C. E. WHITE.

LUMINOUS MARKING DEVICE.

APPLICATION FILED OCT. 1, 1919.

1,346,360. Patented July 13, 1920.

Fig. 1,

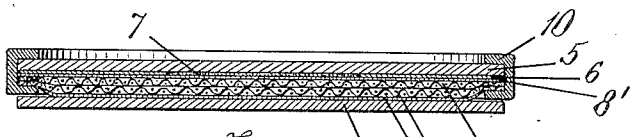


Fig. 2

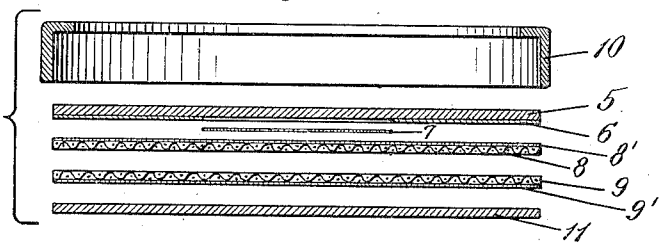


Fig. 3,

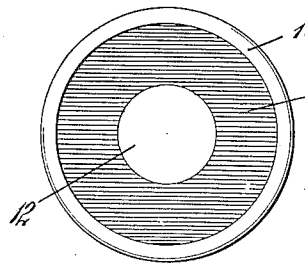


Fig. 4,

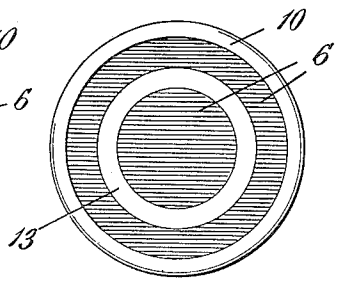


Fig. 5,

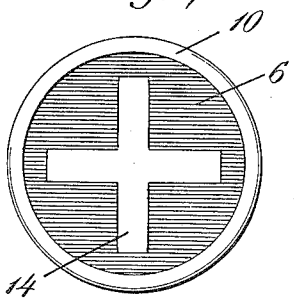


Fig. 6

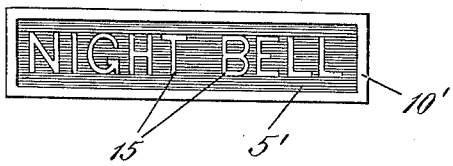
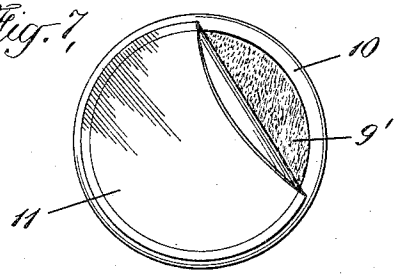


Fig. 7,



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UNITED STATES PATENT OFFICE.

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LUMINOUS MARKING DEVICE.

1,346,360. Specification of Letters Patent. Patented July 13, 1920.

Application filed October 1, 1919. Serial No. 327,632.

To all whom it may concern:

Be it known that I, CHARLES E. WHITE, a citizen of the United States, residing at Orange, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Luminous Marking Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to self-luminous devices adapted for use as marking, indicating and illuminating devices, etc.

An object of the invention is the provision of devices of simple construction, employing luminous material in an economical and satisfactory manner, which devices may be produced in quantity and at moderate expense, thus permitting general use thereof for the purposes for which they are adapted.

Another object of the invention is the provision of devices of the character described which may be readily attached to and detached from a supporting surface to be marked or illuminated.

Further objects and advantages of the invention will be apparent as it is better understood by reference to the following specification when read in connection with the accompanying drawing in which—

Figure 1 is an enlarged cross-sectional view of a device constructed in accordance with my invenion;

Fig. 2 is a view showing the several parts forming a marking device, disassembled;

Figs. 3, 4 and 5 are plan views of three embodiments of simple illuminating devices;

Fig. 6 is a plan view of another embodiment of my invention; and

Fig. 7 is a view in perspective of one of my devices illustrating the removal of the protecting cover for the adhesive.

The production of self-luminous compositions by compounding radium or radioactive substances with phosphorescent zinc sulfid, and the use of such compositions in connection with a paint or varnish vehicle have been heretofore suggested, but such luminous paints are not adapted to permit the utilization of the luminous material in its highest capacity and with the most satisfactory results.

A considerable proportion of the light emitted by self-luminous compositions is due to the alpha rays which have little penetrative power. When therefore the composition is mixed with a paint or varnish vehicle, a considerable portion of its luminous power is obscured and it is necessary to use a correspondingly larger proportion of radio-active material to obtain the desired result.

According to the present invention, the luminous composition, preferably in powdered form, is arranged against a transparent or translucent surface, and held there by a piece of adhesive plaster. The luminous particles are thereby firmly held against movement, and yet there is no coating over them tending to obscure their luminosity, as is the case if varnish is used. For instance, the central part of a transparent or translucent disk may have the luminous material applied thereto, while the disk, toward its periphery, is left clear so that the adhesive will stick thereto.

In another embodiment, the transparent or translucent disk may have a coating of black paint applied on one side, after which the paint, and disk also, if desired, is cut away in any desired pattern to form shallow grooves, in which grooves the luminous particles are placed and held by a piece of adhesive.

A further advantage in using a fibrous material, such as adhesive, is that it is somewhat resilient, thereby holding the luminous material in its proper place, yet not exerting an undue pressure on the crystals, which perssure would tend to fracture the crystals and so lessen their luminosity.

My invention also contemplates the provision of an adhesive surface at the back of the device whereby it is readily secured to the surface to be marked or illuminated, and the protection of the adhesive surface by a removable cover to retain it in its original condition until the device is used. Preferably this adhesive material is adhesive plaster and the cover therefor may be any inexpensive material which is readily de-

tached from the adhesive, and which will maintain and protect the adhesive character of the surface.

My invention may be embodied in various forms, and the accompanying drawing is intended to suggest the preferred structural forms of the invention without limiting the invention to such embodiments.

Referring to Fig. 1, a sheet of transparent or translucent material 5 such, for example, as celluloid, is coated on its rear surface with a film 6, preferably of black paint or other adhering coating which will contrast with the luminous composition. A portion of the film 6 and of the celluloid, if desired, is removed to form a shallow recess which may be of any desired shape, as will more fully hereinafter appear. The luminous composition 7, in pulverulent form, is disposed in the recess, and a sheet 8, preferably of paper or textile fabric impregnated or coated with a suitable adhesive 8′ is applied to the film 6 and holds the luminous powder in the recesses. A yieldable adhesive backing is thus provided for the luminous composition, which prevents shifting of the particles in the recess.

A sheet 9, similar to sheet 8, is arranged behind the latter sheet and with its adhesive surface 9′ exposed, and the several layers of material are clamped by a binder or ring 10 of metal or other suitable material, having its edges crimped over the edges of the various layers, holding them rigidly together. To protect the exposed adhesive surface, I preferably employ a sheet 11 of material, such as celluloid, which may be stripped off when the device is to be used, thus exposing the fresh adhesive surface.

In Figs. 3, 4 and 5 of the drawing, I have illustrated three forms of my invention in which the recess for the luminous composition is circular, as at 12, annular as at 13, or in the form of a cross, as at 14. The particular form selected is largely a matter of choice, and conventional or fanciful forms or designs may be provided.

In Fig. 6 of the drawing, my invention is illustrated as applied to a small sign, the recesses for the luminous composition forming the letters. A transparent plate 5′, corresponding to disk 5, is painted on one side as usual and then the paint film is cut away to form any desired letters, such as 15. A clamping ring 10′ binds the plate 5′ to a series of backing elements similar to those shown in Figs. 1 and 2.

Various other embodiments will readily suggest themselves, in which the luminous material is disposed in a shallow recess and secured in place by an adhesive backing.

The luminous composition employed, according to my invention, is a self-luminous composition, in dry or powder form which contains radium or radio-active material and phosphorescent zinc sulfid or other radio-responsive material. The composition may be made for example, by compounding phosphorescent zinc sulfid of high efficiency, with exceedingly small amounts of a radium salt. In the utilization of this dry pulverulent composition, the radium is not restrained in its action, because it is used in a dry and finely divided form without paint or varnish vehicles. It is thus possible to use less of the radium and hence to use a less expensive self-luminous composition and nevertheless obtain the illuminating effect of a paint or varnish composition of higher radium content.

Moreover the use of this smaller amount of radium in the composition has the further advantage of increasing the life of the composition because of the slower rate of decomposition of the zinc sulfid due to the lower radium content. Compositions containing larger amounts of radium are subject to more rapid decomposition of the zinc sulfid with corresponding decrease of the life of the composition itself. The present invention accordingly has the advantage of permitting the use of less expensive materials which have a prolonged period of usefulness and which are therefore more efficient in their action.

If desired, instead of using two pieces of adhesive, one to hold the luminous powder in place and the other to furnish an adhesive mounting surface, I may use a single piece of fabric, with adhesive on both sides, one adhesive side corresponding to 8′, and the other corresponding to 9′, Figs. 1 and 2, and respectively fulfilling the functions of the adhesive portions 8′ and 9′.

I claim:

1. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face thereof and having a cut out portion forming a recess, a body of self-luminous composition in said recess, and a sheet of adhesive material applied to said film and forming a cover for said recess.

2. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face thereof and having a cut out portion forming a recess, a body of self-luminous composition in said recess and a yieldable adhesive backing to support said composition.

3. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face thereof and having a cut out portion forming a recess, a body of self-luminous composition in said recess, a yieldable adhesive backing to support said composition and means for holding said sheet and backing in assembled relation.

4. In a device of the character described,

the combination of a transparent sheet, a film applied to the rear face of said sheet and having a cut out portion forming a recess, a body of self-luminous material in a finely divided condition disposed in said recess and a yieldable backing to support said material.

5. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face of said sheet and having a cut out portion forming a shallow recess, a body of self-luminous material in a finely divided condition disposed in said recess and means for supporting said material.

6. In a device of the character described, the combination of a transparent sheet, a film applied to the rear of said sheet and having a cut out portion, forming a shallow recess, a body of self-luminous material in said recess, means for supporting said material, adhesive means for attaching said device to a supporting surface and means for holding said sheet, material supporting and adhesive means in assembled relation.

7. In a device of the character described, the combination of a body of self-luminous composition, supporting means therefor, adhesive means at the back of said device whereby it is attached to a surface and means for protecting said adhesive means.

8. In a device of the character described, the combination of a body of self-luminous composition, supporting means therefor, a sheet of adhesive material at the rear of said supporting means and a cover sheet adapted to be stripped from said adhesive material to expose it for use.

9. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face thereof and having a cut out portion forming a recess, a body of self-luminous composition disposed in said recess, a backing for said composition having an exposed adhesive surface and a temporary cover for said surface.

10. In a device of the character described, the combination of a transparent sheet, a film applied to the rear face thereof and having a cut out portion forming a recess, a body of self-luminous material in said recess, a backing for said composition having an adhesive surface contacting with said body and an exposed adhesive surface and a temporary cover for the latter purpose.

11. In a device of the character described, the combination of a sheet of light transmitting material, a body of luminous powdered material unmixed with a binder and a sheet of adhesive stuck to said sheet of light transmitting material and holding the luminous material between it and the sheet of light transmitting material.

12. In a device of the character described, the combination of a light transmitting sheet, a luminous composition, a sheet of adhesive stuck to the light transmitting sheet and holding the luminous composition between it and the light transmitting sheet, a second piece of adhesive with its adhesive surface facing outwardly, and means, engaging with the light transmitting sheet, to hold the second mentioned piece of adhesive in place.

13. In a device of the character described, a sheet of light transmitting material, a powdered luminous material, a sheet of fabric to hold the powdered luminous material between it and the sheet of light transmitting material, a sheet of adhesive with its adhesive surface facing outwardly placed against the said fabric sheet and means to clamp the said several sheets into a compact unit.

In testimony whereof I affix my signature.

CHARLES EUGENE WHITE.