

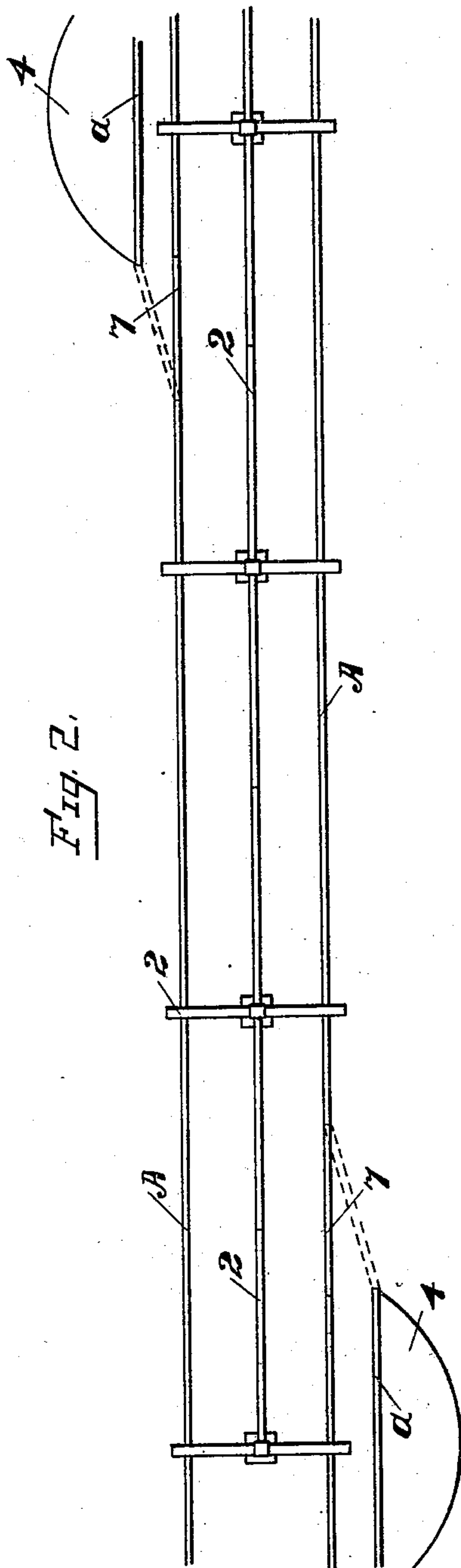
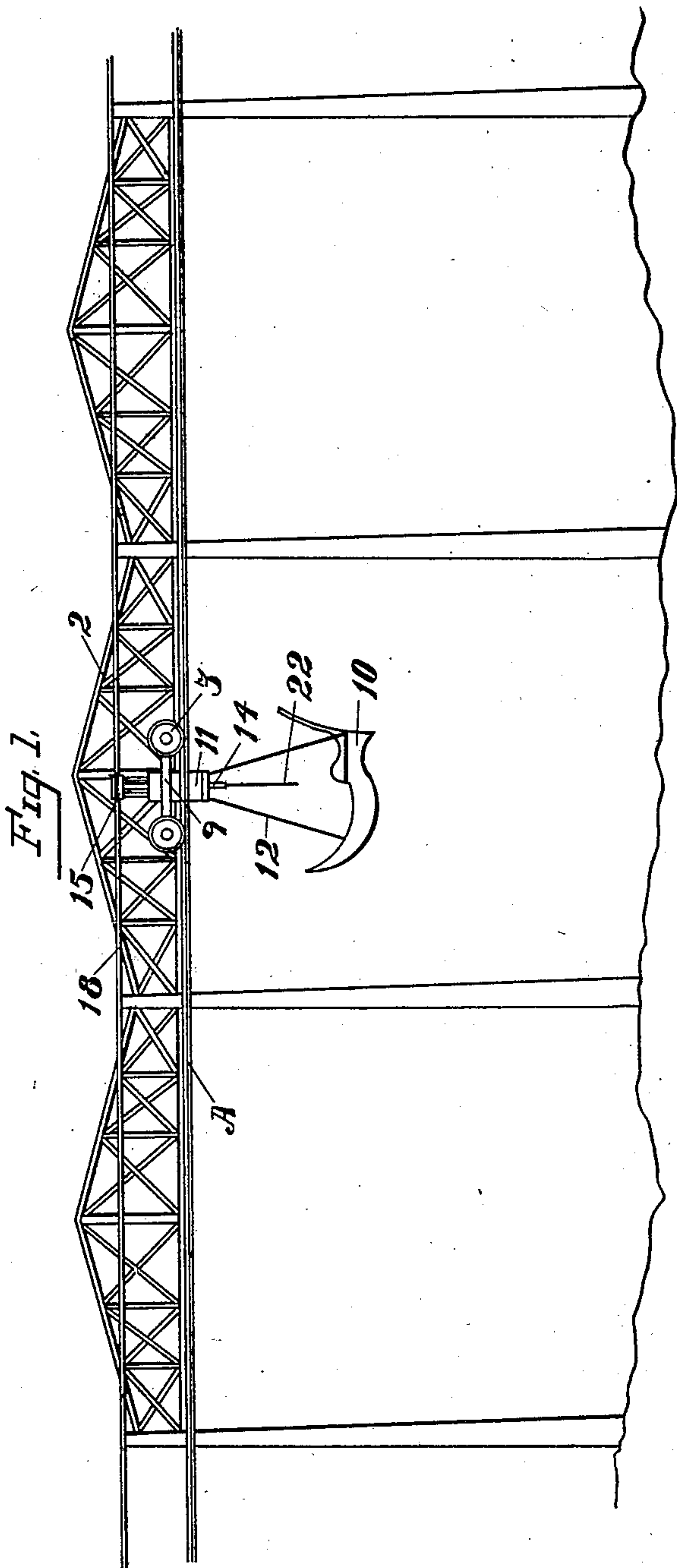
No. 725,838.

PATENTED APR. 21, 1903.

L. A. GROSS.
AERIAL RAILWAY SYSTEM.
APPLICATION FILED DEC. 5, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses,
J. H. Morse
Dudley Moss.

Inventor,
Louis A. Gross
By *Dwight Strong & Co.*
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3 SHEETS—SHEET 2.

Fig. 3.

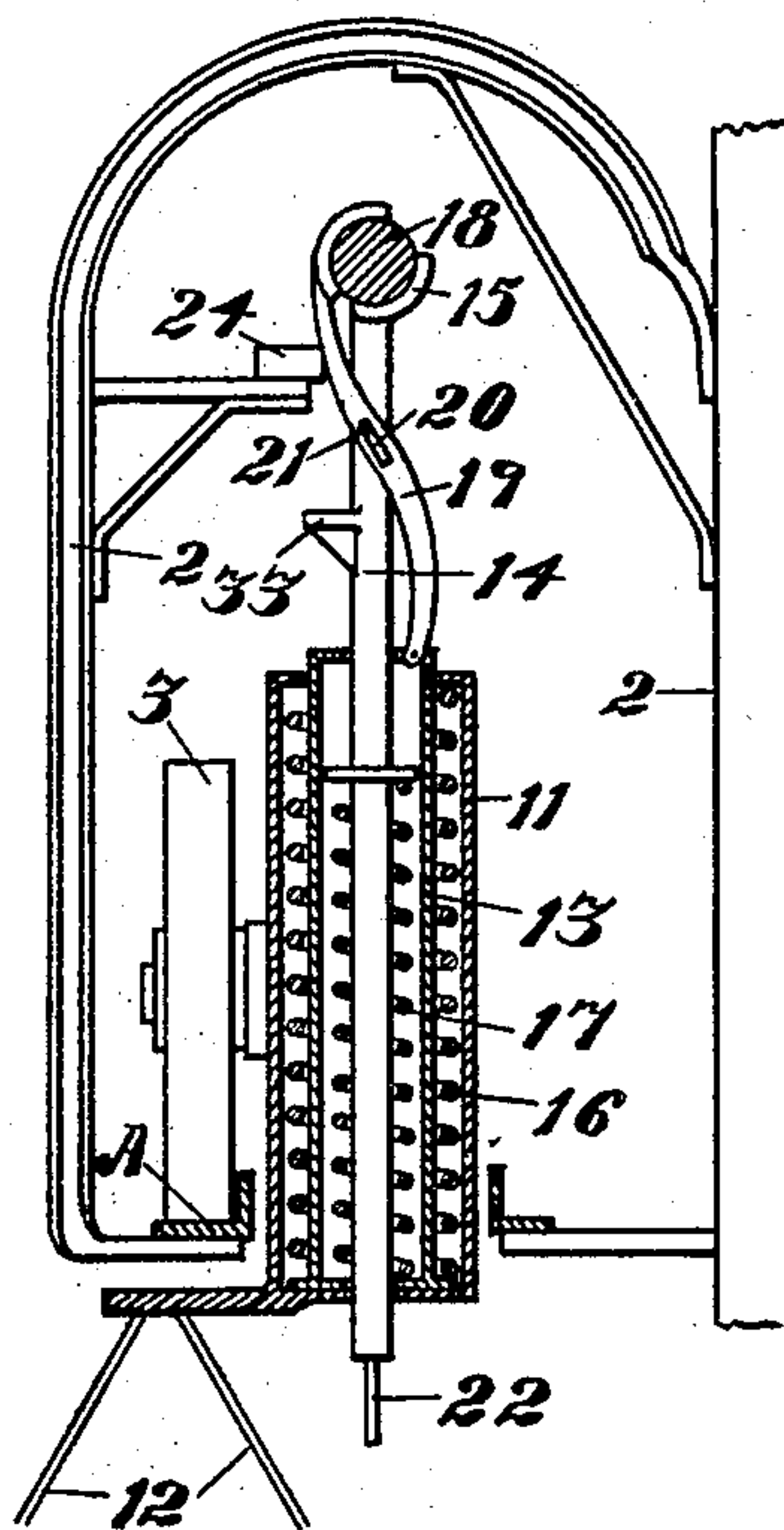


Fig. 4.

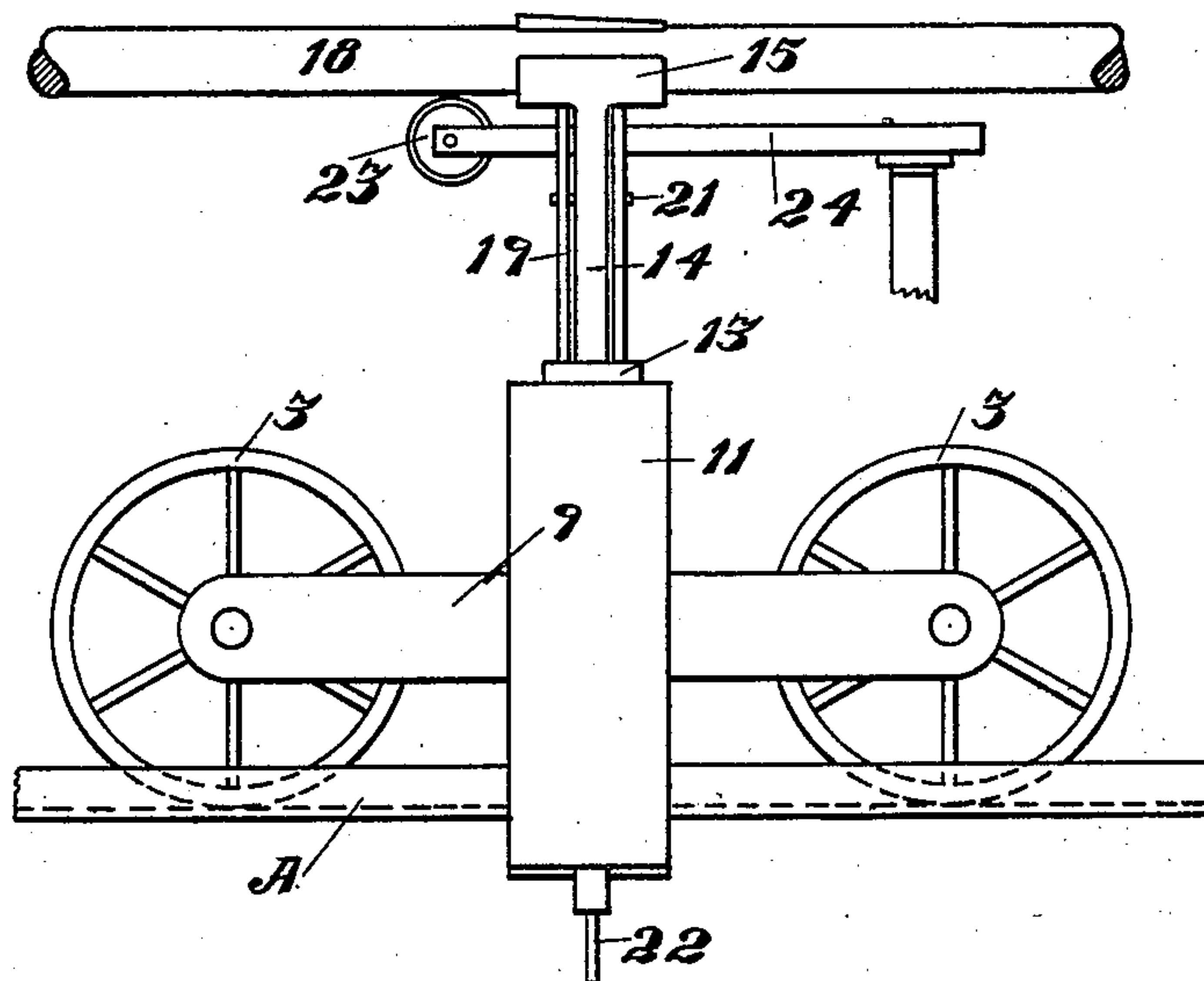


Fig. 5.

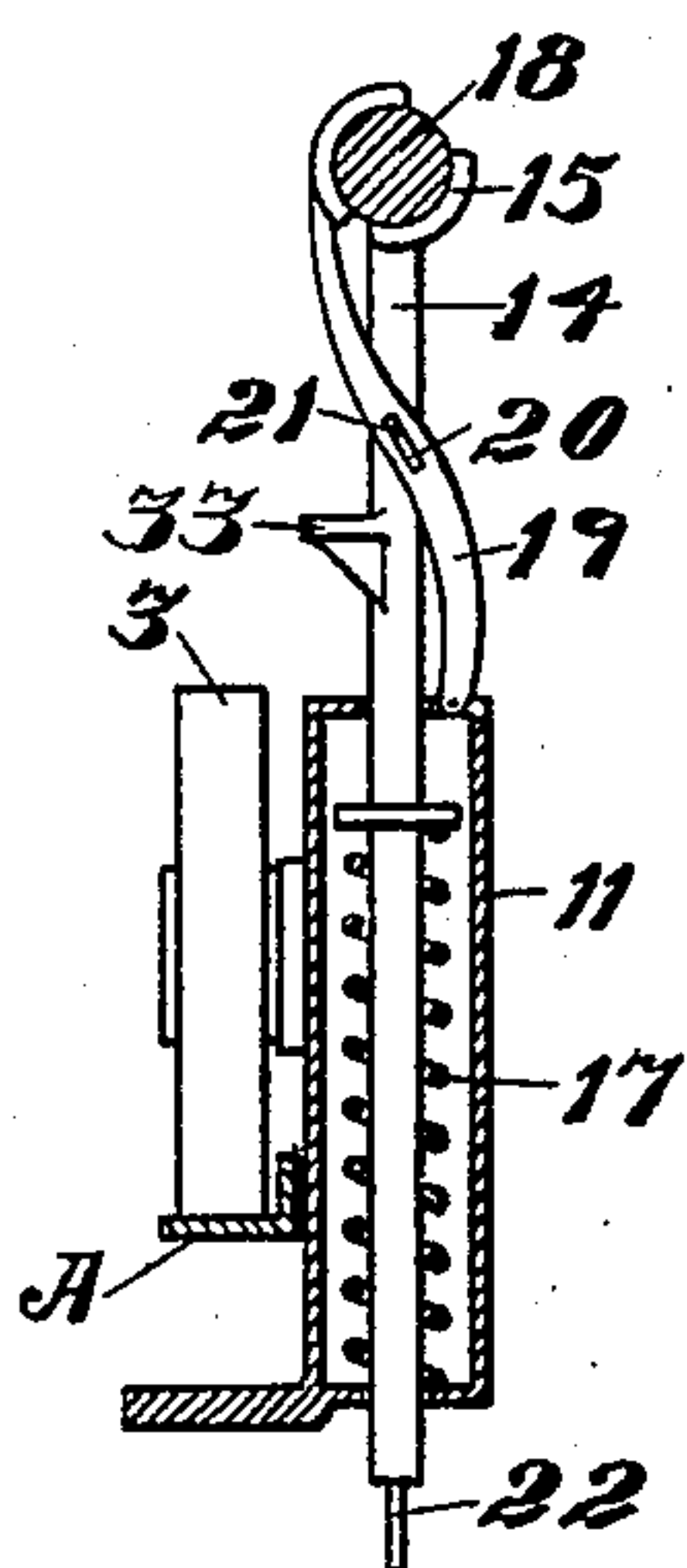
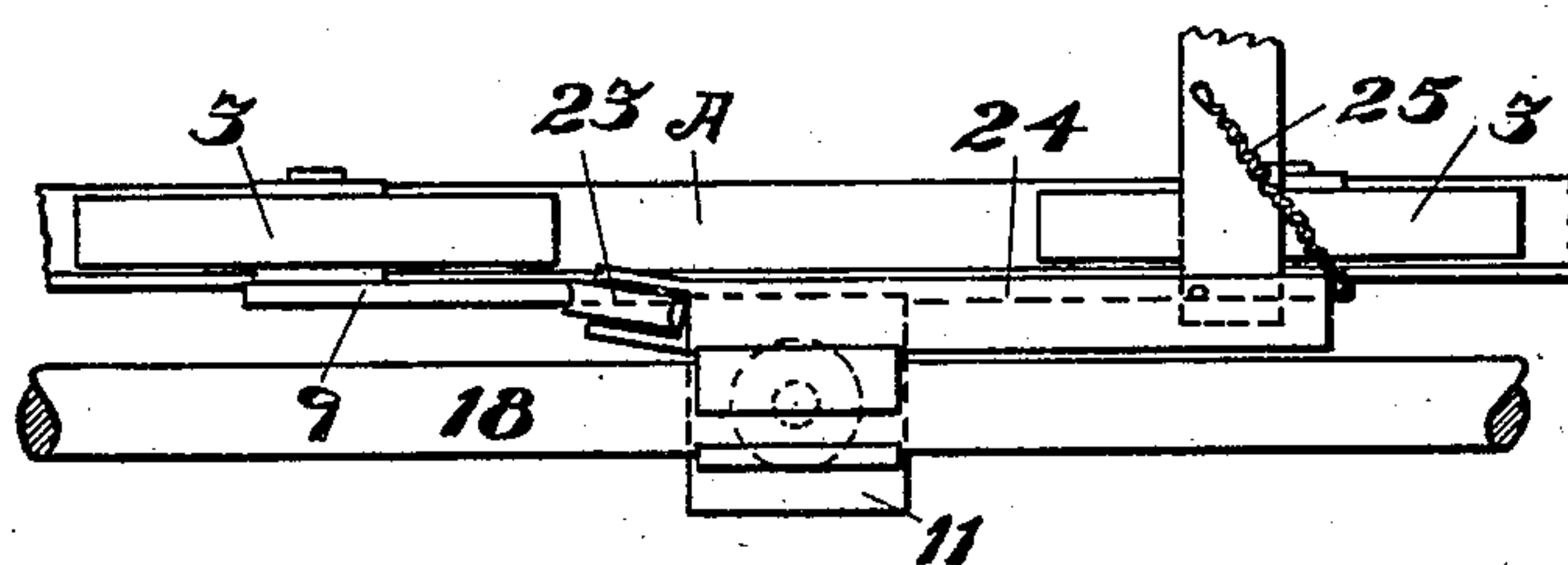


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

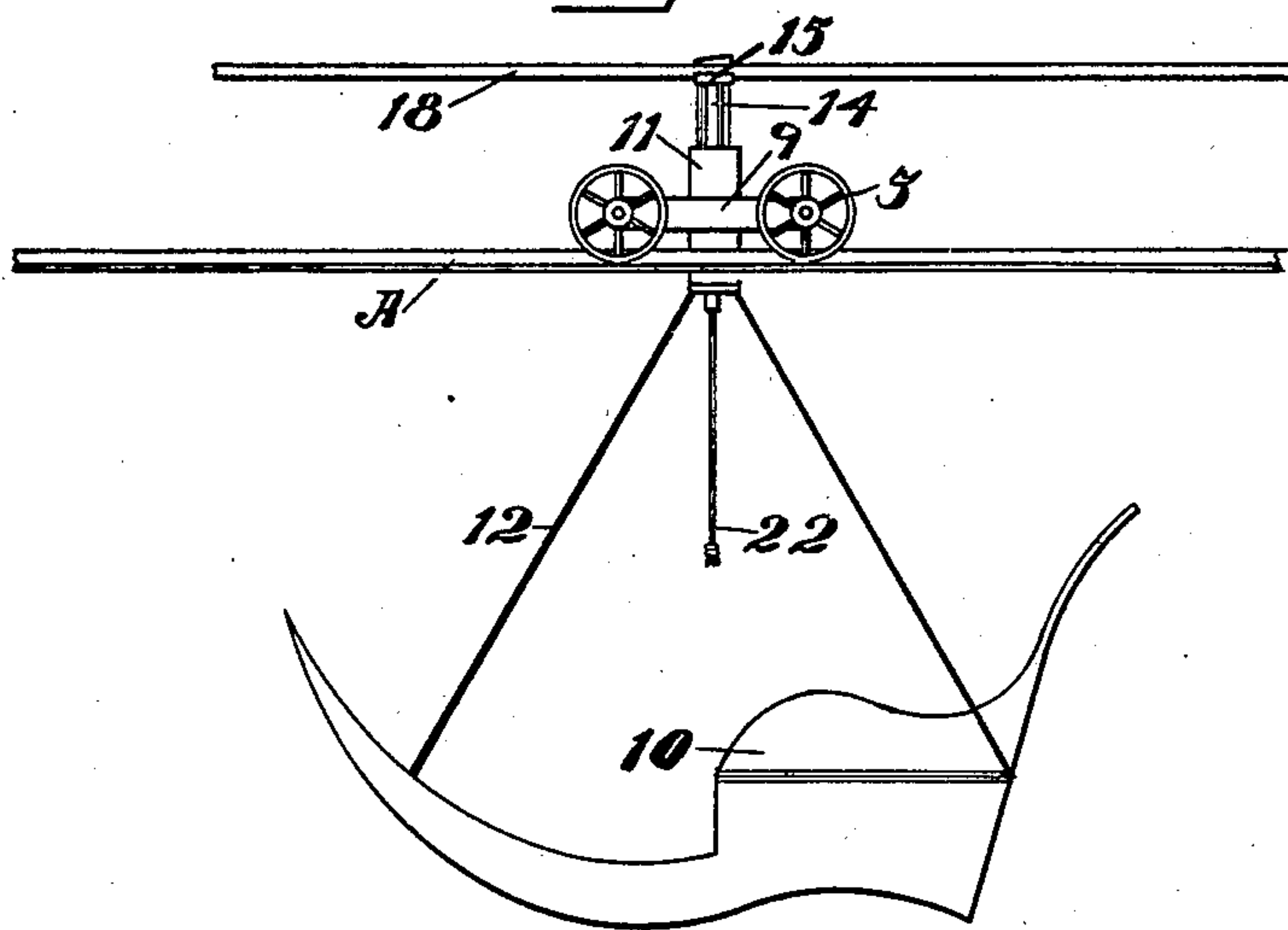


Fig. 8.

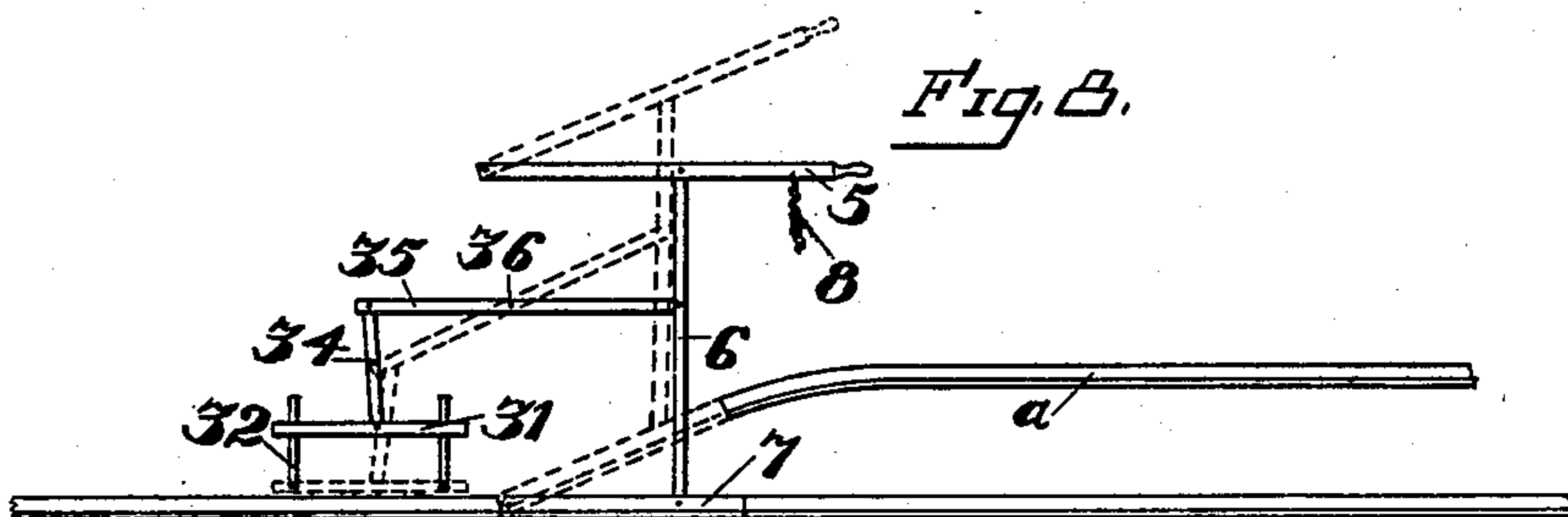


Fig. 9.

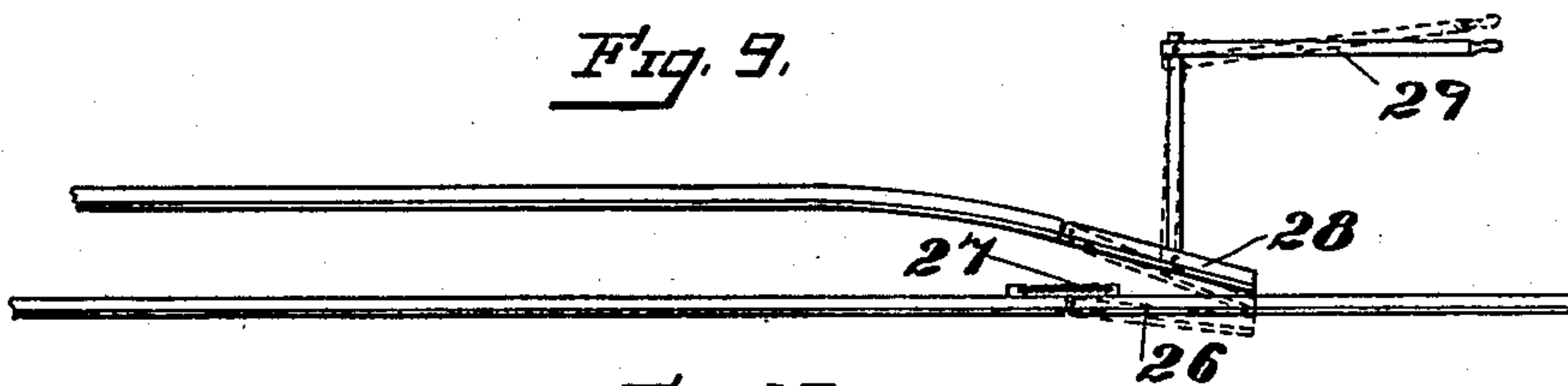
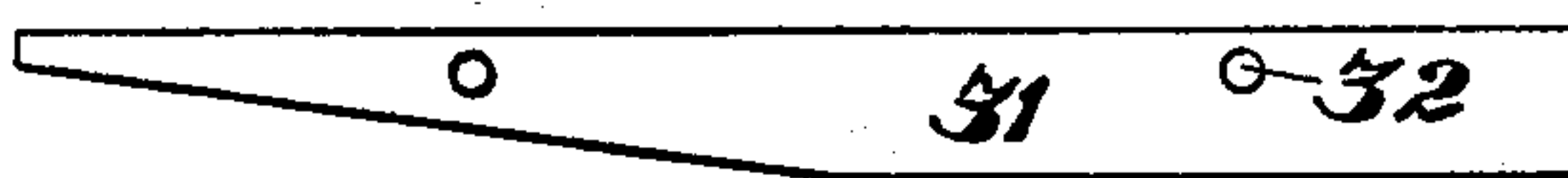


Fig. 10.



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UNITED STATES PATENT OFFICE.

LOUIS A. GROSS, OF SAN FRANCISCO, CALIFORNIA.

AERIAL-RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 725,838, dated April 21, 1903.

Application filed December 5, 1902. Serial No. 133,945. (No model.)

To all whom it may concern:

Be it known that I, LOUIS A. GROSS, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Aerial-Railway Systems; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in overhead transportation systems employing a single rigid track and a movable cable to propel the car. Its objects are, first, to provide means by which it is possible for all passengers to continue a journey uninterruptedly from the time of taking car until destination is reached; secondly, to provide seats and afford exclusiveness for all passengers by means of my improved chair-car system; third, to provide means for the occupant or occupants of any car stopping off at way-stations without interfering with the continuity of passage of succeeding cars.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is an elevation of my invention. Fig. 2 is a plan view of same. Fig. 3 is a section of carrier-truck and grip mechanism. Fig. 4 is a side elevation of same. Fig. 5 is a sectional view of modification of same. Fig. 6 is a plan view of carrier-truck shown in Fig. 4. Fig. 7 is a side view of carrier, truck, track, and cable. Fig. 8 is a diagrammatic view of turnout and switch mechanism. Fig. 9 is a diagrammatic view of opposite switch. Fig. 10 is a side elevation of grip-operating wedge.

In carrying out my invention I employ a single rigid track, as A, supported at a convenient height above the ground upon a suitable framework, as 2. The track is preferably of angle-iron, as shown, with one flange supporting the wheels 3 of the carrier and the other flange disposed on the inside of the track portion proper and affording a guide for the wheels. The going and return lines of track are upon the same frame, and any suitable form of construction may be employed at the terminals to shift the carriers from one track to the other. At convenient

intervals along either line of track are arranged stations, as indicated at 4, where passengers may alight or others take passage. By a suitable switch mechanism—as, for instance, the lever 5 and rod 6—connecting the switch-point 7 the latter may be thrown to shunt a carrier off onto the branch track *a* at any one of the various stations. As soon as pressure is relieved on lever 5, which takes place as soon as a carrier passes the switch, a spring 8 causes the switch-point to fly back into place to allow succeeding carriers destined for points beyond to continue direct on the main track.

The carriers and their means of support and of propulsion are as follows: Each carrier-truck comprises two wheels 3, disposed one behind the other, having their axles connected by a bar 9. Centrally of this bar is secured the grip mechanism, from which depends the car or vehicle 10. The latter is adapted to accommodate one or more persons, the object being that all travelers may have a seat and such exclusiveness as they may desire. The grip mechanism comprises a vertically-disposed casing 11, rigidly fixed to bar 9. The suspending rods or chains 12, connecting with the car, are secured to this casing. The latter extends below the track, and the vertical flange of the track acts as a guide between the wheels and casing to prevent derailment of the carriage. Within the casing and having a sliding movement in relation thereto is a cylinder 13, and passing through the casing and cylinder is a rod 14, whose upper end terminates in a grip member 15. Between the casing and cylinder is a helical spring 16, having one end bearing against a flange on the upper end of the former and the other end of the spring against a flange on the periphery of the latter. This spring acts in opposition to any upward pull, and a similar spring 17, disposed between the cylinder and rod 14, acts in opposition to any downward pressure exerted by or on the grip. The grip member 15 consists of a curved plate projecting upwardly to one side of rod 14 and adapted to engage the under surface of the propelling-cable 18. The complementary grip member consists of a curved bar 19, pivoted at its lower end to cylinder 13, having a longitudinal central slot 20, in which a pin

or cam 21 on rod 14 is slidable, and having its upper end adapted to engage the surface of a cable at points opposite to member 15. The effect of the spring-supports in the grip is to
 5 relieve any tendency of the cable by reason of "whipping" to lift the trucks from the track. A cord 22, attached to the lower end of rod 14, depends within easy reach of the occupant of the car. A sufficient pull on
 10 cord 22 causes jaw 15 to drop below the cable, at the same time by reason of the pin 21 operating in slot 20 causing jaw 19 to open out to one side of and entirely free of the cable, so that the wheels may pass off onto a side
 15 track out of line with the cable. On releasing the cord spring 17 immediately causes the jaws to close and to grip the cable, providing the car is on the main track. The cable is disposed parallel with the main track, and
 20 its rate of travel determines the rate of travel of each car. Inasmuch as the cars are supported solely by the track, the cable has only the function of propulsion to perform. Accordingly the cable-supports have only the
 25 weight of the cable itself to sustain. The cable is here shown as supported on rollers 23, carried upon horizontally-disposed arms 24, pivoted at points adjacent to the cable and extending in the direction of travel of
 30 the cable.

In operation as a carrier approaches a roller 23 the weight of the cable at that point is lifted from the roller and borne by the grip, which striking arm 24 pushes it and roller 23
 35 aside, allowing the grip to pass by. Immediately on passing the roller a spring 25 causes the arm and roller to fly back into position again beneath the cable. At the foot of declivities the cable is supported from above by
 40 suitable rollers, under which the grip may easily pass without jar, owing to the wedge shape of the upper grip member, as shown.

In operation travelers desiring to disembark from a car at any station along the line
 45 signal a switchman on approaching that station, whereupon the switchman throws open the switch to receive the car onto the turnout. Before reaching the switch the cord 22 within the car is pulled to release the grip
 50 from the cable and the car is carried by its momentum or by gravity into the station, where it comes to rest and the passenger alights. Meantime the switch being controlled by spring 8 closes automatically, so
 55 that succeeding cars carrying parties destined for points beyond may continue through to their destination without interruption. Parties at the station contemplating passage from that point take the now idle car, which is run
 60 onto the continuation of the main track and the grip engaged, as previously, with the cable.

At the departure end of the side track are two switches, the one, 26, pivoted in the main
 65 line of track and normally held in closed position by a spring 27, and the other, 28, pivoted in the side track and normally pressed

out of line with the continuation of the main track by the first switch 26.

When a car is to be run from the station 70 onto the main line, switch 28 is thrown into line with track A by means of lever 29, causing the end of switch 26 to be pushed to one side. As soon as lever 29 is released, however, the spring-pressed switch 26 pushes
 75 switch 28 out of the way to close the gap in the main line and bridge the slot.

That the release of the grip on the cable may not be entirely dependent on the attention and skill of the passenger I have devised
 80 means whereby the grip will be released automatically when any car is to be shunted off at a station.

31 is a cam or wedge disposed parallel with the track and located at the entrance of all
 85 stations immediately behind switch 7. This wedge is slidable on guides 32 at right angles to the track, so as to be moved into and out of the path of a pin 33, carried by rod 14 of the grip. It is adapted to be operated simul-
 90 taneously with the movements of the switch—that is, when the switch is opened the wedge is moved into the path of pin 33, so that as the front wheel of the truck passes upon the
 95 switch rod 14 is depressed to open the grip and release the cable automatically. When the switch closes, the wedge moves outward again out of engagement of the pins on the grips of cars passing along the main line.

I have shown a simple means of operating
 100 the wedge. The wedge is connected by a rod 34 with one end of a lever 35, which is fulcrumed, as at 36, the other end of the lever being pivotally connected with the switch-rod 6. Thus when the switch is opened the wedge
 105 is moved oppositely in the direction of track A to engage and release the grip of the approaching car. Similar means for opening the grip to engage the cable automatically might be employed at the opposite ends of the sta-
 110 tions.

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

1. An aerial-tramway system, comprising
 115 in combination, an overhead rigid track, a car pendent therefrom and movable thereon, a propelling-cable, turnouts along said track onto and from which said car may be switched, grip mechanism operable from the
 120 car by which the cable may be engaged to propel it along said track or disengaged to allow the car to pass onto said turnouts, a switch controlling the turnouts and means connected therewith whereby the grip mechanism is op-
 125 erated to release the cable substantially simultaneously with the throw of the switch.

2. In an aerial tramway, the combination of a single rigid track, a movable cable parallel therewith, burden-carriers movable
 130 along said track, grip means on the latter engaging the cable, lateral track-sections intermediate of the ends of the main track, switch-controlling means by which carriers

may be shunted off from the main track onto said lateral sections and be returned from said sections onto said main track without interruption to the continuity of passage of
 5 succeeding carriers, and an automatic grip-releasing mechanism between the switch mechanism and the cable and actuated by the movement of the former.

3. In an aerial tramway, the combination
 10 of a rigid overhead track, burden-carriers movable along said track, a traction-cable in relation to said track, grip mechanism on the carriers engaging said cable, turnouts along said track, switch mechanism disposed
 15 in the main line of track controlling entrance to and passage from said turnouts, and means operated in connection with said switch mechanism by which said grip mechanism may be automatically released to allow a car-
 20 rier to pass onto said turnouts.

4. In an aerial tramway, the combination of a track, a burden-carrier movable thereon, a traction-cable, grip mechanism on the carrier engaging said cable, said grip mechanism
 25 including a reciprocable part having a grip member, a pivoted bar having a complementary grip member, and connective means between said bar and said reciprocable part whereby upon the reciprocation of the latter
 30 said grips are opened and closed in unison.

5. In an aerial tramway, the combination of a single rigid track, a traction-cable parallel thereto, a burden-carrier supported upon wheels on said track, grip mechanism upon
 35 the carrier engaging said cable, and means including a wedge disposable in the path of said carriers whereby said grip mechanism is actuated automatically to release the cable.

6. The combination with a track, a carriage
 40 movable thereon and a traction-cable, of a grip mechanism including a casing, a rod reciproc-

cable therethrough and carrying a grip member on one end, a slotted pivoted arm carrying a second grip member, and a cam projection engaging the slot in said arm whereby
 45 said grip members are opened and closed in unison on the reciprocation of said rod.

7. The combination with a rigid overhead track, of a wheeled truck operable thereover, a traction-cable, grip mechanism carried by
 50 said truck and adapted to engage said cable, a car pendent from said grip mechanism and means by which said mechanism may be operated by an occupant of the car to release the cable.
 55

8. In an aerial tramway the combination of a single rigid track having a lateral guide-flange, a wheeled burden-carrier movable along said track, a traction-cable, grip mechanism upon the carrier engaging said cable,
 60 said grip mechanism and the wheels of the carrier cooperating with said lateral guide-flange to prevent derailment of the carrier.

9. The combination of a single rigid overhead track having a lateral guide-flange, a
 65 wheeled truck movable over said track, a traction-cable, grip mechanism carried by said truck, said grip mechanism including a casing extending below the track and forming a guide with the wheels of the truck to
 70 engage opposite sides of said flange to prevent derailment of the truck, a car pendent from said grip mechanism, and means operable from within the car to disengage the grip from the cable.
 75

In witness whereof I have hereunto set my hand.

LOUIS A. GROSS.

Witnesses:

S. H. NOURSE,
 JESSIE C. BRODIE.