

No. 686,202.

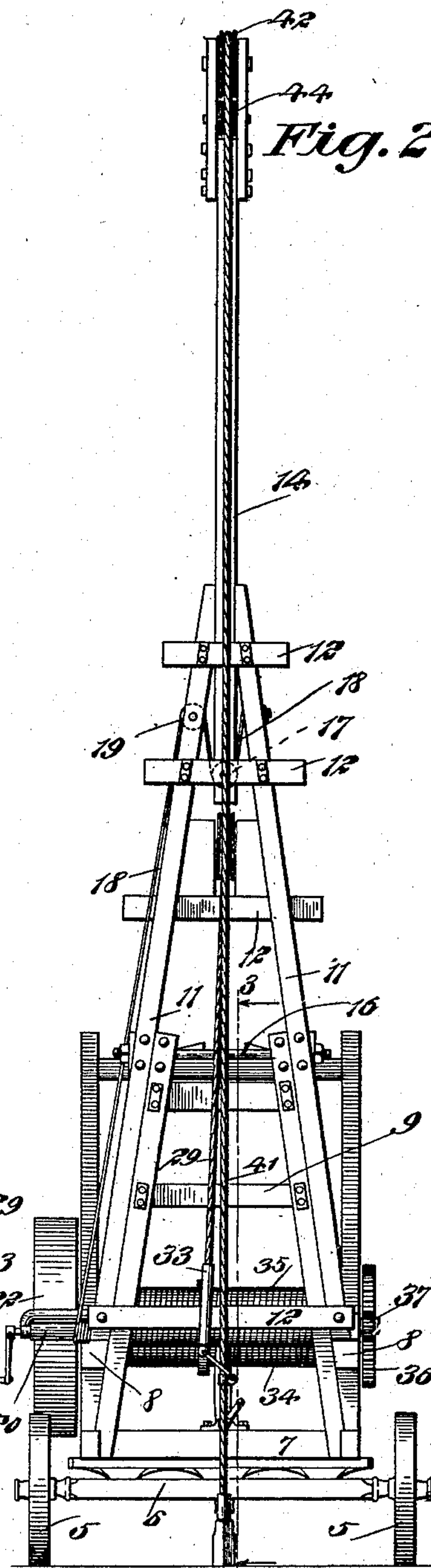
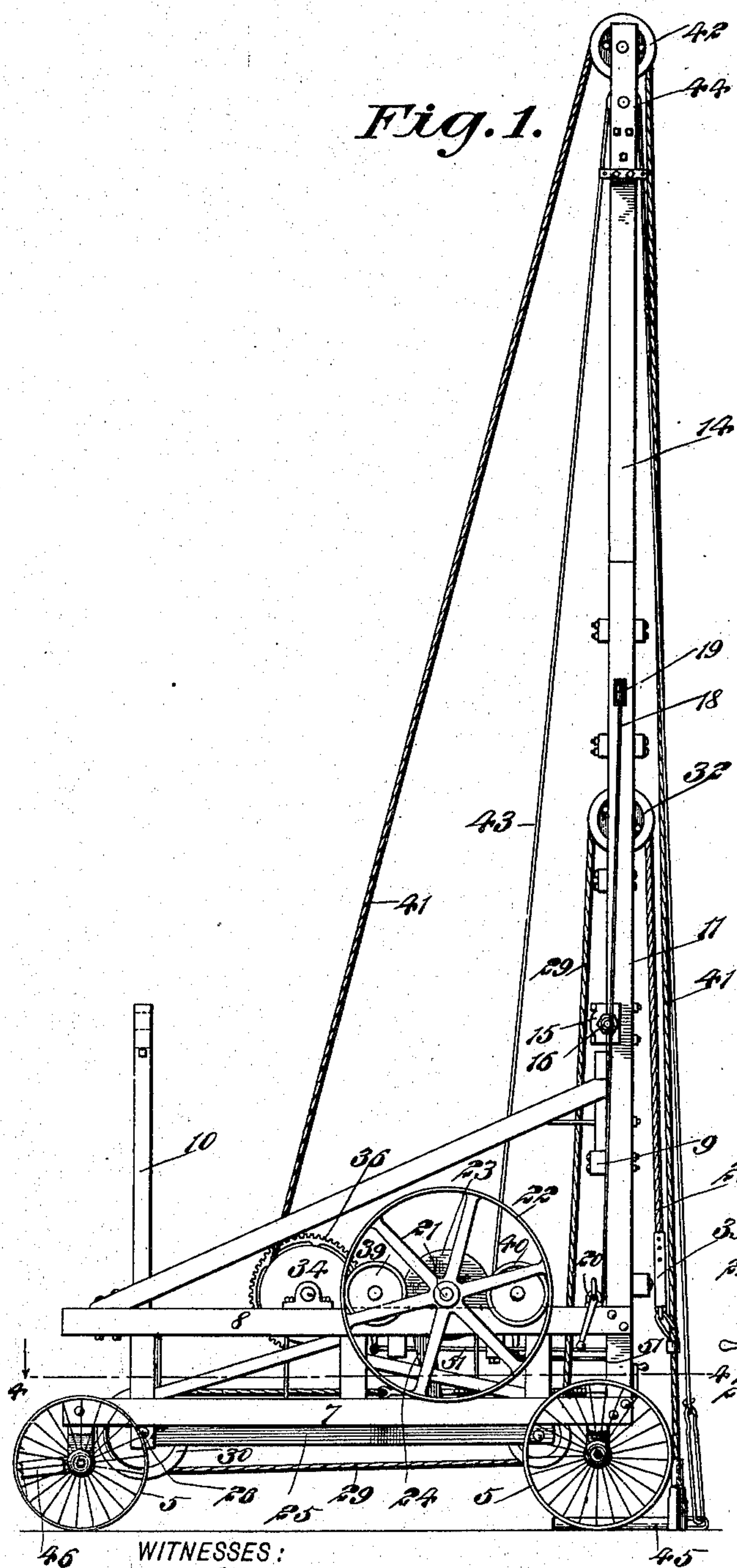
Patented Nov. 5, 1901.

F. W. BUSHNER.
WELL DRILLING APPARATUS.

(Application filed Aug. 25, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

C. W. Smith
Isaac B. Cline.

INVENTOR

F. W. Bushner
BY *muu*
ATTORNEYS

No. 686,202.

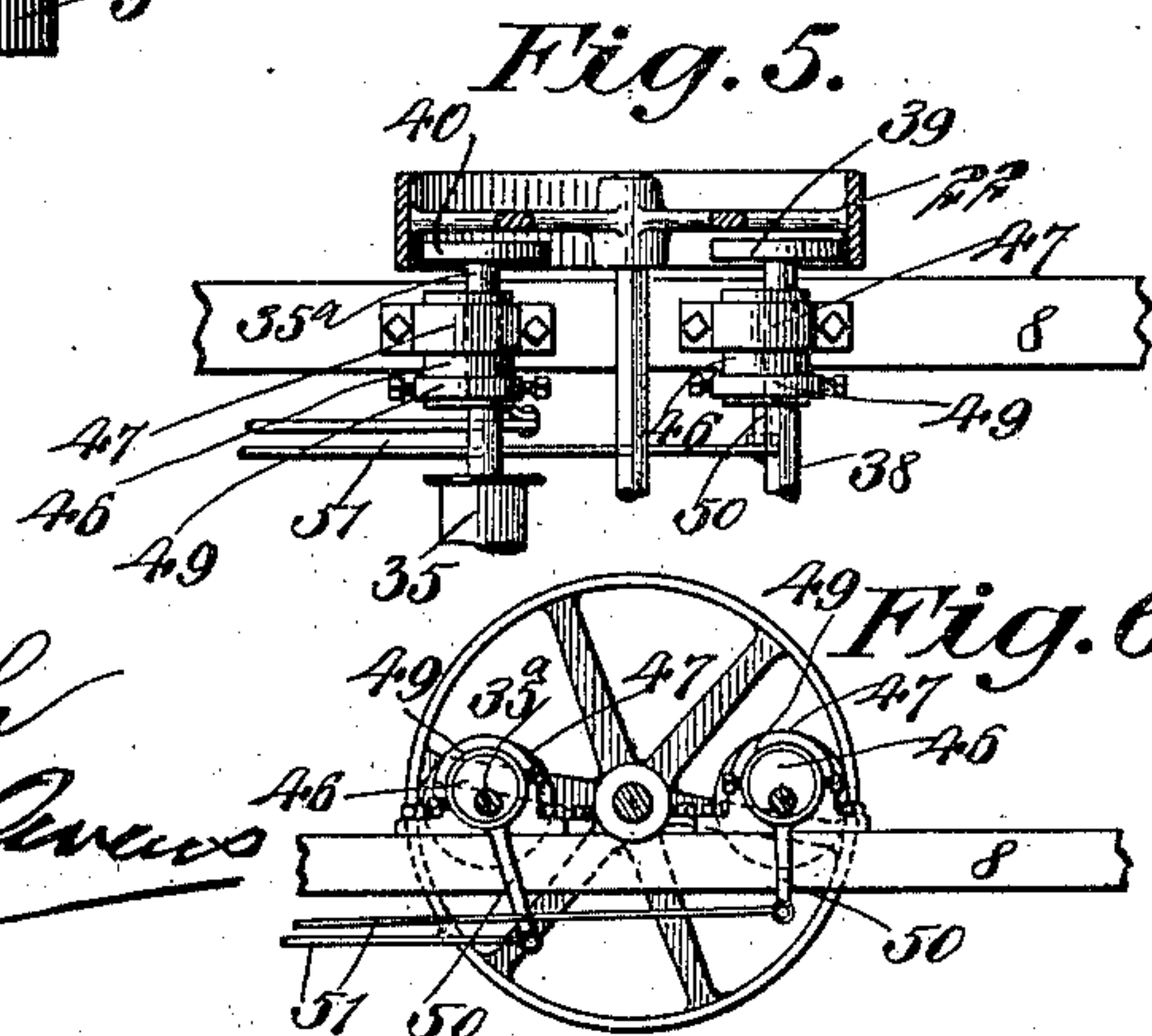
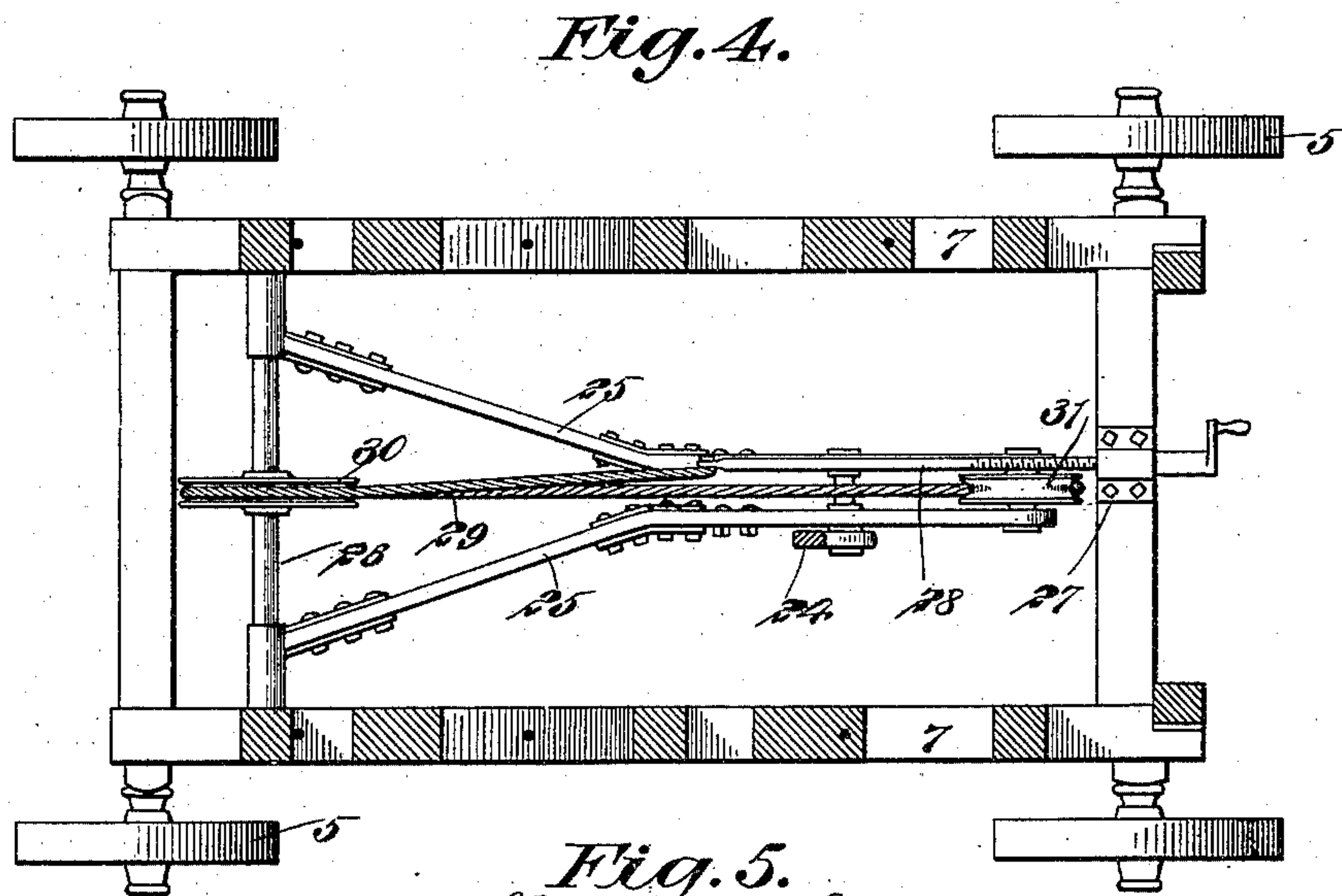
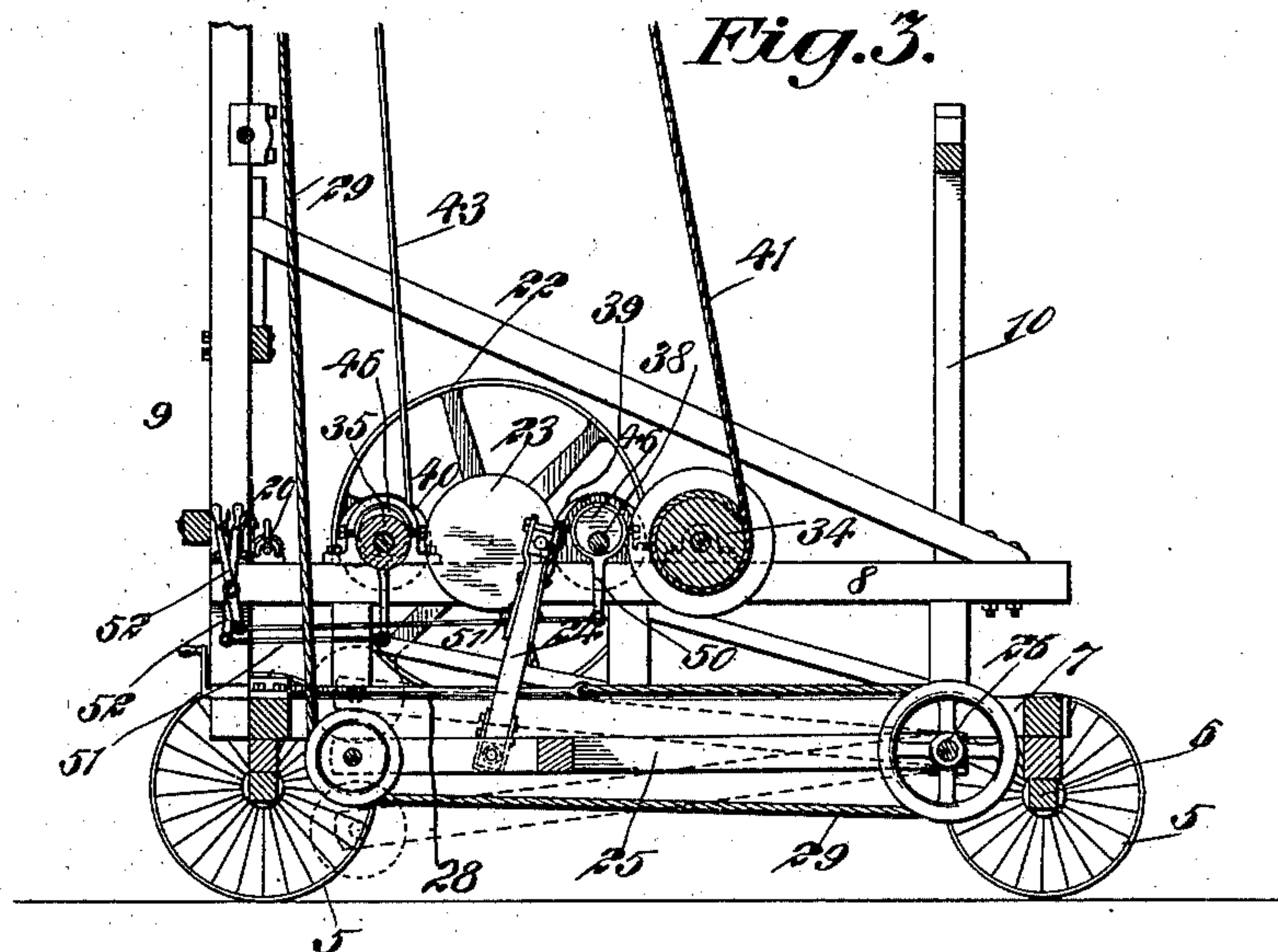
Patented Nov. 5, 1901.

F. W. BUSHNER.
WELL DRILLING APPARATUS.

(Application filed Aug. 25, 1899.)

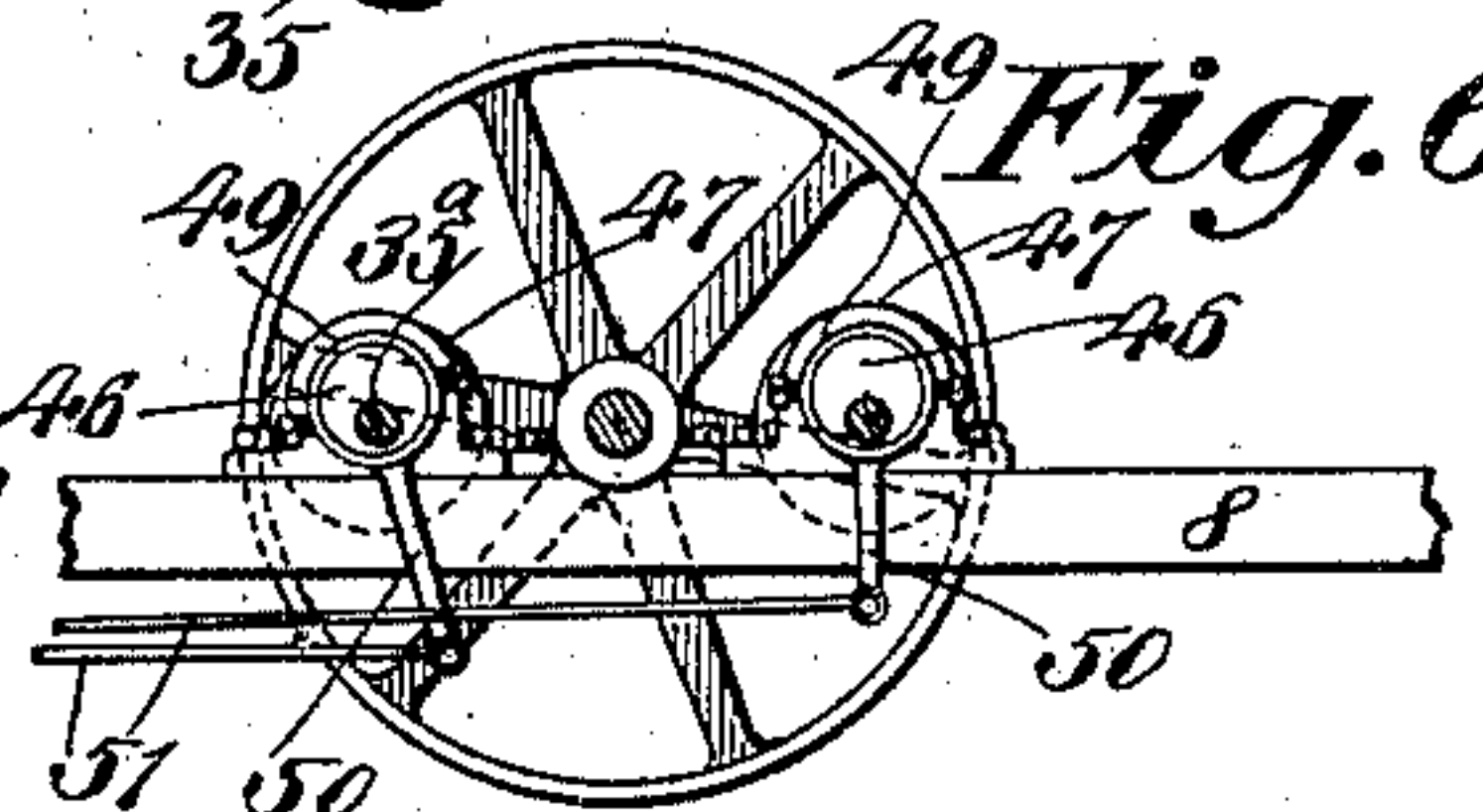
(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

C. W. Smith
James B. Owens



INVENTOR

F. W. Bushner
BY *[Signature]*
ATTORNEYS

UNITED STATES PATENT OFFICE.

FREDERIC W. BUSHNER, OF NEOSHO, MISSOURI.

WELL-DRILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 686,202, dated November 5, 1901.

Application filed August 25, 1899. Serial No. 728,449. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC W. BUSHNER, of Neosho, in the county of Newton and State of Missouri, have invented a new and Improved Well-Drilling Apparatus, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide an apparatus for drilling wells in which the jerk-rope for actuating the drill will be driven by a swinging arm or walking-beam, thus operating the jerk-rope in a more regular and effective manner than heretofore.

This specification is the disclosure of one form of my invention, while the claim defines the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the invention. Fig. 2 is a front elevation thereof. Fig. 3 is a vertical section taken on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section on the line 4 4 of Fig. 1. Fig. 5 is a plan view of the friction-gear, and Fig. 6 is a side view thereof.

The apparatus is carried on four wheels 5, which are mounted on axles 6, in turn supporting a horizontal base-frame 7, which carries a superstructure 8, at one end of which is an upwardly-projected support 9 for the derrick, to be hereinafter described, and at the other end of which is an upwardly-projecting support 10 for supporting the derrick when the same is moved down into folded position.

The derrick comprises a lower section formed of two divergent beams 11, rigidly fastened to each other by means of cross-braces 12, located at various points throughout the length of the lower section, and the derrick further comprises an upper section 14, which is mounted to slide between the beams 11 of the lower section. The lower section of the derrick has boxes 15 secured thereto, which are mounted loosely on a shaft 16, the shaft being carried in the upper end of the support 9, so that the derrick may be moved into the vertical position illustrated in Figs. 1 and 2 or so that it may be thrown down in a horizontal position, the upper portion of the

lower section of the derrick then resting upon the support 10. When the derrick is in raised position, the lower ends of the side beams 11 of the lower section of the derrick lie, respectively, at the outer sides of the support 9, and the lowermost cross-brace 12 engages said support to hold the derrick firmly in place. The sliding or upper section 14 is provided at its lower extremity with a sheave 17, around which is passed a line 18, the upper end of which is fast to the upper portion of one of the beams 11. From the sheave 17 the line 18 passes over a sheave 19, mounted in the other beam 11, and from this sheave 19 the line passes downward to a hand-operated drum 20, mounted on the superstructure 8, adjacent to the support 9. By means of this line and the drum therewith connected the upper or sliding section 14 of the derrick may be raised or lowered. When the derrick is folded, the upper section 14 should be lowered, as described.

A main shaft 21 is mounted revolvably on the superstructure 8 of the frame and carries a band-wheel 22, by means of which power is applied thereto and the shaft continuously driven. This shaft extends approximately half-way across the machine and is provided at its inner end with a crank-disk 23, to which is connected a pitman 24, the pitman extending downward and having connection with the swinging arm or walking-beam for operating the jerk-rope. This arm or walking-beam is formed of two side beams 25, suitably joined in rigid connection and spread at their inner ends, which ends are mounted to rock on a shaft 26, mounted below the main framing 7 and carried thereby. The arm or walking-beam is therefore mounted to swing vertically on a horizontal axis, and such movement is imparted to the walking-beam by means of the pitman 24, with which the walking-beam is connected, as shown. Mounted on the frame 7 at the end adjacent to the support 9 is a stationary nut 27, in which works a hand-screw 28, the screw extending longitudinally with the machine and having connection at its inner end with the jerk-rope 29. This rope extends from the screw around a sheave 30, mounted loosely on the shaft 26, and from this sheave the jerk-rope extends forwardly and around a sheave 31, carried

loosely in the free end of the arm or walking-beam. The jerk-rope then extends upwardly over a sheave 32, mounted at the upper portion of the stationary or lower section of the derrick. From this sheave 32 the jerk-rope extends downward, and its lower end is provided with the usual appliance 33 for connecting it with the drill-rope, to be hereinafter described.

Mounted on the superstructure 8, respectively at the sides of the shaft 21, is a drill-rope drum 34 and a sand drum or reel 35. The drill-rope drum has a spur-gear 36 attached to the axis thereof, and this gear meshes with a pinion 37, fastened to a shaft 38, provided with a friction-wheel 39, which engages the inner face of the band of the wheel 22, whereby the shaft 38 is driven, and from it is driven the drill-rope drum 34. A friction-wheel 40 is mounted on a shaft 35^a, forming the axis of the drum 35, and this friction-wheel engages the band of the wheel 22, inside the periphery thereof at a point opposite the wheel 39. From this friction-wheel 40 the sand-reel 35 is driven. The ends of shafts 38 and 35^a opposite the wheel 22 are mounted to turn in bearings carried by the superstructure 8 and are also allowed a very slight sidewise movement. The other ends of the shafts 38 and 35^a are mounted to turn in eccentrics 46, in turn held to roll in bearings 47, carried by the superstructure 8. These eccentrics 46 have straps 49 fastened thereto, the straps carrying arms 50, to which are attached links 51, in turn attached to hand-levers 52. By throwing the hand-levers 52 the eccentrics 46 may be rolled and the shafts 35^a and 38 swayed to engage and disengage the wheels 39 and 40 with and from the wheel 22, thus to start or stop the drums 34 and 35. The drum 34 carries the drill-rope 41, which passes upwardly over a sheave 42, mounted at the uppermost extremity of the derrick, and from thence the drill-rope 41 passes downward to carry the drill in the

usual manner. The sand-reel 35 carries the sand-rope 43, which passes upward over a sheave 44, mounted just below the sheave 42, and thence passes downward to carry the usual sand-pump 45. (See Fig. 1.)

The operation of the apparatus will readily be understood by those skilled in the art. The drill being carried by the drill-rope 41 may be used in top soil without the operation of the jerk-rope and its attendant parts; but for deep drilling in rock and subsoil the parts are connected, as shown in Figs. 1 and 2, so that the jerk-rope 29, having connection with the drill-rope, serves to raise and lower the same, and thus operate the drill. It will be observed that by means of the folding derrick the apparatus may readily be reduced into compact compass, facilitating the transportation thereof, for which purpose it may be provided with a pole 46 (see Fig. 1) for the attachment of a team. By means of the walking-beam, arranged as described, the jerk-rope may be operated in very effective manner, and the maximum amount of power is applied from a minimum expenditure.

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

In a drilling apparatus, the combination with a frame or body, of an arm pivoted at one end on the frame or body, the arm being capable of swinging on the pivot, a drive-shaft, a connection between the arm and the drive-shaft to drive the arm; a screw mounted on the frame or body adjacent to the free end of the arm, and a jerk-rope attached to the screw and passed around the pivoted end of the arm and back to the free end thereof, from which free end the jerk-rope extends transversely so that the vibration of the arm drives the jerk-rope.

FREDERIC W. BUSHNER.

Witnesses:

ANDREW J. HARBISON,
N. C. FAULKNER.