Direct rays of the filament pass through the inwardly sloping cone surfaces of the diffuser, which are matted so as to completely hide the source of light. While this translucent surface hides the image of the filament, it is not dense enough to affect the efficiency greatly.

Rays which do not go directly from the filament to the diffuser, strike the reflector surface. From this they are reflected back downward and pass out through the outwardly

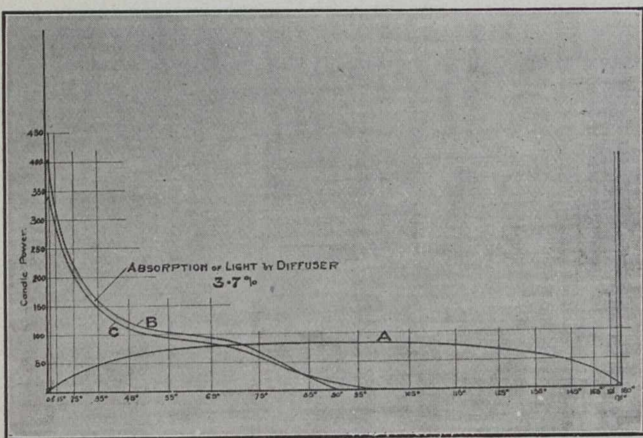

Fig. 3.

sloping cone surfaces of the glass, which are clear. Again, those rays which are reflected from the matted surface of the diffuser, strike the reflector, and from there pass out through the clear glass of the diffuser. I am inclined to think that this class of rays deserves more attention than is usually given to it, and that it adds materially to the efficiency of the combination. A maximum outlet for the whole spherical flux is thus provided through the lower surface, most of the light undergoing only a single diffusion. This, in addition to the correct matting of the translucent surfaces, contributes to the unusual high efficiency of this combination.

In Fig. 2, the polar diagram, curve A, shows the shape of the distribution curve for a 100-watt lamp without accessories; curve B, when a matted aluminum reflector is employed, and curve C shows the effect of the diffuser added.

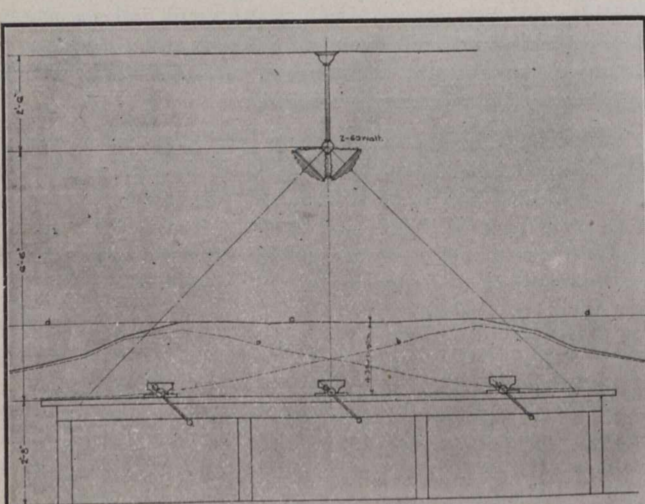

Fig. 4.

Any desired light distribution can be effected, as this depends entirely on the shape of the reflector and the position of the lamp in relation to it; not on the diffuser, as some might expect.

From the Reousseau curve (Fig. 3), you may note that the absorption of the diffuser amounts (curve C) to 3.7% of the total light flux (curve A).

But the efficiency is supplemented by other favorable points in this combination. The unit is practically dustproof. No dirt can hang on to the inner diffusing or reflecting surfaces, so the maintenance cost is low.

The size of the diffusing envelope depends upon the size of the lamps used, so that for a small lamp small units are fabricated and for large lamps, large ones.

Before I go over to the practical application of this unit as an efficient illuminant for the lighting of working planes, I wish to emphasize that from no point beneath the fixture can the filament itself been seen through the clear glass surfaces. Eye protection is therefore afforded to the fullest extent.

Innumerable applications can be made of this unit when suspended vertically; but with the advent of the wire-type tungsten lamp no necessity exists to use these lamps only in a vertical or upright position. By means of the patented diffuser described, we can with equal efficiency employ the lamp at any desired position.

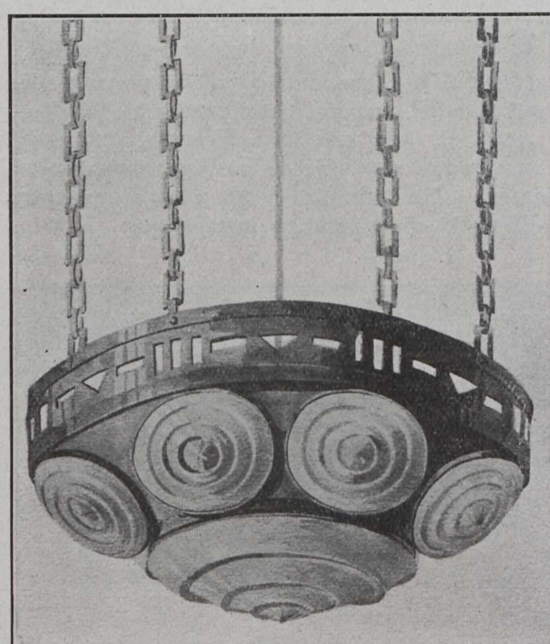

Fig. 5.

It is widely known that a series of sources of light, distributed in a given space and employing one type of reflector hanging vertically, give an even light distribution only when given a certain spacing distance and placed above a certain height.

For a light source in a reflector placed on an angle, the light distribution being of the focusing type, it is different. Here we are only concerned to find the angle which would correspond to an even illumination of a zone on the working plane, and any lowering or raising of the fixture does not affect the even distribution of light in one zone on the working surface. In Fig. 4 such a condition is shown. By the point-by-point method the illuminating values are projected on the working plane and the resulting illumination values computed.

A material saving of light is thereby effected, as the highest intensity is actually brought in the working zone. Further, by using a cluster a saving of outlets required, results.

For instance, in the conditions considered, two 60-watt lamps, each placed in a unit as described and standing at