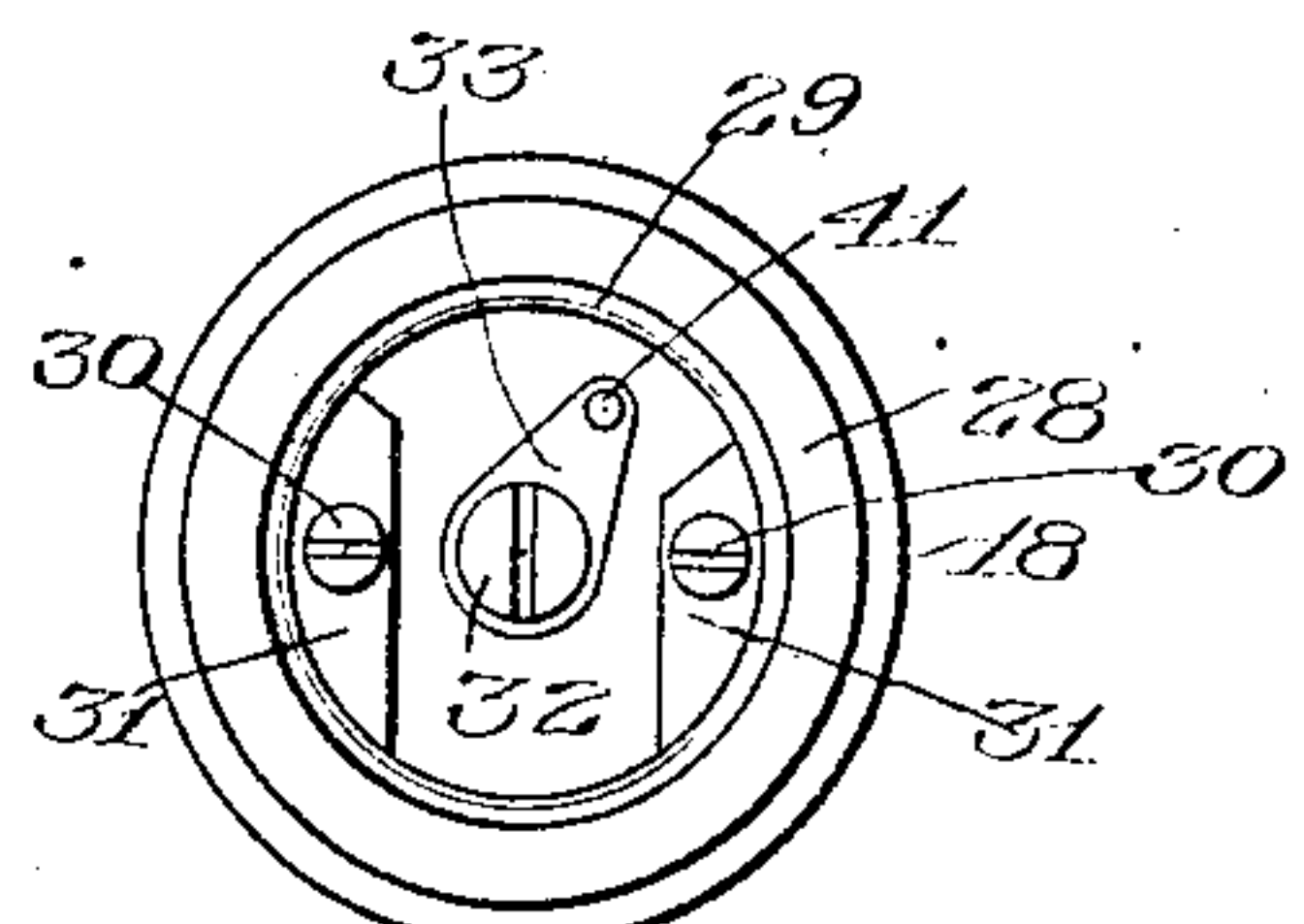
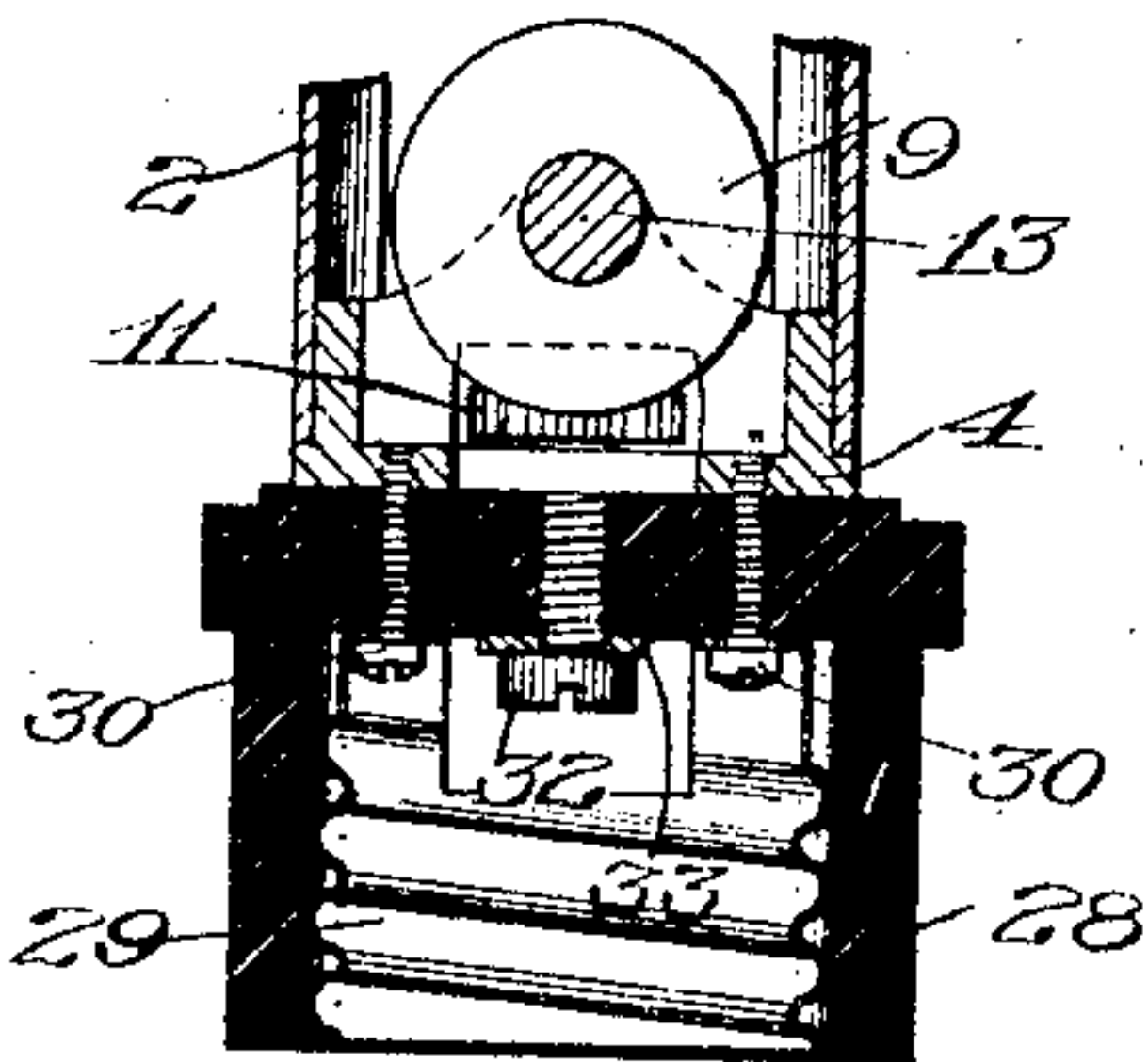
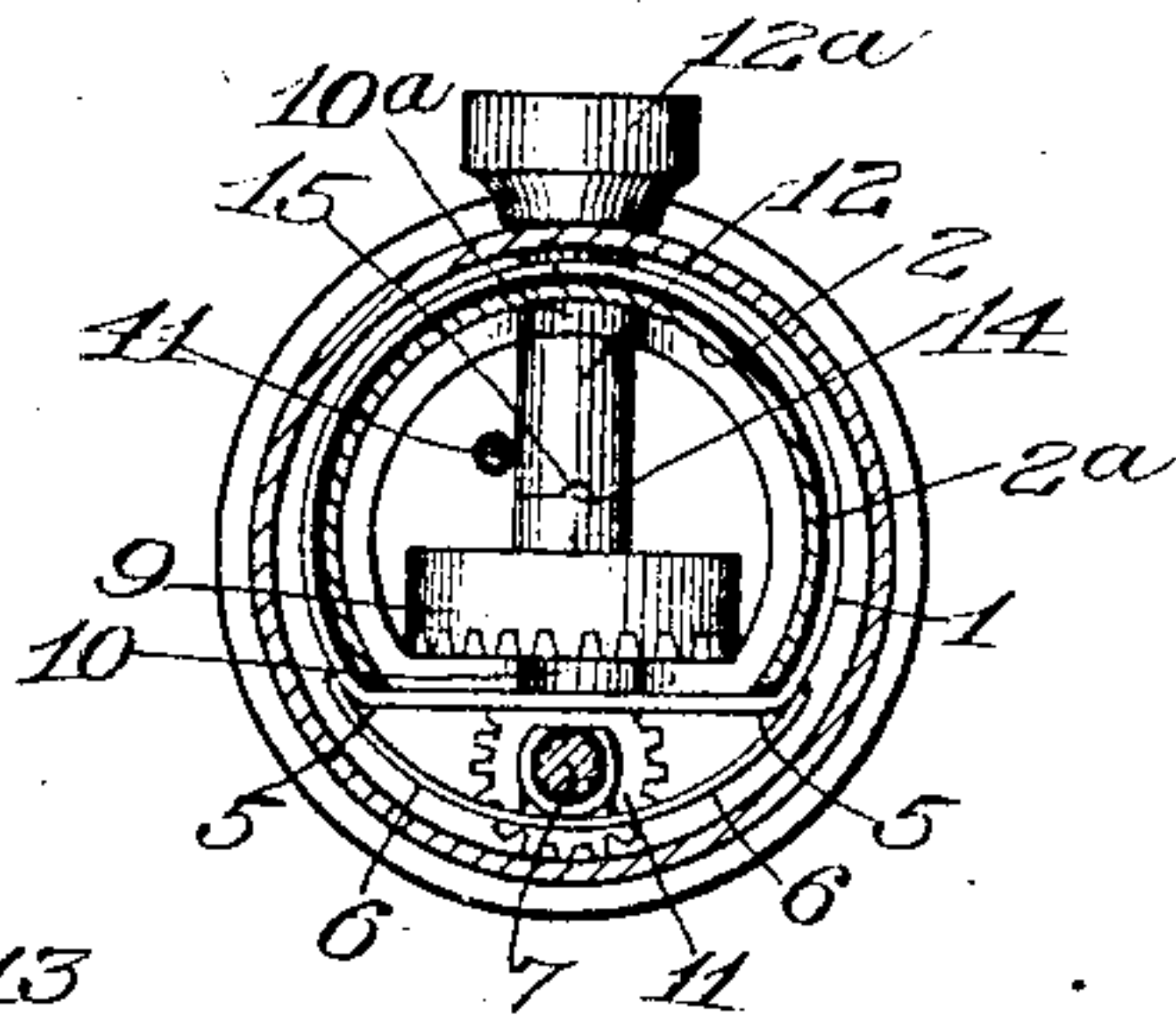
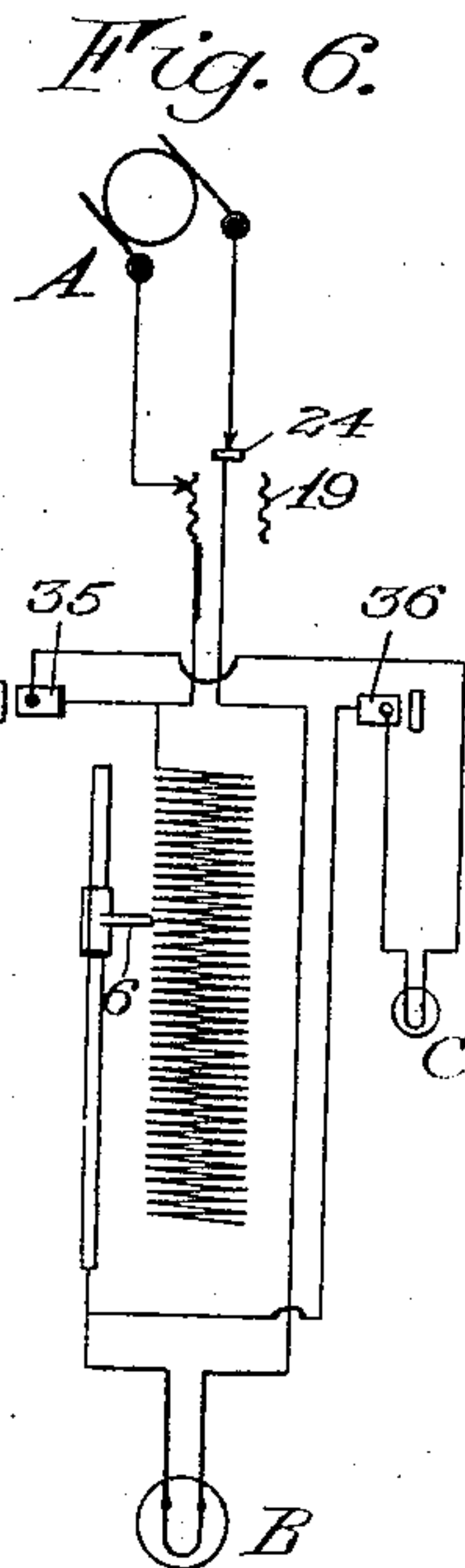
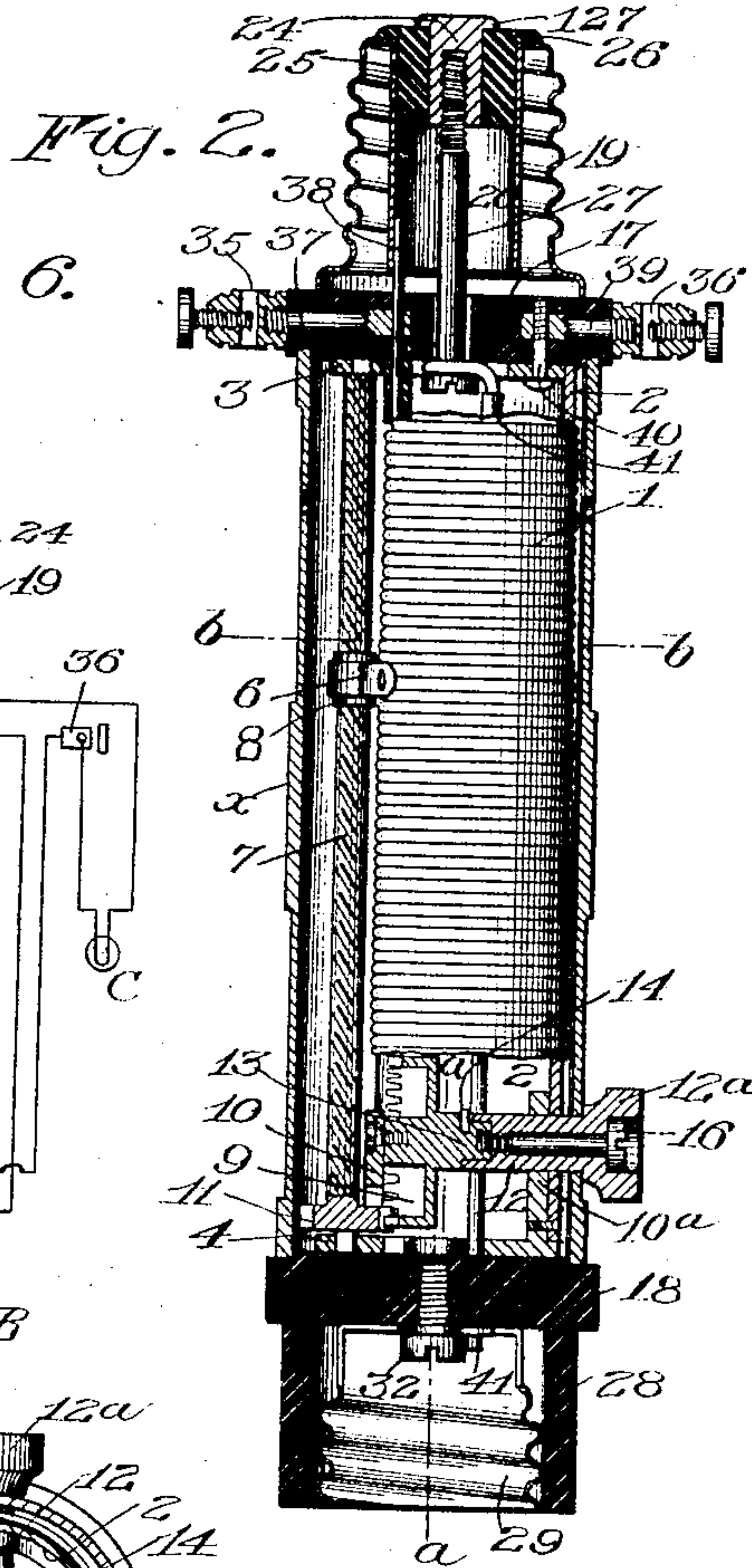
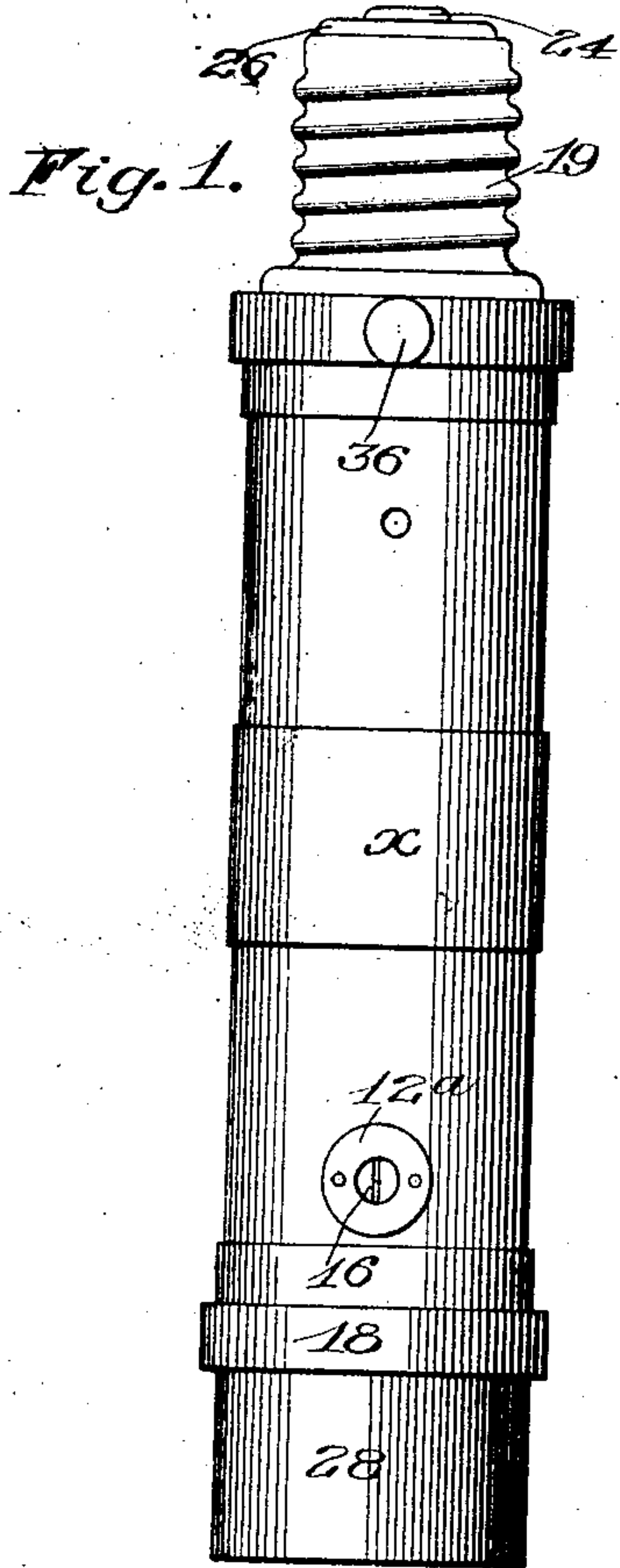


H. A. KEIP.
ELECTRIC CURRENT REGULATOR.
APPLICATION FILED OCT. 1, 1908.

925,776.

Patented June 22, 1909.



Witnesses

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HERMAN A. KEIP, OF ROCHESTER, NEW YORK, ASSIGNOR TO ELECTRO SURGICAL INSTRUMENT COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRIC-CURRENT REGULATOR.

No. 925,776.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed October 1, 1908. Serial No. 455,740.

To all whom it may concern:

Be it known that I, HERMAN A. KEIP, of Rochester, in the county of Monroe and State of New York, have invented certain
5 new and useful Improvements in Electric-Current Regulators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part
10 of the specification, and to the reference characters marked thereon.

The present invention relates to electric current regulators of the type in which a variable resistance is employed and it has for
15 an object to provide a simple and inexpensive construction adapted to reduce the voltage of the ordinary commercial current to enable the latter to be used for medical or other purposes where a low voltage is re-
20 quired.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being
25 pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a side view of a regulator embodying the present invention. Fig. 2 is a longitudinal section with
30 some of the interior parts shown in elevation. Fig. 3 is a detail longitudinal section on line *a-a* of Fig. 2. Fig. 4 is a horizontal section on line *b-b* of Fig. 2. Fig. 5 is a view of the socket end of the device, and Fig. 6 is a
35 diagrammatic view illustrating the circuits.

The invention in this instance embodies a variable resistance preferably consisting of a winding or coil 1 of resistance wire surrounding a support 2, and insulated therefrom by
40 a coating on the wire and an insulating sheet 2^a on the drum. The support is preferably in the form of a split hollow drum provided with heads 3 and 4 at its ends and made of resilient material, such as sheet metal, with
45 the windings placed about it under tension in order to compress the drum and give it a normal tendency to expand. With this arrangement when the resistance wire becomes heated due to the passage of a current there-
50 through the drum will expand with the wire and prevent the latter becoming loose. The split in the drum causes the coil to have a flattened portion on one side and the insulation on the windings may be removed at 5 on the
55 side or edges of the flattened portion to pro-

vide two series of contacts extending longitudinally of the coil. Of course I may provide only one longitudinal extending series of contacts, but I prefer to employ two, as I may then secure constant and firm engage-
60 ment between the coil and a contact that moves longitudinally of the coil and has a pair of spring contact portions 6. This movable contact may be operated by a high speed screw 7 that works through a nut 8 se-
65 cured thereto, the screw being located in proximity to the flat portion of the coil and preferably journaled at its ends in the heads 3 and 4. The rotation of the screw in either
70 direction will by reason of the friction produced on the nut, cause either one of the contact points to bear with pressure against one of the series of contacts on the coil, although
75 both will at all times contact. The arrangement of the screw in proximity to the flattened portion of the coil permits the lat-
ter to be surrounded by a smaller casing *x* than would otherwise be necessary.

To rotate the screw there is provided means preferably arranged within the hol-
80 low drum and consisting in this instance of a crown gear 9 journaled on and secured to a bracket 10 on end piece or head 4 and meshing with a pinion 11 that is rigidly se-
85 cured to screw 7. The operating shaft 12 for the gear is journaled in a bracket 10 on head 4 and extends to the exterior of the drum and the casing *x*, where it is provided with a thumb piece 12^a. The thumb piece
90 and shaft may be detachably secured to the crown gear and for this purpose the latter has an internally threaded boss 13 provided with projections 14 at its base to fit in re-
95 cesses or notches 15 on the shaft 12 which is made hollow so as to fit over the boss and receive a screw or bolt 16 that engages the internal threads on boss 13 and holds the shaft and thumb piece thereto.

Arranged at the ends of the variable re-
100 sistance are the insulators 17 and 18, the former carrying means adapting the resistance for attachment to the ordinary incandescent lighting circuit A, such as an electric plug or base, and the latter adapting the
105 resistance for connection in series with a known resistance B, an electric socket being preferably employed to receive a plug connected to a known resistance such as an incandescent lamp. The insulator 17 also
110 carries a pair of binding posts 35 and 36

which are electrically connected with the device so that the current consuming device C connected therewith shall be in series with the known resistance and in parallel with the variable resistance.

The plug that serves for connecting the device to an ordinary socket may comprise two concentrically arranged tubes 19 and 20 connected at their outer ends, the outer tube being externally screw threaded and abutting the insulator at its inner end. The two tubes 19 and 20 form one contact for the plug, and the other contact 24 is arranged concentrically thereof and is insulated therefrom by an insulator 25 preferably in the form of a sleeve having a flange 26 at one end abutting the outer end of the contact 19—20 so that the latter may be held to insulator 17 by a screw bolt or other fastener 27 that passes through the insulator 17 and engages the contact 24 which also has a flange 27 engaging or abutting the outer end of insulator 25 to hold the latter. It will thus be seen that the screw serves for holding both contacts and the insulator 25 to the insulator 17.

The socket that receives the plug of a known resistance B is preferably formed by an annular extension 28 of the insulator 18 providing a cup in which is arranged an annular contact 29 internally threaded to receive the usual lamp base or plug and held in the insulator cup by screws 30 which engage laterally turned portions 31 on the contact 29 and project through the insulator and engage the head 4 of the drum, thus serving to hold the insulator to the latter. Located at the base of the cup is a contact 32 in the form of a screw that engages and holds a plate 33 for a purpose to be described.

The current consuming device, such for instance, as a low voltage lamp, indicated at C, has its terminals connected to the binding posts 35 and 36 which are preferably arranged on insulator 17. The binding post 35 is electrically connected to contact 19—20 of the base preferably by a stem 37 which projects into the insulator 17 and is perforated near its inner end to receive a conductor 38 that connects contacts 19—20 to one end of the resistance coil. The binding post 36 has a stem 39 that also projects into the insulator 17 and is held therein by one of a series of screws 40 that serve to hold the head 3 of the drum 2 to the said insulator 17. This screw or fastener 40 also electrically connects the binding post 36 to the drum or support 2. The drum or support electrically connects the contact 29 of the socket with the binding post 36 and through screw 7, movable contact 6, coil 1 and conductor 38, with binding post 35, while screws 30 connect the contact 29 of the socket to the support 2. Contact 24 of the plug is connected to contact 32 of the socket by a con-

ductor 41 which is secured by the fastener 27 and projects through drum 2 and insulator 18 into contact with plate 33.

In use, the plug is inserted in an ordinary incandescent lamp socket and a lamp or other known resistance, indicated at B has its plug fitted in the socket at the lower end of the device, the current consuming device C having previously been connected with terminals or binding posts 35 and 36. The resistance B and the variable resistance will reduce the current flowing to the current consuming device 34 and this current be changed by adjusting the variable resistance in the manner set forth.

From the foregoing it will be seen that there has been provided a construction which is simple to operate and inexpensive to manufacture, the parts are compactly arranged and are not liable to get out of order.

I claim as my invention:

1. The combination with a resistance wire, of a split drum about which the wire is wrapped, made of spring material and held against expansion by the resistance wire.

2. The combination with a pair of insulators, of a split drum made of spring material, connecting said insulators, a resistance wire wrapped about said drum and holding it against expansion, said resistance wire being provided with a longitudinal series of contacts, a contact movable longitudinally of the drum cooperating with the longitudinal series of contacts on the resistance wire, and a casing connecting the insulators and surrounding the resistance wire and the movable contact.

3. The combination with a coil of resistance wire having two longitudinal series of contacts, of a movable contact having two contact points for cooperating with both series of contacts and the screw member extending longitudinally of the coil and cooperating with the movable contact between the contact points of the latter.

4. The combination of a cylindrical coil having one side flattened and provided with two longitudinal series of contacts at the edges of the flattened portion, with a contact movable longitudinally of the coil and provided with two contact points to cooperate with the two longitudinal series of contacts on the coil.

5. The combination with a hollow drum, and a resistance coil surrounding the same having a longitudinal series of contacts, of a movable contact for cooperating with the longitudinal series of contacts, a screw arranged to operate the movable contact, and means for operating the screw arranged within the drum and having an operating shaft extending to the exterior of the drum.

6. The combination with a hollow drum and a resistance coil surrounding the same and having a longitudinal series of contacts,

of a screw arranged longitudinally of the coil, a movable contact operated by the screw, a pinion on the screw, a gear arranged in the drum and meshing with the pinion, an
 5 operating shaft for the gear extending to the exterior of the drum.

7. The combination with a hollow drum, of heads at each end of the drum, a resistance coil surrounding the drum and having a longitudinal series of contacts, a screw journaled
 10 in the heads, a contact movable on the screw end coöperating with the longitudinal series of contacts, a gear for operating the screw arranged in the drum and journaled on one
 15 of the heads and an operating shaft for the gear journaled in the same head and extending to the exterior of the drum.

8. The combination with a resistance coil having a flattened portion, and a longitudinal
 20 series of contacts, of a contact movable longitudinally of the coil to coöperate with the series of contacts thereon, and an operating shaft for the movable contact arranged longitudinal of the coil and in proximity to
 25 the flattened portion.

9. The combination with an insulator, of a base or plug secured to the insulator and comprising a screw member, an insulator fitting in said hollow screw member and having
 30 a flange abutting the outer end of the screw member, a contact fitting in the flanged insulator and having a flange abutting the outer

end of the latter, and a fastener connecting the flanged contact and the first named insulator.

10. The combination with a pair of insulators, and a variable resistance interposed between them, of a pair of terminals carried by each insulator and electrically connected
 40 to the resistance, a pair of binding posts carried by one of the insulators, one of said binding posts having a perforated stem extending into the said insulator, and a conductor secured to one of the contacts on the
 45 same insulator, extending through the perforation in the stem and connected to the variable resistance.

11. The combination with a hollow drum and a resistance coil surrounding the same and having a longitudinal series of contacts,
 50 of a screw arranged longitudinally of the coil, a movable contact operated by the screw, a pinion on the screw, a gear arranged in the drum and meshing with the pinion, an operating shaft for the gear extending to the exterior
 55 of the drum and detachably connected to the gear, a casing surrounding the drum and the screw, and a thumb piece carried by the shaft and arranged on the exterior of the casing.

HERMAN A. KEIP.

Witnesses:

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