No. 764,005. PATENTED JULY 5, 1904.

H. N. POTTER.

GLOWER SUPPORT FOR SECOND CLASS CONDUCTOR LAMPS.

APPLICATION FILED OCT. 9, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

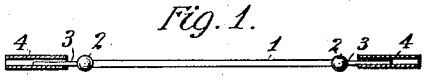


Fig. 2.

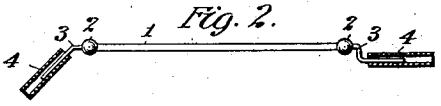


Fig. 3.

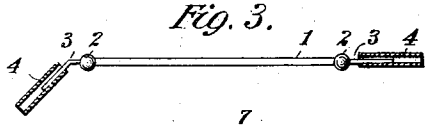


Fig. 4.

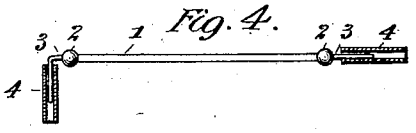


Fig. 5.

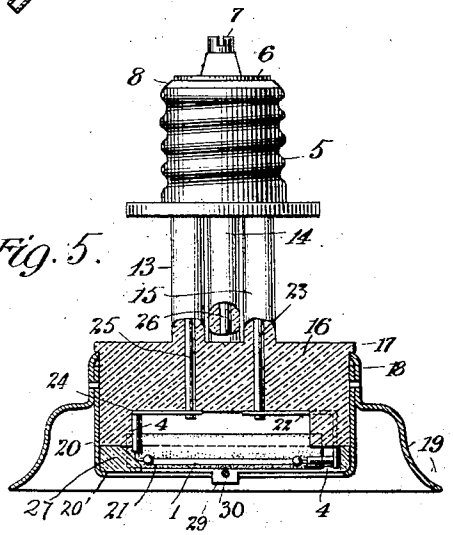


Fig. 6.

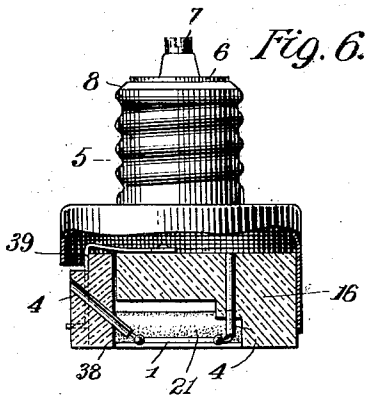


Fig. 7.

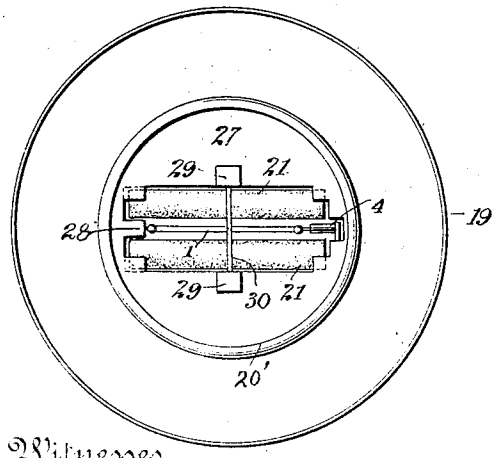
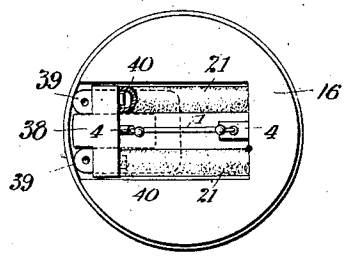


Fig. 8.



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GLOWER SUPPORT FOR SECOND CLASS CONDUCTOR LAMPS.

APPLICATION FILED OCT. 9, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

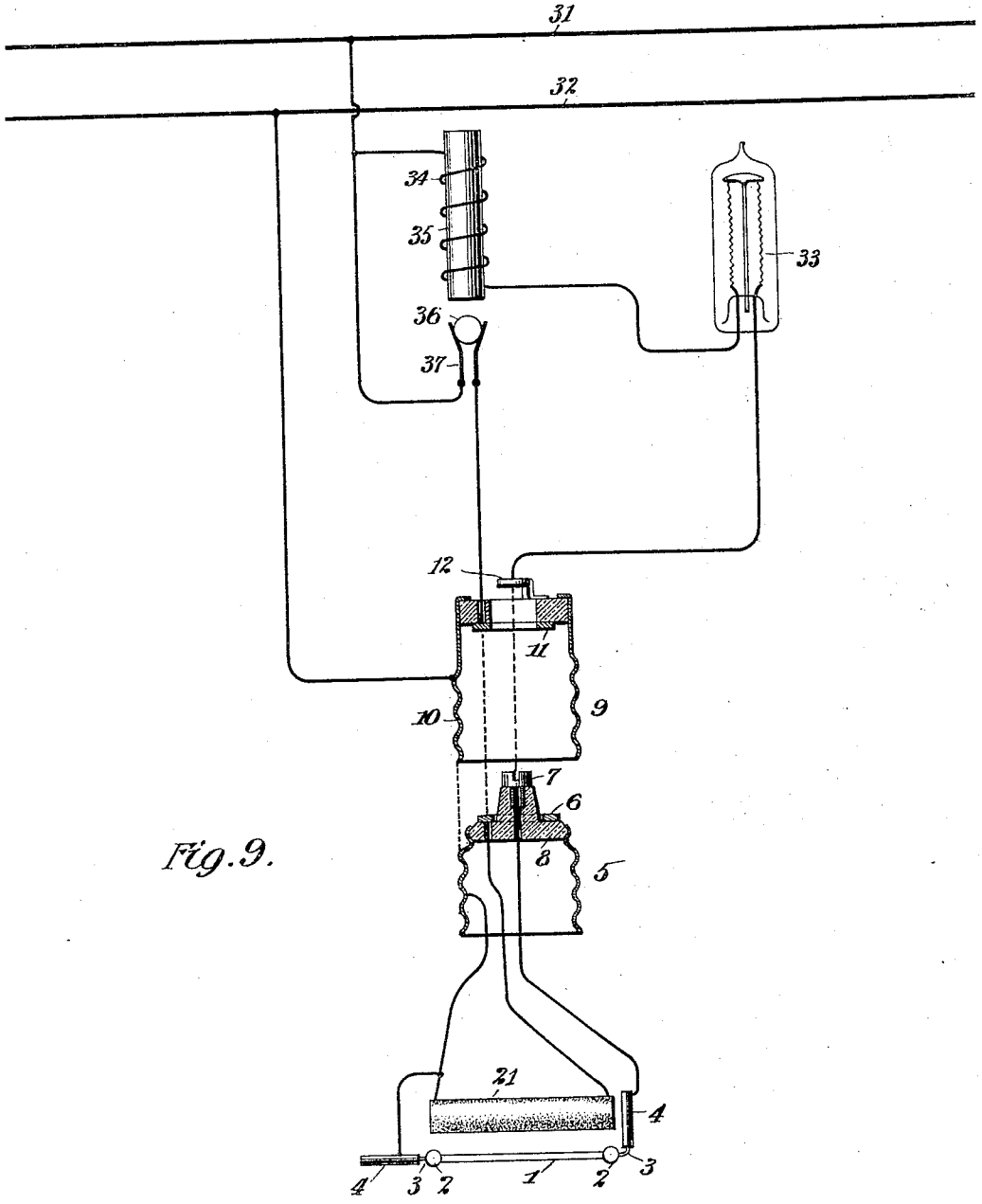

Fig. 9.

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No. 764,005. Patented July 5, 1904.

UNITED STATES PATENT OFFICE.

HENRY NOEL POTTER, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO GEORGE WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA.

GLOWER-SUPPORT FOR SECOND-CLASS-CONDUCTOR LAMPS.

SPECIFICATION forming part of Letters Patent No. 764,005, dated July 5, 1904.

Application filed October 9, 1902. Serial No. 126,411. (No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States, and a resident of New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Glower-Supports for Second-Class-Conductor Lamps, of which the following is a specification.

My invention relates to means for holding and protecting the glowers of electric lamps of the well-known Nernst type.

Among the objects of the invention I may mention that of securing convenience of insertion and replacement, that of avoiding the bending or buckling of the glowers in use, and that of maintaining good electrical connection between the platinum leads and the parts with which they coöperate by making it possible to keep the contact-surfaces clean or to make them clean if they should become clogged in actual use.

The invention also contemplates other improvements in the same general line, all of which will be clearly set forth in the present specification.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 illustrates a glower and its leads in combination with sockets for receiving the leads. Fig. 2 is a similar view of an arrangement in which the sockets are at an angle to each other instead of being in line or parallel with each other, as in Fig. 1. Fig. 3 is a view similar to Fig. 2, except that one of the sockets or sleeves is coaxial with the glower instead of having its axis parallel to the glower-axis. Fig. 4 shows one sleeve or socket at right angles to the glower-axis. Fig. 5 is an elevation and part section of a three-terminal Nernst lamp, showing the glower-supports in place. Fig. 6 is a similar view illustrating a slightly-different arrangement of the glower-supports. Fig. 7 is a bottom view of a lamp such as is illustrated in Fig. 5. Fig. 8 is a similar view of the lamp shown in Fig. 6, and Fig. 9 is a diagram illustrating the lamp-circuits and their connections with the main lighting-circuit.

Referring to the drawings in detail, 1 is a glower of the Nernst type, the same being practically a non-conductor at ordinary temperatures and requiring to be heated in order to become conductive. To the enlarged ends 2 2 of the glower are connected lead-wires 3 3, of platinum or other suitable material. In the present instance I propose to provide a simple and easy connection between the lead-wires and the external circuit by means of sleeves or sockets 4 4, into which the platinum lead-wires may extend and with which they may make good electrical connection. The sleeves or sockets will generally be made of a metal, such as platinum, which is not deleteriously oxidized at the operating temperature of the lamp. In general I prefer that the sleeves 4 4 should be at an angle to each other—as illustrated, for example, in Figs. 2, 3, and 4. In Fig. 2 the right-hand sleeve has its axis parallel with that of the glower, while the left-hand sleeve is at an angle of approximately forty-five degrees to the said axis. In Fig. 3 the arrangement is a similar one, except that the right-hand sleeve is coaxial with the glower. In Fig. 4 the right-hand sleeve has the same relation to the glower as that in Fig. 3, while the left-hand sleeve is arranged at right angles to the axis of the glower.

Figs. 5, 6, 7, and 8 illustrate the actual mounting of glowers in lamp structures wherein three terminals are provided on the lamp-base to coöperate with corresponding terminals in the lamp-socket. Referring to these figures and also to Fig. 9, one of the terminals of the lamp-base appears at 5 as the threaded shell of the standard "Edison" base, while the other two terminals appear at 6 and 7 in the form of the ring and screw terminals of the standard "United States" base, the whole being supported upon an insulator 8, of porcelain or other suitable insulating material. As shown in Fig. 9, the socket 9 for the lamp-base thus described, with its terminals 5, 6, and 7, is provided with coöperating terminals 10, 11, and 12, respectively. The insulating-support 8 is connected by insulating-posts 13, 14, and 15 with the main portion 16 of the lamp-base. This main portion of the lamp-base is provided with a flange 17

at its top, beneath which flange may be secured by set-screws 18 a globe-holder 19. To the globe-holder 19 is usually riveted a cylindrical piece of metal 20, which fits closely around the lower part of the base portion 16 and extends some little distance below the same, with an inwardly-turned flange 20′ at its lower end. The base portion 16 is hollowed out to receive heaters 21 21, which consist of some good insulating and heat-resisting material, such as talcite wound with fine platinum wire. Below the heaters the glower 1 is arranged, and the sleeves 4 4 are mounted in proper relation to the glower. In the lamp illustrated in Figs. 5 and 7 one of the sleeves is shown at right angles to the glower and the other is coaxial therewith. The latter sleeve is illustrated as being supported upon an angular piece of metal 22, connected with a metallic post 23, running up through the insulating-post 15 into contact with the threaded shell 5. The other sleeve is supported by a metallic piece 24, which is connected by a post 25, of metal, running through the insulating-post 13 to the pin or screw 7 on the lamp-base. One terminal of the fine platinum wire running through the heaters 21 21 is connected electrically to the post 23, while the other terminal of the heater-wire is connected, through a post 26, to the ring-terminal 6 on the lamp-base. By referring to Figs. 5 and 7 it will be seen that an insulating-disk 27, suitably cut away in the center to expose the glower and a portion of the heaters, is put in between the bottom of the base portion 16 and the flange 20′ on the lower end of the cylinder 20. This disk 27 extends under the heaters sufficiently to prevent them from dropping out, and a tongue 28 on the disk is also arranged to extend under the sleeve 4, lying at right angles to the glower. In this way the tendency of the lead-wire 3 connected with that particular sleeve to drop down by gravity out of contact with the sleeve is prevented. On the disk 27 are arranged lugs 29 29, between which extends a bridge 30, of insulating heat-resisting material, which serves to prevent excessive bending or buckling of the glower 1 under the influence of the temperature at which it is operated. This bridge may be of the same material as the glower itself. Referring to Fig. 9 once more and assuming that the lamp-base is inserted in place within the socket 9, we can now trace the entire circuit of the lamp to and from the lighting-mains 31 and 32. Before doing this I may point out the part 33 as the usual glower-ballast and the parts 34, 35, 36, and 37 as, respectively, the coil and core of an electromagnet or solenoid and the movable and stationary contacts of a heater cut-out operated thereby. The ballast in this instance is of iron wire supported within an atmosphere of hydrogen. By a careful inspection of Fig. 9 it will be seen that the shell 5 and its corresponding terminal 10 are connected with the common circuit of the glower 1 and the heaters 21. The opposite end of the heater-circuit is connected, through the rings 6 and 11, with the opposite main, and the opposite end of the glower-circuit is connected, through the insulated terminals 7 and 12 and through the ballast 33 and the wire 34, also with the opposite main. When the heaters 21 have brought the glower to a conducting temperature, so that current passes through the circuit last described, the coil 34 energizes its core 35, removing the movable terminal 36 from contact with the stationary terminals 37. Thus the heater-circuit is broken, and the lamp continues to operate by current passing through the glower and through the ballast 33. In Figs. 6 and 8 the base portion 16 is cut away so as to leave room for a movable insulating-piece 38, mounted on a spring 39, the latter constituting practically a hinge for the part 38. The angular sleeve 4 in this instance runs at an angle of about forty-five degrees through the insulating-piece 38. The heaters 21 21 can be inserted in place by turning the part 38 outward on its hinge and allowing it to fall back again after the heaters have been put in. The heater-bodies being cylindrical in form, the holding of the heaters in place is facilitated by forming lugs 40 40 on the part 38 at points where they will enter the hollow portions of the cylinders.

The sleeves or sockets 4 4 are preferably left open at both ends, whereby the cleaning of the inside of the sleeve, as by running a wire through them from end to end, is facilitated.

It will be understood that the bridge 30 may be used to protect the glowers of a multi-glower-lamp as well as the single glower of the lamp illustrated.

It will be seen that by virtue of the structures and arrangements set forth in the foregoing specification and illustrated in the drawings the object is attained of providing convenience in replacement and insertion of the glower and its lead-wires, of avoiding the bending or buckling of the glowers in use, and of maintaining good electrical connection between the platinum leads and the parts with which they coöperate. For example, by employing conducting-sleeves into which the lead-wires may extend and with which they may make contact it is made possible to insert or replace any given glower without inconvenience of any sort. At the same time good electrical contact is secured even though the connection between the lead-wire and the tube in which it is inserted may be described as a loose contact or connection. By the term "loose" I refer to a connection which is sufficiently free to permit of the easy insertion of a lead-wire into its corresponding tube, though it will of course be understood that the connection when made will be suffi-

cient for the purposes of electrical continuity. Moreover, by constructing the sleeves of a material which is not deleteriously oxidized at the operating temperature of the lamp, and by thus making it possible to keep the contact-surfaces clean, or by providing means whereby any one of the tubes may be cleaned if it should become clogged I make it possible to maintain good electrical connection under all the conditions of operation. By adopting a form of construction such as is illustrated and described herein I also remove the danger of buckling or bending the glowers—that is to say, if the lead-wires enter coaxial tubes, as illustrated in Fig. 1, any spreading or elongation of the glower will only result in the lead-wires being pushed farther into the contact-tubes without any tendency to cause a buckling of the glower. In other words, there is freedom of expansion for the glower under these circumstances. The same freedom exists, possibly in a lesser degree, in the structures illustrated in Figs. 2, 3, and 4. At one end of the glower the expansion may take place freely, while at the opposite end there may be some movement of the lead-wires into the respective tubes, at least in the structure illustrated in Figs. 2 and 3.

The bridge 30 appearing in Figs. 5 and 7 will generally be placed so far from the heaters and the glowers as not to become conductive during any part of the operation of the lamp. It is desirable that this bridge should be of the same material as the glower itself, as under other circumstances there might be a greater tendency for the glower to become broken by its contact with the bridge in case of buckling. In other words, should a highly-heated glower make contact with a bridge of widely-different material having a different temperature coefficient the result might be a rupture of the glower, whereas such a rupture would not take place if the bridge and the glower were of the same or substantially the same material.

Instead of being supported at both ends the part 30, which I have called a "bridge," may be supported at only one end and may perform the same functions as if it extended between the two lugs 29 29, as described. In case the said element were supported at one end only it might be described as an arm adapted to prevent the buckling of the glower in the same way as the bridge above described.

I claim as my invention—

1. In an electric glower-lamp, a glower, a lead-wire attached to the glower at each end, and conducting-supports for the lead-wires, at least one of which supports is a conducting-sleeve so disposed with relation to the glower that the effect of expansion upon the glower will cause the lead-wire to be pushed farther into the sleeve.

2. In an electric glower-lamp, a glower, a lead-wire attached to the glower at each end, and conducting-supports for the lead-wires, at least one of which supports is a conducting-sleeve so disposed with relation to the glower that the effect of expansion upon the glower will cause the lead-wire to be pushed farther into the sleeve, the latter being of a material which is not deleteriously oxidized at the operating temperature of the lamp.

3. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, the said sleeves being inclined with respect to each other.

4. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, the said sleeves being inclined with respect to each other, and one sleeve being parallel to the glower-axis.

5. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, the said sleeves being inclined with respect to each other, and one sleeve being coaxial with the glower.

6. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, one sleeve being coaxial with the glower, and the other at right angles thereto.

7. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, one sleeve being coaxial with the glower, and the other at right angles thereto, in combination with a portion of the lamp structure extending under the sleeve which is at right angles to the glower.

8. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, one sleeve being coaxial with the glower, and the other at right angles thereto, in combination with a movable portion of the lamp structure, a part of which extends under the sleeve which is at an angle to the glower-axis.

9. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, the said sleeves being in separate parts of the lamp structure, such parts being adapted to be moved toward and away from each other in mounting and dismounting the glower.

10. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, the said sleeves being in separate parts of the lamp structure, one of which parts is hinged to the other.

11. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, one sleeve being coaxial with the glower, and the other at right angles thereto, the two sleeves being in separate, relatively movable parts of the lamp structure.

12. In an electric glower-lamp, a suitably-

supported glower, and an arm arranged beneath the glower to prevent undue bending or buckling thereof.

13. In an electric glower-lamp, a suitably-supported glower, and a bridge of the same material as the glower arranged beneath the glower and in proximity thereto, to prevent undue bending or buckling of the glower.

14. In an electric glower-lamp, a suitably-supported glower, and an insulating-arm located beneath the same to prevent undue bending or buckling of the glower.

15. In an electric glower-lamp, a glower having a lead-wire at each end, and sleeves for receiving the lead-wires, one of the sleeves being at an angle with the glower, and a hinged portion of the lamp structure in which the said sleeve is mounted.

Signed at New York, in the county of New York and State of New York, this 8th day of October, A. D. 1902.

HENRY NOEL POTTER.

Witnesses:
WM. H. CAPEL,
GEORGE H. STOCKBRIDGE.