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P. OLDS
FLASHLIGHT APPARATUS
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2,205,860

Fig. 1.

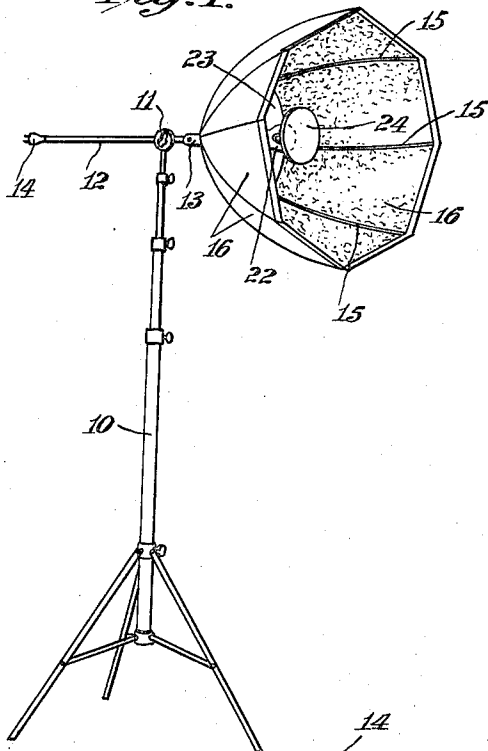


Fig. 2.

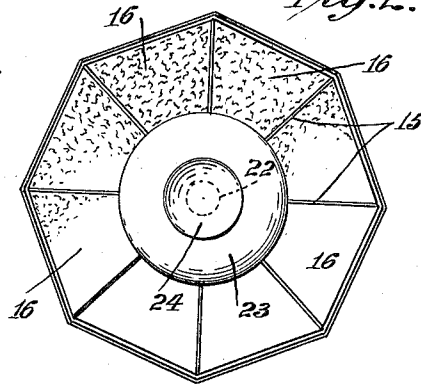


Fig. 3.

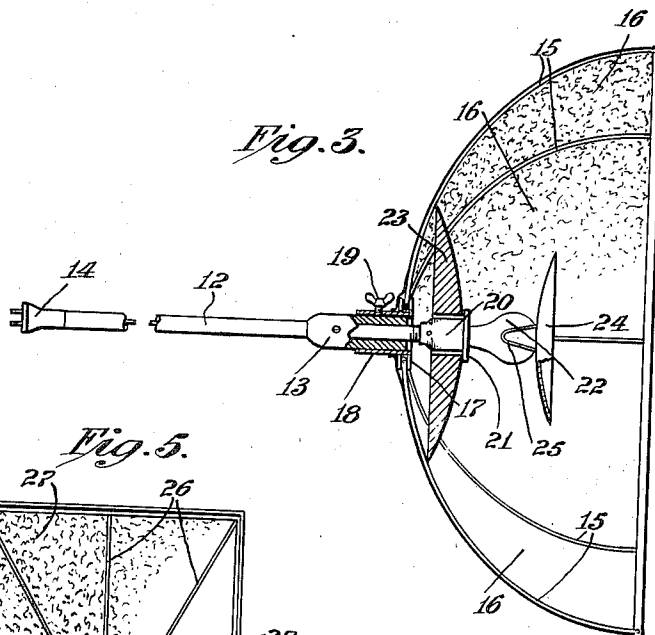


Fig. 4.

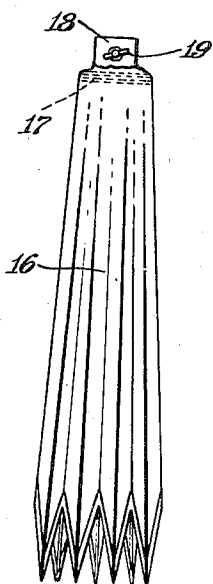
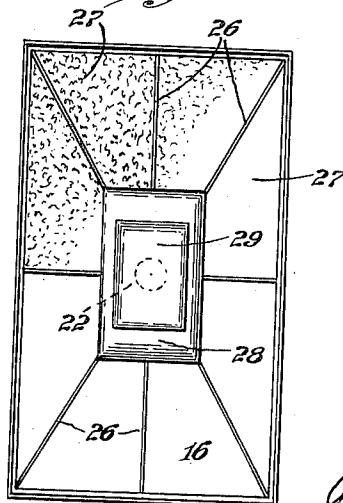


Fig. 5.



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FLASHLIGHT APPARATUS

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14 Claims. (Cl. 240—1.3)

The invention relates to flashlight apparatus, and more particularly to a portable structure so constructed as to secure the effective distribution of light from a flashlight bulb.

Particularly in portraiture work, a common practice at the present time is for the photographer to travel from place to place and make the necessary exposures amidst surroundings selected by the subject.

When taking a portrait with the aid of an electric flashlight bulb, with ordinary reflectors as now commonly used, the concentration of the light of the lamp results in the production of a negative in which there is too great a contrast between the highlights and the deeper tones, or there are what is known amongst photographers as "hot spots." This condition results in harshness in prints made from the negative and conditions which cannot be corrected even by skillful re-touching.

Apparatus made in accordance with my invention is so constructed as to not only be capable of being disassembled and collapsed so as to be readily portable, but the reflector is so constructed as to utilize a high percentage of the light rays from a flash bulb and so direct them toward a subject as to effectively illuminate all parts of the subject in a manner to avoid excessive contrast between the highlights and the deeper tones, or the presence of "hot spots" in the negative.

The apparatus is so constructed that no direct light rays from the source of light, an ordinary flash bulb, are directed upon the subject, although the construction is such as to utilize such rays in the making of a negative. Glare visible to the subject is avoided, not only by the concealing of the flash bulb from the subject, but by using a reflecting surface which is so broken up as to minimize glare from this surface while utilizing a high percentage of the light rays emanating from the flash bulb.

To secure the desired application of light to the subject, a large main reflector is required, and to make the apparatus portable, lightness and collapsibility of the structure of this reflector are essential. The construction must be such as to permit the convenient and rapid distention of the reflector and the assembly of the entire apparatus, and the various parts must be light in weight, and capable, when collapsed, of being brought within small compass.

By using a reflecting surface upon the main reflector which is broken up or made irregular, excessive glare is not only avoided, but a sort

of stippled or half-tone effect is secured in the negative by the varying intensity of the light rays projected from different parts of the reflector.

The invention consists primarily in flashlight apparatus embodying therein a collapsible frame, a covering of flexible material for said frame having upon one face thereof a reflecting surface, means engaging said collapsible frame adjacent said reflecting surface, a support for said means passing through said reflecting surface, whereby said frame may be collapsed or distended, means whereby said support may be secured in relation to said frame, and a lamp socket carried by said support within and adjacent the reflecting surface of said flexible covering adjacent said first named means; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is an assembled perspective view of apparatus embodying the invention;

Fig. 2 is a front view of the collapsible reflector structure;

Fig. 3 is a view showing said structure upon a larger scale in vertical section;

Fig. 4 is a view of the reflector proper, collapsed; and

Fig. 5 is a view showing a reflector structure having a different form from that shown in Figs. 1 to 3.

Like numerals refer to like parts throughout the several views.

In the embodiment of the invention shown in the drawing, a tripod stand 10, having a telescopic standard as shown, is employed. This stand is old and well known and is used for various purposes where adjustability for height is desired.

The upper part of the stand has a collar 11 in which a rigid supporting tube 12 carrying conductor wires may be mounted and held by means of a thumb screw, as shown in the drawing, or in any other desired manner. Adjacent one end of this tube is an enlarged portion or sleeve 13, and at the other end thereof is an ordinary electrical plug fitting 14.

The reflector proper embodies therein a frame composed of a plurality of resilient or spring ribs which may be of any desired length, or may vary in length according to the size and form of the reflector desired. In actual practice, I have used ribs of about twenty-four inches in length,

since such ribs, when distended, form a reflector, the open end of which will be approximately thirty-six inches. Dimensions, however, are not critical.

5 The frame formed by the ribs 15 has a cover 16 of flexible material, such as fabric, secured to the several ribs in any desired manner, so that with movement of these ribs in a manner to be hereinafter described, said cover will be drawn
10 taut between, and restrain the flexure of, said ribs in a manner to give the desired dished form to the reflector. The ribs may be upon either the inside or the outside of the cover, since the function of these ribs is purely a mechanical one in
15 causing the distention of the reflector and in permitting it to be collapsed.

One face of the flexible cover 16 is provided with a flexible reflecting medium. A bright metal foil is suitable for this purpose. When the
20 ribs are on the inside, if desired they also may be covered with the same material, or may be coated with a reflecting enamel, although the light losses due to the presence of these ribs, even though they be non-reflecting, would not be
25 appreciable in the operation of the apparatus.

The various ribs 15 are pivotally mounted in any desired manner upon a flange 17 carried by a sleeve 18 of an inside diameter to receive the sleeve 13 carried by the tube 12, to which it may
30 be clamped by a thumb screw 19 when assembling the structure.

The end of the tube 12 adjacent the sleeve 13 is provided with an ordinary electric lamp socket 20 having a flange 21. The flash bulb proper
35 is shown at 22.

Loosely mounted upon the socket 20 is a plate 23 which, in the form of the invention shown in Figs. 1 to 3, is a circular plate having a convex surface presented toward the flange 21. This
40 plate has an opening therethrough and said flange engages the plate about this opening. The size of this opening is such as to permit the passage therethrough of the sleeve 13.

The configuration of the main reflector is determined by the size and form of this plate 23. The larger the diameter of the plate the smaller will be the front opening of the reflector and the flatter will be the dished portion thereof rearwardly of the flash bulb. Furthermore, with a
50 larger plate, the depth of the reflector will be lessened.

Preferably the convex surface of the plate 23 is provided with a bright reflecting coating, either of metal foil or enamel, so that light rays directed
55 thereon from the bulb will be reflected upon the inner face of the main reflector.

To intercept the direct rays from the flash bulb, I provide a cap 24 provided with spring clips, as 25, adapted to engage the flash bulb. The convex face of this cap, presented towards the bulb, is also provided with a reflecting surface, so that light rays directed upon this cap will be reflected backwardly of the reflector structure, against either the plate 23 or the portion 16 of
60 the main reflector.

The construction of the reflector shown in Fig. 5 differs from that heretofore described in the respects that the various resilient ribs 26 are of different lengths and the flexible gores of which the flexible cover is made, instead of being symmetrical as shown in Figs. 1 to 3, vary in form as shown, so that when the ribs are distended, the reflector will have the desired form.

In Fig. 5, the covering 27, which corresponds
75 in construction with the covering 16, is so formed

that when these ribs are distended, the open end of the reflector will be substantially rectangular, although the various panels will have a forward curvature to give the desired depth to the reflector.

In this embodiment of the invention, the plate 28 is generally oblong in form, being curved adjacent each edge thereof, as indicated, so as to reflect the light rays against the reflecting inner face of the main reflector. The cap 29 in this form of the invention may be of the same form as the cap 24, or have any desired form which will interrupt the light rays extending forwardly from the lamp bulb and reflect these rays backwardly upon the plate 28 or the inner face of the main reflector.

Whatever the general form of the reflector, when the ribs are distended, and this form may be varied indefinitely, no light rays will be projected upon a subject directly from the bulb, thus avoiding "hot spots" in the negative or prints therefrom.

Irrespective of the form of the main reflector, it is made of flexible material built up from gores of the desired shape to give to the main reflector, when in use, the desired form. These gores may be united by stitching, cementing or in any other desired manner, and the outer ends of the ribs may be secured thereto by forming a hem about the portion of the material at the free edge of the reflector, having pockets therein for the reception of the ends of the ribs. The portion of the cover about the flange 17 may be sewed or otherwise secured thereto in any desired manner.

The reflecting surface of the cover 16 is applied thereto before attachment of this cover to the ribs 15. While this reflecting surface may be perfectly smooth when first applied to the material of the cover, it will, during the assembly operation and repeated flexure of the material of the cover, become irregularly creased or crinkled so as to form a multitude of distinct adjacent reflecting surfaces, separated by creases. This crinkled effect in the reflecting surface of the covering 16 destroys or minimizes glare from the flash bulb, and yet the aggregate of the reflected portions is sufficiently great to utilize a very high percentage of the light rays from the lamp.

The operation of flashlight apparatus embodying the invention is substantially as follows:

When it is necessary to transport the device, the tube 12 is removed with the sleeve 13, the set screw 19 being released, so that the said tube and the sleeve 13 carried thereby may slide freely through the sleeve 18, and this sleeve and the plate 23 or 28 removed from operative relation to the main reflector.

When this is done, the resiliency inherent to the ribs 15 will cause these ribs to straighten themselves, so that the reflector as a whole may be collapsed, the flexible covering material 16 assuming folds, as shown in Fig. 4, in much the same manner as the cover of an ordinary umbrella. Before collapsing the main reflector, the spent flash bulb 22 is removed from the socket 20 and the cap 24 removed from the bulb. The plate 23 is then removed from the socket 14 in the tube 12 so that the cap 24 and the plate 23 may be separately packed.

The main reflector possesses but little more weight than an ordinary umbrella, and the portable stand and tube 12 may also be made of very light weight. In fact, the aggregate weight of the entire apparatus, including the plates 23
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and 28, and the length of these parts, are such that they may be readily packed in an ordinary suitcase for transportation purposes.

When assembling the device, the plate 23 is first mounted upon the socket 20 and the tube and sleeve 13 are passed through the sleeve 18, the ribs 15 being moved outwardly to permit the insertion of this plate. The tube 12 is then drawn rearwardly, the engagement of the edge of the plate 23 with the various ribs 15 forcing the ribs outwardly of the axis of the tube 12, which outward movement, when restrained by the covering material 16, will flex the ribs in a manner to impart the desired shape to the reflector. The tube 12, when the ribs have been thus distended and flexed, is locked in relation to the sleeve 18 by the thumb screw 19 acting on the sleeve 13.

Notwithstanding that the entire structure weighs only a few pounds, a reflector is provided which may have a spread of thirty or forty inches or more, which size reflector is highly desirable, particularly for portraiture work.

When the tinsel of the flash bulb is ignited, the light rays emanating therefrom will not be concentrated upon any particular spot of the subject. These light rays will be distributed throughout an area and directed at angles which will modify all shadows and modulate the highlight effects while still preserving contrasts resulting in a highly effective photograph. There will be no "hot spot."

The crinkled or stippled effect in the reflector aids in securing this modulation of the light tints in the negative in a manner similar to the breaking up of shadows in the production of an engraved plate by half-tone methods.

The absence of glare, due in part to the control of the light rays by the reflector mechanism, also contributes largely toward the quality of, and effects secured in, the negative.

It is obvious that the rays directed forwardly of the bulb will be reflected against the plate 23, and that many of the rays will be reflected back and forth between said cap and said plate, and ultimately be directed against the inner face of this covering. The angle of projection of these rays in relation to the subject will reduce the contrasts in the manner above described and thus soften the whole negative.

The shape of the reflector may be varied greatly without sacrificing the above characteristics.

I have found that repeated collapsing of the main reflector does not impair its efficiency and ensures the crinkled or stippled effect above referred to.

It is not my intention to limit the invention to the precise details of construction shown in the accompanying drawing, it being apparent that such may be varied while still preserving the essential characteristics of the apparatus.

The scale of the drawing is so small as to merely indicate the actual conditions, since in a full-size device, the number and irregularity of the reflecting surfaces, due to the crinkling of the surface of the cover 16, will vary in different portions of the cover and in different reflectors. The general effect secured, however, is the same.

Having described the invention, what I claim as new and desired to have protected by Letters Patent, is:

1. Flashlight apparatus embodying therein a collapsible frame, a covering of flexible material for said frame having upon one face thereof a reflecting surface, means engaging said collapsible frame adjacent said reflecting surface, a sup-

port for said means passing through said reflecting surface whereby said frame may be collapsed or distended, means whereby said support may be secured in relation to said frame, and a lamp socket carried by said support within and adjacent the reflecting surface of said flexible covering adjacent said first named means.

2. Flashlight apparatus embodying therein a collapsible frame, a covering of flexible material for said frame having upon one face thereof a crinkled reflecting surface, means engaging said collapsible frame adjacent said reflecting surface, a support for said means passing through said reflecting surface whereby said frame may be collapsed or distended, means whereby said support may be secured in relation to said frame, and a lamp socket carried by said support within and adjacent the reflecting surface of said flexible covering adjacent said first named means.

3. Flashlight apparatus embodying therein a collapsible frame comprising a plurality of ribs, means pivotally supporting said ribs at one end thereof, a covering of flexible material secured to said ribs limiting pivotal movement of said ribs when distending the frame, said flexible material having a reflecting surface, a plate, a support for said plate adapted to pass through the means pivotally supporting said ribs, whereby said plate is adapted to be movably mounted in relation to said means supporting said ribs, locking means preventing relative movement of said plate and said means, and a lamp socket carried by said support and positioned forwardly of said plate and adjacent the reflecting surface of said flexible covering.

4. Flashlight apparatus embodying therein a collapsible frame comprising a plurality of ribs, means pivotally supporting said ribs at one end thereof, a covering of flexible material secured to said ribs limiting pivotal movement of said ribs when distending the frame, said flexible material having a crinkled reflecting surface, a plate, a support for said plate adapted to pass through the means pivotally supporting said ribs, whereby said plate is adapted to be movably mounted in relation to said means supporting said ribs, locking means preventing relative movement of said plate and said means, and a lamp socket carried by said support and positioned forwardly of said plate and adjacent the reflecting surface of said flexible covering.

5. Flashlight apparatus embodying therein a collapsible frame, a covering of flexible material for said frame having upon one face thereof a reflecting surface, means engaging said collapsible frame adjacent said reflecting surface, a support for said means passing through said reflecting surface whereby said frame may be collapsed or distended, means whereby said support may be secured in relation to said frame, a lamp socket carried by said support within and adjacent the reflecting surface of said flexible covering adjacent said first named means, a cap, and means whereby said cap may be mounted upon a flash bulb in said socket so as to be positioned between said bulb and the subject to be photographed.

6. Flashlight apparatus embodying therein a collapsible frame comprising a plurality of ribs, means pivotally supporting said ribs at one end thereof, a covering of flexible material secured to said ribs limiting pivotal movement of said ribs when distending the frame, said flexible material having a crinkled reflecting surface, a plate, a support for said plate adapted to pass through

the means pivotally supporting said ribs, whereby said plate is adapted to be movably mounted in relation to said means supporting said ribs, locking means preventing relative movement of said plate and said means, a lamp socket carried by said support and positioned forwardly of said plate and adjacent the reflecting surface of said flexible covering, a cap, and means whereby said cap may be mounted upon a flash bulb in said socket so as to be positioned between said bulb and the subject to be photographed.

7. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a reflecting surface, a tube adapted to pass through said sleeve, a plate adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, and a lamp socket carried by said tube adjacent said plate and the reflecting surface of said flexible covering.

8. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a crinkled reflecting surface, a tube adapted to pass through said sleeve, a plate adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, and a lamp socket carried by said tube adjacent said plate and the reflecting surface of said flexible covering.

9. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a reflecting surface, a tube adapted to pass through said sleeve, a plate having a convex reflecting surface adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, and a lamp socket carried by said tube adjacent the convex reflecting surface of said plate and the reflecting surface of said flexible covering.

10. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a reflecting surface, a tube adapted to pass through said sleeve, a plate having a convex reflecting surface adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, a lamp socket carried by said tube adjacent the convex reflecting surface of said plate and the reflecting surface of said flexible covering, a cap having a convex reflecting surface presented towards the convex surface of said plate, and means whereby said cap may be mounted upon a flash bulb in said socket so as to be positioned between said bulb and the subject to be photographed.

11. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a crinkled reflecting surface, a tube adapted to pass through said sleeve, a plate having a convex reflecting surface adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, a lamp socket carried by said tube adjacent the convex reflecting surface of said plate and the reflecting surface of said flexible covering, a cap having a convex reflecting surface presented towards the convex surface of said plate, and means whereby said cap may be mounted upon a flash bulb in said socket so as to be positioned between said bulb and the subject to be photographed.

12. Flashlight apparatus embodying therein a collapsible frame, a covering of flexible material for said frame, a coating of bright, crinkled, metal foil upon one face of said material, means engaging said collapsible frame adjacent the metal foil coated surface thereof, a support for said means passing through the covering for said frame whereby said frame may be collapsed or distended, means whereby said support may be secured in relation to said frame, and a lamp socket carried by said support within and adjacent the metal foil coating of said flexible covering adjacent said first named means.

13. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a coating of bright, crinkled, metal foil upon one face thereof, a tube adapted to pass through said sleeve, a plate having a convex reflecting surface adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, and a lamp socket carried by said tube adjacent the convex reflecting surface of said plate and the metal foil coating of said flexible covering.

14. Flashlight apparatus embodying therein a collapsible frame comprising a flanged sleeve, a plurality of resilient ribs pivotally mounted thereon, a covering of flexible material secured to said ribs limiting pivotal movement and flexure of said ribs when distending the frame, said flexible material having a coating of bright, crinkled, metal foil upon one face thereof, a tube adapted to pass through said sleeve, a plate having a convex reflecting surface adapted to be removably mounted upon said tube in engaging relation with said ribs, locking means carried by said sleeve engageable with said tube, a lamp socket carried by said tube adjacent the convex reflecting surface of said plate and the metal foil coating of said flexible covering, a cap having a convex reflecting surface presented towards the convex surface of said plate, and means whereby said cap may be mounted upon a flash bulb in said socket so as to be positioned between said bulb and the subject to be photographed.