

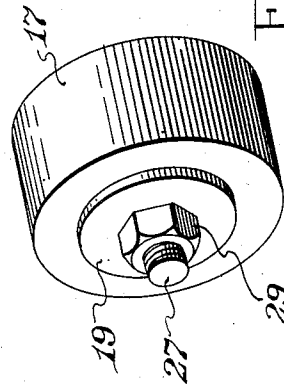
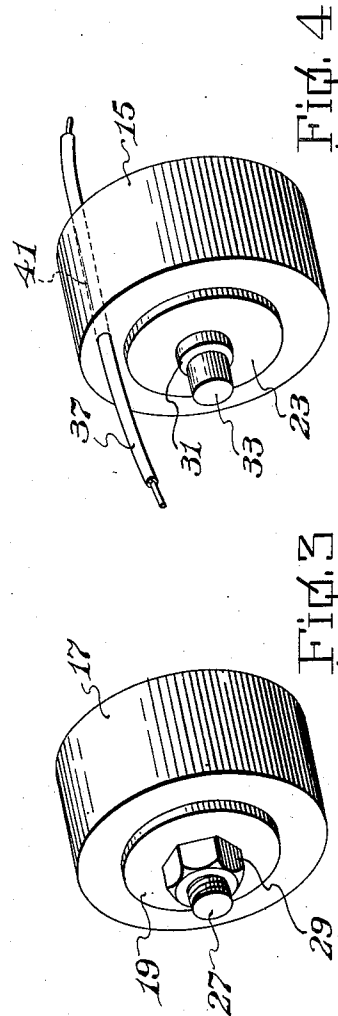
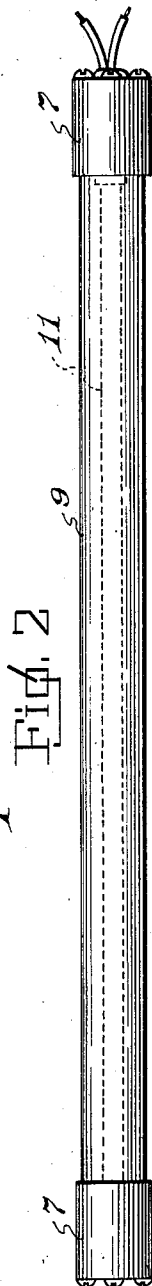
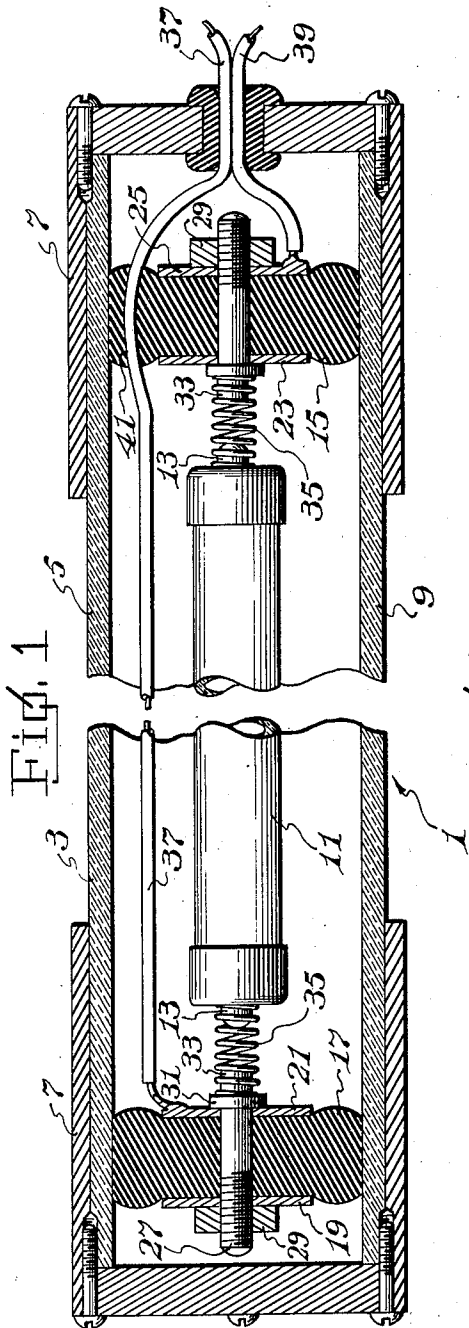
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F. E. WILLIAMS

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INSPECTION LAMP

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Fred E. Williams
INVENTOR.

BY *Robert R. Raim*

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2,807,710

INSPECTION LAMP

Fred E. Williams, Tulsa, Okla.

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The present invention relates to inspection lamps, and more particularly to vapor and explosion-proof lamps which are useful in cramped quarters.

It is an object of the present invention to provide an inspection lamp which will be essentially shock-proof.

Another object of the invention is the provision of an inspection lamp which will be explosion-proof.

Still another object of the invention is the provision of an inspection lamp which will be vapor-proof.

A further object of the invention is the provision of an inspection lamp having a fluorescent lighting element which may be quickly and easily removed and replaced when necessary.

A still further object of the invention is the provision of an inspection lamp which will be self adjusting during assembly and which will be proof against the inadvertent displacement of parts.

Finally, the invention also contemplates the provision of an inspection lamp which will be relatively simple and inexpensive to manufacture, compact in construction, easy to disassemble, repair and reassemble, and rugged and durable in use.

Other objects and advantages of the present invention will become apparent from a consideration of the following description, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a longitudinal cross-sectional view, with parts broken away, of an inspection lamp according to my invention;

Figure 2 is an overall view giving the general proportions of an inspection lamp according to my invention;

Figure 3 is a view of a supporting means at the blind end of an inspection lamp according to my invention; and

Figure 4 is a view similar to Figure 3 but showing a supporting means at the power source end of an inspection lamp according to my invention and showing the relationship of certain parts of the invention.

Referring now to the drawings in greater detail, I have shown an inspection lamp indicated generally at 1, comprising a hollow cylindrical casing 3 made up of a cylindrical sleeve 5 and a pair of opposite end caps 7, all of essentially non-conducting material. Casing 3 may for example be made of plastic; and that portion of casing 3 comprising sleeve 5 may be made of a transparent plastic such as methyl methacrylate polymerized to desirable hardness, or the like, thereby to provide a transparent section 9 intermediate the ends of casing 3 for the transmission of light from a fluorescent tube 11 disposed coaxially in casing 3 out of contact with the walls thereof. Tube 11 has a contact pin 13 at each end thereof extending axially outwardly from tube 11 and surrounded by an abutment shoulder provided by the remainder of the end of the tube, the pins 13 serving as the electrical contacts by which an electrical circuit is established through tube 11.

Supporting means are provided for tube 11, comprising a pair of cylindrical plugs 15 and 17 disposed in casing 3 adjacent opposite ends thereof and closing the ends of

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the casing. Plugs 15 and 17 have substantial axial extent and are formed from an elastic deformable material such as rubber or the like which will be readily displaceable but largely incompressible. Annular washers or plates 19, 21, 23 and 25 are disposed in pairs on opposite sides of plugs 15 and 17; and take-up bolts 27 having take-up nuts 29 on their outer ends pass through plugs 15 and 17 and their associated plates. Upon turning of nuts 29, the plates of a pair may be moved closer together, thereby displacing the material of the plug between the plates so that this material moves generally radially outwardly and presses firmly against the inside of casing 3. In this way, the plugs are secured firmly in the casing and the assembly of a take-up nut and bolt and its associated pair of plates is centered within the casing. Inasmuch as the plugs have substantial axial extent, displacement of the material of the plugs as aforesaid will result in the bolts 27 being brought into coaxial alignment with casing 3. It should be particularly noted that the plates are of substantially less diameter than their associated plugs, so that the assembly of the plates and nuts and bolts provides means for selectively lessening the axial extent of an axially central portion only of each plug.

Each bolt 27, adjacent its inner end toward tube 11, is provided with an annular abutment flange 31 which abuts against the tube side of plate 21 or 23. Inwardly of flanges 31 toward tube 11, each bolt 27 has a centering pin 33. It should be particularly noted, however, that pins 13 and 33 are spaced apart from each other. There is a coil compression spring 35 at each end of tube 11, in compression between an end of tube 11 and an abutment flange 31. Each spring 35 encircles a pin 13 and a pin 33. Casing 3, tube 11, pins 13, springs 35, pins 33, flanges 31, bolts 27, nuts 29, plugs 15 and 17, and plates 19, 21, 23, and 25 are all coaxial.

Plates 21 and 25, bolts 27 with their flanges 31 and centering pins 33, and springs 35 are all electrically conductive; and a pair of wires 37 and 39 are current carrying and complete the circuit through tube 11. Wire 37 has terminal connection with plate 21; and wire 39 has terminal connection with plate 25. In this manner, wires 37 and 39 are in electrical circuit with opposite ends of tube 11. Plug 15 is provided with a hole 41 therethrough disposed between plates 23, 25 and casing 3 and running longitudinally relative to casing 3. Wire 37 is trained through hole 41; and when plug 15 is compressed between its plates 23, 25, not only will the material of plug 15 be displaced firmly against the inside of casing 3, but also the material of plug 15 will squeeze wire 37 within hole 41 and thereby seal the wire in the hole against accidental displacement. Wires 37 and 39 are trained through a grommet disposed centrally in the circular disc of an end cap 7 at the power source end of the lamp. Thus, it will be noted that the end caps at both ends provide an additional closure for the lamp in case of failure of plug 15 or 17 and guard against accidental rotation of nuts 29, and that, in addition, end cap 7 at the power source end provides a protection for the connection of wire 39 with plate 25, the connection of wire 37 with plate 21 being protected between the plugs.

From all of the above, it will be apparent that an inspection lamp has been provided which is essentially vapor-proof, explosion-proof and shock-proof. Tube 11 is supported resiliently entirely on springs 35 and does not touch any other portion of the lamp. Hence, tube 11 has resilient support in all directions and can withstand the shocks which would shatter fluorescent elements as mounted heretofore.

Thus, it will be obvious that I have achieved all of the initially recited objects of my invention.

Although the present invention has been described in conjunction with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

I claim:

1. An inspection lamp comprising in combination a casing having a transparent section intermediate its ends, a fluorescent tube, means supporting said tube in said casing, said means comprising an elastic deformable plug closing each end of said casing, a plate disposed on each side of each said plug, a take-up bolt passing through each said plug and pair of associated plates and a take-up nut on the outer end of each said bolt for moving the plates of each pair closer together to displace the material of the plugs firmly against the inside of the casing to secure the plugs in place, and a coil compression spring at each end of said tube, each said spring being in compression between an end of said tube and said supporting means, said tube, springs and bolts being coaxial.

2. The invention of claim 1, the pair of plates associated with one said plug being of substantially less diameter than said one plug, said one plug having a hole therethrough disposed between its associated plates and the inside of said casing, and a pair of current carrying wires in electrical circuit with the opposite ends of said tube, one of said wires passing through said hole, whereby when the plates associated with said one plug are moved together, the displacement of the material of said one plug against the inside of said casing will seal said one wire in said hole.

3. The invention of claim 2, said plates, bolts and springs being electrically conductive, said one wire having terminal connection with the plate on the tube side of the other said plug, and the other said wire having terminal connection with the plate opposite the tube side of said one plug.

4. An inspection lamp comprising in combination a casing having a transparent section intermediate its ends, a fluorescent tube having an axial contact pin extending outwardly from each end thereof, means supporting said tube in said casing, said means comprising an elastic deformable plug closing each end of said casing, a plate disposed on each side of each said plug, a take-up bolt passing through each said plug and pair of associated plates and a take-up nut on the outer end of each said bolt for moving the plates of each pair closer together to displace the material of the plugs firmly against the inside of the casing to secure the plugs in place, each said bolt having an abutment flange abutting the tube side of its associated said plate on the tube side of its associated said plug, each said bolt having a centering pin extending inwardly from said abutment flange toward said tube, and a coil compression spring at each end of said tube, each said spring being in compression between an end of said tube and a said abutment flange, each said spring encircling a said contact pin and a said centering pin, said contact pins being spaced apart from said centering pins, and said tube, springs and bolts being coaxial.

5. The invention of claim 4, the pair of plates associated with one said plug being of substantially less diameter than said one plug, said one plug having a hole therethrough disposed between its associated plates and the inside of said casing, and a pair of current carrying wires

in electrical circuit with the opposite ends of said tube, one of said wires passing through said hole, whereby when the plates associated with said one plug are moved together, the displacement of the material of said one plug against the inside of said casing will seal said one wire in said hole.

6. The invention of claim 5, said plates, bolts and springs being electrically conductive, said one wire having terminal connection with the plate on the tube side of the other said plug, and the other said wire having terminal connection with the plate opposite the tube side of said one plug.

7. An inspection lamp comprising in combination a casing having a transparent section intermediate its ends, a fluorescent tube, means supporting said fluorescent tube in said casing, said means comprising an elastic deformable plug closing one end of said casing, a pair of plates of substantially less diameter than the diameter of said plug and disposed on either side of said plug, means for moving said plates toward each other, said plug having a hole therethrough disposed between said plates and said casing, and a pair of current carrying wires in electrical circuit with the opposite ends of said tube, one of said wires passing through said hole, whereby when said plates are moved toward each other said plates will displace the material of said plug firmly against the inside of said casing to secure said plug in place and to seal said one wire in said hole.

8. An inspection lamp comprising in combination a cylindrical casing having a transparent section intermediate its ends, a fluorescent tube, a cylindrical elastic deformable plug of substantial axial extent closing each end of said casing, means for selectively lessening said axial extent of an axially central portion only of each said plug thereby to displace the material of said plugs firmly against the inside of said casing to secure said plugs in place and to center said means in said casing, and a coil compression spring at each end of said tube, each said spring being in compression between an end of said tube and said means, the ends of said tube being spaced from said means, said springs providing the sole support of said tube on said means, and said casing, tube and springs being coaxial.

9. The invention of claim 8, one of said plugs having a hole therethrough disposed between its associated said means and the inside of said casing, and a pair of current carrying wires in electrical circuit with opposite ends of said tube, one of said wires passing through said hole, whereby when the axial extent of an axially central portion only of said one plug is lessened, the displacement of the material of said one plug against the inside of said casing will seal said one wire in said hole.

10. The invention of claim 8, said means and springs being electrically conductive, and a pair of current carrying wires having terminal connection with said means adjacent opposite ends of said tube.

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