

(No Model.)

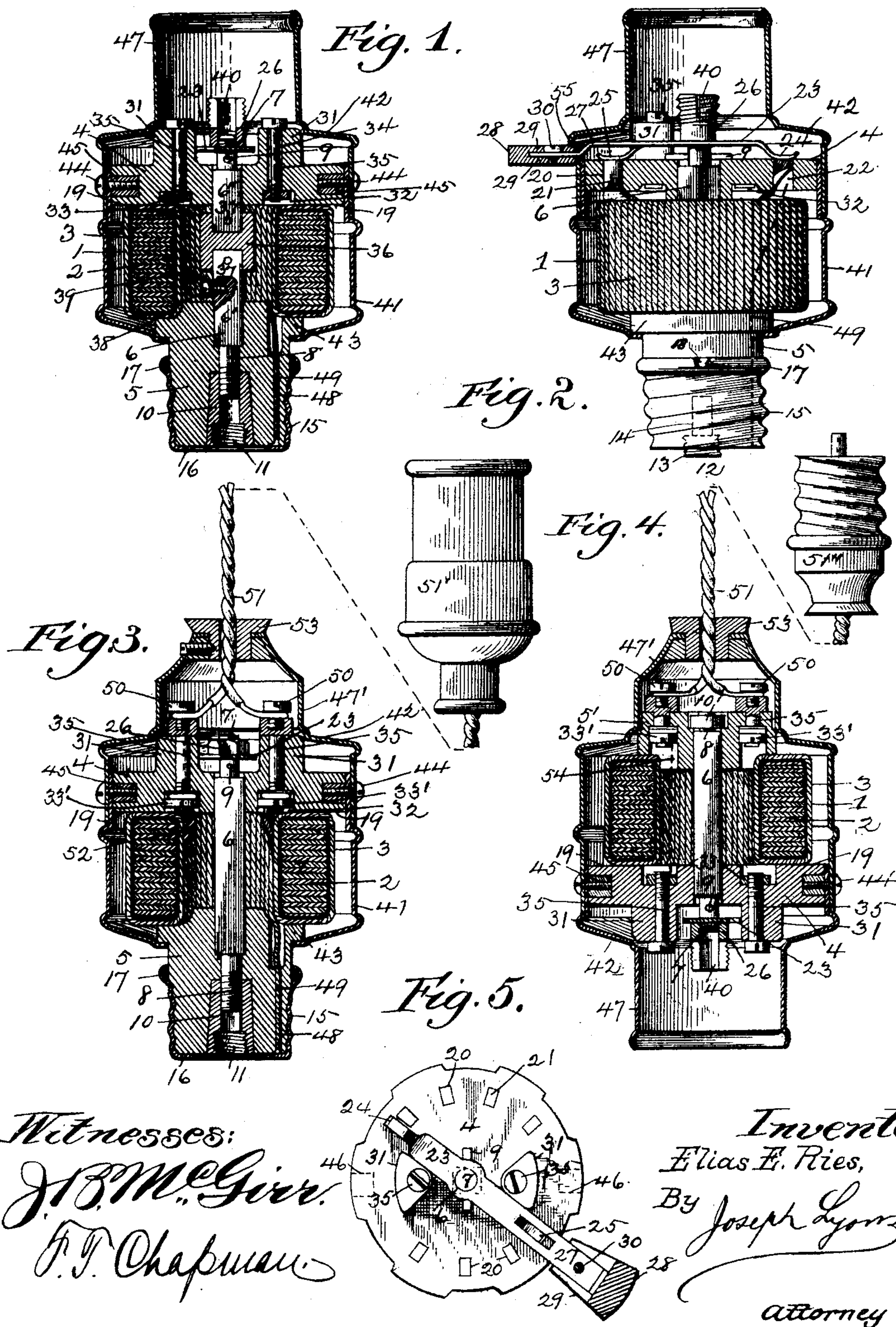
2 Sheets—Sheet 1.

E. E. RIES.

PORTABLE REGULATOR FOR ELECTRIC CURRENTS.

No. 515,971.

Patented Mar. 6, 1894.



(No Model.)

2 Sheets—Sheet 2.

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Fig. 10.

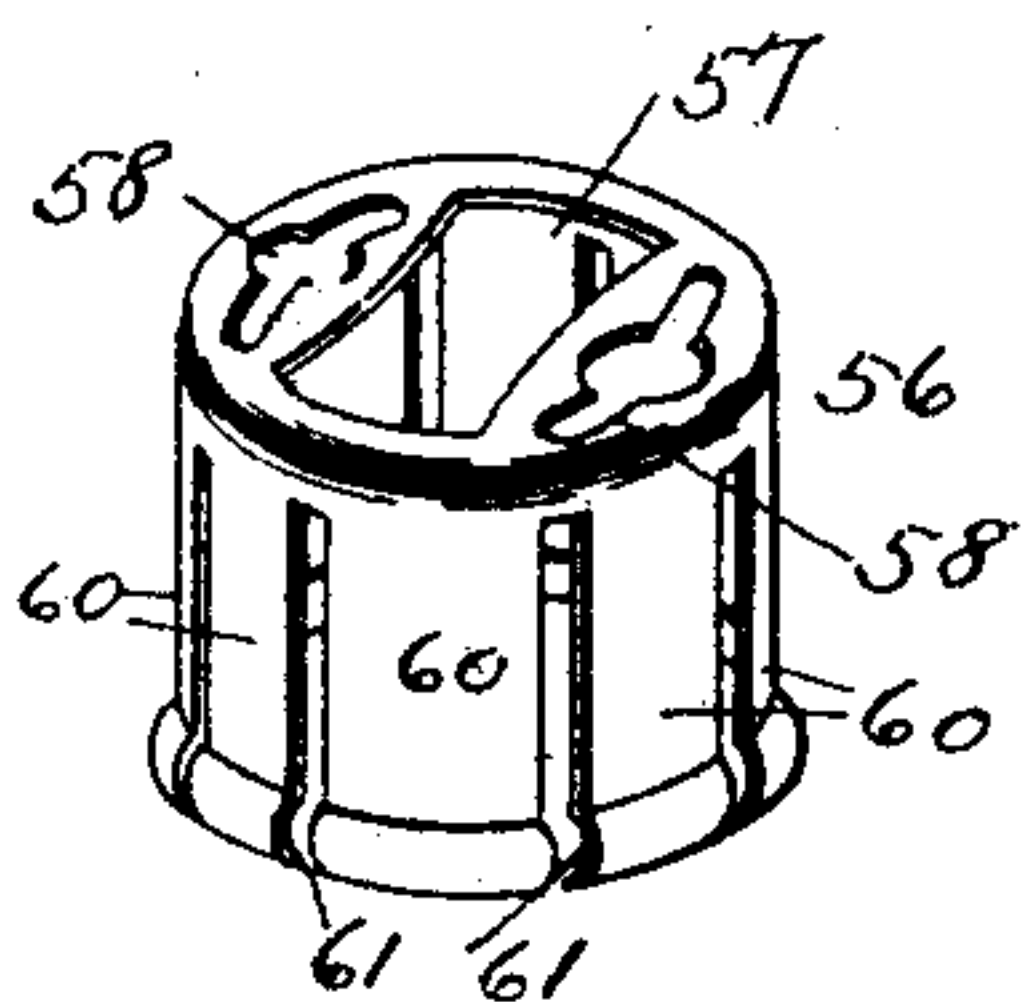


Fig. 12.

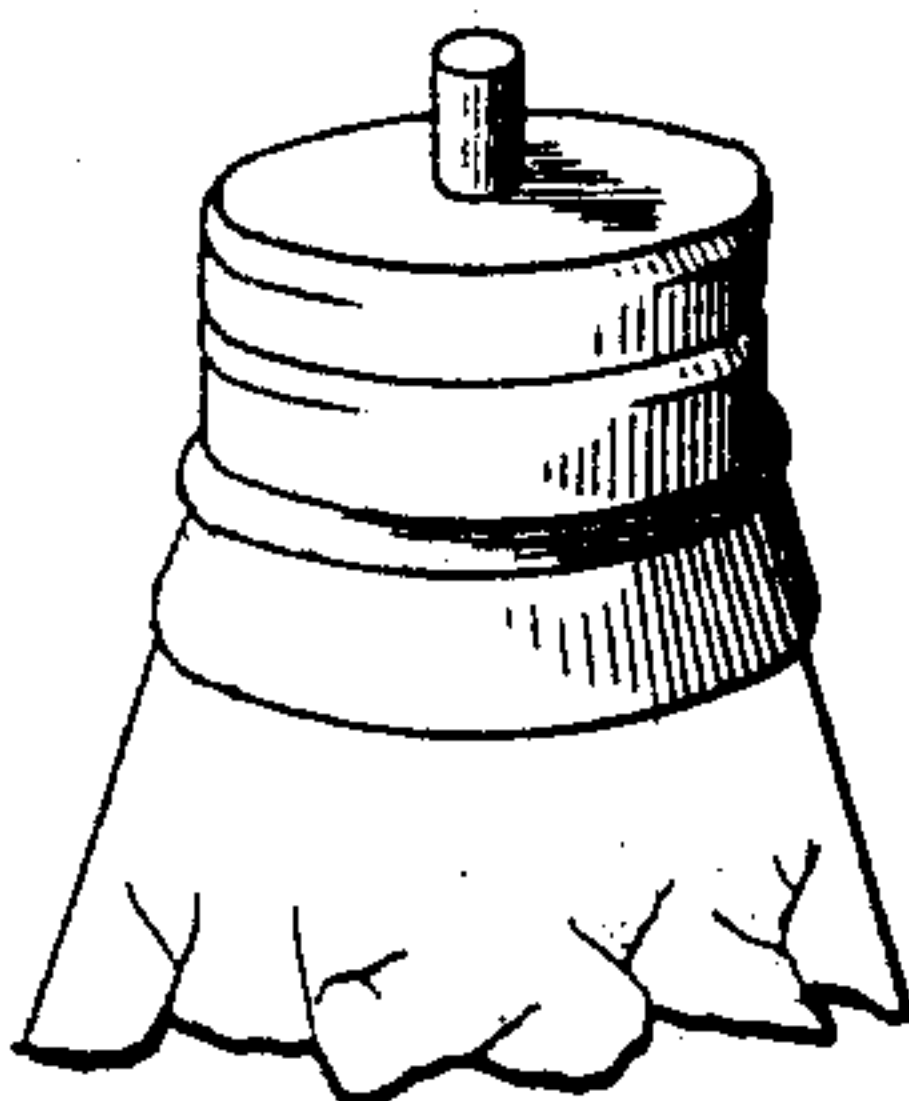


Fig. 8.

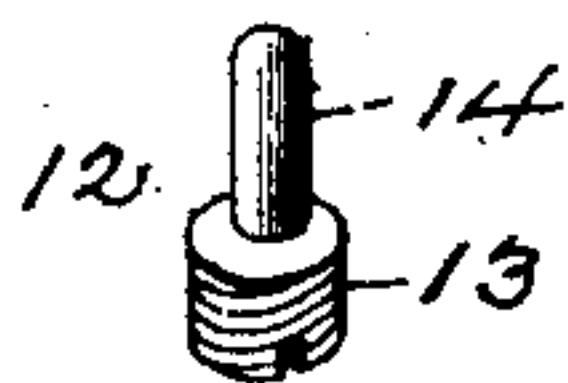


Fig. 7.

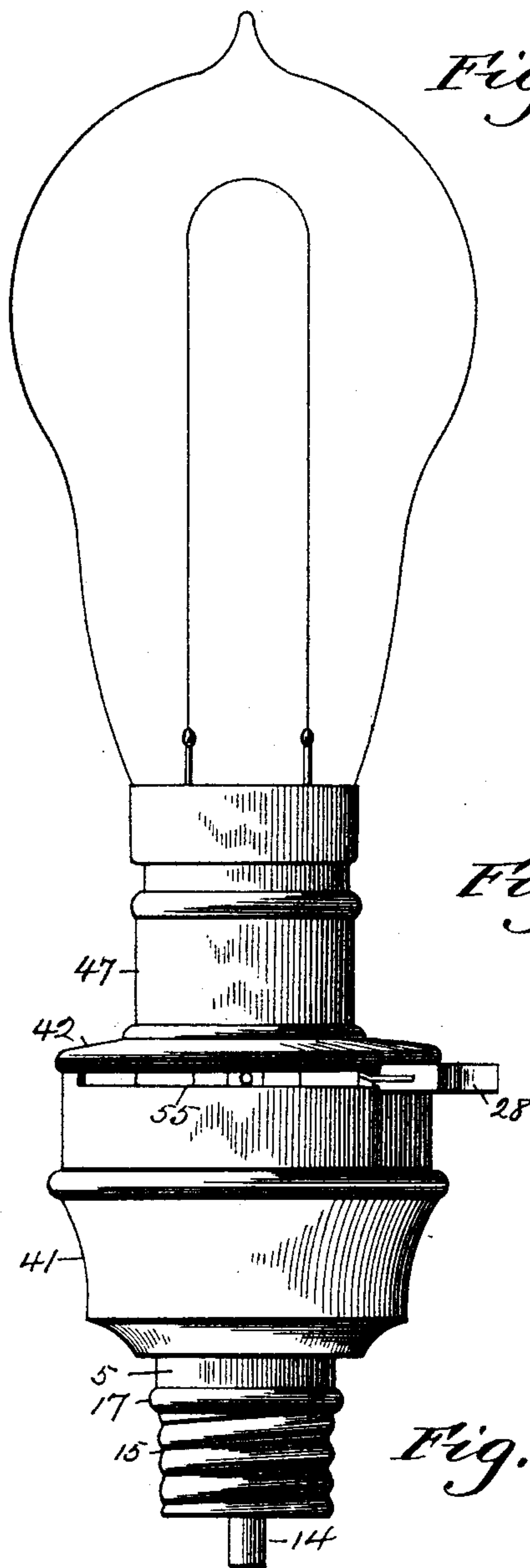


Fig. 13.

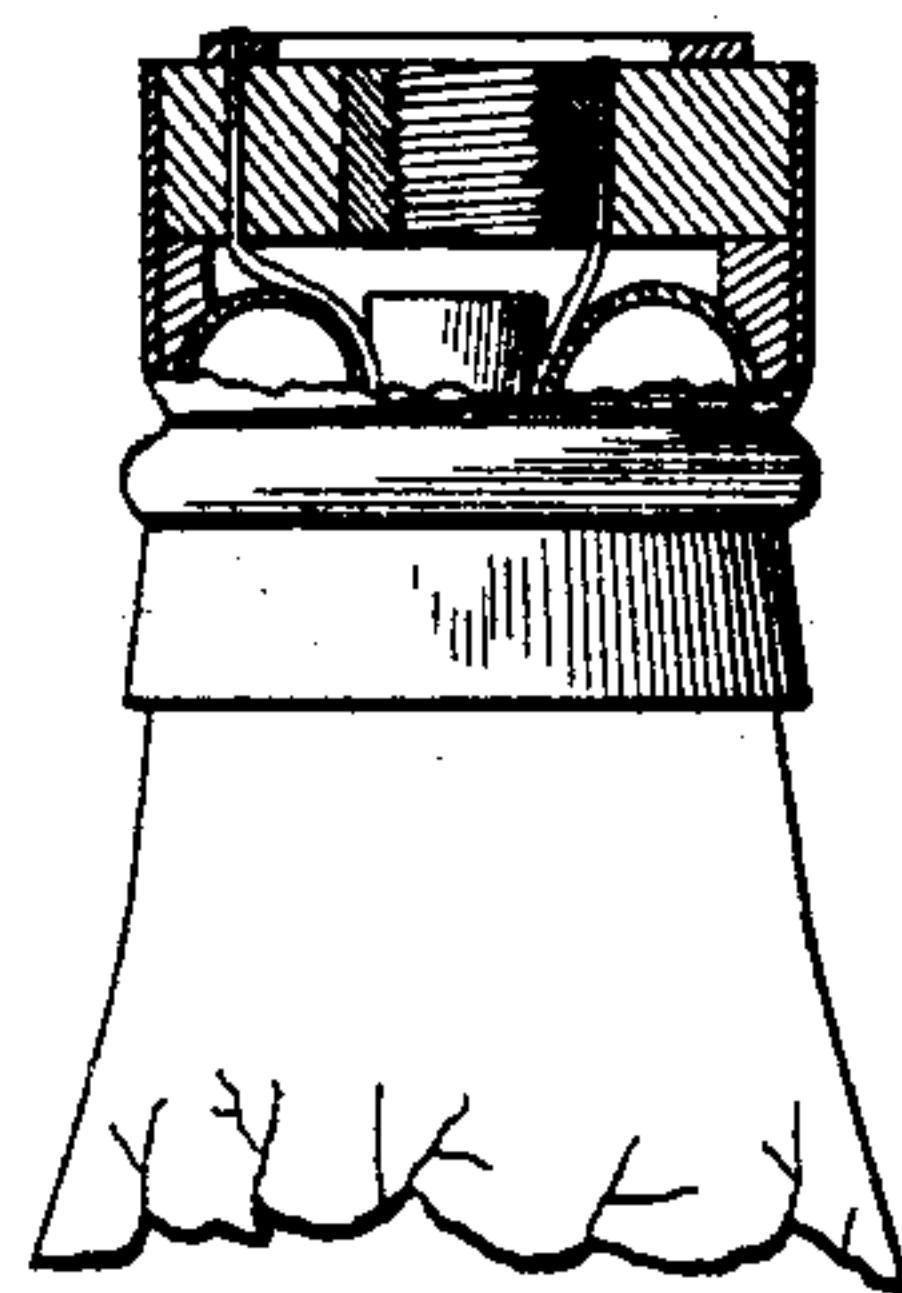


Fig. 9.

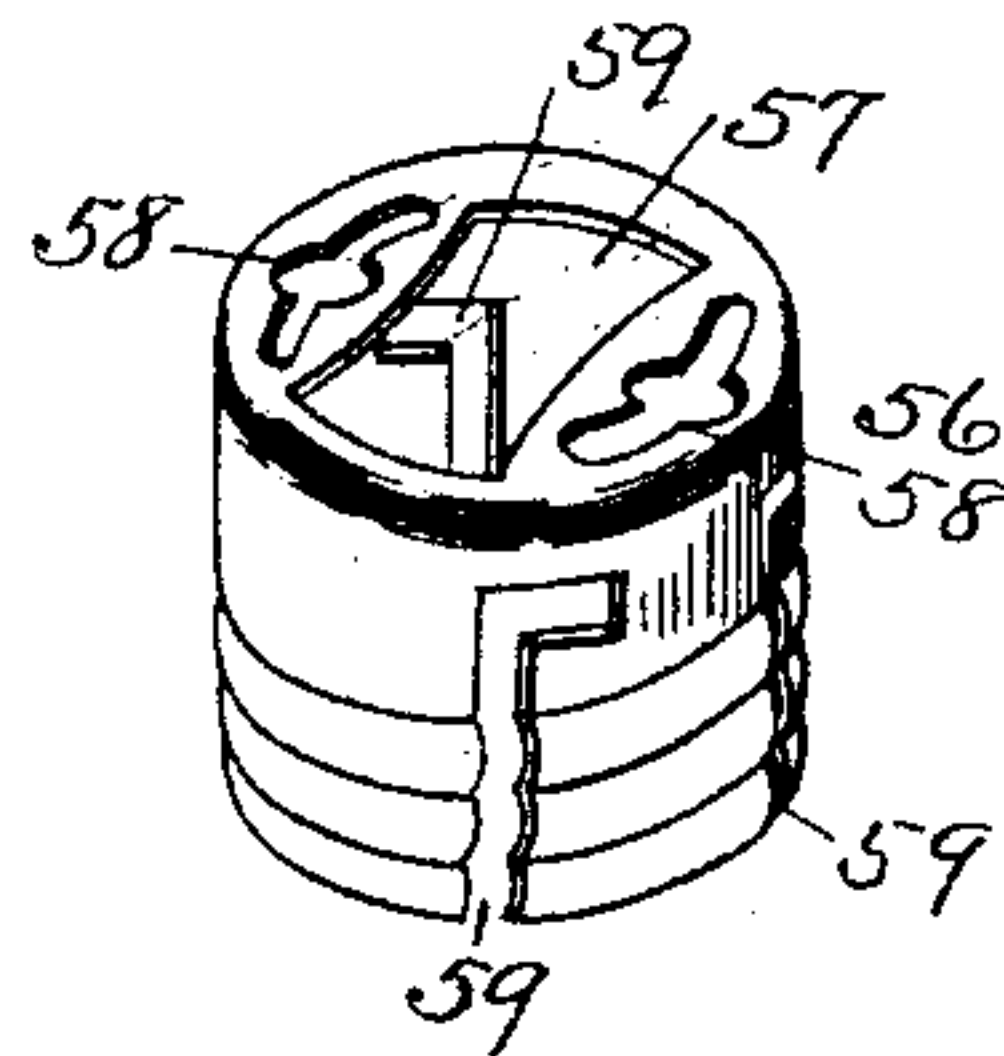


Fig. 11.

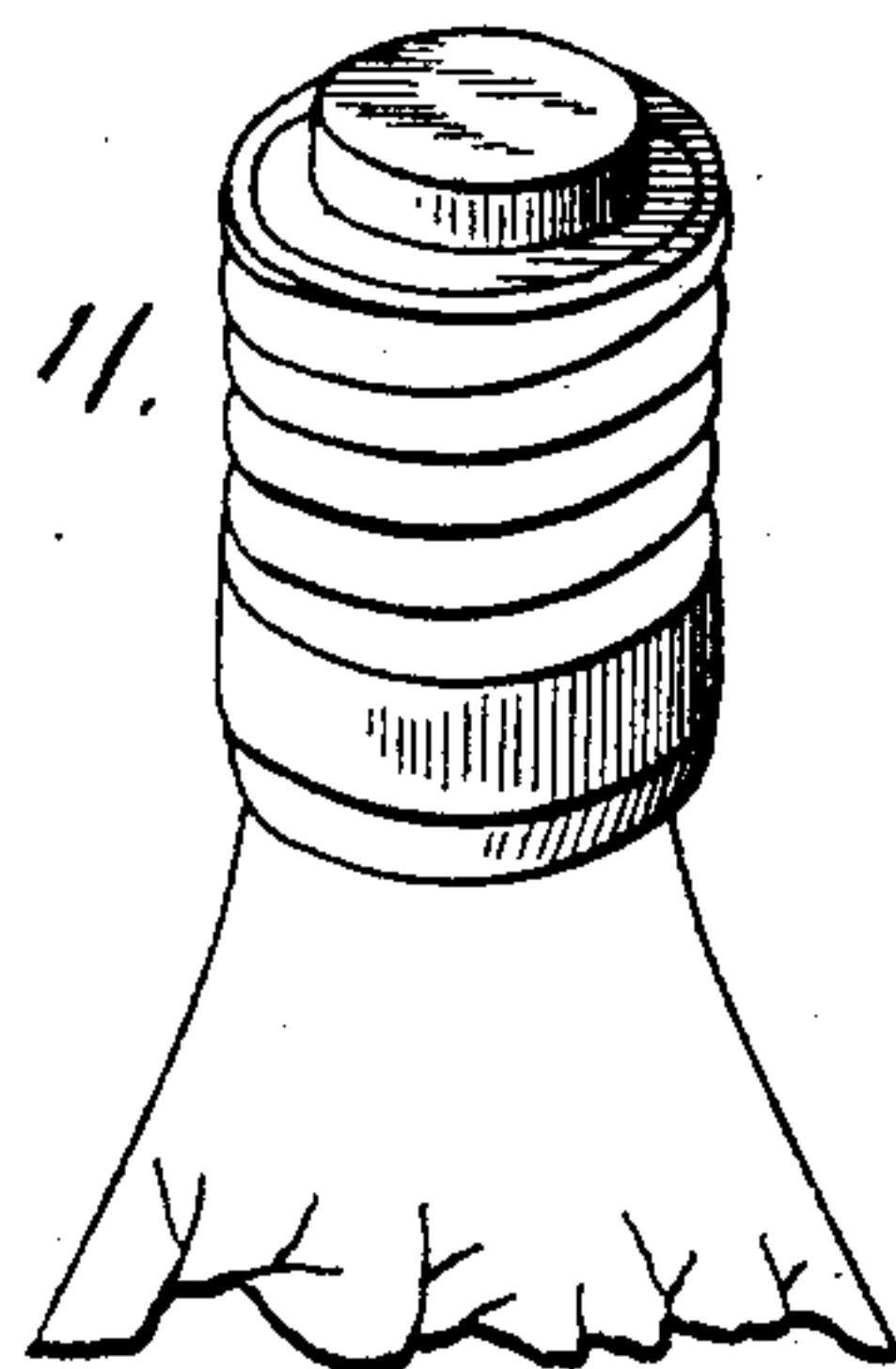
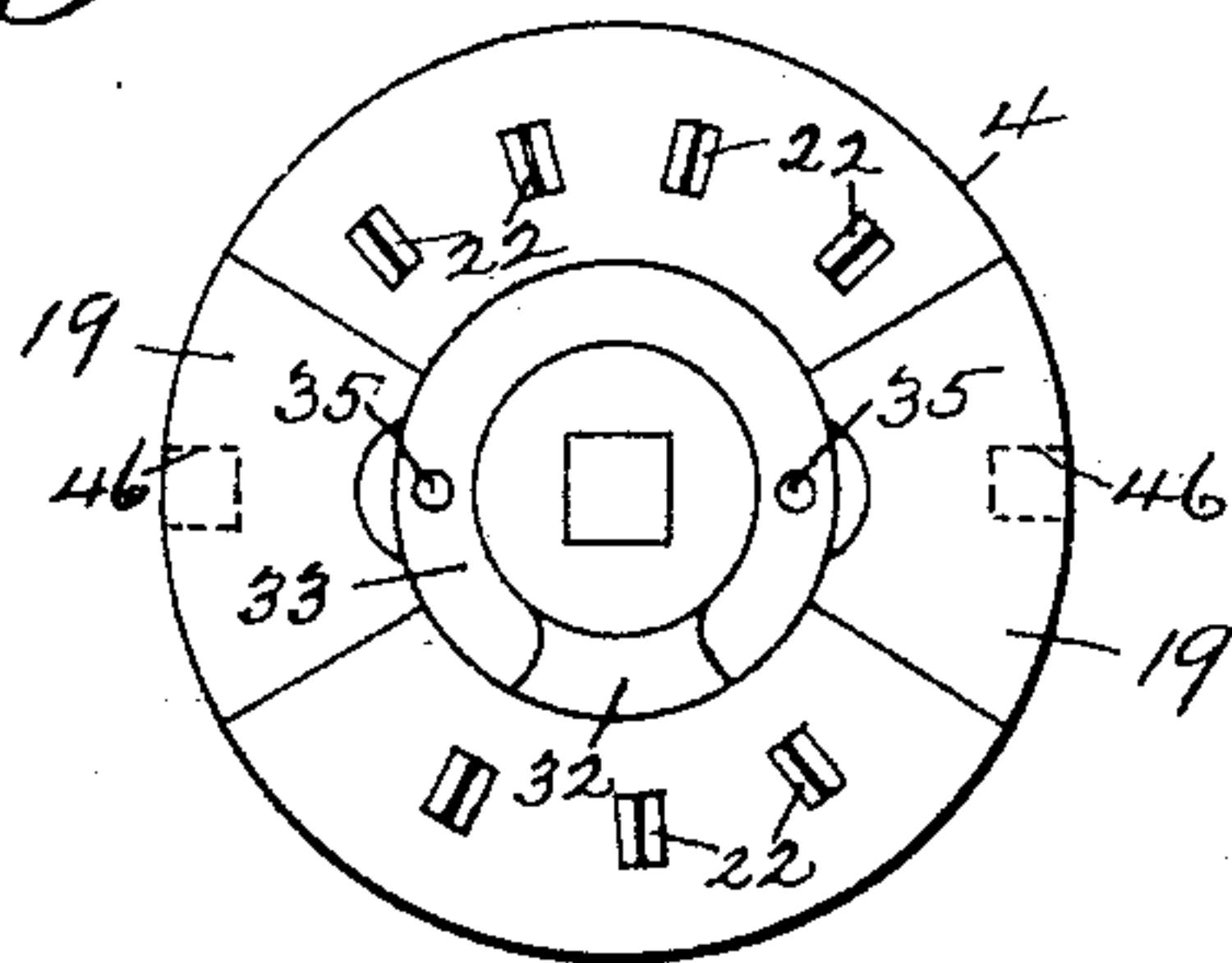


Fig. 6.



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UNITED STATES PATENT OFFICE.

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PORTABLE REGULATOR FOR ELECTRIC CURRENTS.

SPECIFICATION forming part of Letters Patent No. 515,971, dated March 6, 1894.

Application filed April 4, 1893. Serial No. 469,052. (No model.)

To all whom it may concern:

Be it known that I, ELIAS E. RIES, a citizen of the United States, and a resident of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Portable Regulators for Electric Currents, of which the following is a specification

My invention has reference to improvements in regulators for lamps and other translating devices fed by alternating currents, and it is in the nature of an improvement upon the regulating socket for which Letters Patent of the United States have been granted to myself and to W. S. Horry, on March 8, 1892, No. 470,402. In the said patent there is shown a regulating socket containing a reaction coil and a switch key, and by the operation of the latter, portions of the reaction coil can be cut into and out of circuit, whereby the current flowing to the lamp, or other translating device held in the socket, can be regulated at will. The socket shown in the patent is adapted to receive an incandescent lamp, the base of which is constructed to fit into and make electrical contact with properly disposed terminals of the socket. The socket, therefore, as shown in the patent, is, in the nature of things a fixture of a system of incandescent lighting, and is adapted for use only in connection with the particular shape of incandescent lamps or other translating devices for which the socket was constructed. It serves the purpose of enabling the user to burn the lamp with any degree of incandescence. Now, if persons, who have been accustomed to thus use lamps at various degrees of brilliancy, according to the immediate wants or desires, experience great inconvenience when, in travel, they arrive at a place where no regulating socket is provided as a fixture to the electric lighting system, since at such places they are obliged to use the light with full brilliancy or not at all.

My present invention is designed to supply this want, and it consists in a regulator which can be used in connection with any of the more prominent types of incandescent lamps, and which can be coupled with any of the more prominent non-regulating lamp sockets, and can again be detached therefrom with

ease and comfort. A person provided with my improvement can, therefore, use any incandescent lamp at any place with the same advantage which is afforded by the regulating socket shown in the aforesaid patent, since my regulator can be coupled with any of the lamp sockets which are used as fixtures in the various systems of electric illumination. In a modified form of my invention the same can be coupled with any lamp socket for the purpose of conveying current to any other translating device than lamps, such for instance as fan-motors, so that the flow of current to such translating device can be regulated.

From what has been said, it will be clear that my regulator is pre-eminently a portable current regulator, although some of the improvements which I have shown are also adapted for use in connection with a fixed regulating lamp socket. All this will more fully appear from the following detail description with reference to the accompanying drawings, in which—

Figure 1 is a vertical section of a lamp socket embodying my invention. Fig. 2 is a similar section taken on another plane and showing parts in elevation. Fig. 3, is a vertical section of a modified form of the invention. Fig. 4, is a vertical section of still another form of the invention. Fig. 5, is a plan view of the switch board used in the sockets. Fig. 6, is a plan view of the under face of the switch board shown in Fig. 5. Fig. 7, is a side elevation of a regulating socket constructed in accordance with my invention and with an incandescent electric lamp in place. Fig. 8, is a perspective view of a plug for adapting one terminal of the regulating device to various types of sockets. Figs. 9 and 10, are perspective views of structures by means of which the regulating device is adapted to receive various types of lamp bases, and Figs. 11, 12 and 13, are views of some of the well known incandescent electric lamp bases.

Like numerals of reference indicate like parts all throughout the drawings.

Referring to the drawings there is shown a reaction or choking coil 1, composed of a lami-

nated core 2, around which is wound a cable 3, consisting of a number of insulated conductors, the terminals of which are connected together so that the cable is in fact a single conductor formed of a number of sections connected end to end, and one or more of which may be included in the circuit as desired. All this is fully shown and described in the aforesaid Letters Patent No. 470,402.

The coil 1, is clamped between a disk 4, and a cylindrical block 5, both of insulating material, preferably porcelain, by means of a central bolt 6, square for the greater portion of its length and terminating at the ends in reduced cylindrical threaded portions 7, and 8, respectively. This bolt or bar 6, may be formed in one metal piece, as shown in Figs. 3 and 4, or it may be made of two metal pieces joined by an insulating coupling, as shown in Fig. 1, for reasons which will appear farther on.

The disk 4, has a central square hole for the passage therethrough of one end of the bar 6, and the end 7, of this bar projects above the upper face of the disk 4, where a pin 9, is passed through and projects beyond the sides of this end 7, so as to engage the upper face of the said disk 4. The block 5, has a central perforation, one end of which is square for the reception of the bar 6, and the other end is countersunk for a distance, for the reception of a nut 10, and between this countersunk portion and the square portion, the passage is round to receive the cylindrical end 8, of the bar 6, which end projects into the said countersunk portion and there receives the nut 10, by means of which latter pressure may be exerted on the coil in order to clamp it firmly between the disk 4, and block 5, as will be readily understood. The nut 10 is slightly beveled or conical as is also the countersink into which it is seated, so that the said nut will fit tightly in place when applied to the end 8, of the bar 6. The wider end of this nut is countersunk and threaded as shown at 11, for the reception of a plug 12, the latter having a threaded head 13, fitting the countersunk portion of the nut and slotted, as shown, for the application of a screw driver, and also having a smooth shank 14, of such size as to fit loosely into the central bore of the nut. This plug 12, may be applied to the nut with the shank 14, housed in the bore of the nut, in which case the head will protrude a short distance beyond the lower face of the block 5, or the plug 12, may be inserted in such manner that its shank 14, will project outwardly. The lower end of the block 5, has an exterior thread formed thereon and screwed onto this threaded portion there is a threaded metallic sleeve 15, having a narrow inwardly projecting flange 16, which engages the lower face of the block 5, but which does not reach to the nut 10. The upper end of this sleeve is formed with an annular bead 17, and at various points in this bead the metal of the sleeve may be indented as shown at 18, the

said indented portions entering corresponding pits formed in the block 5, and thereby preventing the sleeve from unscrewing from the block. It will now be seen that if the sleeve 15, forms one terminal of an electric circuit and a nut 10, forms the other terminal, the block 5, will constitute a plug adapted to numerous forms of sockets for the bases of incandescent electric lamps, whether the said sockets be constructed for bases having an exterior screw-thread and a central flat boss as in the Edison type, or having a simple rib on the exterior to be grasped by spring fingers, and a central terminal formed either as a nut or a stem, as in the Thomson-Houston, Sawyer-Man, and other types. The disk 4, is of greater diameter than the coil 1, and has on its underface flat bosses 19, on diametrically opposite sides, and these bosses bear on the upper edge of the coil, thus elevating the other portions of the disk above the coil. In each of these elevated or thinner portions, which are diametrically opposite each other, is a series of rectangular perforations 20, arranged upon the arc of a circle, in such manner that each perforation of one series matches a space between two perforations of the other series. The perforations 20, receive metallic contact blocks 21, each of which is split longitudinally, for a portion of its length, into two legs 22. Before the contact blocks are inserted in the perforations 20, the bared ends of the conductors constituting the cable 3, are threaded through these perforations, the adjacent ends of two conductors being passed through the same perforation. The conductor terminals are then inserted between the legs 22, of the blocks 21, slightly spreading them, and the said blocks are then forced into the perforations in such manner as to tightly clamp the conductor terminals between the legs 22, and at the same time cut off any projecting ends by a shearing action between the block and the edge of the perforation 20. It will be observed that the space between the top of the coil 1, and the thinner portions of the disk 4, gives ample room for the proper disposition of the conductor terminals coming from the coil. The extension 7, of the bar 6, forms a pivotal support for a switch arm 23, formed of sheet metal and having two contact fingers 24, 25, integral with it and so bent as to rest on the face of the disk 4, and thereby support the switch arm a short distance above the same. The switch arm has a perforation midway between the two fingers, for the passage of the end 7, of the bar 6. A nut 26, is applied to the extension 7, and is screwed down against the switch arm until the fingers 24, 25, bear with friction on the face of the disk, or on the contact blocks, which latter it will be seen, are in the path of these fingers as the switch arm is moved around its pivot. One end 27, of the switch arm is extended beyond the block 4, and is there provided with a handle 28, split horizontally to form two legs 29, re-

ceiving between them the end 27, of the switch arm to which latter the handle is secured by a screw 30, as shown in Fig. 2.

At diametrically opposite points, on the upper face of the disk 4, are two segmental stops 31, in the path of the switch arm. These stops are so located that the switch arm may be swung on its pivot and make contact with all the blocks of both series and then carry the fingers 24, 25, both out of contact with the contact blocks at one end of its line of travel. The terminals of the coil 1, are connected alternately to the blocks of the two series, that is, one end of the coil is connected to one of the end contact blocks of one series, the coupled ends of the first and second conductor sections are connected to the diametrically opposite end contact block of the other series, the coupled ends of the second and third conductor sections are connected to the second contact block of the first series, and so on. The two series of contact blocks are so arranged that as the switch arm is moved over them one finger will make contact with a block of one series an instant before the other finger breaks contact with a block of the other series, thus the coil 1, or any part thereof, may be cut into or out of circuit gradually without at any time breaking the circuit, except when the latter is purposely broken after the coil sections have all been included.

By arranging the contact blocks in two opposing series, and having the switch arm make alternate contact therewith, I avoid crowding the contact blocks and conductor terminals in a small space, as would be the case were only one series used in connection with a switch arm having the same limited sweep. The disposition of the contact blocks is also of advantage when the disk 4, is made of brittle material, such as porcelain, since the spaces between the contact blocks are broad and strong and not thin and frail as they would be if the contact blocks were all crowded into the same series and the sweep of the switch arm were restricted to the arc shown.

Both the disk 4, and the block 5, may be made of wood, vulcanized fiber, or other similar material, but by preference they are made of porcelain, because this material may be readily molded into the desired shape, and is a refractory insulator of high order.

In the under side of the disk 4, there is an annular groove 32, in which is seated a curved metallic strip or ring 33. Perforations 34, extend through the stops 31, and disk 4, and open into the groove 32, and passing through these perforations are screws 35, having flat heads and (as shown in Fig. 1) entering nuts formed in the strip or ring 33.

In the construction shown in Fig. 1, the bar 6, is composed of two parts 6', and 6'', joined by a coupling 36, into which the adjacent ends of the sections 6' and 6'' are seated, and are there secured by pins 37. This coupling 36, is of insulating material, preferably

porcelain, and consequently the two sections 6', and 6'', are insulated one from the other. The section 6' of the bar is screwed into the nut 10, which together with the plug 12, forms a circuit terminal, as before explained, and tapped into this section 6', of the bar 6, there is a binding screw 38, securing one end of a short conductor 39, to the said bar, the other end of said conductor being secured to the strip or ring 33, before referred to. The nut 26, has a tubular extension 40, split longitudinally and threaded on its exterior, being thus adapted to receive various types of incandescent electric lamp bases, and the screws 35, may be utilized directly as one terminal of an electric circuit and making contact with one terminal of an incandescent electric lamp, or these screws may be used to hold various structures such as shown in Figs. 9 and 10; these structures adapt the socket for use with various types of lamps, and they will hereinafter be referred to as "adapters."

The switch and coil are protected by a shell composed of a body portion 41, and a cap 42. As shown in Figs. 1 and 2, the body portion has one end reduced in diameter, forming a flange which fits under an annular rib 43, on the block 5 near its upper end and also serving as a support for the coil 1. The other end of the body portion of the shell is secured to the periphery of the disk 4, by means of screws 44, entering nuts formed in blocks 45, seated in sockets 46, formed, at diametrically opposite points, in the periphery of the disk 4. This mode of securing the shell to the disk 4, is the one adopted when the disk is formed of porcelain or other similar material. The cap piece 42, may be slipped over the upper end of the body portion 41, of the shell, and may be provided with slots in the shape of bayonet joints, engaging the screws 44, in a well known manner, to lock the cap in place, or the screws 44 may pass through simple perforations in this cap-piece, this latter being the construction illustrated in the drawings. The upper end of the cap-piece is formed into a neck 47, adapted to receive a lamp base, or either of the adapters referred to. The block 5, has a longitudinal perforation 48, for the passage of a conductor, connected at one end to one of the end-blocks of one of the series in the disk 4, and at the other end to the shell 15, this conductor being shown diagrammatically by the dotted line 49, in Fig. 2.

The structure thus far described constitutes a portable regulating socket that may be readily adapted to various styles of lamps and lamp sockets, or other translating devices. When the block 5, is inserted in an ordinary lamp socket, and a lamp or a connector from which conductors lead to a translating device, is inserted in the neck 47, the circuit through the device shown in Figs. 1 and 2, is as follows, assuming that the switch arm is upon some intermediate contact block: Current entering through the plug 12, and nut 10, will pass to the bar section 6', thence by conductor

39, to the ring 33, and screws 35, thence through the lamp or other translating device, returning by the nut 26, to the switch arm, thence to one of the contact blocks 21, through the portion of the coil thereby included in the circuit, thence by the conductor 49, and out through the shell 15. If the switch arm be moved so as to make contact with the contact block to which the conductor 49 is connected, the coil will be cut out of circuit, and consequently the full current will flow. As the switch arm is moved in the other direction the conductor sections of the cable 3, will be successively cut into the circuit and thereby gradually obstruct the flow of current, until, when the switch arm is on the last block and the entire coil is in circuit, the least amount of circuit will flow to the translating device, while a further movement of the switch arm will then break the circuit, with little or no spark.

In Fig. 3, the invention is shown in a form adapted for insertion in a lamp socket, but instead of being provided with means for receiving a lamp base, it has a conducting cord secured to it terminating in a socket, so that the translating device may be situated at any convenient point. In this form of the invention the bar 6, is a single piece of metal through which current will pass from the nut 10, directly to the switch arm 23, and the nut 26, is of ordinary form, the tubular extension 40, being omitted. The heads of the screws 35, have short screws 50, tapped into them and constitute binding posts receiving the terminals of a flexible cable-conductor 51, leading to a socket 51'. In this construction the ring 33, is omitted and in its place nuts 33', are applied to the lower end of the screws 35, there is secured, by means of the nut 33', a conductor 52, coming from the terminal block of one of the series to which one of the terminals of the coil is connected, so that when the switch arm is on this block the coil will be entirely cut out of the circuit. To the other screw 35, the conductor 49, coming from the shell 15, is connected. The circuit through this device will, therefore, be from the shell 15, by the conductor 49, to one of the screws 35, thence by the conductor 51, to the translating device, thence returning to the other screw 35, to the end contact block of the series and by the switch arm, either directly or through one or more of the conductor sections of the coil, and out through the bar 6, and nut 10. In this construction the section 42, of the shell is formed into a neck 47', contracted at the upper end and receiving an insulating plug 53, having a central passage for the cable conductor 51.

The construction shown in Fig. 4, is that of a pendent regulating socket differing from the construction shown in Figs. 1 and 2, in that the block 5, is omitted and in its place is substituted a thick disk 5', carrying two screws 35, with binding screws 50, similar

to those shown in Fig. 3, except that the said screws 35, are shorter. To one of these screws 35, the ring 33, is directly connected by a conductor 54, (shown in dotted lines,) while the other screw 35, is connected by a conductor (not shown) leading to the end contact block of the switch board. The bar 6, is formed in one piece as in Fig. 3, and has applied to it, at the end projecting through the block or disk 5', a nut 10', for holding it in place. In this construction the cap or section 42, of the shell is formed as in Fig. 1, while the other or main part or section 41, of the shell is formed with a neck 47', contracted at its end and receiving a plug 53, of insulating material with a central passage for the flexible cable conductor 51, exactly as in Fig. 3, except that in the latter case this construction of the shell applies to the section 42, instead of the section 41, and the conductor 51, leads to a plug 51'', instead of a socket. In the several constructions shown in the figures, the switch arm projects through a narrow slot 55, formed in the shell and the ends of the legs 29, are reduced in thickness so as to enter this slot and thus prevent accidental contact between the switch arm and the shell.

In Figs. 9 and 10, the adapters before mentioned, are shown. These adapters each consist of a metal cup 56, the bottom of which is cut away, as shown at 57, for the passage of the tubular extension 40, of the nut 26. On each side of the opening 57, there are curved slots 58, enlarged at the middle for the passage of the heads of the screws 35, so that when the adapter is placed within the neck 47, with the heads of the screws 35, extending through the enlarged portions of the slots 58, it is only necessary to turn the adapter in order to cause the screw heads to engage over the metal at the sides of the slots 58, and thereby lock the said adapter in place; the adapter thus becomes one terminal of the socket circuit.

The adapter shown in Fig. 9, is arranged with spring arms to engage lamps of the Sawyer-Man or Westinghouse pattern and is formed with screw-threads so as to receive a lamp base of the Edison type shown in Fig. 11, and it also has a number of slots 59, terminating in short angular extensions forming bayonet catches, for receiving lamp bases of the Swan type.

The adapter shown in Fig. 10, is provided with spring fingers 60, each having a groove 61, at its outer end. All the grooves 61 are curved on the same radius so as to grasp the annular rib formed on the lamp base of the Sawyer-Man type shown in Fig. 12.

The neck 47 of the inclosing shell of the regulating socket is of such size that it will receive and retain a lamp base of the Thomson-Houston type shown in Fig. 13.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. A portable current regulator, comprising

means for graduating the flow of current, a plug adapted to incandescent lamp sockets, and a socket adapted to receive incandescent lamp-bases or plugs, substantially as described.

2. A portable alternating current regulator, comprising an adjustable counter-electro-motive-force generator, a plug adapted to incandescent lamp sockets, and a socket adapted to receive incandescent-lamp-bases or plugs, substantially as described.

3. A portable current regulator, comprising means for graduating the flow of current, a plug adjustable to fit several types of incandescent lamp sockets, in combination with exchangeable lamp holders or adapters for several types of incandescent-lamp-bases or plugs, substantially as described.

4. A portable alternating current regulator, comprising an adjustable counter-electro-motive-force generator, a plug adjustable to fit several types of incandescent lamp sockets, in combination with exchangeable lamp holders or adapters for several types of incandescent lamp-bases or plugs, substantially as described.

5. In a portable alternating current regulator, the combination with a reaction or choking coil, of a switch-board for the coil, a socket adapted to receive incandescent-lamp-bases or plugs, and a plug adapted to incandescent lamp sockets, substantially as described.

6. A portable current regulator comprising means for graduating the flow of current, a plug adapted to incandescent electric lamp sockets, and connections for coupling the current graduating devices to a translating device, substantially as described.

7. A portable current regulator comprising means for graduating the flow of current, a plug adjustable to fit several types of incandescent lamp sockets, and connections for coupling the current graduating devices to a translating device, substantially as described.

8. A portable alternating current regulator comprising an adjustable counter-electro-motive-force generator, a plug adapted to incandescent lamp sockets and connections for coupling the current regulating devices to a translating device, substantially as described.

9. A portable alternating current regulator, comprising an adjustable counter-electro-motive-force generator, a plug adjustable to fit several types of incandescent lamp sockets, and connections for coupling the current regulating devices to a translating device, substantially as described.

10. A portable current regulator comprising means for graduating the flow of current, and

exchangeable lamp holders or adapters for several types of incandescent-lamp-bases or plugs, substantially as described.

11. A portable alternating current regulator, comprising an adjustable counter-electro-motive-force generator, and exchangeable lamp holders or adapters for several types of incandescent-lamp-bases or plugs, substantially as described.

12. In a portable current regulator, the combination of the regulating devices, with a plug provided with two terminals connecting with the regulating devices and adapted to make contact with incandescent electric lamp sockets, one of said terminals consisting of a screw-threaded sleeve, and the other of a central metallic socket provided with a reversible and removable screw pin, whereby the plug is adapted to several types of incandescent lamp sockets, substantially as described.

13. In a portable current regulator, the combination with the regulating devices, of two terminals of the same, for contact with incandescent lamps, one of which contacts consists of a central split tube screw-threaded externally, and the other being constituted by screws and exchangeable concentric sleeves held by the screws, whereby the terminals are adapted to hold and convey current to several types of incandescent electric lamps, substantially as described.

14. A conducting plug, adapted to several types of incandescent electric lamp sockets, consisting of an insulating block carrying two terminals, one terminal consisting of a threaded metallic sleeve applied to the block and provided with an annular head at one end, and the other terminal consisting of a nut seated in the insulating block and a reversible and removable adapter composed of a pin provided with a screw-threaded head fitting the nut, substantially as described.

15. A socket for incandescent electric lamps, adapted to several types of lamp-bases, or plugs, provided with two terminals for contact with the lamp-bases, one contact consisting of a central split tube, screw-threaded externally, and the other contact being constituted by screws and exchangeable concentric sleeves held by the screws, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELIAS E. RIES.

Witnesses:

STEPHEN S. CLARK,
GEO. J. GREENSFELDER.