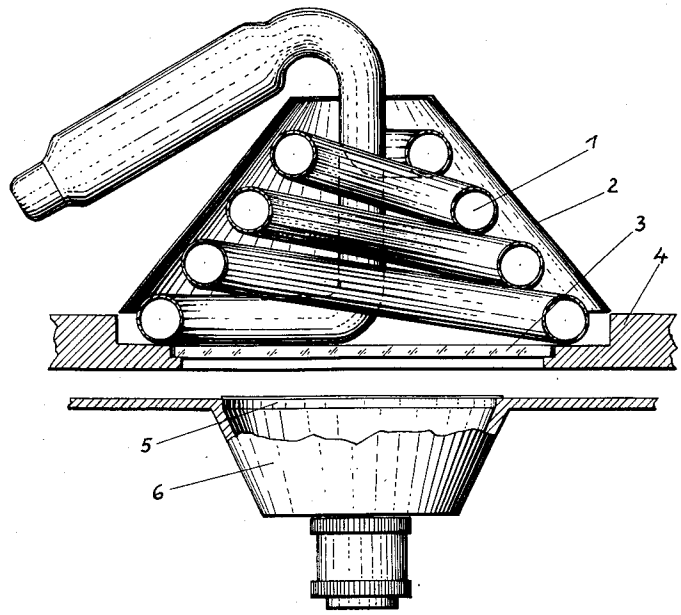
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PHOTOGRAPHIC LIGHT PRODUCING DEVICE

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PHOTOGRAPHIC LIGHT PRODUCING DEVICE

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3 Claims. (Cl. 240—1.3)

This invention relates to a light producing device for photographic enlarging and reproducing.

In lighting systems of this class fluorescent tubes of various kinds are used including single rings, several straight single-layer tubes disposed side by side or comprising a lower and an upper layer covering the intermediate spaces of the lower one or tubes arranged inside on the surfaces of a truncated pyramid. The lighting efficiency of these systems is increased by the provision of suitable reflectors placed behind, laterally of and above the light sources, but it has been found that satisfactory uniform illumination of the image plane free from spots cannot be obtained thereby and the lighting efficiency is still below the luminous intensity of the usual magnifying lamps.

It is the object of the present invention to provide a system of fluorescent tubes for photographic enlarging and reproducing apparatus, which ensures faultless illumination of the image plane and thereby of the negatives concerned, and which increases also the lighting efficiency.

This object is attained according to the invention by e employing a helical fluorescent tube tapering like a truncated cone and surrounded by a conical shell having an inner surface serving as a reflector. Due to the tapering shape of the helical lighting tube the beams of light emanating from the lighting rings within the conical reflector overlap so that no gaps in the light pattern occur, which would appear as shaded ring-shaped portions on the negative or the magnifying plane. The cone-shaped reflector which conforms to the shape of the lighting tube and which is provided with a reflecting inner face causes all light rays to be reflected concentrically toward a dispersion disc which is dispersed below the conical reflector and thereby toward the negative. The variations of light intensity are at the same time avoided due to the diffusing effect of the disc. In this manner a maximum utilization of the light intensity is obtained with a minimum current consumption, since by the present arrangement the entire light effect is utilized by concentrating on the negative.

For compensating halos and equalizing light density in the image plane a dispersion disc is positioned near the base of the truncated conically shaped lighting tube. Lighting efficiency is enhanced by the reflecting inner surface of the shell, and light intensity is increased by corresponding selection of the fluorescent material, whereby the light can be extensively adapted to the sensitivity range of the emulsion of the enlarging paper.

The range of sensitivity of the photographic emulsion is substantially in the short wave length part of the spectrum—that is, below a wave length of 400 mμ—and glass absorbs the wave lengths below 320 mμ. In view of this the present lighting arrangement is adapted to emit light in the wave length range of 320–550 mμ. It follows from this that of the light waves emitted from the tube, the lower wave lengths serve to produce the image and the upper wave lengths supply the light required for foscusing. In contrast to this the so-called "Nitraphot" photographic lamp known in the prior art, which emits light of a wave length of about 400 mμ, has a very low light intensity, most of it being lost as heat radiation which is ineffective in the production of the image.

One embodiment of the invention is illustrated in the accompanying drawing.

The lighting device of the present invention is designated generally in the figure and comprises a fluorescent tube 1 which is wound in a helix so as to form in outline a truncated cone. The turnings of the tube are so arranged that they are displaced inwardly and partially overlie the turn in the tube that is located immediately below it. In this manner there is no gap between the beams of light that are emitted from adjacent turnings of the tube. Fluorescent tube 1 is supported on carrier 4 below, the winding of greatest diameter resting on the support 4.

Overlying fluorescent tube 1 is shell or casing 2 which serves as a reflector for fluorescent tube 1. Reflector 2 has an inner reflecting surface and also takes the form of a truncated cone. In a preferred form of this invention the apex angle formed by the extension of the sides of the reflector lies within an angle of about 90° to 110°. Reflector 2 is also supported by carrier 4.

Lying beneath the bottom turn of fluorescent tube 1 and supported by carrier 4 is dispersion disc 3 which in the preferred form of this invention is made of light transmitting material.

In the use of the present lighting system illustrated in the drawing the film 5 to be enlarged is mounted on lens carrier 6 as shown. This assembly is then brought adjacent to the lighting assembly supported by carrier 4 and the light is caused to pass from tube 1 through disc 3 and film 5 to lens carrier 6 and then to the plane on which the image is projected.

I claim:

1. A light producing device for photographic enlarging and reproducing adapted to be energized by a source of electrical energy, comprising in combination a helically wound fluorescent lighting tube mounted on a carrier and forming in external configuration a first truncated cone, a reflector enveloping said tube and forming a second truncated cone, said reflector having reflecting inner side walls substantially parallel to the sides of said first truncated cone, the wider bases of said first and second truncated cones being located adjacent each other and adjacent the light emitting end of said device, a dispersion disc for equalizing the light intensity passing therethrough, said disc being supported by said carrier below the wider bases of said first and second truncated cones and in a plane substantially parallel to said wider bases of said first and second truncated cones.

2. A light producing device according to claim 1 wherein the apex angle formed by the extension of the sides of said second truncated cone forming the reflector lies within 90° to 110°.

3. A light producing device according to claim 1 wherein the light emitted from said device lies in the wave range of about 320 to 550 mμ.

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