July 30, 1940. R. POPP 2,209,931

VAPORPROOF LAMP

Filed March 30, 1938

Fig. 1.

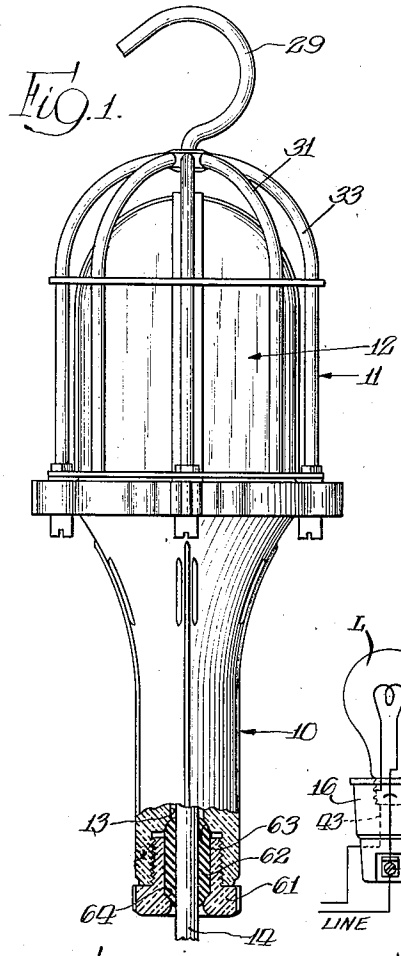


Fig. 2.

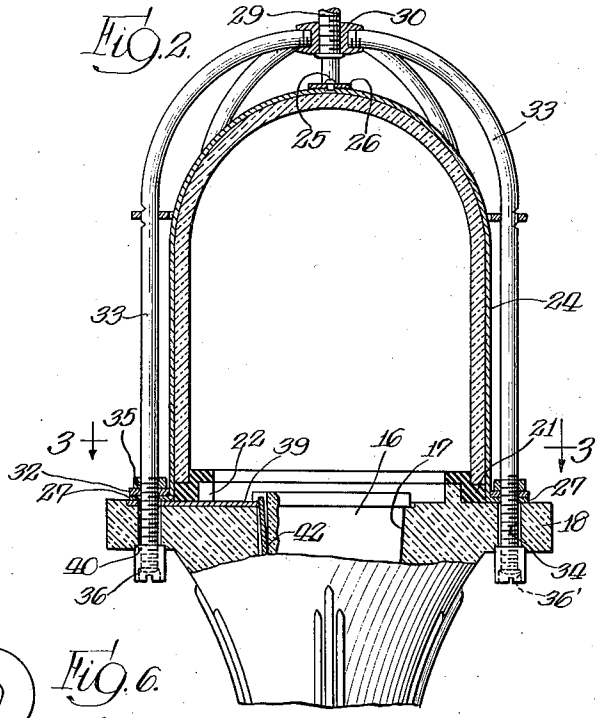


Fig. 6.

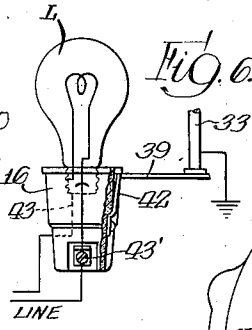


Fig. 3.

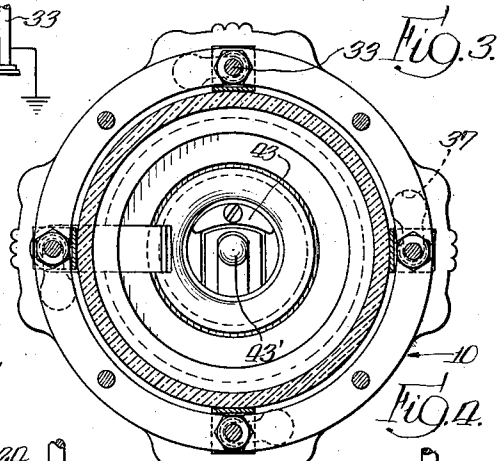


Fig. 5.

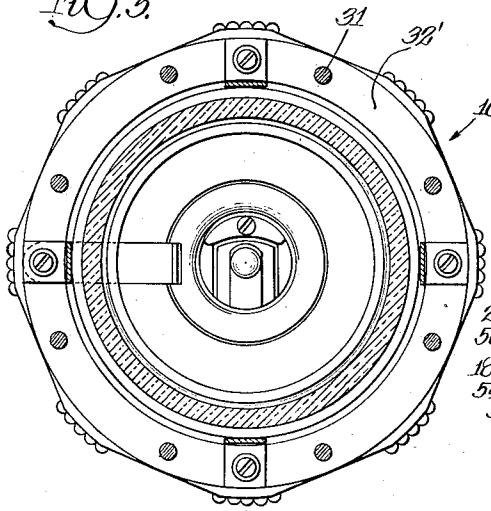
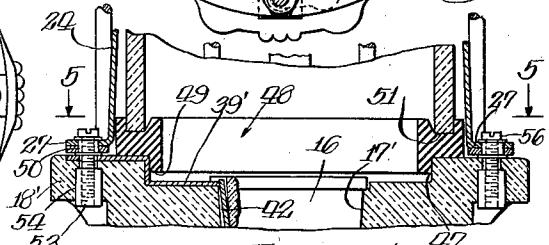


Fig. 4.



Inventor:
Rudolf Popp,
By Isorman L. Mueller Atty.

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UNITED STATES PATENT OFFICE

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VAPORPROOF LAMP

Rudolf Popp, Valparaiso, Ind., assignor to McGill Manufacturing Company, Valparaiso, Ind., a corporation of Indiana

Application March 30, 1938, Serial No. 198,814

2 Claims. (Cl. 240—54)

My invention relates in general to illuminating devices, and more in particular to sealed lamps to exclude moisture and dust, comprising a source of illumination such as an incandescent lamp with an enclosing, non-opaque cover for such incandescent lamp mounted upon a fixed supporting member as in the case of a stationary lamp, or upon a handle member, as in the case of a portable lamp.

Sealed lamps of various types for protection against moisture, dust and the like, have been used in the prior art, both as stationary and portable devices. On both of these types of devices, but particularly in the case of the portable lamp, considerable breakage of the glass cover for the illuminating lamp occurred in spite of efforts to properly guard such cover against breakage. Ordinarily the glass cover screwed into a threaded socket on the lamp handle or stationary supporting member, and then was presumably protected against breakage by an open frame rigid guard on the outside of such cover. With the rigid screw fastening intermediate the cover and support therefor, a severe jar in the case of a stationary lamp, would often break the glass cover at the threaded portion, and frequent breakage at this point or in an adjacent portion occurred with the portable lamp when dropped upon a hard surface or subjected to a severe shock. In other words, the open frame rigid guard around the glass cover, in many instances, afforded no protection whatever against breakage of the glass.

It is an object of my invention to provide an improved lighting device employing an illuminating lamp which is carried on a frame and enclosed in a glass cover to seal the lamp against the introduction of vapors, moisture, dust and the like, to the socket for said lamp. For convenience the device of my invention will be called a vaporproof lamp, as it is known in the trade, but it is understood that it is provided for protection against foreign matter other than vapor.

A further object of my invention is to provide resilient fastening and sealing means for a glass cover over the incandescent lamp of a vaporproof lamp so as to absorb shocks and jars on such devices without breaking the glass cover.

Another object of my invention is to provide flexible mounting and retaining means for a sealed chamber of glass in a vaporproof lamp to permit sufficient movement of the glass of such chamber to prevent breakage thereof, and to maintain the seal therefor.

A still further object of my invention is to provide a portable vaporproof lamp which may be dropped on cement floors or the like, and subjected to all types of severe treatment without the breakage of the glass vaporproof cover in such lamp.

It is also an object of my invention to provide improved circuit grounding means in a portable vaporproof lamp through the metallic safety guard for such lamp so that a ground connection is made whenever such guard is in contact with normally grounded structure.

Other objects and advantages of my invention will be apparent from the following description taken with the drawing, in which:

Fig. 1 is an elevational view partly in section of a portable vaporproof lamp embodying my invention.

Fig. 2 is an enlarged detail view of the upper portion of the portable vaporproof lamp of Fig. 1 with a portion of such lamp in section.

Fig. 3 is a cross-sectional view along the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view of a modified embodiment of my invention in a portable vaporproof lamp.

Fig. 5 is a cross-sectional view along the line 5—5 of Fig. 4; and

Fig. 6 is a schematic illustration of the lamp socket and lamp with the line connections to the socket and the ground connection from the socket through the wire guard for the device of my invention.

Referring now to the drawing, Fig. 1 shows a portable lamp including a molded handle 10, a rigid open frame safety guard 11 mounted upon one end thereof, and a glass cover or globe 12 likewise supported upon one end of the handle member. While the invention is illustrated as applied to a portable lamp, it is understood that the improvements shown and described are also adapted for use with stationary lamps, and particularly those of the vaporproof or dustproof type, as discussed above.

The handle 10 is provided with a central bore 13 for receiving a conductor 14 connected in the usual manner with contacts 43 and 43' (Fig. 6) of a suitable socket 16 carried in an enlarged cavity 17 at the top of the bore 13 in the handle portion. Any desired incandescent lamp L may be secured in the socket 16 in the usual manner. In order to seal such incandescent lamp against water, harmful vapors of all kinds, and dust, as in the case of a grain elevator or the like, so that the lamp device may in general be used satis-

factorily in all places, the relatively heavy glass cover 12 is supported on the handle and sealed at the enlarged upper end 18 thereof. As explained above, the glass covers for this purpose of the prior art devices were mounted on the supporting base with a rigid connection so that if some severe jar or shock was applied to the device, the glass member would often break near the rigid connection. To overcome this difficulty, I provide an annular gasket 21 shaped in a manner to yieldingly support the cover 12, and seated on the top portion 18 of the handle at an annular integral flange 22. Although the illustrated gasket 21 is provided in rubber, any resilient material to provide a cushioned seat and a relatively long life under all types of atmospheric conditions may be used.

The glass cover or globe 12 is pulled down onto the cushioned seat, as explained, by means of a flexible cage including a pair of looped metal bands 24 which cross at their closed or looped ends 26, and have a right-angled flange or lip 27 at each of the end portions thereof. In the illustrated embodiments of the invention I provide only two looped metal bands 24, although it is understood that additional bands may be employed so long as the necessary illumination from the lamp within the cover 12 is not interfered with. The two bands 24 are secured together at their crossed looped ends by a rivet 25 or the like extending through such ends. Uniform circumferential spacing of the bands in the flexible cage is provided when the flanges 27 are connected with the rods of the guard 11 as will be hereinafter described.

The safety guard 11 is utilized not only to protect the glass cover 12 and the incandescent lamp therein against breakage, but the guard is so constructed that it engages the flanges 27 of the bands 24 to draw these bands and the cover 12 therewith toward the handle portion 18 to seal the cover 12 against the cushioned seat member 21 as is apparent from Fig. 2. The flexible cage formed by the bands 24 adapted itself readily to any configuration of the globe 12 and likewise to any slight irregularity in the position of the globe on the cushioned seat as it is drawn toward the handle of the lamp. The guard 11 comprises a plurality of relatively rigid vertically extending wires or rods 31 which converge at their top ends in a fastening member 30 which also supports a hook 29 therein. The lower end of each of the rods 31 is upset or otherwise permanently secured in an annular rim 32 which bears against the flanged ends 27 of the bands 24. Rods 33 similar to rods 31 and spaced therebetween extend through apertures in the rim 32 and corresponding apertures in the flanged end 27 to project through key-slots 34 in the handle portion 18.

Internally threaded nuts 36 with a screw slot in the end thereof are threadably secured on the lower end of each of the rods 33. Their removal from the rods 33 is prevented by countersinking each nut at 36', at the bottom thereof to provide a shoulder against which the bottom of each rod may be upset. This, of course, does not interfere with the turning of the nut on the rod, yet prevents its removal so that it might become lost. The nuts 36 are provided with an outside circumference small enough to pass through the enlarged end 37 of each of the key slots 34 (Fig. 3), and then when the nuts 36 project entirely through the key slots at 37 the guard 11 is rotated until the nuts 36 are below the restricted portion of each key slot 34 in the position shown in Fig. 2. In this position they extend into a slight recess 40, which prevents turning of the guard. As the nuts 36 are turned, when in this position, they bear against the under surface of the handle portion 18 at the recess 40, and draw the guard downwardly, thereby drawing the flexible cage consisting of the bands 24 therewith. A threaded nut 35 on each rod 33 above the rim prevents such rod from being drawn down through the rim during the clamping operation. With this movement the cover 12 is sealed on the seat element 21 to provide a vaporproof, dustproof, and the like, chamber for the socket 16 and incandescent lamp L therein as above described. To insure a substantially non-wearing surface on the head portion 18 against which the nuts 36 may bear, a metal insert may be molded into the handle portion around the edge of the restricted portion of the key slot.

Although the rim 32 of the safety guard bears against the flanges 27 on the bands 24 with some considerable pressure, when the guard 11 is in final adjusted position, this does not interfere with some slight lateral flexibility in each of the bands 24 over the remaining portions thereof. The seat element 21, whether it be a rubber gasket, or of some other resilient material, gives slightly in any direction, so that when the lamp as a whole, or the cover 12 alone on a portable lamp or a stationary device, is subjected to a severe shock or jar, the entire chamber including these elements can move slightly to absorb such shock or jar. There is no rigid body in direct contact with the glass. As a result, the glass cover 12 remains intact, and the seal between the cover and the cushion element 21 likewise is maintained. In the commercial embodiment of my invention, both as to the structure illustrated in Figs. 1 to 3, and that in Figs. 4 and 5, it has been found that the glass cover 12 will withstand the most severe treatment, short of actually hurling the portable lamp onto a cement floor or against a brick wall with considerable force.

In prior portable lamps provided with handles of insulating material there has been no adequate means for providing ground connection from the lamp socket, and this insures the utmost safety in the use of such device. In the present invention, such a ground connection is effected positively and inexpensively by means of a metal strap 39 extending to the cavity 17 for spring pressed engagement with a ground contact 42 on the socket 16 (Fig. 6). The strap 39 may be attached to the handle portion by drive screws, or if desired it may be embedded in the material of the handle in the molding of such handle. The strap 39 extends across the head portion 18 and over the restricted portion of the key slot 24 as shown in Fig. 3. An aperture is provided in such member 39 at the key slot as shown in Fig. 2 so that a rod 33 of the guard 11 may project through the same, and contact is then made with the safety guard 11 through a flanged end 27 and rim 32 pressing such flanged end onto the strap when the guard is drawn into rigid locking position. When the safety guard 11 is in contact with the floor or any other grounded structure through the rods 31 or 33, or the hook 29, a ground connection from the socket 16 is immediately provided. As can be seen from a consideration of Fig. 6, the ground contact 42 is entirely independent of the circuit contacts 43 and 43' of the socket 16, which have connecting por-

tions extending into the side wall of the socket 16 similar to contact 42 as illustrated in Figs. 2 and 6. The contact 42, however, is spaced or positioned, intermediate the socket side wall portions of the contacts 43 and 43' so that any short across such live contacts for the incandescent lamp will immediately be grounded through the contact 42 and the other connections as described, and any static electricity accumulated around the socket within the cover will similarly be conducted to ground.

A modified embodiment of my invention is illustrated in Figs. 4 and 5. In this modification a handle 10' similar to that illustrated in Fig. 1 is provided with a socket cavity 17' at the top of a longitudinal bore as 13 in Fig. 1. A shallow cavity 47 surrounds the socket cavity 17' in the enlarged head portion 18' of such handle. The glass cover 12 for forming the vaporproof chamber as heretofore described is seated on a resilient annular element 48 having a downwardly projecting flange 49 on the lower inside corner thereof and an annular groove or channel 51 in the upper surface to receive the open end of the cover 12 therein as illustrated in Fig. 4. The lower face of the member 48 outside the flange 49 seats on the top surface of the head 18' of the handle. The cushioned seat element 48 as provided in this embodiment may be formed of rubber or any other resilient composition material as described with respect to the element 21 above.

A flexible cage including looped bands 24 is also employed with this embodiment and such bands have a flange 27 at each lower end thereof in engagement with an annular rim 32' of the safety guard. Each flange is secured to the top of the rim 32' as shown in Fig. 4 by means of an eyelet 50. It is believed unnecessary to completely illustrate the safety guard of this embodiment, for this guard is similar to that illustrated in Figs. 1 and 2, and includes relatively stiff rods 31 for securing at their upper end in a fastening member such as member 30 in Fig. 2, and rigidly secured at their lower ends to the rim 32' of the guard. To secure the guard to the handle portion in this embodiment, however, I provide internally threaded bushings or inserts 53 which may be molded into the handle 18' or inserted from the bottom in apertures 54 in the handle which apertures have a shoulder portion or the like to prevent the bushing from being pulled upwardly. These bushings are adapted to receive a set screw 56 which extends down through the eyelet 50 and into the insert or bushing 53. When the screw is turned into the bushing 53, the safety guard and the flexible cage are together drawn down toward the handle portion 18' to draw the cover 12 onto the cushioned seat 48 and seal the same thereon in the manner heretofore described.

A ground connection similar to that described above, is also provided for this embodiment of my invention. The ground strap 39' follows the contour of the head of the handle from engagement with the ground contact 42 on the socket 16 to a position over an aperture 54 in the head portion 18' of the handle for engagement by the rim of the safety guard to connect with the body of such guard.

To prevent moisture from entering the bore 13 in the handle of each of the illustrated embodiments, and for clamping the cord 14 against movement at the lower end of the handle, I provide a packing nut 61 for threaded fastening in the end of the handle. A rubber packing sleeve 62 therein is compressed between the shoulder 63 on the handle, and shoulder 64 in the nut 61, to effectively seal the bore 13 and simultaneously frictionally engage the conductor 14.

Although I have described my invention in its preferred embodiments, it is understood that I do not limit the invention thereby, but limit the same only by the scope of the appended claims.

I claim:

1. A portable vaporproof lamp comprising in combination a handle of non-yielding insulating material having an enlarged body portion at one end, a yielding member removably carried on said enlarged body portion having thereon an annular positioning shoulder and a positioning seat of such a size and shape as to substantially center a breakable cover on said seat at said shoulder, a breakable cover open at one end yieldingly supported on said seat at said open end, a yielding frame in engagement with said cover for drawing said cover into a vaporproof connection with said member at said seat comprising a pair of flat bands with each band extending completely over said cover and said pair of bands crossed at the closed end of said cover, clamping means at the ends of said bands for pulling said bands toward the body portion of said handle to pull the cover therewith to provide a vaporproof connection between said cover and said positioning seat, and with said yieldable cover movable therewith in said yielding frame for absorbing shocks and jars without breaking.

2. A portable vaporproof lamp comprising in combination a handle of non-yielding insulating material having a socket cavity at one end thereof and an enlarged open-ended portion surrounding said socket cavity having a substantially flat surface, a yielding member removably carried on said handle at said open end for supporting and centering on said handle a breakable cover for the lamp, a breakable cover supported on said yielding member, a yielding frame for yieldably maintaining said cover in a vaporproof connection with said yielding member, a rigid frame supported on said handle with a portion thereof resting on said substantially flat surface of said handle in a position outside said yielding member, a lamp socket carried in said socket cavity, and a metal ground strap in electrical connection with said socket at said cavity, secured in said handle and extending radially from said socket cavity across said substantially flat surface, underneath said yielding member, and in electrical connection with said rigid frame at the substantially flat surface of said handle.

RUDOLF POPP.