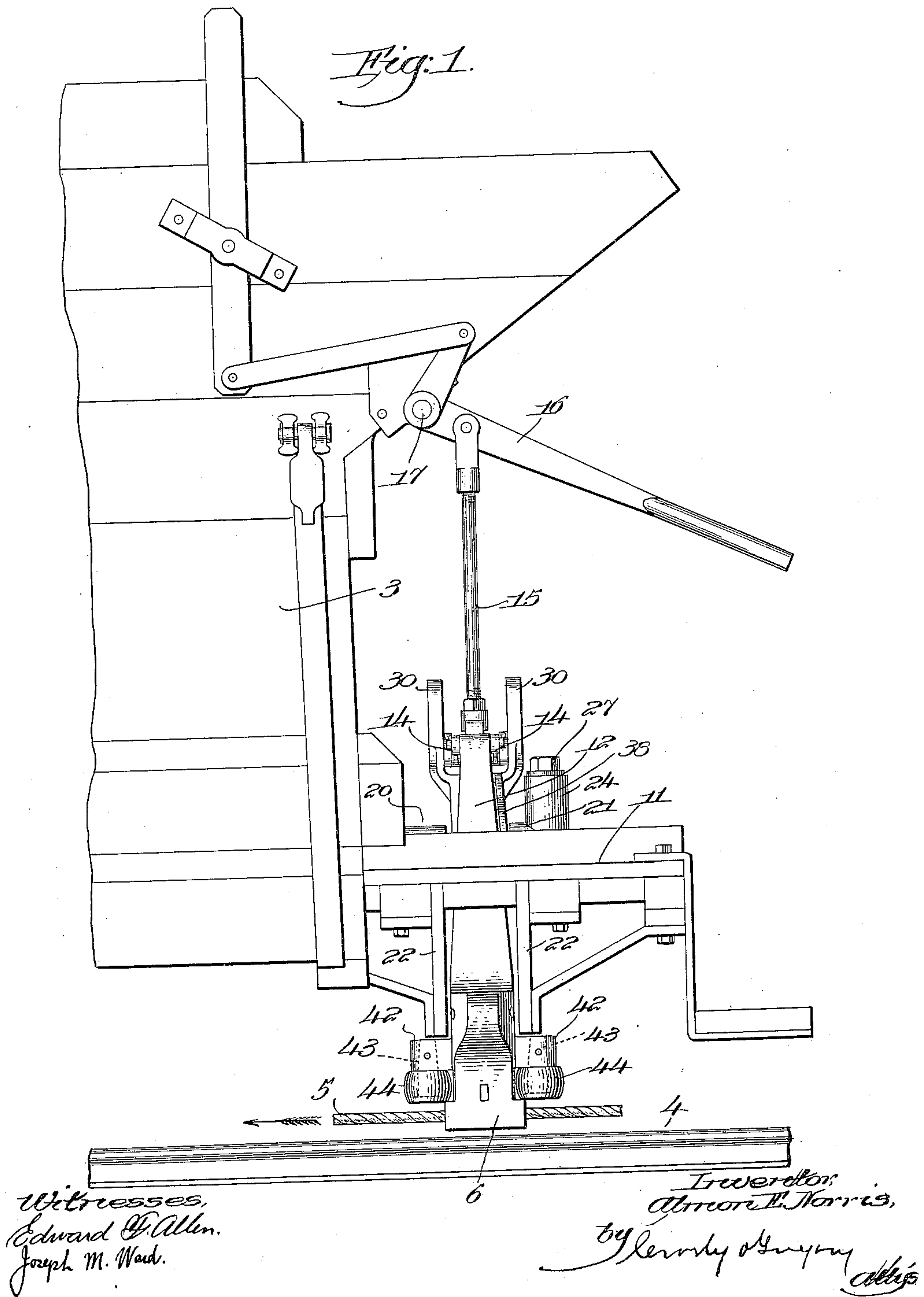


A. E. NORRIS.
GRIP FOR CABLE CARS.
APPLICATION FILED MAR. 22, 1911. RENEWED MAR. 24, 1915.
Patented Sept. 28, 1915.
4 SHEETS—SHEET 1.

1,154,652.



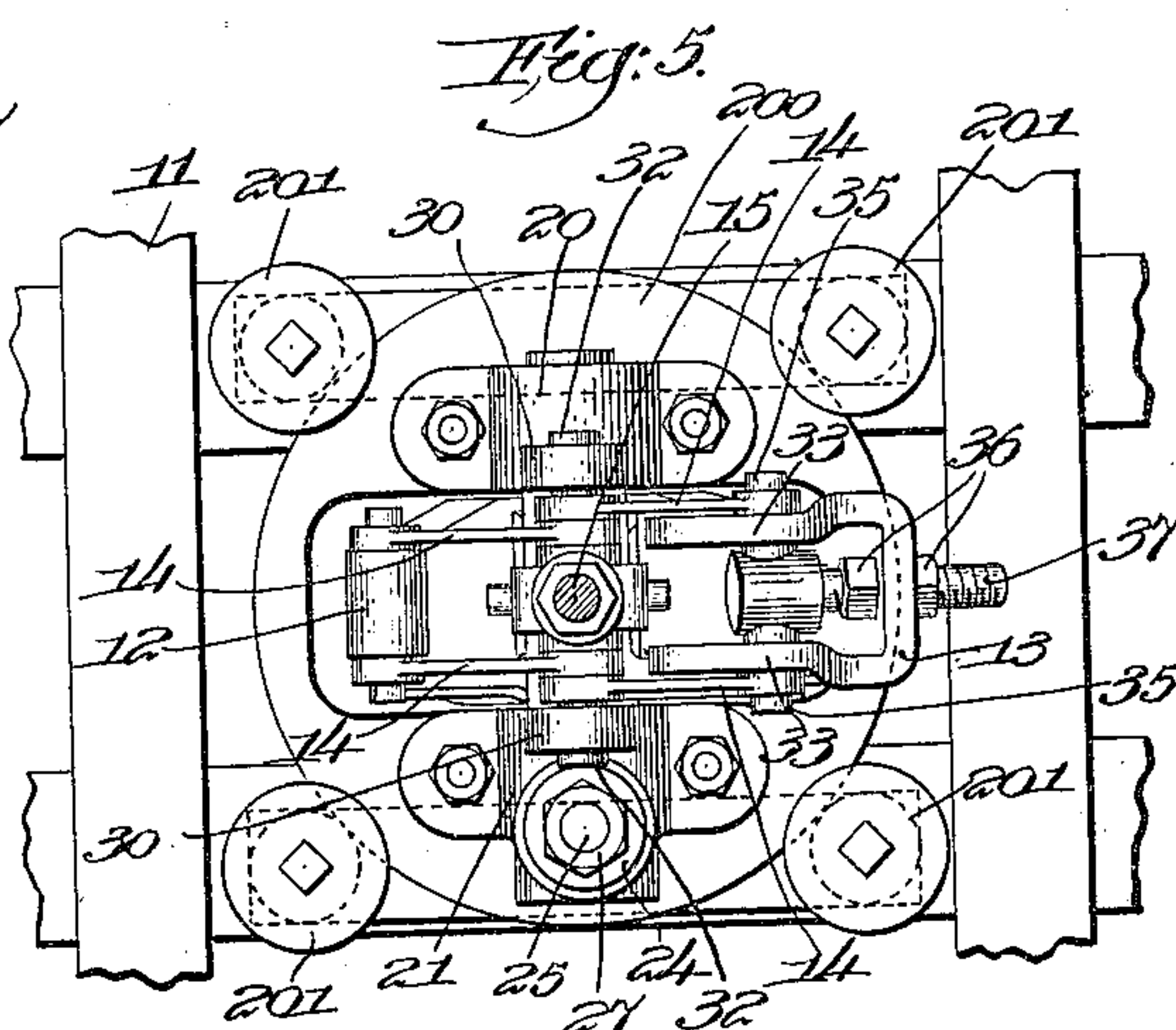
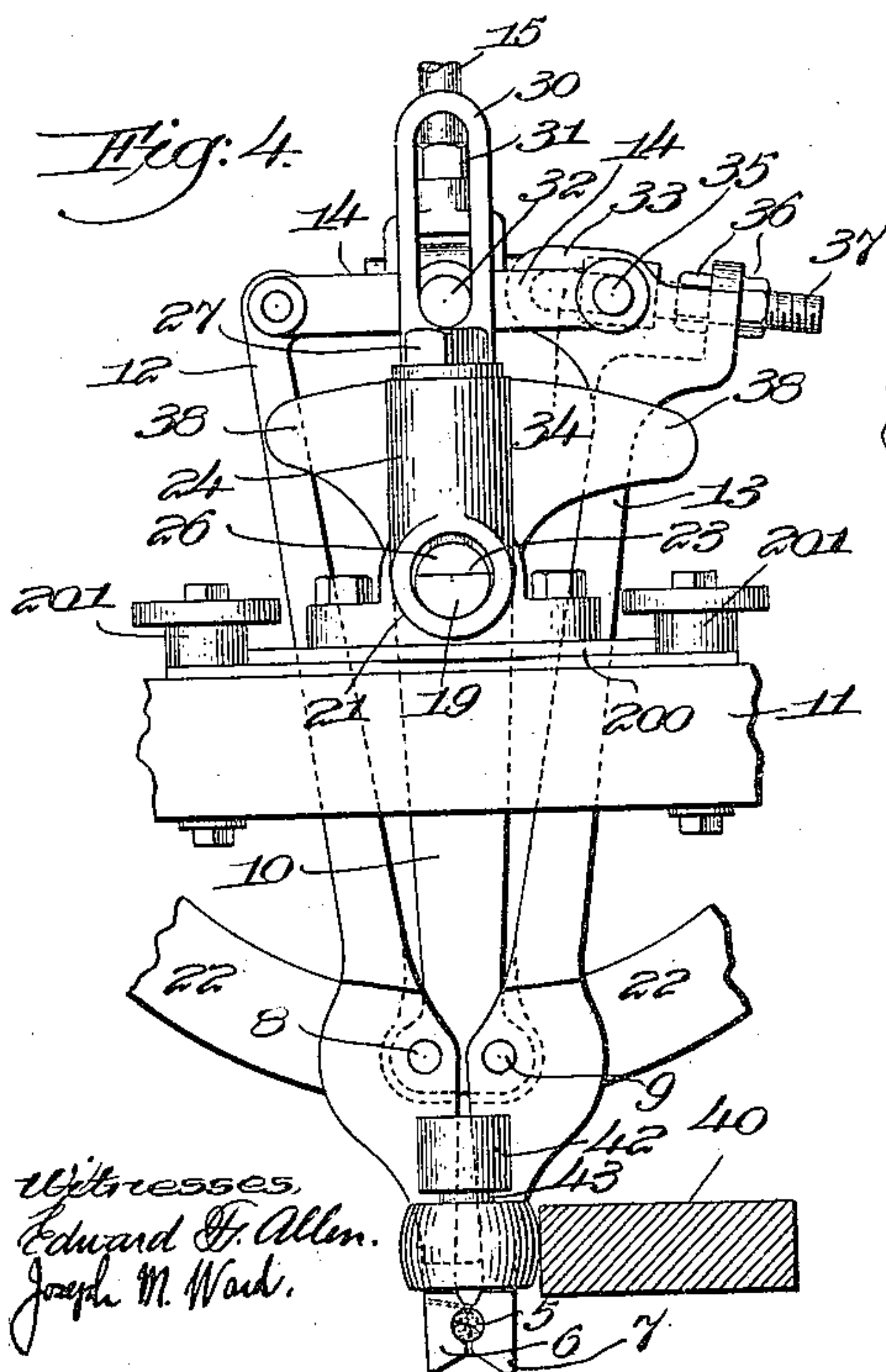
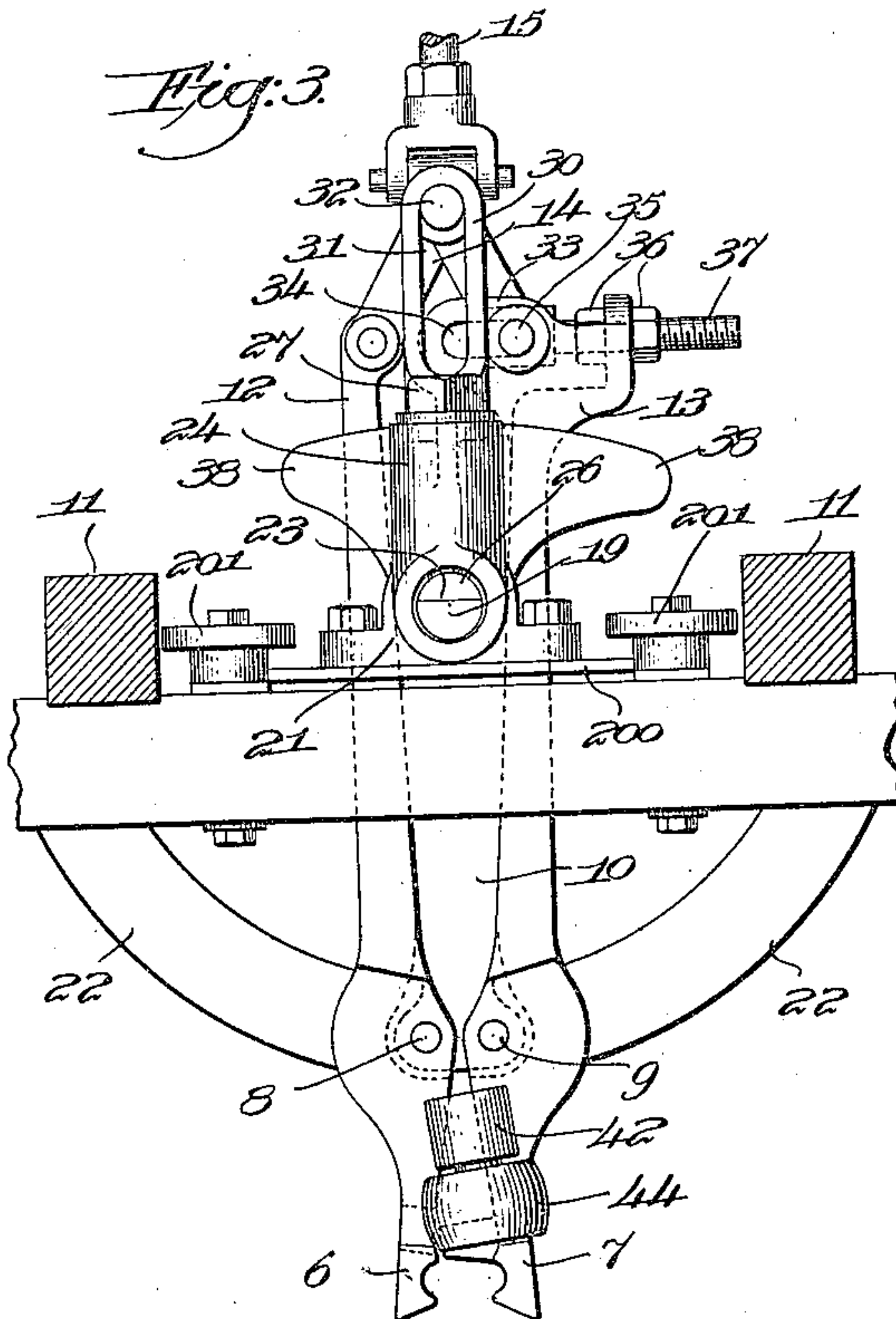
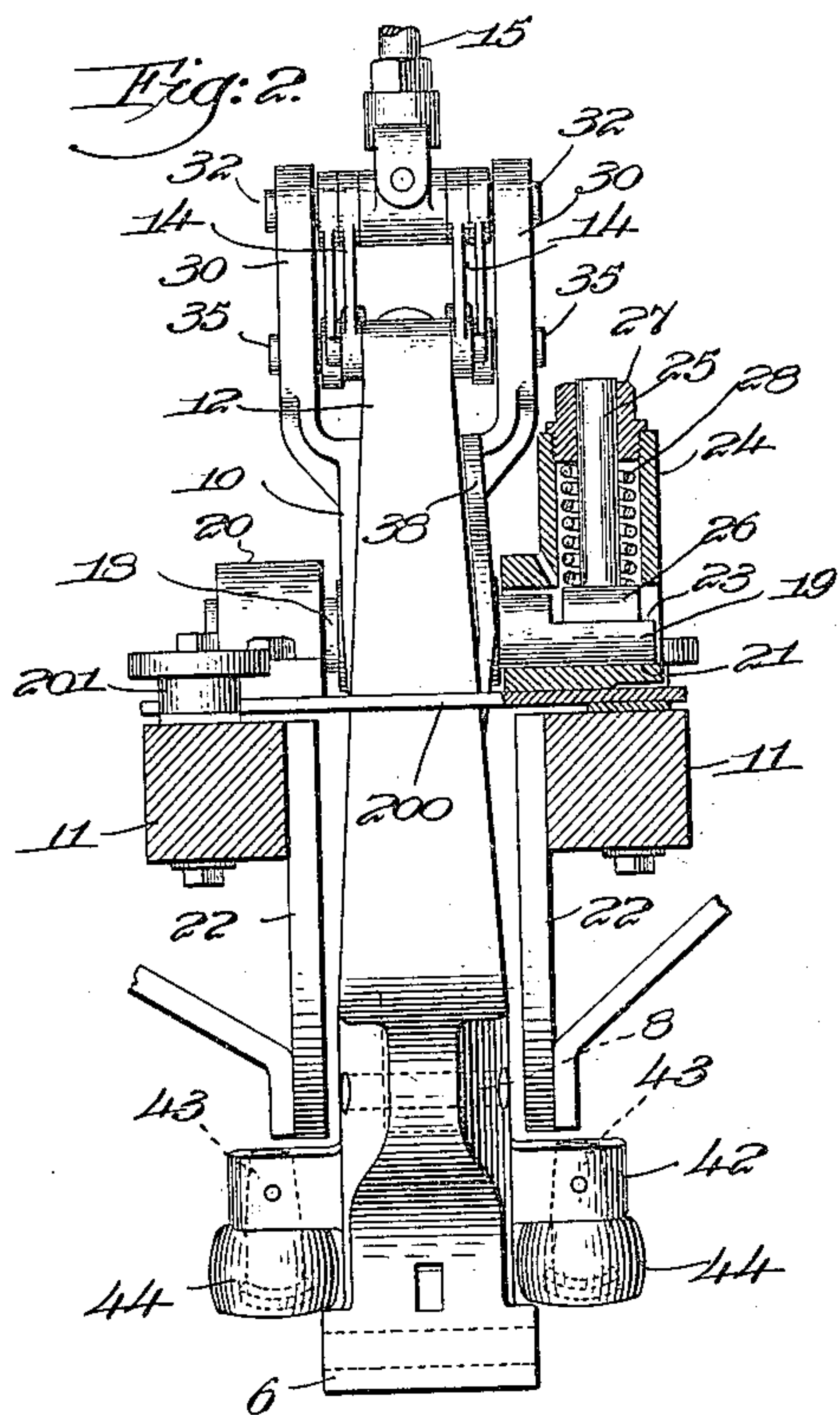
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4 SHEETS—SHEET 2.

1,154,652.



Invented by
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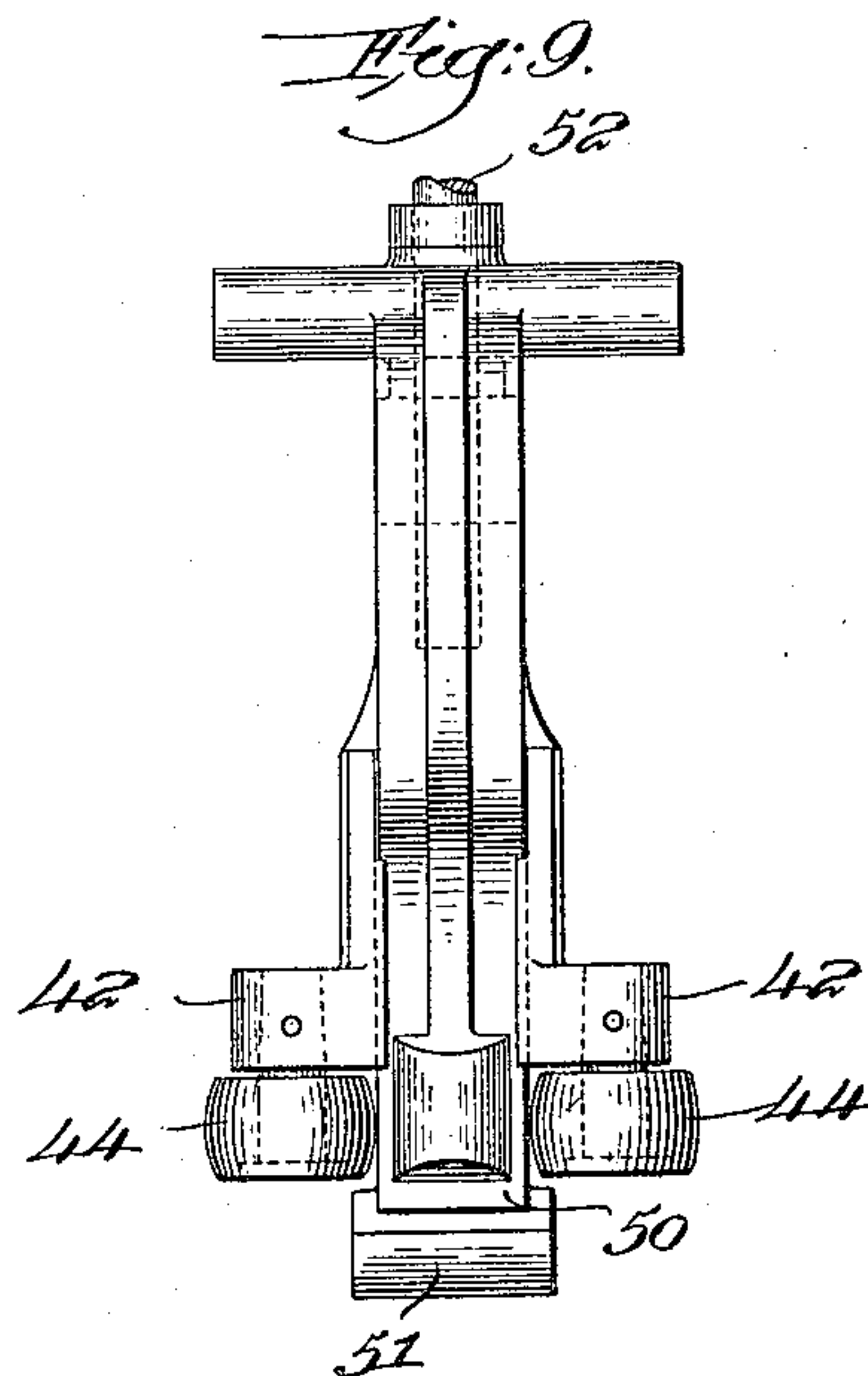
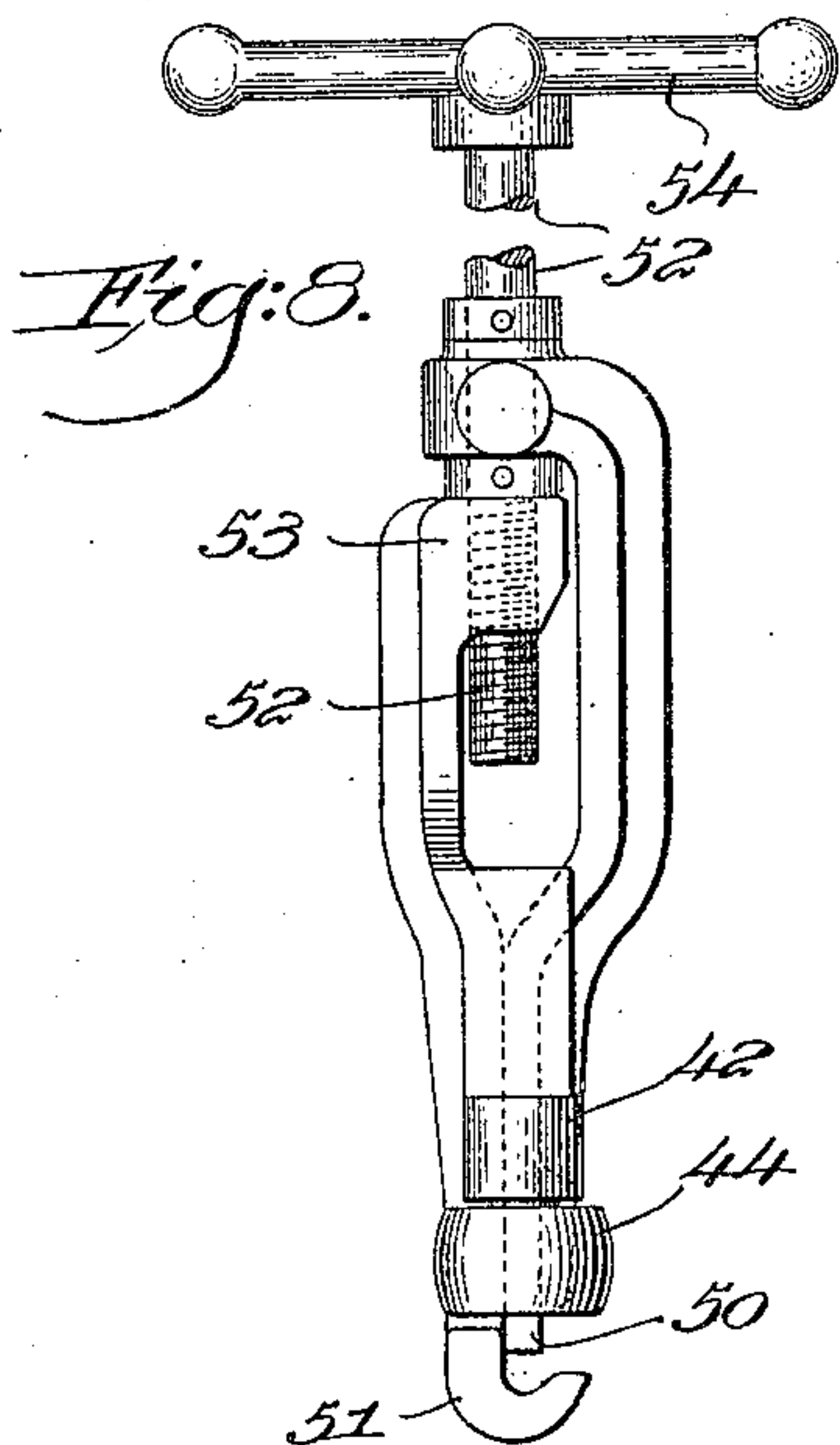
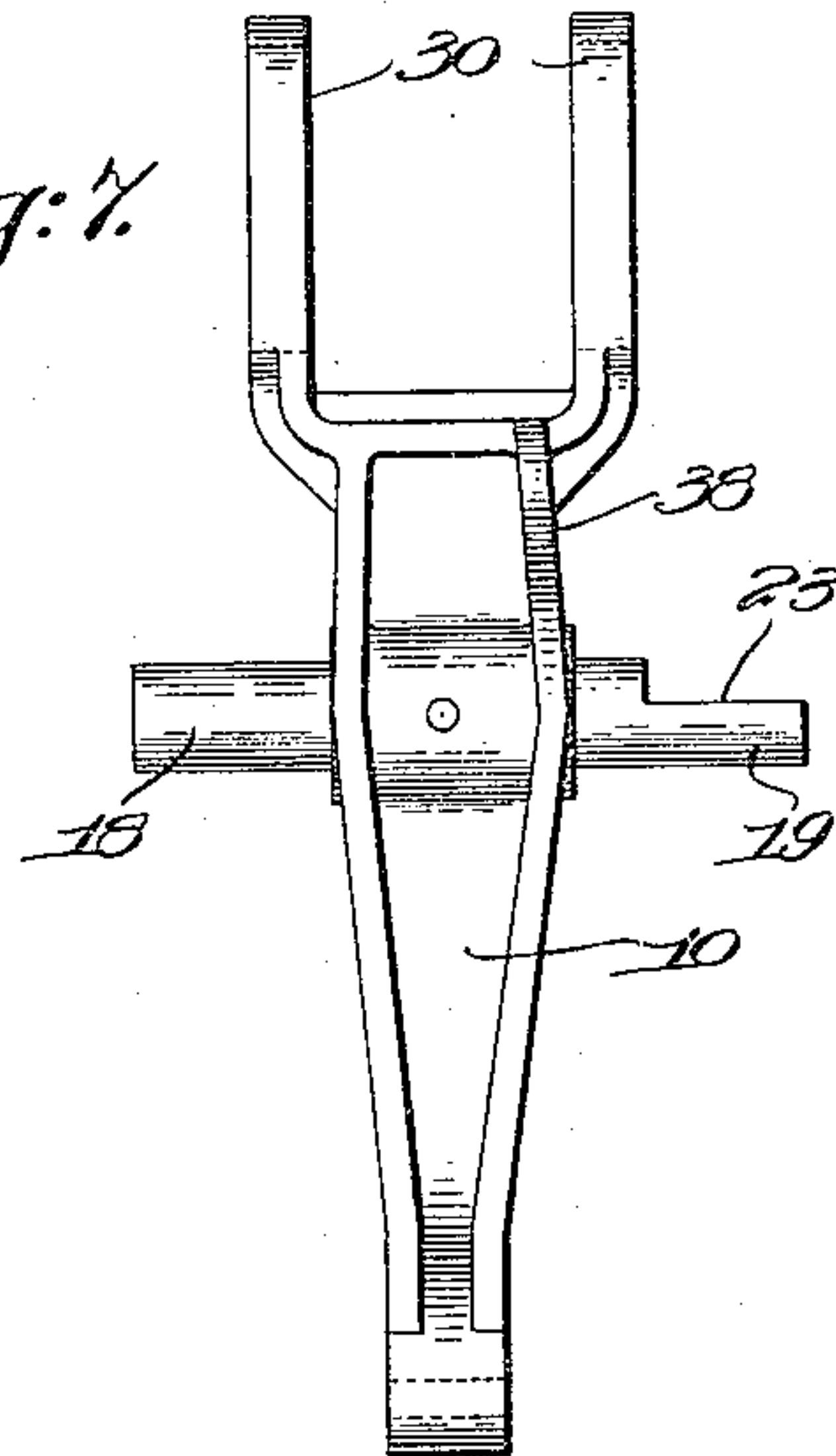
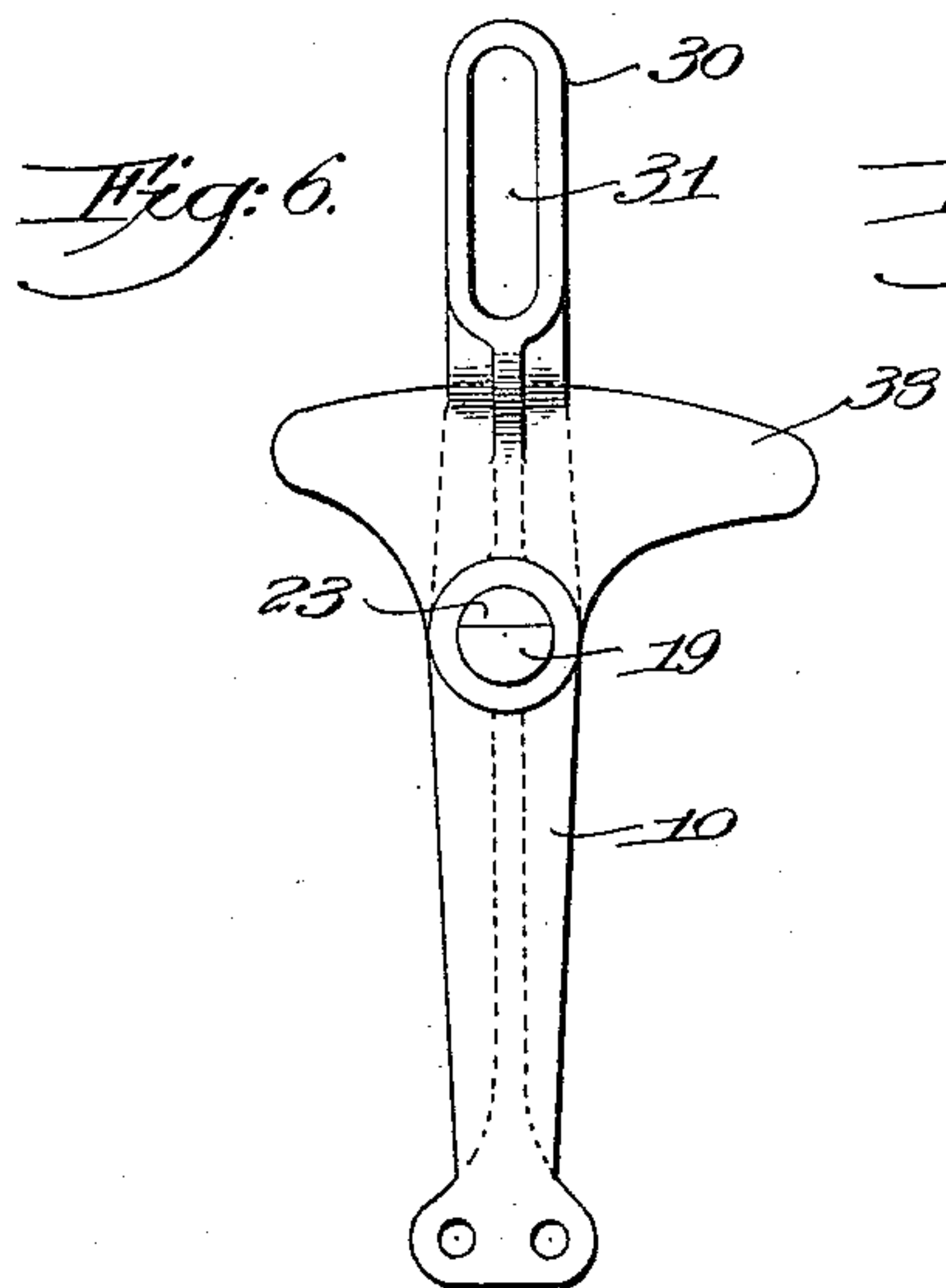
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4 SHEETS—SHEET 3.



Witnesses,
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Joseph M. Ward.

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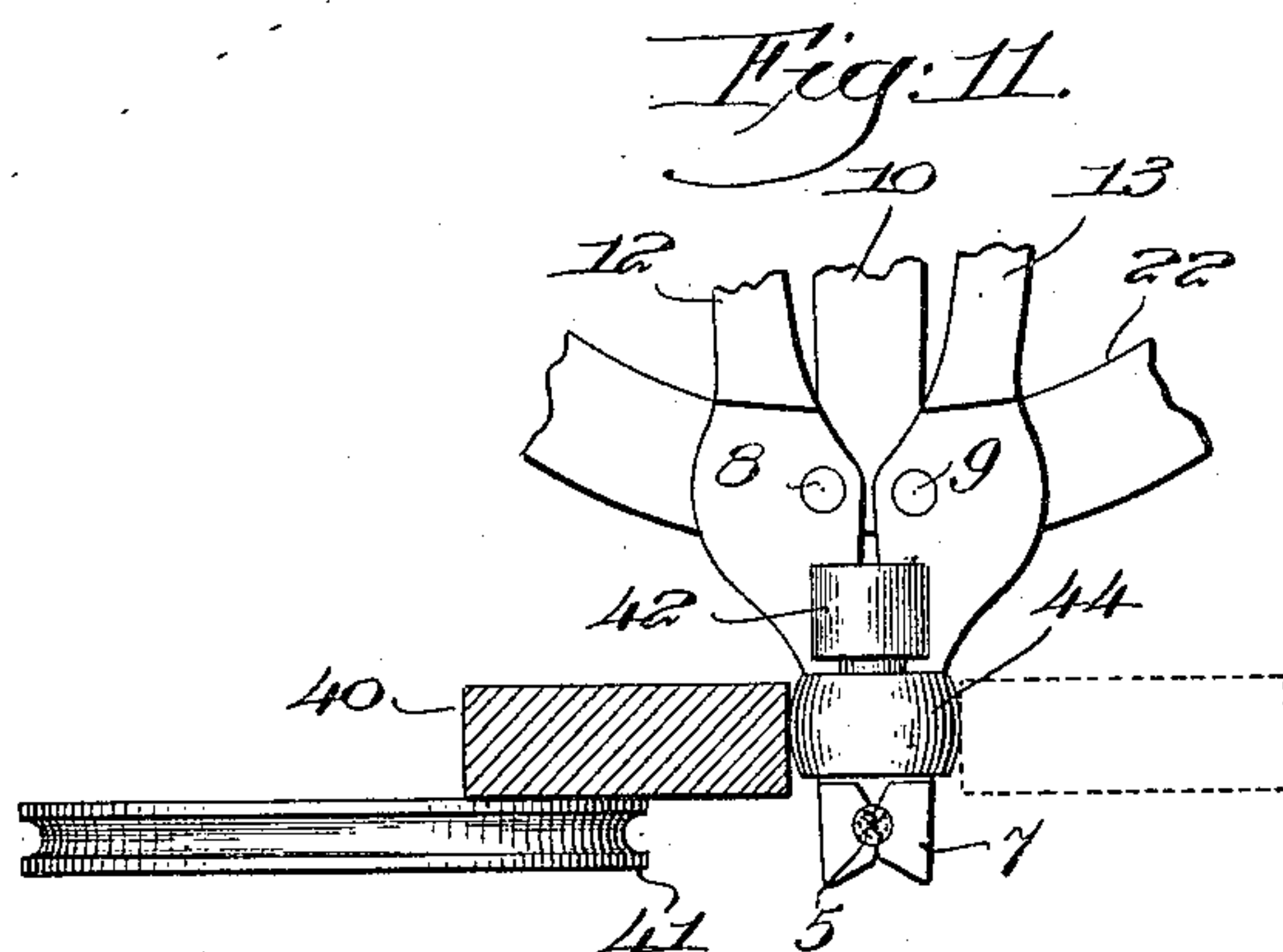
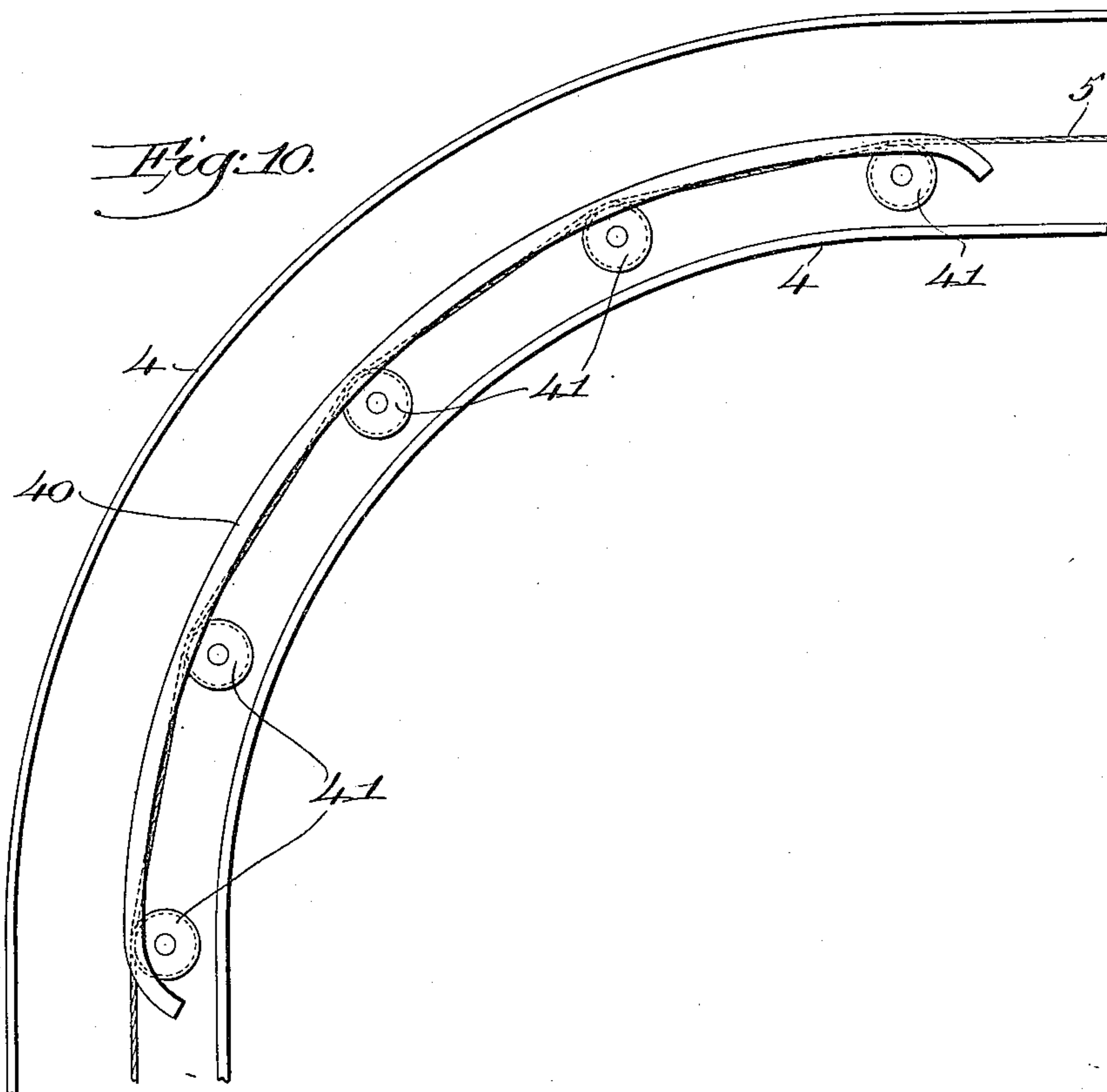
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4 SHEETS—SHEET 4.



Witnesses,
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Joseph M. Ward.

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by Henry J. Guyer
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UNITED STATES PATENT OFFICE.

ALMON E. NORRIS, OF CAMBRIDGE, MASSACHUSETTS.

GRIP FOR CABLE-CARS.

1,154,652.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed March 22, 1911, Serial No. 616,177. Renewed March 24, 1915. Serial No. 16,756.

To all whom it may concern:

Be it known that I, ALMON E. NORRIS, a citizen of the United States, residing at Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Grips for Cable-Cars, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to grips for cable cars and especially to grips for the cable cars of a cable system adapted to transport coal, coke, ore or similar material.

The objects of the invention are to provide a novel grip with anti-friction means to engage the guide on the curves so as to reduce the friction of the grip thereagainst; to provide an arrangement which tends automatically to keep the grip centered while permitting it to swing laterally; to provide a novel means for guiding the toggle-joint device which is used for opening and closing the grip jaws; to provide an improved form of supporting device for the gripping structure, and to otherwise improve the construction, all as more fully hereinafter described and then pointed out in the appended claims.

Referring to the drawings wherein I have shown two embodiments of my invention, Figure 1 shows a portion of the rear end of a car having my improved grip applied thereto; Fig. 2 is a side view of the grip with the centering device shown in section; Fig. 3 is an end view of the grip showing the jaws open; Fig. 4 is a similar view showing the jaws closed; Fig. 5 is a top plan view; Figs. 6 and 7 are two views of the grip-supporting frame; Figs. 8 and 9 show the invention applied to a grip having a vertically-movable jaw; Fig. 10 is a plan view of a curved portion of the track showing the position of the guide for the grip; Fig. 11 shows the manner in which my improved anti-friction device guides the grip.

3 designates a car of any suitable construction adapted to travel on a track 4 along which runs a car-propelling cable 5 as usual in cable haulage systems. In the car herein shown the grip is carried by the rear end of the car and the grip shown in Figs. 1 to 5 is of that well-known type comprising two gripping jaws 6 and 7 pivotally connected at 8 and 9, respectively, to a grip-supporting frame 10 that is secured to the platform or projecting portion 11 of the

car, said jaws having associated therewith upwardly-extending arms 12 and 13 that are connected by the toggle lever device 14, the central joint of which is connected to a rod 15 pivotally mounted to an arm 16 carried by a rock shaft 17 that is journaled to the car. When the arm 16 is swung upwardly the toggle lever device is broken, as shown in Fig. 3, thereby opening the jaws of the grip to release the cable, and when the arm 16 is swung downwardly, the toggle lever device is straightened, as shown in Fig. 4, thereby closing the grip onto the cable 5. This grip as thus far described is one which is in more or less common use at the present time.

It is customary to so mount a grip of this type on the platform 11 of the car that the grip may swing laterally slightly to accommodate itself to the position of the cable. One feature of my invention relates to a device which tends automatically to center the grip and to return it to its vertical position whenever it is relieved from any lateral pull by the cable. There are various ways in which this might be accomplished without departing from the invention. The construction now to be described is the preferred way.

The grip-supporting frame is of the shape shown best in Figs. 6 and 7 and it is provided with the two trunnions 18 and 19 which are rigid with the frame and are mounted to turn in bearings 20, 21 sustained by a turn-table plate 200 rotatably mounted on the platform 11. This turn-table plate is confined in place by guides 201, which also guide it during its turning movement. The lower end of the frame plays between two guide bars 22 suspended from the platform 11 as usual in this class of devices.

My invention comprises means for automatically centering the frame 10 after it has been swung to either side. In the preferred embodiment of the invention this is accomplished by means acting on one of the trunnions. As herein shown the trunnion 19 is slabbled off to provide the flattened portion 23, and the bearing 21 is provided with the extension 24 within which is mounted a spring-pressed plunger having a head 26 that bears against the flattened portion 23 of the trunnion 19. The plunger 26 plays through a bushing 27 carried by the extension 24 and a spring 28 confined between said bushing and the head 26 yieldingly holds

the head against the flattened portion 23. Whenever the grip-supporting frame is swung about the trunnions, the plunger 25 will be elevated, as will be obvious, and as soon as the force tending to swing the grip laterally is relieved, the pressure of the spring 29 will automatically return the grip to its central vertical position.

The grip-supporting frame has two upwardly-extending slotted arms 30, each provided with a slot 31 and the toggle lever device 14 is provided with two guiding projections 32 extending from the central joint thereof, which projections play up and down in the slots 31. These projections operating in the slots 31 serve to guide the toggle joint device so that the two jaws will be opened and closed to the same extent. The advantage of having the guiding slots 31 formed in an integral part of the grip-supporting frame is that said slots are always in proper position for properly guiding the toggle-joint regardless of the position which the frame may assume as it swings about its journals. The guiding projections may be made in any suitable way, but will preferably be the extended ends of the pin constituting the central joint of the toggle lever device 14.

In order to provide for taking up any wear that may occur in the gripping jaws so that they will always bite onto the cable with sufficient friction, I have provided an adjustable connection between the toggle lever device 14 and the arm 13. As herein shown, said arm has integral therewith two laterally-extending wings 33, each provided with a slot 34, and one end of the toggle lever device 14 is connected to a pin 35 which extends through the slots 34 and can play back and forth therein. This pin has connected thereto centrally thereof a stem 37 which extends through an aperture in the upper end of the arm 13, and the stem has lock nuts 36 thereon which engage the arm 13. By adjusting the lock nuts 36, the stem may be adjusted thereby adjusting the point of connection between the toggle-lever device 14 and the arm 13.

The grip-supporting frame is formed at its rear side with the extended bearing flanges or wings 38 against which the upper ends of the arms 12 and 13 may have bearing. When the jaws of the grip are guiding the cable and the car is being hauled thereby in the direction of the arrow in Fig. 1, the pull of the cable comes on the gripping jaws and is by them transmitted to the grip-supporting frame 10 through the pivots 8 and 9. The engagement of the arms 12 and 13 with the bearing wings 38 prevents any twisting of the gripping jaws relative to the grip-supporting frame and thus relieves the pivotal points 8 and 9 from undue strain.

Where the track 4 is provided with a curve, as shown in Fig. 10, it is customary to provide a grip-guiding member 40 over the edge of which the grip will slide as the car moves, said grip-guiding member 70 serving to prevent the grip from engaging with the cable-guiding sheaves 41. When a loaded car is being drawn around a curve, the tension of the cable will cause considerable friction between the grip and the grip-guiding member 40 which causes a rapid wear between these parts and necessitates a more or less frequent renewal of one or both of the gripping jaws. In order to prevent this undue wear I have provided a novel anti-friction bearing for the grip which has engagement with the grip-guiding member 40 and which is arranged so as to operate regardless of the direction in which the track curves and the consequent position of the grip-guiding member. The anti-friction device herein shown comprises rolls sustained by the grip and adapted to rotate about vertical axes and situated to engage the edge of a grip-guiding member, said rolls being so situated and of such a size as to permit them to engage the grip-guiding member whether the latter is on one side or the other of the track.

In the embodiment shown in Figs. 1 to 5 the jaw 7 is provided with laterally-extending bosses 42, one on each side thereof, and each boss is provided with a vertically-extending pivotal shaft 43 on which is rotatably mounted a roll 44. Each roll 44 has a diameter greater than the thickness of the grip when the jaws are closed so that the periphery of the roll extends beyond the jaw on each side thereof, as clearly seen in Fig. 4. These rolls are given such a vertical position that they will engage with the edge of the grip-guiding member 40. The grip-guiding member is placed on one side or the other of the cable, depending on the direction in which the track curves and by providing two rolls, one on each end of the grip and making the rolls as illustrated, said rolls will act against the grip-guiding member whether it is placed on one side or the other of the cable.

In Fig. 4 the grip-guiding member is shown in section on the right-hand side of the grip which will be the position if the track were curving to the right. In Fig. 11 the grip-guiding member is shown on the left which would be the position when the track curves to the left. This feature of my invention is applicable to grips of other types than that shown in Figs. 1 to 5. In Figs. 8 and 9 I have illustrated a more or less common type of grip which comprises a fixed jaw 50 and a vertically-movable jaw 51 which has at its upper end a head 53 through which is screw-threaded a grip-operating screw 52, said screw being swiveled

to the fixed jaw 50 and provided with a handle 54 by which it may be operated. In applying the anti-friction bearing feature to this form of grip, the fixed jaw 50 will be

5 provided with two bosses 42, each of which carries a rotatably-mounted roll 44 that has a diameter greater than the thickness of the grip so that the roll will engage with the grip-guiding member 40 as above described.

10 While I have described in detail some particular embodiments of my invention, I do not wish to be limited to the precise construction shown.

Having fully described my invention, 15 what I claim as new and desire to secure by Letters Patent is:

1. In a cable grip for cable cars, the combination with a grip-supporting frame, of two gripping jaws pivoted thereto, a roll 20 sustained by one of said jaws for rotative movement about a vertical axis, said roll having a diameter greater than the width of the grip whereby when the jaws are closed the periphery of the roll extends be- 25 yond both sides of the grip.

2. In a cable grip for cable cars, the combination with a grip-supporting frame, of two gripping jaws pivoted thereto, one of 30 said jaws having a lug on each side thereof, and a roll rotatably mounted in each lug to rotate about a vertical axis, the periphery of said rolls projecting beyond the side of the grip.

3. In a cable grip for cable cars, the combination with a pair of gripping jaws, one 35 of said jaws having a lug on each side thereof, of a roll rotatably mounted in each lug to rotate about a vertical axis, each roll having a diameter greater than the width of the jaws when the latter are closed.

4. In a cable grip, the combination with a car, of a grip-supporting frame thereon, means to sustain said frame for swinging 45 movement laterally of the car about a horizontal axis, and means tending at all times to maintain the frame in a central position.

5. In a cable grip, the combination with a car, of a grip-supporting frame thereon, means to sustain said frame for swinging 50 movement in a direction laterally of the car, and a yielding centering device acting on said frame and tending to maintain it in a central position.

6. The combination with a car, of a grip-supporting frame having trunnions, bearings 55 carried by the car in which said trunnions are mounted to turn, a grip sustained by said frame, and means acting on one of the trunnions and tending to maintain the frame in central position.

7. The combination with a car, of a grip-supporting frame having trunnions, bearings 60 carried by the car in which said trunnions are mounted to turn, a grip sustained by said frame, one of said trunnions having

a flattened portion, and a yieldingly-sustained follower acting on said flattened portion and tending to maintain the frame in central position.

8. The combination with a car, of a grip-supporting frame sustained thereby and 70 provided with two slotted arms, a pair of gripping jaws pivoted to the frame, a toggle lever device connecting said jaws and by which they are operated, and projections ex- 75 tending from said toggle lever device and operating in the slots of said arms.

9. In a cable grip, the combination with a grip-supporting frame, of a pair of grip- 80 ping jaws pivoted thereto, each having an upwardly-extending arm, a toggle lever device pivotally connected at one end to one of said arms, a member having screw- 85 threaded engagement with the other of said arms and to which the other end of the toggle lever device is connected, and means to operate said toggle lever device.

10. The combination with a car, of a grip-supporting frame sustained thereby and 90 provided with two vertically-extending slotted arms, a pair of gripping jaws pivoted to said frame, a toggle lever device situated between said arms and connecting said jaws and by which the latter are operated, 95 and projections extending from the central joint of said toggle lever device and operating in said slots.

11. In a cable grip, the combination with a grip-supporting frame, of a pair of grip- 100 ping jaws pivoted thereto, a toggle lever device having one end pivotally connected to one of the jaws, adjustable means connecting the other end of said toggle lever device to the other jaw, and means to op- 105 erate said toggle lever thereby to open and close the jaws.

12. In a cable grip, the combination with a grip-supporting frame, of a pair of grip- 110 ping jaws pivoted thereto, each having an upwardly-extending arm, one of which is provided with two slotted wings, a toggle lever device pivotally connected at one end to the other arm and the other end of which 115 has projections guided in said slots, and an adjustable connection between said end of the toggle lever device and said arm.

13. In a cable grip, the combination with a grip-supporting frame having two ex- 120 tended bearing wings 38, of a pair of gripping jaws pivoted to said frame and each provided with an upwardly-extending arm adapted to overlie and bear against said wings 38, and toggle levers connecting said arms.

14. The combination with a car, of a 125 swinging grip-supporting frame sustained thereby, a pair of gripping jaws pivoted to the frame, a toggle lever connecting said jaws by which they are operated, means 130 carried by the frame for guiding the toggle

lever in its movement and yielding means for holding the frame normally in its central position.

15. The combination with a car, of a swinging grip-supporting frame sustained thereby, a pair of gripping jaws pivoted to the frame, a toggle lever connecting said jaws by which they are operated, means carried by the frame for guiding the toggle lever in its movement, and means tending to maintain the frame automatically in its central position.

16. The combination with a car, of a grip-supporting frame pivotally mounted thereon to swing laterally about a horizontal axis and having integral therewith a pair of vertical slotted arms, of a pair of gripping jaws pivoted to the frame, a toggle lever connecting said jaws and by which they are operated, means carried by the toggle lever and operating in said slots whereby the movements of the toggle lever are guided by the frame.

17. The combination with a car, of a turn-

table thereon, a grip-supporting frame pivotally sustained by the turn-table, a pair of gripping jaws pivoted to the frame, a toggle lever connecting said jaws and by which they are operated, said frame having integral therewith means for guiding the toggle lever in its movement.

18. The combination with a car, of a turn-table thereon, a grip-supporting frame pivotally sustained by the turn-table, a pair of gripping jaws pivoted to the frame, a toggle lever connecting said jaws by which they are operated, means rigid with the frame and movable therewith for guiding the toggle lever in its movement, and yielding means tending to maintain the frame in its central vertical position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALMON E. NORRIS.

Witnesses:

LOUIS C. SMITH,

THOMAS J. DRUMMOND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."