc of a circle in continuation of the arc of said semi-annular contact member and insulated from each other and from said annular contact member, a rotary switch mounted on the switch plate and through which said central binding post passes loosely, said switch having two oppositely extending fingers, one of which is in engagement with the face of said semi-annular contact member, and the other of which is adapted to make electrical contact with one or the other of said separate contact points according to the position of the switch member on its axis, and a rheostat coil having electrical connection with one of the contact points in the lamp socket, and having at graduated points in its windings electrical connections with one of the several separate contact points on the switch disk.
5. A disk of insulating material having secured to one face thereof a semi-annular contact member, a binding post mounted on said disk near its periphery, and having electrical connection with one end of said semi-annular contact member, the upper end of said binding post being adapted for connection with an electric wire in a circuit, a plurality of contact points mounted on said disk disposed in a row in an arc of a circle in continuation of the arc formed by said semi-annular contact member but insulated from said semi-annular member and from each other, a second binding post which passes centrally through said disk and is surrounded by an insulating sleeve, the lower end of said post being a contact point to engage with one of the contact points of a lamp, the upper end being adapted for connection with an electric wire in a circuit, an apertured insulating disk through which said central binding post passes loosely, said last disk having mounted on its face a switch having two arms, one of which engages with said semi-annular contact member, and the other of which engages with one or another of the separate contact points, the switch being rotatable to cause its engagement with any one of said separate contact points while it remains in contact with said semi-annular contact member.
6. A disk of insulating material having secured to one face thereof a semi-annular contact member, a binding post mounted on said disk near its periphery, and having electrical connection with one end of said semi-annular contact member, the upper end of said binding post being adapted for connection with an electric wire in a circuit, a plurality of contact points mounted on said disk disposed in a row in an arc of a circle in continuation of the arc formed by said semi-annular contact member but insulated from said semi-annular member and from each other, a second binding post which passes centrally through said disk, the lower end of said post being a contact point to engage with one of the contact points of a lamp, the upper end being adapted for connection with an electric wire in a circuit, an apertured insulating

disk through which said central binding post passes loosely, said last disk having mounted on its face a switch having two arms, one of which engages with said semi-annular contact member, and the other of which engages with one or another of the separate contact points, the switch being rotatable to cause its engagement with any one of said separate contact points while it remains in contact with said semi-annular contact member, the disk on which the switch member is mounted being formed with a peripheral groove, and a flexible member coiled around the groove of the disk to rotate the switch member in either direction according to the end of the flexible member which is pulled.

7. A disk of insulating material having secured to one face thereof a semi-annular contact member, a binding post mounted on said disk having electrical connection with one end of said semi-annular contact member, the upper end of said binding post being adapted for connection with an electric wire in a circuit, a plurality of contact points mounted on said disk disposed in a row in an arc of a circle in continuation of the arc formed by said semi-annular contact member but insulated from said semi-annular member and from each other, a second binding post which passes centrally through said disk and is surrounded by an insulating sleeve, the lower end of said post being a contact point to engage with one of the contact points of a lamp, the upper end being adapted for connection with an electric wire in a circuit, an apertured insulating disk through which said central binding post passes loosely, said last disk having mounted on its face a switch having two arms, one of which engages with said semi-annular contact member, and the other of which engages with one or another of the separate contact points, the switch being rotatable to cause its engagement with any one of said separate contact points while it remains in contact with said semi-annular contact member, in combination with a resistance coil consisting of a tape of insulating material having outside resistance windings of wire, and a facing film of heat-resisting, non-conducting cement, the wire-wound tape with its cement facing being coiled into a roll with the film of cement between the several laps of tape, and an electric wire connection between each one of the contact members on the switch plate and the rheostat coil, the several connections with the said coil being at intervals of regularly increasing number of windings from the end of the coil.

8. A switch plate of insulating material having secured to one face thereof a semi-annular contact member, a plurality of contact points mounted on said disk and disposed in an arc of a circle in continuation

of the arc formed by said semi-annular contact member, but insulated from said semi-annular member and from each other, a binding post which passes through said disk, the lower end of said post being adapted to serve as a contact point, and the upper end being adapted for connection with an electric circuit, an apertured insulating disk through which said binding post passes loosely, said last disk having mounted on its face a switch which has one arm engaging with said semi-annular contact member and another arm which is adapted to engage with one or another of the separate contact points according to the position of the switch, the switch being rotatable to cause its engagement with any one of said separate contact points while it remains in contact with said semi-annular member.

9. A switch plate of insulating material having secured to one face thereof, a semi-annular contact member, a plurality of contact points mounted on said disk and disposed in an arc of a circle in continuation of the arc formed by said semi-annular contact member but insulated from said semi-annular member and from each other, a binding post which passes through said disk, the lower end of said post being adapted to serve as a contact point and the upper end being adapted for connection with an electric circuit, an apertured insulating disk through which said binding post passes loosely, said last disk having mounted on its face a switch which has one arm engaging with said semi-annular contact member and another arm which is adapted to engage with one or another of the separate contact points according to the position of the switch, the switch being rotatable to cause its engagement with any one of said separate contact points while it remains in contact with said semi-annular member, said switch plate disk being formed with a peripheral pulley groove and a flexible operating member which engages with said pulley groove whereby the said switch plate disk may be rotated.

10. A rheostat coil consisting of a tape of insulating material wound with fine wire and coated on at least one face with a heat-resisting, non-conducting cement, which covers the wire as well as the tape, said wire-wound tape being rolled into a coil, the several laps of tape in the coil being hesively united together by the said cement, a binding post which passes centrally through said coil, means for insulating said binding post from said coil, the lower end of the binding post being adapted to serve as a contact point, and the upper end of said post being adapted for connection with an electric circuit, a plate of insulating material through which said binding post passes, a semi-annular contact member se-

cured to one face of said switch plate co-
axial with said binding post, a plurality of
contact points mounted on said switch plate
disposed in an arc of a circle in continuation
5 of the arc of said semi-annular member and
insulated from each other and from said
semi-annular member, a rotary switch
mounted on said switch plate and through
which said central binding post passes
10 loosely, said switch being rotatable to make
contact with said semi-annular member and
to also make contact with any one desired
of said separate contact points according to
the position of the switch on its axis, each
15 of said separate contact points having elec-
tric wire connections with said rheostat coil,
said several connections with the rheostat
being at certain intervals apart from each
other.

20 11. In combination with an electric light
socket, a rheostat coil consisting of a tape
of insulating material having resistance
wire windings around it, said tape being
wound in the form of a roll, the several laps
25 of the tape being adhesively united together
by a non-conducting, heat-resisting cement,
a binding post passing centrally through
said roll as a core, one end of said binding
post being connected with the said socket
30 and forming a contact member therein, the
other end of said binding post projecting
beyond the end of the resistance coil and
adapted for connection with an electric cir-

cuit, a switch plate of insulating material
mounted on the end of the rheostat coil on 35
the opposite side from the connection with
the said socket, said binding post passing
centrally through said switch plate, a con-
tact plate mounted on said disk having a
binding post connected therewith which is 40
also adapted for connection with one of the
leading-in wires of the electric circuit, a plu-
rality of contact points mounted on said
disk insulated from each other and from
said first contact plate, and a switch rota- 45
tably mounted on said first binding post and
having one arm which is adapted to engage
with said contact plate, the other arm of
which is adapted to engage with any one
of the said separate contact points accord- 50
ing to the position of the switch on its axis
while said first arm continues in contact
with the said contact plate, and a separate
electric wire connection between each one
of said contact points on the switch plate 55
and the rheostat coil, the connections with
the resistance coil being at varying dis-
tances from the end of the resistance wire.

In testimony whereof we affix our signa-
tures, in presence of two witnesses.

LOUIS SAWYER-SOUCY.

ALBERT G. SAWYER-SOUCY.

Witnesses:

J. FRANK HUGHES,

DANIEL F. O'ROURKE.