Feb. 28, 1939. K. C. WELCH 2,149,109

LIGHTING FIXTURE

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Fig. 2.

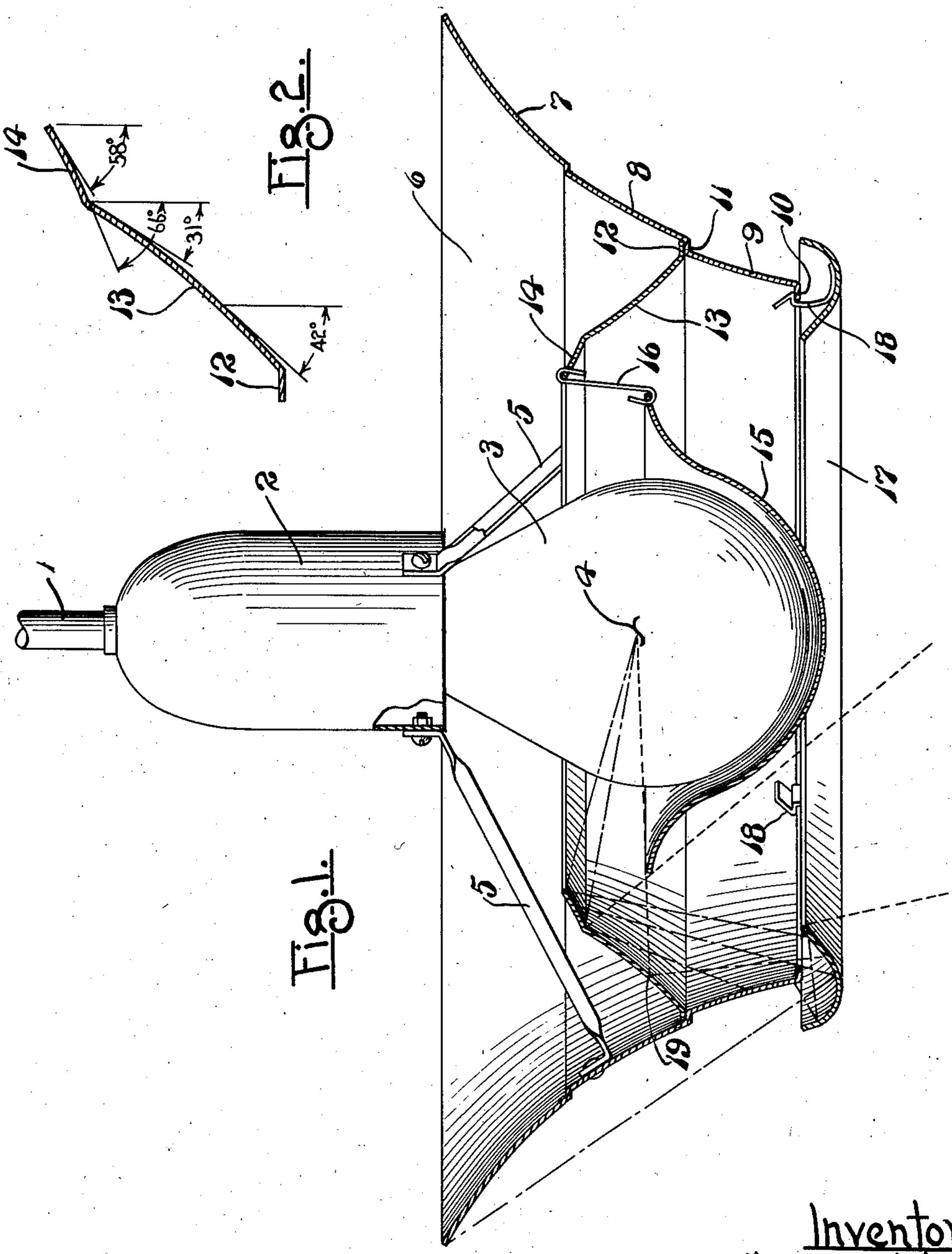

Fig. 1.

Inventor
Kenneth C. Welch
By Lancaster and
Van Antwerp
Attorneys

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Fig. 3.

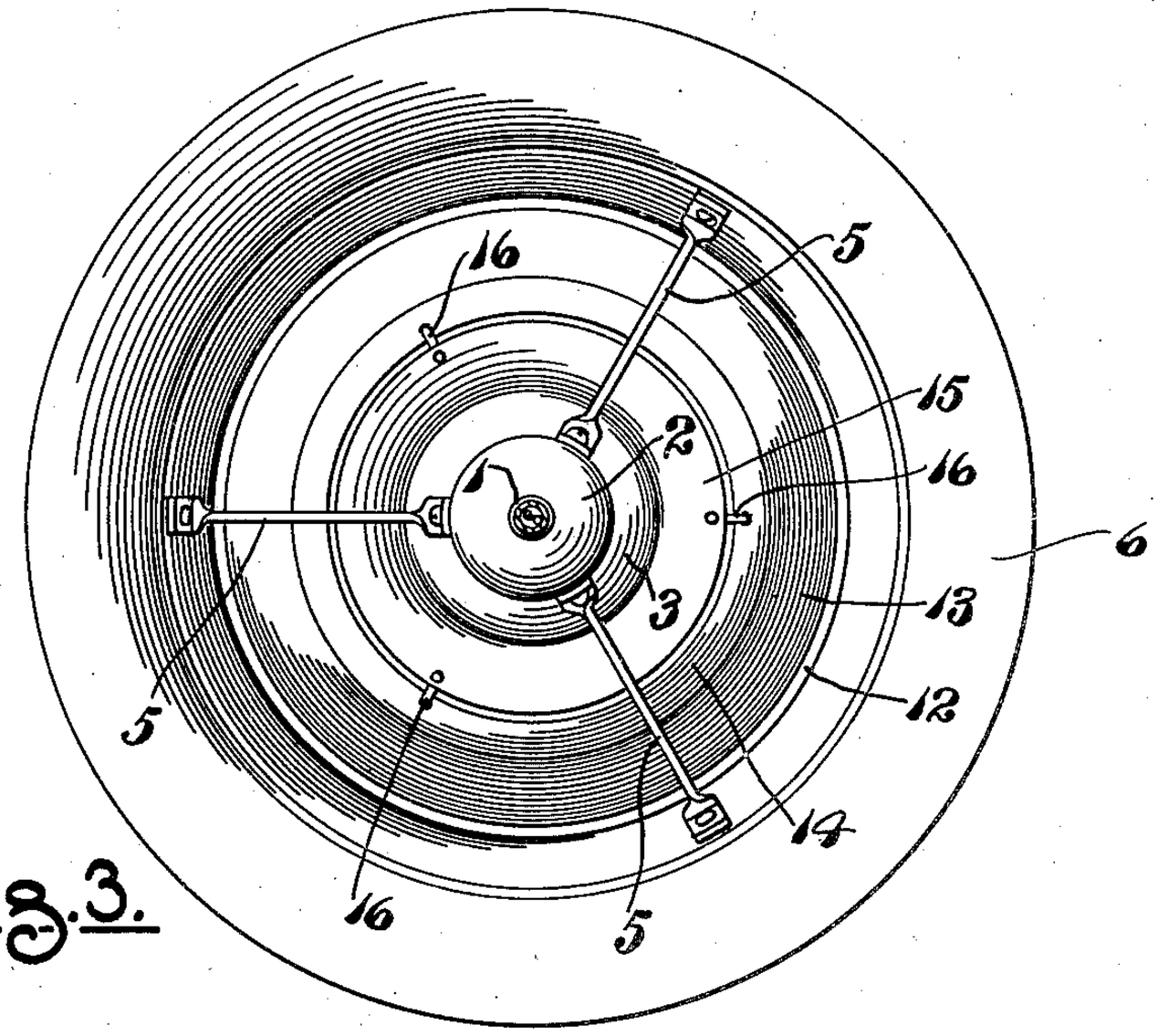
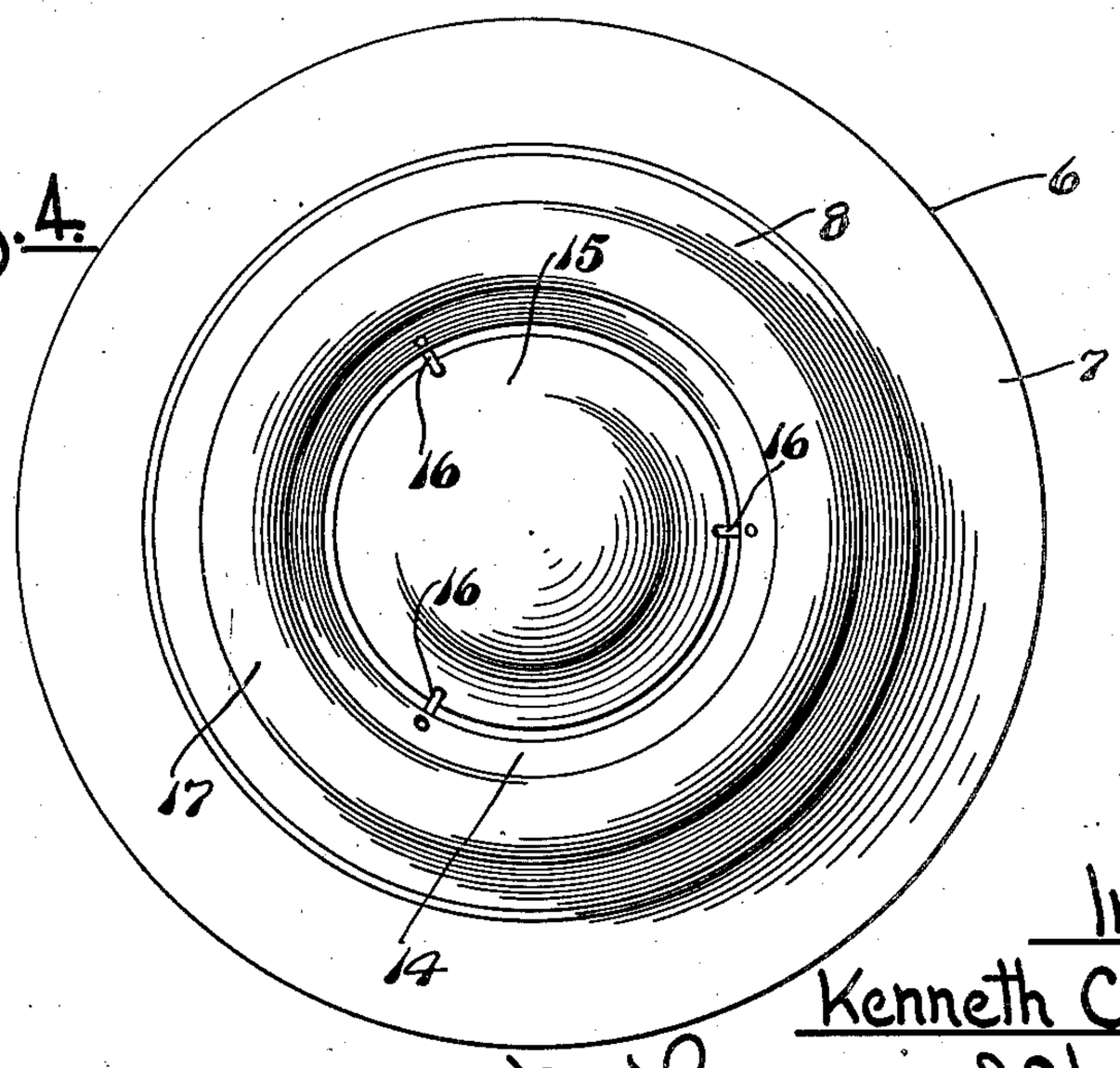


Fig. 4.



Inventor
Kenneth C. Welch
By Livernois and Van Antwerp
Attorneys

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UNITED STATES PATENT OFFICE

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LIGHTING FIXTURE

Kenneth C. Welch, Grand Rapids, Mich., assignor to Grand Rapids Store Equipment Company, Grand Rapids, Mich., a corporation of Michigan

Application January 15, 1938, Serial No. 185,133

4 Claims. (Cl. 240—78)

This invention relates to lighting fixtures and is chiefly concerned with a light adapted to be suspended below the ceiling of a room and in which a part of the rays of light are directed against the ceiling and thence reflected downwardly in a diffused and softened manner, others of the rays of light are directed to a reflector and part of the rays to said reflector are reflected downwardly and spread and diffused to provide a softened illumination of what is below, and still other of the rays from said reflector are utilized to illuminate the outer and lower sides of a casing or shell which surrounds the light and which supports said reflector within it, thereby obviating the appearance of said shell as a dark and particularly noticeable interruption of light from the ceiling. With my invention the under and outer side of said shell is illuminated sufficiently to overcome what would be otherwise the dark and unattractive outer and under surface and to illuminate and display the form and surface ornamentation which the shell may have. It is an object and purpose of the present invention to provide a lighting fixture of the character described, one which is economically produced and which in use is particularly desirable in stores for lighting the same and for illuminating articles of merchandise below the lights with an elimination of all glare and the production of a diffused and softened illumination of the articles of merchandise which are to be displayed.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a transverse vertical section through the lighting fixture of my invention.

Fig. 2 is a fragmentary transverse vertical section through the reflector carried by the shell of the fixture and indicating the preferred mechanical structure thereof.

Fig. 3 is a plan view of the fixture, and

Fig. 4 is an under plan view thereof.

Like reference characters refer to like parts in the different figures of the drawings.

The electric light which is the source of light in the fixture may be depended from the ceiling through the use of a hollow vertical rod 1 through which the electric wiring passes, at the lower end of which is a hood and socket 2 therewithin, the light bulb 3 screwing upwardly into the socket within the hood 2. Said light bulb has an illuminating filament 4 substantially at its center which, when the electric current is passing through said filament, is heated to a high degree of incandescence and emits rays of light in the usual manner.

The lighting fixture which is to be associated with the light bulb 3 is carried by a plurality of downwardly and outwardly extending bars 5 fastened, detachably preferably, at their upper ends to the supporting hood 2 and at their lower ends at the inner side of a surrounding shell 6. The shell 6 may be of sheet metal and comprise a plurality of sections 7, 8 and 9, the sides of which incline or curve downwardly or inwardly, so that the uppermost section 7 has the greatest mean diameter and the lowermost section 9 the smallest mean diameter. The adjacent edges of the section 7, 8 and 9 are connected by narrow horizontal ledges in the form shown, one of which, that indicated at 11 between the lowermost and middle sections 9 and 8, serves as a support for a reflector located within the shell. It is of course to be understood that the design of the shell and its outer configuration and form may be widely varied. At the lower edge of the lowermost section 9 a continuous annular horizontal lip 10 is turned inwardly as shown.

The reflector is approximately the frustrum of a cone and at its lower larger diameter portion is formed with an annular outwardly extending horizontal rim or lip 12 which rests upon the ledge 11. The sections 13 and 14 of the reflector extend, the first upwardly and inwardly from the inner edge of said lip 12, and the latter upwardly and inwardly from the upper edge of the section 13. Said reflector sections preferably are curved as arcs having relatively long radii. In the practical construction of the reflector the angles to the vertical of tangents to the curves of the reflector sections 13 and 14 are as best shown in Fig. 2; though it is to be understood that variations from the specific curvatures and angles are permissible, the disclosure made being the best which has been produced by me at this time.

The electric bulb 3 extends downwardly through the relatively large circular opening around and at the upper edges of the upper section 14 of the reflector. A shield 15 of substantially semi-circular form with the upper portions curved upwardly and outwardly as shown in Fig. 1 is suspended by means of wire hooks 16 from the reflector section 14. The horizontal plane of the upper edge portions of the shield 15 is slightly below the light filament 4. This shield serves the purpose of blocking downward passage of rays of light from the light bulb and also is a receptacle which will catch any broken fragments of the light bulb should it be injured or destroyed.

It is detachable from the reflector for the replacement of a light bulb when needed.

At the lower edge of the shell 6 there is provided a continuous ring 17 made of sheet metal and of substantially concavo-convex form and having a cross section like that best shown in Fig. 1, the concave side of the ring being presented upwardly. This ring is detachably connected to and suspended from the shell by means of yielding spring hooks 18 which may be sprung inwardly to pass within the inner edges of the lip 10 and then over the same as shown in Fig. 1. The concave trough-like upper side of the ring is located with respect to the lower edge of the section 9 and the inturned lip 10 such that a portion of the upper concave surface of the ring is within and another portion outside said lip and lower edge of the shell.

The under surface of the reflector sections 13 and 14 are silvered, polished or in any other preferred manner rendered very highly reflective of rays of light coming against said surfaces. Similarly, the upper concave surface of the ring 17 is provided with a very high light reflecting surface. Rays of light from the filament 4 will be directed upwardly through the opening around the light bulb and within the upper edges of the reflector section 14 and strike against the ceiling above and be reflected from said ceiling to produce soft and diffused lighting. Rays of light cannot pass from the filament 4 directly in a downward direction but any such rays directly from the filament have as their lowest points of striking against the reflector section 13 a circle at the horizontal plane of the point 19 shown in Fig. 1. Those rays which come directly from the filament to the reflecting surface of the section 14 have a part of them directed downwardly to that portion of the upper surface of the ring 17 which is substantially within the inner edges of the lip 10, as indicated by the dot and dash lines, while other rays reflected from the under side of the section 14 illuminate the lower inner portion of the section 9 of the shell, from which in turn there may be some reflected illumination of the under side of the shell 15. Those parts of the rays which reflected from the section 14 strike the upper inner concave reflecting surface of the ring 17 are in turn either directly reflected upwardly against the under outer surface of the section 7 of the shell, or part of them are reflected across to the outer portion of the reflecting concave surface of the ring and thence to the lower portions of the outer under surface of the shell, whereby the entire under outer surface of the shell is softly illuminated with an avoidance of a dark or substantially black unattractive and very prominent surface whose darkness would contrast unfavorably against the lighted ceiling.

Those rays which pass directly from the filament 4 to that part of the section 13 of the reflector above the horizontal plane of the point 19 to the juncture of sections 13 and 14 are in turn spread out and diffused and directed downwardly and inwardly through the opening of the ring 17 being reflected downwardly and inwardly with a considerable spreading of the rays so as to accomplish the desired diffusion and softening of illumination of articles below the lighting fixture.

With my invention it is evident that I have provided a lighting fixture which for illuminating purposes, particularly in stores, is of a very effective and at the same time attractive character. The construction of the parts which go into the building of the lighting fixture and their assembly and connection together is simple and practical. And at the same time it presents an attractive under side of the shell against an illuminating ceiling which would not be presented if the under outer surface of the shell was not illuminated as described.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In combination, a source of light, a shell open at both its upper and lower ends surrounding said light source, a reflector supported within said shell between its upper and lower ends and around the central zone of the source of light, said reflector being arcuate and open at both its upper and lower ends, means at the lower side of the source of light for stopping direct emission of light rays in a downward direction or below a horizontal plane extending substantially through the light source, and a ring of concavo-convex form having a concave upper reflecting surface connected to and depending below the lower edges of said shell, said reflecting surface being located partly within and partly outside of the lower edges of the shell, said light source, reflector, shell and ring being so associated whereby rays of light from the source of light may pass upwardly through the opening in the upper side of the reflector, part of the rays of light coming to the upper portion of the reflector being directed to the upper reflecting surface of said ring and thence directed to the outer side of the shell, and the remaining rays of light coming to the reflector directed downwardly and inwardly through the open lower end of the shell and through said ring, as specified.

2. In a structure of the class described, a light source, a thin shell surrounding the light source, said shell being open at its upper and lower ends, an inwardly curved reflector likewise open at its upper and lower ends surrounding the central zone of the light source, the sides of said reflector diverging downwardly and the lower edges of said sides of the reflector being supported by and within said shell, means at the lower side of the light source impervious to the passage of light and preventing downward passage of direct rays of light from the light source below a horizontal plane substantially coincident with the light source, and a ring of concavo-convex cross section located a short distance below the lower edges of said shell, the upper side of the ring being concave and having a reflecting surface, said reflecting surface being partly inside the lower edges of the shell and partly outside thereof.

3. In combination, an electric light bulb having a light filament, a shell of thin sheet metal surrounding the bulb, said shell being open at its upper and lower ends and having its sides inclining downwardly and inwardly from its upper to its lower ends, and being provided with a horizontal ledge at the inner side between its upper and lower ends, a reflector of thin sheet metal surrounding the light bulb located within the shell and resting at its lower edges on said ledge, the sides of said reflector extending upwardly and inwardly and said reflector being open at its upper and lower ends, means covering the lower portion of the light bulb to prohibit passage of rays of light below a horizontal plane substantially in the horizontal plane of said filament, and reflecting means located and maintained a short distance below the lower edges of said shell, said means having a concave upper reflecting surface

located partly within and partly outside of the lower edges of said shell.

4. A lighting fixture comprising a light source, an outer shell surrounding said light source, a substantially semi-spherical shield immediately below said light source, an annular reflector surrounding said light source within said shell having integral upper and lower zones, a reflecting ring having a concave upper reflecting surface maintained a short distance below the lower edges of said shell, and yieldable devices secured to and extending upwardly from said ring and having means at their upper portions for snapping on to said shell.

KENNETH C. WELCH.