

No. 686,862.

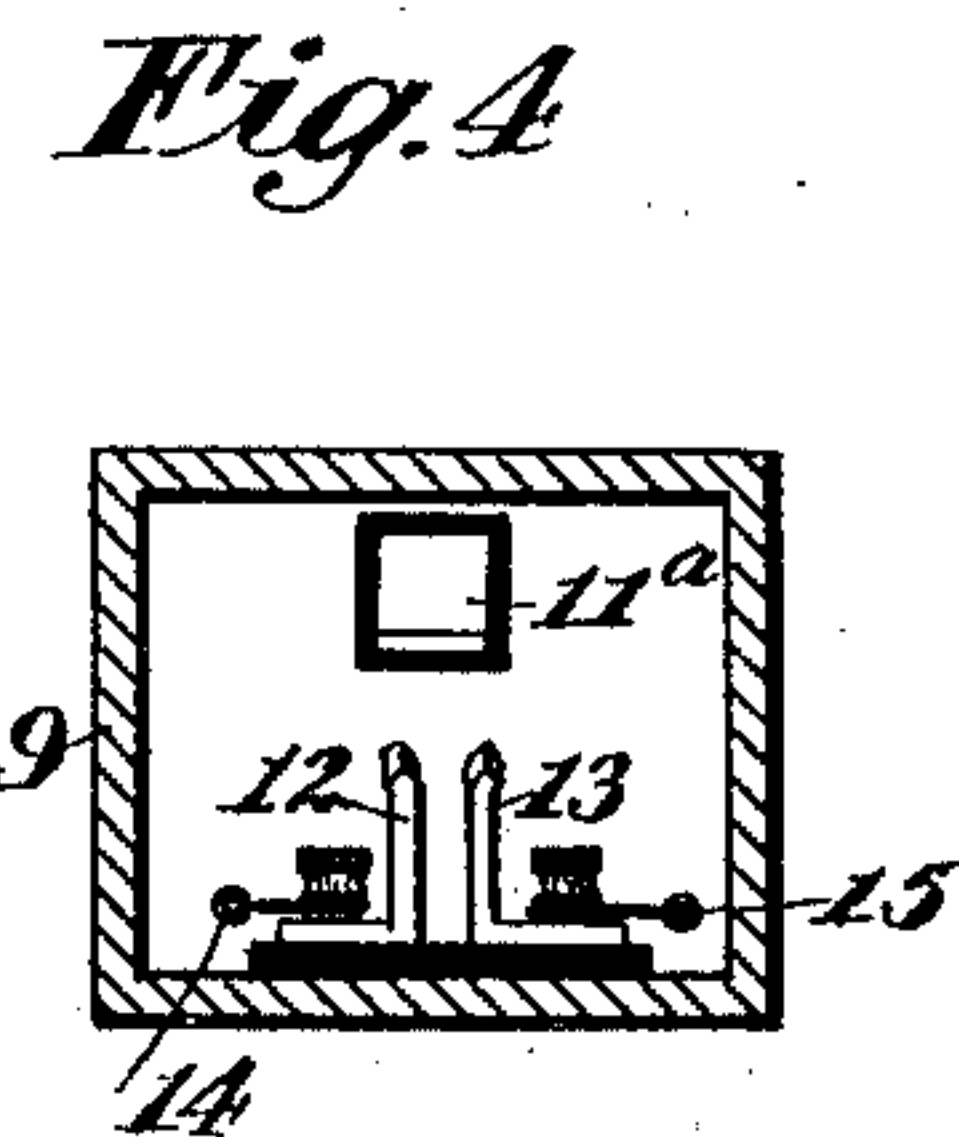
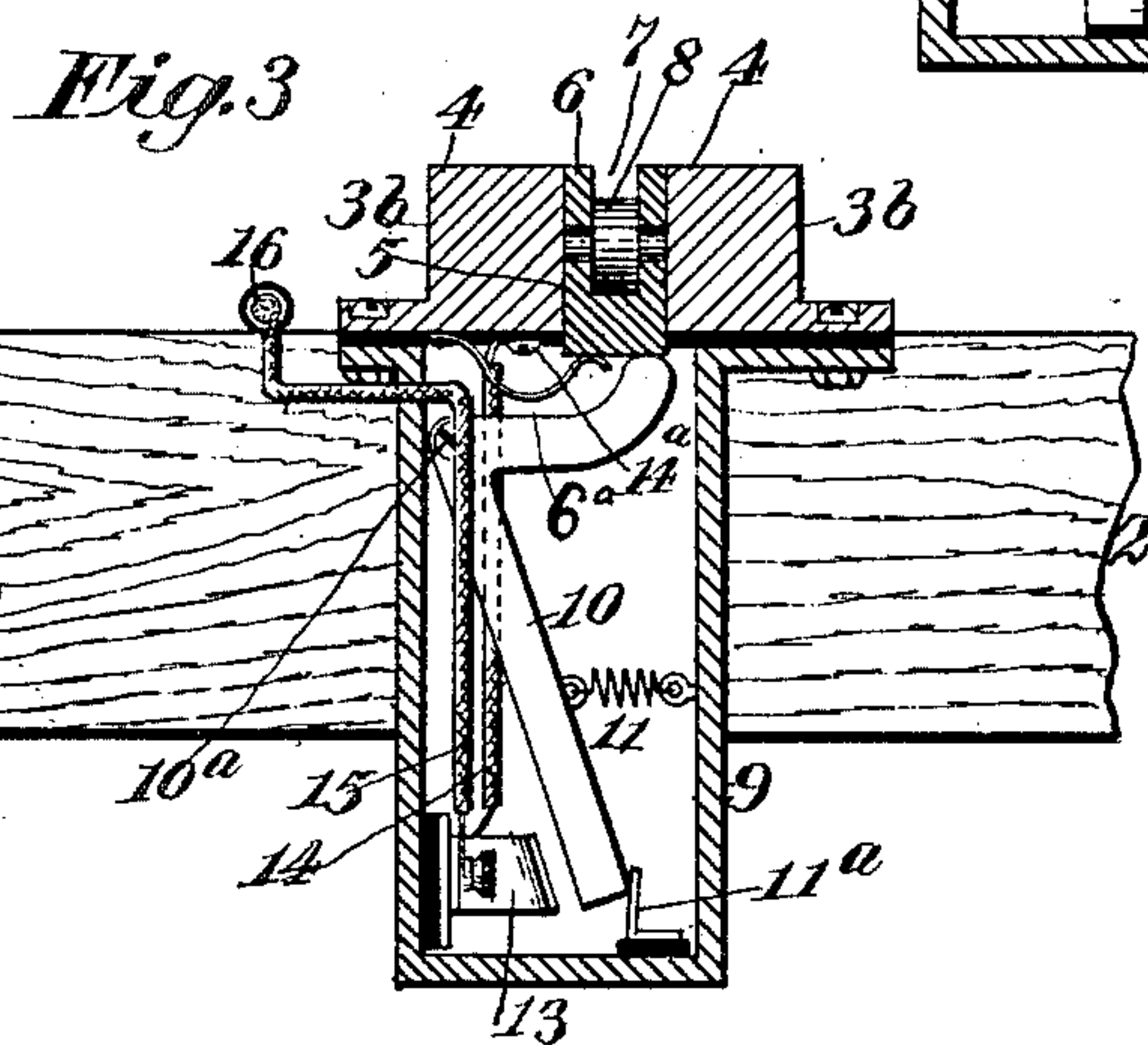
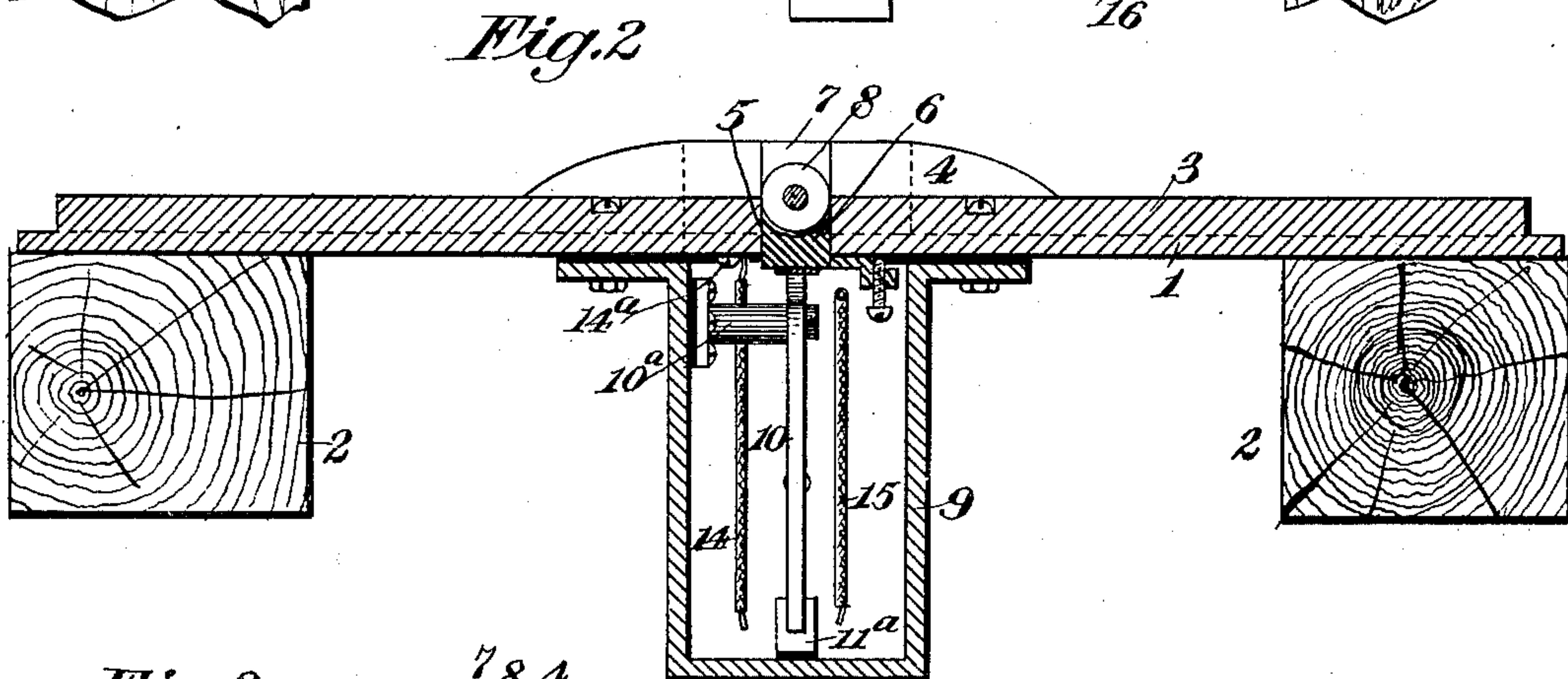
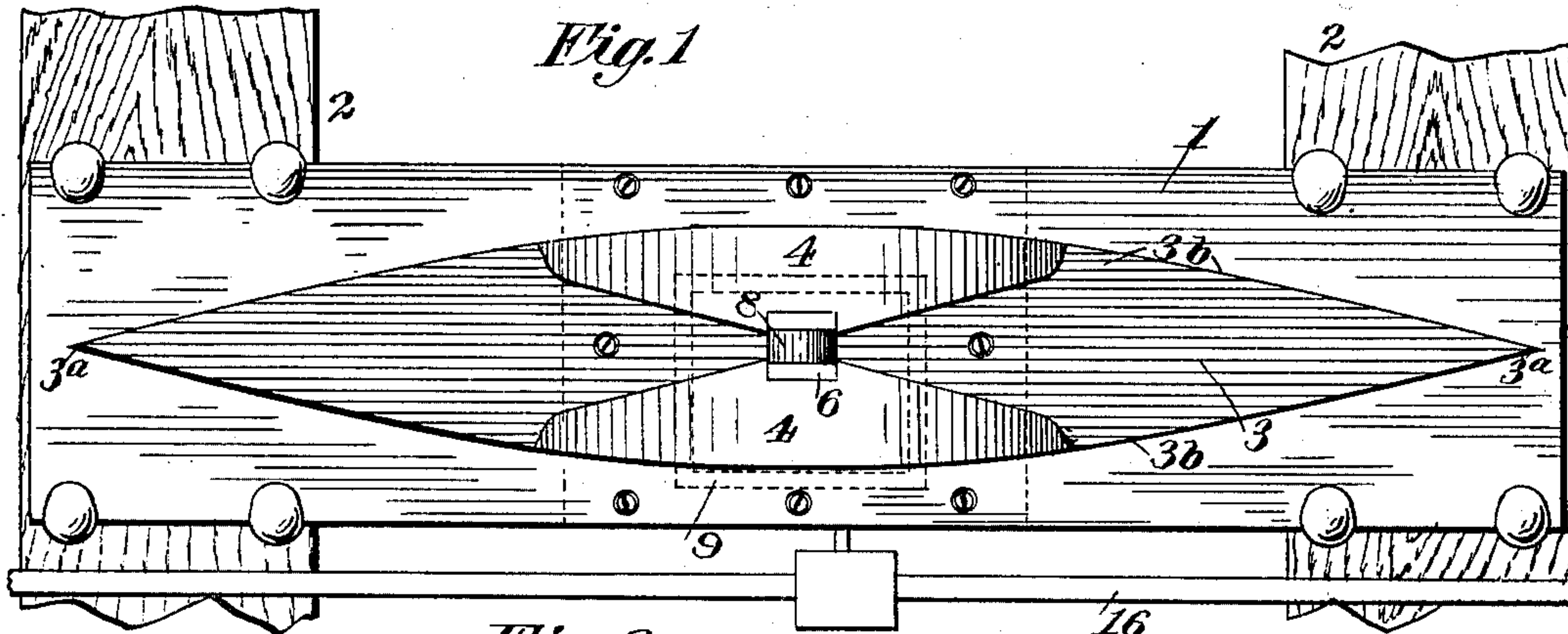
Patented Nov. 19, 1901.

J. F. MUNSIE, Dec'd.  
JULIA F. MUNSIE, Administratrix.  
ELECTRIC RAILWAY.

(Application filed Aug. 24, 1899. Renewed July 31, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
Geo B Rowley.  
F. E. Turner.

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By his Attorney  
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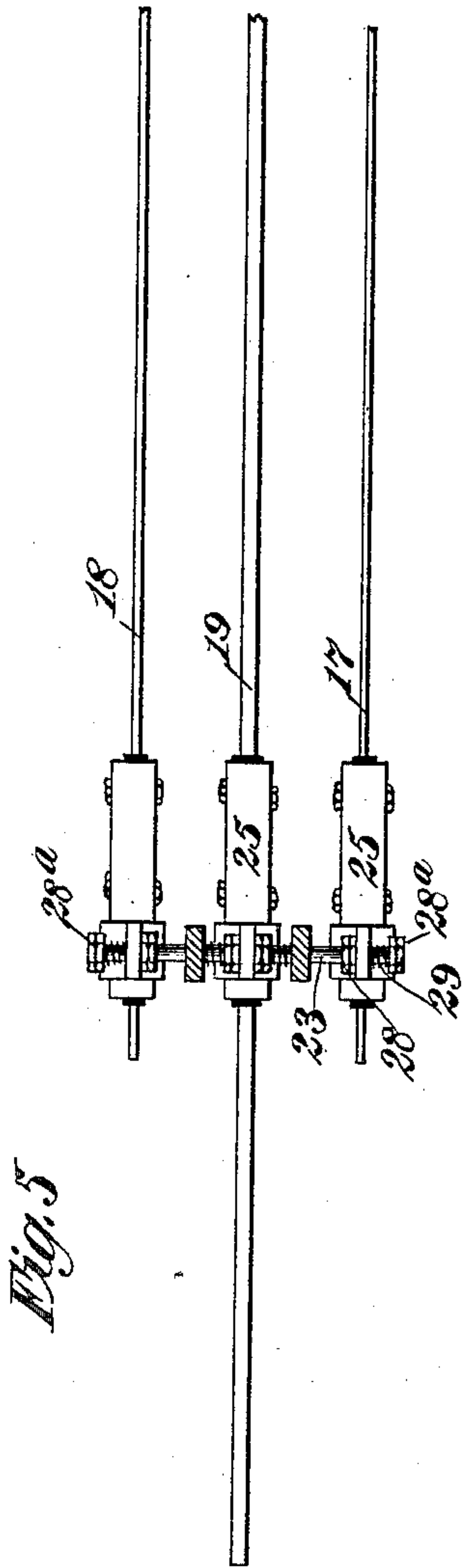


Fig. 5

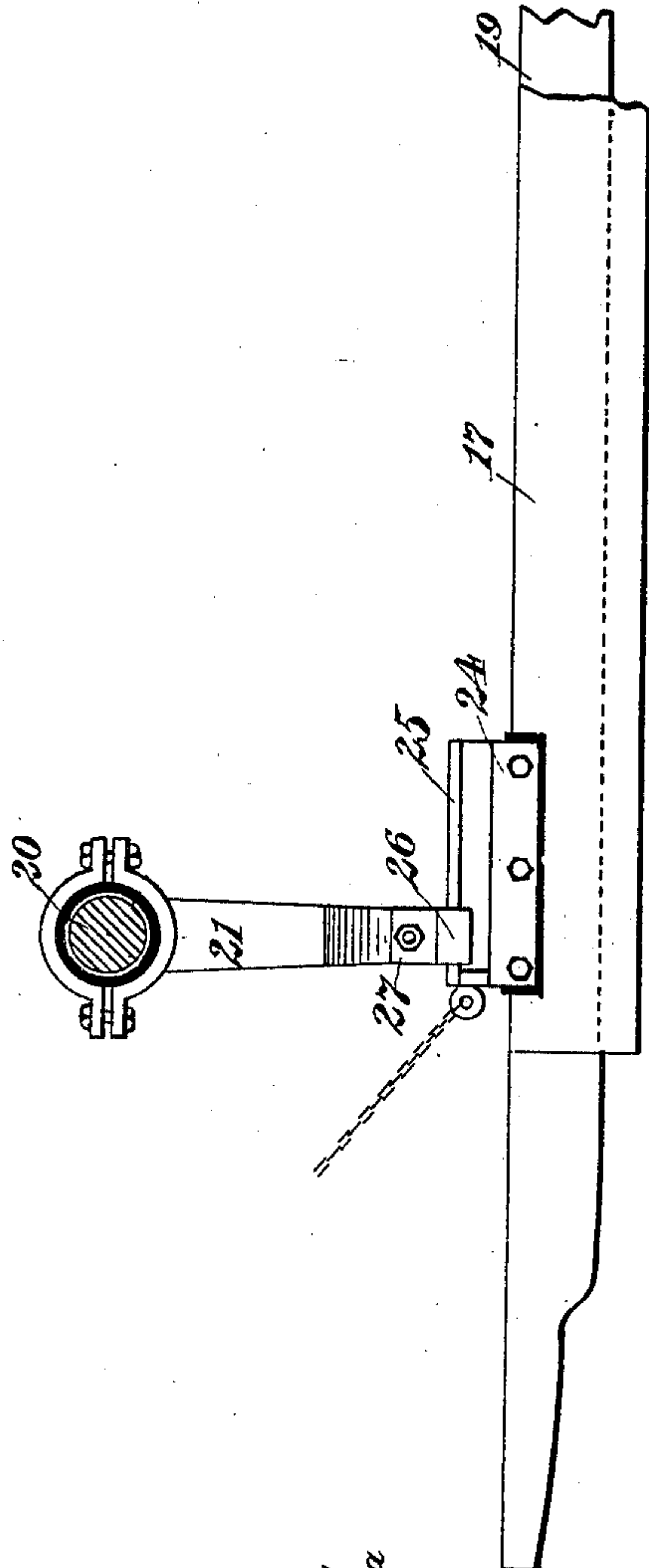


Fig. 6

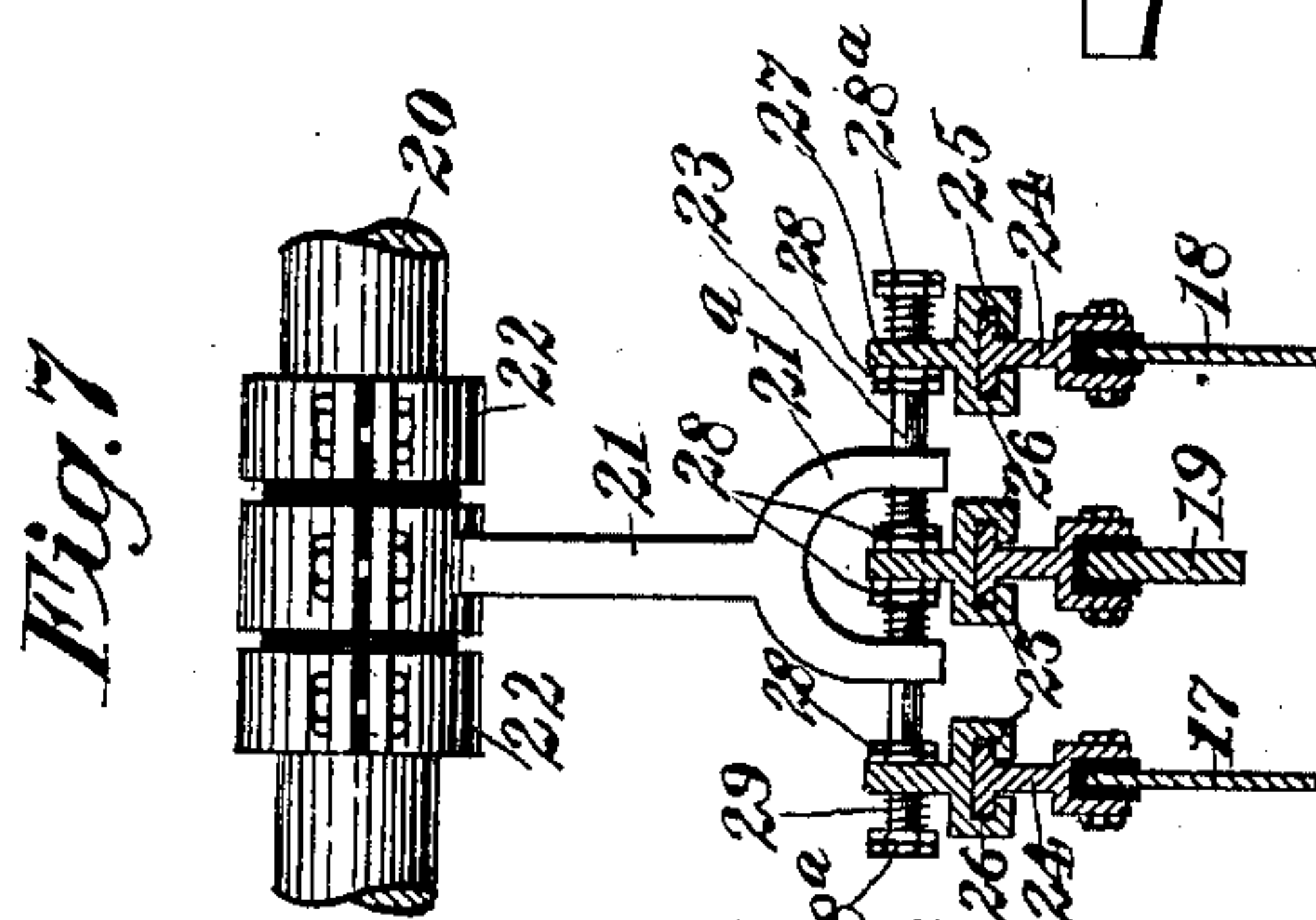


Fig. 7

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 686,862, dated November 19, 1901.

Application filed August 24, 1899. Renewed July 31, 1901. Serial No. 70,419. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. MUNSIE, a citizen of the United States, residing at New York city, borough of Brooklyn, State of New York, have invented certain new and useful Improvements in Electric Railways, of which the following is a specification.

My invention relates to improvements in the class of electric railways in which the current for the motor is taken from determined points of supply, such as contacts located at suitable intervals along the track; and the objects of the invention are to provide means to prevent current from escaping when a car is not present; also, to provide improvements in the manner of collecting the current at the contact-places, so as to assure a large contact-surface for the collector shoe or brush; also, to provide improved means for supporting and guiding the collector shoe or brush, so as to assure its proper position relatively to and its accurate engagement with the contacts or current-concentrators, and also generally to improve the construction of this class of electric-railway equipment.

In carrying out my invention I provide contacts at suitable intervals along the railway adapted to be engaged by one or more collector shoes or brushes carried by a car or vehicle, a supply conductor or feeder for the current, and a switch adapted to close the circuit of said conductor or feeder through said contact or concentrator, which switch is operated through the medium of a plunger and a bar that is carried by the car. The contact or current-concentrator which I prefer to use is provided with a raised portion, the sides of which converge from the central position toward each other at both ends and are to be engaged by a pair of collector-shoes, which are spaced apart.

The invention further consists in the novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a plan view of a portion of a railway system embodying my invention,

showing the contact or current-concentrator in plan view. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a central cross-section thereof. Fig. 4 is a detail sectional view of the switch-containing box. Fig. 5 is a detail plan view, partly in section, showing the collector shoes or brushes and the plunger-operating bar. Fig. 6 is a side elevation thereof, showing the car-axle in section, and Fig. 7 is a view at right angles to Fig. 6.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, 1 indicates a plate or contact, which I term a "current-concentrator," and it may be supported in any suitable manner, preferably between the tracks of a railway. It is shown attached to cross-ties 2, by which means it is insulated from the ground. This plate or concentrator is shown provided on its upper surface with a projecting portion 3, which is substantially in elliptical form, Fig. 1, or, in other words, the sides of the projecting portion 3 from its mid-portion converge toward the opposite ends 3<sup>a</sup>, whereby vertical longitudinally-extending opposed walls 3<sup>b</sup> are formed, against which current-collector shoes are adapted to bear. At about the middle of the raised portion 3 of this contact or concentrator, on opposite sides thereof, rising above the surface of the same, are opposed guides 4, having a space between them which is substantially in the form of two V's having their apexes approaching, or, in other words, from about the middle of these guides 4 their inner walls diverge outwardly toward opposite ends, in which space a bar carried by a car or vehicle is to pass, the walls of these guides serving to guide said bar to a position about central of the part 3. The outer walls of the guides 4 aline or are coincident with the adjacent wall of the part 3, as in Fig. 1. At the mid-portion of the contact or concentrator is an opening 5, passing through the parts 1 and 3, in which is located a vertically-movable plunger 6, shown provided with a central depression 7, or, in other words, being bifurcated, and 8 is a roller suitably journaled in said plunger, which roller is in line with the nar-



row part of the space between the guides 4 and projects above the surface of the part 3. To the lower surface of contact or concentrator 1 is secured a tightly-closed box 9, that is insulated from said contact and into which the plunger 6 is adapted to project, a spring 6<sup>a</sup>, secured within said box, serving to elevate said plunger. Within the box 9 is a switch 10, shown in the form of a bell-crank, pivoted as at 10<sup>a</sup>, insulated from box 9 and having one arm normally bearing against plunger 6, a spring 11 serving to hold the switch in this position and against a stop 11<sup>a</sup>, insulated from the box. (See Fig. 3.) 12 13 are contacts carried by but insulated from box 9 and also insulated from each other, and from contact 12 a conductor 14 leads to and is in electrical connection with the contact or concentrator 1, being shown held in circuit therewith by a screw 14<sup>a</sup>, and contact 13 is connected by a conductor 15 with a main supply conductor or feeder 16, extending along the track in any suitable manner. From this it will be understood that when the plunger 6 is properly depressed the switch 10 will be moved to engage contacts 12 and 13, whereupon a circuit will be established from the feed-conductor 16 through 15, 13, 10, 12, and 14 to the contact or concentrator 1.

The contacts or concentrators 1 are to be placed along the railway-track at suitable intervals and are adapted to be engaged by one or more collector shoes or brushes carried by a car or vehicle. In Figs. 5, 6, and 7 I have shown two such collector shoes or brushes 17 18, (in circuit with the motor,) spaced apart and adapted to straddle and to make contact with the raised portion 3 of contact 1 and can also make contact with the surface of plate 1, and 19 is a bar located between the shoes 17 and 18 and adapted to engage the plunger 6 or its roller 8 to depress the same. The parts 17, 18, and 19 are to be supported at or near both ends; but I have deemed it sufficient to show means for supporting them at one end. I have shown the parts 17 18 19 as suspended from a car-axle 20 by means of a hanger 21, suitably journaled on and preferably insulated from said axle, collars 22 on the axle serving to keep said hanger in the proper position. The lower end of hanger 21 is shown forked at 21<sup>a</sup> and supporting a shaft 23, from which the parts 17 18 19 are suspended. The arrangements I have shown for connecting the parts 17, 18, and 19 with shaft 23 serve to permit said parts to have endwise movement, caused by the passage of the car around a curve in the track, and lateral movement, caused by the same movement around a curve and on the lateral play of the car-wheels upon the track during the engagement of the parts 17 18 19 with the contact 1 3 4. For this purpose I have shown the parts 17 18 19 as provided with blocks 24, secured to and insulated therefrom and provided with substantially T-shaped heads 25, extending longitudinally of the parts 17 18 19

and above the same. The heads 25 of the blocks 24 are received in recessed holders 26, the recesses in which correspond in cross-section to said heads, (see Fig. 7,) whereby the latter are supported so that they can slide longitudinally in the holders 26. It is evident, however, that other means for permitting the parts 17 18 19 to have longitudinal movement relatively to their supports can be provided. To permit the parts 17 18 19 to have progressive movement laterally, they are shown supported upon the shaft 23 by means of lugs 27, projecting from the heads 26 and provided with apertures to receive the shaft 23. Stops 28 28<sup>a</sup> (shown in the form of nuts secured upon shaft 23) limit the lateral movement of the parts 17 18 19, and in order to restore said parts to their normal positions after they have been removed laterally, as well as to retain them in such position, I have shown springs 29, coiled upon shaft 23 and interposed between the parts 27 and the stops on shaft 23. By preference the parts 17 18 19 are supported from three or more axles on the car—say two supports at one end and one or two supports at the other end—whereby as the trucks of the car pass along a curve in the track the supports for the parts 17 18 19 will tend to cause said parts to bend, while at the same time said parts can have substantially longitudinal movement in their supports to compensate for such bend. In Fig. 7 it will be seen that the under surface of the bar 19 is on a plane above the lower surface of shoe 18, whereby the plunger can be operated by the bar 19 while the shoe 18 is in contact with part 3.

The operation of my improvements may be described as follows: When the car is running on a straight track, the collector shoes or brushes 17 18 will straddle the parts 3 4 of the contact or concentrator and will make a firm and long contact therewith, and if the parts 17 18 should sway from side to side from any cause they will still be in such position that one or both can continue in contact with the parts 3 4, and the plunger-operating bar 19 will also be enabled to pass into the space between the guides 4 and will bear upon the roller 8 to depress the plunger 6, whereupon the circuit will be closed from the supply-conductor through the contact or concentrator 1 3, and thence through the collector shoe or shoes to the motor, and may be led back to the supply source through the track-rails. If desired, the plunger-operating bar 19 can also be in circuit with the motor, whereby the three parts 17 18 19 will give a greater surface for collecting the current from the contact or concentrator. When the parts 17 18 19 are in engagement with the parts 3 4 and the car-wheels move laterally of the track, such movement will be compensated for at the parts 23 27, whereby a lateral progressive movement of one part relatively to the other will take place to compensate for the lateral movement of the car-wheels, and if the car



passes around a curve in the track at the time that the parts 17 18 19 are in engagement with contact or concentrator 1 3 they (parts 17 18 19) will bend more or less, and in so bending the parts 25 will slide through the parts 26, whereby strain on the collector-shoe and the plunger-operating bar will be relieved. It will be evident that when a car is not over the contact or concentrator the same will be "dead," as it is not in circuit unless the plunger 6 is depressed, and as that is protected by the guides 4 there is little danger of circuit being established at 1 3 otherwise than by bar 19. Furthermore, as circuit is normally broken in box 9 and as the latter is tightly closed there will be no leakage or short-circuiting of the current when a car is not present. The distance between shoes or brushes 17 18 is preferably less than the widest part of raised portion 3 of the contact or concentrator, so as to preserve contact at all times between the shoe and the contact, and the capacity of the shoes to have lateral progressive movement at the point of suspension enables said shoes to properly straddle and slide past part 3 while still remaining in contact therewith.

I do not limit my invention to the details of construction or the arrangements shown and described, as they may be varied without departing from the spirit thereof.

Having now described my invention, what I claim is—

1. An electric-railway system comprising a series of contacts or concentrators each having an upwardly-extending portion adapted to receive a pair of collector shoes or brushes on opposite sides thereof during the transit of a car over the same, a supply-conductor, and means for closing the circuit of said conductor with said contacts or concentrators during the transit of the car, substantially as described.

2. An electric-railway system comprising a contact or concentrator having an upwardly-extending portion adapted to receive collector shoes or brushes on opposite sides thereof during the transit of a car, a supply-conductor, a normally open switch adapted to close the circuit between said conductor and said contact or concentrator, and means to operate said switch during the transit of a car, substantially as described.

3. An electric-railway system comprising a contact or concentrator having a portion whose sides converge toward each other at opposite ends and adapted to receive collector shoes or brushes on opposite sides thereof during the transit of a car, a plunger, a bar for operating said plunger, a supply-conductor, and a switch to be operated by said plunger for closing the circuit of said conductor with said contact or concentrator, substantially as described.

4. An electric-railway system comprising a series of contacts or concentrators, a supply-conductor, means for closing the circuit of

said conductor through said contacts or concentrators, a bar carried by the car to operate said means, and a pair of collector shoes or brushes located on opposite sides of said bar and adapted to engage opposite walls of the contact or concentrator during transit of a car, substantially as described.

5. In an electric-railway system a car having a collector-shoe and means to permit the same to have progressive movement laterally at the point of suspension, combined with contacts having tapered surfaces to receive said shoe, substantially as described.

6. In an electric-railway system the combination of a car, a collector shoe or brush, means for supporting the latter from said car, and a plunger-operating bar also supported by the car, substantially as described.

7. In an electric-railway system the combination of a car-axle with a hanger carried thereby, a collector shoe or brush supported by said hanger, means to permit said shoe or brush to have progressive movement laterally at the point of suspension, and a plunger-operating bar carried by the car, substantially as described.

8. In an electric-railway system the combination of a car-axle, a hanger supported thereby, a pair of collector shoes or brushes supported by said hanger and spaced apart, and a series of contacts or concentrators located at intervals and adapted to be engaged on opposite sides by said collector shoes or brushes, substantially as described.

9. In an electric-railway system the combination of a car-axle, a hanger supported thereby, a plunger-operating bar supported by said hanger to have progressive movement laterally at its point of suspension, and a collector shoe or brush also supported by said hanger to have progressive movement laterally at its point of suspension, substantially as described.

10. The combination of a longitudinally-extending collector shoe or brush, means for supporting the same near its ends upon a car, means to permit the shoe or brush to have progressive movement laterally at its points of suspension, and means to permit the same to have lengthwise movement at its points of suspension, substantially as described.

11. The combination of a collector shoe or brush, a block carried thereby and having a head, a recessed holder receiving said head to permit the latter to travel therein, a support for said holder adapted to permit the same to have progressive movement perpendicularly to the movement of the head in the holder, and means for suspending said parts from a car, substantially as described.

12. A contact or concentrator comprising a plate having a raised portion whose sides converge at opposite ends, and guides above said raised portion having a space between them whose walls diverge toward opposite ends, substantially as described.

13. The combination of a collector shoe or



brush, a plunger-operating bar whose lower edge is on a plane above the lower edge of said shoe, and means for supporting said bar and shoe from a car, substantially as described.

5 14. A contact or concentrator having its operating-wall inclined toward one end, and a guide inclined at an angle thereto, substantially as described.

10 15. An electric-railway system comprising

a series of contacts each having an operating-wall inclined toward one end adapted to receive a collector shoe or brush, a supply-conductor, and means for closing the circuit of said conductor with said contacts during the transit of a car, substantially as described.

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