

(No Model.)

2 Sheets—Sheet 1.

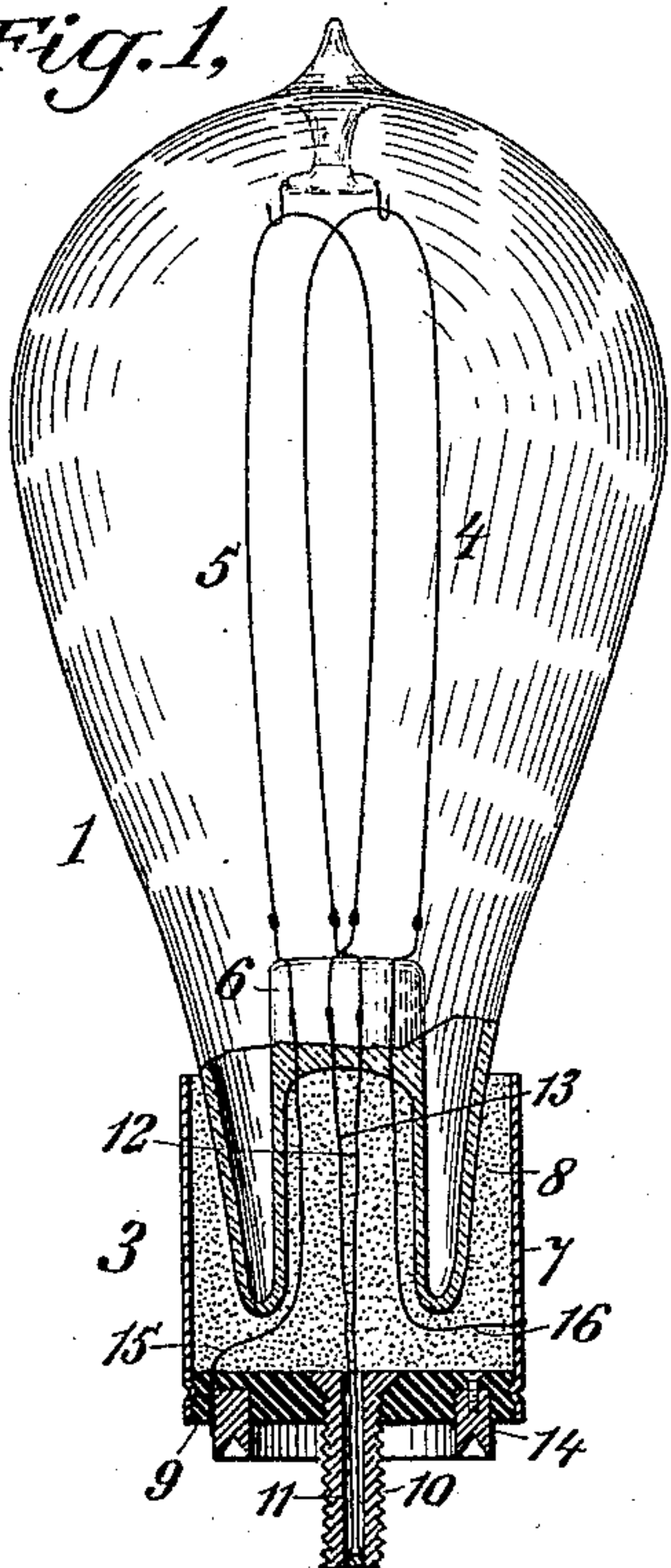
C. A. HUSSEY.

COMBINED REGULATING INCANDESCENT LAMP AND SOCKET.

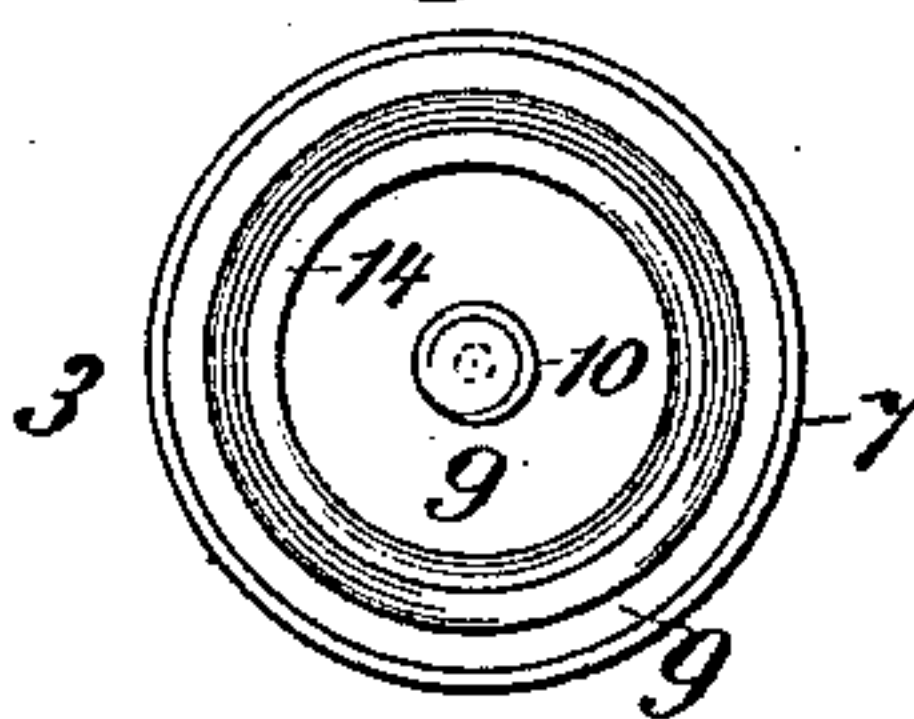
No. 527,989.

Patented Oct. 23, 1894.

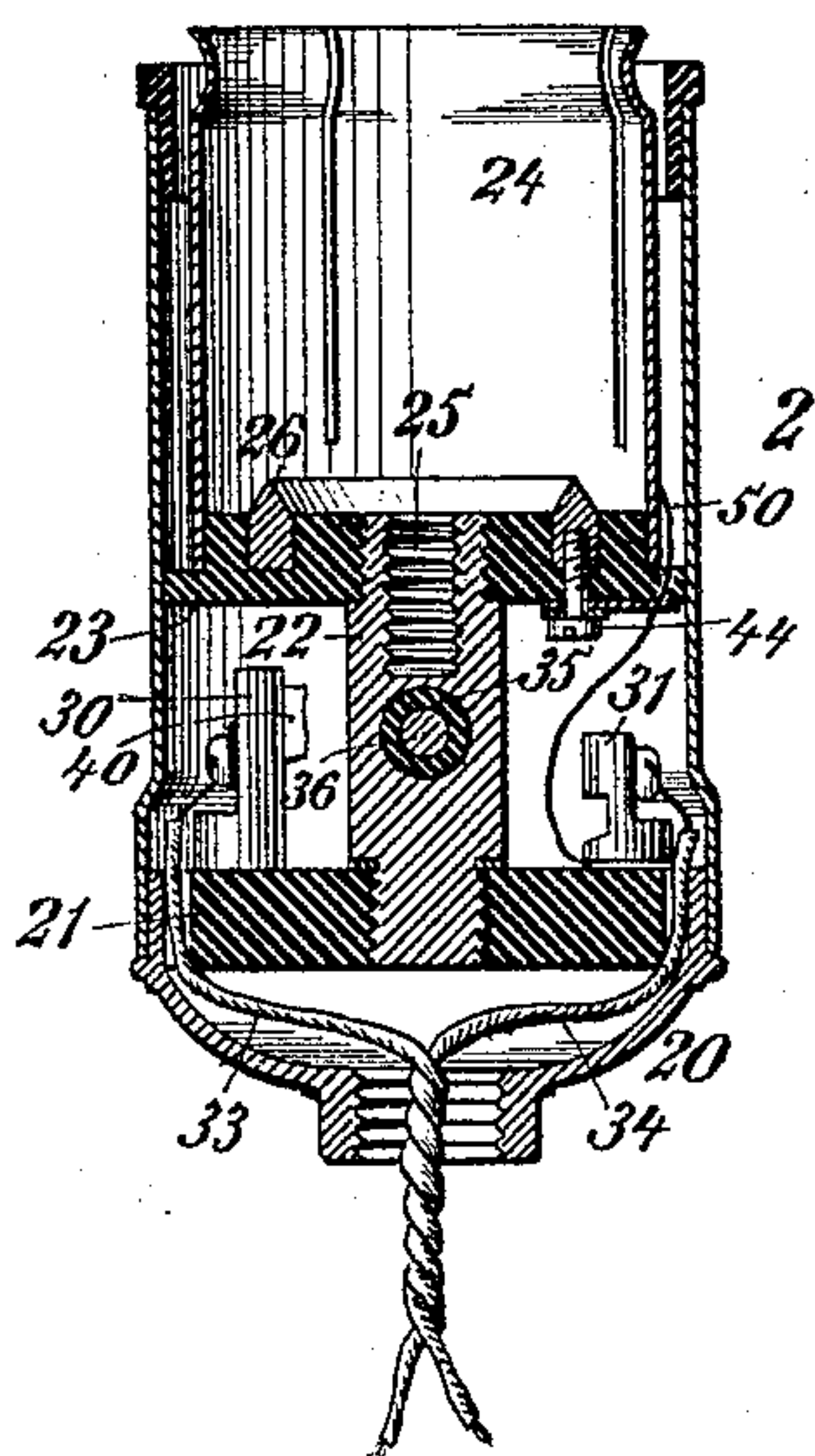
*Fig. 1,*



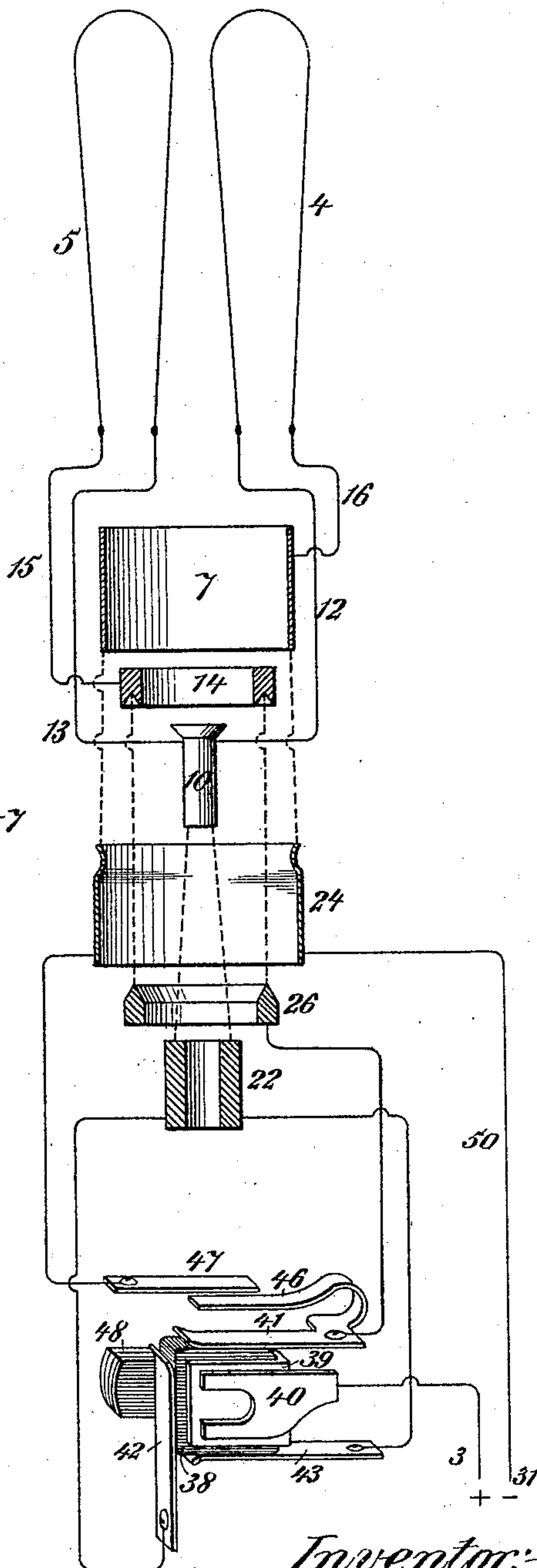
*Fig. 2,*



*Fig. 3,*



*Fig. 4,*



*Witnesses:-*

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5,

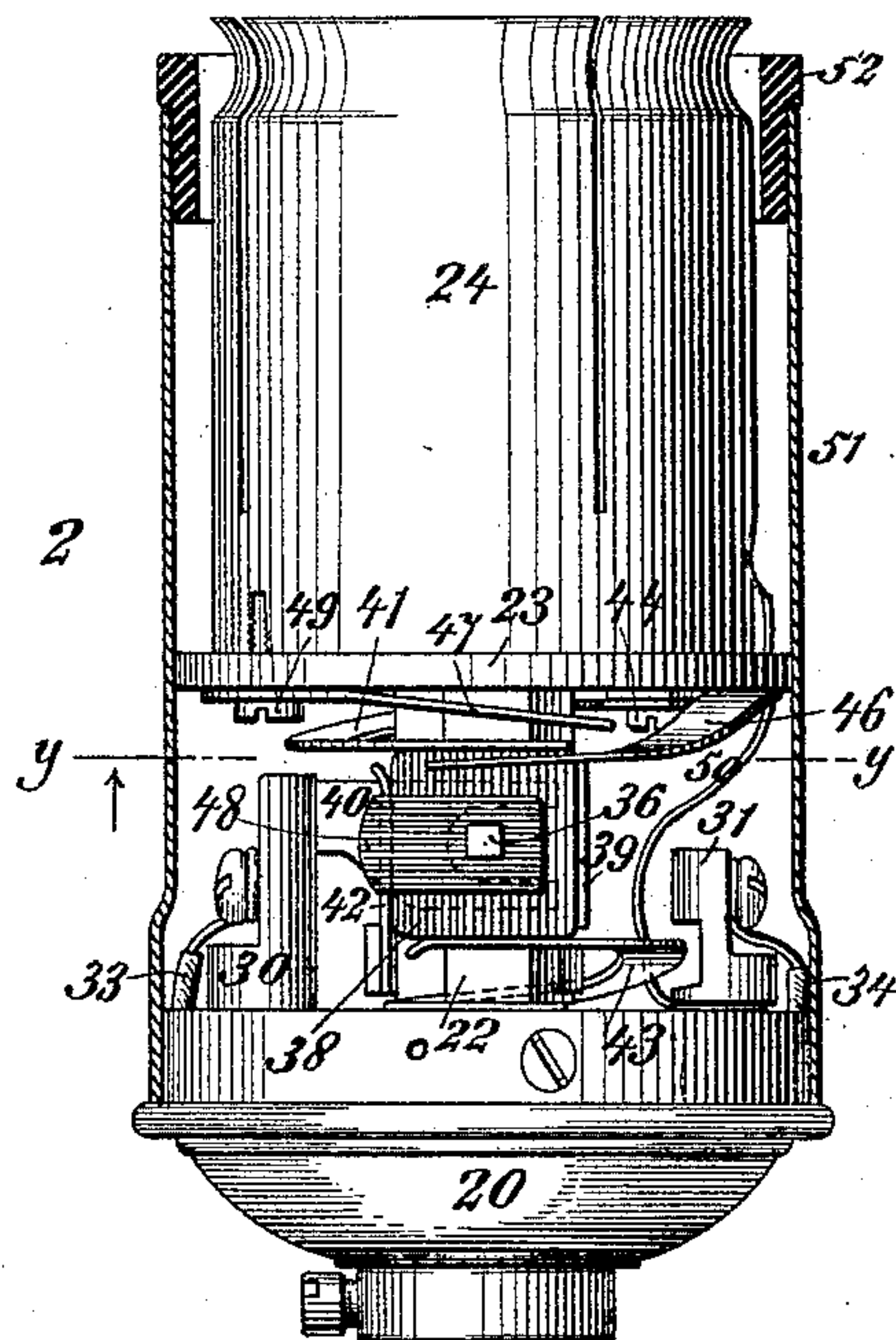


Fig. 6,

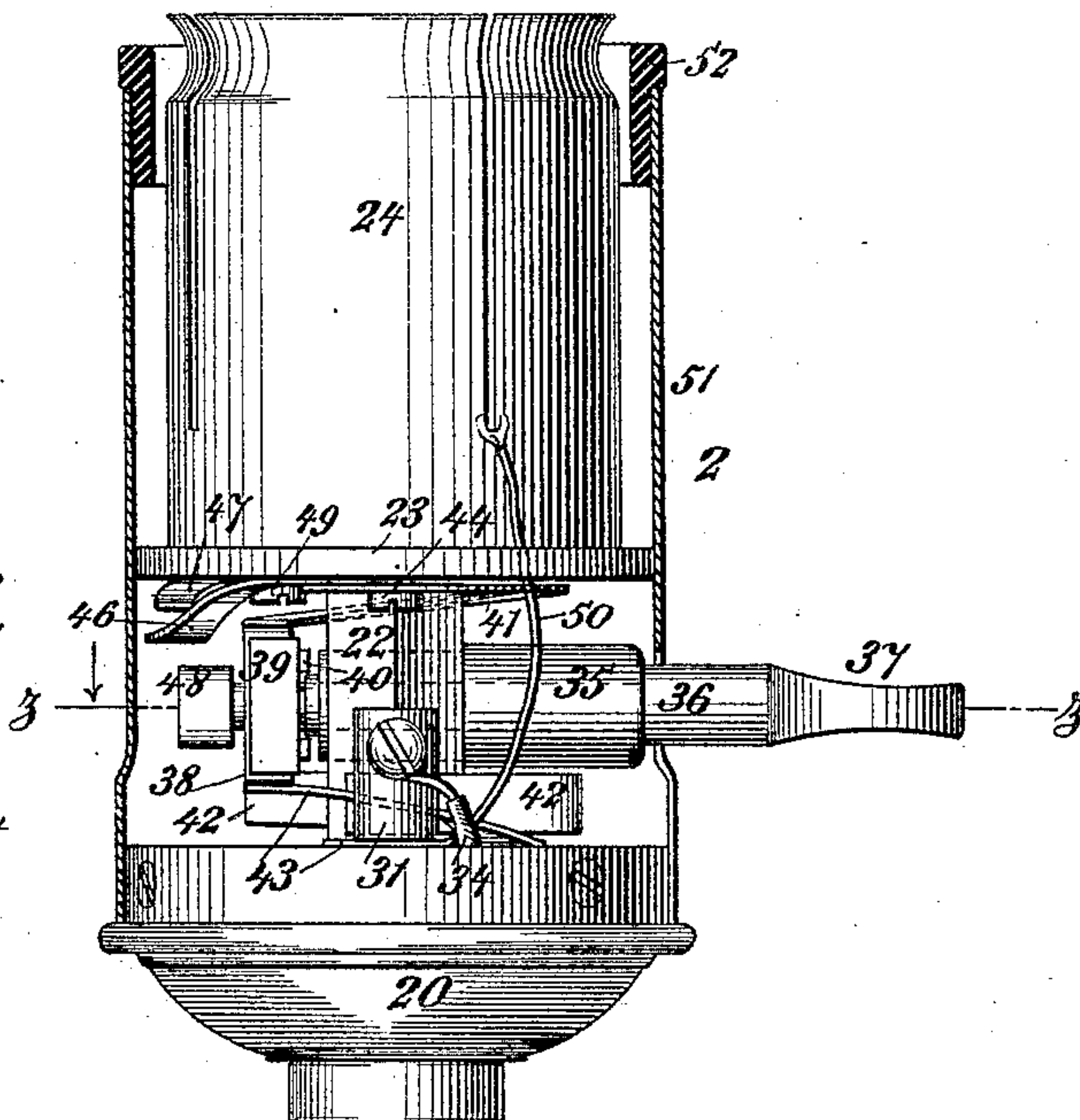


Fig. 7,

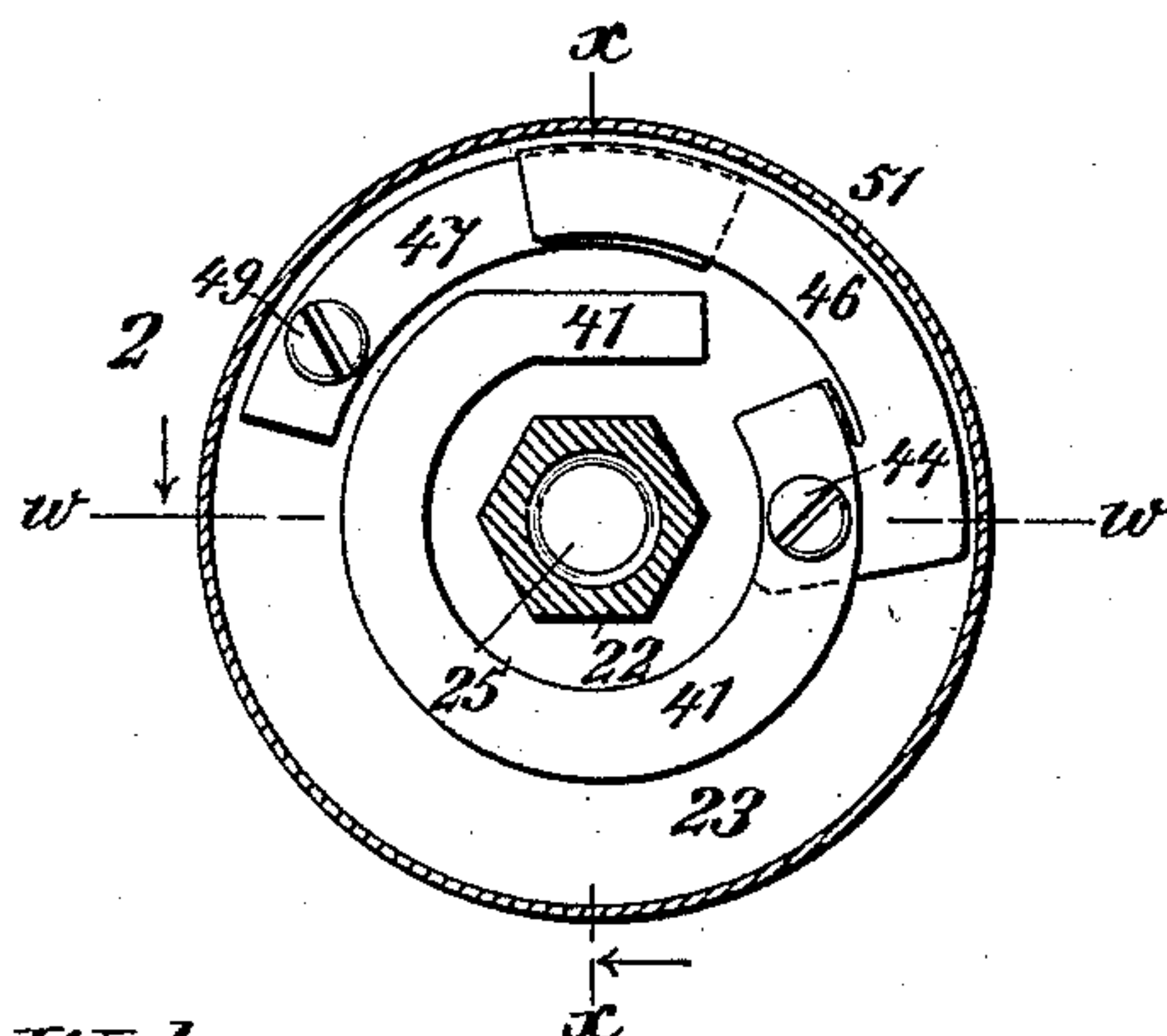
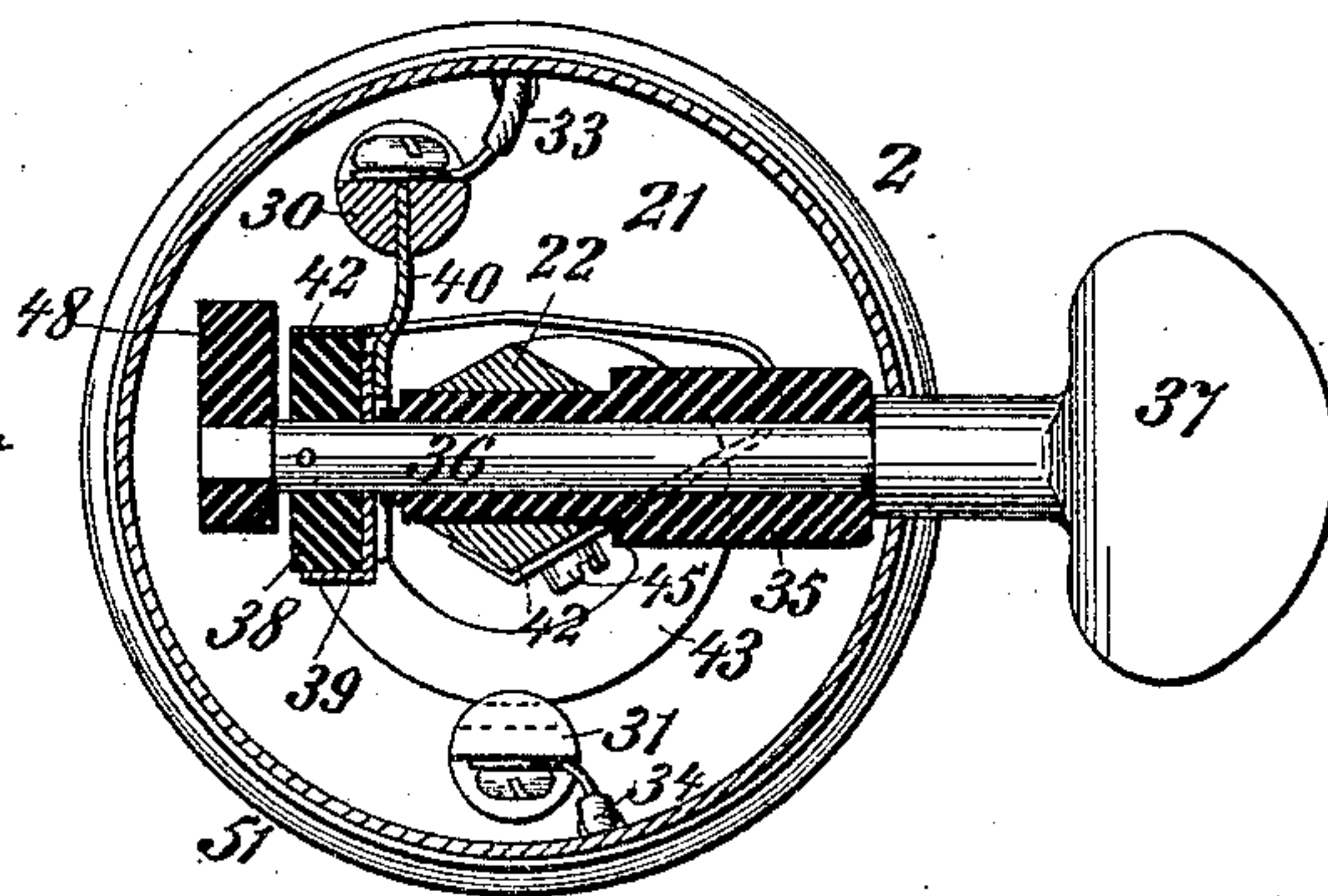


Fig. 8,



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# UNITED STATES PATENT OFFICE.

CHARLES A. HUSSEY, OF NEW YORK, N. Y.

## COMBINED REGULATING INCANDESCENT LAMP AND SOCKET.

SPECIFICATION forming part of Letters Patent No. 527,989, dated October 23, 1894.

Application filed May 14, 1894. Serial No. 511,183. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. HUSSEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Combined Regulating Incandescent Electric Lamp and Socket; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to incandescent electric lamps and sockets therefor, and particularly to incandescent electric lamps in which provision is made for varying at will the strength of light given by the lamp; and my invention consists in the novel construction of the lamp, in the novel construction of the socket, and in the novel construction and arrangement of the parts constituting the switch by which the strength of the light is regulated.

In my invention, I use a lamp having two or more incandescent filaments, which are connected with suitable contact pieces on the base of the lamp. The lamp is arranged to be inserted readily into a suitable socket, which is provided with other contact pieces, so arranged that when the lamp is in place in its socket the contact pieces of the socket are in contact with the contact pieces of the bulb. The contact pieces of the socket are connected, through the mechanism of a suitable switch located in the socket, with conductors for supplying electric current to the lamp; and this switch is adapted to connect the filaments, through the contact pieces of the lamp and socket, with the supply conductors, either singly, in series, or in multiple.

The objects of my invention are, first, to make the construction of the lamp simple, and as nearly as possible similar to the single filament lamps now commonly in use; second, to provide a socket of simple construction, to receive the lamp; third, to provide both lamp and socket with suitable contact pieces which shall be in contact when the lamp is in place within the socket, and which shall be adapted to convey current to the lamp filaments or to one of them, in any desired manner, without danger of short-circuiting; and fourth, to pro-

vide a suitable switch which shall be able to connect the lamp filaments with the wires for supplying current either singly, in series, or in multiple, which shall be of a size such that it may be placed within a lamp socket of usual size, which shall be simple and cheap in construction, easily operated, and which shall not be liable to derangement. These objects are attained in the invention herein described and illustrated in the drawings which accompany and form a part of this application, in which the same reference numerals indicate the same or corresponding parts, and in which—

Figure 1 is a vertical sectional view of a lamp constructed in accordance with my invention. Fig. 2 is a plan view, looking from below, of the base of the lamp, showing the arrangement of the contact pieces thereon. Fig. 3 is a vertical sectional view of the socket, showing the arrangement of the contact pieces therein, the mechanism of the switch being omitted for the sake of clearness. Fig. 4 is a diagrammatic view, showing how the switch acts to connect the lamp filaments with the supply conductors in order to obtain the different gradations of light. Fig. 5 is an elevation of the socket, on an enlarged scale, showing an end view of the switch mechanism, the casing of the socket being sectioned on the center line *ww* of Fig. 7. Fig. 6 is an elevation of the socket, showing a side view of the switch mechanism, the casing of the socket being sectioned on the center line *xx* of Fig. 7. Fig. 7 is a horizontal sectional view of the socket, taken on the line *yy* of Fig. 5, looking upward, and shows the arrangement of the contact springs of the switch mechanism; and Fig. 8 is a horizontal sectional view of the socket, taken on the line *zz* of Fig. 6, which is the center line of the switch key, looking downward.

In the drawings, 1 is the lamp, 2, the socket therefor, and 3 is the base of the lamp, designed to fit within the upper or open end of the socket 2. Within the lamp are two filaments, of any ordinary material and construction, to the ends of which are secured conductors which pass through and are sealed within a glass tube 6, which forms a part of the bulb. So far, the construction is the same as of the ordinary incandescent elec-



tric lamps, except that there are two filaments within the lamp, instead of one, as is ordinarily the case; and to any particular construction of the lamp and to any particular method of securing the filaments therein I do not limit myself.

The end of the glass bulb projects within a metal casing 7, into which the bulb is secured by some suitable filling material 8, such as plaster of paris. The end of the casing 7 is closed by a plug or disk 9 of insulating material, secured within the casing in any suitable manner. Through the center of this disk 9, and embedded therein and in the plaster of paris filling 8, passes a screw 10, having a central aperture 11. Through this central aperture pass conductors 12 and 13, connected respectively with an end of filament 4 and filament 5, and the ends of these conductors are soldered or otherwise secured to the screw 10, so as to be in electrical contact therewith. Embedded in and supported by said insulating disk or plug 9 is a metal ring 14, grooved on its underside for a purpose to be explained hereinafter, and placed so as to be concentric with the screw 10. A conductor 15, connected with an end of filament 5, is secured to this ring 14 and is in electrical contact therewith.

A conductor 16, connected with an end of filament 4, is secured to and placed in electrical contact with the casing 7. The casing 7, ring 14, and screw 10 form the contact pieces of the lamp, which make contact with other contact pieces of the socket, when the lamp is in place in the socket, and through which current is communicated to the filaments.

If more than two filaments be used in the lamp, the base 3 of the lamp may be provided with such number of metal contact rings, such as 14, placed concentric with each other, as may be necessary for the formation of the required electrical connections.

Referring now to the socket shown in Fig. 3 and in Figs. 5 to 8 inclusive, 20 is a metal piece forming the base of the socket, and having a screw-threaded aperture to permit the socket to be secured to a suitable support. Within this base 20 is a disk 21, of insulating material, which supports a metal post 22. This post 22 supports a second disk 23, of insulating material, to which is secured a sleeve 24, of spring metal, formed with a groove at the top and slit vertically at several points through the greater portion of its length, so as to form a clasp adapted to receive and grasp the base 3 of the lamp. In the upper end of the post 22 is a screw-threaded aperture 25, which receives the screw 10 of the lamp when the lamp is inserted into the socket. The post 22 is therefore in electrical contact with the screw 10, and serves as one of the contact pieces of the socket, the spring sleeve 24, which makes contact with the casing 7 of the lamp, being another contact piece. The third contact piece, corresponding to the grooved

ring 14 of the lamp, is a metal ring 26, carried by the insulating disk 23, having the same diameter as the ring 14, and having a V-shaped top adapted to fit within the groove in the bottom of the ring 14. The screw 10, screwing into the aperture 25 in the post 22, serves to hold the lamp in place within the socket, while the ring 26, fitting into the groove in the ring 10 of the lamp, holds the lamp central and prevents it from moving.

The space between the insulating disks 21 and 23 constitutes a switch chamber, within which is placed the switch by which the intensity of the light is regulated. As previously explained, the intensity of the light is varied by connecting the filaments with the supply conductors in different ways, the filaments being connected first in series when the light is weakest, then one filament alone being connected to the supply conductors, which gives the second gradation of light, and then both filaments being connected to the supply conductors in multiple, which gives the strongest light. The switch used must be adapted, therefore, to connect the filaments with the supply conductors in the three ways named.

The switch mechanism is shown in Figs. 5, 6, 7, and 8. 30 and 31 are binding posts, secured to the insulating disk 21, to which the supply conductors 33 and 34 are connected. A bushing 35 passes through and is secured in an aperture in the post, and in this insulating bushing 35 is mounted a key shaft 36 having at its outer end a key 37 by which the switch is operated. To the inner end of the key shaft 36 is secured a contact block 38, of insulating material. Upon the back of this contact block 38 is secured a metal contact plate 39, covering the back of the block, and bent over at one end so as to cover one of the sides of the contact block 38. A metal brush, 40, connected with the binding post 30, bears against the contact plate 39 at the back of the block 38. Other metal contact brushes, 41, 42 and 43, bear each against a side of the contact block 38 and each make contact with the end of the contact plate 39 when the key shaft 36 is so turned as to bring that side of the contact block 38 which is covered by the end of said plate 39 into contact with that contact brush 41, 42, or 43, as the case may be. In the position of the contact block shown in the drawings, none of the brushes 41, 42, and 43 are in contact with the plate 39, all of the brushes being in contact with the insulating surfaces of the block 38. As the key is turned, one after the other of the brushes 41, 42, and 43, are successively brought into contact with the end of the contact plate 39; but only one brush is in contact with the contact plate at each of these positions of the contact block 38, the other two brushes resting on the insulating surfaces of the block. Of the three brushes, 41, 42, and 43, 41 is connected by a screw 44, passing through the brush and through the insulating disk 23,



with the contact ring 26 of the socket. Brush 42 is connected by a screw 45 with the central post 22. Brush 43 is likewise in contact with the post 22, being held between the post and the insulating disk 21 at the bottom of the post. Besides the brush 40, (which places the contact plate 39 in electrical communication with the binding post 30 and so with the supply conductor 33,) and the brushes 41, 42, and 43, above enumerated, there are two other brushes, which do not make contact with the contact plate 39, and are placed in a different vertical plane than the plate 39, as is shown most clearly in Fig. 6. The end of brush 47 is directly above the end of brush 46, and a cam 48, which may be integral with the contact block 38, or may be attached to the shaft 36 separately, pushes 46 up into contact with brush 47 when the end of contact plate 39 is in contact with brush 43. Brush 46 is in contact with and may be integral with brush 41. Brush 47 is connected with the spring sleeve or clasp 24 by a screw 49, passing through the insulating disk 23. The spring sleeve or clasp 24 is likewise connected by a conductor 50, with the binding post 31, and so with the supply conductor 34.

The connections made by the switch in the various positions of the key are best shown in Fig. 4, in which the contact block 38, brushes, contact pieces of the socket and lamp, and the filaments are diagrammatically illustrated. In the position of the contact block shown, none of the brushes 41, 42 and 43 are in contact with the contact plate 39, and consequently no current flows through the lamp. If the block be turned through one-quarter of a revolution, the plate 39 is brought into contact with the brush 41. Current then passes from binding post 30, through brush 40, contact plate 39, and brush 41 to socket contact ring 26, thence to the contact ring 14 in the base of the lamp, and through filament 5 to screw 10, through filament 4, to the casing 7 of the lamp, thence to spring clasp 24, and through conductor 50 to binding post 31. In this position of the contact block 38, therefore, the filaments 4 and 5 are connected in series, the resistance of the lamp is greatest, and the light produced is weakest. When the contact block 38 is turned through another quarter revolution, brush 41 ceases to be in contact with plate 39, and brush 42 is brought into contact with said plate. Current then passes from binding post 30 through brush 40, plate 39, brush 42, post 22, screw 10, through filament 4 to casing 7, thence through spring clasp 24 of the socket, and through conductor 50 to binding post 31. In this position of the contact block, therefore, the current passes through only one of the filaments, and the light produced is stronger than when the current passed through both filaments in series. When the contact block 38 is turned through another quarter revolution, the contact plate 39 is brought into contact with the brush 43; but

since this brush is in electrical communication with the post 22, as is the brush 42, current still passes through filament 4 as when brush 42 was in contact with plate 39; but in this position of the block 38, the cam 48 presses brush 46 up into contact with brush 47, so that the current divides at screw 10, part passing through filament 4, as above described, while the other part passes through filament 5, contact ring 14 on the base of the lamp, contact ring 26 of the socket, brushes 46 and 47, and spring clasp 24, where it joins the current from filament 4 and passes through conductor 50 to binding post 31. In this position of the contact block 38, therefore, the filaments are connected in multiple with the supply conductors, and the light produced is the maximum. With a further quarter turn of the contact block 38, all of the brushes 41, 42, and 43 are caused to bear against the insulating surfaces of the block 38, and the current is cut out from the lamp.

Referring back to the figures showing the construction of the socket, the mechanism of the switch and the spring clasp 24 is all enclosed and protected by a casing 51, secured at the bottom to the base 20 of the socket; the key 37, by which the switch is operated, projecting through an aperture in this casing. At its upper end, the casing is provided with an insulating bushing 52, which prevents contact between the casing and the spring clasp 24, and so prevents possible short-circuiting of the current which might be occasioned by such contact.

In using my improved incandescent lamp, the lamp is first put in place within the socket, which is done by inserting the base of the lamp within the spring clasp 24 and screwing the screw 10 into the aperture of the post 22 until the rings 14 and 26 are in contact. The lamp is then held firmly in place within the socket, the screw 10 is in electrical connection with the post 22, the contact ring 26 is in contact with the contact ring 14, and the spring clasp 24 is in contact with the casing 7 of the lamp, so that all necessary connections between the lamp and socket are made simply by placing the lamp within the socket. By turning the key 37, current will be turned on to the lamp, the current first passing through both filaments in series, then through only one of the filaments, and then through both filaments in multiple, the different gradations in light up to the maximum being thus obtained. A further quarter turn of the key extinguishes the light altogether.

It will be observed that my switch is so constructed that the key may be turned backward without injury, the connections being made in the same manner, but in reverse order.

If more than two filaments are to be used in the lamp, a greater number of contact pieces will be required in lamp and socket, as already stated, and by increasing the num-



ber of sides of the contact block 38 and the number of contact brushes acting thereon, the desired connections between the supply conductors and the filaments may be made.

5 Having thus completely described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination, with  
two filaments having two ends electrically  
10 connected and the other two ends disconnected and insulated from each other, of a circuit controller having a pair of normally open spring contact pieces in circuit respectively with the said insulated filament terminals,  
15 other spring contact pieces in circuit respectively with the common and one of the insulated terminals, and a movable contact piece adapted to make contact with said spring contact pieces and to connect said filaments in  
20 series, singly, and in multiple with conductors for supplying current to the lamp, substantially as described.

2. In an electric lamp, the combination with  
two filaments having their ends joined in a  
25 common terminal at one side, and disconnected and insulated terminals at the other side, of a circuit controller having a pair of normally open spring contacts in circuit respectively with the said insulated filament  
30 terminals, other spring contacts in circuit respectively with the common and one of the insulated terminals, and a rotary contact piece carrying a cam adapted to connect said filaments in series, singly, or in multiple, with  
35 the circuit mains, substantially as described.

3. In a combined incandescent electric lamp and socket, the combination, with a lamp having two filaments, and three contact pieces  
40 on the base of the lamp, insulated from each other, and forming terminals of said filaments, of a socket arranged to receive the base of said lamp, three contact pieces in said socket, insulated from each other, corresponding to and adapted to make contact with the contact  
45 pieces of the lamp when the base of the lamp is in place within the socket, a circuit controller having spring contact pieces in circuit respectively with the said insulated filament  
50 terminals, other spring contact pieces in circuit respectively with the common and one of the insulated terminals, and a movable contact piece adapted to make contact with said spring contacts and to connect said filaments in series, singly, or in multiple, with conductors for supplying current to the lamp, substantially as described.

4. In a combined incandescent electric lamp and socket, the combination, with a lamp having two filaments, a casing surrounding the  
60 base of the lamp and forming a terminal or contact piece for said filaments, and contact pieces in the base of the lamp insulated from each other and from the casing, and forming other terminals of said filaments, of a socket  
65 having a spring clasp, adapted to receive said lamp, and to make electrical contact with said casing contact pieces in said socket, insulated

from each other and from the clasp, and corresponding to and adapted to make electrical contact with the contact pieces of said lamp  
70 when the lamp is in place within said socket, conductors for supplying current to the lamp, and a switch in the socket, connected with said conductors, and with said spring clasp and contact pieces, and adapted to connect said  
75 filaments singly, in series, or in multiple with said conductors, substantially as described.

5. In a combined incandescent electric lamp and socket, the combination, with a lamp having two filaments, a screw projecting from the  
80 base thereof, and forming a terminal or contact piece for said filaments, and other contact pieces in the base of the lamp, insulated from each other and from said screw, and forming other terminals of said filaments, of a  
85 socket adapted to receive said lamp, and having a contact piece with a screw-threaded aperture therein adapted to receive said screw, other contact pieces in said socket insulated from each other and from the apertured contact  
90 pieces, and adapted each to make electrical contact with a contact piece of the lamp when the lamp is in place within said socket, conductors for supplying current to the lamp, and a switch in the socket, connected with  
95 said conductors, and with the contact pieces of the socket, and adapted to connect said filaments singly, in series, or in multiple with said conductors, substantially as described.

6. In a combined incandescent electric lamp  
100 and socket, the combination, with a lamp having two filaments, a screw projecting from the base thereof and forming a terminal or contact piece for said filaments, a grooved ring surrounding said screw and insulated  
105 therefrom, and forming another terminal or contact piece for said filaments, and a casing surrounding the base of the lamp and forming a third terminal or contact piece for said filaments, of a socket, having a spring clasp  
110 adapted to receive said lamp and to make electrical contact with said casing, a contact piece insulated from said spring clasp and having a screw-threaded aperture adapted to receive said screw, and a ring insulated from  
115 said clasp and apertured contact piece and adapted to make contact with the contact ring on the base of the lamp, conductors for supplying current to the lamp, and a switch in the socket, connected to said conductors,  
120 and with said spring clasp, contact ring, and apertured contact piece, and adapted to connect said filaments singly, in series, or in multiple with said conductors, substantially as described.

7. In a combined incandescent electric lamp and socket the combination, with two filaments and a supply and a return conductor for supplying current to said filaments, of a  
130 revolubly mounted conducting contact piece connected to the supply conductor, stationary contact pieces adapted to make contact with said revolving contact piece in different positions thereof, one terminal of each filament



being connected in common to one of said stationary contact pieces, and the second terminal of one filament being connected to another of said stationary contact pieces, suitable connections between the second terminal of the other filament and the return conductor, and means for connecting the second terminal of the first-mentioned filament with the return conductor when the common ends of said filaments are connected with said revolving contact piece, substantially as described.

8. In a combined incandescent electric lamp and socket, the combination, with two filaments and a supply and a return conductor for supplying current to said filaments, of a revolubly mounted conducting contact piece connected to the supply conductor, stationary contact pieces adapted to make contact with said revolving contact piece in different positions thereof, one terminal of each filament being connected in common to one of said stationary contact pieces, and the second terminal of one filament being connected to another of said stationary contact pieces, suitable connections between the second terminal of the other filament and the return conductor, two adjacent contact pieces normally separated, one connected to the second terminal of said first-mentioned filament and the other connected to the return conductor, and means for bringing said adjacent contact pieces into contact when the common ends of said filament are connected with said revolving contact piece, substantially as described.

9. In a combined incandescent electric lamp and socket, the combination, with two filaments and a supply and a return conductor for supplying current to said filaments, of a revolubly mounted conducting contact piece connected to the supply conductor, contact brushes arranged about said revolving contact piece and adapted to make contact therewith in different positions thereof, one terminal of each filament being connected in

common to two of said contact brushes, and the second terminal of one filament being connected to another of said contact brushes, suitable connections between the second terminal of the other filament and the return conductor, two adjacent brushes normally separated, one connected to the second terminal of said first-mentioned filament and the other connected to the return conductor, and means for bringing said adjacent contact brushes into contact when said filaments are connected through one of said common contact brushes with the revolving contact piece, substantially as described.

10. In a combined incandescent electric lamp and socket, the combination, with two filaments, 4 and 5, and a supply and a return conductor for supplying current to said filaments, of a revolubly mounted contact piece 39 connected to the supply conductor, brushes 41, 42 and 43 arranged about said contact piece 39 and adapted to make contact therewith in different positions thereof, one terminal of each filament being connected in common to brushes 42 and 43, and the second terminal of filament 5 being connected to brush 41, suitable connections between the second terminal of filament 4 and the return conductor, two adjacent brushes 46 and 47 normally separated, one connected to the second terminal of filament 5 and the other to the return conductor, and a cam 48, revolving with said contact piece 39, and adapted to bring said brushes 46 and 47 into contact when said contact piece 39 is in contact with brush 43, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. HUSSEY.

Witnesses:

CHAUNCEY P. OVERFIELD,  
E. M. MARBLE.