

No. 863,098.

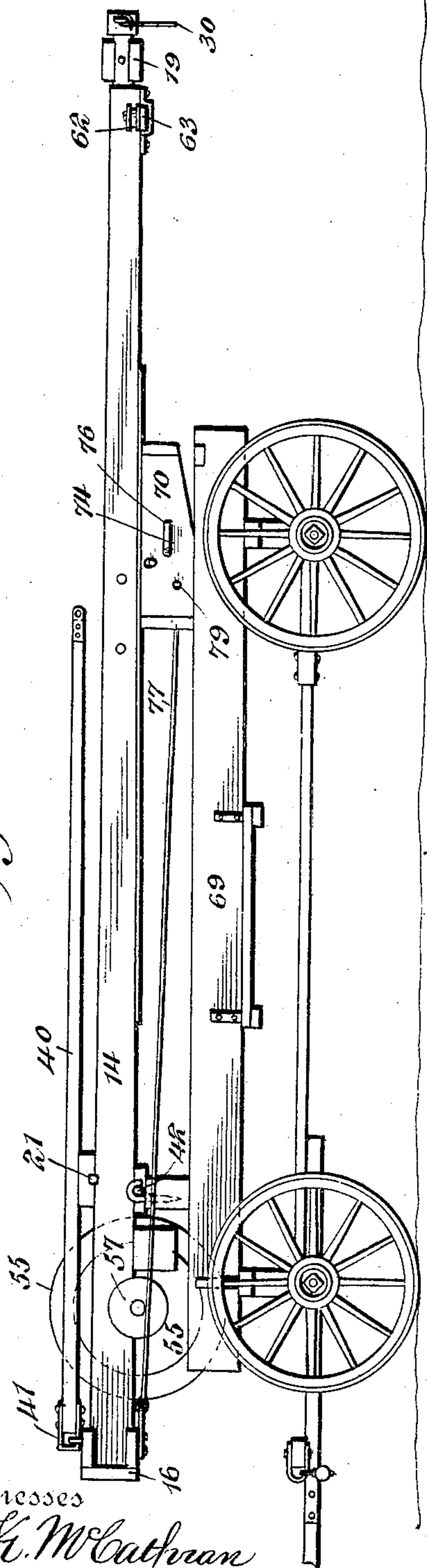
PATENTED AUG. 13, 1907.

F. SANDWISCH.  
HOISTING APPARATUS AND TRANSPORTING MEANS THEREFOR.

APPLICATION FILED DEC. 5, 1906.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
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Fig. 4.

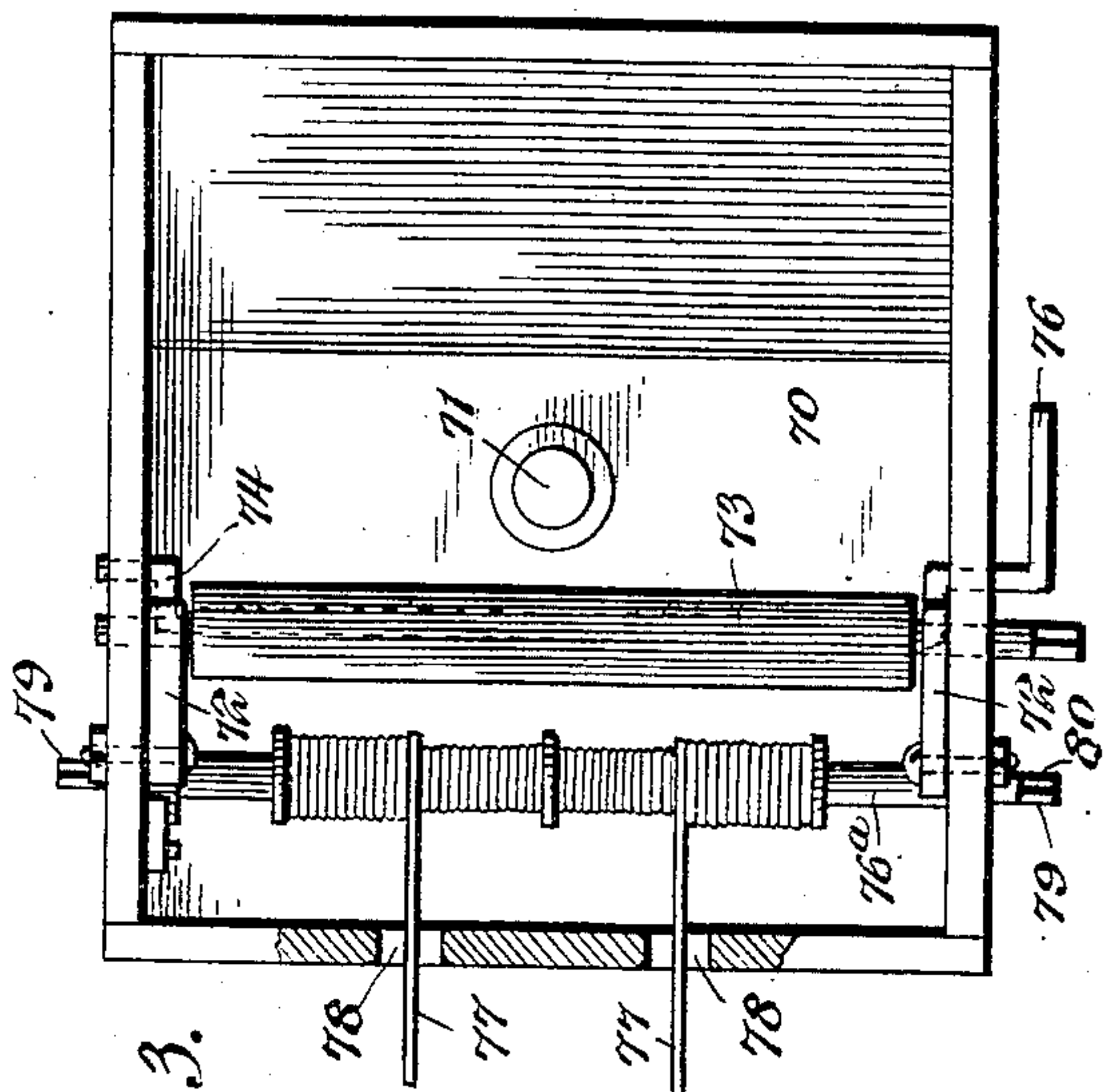
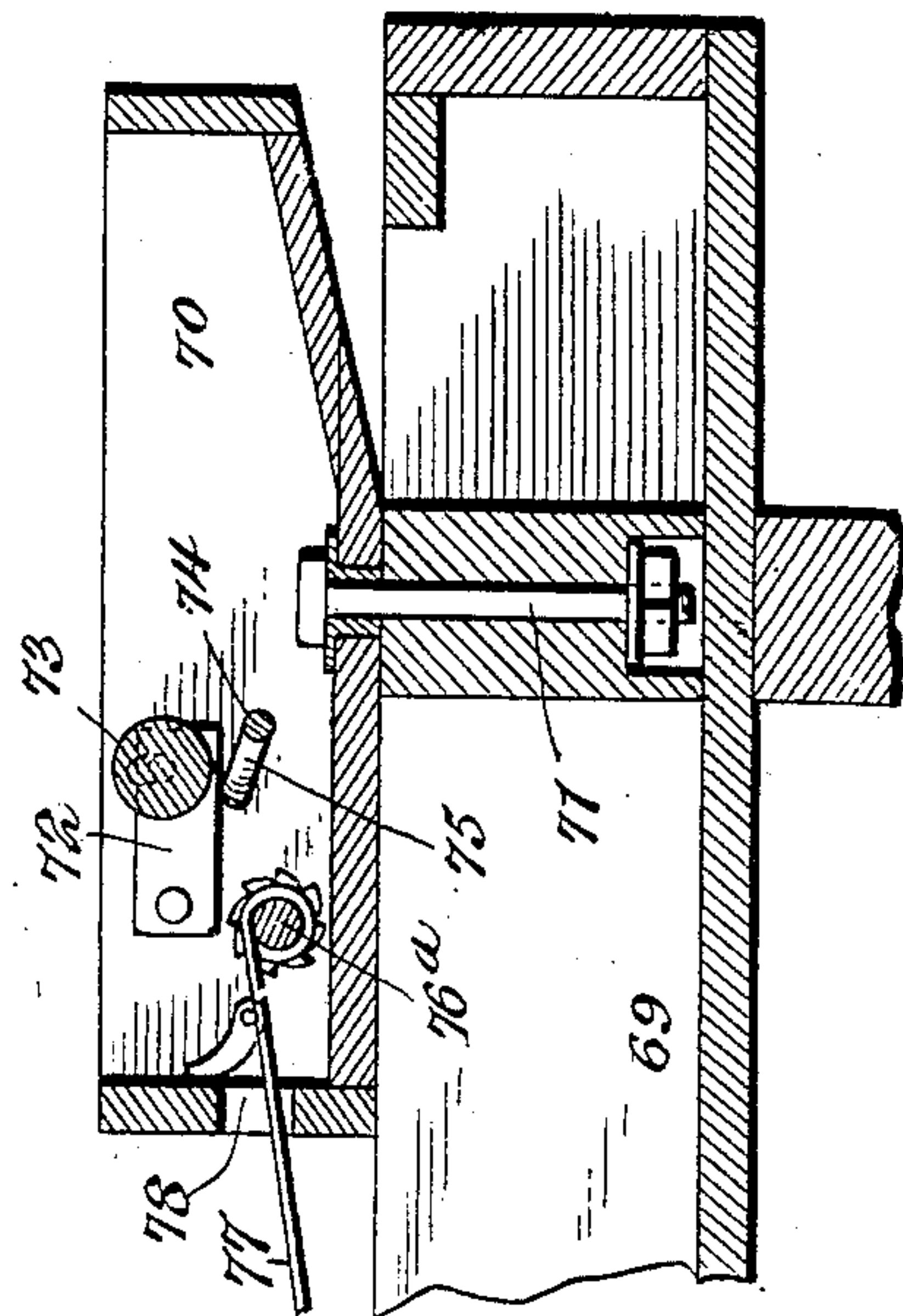


Fig. 3.

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Attorney

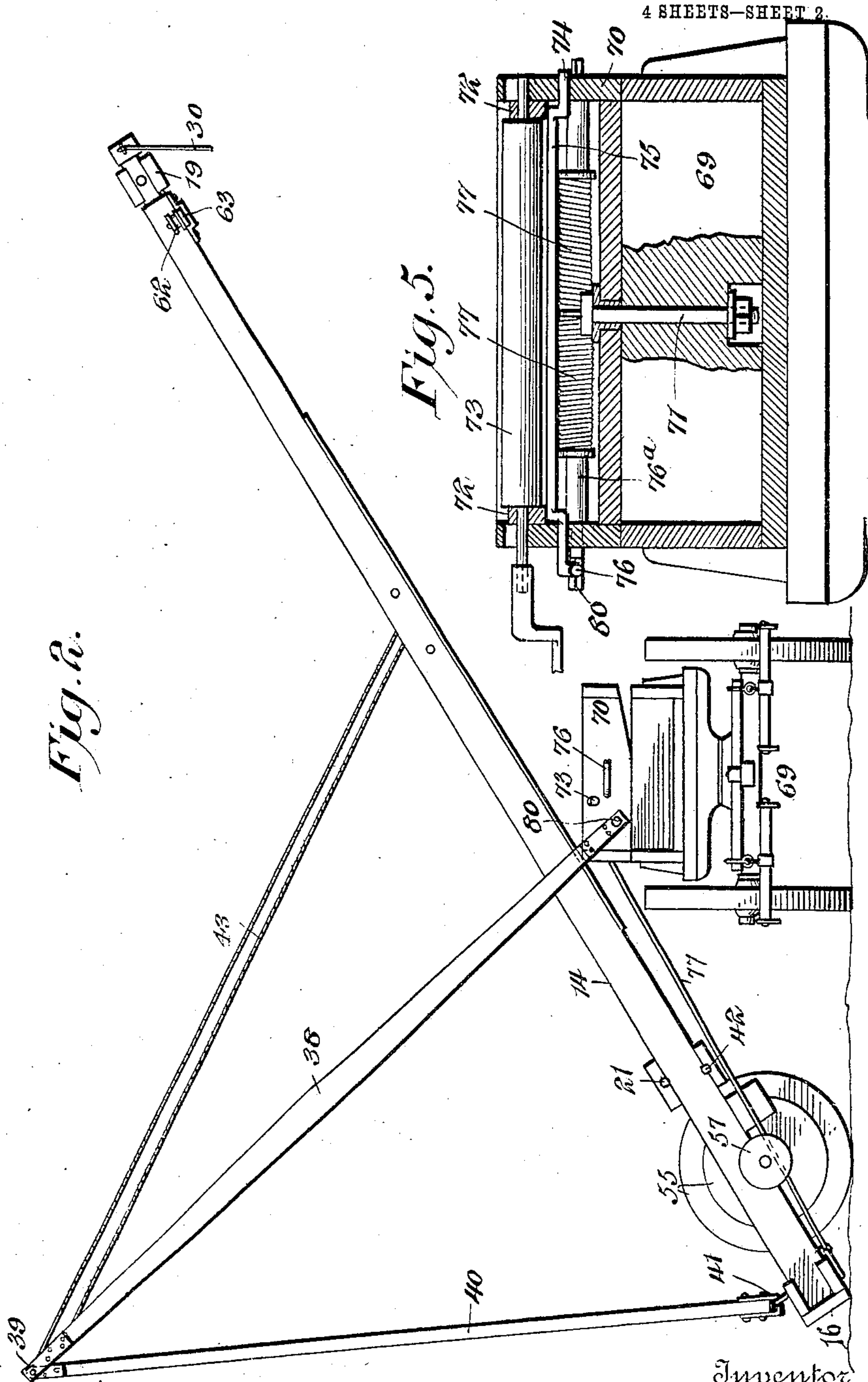
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4 SHEETS—SHEET 2.



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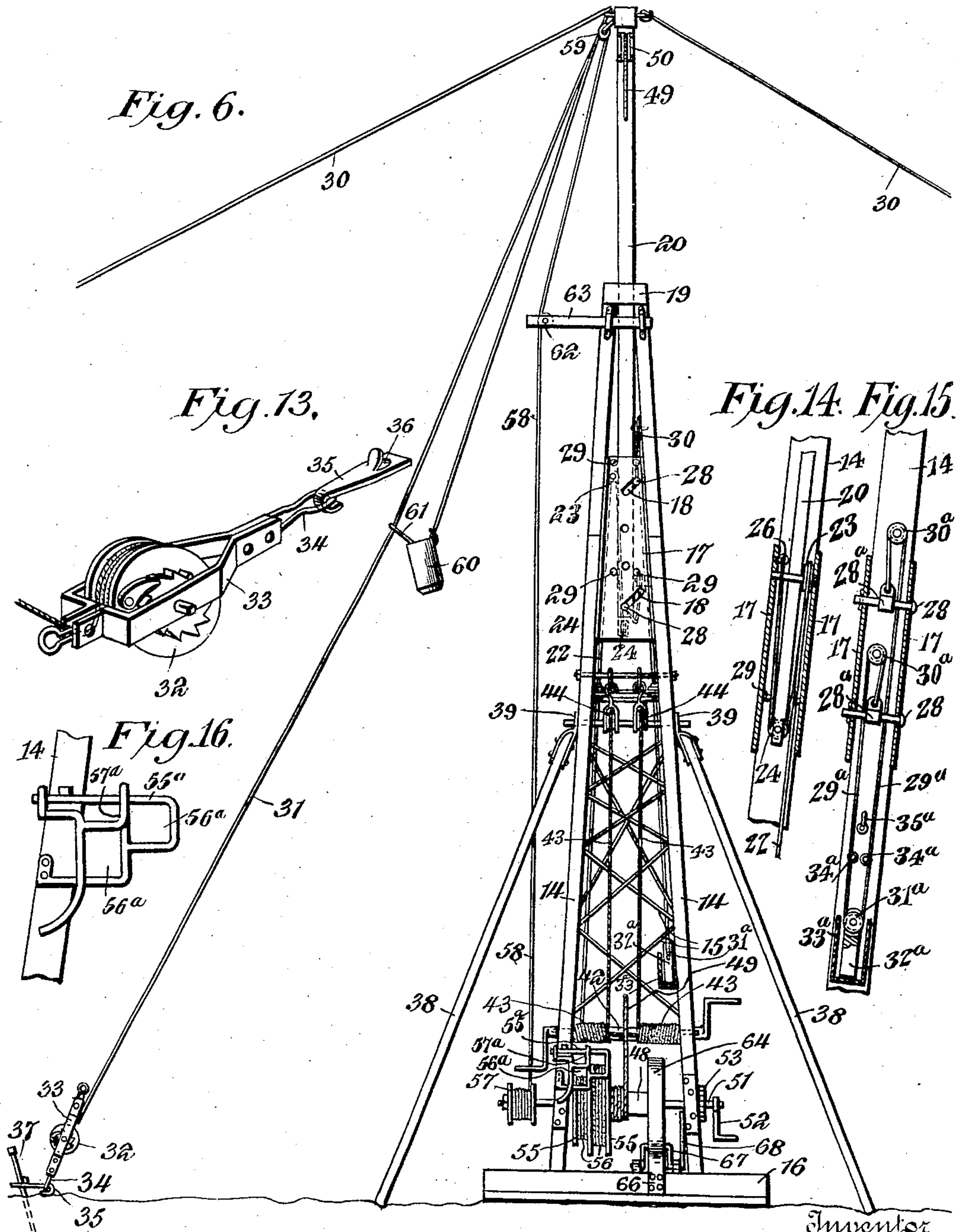
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 7.

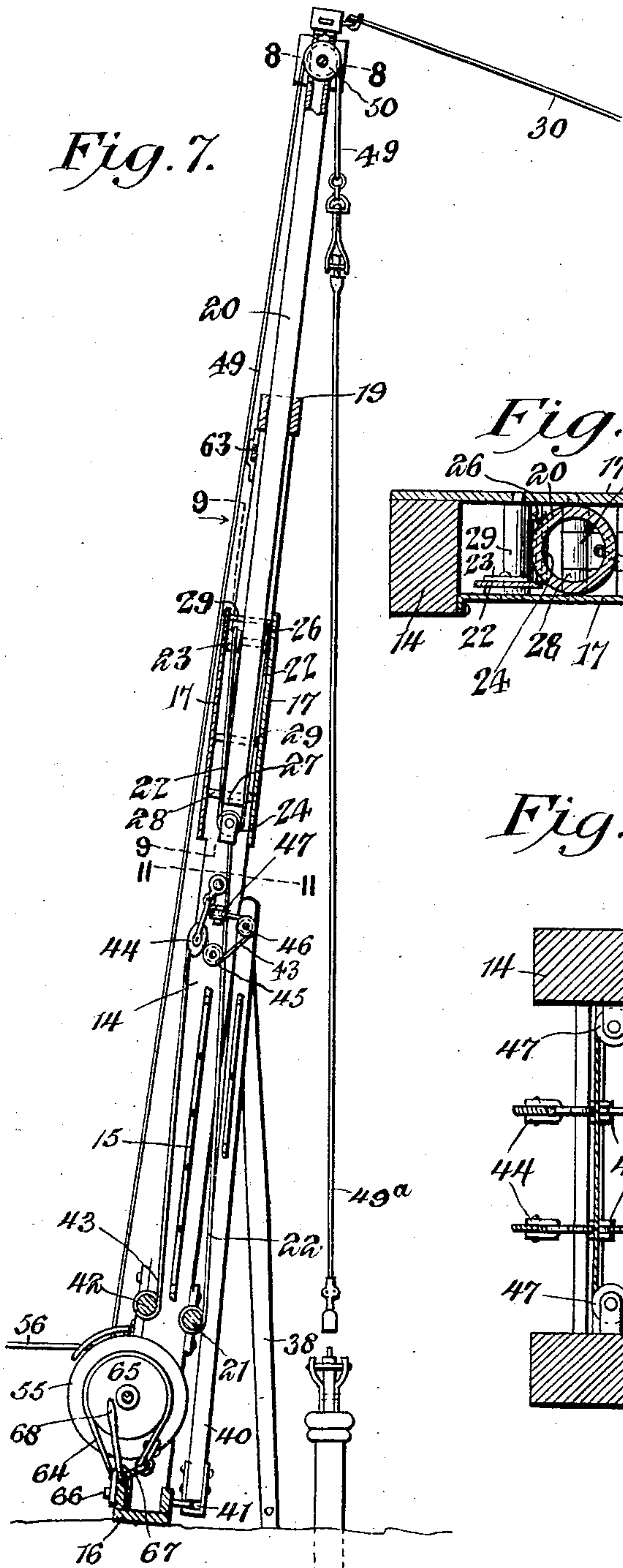


Fig. 8.

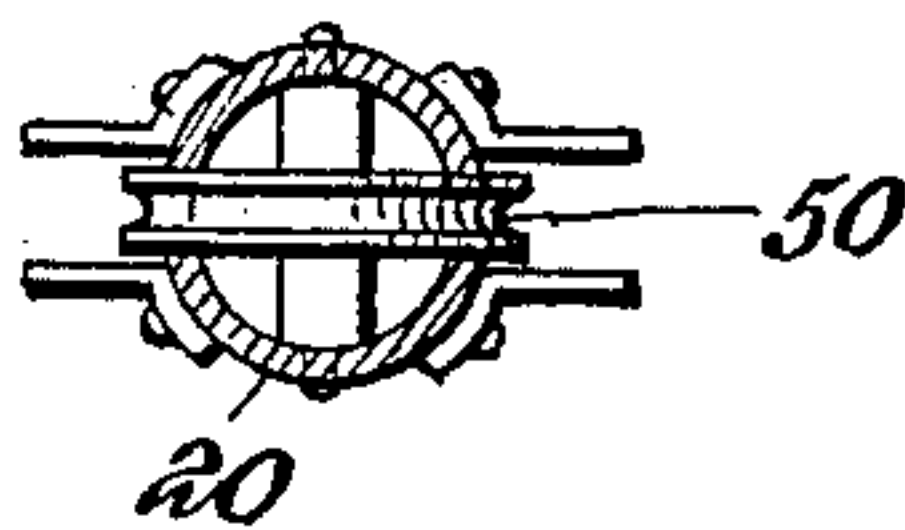


Fig. 9.

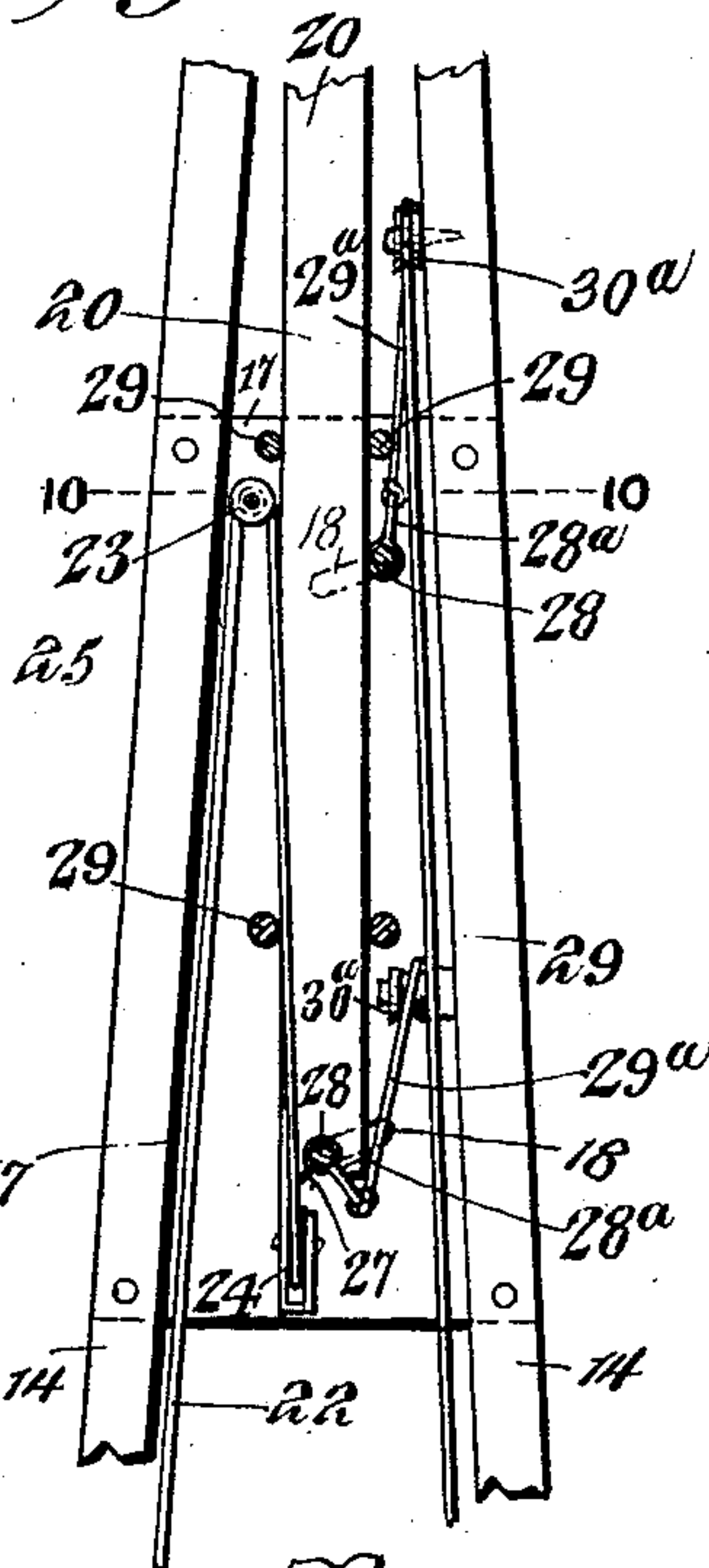


Fig. 10.

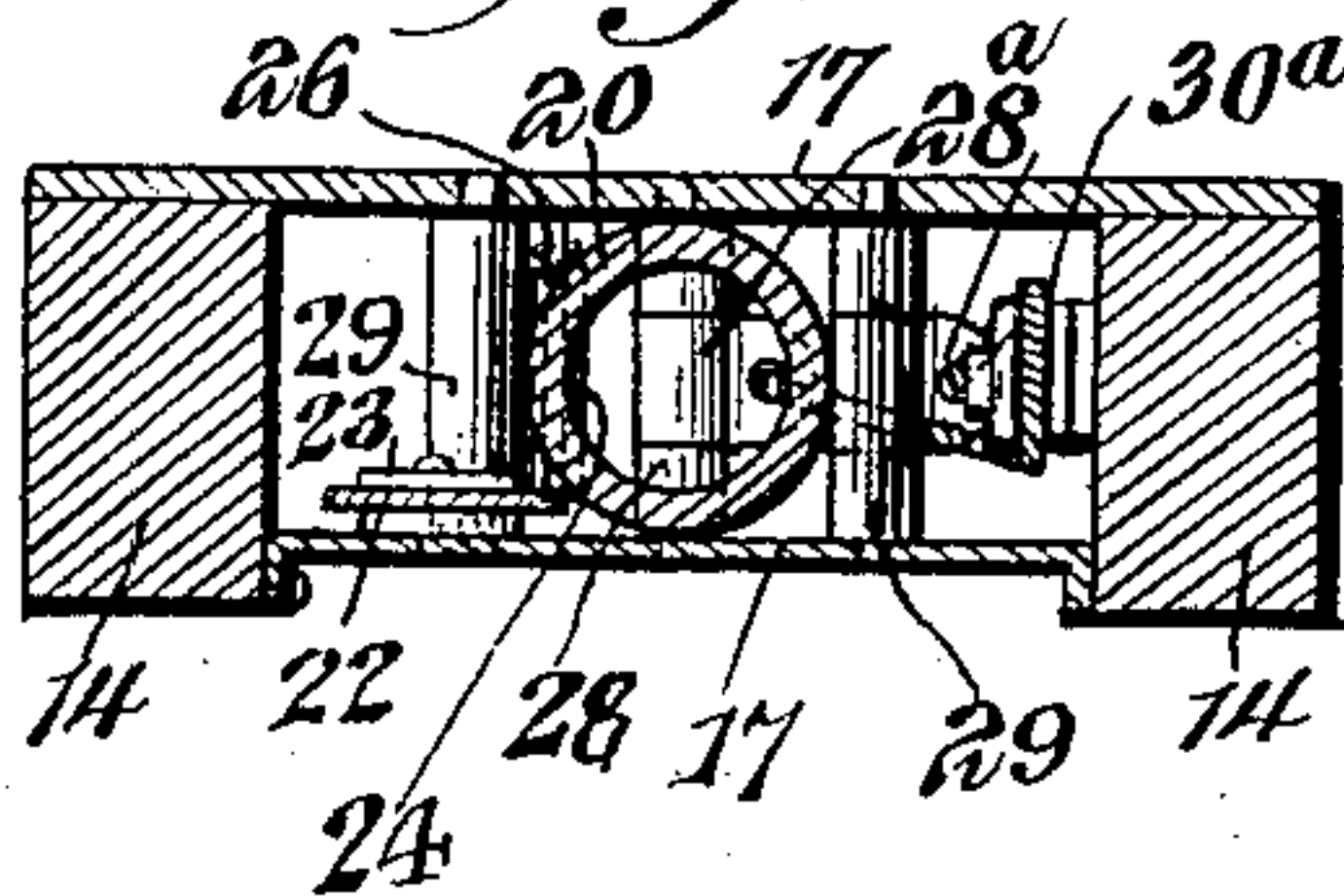


Fig. 11.

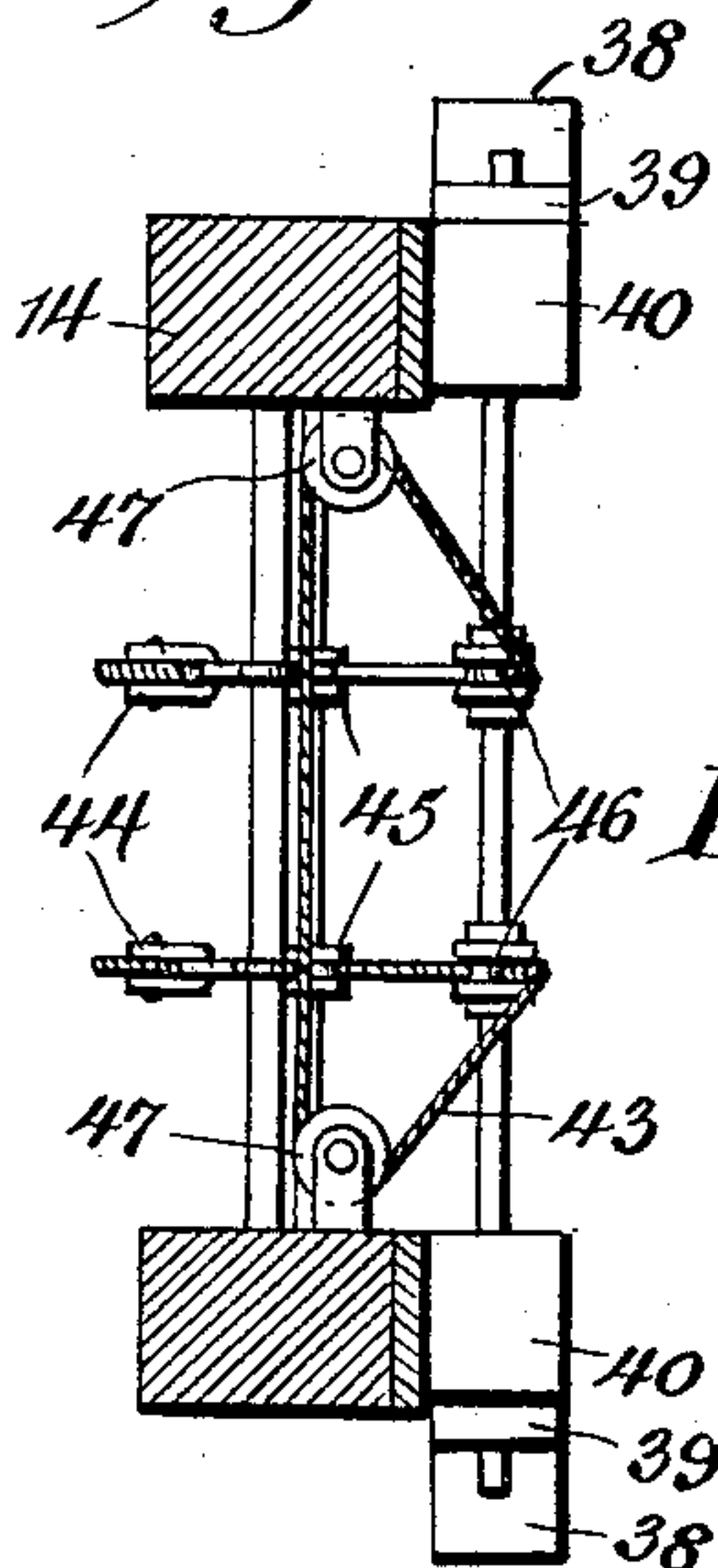
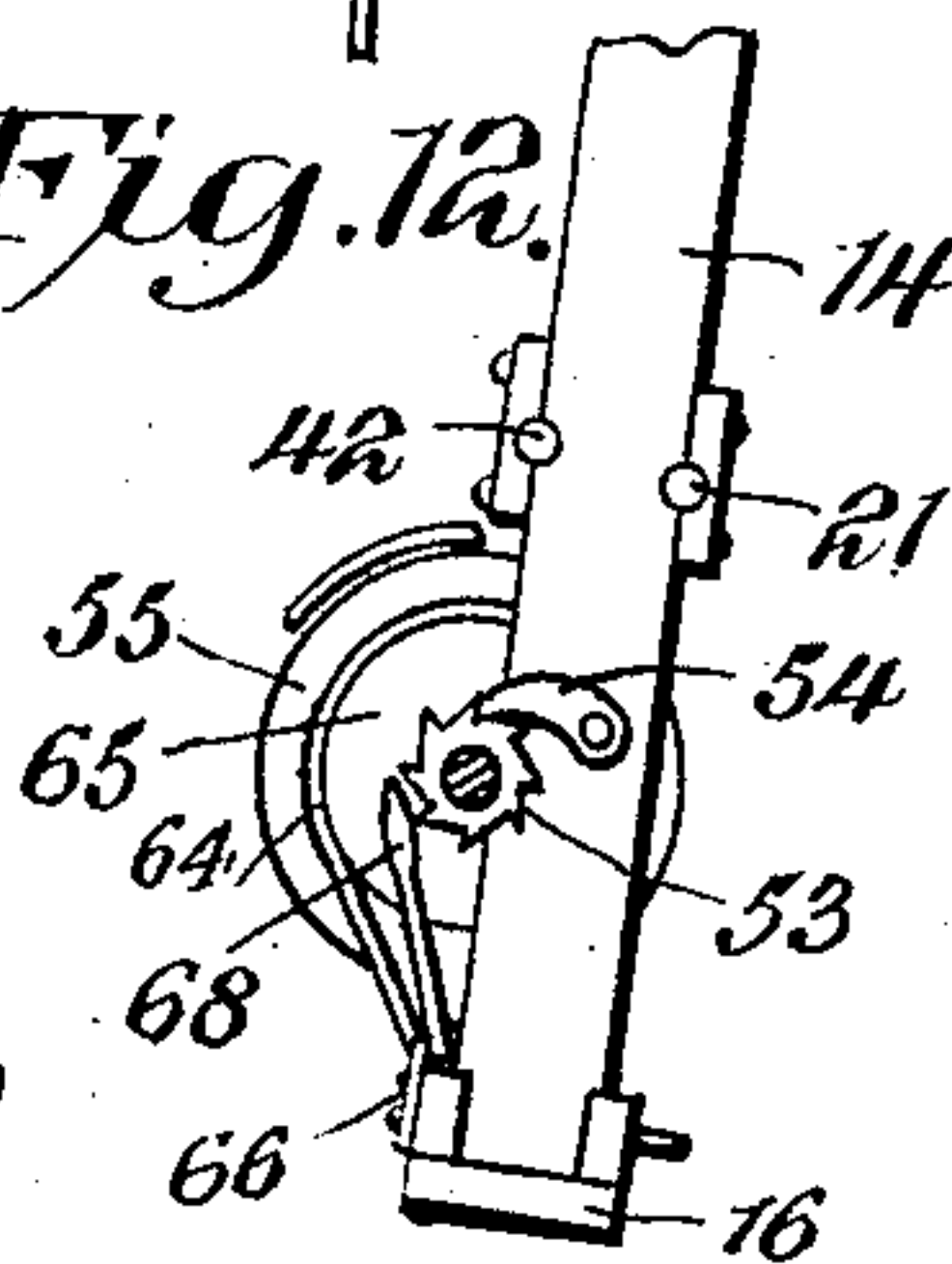


Fig. 12.



Witnesses

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# UNITED STATES PATENT OFFICE.

FREDERICK SANDWISCH, OF WOODVILLE, OHIO.

## HOISTING APPARATUS AND TRANSPORTING MEANS THEREFOR.

No. 863,098.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed December 5, 1906. Serial No. 346,493.

*To all whom it may concern:*

Be it known that I, FREDERICK SANDWISCH, a citizen of the United States, residing at Woodville, in the county of Sandusky and State of Ohio, have invented  
5 a new and useful Hoisting Apparatus and Transporting Means Therefor, of which the following is a specification.

This invention relates more particularly to derricks for use in the oil fields and similar places where piping, pumps, and the like have to be raised from the  
10 wells or holes in the earth.

The principal object of the present invention is to provide novel apparatus of a comparatively simple character that can be transported from place to place,  
15 properly positioned with ease and expedition, raised to operative condition, and constitutes strong, durable and effective means for elevating purposes of the character above outlined.

The preferred form of construction is shown in the  
20 accompanying drawings, wherein:—

Figure 1 is a side elevation of the apparatus when in condition for transportation. Fig. 2 is a view in elevation, showing the derrick when being placed in position. Fig. 3 is a top plan view of the turntable. Fig.  
25 4 is a vertical sectional view therethrough. Fig. 5 is a cross sectional view. Fig. 6 is a view in elevation of the derrick when set up. Fig. 7 is a vertical sectional view therethrough. Fig. 8 is a cross sectional view on the line 8—8 of Fig. 7. Fig. 9 is a section on  
30 the line 9—9 of Fig. 7. Fig. 10 is a sectional view on the line 10—10 of Fig. 9. Fig. 11 is a sectional view on an enlarged scale on the line 11—11 of Fig. 7. Fig. 12 is an end elevation of the lower portion of the derrick, with the handle crank broken off. Fig. 13 is a  
35 detail perspective view of one of the guy tensioning devices. Figs. 14 and 15 are respectively vertical sectional views through the casing looking in opposite directions. Fig. 16 is a detail view on an enlarged scale of the cable guide.

40 Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, the derrick comprises a body and a mast slidably mounted thereon. The body consists of spaced convergently disposed  
45 side standards 14, having their intermediate portions connected by crossed braces 15, the lower ends of the standards being secured to a foot 16. A casing is carried by the upper portion of the standards, and includes spaced side walls 17 provided with downwardly inclined guide-ways or slots 18. The upper  
50 ends of the standards are connected by a guide sleeve or device 19.

A mast 20, slidably mounted in the upper portion of the derrick body, passes through the sleeve 19, and is  
55 slidable in the casing. A windlass 21, journaled on the lower portion of the derrick body, has a cable 22 wrapped

thereon, which cable extends upwardly within the body, and passes over a sheave 23 located in the upper portion of the casing, thence downwardly around a pulley 24 secured to the lower end of the mast, said cable  
60 having its upper end secured within the casing, as shown at 26 in Fig. 14.

The lower end of the mast is provided with a notch 27 arranged to receive one of the pins 28 slidably mounted in the guide slots 18, and movable downwardly to a position beneath the lower end of the mast, when the same  
65 is raised. Rollers 29 are journaled in the casing on opposite sides of the mast, as shown in Figs. 9 and 10. With this construction, it will be evident that if the pins 28 are located in the upper ends of the slots 18, they  
70 will be at one side of the mast, and said mast can be lowered. As many of the pins can be employed as desired. By turning the windlass 21, however, the mast will be elevated, and when its lower end passes above either set of slots, the pins 28 therein will drop to a position be-  
75 neath and in the path of movement of the mast. Therefore, if the mast is lowered, the pins will be received in the notch 27 and will support the mast.

The pins 28 are connected by clips 28<sup>a</sup> to the ends of a cable having stretches 29<sup>a</sup> that pass over the pulleys 30<sup>a</sup>  
80 suitably journaled on the frame. The stretches 29<sup>a</sup> of the cable extend downwardly along one of the side beams 14, and said cable passes around a roller 31<sup>a</sup> secured to the upper end of a weight 32<sup>a</sup> that is slidably mounted in the guide pocket 33<sup>a</sup>.  
85

Eyes 34<sup>a</sup> are carried by the stretches 29<sup>a</sup> of the cable, and are arranged to be engaged with a hook 35<sup>a</sup> secured to the side beam above said eyes. It will be evident that if both eyes 34<sup>a</sup> are disengaged from the hook 35<sup>a</sup>, the weight 32<sup>a</sup> will maintain the pins 28 in the upper  
90 end of the slots 18. If, however, one of the eyes 34<sup>a</sup> is engaged with the hook, the stretch of the cable that is connected to said eye will be sufficiently slackened to permit the pin to drop into the lower end of its set of slots. Thus either or both of the pins may be held in  
95 the upper ends of the slots during the raising and lowering of the mast, and if it is desired to lower the mast, it is only necessary to disengage the eyes from the hook so that when the mast is raised slightly, the pin will be automatically drawn from its position beneath the same  
100 to the upper ends of the slots, and said mast can be lowered.

For the purpose of holding the derrick in erect position, suitable guy cables 30 are connected to the upper end of the mast, and are secured by suitable means on  
105 different sides of the derrick. Another guy cable 31, also secured to the upper end of the mast, extends downwardly at an inclination, and has its lower end wrapped upon a drum 32 journaled in a frame 33. This frame has a link 34 at one end arranged to engage with a  
110 hook 35. The hook 35 is provided with an opening 36 adapted to engage a holding device, as 37. Brace bars



38 have their upper ends hinged, as shown at 39, to the free ends of links 40, which links are hinged, as shown at 41, to the lower end of the derrick body.

A windlass 42, journaled on the lower portion of the body, has the end portions of a cable 43 wrapped thereon. This cable has spaced stretches passing up over pulleys 44, thence about guide sheaves 45 on the standards 14 around other sheaves 46 on the outer ends of the links, and about pulleys 47. With this arrangement, it will be evident that by turning the windlass 42, the links 40 will be drawn towards the derrick, while the braces 38 will be free to swing. When said links 40 are against the derrick therefore, the braces 38 may be disposed at different inclinations thereto in order to reinforce the lower portion or body of the derrick.

Journalled on the lower portion of the body beneath the windlasses 21 and 42 is a hoisting drum 48, and the hoisting cable 49, wrapped upon the drum, extends over a crown pulley on the upper end of the mast, while its free end is arranged to be attached to the parts to be lifted. One end of the drum shaft 51 projects beyond one side of the derrick, and may be provided with a handle crank 52, and a ratchet wheel 53, a dog 54 cooperating with the ratchet wheel. Actuating spools 55, form a part of the drum and have a cable 56 wrapped from one to the other, said cable being adapted to be connected to the draft animals or other means for rotating the drum. Associated with the spools 55 is a cable guide comprising a frame 55<sup>a</sup> having guideways 56<sup>a</sup> therein, communication between these guideways being controlled by a swinging gate 57<sup>a</sup>. The other end of the shaft 51 to that carrying the crank 52, projects beyond the opposite side of the derrick, and a spool 57, that can be removed and reversed, is mounted against rotation thereon.

A cable 58, wrapped upon the spool 57, passes around a sheave 59, secured to the upper end of the mast 20, and is connected to a counterbalancing weight 60, slidably mounted, as shown at 61 upon the guy 31. The cable 58 passes over a guide roller or wheel 62, journaled on an arm 63 that extends from one side of the upper end of the derrick body. A very simple and effective brake is employed for the drum. As shown more particularly in Figs. 6 and 12, a single band 64 surrounds a brake wheel 65, one end of the band being fastened, as shown at 66 to the foot of the derrick, the other end being engaged with a crank 67, secured to an actuating lever 68. By operating the lever 68, the band can be loosened or tightened, as desired, and when loose, will support itself entirely free of the brake wheel 65.

The means for transporting the derrick consists of a vehicle 69 of any suitable character, having mounted on its rear end a turntable 70. The turntable consists of a suitable boxing held upon the vehicle by a pivot bolt 71. Arms 72 are pivoted to opposite inner sides of the boxing, and in these arms, a roller 73 is journaled. A crank shaft 74 is journaled in the turntable, and the crank 75 thereof is arranged to engage the arms 72. One end of the crank shaft projects through the turntable or boxing, and has an offset handle 76. By turning this handle, it will be evident that the roller 73 can thus be raised and lowered. A windlass 76<sup>a</sup> is journaled in the boxing or turntable, and cables 77, wrapped upon this windlass, pass through openings 78 in one side

of the boxing, and are arranged to be detachably secured to the lower end of the derrick body by being tied thereto, or by any other well known method. It will be observed that the ends of the windlass shaft 76<sup>a</sup> project beyond opposite sides of the turntable, as shown at 79, and one of these ends is square, as illustrated at 80 to receive a handle crank.

The operation of this structure is substantially as follows: Assuming that the derrick is loaded upon the vehicle, as shown in Fig. 1, it will be evident that it may be transported from place to place. In this connection, it will be observed that the heavier end is located at the front end of the vehicle, an important feature in this type of structure. When it is desired to erect the derrick, the vehicle is driven alongside of the desired position. The crank shaft 74 is then operated to raise the roller, and the derrick is moved thereon until it is properly balanced. The turntable is turned until the foot of the derrick is in proper position, after which the derrick is lowered from the vehicle by means of the windlass 76 and cables 77. The free ends of the braces 38 are then engaged with the projecting ends 79 of the windlass shaft, whereupon the parts will be as illustrated in Fig. 2. The windlass 42 is then rotated, and as this winds up the cable 43, as already described, therefore and by reference to Fig. 2, it will be evident that the derrick will be drawn by the cable towards the hinged ends 29 of the brace bars 38 and links 40, and this will effect the elevation of the derrick body to a substantially vertical position. The mast is then raised to the desired height by rotating the windlass 21 which draws down the cable 22, thus elevating said mast, the guys are fastened, the braces 38 are detached from the vehicle, and arranged as shown in Fig. 6, thereupon the derrick is in position to be operated. By the reversal of the above described operation, the derrick can be again loaded on to the vehicle.

It will be evident therefore that the apparatus can be readily transported and erected. Experience has demonstrated that it is thoroughly efficient in its work.

The utility of the weight 60 will be clear by reference to Fig. 7. For instance if it is desired to lower a pump rod as 49<sup>a</sup>, the cable 49 is attached to the upper end of one of the pump rod sections 49<sup>a</sup>, and the weight 60 will be sufficient to elevate said section, as illustrated in Fig. 7. The section is then connected to the other section in the well, and their combined weight will be sufficient to raise the weight 60. As a result, the end of the cable will be lowered, and can be readily engaged with another pump rod section. The weight 60 then reacts to again elevate the next section so engaged.

The employment of the gate 57<sup>a</sup> is important. As already stated, the draft cable 56<sup>a</sup> is wound upon both the larger and smaller drums and passes from one to the other. In placing it upon these drums it is first wound on the smaller and thence passes over the rim between the drums and is wound upon the larger. In passing it the gate is held open. When the draft animals are connected to the cable and unwind it, they will of course first unwind it from the larger drum and consequently will have the benefit of the leverage thereof. After the cable has unwrapped from the larger drum it will pass over the rim between the two,



and the portion that is upon the smaller drum will unwrap. As it thus passes it will swing the gate outwardly and pass from one portion of the guide to the other. As a result, the animals do not have to travel as far as if a single drum of large diameter were employed, and it will be evident that any number of these drums of different diameters may be used.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In apparatus of the character described, the combination with a derrick body, of a mast slidably mounted thereon, means for raising the mast, and holding means held inactive by the mast during the movement thereof automatically moving to a position to prevent the descent of the mast when said mast reaches a predetermined position.

2. In apparatus of the character described, the combination with a derrick body, of a mast slidably mounted thereon, means for raising the mast, and a holding pin slidably mounted on the derrick body and automatically movable to a position beneath and in the path of movement of the mast.

3. In apparatus of the character described, the combination with a derrick body, including a casing having inclined ways, of a mast slidably mounted on the derrick body and movable through the casing, means for elevating the mast, and a holding pin slidably mounted in the inclined ways and movable to a position beneath the mast when the same is elevated.

4. In apparatus of the character described, the combination with a derrick body consisting of a frame having a casing on its upper end, of a mast slidably mounted in the casing, a windlass mounted on the lower end of the body, a cable connected to the windlass and engaging the mast, and means carried by the casing and movable to a position beneath the mast to prevent the descent of the same when elevated.

5. In apparatus of the character described, the combination with a derrick, of a link movably connected thereto, a brace movably joined to the link, and means connecting the derrick and the link for drawing the latter toward the former.

6. In apparatus of the character described, the combination with a derrick, of a link hinged to one end of the same, a brace hinged to the free end of the link, and means connecting the derrick and link for drawing the same together.

7. In apparatus of the character described, the combination with a derrick, of a link movably connected thereto, a brace movably joined to the link, a windlass mounted on the derrick, and cable connections between the windlass and the link for drawing the link and derrick together.

8. In apparatus of the character described, the combination with a derrick, of a link hinged to the lower end of the same, a brace hinged to the free end of the link, a windlass journaled on the lower portion of the derrick, pulleys mounted on the link and derrick, and a cable wound upon the windlass and passing through said pulleys for drawing and holding the link and derrick together.

9. In apparatus of the character described, the combination with a derrick, of spaced links hinged at their lower ends to the lower end of the derrick, braces hinged to the upper ends of the links, a windlass, and cable connections between the windlass and the different links for drawing the same toward the derrick.

10. In apparatus of the character described, the combination with a derrick comprising a frame having a casing at its top, of a mast slidable in the casing, guiding and

holding means for the mast carried by the frame and housed within the casing, and means for raising and lowering the mast.

11. In apparatus of the character described, the combination with a derrick comprising a frame having a casing at its top, of a mast slidable in the casing, pulleys mounted in the casing, a windlass journaled on the lower portion of the frame, and a cable wound upon the windlass passing over the pulleys and engaged with the mast.

12. In apparatus of the character described, the combination with a derrick body comprising spaced standards, braces connecting the standards, and a casing located upon the upper ends of the standards, of a mast slidably mounted in the casing, a windlass journaled to and between the lower ends of the standards, and a cable connection between the windlass and the mast for elevating the latter.

13. In apparatus of the character described, the combination with a derrick body comprising spaced standards, braces connecting the standards, and a casing mounted on the standards, of a mast slidably mounted in the casing, a windlass having a cable connection with the mast for elevating the same, inclined guideways formed in the casing, a pin movably mounted in the guide ways and movable to a position beneath the mast, when elevated, links hinged to the lower end of the body, braces hinged to the upper ends of the links, a windlass, cable connection between the windlass and the links, a crown pulley, a hoisting drum journaled on the lower portion of the derrick body, and a cable wrapped upon the drum and passing over the crown pulley.

14. In apparatus of the character described, the combination with a derrick, of a hoisting drum journaled thereon, a spool connected to the drum, a weight, and a cable connected to the weight, said cable extending longitudinally of the mast and being wound upon the spool.

15. In apparatus of the character described, the combination with a derrick including spaced standards, of a hoisting drum journaled on the standards, and located between the same, a spool connected to the frame and located outside the standard, a guy connected to the upper end of the derrick, a weight slidably mounted on the guy, and a cable connected to the weight and wound upon the spool.

16. In apparatus of the character described, the combination with a derrick, of means for transporting the same, said means comprising a vehicle, the derrick being movable from and to a position on the vehicle, a turntable mounted thereon, and derrick engaging draft means mounted on the turntable and arranged to be detachably secured to the lower end of the derrick.

17. In apparatus of the character described, the combination with a derrick, of means for transporting the same, said means comprising a vehicle, on which the derrick is arranged to be placed and from which it is removable, a turntable mounted thereon, a windlass journaled on the turntable, and draft cables carried by the windlass and detachably secured to the lower end of the derrick for raising it upon and letting it off the vehicle.

18. In apparatus of the character described, the combination with a derrick, of means for transporting the same, said means comprising a vehicle, a supporting roller journaled on the vehicle, means for raising and lowering the roller, a windlass journaled on the vehicle, and derrick engaging draft cables carried by the windlass.

19. In apparatus of the character described, the combination with a derrick, of means for transporting the same, said means comprising a vehicle, a turntable mounted thereon, a supporting roller journaled on the turntable, means for raising and lowering the roller, a windlass journaled on the turntable, and a derrick engaging draft cable carried by the windlass.

20. In apparatus of the character described, the combination with a derrick, of means for transporting the same, said means comprising a vehicle, a turntable journaled on the vehicle, arms pivoted on the turntable, a roller journaled on the arms, a crank shaft for raising and lowering the arms, and thereby the roller, a windlass journaled on the turntable, and a derrick-engaging draft cable carried by the windlass.



21. In apparatus of the character described, the combination with a derrick, links movably connected thereto, and means for drawing the links and derrick together, of a turntable, derrick engaging draft means mounted on the turntable, and holding devices also mounted on the turntable and connected to the links for detachably holding the same during the movement of said links and derrick together.

22. In apparatus of the character described, the combination with a derrick, links hinged to the lower end of the derrick, braces hinged to the free ends of the links, and means connecting the derrick and links for drawing the same toward each other, of a vehicle, a turntable journaled on the vehicle and having means for engaging the free ends of the braces, a roller journaled on the turntable, means for raising and lowering the roller, a windlass journaled on the turntable, and a draft cable carried by the windlass and detachably engaging the derrick.

23. In apparatus of the character described, the combination with a derrick body, of a mast slidably mounted thereon, means for raising the mast, holding means mounted on the derrick body and automatically movable to a position to prevent the descent of a mast, and means for automatically moving the holding means to a position to permit the descent of the mast.

24. In apparatus of the character described, the combination with a derrick body, including a casing having inclined ways, of a mast slidably mounted on the derrick body and movable through the casing, a holding pin slidably mounted in the inclined ways and movable to a position beneath the mast when the same is elevated, and means for moving the pin in the inclined ways and to one side of the path of movement of the mast.

25. In apparatus of the character described, the combination with a derrick body having an inclined guideway, of a mast slidably mounted on the derrick body, a pin movable in the guideway to a position to engage the mast, a weight connected to the pin for moving said pin to one side of the mast, and means for holding the weight inactive to permit the pin to move to a position to engage the mast.

26. In apparatus of the character described, the combination with a derrick body, of a mast slidably mounted therein, a pin movable on the body to a position to engage

the mast, a weight having a cable connection with the pin to move it out of engagement with the mast, and means for suspending the weight to permit the pin to move into engagement with the mast.

27. In apparatus of the character described, the combination with a derrick body, of a mast movably mounted thereon, and a plurality of pins movable into and out of the path of movement of the mast, said pins being arranged to hold the mast at different elevations.

28. In apparatus of the character described, the combination with a derrick body, of a mast movably mounted thereon, a plurality of devices for holding the mast at different elevations, common means for maintaining the devices in inoperative positions, and means for maintaining the holding means inoperative with respect to either device to permit said device to hold the mast.

29. In apparatus of the character described, the combination with a derrick body, including a casing having sets of inclined slots, of a mast slidably mounted in the casing, pins slidably mounted in the inclined slots and movable to positions beneath the mast to hold the same at different elevations, a cable connected to the pins, a weight mounted on the cable, and means for suspending the weight to leave the pins loose to gravitate in the slots.

30. In apparatus of the character described, the combination with a derrick, of a hoisting drum mounted thereon and including spools of different diameters, and a cable guide associated with the spools and including a gate that permits the cables to pass from one spool to the next.

31. In apparatus of the character described, the combination with a mast, of a winding drum thereon, spools of different diameters associated with the drum, a draft cable wrapped upon both spools, a guide frame associated with the spools and having communicating guideways, and a swinging gate controlling the communication between said guideways.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FREDERICK SANDWISCH.

Witnesses:

WILLIAM NIEMAN,  
FRANK ROHTERL.