No. 737,911. PATENTED SEPT. 1, 1903.

W. M. & C. M. DENNING.

DRILLING MACHINE.

APPLICATION FILED JAN. 5, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

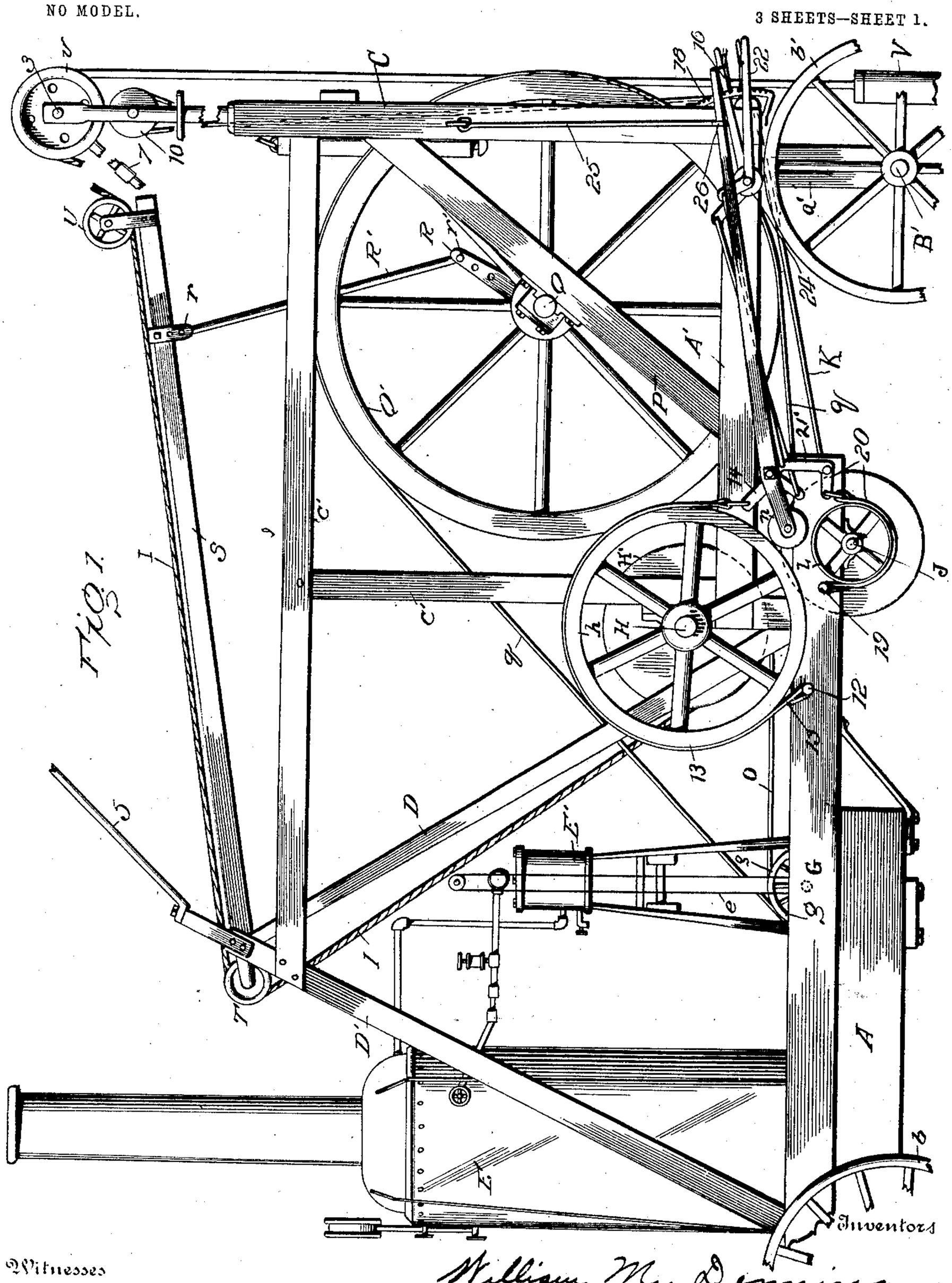

FIG. 1.

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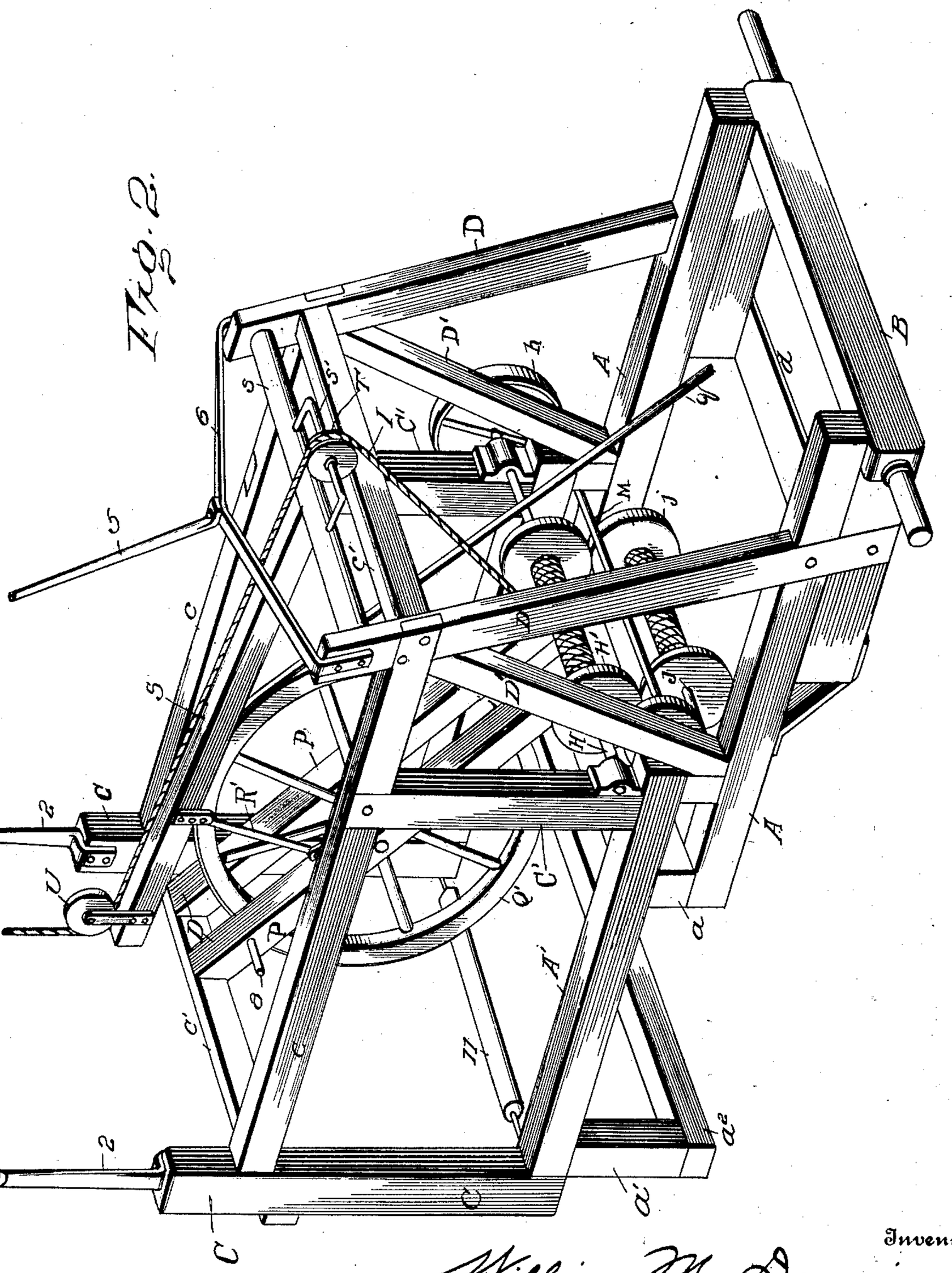
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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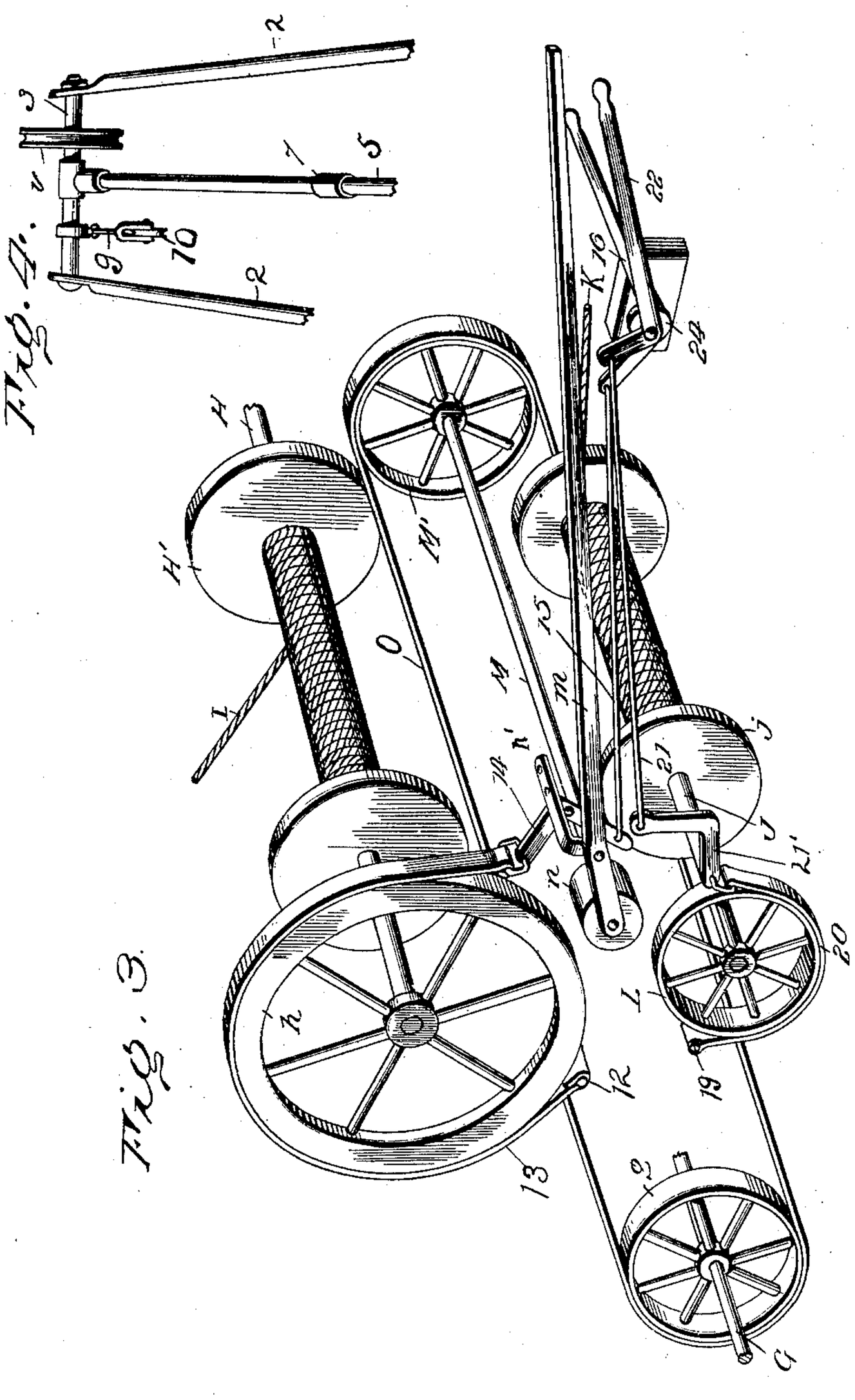
NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM M. DENNING AND CHARLES M. DENNING, OF TOLLGATE, WEST VIRGINIA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 737,911, dated September 1, 1903.

Application filed January 5, 1903. Serial No. 137,871. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. DENNING and CHARLES M. DENNING, citizens of the United States, residing at Tollgate, in the county of Ritchie and State of West Virginia, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

Our invention relates to improvements in drilling-machines, and more particularly to steam-machines used in drilling wells, &c.

The object of our invention is to provide a drilling-machine of this character in which the drill-rope is wound upon a reel and can be readily let out as the drill works its way downwardly and carrying means operated by the drilling means for rotating said reel, and thus drawing the drill out of the well at any desired time, whether the drill is at work or not.

Another object of our invention is to provide a reel on which is wound the bailer-supporting rope and said reel carrying means for supporting the bailer at any desired point or means for dropping said bailer in the well or raising the same at will after the drill has been raised.

Another object of our invention is to provide a more simple, cheap, and more effective transportable drilling-machine adapted to accomplish the results for which it is intended.

In the accompanying drawings, Figure 1 is a side view of our complete drilling-machine, showing the pulley-supporting derrick broken away in the center. Fig. 2 is a perspective view of the supporting-frame with the boiler, engine, and supporting-wheels removed. Fig. 3 is a perspective view of the drill and bailer-supporting-rope reels and the mechanism for releasing and rotating the same. Fig. 4 is an enlarged view of the upper end of the derrick, showing the arrangement of the two pulleys carried thereby.

Referring now to the drawings, A and A′ represent the two sections of which our main supporting-frame is composed and the rear section A, carrying an axle B, upon which are rotatably mounted the supporting-wheels *b*, while the forward frame A′ carries an axle B′, which is connected thereto by a king-bolt in the usual manner and carrying the wheel *b*′, and thus it is seen that the machine can be readily transported from place to place. The forward end of the frame A is provided with a transverse beam, upon which is supported the rear end of the forward frame A′. The forward end of the frame A′ is provided with the downwardly-extending member *a*′, which is connected by the transverse beam a^2 and to which the front axle B′ is pivotally connected by the king-bolt, as before described.

The forward frame A′ is provided on each side with the upwardly-extending standards C and C′, which are connected by the longitudinally-extending side bars *c* and the transverse end bars *c*′. The rear ends of the side bars *c* extend beyond the standards C′ and are connected to the rear frame A by the oblique braces D and D′.

The rear portion A of the main supporting-frame is provided with a platform *d*, upon which is mounted the upright boiler E, which is of any desired structure, as this forms no part of my invention, and also mounted upon the platform *d* is a vertically-arranged cylinder E′ and by means of which, through the piston, the shaft G is rotated. The said shaft G is mounted in the frame A in any desired manner below the cylinder and carries a drive-pulley *g* and *g*′, by means of which the drill and other operating parts are driven, as will be hereinafter more fully described.

Mounted in journals on the standards C′ is a shaft H, which carries a reel H′, upon which is wound the drill-rope, and the outer end of said shaft H carries a large smooth wheel *h*, which is on the outside of the standards C′, as clearly seen in Fig. 1 of the drawings. Journaled to the under side of the frame A is a transverse shaft J, which carries a reel *j*, upon which is wound the bailer rope or cable K, and said shaft carries a smaller pulley L on one end outside the frame A and on the same side as the pulley *h*, and thus it will be seen that the two pulleys L and *h* are in the same plane one above the other with a space between the same.

The frame A also carries a shaft M, which has one end journaled therein, and the opposite end is journaled to lever *m*, which is intermediately pivoted to an L-shaped brace

n', carried by the outside of the frame A'. The said shaft M extends between the pulleys h and L and has rigidly secured thereto a small friction pulley or wheel n, and said shaft being journaled in the intermediately-pivoted lever m it will be seen that the said friction-wheel n can be brought in engagement with either of the pulleys h and L. The said shaft M carries a pulley M', over which passes the belt O, which is driven by the pulley g, carried by the engine-shaft, and means by which the friction-wheel n is driven, and it is readily seen that either of the pulleys L and h can be driven, and thus the drill or bailer can be readily drawn from the well as desired.

The transverse beam c' of the frame A' carries two downwardly-extending oblique supporting-beams P, which have their lower ends secured to the transverse beam a, carried by the forward end of the frame A, and journaled on said beams P is a shaft Q, which carries a large pulley-wheel Q', over which passes a belt q, which is driven by a pulley g, carried by the engine-shaft G. On the outside of said beams P the shaft Q carries a crank-arm R, which is connected by a pitman R' to the walking-beam S by a pivotal connection at r. The said walking-beam S is rigidly connected to a transverse beam s, which is adapted to oscillate between the upper ends of the oblique braces D', and said beam s carries an outwardly-extending U-shaped loop s', upon which is mounted a pulley T, which is adapted to rotate thereon and also adapted to slide thereon as the rope travels from one side of the reel to the other as the drill is either being lowered or raised, as the case may be, as the drill-supporting rope I passes over said pulley T. The forward end of said walking-beam S is provided with a pulley U, under which passes the drill-supporting rope I, and said rope passes upwardly over the pulley v, carried by the upper end of the derrick, and downwardly to the well and carries the drill V'. Thus it will be clearly seen that the one end of the rope being made fast to the reel H' and the rope passing over the pulleys carried by the walking-beam S when the pulley Q' is rotated the walking-beam is raised and lowered through the medium of the crank-arm R, and thus the drill is raised and lowered and the drilling is accomplished.

The derrick has its standards 2 pivotally connected to the upper end of the standards C, and the upper end of said standards 2 are connected by a transverse bolt 3, upon which is mounted the pulley v at one side. One of said standards 2 is provided with transverse bars 4, forming footholds for the purpose of climbing the derrick should the rope break or jump off of the pulley v.

Intermediately connected to the transverse bolt 3 is a brace 5, which is secured to the upper ends of the oblique braces D' by means of the straps 6. The said brace 5 is made in two pieces, and the abutting ends are screw-threaded and provided with a screw-threaded connection 7, and thus when said brace is disconnected the derrick can be lowered, as its lower end is pivoted, as before described, and thus it is seen that it can be more readily transported, as the derrick would prevent it from passing under obstructions.

It will be noted that we use but one crank and one pitman, and this is for convenience in removing the pitman R' from the wrist-pin r', carried by the crank R. It is understood that the lower end of the pitman R' has an opening therein adapted to receive the wrist-pin r', and on the said crank we carry a spring-catch, which prevents the pitman from accidentally slipping therefrom. By operating said catch it will be seen that the pitman can be removed, and we provide the brace P with a pin 8, which is not in a line with the crank, and thus the walking-beam S can be held in a downward position and stationary during the raising of the drill and the bailing operation. It will be seen that it is not absolutely necessary to uncouple the pitman from the crank when it is desired to simply raise the drill, but is absolutely necessary to do so during the bailing operation.

The shaft or bolt 3 has supported thereby a rod 9, which carries at its lower end a pulley 10, which is swiveled thereto, and it will be seen that the bailer-rope passes from the reel j forwardly over a rotatable roller 11, and thus upwardly over the pulley 10, and by swiveling the pulley in the manner described the bailer can be readily swung around out of the way when it is not being used and the drill is operating. It will be readily seen that the roller 11 also serves to prevent the drill-rope I from striking the frame A', and thus preventing the rope from wearing.

Secured to the outside of the frame A is a pin 12, which has rigidly secured thereto a brake-band 13, which passes nearly around the pulley-wheel h, carried by the outer end of the shaft H, and is connected to the upper bar 18. The brake-band is applied to the pulley or friction wheel h, and thus the reel, around which is wound the drill-supporting rope, is prevented from rotating.

The frame A also carries a pin 19 adjacent the friction-wheel L, and secured to said pin 19 is a brake-band 20, which passes down around the pulley L and has its opposite end secured to an L-shaped lever which is intermediately pivoted to the frame A. The upper end has secured thereto a link 21, which extends forwardly and is connected to the intermediately-pivoted L-shaped hand-operated lever 22. The said lever 22 is pivoted on the same pivot 23 as the lever 16, and upon said pivot between the levers is a block 24, which will allow the two levers to pass each other, and said block is of such a thickness to prevent the hand from striking the opposite lever. The said lever 22 passes between the double rack-bar 18 and engages it and is held

in the adjusted position by the said rack-bar. The vertically-arranged standard C has a link 25 loosely connected thereto and which extends downwardly and is provided with an eye 26, which is adapted to be slipped over the end of the lever, and thus support the friction-wheel n, carried by said lever m, between the two pulleys h and L, so that it will not be in an engagement with either one.

The operation of our device is as follows: The engine-shaft G is driven as before described, and said shaft has a pulley q^2, which drives the belt q, which passes over the large drive-wheel Q', or which might also serve the purpose of a balance-wheel. The crank-arm carried by said wheel through the links R' raises and lowers the walking-beam S, and the drill-rope passing thereover is necessarily raised and lowered, and thus the drill is raised and lowered in the well. As the drill works its way downward it is necessary to ease off a little rope or cable at a time, and by raising the lever 16 it will be seen that the brake-band is released on the pulley h, and thus the reel is allowed to rotate as desired and the cable is unwound. When it is desired to raise the drill from the well, the lever 16 is raised, releasing the brake-band 13, and the lever m is at the same time thrown downward, which brings the friction-wheel n in engagement with the pulley h, and thus rotates the reel carried thereby as the wheel n is at times being driven by the engine, so that the drill can be raised at any time. When it is desired to allow the bailer to be lowered into the well, the lever 22 is raised, thus releasing the brake-band 20, and the downward movement of both the drill and bailer can be regulated by the brake-band. When it is desired to raise the bailer from the well, the lever m is drawn upward and the friction-wheel n brought in contact with the pulley L, and the bailer-rope reel rotates, and the bailer is drawn from the well.

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

1. A drilling-machine comprising a frame, a drill-rope reel mounted thereon a bailer-rope reel mounted on said frame below the first reel, a friction-wheel carried by the outer end of the shaft of each reel on the outside of the frame, a brake-band having one end connected to the frame and passing around the upper friction-wheel, an intermediately-pivoted lever connected to the opposite end of said band, an intermediately-pivoted operating-lever, means for holding said lever in the adjusted position, a link connecting said operating-lever and the lever connected to the brake, a second brake-band connected to the frame and passing around the lower friction-wheel, an intermediately-pivoted lever carried by the opposite end of said band, an intermediately-pivoted operating-lever adjacent the first operating-handle, means for handling said handle a link connecting the second operating-handle and the lever carried by the lower brake-band, a shaft having one end journaled in said frame, an intermediately-pivoted lever supporting the opposite end of said shaft, means for rotating said shaft, a friction-wheel carried by the shaft and adapted to engage either the upper or lower friction-wheel, and means supporting said rotating friction-wheel between and out of engagement with either the upper or lower friction-wheel, substantially as described.

2. A drilling-machine comprising a frame, having upwardly-extending standards adjacent its rear end, a shaft journaled between said standards, a bracket carried by said shaft and having an elongated portion parallel therewith, a pulley rotatably mounted on said elongated portion and endwise movable thereon, a beam rigidly carried by said shaft, a pulley carried by the outer end of said beam, means carried by the frame for raising and lowering said beam, a reel carried by the frame, a rope carried by the reel and passing over the reel carried by the bracket and under the reel carried by the beam, and a drill carried by the end of said rope, substantially as described.

3. A drilling-machine comprising a frame, rotatable drill and bailer-rope reels carried thereby, a pulley carried by said reels in a line with each other, a brake-band partially surrounding said pulley having the adjacent faces uncovered, means extending to the forward end of said frame for independently operating said brake-bands, a rotating member between said pulleys and an intermediately-pivoted lever having one end adjacent the brake-band-operating means, and the opposite end carrying said rotating member, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM M. DENNING.
CHARLES M. DENNING.

Witnesses:
R. B. JETT,
O. S. MASON.