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B. D. WHITCOMB.

AUTOMATIC OVERHEAD TROLLEY CONTACT DEVICE FOR OPERATING ELECTRIC SIGNALS.

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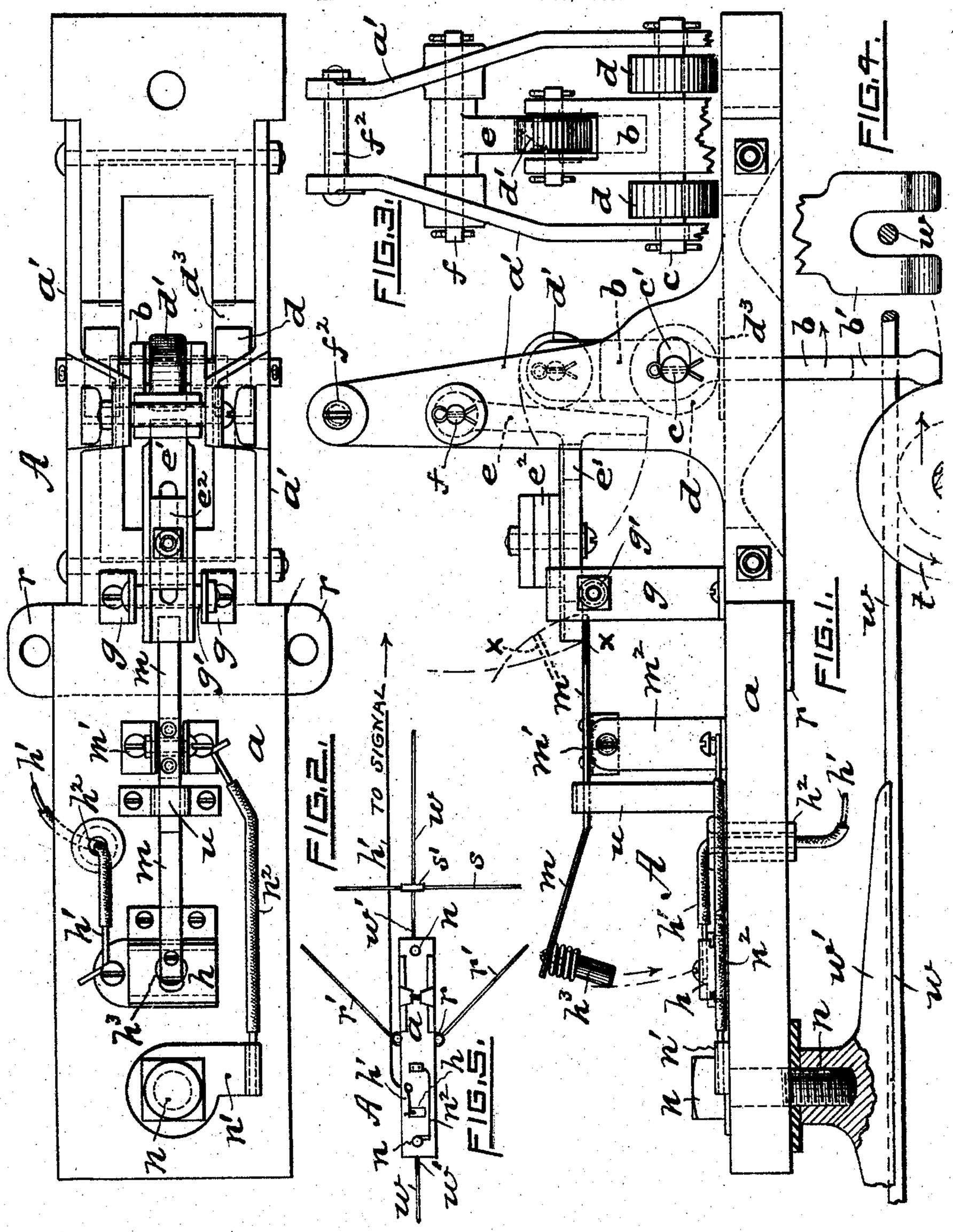

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AUTOMATIC OVERHEAD-TROLLEY CONTACT DEVICE FOR OPERATING ELECTRIC SIGNALS.

No. 815,499. Specification of Letters Patent. Patented March 20, 1906.

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To all whom it may concern:

Be it known that I, BEECHER D. WHITCOMB, a citizen of the United States of America, and a resident of Shawomet Beach, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Automatic Overhead-Trolley Contact Devices for Operating Electric Signals, of which the following is a specification.

My invention relates more particularly to devices adapted to be used for operating signals on overhead-trolley railroad systems; and it consists, essentially, of a stationary contact device located above and secured to the main or live trolley-wire, having a normally open switch or fixed contact electrically connected with the semaphore or signal proper, a continuously-energized self-dropping contact member, and self-setting mechanism for maintaining said contact member in the normally elevated or open position, constructed and arranged whereby upon the engagement of the trolley-wheel or other suitable means mounted on the traveling car with said self-setting mechanism the contact member is released, thereby instantly and automatically closing the said fixed contact and setting the distant signal, the several parts automatically returning to the normal position after the passage of the trolley-wheel.

I am aware that automatic signaling devices for electrically-propelled cars have been produced prior to my present invention. Such former apparatus or mechanisms were quite complicated, expensive to manufacture, and liable to get out of order or become accidentally inoperative.

The object I have in view is to produce a signal-operating device possessing a greater degree of simplicity and efficiency, the same being thoroughly automatic in its action, while at the same time being capable of successfully withstanding any changes or variations in climate, weather, &c., and also being comparatively inexpensive to manufacture.

In the accompanying sheet of drawings, Figure 1 is a side elevation of a signal-operating device embodying my improvement, the several parts being represented in the normal position substantially as in use. Fig. 2 is a corresponding plan view. Fig. 3 is a partial end elevation. Fig. 4 is a side view of the lower portion of the main operating-arm; and Fig. 5 is a plan view, in reduced scale, showing a manner of securing and supporting the device as in use.

In my improved automatic overhead-contact signal-operating device A for electric-railway systems the base a thereof, preferably made of wood, has secured thereto a pair of oppositely-disposed side uprights a' a', of metal. The swinging main operating-arm b extends centrally downwardly through the base, its lower portion b' being made comparatively wide and also being slotted or bifurcated to freely receive the live trolley-wire w. (See Fig. 4.) The said arm is loosely mounted on an axle c, passing freely through elongated openings c', formed in said uprights a'. A freely-turning roll d, resting on a metal plate d^3, is also mounted on said axle intermediate the upright and the corresponding end of the hub of the arm. In the upper end of the latter is mounted a small freely-turning roll or wheel d'.

At a point above and in advance of the top of said arm member is fulcrumed at f a secondary or complementary lever e, having a forward horizontal extension e', to which a weight e^2 is adjustably secured. The back of said lever is in continuous normal frictional engagement with the roll d' of arm b, as clearly represented in Fig. 1.

A pair of short uprights or brackets g are secured to the base a, the same being provided near its upper end with a transverse tie g', arranged to form a support for the forward end of said lever's extension e'.

At or near the front end of the base is mounted a fixed conductor member h of an electric switch, the branch wire h', leading therefrom through the porcelain bushing h^2, being adapted to connect in any well-known manner with a suitable signal device or semaphore located at a distance from the signal-operating device or apparatus A.

In order to close the normally open fixed contact h, thereby energizing the signal-circuit and rendering the signal visible or operative, I provide a swinging or tilting contact-arm or conductor m, the same being fulcrumed at m' in conducting brackets or supports m^2. The tail end of this arm bears against the under side of said extension e', thereby when in normal action keeping the weighted opposite

end h^3 of the contact-arm disconnected from the pole or fixed contact h. In practice I prefer to keep the members or parts m, m', m^2, and h^3 continuously energized by the main or power current of the system. This may be effected by the passage of the current through the following-named parts—viz., the ear or supporter w', soldered to the trolley-wire w, the holding-down bolt n, tapped into the ear, a conducting-washer n', engaging the head of the bolt, and the short wire n^2, secured to the washer and clamped to the bracket m^2.

The signal-operating device A may, as just stated, be rigidly bolted to ears w', soldered to the power-wire, and at the same time be guided laterally by means of wire guys r', attached to a projecting bracket or plate r, secured to the under side of the base a, (see Fig. 5,) the other end of the guys adapted to be fastened to an overhead transversely-arranged supporting span-wire s, the latter being suitably anchored and having a hanger s' fastened thereto, in turn supporting the trolley-wire, substantially as usual. As thus mounted the device A possesses sufficient stability at all times.

Assuming now my improved signal-operating device to be constructed, connected, and mounted substantially as shown and as herein described, the manner of its operation is as follows: The advancing car being provided with a suitably-mounted trolley-wheel t causes the latter to strike the lower portion b' of arm b, thereby swinging the latter rearwardly, its movement at the same time swinging the weighted lever e upwardly by means of the roll d' in the upper end of said arm. Simultaneously with said action of the lever e the continuously-energized contact arm or lever m is released therefrom, the weighted free end h^3 thereof quickly tilting it downwardly until arrested by the contact-plate h of the switch, the result being to close the signal-circuit—that is, the electric current then flowing through the members m, h^3, h, and h' being utilized to actuate a distant signal in any suitable or well-known manner. Immediately following the passage of the trolley-wheel the swinging members b and e return to the normal position again by gravity, the extension e' in its descent engaging the rear end of the contact-lever m, thereby, too, returning the latter to its normal position, thus automatically opening the switch or breaking the signal-circuit. The device remains thus set or positioned until again brought into action by the succeeding trolley-wheel.

I would state that a force equal to a fraction of a pound against the lower end of the operating-arm b is sufficient to properly actuate the device.

The frames a' are united at the top by a cross-tie f^2. This also serves as a stop for limiting the upward movement of the lever e, the bolt or rod g' serving a like purpose for limiting its downward movement. A fixed stop u is used to prevent the arm m from vibrating too far by the force or action of the falling lever e. The latter may be readily increased or diminished in weight by means of the adjustable weights e^2. I prefer to elongate the bearings c' of the axle c, thus lessening the impact of the blow upon the operating-arm when being engaged by the trolley-wheel. If desired, the tail end of the contact member m may be insulated or non-conducting, as indicated at x, Fig. 1.

Among other advantages possessed by my improved signal-operating device are the following: No springs or dash-pots are employed, the several movable members return to the normal or self-set position by gravity, the work is accomplished with a comparatively small degree of friction, and there is no arcing between the trolley-wheel and arm b. It may be added that it is obvious the device should be suitably housed when in service.

In the case of a single-track railway on which the cars are propelled in both directions the device A may be successfully employed. On such a road, however, they should be reversely arranged on the trolley-wire with respect to the direction of travel of the car. In any event the device remains inoperative or practically normal whenever the arm b is engaged by the trolley-wheel of a car moving in the opposite direction from that indicated in the drawings. In such case the arm, being located in the path of the trolley, is simply swung on its axis away from the lever e and automatically returns to its vertical or normal position after the wheel has passed thereunder.

I claim as my invention and desire to secure by United States Letters Patent—

1. In an automatic overhead-trolley contact device for operating electric signals, the combination with a normally non-energized or open fixed contact adapted to be connected with a signal located at a distance, of an electrically-energized self-closing movable contact member, self-setting holding means coöperating with said movable contact member for keeping the latter normally disengaged from said fixed contact, and a trolley wheel or member movable with an electrically-propelled car, arranged whereby the said movable contact member is released and the signal-circuit thereby energized or closed upon the engagement of the trolley-wheel with said holding means.

2. In a device of the character described, the combination of a tilting self-dropping contact-lever m adapted to be continuously energized, a suitably-connected normally open fixed contact arranged to be made operative by the engagement therewith of said contact-lever, a swinging weighted member e for keeping said lever normally disengaged

from the fixed contact, and an operating-arm *b* in engagement with and arranged to actuate said member *e* to release the contact-lever, the lower portion of the arm *b* when in use being located in the path of and adapted to be engaged by the trolley-wheel of an electric car, substantially as described.

3. In a device of the character described, the combination with the base of the device and side frames provided with oppositely-disposed elongated bearings, of an axle journaled in said bearings, rolls mounted on the axle and supported by said base, and an operating-arm also mounted on said axle and extending downwardly through the base to freely receive a trolley-wire, substantially as described.

4. In a device of the character described, the combination with the suitably-mounted self-dropping coöperating levers or members, *b* and *e*, adapted to be actuated by the trolley-wheel of an electrically-propelled car, of an electrically-energized tilting contact-arm *m* arranged to be kept normally elevated by said member *e*, and a fixed contact adapted to be connected with a signal device made automatically operative by means of the current passing through the said fixed contact from said arm *m* when the latter is released from the member *e*, substantially as described.

5. In a device of the character described, the combination of a swinging continuously-energized or live contact member *m*, a normally inactive fixed contact and connection arranged to conduct an electric current to a signal device, and means for keeping said member *m* normally disengaged from said fixed contact, constructed and arranged whereby when in use upon releasing the member *m* it automatically engages and energizes said fixed contact member and connection, for the purpose hereinbefore set forth.

6. In a device of the character described, having a fixed contact adapted to be connected with a signal device, and a movable contact member *m* capable of being continuously energized, the combination therewith of self-setting holding means in normal engagement with the said movable contact member, arranged whereby the latter is adapted to automatically engage and energize the fixed contact member upon being released from said holding means.

7. In a device of the character described, the combination of a normally non-energized fixed contact, an electrically-charged movable contact member, means for holding said movable member normally disengaged from the fixed one, and a trolley-wheel adapted when traveling in one direction to engage and actuate said holding means thereby releasing the said movable contact member to engage and energize the fixed member; said holding means remaining inoperative or idle when the wheel is traveling in the reverse or opposite direction, substantially as described.

8. In a device of the character described, provided with a fixed contact capable of being energized, a movable contact member, and a holding device arranged to keep said movable contact member normally disengaged from the fixed member, in combination with an electrically-charged trolley-wire supporting the above-named parts and at the same time energizing said movable contact member, a conductor *h'* connected with said fixed contact adapted to be connected with a signal device, and a traveling trolley-wheel adapted to engage and actuate said holding device thereby freeing the movable contact member, the latter automatically dropping onto and energizing said fellow or fixed contact member and the conductor *h'*, substantially as described.

Signed at Providence, Rhode Island, this 17th day of November, 1905.

BEECHER D. WHITCOMB.

Witnesses:
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