

No. 753,617.

PATENTED MAR. 1, 1904.

F. A. NOLAN.  
TROLLEY REPLACER.

APPLICATION FILED JAN. 16, 1902.

NO MODEL.

Fig. 1.

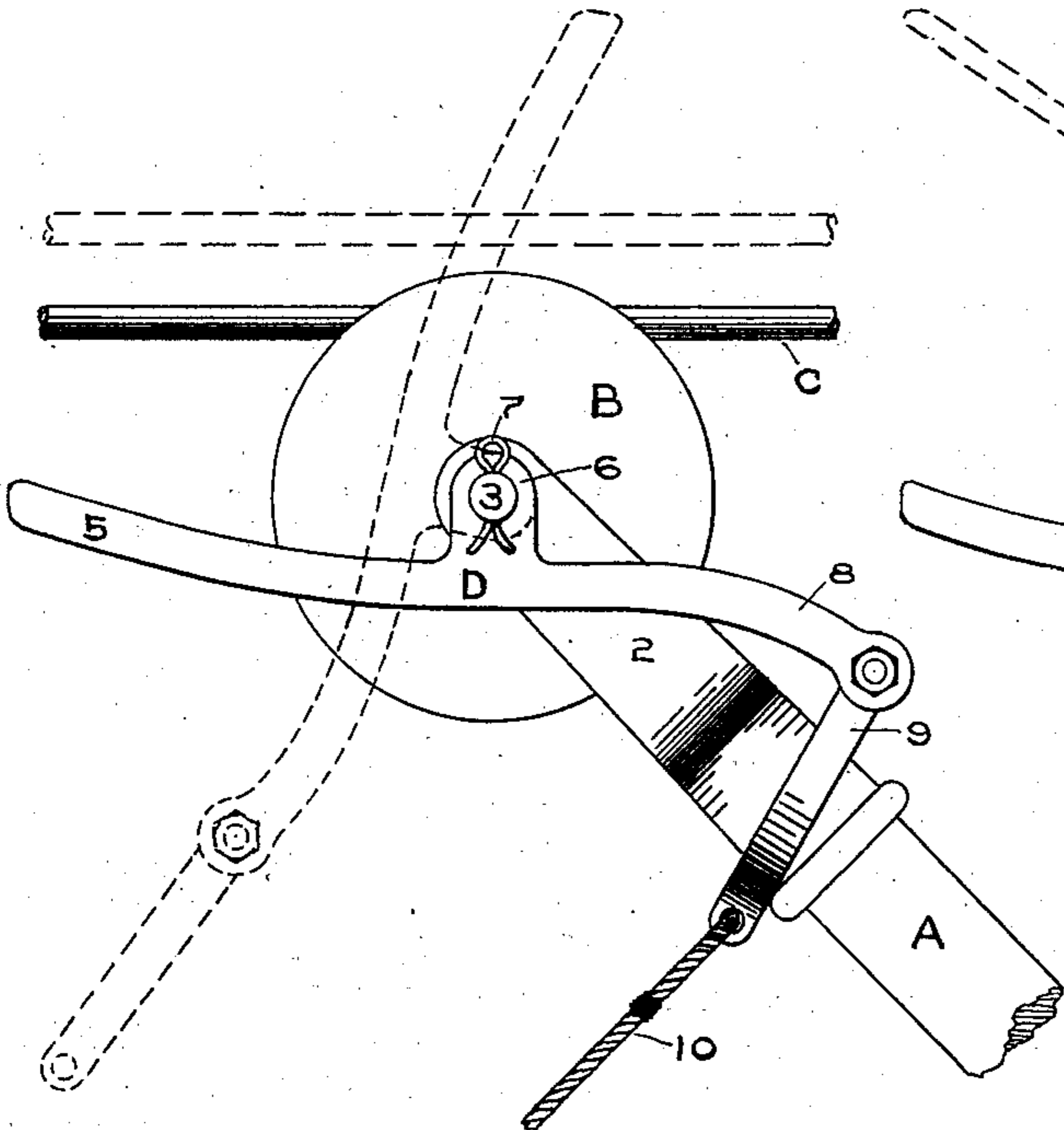


Fig. 2.

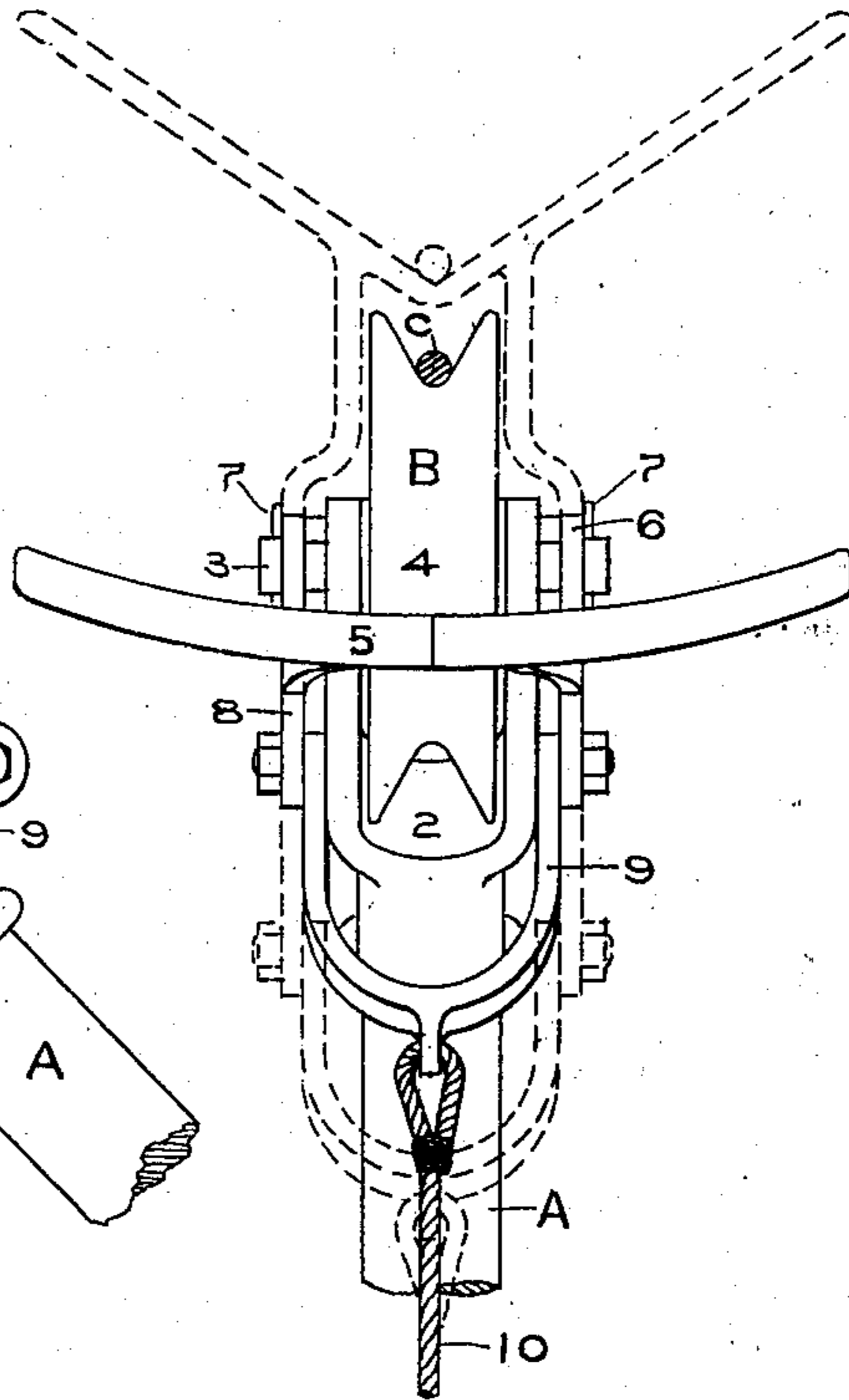
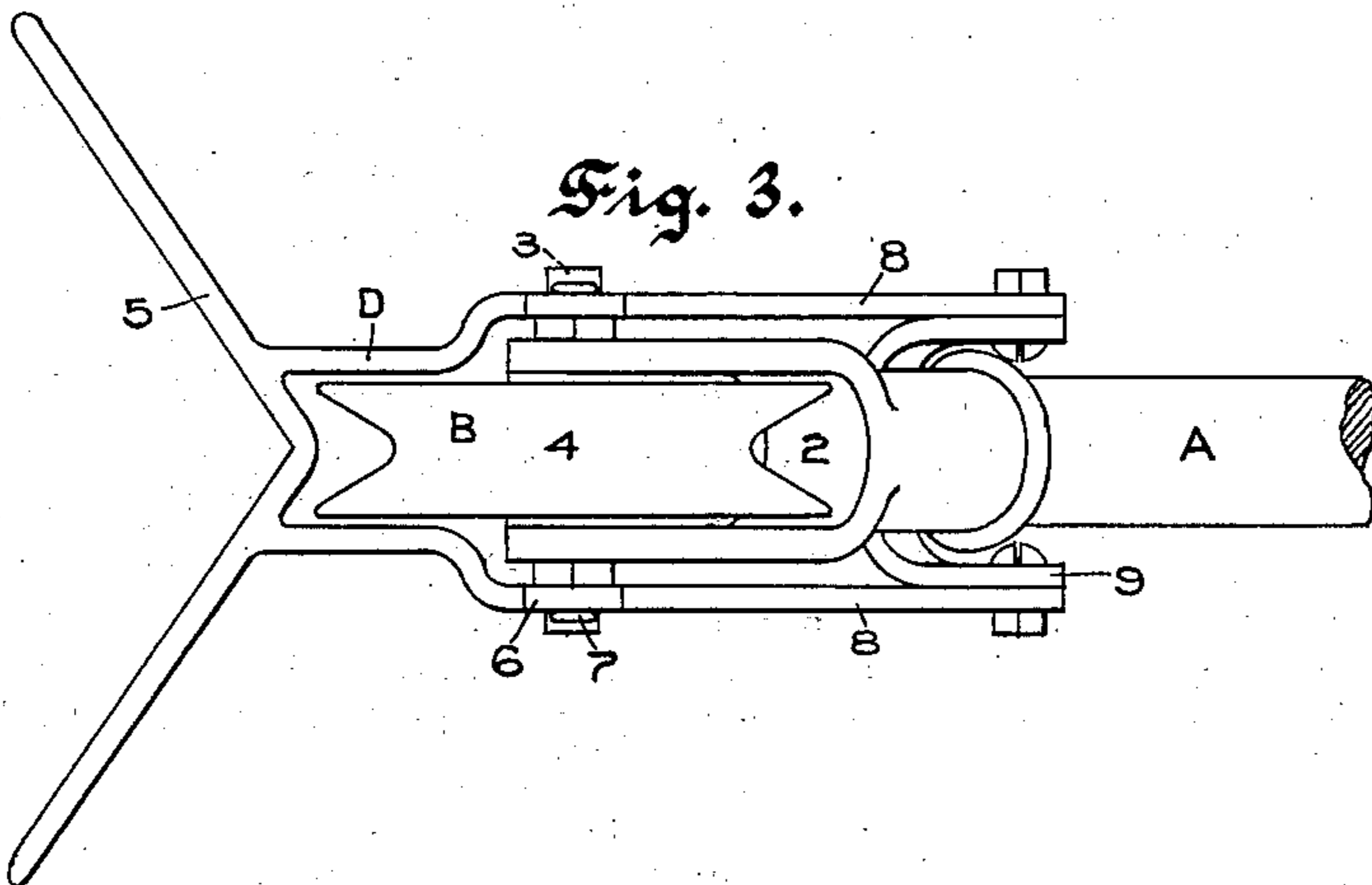


Fig. 3.



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# UNITED STATES PATENT OFFICE.

FRANCIS A. NOLAN, OF ST. PAUL, MINNESOTA.

## TROLLEY-REPLACER.

SPECIFICATION forming part of Letters Patent No. 753,617, dated March 1, 1904.

Application filed January 16, 1902. Serial No. 89,952. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS A. NOLAN, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Trolley-Replacers, of which the following is a specification.

My invention relates to improvements in trolley-replacers for electric railways using the trolley system. In the operation of cars by this system the trolley-wheel often slips or becomes accidentally displaced from the trolley-wire, and it is frequently necessary to draw it out of contact therewith in passing switches and at other times. In replacing the trolley-wheel after it has been displaced it is a matter of some nicety to guide the wheel accurately to the wire.

It is the object of my invention to provide a device which shall accurately and surely guide the trolley to the wire, which shall be simple, inexpensive, and efficient, and which may be attached to and used in connection with any trolley wheel and pole in common use without requiring special construction or adaptation of these parts.

To that end my invention consists in the features of construction, combination, and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of my improved trolley-replacer in normal position when the trolley is in place upon the wire with the trolley-pole partly broken away and showing in dotted lines the position of the replacer and wire when the replacer is operated to engage the wire. Fig. 2 is an end view of the same, and Fig. 3 is a top view of the device in normal or non-operative position.

In the drawings, A represents a trolley-pole having at its upper end a fork 2, of ordinary construction, between the arms of which and upon the axle 3, passing through these arms, is rotatably mounted a trolley-wheel B, of ordinary construction, having a circumferentially-grooved periphery 4 to receive the trolley-wire C.

The replacer consists in general of a lever

D, suitably fulcrumed upon some convenient part of the trolley-support and carrying at its upper end a forked finder 5, having a continuous or substantially continuous upper face and adapted to be thrown above the trolley-wheel to engage the trolley-wire when the lever is suitably actuated.

In use I have found it desirable to fulcrum the lever upon the axle of the trolley-wheel in order to bring the forked finder 5 at all points of its travel as near to the wheel as possible, and thereby more surely and accurately to guide the trolley-wheel into alignment with the wire, and in order to shorten the length of the upper arm of the lever, so that there will be less likelihood of the finder swinging untrue. If, however, the lever were fulcrumed upon the trolley-axle so as to extend radially therefrom, it might not lie a sufficient distance below the trolley-wire when in normal position to avoid entanglement with the frogs and cross-wires along the line. In order to secure these and other advantages and to avoid the objections mentioned, I construct and arrange the replacer as shown in Figs. 1, 2, and 3 of the drawings. As there shown the lever is bifurcated in order to receive between its sides the trolley-wheel B, and each of the sides is formed at a corresponding point between its ends with a laterally-extending offset or lug 6, having an opening to receive loosely the end of the axle 3, which may be lengthened, if necessary, for that purpose. The lugs are held in place upon the axle by means of a key 7 or other suitable device. Bridged across the outer or upper ends of the sides of the lever is the forked finder 5, having a continuous or substantially continuous upper face, the arms of which extend upwardly and outwardly in a plane perpendicular to the plane of rotation of the trolley-wheel. I prefer to construct the forked finder in V-shaped form, as shown in Figs. 2 and 3, with the fork or angle formed by the arms in the plane of the groove of the trolley-wheel and as close thereto as is consistent with the free working of the wheel and lever. To insure the most efficient working of the device in guiding the trolley to the wire and to prevent the forked finder from being thrown back

by sudden and violent engagement with the wire before it has time to guide the trolley to the wire, the arms of the forked finder 5 are preferably bent or turned upwardly or forwardly, so that the finder-arms will extend forwardly beyond the axis of the trolley-wheel when the finder is thrown up to engage the wire.

Pivotally connected with the lower ends 8 of the lever D is a U-shaped link or yoke 9, extending around the under side of the trolley-pole A. To the lower part of this link is secured a rope 10 for operating the replacer and trolley.

Fig. 1 shows in full lines the normal position of the replacer when the trolley is in place upon the wire. To replace the trolley upon the wire after it has been displaced therefrom, the rope 10 is first pulled downwardly, causing the lever to turn upon its pivotal support and throw the forked finder 5 over the top of the wheel, as shown in dotted lines in the drawings, and then manipulated so as to bring the forked finder beneath the wire and between it and the wheel. As the rope is let out the trolley-pole will move up under the tension of its spring (not shown in the drawings) until the forked finder of the trolley-replacer engages the wire. If the fork of the finder be not already directly under the wire, the outspread finder-arms will slide laterally and upwardly upon the wire to bring the trolley-wheel into alinement therewith until the wire is lodged in the fork or angle of the finder, when the wire will be exactly over the groove of the wheel. The rope 10 is then entirely released, allowing the finder 5 to drop back into the position shown in Fig. 1 and the trolley-wheel to move up against the wire under the tension of the trolley-spring. The weight of the lever-arms is so distributed and their length and shape are so arranged that the finder will fall back at once into the normal position (shown in Fig. 1) when the trolley has been replaced.

By connecting the link 9 with the lower end of the lever and securing the trolley-rope to the link I am able to obtain the necessary length of the lever movement without inconveniently lengthening or bending the lower end of the lever. It will be observed that in the construction shown in Fig. 1 the bifurcated link 9, passing around the lower side of

the trolley-pole, will engage the trolley-pole to stop and limit the further movement of the finder when it has dropped back into the position shown in Fig. 1. By reason of the means provided thus to stop the further turning of the finder and by having its arms bent or turned forwardly or upwardly toward the wire, as shown in the drawings, the finder forms a convenient means for catching the wire should the trolley be accidentally displaced therefrom, for the trolley-wheel instead of being thrown upward until checked by the trolley-rope will immediately be checked and held by the engagement with the wire of the outspread arms of the finder.

It is evident that other modifications than those shown in the drawings may be made within the principle of my invention, the scope of which is defined in the claim.

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

In a trolley-replacer, the combination, with a trolley-pole, a trolley-wheel and its axle, of a bifurcated lever formed with lateral lugs at a point between its ends, said lugs being pivotally supported upon the opposite ends of the axle so that the lever will turn freely upon its pivotal support without frictional contact with the trolley-wheel, a forked finder having a continuous upper face and upwardly and outwardly extending arms bridged across the upper or acting end of the lever, a yoke extending around the under side of the trolley-pole and having its ends pivotally connected with the lower or power end of the lever, and a trolley-rope connected with the yoke upon the under side of the pole, the weight of the lever being so distributed that, when the trolley-rope is released, the finder will fall backward by gravity and assume a position where it extends slightly upwardly from the horizontal, and the yoke being adapted to hold the finder from being turned farther on its pivotal support after it has reached such position, substantially as and for the purpose described.

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

FRANCIS A. NOLAN.

Witnesses:

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