Oct. 5, 1937. W. B. WELLS 2,094,689

RAILWAY LIGHT SIGNAL

Filed May 12, 1932

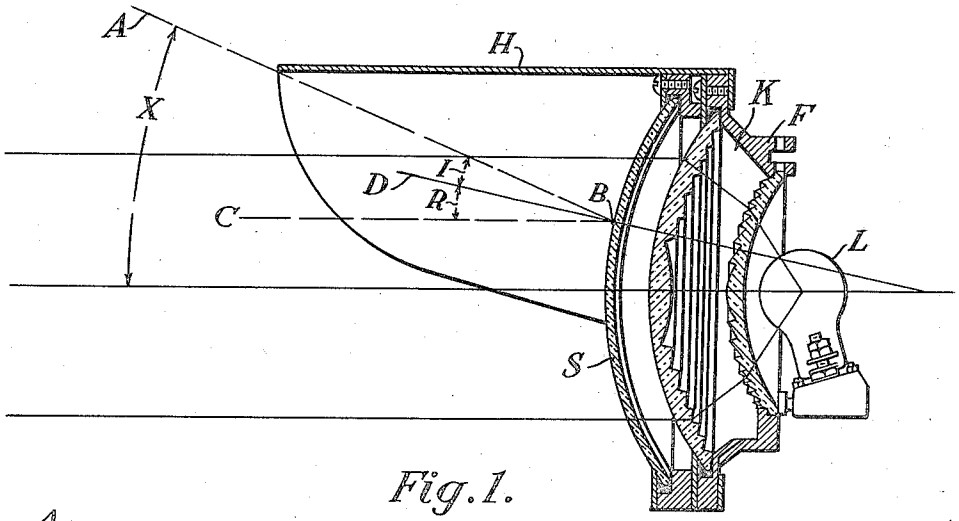


Fig. 1.

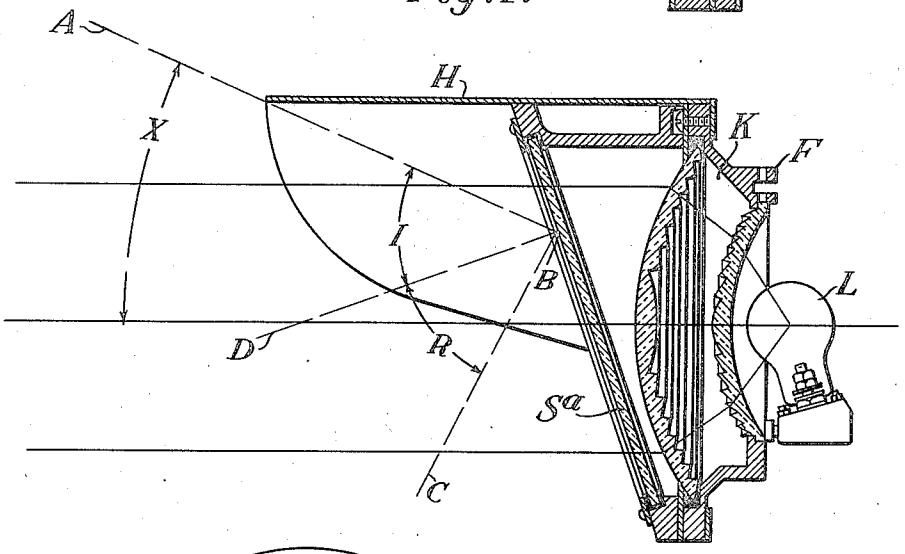


Fig. 2.

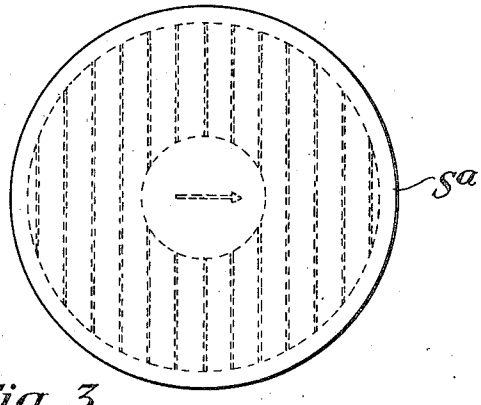


Fig. 3.

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RAILWAY LIGHT SIGNAL

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4 Claims. (Cl. 177—329)

My invention relates to railway light signals of the type in which a source of light is employed for giving indications both at night and in daylight, and in which a prismatic screen is provided to spread the light horizontally so that the beam may be seen from all points on a railway curve.

One feature of my invention is the provision of a signal of this kind so constructed as to prevent sunlight which may be reflected from the prismatic screen from interfering with the color of the beam projected by the signal, or from causing the signal to appear to be illuminated when it is unilluminated.

I will describe one form of signal embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawing, Fig. 1 is a view showing in vertical section a light signal of the type referred to above, as now commonly constructed. Fig. 2 is a view similar to Fig. 1 but showing one form of light signal embodying my invention. Fig. 3 is a front view of the prismatic screen forming part of the signal shown in Fig. 2.

Similar reference characters refer to similar parts in each of the views.

Referring first to Fig. 1, the signal in the form here shown, comprises an incandescent lamp L, from which a beam of light comprising substantially parallel rays is projected by a doublet lens K. Located in the path of the beam projected by this lens, is a glass screen S provided with a plurality of vertically disposed prisms for spreading the beam horizontally. This screen is commonly used when the signal is located on a railway curve, and its purpose is to spread the beam so that it may be seen from all points on the curve. Screens of this character are shown and described in Letters Patent of the United States Nos. 1,227,777 and 1,227,778, granted to Robert M. Gilson on May 29, 1917.

A hood H is usually provided to protect the lens A and the screen S as far as possible from external light rays, such as sunlight.

Still referring to Fig. 1, when the sun shines into the signal in the direction indicated by the line A—B, that is, in a direction at angle X from the horizontal, it will strike the screen S at angle I above a line D—B which is perpendicular to the tangent to the screen S at point B; some of this light may be reflected back at an angle R below the perpendicular D—B, angles I and R, of course, being equal. Under this condition the reflected light will be in the direction indicated by the line C—B, and this line is parallel with the beam projected by the signal. The result may be a fading out of the color of the beam which should be projected by the signal. For example, when the beam is red, the intended color may be faded out to such extent that the beam can be mistaken for a yellow beam. Likewise, when the beam is green, the intended color may be faded out to such an extent that the beam can be mistaken for a lunar white beam. The reflected rays may also cause a signal which is unilluminated to appear to be a yellow signal regardless of the color of the beam which is emitted by the signal when the signal is illuminated.

Referring now to Fig. 2, the structure of the signal is the same as that shown in Fig. 1, except as to the light spreading screen which is here designated S^a. This screen is plane instead of curved as in Fig. 1, and is inclined from the vertical with its lower edge closer to the light projecting means than its upper edge. When the rays from the sun strike the signal along line A—B, which is at an angle X above the horizontal, (this angle being the same as angle X in Fig. 1), the reflected ray C—B will emerge at a considerable angle below the horizontal axis of the signal. Even with the angle X zero, that is, with the sun shining directly into the signal on the horizontal axis, the reflected light from the front surface of the screen S^a will return at an angle below the horizontal equal to twice the angle of inclination of the screen from the vertical. Since the sun can never be below horizontal, the reflected light can never be parallel with the beam projected by the signal, and so the reflected light can never cause fading of the indication given by the signal or cause the signal to appear to be illuminated when it is unilluminated.

One advantage of a light signal embodying my invention is that the angle of inclination of the screen necessary to effectively prevent improper signal indications due to the sun's rays which impinge upon the signal being reflected back into the beam emitted by the signal is not great enough to cause any substantial amount of light from the source to be reflected or refracted by the screen, whereby the efficiency of the signal is not materially decreased by the presence of the screen.

Although I have herein shown and described only one form of signal embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claim without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. A light signal comprising a source of light, means for projecting from said source a beam of substantially parallel rays in a substantially horizontal direction, a screen of transparent material located in said beam and inclined from the vertical with its lower edge closer to the light projecting means than its upper edge, said screen being of such size that all of the light emerging from said signal will pass through said screen and being provided with a plane outer surface and being inclined from the vertical at such an angle that the sun's rays impinging on said screen at angles approaching the horizontal will be reflected downwardly out of said beam, and shielding means between said source and said screen for preventing external light from entering the signal between said source and said screen.

2. A light signal comprising a source of light, means for projecting from said source a beam of substantially parallel rays in a substantially horizontal direction, a glass screen located in said beam and inclined from the vertical with its lower edge closer to the light projecting means than its upper edge and having a smooth plane outer surface and being provided on the side nearest the source with light dispersing means, said screen being of such size that all of the light emerging from said signal will pass through said screen and being inclined from the vertical at such an angle that the sun's rays impinging on said screen at angles approaching the horizontal will be reflected downwardly out of said beam, and shielding means between said source and said screen for preventing external light from entering the signal between said source and said screen.

3. A signal for use on a railway curve comprising a source of light, means for projecting from said source a beam of substantially parallel rays in a substantially horizontal direction, a plane screen of transparent material located in said beam and inclined from the vertical with its lower edge closer to the light projecting means than its upper edge and provided with means for spreading the light from said beam in planes parallel to the axis of said beam and intercepting the screen in substantially horizontal lines in a manner to render the signal visible from all points on the curve, said screen being of such size that all of the light emerging from said signal will pass through said screen and being inclined from the vertical at such an angle that the sun's rays impinging on said screen at angles approaching the horizontal will be reflected downwardly out of said beam, and shielding means between said source and said screen for preventing external light from entering the signal between said source and said screen.

4. A color light signal comprising a source of light, means for projecting from said source a colored beam of substantially parallel rays in a substantially horizontal direction, a plane screen of transparent material located in said beam and inclined from the vertical with its lower edge closer to the light projecting means than its upper edge, said screen being of such size that all of the light emerging from said signal will pass through said screen and being inclined from the vertical at such an angle that the sun's rays impinging on said screen at angles approaching the horizontal will be reflected downwardly out of the beam emitted by the signal in a manner to prevent the reflected rays from fading out the color of the signal, and shielding means extending between said source and said screen for preventing external light from entering said signal between said source and said screen.

WESLEY B. WELLS.