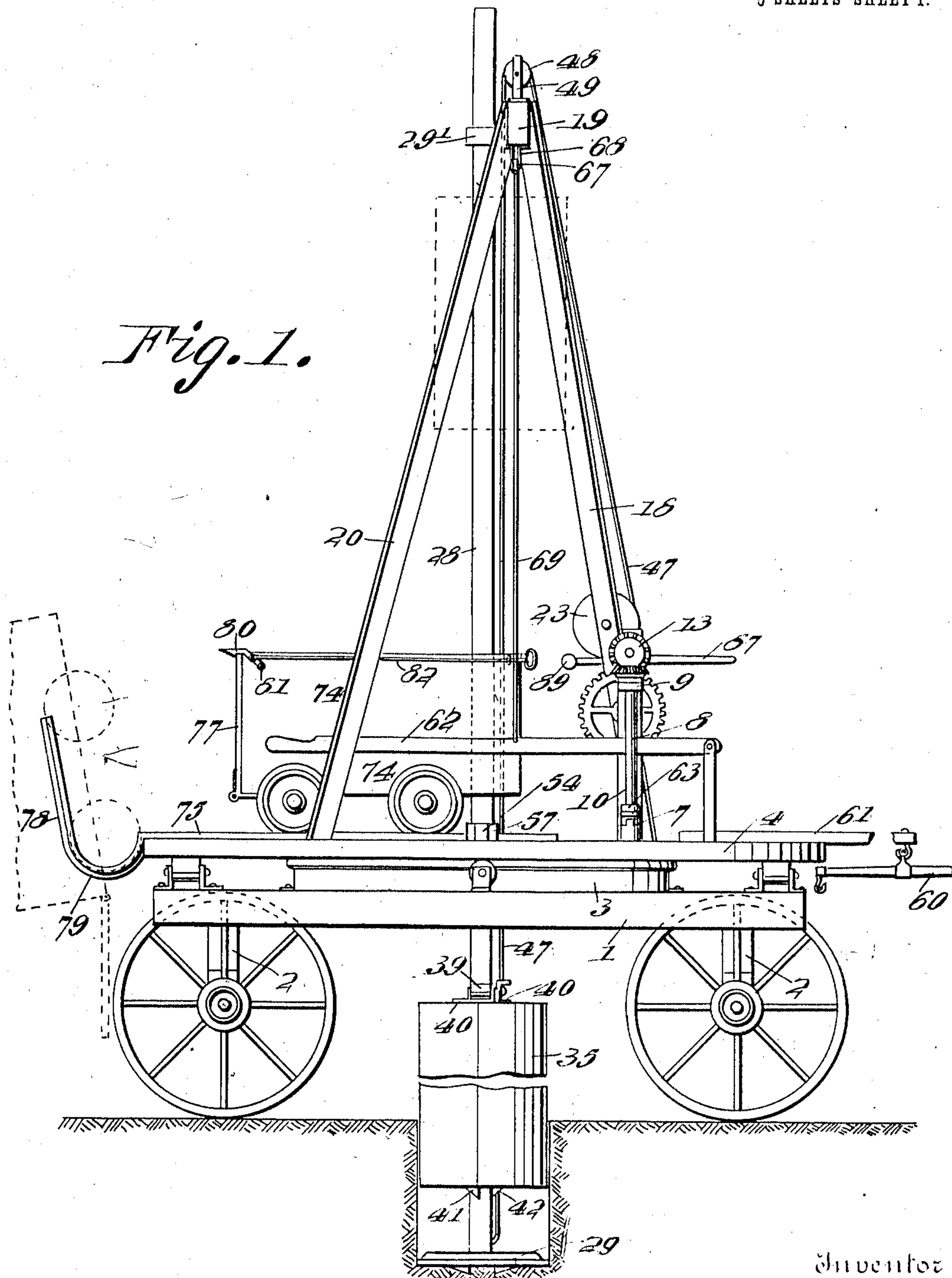


S. H. COLEMAN.
WELL BORING MACHINE.
APPLICATION FILED SEPT. 2, 1909.

978,699.

Patented Dec. 13, 1910.

5 SHEETS—SHEET 1.



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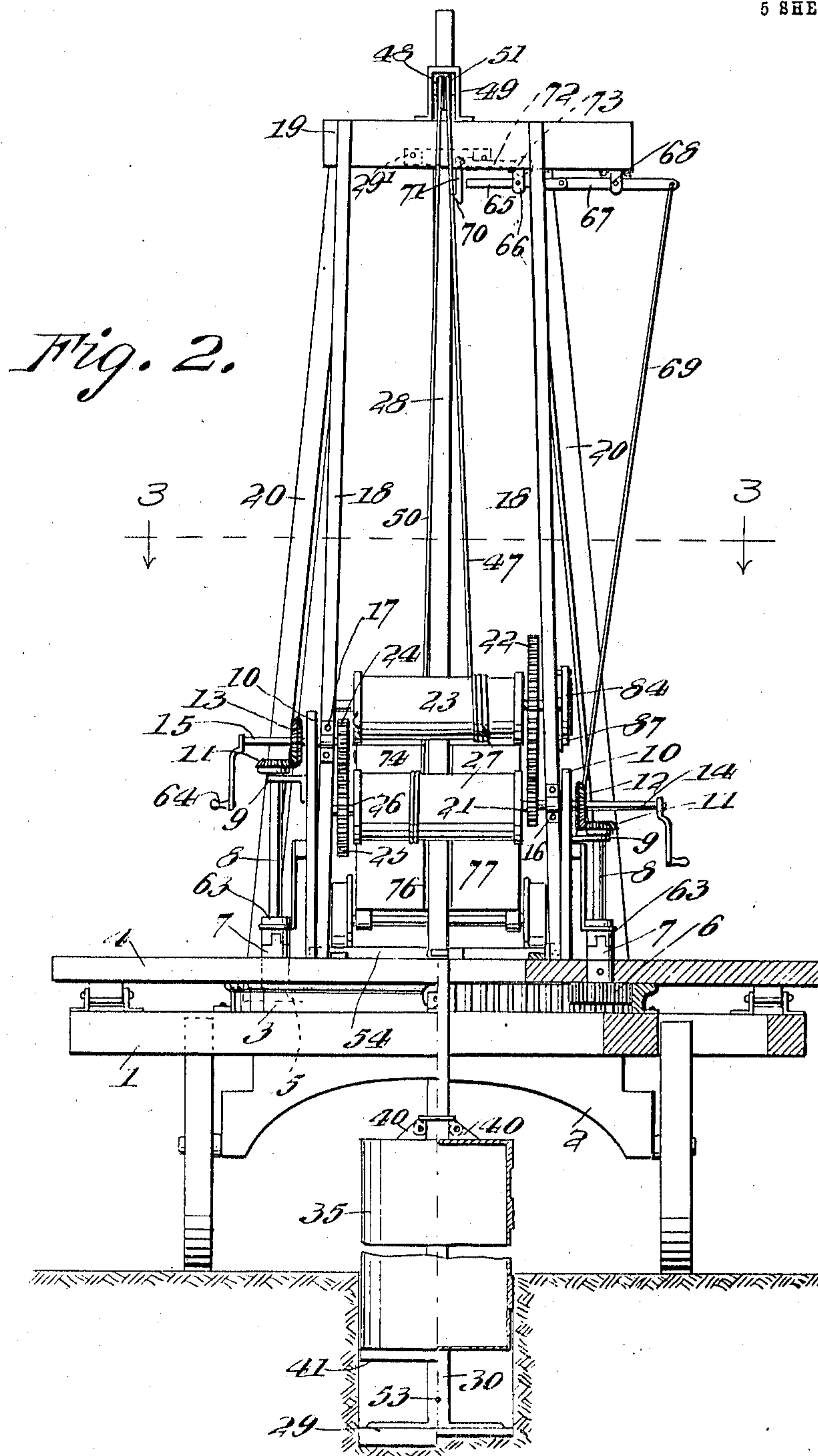
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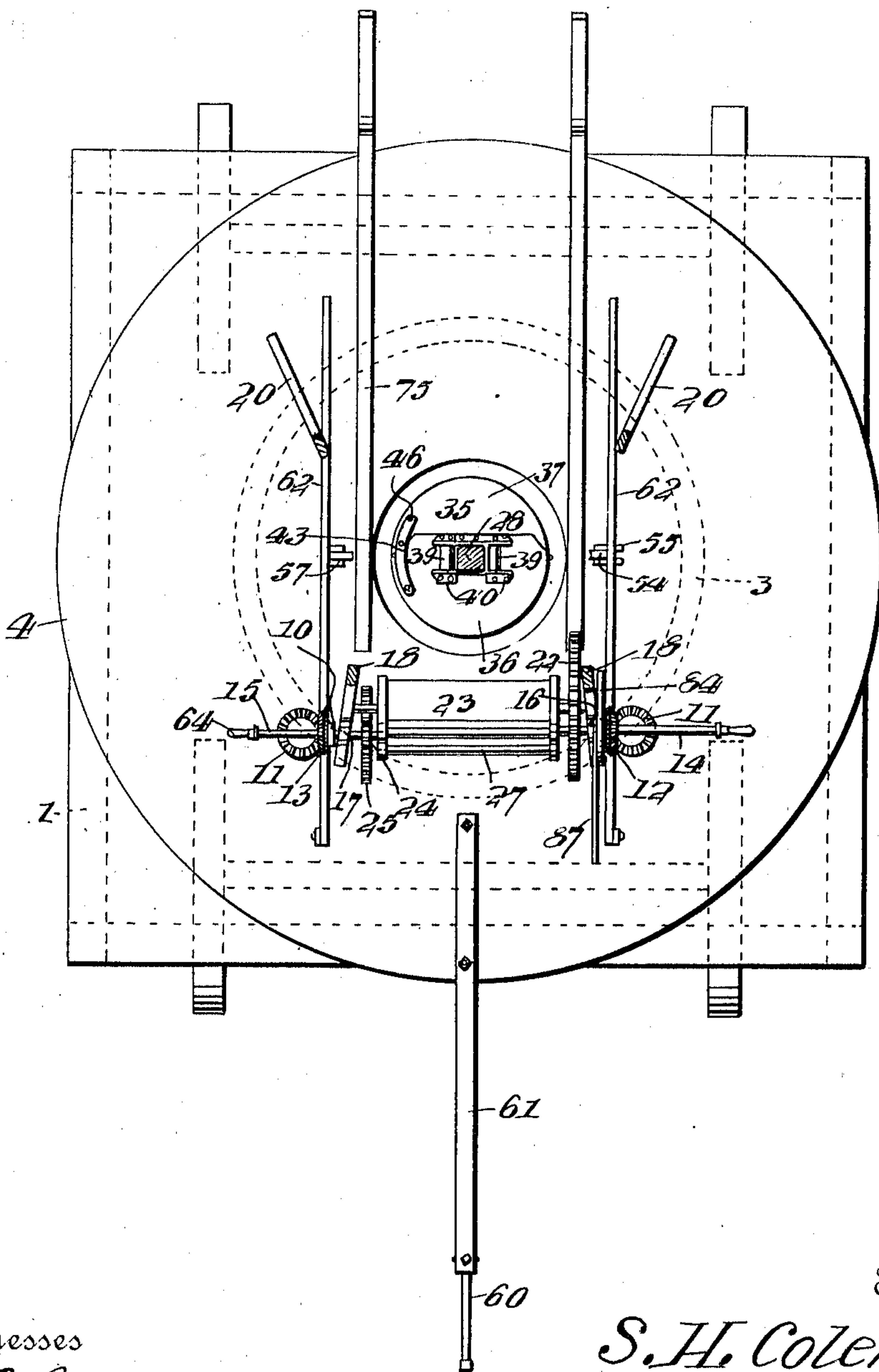
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

Fig. 4.

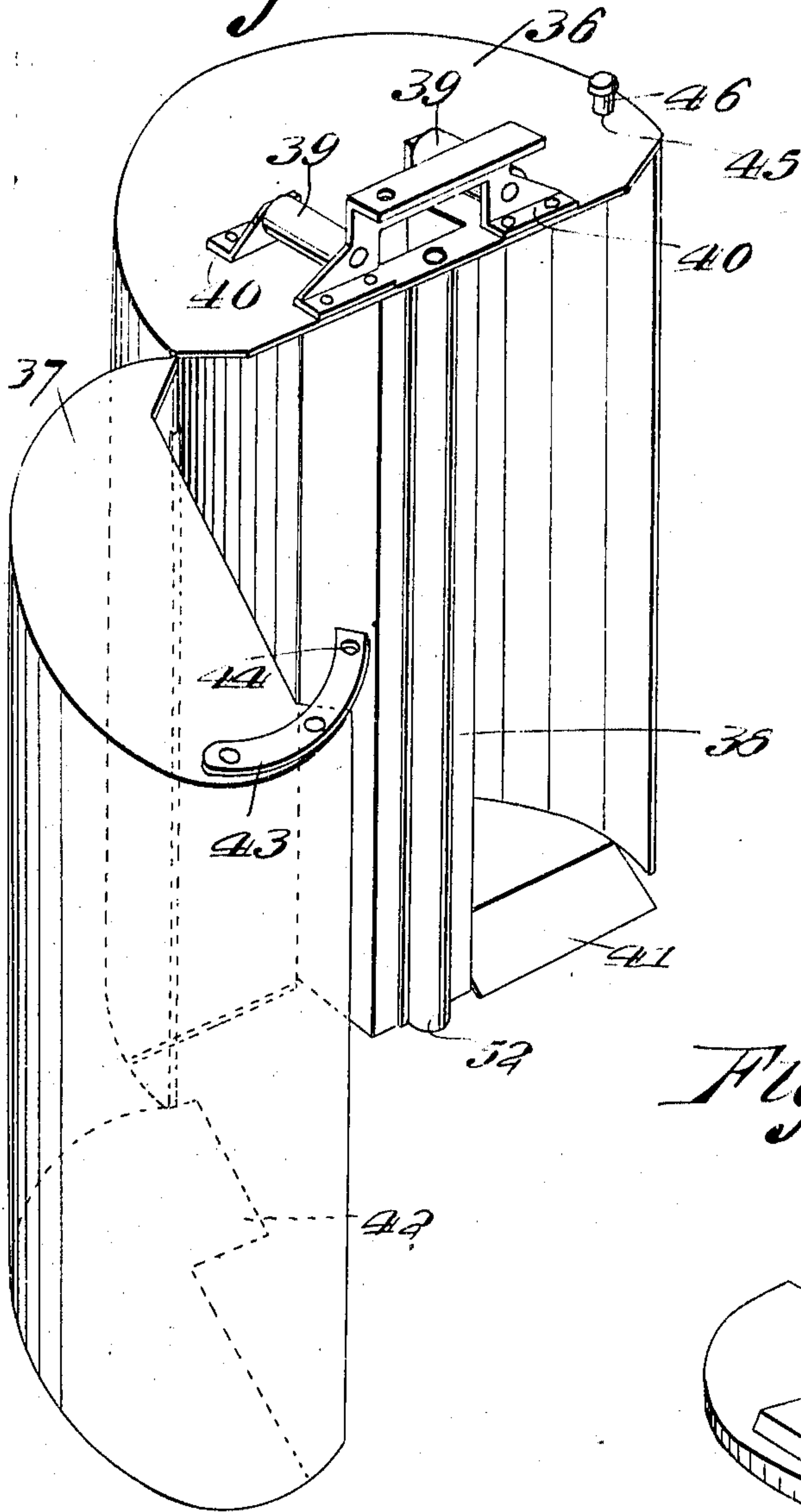


Fig. 5.

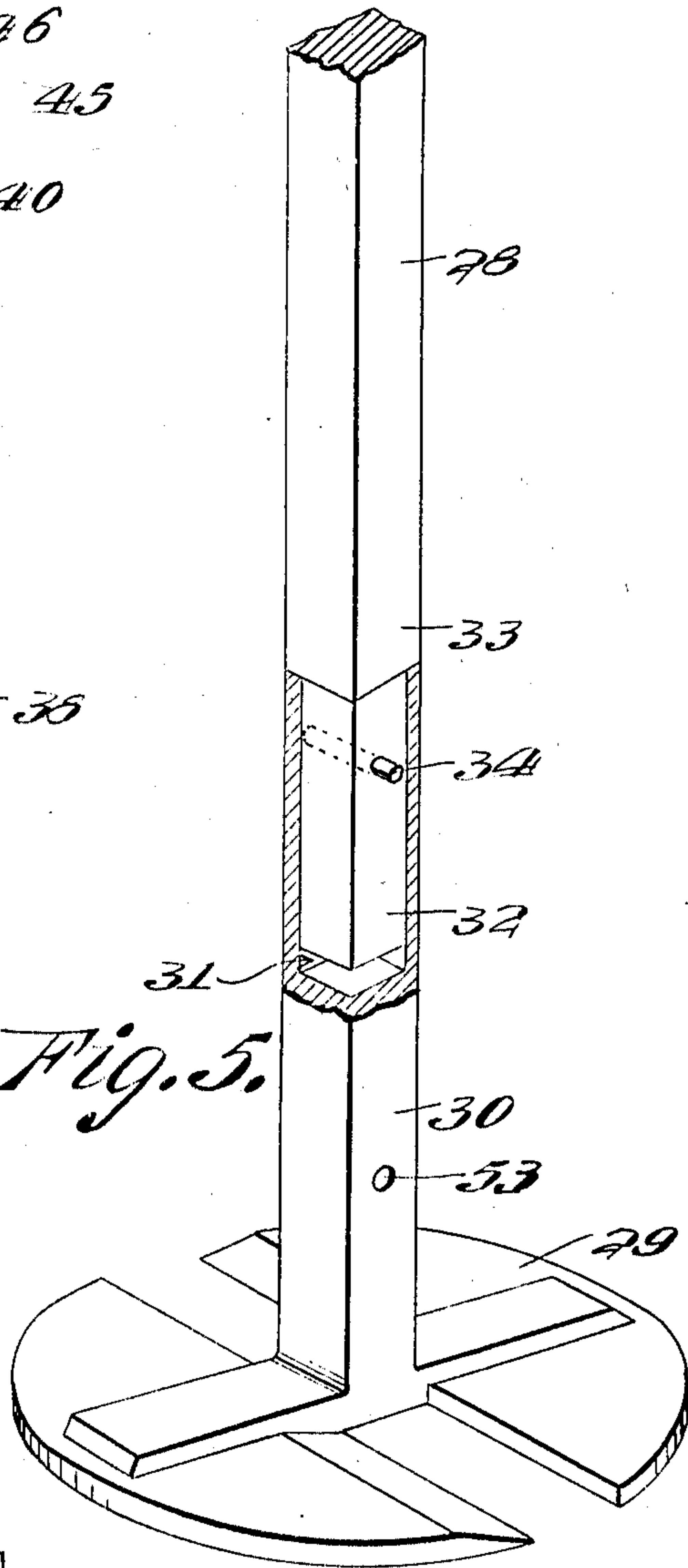
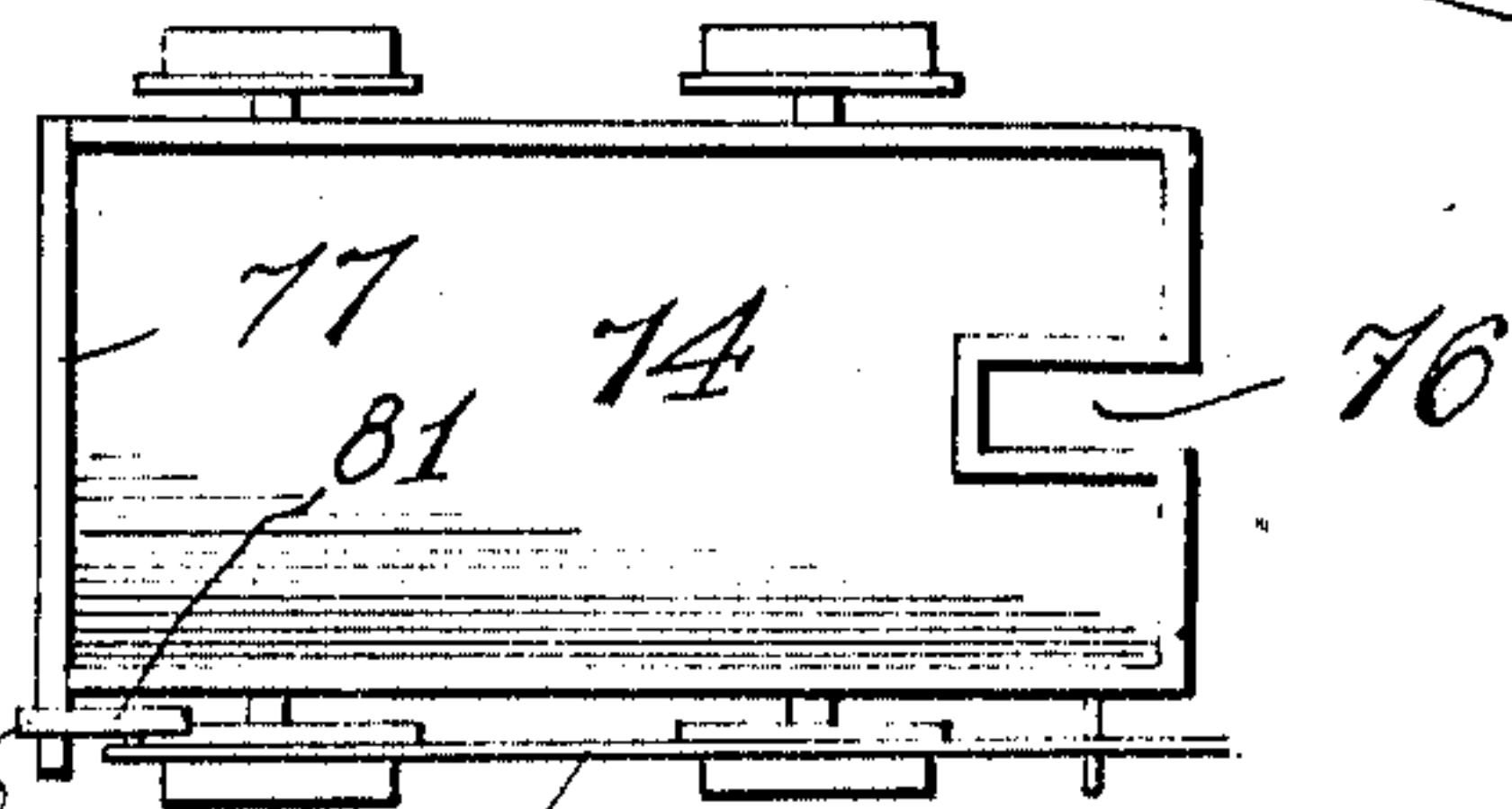


Fig. 9.



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5 SHEETS—SHEET 5.

Fig. 6.

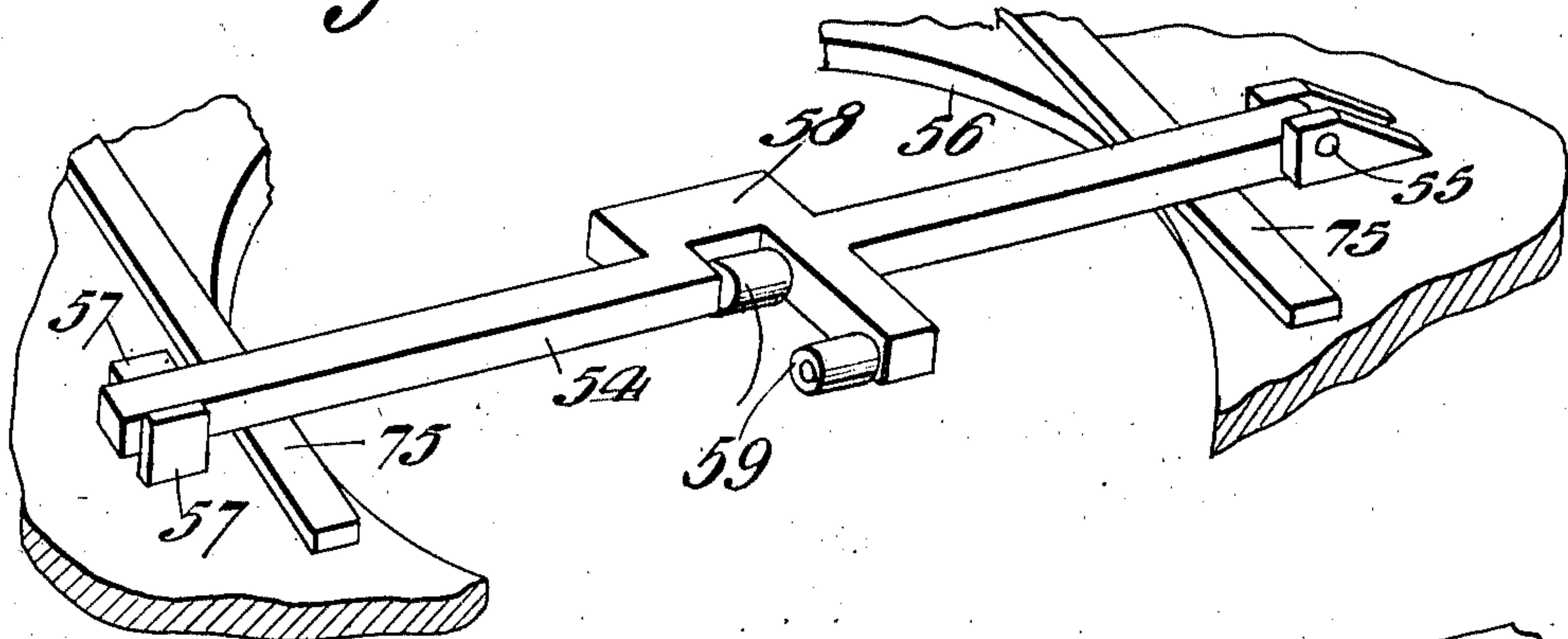


Fig. 7.

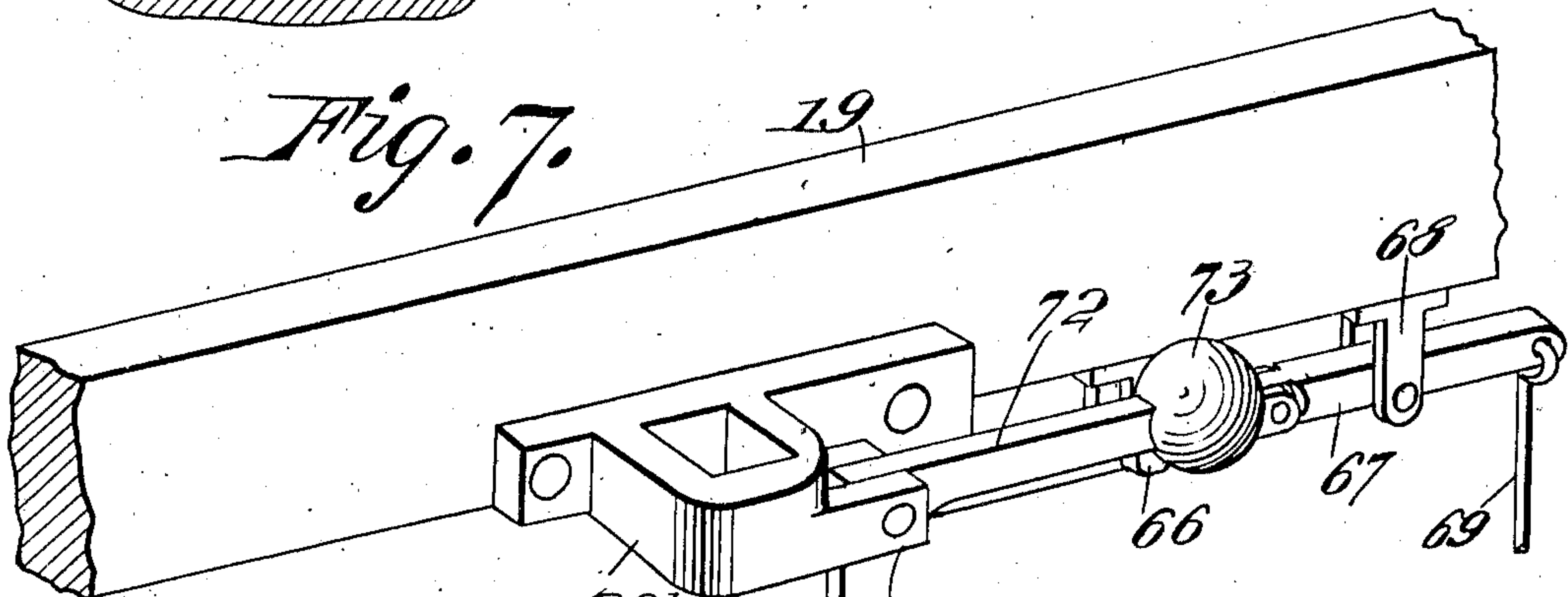
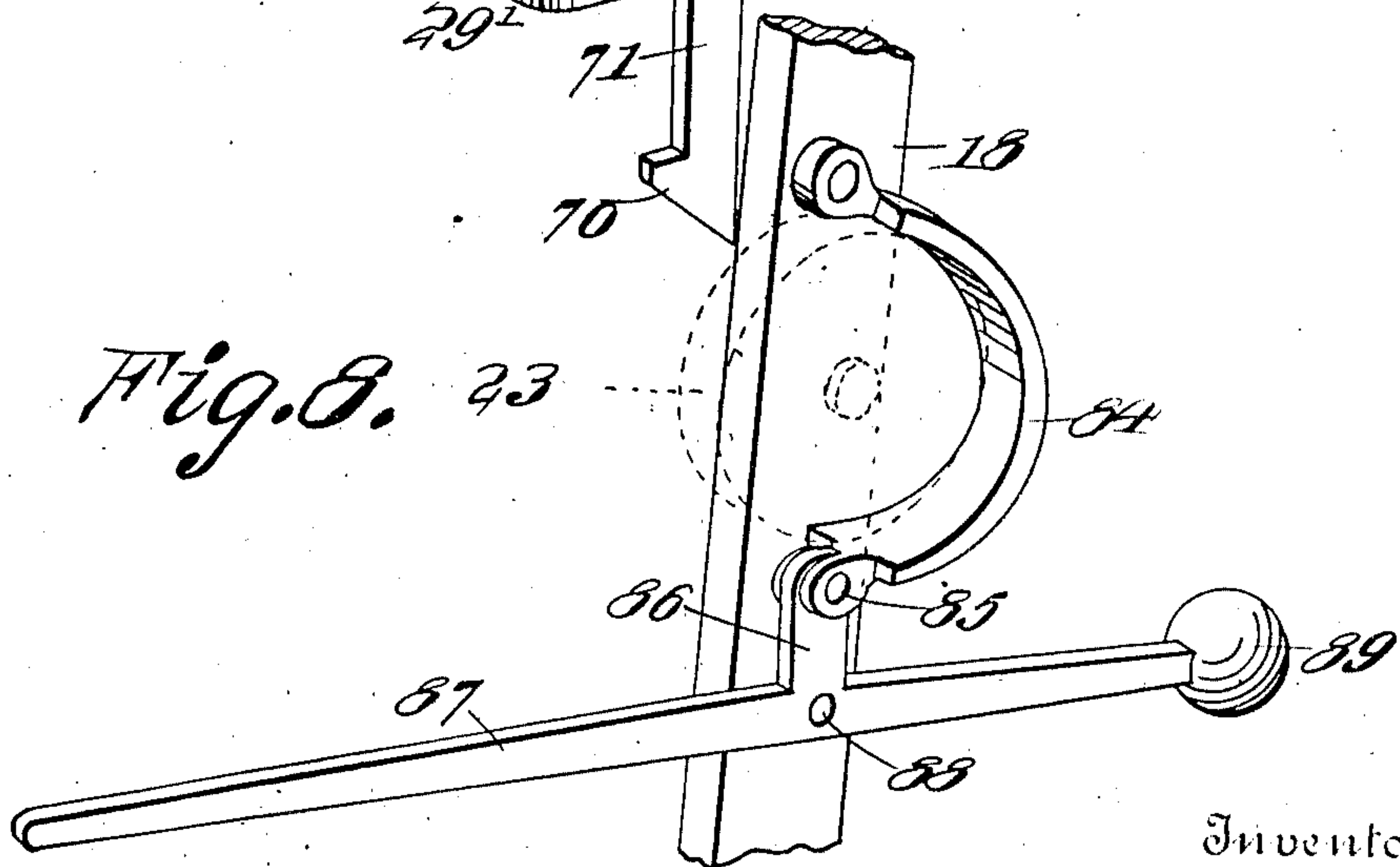


Fig. 8.



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UNITED STATES PATENT OFFICE.

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WELL-BORING MACHINE.

978,699.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed September 2, 1909. Serial No. 515,792.

To all whom it may concern:

Be it known that I, SAMUEL H. COLEMAN, a citizen of the United States, residing at Villisca, in the county of Montgomery and State of Iowa, have invented certain new and useful Improvements in Well-Boring Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to well boring machines and has for its principal object to provide a machine in which the operation of the cutting auger will be continuous and the loosened dirt removed by means of a scoop or bucket which is adapted to be lowered into the bore made by the cutting auger and scoop up the loosened dirt.

In well boring machines now in use, a single auger with one set of cutting blades is let down to the bottom of the well and when as much dirt as will fill the auger body is loaded, then the operator causes the auger shafting to rise, and as the shafting ascends the operator takes off the different lengths of shafts and sets them to one side of the platform and when the load comes up it is detached and carried by the crane to one side of the platform and emptied, and then replaced over the well and lowered, and the needed lengths of shafting added as the auger descends and after the well has been bored down to fifty or one hundred feet, these different operations take up a great portion of the time as, on account of taking up and replacing these different lengths of shafting, the upward and downward movement must necessarily be quite slow thus losing much valuable time.

In our invention the lower or cutting auger works continuously, while the loosened dirt is raised by means of a scoop or bucket and because of not having to disconnect any shafting while doing this the operator can speed the raising of the load.

With this and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1 is a side elevation of the complete machine: Fig. 2 is a front elevation thereof partly

in section, Fig. 3 is the horizontal section taken on line 3—3 of Fig. 2, Fig. 4 is a detail perspective view on an enlarged scale of the scoop or dirt bucket, Fig. 5 is a similar view of the lower end of the boring shaft and the cutting auger, Fig. 6 is a similar view of the coupling bar and a portion of the platform, Fig. 7 is also a similar view of a catch device for the scoop or bucket, Fig. 8 is a detail perspective view on an enlarged scale of the winding drum brake, and Fig. 9 is a detail plan view of car 74.

Referring to the drawings for a more particular description of the invention, 1 indicates the supporting frame which is mounted upon the truck 2 and has rigidly mounted upon it the annular master wheel 3 provided with interior gear teeth. 4 indicates the revolving platform which is mounted upon the master wheel 3. The operating pinions 5 and 6 respectively are mounted beneath the platform at opposite sides of the machine frame and intermesh with the master wheel 3. These pinions are provided with the cylindrical clutch members 7 which extend through and above the platform and the shafts 8 which extend through bearing brackets 9 secured to the vertical supports 10 arising from the platform. The upper ends of the shafts 8 are provided with bevel gears 11 which intermesh with bevel gears 12 and 13 respectively, mounted upon the horizontal shafts 14 and 15, respectively, which are mounted in the upper ends of the vertical members 10 and in bearings 16 and 17 mounted upon the front faces of the vertical members 18 connected at their upper ends by the cross piece 19. The members 18 are inclined rearwardly and form the front portion of a vertical frame consisting, in connection with the vertical members 18 and cross piece 19, of the rearwardly inclined members 20.

The shaft 14 is provided at its inner end with the gear 21 which intermeshes with a second larger gear 22 mounted at the adjacent end of the shaft of the winding drum 23 mounted between the vertical members 18. The shaft 15 is also provided at its inner end with the gear 24 which intermeshes with a second larger gear 25 keyed to the shaft 26 of a second winding drum 27 mounted between the vertical members 18 below the winding drum 23. The shaft 28 of the cutting auger 29 extends through the

platform 4 and through a bearing 29' arranged at the rear face of the cross piece 19. This bearing prevents the shaft 28 from turning with relation to the platform. The shaft 28 is provided with a lower detachable section 30 which carries the cutting auger 29, the section 30 being provided in its upper end with a socket 31 to receive the lower reduced end 32 of the upper or main section 33 of the shaft, the sections 30 and 33 being detachably connected together by the transverse connecting pin 34. By this construction the lower section carrying the cutting auger may be removed for sharpening or different sizes of cutting augers may be used without removing the shafting proper. The scoop or bucket 35 which is of approximately cylindrical form, comprises two hinged sections 36 and 37 the former of which is provided with the vertical boxing 38 which extends the entire length thereof and receives the shaft 28 of the cutting auger, while a pair of bearing rollers 39 are mounted in suitable bearings 40 upon the top of the section 36 and bear against opposite faces of the shaft 28. As shown, the boxing 38 fits the shaft 28 loosely while the bearing rollers 39 hold the scoop or bucket against vibratory movement as it is raised or lowered.

The sections 36 and 37 of the scoop or bucket are provided at their bottoms with the downwardly and oppositely inclined scoops 41 and 42 which scoop up the loosened dirt into the bucket as it is revolved. The section 37 is provided at its top with an arcuate arm 43 provided with the vertical opening 44 which registers with a corresponding opening 45 in the top of section 36 to provide for the insertion of a securing pin 46 for holding the sections closed. A hoisting cable 47 winds upon the drum 23 and after passing upwardly over a pulley 48 mounted in a bearing bracket 49 arranged upon the cross piece 19, passes downwardly and is connected in any substantial manner with the top of the scoop or bucket. A second cable 50 winds upon the other drum 27 and after passing upwardly over the pulley 51 also mounted in the bearing 49 passes downwardly through the tubing 52 formed on the boxing 38 of section 36 of the scoop or bucket and is connected as at 53 with the lower section of the shaft of the cutting auger. The lower end of the cutting auger shaft is coupled with the platform 4 by means of the coupling bar 54 which is pivoted at one end in the bearing 55 and extends across a central opening 56 in the platform of sufficient size to receive the scoop or bucket 35. The free end of the coupling bar 54, when swung down, fits between a pair of vertical lugs 57 rising from the platform while the coupling bar is provided with a central approximately

U-shaped portion 58 to receive the shaft, said portion 58 being provided with a pair of bearing rollers 59 which bear against opposite faces of said shaft. By this means the lower end of the cutting auger shaft is coupled with the platform so that when the platform is turned the shaft is turned with it.

In the operation of the device the platform 4 is rotated by a draft animal which is hitched to the single tree 60 of the carrying bar 61 connected with the platform. As the platform is rotated the cutting auger and shaft is also rotated and cuts into the ground. After the cutting auger has cut to the depth of, say, two feet the scoop or bucket 35 is allowed to descend upon the shaft on the loosened dirt. After the scoop or bucket is filled with dirt the winding drum 23 is thrown into gear by pulling down upon the free end of the clutch lever 62 to throw the clutch member 63 carried thereby into engagement with the clutch 7 of the pinion 5. The scoop or bucket is then caused to ascend upon the shaft 28. Before the bucket reaches the coupling bar 54 the latter is swung into an approximately vertical position to permit the bucket to pass, while the crank 64 on the end of the shaft 15 is turned in order to slightly raise the cutting auger and thus throw it out of operation, while the coupling 54 is not in engagement with the shaft 28. This is done for the reason that the shaft 28 may not be capable of withstanding the excessive twisting strain exerted thereon while the coupling 54 is disengaged therewith. The scoop or bucket 35 ascends upon the shaft 28 until it strikes the inner end of the trip 65 pivoted intermediately of its ends to a bracket 66 depending from the cross piece 19. The outer end of the trip bar 65 is pivotally connected with the trip bar 67 which is pivoted to the bracket 68 and is connected at its outer end by means of the cord or cable 69 with the clutch carrying lever 62. When the bucket strikes the trip bar 65 as is heretofore stated the outer end of bar 67 is swung up and through the medium of the cable 69 raises the free end of the clutch carrying lever 62 which disconnects the clutch member 63 with clutch member 7 of pinion 5 and throws the winding drum 23 out of operation. When the scoop or bucket reaches the limit of its upward sliding movement upon the shaft 28, it is engaged by the hooked end 70 of the catch 71 pivoted at the junction of its arms in the bearing 49, the arm 72 of the catch carrying the weight 73 which holds the hook 70 against accidental disengagement with the scoop or bucket.

The bucket having been raised and engaged as above described, the dumping car 74, which is mounted upon a suitable track

and means of connection between the trip device and the bucket raising mechanism, whereby the latter is thrown out of gear when the former is tripped by the bucket.

- 5 7. A well boring machine of the class described, comprising a supporting structure, an operating shaft mounted therein, a cutting auger at the lower end of the shaft, a scoop or bucket slidable on the shaft, mechanism under the control of the operator for
10 raising the bucket, means to engage and support the bucket when in raised position and a trip device adapted to be engaged by the bucket when at the limit of its upward sliding movement to throw the bucket-raising
15

mechanism out of gear, said trip device comprising a pair of trip bars pivoted immediately of their ends to the supporting structure and loosely connected at adjacent ends, and means of connection between the outer trip bar and the bucket-raising mechanism. 20

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL H. COLEMAN.

Witnesses:

LEROY B. PENTON,
J. H. KELLEY.

75, arranged upon the platform and extending between the inclined members 20, is moved inwardly upon the track into dirt receiving position, in which position the recessed portion 76, at the opposite end of the car from the hinged door 77, receives the shaft 28. The section 37 of the bucket 35, is then swung from the section 36. The outer ends of the rails of the track 75, project beyond the rear side of the platform and terminate in upwardly projecting outwardly inclined stop guards 78, provided at their lower ends with the semi-circular portion 79. The outer end wall 77 of the car body is held in closed position by the catch 80 pivoted, as at 81, to one side of the car body. An operating link or lever 82, is connected with the catch by means of which the catch may be disengaged from the hinged door 77 whenever desired. When the dumping car is filled with dirt, it is pushed to the outer end of the track while the releasing link is pulled upon at the same time to disengage the catch 80 from the door 77. The car, upon reaching the outer end of the track is caused to tilt up in the position indicated in the drawings and deposits the dirt upon the ground or into a suitable car or other vehicle which may be arranged to receive the same. When it is desired to fill the scoop or bucket 35, a second time, it is released and permitted to descend upon the shaft 28, the speed at which said bucket descends being controlled by a hand brake consisting of the U-shaped brake-shoe 84 pivoted at its upper end to one of the vertical members 18 and loosely connected at its lower end, as at 85, to the vertical extension 86 of the horizontal operating lever 87, pivoted intermediately of its ends as at 88, to the vertical member 18, just referred to beneath the lower end of the brake-shoe and provided at its pivoted end with a weight 89 to normally hold the brake shoe out of engagement with the winding drum 23.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

I claim as my invention:

1. A boring machine comprising a supporting frame, a cutting auger, an operating shaft, a scoop or bucket slidably mounted upon said shaft, means for raising said shaft, gearing under the control of the operator for raising the bucket, an operating mechanism adapted to be engaged by the bucket to throw said gearing out of gear,

and a catch to engage and support the bucket when in raised position.

2. A boring machine comprising a supporting frame, a cutting auger, an operating shaft, a scoop or bucket slidably mounted upon said shaft, means for raising said shaft, gearing under the control of the operator for raising the bucket, an operating mechanism adapted to be engaged by the bucket to throw said gearing out of gear, a catch to engage and support the bucket when in raised position, and a dumping car mounted upon the supporting frame to receive the contents of the bucket.

3. A boring machine of the class described, comprising a supporting frame, a cutting auger, an operating shaft, a scoop or bucket slidably mounted upon said shaft, means for raising said shaft, mechanism under the control of the operator for raising the bucket, means adapted to be engaged by the bucket to throw said mechanism out of gear, and means to engage and support the bucket when in raised position.

4. A boring machine comprising a supporting frame, a revolving platform, a cutting auger, an operating shaft, a scoop or bucket slidably mounted upon said shaft, means for raising said shaft, mechanism under the control of the operator for raising the bucket, an operating mechanism adapted to be engaged by the bucket to throw said mechanism out of gear, a catch to engage and support the bucket when in raised position, and means of connection between the operating shaft and platform, whereby the former is constrained to turn the latter.

5. A well boring machine, comprising a supporting frame, a master wheel provided with interior gear teeth mounted thereon, a revolving platform mounted to turn on the master wheel, an operating shaft, a scoop or bucket slidably mounted on said shaft, means for raising said shaft, mechanism under the control of the operator for raising the bucket, an operating mechanism adapted to be engaged by the bucket to throw said mechanism out of gear, a catch to engage and support the bucket when in raised position and a gearing carried by the platform and intermeshing with the teeth of the master wheel for operating said bucket raising mechanism.

6. A well boring machine of the class described, comprising a supporting structure, an operating shaft mounted therein, a scoop or bucket slidable on said shaft, a catch device at the top of the supporting structure to engage and support the bucket when in raised position, a revolving platform, mechanism controlled by the rotation of the platform to raise said bucket, a trip device at the top of the supporting structure adapted to be engaged by the bucket when at the limit of its upward sliding movement