W. P. HALL.

SEMAPHORE.

APPLICATION FILED MAY 8, 1908.

Patented Dec. 15, 1908.

906,707.

Fig: 1

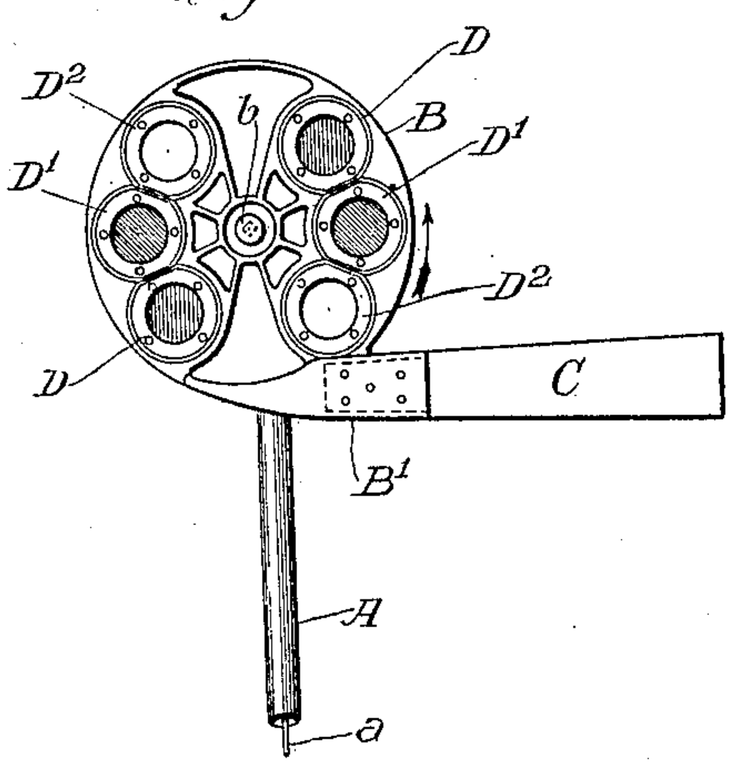


Fig: 2

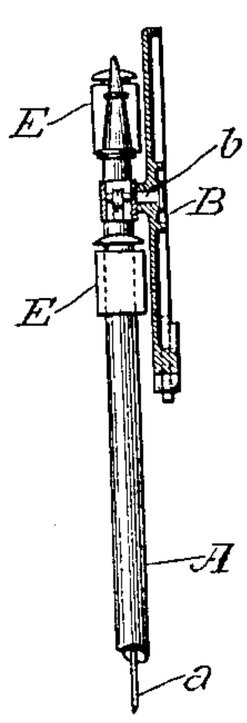


Fig: 3

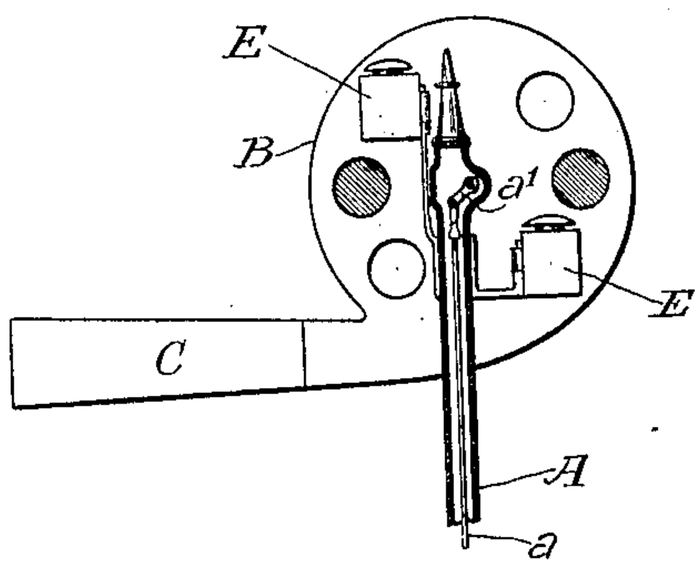


Fig: 4

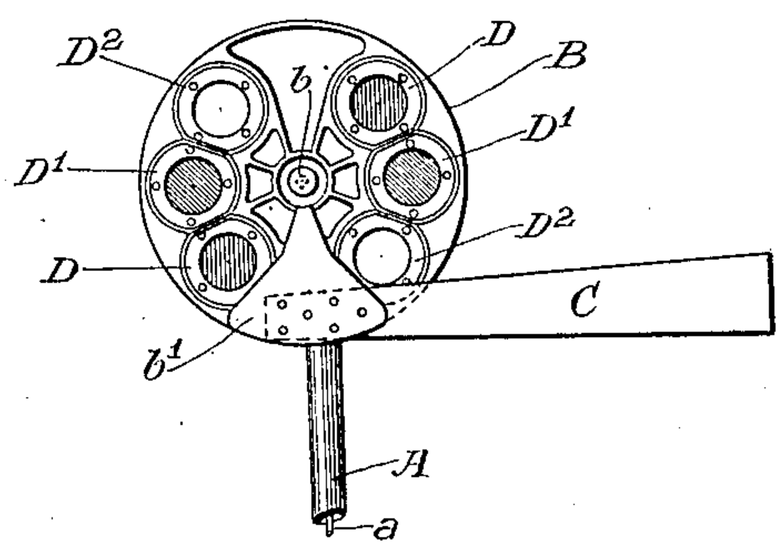


Fig: 5

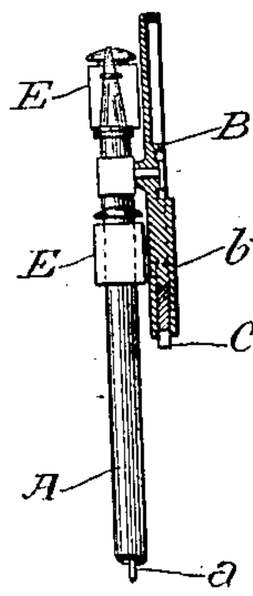


Fig: 6

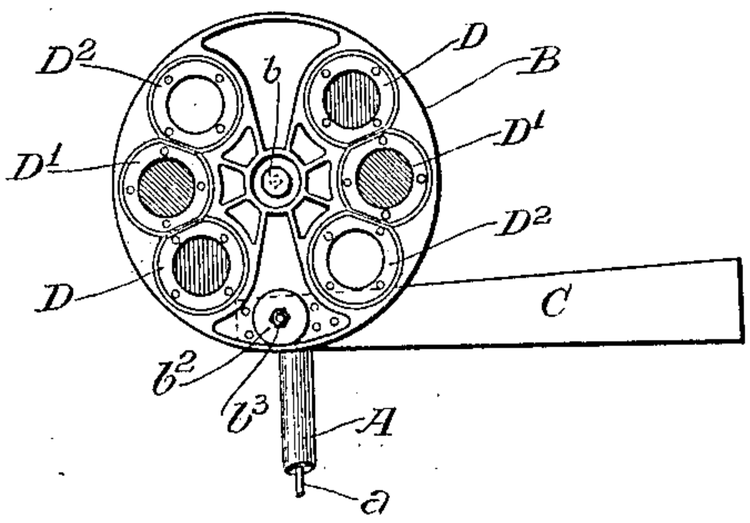
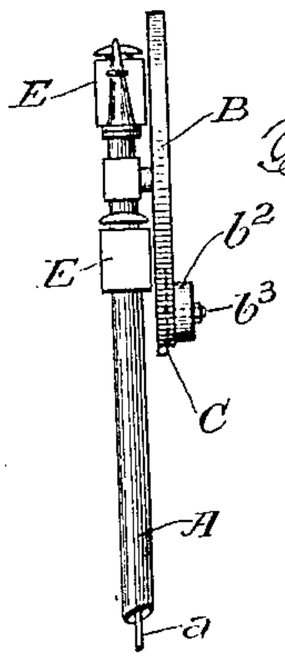


Fig: 7



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SEMAPHORE.

No. 906,707. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed May 8, 1908. Serial No. 431,547.

To all whom it may concern:

Be it known that I, WILLIAM PHILLIPS HALL, a citizen of the United States, and a resident of Greenwich, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Semaphores, of which the following is a specification.

My invention relates to improvements in semaphores or signals such as are ordinarily employed to control the operation of trains by the block system. In such systems it is important that any breakage or defect of any part of the signaling apparatus should cause the semaphore to move to the danger position and that any accumulation of snow, sleet or ice on the semaphore blade or casting should tend to place the signal at the danger position.

In United States Letters Patent No. 733,981, of July 21st 1903, issued to Loree and Patenall, there is shown, described and claimed a semaphore in which the blade moves downward from a vertical clear position to a horizontal danger position and may have an intermediate caution position in which the blade is inclined forty-five degrees upward from the horizontal. In this patent the semaphore casting is pivoted on one side of its center of gravity and the blade is so secured to the casting that the weight both of the blade and of the casting preponderates at all working positions of the semaphore on the same side of the pivot point to place the signal at danger position so that even if the blade be broken the casting moves to the danger position, while accumulations of sleet, ice or snow on the blade also coöperate to move the semaphore to the danger position.

My invention embodies certain features of improvement upon the device of said Loree and Patenall patent whereby I am enabled to use a plurality of lights for each position of the signal while still maintaining the advantageous features set forth in the Loree and Patenall patent. To this end I provide a semaphore spectacle and blade carrying casting that is substantially circular in form and which is preferably pivoted at its geometric center but which is dissymmetrically weighted whereby the center of gravity is brought to one side of the pivotal center of the casting. The blade is secured to the heavier half of the casting extending horizontally therefrom when the casting is at the danger position. The casting is provided with two groups of openings on opposite sides of a diameter of the casting, and a lamp is placed at each side of the vertical diameter of the casting and supported independently of the casting so that different colored glasses at each side of the casting will successively register with one of the lamps whereby at each position of the signal there will be two lights indicating the position. Preferably the heavier half of the casting is provided with a tangentially extending projection adapted to receive and carry the blade so that if the blade should become broken the casting will not only operate in the normal manner and give the proper signals at night, but will also give an indication by day.

I use the terms "casting" and "spectacle casting" to describe the metallic portions of the semaphore to which the blade is secured because these portions have ordinarily been cast and the term has become common in the signal art to designate the spectacle and blade carrier, whether it has been formed by casting or in any other manner.

I will now describe certain specific embodiments of my invention as illustrated in the drawings, and will thereafter point out my invention more particularly in the appended claims.

Referring to the accompanying drawings Figure 1 is a front view of a semaphore embodying the features of my invention; Fig. 2 is an end view, partly in section thereof; Fig. 3 is a rear view of the same embodiment; Fig. 4 is a front view and Fig. 5 is an end view, partly in section of a modified form of my invention. Figs. 6 and 7 are rear and end views of still another modification.

A in each case indicates the upper part of a semaphore support, such as a tubular post within which is the operating rod *a* connected to the pivot crank *a'* for operating the semaphore from its danger position to its caution and clear positions.

B is a semaphore casting which, however, as already indicated, may be cast, wrought or built-up in any manner. This casting is of substantially circular form, being pivoted at its geometric center *b* to the support. The semaphore is shown at the danger position, this being the position that it occupies when it is allowed to take a gravity position. In Fig. 1 the casting is shown at its

lower edge provided with a horizontally extending blade carrying projection B′ which is sufficiently heavy to over-balance the casting and bring it to or beyond the position shown when no opposing force is applied through the rod *a*. The blade is shown at C and extends out horizontally to indicate danger.

There are two groups of spectacle openings carried by the casting, each group having openings D, D′ D², the individual members of the group being preferably provided with glasses of different colors, except that the openings for a clear position need not be provided with glasses. As it is the established practice to move the blade 90° to change the indication from danger to safety, the openings D and D² are separated 90° so that with a 90° movement of the semaphore the opening D² will register with the lamps E carried by the semaphore support, whereas in the drawings the openings D indicating danger are registering with said lamps. Where it is desired to have an intermediate caution position it is customary to move the semaphore an angle of 45° from the danger position, and accordingly the opening D′ of each group is located midway the openings D and D² of that group. A 45° movement of the semaphore, therefore, will cause both openings D′ to register with the lamps.

In the present instance, when it is desired that a caution signal shall be displayed the rods *a* are pushed upward, either through manual means or by automatic devices, so as to cause the casting to revolve 45° from the position shown and in the direction of the arrow. If the clear position is to be shown the rod *a* is moved upward a sufficient distance to move the semaphore casting 90° in the direction of the arrow from the danger position shown. It will be noted that when the semaphore is either at the safety position with the blade projecting vertically and the spectacle openings D² registering with the lamps, or at the caution position with the blade inclined upwardly at an angle of 45° and the spectacle openings D′ registering with the lamps, the heavy side of the casting is at the right, while the entire weight of the blade is at the right, so that the weight of both the casting and the blade preponderates to move the signal to danger position, while any accumulation of ice, sleet or snow also acts to the same end.

At each position of the signal there are two lights of the same color to indicate the position at night, and these serve as a means for assisting the engineer to identify the track which is protected by any given semaphore.

In Figs. 4 and 5 I have shown the essential principle of my invention but instead of providing the casting with a blade carrying a projection, the dissymmetry of the casting whereby its geometric center is placed at one side of its center of gravity is obtained by making a segment of the casting at *b′* thicker than the remaining portions of the casting. The blade is carried by this thickened portion and, as before, extends horizontally when the casting is at its danger position.

In Figs. 6 and 7 the same general result is attained by providing as a part of the casting the weight *b²* which is secured by bolt *b³* to the casting. The blade is secured to the part of the casting which carries the weight *b²*.

It will be understood that as a practical matter the preponderance of the weight of both the blade and casting is still on the same side of the axis when the semaphore is in its danger position, it being usual to provide a stop of some kind that prevents the movement of the semaphore past its danger position. The positions shown in each of the figures are not necessarily therefore the exact gravity positions of the semaphores if their movement be entirely unrestricted.

While I have shown various embodiments of my invention and described them specifically, it is to be understood that my invention is broader than the specific embodiments I have illustrated and that modifications may be made that are within the principle of my invention, as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:—

1. The combination with a semaphore support, of a casting substantially circular in form and pivoted to said support substantially at its geometric center, said casting being weighted to bring said center at one side of the center of gravity of said casting, and a blade secured to said casting and extending substantially horizontally when the casting is at the "danger" position and from below the pivot point thereof.

2. The combination with a semaphore support, of a casting substantially circular in form and pivoted to said support substantially at its geometric center, said casting being weighted to bring said center at one side of the center of gravity of said casting, and a blade carried by said casting at a position causing it to remain at the heavy side of the casting throughout a ninety degree movement of said casting from and to one side of the "danger" position.

3. The combination with a semaphore support, of a casting pivoted to the support at one side of its center of gravity, said casting having a plurality of spectacle openings at each side of its vertical diameter when at the "danger" position, and a blade secured to said casting and extending at substan-

tially right angles to the said vertical diameter and from below the pivot point of the casting.

4. The combination with a semaphore support, of a casting pivoted to the support at one side of its center of gravity, said casting having three spectacle openings at each side of its vertical diameter when at the "danger" position placed forty-five degrees from each other, and a blade secured to said casting and extending at substantially right angles to the said vertical diameter and from below the pivot point of the casting.

5. The combination with a semaphore support, of a casting pivoted to the support at one side of its center of gravity, said casting having a group of spectacles at each side of its vertical axis when at its "danger" position, the members of both groups bearing the same angular relation with each other, and a blade secured to said casting and extending at substantially right angles to the vertical axis of the casting when at the "danger" position and from below the pivot point thereof.

6. A dissymmetrically weighted circular casting pivoted at substantially its geometrical center, in combination with a semaphore blade secured to the heavier half of the casting and extending substantially horizontally when the casting is at the "danger" position.

7. A dissymmetrically weighted circular casting pivoted at substantially its geometrical center, in combination with a semaphore blade secured to the heavier half of the casting and extending substantially horizontally when the casting is at the "danger" position and two groups of spectacle openings on opposite sides of a diameter of the casting.

8. A dissymmetrically weighted circular casting pivoted at substantially its geometrical center, in combination with a semaphore blade secured to the heavier half of the casting and extending substantially horizontally when the casting is at the "danger" position, two groups of spectacle openings on opposite sides of a diameter of the casting, and two lamps located to register with corresponding openings of the two groups at each operative position of the semaphore.

9. The combination with a semaphore support, of a casting substantially circular in form and pivoted to said support substantially at its geometric center, a blade carrying projection extending from said casting and serving to bring the center of gravity at one side of the pivot point of said casting, said projection extending horizontally when the casting is at "danger" position, and a semaphore blade carried by said projection.

10. The combination with a semaphore support and a substantially circular casting dissymmetrically weighted pivoted at one side of its center of gravity, and a blade secured to said casting, the blade being so secured to said casting that the weight of the casting and the weight of the blade each preponderates on the same side of the pivot point of the casting throughout a movement from a substantially vertical position of the blade to a substantially horizontal position thereof.

11. The combination with a semaphore support and a substantially circular casting dissymmetrically weighted pivoted at one side of its center of gravity, a blade secured to said casting, the blade being so secured to said casting that the weight of the casting and the weight of the blade each preponderates on the same side of the pivot point of the casting throughout a movement from a substantially vertical position of the blade to a substantially horizontal position thereof, two groups of openings carried by said casting, and two lamps carried by the support at opposite sides of the vertical diameter of said casting.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM PHILLIPS HALL.

Witnesses:
EDWIN SEGER,
ANNA DALY.