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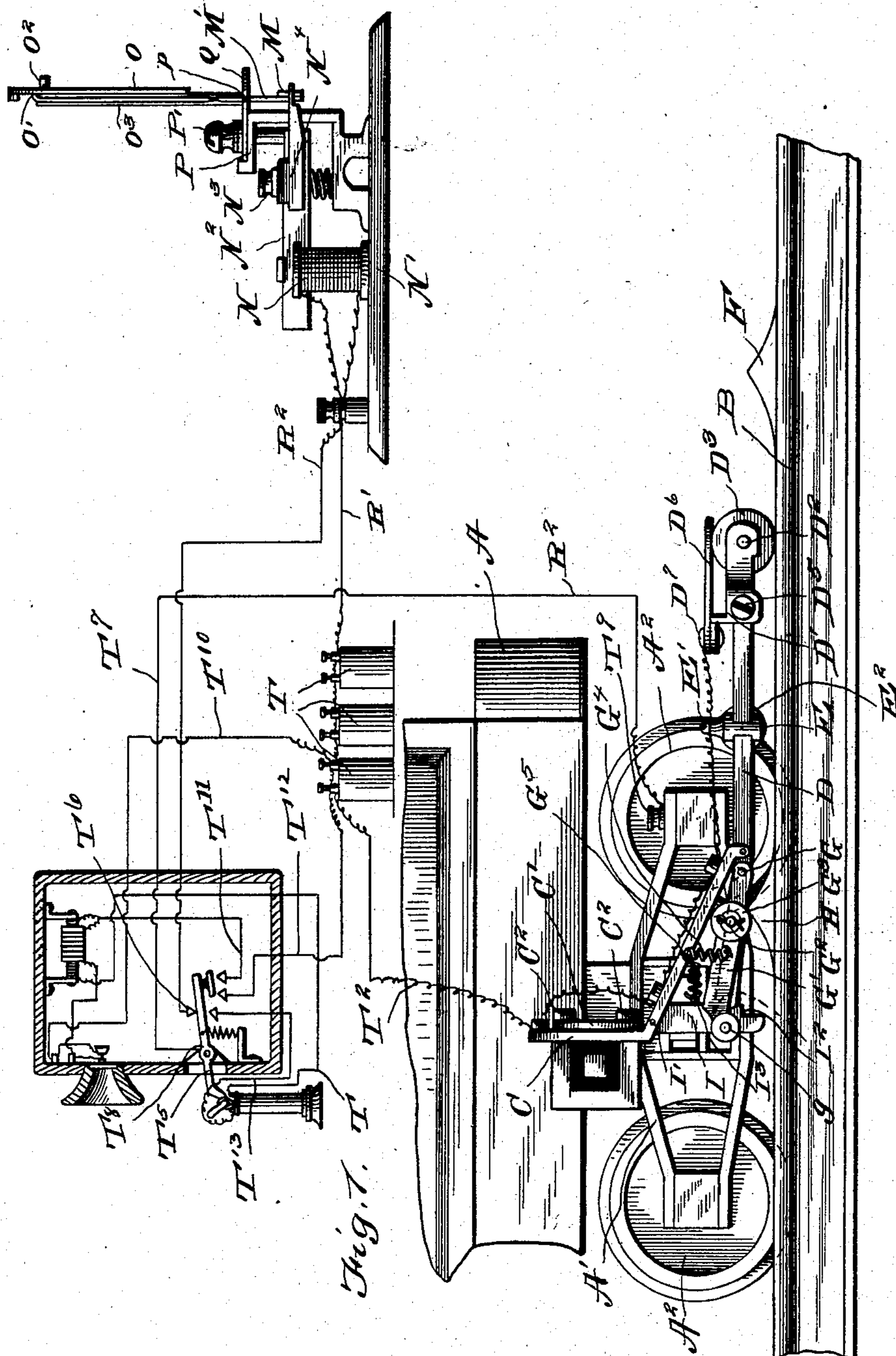
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RAILWAY SIGNALING APPARATUS.

APPLICATION FILED AUG. 1, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

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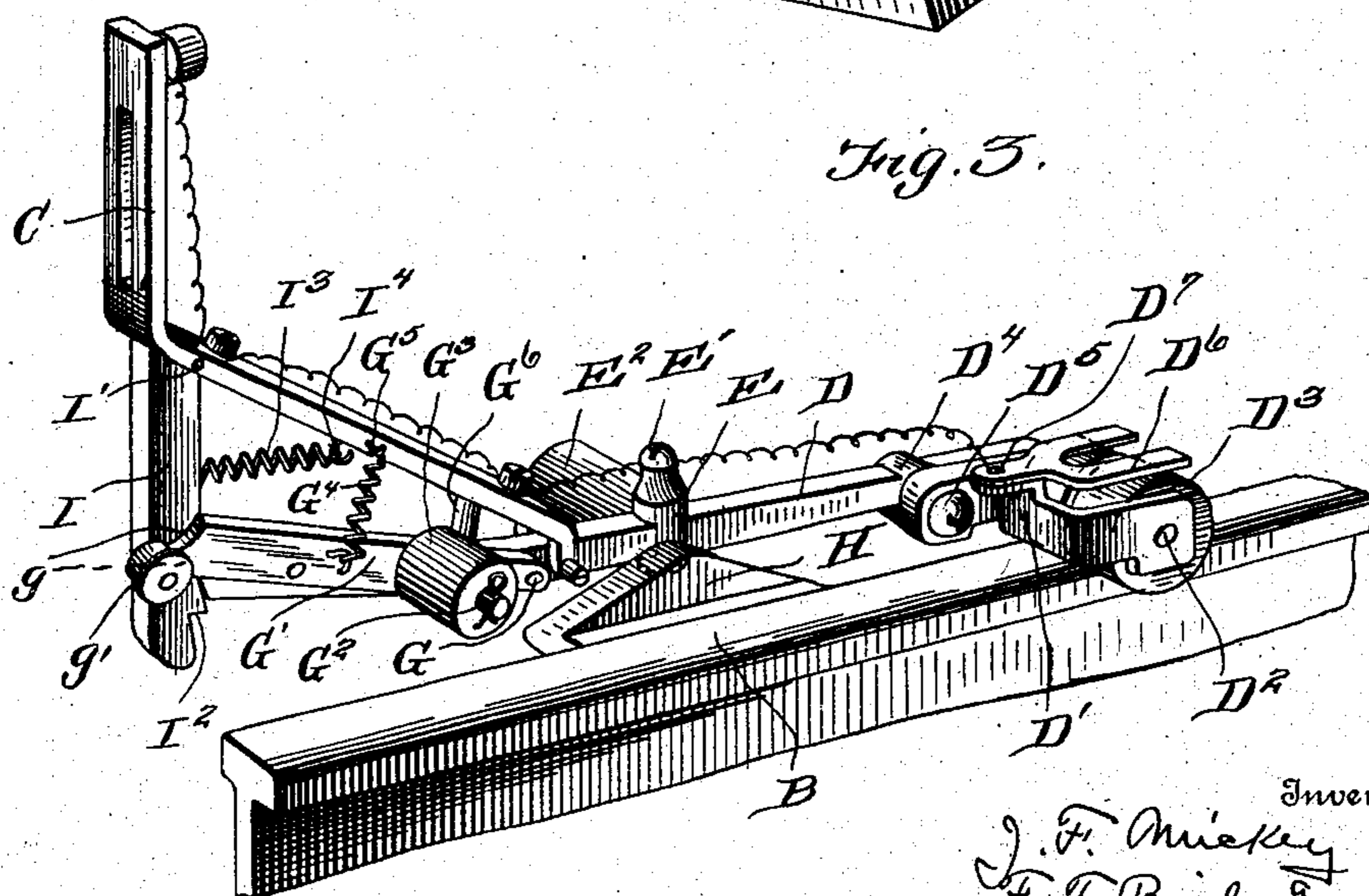
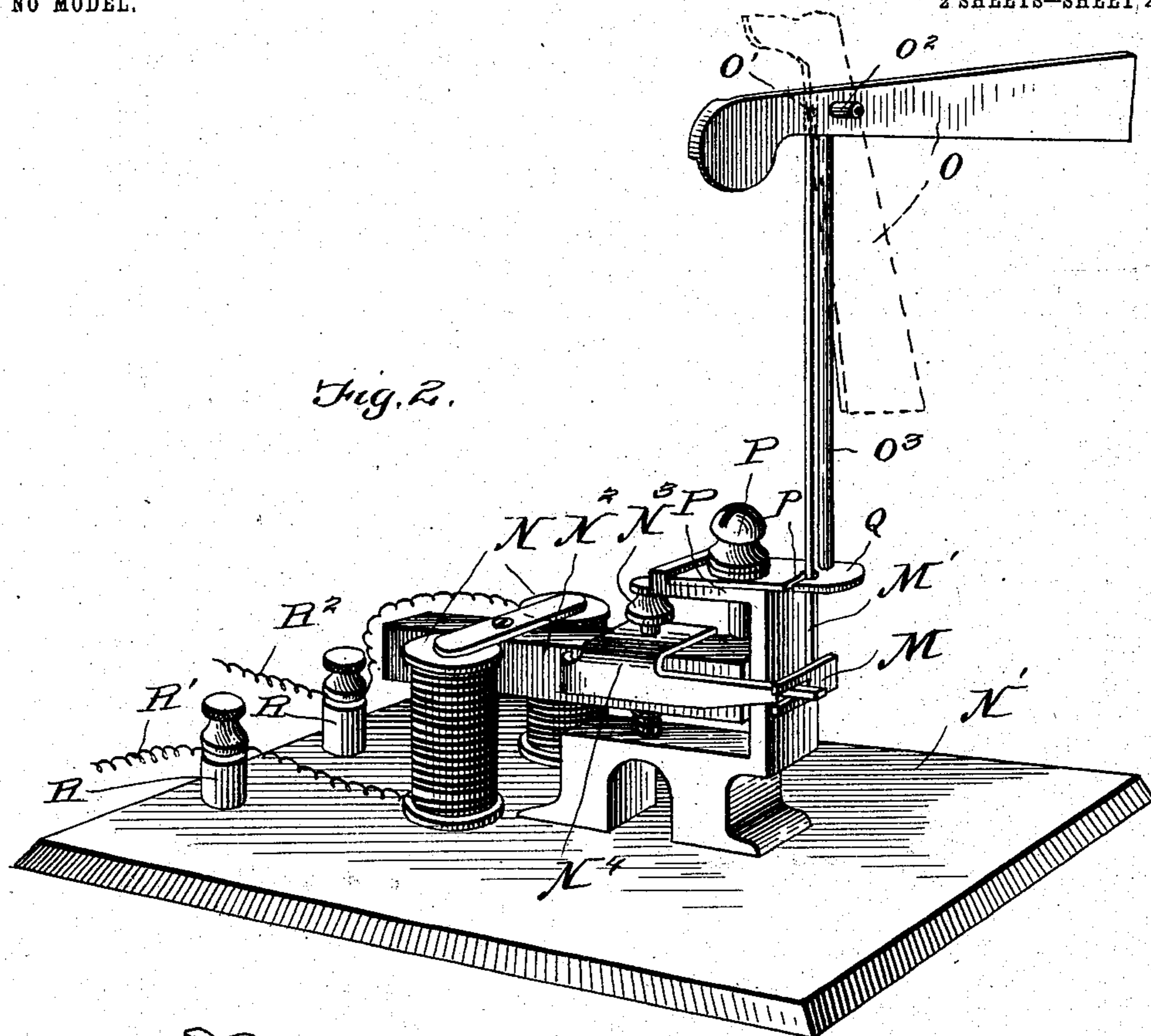
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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RAILWAY SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 749,939, dated January 19, 1904.

Application filed August 1, 1903. Serial No. 167,919. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. MICKEY, FRANK T. BAILEY, and JOSEPH J. NOPPENBERGER, citizens of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Railway Signaling Apparatus; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in signaling apparatus for trains, whereby the proximity of the same while traveling in one direction or another and on the same block may be readily signaled to the engineers in the cabs of the two trains, the circuit being closed, rendering the apparatus operative when trains equipped with our improved apparatus are upon the same block, also affording means for telephoning between the two trains.

The invention consists, further, in the provision of signaling apparatus adapted for use in connection with third rails, comprising means for throwing the conductor-arm out of engagement with a third rail when coming to switches, crossovers, stations, &c., and automatically returning the conductor to electrical contact with the third rail after passing the same.

The invention comprises, further, various details of construction and combinations and arrangement of parts, which will be hereinafter fully described and then specifically defined in the appended claims.

Our invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this application, and in which—

Figure 1 is a side elevation of a portion of the truck of a car and signaling apparatus shown in elevation in connection with a battery. Fig. 2 is a perspective view of the signaling-arm and electromagnet for actuating the same, and Fig. 3 is a perspective view of

the automatically-operated trolley-arm carrying a contact-roller adapted to rest against a third-rail conductor.

Reference now being had to the details of the drawings by letter, A designates the platform of a car mounted upon a truck A', having journaled in suitable bearings therein axles carrying wheels A².

B designates a third rail positioned at any location with reference to the main tracks of the railway, and mounted upon and suitably insulated from the truck is a bar C, being clamped and adjustably mounted upon the truck by means of a plate C', which in the drawings is shown as held to the truck by means of screws C². To the forward end of said bar is pivoted a trolley-arm D, carrying at its forward end a bracket D', having a shaft D² mounted therein, on which a metallic roller D³ is journaled, said roller adapted to travel upon the third rail B. The bracket member D' is mounted upon a collar D⁴ (shown clearly in Fig. 3 of the drawings) and is held to the arms by means of a screw D⁵, from which it is suitably insulated. An insulated brush D⁶ is mounted upon the bracket-arm, being held thereto by means of a screw D⁷, and mounted upon a stub-shaft carried by a collar E, which is held to the trolley-arm by means of a screw E', is an antifriction-roller E², which is provided for the purpose of contact with the raised portions F upon the third-rail conductor when it is desired to raise the contact-roller D³ from engagement with the third rail.

Pivotally connected to the trolley-arm D at G is a link G', carrying a stub-shaft G², on which is journaled an antifriction-roller G³, the latter being adapted to contact with a raised portion H along the marginal edge of the third rail for the purpose of throwing the contact-roller back into contact with the third rail after the contact-roller has been raised by the roller E². A link I is pivoted at its upper end at I' in a recess near the angled portion of the bar C and has notches I² on its forward edge adjacent to its lower end, and a spring I³ is secured at one end to said link I and its other end to a hook I⁴, carried by the inclined portion of the bar C, and is adapted

to hold the link I normally in the position shown in Fig. 3 of the drawings, in which position one or the other of the notches will engage with the inclined end of the trolley-arm D to hold the contact-roller D³ at its forward end either in contact with or out of contact with the third rail. The link G' has a spring G⁴ connected thereto, the other end of said spring being connected to a hook G⁵ on the edge of the bar C. It will be observed that the free end of the link G' has a double taper, as at g, and is adapted to contact with the circumferences of a flanged antifriction-roller g', as shown clearly in Fig. 3 of the drawings, the flange of said roller being provided to guide the link upon the circumference of the antifriction-roller. The function of the link G' is to throw the link I out of engagement with the rear end of the trolley-arm D when a projection H on the third rail comes in contact with the antifriction-roller G³ for the purpose of returning the contact-roller D³ to the third rail. As the roller G³ comes in contact with the projection H the link G' is raised, and the upper tapering portion g contacts with the circumference of the antifriction-roller g' and forces the link I backward, and the spring G⁴ will return the link G' to its normal position, (shown in Fig. 3 of the drawings,) the contact-roller D³ falling by gravity to the third rail when the rear end of the trolley-arm is released from the notch in the link I. In order to limit the upper throw of the rear end of the trolley-arm, a lug G⁶ is provided, which is carried by the bar C and serves as a stop to the trolley-arm when thrown in one direction.

N designates an electromagnet which is mounted upon a plate N', which may be positioned in the cab of an engine, and N² designates an armature through which a thumb-screw N³ passes, the head of which is adapted to clamp an angled plate N⁴ thereto, as shown in Fig. 2 of the drawings. Said angled plate has a slot therein to receive the shank portion of said screw N³ and adjustably held by said screw to the armature, while one end, which is contracted, is positioned in the slot of a plate M, fastened to the rod M', the other end of which rod is pivotally connected to the signal-indicating arm O at O'. Said arm O is pivotally mounted upon a pin O², carried by the rod O³, which rises from the plate Q, which latter is held to the sounder-frame P by means of a screw P'. A slot p is formed in one end of the plate P and has its inner marginal end enlarged and through which enlarged portion the rod M' has a play. The diameter of the rod M' is larger than the width of the aperture of the slot p, thus necessitating the contracting of a portion of the rod M' for the insertion of said rod into the enlarged end of the slot. By the construction illustrated it will be observed that as the armature is drawn to and recedes from the magnet

as its circuit is closed and broken the contracted end of the angled plate N⁴ will cause the plate M to rise and lower, which through the connections between said plate M and the danger-signal O will cause the latter to lower to a perpendicular position or be held horizontally, as shown in the drawings.

Binding-posts R rising from the plate N' are connected by wires with the electromagnet, and a wire R' connects one of the binding-posts with the batteries, which in turn are electrically connected through the wire T² with the brush D⁶, which travels upon the wheel D³, adapted to contact with the third rail. Said binding-posts have connected thereto a wire R², which is electrically in contact with the receiver-hook T⁵ at the point T⁶ when the receiver is hanging upon the same, and a wire T⁷ is connected to the hook T⁵ at the point indicated by reference-letter T⁸, said wire T⁷ being connected, as shown clearly in the drawings, with the binding-post T⁹ adjacent to and in contact with one of the car-wheels on the truck for grounding the wire.

The current will be traced as follows: When two engines equipped with apparatus are upon the same block, with apparatus of opposite polarity: from the third rail through the trolley-wheel D³ to the brush in contact therewith, from the brush through the insulated wire T² to the batteries, from the batteries through the electromagnet, energizing the same and causing the signal to be displayed, from one of the binding-posts R through the wire R², which is in contact with the receiver-hook when the receiver is hanging upon the same, through the receiver-hook and through the wire T⁷, electrically connected with said hook, from the wire T⁷ through the wheel of the truck and ground. When it is desired to utilize the telephone, as the receiver is raised from the hook the circuit is cut off from the electromagnet, throwing out of use the signal, and telephonic communication may be had through the wire T², electrically connected to the trolley-wheel, through the batteries, through the wire T¹⁰ to the transmitter and receiver, through the wire T¹¹, which is thrown electrically in contact with the wire T¹² as the receiver-hook tilts down, which will throw the receiver electrically in communication with the trolley through the wires T¹³ and T¹⁴ and wire T².

The operation of our apparatus is as follows: The rails being laid off in block system with the third rail, through which connection may be had electrically throughout the block, two engines similarly equipped with our improved apparatus when traveling on the same block will have their contact-rollers running along the third rail, which through the electrical connections described will form a circuit from one train to another. When a contact-roller comes against one of the projecting lugs F upon the rail, the end of the trolley-arm will

be raised, so that the contact-roller will be free from the third rail. As the trolley-arm tilts the link I will be thrown rearward, and after the rear end of the trolley-arm frees the notch by which it is held in the position shown in Fig. 3 before being tilted the spring I³ will return the link I, so that the tapering end of the trolley-arm will engage the notch adjacent to the end of the link I and hold the contact-roller D³ in suspension. When it is desired to throw the trolley-arm back to its normal third-rail-engaging position, the roller G³ contacts with the raised portion H upon the rail, which will cause the link G' to be raised, in which movement the antifriction-roller g', carried by the link I, will throw the latter rearward, and the rear end of the trolley-arm will raise by its opposite end tilting down by gravity again upon the third rail, and the contact is resumed. This expedient is provided for the purpose of allowing the contact to be broken at switches, crossings, stations, &c., as may be desired. When two trains equipped with our improved apparatus are upon the same block and the contact-rollers of each engine are upon the third rail, the circuit will be closed and the danger-signal thrown to a horizontal position. When the trains are in these relative positions, should the engineers or other persons on the trains desire to communicate between the trains the telephone may be utilized, in which case the signal is thrown out of service.

Our improved apparatus may be used for an open-circuit telephone and block system or as a complete closed block system with the danger-signal in the cab of the engine and constantly before the engineer.

While we have shown a particular form of apparatus embodying the features of our invention, it will be understood that we may make alterations in the detailed construction of the same without departing from the spirit of the invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A signaling apparatus for third-rail block systems, comprising a trolley-arm, a contact-roller mounted thereon, a brush connected to said roller, a danger-signal, electrical connections between the same and said brush, an antifriction-roller carried by the trolley-arm, a rail and a projection thereon adapted to contact with said roller to raise the trolley-arm, means for holding the trolley-arm raised, and mechanism for releasing the trolley-arm and allowing the same to fall by gravity so that the contact-roller carried thereby will engage the third rail, as set forth.

2. A signaling apparatus for third-rail block systems, comprising a tilting trolley-arm adapted to be connected to a truck, a contact-roller carried by said arm, a brush in contact with said roller, a danger-signal, electrical

connections between the same and said brush, an antifriction-roller carried by the trolley-arm, a rail with projections thereon against which an antifriction-roller is adapted to contact to raise the trolley-arm so that the contact-roller thereon will be out of engagement with the third rail, a spring-actuated link adapted to hold the trolley-arm in an adjusted position, and means for releasing said trolley-arm to allow the contact-roller to engage the third rail, as set forth.

3. A signaling apparatus for third-rail block systems, comprising a pivoted trolley-arm mounted on a truck, a contact-roller carried by said trolley-arm, a brush in contact with said roller, a danger-signal, electrical connections between the same and the brush, an antifriction-roller carried by the trolley-arm, a rail with projections thereon against which said antifriction-roller is adapted to contact to raise the trolley-arm so that the contact-roller thereon will be out of electrical connection with the third rail, a pivoted spring-actuated link having notches therein adapted to engage and hold the trolley-arm in an adjusted position, and means for tilting said spring-actuated link to allow the trolley-arm to lower so that its contact-roller will engage the third rail, as set forth.

4. An electrical signaling apparatus for third-rail block systems, comprising a pivoted trolley-arm connected to a truck, a contact-roller carried by said arm, a brush in contact with said roller, a danger-signal and electrical connections between the same and said brush, an antifriction-roller, a rail with projections thereon against which said antifriction-roller is adapted to contact to raise the trolley-arm so that its contact-roller will be out of electrical connection with the third rail, a spring-actuated link having notches therein, a second link pivoted to the trolley-arm, and an antifriction-roller carried by said second link, which latter is adapted to throw the notched link out of engagement with the trolley-arm, and means for actuating said roller-carrying link, as set forth.

5. An electrical danger-signaling apparatus for third-rail systems, comprising in combination with a truck, a bar secured thereto, a trolley-arm pivotally connected to said bar, a contact-roller carried by the trolley-arm, a brush in engagement with said contact-roller, a danger-signal and electrical connections between the same and said contact-roller, a rail with projections thereon, an antifriction-roller carried by the trolley-arm and adapted to engage said projections to raise the contact-roller from the third rail, a spring-actuated notched link pivotally connected to said bar and engaged by the end of the trolley-arm, a roller-carrying link pivoted to the trolley-arm, the roller on said link adapted to engage projections on said rail, whereby the roller-carrying link may actuate said notched link to release

the end of the trolley-arm therefrom to allow the contact-roller to fall by gravity against a third rail, as set forth.

6. A railway danger-signaling apparatus for third-rail systems, comprising in combination with a truck, a bar secured thereto, a pivoted trolley-arm mounted upon said bar, a contact-roller carried by the arm, a brush in contact with said roller, a danger-signal apparatus electrically connected with said brush, a notched and spring-actuated link pivoted to said bar, an antifriction-roller carried by said link, a spring-actuated roller-carrying link mounted upon the trolley-arm, and having a beveled end adapted to contact with the antifriction-roller on the notched pivoted link, an antifriction-roller upon the trolley-arm, a rail with projections thereon adapted to contact with said rollers to cause the trolley-arm to be raised and released, as set forth.

7. In combination with trolley mechanism with a contact-roller thereon adapted to ride upon a third rail, an electromagnet with armature, and electrical connections between said magnet and contact-roller, an angled plate secured to said armature, a tilting signal, a rod pivotally connected at one side of the pivotal point of said tilting signal, a slotted plate secured to said rod and engaged by the contracted end of said angled plate, whereby as the circuit is closed and opened, the signal will be displayed or lowered, as set forth.

8. In combination with trolley mechanism, a contact-roller carried by the truck and adapted to engage the third rail, an electromagnet

with armature, and electrical connections between the armature and contact-roller, an angled plate secured to said armature and having a contracted end, a tilting signal, a post upon which the same is mounted, a rod pivotally connected at one end to said signal, a slotted plate secured at the lower end of said rod which is engaged by the contracted end of the angled plate, and means for guiding said rod in its longitudinal movements, as set forth.

9. In combination with the trolley mechanism, a contact-roller adapted for connection with a third rail, an electromagnet, an armature, and electrical connections between said electromagnet and the contact-roller, an angled plate adjustably held to the armature and having a contracted end, a bracket-arm, a recessed plate secured thereto, a post rising from said recessed plate, a danger-signal pivotally mounted upon said post, a rod pivotally connected to said danger-signal, a slotted plate at the lower end of the rod engaged by the contracted end of said angled plate, said rod having a contracted portion adapted to enter the contracted recess in the post-carrying plate, as set forth.

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

JOHN F. MICKEY.

FRANK T. BAILEY.

JOSEPH J. NOPPENBERGER.

Witnesses:

GEORGE W. BAILEY,

DANL. BRIDE.