

April 14, 1942.

A. J. SCHIPPER

2,279,596

LANTERN

Filed Feb. 17, 1938

2 Sheets-Sheet 1

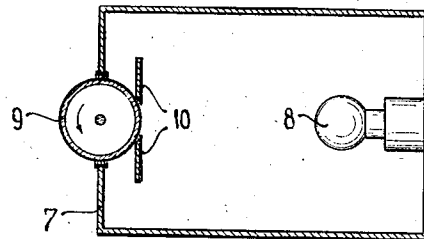


FIG. 1

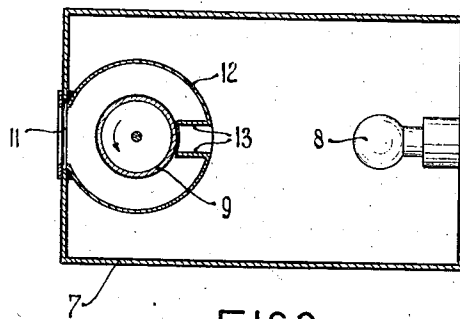


FIG. 2

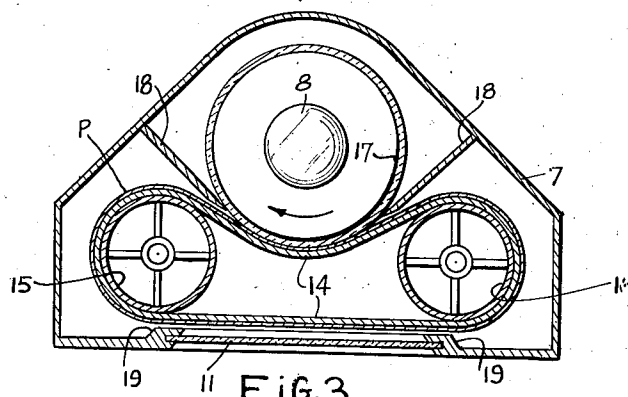


FIG. 3.

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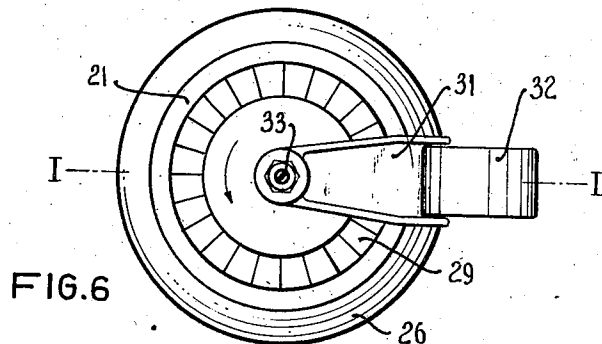
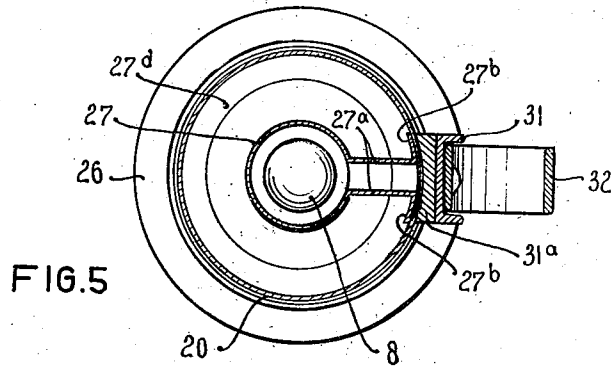
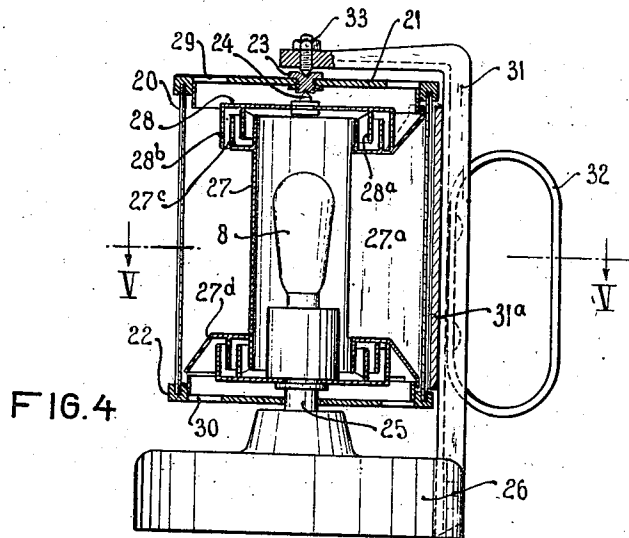
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LANTERN

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,279,596

LANTERN

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Zeeland, NetherlandsApplication February 17, 1938, Serial No. 191,004
In the Netherlands December 29, 1937

4 Claims. (Cl. 240—20)

This invention relates to a lantern which is capable of diffusely radiating light with extremely little photo-chemical action, and is therefore particularly suitable for illuminating photographic workshops and other places where photographic material is being used. The lantern according to the present invention is, however, suitable for other purposes, for example for emergency lighting during air raids.

According to the present invention, the lantern comprises a movable phosphorescent or luminescent body in the form of a band or strip the points of which during the movement of the body successively pass the light beam from the lantern lamp and the lantern window, so that only the light which is radiated by the phosphorescence or luminescence passes through the window outwards. In this manner the luminescent body is continuously activated so that during its movement past the window it continually radiates diffused light.

The invention can be carried into practice in a number of ways. The accompanying diagrammatic drawings illustrate some examples.

Figs. 1, 2 and 3 illustrate three different forms of lantern in horizontal section.

Figs. 4, 5 and 6 illustrate a fourth constructional example in vertical section, in horizontal section on the line V—V of Fig. 4 and in plan view.

Fig. 1 illustrates the principle underlying the present invention. Within a lantern casing 7 of rectangular parallelepiped form and of non-transparent material there is provided a lamp 8 on the rear wall. The lamp may be an ordinary electric lamp, but it may for example be a lamp which radiates principally ultra-violet light.

The front wall of the casing has a rectangular window in which is mounted upright a rotating cylinder 9 of non-translucent material, which is coated on the outside with a layer of a phosphorescent or luminescent substance.

The cylinder may in some cases be surrounded by a loose sleeve which carries the phosphorescent or luminescent substance and can easily be exchanged.

The edges of the window lie as close as possible to the cylinder. In order to obtain a light-proof closure, the edges of the window may if required be covered with strips of felt or the like, screens 13 may be arranged within the lantern casing and the inside of the casing may be painted dull black.

If the cylinder 9 is set in uniform rotation by a motor or by hand, there will always be a part

of the phosphorescent or luminescent layer moving through the beam of light (which may in some cases be directed by an optical system) and the layer is consequently activated. This activated part then passes through the window of the casing 7 so that it illuminates diffusely the space or room in which the lantern is. The rate of movement of the cylinder must of course be such that the activated part moves through the window before it has lost any considerable part of its illuminating property.

Fig. 2 shows a somewhat different construction. The rotating cylinder 9 which is of nontransparent material and is coated on the outside with a phosphorescent or luminescent mass, is here mounted completely behind the window 11 in the front wall of the casing 7 and the window may in some cases be of coloured glass. Around this cylinder are arranged two semi-cylindrical screens 12 which at their front edges are attached in a light-proof manner to the front wall of the casing and at their rear edges they are provided with flat screens 13 which extend inwards up to quite close to the cylinder 9 and there make a light-proof closure with the coated cylinder by means of felt strips.

The light from the lamp 8 falls exclusively through the gap between the screens 13 upon the phosphorescent or luminescent screen, which as it is rotated radiates diffused light through the window 11 outwards.

In the construction according to Fig. 3 the phosphorescent or luminescent layer is not applied to a cylinder but to a flexible non-transparent endless band 14 which is passed round two rotating cylinders 15, 16 and with its inner loop is guided over a glass cylinder 17. Within this glass cylinder, which can be driven round by means of a motor and takes the band 14 with it, is a lamp 8. The band 14 runs with its outer loop past the window of the lantern which is closed by the pane 11. The screens 18, 19 prevent the reflected light rays of the lamp 8 from passing outwards.

The lantern according to Figs. 4 to 6 comprises a glass cylinder 20 which on the inner side is coated with a phosphorescent or luminescent mass and with its upper and its lower edges is held in non-transparent plates 21, 22. The plate 21 is provided in the middle with a pivot bearing 23 which rests upon a pivot 24 and the plate can rotate about the latter. The plate 22 has in the centre a hole through which passes with but little play a cylindrical pin 25. This pin is mounted rigidly in the lantern base 26 and carries within

the cylinder 20 a non-transparent casing 27 for the lamp 8 which is fed with current from a source within the base.

The casing 27 is formed of a sheet of metal which is bent up into the form of an almost closed cylinder. At its edges it is provided with flat flanges 27a directed radially outwards, which in turn have outwardly bent flanges 27b, and these are coated on the outside with felt and make as nearly as possible a light-proof closure with the inner wall of the cylinder 20.

On the upper side the casing 27 is provided with a cover 28, some play being left between them, and it is the cover 28 which carries the pivot 24. This cover has two concentric downwardly directed collars 28a, 28b which surround the upper end of the casing 27 and between which extends upwards a suitable collar 27c of the casing 27, so that air can escape from the casing 27 in a zig-zag path between the collars and pass out upwardly, without any rays of light from the lamp 8 being able to escape upwards. This air can escape from the space between the casing 27 and the cylinder 20 by way of the intervals between the blades 29 arranged in a circle in the plate 21.

On the underside the casing 27 is closed in like manner against the escape of light but non-air-tight, and so that air drawn in from the outside must first pass the circle of blades 30 in the plate 22. In addition to this the under-end of the casing has a conical screen 27d which extends up to near the inside of the cylinder 20 but leaves there a narrow gap.

The base 26 carries a bent arm 31 with handle 32 and an adjusting screw 33 which can be screwed down into a conical recess in the upper side of the pivot bearing 23 so that the cylinder 20, 21, 22 can be held in the correct position, but can remain rotatable with the least possible friction. The rotation of this cylinder is effected in known manner by means of the air which is drawn in by the lamp between the blades 30. This air streams partly through the casing 27 and partly through the space between this casing and the cylinder 20 and escapes outwards through the blades 29. Opposite the flanges 27b the arm 31 has a strip 31a which serves to make light-proof the closure of the cylinder 20 at this point.

From the foregoing it will be clear what is to be understood by a band or strip shaped phosphorescent or luminescent body. The body need not necessarily be endless. The body in question may for example also be in the form of a luminescent coating applied to a flexible band either end of which is coiled round a spool and which can be wound alternately in either direction from one spool to another. A flat strip coated with a layer of luminescent material may also be used which is moved to and fro in front of the window. It is also not necessary that the phosphorescent or luminescent mass should form an uninterrupted layer.

The expression "lantern window" is moreover to be interpreted as widely as possible, see Figs. 4 to 6.

The manner in which the phosphorescent or luminescent band is moved is of course a matter of secondary importance. For reasons of economy the lantern may be provided simply with a crank by which the desired movement can be produced by hand. A uniform movement of the band is desirable, as otherwise the strength of the radiated light will fluctuate. An intermit-

tent movement is, however, not altogether useless. The same applies to the current applied to the lamp.

A lantern with a phosphorescent or luminescent band kept stationary and with a window which is set in motion with relation to this band is also to be regarded as an obvious equivalent of what has been described.

The lantern according to the present invention may be portable or it may be a permanent fixture.

The beam of light for activating the luminescent or phosphorescent body may be produced by any suitable natural or artificial source of light. So, the expression "lantern lamp" in the claims should be so broadly construed as to also cover, for instance, direct or reflected sunlight.

What I claim is:

1. A lantern comprising an opaque casing having a light transmitting opening therein, a source of light in said casing, a rotatable cylinder having a throughout uniform luminescent surface continuously activated by said light source, opaque screen members between said cylinder and said light source spaced apart to provide an opening whereby a beam of light from said light source is allowed to pass said last mentioned opening onto equal areas of said movable luminescent cylinder limited by said screen members while preventing the outward passing of direct light from said casing, means to move said cylinder whereby equally luminescent limited areas successively pass said light transmitting opening and create a uniform constant uninterrupted outside illumination of invariable light intensity.

2. A lantern comprising an opaque casing having a light transmitting opening therein, a source of light in said casing, a rotatable transparent cylinder encircling said casing and having a throughout uniform luminescent surface continuously activated by said light source, a light-proof bottom and top cover for said casing, opaque screen members between said cylinder and said light source spaced apart to provide an opening whereby a beam of light from said light source is allowed to pass said last mentioned opening onto equal areas of said movable luminescent cylinder limited by said screen members while preventing the outward passing of direct light from said casing, means to move said cylinder whereby equally luminescent limited areas successively pass said light transmitting opening and create a uniform constant uninterrupted outside illumination of invariable light intensity and a series of circularly arranged blades in said covers for allowing an air current to successively pass the blades of the bottom cover, the light source and the blades of the top cover.

3. A lantern comprising an opaque casing having a light transmitting opening therein, a source of light in said casing, a rotatable transparent cylinder encircling said casing and having a throughout uniform luminescent surface continuously activated by said light source, a light-proof top and bottom cover for said casing, means in said covers to permit passing of air therethrough, opaque screen members between said cylinder and said light source spaced apart to provide an opening whereby a beam of light from said light source is allowed to pass said last mentioned opening onto equal areas of said movable luminescent cylinder limited by said screen members while preventing the outward passing of direct light from said casing, means to move said cylinder whereby equally luminescent

limited areas successively pass said light transmitting opening and create a uniform constant uninterrupted outside illumination of invariable light intensity.

4. A lantern comprising an opaque casing having a light transmitting opening therein, a source of light in said casing, a rotatable cylinder having a throughout uniform luminescent surface continuously activated by said light source, opaque semicylindrical members encircling said cylinder, the rear edges of said members being spaced apart to provide an opening whereby a

5 beam of light from said light source is allowed to pass said last mentioned opening onto equal areas of said movable luminescent member limited by said semicylindrical members while preventing the outward passing of direct light from said casing means to move said cylinder whereby said equally luminescent limited areas successively pass said light transmitting opening and create a uniform constant uninterrupted outside illumination of invariable light intensity.

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