J. R. CRAVATH.

LIGHT NG FIXTURE.

APPLICATION FILED NOV. 14, 1913.

1,137,954.

Patented May 4, 1915.

3 SHEETS—SHEET 1.

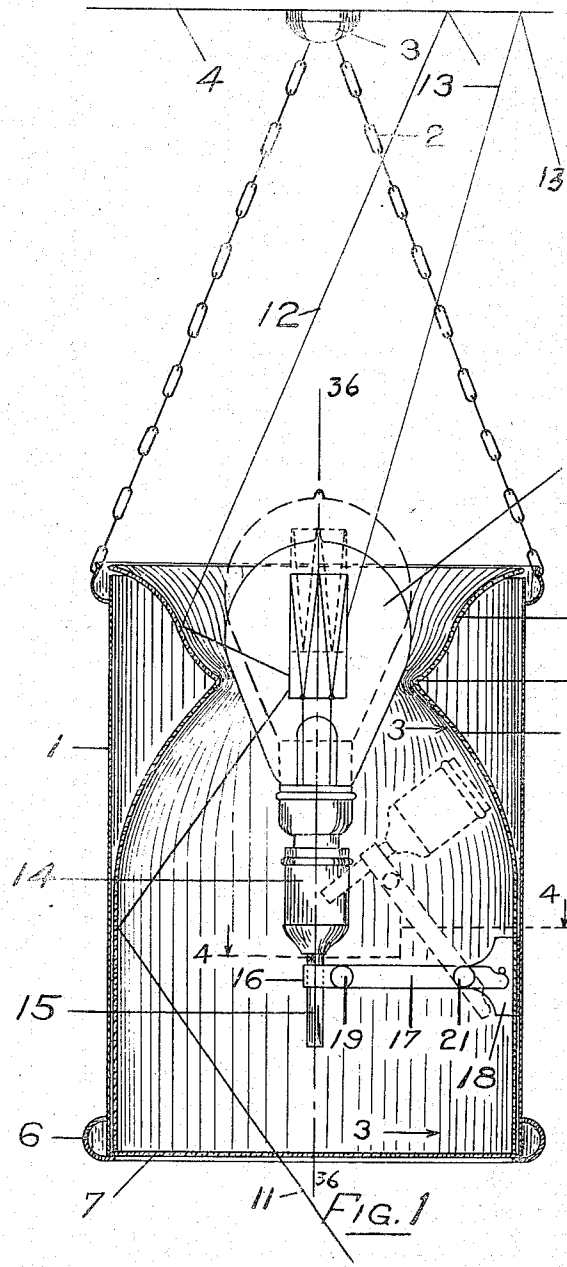

FIG. 1

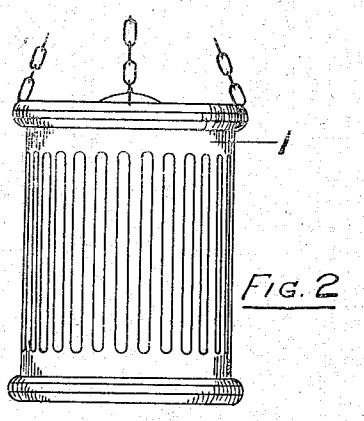

FIG. 2

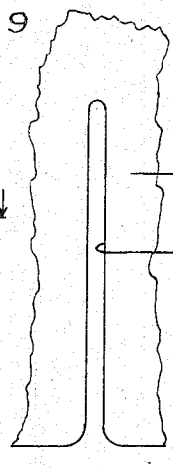

FIG. 3

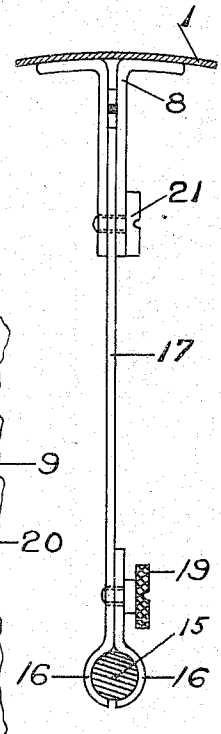

FIG. 4

WITNESSES

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3 SHEETS—SHEET 2.

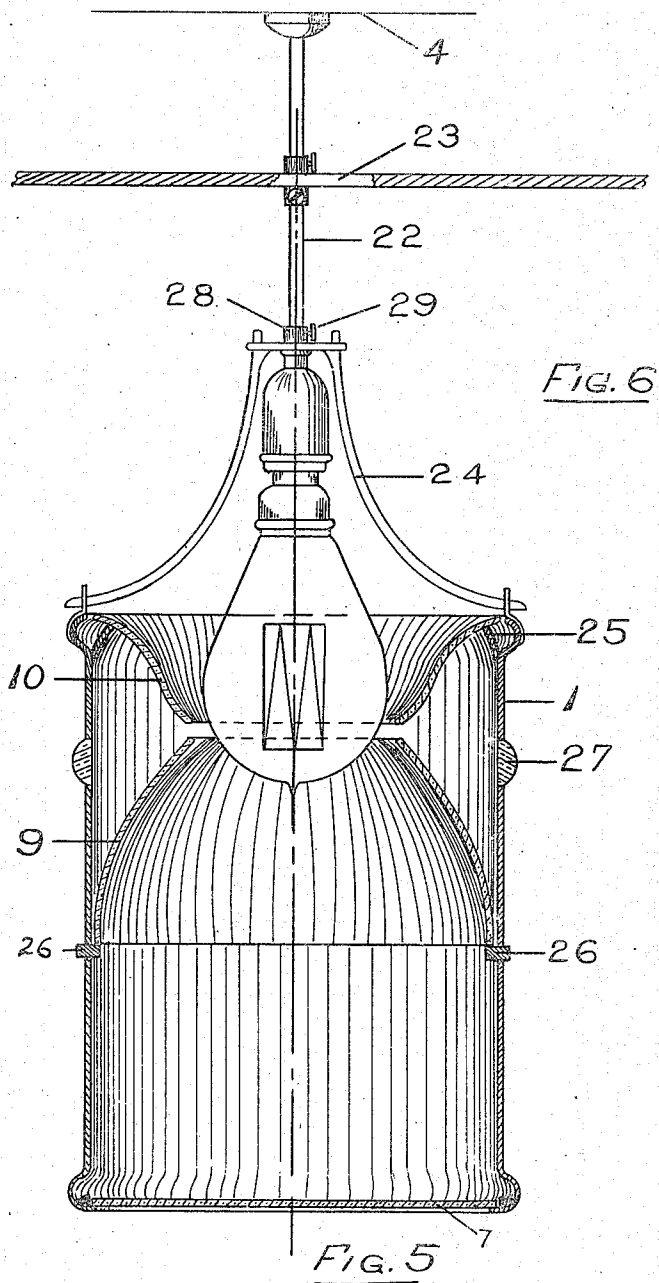
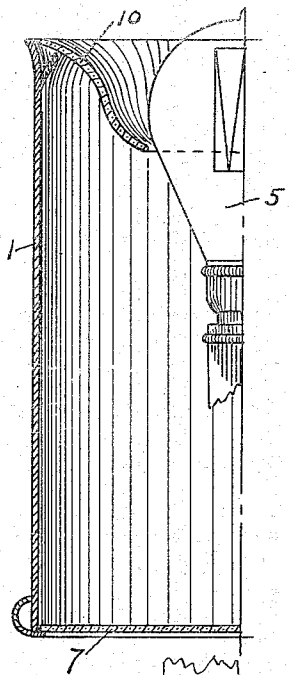


FIG. 5



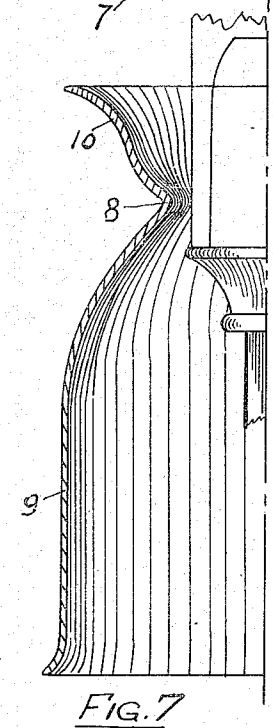


FIG. 7

FIG. 6

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3 SHEETS—SHEET 3.

FIG. 8

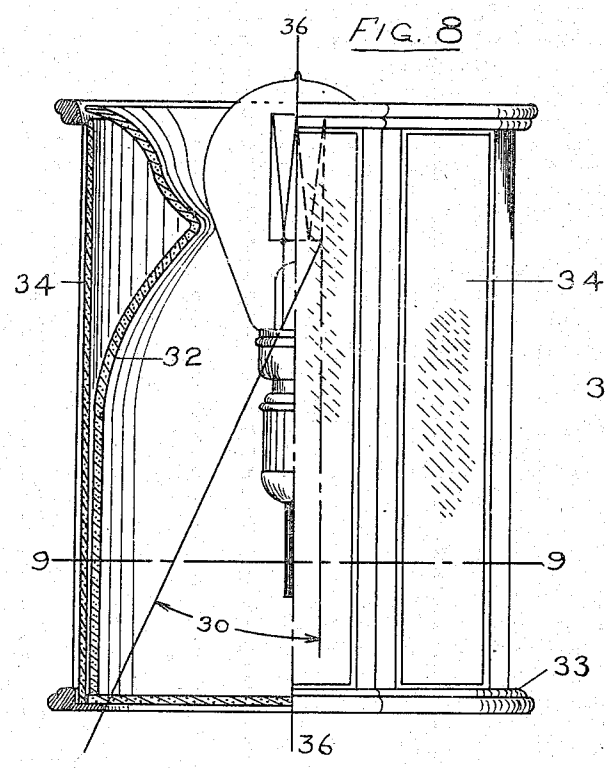
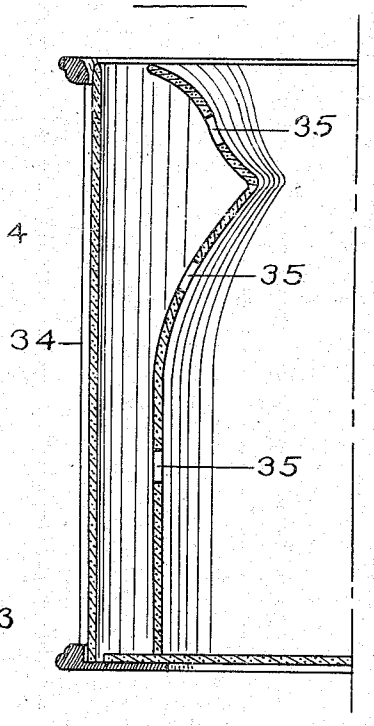


FIG. 10.



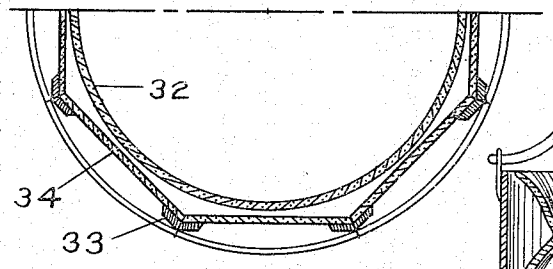
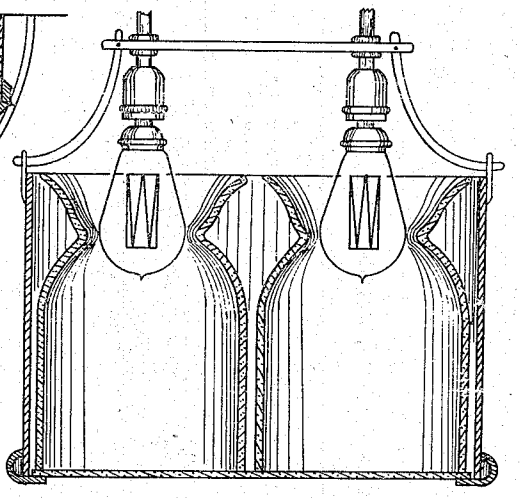


FIG. 9

FIG. 11



WITNESSES

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UNITED STATES PATENT OFFICE.

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LIGHTING-FIXTURE.

1,137,954. Specification of Letters Patent. Patented May 4, 1915.

Application filed November 14, 1913. Serial No. 800,935.

To all whom it may concern:

Be it known that I, JAMES R. CRAVATH, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lighting-Fixtures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to indoor lighting fixtures and more particularly to fixtures for enabling light to be distributed simultaneously by the so-called direct and indirect lighting methods.

Indirect lighting by the method of directing the rays of a lamp upward against a light colored ceiling is becoming extensively used on account of the pleasant diffused character of the illumination so produced, and because it conceals the source of light from the eye and so prevents the annoyance, discomfort and harmful effects of an exposed light source on the eye. It sometimes happens that for some special purpose it is desirable to have a much higher intensity of illumination in one or more parts of a room than is required in other parts. If the lighting is purely by the indirect method, the light is so diffused to all parts of the room by reflection from a diffuse reflecting ceiling, that it is not economical by this method to produce such localized or specially intense illumination in one part of the room, and it becomes desirable where economy is an object to supplement the general illumination afforded by the indirect lighting with localized illumination at one or more points. This localized lighting is sometimes best done by the method commonly called "direct", that is with lamps so placed that the light from the lamp and its reflector equipment falls directly on the work without first being reflected from ceiling or walls. If both direct and indirect lighting are provided, it has heretofore been necessary to use separate fixtures, or at least separate lamps and reflectors on the said fixture, thus making the combination of methods cumbersome, expensive and often inartistic.

The prime objects of my invention are to provide a simple, compact and artistic fixture which will enable portions of the light from a given lamp to be distributed respectively by the direct and indirect methods, thereby making it unnecessary to install and operate separate lamps for each method; to provide means for restricting the light distributed by the direct method to directions not in the normal lines of vision of occupants of the room lighted by the said lamp; to provide means for adjusting the lamp with respect to the fixture so as to vary the proportions of the light distributed by the direct and indirect methods; and to provide ready access to the interior surfaces of the fixture for cleaning the same. The means by which I accomplish these objects may be embodied with substantially equal advantages in a number of different forms, as shown in the accompanying drawings, in which—

Figures 1, 5 and 8 are vertical sections of tungsten lamp fixtures embodying my invention. Fig. 2 is a fragmentary elevation of the fixture of Fig. 1 on a reduced scale. Fig. 3 is a fragmentary view of the lower slotted end of the reflector of Fig. 1. Fig. 4 is an enlarged plan view of the bracket supporting the socket in the embodiment of Fig. 1. Figs. 6 and 7 are fragmentary vertical sections through embodiments of my invention equipped respectively with a tungsten lamp and a mantle gas lamp. Fig. 9 is a fragmentary section through Fig. 8 along the line 9—9. Fig. 10 shows an alternative type of reflector member for use with the construction shown in Fig. 8. Fig. 11 shows a number of lamps and reflector members housed in a single casing.

In Fig. 1, the fixture of my invention consists essentially of an ornamental casing 1 suspended by chains 2 from a canopy 3 secured to a ceiling 4, the latter having a light colored under surface adapting it to act as a reflecting or diffusing surface for upward rays of light from a lamp 5 mounted within the said casing. The casing 1 is preferably substantially cylindrical and equipped at its lower end with an ornamental bead 6 having its open end contracted sufficiently to support a diffusing plate 7 of ground glass or other translucent material. Resting at its lower end upon the said translucent plate 7 is a tubular reflector of silvered glass, metal or other suitable material divided by

a contracted neck portion 8 into two parts each shaped substantially like a truncated conoid, the lower portion 9 thereof closely interfitting the lower end of the casing 1 while the upper end 10 extends approximately to the top of the casing 1. The neck portion of the composite reflector member is positioned close to the portion of the lamp 5 housing the filament or light-emitting part of the lamp, so that the light radiated from the lamp will be redirected in substantially opposite directions by the said reflector portions 9 and 10 as shown by the lines 11 and 12 respectively. The rays of light 12 thus reflected against the ceiling or diffusing surface 4, together with rays 13 reaching the diffusing medium direct from the filament of the lamp will be reflected and diffused by the diffusing surface, thereby utilizing these upward rays by the so-called indirect method. However, the rays of light reaching the lower portion 9 of the reflector will be redirected in substantially downward directions and with the lower portion of the reflector shaped as in Figs. 1, 5, 7, 8 or 10, these downward rays will be concentrated so as to produce a comparatively intense direct lighting.

It will be evident from Fig. 1 that the proportion of the light flux of the lamp thus reflected respectively in upward and downward directions would depend upon the position of the neck 8 or juncture between the two reflector portions with respect to the light-giving portion of the lamp. Thus, if the lamp is raised as shown by the dotted lines, the proportion of light directed downward will be decreased, while the light radiated upward and distributed by means of the reflector portion 10 and the diffusing surface 4 will be increased. Consequently, the relative proportions of direct and indirect light can readily be varied to suit different requirements, so as to adapt the same lighting fixture for effecting the lighting of a room which may be used for a variety of purposes. I am thus able to produce the general illumination of a room by the pleasant method of indirect lighting, while at the same time providing a concentrated light of adjustable intensity underneath the fixture so as to suit special requirements for an abnormally strong illumination for sewing, reading or other purposes. My investigations have shown that for reading purposes most persons are satisfied with an illumination intensity of 1.5 to 2.5 foot candles, and many even less. However, some individuals (particularly those over forty-five years of age or whose eyesight is abnormal) require as much as five or six foot candles, and a like intensity is required by most people for sewing on dark goods if the work is to be done without straining their eyes. By positioning the lamp properly within the fixture, an intense illumination is supplied right under the fixture without making the general illumination of the room unnecessarily great for the other purposes for which the room is used.

The adjustable supporting of the lamp may be accomplished in many ways. Thus, Fig. 1 shows the lamp 5 as mounted in a socket 14 equipped at its lower end with a stem 15 clamped between curved jaws 16 carried by an arm 17, which arm is supported by a bracket 18 secured to the casing 1. By loosening the screw 19 which draws the curved jaws 16 toward each other, the stem 15 may be slid up or down with reference to the said supporting arm so as to raise or lower the lamp with respect to the casing and the reflector parts housed therein. To provide for the brackets 18, I equip the lower end of the reflector 9 with a slot 20, thereby permitting the reflector member of the fixture to be inserted in the casing or removed therefrom without disconnecting the bracket 18 and the arm supported thereby from the casing. To permit access to the upper surface of the bottom plate 7 for removing or cleaning the latter, I preferably mount the arm 17 upon a pivot 21 carried by the bracket 18, so that the said bracket together with the socket carried thereby may be swung out of its normal position as shown in dotted lines in Fig. 1.

While the various dimensions of the reflector members of my fixture may be varied greatly while producing the combined direct and indirect lighting effect above described, I preferably proportion the lower portion of the reflector member so that it will intercept all rays of light emanating directly in downward directions at angles of greater than about 25° with the vertical, *i. e.*, the axis 36 of the reflector member. In other words, I so shape and proportion this reflector part that the angle 30 in Fig. 8 will not be greater than about 25°. As the eyebrows of the average person will shade the eyes from light coming at such angles when the head is erect, it is evident that with the head in any normal position, no direct light from the filament will shine in the eyes of persons occupying a room lighted from such a fixture. However, I do not wish to limit myself to the exact shape or proportioning of the reflector or other parts shown, as there are cases where it might be desirable to extend the angle of direct illumination, although it is my intention in all cases to keep the light source so completely shaded from the eye as to avoid all annoying and injurious effects.

While I have described the appliance of my invention as equipped with a reflector member having upper and lower portions integrally connected, as having the lamp supported by the casing, and as utilizing the

ceiling of the room as a diffusing surface, I do not wish to be limited to these or other details of the construction thus, disclosed, it being evident that these may be varied in many ways without departing from the spirit of my invention. Thus, Fig. 5 shows an embodiment in which the fixture is supported from the ceiling 4 by a tubular stem 22 carrying a metal disk 23 which serves as the diffusing surface of the appliance, the casing 1 of the fixture being connected to the stem 22 by arms 24. Mounted upon and projecting inwardly of the casing 1 are projections 25 and 26 supporting the upper and lower portions 10 and 9 of the reflector respectively, these reflector portions being separated by an annular space permitting the small portion of light to enter the space between the said reflectors and the casing 1 so as to light the glass beads or translucent portions 27 mounted in perforations in the casing 1. In this case, the position of the lamp with respect to the reflector members may be made adjustable by vertically moving the sleeve 28 to which arms 24 are attached, said sleeve telescopically interfitting the tubular stem 22 and being clamped thereon by a screw 29.

The casing 1 may be ornamental as desired, and if the reflector members are entirely opaque and contiguous at their adjacent ends, as in Fig. 1, the casing may be made of any opaque material such as metal, wood, paper, fiber or plaster which can be worked into the desired ornamental design. However, a portion of the light of the lamp may also be used to illuminate parts of the casing, thereby adding to the ornamental effect of the latter, by providing openings in the reflector member or by making the latter of a translucent material. For example, Figs. 8 and 9 show a reflector member 32 of dense opal or other translucent material housed within an inclosure consisting of a lantern-frame 33 supporting glass panels 34. Likewise, Fig. 10 shows a section of a similar fixture equipped with an opaque reflector member having perforations 35 through which light may pass from the lamp to the panels 34 of the inclosure.

Instead of extending the lower end of the reflector 9 substantially to the lower end of the casing, the interior of the lower end of the casing 1 may be equipped with a reflecting surface, thereby enabling the reflector 9 to be shortened as in Fig. 5. Or, if desired, the entire interior surface of the casing may be equipped with a reflecting surface, as in Fig. 6, thereby enabling me to dispense with the separate reflector portion 9. So also, if the appliance of my invention is to be used in shops or other places where the cost of an ornamental casing would not be warranted, the latter may be omitted altogether as in Fig. 7. In any case, it will be evident that by thus utilizing the light of a single lamp in two substantially opposite directions, I am enabled to make efficient fixtures much shorter than corresponding fixtures employing two lamps one placed above the other. I have thus been enabled to make fixtures which can be used in rooms having ceilings as low as 8.5 to 9.5 feet from the floor, in which rooms two-lamp fixtures would not be practical on account of insufficient head room. Moreover, I am thus able to combine an indirect lighting effect with a certain amount of direct but well shaded lighting (and, in the case of fixtures having translucent casings, with the soft illumination of an ornamental housing) by the use of a single lamp and socket. This reduces both the first cost and the cost of maintenance over that which would be required with fixtures equipped with separate lamps for the direct and indirect portions of the lighting. However, I do not wish to be limited to fixtures equipped with only one lamp, as a number of lamps and reflector members might be housed in a single casing, as shown sectionally in Fig. 11.

I claim as my invention:

1. A lighting fixture comprising a frame, a casing and a tubular reflector member both supported thereby, the reflector member housed by the casing and equipped intermediate of its ends with a contraction dividing the same into two substantially truncated conoidal reflectors opening in opposite directions; a socket adjustably supported by the casing, and a lamp mounted in the socket, the adjustable supporting of the socket permitting the lamp to be moved with respect to the said contraction of the reflector member.

2. A lighting fixture comprising an axially vertically disposed tubular reflector member equipped intermediate its ends with a contraction dividing the same into two substantially truncated conoidal reflectors opening respectively upward and downward, a casing member housing and supporting said reflector member, and a lamp supported by the casing member and so disposed with respect to the reflector member and casing that the lower edges of one of the latter will intercept all direct rays of light emanating from the lamp at angles of more than about twenty-five degrees with the axis of the reflector member.

3. A lighting fixture including an at least partially translucent casing member, an at least partially translucent tubular reflector member housed and supported thereby and divided by a contraction into two reflectors flaring in opposite directions, a lamp mounted within the reflector member and means associated with said lamp for varying the position of the latter with respect to said contraction, thereby simultaneously varying

the proportion of the light distributed by the respective reflectors and the casing member.

4. In a lighting fixture, the combination with a lamp and a socket therefor, a pair of reflectors jointly housing the said lamp and reflecting portions of the light therefrom in substantially opposite directions, a casing housing the said reflectors, an arm connecting the socket and the casing to support the former, and a translucent cover for one end of the casing, the said arm being movable to move the socket out of its normal position to permit access to said cover through the other end of the casing.

5. In a lighting fixture, the combination with a lamp and a socket therefor, a pair of reflectors jointly housing the said lamp and reflecting portions of the light therefrom in substantially opposite directions, a casing housing the said reflectors, and a detachable translucent cover for one end of the casing.

6. A lighting fixture comprising a pair of reflector elements having a common vertical axis and flaring in opposite directions, a translucent casing housing at least one of said reflector elements, a lamp housed jointly by the reflector elements, and means associated with at least one of said reflector elements for permitting a portion of the light of the lamp to light the interior of said translucent casing.

7. In a lighting fixture, the combination with a lamp and a tubular casing housing the lamp, of a translucent bottom for said casing, and a tubular reflector member interposed between said lamp and casing and carried by the said bottom, said member comprising a pair of axially alined reflectors flaring in opposite directions.

8. In a lighting fixture, the combination with a lamp, of a pair of reflectors jointly housing the lamp and reflecting portions of the light thereof respectively in upward and downward directions; a support for said lamp, means for adjusting the lamp with respect to said support to vary the relative proportion of the light reflected in the said directions; and means associated with said lamp and support for limiting the relative adjustment thereof in one direction, said last-named means so disposed as to coact with the end of one of said reflectors to limit the direct downward rays of light of the lamp to angles of not exceeding about thirty degrees with the vertical axis of the said reflectors.

9. A lighting fixture comprising a pair of reflector elements having a common vertical axis and flaring in opposite directions, a casing housing the lower reflector element; and a lamp housed jointly by both reflector elements, and so disposed with respect to the lower reflector element and the casing that the lower edge of one of the latter will intercept all direct rays of light emanating from the lamp at angles of more than about twenty-five degrees with the axis of said reflector elements.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

JAMES R. CRAVATH.

Witnesses:
ALBERT SCHEIBLE,
M. M. BOYLE.