Dec. 30, 1941. W. O. LYTLE 2,268,258

REFLECTOR AND PROCESS OF MANUFACTURE THEREOF

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Fig. 1.

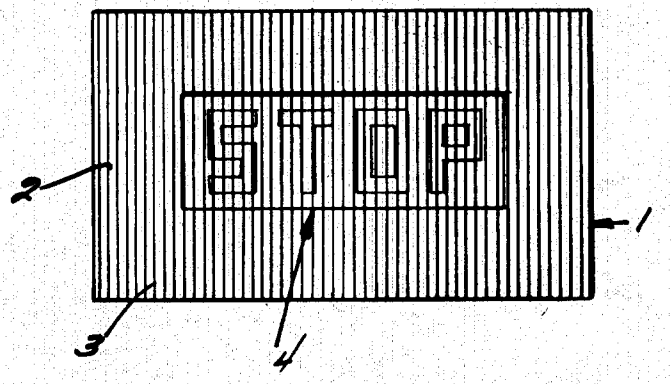


Fig. 2.

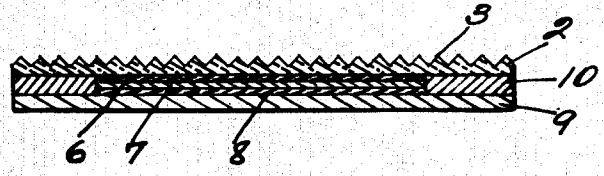
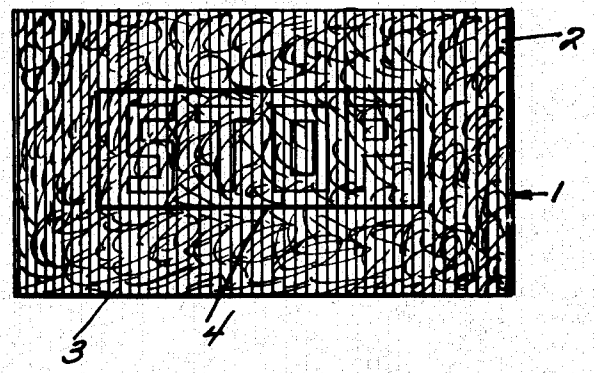


Fig. 3.



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Fig. 4.

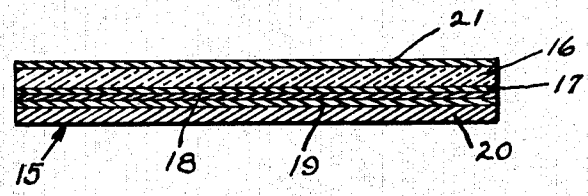


Fig. 6.

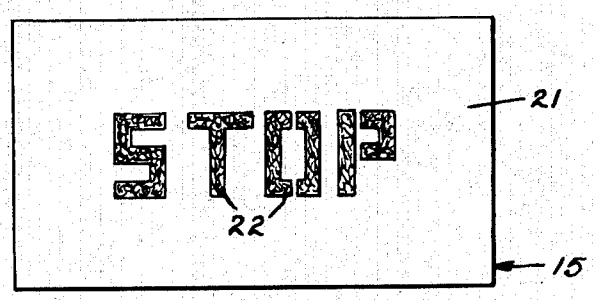


Fig. 6.

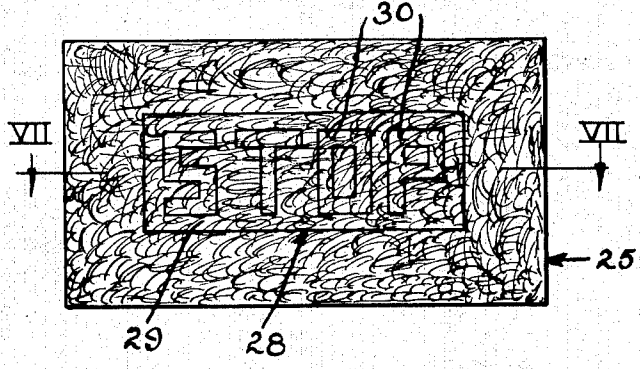
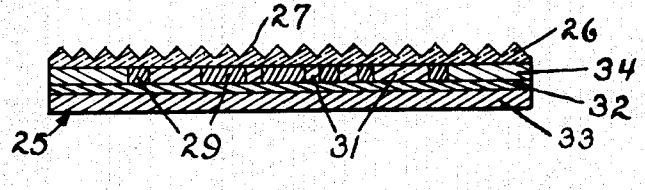


Fig. 7.



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REFLECTOR AND PROCESS OF MANUFACTURE THEREOF

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Application July 15, 1939, Serial No. 284,693

11 Claims. (Cl. 41—22)

The present invention relates to reflectors and more particularly to laminated plates containing a centrally disposed reflecting surface.

One object of the invention is to provide a reflector from which light rays will be visible to an observer through a greater horizontal angle than is presently possible in similar articles.

A second object of the invention is the provision of means for prolonging the effective life of the reflector plates.

Other objects and advantages of the invention will become more apparent from the following detailed description of certain embodiments thereof.

In the accompanying drawings:

Figure 1 is an elevational view of a reflector plate, as contemplated by my invention, at an intermediate stage of its manufacture.

Figure 2 is a vertical sectional view thereof in which the several elements are of exaggerated size for clarity of illustration.

Figure 3 is a front elevational view of a completed reflector.

Figure 4 is a vertical sectional view of another form of the invention.

Figure 5 is a front elevational view thereof.

Figure 6 is a front elevational view of a third form of my invention.

Figure 7 is a vertical sectional view taken substantially along the line VII—VII of Figure 6.

Referring to the drawings, a reflector 1 comprises a plate 2 of glass, preferably having a prismatic or otherwise figured surface 3. The plate 2 is of tempered glass, that is, glass which has been heated substantially to the softening temperature and subsequently chilled rapidly to place the surfaces thereof under compression.

Any desired combination of letters, numerals or other indicia may be formed on the smooth, under surface of the plate 2. For example, the reflector illustrated in Figure 2 is intended to serve as a highway marker and bears a legend 4 consisting of the letters "Stop." The letters are outlined by a thin film 6 of a transparent colored material, as for example, a red vitreous glaze or enamel or a lacquer. If it is desired the letters themselves may be formed of the colored material and the remainder of the plate is untreated or coated with a film of a contrasting color. The use of vitreous glazes or enamels for the creation of the particular indicia is preferable inasmuch as they may be fused into the base plate 2 by the application of heat and this may be accomplished simultaneously with the tempering of the plate 2. Obviously other highly decorative effects may be obtained by utilizing colored glass in the formation of the plate 2.

The base plate 2 is also provided with a reflecting film 7 of silver or other metal applied by any suitable process directly over the legend 4. This film of metal causes the legend to become more apparent and light reflected from the film 7 brings the legend into even greater prominence. A layer 8 of plastic material, such as a synthetic resin or a cellulosic derivative, covers the reflecting film 7 and through its own adhesiveness or with the application of suitable cements serves to secure a reinforcing element 9 of glass, metal, wood or other material to the plate 2. In certain instances it has been found desirable to leave the borders of the plate 2 free of silver, and additional strips 10 of a plastic material similar to that utilized in the layer 8 are positioned therealong in order that a more perfect union between the plate 2 and reinforcing element 9 is possible.

When the several elements of the reflector have been assembled, they are pressed or laminated into a composite plate. The conditions of temperature and pressure necessary to effect the lamination will, of course, vary according to the nature of the plastic material selected and the reinforcing element utilized. Obviously the lamination should be performed in such manner that the reflecting film will not be destroyed, but it has been found possible to form a satisfactory plate under those conditions normally experienced in the manufacture of safety glass.

The composite plate having been formed, the plate 2 is then fractured by a penetration of the surface skin. This action releases the compression under which the surfaces of the plate were placed by the tempering action and causes a disintegration of the plate into small fragments. Because of the presence in the composite reflector of the layer of plastic material, the small particles or fragments of glass are not dislodged but are retained in their relative positions upon the backing member. In its new form, the plate 2 possesses many additional faces which will divert both the incident and reflected light rays, diffusing those rays, and as a result increase the brilliancy and visibility of the reflector.

A second form of my invention is illustrated in Figures 4 and 5 of the drawings wherein a reflector 15 comprises an ordinary flat glass plate 16, the under surface of which is coated with a film 17 of silver and a protecting film 18 of copper or lead. A layer 19 of plastic material bonds a backing member 20 of glass, metal, wood, fabric, etc., to the plate 16. The composite plate is

laminated in the customary way and the plate 16, which may be tempered or untempered glass is broken by impact or sudden temperature variation. An opaque sheet 21, of metal, wood, etc., from which a suitable legend 22 is cut, is secured to the outer surface of the plate 16 by any suitable means restricting the light reflection therefrom to the legend. If it is desired, the several indicia forming the legend may be cut from opaque material and secured to the plate 16, permitting light to be reflected from the body of the reflector only, the legend being dark.

In a third form of my invention, illustrated in Figures 6 and 7, a reflector 25 comprises a plate 26 of glass either tempered or untempered having a prismatic or otherwise figured surface 27. A legend 28 is formed on the under surface of the plate 26, for example by affixing a layer 29 of vitreous enamel thereon outlining a series 30 of letters or other indicia. The letters or open spaces in the layer 29 are then supplied with a metallic filling 31, by spraying or other suitable process. If it is desired, the relative positions of the vitreous enamel and metallic filling may be reversed, thus altering the appearance of the reflector. A layer 32 of plastic material is adhered to the coated surface of the plate 26 and serves to bond a reinforcing backing plate 33 thereto. Marginal strips 34 of plastic material are supplied to insure a more perfect bond between the plates 26 and 33.

The assembled reflector is laminated in the customary manner and the plate 26 is fractured. If the plate 26 is of tempered glass, penetration of the surface skin is sufficient, whereas, a strong impact or sudden temperature variation is necessary to fracture untempered glass. As in the other forms of the invention, the small fragments of glass remain in position upon the backing plate 33, and the additional faces again increase the diffusion and reflection of light rays.

It is not necessary that a legend be made a part of the reflector plate. The plain reflector itself may be cut into the form of letters and used in the preparation of the so-called "self-illuminating" signs, or small sections of the plain reflector may be arranged in other designs suitable for marking road edges and the like.

It will at once be obvious that various modifications in the arrangement of the component elements of the reflector are possible without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. A process of manufacturing a reflector which comprises applying a metallic reflecting coating to one surface of a glass plate, adhering a reinforcing backing to the coated surface of the glass plate through the medium of an intermediate reinforcing layer of synthetic resin, securing means depicting a suitable legend to the opposite surface of the glass plate, and subsequently fracturing the glass plate.

2. A process of manufacturing a reflector which comprises applying a metallic reflecting coating to one surface of a tempered glass plate, adhering a backing member to the coated surface of the glass plate through the medium of an intermediate reinforcing layer of synthetic resin, securing means depicting a suitable legend to the opposite surface of the tempered glass plate, and subsequently fracturing the tempered glass plate.

3. A process of manufacturing a reflector which comprises securing suitable indicia to one surface of a glass plate, applying a metallic film over said indicia and portions of the glass surface immediately adjacent thereto, adhering a backing member to the coated surface of the glass plate through the medium of an intermediate reinforcing layer of synthetic resin, and subsequently fracturing the glass plate.

4. A process of manufacturing a reflector which comprises forming a suitable legend in a vitreous enamel upon the inner smooth surface of a tempered glass plate provided with an outer figured surface, heating the plate sufficiently to fuse the vitreous enamel, applying a metallic reflecting film to the smooth surface of the tempered glass plate in and about the legend, adhering a backing member to the coated surface of the glass plate through the medium of an intermediate reinforcing layer of synthetic resin, and subsequently fracturing the tempered glass plate.

5. A reflector comprising a plate of glass in the form of discrete particles maintained in their relative positions as components of the plate, means depicting a suitable legend secured to the glass plate, a metallic reflecting coating applied to one surface of the plate, and a reinforcing backing adhered to the coated surface of the glass plate.

6. A reflector comprising a plate of glass in the form of discrete particles substantially of uniform pattern maintained in their relative positions as components of the plate, means depicting a suitable legend secured to the glass plate, a metallic reflecting coating applied to one surface of the plate, and a reinforcing backing adhered to the coated surface of the glass plate.

7. A reflector comprising a plate of glass, provided with at least one figured surface, in the form of discrete particles maintained in their relative positions as components of the plate, means depicting a suitable legend secured to the glass plate, a metallic reflecting coating applied to one surface of the plate, and a reinforcing backing adhered by a plastic medium to the coated surface of the glass plate.

8. A reflector comprising a plate of glass, provided with at least one figured surface, in the form of discrete particles substantially of uniform pattern maintained in their relative positions as components of the plate, means depicting a suitable legend secured to the glass plate, a metallic reflecting coating applied to one surface of the plate and a reinforcing backing adhered by a plastic medium to the coated surface of the glass plate.

9. A reflector comprising a plate of glass, provided with an outer figured surface and an inner smooth surface, in the form of discrete particles maintained in their relative positions as components of the plate, an indicia layer of vitreous material depicting a suitable legend secured to the smooth surface of the glass, a metallic reflecting coating covering the indicia layer, and a reinforcing backing adhered to the coated surface of the glass plate.

10. A reflector comprising a plate of glass, provided with an outer figured surface and an inner smooth surface, in the form of discrete particles substantially of uniform pattern maintained in their relative positions as components of the plate, an indicia layer of vitreous material depicting a suitable legend secured to the smooth surface of the glass, a metallic reflecting coating covering the indicia layer, and a rein-

forcing backing adhered to the coated surface of the glass plate.

11. A reflector comprising a plate of glass, provided with an outer figured surface and an inner smooth surface, in the form of discrete particles substantially of uniform pattern maintained in their relative positions as components of the plate, a suitable legend formed of a vitreous enamel secured to and fired on the smooth surface of the glass plate, a metallic reflecting coating applied to the inner surface of the glass plate in and around the legend, and a reinforcing backing adhered by a plastic medium to the coated surface of the glass plate.

WILLIAM O. LYTLE.