(No Model.)

W. H. KNIGHT.

ELECTRIC RAILWAY PLOW.

No. 455,343. Patented July 7, 1891.

Fig. I.

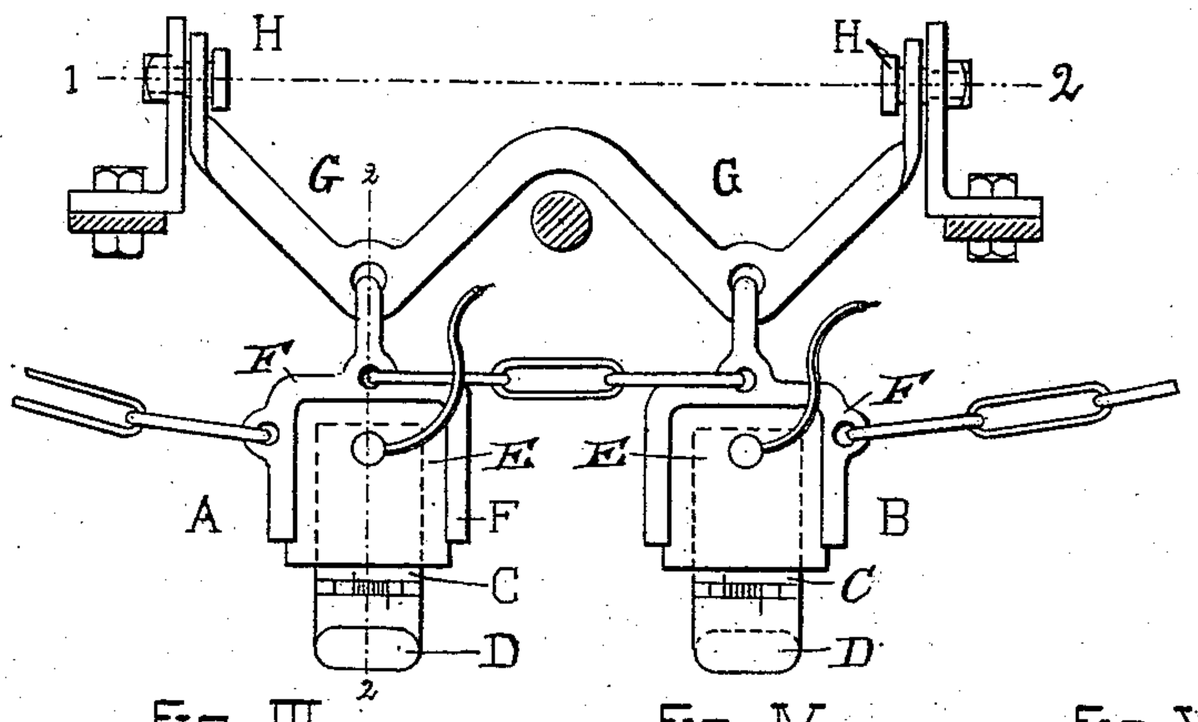


Fig. II.

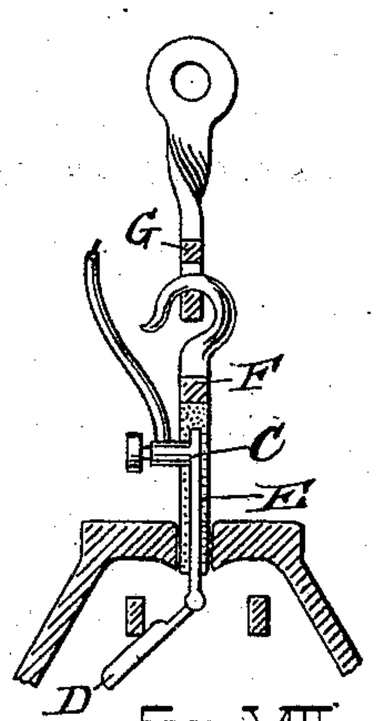


Fig. III.

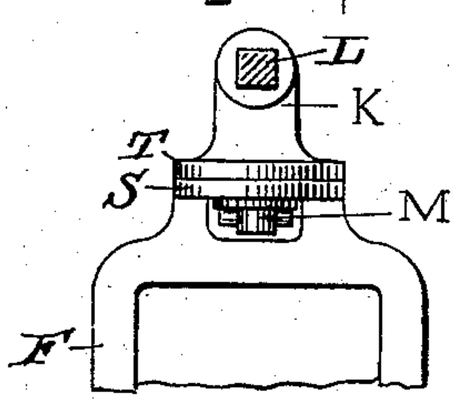


Fig. IV.

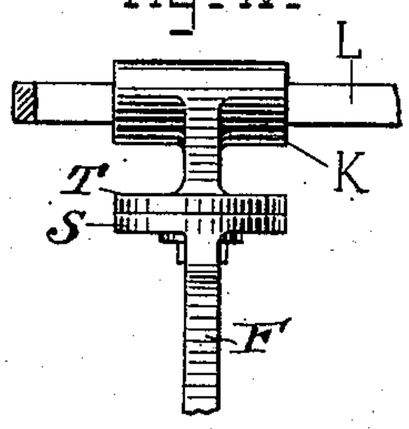


Fig. VII.

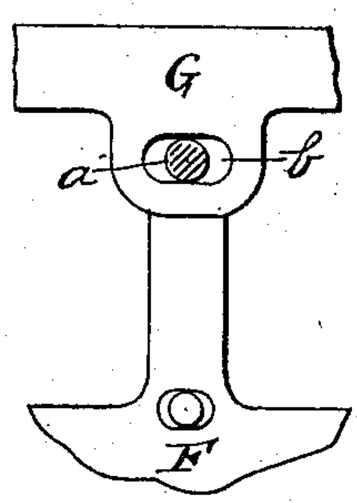


Fig. VIII.

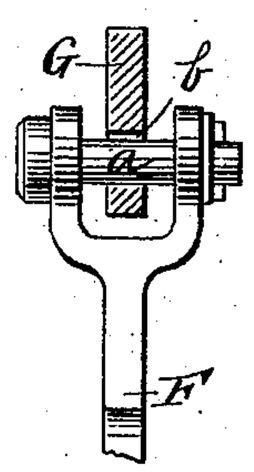


Fig. V.

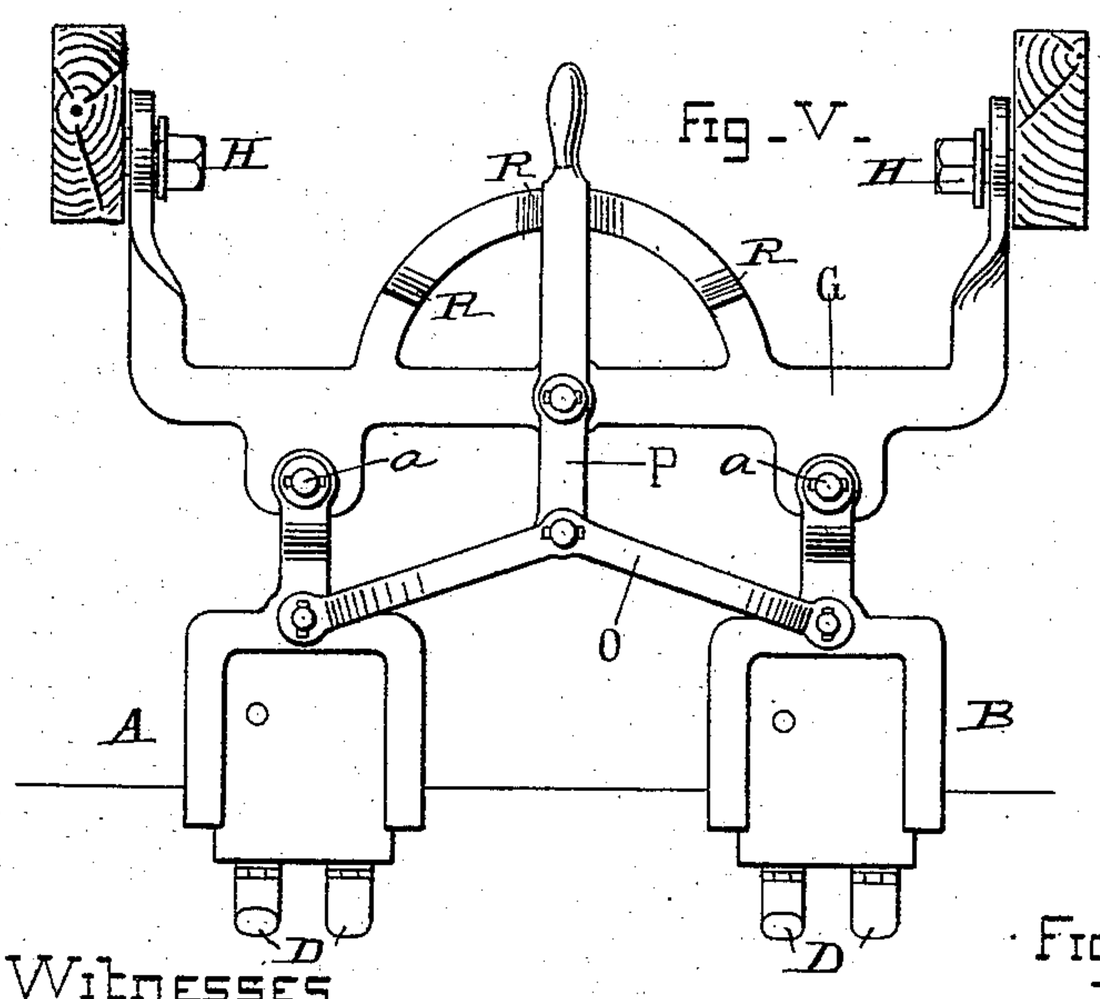


Fig. VI.

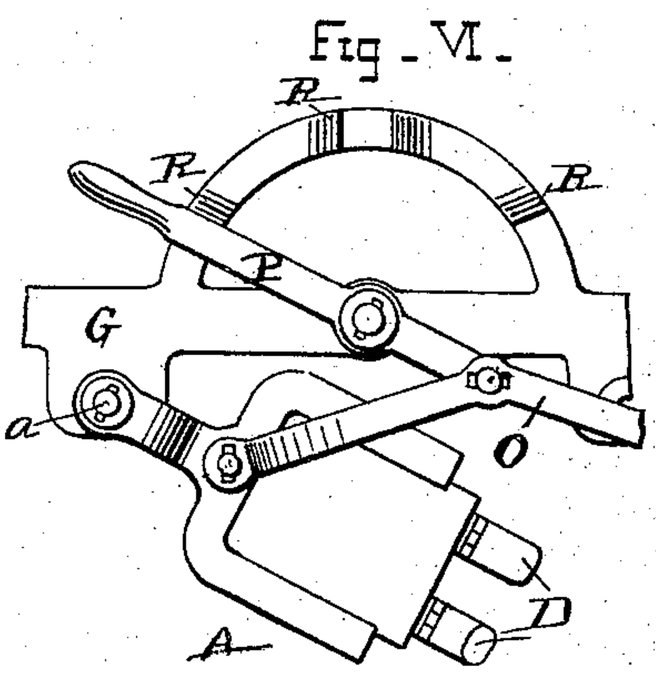


Fig. IX.

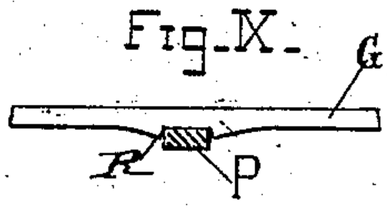
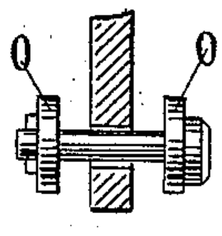


Fig. X.



Witnesses

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by Bartley & Knight

Attys

UNITED STATES PATENT OFFICE.

WALTER H. KNIGHT, OF NEW YORK, N. Y.

ELECTRIC-RAILWAY PLOW.

SPECIFICATION forming part of Letters Patent No. 455,343, dated July 7, 1891.

Application filed March 5, 1889. Serial No. 301,858. (No model.)

To all whom it may concern:

Be it known that I, WALTER H. KNIGHT, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Electric-Railway Plows, of which the following is a specification.

My invention relates to electric railways; and it consists in a method of supporting the contact device which is adapted to extend into a slotted conduit and make connection with a line conductor therein, which extends along the roadway.

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

Figure 1 is a side elevation of my contact device. Fig. 2 is a section of Fig. 1 on the line 2 2. Fig. 3 is a side elevation of a modified form of my device. Fig. 4 is an end elevation of the device shown in Fig. 3. Fig. 5 is a side elevation of another form embodying similar principles. Fig. 6 shows the last plow when thrown out of the conduit. Figs. 7 and 8 are respectively longitudinal and transverse sections of the upper plow-joint. Fig. 9 is a section of plow-handle showing spring-catch, and Fig. 10 is a transverse section of the lower plow-joint.

The device consists in general of a protected insulated conductor which extends through the slot of a conduit and usually called a "plow." This plow, which is substantially such as is shown in my patent, No. 338,175, of March 16, 1886, is supported from the vehicle, first, by a frame or movable part, which is adapted to swing or slide transversely relatively to the vehicle, and from which the plow is suspended by a swivel moving about a vertical axis.

In Fig. 1, A and B are respectively two plows consisting of an insulated conducting-shank C, having a spring contact-shoe D on its lower end and extending upward into an insulating-panel E, carried by a frame F. Each of these plows is loosely hooked into a W-shaped frame G, so as to turn freely about a vertical axis. The frame G is bent up in the middle, so that it may pass over the axle on the vehicle, and its upper ends are pivoted by bolts H, which attach it to a fixed part of the vehicle. The frame is thus able to swing freely about a horizontal axis 1 2, passing through the bolts H. By this arrangement a transverse or side movement is given to the supports of frame G, from which the plow is carried by a vertical swiveling joint.

In Figs. 3 and 4 the transversely-swinging frame G is replaced by a sliding traveler K, movable on a guide L. In this case the frame F has at its upper end a turn-table S, from which passes a king-bolt M, projecting from a corresponding part T on traveler K. This makes a firm swiveling joint between K and the plow, while the necessary transverse movement is gained by the sliding of the traveler on the guide L. In this form of plow the joint permitting a swiveling motion about a vertical axis is a firm joint, holding the plow in a substantially vertical position. Substantially the same arrangement is shown in Figs. 5 and 6, where the frame G is suspended from such a point that the angular movement of the plow as the frame swings from side to side is inappreciable, and the firm swivel action is attained by a looseness in the upper joint by which the plow is attached to the frame. In this form the upper end of the plow is forked, and a bolt *a* is loosely put through the two forks and a slotted hole *b* in the frame, as shown in Figs. 7 and 8. This permits a sufficient swivel movement with substantially no angular movement of the plow relatively to the frame.

The two plows are joined at their center by links O, one on each side, and these are held by attachment to the lower end of a lever P, pivoted firmly to frame G. The upper end of the lever P is held by a spring-catch connection R with frame G, as is shown in Fig. 9 and in my patent, No. 338,174. This spring-catch is adapted to give way when an obstruction is encountered, as shown in Fig. 6.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with an electrically-propelled vehicle and a line conductor, of a transversely-moving support and a contact device pivoted thereto on a vertical axis and extending to connect with the supply-conductor.

2. The combination, in an electric railway, of an electrically-propelled vehicle, a supply-

conductor inclosed in a slotted conduit, and an intermediate contact device extending into the conduit and connected by a joint having a vertical axis with a transversely-moving piece connected to the vehicle.

3. The combination, in an electrically-propelled vehicle, of a transverse horizontal guide, a traveler movable thereon, and a contact device connected with said traveler by a joint having a vertical axis.

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Witnesses:
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