

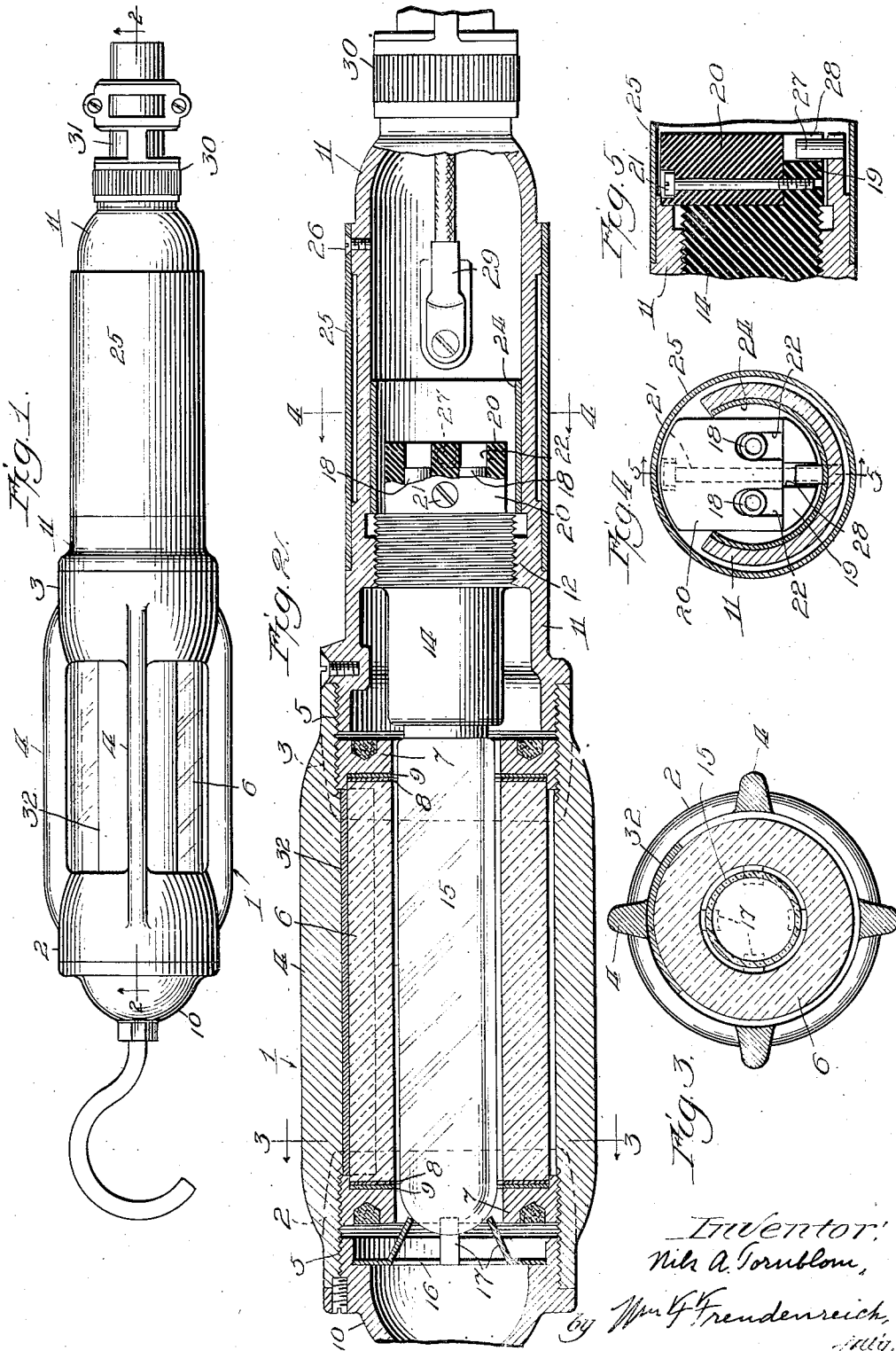
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EXPLOSIONPROOF HAND LAMP

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EXPLOSIONPROOF HAND LAMP

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6 Claims. (Cl. 240—54)

The object of the present invention is to produce a simple and novel electric lamp connected to one end of a cable and adapted to be held in the hand to provide illumination in comparatively inaccessible places and elsewhere.

Viewed in one of its aspects, the present invention may be said to have for its object to produce a hand lamp that shall be compact, of very sturdy construction so as to be capable of withstanding rough usage, and have its lighting bulb so housed that there is no danger of igniting combustible gases in the surrounding atmosphere in the event of breakage of the bulb unless the lamp structure as a whole is destroyed.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a side elevation of a lamp embodying the present invention; Fig. 2 is a central longitudinal section through the lamp, the extreme end portions of the lamp being broken off; Figs. 3 and 4 are sections taken respectively on line 3—3 and line 4—4 of Fig. 2; and Fig. 5 is a section on line 5—5 of Fig. 4, showing only a fragment of the lamp.

Referring to the drawing, 1 represents a cage, comprising two short sleeve-like end members 2 and 3 connected by longitudinal bars 4, spaced apart from each other. The sleeve members 2 and 3 are internally screw threaded for a considerable distance inwardly from their outer ends, as indicated at 5. Within this cage is a thick-walled glass tube 6 sufficiently long to permit both of its ends to extend for some distance into the inner ends of the two sleeves. In actual practice I have found it advisable to give the wall of this tube a thickness of about three-eighths of an inch. Screwed into the members 2 and 3 are ring nuts 7 which serve to hold the glass tube in place.

These nuts are preferably recessed on their inner faces, over a diameter equal to the external diameter of the glass tube, so that the ends of the tube may fit into these recesses and cause the tube to be accurately centered. Within the recesses in each nut are two flat rings or washers 8 and 9, preferably composed of soft aluminum. The end faces of the glass tube are preferably ground so as to be flat and make good contact over their entire areas with the rings. When the ring nuts are tightened, the metal of the rings or washers flows

sufficiently to seal the joints between the nuts and the glass tube.

The outer end of the sleeve 2 is closed by a cap or head 10 screwed into the same, while a hollow handle 11 is screwed into the outer end of the sleeve 3. The parts are so proportioned that there are enough screw threads between each ring nut and the corresponding sleeve and between the members 10 and 11 and the sleeves with which they respectively cooperate, to insure against ignition of a surrounding combustible atmosphere due to leakage through these joints in the event of the creation of a spark or flame within the cage and its hollow handle.

The handle 11, which is in the form of a long sleeve, contains a thick transverse partition 12 near its inner end. Screwed into and extending in opposite directions from the partition 12 is a receptacle 14, formed of suitable insulating material. Supported by the receptacle 14 is a long, slender electric light bulb 15 that extends through the cage to the farther end of the latter and there engages a suitable centering device that may conveniently take the form of a disc 16 of resilient sheet metal, having a plurality of fingers 17 struck therefrom and engaging with the rounded free end of the bulb. It should be noted that the partition 12 is thick enough to provide the requisite number of screw threads between the same and the receptacle to insure against propagation of flame on one side of the partition in the event that flame is created on the opposite side. The terminals by which the supply wires are connected to the receptacle are conveniently tubular members 18 that are molded into the body of the receptacle in the process of manufacturing the latter. The terminal end of the body of the receptacle is cut away so as to leave a mere shelf 19 underlying and parallel with the two terminals. Resting upon this shelf is a block 20 of insulating material that may conveniently be held in place by a screw 21 extending down through the same and into the shelf. The block 20 has two deep notches 22 cut into the same from the bottom edge; the notches being at least as wide as the diameters of the terminals 18, and being so spaced that when the block is lowered upon the shelf, the terminals are received in the notches. Thus the block insulates the projecting portions of the terminals 18 from each other and from the surrounding handle housing. It will be seen in Fig. 2 that the terminals 18 do not extend clear through the block 20 but stop short a substantial distance inwardly from the outer or rear face of the latter. This permits the insulation on the conductors leading

to the terminals to enter the notches or pockets in the block and thus leave no metal exposed in a manner to make a short circuit possible. The interior of the handle housing is preferably lined
5 with a sleeve 24 of insulating material which may be simply paper, in the zone of the insulating block 20 and for some distance outwardly beyond the same.

The handle housing is cut away, as indicated in
10 Figs. 4 and 5, to give access to the interior in the vicinity of the insulating block which extends up into or through this opening. It will be seen that upon removing the screw 21, the insulating block may be lifted out of the handle and expose
15 the terminals 18; thereby facilitating the connection of the leads to the terminals. The lining 24 is also cut away in registration with those portions of the opening or window in the handle housing which it spans.

20 In order to close the opening in the handle housing, I have provided the housing with a detachable casing in the form of a cylindrical sleeve 25 that may be slipped upon the same and be held in place by means of a screw 26, or otherwise.

25 After the receptacle 14 has been properly assembled in the handle housing, it is held against accidental rotation by means of a pin 27 inserted in the wall of the handle housing and extending inwardly into a notch or hole 28 in the shelf 19.

30 The cable containing conductors to be connected to the terminals 18 and to a ground terminal 29 within the handle may be led into the free end of the handle through any suitable connector 30, preferably of the type containing a
35 soft rubber sleeve 31 that provides a seal around the cable at the point where it enters the handle.

It is desirable that the lamp be provided with a reflector. By fitting the ends of the glass tube 6
40 into the recesses in the ring nuts 7, an annular space is provided between the glass tube and the surrounding cage members into which may be set a curved reflector plate 32 that is made approximately as long as the distance between the two ring nuts when the latter are tightened, but preferably a little shorter, so that it will not interfere
45 with the proper adjustment of the nuts and yet will cause both of its ends to be entered for some distance into the sleeve members 2 and 3.

It will be seen that by making the wall of the
50 glass tube 6 quite thick, it is not only provided with great mechanical strength to insure against breakage, but its end faces may be of sufficient radial widths to comply with the requirements of fire underwriting associations which regard
55 a good contact between flat faces over a width of three-eighths of an inch as constituting an explosionproof joint. In the same way, by making the screw threaded portions of the sleeve-like
60 ends of the cage sufficiently long, the number of screw threads embodied in each joint is large enough to comply with the requirements to make screw thread joints explosionproof. This is also true with respect to the joint between the recep-
65 tacle 14 and the thick partition 12. Consequently, when the parts are properly assembled, the lamp as a whole is very rugged and, for all practical purposes, explosionproof.

It will also be seen that by providing the hol-
70 low handle with an opening or window, the conductors contained in the cable entering the end of the handle can be easily connected to and disconnected from the several terminals and the connections be then protected against tampering when the sleeve or cover is slipped on the handle
75 and secured in place.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described, but intend to cover all forms and ar-
rangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. In combination, an open-work cage having sleeve-like ends, a thick-walled glass tube con-
siderably shorter than the cage arranged within
the same, ring nuts screwed into said sleeve-like
ends and serving to clamp the tube between them,
the end faces of said tube being ground
smooth, sealing means between the said end faces
15 and the nuts including metal washers having smooth faces engaged with said end faces of the tube, an imperforate cap screwed into one of said
sleeve-like ends outwardly from the corresponding
ring nut, an imperforate holder for a re-
ceptacle screwed into the other of said sleeve-like
ends, the radial widths of said tube end faces and
the number of threads between the sleeve-like
ends of the cage and each of the members screwed
into the same being such that no flame can pass
25 through the joints made thereby.

2. In combination, an open-work cage having sleeve-like ends, a thick-walled glass tube con-
siderably shorter than the cage arranged within
the same, ring nuts screwed into said sleeve-like
ends and serving to clamp the tube between them,
the end faces of said tube being ground smooth,
sealing means between the said end faces and the
nuts including metal washers having smooth
faces engaged with said end faces of the tube, a
cap screwed into one of said sleeve-like ends out-
wardly from the corresponding ring nut, a holder
for a receptacle screwed into the other of said
sleeve-like ends, the radial widths of said tube
end faces and the number of threads between the
sleeve-like ends of the cage and each of the
members screwed into the same being such that
no flame can pass through the joints made there-
by, fingers on said cap for engaging with the
end of a light bulb mounted in the receptacle
45 and holding said bulb centered.

3. In combination, an open-work cage having sleeve-like ends, a thick-walled glass tube con-
siderably shorter than the cage arranged within
the same, ring nuts screwed into the said sleeve-
like ends and clamping the tube between them, a
cap screwed into one of said ends, a hollow handle
screwed into the other of said ends, said handle
having a thick internal transverse partition at
some distance from the cage, a receptacle
55 screwed into and projecting from both sides of the said partition, said receptacle having a socket for a light bulb on the end at the cage, and terminals molded into the body of the receptacle and exposed within the handle on the side of the
60 partition remote from the cage.

4. A shield unit for a lamp bulb comprising an open-work cage having like sleeve-like end
members, a glass tube considerably shorter than
the cage and somewhat smaller in external di-
ameter than the internal diameter of said sleeve-
like members arranged within the cage, ring
nuts screwed into the sleeve-like members and
clamping the tube between them, said nuts hav-
ing recesses into which the ends of the tube fit,
70 and a loose curved reflector arranged between the tube and the surrounding cage and extending from one of said nuts to the other.

5. In combination, an open-work cage having sleeve-like ends, a thick-walled glass tube con-
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siderably shorter than the cage arranged within the same, ring nuts screwed into the said sleeve-like ends and clamping the tube between them, a cap screwed into one of said ends, a hollow handle screwed into the other of said ends, said handle having a thick internal transverse partition at some distance from the cage, a receptacle having a body of insulating material screwed into and projecting from both sides of the said partition, the cage end of the receptacle being adapted to receive a light bulb, terminals molded into the body of the receptacle and exposed within the handle on the side of the partition remote from the cage, the receptacle body having a shelf projecting therefrom on one side of and beyond the said terminals, and a block of insulating material resting on and detachably secured to said shelf, said blocking having recesses for the terminals.

6. In combination, an open-work cage having sleeve-like ends, a thick-walled glass tube considerably shorter than the cage arranged within

the same, ring nuts screwed into the said sleeve-like ends and clamping the tube between them, a cap screwed into one of said ends, a hollow handle screwed into the other of said ends, said handle having a thick internal transverse partition at some distance from the cage, a receptacle having a body of insulating material screwed into and projecting from both sides of the said partition, the cage end of the receptacle being adapted to receive a light bulb, terminals molded into the body of the receptacle and exposed within the handle on the side of the partition remote from the cage, the receptacle body having a shelf projecting therefrom on one side of and beyond the said terminals, and a block of insulating material resting on and detachably secured to said shelf, said block having recesses for the terminals, there being an opening in the side of the handle through which the said block of insulating material may be removed or inserted.

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