



No. 609,851.

Patented Aug. 30, 1898.

H. VAN HOEVENBERGH.  
ELECTRIC LOCOMOTION.

(Application filed Oct. 10, 1895. Renewed June 23, 1898.)

(No Model.)

6 Sheets—Sheet 2.

Fig. 3.

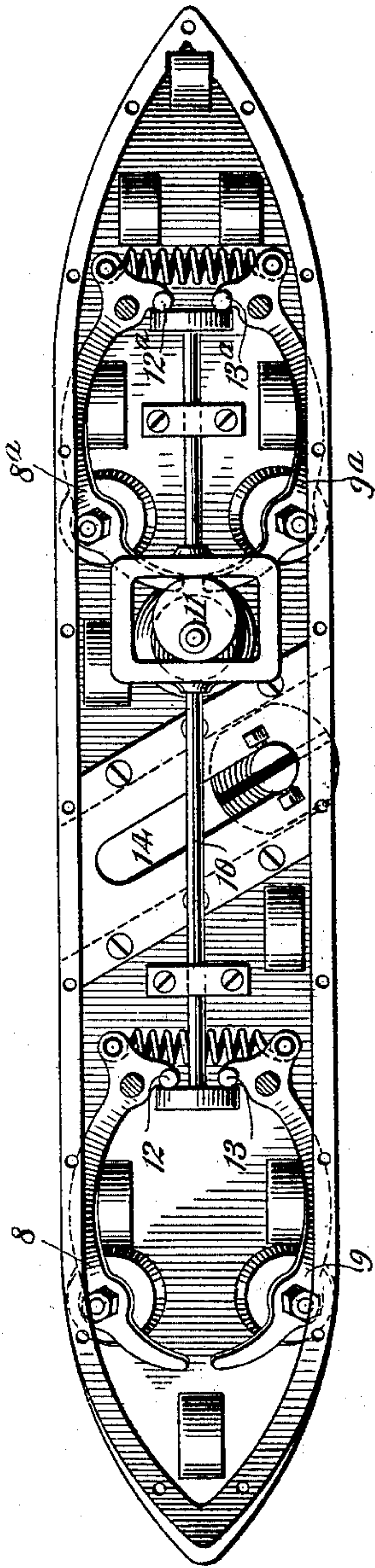
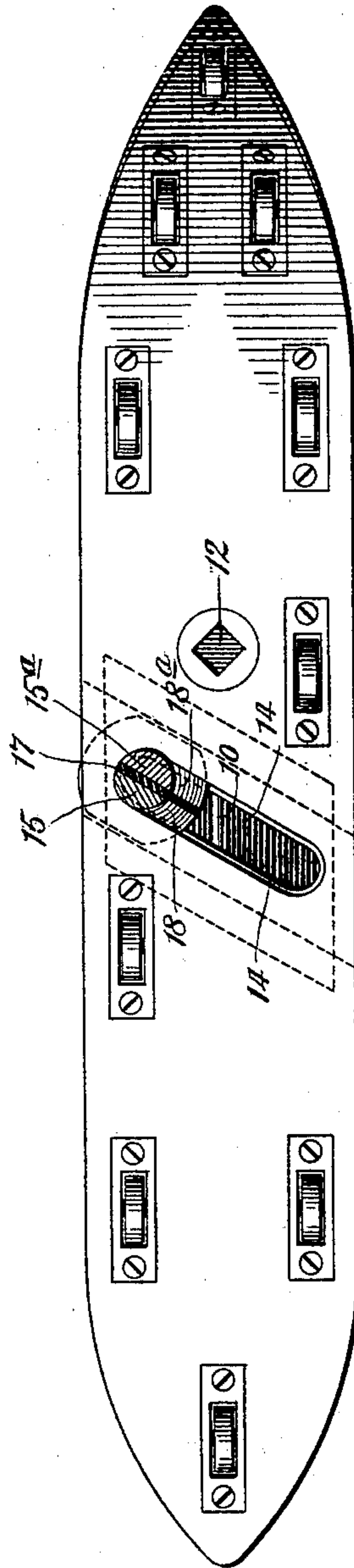


Fig. 4.



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INVENTOR:

*Henry Van Hovenbergh*  
By his Attorney

*R. M. H. H.*



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Fig. 8,

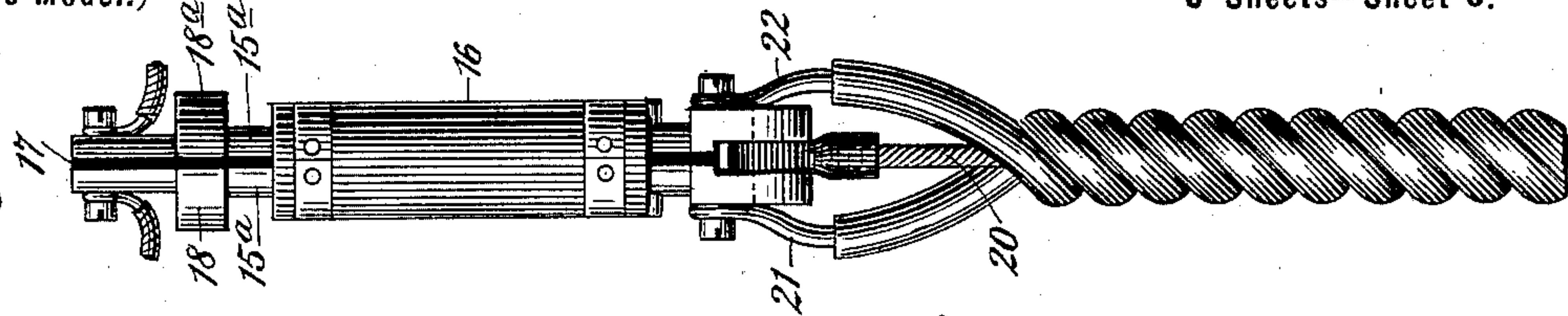


Fig. 7,

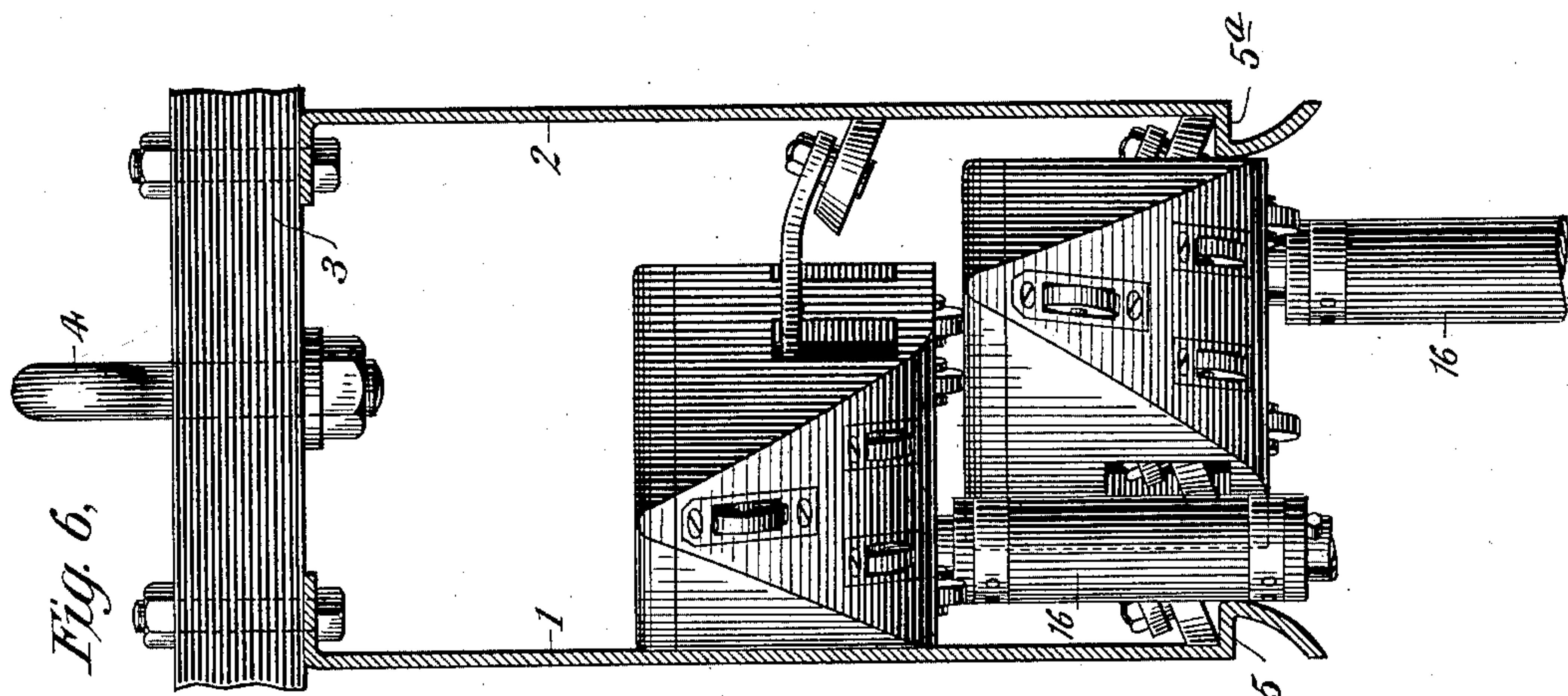
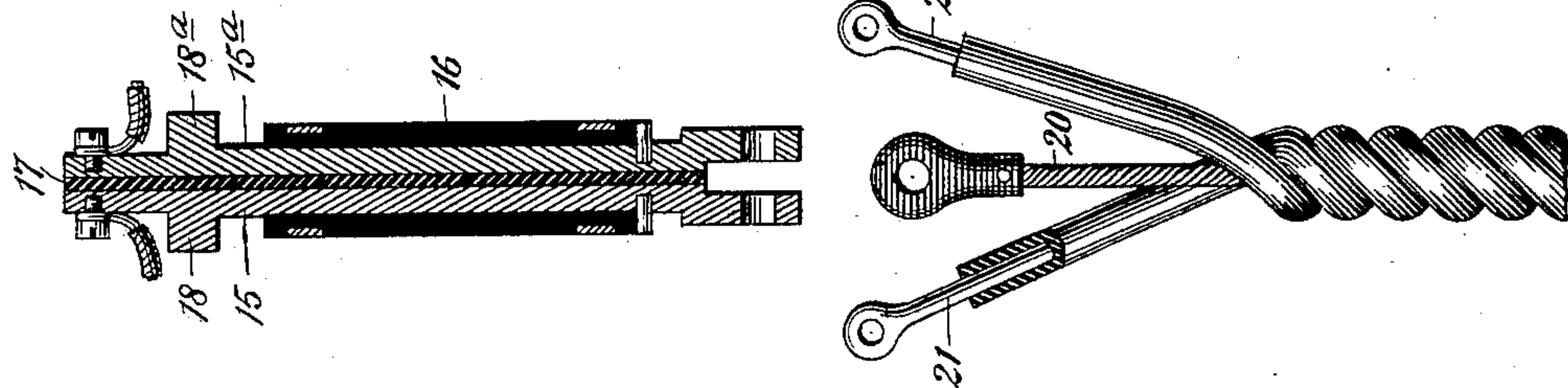


Fig. 6,

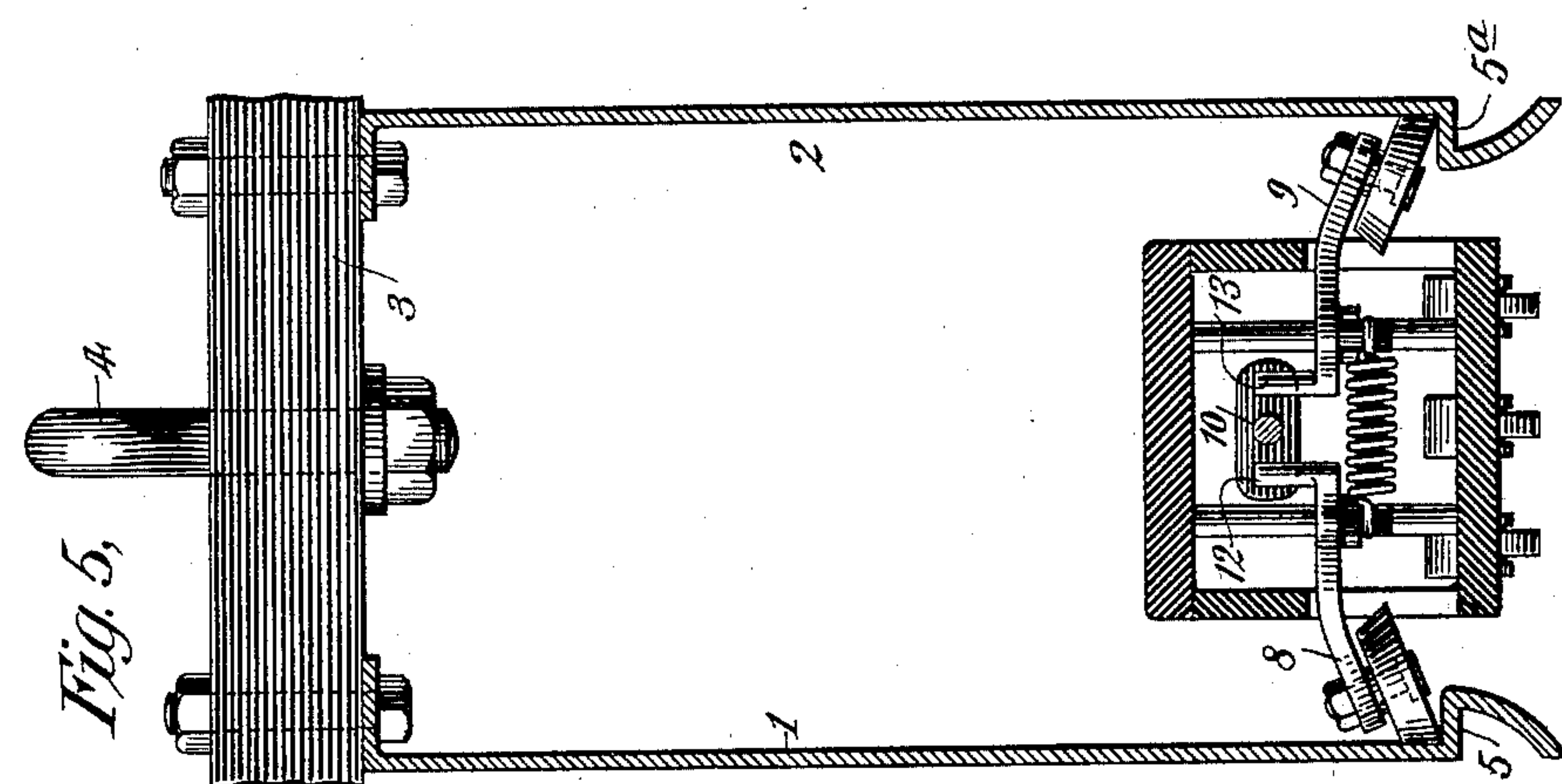


Fig. 5,

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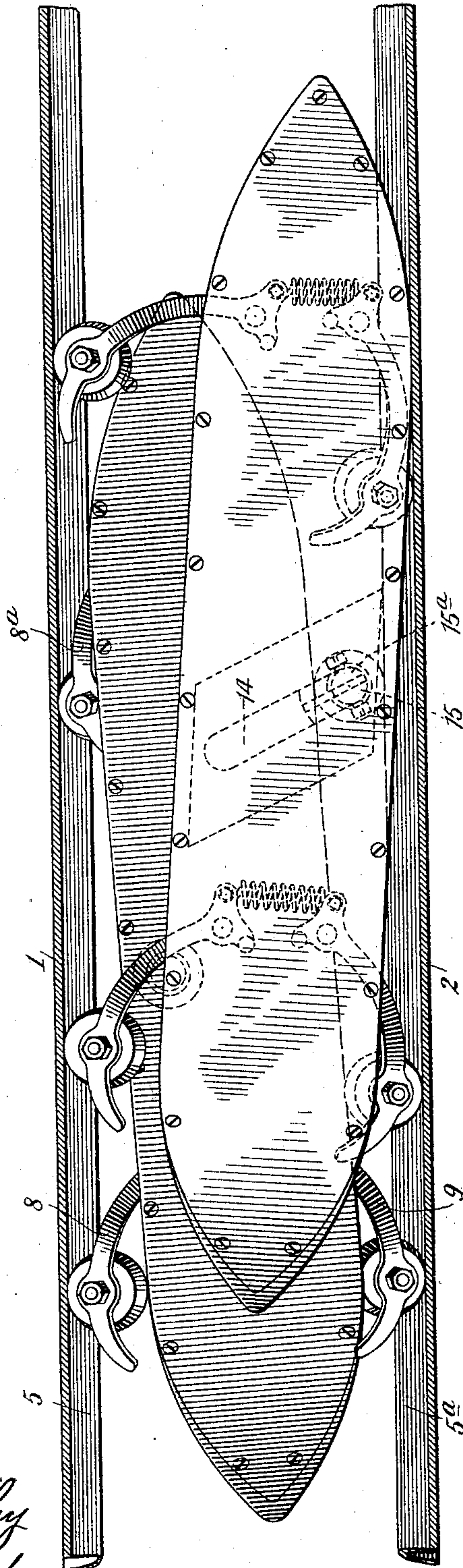
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Fig. 9,



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Fig. 11,

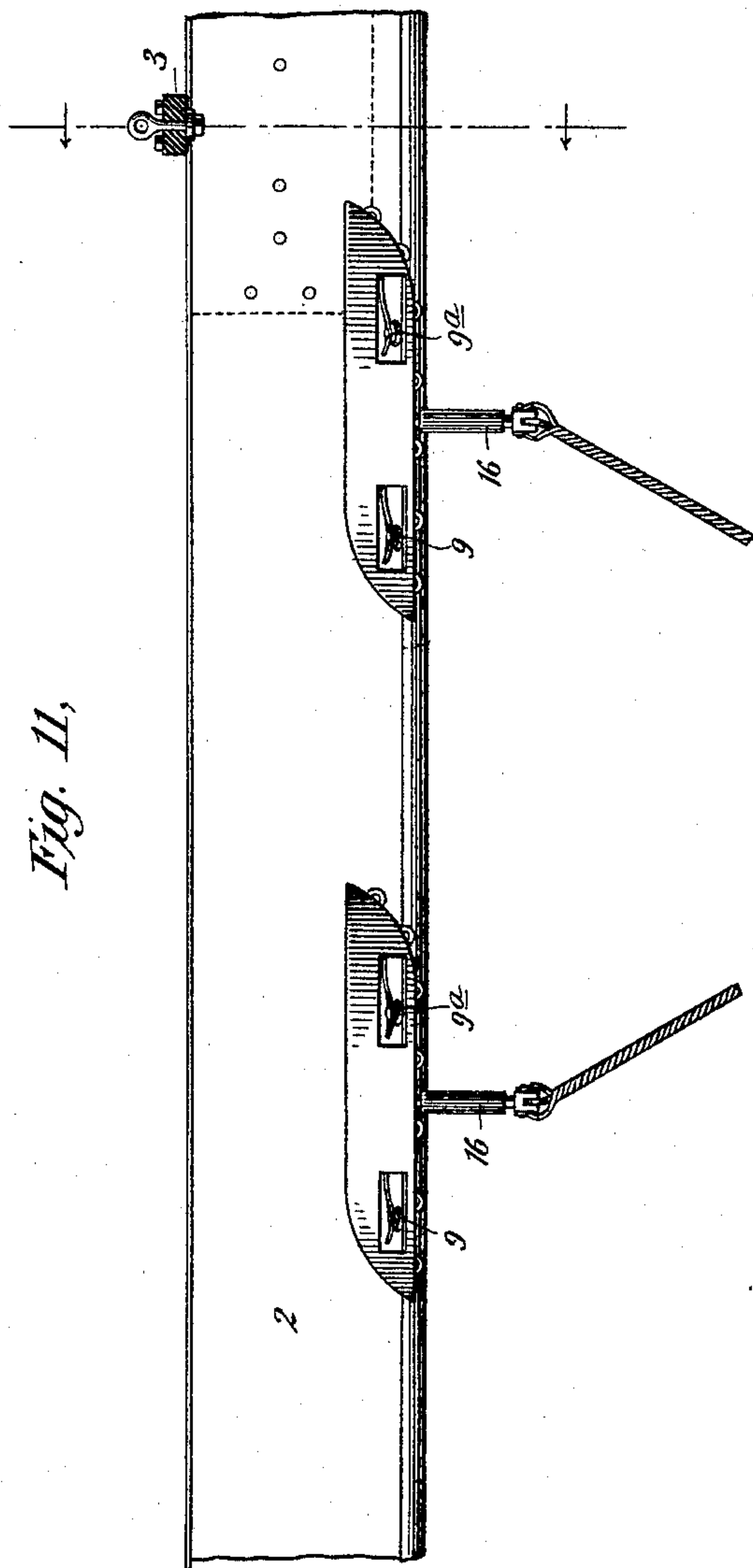


Fig. 13,

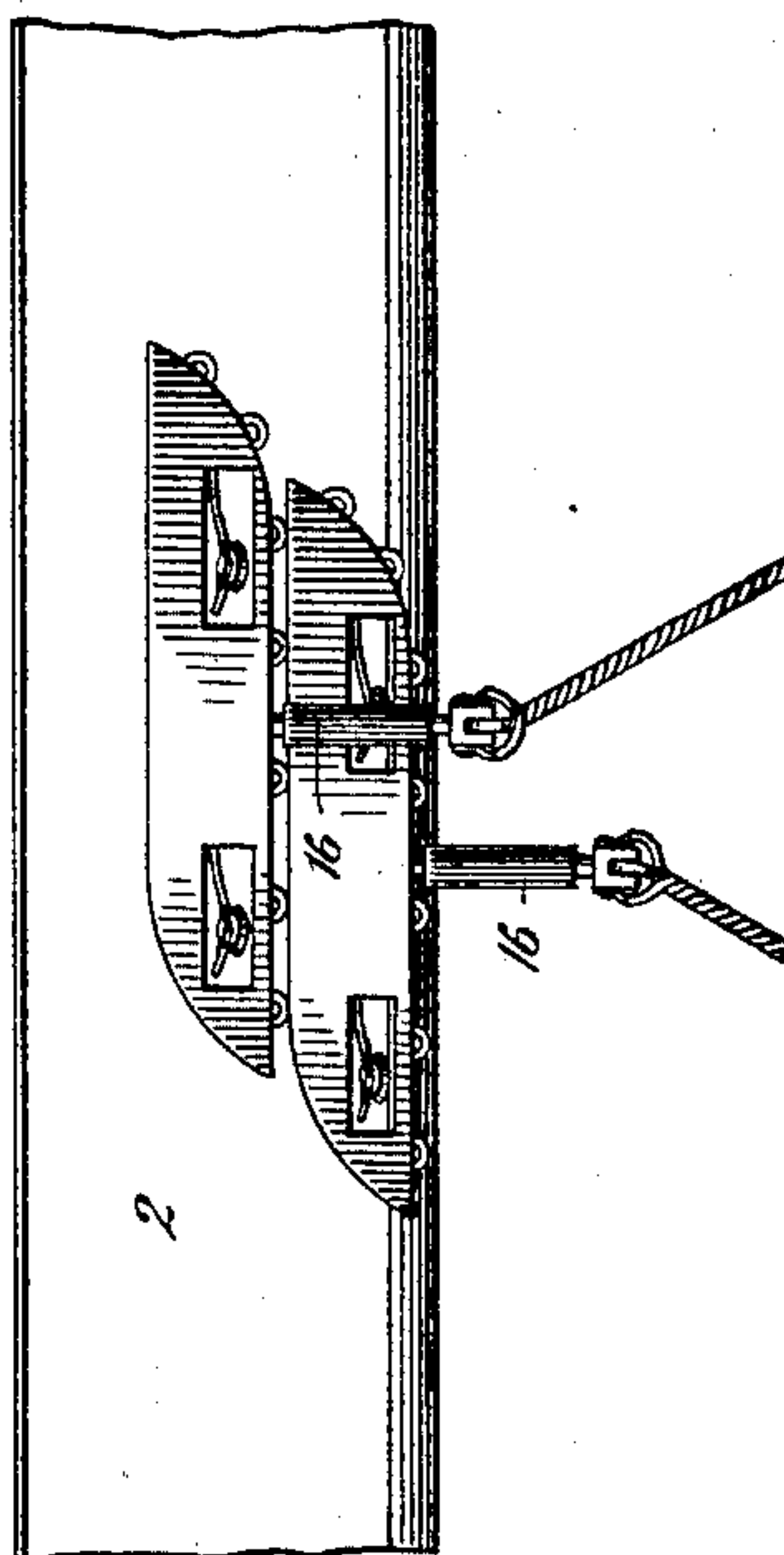


Fig. 12,

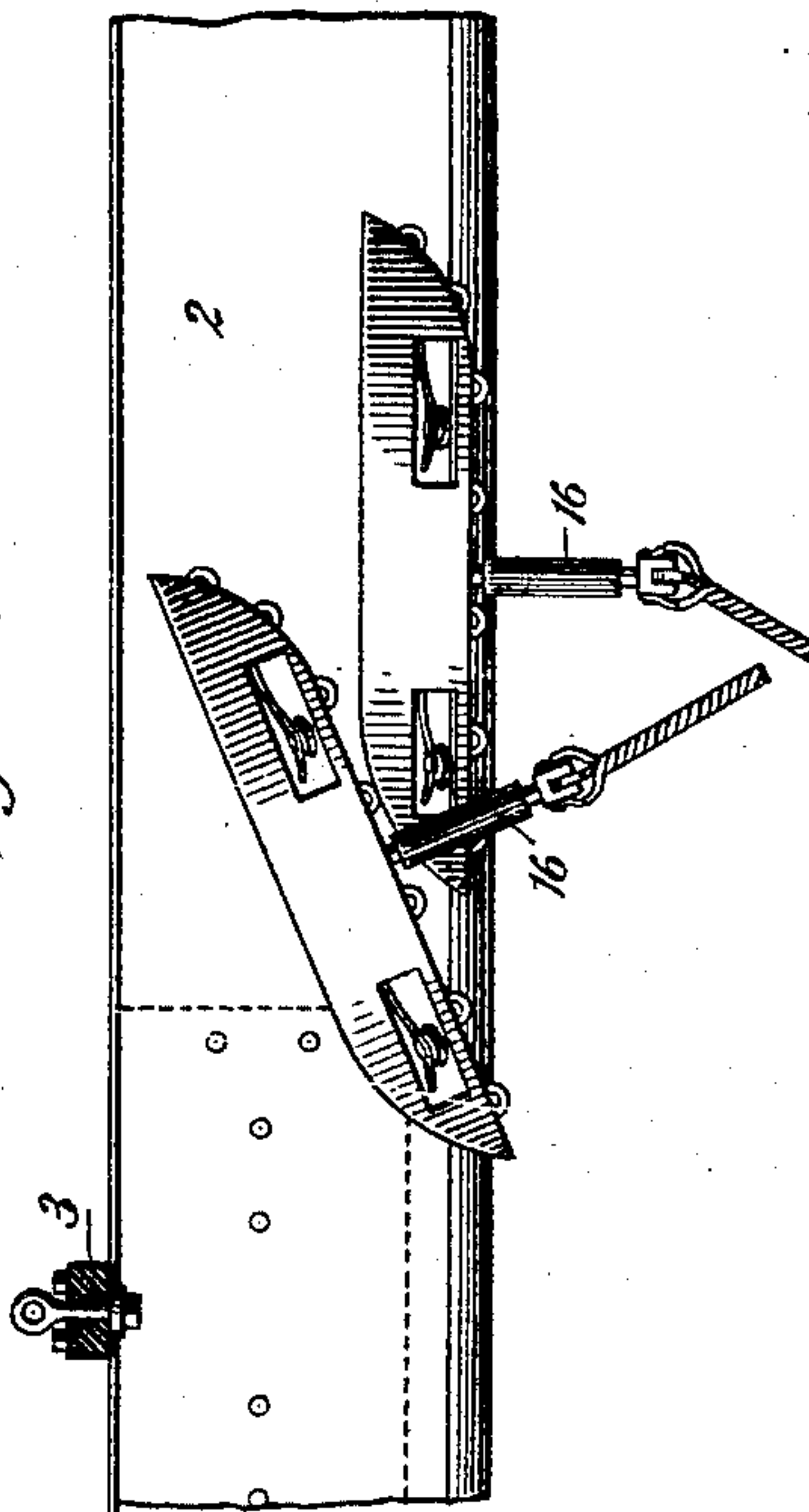
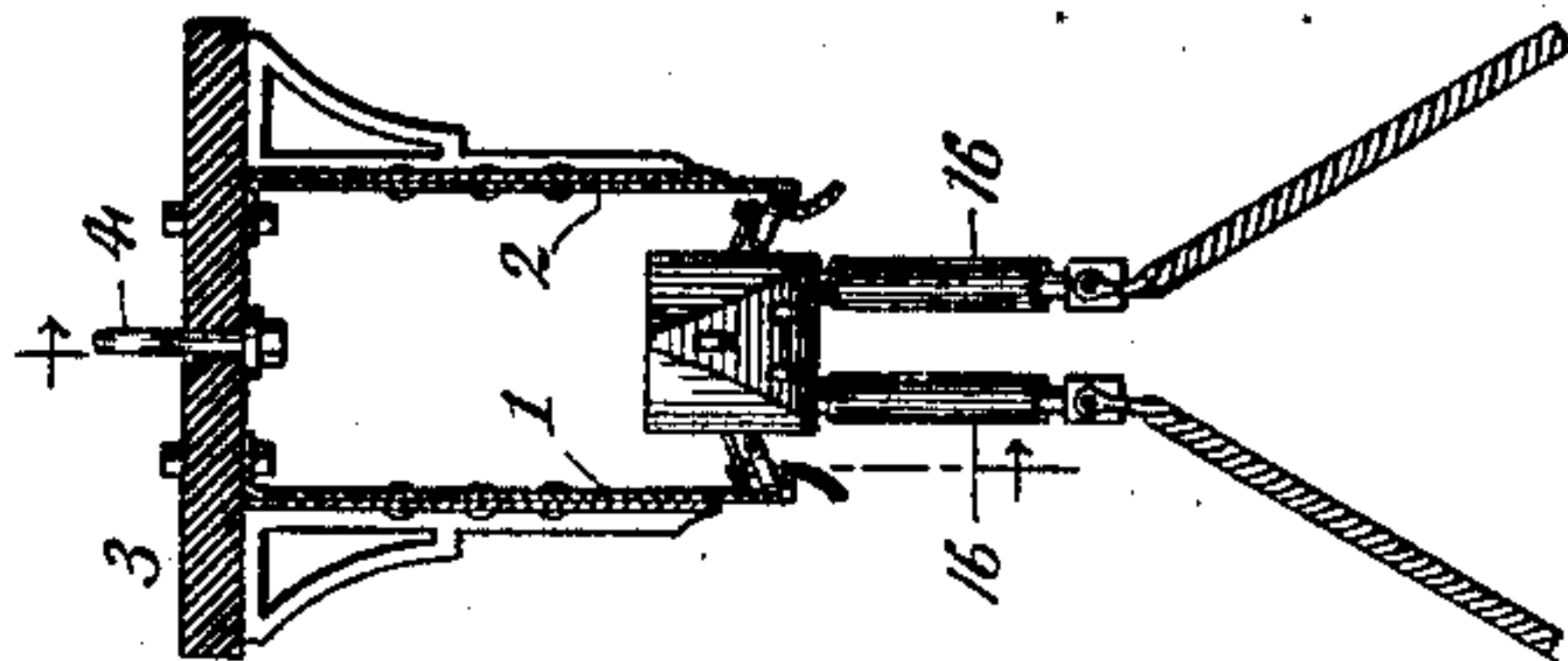


Fig. 10,



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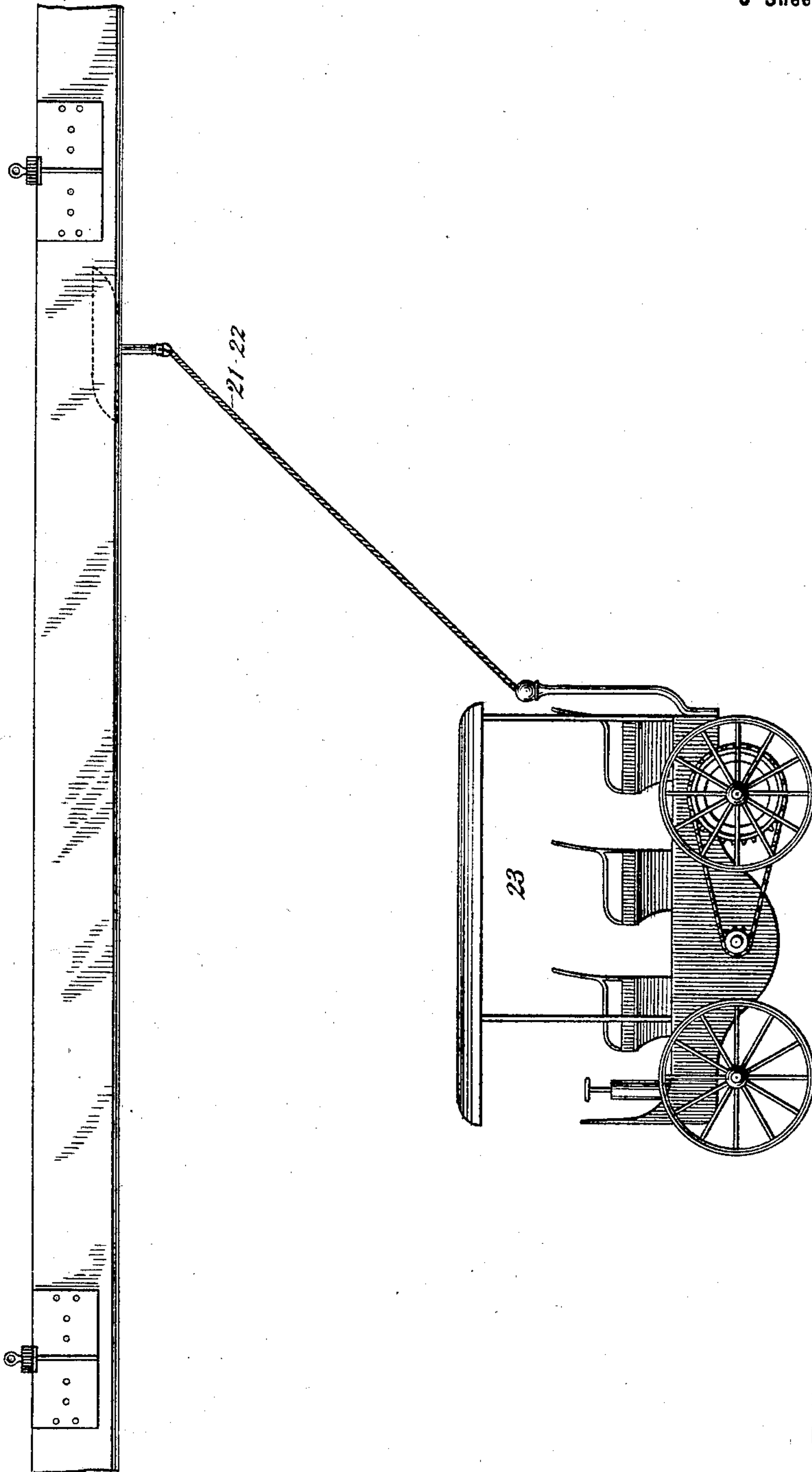
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6 Sheets—Sheet 6.

Fig. 14.



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# UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF NEW YORK, N. Y., ASSIGNOR TO NOAH C. ROGERS, OF SAME PLACE.

## ELECTRIC LOCOMOTION.

SPECIFICATION forming part of Letters Patent No. 609,851, dated August 30, 1898.

Application filed October 10, 1895. Renewed June 23, 1898. Serial No. 684,309. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Locomotion, of which the following is a specification.

This invention relates to electric locomotion, the general object being to permit vehicles running in the same or opposite directions along a roadway to derive their propelling energy from the same supply conductor or conductors.

In carrying out my invention I construct the trolleys or current-collectors in such a manner that when two of them approach one of them will be automatically lifted on top of the other by the tractive power of the vehicle, the forward and rear ends of the trolleys being provided with sloping walls to facilitate this result. I preferably provide a conduit in which the trolleys run, open underneath, forming a longitudinal slot the length of the road, the slot edges being provided with rails formed by flanges on the walls of the conduit, thus furnishing a track for the trolleys. The side walls of the conduit may be formed of sheet metal, the two being insulated from one another and connected at suitable intervals on long roads with feeders leading to a source of electric energy.

The several features of novelty of the invention will be more particularly hereinafter described and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings, which illustrate the invention, Figure 1 is a top plan, with the top or cover removed, of a trolley or current-collector embodying my improvements, showing also the conduit-walls. Fig. 2 is a longitudinal median section on a plane indicated by the line  $xx$ , Fig. 1, looking in the direction indicated by the arrows. Fig. 3 is a view of the trolley similar to Fig. 1, the collector-wheels being folded within the body to permit withdrawal of the trolley from the conduit. Fig. 4 is a bottom plan view of the trolley. Fig. 5 is a cross-section of a conduit and trolley. Fig. 6 is a cross-section of the conduit, showing two passing trolleys in front elevation. Figs. 7 and 8 are detail

views showing the conductors leading from the trolley to the vehicle and the mode of connecting with the trolley. Fig. 9 is a top plan view of two passing trolleys. Figs. 10, 11, 12, and 13 are sectional views showing the manner in which two trolleys and their conductor connections with the vehicle pass by one another. Fig. 14 is a side elevation of a motor-driven vehicle and a trolley connecting it with the supply-conduit.

Referring to the drawings, 1 and 2 represent two walls of sheet metal firmly supported by yokes 3, (see Figs. 5, 6, and 10,) placed sufficiently close together and suitably braced to produce a firm structure. The yokes may be made of wood saturated with paraffin or other suitable insulating compound, or may be made of metal well insulated from the conduit-walls. Eyebolts 4 permit the conduit to be hung from span-wires or pole-brackets. The conduit may be supported over any part of the roadway, preferably one side. The conduit is provided with a wide slot at the bottom, the side walls being simply provided with inwardly-turning flanges 5 5<sup>a</sup>, forming corners, against which the wheels of the trolleys may bear. The entire side wall is thus capable of guiding the trolley and supplying it with current. The bodies of the trolleys are formed of hollow boxes wedge-shaped at the ends, the two ends sloping away from the base in parallel directions. The overhanging end is preferably shod with rollers mounted in sockets, so that they may lie almost flush with the surface of the box. The shape of the trolley-body in plan is shown in Fig. 1 and in elevation in Fig. 2. Openings 6 7 and 6<sup>a</sup> 7<sup>a</sup> are formed in the sides, through which project pivoted arms 8 8<sup>a</sup> 9 9<sup>a</sup>, shod with wheels to roll in the corner of the conduit formed by the side wall and flange. The arms are mounted on spindles journaled in the top and bottom of the box. A coil-spring, as seen in the drawings, tends to throw the arms out through the openings 6 7, and thus retain the trolley in the conduit.

For the purpose of removing the trolley a sliding rod 10, provided with means for shifting it, as an eccentric 11, is mounted in such a position that when moved by a key inserted in a square socket the rod will be shifted and



disks or heads on its ends will engage projecting studs 12 12<sup>a</sup> 13 13<sup>a</sup> on the arms and fold the latter in against the tension of the springs, as clearly shown in Fig. 3.

5 Extending across the bottom of the trolley box or frame is a slot 14, through which extend two conductors 15 15<sup>a</sup>, inclosed in a jacket 16 of insulating material to avoid short circuits when two trolleys pass. The conductors are  
10 separated by a web of insulating material 17. They are provided with flanges 18 18<sup>a</sup>, which are housed under a cover or yoke 19, fixed to the trolley-frame and adapted to permit the conductors to slide in the slot 14. The con-  
15 ductors are provided at the top with binding-screws electrically connected with the pairs of trolley-wheels on opposite sides of the trolley, as seen in Fig. 1. From the lower ends of the conductors 15 15<sup>a</sup> is supported a hemp  
20 or other cable 20, upon which is supported the conductors 21 22, leading to the motor-carriage 23. (See Figs. 7, 8, and 14.) The bottom of each trolley is provided with a plurality of rollers on each side, which facili-  
25 tates the transit of one trolley over the other, as seen in Figs. 2 and 6, and one or more rollers may be secured in each end near the point formed by the junction of the two sides.

The operation of my invention will now be  
30 understood. By the insertion of a squared key into the socket 12 the arms 8 9 8<sup>a</sup> 9<sup>a</sup> may be folded within the trolley-frame and the latter introduced into or withdrawn from the conduit. Upon release of the key the springs  
35 lock the wheels in the corners of the conduit. A suitable controller and switch apparatus is mounted on the carriage, by which current may be admitted to the motor and varied in strength or cut off at pleasure. As such or-  
40 ganizations are well-understood articles of commerce, no further reference need be made to them here. The trolleys are placed in the conduit with similar ends facing in the same direction, as seen in Figs. 11, 12, and 13. The  
45 manner in which the two trolleys pass is clearly shown in Figs. 6 and 12, whether the vehicles be moving in the same or opposite directions. In passing the vehicles may turn to opposite sides of the road, or the one hav-  
50 ing the right of way may remain in its course, the other being turned to the side of the road by the driver operating any suitable steering device. The conductors 15 15<sup>a</sup> are thus drawn to one extreme of the slot in the trolley cor-  
55 responding to the carriage which turns aside, as best seen in Fig. 9, thus bringing the conductors 15 15<sup>a</sup> on a line between the wall of the conduit and the curved tip of the arms 8 8<sup>a</sup>, when the cable draws them past the trolley-wheels by forcing the latter to fold into their recesses in the box. This action is

clearly depicted in Figs. 6, 9, 12, and 13. The springs connecting the arms which carry the collector-wheels are stretched in this action and cause the wheels on the outside to bear  
65 hard against the wall of the conduit. The trolleys thus pass one over the other, the conductors of the overrunning trolley forcing the arms of the lower one inwardly to permit it to pass. This action takes place whether the  
70 vehicles are moving in the same or opposite directions, as will be seen upon comparison of Figs. 1 and 12.

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

1. A system of electric locomotion comprising a supply-conductor extending along a roadway, and a series of trolleys supported thereon for leading current to road-vehicles,  
80 said trolleys being provided with sloping frames to permit transit over one another and a flexible conductor connected with a traveling vehicle whereby the trolleys may rest by gravity on the supply-conductors. 85

2. A system of electric locomotion comprising a supply-conductor extending along a roadway, and a series of current-collecting trolleys supported thereon, the trolley-frames being provided with front and rear extensions  
90 sloping in parallel directions from the base and a flexible conductor connected with a traveling vehicle whereby the trolleys may rest by gravity on the supply-conductors.

3. A system of electric locomotion comprising a slotted conduit extending along a roadway, said conduit having a metallic inner vertical wall electrically connected with the source of current, a series of current-collecting  
95 trolleys having folding arms bearing against the metallic wall, and conductors leading from the trolleys to road-vehicles. 100

4. A trolley having spring-pressed contacts, and conductors for connecting with a vehicle, the conductors being mounted on the frame  
105 by a laterally-movable connection.

5. A system of electric locomotion comprising a slotted overhead conduit extending along the side of the roadway, trolleys or current-collectors having folding arms, and movable connections between the trolley and conductor so organized as to permit two trolleys  
110 to pass each other on the same set of conductors, substantially as described.

In testimony whereof I have hereunto subscribed my name this 16th day of September,  
115 A. D. 1895.

HENRY VAN HOEVENBERGH.

Witnesses:

BENJAMIN S. POND,  
W. S. BROWN.