(No Model.)

3 Sheets—Sheet 1.

J. J. HOPPES.

ELECTRIC CONTACT DEVICE.

No. 436,874. Patented Sept. 23, 1890.

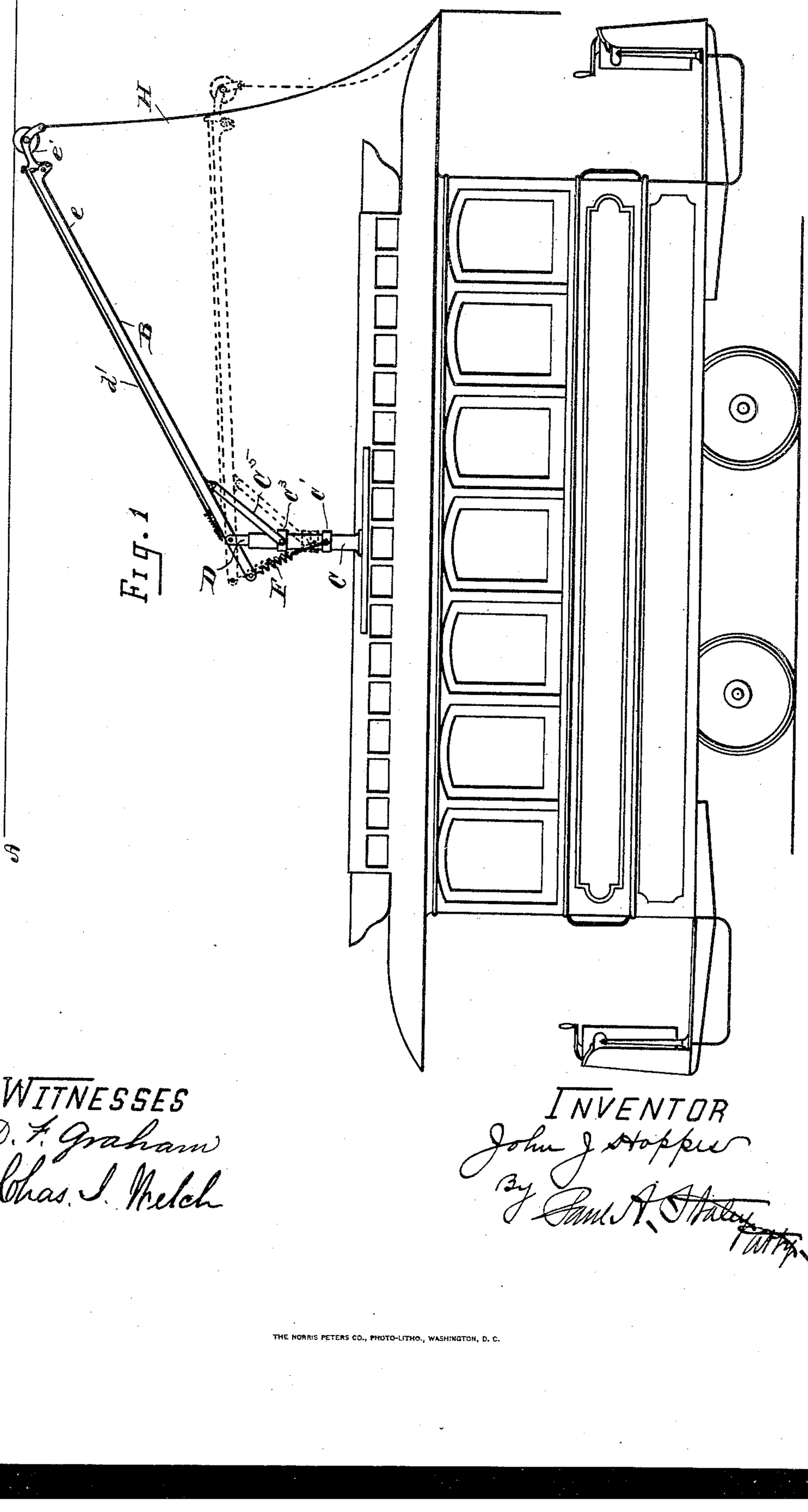

FIG. 1

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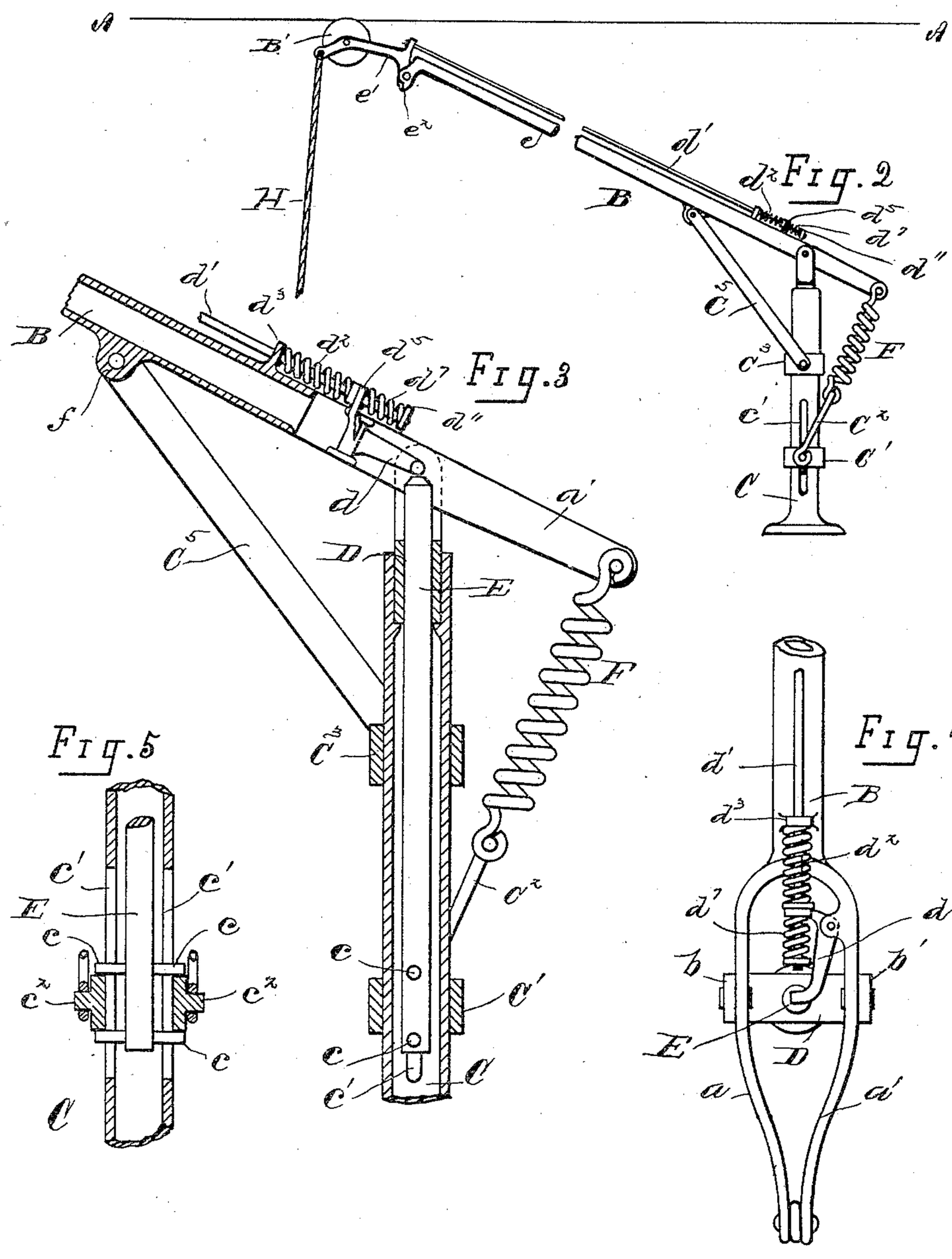

FIG. 2

FIG. 3

FIG. 5

FIG. 4

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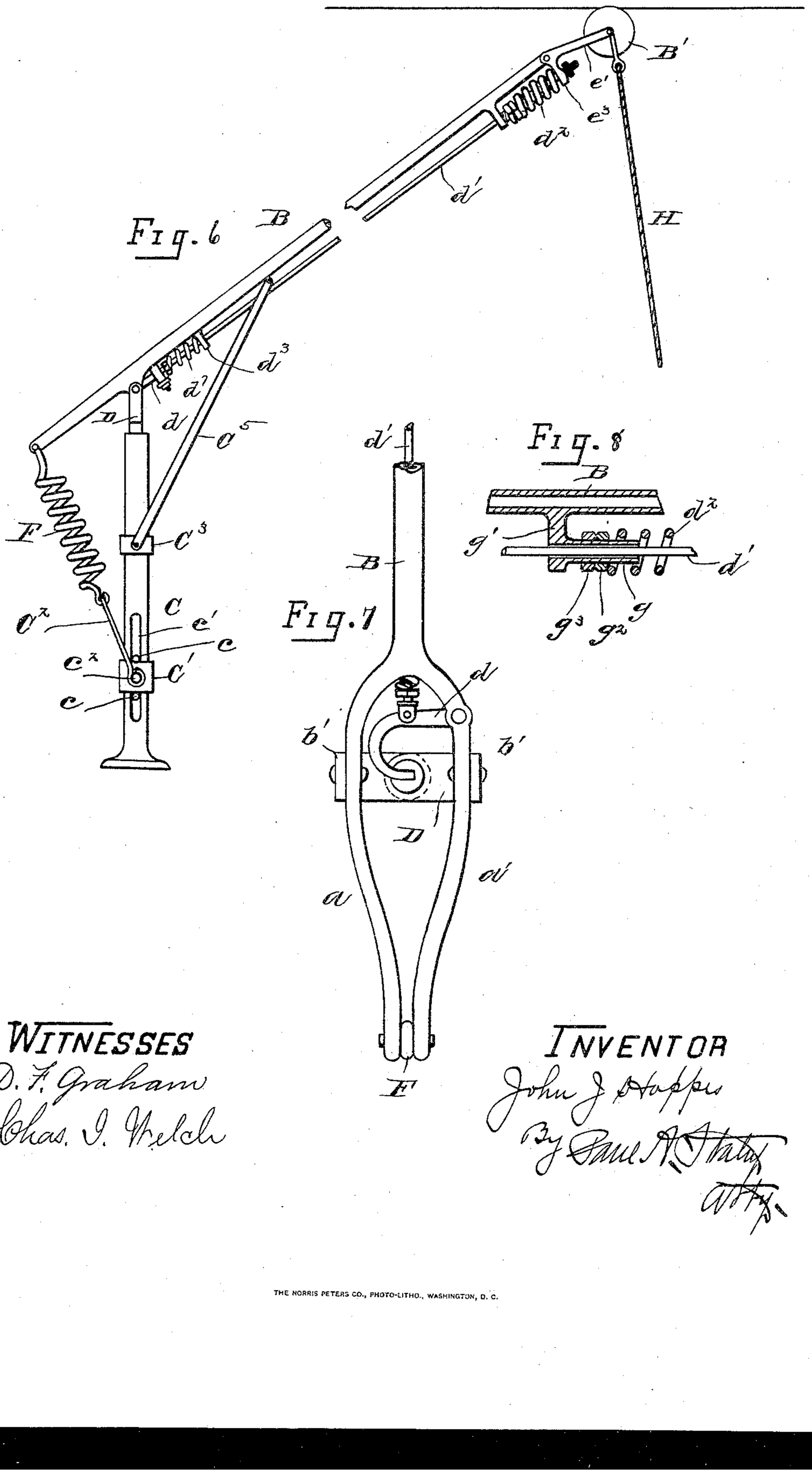

Fig. 6

Fig. 7

Fig. 8

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UNITED STATES PATENT OFFICE.

JOHN J. HOPPES, OF SPRINGFIELD, OHIO.

ELECTRIC CONTACT DEVICE.

SPECIFICATION forming part of Letters Patent No. 436,874, dated September 23, 1890.

Application filed January 30, 1890. Serial No. 338,605. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HOPPES, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Electric Contact Devices, of which the following is a specification.

My invention relates to improvements in electric contact devices which are particularly adapted for use with overhead conductors in street-railroads.

The object of my invention is to provide means for automatically releasing an electric trolley and permit it to clear the conductor and its supports in the event that the same becomes accidentally displaced with reference to the said conductor in connection with which it operates.

To this end my invention consists in a jointed or flexible trolley-arm, a portion of which is adapted to assume an unusual position, which shall cause the supporting mechanism to be released and permit said trolley to drop free of the conductor in the event that the trolley-wheel becomes removed from the track.

My invention further consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is an elevation of a street-car to which my improved contact devices are shown attached, the trolley being shown in full lines in contact with the conductor and in a released position in dotted lines. Fig. 2 is a side elevation view of the contact devices removed. Fig. 3 is a sectional view somewhat enlarged, showing the details of the supporting and releasing mechanism. Fig. 4 is a top view of the same, and Fig. 5 a sectional view of a portion of the same. Figs. 6, 7, and 8 are detail views showing a modification in the construction of my improved trolley.

Like parts are indicated by similar letters of reference in the several views.

In the said drawings, A A represent the conductor, B the trolley-arm, and C the standard or column on which said arm is supported and by which it is connected to the car.

B′ is the trolley-wheel, which is preferably used to form the contact between the trolley-arm B and the conductor A A.

The column C is preferably made hollow, and is provided at the top with a supporting-yoke D, the lower portion of which is prepared to fit in a socket at the upper end of the column C, in which it is adapted to turn. To the supporting-yoke D is pivoted the trolley-arm B, which is preferably bifurcated at its rear end, as shown in Fig. 4, the arms or prongs a and a' thereof being pivoted to the respective arms or prongs b and b' of the yoke D.

Located within the column C and extending upwardly through the center of the supporting-yoke D is a reciprocating rod or plunger E, provided at its lower end with projecting pins c c, which preferably extend through said rod E and project each way through slotted openings c' in the sides of the column C and engage on each side of a collar C′, adapted to slide on the outside of the column C. The collar C′ is preferably provided on each side with trunnions c^2, on which are journaled the respective ends of a yoke C^2, to which is secured one end of a spring F, the other end being connected to the extended prongs a and a' of the trolley-arm B.

The plunger or push rod E is adapted to be held in its normal position, as shown in Fig. 3, by means of a pivoted latch d, pivoted in the bifurcated portion of the trolley-arm B and extending over the top of said push-rod.

It will be understood that the collar C′ is free to turn on the column C between the projections c. The supporting-yoke D also turns freely in said column, which permits the trolley-arm B to turn to any position about the axis of the column C.

The latch d rests on the top of the push-rod E and at the center of revolution. The contact-point between the latch and shaft is also in line with the pivotal connection between the trolley-arm and the supporting-yoke D.

The trolley-arm B, I preferably form in two parts e and e', the outer portion e' being adapted to carry the trolley-wheel B′ and being pivoted to the main portion e.

Extending from the pivoted portion e' to the latch d is a connecting-rod d'. On this connecting-rod d' is a spring d^2, one end of which rests against a lug or projection d^3 on

the trolley-arm and at the other against a projecting ear d^5 on the spring-latch. A short spring d^7 is also interposed on the connecting-rod d' between the latch d and a head or shoulder d'' on the inner end of said connecting-rod. The spring d^7 has a greater tension than the spring d^2, and when the pivoted portion e' of the trolley-arm B is in the position shown in Fig. 2 the spring d^2 is slightly compressed, while the latch d is in its normal position over the push-rod E.

It will be understood that the main spring F holds the trolley-wheel B′ yieldingly against the conductor A. The tension of the spring F is sufficient to cause the pivoted portion e' of the trolley-arm to turn about its pivoted center, and thus compress the spring d^2 in the manner just described. A stop e^2 is provided to limit the movement of the pivoted portion e' of the trolley-arm.

In the event that the trolley-wheel B′ should become displaced from the conductor A A, the pressure against the pivoted portion e' of the arm would be removed. The spring d^2 would thus be permitted to act against the latch d and withdraw the same from engagement with the push-rod or plunger E. The push-rod E being released, the collar C′ would be permitted to rise on the standard C, thus releasing the spring F, which would in turn permit the arm B to drop down to the position indicated in dotted lines in Fig. 1, thus completely clearing the conductor and its supports. The trolley-wheel would thus be prevented from becoming entangled with the conductor-supports and any danger to the conductors would be obviated.

For returning the trolley to its normal position I place about the column C a loose collar C^3 above the supporting-collar C′. To the collar C^3, I pivot a brace-connection C^5, which is pivoted at its opposite end to a lug or projection f on the trolley-arm B. As the arm B turns on its pivoted center when released by the push-rod E, the collars C′ and C^3 are both moved on the column C and approach each other. When the collars meet, the motion of the arm is retarded, the spring F being adapted to receive any shock or jar thereon.

Attached to the outer pivoted portion e' of the trolley-arm is a rope or cord H. By drawing down on the cord H the collar C^3 is forced against the collar C′ and carries said collar downwardly along the column C until said collar assumes its normal position, the spring F being compressed as the collar is forced downwardly. The push-rod E is carried with the collar C′, and when it assumes its normal position the spring d^7, having been compressed by the pressure against the pivoted portion e' of the trolley-arm, forces the retaining-latch d into position over the push-rod E. The spring F is now compressed, and by paying out the cord H slowly the arm B may be permitted to rise until the trolley-wheel again rests against the conductor. The pressure of the spring F against the cord H as the arm B rises serves to hold the pivoted portion e' of the arm in the normal position to retain the latch in place. When the trolley-wheel is in place, the cord H is adapted to hang loosely therefrom, and the device is again ready for operation. The cord H furnishes means for operating the trolley-arm, as desired, without releasing the spring F, since a pressure on the cord depresses the hinged portion e'.

Figs. 6, 7, and 8 show a modification in the construction of the different parts. In the plan as heretofore described the connecting-rod d' and its springs are placed above the arm. In the modified form the rod d' is placed below the arm. The pivoted or hinged portion e' of the arm is provided with a projecting lug e^3, adapted to bear against the spring d^2, which is supported on a sleeve g, through which the connecting-rod d' passes, the sleeve g being preferably cast rigid to the arm B by a lug or projection g'. The sleeve g is preferably screw-threaded and provided with an adjusting-nut g^2 and a locking-nut g^3, by which the tension of the spring may be adjusted, as desired. The spring d^7 is placed between the spring-latch d and the projecting lug d^3. In this case the spring-latch is adapted to be pulled away from the push-rod E by the action of the spring d^2 against the projecting lug e^3.

It is obvious that various modifications of this device may be employed without departing from the spirit of my invention, and I do not intend to limit myself to the constructions herein shown and described; but

I claim, broadly, as my invention—

1. A trolley-arm in two or more parts adapted to move in relation to each other, a catch mechanism adapted to hold said trolley-arm in operative position, and means for operating said catch mechanism by the relative movement of said parts, substantially as specified.

2. A trolley-arm provided with a broken or flexible portion having an independent movement with reference to the solid or main portion, a catch mechanism adapted to hold said arm in operative position, and means for operating said catch mechanism by an independent movement of said flexible portion, substantially as specified.

3. An electric trolley-arm having a flexible or yielding portion, a spring for holding the trolley yieldingly against an electric conductor and thus moving the flexible portion of said arm to an unusual position, a latch adapted to release said spring, and means for connecting said latch to the flexible portion of said arm, substantially as specified.

4. An electric contact device having a flexible or yielding arm, and a spring adapted to hold said arm yieldingly against an electric conductor and thus force said flexible portion of said arm to an unusual position, means for automatically returning said flexible portion to its normal position, and a latch connected

to said yielding portion adapted to release said spring, substantially as specified.

5. An electric contact device having a flexible portion adapted to be held in an unusual position when the trolley is in operation, said flexible portion being adapted to return to its normal position when the pressure thereon is released, a latch connected to said flexible portion and adapted to release said arm when said flexible portion assumes its normal position, and means for returning said latch and arm to their normal relative positions by a further movement of said arm, substantially as specified.

6. An electric contact device having a flexible or yielding arm pivotally supported on a column or standard, a spring connected to said standard for holding said arm against an electrical conductor and thus forcing the flexible portion of said arm to an unusual position, means for releasing said spring when said flexible portion assumes its normal position to permit the arm to turn to a limited extent upon its pivotal support, and means for resetting said spring and said flexible portion by a further movement of said arm about its pivotal center, substantially as specified.

7. The combination, with a flexible trolley-arm and its supporting-standard, of a main operating-spring adapted to hold said arm in an operative position, a latch connected to said flexible portion adapted to release said spring, and a brace-rod connected to said arm adapted to act against said spring and to carry the same to its normal position when said arm is depressed to an unusual degree, substantially as specified.

8. The combination, with a trolley-arm and its supporting-standard, of a hinged or flexible portion on said arm having a trolley-wheel adapted to operate against an electrical conductor, a sleeve on said standard and a push-rod in said standard connected to said sleeve, a spring connected to said sleeve and to said arm to hold said arm in an operative position, a latch operating against said push-rod, said latch being connected to the flexible portion of said arm, means for releasing said latch when the flexible portion is turned to its normal position to permit said arm to drop to a limited extent from said conductor, and means for returning said spring and latch to their normal positions when said arm is further depressed, substantially as specified.

9. The combination, with a hinged trolley-arm having a flexible portion adapted to assume an unusual position when said arm is in an operative position, of a latch adapted to hold said arm in its operative position, and means for disengaging said latch when the flexible portion of said arm assumes its normal position, said latch being placed at the pivotal center of said arm, substantially as specified.

10. The combination, with a trolley-arm pivotally connected to a revolving support, said trolley-arm being provided with a flexible portion adapted to assume an unusual position when in an operative position, of a latch attached to said flexible portion and adapted to hold said arm in an operative position, said latch being placed in a line with the axis of revolution of said trolley-arm, substantially as specified.

11. The combination, with a trolley-arm having a flexible or yielding portion, of a latch adapted to hold said arm yieldingly in position, a connection from the yielding portion of said arm to said latch, and means for moving said flexible portion and thus releasing said latch when the pressure on said arm is removed, substantially as specified.

12. An electric contact device adapted to be held by upward pressure in contact with an overhead conductor, a trolley or trolley-wheel to travel along said conductor, a catch mechanism to hold said contact device in operative position, and means for releasing said catch mechanism when the trolley is raised to an unusual position, substantially as specified.

In testimony whereof I have hereunto set my hand this 28th day of January, A. D. 1890.

JOHN J. HOPPES.

Witnesses:

JOSHUA SCOTT,

CHAS. I. WELCH.