July 2, 1957 H. BODEZ 2,798,149

ELECTRIC LAMP

Filed June 3, 1954 3 Sheets-Sheet 1

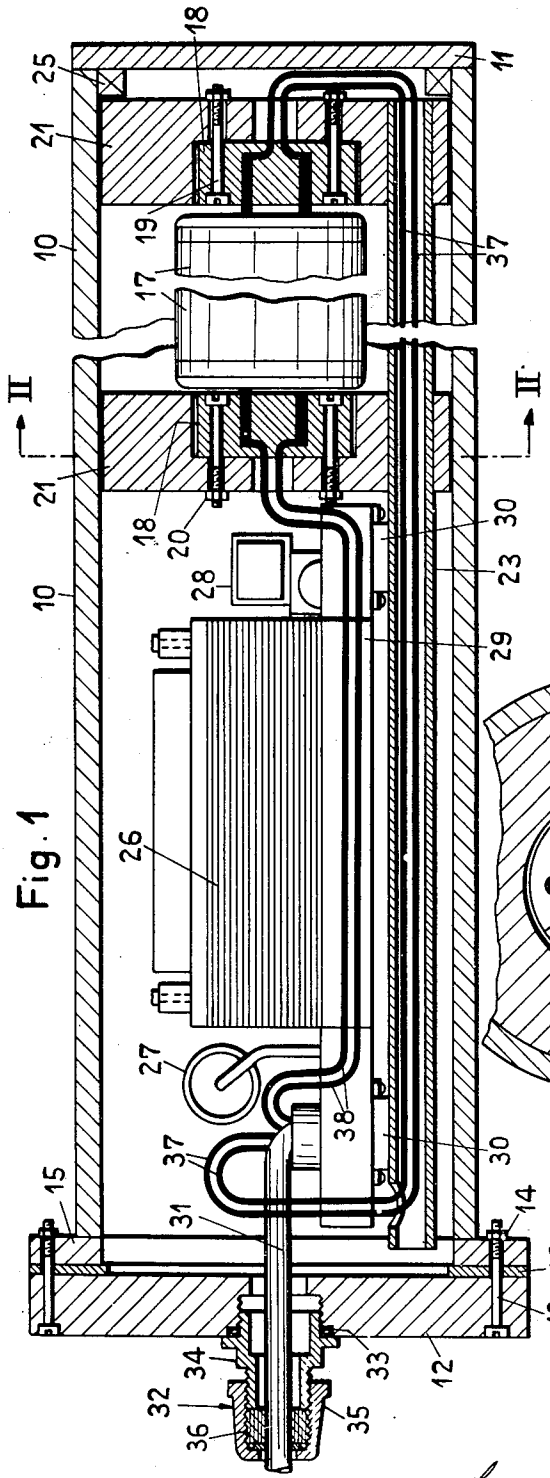


Fig. 1

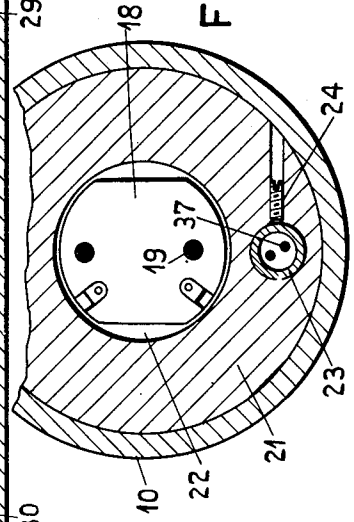


Fig. 2

Inventor:-
Henry Bodez,
by
Pierce, Scheffler & Parker,
Attorneys.

July 2, 1957 H. BODEZ 2,798,149

ELECTRIC LAMP

Filed June 3, 1954 3 Sheets-Sheet 2

Fig. 3

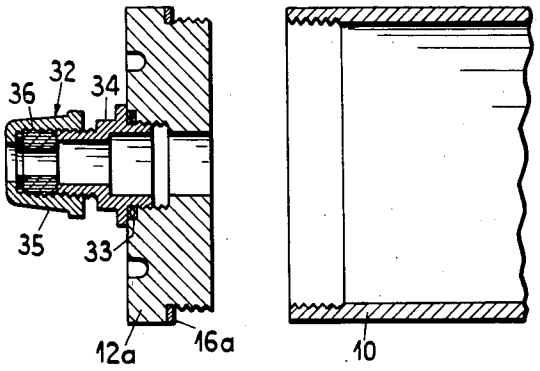
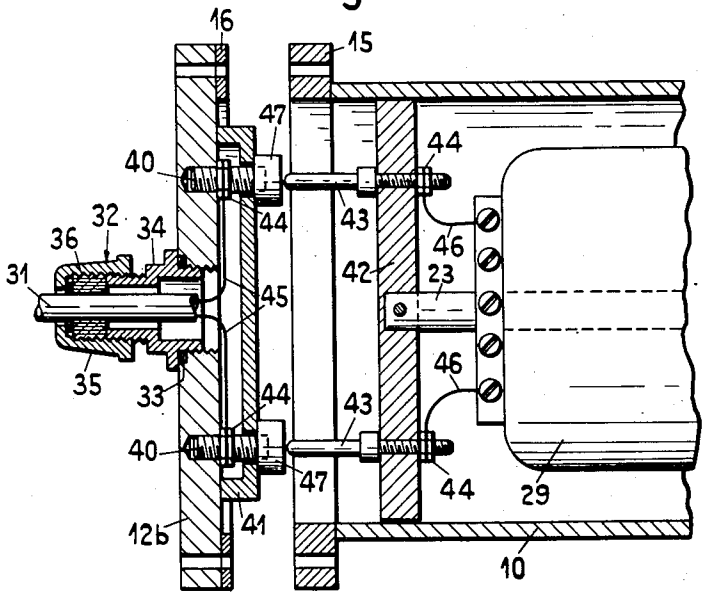


Fig. 4



Inventor:-

Henry Bodez,

by Pierce, Scheffler & Parker,

Attorneys.

July 2, 1957 H. BODEZ 2,798,149

ELECTRIC LAMP

Filed June 3, 1954 3 Sheets-Sheet 3

Fig.5

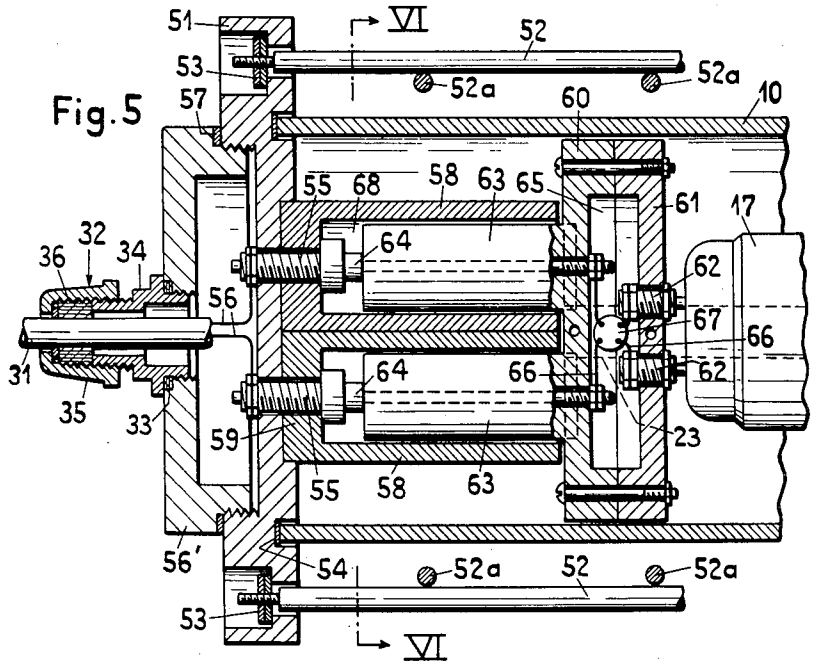
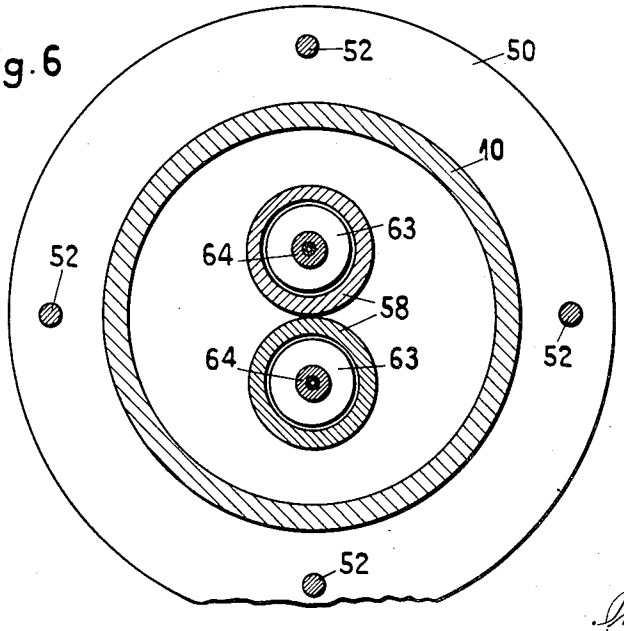


Fig.6



Inventor :-

Henry Bodez,

by Pierce, Scheffler & Parker,

Attorneys.

United States Patent Office

2,798,149

Patented July 2, 1957

2,798,149

ELECTRIC LAMP

Henry Bodez, Zurich, Switzerland

Application June 3, 1954, Serial No. 434,229

1 Claim. (Cl. 240—11.4)

Electric lamps made known so far and particularly intended for wet rooms may be divided into two groups, viz. such with a metallic casing usually serving as a reflector which is made watertight in front by a protective glass, and such with a metallic casing which is open in front. The first-named type involves the drawback that, within the closed casing condensed water may form which in time leads to destruction of the lamp by corrosion and rotting. In the second-named type of lamps the formation of condensed water is excluded, but the inside of the casing is exposed to dirt.

The present invention relates to a lamp particularly adapted for use in wet or damp rooms and in which the aforementioned shortcomings are obviated. The lamp according to the invention is essentially characterized in that it comprises at least one fluorescent tube with stabilizer and ignition in an air- and watertight casing of an insulating material transmitting light at least in part.

By the use of insulating material for the casing, temperature variations within the casing can be practically avoided so that formation of condensed water is excluded.

Further features of the invention will appear from the specification, claim and accompanying drawing which represents by way of example some preferred forms of embodiment incorporating the invention.

Fig. 1 shows a longitudinal section of fluorescent lamp;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1;

Figs. 3 and 4 are longitudinal sections through one end of a lamp of modified forms;

Fig. 5 is a longitudinal section through the connection end of a further modified form, and

Fig. 6 is a sectional view taken on the line VI—VI of Fig. 5.

The electric lamp as shown in Fig. 1 incorporates a casing formed of an insulating pipe 10 permeable to light and closed at both ends by end plates 11 and 12 of insulating material. The end plate 11 is at one extremity of the casing 10 undetachably secured, air- and watertight, by being for instance welded or cemented thereto. According to Fig. 1 the end plate 12 at the other end of the casing 10 is secured by screws 13 and nuts 14 to a flange ring 15 in turn welded or cemented to the respective front side of casing 10. Flange ring 15 and end plate 12 have a gasket 16 of elastic material, say rubber, interposed therebetween to provide an air- and watertight closure of the body. Instead of, according to Fig. 3, an end plate 12*a* may be provided which for quicker fitting is simply screwed through a gasket 16*a* into the casing 10 which is then provided with a female thread. The whole casing preferably consists of a translucent synthetic material, such as known under the registered trade name Plexiglas. This material has an extremely high insulating property against electricity and heat so as to practically exclude the formation of condensed water within the casing, because the air within it will be substantially kept at constant temperature.

Centrically arranged in the casing 10 is a fluorescent tube 17 engaging sockets 18 at both ends in known manner. These are each fixed by screws 19 and nuts 20 to a suitable socket carrier 21 supported on the inner wall of the casing 10. The socket carriers 21 include circular disks which in size conform to the inner diameter of the casing 10. They preferably consist of the same insulating material as the casing and are each provided with a cylindrical recess 22, wherein the socket 18 fits. Extending parallel to the fluorescent tube 17 is a tubular spacer bar 23 which passes through the two socket carriers 21. The latter are each detachably mounted on said bar 23 and secured against displacement by a set screw 24. One socket carrier 21 axially abuts on stops 25 of the casing. Located between the socket carrier at the other end of the fluorescent tube and the removable end plate 12 is the stabilizer with choker 26, condenser 27 and ignition device 28 commonly known as a starter necessary for operating the tube. These accessories are mounted on a base plate 29 screwed to cross-members 30 which in turn are rigidly united to the bar 23 by welding or soldering. The fluorescent tube with sockets, socket carriers and accessories consequently constitutes an assembly which, with end plate 12 removed, may be bodily inserted in or withdrawn from the casing 10.

A rubber-sheathed cable 31 for the supply of electric current is introduced watertight through a gland 32 into the casing of the lamp. Said gland 32 possesses a nipple 34 screwed through an elastic gasket 33 into the removable end plate 12 and has threaded thereon a locknut 35 which contains a packing pressed against the sheath of the cable 31. Two insulated electric conductors 37 are passed through the tubular bar 23 and lead to the socket 18 remote from the accessories, while two further insulated conductors 38 lead from the stabilizer direct to the other neighboring socket 18.

In order that the stabilizer and the ignition device cannot be seen through the translucent insulating pipe or casing 10, the latter may inside, within the region of these accessories be provided with an opaque film or layer (not shown) or else the casing 10 may consist of a material permeable to light, but not transparent.

To exclude the risk of shocks to men due to unskilled manipulation it is also possible to provide the removable closure of the casing as shown in Fig. 4. In this shockproof closure the end plate 12*b* has inside two pin sockets 40 screwed therein by which the flanged insulating disk 41 is at the same time attached thereto. In this case, in casing 10, at a certain distance from the flange ring 15, there is a disk 42 attached to the spacer bar 23 and which carries two plug pins 43. Both the sockets 40 as well as the pins 43 are fitted with double nuts 44 having electric conductors 45, 46 clamped therebetween and connecting these respectively to the cable 31 inserted through the gland 32 and to the base plate 29 which carries the accessories. Protective sleeves 47 of insulating material are arranged to prevent exposure of the sockets 40 and the risk of shocks to operators when the end plate 12*b* is removed with cable and sockets alive. To close the casing 10 the end plate 12*b* has to be screwed up with the flange ring 15 in the same way as described above by interposing a gasket 16.

According to a further feature of the invention, the lamp may also be provided so that it can not only be employed in wet or damp rooms, but also in those liable to the risk of explosion, i. e. such containing an explosive gas mixture. For this purpose the lamp should on the one hand be of greater strength, and on the other hand the electric conductors be removably connected to the

lamp so that, if any explosive gases should penetrate the open lamp, their ignition is impossible.

Such a form of embodiment is shown in Figs. 5 and 6, where the body **10** of the lamp includes two end plates **50** and **51** of translucent insulating material, whose diameter is greater than that of the pipe **10** (Fig. 6). At their flanges projecting beyond the periphery of the body or pipe, the end plates are inconnected by four tie-rods **52** of steel and secured by triangular double nuts **53**. The end plate **51** is thus pressed through a gasket **54** of brass asbestos towards the body or pipe **10**, while the end plate **50** is chemically welded thereto.

The end plate **51** has screwed therein two pin sockets **55** to which the electric leads **56** are connected. To protect these connecting points from contact with penetrating moisture or explosive gases, the end plate **51** has a protective cover **56'** screwed therein through an interposed gasket **57** of brass asbestos. The cable **31** for the supply of electric current is inserted through this protective cover by means of a gland **32** in the aforedescribed way.

Chemically welded to the inner surface of the end plate **51**, in side-by-side arrangement, are two parallel tubular sleeves **58** of insulating material and permeable to light, the bottoms **59** thereof being each traversed by a socket **55**. The flanged disks **60** and **61** incorporated in the body **10** are attached to the spacer tube **23**, of which one, **61**, is designed as socket carrier for the fluorescent tube **17** and carries screwed-in sockets **62** for the pins thereof. The other disk **60** has two round bars **63** of insulating material fitted therein and chemically welded thereto and which are inserted in the two tubular sleeves **58**, each of said bars carrying a plug pin **64** resiliently contacting and engaging the respective socket **55**. The pins **64** axially protrude through the respective round bars **63** and extend into the hollow space **65** constituted by two screwed-up disks **60**, **61**, thus forming a pressure chamber. Attached respectively to the ends of the pins **64** and to the sockets **62** are electric conductors **66** which are passed through an opening **67** in the spacer tube **23** and connected through the same with the stabilizer and starter (not shown) which in this form of embodiment are located at the opposite end of the body of the lamp.

When taking off the end piece **51** by removing the nuts **53** from the body, at the same time both round bars **63** will be withdrawn from the tubular sleeves **58** and the pins **64** from the sockets **55**. Incidentally a rupturing spark will set up in each of them in case of the lamp being alive. If an explosive gas has penetrated into the body **10**, it will be ignited by the spark. The explosion, however, will be confined to and is extinguished in the hollow space **68** acting as a pressure chamber since, after the pins **64** have got clear of the sockets, the round bars **63** are still contained by about half their length in the tubular sleeves **58**, whereby between these parts a clearance of about 0.2 mm. is provided so that an exit of the explosive gases into the body of the lamp is impossible.

Should, on the other hand, due to gradual slackening of the electric connections in the hollow space **65**, sparking with explosion occur, this will also be extinguished in the pressure chamber **65**.

The current-carrying parts of the lamp are therefore, besides being damp- and moisture-proof, protected threefold from the risk of explosion, viz. (first) by the screwed end piece **56** adapted to prevent dangerous gases from entering the body, and (second and third) by the pressure chambers **65** and **68** surrounding the points of connection.

The body of the lamp is protected from external mechanical actions by four steel bars **52** having spaced

parallel rings **52***a* welded thereto. The guard attached to the end pieces **50** and **51** is therefore at the same time immovable and secured against loosening.

As compared with the hitherto known lamps of the type, the aforedescribed fluorescent lamp has the following merits:

Within the air- and watertight body there will be no formation of condensed water, since, because of the insulating property of the casing, interiorly the temperature will be kept substantially constant. All essential elements of the lamp, such as tube **17**, sockets **18**, stabilizer **26**, **27** with starter together with the electric conductors **37** and **38** are therefore protected from injurious action of moisture and dirt. Also in electrical respects the insulation of the casing is so good as to exclude all danger of accidental shocks to men or animals. Special earthing may be dispensed with. The spacer bar **23** keeps the sockets **18** and socket carriers **21** so firm in relation to each other that any unwanted loosening of the fluorescent tube **17** therefrom due to vibrations during transport or action of heat is practically excluded.

A further advantage of the lamp according to Figs. 5 and 6 is seen in that it may be utilized in rooms where there is some risk of explosion, which merit need not be discussed in detail.

Alternatively, some forms of the lamp might be conceivable, in which two or more fluorescent tubes are arranged parallel within the insulating pipe or body **10**.

What I claim is:

In an electric lamp, particularly for use in moist and wet rooms, the combination comprising a cylindrical casing of light transmitting material, permanently closed at one end thereof by the same material and threaded at the opposite end thereof, such material being a synthetic such as Plexiglas or the like having a high degree of insulating ability against transfer therethrough of electricity or heat, a fluorescent lamp assembly comprising a pair of sockets for receiving the terminals at the opposite ends of a fluorescent light tube, longitudinally spaced cylindrically shaped carrier discs for said sockets, said socket carrier discs being slidable along and being supported by the wall of said casing, a tubular spacer bar to which said socket carrier discs and the sockets thereon are secured in longitudinally spaced relation, a tubular fluorescent lamp secured between said sockets, said spacer bar enclosing and serving as a duct to carry conductors extending to the socket for those end terminals of said light tube located adjacent the permanently closed end of said casing and stabilizer and starter units supported upon said spacer bar and connected in the lamp circuit, and a gasketed end plate of the same material as said casing for closing and sealing the threaded end of the latter after said fluorescent lamp assembly has been slidably inserted into said casing, said end plate being threaded for screw engagement with the threads provided on that end of said casing and being provided with an axial opening therethrough and packing gland cooperative with said opening for leading conductors through said end plate for connection to said lamp assembly.

References Cited in the file of this patent

UNITED STATES PATENTS

1,407,473	Murray	Feb. 21, 1922
2,347,174	Cross et al.	Apr. 25, 1944
2,382,538	Biller	Aug. 14, 1945
2,472,180	Tittle	June 7, 1949

FOREIGN PATENTS

640,250	France	Mar. 24, 1928
990,440	France	June 6, 1951