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LIGHTING UNIT

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Fig. 1.

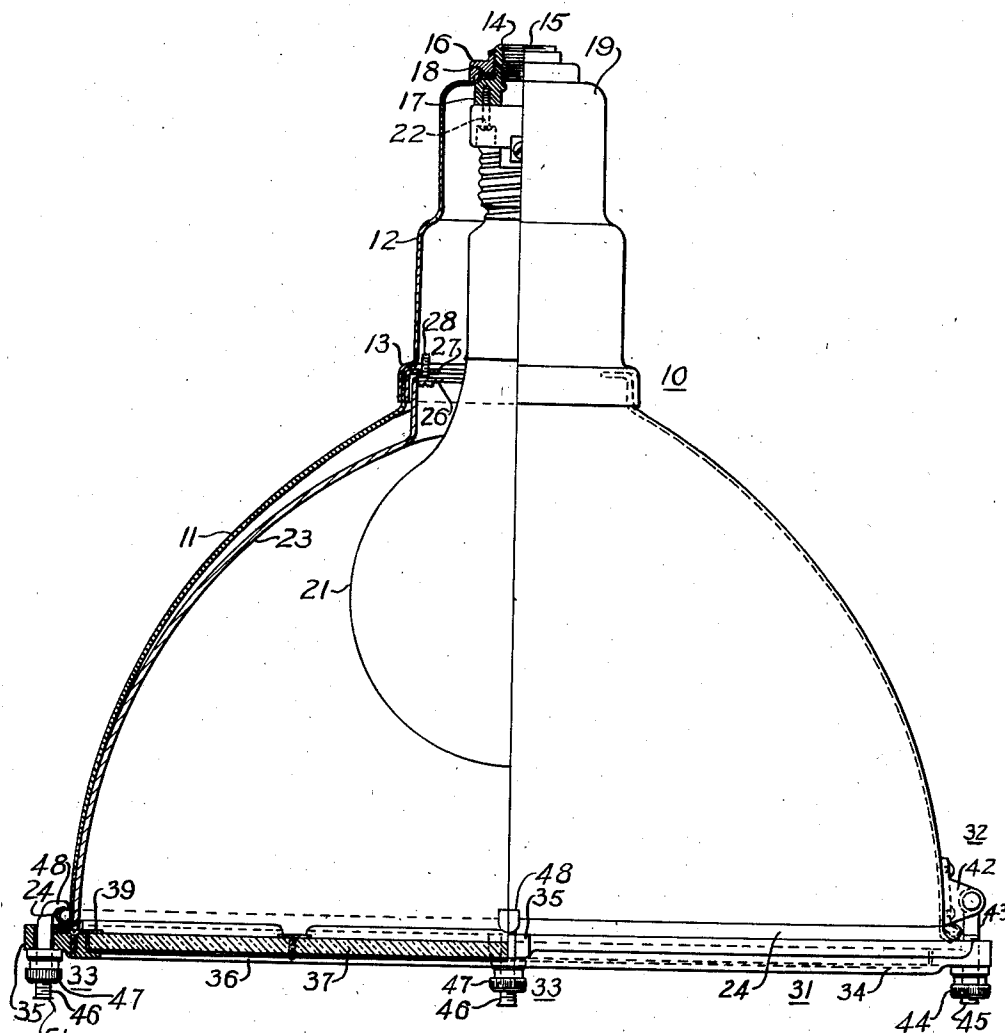
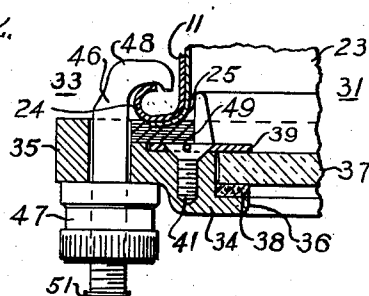


Fig. 2.



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LIGHTING UNIT

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3 Claims. (Cl. 240—11.2)

My invention relates, generally, to lighting units or fixtures and, more particularly, to lighting units of the industrial type especially adapted for use in steel mills, foundries and the like, where the most adverse atmospheric conditions prevail and where safety is a predominant factor.

The lighting of industrial plants such, for example, as steel mills, foundries and the like involves many problems not found in ordinary lighting applications. Lighting units of the ordinary type, such as are commonly used for industrial application, are not satisfactory for steel mill and foundry lighting where the most severe atmospheric conditions prevail and where safety to the workers is of much importance. In places of this character, the air is heavily laden with dust and vapors of many kinds which are highly destructive to ordinary lighting units and which seriously impair their efficiency and effectiveness.

In addition, cranes of various types and other forms of heavy machinery are in operation which creates a condition such as may result in breakage of lighting units constructed mainly of glass, thus creating a source of danger to workmen from falling glass.

Industrial plants of this kind require that the lighting units be mounted at relatively great heights which makes it highly desirable to not only use a unit which is of rugged construction but also one which will require a minimum of maintenance and which may be kept in efficient operating condition with the least amount of expense and effort.

Heretofore the type of unit most commonly employed is constructed almost entirely of glass which is heavy, easily broken and difficult and expensive to maintain. The glass unit is also a source of potential danger to workmen, which is a decided disadvantage in its use and has prevented extensive application of it to mills.

Industrial lighting units of the ordinary type using an open metal reflector are not satisfactory. These units are of rugged construction but deteriorate rapidly, become dirty quickly and are difficult and expensive to maintain.

The object of my invention, generally stated, is to provide a lighting unit of the industrial type which shall be of simple construction, economical to manufacture and install, and which may be used in locations where a rugged, dust and vapor proof unit requiring a minimum of maintenance is required and which may be easily and economically maintained.

A more specific object of my invention is to provide, in a unit of this general character, for ready

access to the interior thereof for relamping, cleaning and other maintenance purposes.

Another object of the invention is to provide an industrial lighting unit of this character having a dust proof enclosure or cover which may be opened and closed by simple manual operations which do not require the use of tools or handling devices of any kind.

A further object of my invention is to provide a lighting unit of the character described wherein the glass cover is secured to the reflector housing by an adjustable hinge and adjustable clamps or hook bolts so arranged that the cover may be loosened and permitted to swing freely on the hinge and retained in a partially closed position preparatory to final tightening into its normal position by the hinge and only one of the clamps.

A still further object of the invention is the provision of a lighting unit for industrial use of which all of the principal parts, with the exception of the lens, are of metal construction.

Another object of the invention is to provide an industrial lighting unit of such construction that it will retain its efficiency over long periods of time when used under the most severe and adverse conditions, such as are encountered in steel mills and similar industrial works.

Another object of the invention is to provide, in a lighting unit of this type, for securing the metal reflector within the housing in a simplified manner.

These and other important objects of my invention will become more apparent when the following description of a preferred embodiment of the invention is considered in connection with the drawing in which:

Figure 1 is a partially sectionalized view in elevation of a lighting unit embodying the principal features of the invention; and,

Fig. 2 is an enlarged view of a portion of the unit of Fig. 1 showing details of the cover assembly.

A preferred form of my invention may comprise three essential elements, namely, a reflector, a supporting housing therefor and a transparent cover for the housing. The reflector and housing are preferably constructed of a suitable metal while the cover comprises a glass lens supported by a metallic ring. The cover ring is preferably attached to the housing by means of a plurality of adjustable members one of which is in the form of a hinge and the remainder in the form of clamps or hook bolts, one of the clamps being positioned opposite the hinge so that it and the hinge may be used as the sole holding agency for the cover

when opening and closing the cover. The clamps are all positioned in suitable openings in the cover ring and disposed to hook over the rim or bead of the housing. They each comprise a threaded stem with a hook portion on one end and a thumb nut on the other, the threaded end of the stem being upset to cause the nut to become tight as it is unscrewed, which enables the clamp to be raised and rotated to cause the hook portion to disengage or engage the rim of the housing. The hinge element is of the same general construction as the clamps, except that, the stem is not provided with a hook portion but is hinged to the housing.

The housing is provided with suitable means to hold the reflector in position and to attach it to a supporting conduit or the like. The reflector is preferably formed of aluminum and, is, therefore, unbreakable and highly resistant to tarnishing elements found in the air.

A suitable gasket is provided for the cover which is compressed when the cover is drawn into position by the thumb nuts on the clamps and hinge. By drawing up all the thumb nuts an even pressure is applied to the gasket and a dust and vapor tight joint is formed.

Referring now to the drawing, the unit illustrated represents a preferred embodiment of my invention. The unit comprises, generally, a metallic housing 10, preferably constructed of steel, having a lower bowl-shaped portion 11 and an upper dome-shaped portion 12 which may be suitably joined together in overlapping relation, as at 13, to provide an integral assembly. The two parts of the housing are preferably joined together by a welding process which provides a continuous union therebetween. If desired, the housing 10 may be of one-piece construction.

The unit may be supported in any suitable manner, as by means of a conduit (not shown) and in this instance is provided with an adapter 14 for conduit mounting. As shown, the necked down portion 15 of the adapter extends through an opening in the top of the dome portion 12 of the housing and is internally threaded to receive the conduit (not shown) and externally threaded to receive a cap or nut 16 which clamps the base 17 of the adapter tightly to the opening in the top of the housing. A suitable ring gasket 18 is used in this joint to render it gas and vapor proof.

A socket 19 for the lamp 21 is disposed within the dome-portion 12 of the housing and may be conveniently supported by attaching it to the base 17 of the adapter by means of screws 22, as shown. This method of mounting the lamp socket eliminates the need for any separate support means and greatly simplifies the construction of the unit.

With a view to reducing the maintenance of the unit to the lowest possible degree and increasing its efficiency, a one-piece metallic reflector 23, preferably of aluminum, is used. The reflector may be plain (as shown) or stippled. For mounting heights exceeding forty-five feet, it is preferred to use a specular reflecting surface and below this height, a semi-specular surface. The reflector is preferably finished both inside and outside by a special process which makes it highly resistant to corrosion or tarnish, thereby greatly increasing its efficiency and reducing maintenance to a minimum.

One of the principal features of the unit of my invention is the method of mounting the reflector within the lower portion 11 of the housing. It will be observed that the lower edge of

the housing is rolled over or curled to form a bead 24, as best shown in Fig. 2. The lower end of the reflector has an outside diameter substantially equal to that of the inside diameter of the housing and is flanged at 25 to conform generally to the shape of the lower edge of the reflector housing. The reflector is provided at its top with an annular flange 26 which may be secured to a flange 27 on the reflector housing by screws 28. The housing flange 27 may be formed from an extension of the lower portion of the housing, or it may be a separate member, as shown, located at the juncture of the upper and lower sections of the housing and joined thereto in any suitable manner.

As will be readily understood, when the screws 28 are tightened, the reflector is pulled upwardly so that its lower flange 25 engages the lower edge 24 of the housing and is thereby securely held in the desired position within the housing in a very simple and effective manner which permits of its ready removal from the housing.

Another important feature of the unit is the cover 31 and method of attaching it to the housing. In order to provide a cover for the unit that is dust and vapor proof, which may be easily and quickly opened and closed without the use of tools and by one hand if necessary, and which cannot be accidentally detached from the housing, provision is made for hinging it to one side of the housing by means of an adjustable hinge 32 and detachably supporting it at a plurality of other points by fastening devices 33.

The cover may comprise a metal ring 34, preferably cast aluminum, provided with a plurality of ears 35, disposed around the periphery thereof and a flange portion 36 to support the lens 37. The lens is held in position upon the gasket 38 by means of holding clips 39, fastened to the ring by screws 41, which function to subject the gasket 38 to a pressure of sufficient magnitude to produce a vapor and dust proof joint.

In order to minimize the danger from falling glass resulting from breakage of the lens for any reason and to provide a lens which is extremely durable and efficient, I prefer to use a special plate glass having unique and unusual characteristics. This is a specially processed plate glass about five times as strong as ordinary plate glass, which has a high resistance to impact, is not affected by varying surface temperatures, does not solarize or discolor and primarily does not shatter and shiver when broken but instead, disintegrates into small, harmless fragments.

The cover is attached to the housing by means of the adjustable hinge 32 and a plurality of fasteners 33 in order that it may be readily opened and closed with one hand even though the unit is supported on flexible conduit, so that it may be tightly clamped to the housing and so that it cannot be removed or accidentally dropped when the unit is opened.

The hinge 32 may comprise a bracket 42 riveted or otherwise fastened to the housing and to which is pivoted a bolt member 43 which extends through the ear 35 and which is threaded to receive a thumb nut 44. The end 45 of the bolt is upset to prevent removal of the nut 44.

The construction of the fasteners 33 is shown best in Fig. 2. Each fastener comprises a hook bolt 46 extending through an ear 35 and threaded at its lower end to receive a thumb nut 47. As shown, the hook portion 48 of the bolt engages or hooks over the rolled edge 24 of the reflector housing and when tightened compresses the seal-

ing gasket 49 disposed between the lower rim of the reflector and the cover ring, thereby forming a dust and vapor proof joint.

The fasteners 33 are constructed and attached to the cover in this manner to facilitate the opening and closing of the cover. The hook bolt of each fastener is also upset at its lower end 51 to prevent complete removal of the thumb nut when it is backed off. By unscrewing the thumb nut until it engages the upset end of the bolt and thus becoming tight, the hook may be raised and rotated out of engagement with the rim of the housing. Likewise, each fastener may be hooked over the rim and tightened by the reverse of this operation.

It will now be readily apparent how a maintenance man may quickly and easily open and close the unit. When it is desired to open the unit, all of the hook bolts except the one opposite the hinge may be loosened and unhooked from the rim of the housing. Then by simply loosening and unhooking the hook bolt opposite the hinge the cover may be permitted to swing on the hinge 32.

In closing the cover, it may be swung to the partially closed position where the hook bolt opposite the hinge will engage the rim. Each hook bolt may then be fastened and all of the thumb nuts tightened to the necessary degree.

All of these operation may be carried out with a minimum of effort and skill and without the use of tools while the unit is suspended rigidly or flexibly at great heights. The use of an adjustable hinge enables the cover to be tightened into position and at the same time makes it impossible for the maintenance man to drop the cover, or remove it from the unit.

Aside from the fact that the unit is constructed of durable and practically indestructible materials throughout, it is also provided with a finish which further increases its permanence and durability. A special acid-resisting, multi-coat enamel is applied to and baked on the unit at an extremely high temperature far in excess of any possible temperature to which the unit will be subjected in actual use. This enamel is applied to all metal surfaces, including the inside and outside surfaces of the reflector housing, the outside surface of the reflector and the cover rings.

In view of the foregoing, it will be apparent that my invention provides a light weight, rugged and efficient lighting unit of great utility for industrial applications where adverse atmospheric conditions prevail and where the units may be subjected to rough treatment. By constructing the unit primarily of metal and utilizing a practically indestructible glass lens, many of the disadvantages of the prior art devices have been overcome and a unit produced which functions efficiently over long periods of time with a minimum amount of maintenance and repair.

Since the unit is totally enclosed its "in-service" efficiency over long periods of time decreases very slowly and its high efficiency is readily restored by simply cleaning the outside of the glass lens or cover.

It may be stated in conclusion, that, while the illustrated example constitutes a practical embodiment of my invention, I do not wish to limit myself strictly to the exact details herein illustrated, since modifications of the same may be made without departing from the spirit of the invention, as defined in the appended claims.

I claim as my invention:

1. A totally enclosed vapor- and dust-tight lighting unit of the pendant type adapted for use where adverse atmosphere conditions prevail and safety is required comprising, a one-piece metal reflector housing having a dome-shaped top portion and a bowl-shaped bottom portion and having a beaded rim, an aluminum reflector disposed within the bottom portion of the housing and having a flanged rim engaging the beaded rim of the housing, an inwardly extending flange at the juncture of the top and bottom portions of the housing for supporting the reflector, a cover member for the housing comprising a tempered plate glass lens and a rigid metallic supporting ring therefor, an adjustable hinge secured to the housing for adjustably attaching one side of the supporting ring thereto, and a plurality of spaced adjustable hook bolts carried by the supporting ring disposed to engage the beaded rim of the housing and cooperating with said adjustable hinge for clamping the cover to the rim of the housing.

2. A vapor- and dust-tight lighting unit of the pendant type for industrial application where the most severe atmospheric conditions prevail and safety is a predominant factor comprising, a one-piece metallic reflector housing having a dome-shaped top portion with an opening in the top thereof and a bowl-shaped lower portion with a beaded rim, an adapter detachably mounted in the top opening of the dome-shaped portion for supporting the unit, a lamp socket disposed within the dome-shaped portion and attached to the adapter for supporting a lamp in a vertical position, a metallic reflector detachably supported within the lower portion of the reflector housing and having a flanged rim engaging the beaded rim thereof, a cover for the reflector housing comprising a rigid metallic supporting ring and a lens of heat and impact resisting glass which shatters into relatively small fragments when broken, an adjustable hinge secured to the reflector housing for attaching one side of the cover thereto, a cover gasket carried by the supporting ring, and a plurality of adjustable hook bolts carried by the supporting ring of the cover disposed to engage the beaded rim of the reflector housing and cooperating with said adjustable hinge for clamping the cover gasket tightly against the flanged rim of the reflector.

3. A totally enclosed vapor-proof and dust-tight lighting unit of the pendant type adapted for use in the lighting of industrial plants where adverse atmospheric conditions prevail and safety to workmen is a predominant factor comprising, a metallic reflector housing having a dome-shaped top portion and a bowl-shaped bottom portion with a beaded rim, a socket mounted within the dome-shaped top portion of the housing for supporting a lamp in a vertical position within the bowl-shaped bottom portion of the housing, a metallic reflector mounted within the bottom portion of the housing, an openable cover for the housing comprising a metallic ring member provided with outwardly extending spaced lugs having apertures therein, a lens of tempered plate glass carried by the ring member, said glass being so constituted that when broken it shatters into relatively small fragments of a harmless nature, an adjustable hinge attached directly to the housing and having an adjustable bolt member extending through the aperture of one of said lugs, a plurality of adjustable hook bolt members mounted in the apertures of the remainder of the lugs disposed to engage the beaded

rim of the reflector housing and cooperating with the adjustable hinge for clamping the cover ring to the bottom rim of the reflector housing, and a gasket interposed between said cover ring and rim of the housing to provide for sealing the joint 5 when the cover ring is clamped to the bottom of

the housing by the adjustable hinge and hook bolts, thereby to provide a totally enclosed unit of rugged construction and of a non-hazardous nature.

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