March 28, 1933. R. B. BENJAMIN ET AL 1,903,087

LIGHTING CONSTRUCTION

Filed July 2, 1931 3 Sheets-Sheet 1

Fig. 1

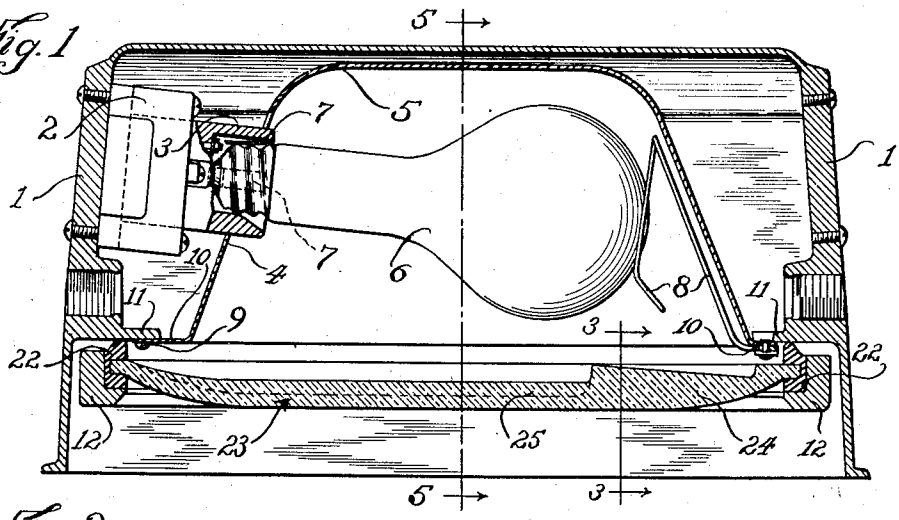


Fig. 2.

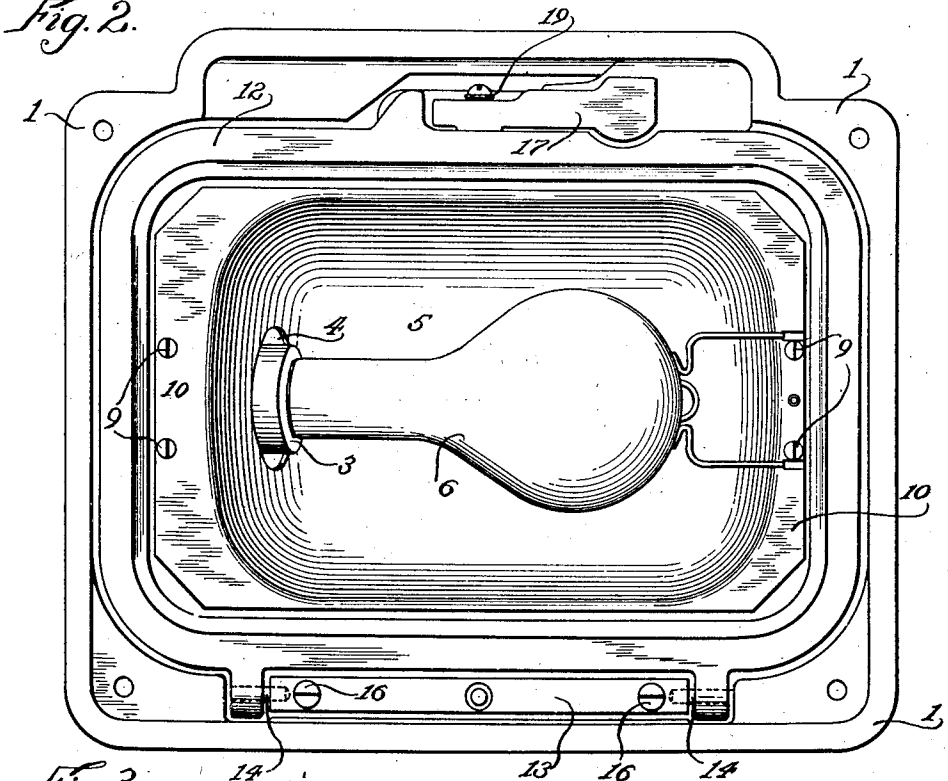
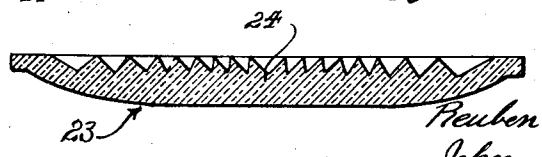


Fig. 3.



Witness:
A. B. Davison.

Inventors:
Reuben B. Benjamin
John H. Waterbury.
By Jones, Addington, Ames & Seibold
Attys.

March 28, 1933. R. B. BENJAMIN ET AL 1,903,087

LIGHTING CONSTRUCTION

Filed July 2, 1931 3 Sheets-Sheet 2

Fig. 4.

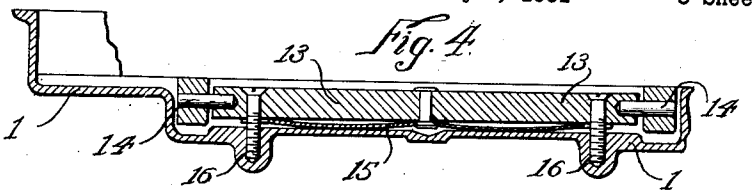


Fig. 5.

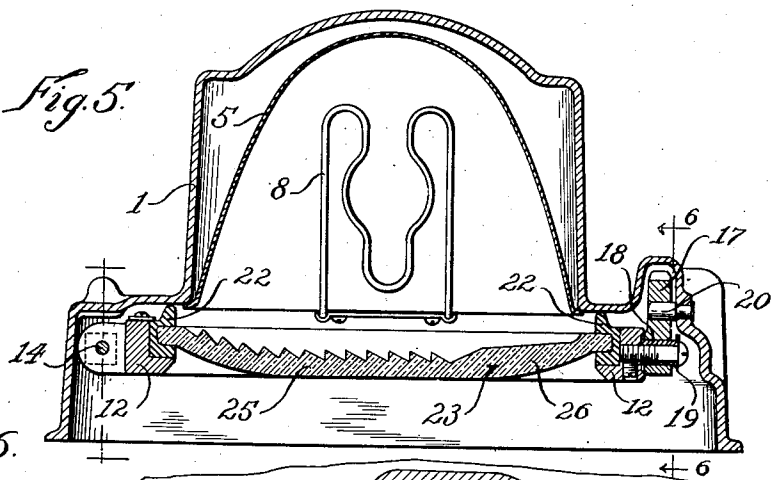


Fig. 6.

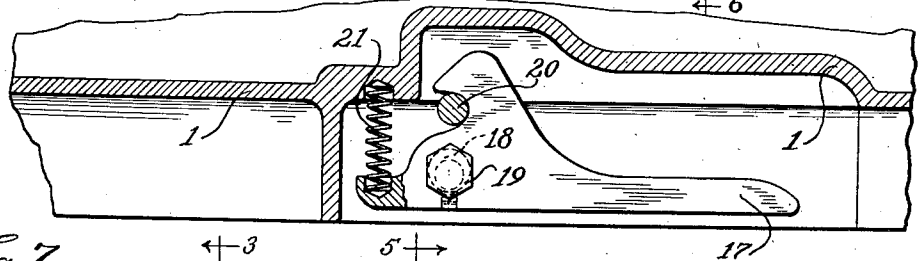
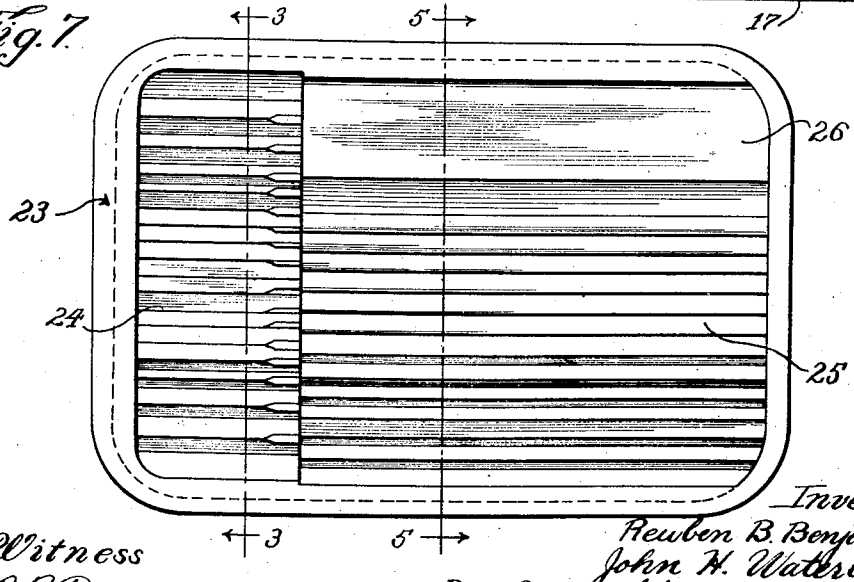


Fig. 7.



Witness
R. B. Davison.

Inventors
Reuben B. Benjamin.
John H. Waterbury.
By: Jones, Addington, Ames & Selbold,
Attys.

March 28, 1933. R. B. BENJAMIN ET AL 1,903,087

LIGHTING CONSTRUCTION

Filed July 2, 1931 3 Sheets-Sheet 3

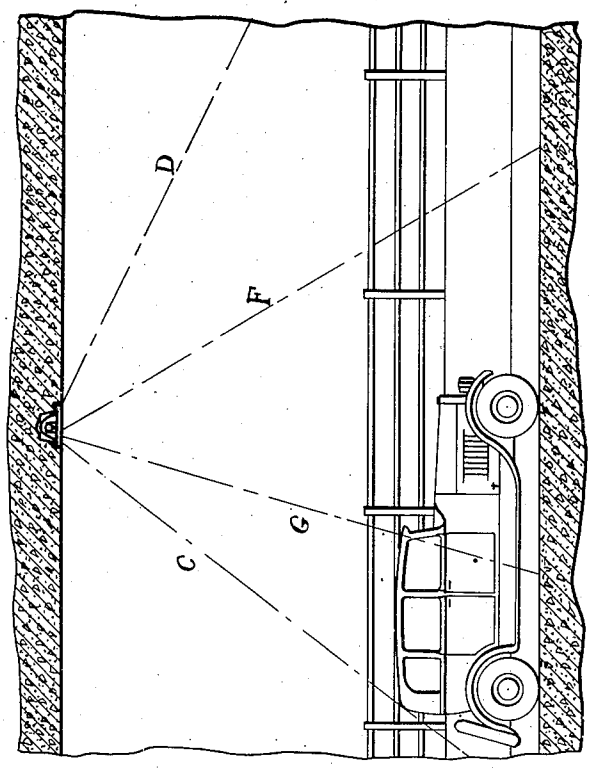


Fig. 9.

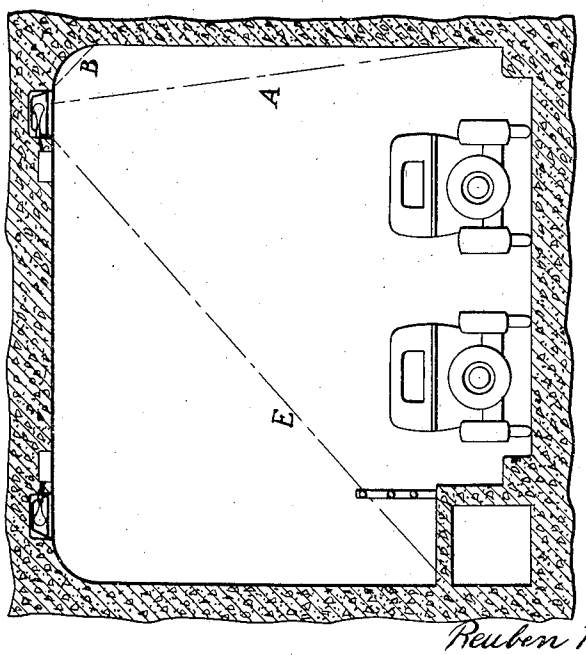


Fig. 8.

Witness:
R. B. Davison.

Inventors:
Reuben B. Benjamin.
John H. Waterbury
By: Jones, Addington, Ames and Seibold,
Atty's.

Patented Mar. 28, 1933 1,903,087

UNITED STATES PATENT OFFICE

REUBEN B. BENJAMIN AND JOHN H. WATERBURY, OF CHICAGO, ILLINOIS, ASSIGNORS TO BENJAMIN ELECTRIC MANUFACTURING COMPANY, OF DES PLAINES, ILLINOIS, A CORPORATION OF ILLINOIS

LIGHTING CONSTRUCTION

Application filed July 2, 1931. Serial No. 548,390.

Our invention relates to a lighting construction and more particularly to the lighting of tunnels or subways.

One of the objects of our invention is to provide a lamp construction to be installed in the ceiling of a tunnel adjacent the side wall and having provisions whereby the light emitting from the lamp will be spread out uniformly along the wall so as to prevent vertical light streaks.

A further object of our invention is to provide a construction wherein the light rays emitting downwardly will be refracted in a forward direction (that is, in the direction of travel of a vehicle using the tunnel) so as not to inconvenience the driver of a vehicle.

Another object is to provide an improved latching means for the hinged door containing the lens.

Further objects will appear from the description and claims.

In the drawings in which our invention is illustrated,

Figure 1 is an axial section through a construction embodying our invention;

Fig. 2 is a bottom plan view of our lamp, but with the lens removed;

Fig. 3 is a section of the lens only on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 5;

Fig. 5 is a vertical section on the line 5—5 of Figure 1.

Fig. 6 is a fragmentary section on an enlarged scale illustrating the latching means and is substantially on the line 6—6 of Fig. 5;

Fig. 7 is a bottom plan view of the lens alone; and

Figs. 8 and 9 are, respectively, vertical and longitudinal sections through a typical installation of my invention, and illustrating the light distribution from the lamps.

Referring to the drawings in detail, the construction shown comprises a housing 1 having mounted therein a socket 2, said socket having a portion 3 extending through an aperture 4 in the reflector 5. In order that the bulb 6 may be readily removable and replaceable, a construction is provided whereby the bulb may be inserted in the receptacle by a swinging movement without any axial rotation. For this purpose the outer side of the insulating cup portion 3 is made flaring, as indicated at 6*a*, and a laterally-yielding spring contact member 7 is provided opposite this flaring entrance which bears against the threaded shell contact 7*a* of the bulb. The bulb is held in proper position in the socket by means of a spring wire clip 8 having a loop portion which engages the end of the bulb and presses it into the socket, this spring loop yielding to permit the bulb to swing into position in inserting the bulb into the socket. The reflector 5 is retained in the housing 1 by means of screws 9 being passed through the flanged portion 10 and into the lugs 11 of the housing 1. A door 12 is mounted on the bar 13 by means of the hinge pins 14. A suitable spring tension is maintained on said bar 13 by means of spring 15 and the adjusting screws 16.

To hold the door in its proper position an adjustable latching means is provided comprising a latch member 17 mounted on the eccentric bushing 18, said eccentric bushing being provided with a hexagonal head 19 by which said bushing 18 may be rotated to cause the latch member 17 to exert less or greater pressure on the latch pin 20. A spring 21 is provided to keep the latch member under proper tension when the door 12 is closed. Within the door 12 is protectively mounted, by means of the rubber gasket 22, the lens 23, said lens having a first zonal portion 24 nearest the side wall of the tunnel, provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks. The distribution of the light emitting from said first zonal portion 24 is shown in Figure 8 as being bounded by the lines A and B and in Fig. 9, C and D, said prismatic formation comprising a plurality of prisms, substantially as shown in Fig. 3, extending longitudinally of the reflector. The lens also has a second zonal portion 25 extending substantially from the first zonal portion 24 to the other end of the reflector and from a line substantially parallel to the rear edge of the reflector to the front edge of said reflector, said second zonal

portion 25 being provided with a prismatic formation substantially as shown in Fig. 5, for causing light rays passing therethrough to be refracted forwardly. The distribution of the light emitting from said second zonal portion 25 is shown in Fig. 8 as being bounded by the lines A and E and in Fig. 9 by the lines D and F. The said prismatic formation of the zonal portion 25 comprises a plurality of substantially parallel prisms extending substantially longitudinally of the reflector. The lens has a third zonal portion 26 extending substantially from the first zonal portion 24 to the other end of the reflector and from the zonal portion 25 to the rear edge of the reflector. The light emitting from the zonal portion 26 is shown in Fig. 8 as being bounded by the lines A and E and in Fig. 9 by the lines D and G. The third zonal portion 26 comprises a prism extending longitudinally of the reflector, said prism being wider than the prisms of the zonal portions 24 and 25.

It may be noted that the housing 1 is symmetrical about a center line so that the same housing may be used on either the right or left side of the tunnel.

It will now be apparent that our invention presents a highly desirable method of illumination for tunnels and the like, and it will be evident that the light emanating from the lamps as shown and described will be of a character pleasing and restful to the eye.

It will also be apparent that the light from the fixture will be spread out uniformly along the wall so as to prevent vertical light streaks.

The operator of a vehicle driving through a tunnel or subway lighted after the manner of our invention will not be subjected to the eye strain usually encountered in places of this type, artificially illuminated, as the greater part of the light is at all times directed forwardly.

Further modifications will be apparent to those skilled in the art and it is desired, therefore, that our invention be limited only by the prior art and the scope of the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks, said prismatic formation comprising a plurality of prisms extending longitudinally of the reflector, said lens also having a second zonal portion extending substantially from said first zonal portion to the other end of the reflector and from a line substantially parallel to the rear edge of the reflector to the front edge of the reflector, said second zonal portion being provided with a prismatic formation for causing light rays passing therethrough to be deflected forwardly so as not to inconvenience the driver of a vehicle, said second prismatic formation comprising a plurality of substantially parallel prisms extending substantially longitudinally of the reflector, said lens having a third zonal portion extending substantially from said first zonal portion to the other end of the reflector and from said second zonal portion to the rear edge of the reflector, said third zonal portion being provided with a prismatic formation for causing the light rays passing therethrough to be deflected forwardly so as not to inconvenience the driver of a vehicle, and said third prismatic formation comprising a prism extending longitudinally of the reflector and wider than the prisms of the second zonal portion.

2. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks.

3. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical

light streaks, and said prismatic formation comprising a plurality of prisms extending longitudinally of the reflector.

4. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, the light center of the lamp being adjacent that end of the reflector remote from the socket, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks.

5. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, the light center of the lamp being adjacent that end of the reflector remote from the socket, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks, and said prismatic formation comprising a plurality of prisms extending longitudinally of the reflector.

6. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks, said prismatic formation comprising a plurality of prisms extending longitudinally of the reflector, and said lens also having a second zonal portion extending substantially from said first zonal portion to the other end of the reflector and from a line substantially parallel to the rear edge of the reflector to the front edge of the reflector, said second zonal portion being provided with a prismatic formation for causing light rays passing therethrough to be deflected forwardly so as not to inconvenience the driver of a vehicle.

7. A lighting construction to be installed in the ceiling of a tunnel adjacent the side wall thereof comprising an elongated dished reflector to be installed in the ceiling with its open side down and extending in a transverse direction, a housing for said reflector, a lamp socket adjacent one end of the reflector and mounted on said housing for supporting a lamp in substantially horizontal position in said reflector, and a lens lying in a general horizontal plane across the open side of said dished reflector, said lens having a first zonal portion nearest the side wall of the tunnel provided with a prismatic formation for causing the light rays passing therethrough to diverge forwardly and rearwardly along the side wall of the tunnel to prevent vertical light streaks, said prismatic formation comprising a plurality of prisms extending longitudinally of the reflector, and said lens also having a second zonal portion extending substantially from said first zonal portion to the other end of the reflector and from a line substantially parallel to the rear edge of the reflector to the front edge of the reflector, said second zonal portion being provided with a prismatic formation for causing light rays passing therethrough to be deflected forwardly so as not to inconvenience the driver of a vehicle, and said second prismatic formation comprising a plurality of substantially parallel prisms extending substantially longitudinally of the reflector.

In witness whereof, we have hereunto subscribed our names.

REUBEN B. BENJAMIN.
JOHN H. WATERBURY.