Aug. 23, 1932. L. C. DOANE 1,873,310

COLLAPSIBLE REFLECTOR

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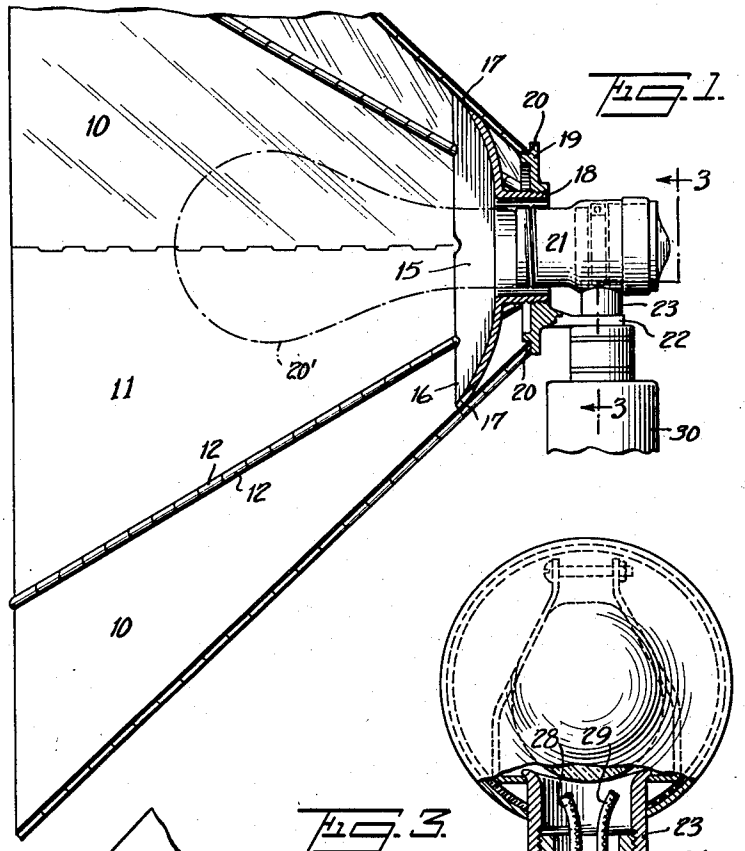


FIG. 1.

FIG. 3.

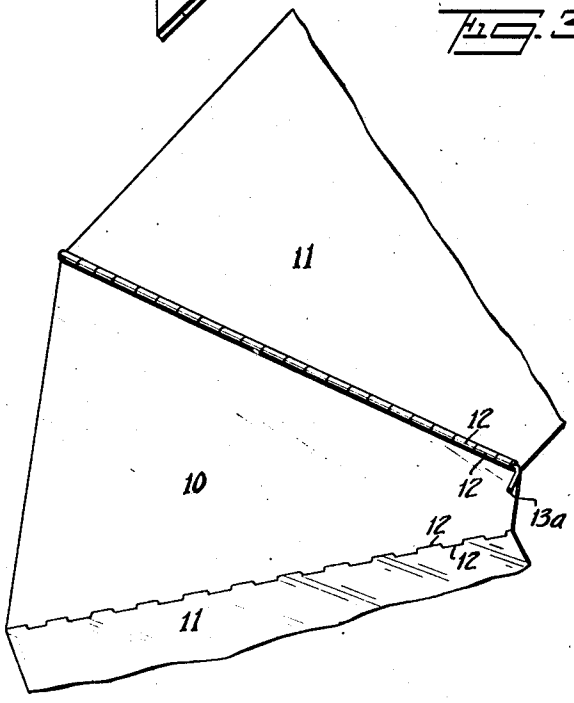


FIG. 2.

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COLLAPSIBLE REFLECTOR

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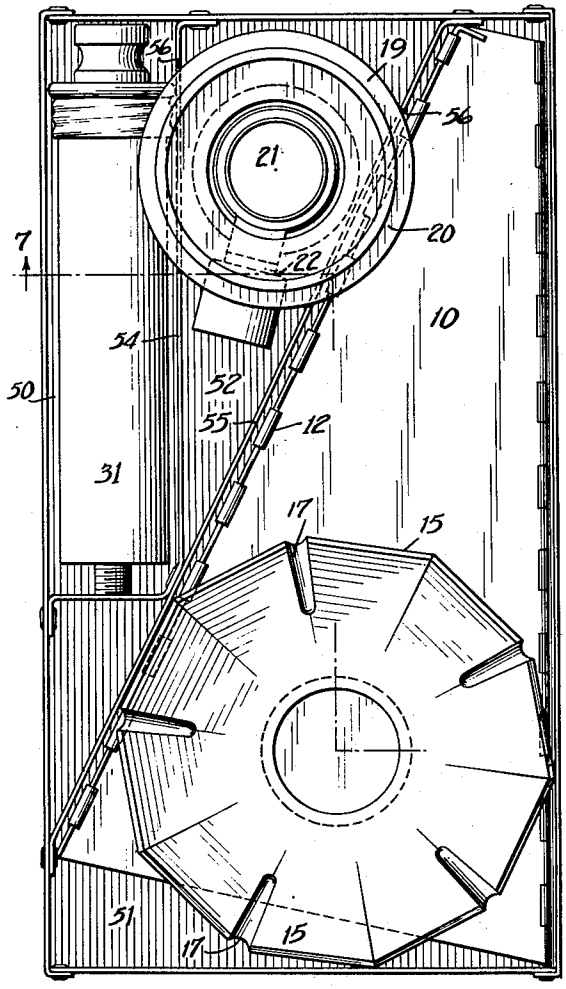


FIG. 6.

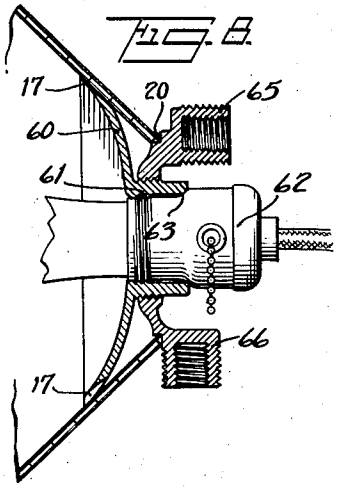


FIG. 8.

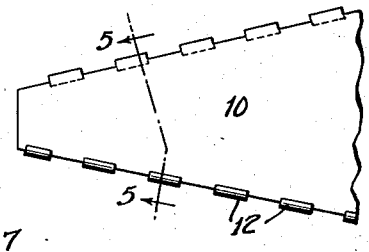


FIG. 4.

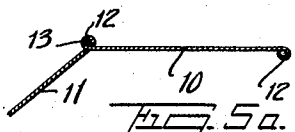


FIG. 5a.

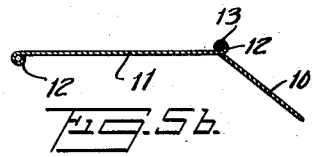


FIG. 5b.

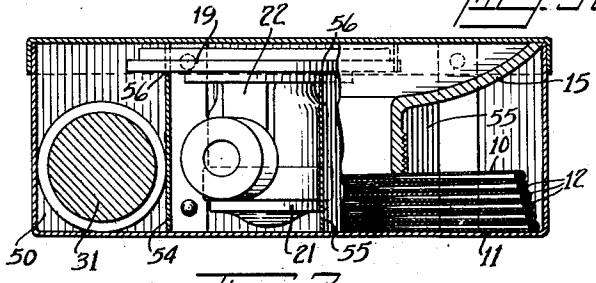


FIG. 7.

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Patented Aug. 23, 1932 1,873,310

UNITED STATES PATENT OFFICE

LEROY C. DOANE, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE MILLER COMPANY, OF MERIDEN, CONNECTICUT, A CORPORATION OF CONNECTICUT

COLLAPSIBLE REFLECTOR

Application filed January 24, 1931. Serial No. 510,866.

The present invention relates to collapsible reflectors and is more particularly directed toward a construction of portable reflectors and lighting apparatus susceptible of being collapsed and stored in a compact manner.

The present invention contemplates a collapsible reflector made out of a few simple rigid parts capable of being assembled to form a substantial rigid reflector and support the light source in position within the reflector. The reflector is, however, so designed that it can readily be taken apart for storage in a comparatively small space.

Reflectors such as contemplated by the present invention are susceptible of use where large portable outdoor reflectors are required for temporary flood lighting, or they may be used as reflectors about explosive flash lamps, now available for flash light photography.

The accompanying drawings show, for purposes of illustrating the present invention, two forms in which it may be embodied, it being understood that the forms shown are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is a vertical sectional view through a reflector with the parts opened or expanded in position;

Figure 2 is a developed plan view showing a plurality of panels making up the collapsible reflector;

Figure 3 is a sectional view on the line 3—3 of Figure 1, parts being in elevation;

Figure 4 is a fragmentary plan view of one of the plates of the reflector;

Figures 5*a* and 5*b* are sectional views on the line 5—5 of Figure 4 through two of the panels;

Figure 6 is a top plan view of a box or carrying case for the parts shown in the preceding figures, the parts being shown in place therein;

Figure 7 is a sectional view taken on the line 7—7 of Figure 6; and

Figure 8 is a sectional view through a modified form of socket support for use with the collapsible reflector.

The reflecting element of the collapsible reflector is in the form of a plurality of sheet metal panels 10 and 11 arranged alternately. These panels may conveniently be made out of sheet aluminum cut wedge shaped, as indicated in the drawings. The edges of the wedge shaped or tapered panels are rolled, as indicated at 12, to form knuckles, and hinge pins 13 are passed through these knuckles so as to hold the panels together. One of the hinge pins 13*a*, as indicated in Figure 2, is provided with an accessible extension so as to facilitate its removal. The other hinge pins may be permanently secured in place. A relatively large number of these panels is preferably employed so that the reflector may assume a more conical shape and provide a more even distribution of light. When the removable hinge pin is taken out, all the panels will fold back on one another and lie flat, somewhat as indicated in plan in Figure 2, or they may be folded one on the other, as indicated in Figures 6 and 7.

To assemble this multiple panel reflector into open shape for use, the removable hinge pin is replaced and the panels brought into position by a former 15 which is inserted from the front of the reflector. This former is in the shape of a ring-like casting having a peripheral portion 16, notches as indicated at 17 to receive the knuckles of the hinges. The former 15 has a rear threaded extension indicated at 18 to cooperate with a threaded locking ring 19 having a forwardly facing abutment surface 20 which is left to engage with the rear or narrow ends of the panels. The ring 19 is threaded onto the ring 18, as indicated in Figure 1, and this acts to clamp the panel securely in place making a very rigid conical shaped reflector.

A light source, such as an incandescent lamp bulb or a flash lamp bulb, is indicated at 20′. This light source is carried in a lamp socket 21 conveniently supported from one of the rings. It is shown in Figures 1 and 3 as being carried on a bracket 22 formed integral with the ring 19. The socket 21 is the well known brass shell keyless lamp socket with a side bushing indicated at 23.

A fitting 24 of the type shown in my application Serial No. 483,814, filed Sept. 23,

1930, passes through the hole in the lug 22 and is threaded onto the bushing 23 carried by the lamp socket, these parts being locked together by a locking screw indicated at 25. The fitting 24 has concentric contacts 26 and 27 connected by wires 28 and 29 with the usual terminals of the lamp socket. The fitting 24 with associated terminals 26 and 27 is adapted to receive a support or handle indicated at 30. This support or handle may assume various forms. Where the device is intended for use with ordinary incandescent lamps or with explosive flash lamps which are to be flashed by connecting them to a 110 volt lighting circuit, the parts are completely insulated. The support emolpyed in this case may include a suitable lamp base and column, such as shown in the application above referred to. Where, however, the device is intended for use away from lighting mains and for explosive flash lamps only, the handle may be in the form of a detachable unit, such as indicated at 31 in Figures 6 and 7. It is provided with a suitable chamber to carry dry cells and with a circuit closer to close the circuit and flash the lamp, somewhat as shown in my application Serial No. 473,811, filed August 8, 1930. The device shown in Figures 1 and 3 is, however, susceptible of use either with commercial lighting voltages and incandescent lamps or for use with flash lamps exploded either by lighting voltage or by current from dry cells.

Figures 6 and 7 show a convenient carrying case for the battery operated flash lamp device. This carrying case may take the form of a generally rectangular, shallow box having a compartment indicated at 50 for the battery casing and battery 31, a compartment 51 adapted to receive the collapsed reflector panels 10 and 11, and a third compartment 52 adapted to receive the locking ring 19. The battery casing or handle 31 is placed in the bottom of the compartment 50, and, likewise, the folded panels are placed in the bottom of the compartment 51. The former 15 is placed on top of the folded panels, as indicated. The walls 54 and 55 forming the chamber 52 are notched, as indicated at 56, so that the locking ring 19 may be received as shown.

In the form shown in Figure 8, the former ring 60 is like the former ring 15, except that it is threaded at 61 to fit the standard lamp socket shell of a lamp socket 62 and is of a length to bear against the shoulder 63 of such shells. The locking ring 64 is threaded to the former ring 60, as shown, and bears against the ends of the reflector panels in the same manner as the ring 19. To facilitate securing the device to supports, threaded bosses 65 and 66 may be provided, if desired.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims, and I wish it to be understood that the particular forms shown are but two of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

I claim:

1. A collapsible reflector comprising a plurality of panels of reflecting material hinged together, an abutment against which the ends of the panels engage, and a former detachably associated with the abutment and engaging the panels to prevent their collapsing.

2. A collapsible reflector comprising an abutment ring, a former ring detachably secured thereto, and a plurality of panels of light reflecting material hingedly secured together, the ends of the panels being clamped by the former ring against the abutment ring when the reflector is open.

3. A collapsible reflector comprising a plurality of sheet metal panels hinged together, the panels tapering so that the reflector, when expanded, assumes a generally conical shape, and a pair of rings threaded together, one ring having an abutment engaging the small ends of the panels, the other ring being larger and engaging the inner face of the panels near the small end.

4. A portable lighting appliance comprising a multiple paneled collapsible reflector, detachable clamping rings to hold the reflector expanded, a lamp socket carried by one of the rings, and a lamp bulb in the socket with its light source inside the reflector.

5. In a portable lamp, a ring having a rearwardly extending lug, a forwardly opening lamp socket carried by the lug, a multiple panel, conically shaped, collapsible reflector whose rear edges engage the front face of the ring, and a former ring detachably secured to the first ring and engageable with the panels for clamping them against the first ring and preventing their collapsing.

6. In a portable lamp, a ring having a rearwardly extending lug, a forwardly opening lamp socket carried by the lug, a multiple panel, conically shaped, collapsible reflector whose rear edges engage the front face of the ring, and a former ring threaded to the first ring and engageable with the panels for clamping them against the first ring and preventing their collapsing.

7. In a portable lamp, a ring having a rearwardly extending lug, a forwardly opening lamp socket carried by the lug, a multiple panel, conically shaped, collapsible reflector whose rear edges engage the front face of the ring, a former ring detachably secured to the first ring and engageable with the panels for clamping them against the first ring and preventing their collapsing, and a detachable handle carried by the lug.

8. In combination, a multiple panel, conically shaped, collapsible reflector, each panel

being wedge shaped and having hinge knuckles along the sides thereof, the knuckles containing hinge pins, and a former ring slightly larger than the small end of the reflector, the former ring engaging the inside surface of the panels and being notched to accommodate the knuckles.

9. In combination, a multiple panel, conically shaped, collapsible reflector, each panel being wedge shaped and having hinge knuckles along the sides thereof, the knuckles containing hinge pins, a former ring slightly larger than the small end of the reflector, the former ring engaging the inside surface of the panels and being notched to accommodate the knuckles, and having a rear threaded extension, and an abutment ring threaded to the extension and engaging the ends of the panels.

10. In combination, a multiple panel, conically shaped, collapsible reflector, a pair of rings, one engaging the small ends of the panels of the reflector when the reflector is opened and the other the inside of the reflector adjacent the small end, and means to clamp the reflector between the rings to prevent collapsing.

11. In combination, a multiple panel, conically shaped, collapsible reflector, a pair of rings, one engaging the small ends of the panels of the reflector when the reflector is opened and the other the inside of the reflector adjacent the small end, means to clamp the reflector between the rings to prevent collapsing, an axially disposed lamp socket carried by one of the rings, and a lamp bulb carried in the socket.

12. In combination, a multiple panel, conically shaped, collapsible reflector, a pair of rings, one engaging the small ends of the panels of the reflector when the reflector is opened and the other the inside of the reflector adjacent the small end, means to clamp the reflector between the rings to prevent collapsing, an axially disposed lamp socket carried by one of the rings, a lamp bulb carried in the socket, and a lamp socket having a shell provided with threads to fit threads in one of the rings.

13. In combination, a multiple panel, conically shaped, collapsible reflector and a pair of rings, one engaging the small ends of the panels of the reflector when the reflector is opened and the other the inside of the reflector adjacent the small end, the two rings being threaded together for clamping the reflector between the same to prevent collapsing.

Signed at Meriden, in the county of New Haven and State of Connecticut, this 22nd day of January, 1931.

LEROY C. DOANE.