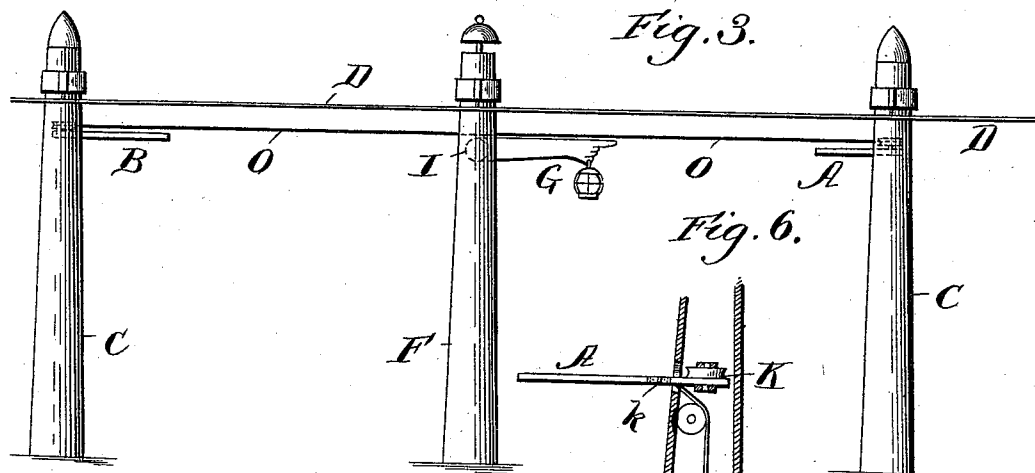
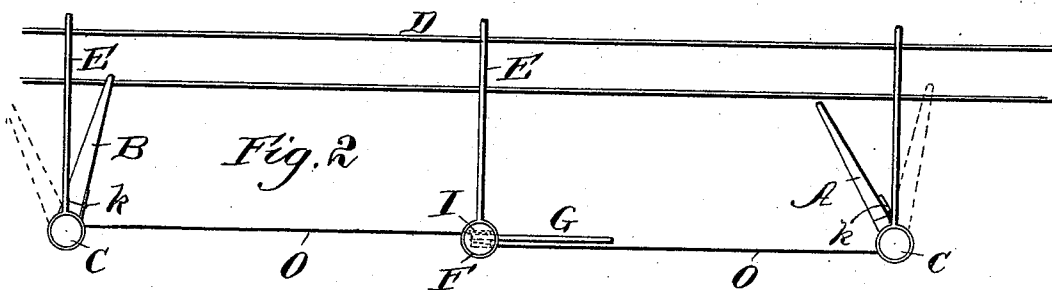
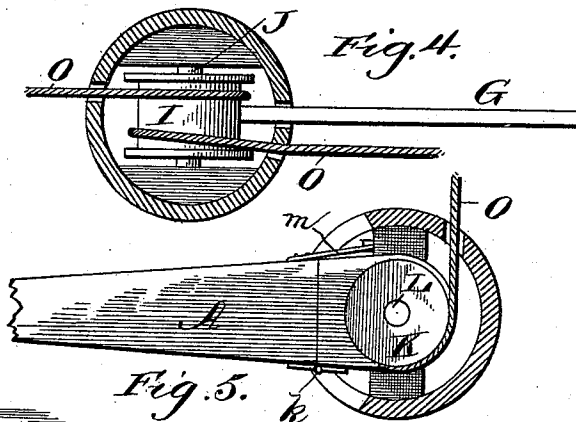
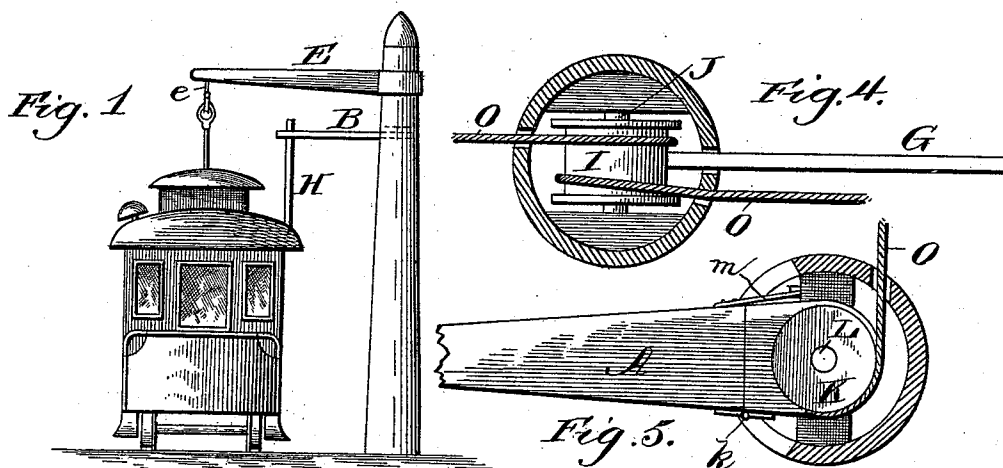


(No Model.)

J. G. HARTMAN & E. BAKER.
AUTOMATIC SIGNAL FOR STREET RAILWAYS.

No. 499,163.

Patented June 6, 1893.



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UNITED STATES PATENT OFFICE.

JACOB G. HARTMAN AND ELIJAH BAKER, OF BALTIMORE, MARYLAND.

AUTOMATIC SIGNAL FOR STREET-RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 499,163, dated June 6, 1893.

Application filed June 30, 1892. Serial No. 438,531. (No model.)

To all whom it may concern:

Be it known that we, JACOB G. HARTMAN and ELIJAH BAKER, citizens of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Automatic Signals for Street-Railways; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our present invention relates to improvements in automatic signals for street railway cars designed to warn or notify the public of the approach or passage of a car at a street crossing; and the object of the invention is to provide novel means adapted to automatically set a signal vane on the approach of the car and to lower the vane after the car passes the crossing.

The present signal mechanism is more particularly designed for use by electric street railways employing rapidly moving cars which sometimes meet with accidents in traveling across a street or road crossing from the fact that the public is not warned of the approach of the car; but the signal mechanism is equally adapted to other lines of railways by the provision of suitable means on the cars to operate the signal-setting mechanism.

In the preferred embodiment of our present invention, we employ a vertically-swinging signal vane carried by a horizontal shaft which is provided with a vertically disposed pulley, two tappet arms located on opposite sides of the signal-vane and each having a horizontal pulley, and a connecting cable coiled around the vertical pulley of the signal vane and connected at its ends to the horizontal pulleys of the tappet arms. These tappet arms normally stand across and toward the track over which the car travels, and one of the tappet arms is always in the path of a projecting part of the car so that as the latter approaches the crossing the projection will strike one arm to set the signal vane and turn the other tappet in the path of the projection on the car and thus the arm or projection, after the car passes the crossing, will strike the other tappet arm which operates to restore the signal vane to safety and reset the first named tappet in the posi-

tion to be struck or operated on the following car.

Our invention further consists in the novel combination of devices and peculiar construction and arrangement of parts which will be hereinafter more fully described and particularly pointed out in the claims.

The accompanying drawings fully illustrate the preferred embodiment of the present invention, in which—

Figure 1 is a view illustrating the one tappet arm in side view and an electric street railway car in end view. Fig. 2 is a plan view illustrating the signal mechanism and a single track. Fig. 3 is a side elevation of the signal shown in Figs. 1 and 2. Fig. 4 is a detail view showing the post in transverse section, and the signal vane, its drum and part of its connecting cable, by plan. Fig. 5 is a detail view showing the post in transverse section and the tappet arm in plan view, the drum and a part of the cable being connected with said tappet-arm. Fig. 6 is a detail view showing one of the hinged tappet arms and its balance weight.

Like letters of reference denote corresponding parts in all the figures of the drawings.

In the embodiment or application of our signal to an electric street railway as in Figs. 1, 2 and 3, of the accompanying drawings, we mount the tappet arms A, B, on the posts C provided for the support of the electric conductor or trolley-wire D. As is usual, the posts are erected at suitable intervals apart, and they are provided with the horizontal mast arms E which are rigidly secured to the posts and provided at their outer ends with the hangers e to which the electric conductor D is fastened.

For the purposes of our invention, one or more posts F should be erected at the street or road crossing, and on this post F the signal vane G is mounted to swing or turn in a vertical direction.

It will be understood that the tappet arms A, B, are mounted on posts which are erected at suitable distances from and on opposite sides of the post F which carries the signal vane; and these tappet arms stand at right angles to the posts and are of such length that they project or extend to or across the track on which the car travels. The car has

a suitable arm or projection H which is adapted to successively strike the tappet arms as the car approaches and passes the posts on opposite sides of the crossing, whereby the projection H is adapted to operate the signal vane so as to set the same to "danger" and return it to "safety."

We will now proceed to a detailed description of the construction and operation of our improved signal mechanism. The signal vane is preferably in the form of a flat oblong arm G which is secured to a vertical pulley or drum I, and this drum or pulley is fixed on or carried by a horizontal shaft J which in turn is suitably journaled in bearings (not shown) in the post F. This post is suitably slotted or recessed to adapt the signal vane to be inclosed or housed therein when said vane is lowered to its "safety" position, and when the vane is raised to its "danger" or warning position it stands across the crossing in line with the posts C, F, as shown in Fig. 2. Each tappet arm A, B, is secured at its inner end to a horizontal drum or pulley K carried by a vertical shaft L having a bearing in the post C. The connection between the tappet arm and its drum or pulley is effected by means of a hinge joint k which permits the arm to have a free movement in one direction so as to avoid operating the pulley and signal vane, and which joint holds the arm rigidly against movement in the opposite direction except when acted on by the projection or arm on the car moving on the track in the proper direction. The tappet arm is held in its proper position by means of a drop weight l having its flexible connection or cable m passing through a suitable guide and attached to the tappet arm on the opposite side from its hinge-joint as shown by Fig. 5 so as to normally hold the tappet arm in position. The purpose of this hinged tappet and the counterbalance weight is to hold the arms in their proper operative position across the track and in the path of the projection on the car, but it sometimes becomes necessary to reverse the car or run it backward adjacent to the crossing, the hinged tappet arms permitting the arm or projection H on the car to pass the tappet arms without injury thereto or to the arm H, and without affecting the position of the signal vane. The tappet arms are connected to the signal vane by means of a cable O which, in the example shown herein, is connected at its ends to the horizontal pulleys or drums of the tappet arms and passes one or more times around the vertical drum of the signal vane; but it is obvious that the cable may be made of one continuous piece and be simply coiled around the drums or pulleys of the tappet arms and the signal vane.

This being the construction of our improved signal, the operation thereof is as follows:—The cable O and the tappet arms are so adjusted that one of the arms stands directly across the path of the projection H on the car while the other arm stands at an angle to the

line of travel of the arm H on the car as indicated by dotted lines in Fig. 2 of the drawings, the signal vane being lowered against the post F. As the car approaches the crossing, the projection or arm H strikes the tappet A, and turns the same to the full line position indicated by Fig. 2. This movement of the tappet A turns its pulley and draws on the cable to raise the signal vane to "danger" position, and the cable also turns the pulley of the tappet B and moves the latter across the track in the path of the projection H on the car, whereby the projection or arm H is adapted, after the car passes the crossing, to turn the tappet B to its dotted line position in Fig. 2 and restore the signal vane to safety and the tappet A to its initial position in the path of a projection or arm on the following or succeeding car.

Should it become necessary to back or reverse the car while near the posts C at the crossing, it can be readily effected without injury to the tappet arms or other parts of the signal mechanism as said tappet arms will yield or turn on their hinge joints to permit the arm H to pass and the weight returns the tappet arm to its normal position.

It will be seen from the foregoing description that we provide a simple and efficient mechanism which will be automatically set to warn the public of an approaching or passing car, and the signal is likewise returned to its safety position after the car passes the crossing; also, that the car can be run back or reversed on the track without damage to the signal mechanism.

If desired, the post F may be provided with an audible signal or alarm adapted to be operated in connection with the visual signal; and this audible signal mechanism is mounted on the top of the post and connected with the signal vane to be operated as the latter is raised. We have not deemed it necessary to illustrate and describe the audible signal mechanism herein, as the same forms the subject matter of another application filed by us of even date herewith, Serial No. 438,534.

Although we have illustrated our signal as especially adapted for use on electric street railways, we do not confine ourselves to this specific adaptation of the signal, as it is evident that the same can be readily applied to other forms of railways.

We are aware that changes in the form and proportion of parts and details of construction of the mechanism herein shown and described as an embodiment of our invention can be made without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve the right to make such changes as fall within the scope of the same.

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

1. In an automatic signal for street railways, the combination with the post F situated at a crossing and the posts C, C, on opposite sides of said post F, of the tappet-arms A, B,

supported by vertical shafts in the posts C, C, to extend horizontally across a track and each provided with a drum, a signal vane G pivoted to the post F by a horizontal shaft to stand at right angles to the position of the tappet arms when extended and provided with a drum which is rigid with said signal vane, and the continuous cable O connecting the drums of the signal vane and the tappet-arms for simultaneous operation, substantially as and for the purpose described.

2. In an automatic signal for street railways, the combination, with the post F situated at a crossing and the posts C, C, situated on opposite sides of said post F, of the vertical shafts L supported in said posts C, C, and each carrying a drum K, the tappet-arms A, B, hinged at *k* to said drums and each arranged to have a limited movement in one direction on the drum and to abut against the same

when moved in the opposite direction and thereby cause said drum and tappet-arm to move together, a drop weight connected by a cord to each tappet arm on the opposite side from its hinge-joint *k*, the signal vane G pivoted to the post F by a horizontal shaft and adapted, when exposed to "danger" position, to stand at right angles to the normal positions of the tappet-arms, a drum I rigid with the shaft of the signal vane, and a continuous cable O connecting the drums of the tappet-arms and the signal vane, substantially as and for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

JACOB G. HARTMAN.
ELIJAH BAKER.

Witnesses:

HENRY E. COOPER,
H. I. BERNHARD.