Nov. 23, 1943. S. HERMANN 2,334,766

DEVICE PERMITTING THE READING OF MAPS, MANUSCRIPTS, PRINTED MATTER, ETC., IN THE DARK

Filed May 10, 1941

Fig. 1.

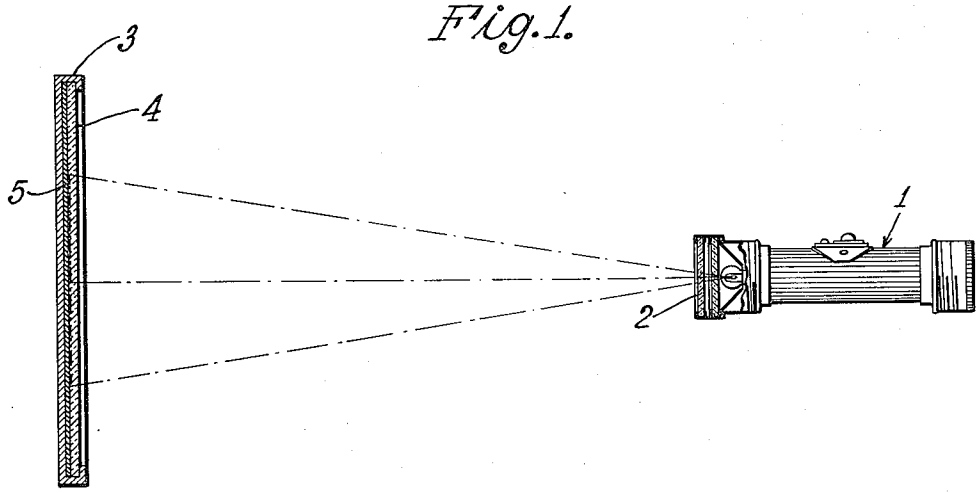
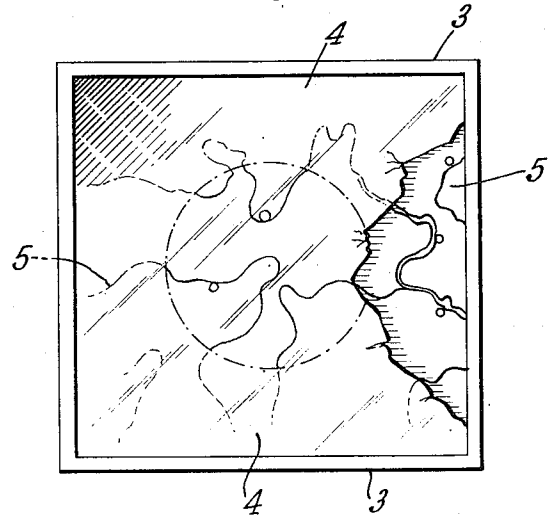


Fig. 2.



INVENTOR
Siegwart Hermann
BY Gerhard E. Myers
ATTORNEY

Patented Nov. 23, 1943 2,334,766

UNITED STATES PATENT OFFICE

2,334,766

DEVICE PERMITTING THE READING OF MAPS, MANUSCRIPTS, PRINTED MATTER, ETC., IN THE DARK

Siegwart Hermann, New York, N. Y.

Application May 10, 1941, Serial No. 392,912
In France November 21, 1939

4 Claims. (Cl. 250—71)

This invention relates to a device permitting the reading of maps, manuscripts, printed matter, etc., in the dark without generating light perceivable by third persons from any considerable distance.

In a corresponding patent application filed simultaneously with the present one, I have described a signaling system comprising a device for the sending of signals without generating visible light rays. Such a device is usable for the purposes of this invention.

In the sending device normal light sources are used, e. g., ordinary electric bulbs in normal flashlights. These lights, according to my invention, are covered by a screen of special glass which is very dark. Light beams of normal wave length cannot penetrate this kind of glass; only the dark rays having a wave length of 3,000 to 4,500 Å. are able to pass through this screen. When these rays fall onto the reflector, luminescence of this reflector will occur, but it will be perceivable only in one single direction.

As to the screen to be used, according to this invention, I am aware that the so-called Wood-glass has been used in connection with ultra-violet rays which cause luminescence, fluorescence or phosphorescence in meeting certain objects. However, beams originating from ordinary bulbs do not penetrate Wood-glass sufficiently to generate luminescence of appropriate objects. Now I have discovered that it is possible to produce a kind of special glass which permits the rays generated in ordinary electric bulbs having a wave length of, e. g., 3,000 to 4,500 Å. to penetrate it, but not the light beams of normal wave lengths.

The glass, according to my invention, is made by adding oxide of nickel and oxide of copper to silica, borax, potash, possibly borate of potassium, to which substances is also added a small amount of nitrate of potassium.

The amount of oxide of nickel and oxide of copper and the proportions of each of these substances give the possibility of rendering the glass permeable to rays of certain wave lengths.

Example 1

The basic material contains

	Parts
Silica	580
Boric acid	20
Potassium carbonate	220
Borate of potassium	60–80

In order to obtain permeability for wave lengths of 3,100 to 4,200 Å., 7 parts of oxide of nickel and 0.5 part of oxide of copper are added.

Example 2

In order to obtain permeability for wave lengths of 3,300 to 4,200 Å., 8 parts of oxide of nickel and 5 parts of oxide of copper are added to the basic material described in Example 1.

Example 3

In order to obtain permeability for wave lengths of 3,400 to 4,400 Å., 14 parts of oxide of nickel and 4 parts of oxide of copper are added to the basic material described in Example 1.

The permeability in all examples is measured with the spectograph of Féry; plates are of 3 mm. thickness; exposure is 15 seconds.

According to this invention, the dark rays generated from flashlights covered with a screen, as described, are used to illuminate a transparent sheet arranged over the map, manuscript, printed matter, etc., to be read in the dark. This sheet may consist of thin glass, Celluloid, Cellon or any transparent synthetic matter. It is provided with well-known agents, luminescent, fluorescent or phosphorescent, when met by rays having a wave length of 3,000 to 4,500 Å., e. g. with fluorescein, uranine, sulfide of zinc, etc.

In the annexed drawing the application of the invention for reading of maps is diagrammatically illustrated as an example.

In the drawing the reference characters in the various figures denote like parts:

Fig. 1 is a diagrammatic section through a system, according to my invention.

Fig. 2 is a plain view of a map to be read in the dark, according to my invention.

The flashlight 1 is covered with a screen 2 of dark glass as above described.

A map container 3 provided on its front side with a transparent sheet 4 contains a map 5. When the dark rays originating from the flashlight 1 covered with screen 2 meet the transparent sheet 4, prepared according to this invention, the luminescence of this sheet will permit the reading of the map without generating any light rays. According to another performance of this invention, the map itself can be provided with luminescent agents.

I have described preferred embodiments of my invention, but it is understood that changes may be made without departing from the spirit of my invention.

What I claim is:

1. A combination of a light source and of a

transparent sheet for the purpose of reading normal and not previously prepared maps, printed matter, manuscripts etc. in the dark without generating any light rays, said light source consisting of a normal flashlight protected by a special glassfilter containing oxide of nickel together with oxide of copper being permeable only to dark rays having a wave length of 3000 to 4500 A.; said transparent sheet containing well known luminescent agents when met by rays having a wave length of 3000 to 4500 A. and being provided over the matter to be read in the dark.

2. In a combination according to claim 1 the use of a filter consisting of a special glass comprising a basic material containing silica, potash, borate of potassium and a mixture, 7 parts of oxide of nickel and 0.5 part of oxide of copper, said glass being permeable for a wave length of 3,100 to 4,200 A.

3. In a combination according to claim 1 the use of a filter consisting of a special glass comprising a basic material containing silica, potash, borate of potassium and a mixture, 8 parts of oxide of nickel and 5 parts of oxide of copper, said glass being permeable for a wave length of 3,300 to 4,200 A.

4. In a combination according to claim 1 the use of a filter consisting of a special glass comprising a basic material containing silica, potash, borate of potassium and a mixture, 14 parts of oxide of nickel and 4 parts of oxide of copper, said glass being permeable for a wave length of 3,400 to 4,400 A.

SIEGWART HERMANN.