

May 3, 1966

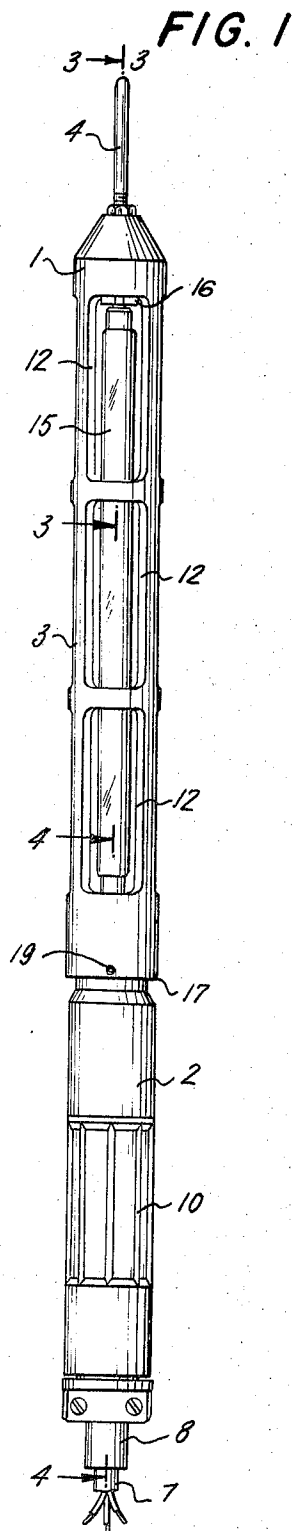
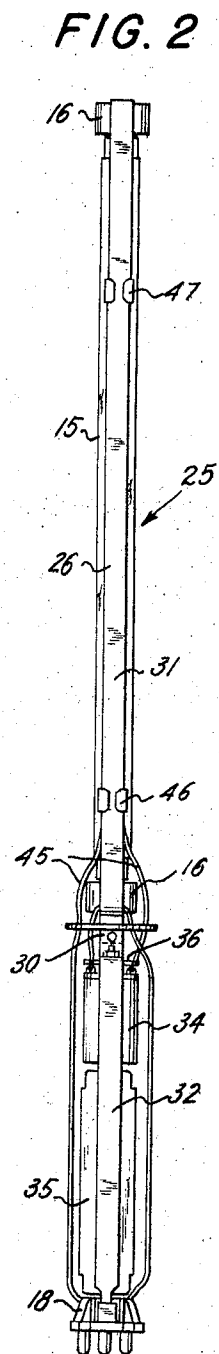
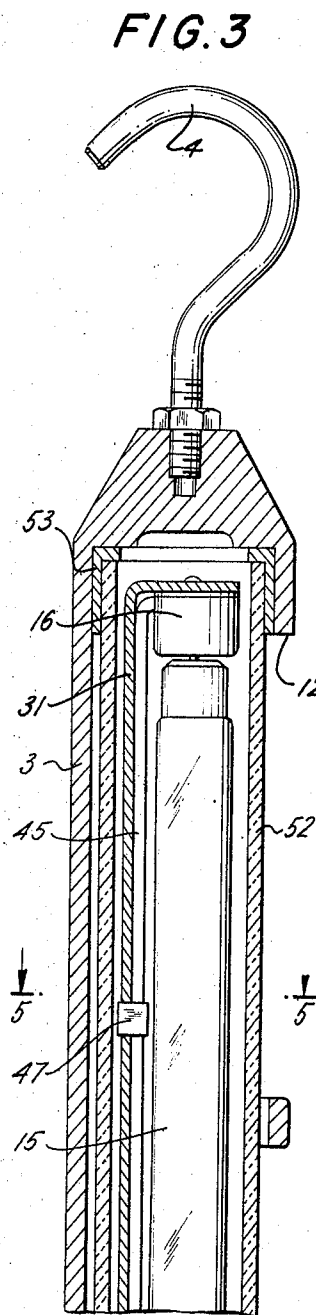
P. C. HAAS

3,249,749

PORTABLE LAMP STRUCTURE

Filed Aug. 12, 1963

2 Sheets-Sheet 1



INVENTOR
PAUL C. HAAS

BY

Kane, Dalsimer and Kane
ATTORNEYS

May 3, 1966

P. C. HAAS

3,249,749

PORTABLE LAMP STRUCTURE

Filed Aug. 12, 1963

2 Sheets-Sheet 2

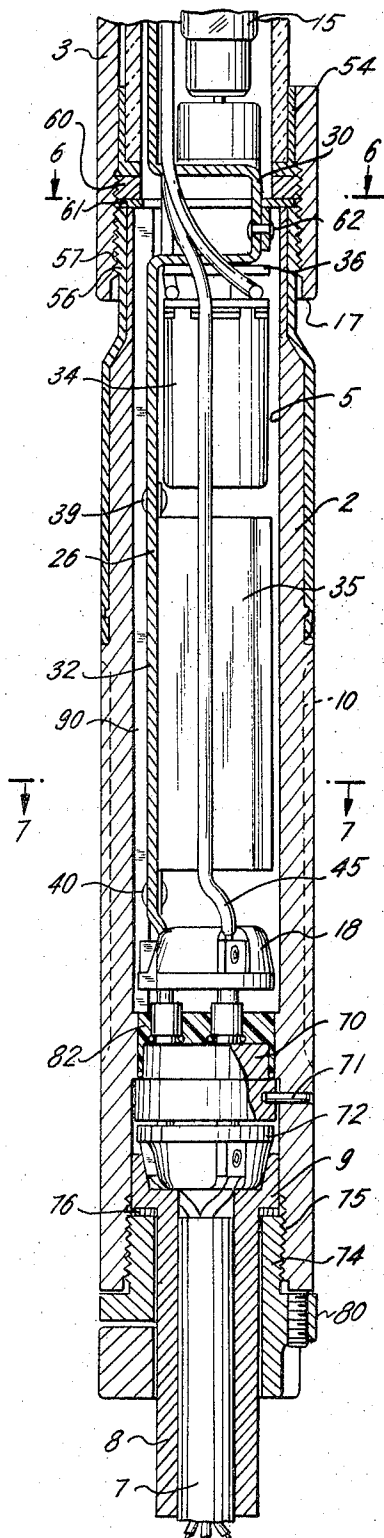


FIG. 4

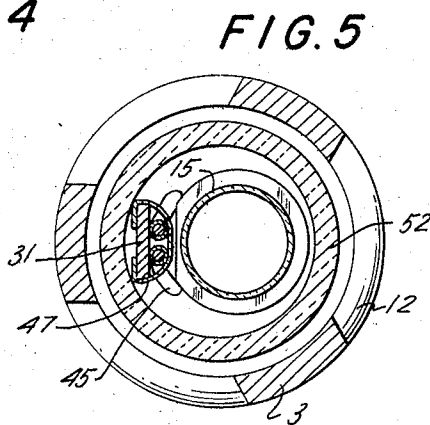


FIG. 5

FIG. 6

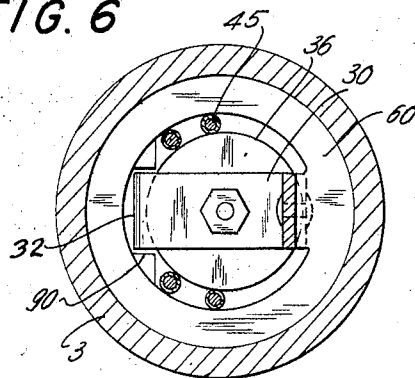
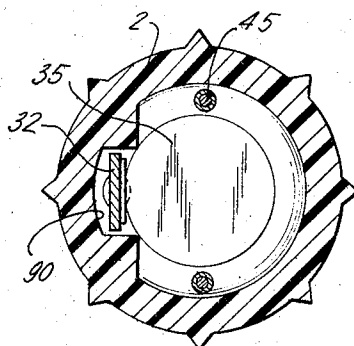


FIG. 7



INVENTOR.
PAUL C. HAAS

BY

Kane, Dalsimer and Kane
ATTORNEYS

1

3,249,749

PORTABLE LAMP STRUCTURE

Paul C. Haas, Mendon, Mich., assignor to Stewart R. Browne Mfg. Co., Inc., New York, N.Y., a corporation of New York

Filed Aug. 12, 1963, Ser. No. 301,558

9 Claims. (Cl. 240—11.4)

This invention relates to a portable lamp structure of the kind often used in heavy industry under circumstances where it is imperative that the lamp be explosion-proof. In particular, the invention relates to a lamp preferably of the fluorescent type encased in an elongated protective shield and in which all electrical contacts are sealed from the entry of outside gases that might cause explosion.

There has, in the past, been a need for a portable work lamp utilizing elongated bulbs, such as fluorescent bulbs, which will meet the requirements of various regulatory agencies and be explosion-proof and otherwise safe for use. This necessitates that the unit be of effective unitary construction, that it be protected throughout, that there be no access for admittance of gases through any portion of the electrical unit, and that the unit be able to be disassembled and reassembled readily for repairs or replacement of bulbs without any reduction in its safety factors.

Accordingly, the object of this invention is to provide an explosion-proof portable lamp which will meet the requirements of the various regulatory agencies, and, in particular, one in which access of external gases is held to a minimum. This means that the maximum clearance to the outside atmosphere of any joint be no greater than $\frac{1}{1000}$ of an inch.

A further object of this invention is to produce such a lamp having a unitary construction protecting it against breakage.

A further object of this invention is to produce such a lamp which may be readily assembled and disassembled for repair or replacement of bulbs, and in the reassembly of which even by the most careless workman the unit will remain safe and explosion-proof.

It is a further object of this invention to so design such unit that the assembly may be readily accomplished through various keying structures.

It is a further object of this invention to provide such an assembly that may be readily manufactured and be relatively inexpensive in price.

These and other objects of the invention are accomplished by the utilization of an internal frame structure in addition to the outer shell. This internal frame structure, of an elongated nature, serves to support a lamp, a starter, ballast, and the various connections therefor. The internal structure is keyed to fit within the outer supporting structure so that the entire unit may be readily assembled and protected against the outer atmosphere. The outer structure, preferably is a two-piece construction including a hollow handle that serves to support and protect the electrical network and to connect it to an outside source of electricity. The remaining outer structure consists of a protective shield surrounding the bulb and rigidly secured to the handle in axial alignment therewith.

Details of the invention and preferred design are shown in the accompanying drawings in which:

FIG. 1 is a view of the assembled structure from one side;

FIG. 2 is a view of the back of the internal frame structure and related electrical units;

FIGS. 3 and 4 together are a longitudinal section of the lamp showing both the outer and inner structures;

2

FIG. 5 is a section taken along lines 5—5 of FIG. 3; FIG. 6 is a section taken along lines 6—6 of FIG. 4; and

FIG. 7 is a section taken on lines 7—7 of FIG. 4.

FIG. 1 of the drawings shows the external unitary structure of my invention and a portion of the internal structure. The portable lamp 1 includes a supporting hollow handle portion 2 secured to a tubular protective shield or guard 3. Secured to the upper end of guard 3 is a hook 4 adapted to hold the lamp in position for use. Handle 2 is made of non-conducting material and has an internal bore 5 for receiving the internal frame structure below described. Electrical leads 7 enter the handle at its outer end and may, if desired, include a ground wire. The leads are secured against entry of the outer atmosphere by bushing 8 having inner shoulder 9 (FIG. 4). For ease and secure gripping of the handle 2 the outer surface of the handle may be knurled or otherwise indented as at 10.

Protective shield 3 has openings 12 therein permitting exposure of the enclosed lamp 15. In FIG. 1 portions of this lamp 15 and portions of the electrical connections 16 may be seen through the openings 12. Protective shield 3 is secured to the hollow handle 2 by a threaded connection located at point 17 in FIG. 1. If desired, it may be locked in position with set screw 19. This provides a rigid connection which makes the outer unitary structure act as a single unit.

Adapted to fit within bore 5 of handle 2 and protective shield 3 is an internal unitary structure 25, as shown in FIG. 2. This structure includes a frame 26 which extends almost the entire length of the unit from the top electrical connection 16 to, at the other end, a male socket 18. Frame 26 is preferably made of metallic or other material of sufficient strength to provide over-all rigidity to the internal structure. For purposes to be later described, frame 26 includes slightly below its midpoint and at the base of lamp 15 a reversed bend 30, best shown in FIG. 4. Bend 30 divides frame 26 into an upper portion 31 and a lower portion 32. Secured to upper portion 31 are electrical sockets 16 adapted to receive lamp 15.

Secured to lower frame portion 32 is starter 34 and ballast 35. Starter 34 is secured to frame portion 32 by starter socket 36 secured to the lower portion of the reverse bend 30. Comparably, ballast 35 is secured to frame portion 32 by ballast mounting rivets 39 and 40 shown in FIG. 4. Socket or lampholder contact pin holder 18 is also secured to frame portion 32 by rivet 40.

Electrical leads, represented generally by the numeral 45, connect socket 18, ballast 35, starter 34, and lamp 15 in the usual manner. These leads are secured against movement relative to the frame 26 by clips 46 and 47. Preferably the lamp 15 used in the circuitry of this invention is a customary elongated fluorescent type. If desired, of course, other types of lamps may be used with comparable modifications in the electrical circuitry.

As shown in FIG. 3, there is a transparent globe 52 surrounding the lamp 15 and positioned within protective guard 3. This globe, which may be made of glass, plastic or other desired material, fits into the upper portion of protective shield 3 and is sealed with ferrule 53. Its lower end also fits within cage 3 and is likewise held by flame retarding ferrule 54 shown in FIG. 4.

The external unitary structure as previously referred to is made up of handle portion 2 and protective shield 3 threaded together at point 17. In the preferred embodiment the upper portion of the outer surface of handle 2 is threaded at 56 and the lower internal portion of shield 3 is threaded at 57. As shown in FIG. 4, these may be interengaged to create a unitary external structure carrying the inner electrical structure. As the units

3

are threaded together there is inserted a globe retaining nut 60 and a circular grounding washer or sealing ring 61. Grounding washer 61 is pivoted to bend 30 at pivot 62 so that it is self-adjusting for maximum contact with retaining nut 60 as threads 56 and 27 are drawn together. Openings in sealing ring 61 permit passage therethrough of frame 26 and wires 45.

Mounted in the lower portion of handle 2 is connector 70. It is secured against rotation by pin 71 passing through handle 2. Connector 70 is a double female type adapted to receive at its upper end the pins of socket 18 and at its lower end to connect with input lead 7. These leads 7 normally are connected from a source of external voltage through bushing 8 to connector 72 which in turn is connected to connector 70. Lead 7 and bushing 8 are secured to the lower end of handle 2 by bushing 74 threaded to internal threads 75 of bore 5 of handle 2; and preferably a lock washer 76 is inserted between bushings 74 and shoulder 9 at the upper end of bushing 8. Retaining screw 80 holds the unit in place.

The input connections are sealed against passage of the outside atmosphere by means of epoxy resin 82 which positions pin connector 70 within the bore of handle 2 and by means of the lock washer 76 and shoulder 9 of bushing 8.

Preferably, as previously mentioned, there is an additional seal 60 at the threaded junction of handle 2 of shield 3; and there are flame retarding ferrules 53 and 54 at each end of globe 52. Thus as assembled the unit is airtight and satisfies regulations for explosion-proof lamps.

The internal bore 5 of handle 2 contains, along one side thereof, an internal groove or key slot 90, shown in FIGS. 4 and 7. Slot 90 is adapted to receive and position lower portion 32 of frame 26. Slot 90 is positioned relative to connectors 70 and connector 18 is positioned relative to frame portion 32 such that the pins of the connector 18 are aligned with the openings of connector 70 to connect the electrical circuitry to the outside power source. The key relationship between slot 90 and frame portion 32 also serves to prevent rotational movement of the internal structure and external structure relative to one another once the unit is assembled. This, of course, adds to the integrity of the unit and to its safety.

An explosion-proof on/off switch, not shown, may be provided along lead 7 outside handle 2.

Thus, it may be seen that I have provided a lamp structure made up of two integral parts, first, an external protective structure and second, an internal electrical structure. These are fixed against movement relative to one another; and the external structure is secured against gas leakage and protects the internal structure. The lamp may be readily disassembled by unscrewing the protective shield 3 from handle 2 and sliding that entire internal electrical structure mounted on frame 26 out of the bore of handle 2. A slight pressure will release the connection between socket 18 and connector 70. By removal of internal frame unit 26 from bore 5 the ballast or starter units may readily be replaced if desired. The lamp 15 itself may be replaced simply by removal of the protective shield 3 without further removal of the entire internal structure from the handle. Replacement of the protective shield 3 and securing it to handle 2, as above described, once again assembles the unit. The pivoted action of grounding washer 61 pressing against the base of ferrule 64 at time of closure enhances the integrity of the seal obtained.

As is readily apparent, other and further modifications of my invention may be made by those skilled in the art without departing from the spirit of the invention as set forth in the accompany claims.

I claim:

1. An explosion-proof portable lamp structure including an external unitary structure and a removable internal unitary structure positioned within said external structure, said external structure including a handle hav-

4

ing a bore therein and an elongated protective element to receive a lamp, said protective element including a shield having openings therein and a transparent globe positioned within said shield, said shield and said handle being secured together in axial alignment against relative movement, said internal structure including an elongated frame member which is positioned partially within said shield and partially within the bore and adapted to receive an electrical lamp and associated circuitry, electrical contact means mounted at one end of the frame member for operative association with said lamp, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, and said first and said second electrical means being connected when said frame member is positioned within said bore.

2. An explosion-proof portable lamp structure including an external unitary structure and a removable internal unitary structure positioned within said external structure, said external structure including a handle having a bore therein and a protective element to receive a lamp, said protective element including a shield having openings therein and a transparent globe positioned within said shield, said shield and said handle being secured together against relative movement, said internal structure including an elongated frame member adapted to receive an electrical lamp and associated circuitry, a key slot within the bore of said handle adapted to receive a portion of said frame member, electrical contact means mounted at one end of the frame member for operative association with said lamp, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, and said first and second electrical means being in connecting alignment when said frame member is within the said key slot.

3. An explosion-proof portable lamp structure including an external unitary structure and a removable internal unitary structure positioned within said external structure, said external structure including a handle having a bore therein and a protective element to receive a lamp, said protective element including a shield having openings therein and a transparent globe positioned within said shield, said shield and said handle being secured together against relative movement, said internal structure including an elongated frame member adapted to receive an electrical lamp and associated circuitry, means within the bore of said handle adapted to receive and align a portion of said frame member, electrical contact means mounted at one end of the frame member for operative association with said lamp, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, and said first and said second electrical means being in connecting alignment when said frame member is aligned within said handle.

4. An explosion-proof portable lamp structure including an external unitary structure and a removable internal unitary structure positioned within said external structure, said external structure including a handle having a bore therein and a protective element to receive a lamp, said protective element including a shield having openings therein and a transparent globe positioned within said shield and sealed thereto to prevent leakage of gas therebetween, said shield and said handle being secured together in axial alignment against relative movement, said internal structure including an elongated frame member carrying a fluorescent lamp and associated circuitry, a ground washer pivoted on said frame member to bear against said globe sealing means when said shield and said handle are secured together, a key slot on the surface of the bore of said handle adapted to receive a portion of said frame member, electrical contact means mounted at one end of the frame member for operative association with said lamp, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, and said first and said sec-

5

ond electrical means being in connecting alignment when said frame member is within said key slot.

5. An explosion-proof portable lamp structure including an external unitary structure and a removable internal unitary structure positioned within said external structure, said external structure including a handle having a bore therein and a protective element to receive a lamp, said protective element including a shield having openings therein and a transparent globe positioned within said shield and sealed thereto to prevent leakage of gas therebetween, said shield and said handle being secured together in axial alignment against relative movement, said internal structure including an elongated frame member carrying a fluorescent lamp and associated circuitry, a grounding washer pivoted on said frame member to bear against said globe sealing means when said shield and said handle are secured together, means within the bore of said handle adapted to receive and align the portion of said frame member for operative association with said lamp, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, and said first and said second electrical means being in connecting alignment when said frame member is aligned within said handle.

6. A portable lamp including an elongated frame member, a lamp secured to said frame member, first electrical connecting means associated with said lamp and secured to one end of said frame member, a handle having a bore therethrough adapted to receive the portion of said frame member carrying said electrical connecting means, second electrical connecting means positioned in said bore, keying means within said bore to interengage said first and said second electrical connecting means, and a tubular shield positioned around said lamp and said frame to protect same, said shield being rigidly secured to said handle in axial alignment therewith.

7. A portable lamp structure including an elongated frame member adapted to receive a circuit, said circuit including an elongated fluorescent lamp, a starter and a ballast, said lamp, said starter and said ballast being mounted on said frame member in operative electrical relationship, first electrical connecting means operatively associated with said circuit and secured to one end of said frame, a handle having a bore therethrough and receiving that portion of said frame carrying said starter, said ballast and said first electrical connecting means, a second electrical connection positioned in said handle adjacent the outer end thereof, keying means within said bore removably positioning said frame within said bore to engage said first and said second electrical connecting

6

means, and a tubular shield positioned above said lamp to protect same and rigidly secured to said handle.

8. A portable lamp structure including an elongated frame member adapted to receive a circuit, said circuit including an elongated fluorescent lamp, a starter and a ballast, said lamp, said starter and said ballast being mounted on said frame member in operative electrical relationship, first electrical connecting means operatively associated with said circuit and secured to one end of said frame, a handle having a bore therethrough and receiving that portion of said frame carrying said starter, said ballast and said first electrical connecting means, a second electrical connection positioned in said handle adjacent the outer end thereof, keying means within said bore removably positioning said frame within said bore to engage said first and said second electrical connecting means, a tubular shield positioned above said lamp to protect same and rigidly secured to said handle, and a lamp globe mounted within said shield in a sealed relationship therewith and surrounding said lamp.

9. A portable lamp including an elongated frame member, a reverse bend in said frame member defining first and second axially aligned portions of said frame member, a fluorescent lamp positioned on said first portion, a starter and ballast positioned on said second portion and electrically connected to said lamp, first electrical contact means positioned at the outer end of said second portion and electrically associated with said ballast and starter, an external protective structure for receiving said frame member and its associated electrical units, said protective structure including a hollow protective shield with a globe therein sealed to said shield, and a handle having a bore therein, second electrical contact means mounted within said handle and adapted to receive an external source of electricity, means for aligning said second portion within said handle to align said first and said second electrical contact means, and means to secure together said shield and said handle in axial alignment and surrounding said frame member and associated circuit elements.

References Cited by the Examiner

UNITED STATES PATENTS

2,347,174	4/1944	Cross et al.	240—54 X
2,496,197	1/1950	Buck	240—11.4 X
2,874,270	2/1959	Douglass et al.	240—11.4
2,939,945	6/1960	Ryen	240—11.2 X
3,154,252	10/1964	Baake	240—11.4

NORTON ANSHER, *Primary Examiner.*

C. R. RHODES, *Assistant Examiner.*