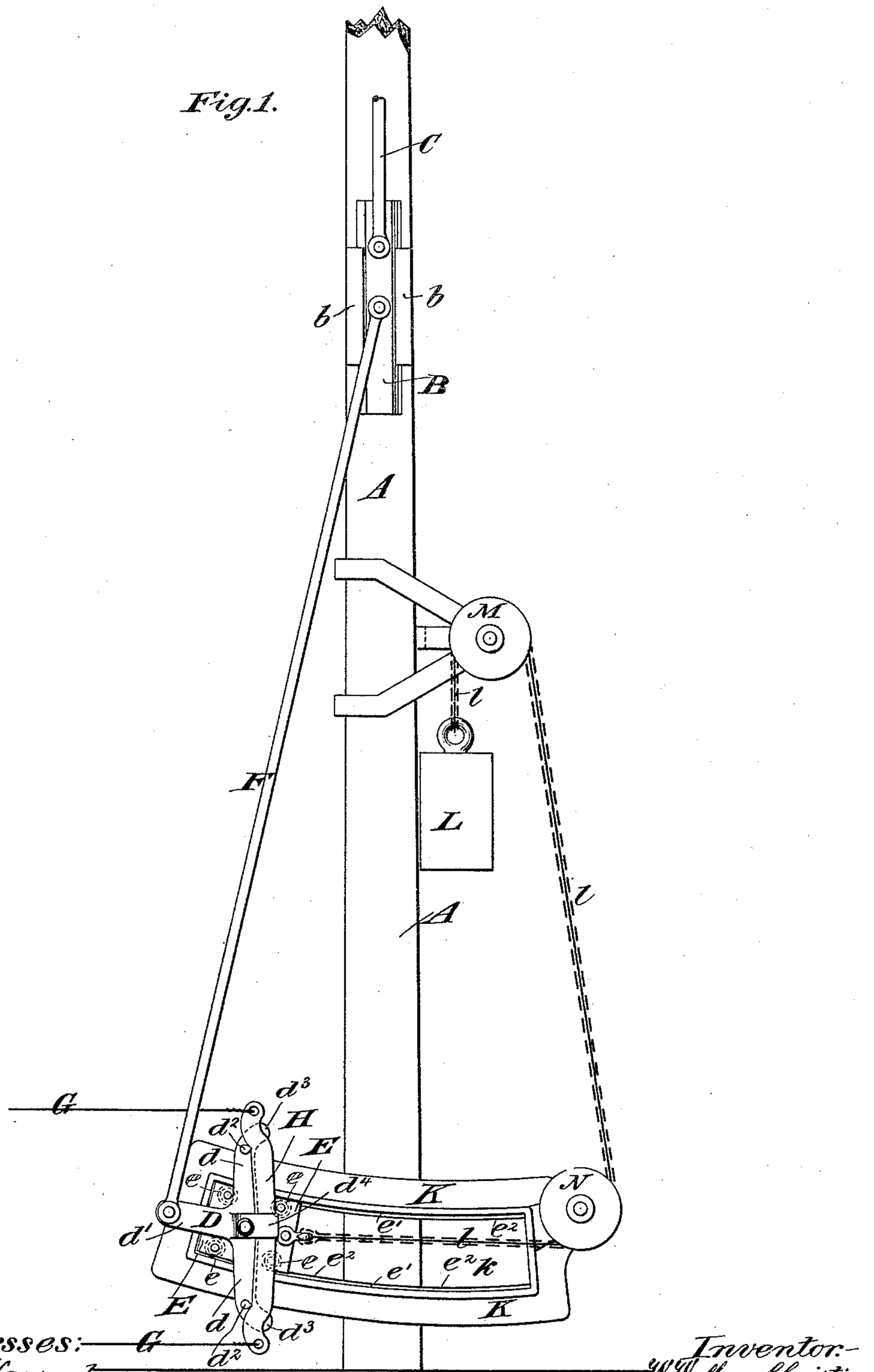
(No Model.) 2 Sheets—Sheet 1.

W. W. CHRISTIE.

RAILROAD SIGNAL COMPENSATOR.

No. 432,155. Patented July 15, 1890.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2

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No. 432,155. Patented July 15, 1890.

Fig. 2.

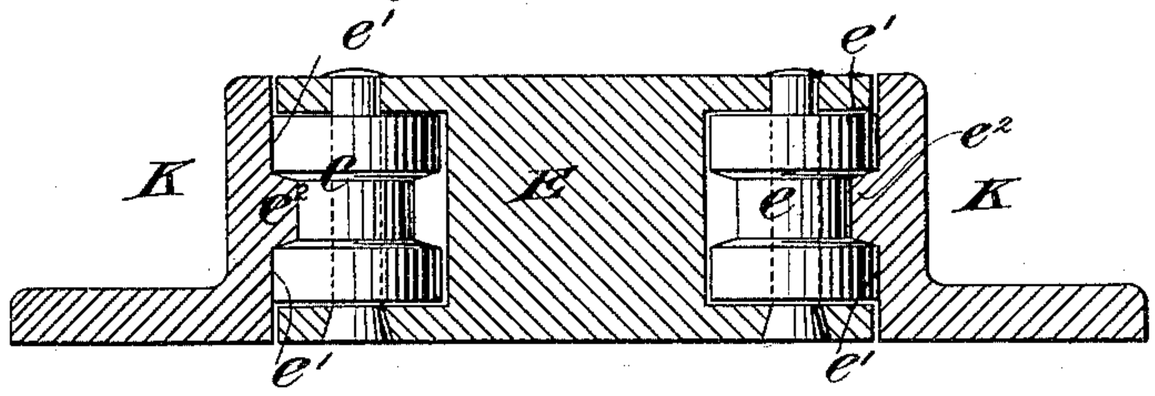


Fig. 3.

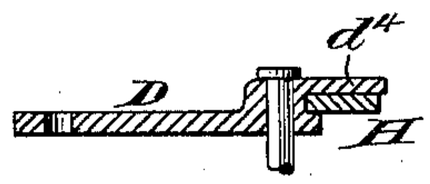
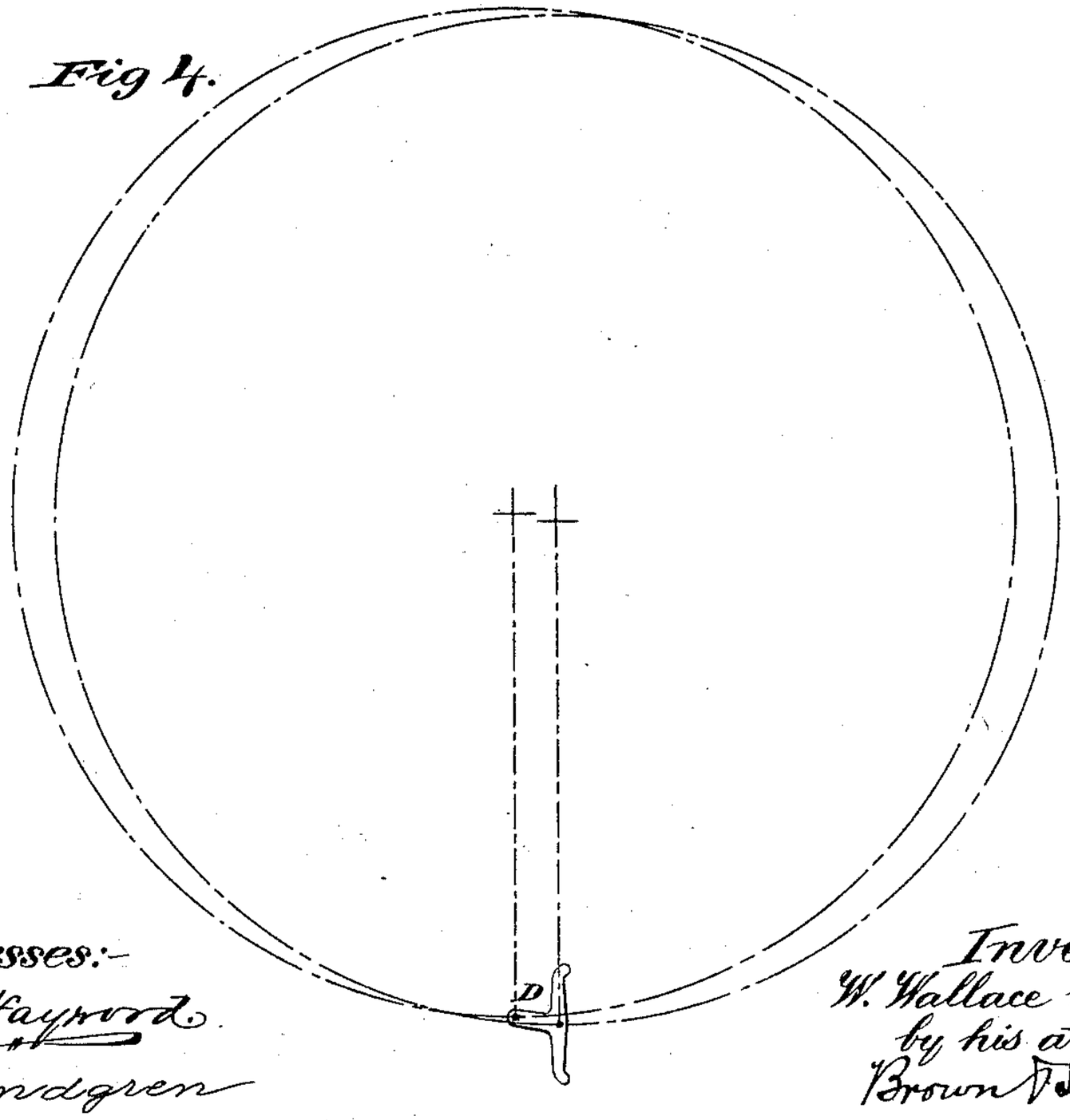


Fig 4.



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UNITED STATES PATENT OFFICE.

WILLIAM WALLACE CHRISTIE, OF HILLBURN, NEW YORK.

RAILROAD-SIGNAL COMPENSATOR.

SPECIFICATION forming part of Letters Patent No. 432,155, dated July 15, 1890.

Application filed April 14, 1890. Serial No. 347,807. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WALLACE CHRISTIE, of Hillburn, in the county of Rockland and State of New York, have invented a certain new and useful Improvement in Railroad-Signals, of which the following is a specification.

My invention relates to an improvement in railroad-signals, and more particularly to compensating mechanism to be employed in connection with wires for operating a semaphore from a distance.

The object is to simplify the compensating mechanism and to provide against any liability of the semaphore becoming disturbed by the contraction or expansion of the operating-wires, and at the same time to provide for the setting of the semaphore to signal danger in case of the breakages of either one of the wires.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the semaphore-operating mechanism in side elevation. Fig. 2 is a section through the carriage which supports the operating-lever. Fig. 3 represents a transverse section centrally through the operating-lever and loose yoke carried thereby. Fig. 4 is a diagram.

A represents a post or other suitable support adapted to the purposes of displaying a semaphore at the desired height and in the desired position with relation to the track. A vertically-movable slide B is mounted in suitable ways *b*, attached to the post, and is connected by means of a connection C, shown here as broken away, but supposed to connect with a semaphore (not shown) of any well-known and approved construction. The said slide B is also connected with an operating-lever D, as follows: The operating-lever D is pivotally secured to a movable carriage E, and is provided with arms *d*, extending upwardly and downwardly from the pivotal point, and with an arm *d'*, extending laterally from the pivotal point, so that the rocking of the lever on its pivot in a vertical plane will cause the free end of the arm *d'* to rise and fall. The free end of the arm *d'* is connected with the slide B by means of a connecting-rod F, and hence a rocking of the lever D upon its pivot will, through the said connecting-rod F, cause the slide B to rise and fall, and hence set the semaphore for "danger" or the opposite. In the present instance I have shown the operating-lever D as a tri-armed lever. It is evident, of course, that it might be of disk form or any other well-known shape, so that leverage might be exerted upon it above and below its fulcrum and at a point to one side thereof.

The wires G for operating the lever D are supposed to extend from a distant station to the position which the semaphore occupies, and their ends at the semaphore are connected to the opposite ends of a yoke H, which rests loosely upon the lever D, as follows: The upwardly and downwardly extending arms *d* of the lever D are provided near their ends with abutments or bearings d^2, which may consist of studs or pins projecting from the side of the arms, as shown herein, and the yoke H is curved at its ends toward the direction from which the wires G move, the curves at its ends preferably extending farther toward the wires than the points where it engages the pins or bearings d^2. When the yoke rests in engagement with the said pins d^2 and the wires G attached to its ends exert a strain upon it, it will be prevented from rolling in one direction by the projected portions d^3 on the lever D, and will be prevented from rolling in the opposite direction by a lip d^4, fixed to the lever about centrally thereof and projecting over the side of the said yoke. The yoke thus prevented from displacement so long as the strain of the wires G is exerted will, however, be free to fly back out of engagement with the lever D immediately upon the breaking of one of the said wires.

To provide against any movement of the slide B by the contraction or expansion of the wires G, I mount the carriage E in a support K, provided with a curved slot *k*, in which latter the carriage is secured in such a manner as to move freely backward and forward toward and opposite the direction in which the wires G pull. It is evident that, in order to prevent the slide B from moving as the lever D under the strain of the wires G moves, the point of connection of the rod F with the arm *d'* of the lever must remain at a constant distance from the point of its connection with

the slide; and as the upwardly and downwardly extending arms *d* of the lever must remain substantially parallel with their former position as they move under the contraction or expansion of the wires, it therefore follows that the position of the connecting-rod F with respect to the arm *d'* of the lever will constantly vary during such movement. It is evident, therefore, that the center of the carriage should move along a curved path which shall bear such a relation to the curved path that the point of connection of the connecting-rod F with the arm *d'* moves in as to keep the said point of connection at a constant distance from the point of connection of the rod F with the slide, the latter being assumed as fixed. Such a path can be readily determined by making the distance between the pivotal point of the lever D and the connection of the rod F with the arm *d'* the distance between the centers of two circles, the circumference of one of the circles forming a path in which the connection F with the arm *d'* must travel, and the circumference of the other circle denoting the path in which the pivotal point of the lever D must travel, and hence the curvature of the slot *k*, in which the carriage E moves. The diagram, Fig. 4, represents these paths. The carriage E is provided upon its opposite bearing-edges with double rollers *e*, mounted therein and adapted to bear upon tracks *e'* along the walls of the slot, the said tracks being separated by ribs e^2, which serve to hold the carriage in position by entering the spaces between the wheels of the double rollers. The carriage may be held under tension opposed to the strain of the wires G by a spring or weight. In the present instance I have shown a weight L suspended over a pulley M, attached to a post connecting with the carriage by a flexible connection *l*, which passes about a guide-pulley N at the end of the support K. From the above construction it will appear that no matter how far the lever D be moved under the influence of contraction or expansion of the wires the operating-slide B will not be disturbed, while in whatever position the said lever D be the semaphore may be operated by manipulating the wires G. Should either of the wires G break, the yoke H would fall from its position in engagement with the lever, and the weight of the slide B and the parts connected therewith would fall, thereby setting the semaphore to signal "danger."

What I claim as my invention is—

1. The combination, with a rocking lever and its connections with the semaphore-operating part and with the operating-wires, of a movable support for the rocking lever and a curved track for guiding the support, substantially as set forth.

2. The combination, with the rocking lever for operating the semaphore, of the lever-support and its curved track, the lever-support being provided with anti-friction rollers on its opposite sides, substantially as set forth.

3. The combination, with the rocking lever for operating the semaphore, of the lever-support provided with anti-friction rollers and a curved track provided with a projection extending between the rollers and forming a guide for the lever-support, substantially as set forth.

4. The combination, with the rocking lever for operating the semaphore, the operating-wires exerting a strain upon the lever in one direction, and a tension device exerting a strain upon the lever in the opposite direction, of a yoke to which the operating-wires are connected, having a loose connection with the rocking lever, the rocking lever being provided with extensions to guard the yoke in one direction and with an overhanging lip to guard the yoke in the opposite direction, substantially as set forth.

W. WALLACE CHRISTIE.

Witnesses:

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