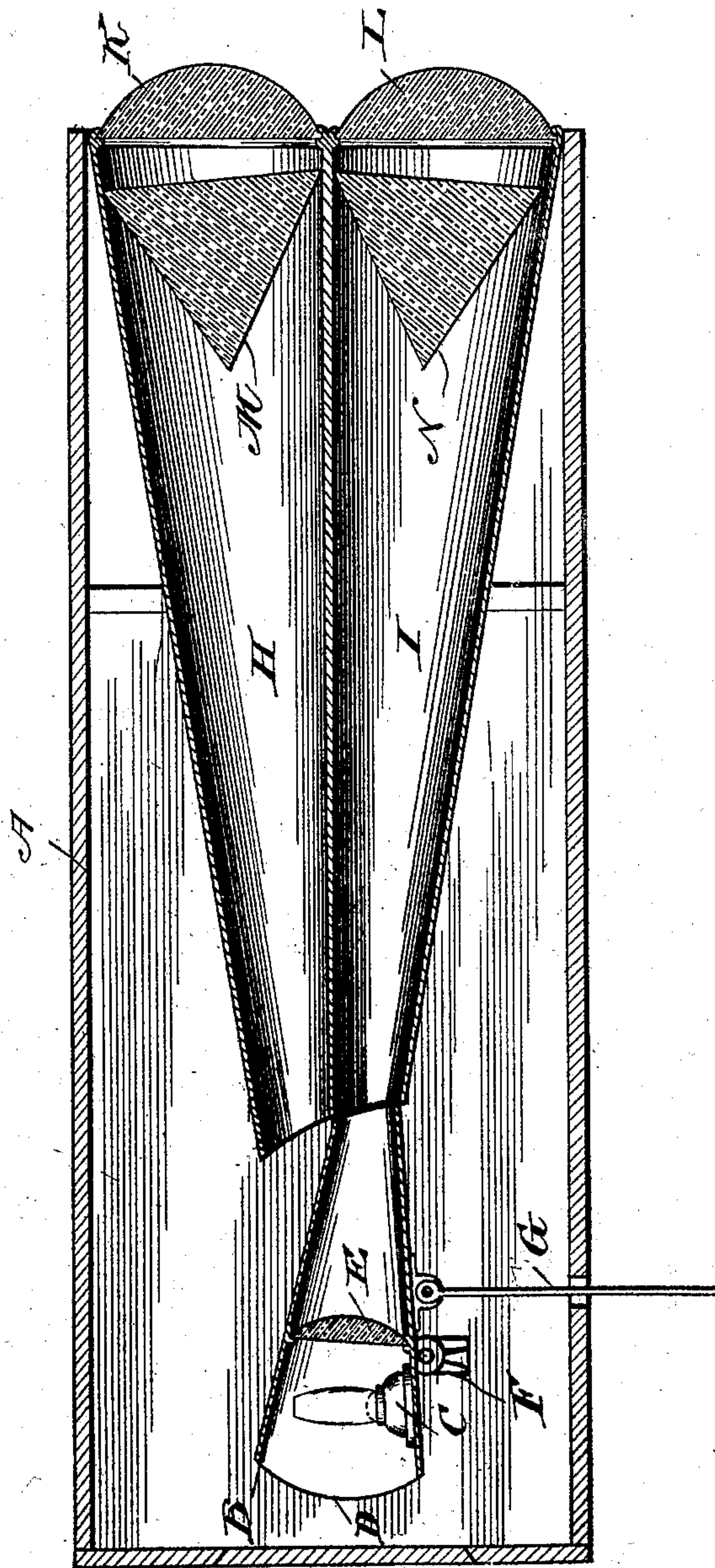


(No Model.)

W. H. HALL.
SIGNALING APPARATUS.

No. 505,102.

Patented Sept. 19, 1893.



Witnesses;

J. E. Mann.
J. C. Goodwin

Inventor,

William H. Hall
By Alfred Fowler & Luthman
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM H. HALL, OF CHICAGO, ILLINOIS.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 505,102, dated September 19, 1893.

Application filed January 3, 1893. Serial No. 457,050. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HALL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Signaling Apparatus, of which the following is a specification.

This invention relates to means for producing different colored lights of large area and great intensity by the use of a single lamp or illuminating device, and is particularly adapted for railway signals.

In the construction of devices for railway signals it is essential that the rays of light should be cast in a plane parallel to the railway track or other structure with which the signal is employed.

I have provided a device wherein a single lamp or illuminating means is combined with lenses in such manner that the light is greatly intensified, magnified or increased in illuminating power and the rays of light pass from the device horizontally or parallel to the surface of the earth.

In carrying out my invention I employ a lamp or other suitable illuminating device which is arranged within a tubular case preferably in the form of the frustum of a cone, which is pivoted or hinged so that its end may be moved to register with two or more tubes or cylinders, having arranged therein at their outer ends large disks, said disks being of different colors.

A magnifying lens is placed in the lamp tube, preferably near the flame and the light is thus intensified or magnified many fold.

Prisms are placed within the tubes or cylinders containing the disks on which the rays of light issuing from the lens in the lamp tube are thrown, said prisms being so ground and set at such angle as to correct the refracted rays of light and cause them to issue through the colored disks in the ends of the tubes parallel to the earth's surface.

I preferably arrange the pivot of the lamp tube in the vertical plane of the lamp, the tube being of such length and so mounted that but a short range of movement is necessary to bring it to register with either of the larger tubes containing the colored disks and prisms. The tubes containing the prisms and

colored disks are preferably made of frusto-conical form, the smaller ends being placed opposite the open end of the lamp case.

The lamp case is practically balanced on its pivot and the application of slight force will be sufficient to move it so as to cause its small end to register with either of the stationary tubes. The range of movement being short and the motive force necessary being slight, the apparatus is particularly adapted to be operated electrically with a small battery and short armature movement or by a short electrical contact such as would be given by a passing train running at a high rate of speed where but one contact is possible, these capabilities being of the utmost importance in the operation of railway signals.

The accompanying drawing is a sectional elevation through the signal case, tubes, lenses, reflector, colored disks, and prisms, the lamp and a part of the operating rod being shown in elevation, the latter broken away.

In the drawing A represents a suitable housing in which the device is mounted.

B represents the lamp tube which is in form the frustum of a cone, the lamp C being placed near the larger end thereof which is closed by a reflector D. Immediately in front of the lamp and at right angles thereto is arranged a refracting lens E. The tube B is pivotally mounted, its pivot being so arranged that the tube and the parts carried therein are balanced on the pivot so that but slight motive force is necessary to rock the tube upon its pivot. As shown the pivot pin is supported by the bracket F.

G is an operating rod which may be moved by any suitable force either mechanical, electrical or pneumatic.

H and I represent respectively two tubes each of which is in form the frustum of a cone and arranged radially with reference to the pivot of the tube B which contains the lamp. In their outer ends are placed the disks K and L, which are of different colors. Immediately behind said disks are arranged the prisms M and N. The smaller ends of the larger tubes containing the colored disks are formed in the arc of a circle so that the movable tube B may be brought to register with

either of them without permitting any opening through which the rays of light may escape.

The operation of the device is as follows:—

5 The rays of light from the lamp pass through the refracting lens and are greatly magnified thereby and the intensified light is directed into the tube containing the prism and colored disk with which the lamp tube then registers. The rays of light thus thrown into this
10 tube are first straightened by the prism and then pass through the colored disk in a plane parallel with the bottom wall of the case which will usually be arranged parallel with the
15 earth's surface. Where more than two colors are desired other tubes may be mounted in the same manner and yet be within practical range of the lamp tube which can be so mounted upon its pivot as to be brought to register
20 with additional tubes without interfering with the lamp or illuminating device. By mounting the lamp on the bottom of the movable tube instead of mounting it upon an independent base it will always maintain the
25 same relative position to the reflector, lens and prisms; and by arranging the pivot immediately beneath the lamp thus mounted on the bottom of the tube, the movement which the lamp itself will make, when the tube is
30 brought to register with the different stationary tubes, is so slight as not to interfere with it in any manner, no matter how quick the movement of the tube may be made.

By means of the apparatus above described
35 a single lamp or other illuminating agent of small candle power may be made efficient to produce various colored lights of large area and great intensity by moving the lamp case a short distance only.

40 I claim—

1. In an apparatus for casting different colored lights, the combination with a pivoted case, a lamp or other suitable illuminating agent mounted within the case, a lens arranged within the lamp case in front of the
45 lamp and a plurality of stationary cases hav-

ing their open ends within the range of movement of the lamp case, colored disks mounted in said cases and prisms also arranged in said cases for straightening the rays of light, substantially as described. 50

2. In a signal apparatus, the combination with a lamp case having its pivot arranged below the lamp, a reflector arranged behind the lamp, a lens arranged within the lamp case in front of the lamp, a plurality of stationary cases each containing at its front end a disk, the respective disks being of different colors, and the rear ends of said disk cases being within the range of movement of the
60 lamp case, and prisms arranged within the disk cases for straightening the rays of light, substantially as described.

3. In a signal apparatus the combination with a lamp case having converging walls, a
65 reflector, a lamp and a lens mounted within said case and the latter being so pivoted as to balance upon its pivot, and a plurality of stationary cases having converging walls and each containing a disk and a prism, the small
70 end of the lamp case being adapted when the latter is moved on its pivot to be brought to register with the small end of either of the stationary cases, substantially as described.

4. In a signaling apparatus the combination with a lamp case having a lamp, a reflector and a lens mounted therein, said case being pivoted and an operating rod pivotally connected to the lamp case whereby the case, lamp, reflector and lens may be moved in
80 unison, and a plurality of stationary cases each containing a disk and a prism and having open ends within the range of the movement of the lamp case whereby the rays of light may be directed through either of said
85 stationary cases at will, substantially as described.

WILLIAM H. HALL.

Witnesses:

C. C. LINTHICUM,
FREDERICK C. GOODWIN.