(No Model.) 2 Sheets—Sheet 1.

G. CORBETT.

RIG FOR DRILLING WELLS.

No. 428,461. Patented May 20, 1890.

Fig. I.

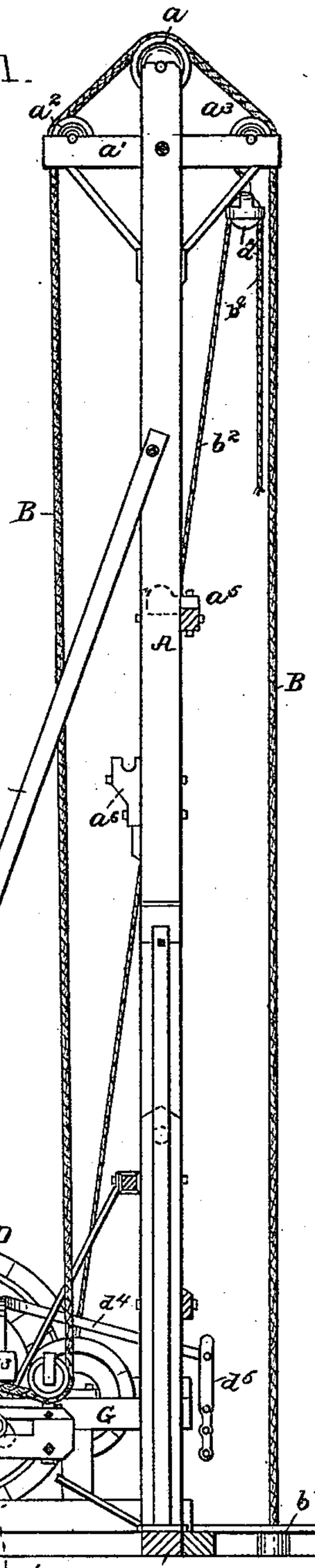


Fig. II.

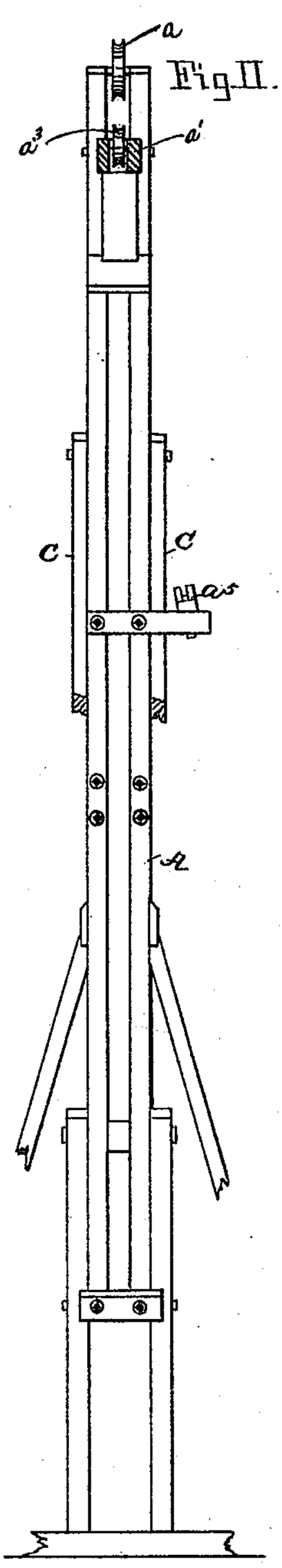


Fig. III.

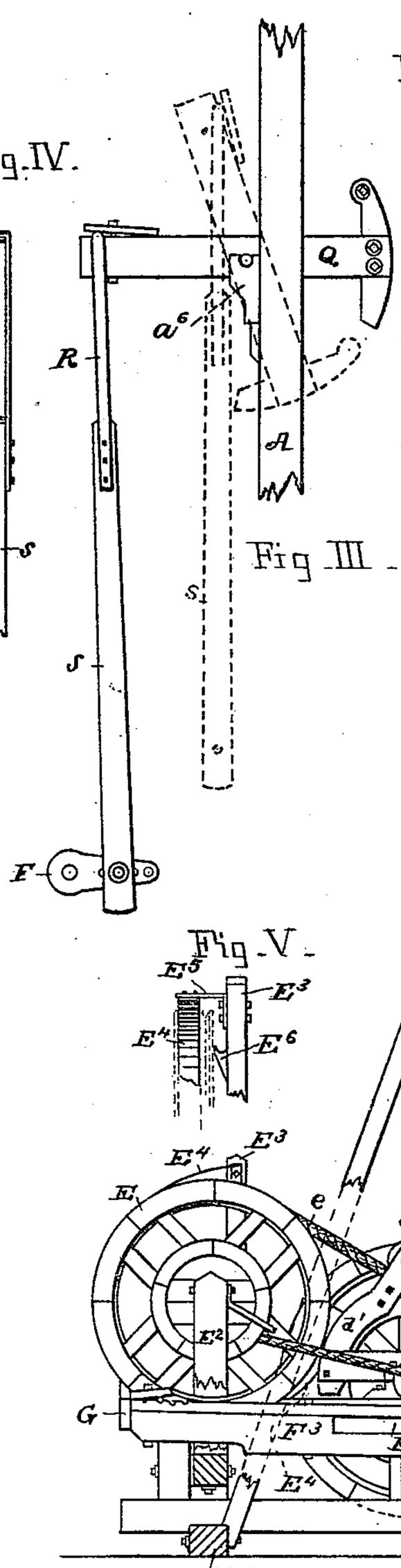
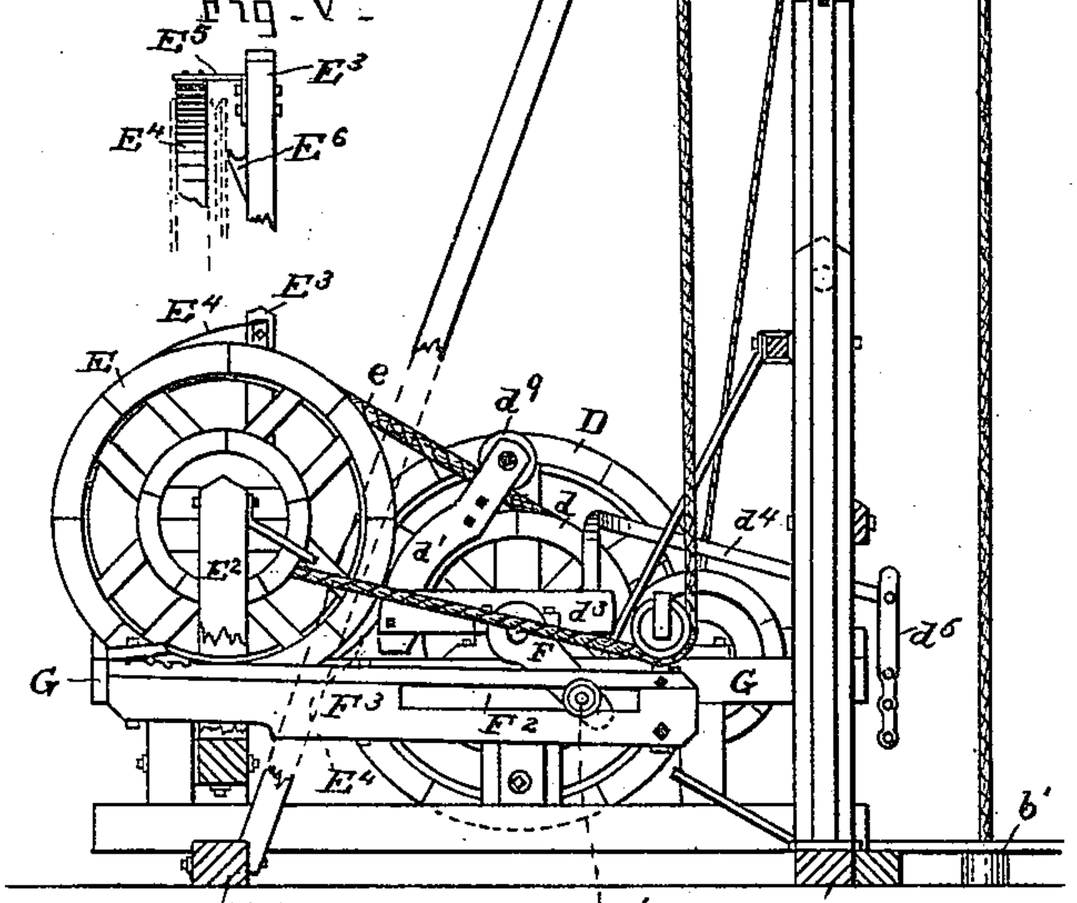


Fig. IV.

Fig. V.



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(No Model.) 2 Sheets—Sheet 2.

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RIG FOR DRILLING WELLS.

No. 428,461. Patented May 20, 1890.

Fig. VI.

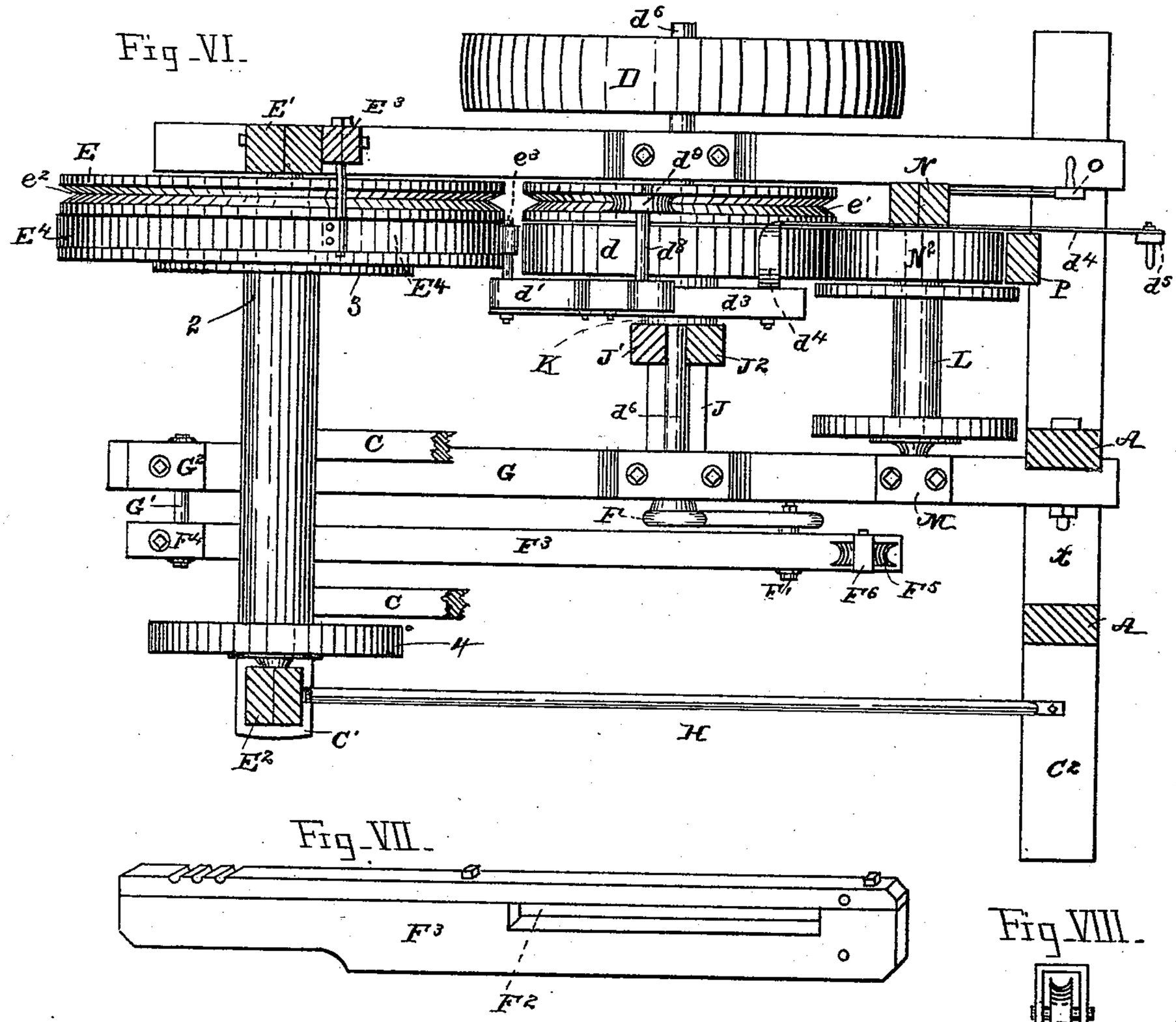

Fig. VII.

Fig. VIII.

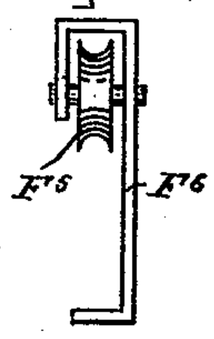

Fig. X.

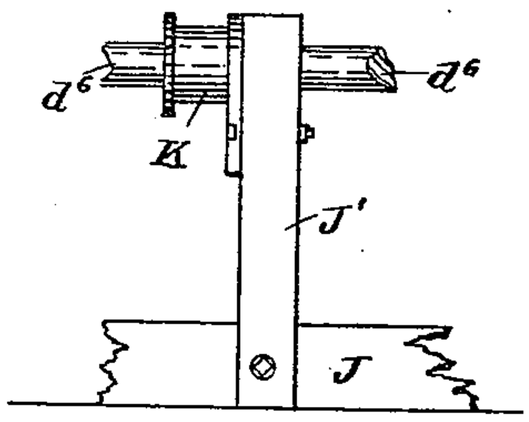

Fig. IX.

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UNITED STATES PATENT OFFICE.

GEORGE CORBETT, OF BRADFORD, PENNSYLVANIA.

RIG FOR DRILLING WELLS.

SPECIFICATION forming part of Letters Patent No. 428,461, dated May 20, 1890.

Application filed August 9, 1888. Serial No. 282,302. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CORBETT, a citizen of the United States, residing at Bradford, county of McKean, and State of Pennsylvania, have invented certain new and useful Improvements in Rigs for Drilling Wells, of which the following is a specification.

My invention relates to improvements in portable rigs for drilling Artesian and other wells, and will first be described with reference to the accompanying drawings, which form an important part of the specification, and then more specifically pointed out in the claims hereto annexed.

In the said drawings, Figure I is a side elevation of my portable drilling-rig. Fig. II represents a front elevation of the mast or derrick. Fig. III represents a portion of the mast supporting a segment walking-beam connected by a pitman to the crank, the dotted lines showing said walking-beam disconnected from the crank and swung up out of the way in the position it assumes when the tools are being drawn from the well. Fig. IV represents a face view of the stirrup with the upper portion of the pitman attached. (Shown in Fig. III.) Fig. V is a front elevation of the back brake-post, showing the back brake connected thereto by means of an angle-iron or bracket, the lower portion being broken away. Fig. VI represents a top elevation of the rig, the mast or derrick being in section. Fig. VII represents the crank-beam hereinafter described. Fig. VIII represents the pulley or saddle carried by the crank-beam. Fig. IX is a side elevation of the tightening mechanism, as hereinafter fully described. Fig. X is a detail view showing the manner of supporting said tightening mechanism.

A represents the mast or derrick, in the crown of which is journaled a large pulley a, and at a suitable distance below this pulley is secured to the mast a cross-bar a', having mounted in each end smaller pulleys a^2 and a^3, respectively.

My object in so arranging these pulleys is twofold: first, to enlarge the bend of the drilling-cable B, whereby the strands are less liable to break, as often happens when running over a small pulley under heavy strain, and, second, the drilling-tools can thus be suspended a sufficient distance away from the rig to afford ample room for the workmen around the well-hole b'.

a^4 is a sand-pump pulley suspended from the cross-bar a', and a^5 is the guide-pulley for the sand-line b^2. The mast A and the frame rest upon the mud-sills C′ and C², and the mast is braced by means of the braces C C, secured thereto and to the mud-sill C′.

The frame of this improved rig is practically the same as that shown and described in my United States Letters Patent No. 385,241, and will therefore not require a detailed description here.

Extending athwart the machine is the driving-shaft d^6, which carries at one end the driving-pulley D and at the other a crank F. Mounted upon this shaft is a combined pulley and friction-wheel d, having to one side of its periphery a peripheral groove e', and mounted upon the bull-wheel shaft 2 directly opposite is a similar wheel E, which, however, I will hereinafter term a "combined pulley and brake wheel." This wheel E is likewise provided to one side of its periphery with a peripheral groove e^2, and at the other side it is provided with a groove in which engages a brake-band E⁴, hereinafter described. Passing around these wheels E and d and resting in the grooves e' e^2 is a belt or rope e, which is adapted to impart motion from the driving-shaft to the bull-wheel, which, it will be understood, is formed by the two flanges or wheels 3 4 and the shaft 2, upon which they are mounted.

Projecting upwardly from the sill J are two standards J′ and J², which carry at their upper ends a sleeve K, having a flange at its outer end, as shown in Fig. X, and a bracket at its inner end, by means of which the sleeve is secured to the posts J′ and J² by bolts, as shown. Journaled to this sleeve K is a horizontal lever d^3, having in its lower edge a cut-away portion, so as to form a bearing for the sleeve, and a block d^7 secured thereto and engaging at the under side of such sleeve, so as to form a complete bearing. To one end of this lever d^3 is secured an upwardly-projecting arm d', which carries at its upper extremity a horizontal shaft d^8, upon which is journaled directly over the belt or rope e a friction-wheel d^9, and at the other end of such

lever is secured an extension-arm d^4, having the operating-handle d^5.

The gudgeons of the bull-wheel shaft 2 are journaled in rigid vertical posts or standards E′ and E² planted upon the mud-sill C′, and the post E² is braced by means of a bar H secured to it and to the other mud-sill C². Secured to the side of the post E′ is the brake-post E³, upon the inside of which is secured an angle-iron or bracket E⁵, to which latter the upper end of the brake-band E⁴ is secured, while the lower end of such band, after passing around the brake-wheel, is secured to a pin or lug e^3 projecting from the end of the horizontal lever d^3. By this arrangement it will be seen that when the operating-handle d^5 is moved in one direction the friction-wheel d^9 will depress the upper fold of the rope or belt *e*, thus making sufficient friction between such belt and the two wheels *d* and E to impart motion from the revolving wheel *d* to the wheel E, and consequently to the bull-wheel, and at the same time the lower end of the brake-band will be lowered and the brake loosened upon the brake-wheel, and when such handle d^5 is operated in the opposite direction the friction-wheel d^9 will relieve the belt *e*, allowing it to become sufficiently slack to enable the wheel *d* to revolve without imparting motion to the wheel E, and the lower end of the brake-band E⁴ will be raised, and such band consequently pressed firmly against the wheel E, and thus check the revolutions of the bull-wheel.

L is a sand-reel which is mounted at one end in a fixed bearing M and at the other end in a swinging lever N. To the lower end of this lever is attached the operating-handle O, by means of which the sand-reel friction-wheel N² may be forced into engagement with the friction-wheel *d* or with the back brake-block P. This arrangement is substantially the same as that shown and described in my United States Letters Patent aforesaid, to which reference may be had for a more full explanation of this feature.

F³ is a beam, which I shall hereinafter term a "crank-beam." This beam is supported or pivoted at one end, by means of the bolt or shaft G′, to the end of the plate or frame G. The bolt is held in place on such plate by means of the block G², and it is secured to the crank-beam by a similar block F⁴, the upper edge of the crank-beam, however, being provided with a series of countersinks, the bolt being secured in any one of these countersinks, according to the distance it is desired to have the beam project from its pivot. This beam is composed of two parts, the upper one of which being a straight strip suitably bolted to the lower one, which latter is provided with an elongated notch in its upper edge, whereby the slot F² is formed. Secured on the wrist-pin of the crank F is a friction-roller F′, which engages in this slot, and is provided with a washer at its outer extremity for preventing the crank-beam from becoming displaced, the slot F² being of sufficient length to allow the crank to make an entire revolution and carry the beam with it; or, in other words its length is greater than the diameter of the circle described by the wrist-pin, so that the latter will not come against the ends of the slot when the beam is shortened or lengthened. At the upper extremity of this beam is secured a saddle, (shown in Fig. VIII,) which is composed of the hook-shaped bracket F⁶, carrying a friction-pulley F⁵, which latter is adapted to be hooked over the drilling-rope B, the slot being between the said saddle and the pivotal point of the beam. Thus it will be seen that when motion is imparted to the driving-shaft the crank F will cause the said crank-beam to rise and fall with a rapid and regular movement and impart to the drilling-rope the desired drilling motion.

This method of raising and lowering tools when drilling is advantageous for the reason that it performs the work with the utmost precision and entirely avoids the jerk or snap action of the treadle-machines.

The arrangement just described is more particularly adapted for the initial drilling—that is, drilling until the tool sinks sufficiently into the earth to permit of attaching the drilling-rope to the walking segment-beam Q, Fig. III, in the manner fully shown and described in my United States Letters Patent No. 396,544, granted January 22, 1889. After this initial drilling is performed I release the drilling-rope from the pulley F⁵ in the bracket F⁶ and remove the crank-beam F³, and then attach the pitman S, secured to one end of the beam Q, to the crank F and the segment to the drilling-rope by means of a clamp, as fully shown and described in my aforesaid patent. The beam Q is supported or journaled in pillow-blocks a^6 on the mast or derrick, and the beam is connected to the pitman S by means of a stirrup R. The side straps of this stirrup are of considerable length, as shown, in order that the walking-beam may be folded as nearly as practicable parallel with the mast or derrick out of the way when the drilling is being performed by other means, as described.

When the band or belt *e* is not in use, it may, if desired, be suspended upon a hook or support E⁶ on the inner side of the brake-post E³.

It will of course be understood that the belt *e* is only used when it is desired to raise the tools from the well, and it will be observed that by this arrangement I am enabled to journal the bull-wheel more firmly in the frame, and at the same time to readily impart motion to it from the driving-shaft.

The invention also possesses several advantages in addition to those which have already been named—*i. e.*, the drilling-rope may be readily and easily attached to the crank-beam or detached therefrom when the tools are to be drawn from the well. By the employment

of this crank-beam a longer stroke is obtained than can be had by direct connection to the wrist-pin, and the drilling motion is noiseless and exceedingly steady.

I claim—

1. In a drilling-rig, the combination, with the driving-shaft and drilling-rope, of a crank on said shaft, a crank-beam adjustably pivoted at one end, the saddle secured at the other end of said beam and bearing on the drilling-rope, said crank-beam having a slot between its pivotal point and said saddle, and a wrist-pin on said crank engaging in said slot, the length of said slot being greater than the diameter of the circle described by said wrist-pin, substantially as and for the purposes set forth.

2. In a drilling-rig, the combination, with the wheels *d* and E, of the brake-post E^3, a belt surrounding said wheels, a standard, a lever pivoted in said standard, the arm *d'* on said lever, the bracket E^5, secured to said post and overhanging the wheel E, a strap-brake secured to said bracket at one end and partially surrounding the wheel E, the lug e^3, secured to the other end of said brake, the shaft d^8, carried by said arm *d'* and projecting axially over the wheel *d*, and a pulley on said shaft adapted to depress said belt, substantially as set forth.

3. In a drilling-rig, the combination, with the posts J' J^2 and the shaft d^6, of the sleeve K, surrounding said shaft and having a flange at each end, bolts passing through one of said flanges and securing said posts and sleeve together, and the lever d^3, journaled upon said sleeve between said flanges, as set forth.

4. The combination, with the bull-wheel and drilling-rope, of the slotted crank-beam adjustable endwise, the crank having a pin engaging in said slot, and said slot being longer than the stroke of said crank, a bracket projecting upwardly from said beam, and a pulley journaled in said bracket and engaging over the drilling-rope, whereby the rope may be released from said pulley at will, substantially as set forth.

5. In a drilling-rig, the combination, with the driving-shaft and the drilling-rope, of a crank on said shaft, the slotted crank-beam F^3, pivoted at one end, whereby it may be adjusted endwise, a wrist-pin projecting from said crank and engaging in said slot, said slot being greater in length than the diameter of the circle described by said pin, and a saddle pivoted to said crank-beam and consisting of the hook-shaped bracket F^6 and the pulley F^5, journaled in said bracket and engaging over said drilling-rope, substantially as set forth.

GEO. CORBETT.

Witnesses:
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JAMES ROURKE.