Aug. 11, 1936. H. P. HASTINGS 2,050,839

EXPLOSION RESISTING LIGHTING UNIT

Filed Oct. 22, 1932 2 Sheets-Sheet 1

Fig. 1.

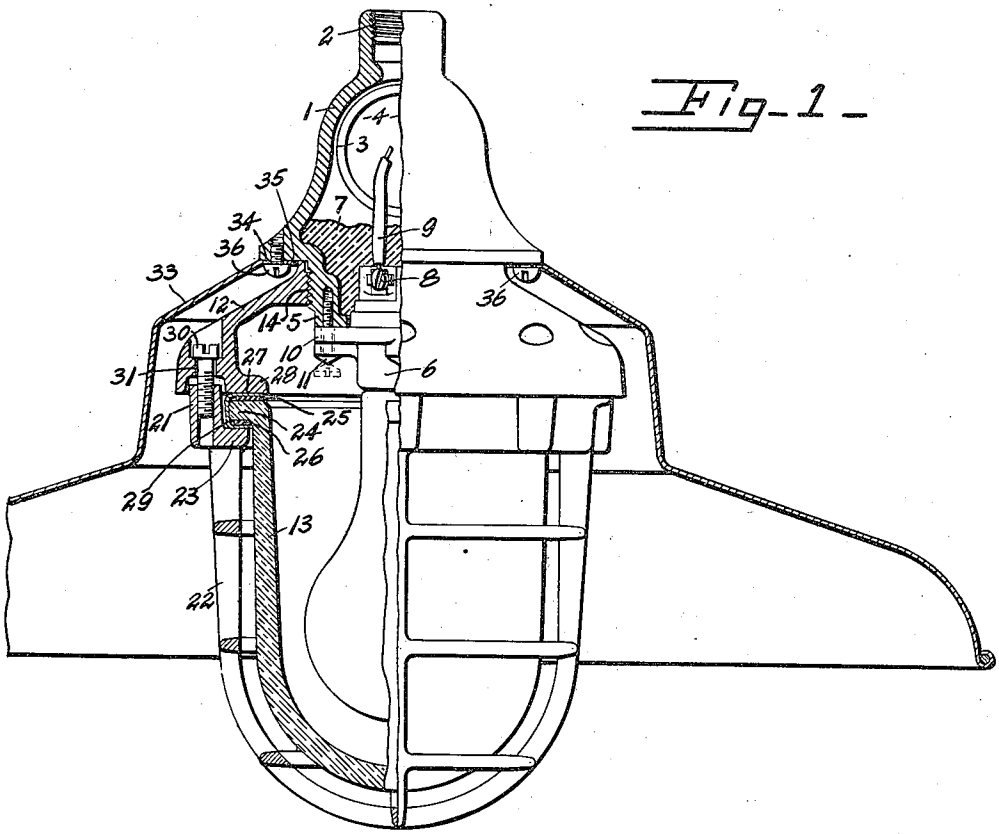
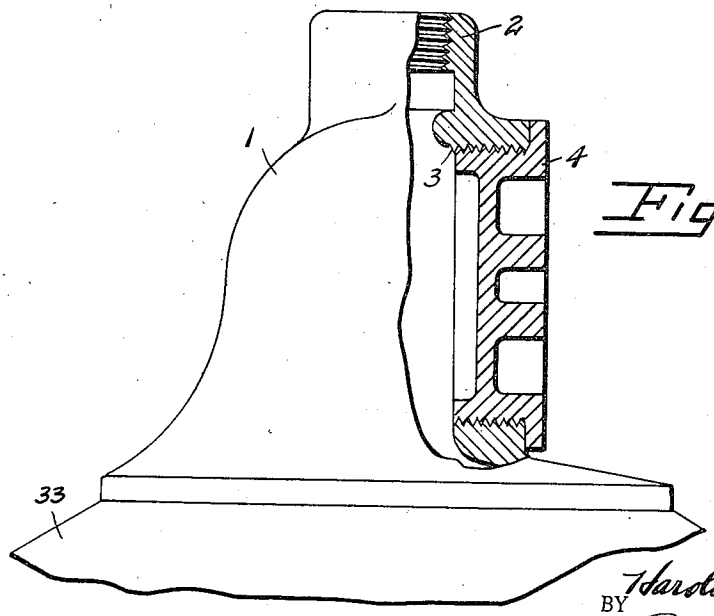


Fig. 2.



INVENTOR.

BY Harold P. Hastings

Bodell & Thompson

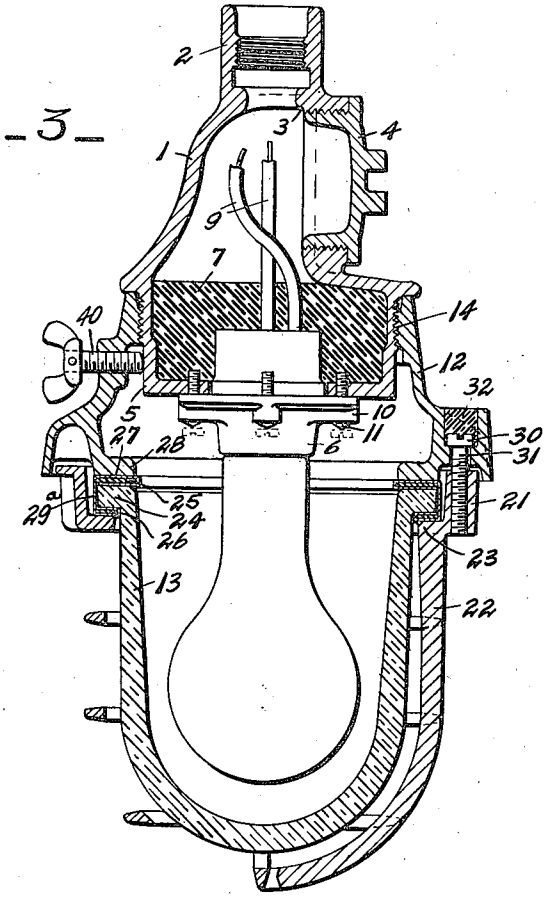
ATTORNEYS.

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Fig-3-



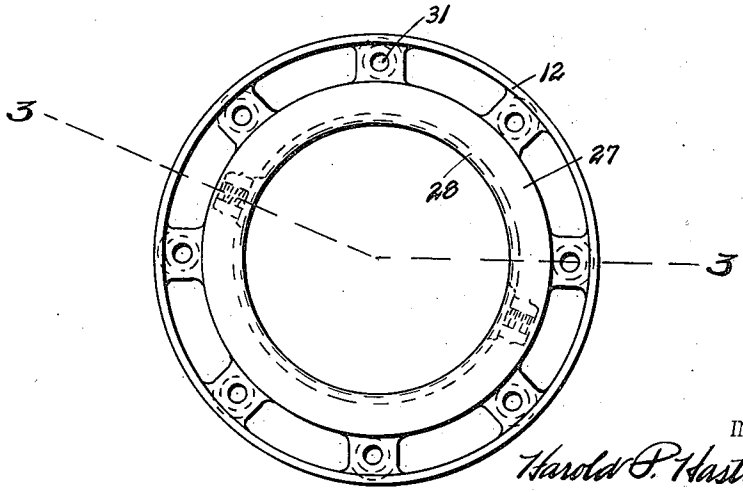


Fig-4-

INVENTOR.
Harold P. Hastings
BY
Bodell & Thompson
ATTORNEYS.

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UNITED STATES PATENT OFFICE

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EXPLOSION RESISTING LIGHTING UNIT

Harold P. Hastings, Syracuse, N. Y., assignor to Crouse-Hinds Company, Syracuse, N. Y., a corporation of New York

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2 Claims. (Cl. 240—11.2)

This invention relates to what for convenience is called explosion resisting lighting units, and has for its object a construction by which heated gases from the explosion occurring within the lighting unit can not communicate with and ignite explosive vapors that may be present outside of the lighting unit and cause disastrous explosions.

It has been found practically impossible to make an absolutely vapor-proof fitting or lamp which will prevent outside vapors from finding their way inside of the lighting unit or the globe thereof. So-called vapor-proof fittings that are satisfactory or practically vapor-proof in some situations are not vapor-proof in others, especially where the highly explosive vapors, as gasoline vapors, are present, and the object of this invention is a lighting unit which confines the explosion, where it originates inside of the unit, so that the exploded gases before they find their way outside the unit are cooled below the ignition point of any explosive vapors that may be present in the surrounding atmosphere.

A further object of this invention is the provision of metal to metal, or metal to glass, joints throughout the construction, whereby such joints may be machined accurately and thus retard the escape of the ignited gas until the same has been cooled below the ignition point. Such a joint, while not necessarily vapor-tight, may be described as flame-tight, or explosion proof.

Another object of the invention is provision for relamping the fixture without disassembling any of the joints thereof that would require any particular care in reassembling them, in order to maintain the flame-tight joint and the efficiency of the lighting unit.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation, partly in section, of this lighting unit.

Figure 2 is an enlarged elevation, taken at a different angle from Figure 1.

Figure 3 is a vertical, or lengthwise sectional view, of a slightly modified form of this lighting unit on the plane of line 3—3 Figure 4.

Figure 4 is a plan view looking upward of the globe support shown in Figure 3.

This lighting unit comprises generally a hollow base having means for connection to an electric conduit system enclosing service wires, which service wires enter the hollow base for connection to the terminals of a lamp socket, a lamp socket mounted on or within the base and so arranged as to form a well for receiving a sealing medium in which the portion of the lamp socket in the base, its wire terminals, and the contiguous portions of the wires, are embedded, a globe support coupled to the base around the lamp socket, a globe carried by the support, means for securing the globe to the support, and means for preventing detachment of the globe from the support, while the support is coupled to the base, there being a vapor-proof and flame-tight joint between the globe and its support and also a flame-tight joint between the support and the base being such as to baffle the outlet of exploded gases.

The means for preventing the detachment of the glass globe from its support, when the support is coupled to the base, is for the purpose of requiring a workman when changing the lamp bulbs to remove the globe and its support, as a unit, and making it impossible to disturb the vapor-proof and flame-tight joint between the globe and its support by removing the globe from its support. This joint is initially made vapor-proof at the factory and it is not intended to be disturbed by a workman who in exchanging the lamp might leave it loose or defective so that it would not be vapor-proof, or flame-tight.

1 designates the base, which is here shown as bell-shaped in form and having means as an internally threaded nipple 2 at its upper end for connection to an electric conduit, not shown, enclosing the service wires. The base, as here shown, is also provided with a work hole 3 in one side, which is normally closed by a closure or plug 4. This work hole is for the purpose of splicing the wires of the lamp socket to the service wires. The base 1 is provided with a hub portion 5 at its lower end in which a lamp socket base 6 is mounted, the inner end portion of the lamp socket extending into the hub, and the hub and contiguous portion of the base forming a receptacle or well for receiving a sealing medium 7 around the lamp socket base, wire terminals 8, and contiguous portion of the wires 9. The lamp socket base is provided with a flange 10 lapping the end of the hub and secured thereto in any suitable manner, as by screws 11. The screws 11 are provided with break-off heads so that the lamp socket can not be disturbed after it is once in position.

12 designates the globe support, and 13 the

globe. The support 12 is also shown as bell-shaped in general form and as threaded at 14 on the hub 5 of the base. The globe 13 may be of glass, or other transparent material, and is formed sufficiently thick or heavy to resist explosions of the thin vapors that work their way into the interior of the globe. The means for securing the globe to its support is here shown as an annular metal ring 21 formed on the upper end of the guard or cage 22, and provided with an inwardly extending flange 23 which engages the under side of an outwardly extending flange 24 at the upper edge of the globe 13. Preferably, yielding gaskets, or washers, 25, 26, are interposed between the upper face of the flange 24 and the abutting face 27 of the flange 28 of the support 12, and between the lower face of the flange 24 and the supporting flange 23.

In order to provide a metal to metal, or metal to glass contact, the gasket 25 is metal covered. This metal covering 29 is formed U shaped in cross section, firmly securing the gasket 25 to the upper face of the flange 24, and also securing the cushioning gasket 26 to the under side of the flange 24. The ring 21, guard 22, globe 13, and gaskets 25, 26, are all secured to the support 12 by means of a plurality of screws 30 passing through the support 12 from the top thereof, and threading into the annular ring 21, or into bosses formed thereon. The holes 31, through which the screws 30 pass, are counterbored at the outer end into which counterbores the heads of the screws 30 are seated. In the structure shown in Figure 3, these counterbores are filled with sealing compound 32 after the screws have been threaded into the ring 21. The object of this procedure is to prevent accidental or unnecessary removal of the ring 21 from the support 12 by inexperienced persons. In the structure shown in Figure 1, the screws are not sealed with compound. However, it is impossible to remove the screws 30 without first having unscrewed the support 12 from the base 1 due to the fact that the shade 33 extends over the counterbores in which the screws 30 are located. Inasmuch as the guard 22 is formed integral with, or secured by the ring 21, the guard is firmly secured to the support 12 together with the globe and gaskets.

The provision of a flame-tight metal to metal, or metal to glass joint, Figure 3, between the globe 13 and the support 12 is most essential in a fitting of this type. The method of forming the metal covering 29, Figure 1, and 29a, Figure 3, on the flange 24 of the globe constitutes a separate invention and does not form part of this application. The metal coverings 29, 29a, are rings U shaped in cross section, and the covering 29a has reentrant flanges 29b between which and the branches of the U formation the gaskets 25, 26, are located.

After the globe is provided with the gaskets 25, 26, and the metal covering 29, a high degree of skill is not required to establish a flame-tight joint between the globe and the support 12. However, it has been found in practice that the average person in relamping a fixture of this type, and in most cases not appreciating the necessity of a flame-tight joint, does not exercise sufficient care in securing the ring 21 to the support 12 and thereby securing the globe to the support. It is chiefly because of this fact that the fixture is provided with means whereby the support 12, guard 22, and globe 13, are removed as a unit from the base 1 when the fixture is relamped. The shield or reflector 33 Figure 1, and the sealing compound 32, Figure 3, prevent accidental or unnecessary removal of the screws 30. The reflector 33 is secured to the base 1 by means which are inaccessible when the support is coupled to the base 1. As here shown, the reflector is provided with an internal annular flange 34 lapping a downwardly facing shoulder 35 on the base 1, and the shield, or reflector, is secured in position by screws 36 threading through the flange and into the shoulder on the base, the heads of the screws being opposed to and obstructed by the support 12 when coupled to the base 1. In Figure 3, the hub portion 5 of the base 1 is of sufficient length to provide an abutment for the set screw 40 which threads through the wall of the support 12. The purpose of this set screw is to prevent the support 12 from loosening on the base 1 due to vibration inherent in certain uses such as when the lighting fixture is secured to the top of an oil well derrick.

Initially, the parts are assembled at the factory and none of the joints are intended to be interfered with by workmen except that the workmen can detach the support 12, globe 13, and the guard 22, from the base 1, as a unit, without disturbing vapor-tight joints accurately made at the factory. When the unit is installed in a place where volatile vapors are present, as for instance, gasoline vapors, the vapors will, regardless of all precautions that can be taken, find their way into the globe around the lamp bulb. If an explosion occurs by reason of breaking the bulb, or a spark due to vibration of the bulb in the socket, or for any other reason, the explosion is confined entirely within the globe, the glass of the globe being strong enough to withstand such explosion and the joints between the U-shaped member 29 and the support 12, or between said member and the globe 13, and the threaded joint between the support 12 and the hub 5 of the base 1 are sufficiently tight to prevent the escape of the ignited gases until they have been cooled below the ignition point, the threads at 14 being sufficiently numerous to require the exploded gases to take a tortuous path to find their way out of the globe and support, and in so doing become cooled sufficiently so as not to ignite the vapors present outside of the unit.

When it is necessary to remove a lamp bulb, a workman must remove the support and globe, as a unit, by unscrewing them from the base. Because of the relative arrangement of the shield or reflector 24, it is impossible for him to remove the globe from its support, and hence make defective the factory-made vapor-proof joints, and the only operation possible is the unscrewing of the support. After the exhausted lamp has been removed and a new lamp replaced, the globe and its support are replaced as a unit, and owing to the threaded joint between the support and the base, a long tortuous passage is provided which obstructs inlet of vapors from the outside of the unit and also obstructs and cools exploded gases when finding their way outside of the fixture.

What I claim is:

1. In an explosion resisting lighting unit including a hollow base having means for connection to an electric conduit system enclosing the service wires, a lamp socket mounted on said base and having its wire terminals located in the base, means sealing the interior of the base from the interior of the globe, a globe support, and a globe carried thereby, means for securing the globe to its support, and a vapor-proof joint between the globe and its support, the support being detach-

ably secured to the base by a joint operating to baffle the outlet of exploded vapors from within the globe and its support, means for preventing detachment of the globe from its support, when the support is coupled to the base, the means for preventing the detachment of the globe from its support being carried by the base, and means for securing the same to the base, the globe support being arranged to normally prevent access to said securing means.

2. An explosion resisting lighting unit including a hollow base having means for connection to an electric conduit enclosing the service wires, an external annular shoulder and a threaded axial hub below said shoulder, a lamp socket mounted at the end of the hub and extending into the hub and having wire terminals in the hub for connection to said wires, the hub and the contiguous portion of the base forming a receptacle for receiving a sealing medium surrounding the lamp socket and the wires attached thereto, a globe support threading on the hub toward said shoulder, a globe carried by the support with a vapor-tight joint between the globe and its support, means for securing the globe to the support, including members operable from the side of the support toward the base, means for preventing detachment of the globe from the support, when the support is mounted on the hub comprising a shield carried by the base and having a portion lapping said shoulder, and fastening screws extending through the lapping portion of the shield and into said shoulder, the heads of the screws being opposed to the support, whereby the screws are inaccessible when the support is mounted on the base, all whereby the shield can not be removed from the base while the support is coupled to the base and the globe from its support, when the support is coupled to the base.

HAROLD P. HASTINGS.