Sept. 20, 1932. L. L. BECK 1,878,247

FIXTURE

Filed Aug. 26, 1930

FIG.1.

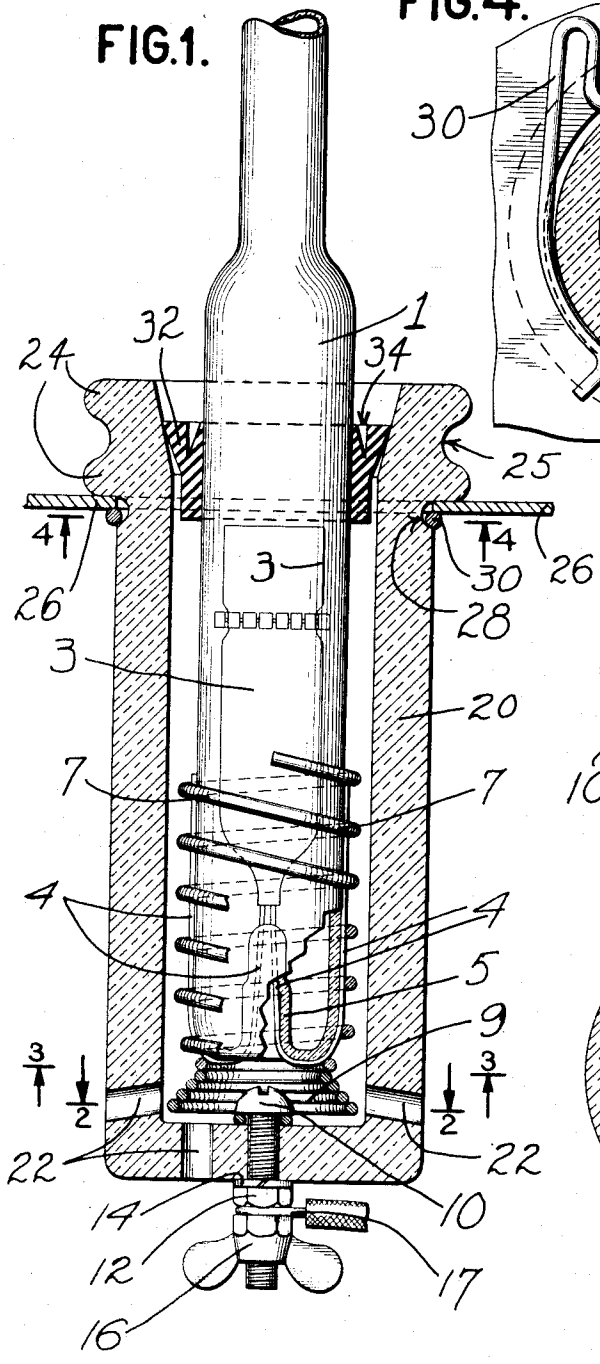


FIG.4.

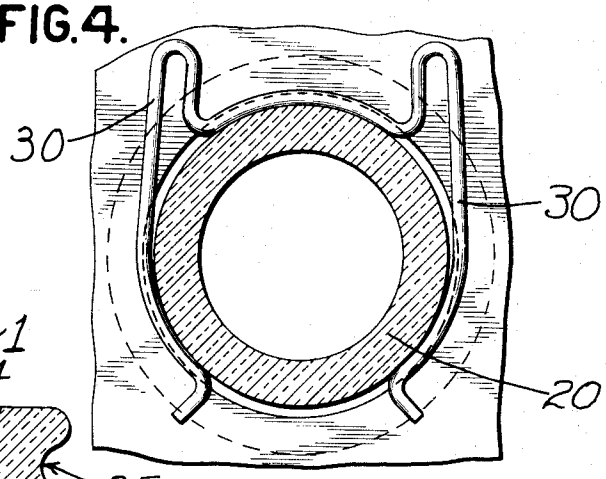


FIG.2.

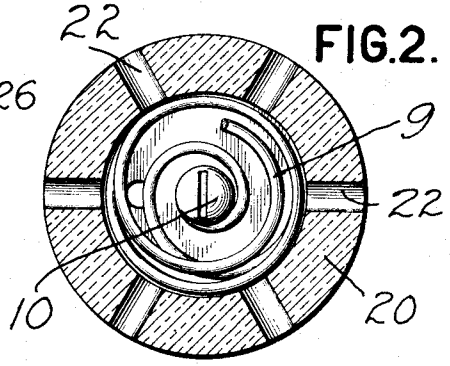
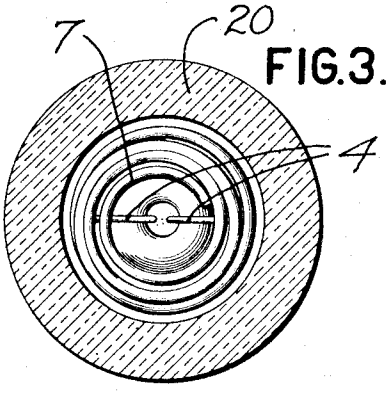


FIG.3.



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UNITED STATES PATENT OFFICE

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FIXTURE

Application filed August 26, 1930. Serial No. 477,969.

The present invention relates to an improved device for use in connection with luminescent gas discharge tubes, more particularly to an improvement in a socket for holding the electrode portion of a luminescent tube, all as will be more fully hereinafter described and claimed.

The gas filling of luminescent tubes is subject to gradual depletion and when the pressure of the gas in the tubes becomes so low that the further operation of the tube is attended with undue difficulty, it may be necessary to provide the tube with a new filling and incidentally to subject the tube to a process which comprises passing a heavy discharge current through the tube to drive out impurities from the electrodes and from the walls of the tube prior to recharging the same with a fresh or new gas filling. If the tube is provided with an external cap covering the end of the tube and intended as a means of electrical contact between the electrode and the terminals which supply current to the electrode, further difficulty may be experienced during the reprocessing of the tube incident to supplying the same with a fresh charge of rare gas such as neon. For example, the cap may be cemented to the tube with a plastic cement which softens and loses its binding characteristic upon the heating of the tube, which as above stated, takes place during the reprocessing thereof. In such a case the said cap must be again cemented to the tube in the same manner which occurred in the original assembly of the luminescent tube. In other cases, heating of the luminescent tube in contact with the said cap may cause breakage owing to the unequal expansion of the glass envelope and of the metallic cap.

The present invention provides, in combination, an improved device for establishing and maintaining contact between the lead wires or electrodes of the luminescent tube and the terminal which supplies electrical energy to the electrode. The invention therefore provides a new and improved socket or tube holding assembly including in combination the said improved device.

In addition to the general features and provisions recited above, the invention includes such further provisions, objects, improvements and advantages as are found to obtain in the structures and devices hereinafter described, shown or claimed.

The invention will be described in greater detail by reference to the accompanying drawing which illustrates a preferred embodiment of the apparatus of the invention.

Figure 1 shows partly in section and partly in elevation the improved device herein described.

Figure 2 is a section of the line 2—2 Figure 1, Figure 3, a section of the line 3—3 Figure 1, and Figure 4 is a section of the line 4—4 Figure 1.

Referring now more particularly to Figure 1, the tube has an expanded electrode portion 1 in which is located the electrode 3 which is essentially a hollow cylindrical body made of iron, copper, nickel or the like, closed at one end. To this end, lead wires 4 are joined. These lead wires are sealed into and project through the press member 5 and are then bent back and up along the tube as shown. A spiral spring member 7 made of brass or other suitably resilient material, fits over the ends of the tube, presses against the lead wires 4, holds them against the surface of the tube and is in good electrical contact with the said lead wires. An advantage of this spiral spring member is that it not only clings to the tube and maintains satisfactory electrical contact with the lead wires but it is also very readily removed by simply slipping it off the end of the tube whenever the occasion arises. Another spring member 9 is positioned within and secured to the bottom of the socket member and makes electrical contact with the first mentioned spring member. The spring member 9 is secured to the base of the interior of the socket member by the bolt 10 which is held in place by a nut 12 and split washer 14. The latter coacts with a wing nut 16 to secure between the said nut and the said wing nut, an electrical conduit such as the wire 17 which supplies current to the electrode 3. It will be observed that the bolt, spring member, lead wires, and electrode are all in electrical connection. Figure

2 shows a plan view of the spring member 9 and its securing bolt 10 looking in the direction of the arrows along the section 2—2 of Figure 1. Figure 3 shows a plan view of the spring member 7 looking in an opposite direction, that is in the direction of the arrows on the section 3—3 of Figure 1.

The socket member 20 is shown in longitudinal section in Figure 1 and in cross sections in Figures 2, 3 and 4 and broadly comprises a hollow cylindrical socket member adapted to receive the expanded portion of the luminescent tube 3 and adapted to protect the tube as well as its accessories. It may be made of porcelain, glass or other suitable electrical insulating material. The said socket member is provided with holes 22 adapted to efficiently drain away accumulated water from the interior thereof when the socket is in any position, whether vertical, horizontal or in intermediate positions.

The said socket member 20 has a portion of increased diameter at its upper end provided with an annular depression 25 as indicated. The function of the said enlarged portion provided with the annular depression is to present an increased electrical leakage bath between the interior of the socket member and supporting external member such as the supporting wall 26 indicated in section. Between the annular protuberance and the cylindrical external surface of the socket member, another annular depression 28 is provided which coacts with a spring clip 30 to hold the said socket member in place as will be presently more fully described.

In the usual application of the socket member of the present invention, it is inserted in a hole in the vertical front wall 26 or partition of a luminescent tube sign, as shown in Figure 1. To secure the socket member against the said wall of the sign base, the annular shoulder or protuberance 24 is pressed against the wall. The width of the annular depression 28 is then enough to permit a spring clip member 30 to be inserted between the said wall 26 of the sign base and a portion of the annular depression or trough 28, as shown in vertical longitudinal section in Figure 1 and in transverse section in Figure 4.

To maintain the luminescent tube in position inside the socket member and to maintain good electrical contact between the spring members, an annular gasket 32 is provided. This preferably has a bevelled or conical exterior surface and an annular groove portion 34 and the inside diameter of the said gasket or washer is made such that it fits snugly around the expanded portion of the luminescent tube. As the luminescent tube with its said gasket is inserted into the socket member the gasket is readily contracted and efforts to withdraw the tube and its gasket from the said socket member 20 causes the said gasket to resist such efforts because of the tendency of the gasket to expand and to cling firmly to the surface of the said socket member 20. The tube and its gasket may therefore be depressed until the spring member 9 is compressed to the desired degree and good electrical contact established between it and the spiral spring member 7. The said gasket or washer 32 then acts as a locking member and maintains the luminescent tube in the desired position. At the same time, the said gasket or washer efficiently prevents the ingress of water to the interior of the socket member and if, for any reason, water should be admitted thereto, the drainage holes 22 will drain off the same. The open end of the said socket member is preferably flared somewhat as shown in Figure 1 so as to correspond more or less with the bevel of the gasket or washer.

What is claimed is:

1. A luminescent tube electrode contact comprising a lead wire which is sealed in the tube envelope and connects at one end with an internal electrode in said tube, the other end of the lead wire being bent back along the external surface of the tube and held in that position with a spiral spring cap which fits over the end of the tube.

2. The method of mounting a luminescent tube to receive discharge current said tube having an internal electrode connected to a lead wire which projects through the tube, which comprises bending the lead wire back along the surface of the tube and slipping over the end of said tube a spiral spring member which holds said electrode against said tube surface and contacting said spiral member with a source of discharge current.

In testimony whereof I affix my signature.

LEO L. BECK.