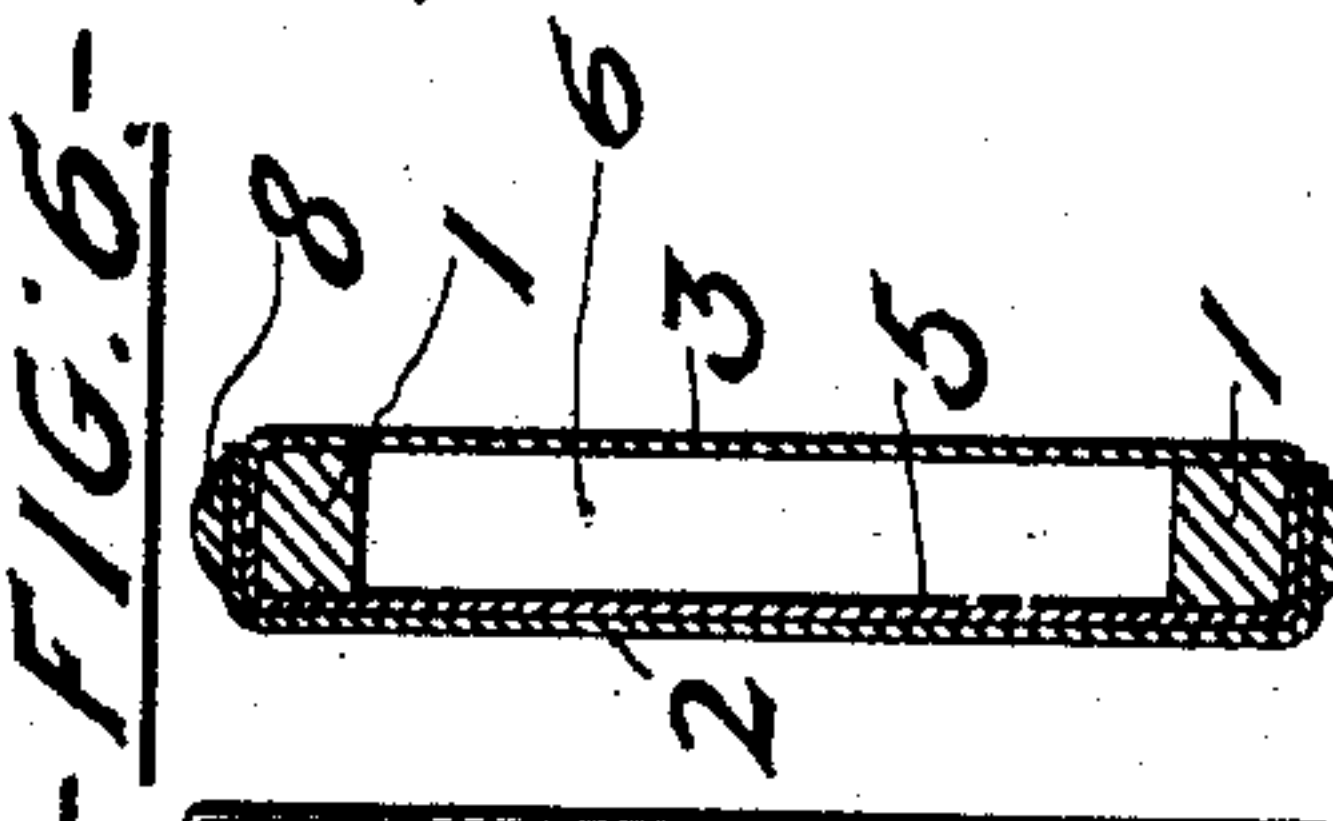
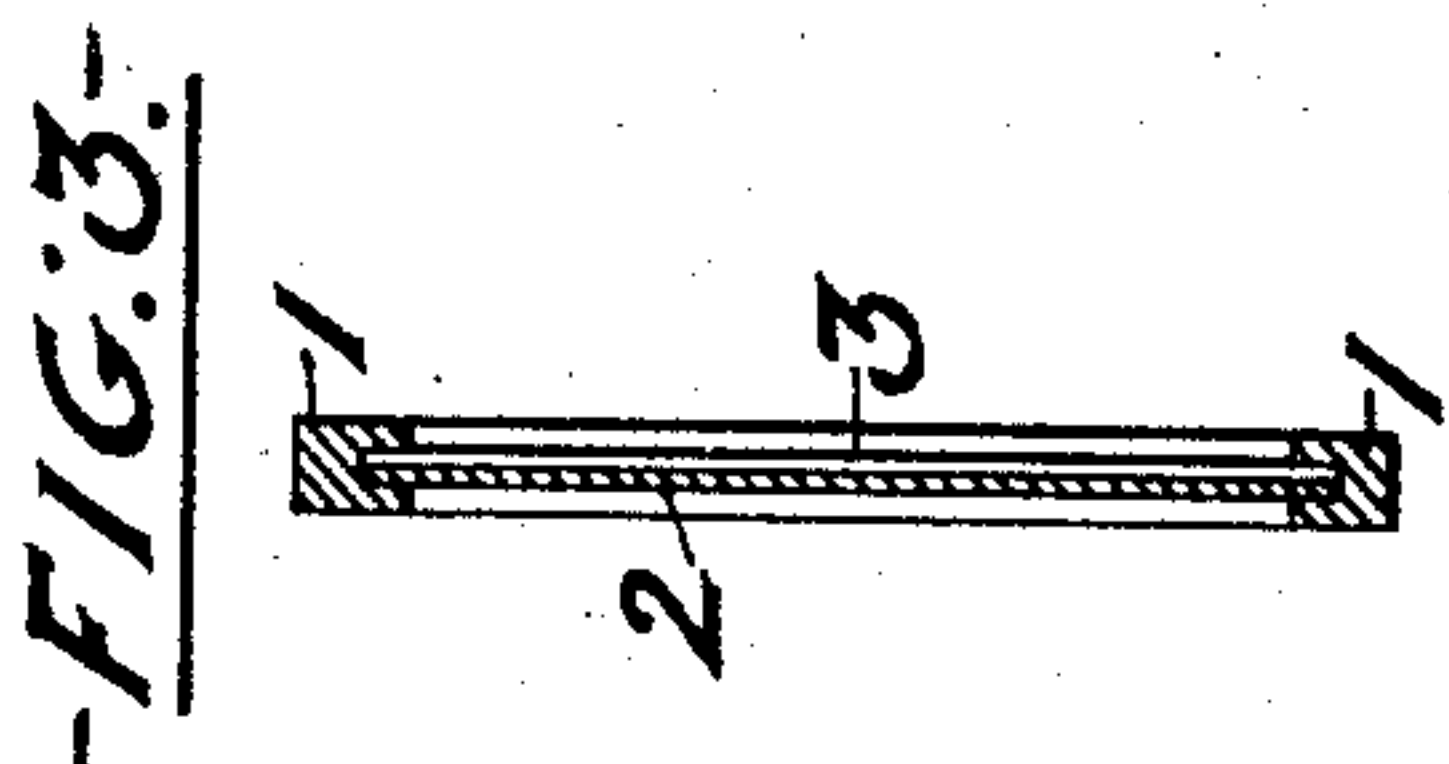
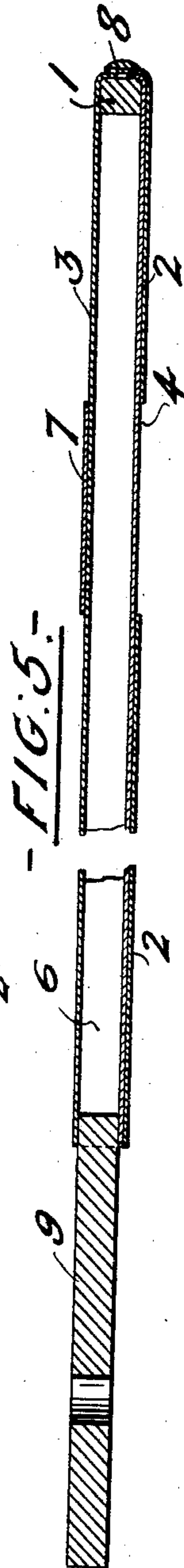
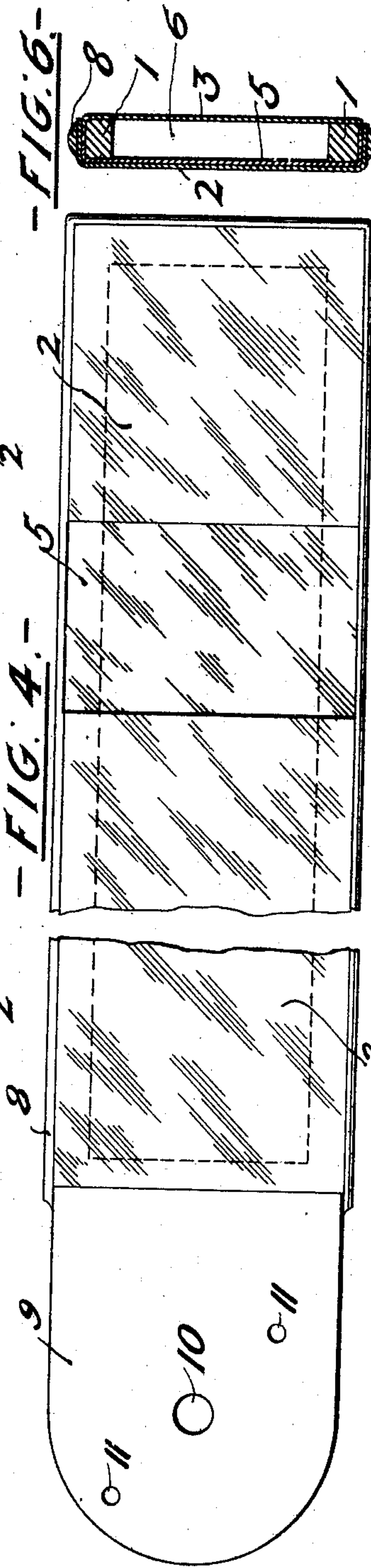
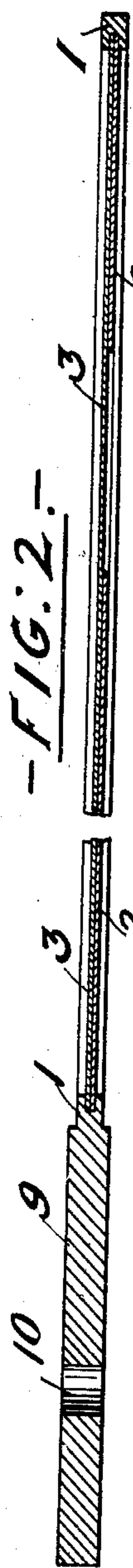
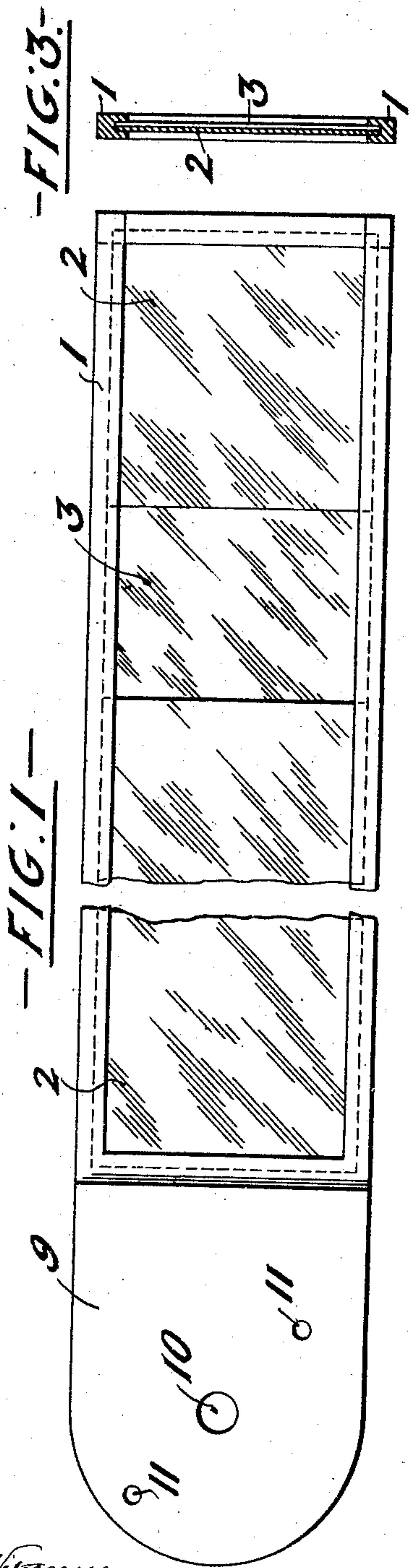


No. 859,639.

PATENTED JULY 9, 1907.

W. BLEAKLEY.  
SEMAPHORE SIGNAL USED ON RAILWAYS.  
APPLICATION FILED MAY 8, 1907.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## SEMAPHORE-SIGNAL USED ON RAILWAYS.

No. 859,639.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed May 6, 1907. Serial No. 371,957.

*To all whom it may concern:*

Be it known that I, WILLIAM BLEAKLEY, a subject of the King of Great Britain, residing at Leeds, in the county of York, England, have invented certain new and useful Improvements in Semaphore-Signals Used on Railways, and of which the following is a specification.

In semaphore signals used on railways, the signal-arms are counterweighted so that they naturally stand horizontal at "danger", and to show a "clear" road the signalman has to pull them down. The side of a signal-arm next to an approaching train to which it refers, is colored red and usually with a white patch thereon, while the other side is white and usually with a black patch thereon; and colored glasses, termed the "spectacles", are fastened to the signal-arm and move in front of a lamp, showing at night either a red or green light according as the arm is at "danger" or "clear". These signal-arms have hitherto been commonly made either of metal or wood, coated with paint of the distinguishing colors; but it is found in practice that these painted signal-arms, by reason of exposure, soon become obscured and coated with dirt, with the result that additional coats of paint must at frequent intervals be applied to the said signal-arms; otherwise they become unsatisfactory in use, while the cost incurred by the frequent re-painting is very considerable.

There are two reasons why the ordinary painted surface of the signal suffers from the disadvantages stated above; the first is that ordinary paint, when applied to wood or iron such as signal-arms are usually composed of, presents a surface to which soot and other impurities contained in the atmosphere very readily adhere, and the second and most important reason is that the rays of light for illuminating the face of the signal so as to make it visible, are received only from that side of the signal which is presented to the engine driver, and the said rays of light, so directed upon that one side, illuminate most prominently the soot or other foreign matter which so readily collects on the surface of the signal.

Now the object of the present invention is to construct a signal-arm which does not require to be painted, and which will give a perfectly clear signal to the eye of the observer at all times, and this result is attained by forming the surface of the signal of materials to which soot etc., does not readily adhere, and from which it is easily washed or blown off, and which transmit light in such a manner that the said signal-arm receives the greater part of its light from the opposite side to that from which it is viewed, the light rays passing through the signal-arm and illuminating the same from behind what little foreign matter, if any, may be adherent thereto, and thereby minimizing the detrimental effect of such foreign matter and showing the colors clearly.

With these objects in view, and in order to attain the desired ends, I construct a signal-arm composed of an open frame carrying or supporting a diaphragm made of a sheet or sheets of xylonite or celluloid, which diaphragm is adapted to permit the penetration of the light rays from the side opposite to that on which it may be viewed, and presenting a surface or surfaces to which soot or other foreign matter is not readily adherent.

The diaphragm is preferably composed of two adjacent sheets of xylonite or celluloid, one sheet being white and translucent, and the other sheet red and transparent, and portions of either sheet may be cut away so as to expose to view portions of the other sheet, and such cut-away portions of the colored sheet may represent the usual white patch and any distinguishing letters or numbers required to be exhibited; or a composite sheet may be made of colored and uncolored xylonite or celluloid and used to form such arms, portions being cut away from either side to form the desired openings. The signal-arm—which may be of the usual shape and which may carry the "spectacle"—is pivoted and operated in like manner to that of the ordinary signal-arm.

In order that the invention may be readily understood, I will describe the same with reference to the examples of construction shown in the accompanying drawings, whereon:—

Figure 1 is an elevation; Fig. 2 is a sectional plan, and Fig. 3 a transverse section, of one construction, and Figs. 4, 5 and 6 are similar views of a second construction.

Referring to Figs. 1, 2 and 3; the arm is composed of a skeleton frame 1 grooved to receive two adjacent sheets of xylonite or celluloid, one of which 2 is represented as being red in color and is transparent, while the other sheet 3 is white and translucent, and the transparent sheet 2 may be cut away as indicated at 4 (Figs. 1 and 2) to expose to view a portion or portions of the white translucent sheet, and similarly a portion of the white sheet might be cut away to show the red sheet.

In Figs. 1, 2 and 3 the two sheets composing the diaphragm of the arm are shown with their surfaces adjacent to one another, but obviously as in Figs. 4, 5 and 6, the said sheets may be placed so that their surfaces are separated one from another by any desired or convenient space, and should it be considered that the white translucent sheet 3 (Fig. 6) becomes too strongly tinted with a reddish shade obtained from the transparent sheet 2, the construction shown particularly at Figs. 5 and 6 may be adopted, that is, an additional white translucent sheet 5 may be fitted immediately at the back of the red transparent sheet 2, and the white translucent sheet 3 is separated from the sheet or sheets upon the opposite side of the frame by the space 6.



The red transparent sheet 2 as at Fig. 5 may be cut away to leave a space 4 exhibiting the white translucent portion of the sheet 5, and, if so desired, a black xylonite strip may be affixed at 7 (Fig. 5) to the sheet 3.

5 The framework 1 in the example shown at Figs. 4, 5 and 6, is covered by the xylonite or celluloid sheets which overlap the outer edges and are bound there-onto by a strip such as 8.

10 In employing the signal-arm, the examples of construction of which have now been described, it will be found that in the day time the light rays passing from the opposite side to which the signal may be observed, will cause the said arm to be practically illuminated, and thereby give a clear and distinct optical signal, while at night the usual lamp in connection with the spectacle, or a separate lamp, may be caused to throw its light, or a portion thereof, onto the back of the signal-arm to illuminate the same, and thus form an efficient signal at night as well as during  
20 the day time, and it will be realized that signal-arms, so constructed, will require practically no attention to keep them clean, and the continual expense hitherto connected with the proper maintenance of the ordinary painted opaque signal-arms is entirely ob-  
25 viated.

The frames 1 will obviously be constructed with conveniences by which they can be fixed to the operating members by which they are moved, and thus for instance as shown in the drawings each frame 1 is  
30 formed with an extending tongue 9 at one end, which may be formed with a hole 10 to receive a rock shaft (not shown) and with screw holes 11 by which the tongue may be fixed to a disk or the like upon the said rock shaft.

35 What I claim as my invention and desire to secure by patent is:—

40 1. An arm for a semaphoric railway signal; consisting of an open skeleton frame and a diaphragm carried and surrounded by said frame, said diaphragm consisting of a sheet of colored transparent celluloid, and a sheet of

white translucent celluloid, said sheets having their surfaces adjacent and parallel to each other, substantially as set forth.

2. In an arm for a semaphoric railway signal; the combination with an open skeleton frame and a diaphragm 45 carried and surrounded by said frame, said diaphragm consisting of a sheet of colored transparent celluloid and a sheet of white translucent celluloid, said sheets having their surfaces adjacent and parallel to each other; of means for fixing the edges of said celluloid sheets in said frame, and a tongue extending from said frame for carrying the latter, substantially as set forth.

3. In an arm for a semaphoric railway signal; the combination with an open skeleton frame, and a tongue extending from said frame for carrying the latter; of a sheet 55 of white translucent celluloid, means for fixing the edges of said sheet in said frame, a sheet of colored transparent celluloid arranged with its surface adjacent and parallel to the said white translucent sheet, and means for fixing the edges of the colored celluloid sheet in said frame, substantially as set forth.

4. In an arm for a semaphoric railway signal; the combination with an open skeleton frame, and a tongue extending from the said frame for carrying the latter; of a sheet of white translucent celluloid, and means for fixing 65 the edges of said sheet in said frame, a sheet of colored transparent celluloid having an aperture therein, and means for fixing the edges of said colored celluloid sheet in said frame with its surface adjacent and parallel to the white translucent sheet, so that a portion of the latter is visible through the aperture in the colored transparent sheet, substantially as set forth.

5. In an arm for a semaphoric railway signal; the combination with an open skeleton frame, and a tongue extending from said frame for carrying the latter; of a sheet 75 of white translucent celluloid arranged in surface contact with one side of said frame and with its edges overlapping the exterior edges of said frame, a sheet of transparent colored celluloid in surface contact with the opposite face of said frame and with its edges overlapping the exterior edges of said frame and the edges of the said white translucent sheet, and a strip fixed to said frame and overlying the overlapping edges of said celluloid sheets to secure the same to said frame, substantially as set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses. 85

WILLIAM BLEAKLEY.

Witnesses:

JOHN JOWETT,

VANCE E. GALLOWAY.