(No Model.)

S. H. HARRINGTON

RAILWAY TIME SIGNAL.

No. 433,565. Patented Aug. 5, 1890.

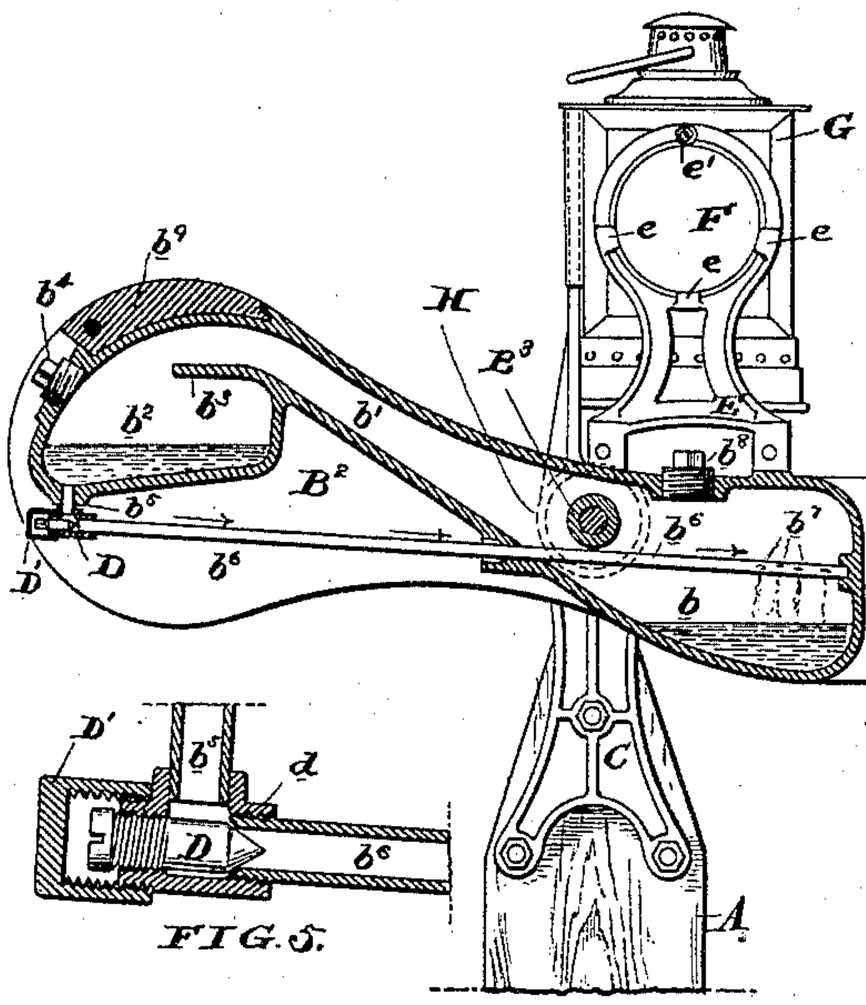


FIG. 1.

FIG. 5.

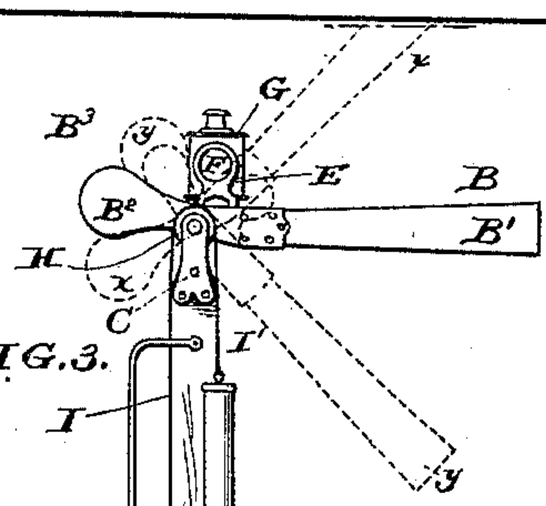


FIG. 3.

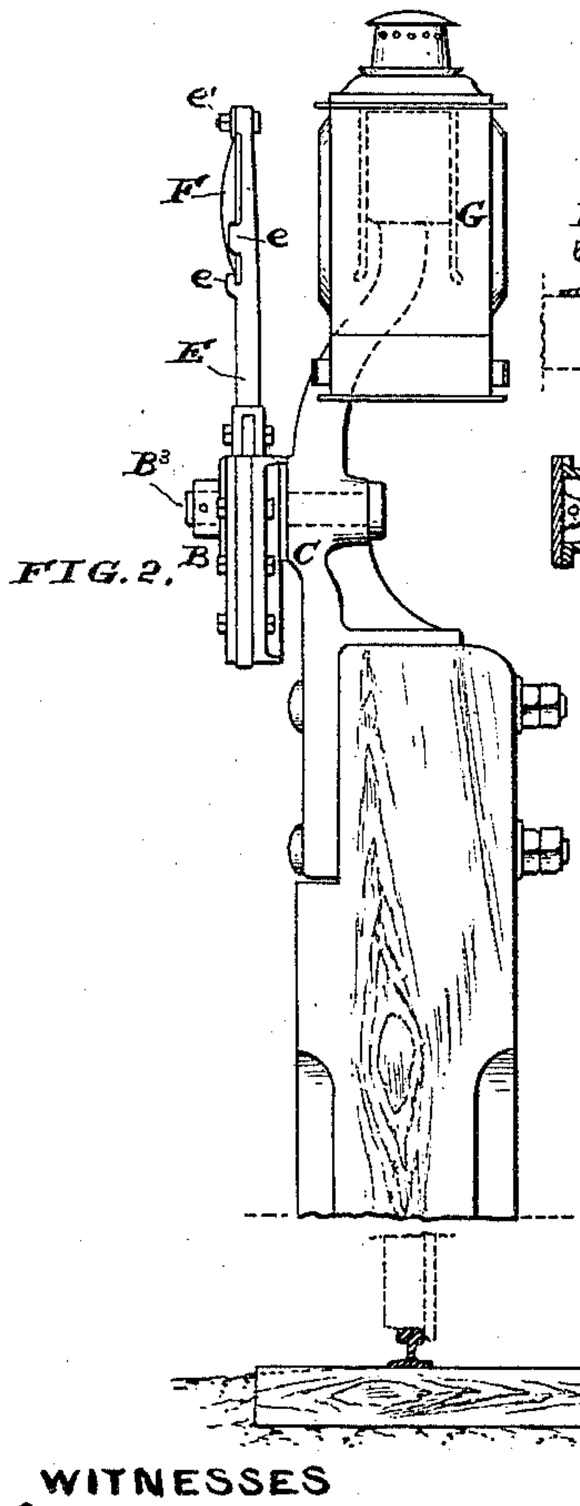


FIG. 2.

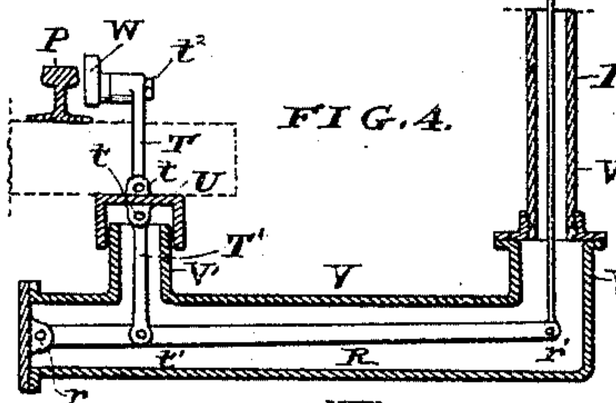
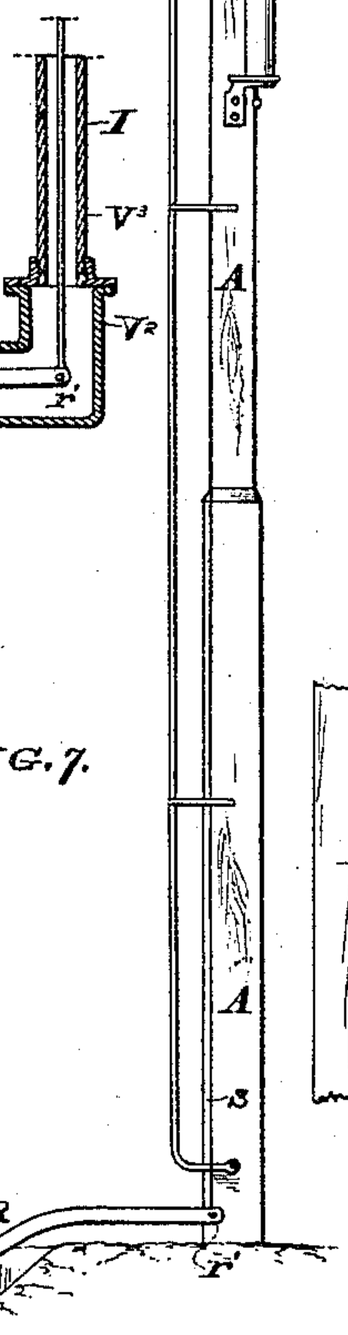


FIG. 4.



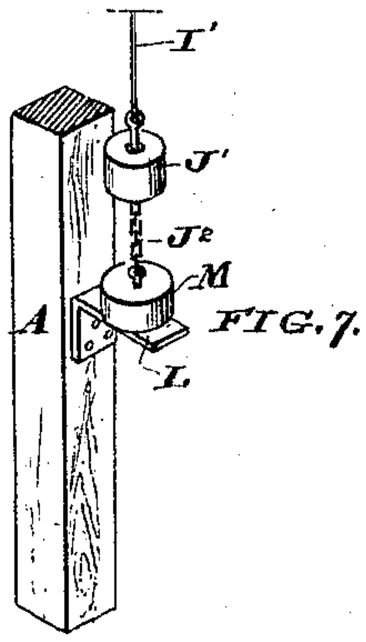


FIG. 7.

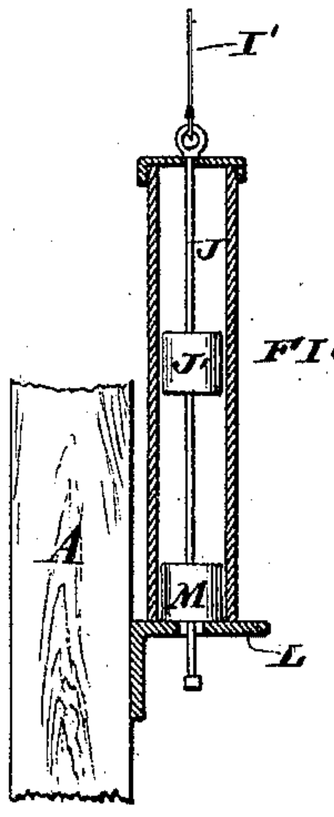
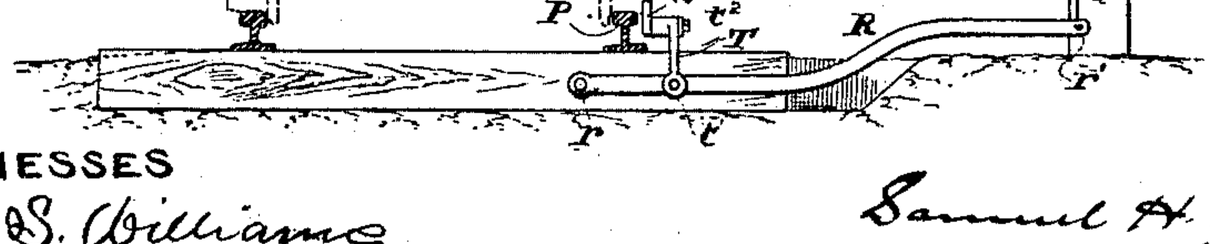


FIG. 6.



WITNESSES

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RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 433,565, dated August 5, 1890.

Application filed September 23, 1889. Serial No. 324,823. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. HARRINGTON, of Binghamton, county of Broome, State of New York, have invented a new and useful Improved Actuating Device for Signals, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a device for actuating railway-signals in which, after the signal is made to indicate "danger," it is maintained in this position for a determined length of time and then caused to assume the position which indicates "safety;" and particularly my invention relates to the mechanism for so actuating signals which is shown and described in the application of John F. O'Brien and Samuel H. Harrington, filed in the United States Patent Office August 29, 1888, and bearing the Serial No. 283,620, my present invention being an improvement on the device therein shown and described.

The novel features of my device will be best understood after an explanation of the drawings, in which it is illustrated, and will be hereinafter particularly referred to in the claims.

Reference is now had to the drawings, which illustrate my invention, and in which—

Figure 1 is a side view, partially in section, illustrating my improved actuating device as attached to and forming part of a semaphore-arm and secured on the top of a signal-post in the usual manner. Fig. 2 is an edge view of the same parts; Fig. 3, a view illustrating my improved device attached to a signal-post, showing mechanism by which it can be actuated by a passing train, and also a device for accomplishing a part of the movements of the actuating device, which will be hereinafter described. Fig. 4 is a view illustrating a mode in which I prefer to protect the levers which communicate motion from a passing train to the cord or rod which actuates the signal. Fig. 5 is an enlarged sectional view of the valve which I prefer to use in my improved device, and Figs. 6 and 7 views showing two modifications of my device for causing a counter-weight to accomplish a portion of the movements of the signal-actuating device.

A is a signal-post; B, a semaphore-signal, which in the present case is made up of the signal-blade B′ and the signal-actuating device B^2, combined in the form of an ordinary semaphore-arm; and I will here state that I do not limit the application of my improved actuating device to a construction in which it forms a part of or is rigidly attached to the signal-arm, but wish to be understood as claiming the same as a device for actuating signals either directly or indirectly connected with it. The signal-actuating device B^2 is pivoted at the point B^3, and consists of two communicating chambers or boxes b and b^2, which, for the purpose of reference, I will call the "lower" and "upper" boxes. The box or chamber b is connected with the top of the chamber b^2 by a passage b', which should have a gradual sloping ascent, as shown, and the bottom of the upper chamber b^2 is also connected with the chamber b by means of a conduit or pipe, (here shown in two parts b^5 and b^6,) the above features being also shown in the earlier application above referred to.

A regulated quantity of mercury or other fluid is introduced into the boxes b or b^2 through the openings b^4 or b^8, and as in the earlier application this fluid, when resting in the lower box b, will cause the apparatus to turn down on the pivot B^3 and pull or carry the signal to the position indicating "safety," while when resting in the upper box b^2 it will cause the center of gravity of the actuating device and its attachments to move to the other side of the pivot B^3 and hold or maintain the signal of the position indicating "danger" until the mercury or other fluid passes through the lower conduit into the lower box, thus again transferring the center of gravity to the outside of the pivot and causing the signal to assume the "safety" position, the length of time during which the signal will be held in the "danger" position being regulated by the length of time the fluid will require to pass from the upper to the lower box in sufficient quantity to change the center of gravity from one side to the other of the pivot.

To insure uniformity in action to the apparatus, it is of course important that all of the mercury should be transferred from the lower to the upper box when the signal is set

to the position indicating "danger." This transfer is accomplished by turning the actuating device upon its pivot, so that the lower box will lie above the upper box b^2, and the mercury consequently run through the passage b' into the upper box, thus temporarily occupying the lower position. The next step is to turn the apparatus backward, so that the box b will lie below or on a level with the box b^2, so that the mercury or other fluid will tend by gravity to pass from the upper to the lower box through conduits b^5 b^6. This may be accomplished in any convenient way; but I prefer the device illustrated in Figs. 3, 6, and 7—that is, I attach a cord I′ to the actuating device on the side of the pivot upon which the lower box b lies. This may be conveniently attached, as shown, to a pulley H, and to this cord I connect a weight M of such a character that it will overcome the weight of the mercury in the chamber b^2 and pull the actuating device down from the position shown by the dotted lines x in Fig. 3 to the central position there indicated in full lines. A stop or rest L is provided to receive and sustain the weight when it has fallen to this point, and the actuating device will therfore remain in the horizontal or substantially horizontal position shown until the mercury has passed in sufficient quantity to the lower box to change its center of gravity. In order to bring the actuating device to this horizontal position with as little jar as possible, I prefer to employ two sets of weights connected together, so that when one is at rest the other will still have some distance to fall before reaching a point of support. Thus in Fig. 6 a weight M is secured on a rod J by means of an enlargement at its end, and so that it can slide on the upper part of the rod, while a weight J′ is permanently attached to the rod above it. The cord I′ is attached to rod J, and a rest L provided for the weight through which the rod can pass below it.

In moving the box B^2 to the position x the cord first raises the weight J′ and then the weight M, and when the box is released the two weights, acting together, bring it back toward a horizontal position until the weight M reaches the rest L, after which the weight J′ acts alone and brings the box to the substantially horizontal position shown in full lines in Fig. 3 with a less rapid movement than when the weights act together. In this way the motion of box B^2 from position x to the desired horizontal position is accomplished rapidly, and yet without the excess of momentum at the end of the movement which would tend to cause it to move too far down.

In Fig. 7 the weights M and J are connected by a chain and act in the same way, as above described. This device of the double weight is particularly important where the semaphore-arm is attached directly to the actuating device, as the weight and momentum of the parts are necessarily quite large.

In order to prevent mercury or other fluid from being splashed or thrown back from the chamber b^2 into the passage b', I continue said passage beyond the wall of the chamber, causing it to extend into the upper part of the chamber, as is indicated at b^3 in Fig. 1; and in order to prevent the mercury or other fluid from being thrown from the chamber b into the conduit b^6, which leads into said chamber from the upper chamber b^2, I construct the pipe of which conduit b^6 is formed so that it will extend into the chamber b above the normal level of the fluid therein, providing it with openings, preferably numerous small holes b^7, at and near the back end of chamber b.

The passage of the fluid from chamber b^2 to chamber b through conduits b^5 and b^6 is regulated by a valve D, for which I provide a seat d in the conduit, and which, preferably, I make in the form of a needle-valve, as shown, screwing into the end of conduit b^6 and adjustable with respect to its seat d, so that the orifice for the passage of the fluid can be regulated with any desired degree of nicety. A cap D′ should be secured, as shown, on the end of the pipe b^6, so as to protect the needle-valve D and prevent it from being tampered with after adjustment.

The actuating device is pivoted at B^3 to a casting C, which in the plan shown is attached to the top of the signal-post A, and which also supports a lantern G; and upon lugs cast on the top of the frame of the pivoted boxes is secured an upright frame E to hold the lens F in front of the lantern. The lens-frame is provided with three lugs or ears $e\,e\,e$, into which the lens F is slipped, as shown, and the lens is permanently secured in place by a lug e', fastened by a bolt in the top of the frame.

I indicates a cord which is attached to the actuating device on the same side of its pivot as the upper box b^2, as shown in Fig. 3. It is attached to the pulley H, and it may form a part of the same cord I′, to which the counterbalancing-weight already described is connected, and which extends down from the other side of the pulley—that is, the actuating-cord may extend over the pulley and have a counterbalancing-weight attached to its end. The cord I when pulled upon will throw the actuating device into the position indicated at x in Fig. 3, and in the construction shown said cord I is attached at r' to the end of the lever R, which is pivoted at r, and to which a rod—such as T, Fig. 3, or T T′, Fig. 4—is connected, the other end of said rod or rods being pivoted at t^2 to a lever W, lying along and close to the railroad-track P, so that a car-wheel Q, Fig. 3, in passing along the track will press it down. By the construction shown the downward motion of the track-lever W will be communicated to the pivoted lever R, and through it and the cord I will cause the actuating device to be thrown into the position indicated by x. The weight or weights M and J will then cause the actuating device

to come back to the substantially horizontal position indicated, and the device will remain in said position until the mercury is passed from the box b^2 into the box b in sufficient quantity to bring the center of gravity of the device and its attachments to the same side of the pivot on which the box b lies, when the actuating device will assume the position indicated at y in Fig. 3.

In Fig. 4 I have shown the pivoted lever R as inclosed in a pipe-section V, from which the elbow V^2 and attached pipe-section V^3 extend upward and inclose the cord I, while another upwardly-extending section V′ incloses a portion of the rod connecting the levers W and R, a cap U being attached to said rod, as indicated at t t, Fig. 4, extends over the top of the section V′ and prevents the entrance of dirt into the pipe V.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an actuating device for signals, the pivoted boxes b b^2, having a conduit b^6 by which one can drain into the other, and a passage b', connecting one chamber with the top of the other and extending out into said chamber, substantially as and for the purpose specified.

2. In an actuating device for signals, the pivoted boxes b b^2, having a conduit b^6 by which one can drain into the other, a valve controlling the flow of fluid through said conduit, and a passage b', connecting one chamber with the top of the other, substantially as and for the purpose specified.

3. In an actuating device for signals, substantially as described, the combination, with the boxes b b^2, connected above by a passage b', of a conduit b^6, extending from the bottom of the one chamber into and beyond the wall of the other.

4. In an actuating device for signals, substantially as described, the combination, with the boxes b b^2, connected above by a passage b', of a conduit b^6, extending from the bottom of the one chamber into and beyond the wall of the other and having its said projecting end pierced with holes b^7.

5. In an actuating device for signals, the pivoted oscillating boxes b b^2, having a conduit b^6, by which one can drain into the other, and a passage b', connecting one chamber with the top of the other, in combination with a weight connected to the box-frame on the side of the lower box and arranged to counteract the weight of the fluid when it is thrown into the upper box, and a rest or stop for said weight arranged, as specified, so as to relieve the box-frame of said weight at a certain point in its motion.

6. In an actuating device for signals, the pivoted oscillating boxes b b^2, having a conduit b^6, by which one can drain into the other, and a passage b', connecting one chamber with the top of the other, in combination with two weights connected to the box-frame on the side of the lower box and arranged to counteract the weight of the fluid when it is thrown into the upper box, and a rest or stop on which said weights will come successively to rest, all substantially as and for the purpose specified.

SAMUEL H. HARRINGTON.

Witnesses:
THOS. F. KEOGH,
ASAHEL W. CUMMING.