Aug. 4, 1931. P. A. PREUS 1,817,646

HIGHWAY SIGN

Filed April 16, 1930

2 Sheets-Sheet 1

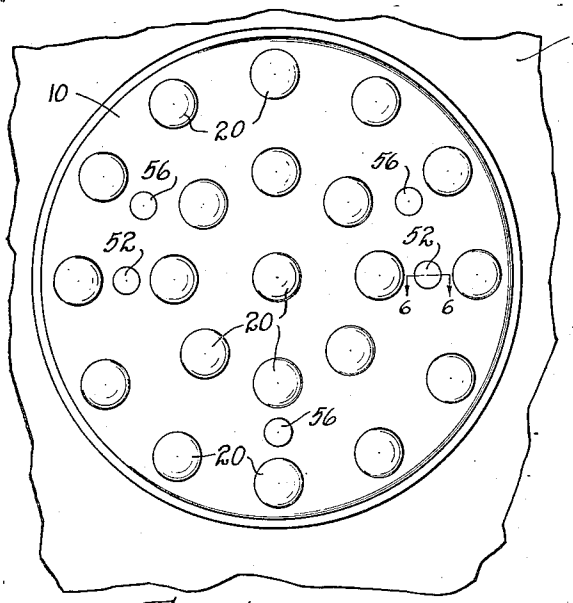

FIG. 1



FIG. 4

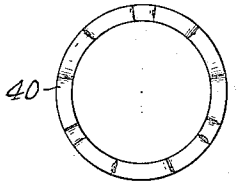

FIG. 5

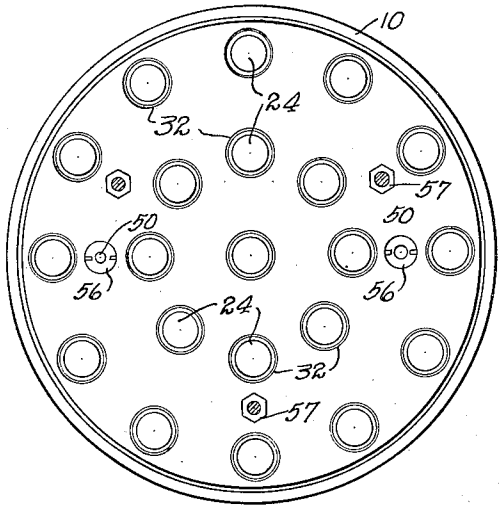

FIG. 3

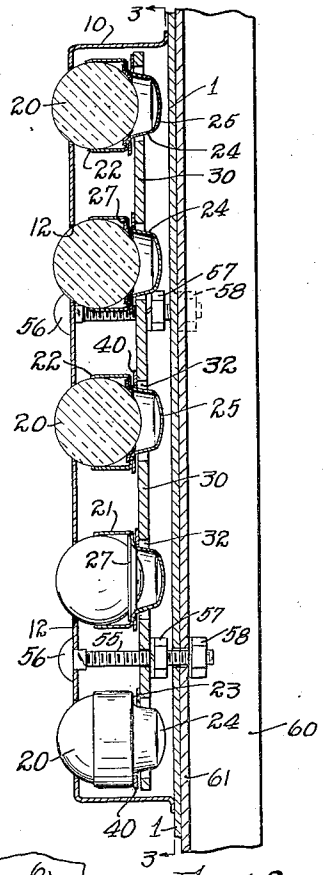

FIG. 2

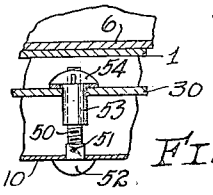

FIG. 6

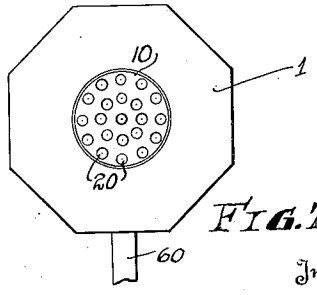

FIG. 7

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HIGHWAY SIGN

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2 Sheets-Sheet 2

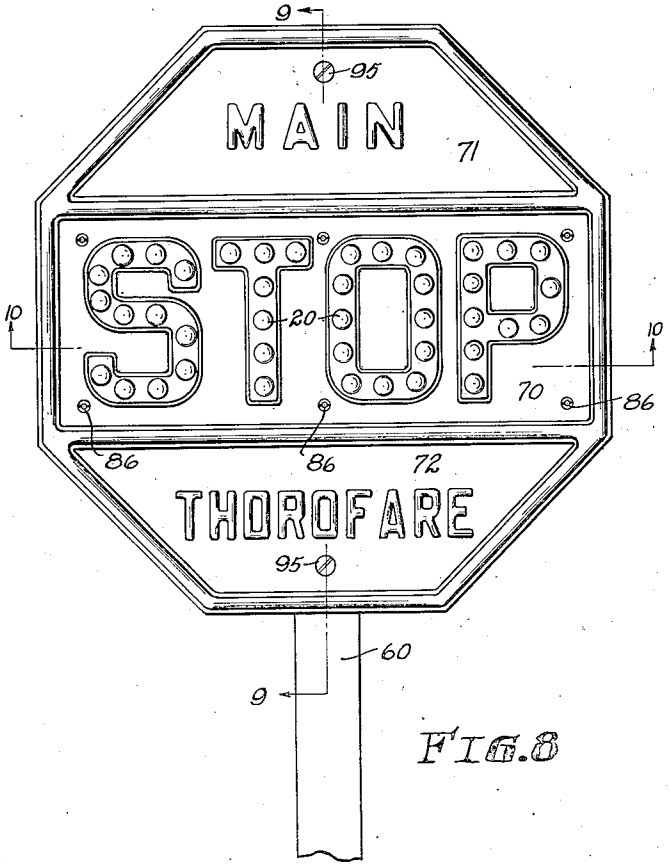

FIG. 8

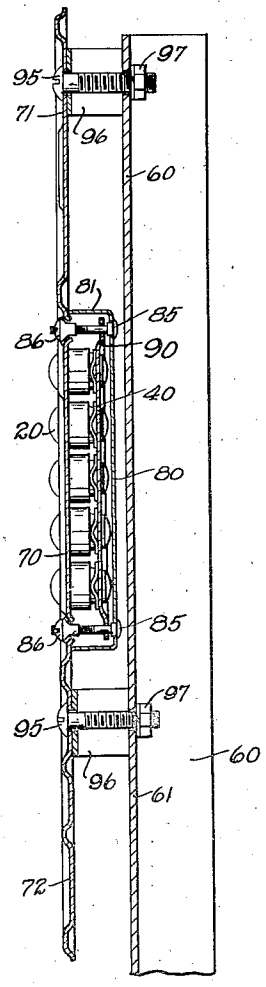

FIG. 9

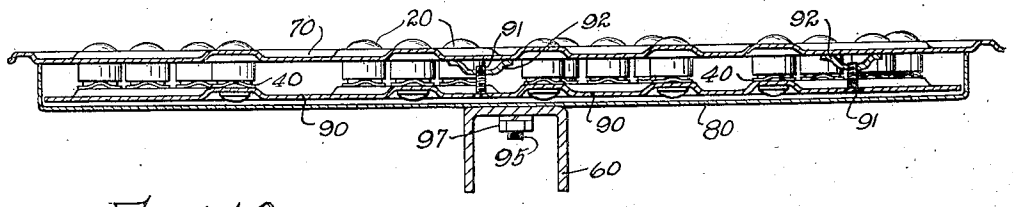

FIG. 10

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Patented Aug. 4, 1931 1,817,646

UNITED STATES PATENT OFFICE

PAUL A. PREUS, OF ST. PAUL, MINNESOTA, ASSIGNOR TO WESTERN STAMPING & MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF MINNESOTA

HIGHWAY SIGN

Application filed April 16, 1930. Serial No. 444,673. REISSUED

This invention relates to a highway sign of the type having a series of reflecting units adapted to throw back rays received from an automobile headlight and thereby warn the driver. The object of the invention is to provide a very simple and efficient case for carrying the reflecting units suitably grouped either as a general warning panel or in the outline of suitable letters as for example the word "Stop" or "Danger".

Two embodiments of my invention are shown in the drawings hereof and are hereinafter more fully described and the essential novel features of the invention are summarized in the claims.

In the drawings Fig. 1 is a front elevation of a portion of a sign having a reflecting panel embodying this invention; Fig. 2 is a diametric vertical section of parts of the sign shown in Fig. 1; Fig. 3 is a sectional rear elevation of the reflecting panel of the sign the plane of the section being indicated by the line 3—3 on Fig. 2; Figs. 4 and 5 are respectively a side elevation and face view of an elastic washer used for positioning the individual reflectors in the reflecting panel; Fig. 6 is a detail illustrating locking bolts which assist in making a unit of the reflecting portion of the sign; Fig. 7 is a front elevation on a smaller scale of one form of complete sign; Fig. 8 is a larger view in front elevation of another form of a complete sign; Figs. 9 and 10 are respectively a vertical section and a horizontal section on correspondingly numbered lines on Fig. 8.

Referring first to the embodiment of Figs. 1 to 7 inclusive 1 indicates a suitable back panel and 10 a shallow drum-like casing carried thereby adapted to house a group of reflecting units indicated individually at 20. The casing 10 is shown as mounted centrally on the panel 1 leaving a marginal region of the panel on which any suitable words may be displayed. The reflecting units, may, if desired, be of a red color, and the casing 10 may be red, so that the whole central region presents a red glare to the approaching automobile.

The reflecting units 20 as illustrated in the drawings are a type common on the market, comprising spherical balls which may be of red glass and are individually mounted in metal housings 21. Each housing is shown as having a substantially cylindrical portion embracing the ball and peened inwardly just in front of its diameter as at 22. The other end of the cylindrical portion is shown as extended inwardly as at 23 and then continuing in a slightly conical portion 24 terminating in a dish-shaped base 25. The balls are shown as resting on a non-metallic washer 27 bearing against the inwardly offset portion of the housing. The surface of the base 25 acts as a reflector tending to increase the reflection from the unit.

In my invention, I take a number of units as described and effectively mount them in the casing and hold them in place therein without danger of breaking the glass balls. To this end, I form through the face of the casing 10, a series of holes 12 of smaller diameter than the balls, and I provide a backing-plate 30 which has holes 32 registering with the holes 12 and adapted to embrace the conical walls 24 of the unit housings. Between the housing and the face of the backing plate 30, I place around the metal housing of each unit a cushioning washer 40. This cushioning washer allows the back plate 30 to be bolted effectively to the casing front plate without danger of injuring the reflecting units and with the assurance that they will be tightly held in place.

The washer 40 is shown in detail in Figs. 4 and 5 and comprises an annular member which is made sinuous in a circumferential manner as shown. This washer may readily be made of spring metal, and thus is sufficiently yielding and operates to maintain the reflecting ball snugly in the opening 12 of the casing front.

The casing, the backing plate, the reflecting units and the yielding washers are all secured together by any suitable means into one unitary panel. For this purpose I have shown bolts passing through the front and back plates. In Figs. 1 and 6, I have indicated two of such bolts comprising a threaded shank 50 equipped with a squared portion 51 and a rounded head 52. As a nut for

such bolt, I may provide a member having an internally threaded sleeve 53 and a rounded head 54 provided with a suitable notch or notches. This nut member is shown as rotatably mounted in the back plate 30.

In assembling the members of the entire reflecting device, using the parts shown, the reflecting units may be placed in the holes 12 in the casing front, while the same is held horizontal, then the washers may be put on the backs of the unit housings and the plate 30 put into position. The bolts 50 may then be passed through the front and the nuts screwed in from the back. This makes a complete assembled reflecting member ready for mounting alone or on a sign panel as illustrated in Fig. 7.

I have illustrated a specific form of reflecting unit which I have found satisfactory. However, it should be noted, that one of the advantages of my sign is that various shapes and sizes of reflecting units may be employed. By making the holes in the back plate in registration with the holes in the front plate, I am enabled to hold such different units so that they will be maintained in position to be visible through the openings in the front plate. It is convenient to have the holes in the back plate of the same size as those in the front plate, but this is not necessary, as registration of the centers or corresponding points in the two sets of holes may be sufficient to insure proper positioning of the units. As shown in Fig. 2, the backing plate stands well within the border flange of the casing, and thus the identical plate shown might be used with large units, by simply standing farther back in the casing.

My reflecting device may be mounted on the sign panel 1 by any suitable means, as for instance bolts passing through the casing 10. I have shown three of these through bolts, indicated at 55, having heads 56 on the front of the casing and extending through the back of the casing, where they first receive nuts 57 (Fig. 2) clamped against the back of the casing and extend beyond such nuts to pass through the sign panel 1, finally carrying nuts 58 holding the reflecting device to the sign panel.

I have indicated at 60 a metal supporting post for the sign having a front wall or flange 61. I have shown in Fig. 2 the bolts 55 passing through this front wall so that these same bolts hold the casing to the sign panel and both the casing and panel to the post.

In Figs. 8, 9 and 10, I have illustrated my invention embodied in a sign where the reflecting units are the same as already described, but are grouped in the form of certain letters, as for instance the letters making the word "stop". The outline of these letters is preferably made more definite, either by embossing them on the panel, or distinctively painting them, or both.

In this second embodiment, I make the front of the casing for the reflecting units and the marginal sign proper in one plane; that is to say, the central zone of the front plate designated 70 constitutes the front of the casing for the reflecting units, while the marginal portions 71 and 72 are parts of the sign beyond the reflecting region. I provide behind the group of reflecting units a suitable box-like casing 80 having edge flanges 81 which abut the back of the front panel, the casing being held to the panel by bolts and nuts. The bolts 85 are shown as passing through the back plate 80 and receiving nuts 86 which are screwed onto the bolts in front of the front plate 70.

The reflecting units 20 are carried in the sign just described in the same manner as already explained; that is to say, the glass spheres project partially through openings in the front plate 70 and the reduced shanks of the individual housings for these spheres extend through a clamping plate 90, with intermediate sinuous spring washers 40. The back plate 90 may be held in proper relation to the front plate by any suitable means; I have shown screws 91 passing through the backing plate into internally threaded stirrups 92 which are electrically welded to the back of the front plate 70. In this manner, the reflecting units are effectively held in place on the front plate before the casing 80 is applied.

I have shown the sign of Fig. 8 secured to a suitable post 60 by means of bolts 95 passing through the panel portions 71, 72 and through intermediate distance passes 96 and receiving nuts 97 behind a front wall 61 of the post.

It will be seen that in both embodiments of my invention the reflecting units are similarly held in position in openings in the metal front. I find it very convenient in manufacture to make those openings and the corresponding openings through the back plate of the same diameter and thus both sets of openings may be made by the same tool and absolute registration of the front and back insured. My method of holding the reflecting units causes them to be retained firmly in place without danger of breakage. Should, however, one be broken by external means, it is a simple matter to separate the casing and replace any broken unit.

I claim:

1. In a sign of the character described, the combination of a front plate having openings therein, reflecting units each having a reflecting portion and a casing with a reduced shank, a back plate having openings positioned with reference to those of the front plate, said units being mounted between the plates with the reflecting portion extending through the front plate and the shanks extending through the back plate, and means

for holding the front and the back plate together.

2. In a sign of the character described, the combination of a front plate having a series of round openings therein, a back plate having openings correspondingly positioned, a series of reflecting units each comprising a glass ball and a metal housing which embraces the ball and then has an inwardly directing shoulder and then a projecting shank, sinuous washers embracing the shanks, the glass balls projecting through the openings in the front plate and the shanks behind the washers projecting through openings in the back plate, and means for holding the plates together with the sinuous washers under constraint to maintain the glass balls tight in the openings of the front plate.

3. In a sign of the character described, the combination of a casing and a group of reflecting units therein, the casing having a series of openings through its front, a back plate behind the reflecting units with correspondingly positioned openings, the units projecting through the front openings and held in place by projecting through the back openings, means for holding together the front and back of the casing, said sign having a panel extending beyond the region of the reflecting portion and adapted to carry suitable indicia on such marginal portion.

4. In a sign of the character described, the combination of a series of reflecting units, an enclosing casing therefor having a front member, a back member and a surrounding wall, the front member of the casing having openings, an intermediate plate within the casing having openings in registration with openings in the front plate, the reflecting units being within the casing and projecting through the front plate thereof and having portions projecting through the intermediate plate, means for holding the intermediate plate to the front plate to confine the reflecting units as a group, and means for holding such entire group in a certain region of a sign panel which has marginal portions for suitable indicia.

5. In a sign of the character described, the combination of a series of reflecting units, an enclosing casing therefor having a front member, a back member and a surrounding wall, the wall being formed integral with one of said members and at its free edge abutting the other member, the front member of the casing having openings, an intermediate plate within the casing having openings in registration with openings in the front plate, the reflecting units projecting through the front plate and having housings with shanks projecting through the intermediate plate, means for holding the intermediate plate to the front plate to confine the reflecting units as a group, and means for mounting the entire reflecting device.

6. In a sign of the character described, the combination of a panel member having openings therein, a back member having openings corresponding to the openings in the panel member, a plurality of reflecting units, said units projecting through the panel openings and having housings with shanks projecting through the back member, means for securing the back member to the panel, whereby said reflecting units are securely held in place, and an enclosing casing for said units.

7. In a sign of the character described, the combination of a panel member, said member having a series of openings therein, a corresponding series of reflecting units projecting through said openings, a back member having sinuous washers associated therewith for holding said reflecting units in place and a box like member associated with the back of the panel member for enclosing said reflecting units.

8. In a sign of the character described, the combination of a panel member, a series of reflecting units, an enclosing casing for said units, said casing having a front member, and a side wall formed integral therewith, the front member having a plurality of openings, a plate member within the casing having openings in registration with the openings in the front member, the reflecting units projecting through the front member and having housings with shanks projecting through the plate member, means for holding the plate member to the panel member, to confine the reflecting units as a group said means acting also as a means for mounting the casing to the panel member.

9. A sign having a group of reflecting units, said units each having a reflecting portion and a casing with a reduced shank, a front plate with openings registering with the units, a back plate, means for securing the front and back plates together, and yielding washers surrounding the shanks of the units and positioned between the front and back plates, said washers being adapted to protect the reflecting units when the two plates are secured together, as well as to securely hold them against the front plate.

10. In a sign of the character described, the combination of a front plate having openings therein, reflecting units each having a reflecting portion and a casing with a reduced shank, a back plate having openings positioned with reference to those of the front plate, said units being mounted between the plates with the reflecting portions extending through the front plate and the shanks of the casing extending through the back plate, means for holding the front and back plates together and yielding washers surrounding the shank between the shoulders thereon and the back plate, whereby the reflecting units are protected from injury, but at the same time securely held against the front plate.

11. In a sign of the character described, the combination of a front plate having openings, a series of reflecting units each comprising a glass ball and a metal housing with a reduced shank, a back plate having openings registering with those of the front plate, the glass balls extending partially through the openings in the front plate and the shank extending through the openings in the back plate, means for holding the front and back plates together and yielding washers surrounding the shank betwen the shoulders thereon and the back plate, to protect the glass balls from injuries, as well as to hold them securely against the front plate.

12. In a sign of the character described, the combination of a front plate, having openings, reflecting units positioned behind the front plate and registering with the openings therein, said reflecting units having reduced shanks and shoulders caused by said reduction, and means for holding the units in place, including sinuous washers surrounding the shanks and adapted to act upon the shoulders thereof and a back plate against which the washers bear.

In testimony whereof, I hereunto affix my signature.

PAUL A. PREUS.