W. A. SCHLESINGER.

LUMINOUS INDICATING DEVICE AND PROCESS OF MAKING SAME.

APPLICATION FILED JAN. 25, 1917. RENEWED FEB. 26, 1920.

1,342,767. **Patented June 8, 1920.**

Fig. 1.

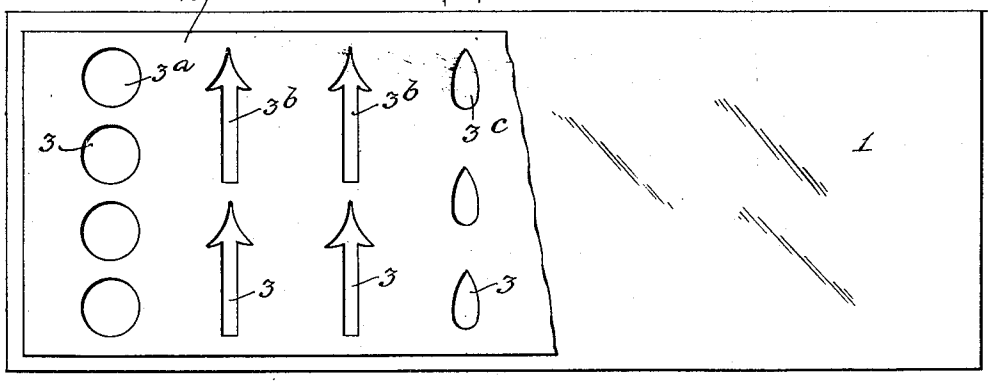


Fig. 2.

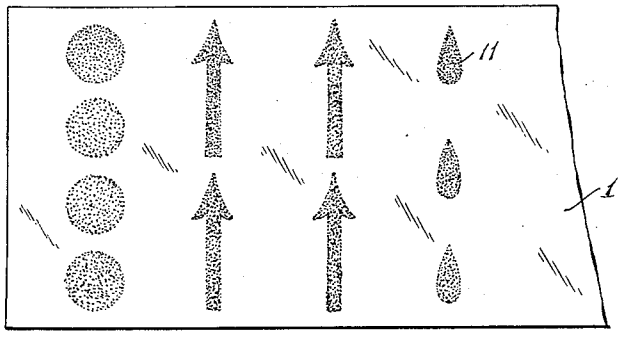


Fig. 3.

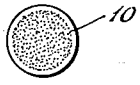


Fig. 4.

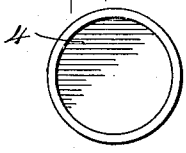


Fig. 5.

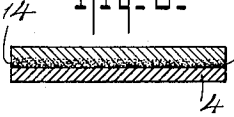


Fig. 6.

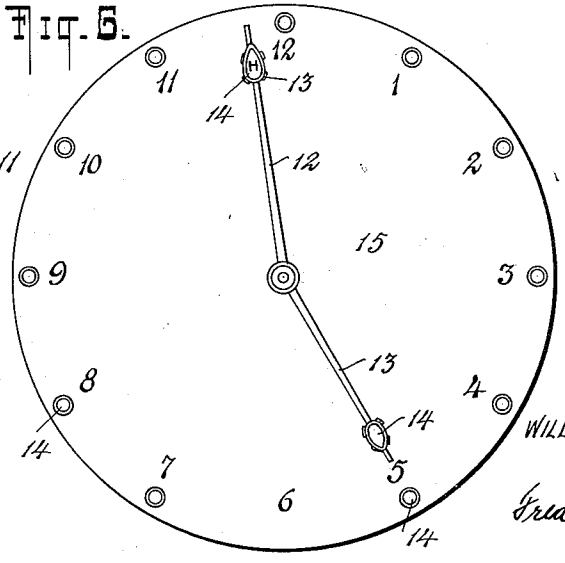
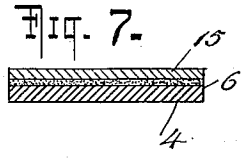


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM A. SCHLESINGER, OF DENVER, COLORADO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLD LIGHT MANUFACTURING COMPANY, INC., A CORPORATION OF COLORADO.

LUMINOUS INDICATING DEVICE AND PROCESS OF MAKING SAME.

1,342,767. Specification of Letters Patent. Patented June 8, 1920.

Application filed January 25, 1917, Serial No. 144,385. Renewed February 26, 1920. Serial No. 361,410.

To all whom it may concern:

Be it known that I, WILLIAM A. SCHLESINGER, a citizen of the United States of America, residing at Denver, Colorado, have invented certain new and useful Improvements in Luminous Indicating Devices and Processes for Making Same, of which the following is a full, clear, and exact description.

My invention has for its object a method for fixing and a device for holding luminous materials. Primarily, my device is intended to securely and evenly unite a luminous material to a carrying sheet, the luminous fields being capable of formation in any desired shape or configuration, and thus is intended for use in connection with objects and appliances which it is necessary to read or locate in the dark, such as dials, indicating hands, compasses, gages, push buttons, switches, door knobs, key holes, medicine or poison bottles, and many others. With poison bottles the luminous parts of the device are given the shape of a skull and cross bones. Although the face of the device is slightly flexible, the luminous compound will not crack.

Figure 1 represents a mask or stencil with a base sheet of celluloid thereunder. Fig. 2 the base sheet of celluloid after the luminous material has been united thereto. Fig. 3 a plan view of the base with the luminous material thereon after being cut from the base sheet. Fig. 4 a plan view of a carrier, holder or backing to which the base is secured. Fig. 5 a cross section of Fig. 6 after the base of Fig. 3 has been secured thereto. Fig. 6 a clock dial and hands with the device secured thereto. Fig. 7 a method of placing the luminous material on the carrier.

I take a thin sheet of celluloid 1, or like translucent or transparent material, which permits the passage of luminous rays of a luminous material, and over it clamp a mask 2 having the form or forms in which it is intended to cover the celluloid with luminous material represented therein by perforations 3, 3^a representing a push button, 3^b an arrow, and 3^c part of a clock hand. Over the mask, a solution, containing an agent capable of softening the celluloid, such as acetone, amylacetate and similar chemicals or a mixture thereof, and a binder which will permit the passage of the rays of the luminous material, to attach the luminous material to the celluloid, such as a cellulose lacquer known in the trade as "Zapon" or the like, is sprayed with an air brush. The solution passes through the perforations in the mask and on to the surface of the celluloid—the solution is thereby distributed evenly and uniformly on the base sheet. The solvent therein contained softens, eats into, or partially dissolves the surface of the celluloid to which it is applied, and also forms therein recesses or depressions. The amount of solvent used should be controlled so as not to eat through the sheet. The mask is removed and a luminous material, such as a mixture of radium or other suitable radio active substance and zinc sulfid, is dusted over the entire celluloid sheet. The softened celluloid sheet, where the solvent has acted upon it, takes hold of the luminous material. The even distribution of the solution has the effect of taking up an even and uniform amount of luminous material. The celluloid sheet and the lacquer are allowed to dry and set, securely attaching the luminous material to the base by the union of the celluloid lacquer and luminous material in a homogeneous mass 11. The surplus luminous material is removed from the sheet by striking it on its edge while in an upright position, and a soft brush is lightly passed over the sheet, leaving the sheet as shown in Fig. 2. I then prefer to spray over the entire sheet a coating of lacquer, thus more firmly fixing the luminous material to the celluloid.

After the lacquer has dried, the celluloid sheet is cut around the outline of the luminous material, thus forming disks or plates of celluloid with the luminous material secured thereto, Fig. 3. The celluloid is cut around the the mass to the desired shape 10.

Plates 4 are formed in any desired configuration out of suitable material. I prefer to use brass or German silver, on which the prepared celluloid carrying the luminous material is to be secured.

I prefer to have the untreated side of the celluloid form the face of the device with the luminous material next to the carrier. The luminous material may be placed on the

carrier face out as at 6, and, if desirable, it may be covered with a material 15 through which the rays can pass. When plates are used the celluloid disk may be secured to the plate with lacquer or glue.

The finished article 14, is adapted to be attached to different articles and readily distinguishes and locates them in darkness or semi-darkness. The device may be attached to such different articles by glue, by applying the adhesive to the back of the plate or by other suitable means. Fig. 6 shows the device attached to the hands 12 of a clock by the turned over wings 13 and to a dial 15 of a clock by gluing.

If it is desirable, a second coating of luminous material may be applied over the second coating of lacquer, by dusting the same, while soft, with luminous material. I always prefer to give the luminous material a final coating of lacquer.

The union of the luminous material to the celluloid sheet by first softening the sheet and then uniting the luminous material thereto with a binder avoids the heretofore experienced difficulty of firmly fixing the luminous material to its holder or carrier.

The celluloid 10 with the luminous material thereon, may be framed with a rim so that both sides thereof are exposed and visible and an eye formed on the rim for securing the device to an object.

I sometimes stamp letters or numerals on the face or back of the translucent material with waterproof ink and then secure on the back of the material the luminous material so that when placed on an object to be indicated the letter or numeral on the translucent material will be visible.

The softening of the base sheet and the application of the luminous material thereto, when the material of the base sheet again sets or hardens, causes the luminous material to be embedded in the base sheet and by the use of the words "homogeneous union" this union is intended to be described as distinguished from gluing. The primary object of this invention is to bring about this union.

What I claim and desire to secure by Letters Patent is:

1. The process of fixing a luminous material to a material consisting of coincidentally plasticizing a surface of said material and applying a binder thereto, and coating the material and binder with a luminous material.

2. The process of fixing a luminous material to a substance which consists in softening a surface of celluloid with a solvent thereof and coincidentally applying to the softened surface a binder contained in the solvent and covering the softened material with luminous material.

3. The process of fusing a luminous material to a substance for carrying the luminous material which consists in softening the surface of said substance, applying thereto simultaneously with softening a binder and a luminous material.

4. The process of fixing a luminous material to a substance for carrying the luminous material which consists in softening and applying a binder with the softening agent to the surface of said substance, applying to said substance a luminous material and then permitting the substance to set whereby a homogeneous union of the carrying substance and luminous material takes place.

5. The process of fixing a luminous material to a carrying substance, which consists of partially bringing celluloid into solution by spraying thereon a solvent of the celluloid, the solvent containing a binder, coating the celluloid and binder with a luminous material and allowing the celluloid, binder and luminous material to set, whereby the said materials are homogeneously united.

6. In the process of uniting luminous material to a carrying substance comprising the step of placing a mask having therein a design in the form of an aperture, over a material capable of being softened, applying a softening agent of the material through the aperture thereby causing said softening agent to soften said carrying material, applying a binder simultaneously with said softening agent and luminous material to the softened parts and causing the softened parts to set thereby homogeneously binding the luminous material to the carrying material.

7. In a luminous indicating device a carrying substance having particles of luminous material embedded therein and surrounded by material of the carrying substance.

8. In a luminous indicating device a translucent carrier with a luminous material homogeneously attached to one side thereof, the other side of the carrier forming the facing of the device.

9. A luminous indicating device comprising a carrying sheet and luminous material homogeneously secured to the carrying sheet.

10. A luminous indicating device comprising a carrying sheet having a luminous material, and binder homogeneously secured to the carrying sheet.

In testimony whereof I have hereunto set my hand.

WILLIAM A. SCHLESINGER.