J. J. JOHNSON.

COMBINED LAMP HOLDER AND REFLECTOR.

APPLICATION FILED SEPT. 17, 1917. RENEWED JULY 19, 1920.

1,376,941.

Patented May 3, 1921.

3 SHEETS—SHEET 1.

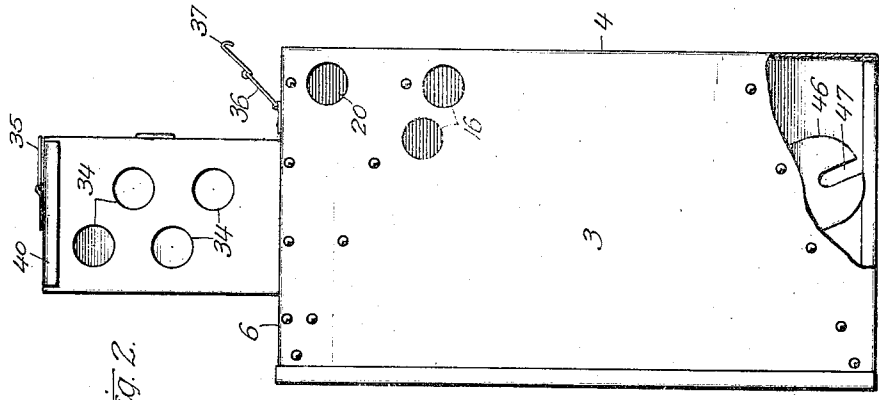


Fig. 2.

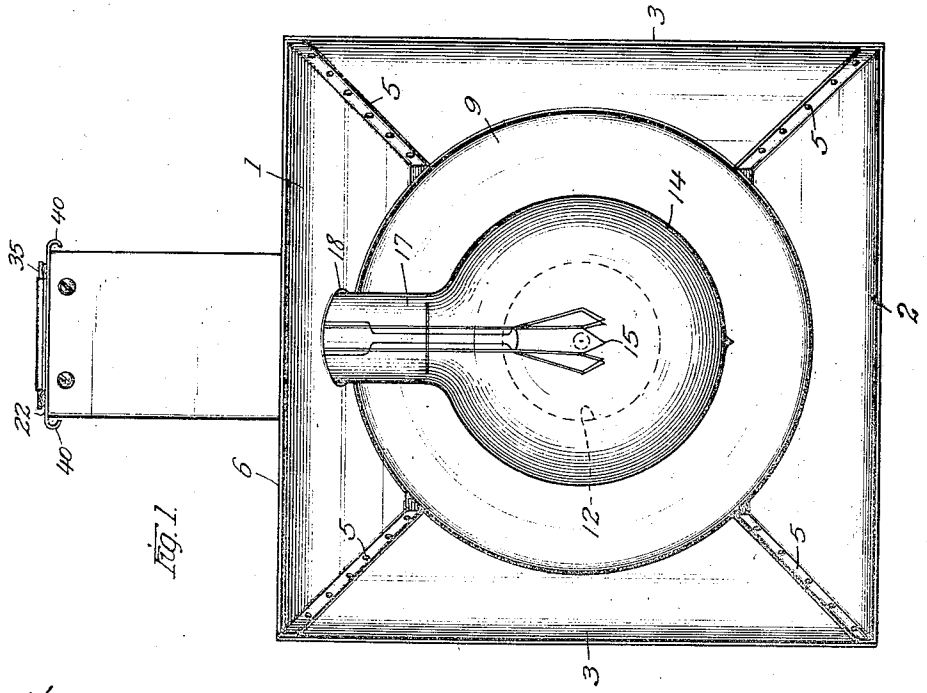


Fig. 1.

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Fig. 4.

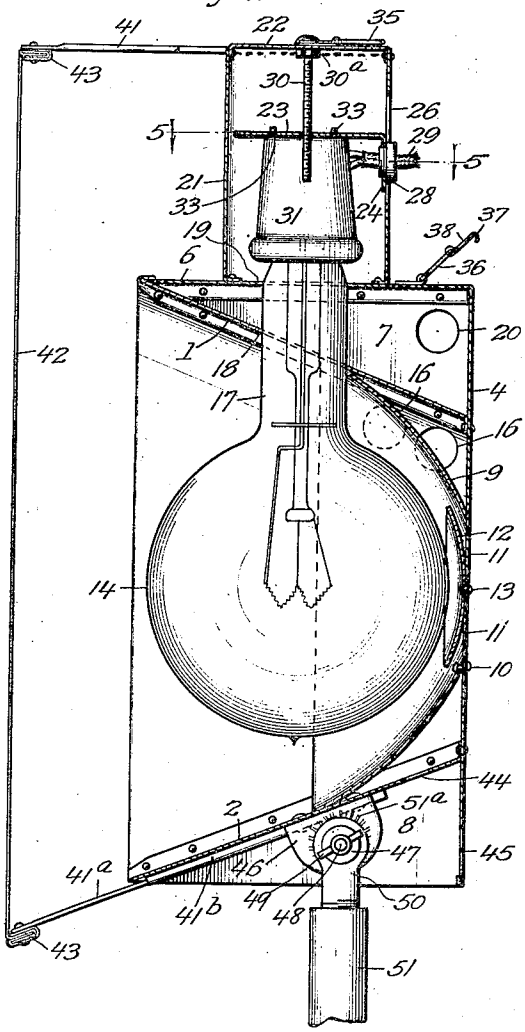


Fig. 5.

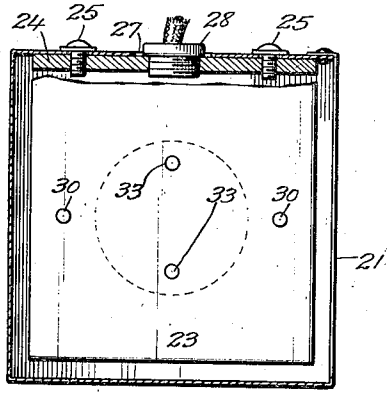


Fig. 3.

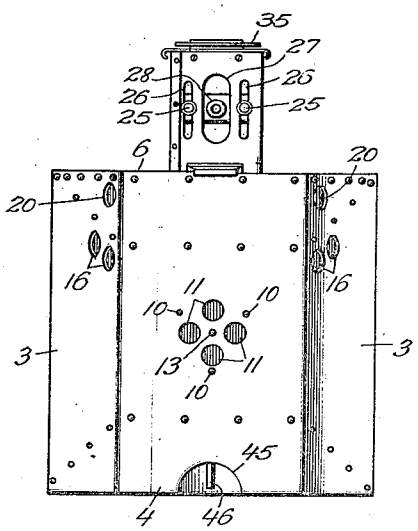


Fig. 14.

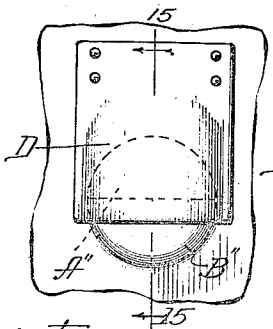
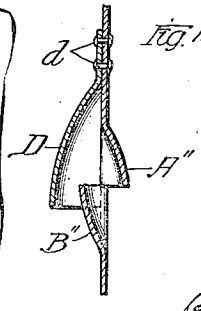


Fig. 15.



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3 SHEETS—SHEET 3.

Fig. 6.

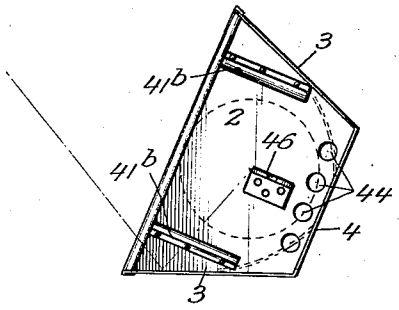


Fig. 7.

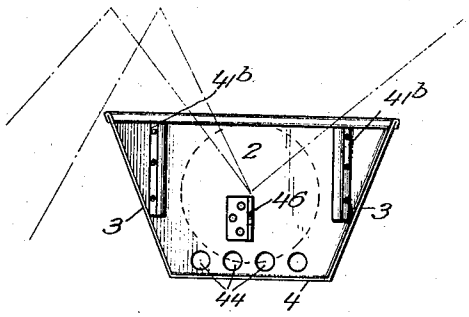


Fig. 9.

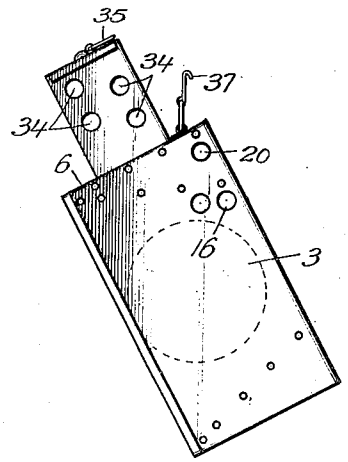


Fig. 12.

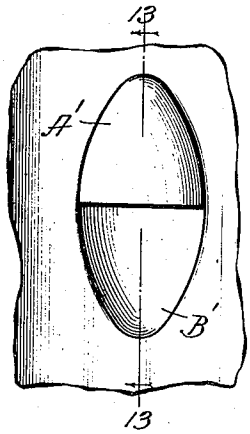


Fig. 13.

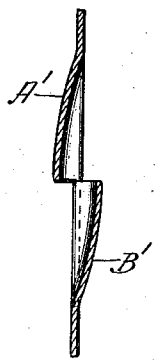


Fig. 8.

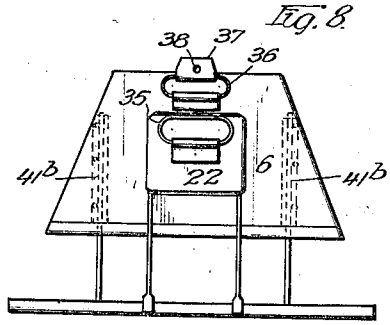


Fig. 10.

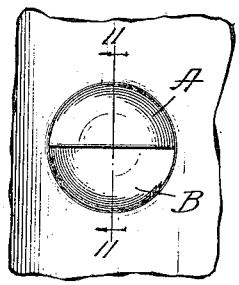
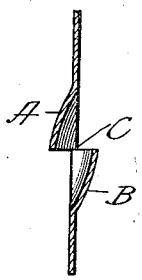


Fig. 11.



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UNITED STATES PATENT OFFICE.

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COMBINED LAMP-HOLDER AND REFLECTOR.

1,376,941. Specification of Letters Patent. Patented May 3, 1921.

Application filed September 17, 1917, Serial No. 191,790. Renewed July 19, 1920. Serial No. 397,549.

To all whom it may concern:

Be it known that I, JAMES J. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Combined Lamp-Holders and Reflectors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to combined lamp holders and reflectors of that general type employing high wattage incandescent lamps and used for commercial photography, portrait photography, home portraiture, copying, photograph printing machines, art gallery illumination of paintings and statuary, the lighting of large mural decorations and mosaics, surgeons' operating illumination, show-window illumination, outdoor lighting of posters, signs and advertisements, and generally where an all-around powerful flood light is desired or required.

Some of the objects, generally stated, of my invention are to increase the efficiency of the reflector over those heretofore known, to secure a better and more efficient light for photographic or other uses requiring a strong flood light, to increase the longevity of the lighting element, to secure a light-weight apparatus and one that is compact, simple and economical to construct, and which cannot readily be gotten out of proper working order.

In carrying out my invention I provide an improved ventilating structure by which the maximum ventilation is afforded to both the lighting element and its socket, permitting the ready dissipation of the heat and preventing the melting of solder and the shrinking of cement in the socket, which frequently takes place in lamps of this character, rendering them short-lived and inefficient. The lamp holder and reflector is of very compact construction and unusual lightness and may readily be placed in a large variety of different positions so as to secure direct, indirect and semi-direct flood lighting, as desired. Means are provided for readily adjusting the focus of the lamp, for readily supporting the lamp in a vertical or in any desired angular position, for supporting a diffuser curtain in front of the lamp from the frame of the latter whenever required, and generally for rendering more handy, convenient and efficient lamps of the character and for the purpose described.

My invention, its manner of use, and the numerous advantages inherent therein will readily be understood and appreciated by those skilled in the art from the following detail description when taken in connection with the accompanying drawings forming a part of this specification, wherein I have illustrated one practical mechanical embodiment of the invention, and in which—

Figure 1 is a front elevation of the complete lamp holder and reflector.

Fig. 2 is a side elevation.

Fig. 3 is a rear elevation on a reduced scale.

Fig. 4 is a vertical section showing the lamp mounted on a tripod or other stand.

Fig. 5 is a horizontal section through the socket housing on the line 5—5 of Fig. 4.

Fig. 6 is a bottom view showing the reflector lying on one side.

Fig. 7 is a view similar to Fig. 6 showing the reflector lying on its back.

Fig. 8 is a top plan view illustrating the attachment of the diffuser curtain.

Fig. 9 is a side elevation showing the reflector suspended in an inclined position.

Fig. 10 is a detail fragmentary front view illustrating a modified form of weather-proof ventilation opening.

Fig. 11 is a section on the line 11—11 of Fig. 10.

Fig. 12 is a view similar to Fig. 10 showing oval form of weather-proof ventilation opening.

Fig, 13 is a section on the line 13—13 of Fig. 12.

Fig. 14 is a view similar to Figs. 10 and 12 showing still another construction of weather-proof ventilation opening; and

Fig. 15 is a section on the line 15—15 of Fig. 14.

Referring to the drawings, the main reflector frame is of rectangular form and includes flat forwardly flaring top, bottom and side reflector walls 1, 2 and 3, 3, respectively, and a back wall 4. The side walls 3 and back wall 4 may conveniently be pressed to shape from a single sheet of metal and extend the full height of the reflector frame, as clearly shown in Fig. 3. The flaring top and bottom walls 1 and 2, respectively, are flanged at their ends and riveted to the side walls 3, as clearly illustrated at 5 in Fig. 1.

A horizontal top frame wall 6 is suitably secured to the upper ends of the side and rear walls 3 and 4, and forms a support for the socket housing hereinafter described, and also forms, with the top reflector wall 1 and the upper end portions of the side and rear walls, an upper ventilation chamber 7 (Fig. 4.) A similar lower ventilation chamber 8 is formed by the bottom reflector wall 2 and the lower end portions of the side and rear walls.

Within the four flaring walls of the reflector is set a preferably parabolic reflector 9, which is secured by rivets 10 to the back wall 4 and is formed with a central opening that lies directly in front of a series of openings 11 formed through the back wall 4 (Fig. 3). To prevent passage of light through the openings 11 a small parabolic section 12 is riveted centrally at 13 to the back wall 4, and is spaced about one-quarter of an inch in advance of the central opening of the main parabola section 9, as clearly shown in Fig. 4. The parabolic reflector extends from a point behind the lamp bulb 14 to substantially the center plane of the lighting element 15, thus permitting ventilation openings 16 to be formed through the side walls 3 which are occluded by the parabolic reflector. Efficient ventilation of the lamp 14 and the parabolic reflector is thus afforded by the ventilation openings 11 and 16, the annular space between the parabolic reflector sections 9 and 12, and the holes 44 in the bottom plate 2.

The neck 17 of the lamp extends through holes 18 and 19 in the walls 1 and 6, and the upper ventilation chamber 7 is provided in its side walls with ventilation openings 20.

Secured to and superposed on the top horizontal wall 6 of the frame is a rectangular socket housing 21, having a flat top or cover 22. Within this housing is an angle bracket comprising a horizontal member 23 and a vertical member 24. The vertical member 24 of the bracket is adjustably secured to the rear wall of the housing by means of screws 25 (Fig. 5) that pass through vertical slots 26 (Fig. 3) in said back wall and are tapped into the vertical member 24 of the bracket. The rear wall is further provided with a central vertical slot 27 (Fig. 3), through which extends a porcelain insulating bushing 28 that carries the light wiring 29. A pair of vertical adjusting screws 30 pass through the top plate 22 just inside the side walls of the housing and are tapped through the horizontal member 23 of the angle bracket. A collar 30^a on these screws 30 just inside the top plate prevents them from backing up through the top plate when they are rotated to push the plate 23 down. 31 designates the porcelain socket-piece of the lamp in which the neck 17 is secured, by threading in the usual way, this socket-piece being preferably any well known and satisfactory type of weather-proof socket on the market, and rigidly secured to the bracket member 23, as by screws 33. By the described means of supporting the lamp socket within the socket housing, it is possible to adjust the focus of the lamp up and down, or sidewise, or fore and aft; the up and down and sidewise adjustments being effected by manipulation of the screws 30, the screws 25 being loosened sufficiently to permit the same, and the fore and aft adjustments being effected by the screws 25. In the opposite side walls of the socket housing are a plurality of openings 34 (Figs. 2 and 9) which permit ready circulation of air for cooling purposes through the socket housing and around the socket-piece. Secured to the top plate or cover 22 of the socket housing is a handle 35 which constitutes a convenient means for lifting the device out of its case or container, as well as for carrying the same around; and the handle is so located directly over the center of gravity as to serve as a means for hanging the reflector in a true vertical position from above. To the top wall 6 of the main frame, in rear of the socket housing, is secured a handle or clevis 36 to which is attached a hook 37 having a hole 38 formed through the stem or shank thereof. This device is used when a studio or angular light from above is wanted, the hook 37 being suspended from any suitable overhead support. The hook may also be used to fasten the lamp to a wall or pillar by driving a nail into or tying a string around the pillar, hole 38 engaging over the nail, when this is used, and the hook 37 engaging the string when the latter is used.

By reference to Figs. 1 and 2 it will be observed that the opposite side edges of the cap plate 22 are extended and bent downwardly and inwardly, thereby forming a pair of sockets 40 that are adapted to receive rods 41 (Fig. 4), by which a diffuser curtain 42 of tracing cloth or other suitable material may be suspended in front of the lamp, the curtain being provided transversely of its ends with aluminum strips 43, one of which is riveted to the rods 41 and the other to rods 41^a (Figs. 4 and 8), the latter being slipped into sockets 41^b formed by suitable strips secured to the lower side of the bottom plate 2. By this arrangement the diffuser curtain may be used in any position of the reflector.

The bottom reflector plate 2 is provided with a series of ventilation openings 44 that lie behind the lower portion of the parabolic reflector 9, as best shown in Figs. 6 and 7,

and the back wall 4 has formed in its lower edge a notch 45, whereby, when the lamp rests on a flat horizontal surface, such as a table, air can circulate freely through the notch 45 into the lower ventilation chamber 8, through the holes 44 into the space behind the lower portion of the parabolic reflector, thereby affording efficient ventilation in this region, and facilitating the continuous flow of a stream of cold air through the openings 45 and 44, upwardly, around and in rear of the parabolic reflector, and out through the side openings 16.

To the under side of the lower reflector plate or wall 2 is strongly secured an angle bracket 46, the downwardly projecting wing of which has a radial slot 47 adapted to receive a bolt 48 and wing nut 49 carried by a coöperating bracket-piece 50 mounted on a suitable stand 51 (Fig. 4). The coöperating bracket plates 46 and 50 are corrugated or formed with ratchet faces, as indicated at 51ª, by which the lamp can be set upon the stand at any desired angle. The notch 45 in the lower edge of the back wall 4 also facilitates the backward tilting movement of the lamp when supported upon a stand, by affording clearance for the latter.

The sheet metal parts, including the parabolic reflector sections, are preferably made of aluminum, which construction and arrangement affords a highly desirable and useful combination of strength and lightness, enabling the lamp to be carried, mounted in position, and adjusted with hardly any appreciable labor or effort on the part of the operator. This reflector apparatus as I have constructed and use it, weighs from three to three and one-half pounds, as compared with fifteen to sixty pounds for older devices, which is a matter of considerable importance for portable work where they have to be carried by hand. The lamp is capable of being readily supported in practically any desired position so as to direct the light in any desired manner. Indirect lighting is secured by laying the device on its back, as shown in Fig. 7. The angular side walls serve to support the device on either side for semi-indirect lighting in either direction. The bottom supporting lug 46 in coöperation with a suitable stand and clamp enables the device to be supported with any desired degree of forward or rearward tilt, while the hook 37 enables the lamp to be readily suspended from any convenient support. The ventilation chambers and openings are so located as to insure a thorough circulation of air around the parabolic reflector and the neck and socket of the lamp, thereby maintaining these parts in a relatively cool and safe condition. Lamps of this type ordinarily employ high wattage nitrogen tungsten bulbs which, when in use, emit a large amount of heat; and they are relatively short-lived owing to lack of means for ventilating and dissipating the heat, particularly around the socket, as a result of which the parts become so hot that the solder melts and the cement shrinks, causing cracks and openings, and the escape of the gas. I have found by tests that the ventilation features of my present invention fully double the average life of the lamp, in addition to making it easier to handle on account of a reduction of heat. The neck and plug end of the lamp, the lamp socket, and the various associated parts remain cool, even to the touch, when it is impossible to hold the hand stationarily longer than a second or two in front of the burning lamp.

This ability to keep the lamp and other parts cool enables the lamp to be used at a somewhat higher rate of current, thus increasing the amount of light given off by the lamp, and considerably shortening the time of exposure of the negatives, if the lamp is being used for photographic purposes. Thus a 110-volt lamp can be used on a 115-volt circuit, with greatly superior lighting. This may tend to shorten the life of the lamp a little but is more than offset by the extra light and the shortening of the time of exposures. This, therefore, increases the efficiency of the apparatus as a whole. The apparatus is about half the size of older devices, and owing to its slanting sides, two in a case, when oppositely faced, takes up considerably less over all space than twice that required for one. Owing to the external form and flat sides, top and bottom, the device lends itself to convenient handling, manipulation, packing and transporting.

In the principal views I have shown the ventilation openings as consisting of plain holes in the walls. Where the lamp is to be used for outdoor work I preferably provide what I term weather-proof ventilation openings, such as are illustrated in Figs. 10 to 15, inclusive. According to these figures, the opening is made by forming a slit in the wall and pressing or swaging the metal in opposite directions to form an opening in a horizontal plane. In Figs. 10 and 11, A and B represent the portions of the metal on opposite sides of the slit that are swaged outwardly and inwardly, respectively, thereby forming a horizontal opening C between their opposed free edges. In Figs. 12 and 13 the same construction is employed as in Figs. 10 and 11, but the laterally displaced portions A′ and B′ are of semi-elliptical instead of semi-circular form. In both of these cases the upper overhanging wall A or A′ of the opening is formed on the outer or weather side of the wall, so as to readily shed rain or moisture accumulating thereon. In the form shown in Figs. 14 and 15 the upper laterally displaced portion A″ is dis-

posed inwardly and the lower laterally displaced portion B'' is disposed outwardly, and a separate guard D is attached to the wall as by rivets *d*, and overhangs the opening. The construction illustrated in these figures is useful not only for excluding moisture but also for preventing in a large measure the entrance of dust and dirt inside the walls.

I have herein shown and described what I have found in practice to be a thoroughly practicable and workable embodiment of the invention herein presented; but it will be manifest to those skilled in the art that variations and modifications in respect to detail features, such as ventilation openings and passages, may be made without departing from the principles involved or sacrificing any of the advantages secured. Hence, I do not limit the invention to the particular construction shown and described, but reserve all such modifications as fairly fall within the scope and purview of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, the combination of a main rectangular frame having flat outwardly flaring top, side and bottom reflector walls, with a curved reflector within said walls, and a lighting element in front of said curved reflector, said side and bottom reflector walls being provided with ventilation openings in rear of said curved reflector.

2. In a device of the character described, the combination of a main frame having a centrally apertured back wall and outwardly flaring top, bottom and side reflector walls, with a curved reflector set within said reflector walls and having a separate central focal section spaced inwardly from the main section thereof and occluding the central aperture of said back wall, thereby providing a rear ventilation passage to the interior of said reflector, and a lighting element in front of said curved reflector.

3. In a device of the character described, the combination of a main frame having a centrally apertured back wall and outwardly flaring top, bottom and side reflector walls, with a curved reflector set within said reflector walls and having a separate central focal section spaced inwardly from the main scetion thereof and occluding the central aperture of said back wall, thereby providing a rear ventilation passage to the interior of said reflector, said side and bottom reflector walls being also provided with ventilation openings in rear of and occluded by said curved reflector, and a lighting element in front of said curved reflector.

4. In a device of the character described, the combination of a main frame having outwardly flaring reflector walls provided with ventilation openings, with a curved reflector set within said walls and occluding said openings, an incandescent lamp bulb in front of said reflector having a neck extending through the upper reflector wall, a lamp socket, and a ventilated socket housing secured to the top of said main frame.

5. In a device of the character described, the combination of a main frame having a horizontal top wall, a vertical back wall, and outwardly flaring top, bottom and side reflector walls, said side walls being provided with ventilation openings both above and below said top reflector wall, with a curved reflector set within said reflector walls, an incandescent lamp bulb in front of said reflector having a neck extending through said top reflector wall and horizontal top frame wall, a lamp socket, and a ventilated socket housing secured to said top frame wall.

6. In a device of the character described, the combination with a reflector frame having flat, outwardly flaring top, bottom and side reflector walls, and a ventilated air chamber above said top wall, of a lamp socket housing superposed on said air chamber, a parabolic reflector set within said reflector walls, a lamp bulb in front of said parabolic reflector having a stem extending through said air chamber, and a lamp socket secured within said socket housing.

7. In a device of the character described, the combination with a reflector frame having flat, outwardly flaring top, bottom and side reflector walls, and ventilated air chambers above and beneath said top and bottom walls respectively, of a ventilated socket housing superposed on said upper air chamber, a parabolic reflector set within said reflector walls, a lamp bulb in front of said parabolic reflector having a stem extending through said upper air chamber, and a lamp socket adjustably secured within said socket housing.

8. In a device of the character described, the combination with a reflector frame having a back wall and flat, outwardly flaring top, bottom and side reflector walls, and a ventilated air chamber above said top wall, of a ventilated socket housing superposed on said air chamber, a parabolic reflector set within said reflector walls, and a lamp bulb in front of said parabolic reflector having a stem extending through said air chamber, and a socket secured within said socket housing, said back and side reflector walls being formed with ventilation openings behind and occluded by said parabolic reflector.

9. In a device of the character described, the combination with a reflector frame, a lamp therein, and a socket housing attached to the top of said frame and receiving the lamp socket, of means on said socket hous-

ing for removably supporting means for suspending a diffuser curtain in front of said reflector frame.

10. In a device of the character described, the combination with a reflector frame, a lamp therein, and a socket housing attached to the top of said frame and receiving the lamp socket, of a pair of sockets formed on said socket housing, rods mounted in said sockets, and a diffuser curtain suspended from said rods.

11. In a device of the character described, the combination with a reflector frame and a lamp therein, of a socket housing attached to the top of said frame and receiving the lamp socket, said socket housing having a top wall opposite ends of which overhang the side walls thereof and are bent to form parallel sockets adapted to receive rods for suspending a diffuser curtain.

12. In a device of the character described, the combination of a reflector frame having flat outwardly flaring walls, a parabolic reflector set in said walls, and a socket housing superposed on said frame, all of said parts being constructed of sheet aluminum suitably secured together; the walls of said socket housing and the walls of said frame in rear of said parabolic reflector being provided with ventilation openings permitting the free flow of air therethrough.

13. In a device of the character described, a reflector, an incandescent electric lamp having its source of light located within said reflector, an electric lamp socket outside of said reflector and spaced therefrom, a socket-housing surrounding said socket and spaced from said reflector, and a heat-insulating air-chamber located between said reflector and said housing, having openings through which said lamp extends from said socket to the interior of said reflector, the edges of said openings closely surrounding said lamp, whereby the heat from the lamp-bulb is prevented from reaching that portion of the lamp located in the housing.

14. In a device of the character described, a hollow reflector, an incandescent electric lamp having its bulb portion located in said reflector, an electric lamp socket outside of said reflector and spaced therefrom, a housing surrounding said socket and spaced from said reflector, and a heat-insulating air-chamber located between said housing and said reflector and having openings through which said lamp extends from said socket to said reflector, the edges of said openings closely surrounding said lamp, whereby heat from said bulb is prevented from reaching the part of the lamp within said housing, said intermediate chamber being provided with ventilation openings to permit the escape of heated air from said chamber.

15. In a device of the class described, a hollow reflector, an incandescent electric lamp having its bulb located in said reflector, an electric lamp socket for said lamp, a housing in which said socket is located, an angle bracket secured to said socket and located in said housing, means for adjusting said angle bracket and socket in said housing comprising a pair of screws having their axes parallel to the axis of said socket and located on opposite sides of said socket and threaded into said angle bracket, whereby operation of both of said screws will move said socket bodily and operation of either one of said screws will tilt said socket, and means for holding said angle bracket in adjusted position comprising a screw extending through said casing and threaded into said angle bracket.

16. In a device of the class described, a hollow reflector, an electric lamp therein, an attaching lug rigidly secured with respect to said reflector and having a forked bearing portion, a pivot pin engaging said bearing portion and straddled by said fork, and means for holding said lug in various positions of adjustment on said pivot pin, whereby said reflector may be held in various positions of adjustment and may be quickly detached from said pivot pin.

17. In a device of the class described, a hollow reflector, an incandescent electric lamp in said reflector, a casing surrounding said reflector, an electric lamp socket outside of said reflector and spaced therefrom, a housing member surrounding said socket and secured to said reflector housing, one wall of said casing forming, with one wall of said housing, a reëntrant angle, and a supporting hook pivoted adjacent the apex of said angle, whereby it may be folded out of the way against one of said walls.

18. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral pyramidical portion, and a concave portion seated in said pyramidical portion, the walls of said pyramidical portion being substantially tangential to the concave portion, and the corners of the pyramidical portion being spaced from the concave portion whereby ventilation is afforded between the pyramidical portion and the spherical portion, the walls of said pyramidical portion extending forwardly of the concave portion.

19. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral pyramidical portion having four flaring walls, two opposite vertical walls of the pyramidical portion being extended downwardly beyond the lower wall to form legs for supporting the pyramidical portion with its base in vertical position.

20. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral pyramidical portion, and a concave portion seated in said pyramidical

portion, the walls of said pyramidical portion being substantially tangential to the concave portion, and the corners of said pyramidical portion being spaced from the concave portion whereby ventilation is afforded between the pyramidical portion and the concave portion, the walls of said pyramidical portion extending forwardly of the concave portion, the upper wall of the pyramidical portion having an opening through which the neck of the lamp bulb extends.

21. An electric lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral pyramidical portion, a lamp socket outside the reflector and spaced therefrom, a heat insulating air chamber between said socket and reflector, two opposite side walls of said pyramidical portion extending beyond the edges of the upper wall of the pyramidical portion to form the side walls of said heat insulating chamber.

22. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral frusto-pyramidical portion, a wall extending across the smaller end of said frusto-pyramidical portion, and a concave portion seated in said pyramidical portion, the walls of said pyramidical portion being substantially tangential to the concave portion, and the corners of said pyramidical portion being spaced from said concave portion, whereby ventilation is afforded between the pyramidical portion and the concave portion, the walls of said pyramidical portion extending forwardly of the concave portion, said rear wall being provided with a ventilating opening.

23. A lighting device comprising a lamp, a quadrilateral pyramidical portion having four adjoining tapering walls forming a combined housing and reflector portion, supporting means for supporting the lighting device so that the base of the pyramidical portion will lie in a substantially vertical plane, one of the two vertical side walls of the pyramidical portion being free from obstruction on the outside, so that when desired the lighting device can be laid on its side using said side portion as a supporting base, whereby the base of the pyramidical portion will be held in inclined position.

24. A lighting device comprising a lamp, a quadrilateral frusto-pyramidical portion having four adjoining tapering walls and a fifth wall extending across the smaller portion of the frusto-pyramidical portion, said pyramidical portion forming a combined housing and reflector portion, and supporting means for supporting the lighting device so that the base of the pyramidical portion will lie in a substantially vertical plane, one of the vertical side walls of the pyramidical portion and the fifth wall being free from obstruction on the outside so that when desired the lighting device can be laid on one of its sides, to direct the light upwardly at an inclination, or so that the lighting device can be laid on its back to direct the light straight upwardly.

25. A lighting device comprising a lamp, and a quadrilateral frusto-pyramidical portion forming a combined housing and reflector, said frusto-pyramidical portion comprising four flaring walls having adjoining edges and a rectangular wall extending across the smaller end of said frusto-pyramidical portion, and a dished reflector substantially tangential to all five of said walls.

26. A lighting device comprising a lamp, and a quadrilateral frusto-pyramidical portion forming a combined housing and reflector, said frusto-pyramidical portion comprising four flaring walls having adjoining edges, and a rectangular wall extending across the smaller end of said frusto-pyramidical portion, two of said flaring walls and said rectangular wall being formed of a single piece of sheet material.

27. A lighting device comprising a lamp, and a combined housing and reflector comprising a single sheet of material bent to form two flaring vertical side walls, and an intermediate back wall, said side walls flaring outwardly away from said back wall, and top and bottom walls extending between said flaring side walls, said top and bottom walls diverging outwardly with respect to each other, away from said rear wall.

28. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral frusto-pyramidical portion, having vertical flaring side walls, and inclined flaring top and bottom walls, the neck of the lamp bulb extending through said upper wall, the two bases of said frusto-pyramidical portion lying in substantially parallel vertical planes, said lighting device being substantially free from obstructions in front and in the rear of the bases of said frusto-pyramidical portion, whereby the device can be easily and compactly fitted into a case having parallel vertical walls.

29. An electric lighting device comprising a reflector, a lamp socket outside said reflector and spaced therefrom, a lamp secured in said socket and extending into said reflector, a heat insulating air chamber between said lamp socket and reflector and means for preventing circulation of air between said reflector and heat insulating air chamber.

30. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral frusto-pyramidical portion, having vertical flaring side walls, and inclined flaring top and bottom walls, a lamp socket for said lamp supported above said top wall, a housing for said lamp socket also

supported above said upper wall, the two bases of said frusto-pyramidical portion lying in substantially parallel planes, said lighting device being substantially free from obstructions in front and in the rear of the bases of said frusto-pyramidical portion, whereby the device can be easily and compactly fitted into a case having parallel vertical walls.

31. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral frusto-pyramidical portion having vertical flaring side walls and inclined flaring top and bottom walls, a lamp socket for said lamp supported above said top wall, a housing for said lamp socket also supported above said top wall, said top wall having an opening through which the lamp extends into the reflector, the two bases of said frusto-pyramidical portion lying in substantially parallel planes, and a dished reflector portion extending from said frusto-pyramidical portion embracing the rear part of the lamp bulb.

32. A lighting device comprising a lamp and a reflector, said reflector comprising a quadrilateral frusto-pyramidical portion having vertical flaring side walls and inclined flaring top and bottom walls, a lamp socket for said lamp supported above said top wall, said top wall having an opening through which the lamp extends into the reflector, the two bases of said frusto-pyramidical portion lying in substantially parallel planes, and a dished reflector portion extending from said frusto-pyramidical portion embracing the rear part of the lamp bulb.

In witness whereof, I have hereunto subscribed my name.

JAMES J. JOHNSON.