No. 843,182. PATENTED FEB. 5, 1907.

T. W. SMALL.

CIRCUIT CLOSING MECHANISM FOR INDICATORS ON CARS.

APPLICATION FILED MAY 17, 1905.

3 SHEETS—SHEET 1.

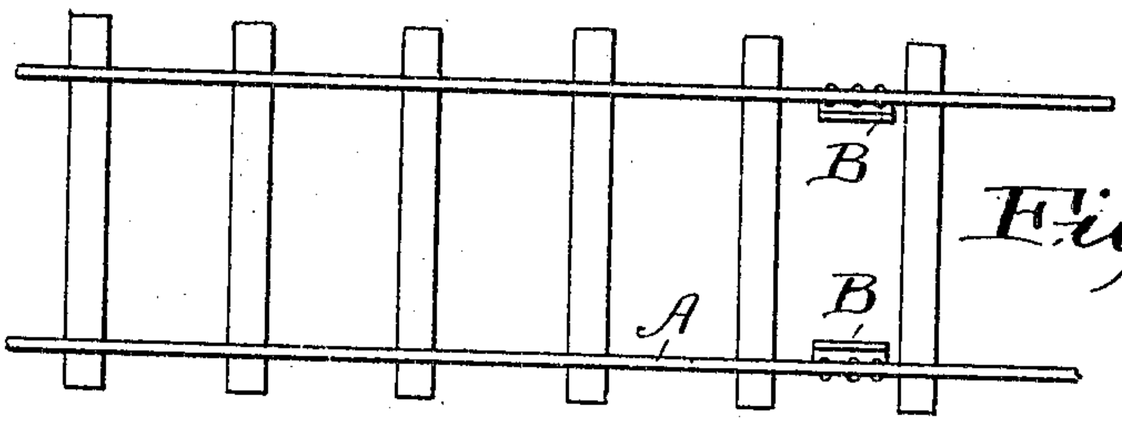

Fig. 1.

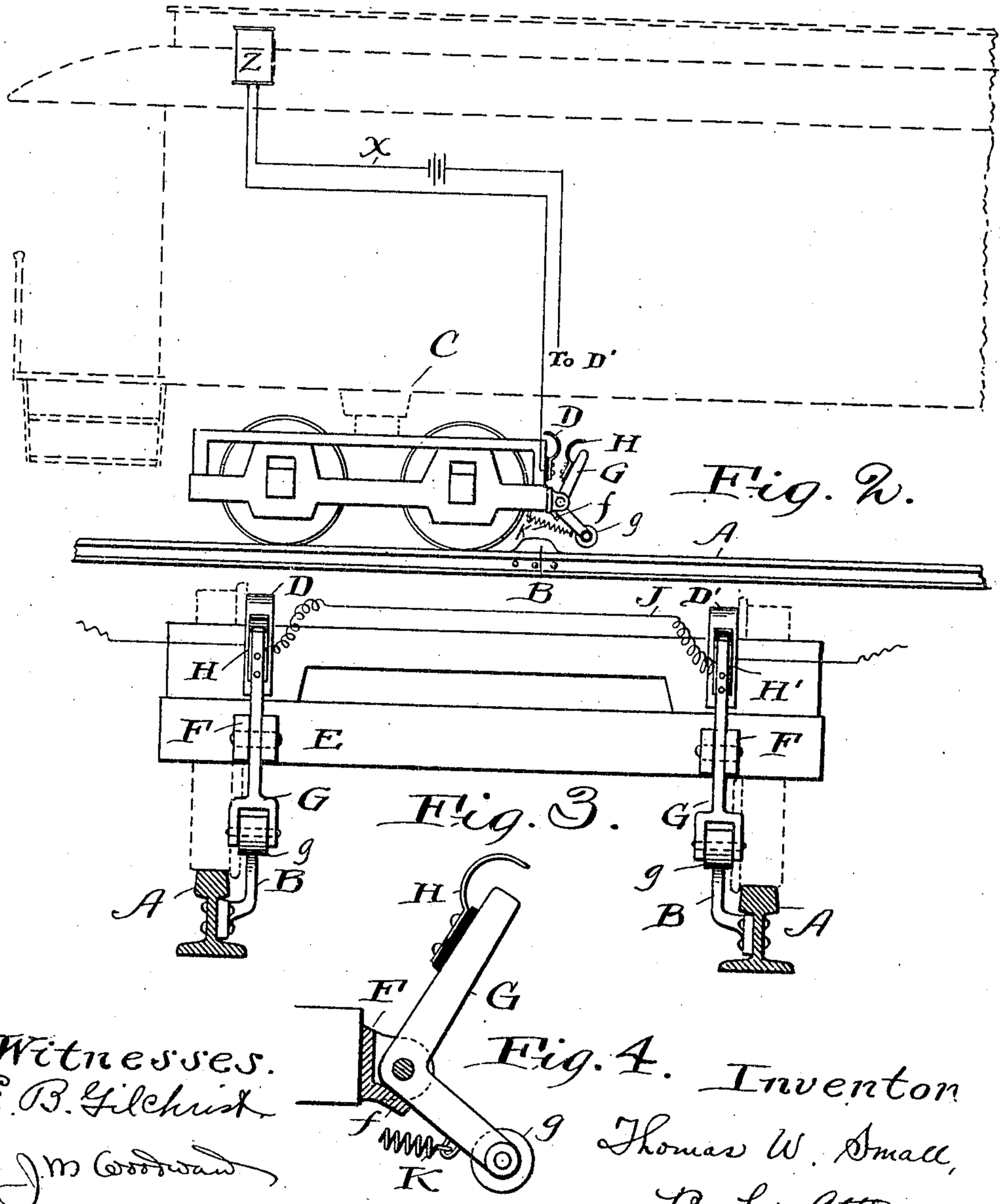

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses.
E. B. Gilchrist.
J. M. Goodwin

Inventon
Thomas W. Small,
By his Attorneys,
Thurston & Bates

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3 SHEETS—SHEET 2.

Fig. 5.

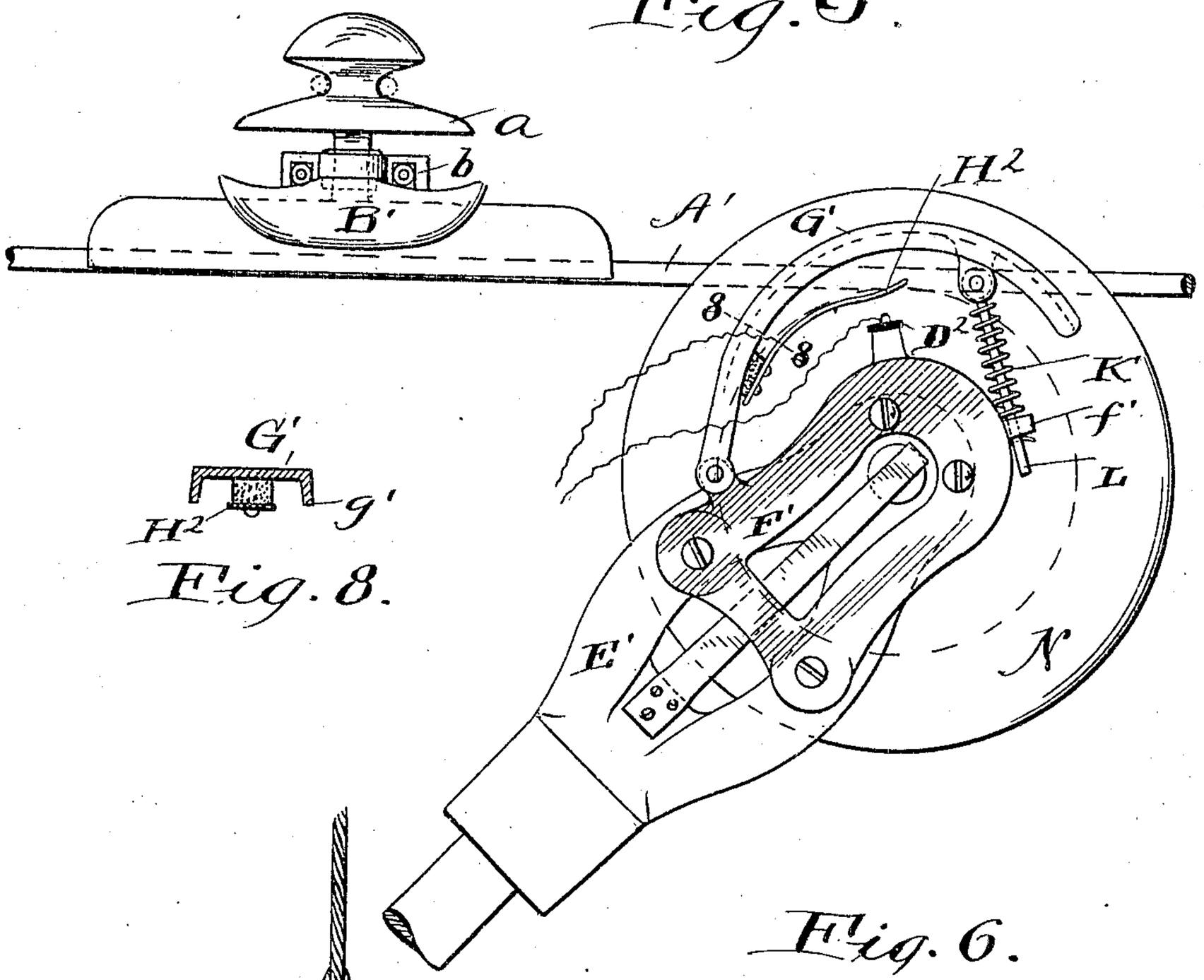
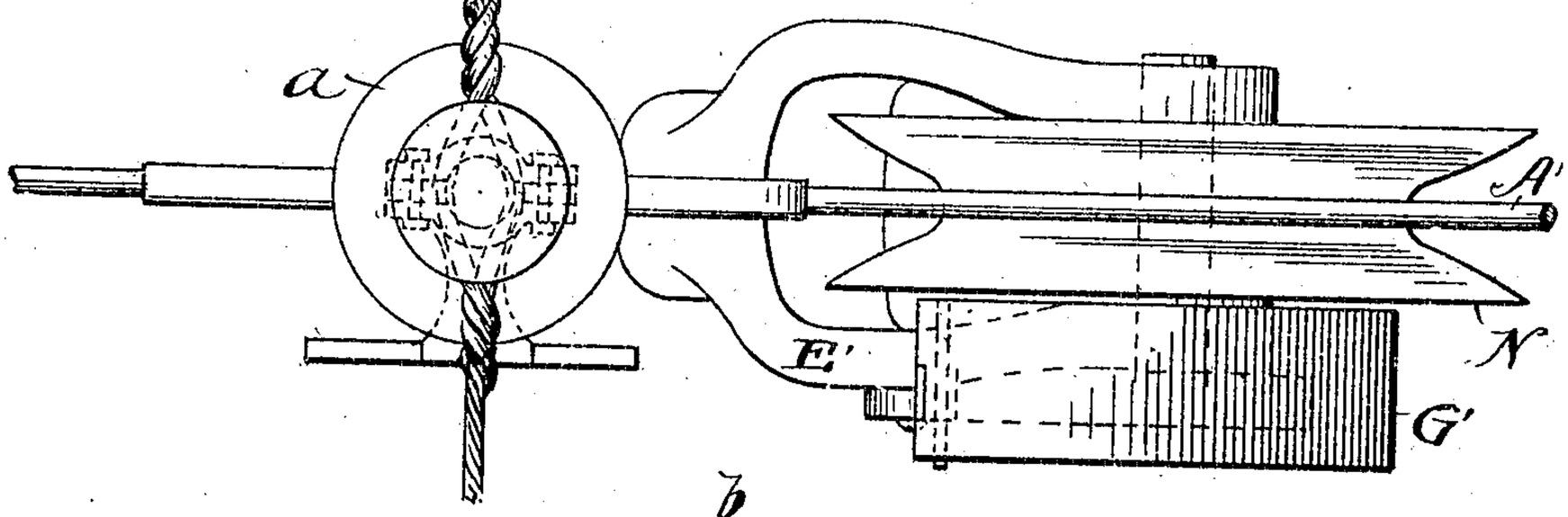


Fig. 8.

Fig. 6.



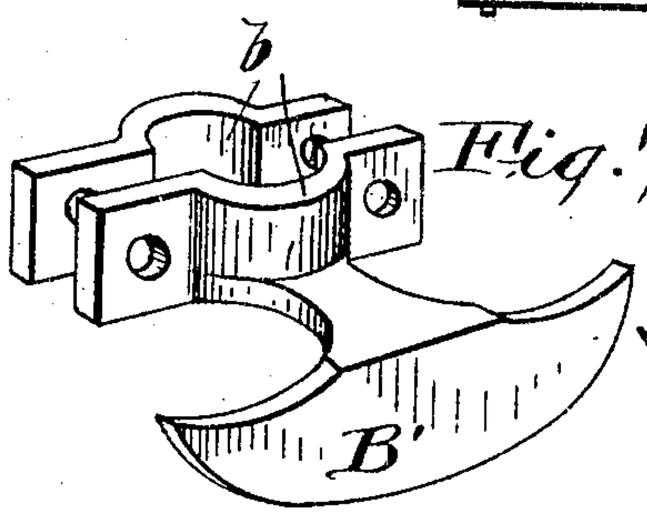


Fig. 7.

Witnesses.
E. B. Gilchrist
J. M. Woodward

Inventor
Thomas W. Small,
By his Attorneys,
Thurston & Bates

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T. W. SMALL.

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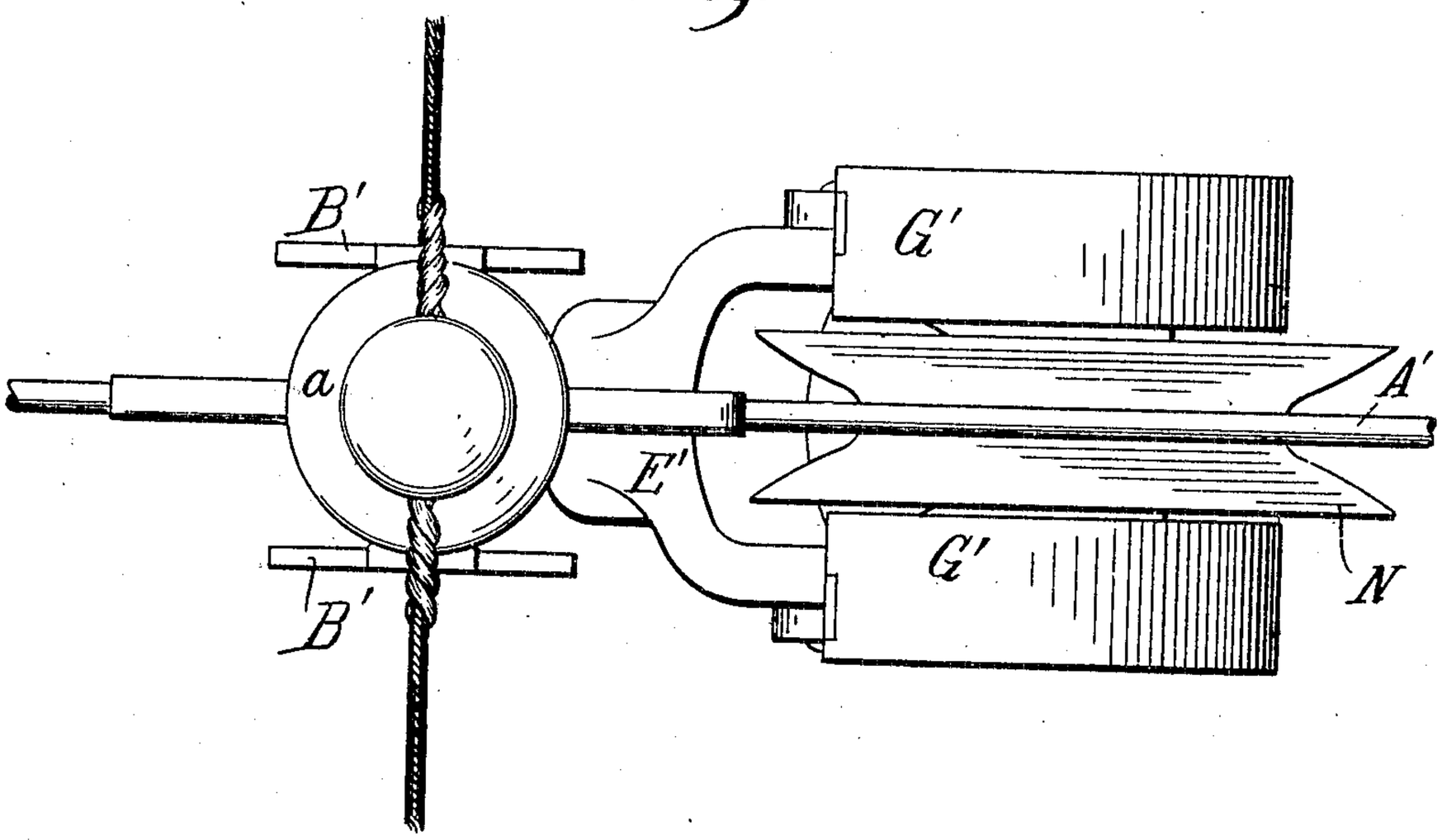
3 SHEETS—SHEET 3.

Fig. 9



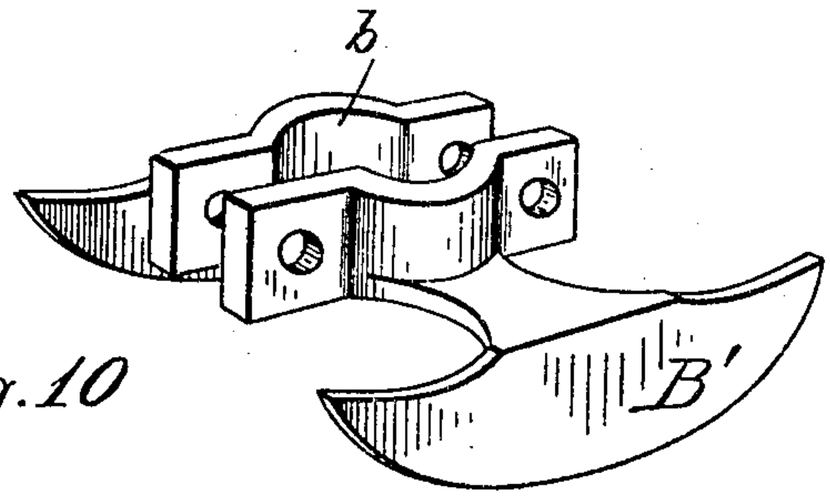


Fig. 10

Witnesses:

Brennan & West

Ludo A. Teller

Inventor,

Thomas W. Small

By his Attorneys,

Thurston & Bates

UNITED STATES PATENT OFFICE.

THOMAS W. SMALL, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ACME AUTOMATIC STREET INDICATING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

CIRCUIT-CLOSING MECHANISM FOR INDICATORS ON CARS.

No. 843,182. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed May 17, 1905. Serial No. 260,772.

To all whom it may concern:

Be it known that I, THOMAS W. SMALL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Circuit-Closing Mechanism for Indicators on Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide simple and efficient mechanism for making electric contacts to control indicating mechanism on moving vehicles.

The invention is especially provided for use with street-indicators on trolley-cars. It is adapted for cars having either a trolley-pole or an underground connection through a slot or other means of propulsion.

To this end the invention consists of a suitable projection stationarily located—as, for example, along a track or on the trolley-wire—and a pivoted arm held by a spring normally in the path of said projection and a contact carried by said arm and swung by it into engagement with another contact when said projection is encountered.

The invention is herein illustrated as applicable both as to installation along the track and one along the trolley-wire.

Figure 1 is a plan of the track having the operating projection secured to it. Fig. 2 is a side elevation of a portion of the car, showing my circuit-closer. Fig. 3 is a vertical cross-section through the rails and car shown in Fig. 2. Fig. 4 is an enlarged side elevation of the circuit-closer shown in Figs. 2 and 3. Fig. 5 is a side elevation of the circuit-closer mounted on a trolley-pole. Fig. 6 is a plan view of the same. Fig. 7 is a perspective view of the tripping device carried by the trolley-wire support. Fig. 8 is a cross-section on the line 8 8 of Fig. 5. Fig. 9 is a plan of the circuit-closer mounted on the trolley-pole when two closing mechanisms are employed. Fig. 10 is a perspective view of the tripping device in coöperation with the circuit-closer shown in Fig. 9.

The trip mounted on the trolley-wire in Figs. 5 and 6 corresponds to the trip mounted on the track in Figs. 2 and 3.

In Figs. 1, 2, and 3, A represents the track, and B the trips mounted thereon. In this case two are employed directly opposite each other. C designates the car. Mounted on the truck thereof are a pair of contact-springs D and D′, which form terminals of an electric circuit X, leading from the street-indicator Z. Secured to a cross-beam E of the truck are a pair of brackets F. Pivoted in these brackets are bell-cranks G. These bell-cranks carry at their lower ends rollers *g*, adapted to engage the trips B, carried by the rails. The upper arms of the bell-cranks carry insulated contact-springs H and H′, respectively. These two contact-springs H and H′ are connected together by a suitable conductor, (indicated by J.) These contact-springs and conductor are thus adapted to form a bridge between the two contacts D D′ and close the circuit. Springs K, secured to the arms G, normally keep them in the path of the trips B. A suitable projection *f* on the bracket F prevents the arms swinging too far under the influence of the spring K.

Two trips and two closers are provided for the projections along the track, so as to prevent a false operation if a stone or other obstruction lying adjacent to the track should operate the trip. To close the circuit with my device as above described, it is necessary to have both arms operate together, and it is improbable that two obstructions will be encountered directly opposite each other.

In Figs. 5 and 6 the trip B′ is carried by the support *a* of the trolley-wire A′. A pivoted arm G′ is mounted on the bracket F′, which is carried by the trolley-harp E′. The arm G′ carries a contact-spring H^2, which is adapted to coöperate with another contact D^2, insulatingly carried by the harp. A spring K′ operates to normally hold the arm in the path of the trip B′. This spring is shown as a coiled spring surrounding a rod L, which is pivoted to the arm G′ and passes through an ear *f*′ on the bracket F′. This ear, by reason of a pin projecting through the rod L, limits the movement of the arm G′ under the influence of the spring.

The trip B′ is shown in perspective in Fig. 7, where it will be seen it has a pair of yoke-pieces *b* by which it may be clamped in place. The arm G′ is a broad flat arm, as shown in Figs. 6 and 8, and has downturned edge flanges *g*′, so as to protect the contact-strip

H^2 from accidental contact with the trolley-wire when replacing the wheel on the wire. This arm G′ lies close enough to the trolley-wheel N so that the trolley-wire cannot accidentally pass between them.

I have shown in Fig. 6 the circuit device when applied to the trolley-harp as being mounted but on one side thereof. This is of course cheaper than to mount contacts on both sides to prevent accidental closure. Disregarding the expense, however, to mount it on both sides is better, for in that case if a trolley-wire engages either arm G when the conductor is endeavoring to replace the trolley-wheel on the wire no closing of the circuit is effected, the two terminals for the indicator-circuit leading to the two springs H^2 and the two springs D^2 being electrically connected together. This is illustrated in Figs. 9 and 10, where the trolley-harp carries two arms G, and the trip has two operating-blades B′. The electric connection of the two contacts D^2 may take place by means of the trolley-harp itself if the insulation were omitted. The example of the double-break contacts shown in Figs. 2 and 3 is deemed a sufficient illustration of the same feature when applied to the installation shown in Figs. 5 and 6.

Having thus described my invention, I claim—

1. The combination, with a vehicle adapted to move along a track, of a stationary projection, a spring-pressed member carried by a trolley-pole on the vehicle and comprising a plate adapted to stand in the path of said projection and a spring pressing it upward to be engaged by said projection, and a pair of contacts one of which is carried by said member and which are adapted to be closed when the member is moved by reason of engaging said projection.

2. The combination with a trolley-pole, a harp thereon, an arm pivoted to said harp, a contact member on the under side of said arm, a coöperating contact member carried by the harp, and a spring pressing said arm upward.

3. The combination with a trolley-pole, of a curved arm pivotally carried thereby alongside of the trolley-wheel, a contact member carried by said arm on its under side, a cooperating contact member, a bolt secured to the under side of the arm to limit its upward movement, and a spring surrounding said bolt to give the arm an upward tendency.

4. The combination with a trolley-pole carrying a trolley-wheel, of a pair of arms pivoted to the trolley-harp on opposite sides of the wheel, circuit-closing devices carried by said arms, and a double trip adapted to depress the two arms.

5. The combination with a trolley-pole, of a wheel carried thereby, a pivoted arm carried by the pole alongside of the wheel, a contact device on the under side of said arm, a blade carried alongside of the trolley-wire and having an under surface which said arm may engage and by which it may be depressed.

6. The combination with a trip having a blade B′ carried parallel with the trolley-wire but insulated from it, of a trolley-pole having a harp carrying a wheel and a curved wide arm G′ pivoted to the harp alongside of the wheel and adapted to engage the under side of the blade B′ and be depressed thereby, a spring tending to press said arm upward, means for limiting the upward movement, and a pair of contacts on the under side of said arm, one carried by the arm, and the other by the harp.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

THOMAS W. SMALL.

Witnesses:

ALBERT H. BATES,

W. L. MCGARRELL.