

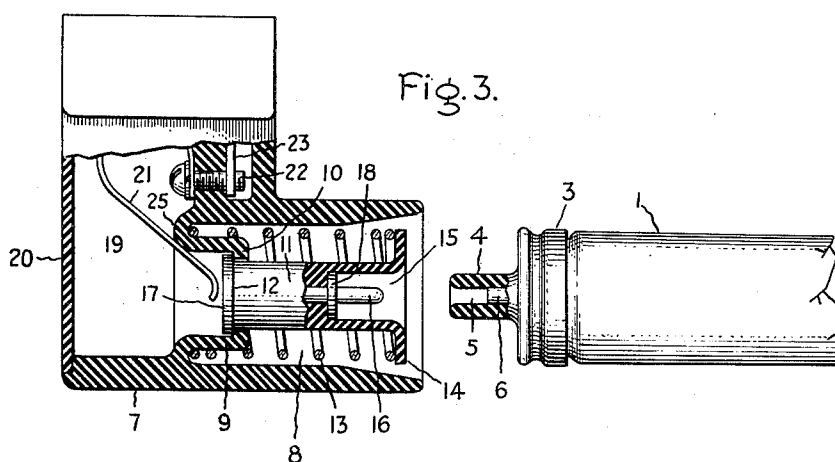
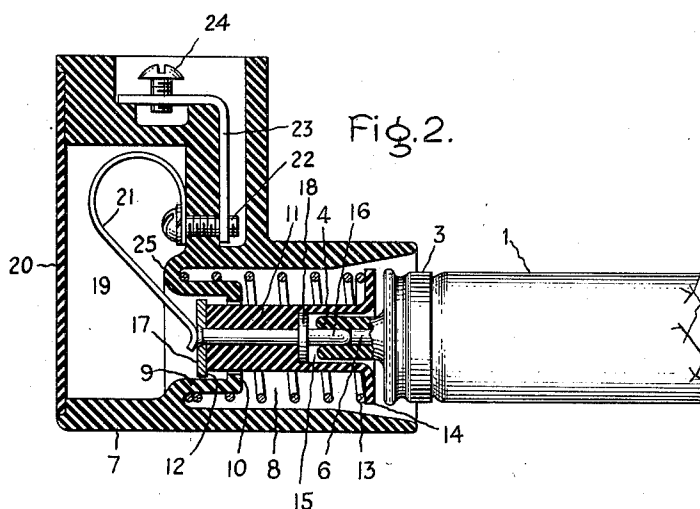
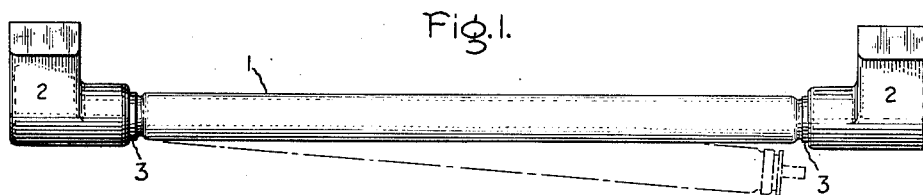
Jan. 29, 1946.

F. C. DE REAMER ET AL

2,393,616

TUBULAR LAMP AND HOLDER THEREFOR

Filed Oct. 23, 1944



Inventors:
Frank C. De Reamer,
John M. Pistey,
by *Harry E. Smith*
Their Attorney.

UNITED STATES PATENT OFFICE

2,393,616

TUBULAR LAMP AND HOLDER THEREFOR

Frank C. De Reamer, Bridgeport, and John M. Platey, Fairfield, Conn., assignors to General Electric Company, a corporation of New York

Application October 23, 1944, Serial No. 559,990

5 Claims. (Cl. 176—32)

The present invention relates to tubular lamps and to holders for tubular lamps. It is especially applicable to tubular lamps intended to operate at voltages higher than ordinary house lighting circuit voltage, i. e., 120 volts, or which require for starting a voltage higher than that required by tubular fluorescent lamps now in use and which utilize a hot cathode for starting. Such tubular lamps are termed usually cold cathode lamps. It is to be understood, however, that the invention is not limited thereto necessarily but may be used wherever found applicable.

The object of the invention is to provide an improved construction and arrangement of tubular lamp and an improved construction and arrangement of holder therefor, and for a consideration of what we believe to be novel and our invention, attention is directed to the following specification and to the claims appended thereto.

In the drawing, Fig. 1 is a side elevation of a tubular lamp mounted in lamp holders embodying our invention; Fig. 2 is a sectional view through one of the lamp holders with the lamp mounted therein, and Fig. 3 is a sectional view through one of the lamp holders with the lamp removed from the holder.

Referring to the drawing, 1 indicates a tubular lamp mounted in holders 2, there being a holder at each end of the lamp. The holders may be of like construction.

Referring particularly to Figs. 2 and 3, the lamp comprises a glass tube sealed at its ends and on each end of which is fixed an insulating cap 3. Insulating cap 3 may be fixed in position on the sealed end of the glass tube in any suitable way. It is provided with a centrally located axially extending projection 4 having an axially extending hole 5, thus providing on cap 3 what in substance is an axially extending sleeve. Positioned at the bottom or inner end of hole 5 is a metal contact pin 6 which may be fixed in position in any suitable way and which at its inner end is connected with the cathode of the lamp which cathode is located inside the glass tube. Contact 6 is of relatively small diameter and its outer end terminates well below the outer end of hole 5. Thus, it will be seen that it is embedded in sleeve 4 and is well protected by it so it cannot well be contacted accidentally. It will be understood that each end of the lamp is provided with a terminal similar to that just described.

The lamp holder comprises a base 7 having walls which define a cylindrical housing 8 open at its outer end and at the bottom of which is located a sleeve 9 having an inturned stop flange

10. Positioned in cylindrical housing 8 is a contact carrier 11 formed of insulating material and provided with a flange 12 which is adapted to engage annular stop 10, the flange being biased against the stop by a spring 13 located between the bottom of housing 8 and a flange 14 on the outer end of contact carrier 11. Contact carrier 11 is provided with an end recess 15 of a diameter to receive sleeve 4. Positioned centrally of end recess 15 is a contact pin 16 which extends through carrier 11 and at its end is riveted in a contact plate 17. Flange 12 may with advantage be provided by extending contact plate 17 beyond the periphery of contact carrier 11 as is clearly shown in Fig. 2. On contact pin 16 is fixed a collar 18 which engages the bottom of recess 15 and serves to position the contact pin. In other words, the contact pin is fixed to the contact carrier by collar 18 and contact plate 17. In base 7 are walls which define a chamber 19 closed by a cover plate 20 and in which is located a contact spring 21. One end of the contact spring is fixed to the wall of chamber 19 by a screw 22. The other end engages the end of contact pin 16. Screw 22 holds in place also a terminal plate 23 provided with a binding screw 24 by means of which an electrical conductor may be connected to contact spring 21. Contact spring 21 is positioned in a way such that when a lamp is not in the holder and spring 13 holds the contact carrier in its forward position, the contact spring engages a wall of the base as is indicated at 25 in Fig. 3 which forms a stop to hold contact 21 out of engagement with the contact pin. Thus, it will be seen that when a lamp is not in the holder, contact pin 16 is out of engagement with contact spring 21 so that the circuit is open at this point. This means that when a lamp is not in the holder, the contact pin is disconnected from the circuit so that it is no longer electrically alive. When a lamp is positioned in the holder, the contact carrier 11 occupies the position shown in Fig. 2, contact pin 16 being in engagement with contact spring 21.

In use, the two lamp holders 2 are mounted in spaced relation to each other on a suitable support, being spaced apart a distance as indicated in Fig. 1 such that the lamp correctly seats between them. The electric circuit is connected to the two lamp holders by means of the binding screws 24. To insert a lamp in the lamp holders, one end of the lamp is fitted in the one holder, the sleeve at the one end of the lamp holder being inserted over pin 16. This is permitted by reason of the fact that contact carrier 11 is loosely

mounted in the holder so that it may assume a slightly angular position relatively thereto. The lamp is then pushed axially into the holder against the action of spring 13. At this time, contact pin 16 is brought into engagement with contact spring 21 but a circuit through the lamp is not completed since the other end of the lamp is not yet in its lamp holder. The lamp is pushed axially into the one holder until the other end of the lamp clears the other holder after which it is moved into line with the second holder and then permitted to move axially into engagement with it to position the sleeve 4 at the other end of the lamp over the contact pin 16 of the other holder. The lamp is centered axially by the two springs 13. The circuit is now completed through the lamp. When in position, the circuit for the lamp is from terminal 23 of the one lamp holder through contact spring 21, contact pin 16, the contact terminal 6 at the one end of the lamp, thence through the lamp and out through the holder at the other end of the lamp.

To remove a lamp from the holders, the lamp is moved axially in one direction until it is free of the one lamp holder after which it is moved to an angle to one side of such lamp holder and then removed from the other lamp holder by moving it axially. As already stated, the clearances between the parts are such as to permit of a lamp being inserted into and removed from a lamp holder when at the slight angle required for it to clear the lamp holder at its other end. It will be seen that as soon as a lamp is moved axially to remove it from the holders, the circuit is broken immediately at contact spring 21 of the one lamp holder by the movement of its contact carrier 11. Thus, the circuit through the lamp is opened and the contact pin 16 is electrically disconnected from the circuit. Since the contact terminal 6 at the end of the lamp is housed at the bottom of sleeve 4, the operator cannot complete a circuit through the lamp by accidentally making contact with the lamp terminal 6. When the lamp is removed from the other lamp holder, its circuit likewise is broken at the contact spring 21. Thus, it will be seen that by means of our lamp terminal and lamp holder construction, we provide a combination which affords a high degree of safety.

Tubular lamps of the type illustrated are well adapted for use in series circuit, a number of lamps being connected in series and the power circuit being connected to the two ends of the series of lamps. In such an arrangement, intermediate lamp holders 2 may be placed directly adjacent to each other and connected together by a jumper wire. Or, if desired, a special intermediate lamp holder may be provided which comprises two of the lamp holders 2 built into a single structure and facing in opposite directions as will be obvious. With such a series lamp arrangement, when any one lamp is removed from the circuit, the circuit for the entire series is opened. Our lamp and lamp holder combination possesses particular utility when used in a series circuit since such a circuit operates at higher voltage than a circuit for a single lamp.

In accordance with the provisions of the patent statutes, we have described the principle of operation of our invention, together with the apparatus which we now consider to represent the best embodiment thereof, but we desire to have it understood that the apparatus shown

is only illustrative and that the invention may be carried out by other means.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a lamp holder comprising a base of insulating material having walls which define an open ended housing, a spring pressed axially movable contact carrier in the housing having a recess in its end, a contact pin positioned centrally in said recess, and a tubular lamp having an end adapted to be inserted into said recess, said lamp end being provided with a projection of insulating material having a central hole therein, and a lamp terminal contact positioned in said hole and spaced from its outer end, said contact pin entering said hole to engage the lamp terminal contact.

2. The combination with a lamp having at its end a centrally located axially extending projection having a central hole therein and a lamp terminal concealed in the hole, of a lamp holder having walls which define an open ended housing into which the lamp is inserted, a movable member of insulating material in the lamp holder housing having a contact pin thereon adapted to be engaged by said lamp terminal, and a spring contact in the lamp holder with which the contact pin engages when a lamp end is positioned in the lamp holder.

3. The combination with a tubular lamp having an insulating wall at its end provided with a central axially extending hole and a lamp terminal concealed in the hole, of a lamp holder having a wall which defines an open ended housing, a member of insulating material slidable axially in the housing, spring means biasing said member outwardly, said member being moved axially in the housing by the lamp end when inserted into the lamp holder, a contact pin extending axially through said member for engagement with the lamp terminal, and a contact member mounted in the lamp holder which is engaged by the contact pin when said member is moved axially by the insertion of a lamp end into the lamp holder.

4. A lamp holder comprising a casing having a wall which defines an open ended housing, a spring pressed insulating member in the housing, an axially extending contact pin which extends through said member having a forward end for engagement with a lamp terminal contact, and a spring contact strip in the lamp holder which is engaged by the rear end of said pin when a lamp end is positioned in the holder to move the contact pin against the spring contact strip.

5. A lamp holder comprising walls defining an axially extending open ended housing having a stop shoulder therein, an insulating member slidably mounted in said housing, a coiled spring disposed around said member for biasing it toward said shoulder, a contact pin which extends axially through said insulating member and projects beyond it at its forward end to form a contact in the lamp holder for connection with a lamp terminal, and a spring contact in the lamp holder with which the other end of the pin engages when a lamp end is positioned in the lamp holder to move the contact pin against said spring contact.

FRANK C. DE REAMER.
JOHN M. PISTEY.