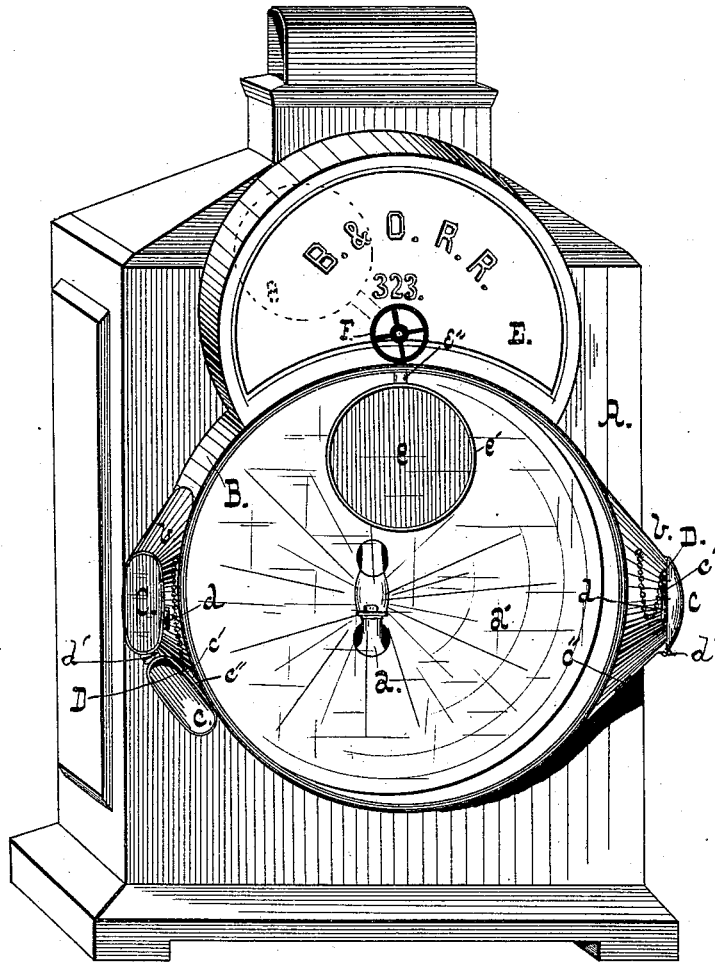


M. NICHOLSON.  
Signal Head-Lights.

No. 215,656.

Patented May 20, 1879.



Witnesses,

W. A. Bertram  
L. H. Barclay.

Inventor

M. NICHOLSON.

by

R. A. Williams.

Attorney.

# UNITED STATES PATENT OFFICE.

MICHAEL NICHOLSON, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN SIGNAL HEAD-LIGHTS.

Specification forming part of Letters Patent No. **215,656**, dated May 20, 1879; application filed March 28, 1879.

### *To all whom it may concern:*

Be it known that I, MICHAEL NICHOLSON, of Baltimore city, State of Maryland, have invented certain new and useful Improvements in Signal Head-Lights; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawing, in which the said device is illustrated in perspective.

My invention has reference to signal-lights in general, and to locomotive head-lights in particular; and it consists in a signal head-light constructed as hereinafter described, and possessing points of novelty indicated in the claims.

It is customary on railroads to require a colored signal (generally a red light by night and red flag by day) to be displayed on every engine of a convoy of trains except the last, the object being to indicate that another train is immediately following any one which shows the red signal. Prior to the introduction of signal head-lights embodying my invention, each engine was provided with one or more red lanterns in addition to the ordinary head-light, involving a considerable outlay to provide the lanterns and keep them filled and in repair.

I have devised a head-light designed to show colored front and side lights when occasion requires, and admitting of their being readily and expeditiously concealed when desired.

In the accompanying drawing, A is the body of an ordinary locomotive head-light, provided with the usual parabolic reflector *a'*, cowl, and lamp *a*, the latter being so situated that its flame is at or near the focus of the parabola. The opening inclosed by the front projecting rim, B, is glazed over, as usual. At either side of the rim B a lenticular pane or bull's-eye, C, of colored glass, is inserted in a projection, *b*, and is inclined at about an angle of thirty degrees to the axis of the parabolic reflector. These panes or lenses constitute the side lights, and are so situated as to receive the direct rays from the lamp, and not depend for their illumination upon the diffused light within the casing A.

A cover, *c*, is hinged at *d'* to the projection *b* at either side, as shown, being adapted to be swung up and completely cover the side light when desired. The covers are provided

at their sides with thimbles *c'*, which register with similar thimbles, *d* and *c''*, when the covers are, respectively, swung up in front of the side lights or lowered, in either of which positions they are secured by means of pins D, which pass through the thimbles, and are preferably attached to the projection *b* by light chains. Above the front rim of the head-light is a casing, E, which contains the front signal-pane, *e*, inclosed in a frame, *e'*, and mounted in the casing E upon an axis, from which it depends upon an arm, *e''*, and upon which it is adapted to be rotated by means of a hand-wheel, F, upon the outside of the casing. This pane is, preferably, circular in shape, and is of a size to reach, when swung down in front, not quite to the axis of the parabolic mirror or reflector. When it is desired to conceal the front signal the pane is rotated within the casing to the point shown in dotted lines. The front rim, B, not being cut away on that side of the pane, the latter cannot fall in front of the light and become accidentally exposed. In a word, it is held by gravity in its position, whether displayed or concealed.

Important results are secured by the peculiar arrangement of the front signal-pane, *e*. Occupying as it does a position above the axis of the parabolic reflector, it intercepts but a small portion of the reflected rays, and in no material degree diminishes the illumination of the track or tracks by the white light of the lantern. The head-light is unimpaired in the exercise of its ordinary functions, while adding thereto the effects of front and side signals, either or both.

It is obvious that by a rod or rods extending back and appropriately geared to the front signal and the covers of the side signals they might be operated from the cab. Such complications of the device would, however, be liable to get out of order, and, as the signal never requires to be changed while the train is in motion or between stations, would be of little advantage or convenience.

The signal-light is eminently adapted for use on shipboard. Ships under way are required by law to show a green light on the starboard side and a red one on the port, and while at anchor are required to show a single light, which is generally run up to the head of the foremast, or

just under the foreyard. It is common, however, on vessels even at anchor, to burn the usual port and starboard lights in addition to the white light, as a guide for shore-craft in coming alongside. These lanterns are of large size, and burn a considerable quantity of oil, two-thirds of which may be saved by use of the head-light just described. For use in this connection, of course a green pane or lens is inserted in the right side of the casing, and a red one on the left.

As the lenses are inclined at an angle of about thirty degrees to the side of the casing A, the side lights are visible on either side from a point dead ahead to one about five points aft the beam, a range equal to that of the ordinary side lights. The pane *c*, being located behind the front pane of the head-light, is not liable to become dimmed by rain or snow, as would be the case were it outside.

By displaying the front signal in combination with either or both side signals according to a predetermined code, the lights, when used on a locomotive, may be made to indicate the position of a train in a convoy.

In an application of even date herewith I have laid broad claim to a signal head-light

having its front rim provided with concealable side lights, with or without a colored front signal, and therefore claim here as follows:

1. A signal head-light having a circular colored signal-pane behind its front transparent pane, pivoted in a casing, E, surmounting the front flange, the said signal-pane occupying, when displayed, a position above the center of the latter, as set forth.

2. A signal head-light having a colored signal-pane, pivoted as described, and adapted to be swung in front of the lantern or away from its face, as may be desired, the said pane resting upon a suitable stop, and being held by gravity in its adjusted position, as described.

3. In a signal head-light, side lights or signals having pivoted covers provided with thimbles adapted to register with thimbles at the sides of the panes and on the casing, and having pins for securing the covers in either of the positions they are designed to occupy, as set forth.

MICHAEL NICHOLSON.

Witnesses:

R. D. WILLIAMS,  
J. C. GITTINGER.