

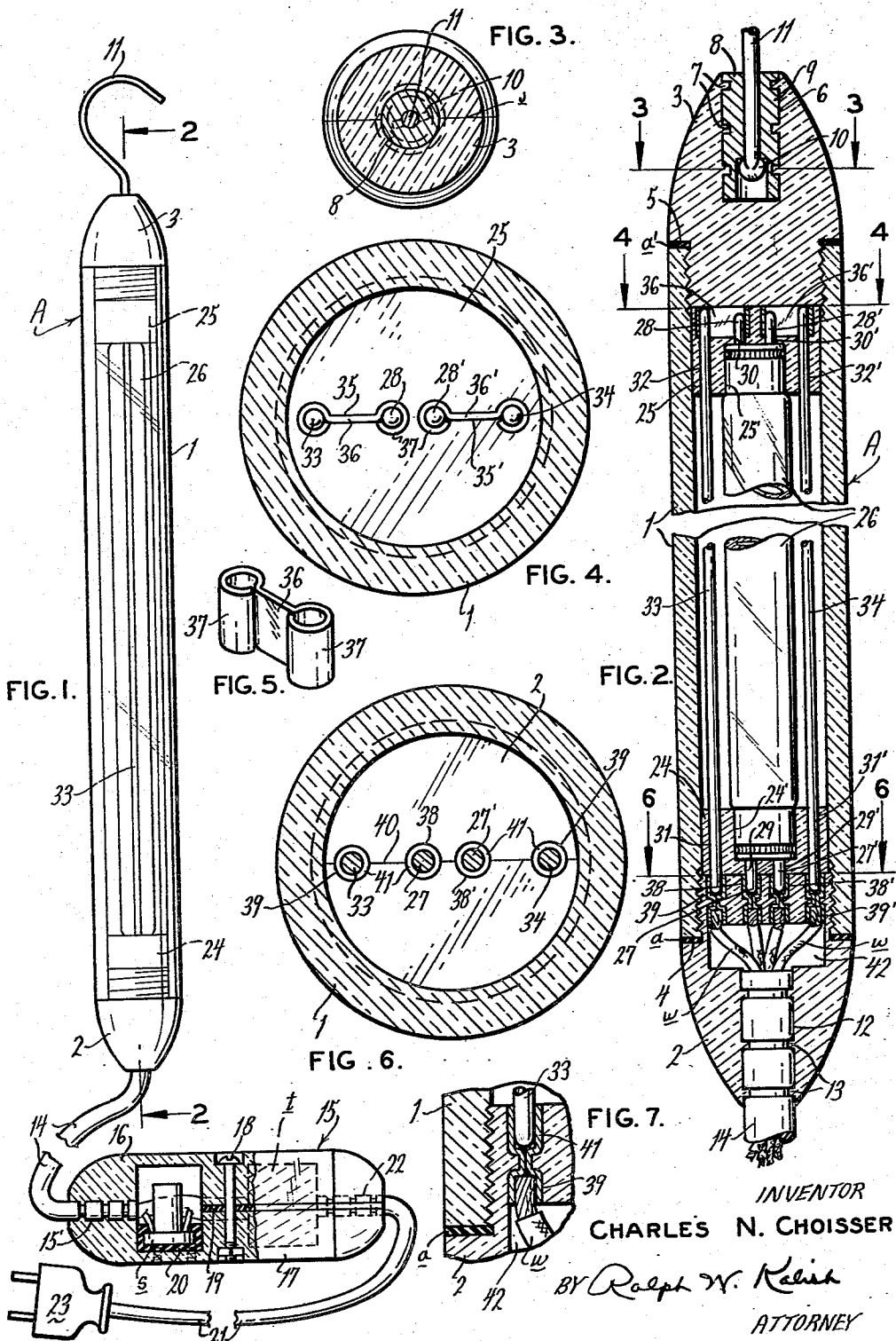
Aug. 21, 1956

C. N. CHOISSER

2,760,053

FLUORESCENT INSPECTION LAMPS

Filed March 6, 1953



1

2,760,053

FLUORESCENT INSPECTION LAMPS

Charles N. Choisser, St. Louis, Mo., assignor, by direct and mesne assignments, to C & I Lighting & Metals, Inc., St. Louis, Mo., a corporation of Missouri

Application March 6, 1953, Serial No. 340,816

3 Claims. (Cl. 240—11.4)

This invention relates in general to lamps and, more particularly, to a portable fluorescent inspection lamp.

It is an object of this invention to provide a fluorescent inspection lamp which is designed for convenient and effective use within relatively inaccessible or constricted spaces by mechanics, construction workers and the like; which lamp is adapted for suspension from any available point of support; and which emits light uniformly to an extent of 360° therearound.

It is another object of this invention to provide a fluorescent inspection lamp having a marked simplicity of parts whereby the lamp may be readily disassembled for replacement purposes and reassembled for operation by unskilled users.

It is a further object to provide a fluorescent inspection lamp having positioning means for maintaining the various components thereof in fixed, operative relation so that no unauthorized displacement of any part from operational position will result from accidental impact of the lamp on hard surfaces, as by dropping and the like.

It is a further object to provide a portable fluorescent lamp having the starter unit for the tube carried within a ballast box whereby any repair thereof may be effected without disassembly of the tube-containing portion of the lamp.

It is another object of this invention to provide a lamp of the character stated which when assembled is sealed against the inadvertent admission of water, air or gas whereby the lamp may be utilized in a gaseous atmosphere or under water without danger of explosion or short circuit.

A further object is to provide a lamp preferably substantially fabricated of a suitable plastic material which is durable, resistant to breakage, and adapted for machining; which is easily handled and contoured for passage of the lamp through small openings; and which allows the lamp to be economically manufactured and reliable in usage.

An additional object is to provide a portable lamp incorporating a ballast box within which a fluorescent tube starter unit is resiliently supported to avoid damage from accidental jarring.

With the above and other objects in view, my invention resides in the novel features of form, construction arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing:

Figure 1 is a side elevation of an inspection lamp constructed in accordance with and embodying the present invention, wherein the ballast box is shown as partly cut away.

Figure 2 is a transverse section taken along line 2—2 of Figure 1;

Figure 3 is a transverse section taken along line 3—3 of Figure 2;

Figure 4 is a transverse section taken along line 4—4 of Figure 2;

Figure 5 is an enlarged perspective view of a contact member;

2

Figure 6 is a transverse section taken along line 6—6 of Figure 2; and

Figure 7 is an enlarged fragmentary sectional view of one of the sockets.

Referring now to the drawing which illustrates a preferred embodiment of the present invention, A designates a portable inspection lamp incorporating an elongated, tubular housing or jacket 1 fabricated preferably of a translucent or transparent plastic material, such as Lucite, and the like, having high resistance to breakage and adapted for machining. At each of its ends housing 1 is internally threaded for removable engagement thereto of the externally threaded, diametrically reduced inner ends of closures 2, 3, also of transparent plastic material, such as that of housing 1, and having generally conically-shaped outer portions with a base of slightly increased diameter to provide annular shoulders 4, 5, respectively, for tight sealing disposition against the adjacent end surfaces of housing 1, between which gaskets *a*, *a'*, are placed, whereby housing 1 is rendered airtight and watertight.

Closure 3 is provided with a central passage 6 opening at its outer end and terminating substantially centrally of closure 3; said passage 6 containing a series of inwardly directed, annular protuberances or corrugations 7 and receives a metallic bushing 8 provided with a corresponding series of outwardly projecting, annular protuberances 9 for fitted disposition between protuberances 7 of passage 6 whereby longitudinal displacement of bushing 8 is prevented. Held within bushing 8 by a transverse member 10 is the inner end of a hook 11 for suspension of lamp A from any convenient point of support.

Closure 2 is similarly provided with a central passage 12, having a series of protuberances 13, for extension therein of a four-wire, flexible extension cord 14, which is securely maintained therein by the compressive force of protuberances 13. The engagement of cord 14 within passage 12 completely closes said passage against the entrance of gas, water and the like. Thus, lamp A may be used in compartments filled with gas or water without danger of short-circuiting the lamp or exploding the gas therein. At its outer or other end extension cord 14 is received within a ballast box 15, passing through a corrugated end opening 15' therein whereby same is grippingly held; said box 15 may also be made of plastic material as housing 1 and comprises a pair of symmetrical cast sections 16, 17, secured together by a plurality of bolts 18 and having a gasket 19 interposed between abutting surfaces for making said box 15 air and water proof. Within box 15 there is disposed the customary starter unit *s* for fluorescent tubes and a transformer *t*; starter unit *s* is supported on a resilient mounting 20 to protect same against breakage should box 15 be dropped or subjected to jarring and the like. Two of the leads in cord 14 are connected to starter unit *s* while one of the remaining two leads is connected to transformer *t* and said two remaining leads are carried outwardly of ballast box 15 within a connection cord 21 which passes through a transversely corrugated opening 22, and at its outer end is provided with an end plug 23 for engagement to any suitable electrical outlet, such as a wall socket. The combined length of cords 14 and 21 is relatively great so that lamp may be conveniently used at points remote from a source of electricity; and the flexibility of said cords allows the lamp, when not in use, to be compacted into a small, easily-handled parcel for storage or transportation.

The inner end faces of closures 2, 3, are flat for flush, surfacewise contact with annular positioning members 24, 25, respectively, disposed within housing 1 adjacent its threaded end portions. Each positioning member 24, 25, is centrally recessed as at 24', 25', respectively, on their

confronting or inner faces for fitted projection therein of the capped ends of an elongated, relatively narrow, gas-filled fluorescent tube or lamp 26 capable of diffusing light uniformly in all directions therearound without glare. Extending from each capped end of tube 26 is a pair of the usual terminals or base pins 27, 27', and 28, 28', which are respectively received within paired openings 29, 29', and 30, 30', in positioning members 24, 25, respectively, and communicating with recesses 24', 25', respectively, through the base portions thereof. Outwardly of, and diametrically aligned with, openings 29, 29', and 30, 30', are openings 31, 31', and 32, 32', respectively, which extend from face to face of said members 24, 25, respectively, for insertion therein of the ends of electrodes or conductor rods 33, 34; positioning member 24 being of such thickness as to permit the ends of electrodes 33, 34, and tube terminals 27, 27', received therein to project beyond its outer face for reasons presently appearing. The opening 31, 31', in positioning member 24 are respectively axially aligned with openings 32, 32', in positioning member 25. Thus, electrodes 33, 34, are held by positioning members 24, 25, in spaced, axially parallel relation to tube 26 and on opposite sides thereof. At their outer ends each opening 30, 30', in positioning member 25 is enlarged and is in respective communication with the adjacent openings 32, 32', through a narrow, radially extending opening 35, 35', respectively, within each of which is disposed a thin, flat sheet-like contact member 36, 36', respectively, fabricated of electrically conductive metal, such as copper and the like, having their ends bent to form sockets as at 37 for the terminals 28, 28', and adjacent ends of electrodes 33, 34, whereby a positive conducting path is created therebetween.

Closure 2 is provided with a central and an outer pair of sockets 38, 38', and 39, 39', which are respectively aligned with openings 29, 29', and 31, 31', in positioning member 24, and are each constricted intermediate their length as at 40 for lockingly engaging a metallic, electrically conductive bushing 41 therein. At their inward end each bushing 41 has soldered or otherwise fused thereto one of the four wires *w* carried by cord 14 which progress to their related bushing through an enlarged opening 42 within closure 2 and communicating with passage 12. The projecting ends of terminals 27, 27', and the adjacent ends of electrodes 33, 34, are received within the bushing-clad openings 38, 38', and 39, 39', respectively, and are hence in circuit-closing position, whereby the circuit through lamp A is completed so that upon connecting plug 23 to an electrical outlet current will flow through lamp A with consequent luminescence of tube 26.

It is recognized that starter unit *s* is required to initiate operation of lamp A by heating of the filaments customarily disposed at opposite ends of the tube to support the arc struck thereacross for producing the usual fluorescent tube illumination.

The circuit utilized in lamp A is conventional wherein the leads from starter unit *s* are respectively connected to sockets 38 and 39 and the two main leads carried by connection cord 21 are respectively in circuit with sockets 38', and 39'. Thus, lamp A does not involve any complicated, breakable switch structure since the circuit is permanently closed and lamp A will be illuminated whenever plug 23 is engaged to a source of electricity.

In the event it is necessary to replace tube 26, the disassembly of lamp A is a relatively simple and easily accomplished procedure: Closure 2 is loosened and removed whereby tube 26, electrodes 33, 34, and positioning members 24, 25, are withdrawn as a unit from housing 1. Tube 26 and electrodes 33, 34, are then disengaged from closure 2 and positioning member 24 is removed; tube 26 is then pulled from engagement of its terminals in positioning member 25. Another tube 26 is engaged within positioning member 25 and positioning member 24 is then returned to disposition upon the ends of electrodes 33, 34, and new tube 26. Lamp A is readily

reassembled or re-lamped, by insertion of the protruding ends of terminals 27, 27', and the adjacent ends of electrodes 33, 34, in sockets 38, 38', 39, 39', in closure 2, and the tube assembly is then re-introduced into housing 1 and closure 2 is threaded into closed position whereupon lamp A is ready for use.

Thus, the disassembly and reassembly may be effected in a minimum amount of time by the average unskilled user, with absolute certainty that lamp A will be in operative position upon such reassembly. It is, of course, obvious that either terminal 27, 27', may be received within opening 38, or 38', and similarly the ends of either electrode 33, 34, may be received in opening 39, or 39', with consequent effective operation of lamp A, so that the re-lamping procedure does not involve any tedious realignment and pairing.

Positioning members 24, 25, assure the maintenance of proper alignment and desired spatial relation of tube 26 and electrodes 33, 34, while the abutment of closures 2, 3, against the outer faces of said members 24, 25, prevents any untoward longitudinal displacement of tube 26 or electrodes 33, 34, with the same being thereby retained at all times in circuit-forming position. Thus, closures 2, 3, and positioning members 24, 25, coact to hold the lamp components in assembled relation despite any accidental dropping of lamp A on a hard surface or impact thereof with rigid objects, such as machinery and the like, or any vibration or jarring, as often occurs during usage. The material of which the various lamp parts are made is resistant to breakage whereby lamp A is durable and reliable regardless of the conditions to which it may be subjected during use.

As stated above, closures 2, 3, sealingly engage the housing ends to create watertight and vaportight joints and sections 16, 17, of ballast box 15 are likewise securable to adapt lamp A for equally effective operation under water or in gas-filled chambers without any damaging results.

Section 16, 17, of ballast box 15 are readily disengageable to permit access to the interior thereof should inspection of the transformer *t* or starter unit *s* be indicated. The shock-absorbing mounting for starter unit *s* preserves same against inoperativeness through damage to its breaker point which normally results from jarring and the like. The ends of ballast box 15 are rounded so that the same will not detainingly abut any sharp corners of machinery and the like and hence will flow therearound.

The closures 2, 3, are each composed of a pair of symmetrical molded portions fusibly joined by a suitable agent along a longitudinal joint line indicated at *j* in the drawing. In the manufacture of lamps A bushings 8 and 41 are placed within the hemispherical portions in one of the symmetrical halves of closures 2, 3, which cooperate to form the various openings, and the other symmetrical half is then joined to the one holding the bushings so that the various bushings are held fast and permanently against accidental removal from their associated openings as a result of any pulling force developed by the insertion and removal of the members received therein.

It is to be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the fluorescent inspection lamp may be made and substituted for those herein shown and described without departing from the nature and principle of the present invention.

What we claim and desire to secure by Letters Patent is:

1. An inspection lamp comprising a hollow cylindrical light-transmitting housing, a closure for removable engagement to one end of said housing, first and second cylindrical positioning members disposed in said housing and at opposite ends thereof, said second positioning member abutting on its outer face against the inner face

5

of said closure, a fluorescent tube having a pair of terminals projecting from each of its ends, a pair of elongated electrodes, said first and second positioning members each having first and second pairs of openings for projection therethrough of the terminals at the adjacent end of said tube and the adjacent ends of said electrodes, said first positioning member having on its outer face a pair of radial slot-like openings each for communicating an opening of said first pair with the adjacent opening of said second pair, a rigid conductor member disposed in each slot-like opening and engaged at its ends to the projecting portions of the related terminals and electrode ends to form a conductive path therebetween.

2. An inspection lamp as described in claim 1 wherein each conductor member has a relatively thin sheet-like central portion and collar-forming sockets at each of its ends for extension therethrough of the projecting ends of the terminals and electrode ends.

3. An inspection lamp comprising a hollow cylindrical light-transmitting housing, first and second closures for removable securement on opposite ends of said housing to render same vapor and liquid tight, first and second cylindrically shaped positioning members disposed within said housing and respectively abutting on their outward faces against the inner faces of said first and second closures, a fluorescent tube disposed in said housing, a pair of rod-like electrodes within said housing in axial parallel relation to said tube and on opposite sides thereof, said tube having a pair of terminals projecting from each end face thereof, said first and second positioning members each having a relatively large central recess opening on their inner face for receiving the end portions of said tube, said first and second positioning

6

members each further having a first pair of openings communicating with the respective recess in the base thereof for extension therethrough of the associated terminals, said first and second positioning members also having a second pair of openings outwardly of said recess and said first pair of openings for receiving the ends of said electrodes for maintaining said tube and electrodes in desired spatial relationship, said second closure having a socket aligned with each opening in said second positioning member for reception of the projecting portions of the terminals and electrodes, each of said sockets being lined with electrically conductive material, an electric lead connected to the conductive lining in each of said sockets and passing outwardly through a common passage provided in said second closure, said first positioning member having on its outer face a pair of radial slot-like openings, each for communicating an opening of said first pair with the adjacent opening of said second pair, a rigid conductor member disposed in each slot-like opening and engaged at its ends to the projecting portions of the relating terminals and electrode ends to form a conductive path therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

1,180,797	Rees	Apr. 25, 1916
1,407,473	Murray	Feb. 21, 1922
1,982,501	Douglas	Nov. 27, 1934
2,336,750	Roney et al.	Dec. 14, 1943
2,347,174	Cross et al.	Apr. 25, 1944
2,464,373	Boucher et al.	Mar. 15, 1949
2,472,180	Tittle	June 7, 1949
2,691,092	McConnell	Oct. 5, 1954