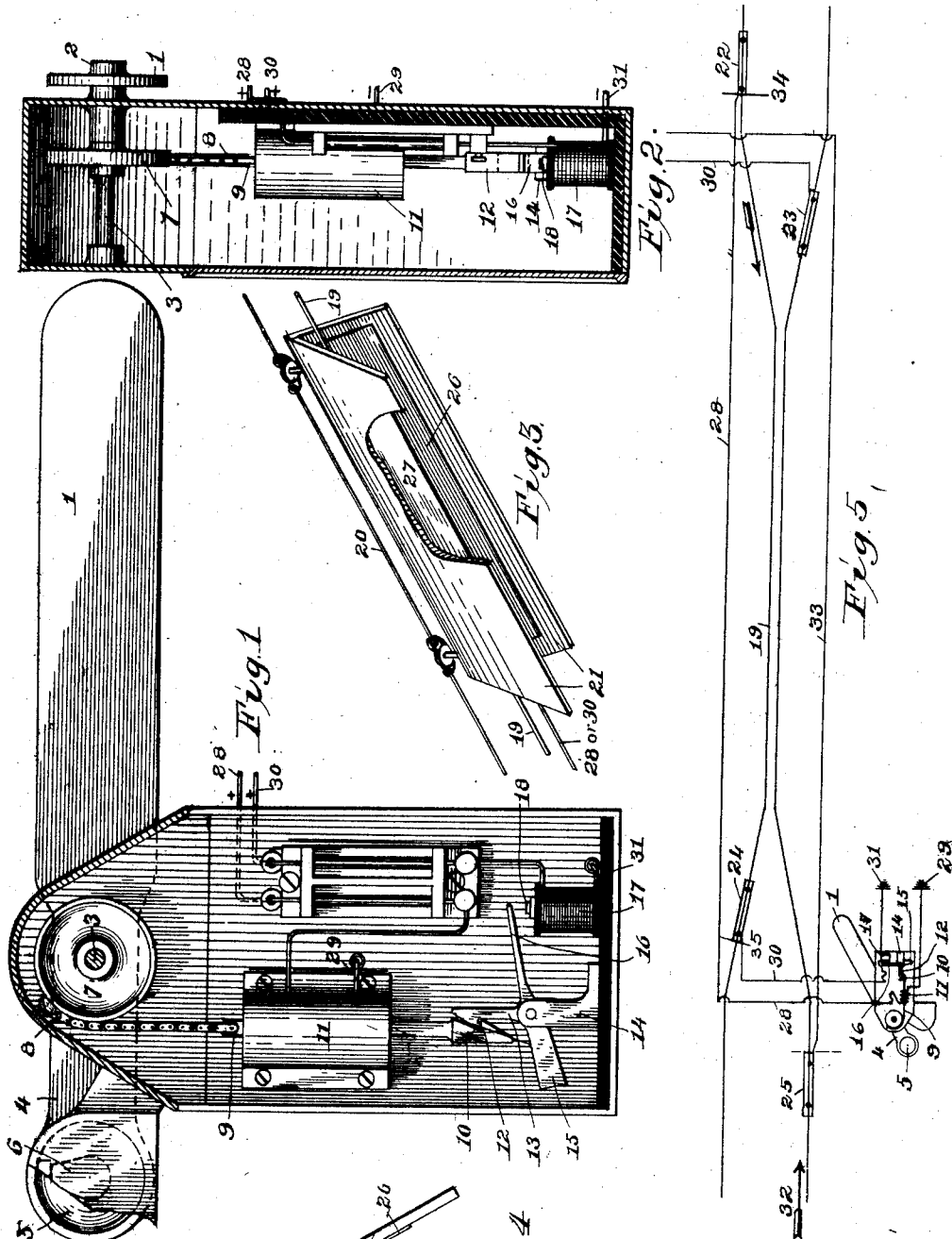


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F. M. HILL & W. C. DAVIS.
ELECTRIC RAILWAY SIGNAL.
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FREDERIC M. HILL AND WILLIAM C. DAVIS, OF COLUMBUS, OHIO.

ELECTRIC RAILWAY-SIGNAL.

No. 879,168.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed April 6, 1907. Serial No. 366,719.

To all whom it may concern:

Be it known that we, FREDERIC M. HILL and WILLIAM C. DAVIS, citizens of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Electric Railway-Signals, of which the following is a specification.

Our invention relates to improvements in electric railway signals, and comprises a signal for use especially at a crossing of several tracks or at a point where a switch or passing track is provided along the line of a single trackway; it further comprises means so located that an advancing car upon reaching a certain point will cause a signal to be shown by electric means actuated by said car; it also comprises means whereby said car when it reaches a certain other predetermined point will cause said signal to be dropped from the danger position; it also comprises means for positively maintaining said signal in its danger position after the advent of the car into the predetermined region, until said car passes out of said region, and its exit releases said signal from its danger position.

The essential feature of our invention is that not only is the signal raised to danger position by electric connections actuated by the car, but it is positively held in said position, and is then released therefrom by said car. If means were not provided for positively maintaining said signal in its danger position during the whole period while the car is in the region desired to be protected, if the current should cease and the car should stop, then the signal would revert to the safe position, which might lead to accident; therefore with our construction, the danger signal is positively set by the car if it has in any manner come into the prescribed region, being propelled by the electric current.

With these and other objects in view which will be more fully hereinafter described and embodied in the claims, reference is made to the accompanying drawings which are hereto attached and hereby made a part of this specification, in which

Figure 1 is a side view of the signal and the devices for controlling the same; Fig. 2 is an end view of the devices shown in Fig. 1; Fig. 3 is a view of the switch supported from the trolley guide wire; Fig. 4 is an end view of

said switch showing the trolley wheel and wire in place therein; Fig. 5 shows a conventional arrangement of electric wires for accomplishing the purpose above noted.

In the accompanying drawings, 1 is the long arm of the signal member, which is pivoted at 2 on the shaft 3, the shorter arm 4 being provided with a colored transparent disk 5, behind which is suspended an electric bulb 6, the color of the disk being usually red to indicate danger. Said shaft 3 carries rigidly fixed thereon a pulley 7 having a chain or cable 8 attached thereto at any desired point of its circumference; the longer arm 1 of said signal member being heavier than the shorter arm will tend to drop, and inspection of the parts as shown in Fig. 1 shows that if said arms drops, the shaft will be rotated thereby and the pulley 7 will be carried therewith, which will lift the chain 8. At the lower end of said chain is secured a rod 9 having at its lower end a hook 10; said rod 9 adjacent its upper end is formed preferably of soft metal, and at its lower end may be formed of brass or some other harder kind of metal. At 11 is shown the outer covering of a solenoid magnet, which when energized will draw the rod downwardly, thereby rotating the pulley 7 and lifting the arm 1 of the signal member. When the signal member is lifted to its horizontal position, the hook 10 at the lower end thereof will engage the hook 12 at the upper end of the rod 13 pivotally mounted upon the bracket 14 and provided with the extensions 15 and 16. At 17 is shown a magnet having the core 18; when magnet 17 is energized, the arm 16 is drawn downwardly against the core 18, thereby retracting the hook 12 out of engagement with the hook 10, whereupon the long arm 1 of the signal member is permitted to fall, thereby exhibiting a safe signal.

The means by which the operation of the devices just described is attained will now be set forth. The trolley wire is shown at 19, suspended from the guide wire 20 in the usual manner; at the entrance to the portion of track which must be protected, or out of which cars moving in opposite directions must be kept to avoid accident, is suspended from the guide wire 20, a hood 21 shown especially in Fig. 3, and also indicated in Fig. 5 at the various points noted at 22, 23, 24 and

25; referring to Fig. 4, the apex of hood 21 is seen to have a partial lining of metal, preferably brass to withstand usage. When the trolley wheel 28 passes into the hood, the flanges thereof travel in contact with both sheets of lining 26 and 27, thereby establishing a circuit through the trolley wheel between said sheets; the current thus passing through the trolley wheel to the sheet 27 is conducted by the wire 28 into the solenoid 11, whence the circuit is completed to the earth at 29. The solenoid, being thus energized, will draw the rod 9 downwardly, thereby lifting the signal arm 1, whereby the red disk 5 is brought in front of the incandescent light 6, and when said arm reaches the horizontal position, the hook 10 on rod 9 will engage with the hook 12 on pivoted rod 13, thereby positively locking the rod 9 in its lower position, whereby the arm 1 is positively held at the danger position.

The car being assumed to be traveling in the direction of the arrow along the trolley wire 19, a car coming from the opposite direction will observe the danger signal in time to stop until the first mentioned car may pass through and out of the danger region; the car passing onwardly, its trolley wheel will enter the hood shown at 24, whereby a current will be set up through a trolley wheel from the trolley wire to the wire 30, said latter wire passing to the magnet 17, the circuit being then completed to the ground at 31. The energizing of the magnet 17 will retract the arm 16, which will thereby disengage the hook 12 from the hook 10, whereupon the signal arm 1 is free to drop and on account of its overbalancing weight will descend and a safe signal or white light will thereupon be presented. At this instant the car coming from the opposite direction will be free to move forward in safety.

Assume that the car is moving in the direction indicated by arrow 32; when the trolley wheel enters hood 25 a current will be set up in the wire 33 which passes to a solenoid (not shown) like that shown in Fig. 1, whereupon the signal will be displayed and positively held in danger position in view of a car coming from the opposite direction. It is not thought necessary to show the signaling arrangement at the latter mentioned place, inasmuch as it is constructed identically like the one shown in Fig. 5, and operates in the same manner. It is therefore seen that the region of track between the points 34 and 35 are protected by our device; it is further seen that an electrically driven car which has sufficient current to bring its trolley wheel into the hood 22 at one end or the hood 26 at the other end will cause a danger signal to be displayed, said danger signal being positively maintained in the danger position by the me-

chanical devices described; and it is further clearly shown that said signal will remain in such position until the car passes out at the hood 24, whereupon the positively engaged hooks will be released. It is apparent that no manual effort need be exercised to operate our signal nor need there be an attendant in connection therewith; the entire construction renders the operation of said signal automatic and also positively and highly effective. Without the positive arrangement of said hooks, the signal would be dropped while the car would be in the danger region if the current driving said car should happen to fail, thereby leaving the danger section of track exposed at the opposite end. Further, the release of the hooks is automatically effected by the exit of the car from the danger section of track. We therefore dispense with all need of an attendant in connection with the operation of our danger signal device, and the construction thereof is so simple that it can readily be adapted for use with electric railway lines as they are at present constructed, and it is so inexpensive that it can easily be provided by electric railways at all possible danger points without becoming a financial burden.

Having described our invention what we claim as new and desire to secure by Letters Patent is:

1. An electric railway signal comprising a pivoted indicating device, a disk rotatable therewith, a hook member depending from said disk formed of harder material in its lower portion, a second hook member pivotally mounted and overbalanced, electric means for engaging said hook members, and electric means for disengaging said hook members.

2. An electric railway signal comprising a pivoted indicating device, a disk rotatable therewith, a flexible element adapted to be wound upon said disk, a hook member depending from said flexible element formed of softer material in its upper portion and harder material in its lower portion, a second hook member pivotally mounted and overbalanced, said hook members adapted to be engaged and disengaged by electric means under the control of a moving car.

3. An electric railway signal comprising a shaft rotatably mounted, an overbalanced indicating device mounted on said shaft, a disk carried by said shaft, a flexible member secured to said disk and adapted to be wound thereon, a hook member suspended from said flexible member and adapted to be elevated by rotation of said disk and to be lowered by electric means, a second hook member pivotally mounted and overbalanced adapted to maintain said signal in its indicating position, and electric means adapted to disengage said

hook members to permit the rotation of said
signal member away from its indicating posi-
tion, all said electric means being under the
control of a moving car, and adapted to raise
5 the indicating device to its signal position
when the car is at one point and to release
said indicating device when the car passes a
second point.

In testimony whereof we affix our signa-
tures in presence of two witnesses.

FREDERIC M. HILL.
WILLIAM C. DAVIS.

Witnesses:

GEO. W. RIGHTMIRE,
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