

No. 612,062.

Patented Oct. 11, 1898.

B. R. SHOPP, JR.

TROLLEY ARM.

(Application filed Mar. 15, 1894.)

(No Model.)

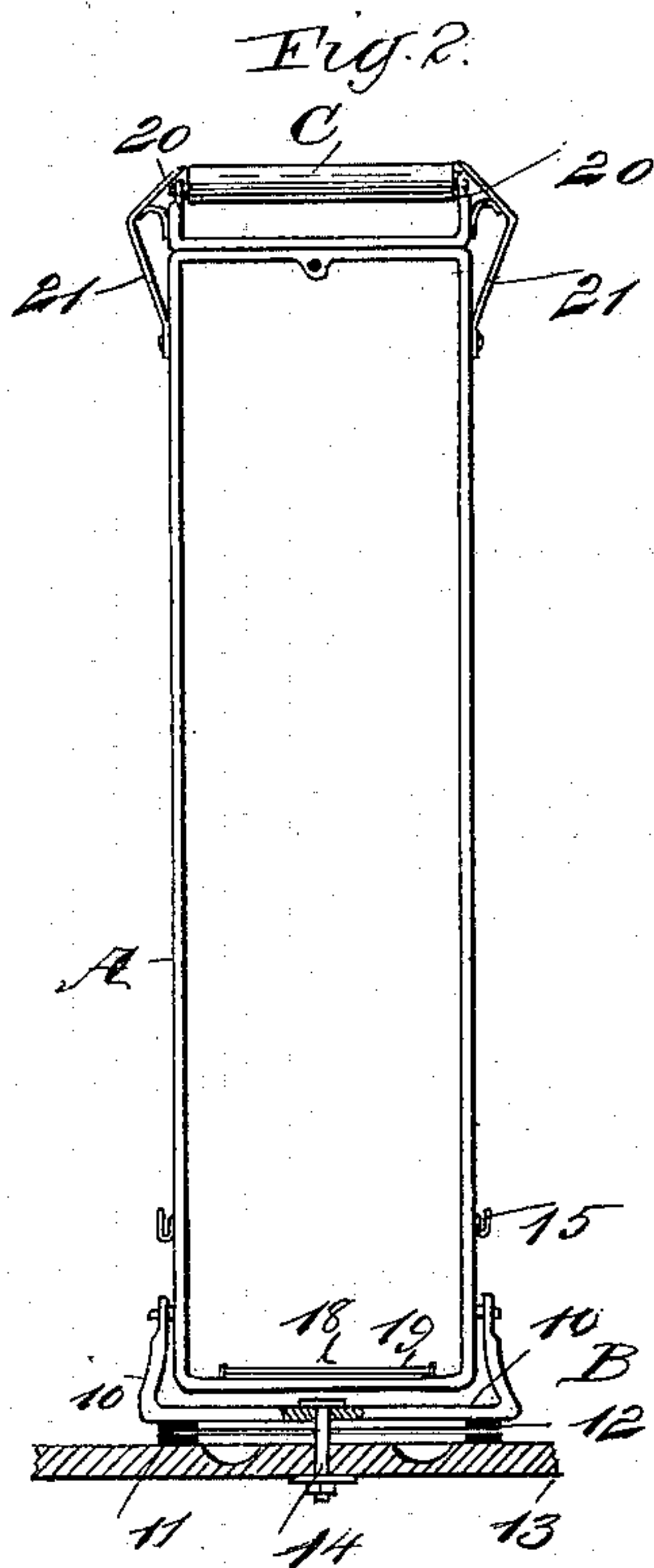
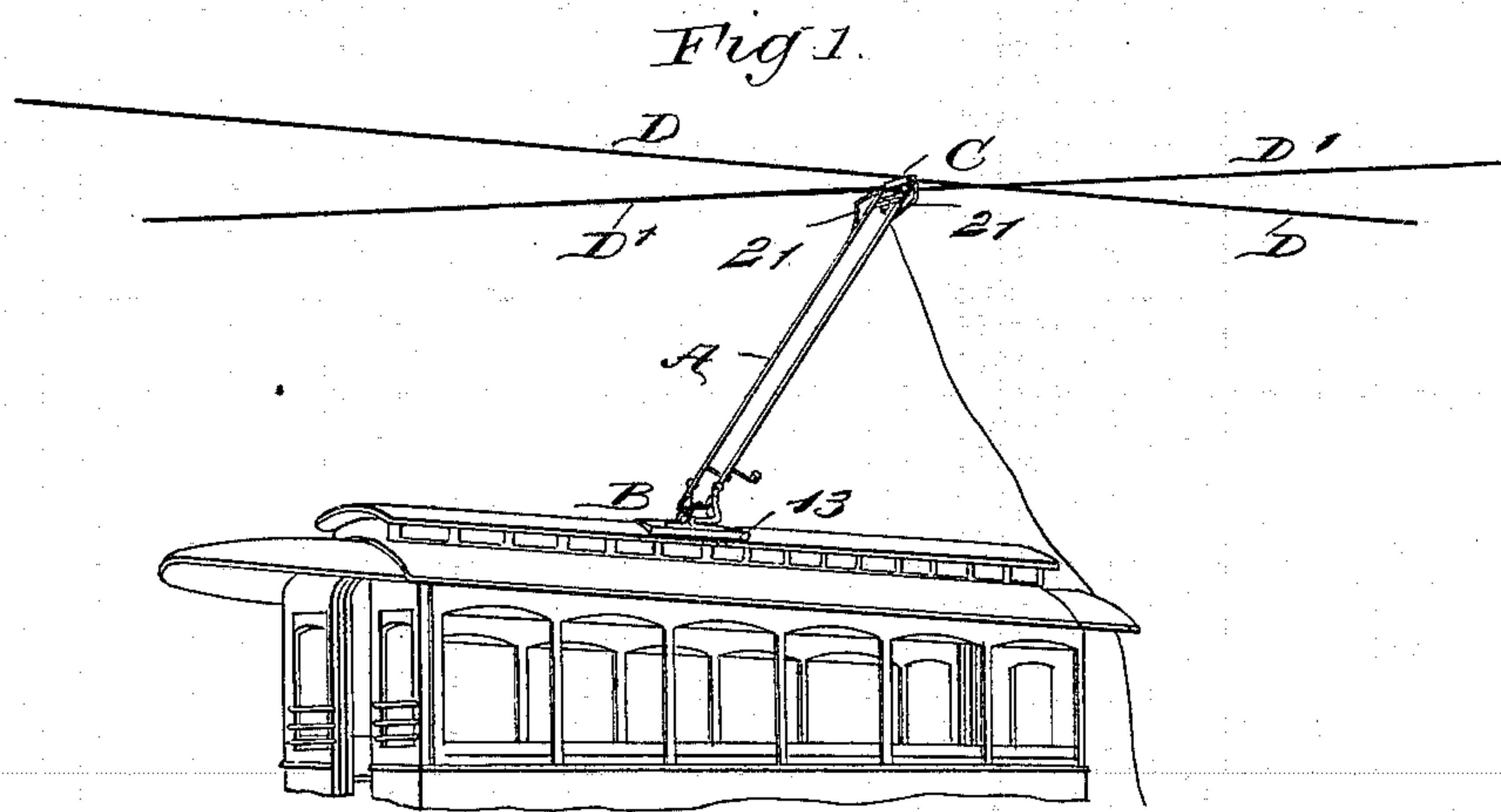


Fig. 3.

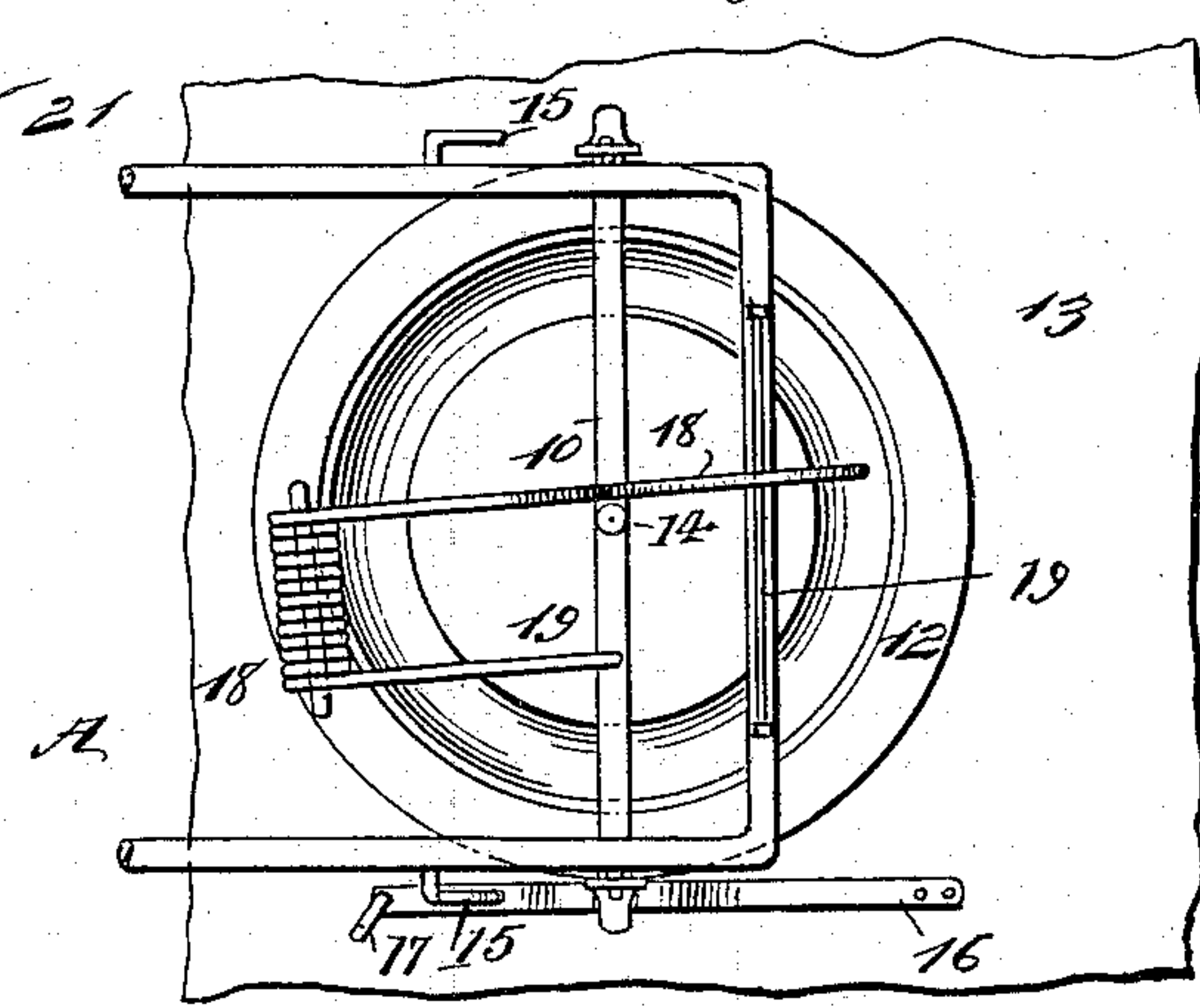


Fig. 4.

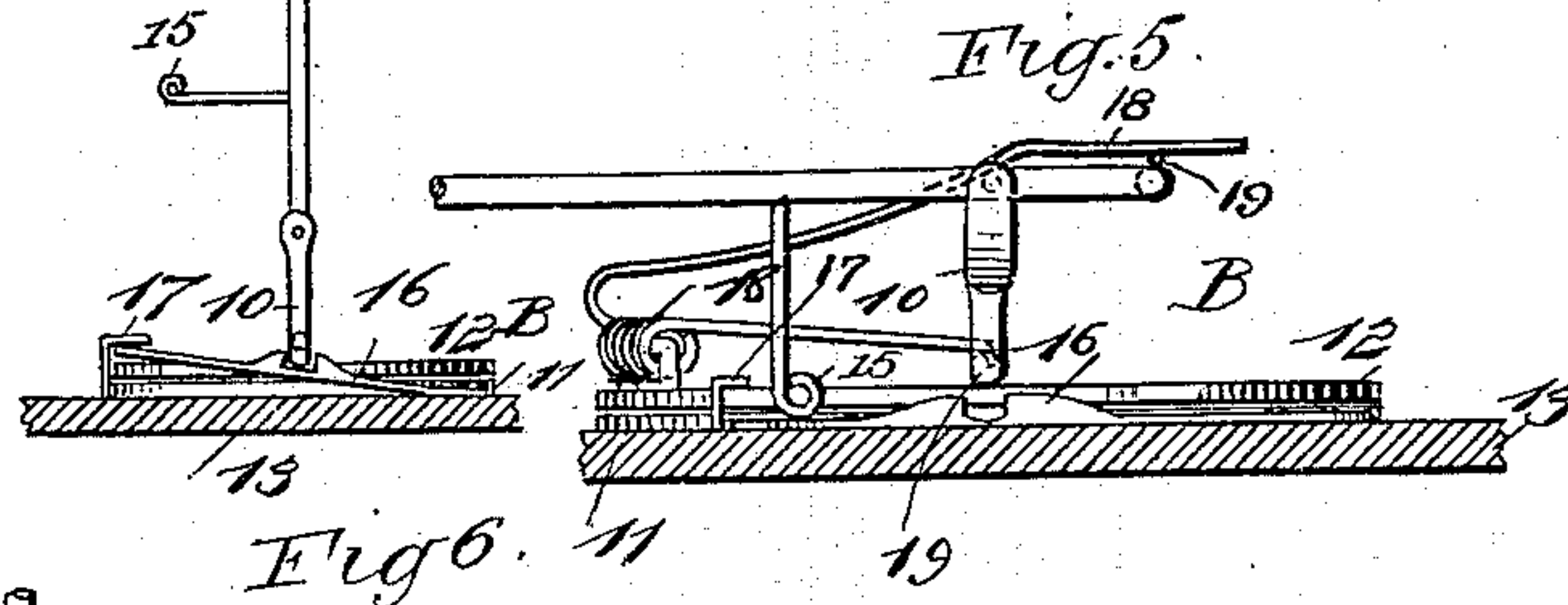
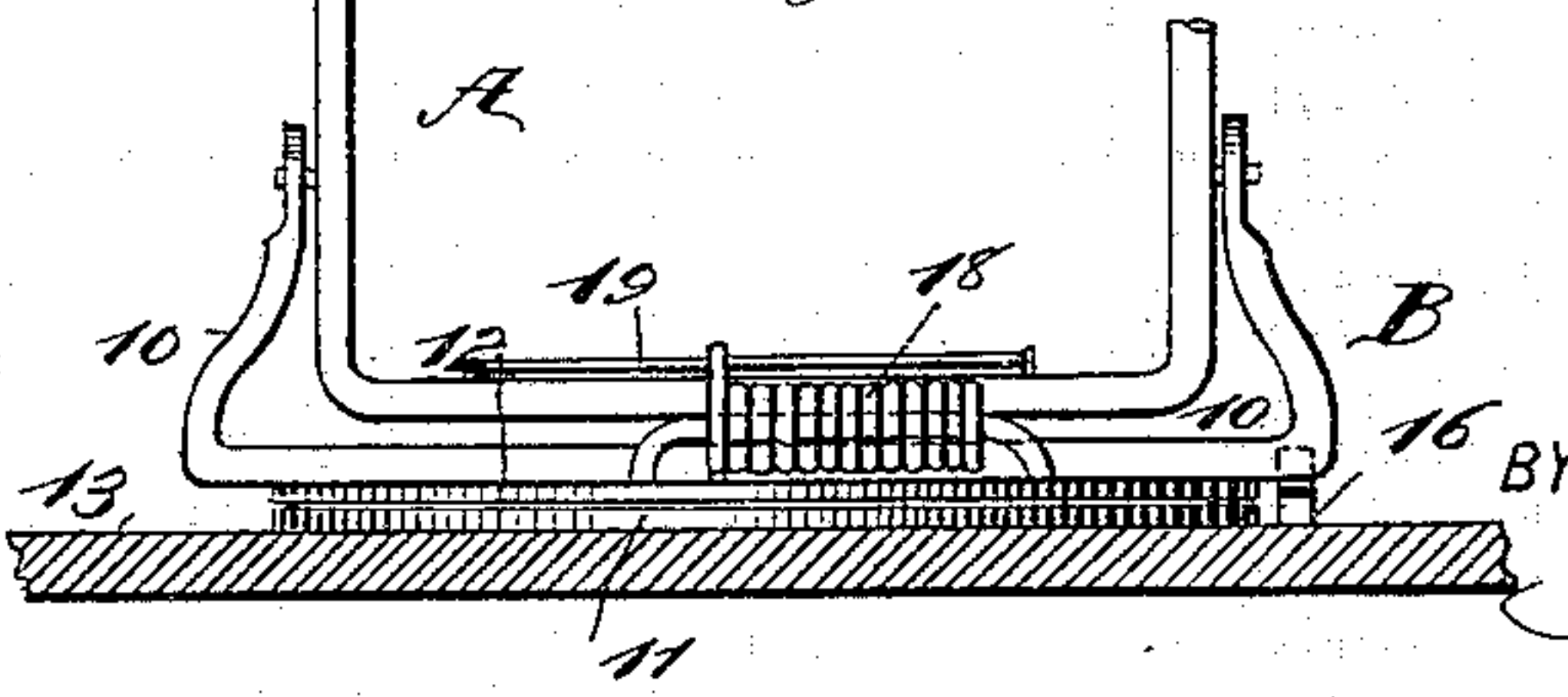


Fig. 6.



WITNESSES:

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TROLLEY-ARM.

SPECIFICATION forming part of Letters Patent No. 612,062, dated October 11, 1898.

Application filed March 15, 1894. Serial No. 503,771. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN R. SHOPP, Jr., of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Trolley-Arm, of which the following is a full, clear, and exact description.

My invention relates to a device for conducting an electric current from a conducting-wire to the motor of a car or like vehicle.

10 The object of the invention is to so construct the trolley-arm that while in use it will constantly exert uniform upward pressure upon the conducting-wire, the pressure remaining comparatively the same, although
15 the wire may be held at variable altitudes, and when the arm is drawn downward for reversal or other purposes the tension upon the arm will be virtually the same as when the arm is in the upper position, so that when the
20 arm is released the rapid return and consequent shock common to trolley-arms as at present constructed is prevented.

A further object of the invention is to provide a conducting or trolley wheel for the arm
25 having a bearing-surface which will render it impossible for the wheel to jump or leave the conducting-wire or in any manner obtain a position above it and which when the arm is released after being drawn downward will
30 readily engage any lateral position of the conducting-wire.

Another object of the invention is to provide the arm with guides so located that at a crossing or switch the branch or cross wire or
35 wires will be automatically conducted to the bearing-surface of the trolley-wheel at the approach to the switch and delivered from the wheel upon leaving the switch or crossing without a break in the current and without
40 possible disarrangement of or injury to the wires.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth,
45 and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the
50 views.

Figure 1 is a perspective view of a portion of a trolley-car having the improved arm ap-

plied thereto, the arm being shown in contact with its conducting-wire adjacent to a crossing. Fig. 2 is a side elevation of the improved
55 arm. Fig. 3 is an edge view of the arm. Fig. 4 is a plan view of the lower or base portion of the arm when in a depressed position. Fig. 5 is a side elevation of the arm when in the position shown in Fig. 4; and Fig. 6 is an en-
60 larged view of the base portion of one side of the arm, the arm being in elevated or working position.

The body A of the trolley-arm consists of a frame usually of rectangular shape, but which
65 may be given any desired contour, the said body being usually constructed of light metal tubing, and the frame may be provided with suitable braces to preserve it against lateral or twisting motion, if found necessary. 70

The arm is mounted upon a base B, and the said base may be said to consist of a turn-
table and a bracket 10 or equivalent device carried by the turn-table, in which the bot-
tom portion of the body of the arm is pivoted. 75
The turn-table usually consists of two plates 11 and 12. These plates are preferably in the nature of rings and one is held to turn upon the other, the lower ring or plate being firmly
80 secured to a base plate or board 13, adapted for attachment to the roof of a car, as shown in Fig. 1, or the said lower ring 11 may be attached directly to the car-roof.

The bracket 10 is secured to the upper plate or member 12 of the turn-table, extending
85 usually from side to side, and the pivot 14 of the turn-table is usually passed through the horizontal member of the body of the said bracket, as illustrated in Fig. 2, and into or through the support provided for the turn-
90 table. The body A of the arm is provided with trunnions, which are held to turn in the upper or end members of the bracket 10, as is shown in both Figs. 2 and 6.

The body of the trolley-arm near its lower
95 or pivotal end is provided with extensions 15 from one of its side faces, the extensions being projected from each side member of the said body. These extensions are in the nature of arms and are usually enlarged at their
100 outer or free ends and are located, preferably, at right angles to the said side members, as shown in Fig. 3. The extensions 15 from the body of the trolley-arm are adapted

to engage with and depress a spring-keeper 16, secured to the base board or plate 13 or to the top of the car at one side of the turn-table. The spring-keeper is secured firmly 5 to its support at one of its ends, and at a point between its ends it is provided with a recess capable of receiving an outer end portion of the base-bracket of the trolley-arm, thereby holding the said bracket, and consequently 10 the upper member of the turn-table, against turning, the free end of the keeper being limited in its upward movement by means of a suitable stop 17. Preferably the upper surface of the keeper at each side of its receiving-recess is more or less inclined; but it will be understood that the keeper may be otherwise constructed to receive and retain the said bracket 10.

The body of the trolley-arm is normally 20 held in working position through the medium of one or more springs 18, a single spring being illustrated in the drawings. The spring shown is coiled around a support carried by the upper or movable member of the turn-table. One end of the spring is attached to 25 the body of the bracket 10, while the other end of the spring is free and is carried over the bottom of the body of the trolley-arm, engaging with the upper surface thereof, and that portion of the arm with which the spring engages is usually provided with a friction-roller 19. Where the free end of the spring 18 engages with the body of the trolley-arm the said spring is bent in a downwardly direction, and at the angular portion thus 35 created the spring has its bearing when the arm is in an upright position, as shown in Fig. 6. It will be observed that this spring has a sliding contact with the body of the trolley-arm. The tendency of the spring is to hold the arm in an upper position or in position for engagement with the conducting-wire, and the spring is sufficiently strong to cause the arm to take up the slack of the 45 wire with which it engages, the wire being under more or less tension when engaged by the arm, and owing to the peculiar bearings of the spring on the trolley-arm when the arm is drawn downward in order that it may be reversed or for any other purpose the tension upon the arm made by the spring will be virtually the same as when the arm is in its upper position, since the fulcrum of the arm upon the spring will be extended, being 55 nearer the free end of the spring, as shown in Fig. 5. In this manner while the arm when released will return automatically to its normal position it will not return with that velocity common to trolley-arms of the ordinary construction, which latter when returning to the conducting-wire sustains more or less of a detrimental shock.

While the keeper 16 normally acts to hold the trolley-arm in the position in which it 65 may be placed, the turn-table may be manipulated whenever the body of the trolley-arm is drawn downward sufficiently far to

bring one of its side extensions 15 in contact with the keeper and depress the same to carry it out of engagement with the pivot-bracket 10 of the trolley-arm, as shown in 70 Figs. 4 and 5, and at this time the said bracket may readily pass the keeper, which will return to its normal position when released by the said extension in order that it may engage with the opposite side of the said bracket 75 when the trolley-arm shall have been reversed.

The most important feature of this invention relates to the means employed to prevent the trolley-wheel from obtaining a position above the conducting-wire, which consists in the employment of a wheel C of cylindrical construction, being virtually a roller of considerably greater length than diameter. 85 In fact, the length of the roller or trolley-wheel preferably corresponds substantially to the width of the trolley-arm upon which it is mounted. The trolley roller or wheel C is provided with trunnions mounted in bearings 90 20, located at the upper side portions of the body of the trolley-arm, as shown best in Fig. 2. By the use of such a roller or cylinder as a trolley-wheel it is impossible for the trolley-arm to be thrown out of contact with the conducting-wire, no matter how rapidly the car 95 may be moving or how great the vibration maybe. Furthermore, when it is necessary to place the arm in engagement with the conducting-wire the wire will be caught by the arm the moment the arm is elevated, owing to the length of the contacting surface presented by the trolley wheel or roller. 100

A guide 21 is located at each end of the trolley wheel or roller C. The said guides are 105 preferably of angular or substantially triangular shape, one of their ends being secured to the side members of the body of the trolley-arm, while the other end is made to approach the upper surface of the trolley roller or wheel, as is likewise shown in Fig. 2. Thus each guide 21 presents two inclined planes, one leading upward and outward from the body of the trolley-arm and the other leading upward and inward to the trolley wheel or 115 roller.

The operation of the guides is shown in Fig. 1, in which the trolley is shown as approaching a switch or crossing of the wires. The conducting-wire for the trolley is designated in the said view as D, while the branch or cross wire is designated as D'. As the trolley-arm approaches the crossing the branch or cross wire is received upon the upper inclined plane of one of the guides 21 and is 120 conducted by said surface upward upon the trolley roller or wheel C. Therefore the trolley roller or wheel will now support two of the wires, the branch wire being the under one, and when the trolley wheel or roller 130 reaches the point of crossing of two wires the under or branch wire will slip toward the opposite end of the trolley-roller, and as the car farther advances, leaving the crossing, the

branch wire will slip from the trolley-wheel downward over the inclined upper surface of the opposite guide, the conducting-wire remaining throughout in engagement with the trolley wheel or roller. It will thus be seen that no matter at what rate of speed the car may be run both wires at a crossing or switch will be taken up by the trolley in an automatic manner and likewise automatically discharged without injury to either, the trolley remaining all the time in contact with its conducting-wire.

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

1. In a trolley-arm, a trolley-wheel consisting of an elongated roller, and inclined guides located at each side of the trolley-arm and inclining in direction of the length of the roller, the said guides leading to the upper surface of the roller at the ends thereof, whereby the wire at a crossing will be taken up by the trolley at one side thereof and discharged from the trolley at the opposite side, as and for the purpose specified.

2. The combination, with a trolley-arm and an elongated roller pivoted therein as a trolley-wheel, of guides located at opposite sides of the trolley-arm, the said guides having inclined surfaces leading upward and inward to the peripheral surface of the roller at its ends, the said guides being arranged in longitudinal alinement with the said roller and with each other, as and for the purpose specified.

3. The combination, with a trolley-arm, of an elongated roller journaled therein, serving as a trolley-wheel, and guides of angular construction located at opposite sides of the trolley-arm, the said guides being arranged in longitudinal alinement with the said roller and one of the inclined surfaces of each guide being carried inward to substantially a connection with the peripheral surface of the roller at the ends thereof, as and for the purpose set forth.

4. The combination with a turn-table, a bracket carried by the movable member of said turn-table, and a trolley-arm pivotally

connected with said bracket at a point above its lower end, of a spring located upon the turn-table and having one of its ends attached to a fixed support, the opposite end of the said spring being carried unconfined over the lower end of the trolley-arm, the said spring being bent to form an angular portion, the angular portion bearing upon the trolley-arm when the latter is in an upright position, as and for the purpose specified.

5. The combination with a trolley-arm and the adjustable support therefor with which the said arm is pivotally connected, the said arm being pivoted at a point above its lower end, of a spring carried by the said support, having one end fixed thereto, the opposite end of the spring being carried over the trolley-arm below its pivot to free engagement with the said arm, the free end of the spring being bent to form an angular portion, as and for the purpose specified.

6. The combination with a turn-table, a support therefor, a bracket carried by the movable member of the turn-table and projecting beyond the sides of the said turn-table, and a trolley-arm pivotally mounted upon the said bracket, of a spring-controlled keeper located upon the said support and provided with a recess adapted to engage the projecting portion of the said bracket, and trips connected with the trolley-arm and adapted to depress the keeper and release the said bracket, as and for the purpose set forth.

7. The combination, with a turn-table, a support therefor, and a trolley-arm pivotally mounted upon the movable member of the turn-table, of a spring-controlled keeper located upon the said support and adapted for locking engagement with an extension from the movable member of the turn-table, and trips connected with the trolley-arm and adapted for engagement with the keeper when the trolley-arm is depressed, as and for the purpose specified.

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Witnesses:

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C. SEDGWICK.