

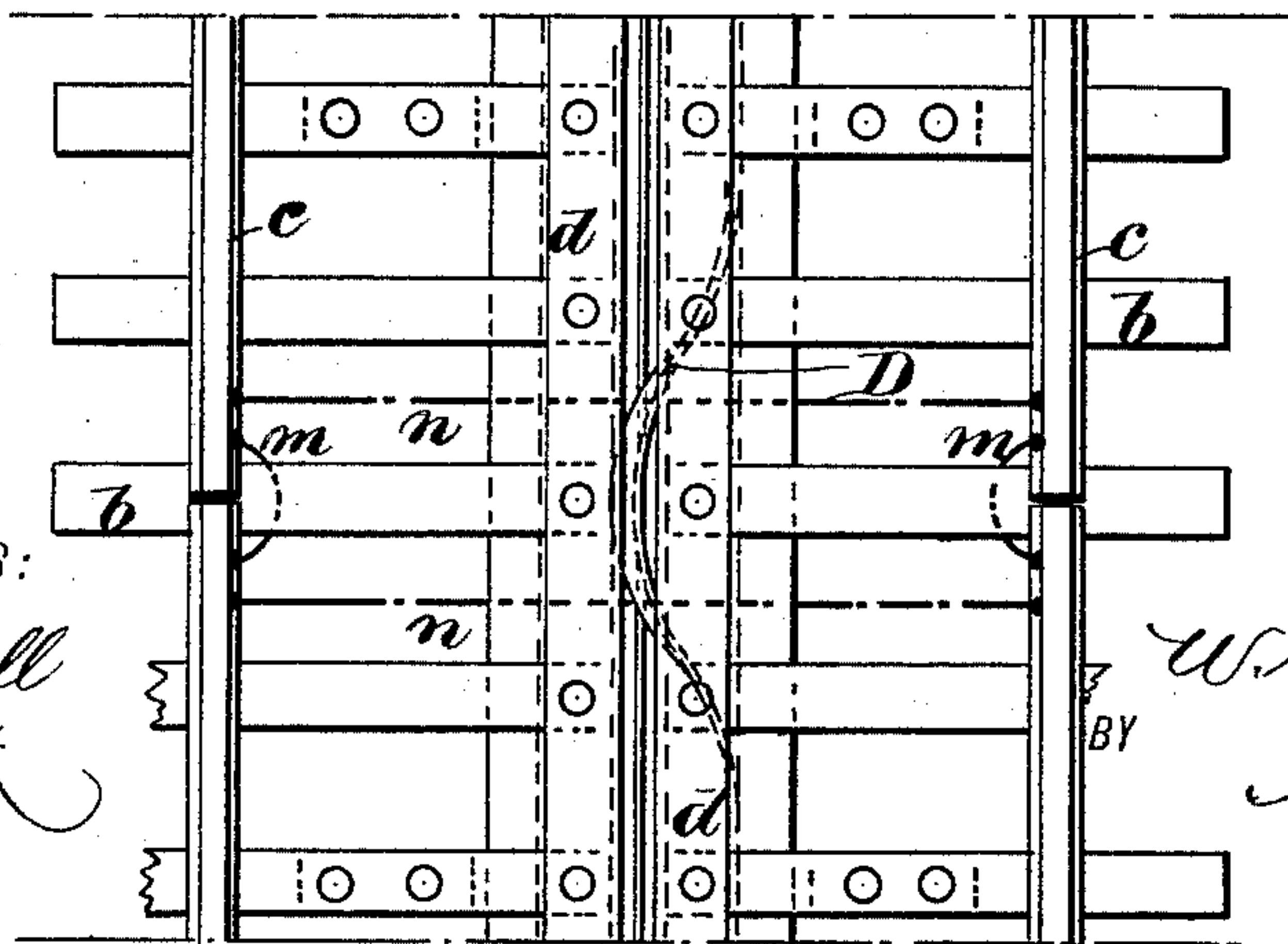
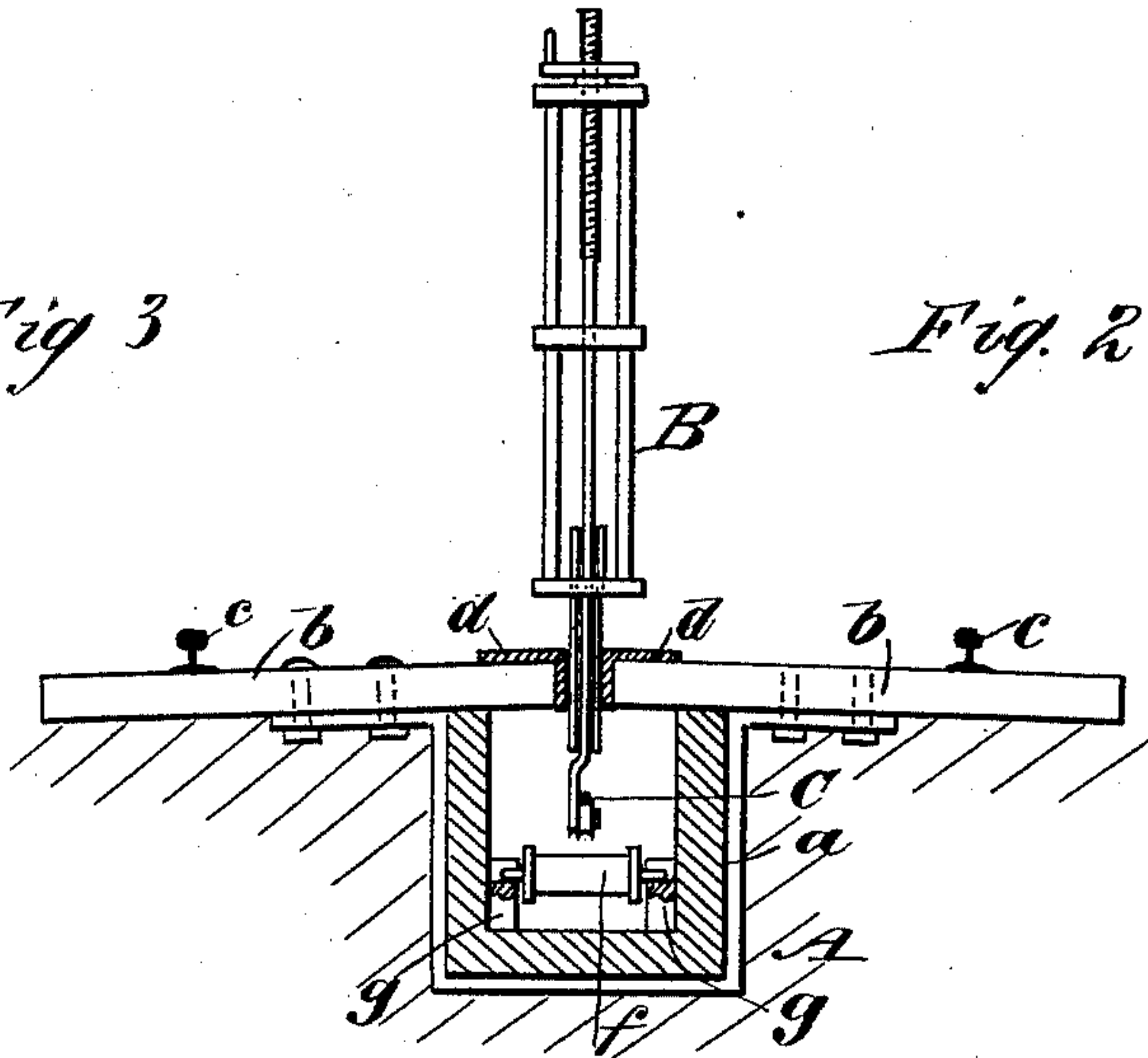
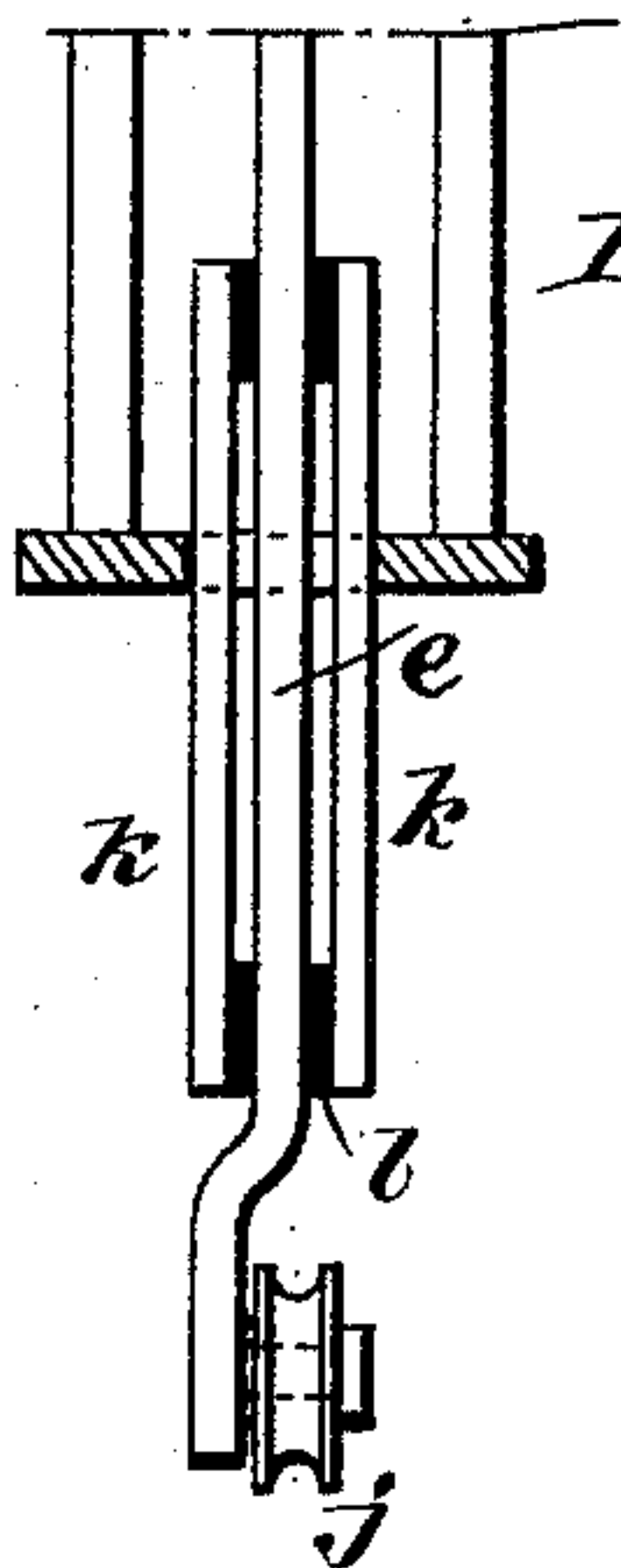
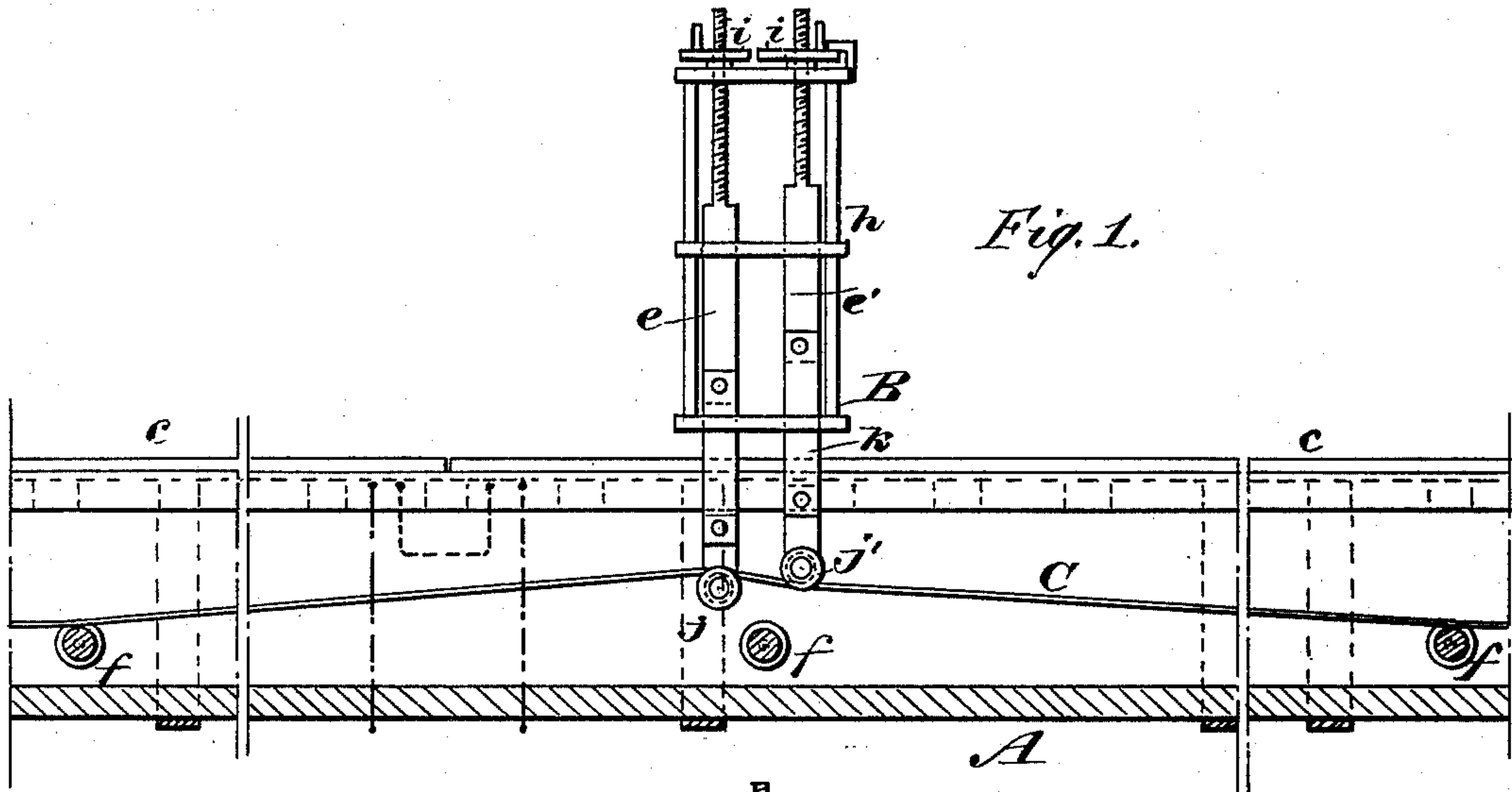
(No Model.)

2 Sheets—Sheet 1.

W. G. MURPHY, Jr.  
ELECTRIC RAILWAY.

No. 483,856.

Patented Oct. 4, 1892.



WITNESSES:

Donn Twitchell  
C. Sedgwick

INVENTOR

W. G. Murphy Jr.

BY

Munn & Co.

ATTORNEYS.

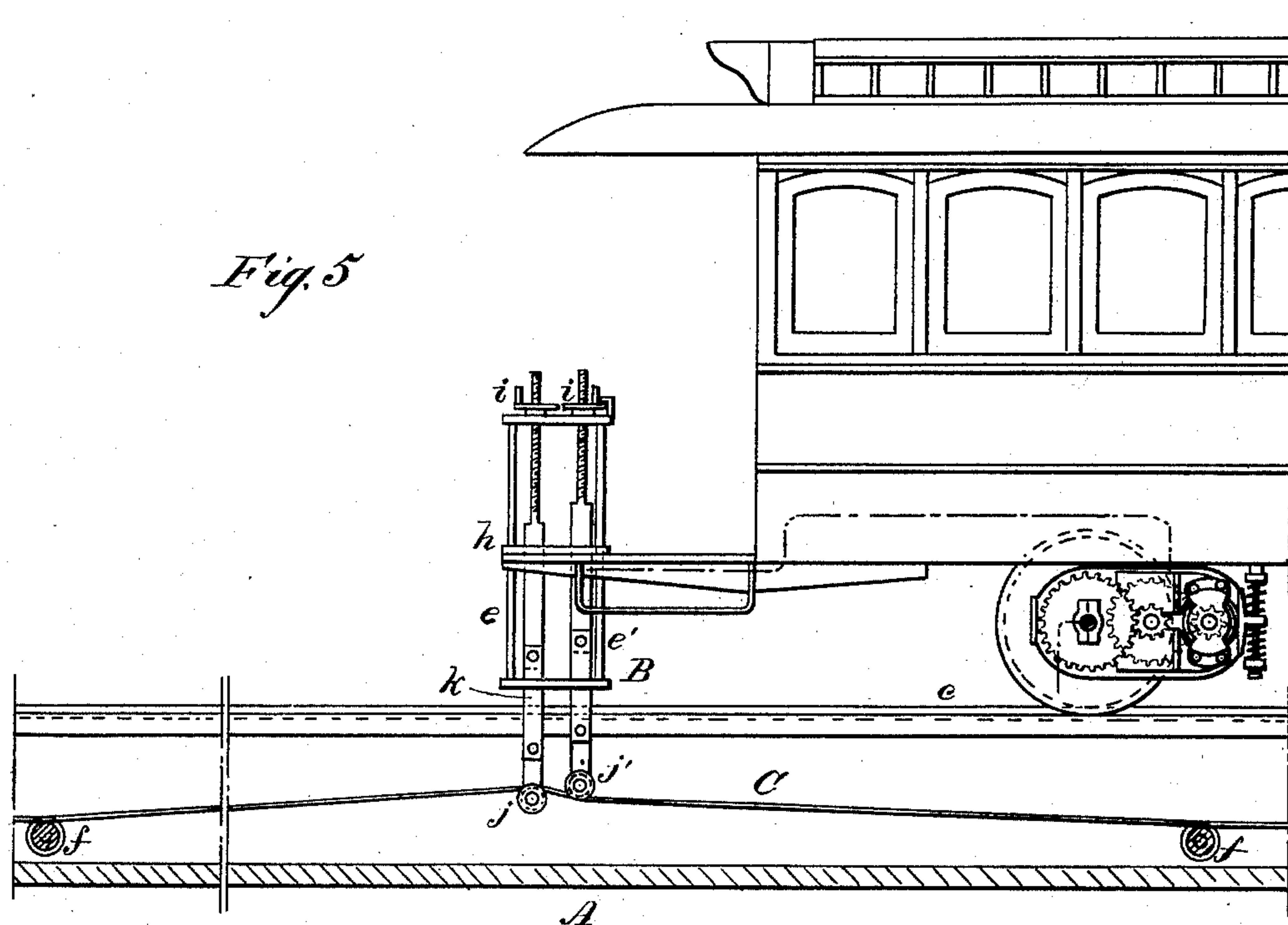
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# UNITED STATES PATENT OFFICE.

WILLIAM G. MURPHY, JR., OF MARYSVILLE, CALIFORNIA.

## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 483,856, dated October 4, 1892.

Application filed September 30, 1891. Serial No. 407,267. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. MURPHY, Jr., of Marysville, in the county of Yuba and State of California, have invented a new and Improved Electric Street-Railway, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a longitudinal section of the cable-conduit, showing the grip or connector. Fig. 2 is a transverse section of the same. Fig. 3 is an enlarged front elevation of one of the connectors. Fig. 4 is a plan view of the track and conduit, showing the spring for holding the cable down; and Fig. 5 is a side elevation, partly in section, of a car provided with my improvement.

Similar letters of reference indicate corresponding parts in all the views.

The object of my invention is to construct an electrical railway in which the cable or conductor will be supported in a conduit below the level of the street and in which the current will be taken through a suitable connector or grip.

My invention consists in the combination and arrangement of parts, as hereinafter described, and pointed out in the claims.

The conduit A is formed of any approved material—such as planking, masonry, or concrete—and at suitable intervals is inclosed by an iron frame *a*, which extends across the bottom of the conduit, up the sides thereof to the top, thence outwardly at approximately right angles for receiving the ties *b*, which are bolted to it and to which are secured the track-rails *c*. The ties *b* extend toward the center of the conduit A, where they are discontinued and angle-plates *d* are attached to their adjacent ends, forming a longitudinal slot midway between the rails *c* for receiving the bars *e e'* of the connector B.

In the bottom of the conduit A are supported flanged rollers *f* upon bearing-blocks *g*, the said rollers or bearing-blocks, or both, being of insulating material. In the conduit A is placed a cable C, formed of one or more naked electrical conductors, said cable being stretched tightly in the conduit and resting normally on the rollers *f*.

The connector B consists of a frame *h*, attached to the framework of the car and form-

ing a guide for the bars *e e'*. The bars *e e'* are arranged to slide up and down upon the frame *h* and are each provided with a threaded upper end for receiving a wheel-nut *i*. The bar *e* carries at its lower end a sheave *j*, which is arranged under the cable C and is designed to lift the cable, while the bar *e'* carries a sheave *j'*, which rests upon the top of the cable, thereby straining the cable between the two sheaves and insuring a good electrical contact. The bars *e e'* are furnished with plates *k* on opposite sides thereof, which are firmly attached to the bars or separated from them by insulation *l*. The plates *k* receive the wear due to the movement of the connector B in its movement along the groove of the conduit.

Where my improvement is applied, the track-rails are made practically continuous by electrical connections *m* at the adjoining ends and cross-wires *n*. The current is taken through the connector B, through the motor carried by the car, and is returned by the track-rails. The cable C is lifted from the rollers *f* as the connector moves along and afterward deposited upon the rollers by its own gravity. The rollers *f* are elevated a sufficient distance above the bottom of the conduit to allow any water which may accumulate in the conduit to flow away without touching the cable. Where the track extends along a hollow or depression in the road, the cable C is prevented from rising by an insulated bow-spring D, attached to one side of the conduit and projecting across the path of the connector B, so that it serves to prevent the cable from rising through the slot of the conduit, but is capable of being displaced laterally by the connector as it passes along.

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

1. In an electric railway, a car carrying a motor, a conduit arranged below the level of the track and provided with insulated roller-supports, a cable resting normally upon the rollers, a connector carried by the car, projecting into the conduit, and furnished with grooved rollers for engaging the cable, and means for bringing the connector in engagement with the cable or removing it therefrom, substantially as specified.

2. A connector formed of two sliding bars, each carrying a grooved roller for contacting with the cable, one bar being adapted to raise the cable and the other to depress it, substantially as specified.

5 3. In an electric railway, the combination, with the conduit, of a bow-spring supported in the conduit and projecting into the path

of the connector for preventing the cable from rising through the slot of the conduit, substantially as specified. 10

WILLIAM G. MURPHY, JR.

Witnesses:

M. C. BARNEY,

EDWIN A. FORBES.