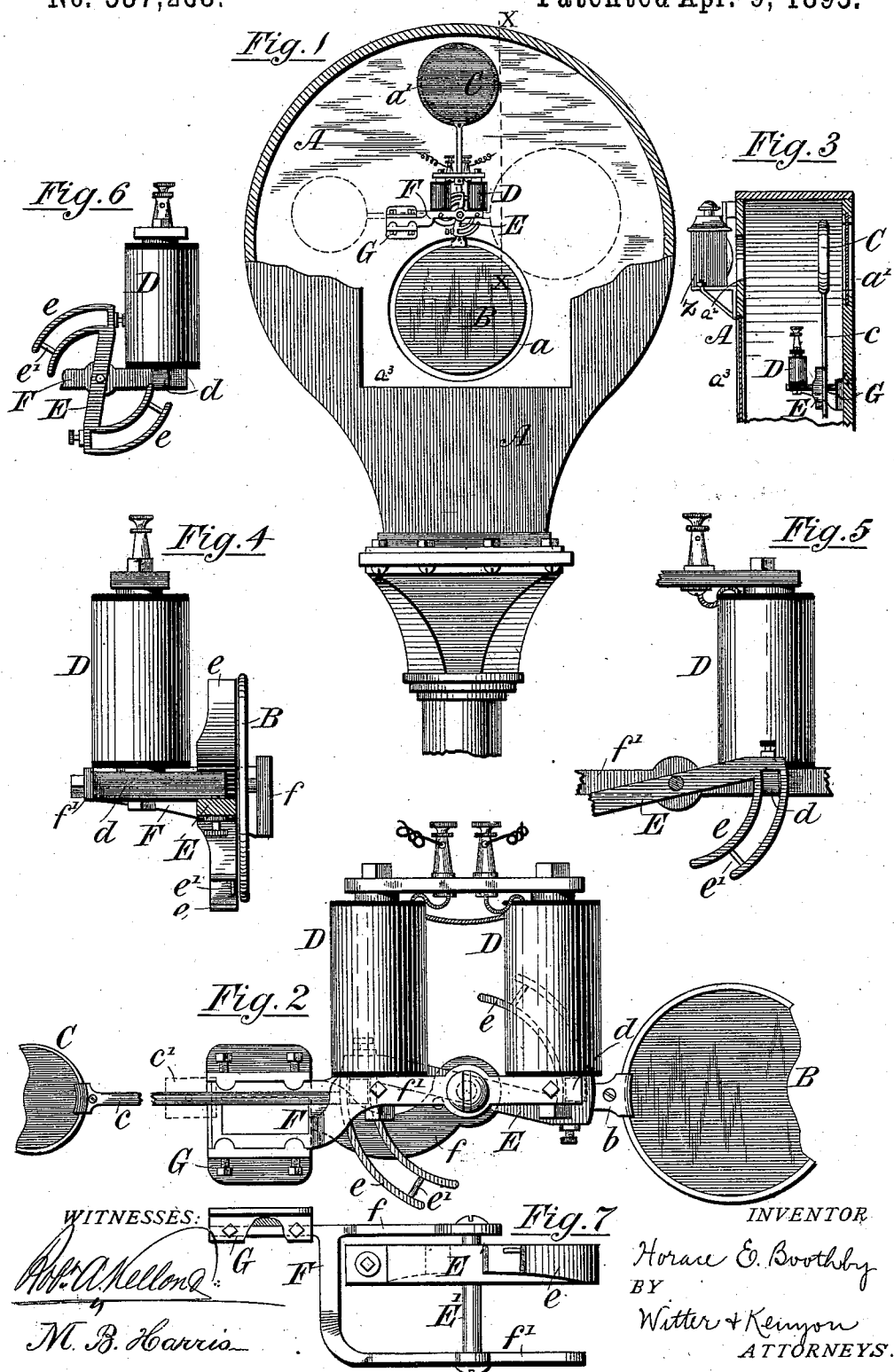


(No Model.)

H. E. BOOTHBY.
RAILWAY SIGNAL.

No. 537,268.

Patented Apr. 9, 1895.



UNITED STATES PATENT OFFICE.

HORACE E. BOOTHBY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE HALL
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RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 537,268, dated April 9, 1895.

Application filed November 30, 1892. Serial No. 453,603. (No model.)

To all whom it may concern:

Be it known that I, HORACE E. BOOTHBY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

My invention relates to railway visual signals and it has for its object to provide an inclosed signal whose indications will be distinctly visible by day and night and whose operation may be effected electrically and automatically if desired.

The invention consists of the construction hereinafter set forth.

In the drawings, in which like letters designate similar parts throughout the several views, Figure 1 is a rear elevation, partly in section, of a signal embodying my invention. Fig. 2 is an enlarged rear elevation of the signal disks and their operating mechanism. Fig. 3 is a transverse section of the upper part of the case on line *xx*, Fig. 1. Fig. 4 is an end view of Fig. 2 with the armature partly in section. Fig. 5 is a front view of part of Fig. 2, showing one helix of the electro-magnet, its core extension, and part of the armature in engagement therewith. Fig. 6 is a detail (to reduce scale) showing armature in position with magnet demagnetized. Fig. 7 is a plan view of armature and supporting bracket.

A is a casing, provided in front and rear with large registering apertures *a* and *a*³, and also with smaller registering apertures *a'* and *a'*², in front and rear, all of which, as shown, may be covered with plates of glass. Within the casing are the signal disks B and C, fixed upon an armature E, turning upon an axis E' and controlled by the motor D. The disk B is the day signal disk and moves in and out of register with the apertures *a*, *a*³ and the disk C is the night signal disk and moves in and out of register with the apertures *a'*, *a'*². If it is intended that these disks shall indicate danger when registering with their apertures they will be suitably colored, as for example red, the day disk being in this case preferably opaque or semi-opaque, so as to reflect sunlight and the night disk being pref-

erably translucent so as to transmit and color a beam of light from a lantern Z, arranged behind the aperture *a'* and preferably fixed upon the back of the casing and in line with both apertures *a'*, *a'*², as shown in the drawings. These disks might however be arranged so that both or either will give a danger or safety indication as desired, when registering with their respective apertures, and although I have shown them as concurrently appearing at their apertures, they might be arranged to appear dis-simultaneously. In this latter case the appearance of one disk would indicate danger and the appearance of the other would cause a safety indication, by obscuring a red lantern for example.

In the usual form of the signal the disks are both danger disks, and register concurrently at their respective apertures, as shown in the drawings, and they are preferably so arranged that when left to the action of gravity they will register with their apertures, being moved out of register by the energization of the actuating mechanism, but this arrangement is not always essential.

The actuating mechanism is preferably constructed as follows: The poles *d* of the electro-magnets D D, are prolonged laterally as shown particularly in Figs. 4 and 5, so as to be embraced by wings *e e*, curved upon the arc of a circle from the same radius but in opposite directions, and extending from the ends of a bar of soft iron forming the body of the armature E, which is pivoted centrally (slightly below the electro-magnets) between the arms *f f*, of a bracket F, which is carried by and adapted to be adjusted lengthwise in a grooved bracket G, fastened to the inner face of the front board of the case A. The pivot E' of the armature is preferably of trunnion form, secured by screws, as seen in Fig. 7. The wings *e e* of the armature are each made up of two curved plates or arms placed a sufficient distance apart to enable them to straddle or embrace the prolonged poles *d* of the magnets, so that while free to move thereupon, a full and efficient contact is made by the armature with said poles when the magnets are energized,—and one arm of each wing is preferably longer than its companion, so as to always maintain contact with or remain

in close proximity to the poles d when the electro-magnets are demagnetized, so as to be easily attracted when the circuit is made and thus economizing battery power in operating the signal. See particularly Fig. 6.

e' is a connecting pin or brace between the arms of each wing near their outer ends, set to one side as seen in Fig 4, so as to allow the armature to move past the poles to the full end of its throw.

The day signal disk B is connected closely by a short metal piece b to one end of the pivoted armature E, while to the opposite end of the armature is connected a rod c , to which may be adjustably secured a balancing-weight c' , as shown in dotted lines in Fig. 2, if found necessary,—and to the extremity of this rod is attached the night signal disk C, this arrangement insuring concurrent movement of both signals with the one armature.

By providing apertures in front and rear of the casing for the day disk the engineer is enabled, upon looking back after having passed a signal, to see that the signal gives the proper indication. Moreover these apertures will present normally, that is, when the disk B is out of register with them, a stationary disk which, if the plates of glass covering the apertures are both plain and transparent, will be white from the sunlight. This stationary disk will contrast strongly with the color of the casing and also with the disk B, and thus make the absence of the disk B from its apertures clearly distinct at a great distance from the signal, and at the same time will operate as a stationary signal disk arranged to be obscured by the disk B and to give a positive indication different from the disk B. In the case of the night signal the two apertures enable me to hang the lantern upon the back of the casing, thus avoiding the necessity of opening the casing to put the lantern inside, and thereby preventing probable disturbance of the signal mechanisms.

Various changes which will readily suggest themselves to any one skilled in the art may of course be made without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a railway signal, the combination of a casing having an aperture in the front for a night signal, and two registering apertures in front and back for a day signal arranged to present a stationary disk to give one positive character of indication, a day signal disk and a separate night signal disk arranged to move in and out of register with their apertures, the day signal disk operating when in register with its apertures to give one positive character of indication and obscure the disk which the apertures normally present, and when out of register with the apertures to

permit them to disclose their normal disk to give another positive character of indication, substantially as set forth.

2. In a railway signal, the combination of a casing having two registering apertures in front and back for a night signal, and two registering apertures in front and back for a day signal arranged to normally present a stationary disk to give one positive character of indication, a day signal disk and a separate night signal disk arranged to move in and out of register with their apertures, the day signal disk operating when in register with its apertures to give one positive character of indication and obscure the disk which the apertures normally present, and when out of register with the apertures to permit them to disclose their normal disk to give another positive character of indication, substantially as set forth.

3. In a railway signal, the combination of a casing having an aperture in the front for a night signal, and two registering apertures in front and back for a day signal arranged to present a stationary disk to give one positive character of indication, a day signal disk and a separate night signal disk fixed upon a pivoted arm provided with wing armatures and a magnet for operating the armatures so as to enable the signal disks to move in and out of register with their apertures, the day signal disk operating when in register with its apertures to give one positive character of indication and obscure the disk which the apertures normally present, and when out of register with the apertures to permit them to disclose their normal disk to give another positive character of indication, substantially as set forth.

4. In a railway signal, the combination of a casing having two registering apertures in front and back for a night signal, and two registering apertures in front and back for a day signal arranged to normally present a stationary disk to give one positive character of indication, a day signal disk and a separate night signal disk fixed upon a pivoted arm provided with wing armatures and a magnet for operating the armature so as to enable the signal disks to move in and out of register with their apertures, the day signal disk operating when in register with its apertures to give one positive character of indication and obscure the disk which the apertures normally present, and when out of register with the apertures to permit them to disclose their normal disk to give another positive character of indication, substantially as set forth.

HORACE E. BOOTHBY.

Witnesses:

HENRY D. WILLIAMS,
ROBT. A. KELLOND.