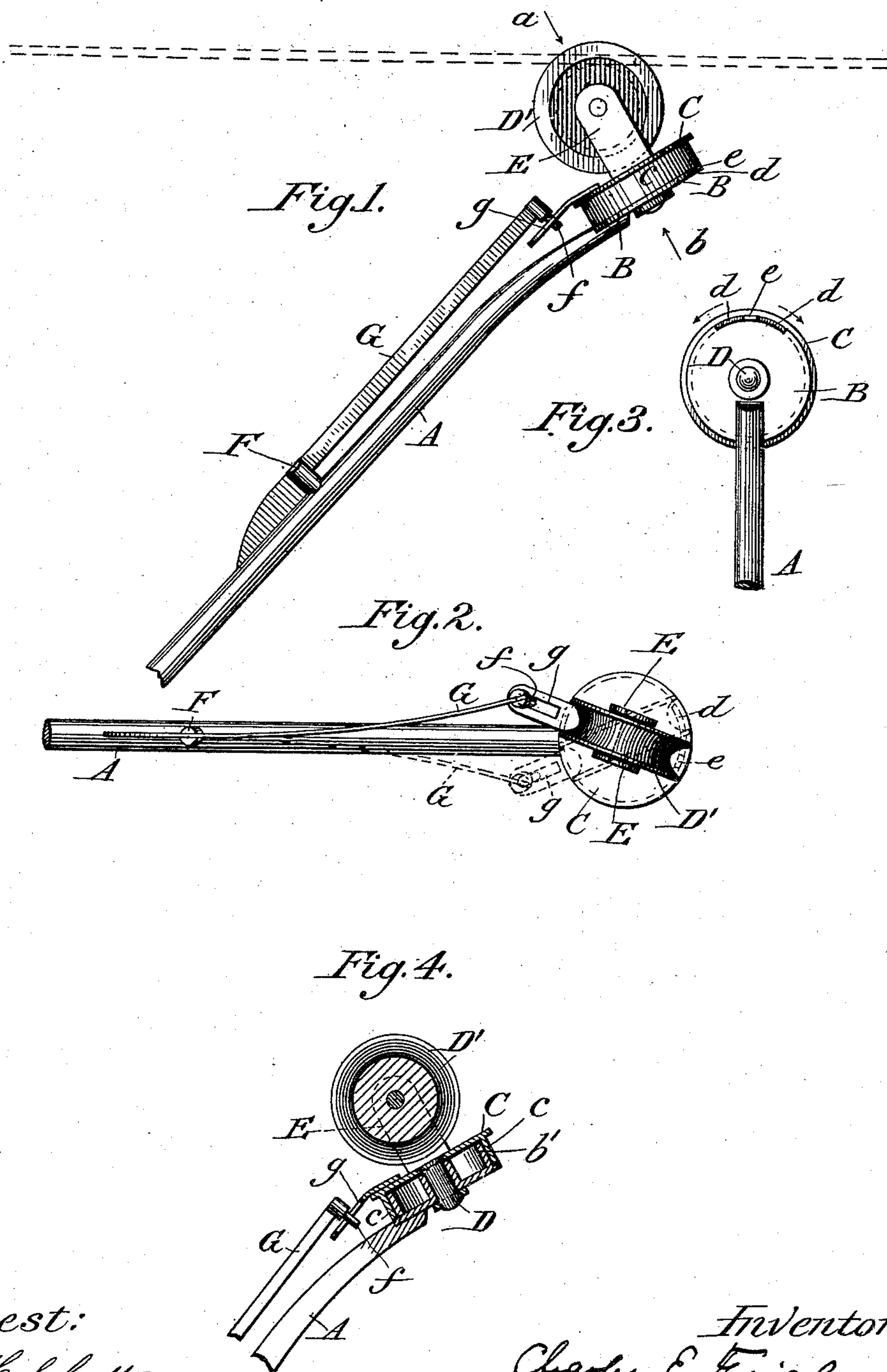


(No Model.)

C. E. FRIEL.  
TROLLEY FOR ELECTRIC RAILWAYS.

No. 474,552.

Patented May 10, 1892.



Attest:

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# UNITED STATES PATENT OFFICE.

CHARLES E. FRIEL, OF BOSTON, MASSACHUSETTS.

## TROLLEY FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 474,552, dated May 10, 1892.

Application filed March 19, 1892. Serial No. 425,597. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. FRIEL, a citizen of Canada, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Trolleys for Overhead Electric Railways, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in trolleys for overhead electric railways; and it has for its object such a construction of the intermediate mechanism connecting the wheel with the arm as will insure the wheel against leaving the conductor on rounding a curve or cramping in passing any irregularities in the wire, and which will insure a positive and at the same time a flexible contact with the conductor.

The invention consists, essentially, of an arm, which is of any construction suitable in the premises, and of a grooved wheel swiveled to the upper end of the arm, and of the conducting-wire. The connection between the grooved wheel and the arm consists of a disk secured to the upper end of the arm, on which a similar disk is pivoted, carrying the wheel, the two plates forming friction-plates, and of a spring connection between the upper disk and the arm, to normally hold the wheel in the same vertical plane as the arm, but allowing it to turn to one side or the other, the connection between the plates being such as to limit the movement of the upper relative to the lower, the spring connection consisting of a flat spring secured at one end to the arm a considerable distance below the wheel, and the other end having a bearing adapted to register with a slotted arm of the upper plate.

The invention further consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter more fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a side elevation

of the upper end of a trolley-arm embodying the invention. Fig. 2 is a plan view taken in the direction of the arrow *a* in Fig. 1. Fig. 3 is a similar view taken in the direction of the arrow *b*. Fig. 4 is a longitudinal vertical section.

Referring to the drawings, A designates a trolley-arm of any construction suitable in the premises, the main part of which is at an angle of substantially forty-five degrees, and its upper end is somewhat more inclined than the main portion. Attached to the upper end of the arm is the plate B, having substantially the same inclination as the upper part of the arm. This plate has projecting upwardly from near its periphery the annular flange *b'*. C designates a similar plate, with its annular flange *c*, however, having a diameter such as will allow the plate to be fitted over the lower plate, the flange *c* encircling the flange *b'* and resting upon the projecting edge of the plate B. The two plates are pivoted together by the bolt D, and are so connected as to allow them to be rotated upon each other. To limit this rotation, a portion of the edge of the lower plate is cut away at *d*, and a portion *e* of the flange of the upper plate is extended to register with the slot formed in the edge of the lower plate, the length of this slot *d* limiting the movement of the upper plate.

D' designates the wheel journaled between the bifurcations of the standard E, secured to the upper face of the plate C, and has its periphery grooved and adapted to ride on the wire conductor.

F designates a lug projecting from the arm, and it is slotted to a considerable depth. G designates a flat spring secured at its lower end below the lug F, and extends through the slot in the latter toward the upper end of the arm. The upper end of the spring has a bearing *f*, which registers with the slotted arm *g*, projecting from the lower side of the plate C, the length of the arm and the slot being such as to give the necessary play to the movement of the upper plate.

The operation of the device is as follows: Normally the wheel, with relation to the supporting-arm, is in the position shown in Fig. 1, and as a car approaches a curve, it, being in



advance of the trolley-wheel, will begin to turn before the wheel reaches the curve in the conductor, which would ordinarily be liable to give the wheel a tendency to leave the conductor.

5 In the present instance the wheel could turn on the arm and follow the course of the wire without being liable to become cramped and displaced. The friction-plates serve to hold the wheel rigidly in an upright position. The  
10 flat spring serves to turn the wheel to its normal position and to hold it in the same against any slight impediment to turn it, at the same time to allow it to follow the wire in any deviation of its course or in turning a  
15 corner.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a trolley for overhead railways, the  
20 combination of the arm, the plate mounted on the upper end of the said arm, the plate pivoted to the first-mentioned plate, the lower of the said plates having a portion of its periph-

ery cut away and the upper plate having a projection registering with the slot formed in  
25 the edge of the lower plate, the wheel mounted on the upper plate, and the spring connecting the upper plate with the arm, substantially as described.

2. In a trolley for overhead railways, the  
30 combination of the arm, the plate secured to the upper end of the said arm, the plate pivoted on the first-mentioned plate, the wheel mounted upon the upper plate, the slotted  
35 arm projecting from the upper plate, and the spring secured at one end to the arm, and having at its other end a bearing registering with the slotted arm, substantially as described.

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

CHARLES E. FRIEL.

Witnesses:

OTTO L. F. LUTHIN,  
N. F. MOSHER.