

N. W. STORER & T. VARNEY.
TROLLEY.

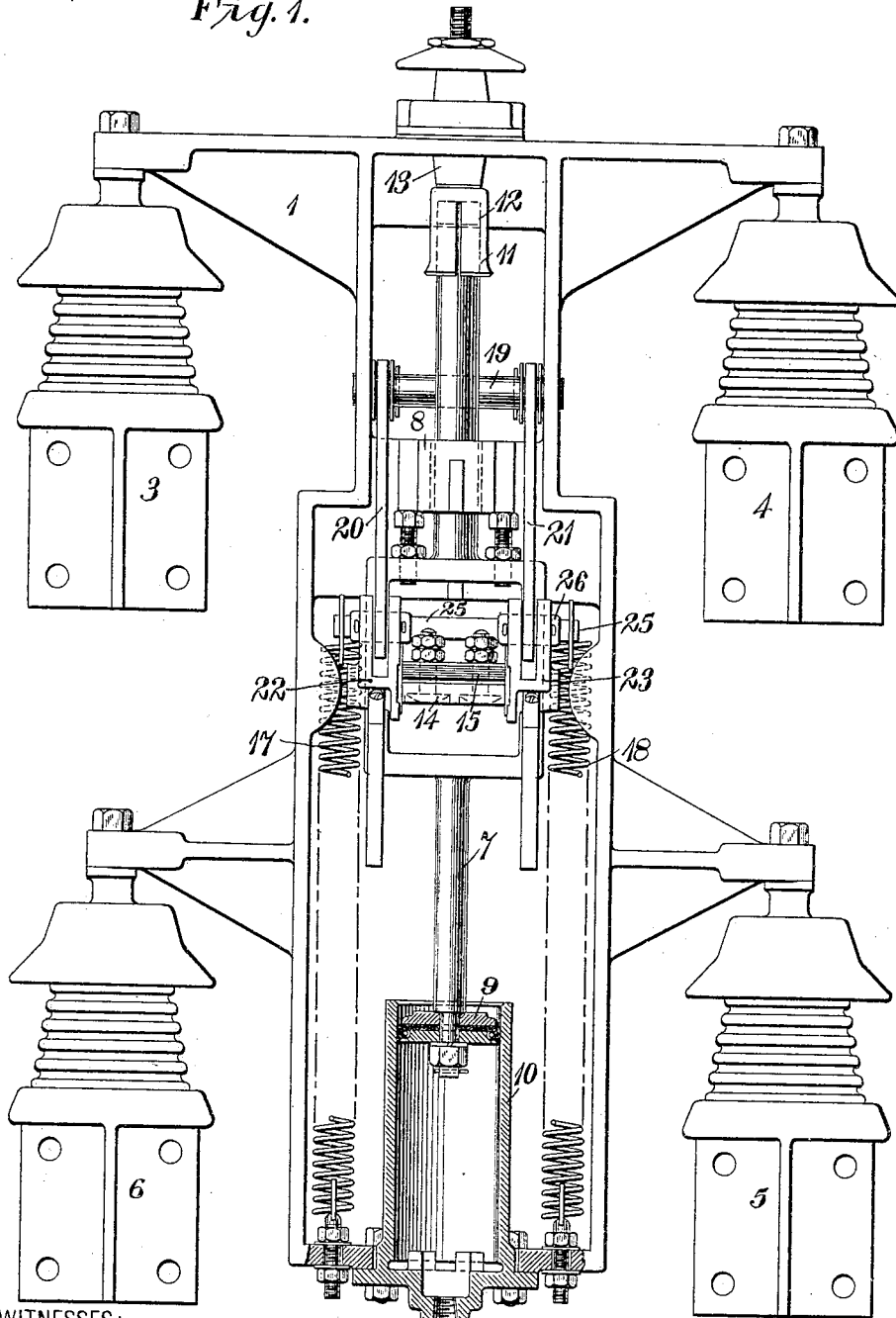
APPLICATION FILED OCT. 18, 1905.

932,511.

Patented Aug. 31, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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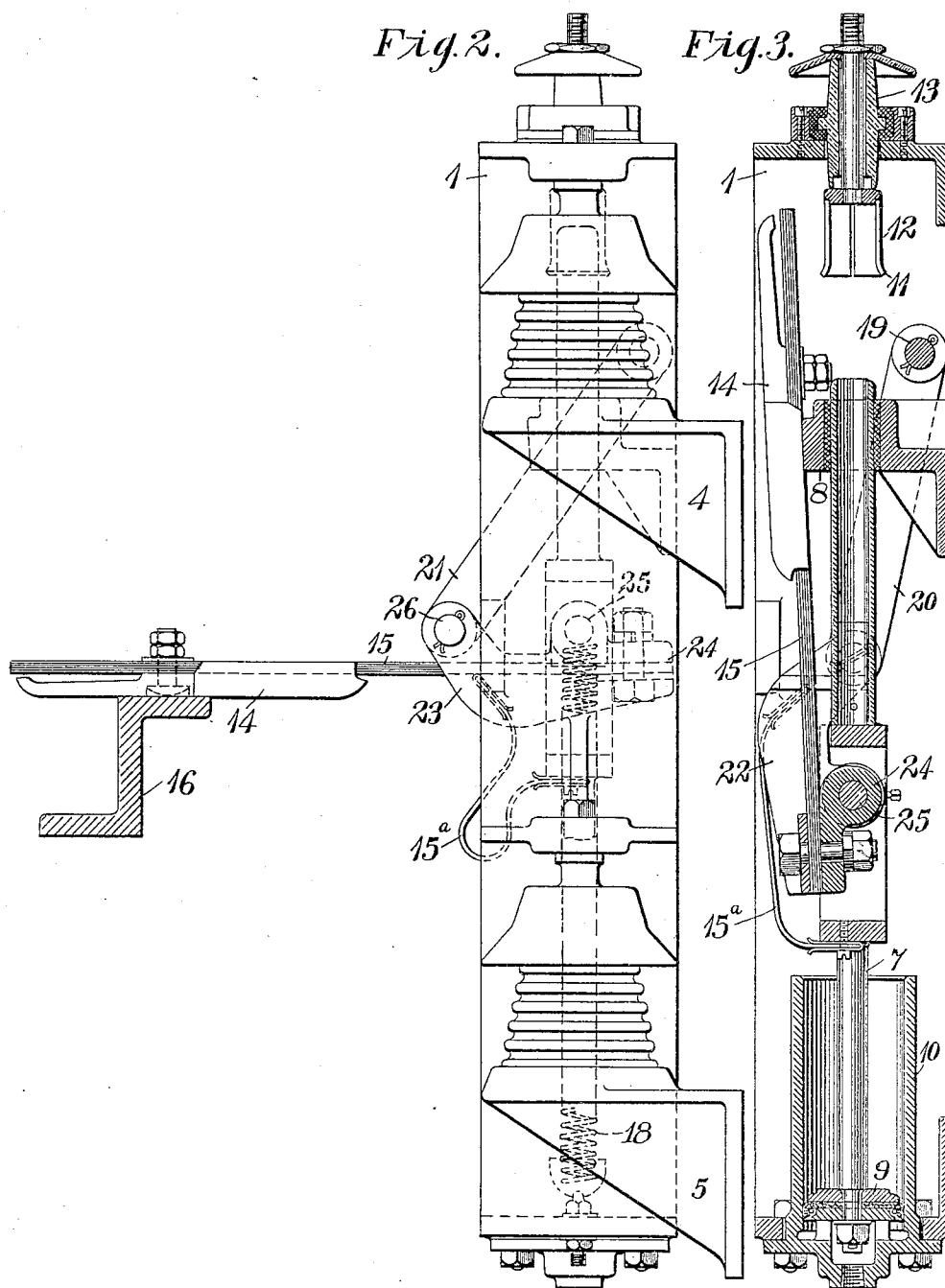
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UNITED STATES PATENT OFFICE.

NORMAN W. STORER AND THEODORE VARNEY, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

TROLLEY.

932,511.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed October 18, 1905. Serial No. 283,335.

To all whom it may concern:

Be it known that we, NORMAN W. STORER and THEODORE VARNEY, citizens of the United States, and residents of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Trolleys, of which the following is a specification.

Our invention relates to trolleys for electric railway vehicles, and has special reference to such moving contact devices as are adapted for use with vehicles supplied with energy from side conductors.

The object of our invention is to provide a trolley for electric railway vehicles that shall be simple and durable in construction and effective in operation and that may be actuated to engage a side rail supply line conductor or may be held in a substantially vertical plane close to its support.

Electric railway vehicles have usually been supplied with energy either from overhead conductors, by means of trolleys of various well known types, or from supply rails located at or below the plane of the track, by means of sliding contact shoes. In tunnels or similar places where overhead space is insufficient for trolley operation and where a third rail structure would be specially dangerous, it is sometimes desirable to supply a vehicle with energy from a side rail which is at a suitable distance above the track.

Another advantage of our invention lies in the fact that the mechanism which actuates the contact arm is arranged to close and open a main circuit switch as the arm is moved into and out of engagement with the line conductor, so that the trolley base and supporting frame are disconnected from all circuits that are electrically alive except when the contact shoe engages the line conductor, although energy may be supplied to the vehicle through any other contact device.

Our invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation and Fig. 2 an end elevation of a trolley constructed in accordance therewith, and Fig. 3 is a sectional view with the contact arm shown in its vertical position.

Referring to the drawings, the trolley mechanism comprises a supporting frame or body portion 1 which is supported by, and insulated from, a side wall of the car or ve-

hicle to which it is attached by a plurality of insulating brackets 3, 4, 5 and 6. A vertically operating piston rod 7 is held in an upright position by a guide bearing 8 with which the frame 1 is provided, its piston 9 being contained in a fluid-pressure cylinder 10. The upper end of the piston rod 7 constitutes the movable contact member of a switch 11, and is moved into and out of engagement with the stationary contact member 12 of the switch, the said member 12 being supported by the upper portion of the frame 1 and being insulated therefrom by an insulating bushing 13.

A flexible arm 15, to which a contact shoe 14 is attached, is so connected by a link mechanism to the piston rod 7, between the guide bearing 8 and the cylinder 10, that the contact shoe may be moved from a vertical position, as shown in Fig. 3, to a substantially horizontal position, as shown in Fig. 2, and into engagement with a supply line conductor 16 just after the movable member of the switch 11 is moved into engagement with the stationary member 12. When the arm 15 is in its horizontal position, the operating circuit is completed through the shoe 14, the arm 15, a flexible conductor 15^a and the piston rod 7, to the stationary contact member 12 of the switch 11.

The arm 15 and the movable member of the switch 11 are moved into their operative positions by means of fluid-pressure in the cylinder 10, which raises the piston rod 7 in opposition to a plurality of springs 17 and 18 that are so attached to the link mechanism as to automatically return the arm to its vertical position when the pressure in the cylinder is exhausted.

It is specially advantageous to provide for the automatic return of the contact arm to a vertical position when the fluid-pressure is exhausted from the cylinder 10 instead of providing a double-acting cylinder for producing such action, because the means for supplying the fluid-pressure might become inoperative, and consequently the vehicle might run outside of the tunnel or the section of road over which the side rail is used with the trolley arm in the horizontal position, when it might interfere with stationary objects along the side of the track.

The link mechanism by which the contact arm is pivotally attached to the piston rod 7 comprises a pair of links 20 and 21 sup-

ported by a stationary shaft 19 and a pair of links 22 and 23 which constitute lateral projections from a clamp 24 to which the inner end of the arm 15 is attached and are rotatably mounted on a shaft 25 carried by the piston rod 7, the other ends of the two pairs of links being connected together by a pin 26. The construction and arrangement of the lever mechanism are such as to effect the lowering of the inner end of the arm 15 as the arm moves into the vertical position, thereby preventing the arm from extending above the vehicle when in its inoperative position.

We desire that all variations in size, form and arrangement of details which do not materially depart from the spirit of our invention shall be included within its scope.

We claim as our invention:

1. In a side rail trolley, the combination with a pivotally mounted contact-bearing arm, a reciprocating rod provided with a switch terminal, and operating connections between said rod and said arm, of means for actuating said rod to move the contact-bearing arm and the switch terminal into their operative position.

2. A side rail trolley comprising a piston rod provided with a movable switch terminal, and a pivotally mounted contact-bearing arm both of which are connected to said piston rod and are actuated thereby, in combination with a stationary switch terminal and a supply line conductor that respectively coöperate with the movable switch terminal and the contact-bearing arm.

3. The combination with a line conductor, a supporting frame and a contact-bearing arm pivotally mounted in said frame and having a substantially horizontal contact position, of constantly acting means tending to move the arm to a substantially vertical position and to retain it in such position, and means for moving the arm into its contact position and holding it therein.

4. The combination with a stationary switch member, a pivotally mounted contact-bearing arm, a piston rod connected to said arm, and a movable switch contact

member carried by said piston rod, of means for actuating the piston rod to simultaneously move the contact arm into a substantially horizontal operative position and the movable switch member into engagement with the stationary switch member.

5. In a side rail trolley, the combination with a frame, insulated supporting brackets therefor, and a pivotally mounted flexible arm having a contact member, of a rod connected to said arm, a pneumatically-actuated piston for operating said rod to move said contact member into its substantially horizontal operative position and springs for moving said member to a substantially vertical position.

6. The combination with a frame, a flexible contact-bearing arm pivotally mounted upon said frame, and a piston rod connected to said arm, of a fluid-pressure cylinder and piston for actuating said piston rod to move the contact member into its substantially horizontal operative position, and springs for moving said contact member into a substantially vertical position.

7. The combination with a pivotally mounted contact-bearing flexible arm, a piston rod connected thereto and provided with a movable switch contact member, of means for actuating the piston rod to simultaneously move the contact arm and the switch member into their operative positions.

8. In a side rail trolley, the combination with a pivotally mounted contact-bearing arm, of means for actuating said arm to a substantially horizontal operating position, and automatically acting means to return said arm to an approximately vertical position and at the same time to bodily lower the arm as it assumes its vertical position.

In testimony whereof, we have hereunto subscribed our names this 11th day of October, 1905.

NORMAN W. STORER,
THEODORE VARNEY.

Witnesses:

F. E. WYNNE,
BIRNEY HINES.