

No. 680,810.

Patented Aug. 20, 1901.

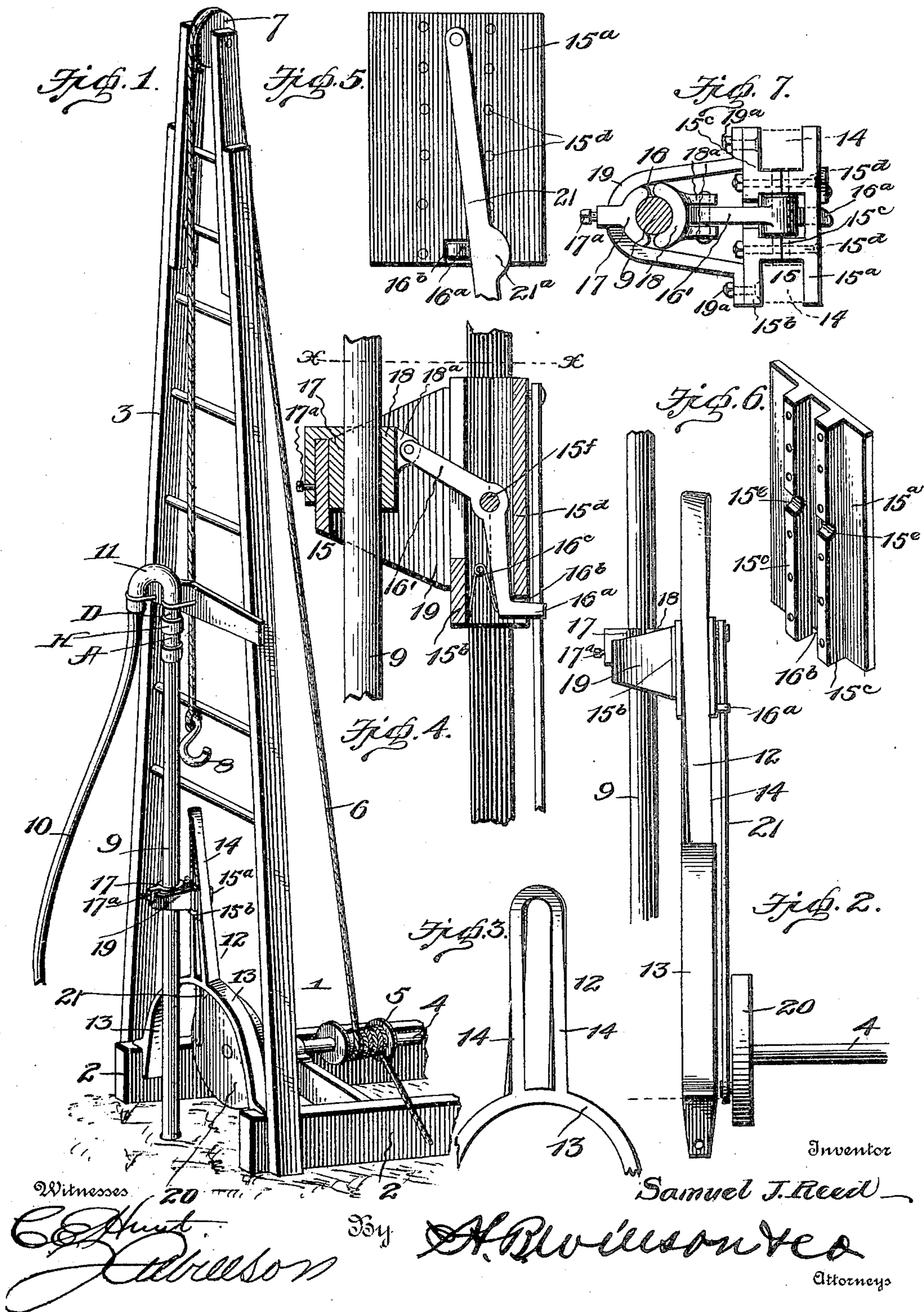
S. J. REED.

WELL DRILLING MACHINE.

(Application filed Mar. 14, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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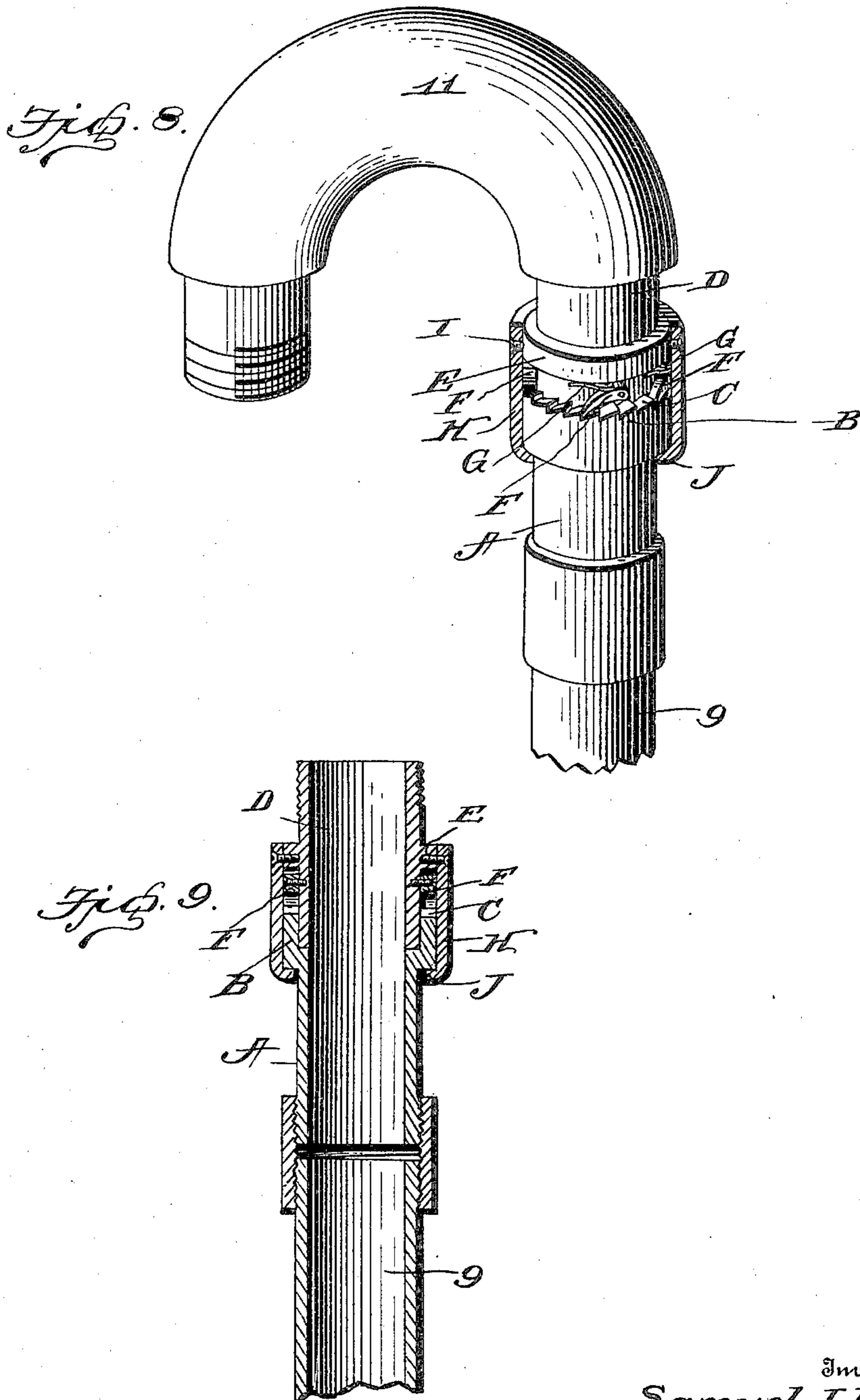
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

SAMUEL J. REED, OF ONSET, ARKANSAS.

## WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 680,810, dated August 20, 1901.

Application filed March 14, 1901. Serial No. 51,123. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL J. REED, a citizen of the United States, residing at Onset, in the county of Marion and State of Arkansas, have invented certain new and useful Improvements in Well-Drilling 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.

The invention relates to a well-drilling machine.

The object of the invention is to provide a simple, durable, and comparatively inexpensive machine of this character, which will perform its work in an efficient manner.

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

In the accompanying drawings, Figure 1 is a perspective view of my improved well-drilling machine. Fig. 2 is a side elevation of the track, carriage, drill-stock, pitman, and crank-wheel. Fig. 3 is a front view of the track. Fig. 4 is a longitudinal sectional view through the track, carriage, and drill-stock-gripping mechanism. Fig. 5 is a rear view of the carriage and the upper end of the pitman, to which it is pivoted. Fig. 6 is a front perspective view of one of the plates of which the carriage is composed. Fig. 7 is a transverse sectional view on line  $x-x$  of Fig. 4. Fig. 8 is a perspective view, partly in section, illustrating the pawl-and-ratchet connection of the drill-stock with the hose-nipple; and Fig. 9 is a longitudinal vertical sectional view.

Referring to the drawings, 1 denotes the frame of the machine, comprising the sills 2 and ladder 3, and 4 denotes the drive-shaft, provided with the winding-drum 5, to which is connected a lifting-cable 6, which extends up over the pulley 7, secured at the upper end of the ladder and provided with a hook 8 for elevating the drill-stock to remove the drill-stock and the drill from the well. These parts may be of any well-known or approved construction and of themselves form no part of my invention.

9 denotes the drill-stock, 10 the flexible hose, and 11 denotes the hose-nipple connecting the drill-stock with the hose.

12 denotes a track, which preferably, as shown, consists of an arched piece 13, bolted to the sills 2 and provided with upright parallel pieces 14, which are made with a slight spiral twist and are strengthened by being connected at their upper ends, as shown in Fig. 3.

15 denotes the carriage, which is adapted to reciprocate vertically upon said track and carries the stock-gripping mechanism 16, which in the upward movement of the carriage grips the drill-stock and elevates it a predetermined distance and, owing to the spiral track, imparts to it a slight twisting or turning movement, and when the stock has reached a predetermined altitude the gripping mechanism is automatically released from the stock to permit it and its attached drill to fall with their combined weight. The carriage preferably consists of two plates 15<sup>a</sup> and 15<sup>b</sup>, each of which has parallel ribs 15<sup>c</sup>. These plates are put together with the ribs abutting and bolts 15<sup>d</sup> inserted through said plates and ribs to hold the plates spaced apart, so that they will freely slide upon the track. Each center rib is formed with recesses 15<sup>e</sup>, in which is journaled a fulcrum 15<sup>f</sup> of a lever 16, preferably angular. This lever has at its lower end a beveled toe 16<sup>a</sup>, which projects through a slot 16<sup>b</sup>, formed in the lower end of the plate 15<sup>a</sup>, said toe being normally held in its projected position by a spring 16<sup>c</sup>. This lever, in connection with the jaws 17 and 18, constitute the drill-stock-gripping mechanism. The jaw 17 is secured to a yoke 19 by a set-screw 17<sup>a</sup>, and the yoke is secured to the plate 15<sup>b</sup> of the carriage by bolts 19<sup>a</sup>. The jaw 18 is provided with ears 18<sup>a</sup>, which are pivoted to the upper end of the lever 16. The adjacent faces of these jaws correspond to the shape of the drill-stock.

20 denotes a crank-wheel fixed to the drive-shaft 4, and 21 a pitman pivoted at its upper end to the upper end of the plate 15<sup>a</sup> of the carriage in a position to contact with and depress the toe 16<sup>a</sup> to release the jaw 18 from the drill-stock when the carriage reaches a predetermined altitude.

The operation of the machine is as follows:

Assuming the drill-stock to be at its lowest point and the shaft 4 to be rotating, the rotary movement of this shaft will through its pitman connection with the carriage elevate said carriage, and the jaw 18 being forced against the drill-stock will in connection with the lifting movement of the carriage clamp the drill-stock and cause it to move upward with said carriage. When the carriage reaches a predetermined altitude and the pitman is moving from an inclined to a vertical position, it engages the beveled toe 16<sup>a</sup> of the lever 16 and forces said toe inward, which movement withdraws the jaw 18 from the drill-stock and permits it with its attached drill to fall to its work. After the pitman has reached a vertical position it swings to the other side of a vertical line, and to prevent it from releasing the toe 16<sup>a</sup> I widen said pitman at the point 21<sup>a</sup>, or, in other words, provide it with a lug, so that in the downward movement of the carriage the toe will be held depressed, and thus prevent the jaw 18 from gripping the drill-stock. When the carriage has reached its lowermost position and the pitman has swung from the left to the right of the vertical line drawn centrally through its pivotal point of connection with the carriage, said pitman moves from its engagement with the toe 16<sup>a</sup> and allows the spring to force said toe outward and the jaw 18 into engagement with the drill-stock, thus securely gripping the stock and causing it to move upwardly with the carriage. In its upward movement the carriage is given a slight twist, due to the spiral twist of the track, so that the drill carried at the lower end of the stock will be given the proper twisting action. To prevent the drill from twisting in a reverse direction, which is often the tendency when it strikes hard rock, I connect its stock 9 to the nipple 11 by a pawl-and-ratchet device, as more clearly shown in Figs. 8 and 9, in which A denotes a short piece of pipe coupled to the upper end of the drill-stock and provided at its upper end with an annular collar B, having ratchet-teeth C in its upper edge. D represents a short piece of pipe coupled to the nipple 11 and provided with an annular collar E, below which are pivoted pawls F, which are forced to their work by springs G, secured to the lower face of said collar E. The short pieces of pipe are connected together by a coupling H, which consists of a sleeve fastened to the collar E by set-screws I and having an inwardly-projecting flange J, which projects under the collar B. By this construction and arrangement of parts the drill-stock will be permitted to rotate in one direction and be prevented from rotating in the opposite direction.

From the foregoing description, taken in

connection with the accompanying drawings, the construction and mode of operation of my improved well-drilling machine will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

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

1. In a well-drilling machine, the combination with a vertically-reciprocatory carriage, a drive-shaft, a pitman pivotally connecting the drive-shaft to the carriage, a lever pivoted to the carriage and having one end connected to an element of the gripping mechanism and having its other end projecting within the path of movement of the pitman to be engaged thereby and be depressed to release the gripping mechanism from the drill-stock, substantially as set forth.

2. In a well-drilling machine, the combination with a vertically-reciprocatory carriage, a drive-shaft, a pitman pivotally connecting the drive-shaft to the carriage, a lever pivoted to the carriage and having one end connected to an element of the gripping mechanism, and having its other end projecting within the path of movement of the pitman to be engaged thereby and to be depressed to release the gripping mechanism from the drill-stock, said lever being provided with means for holding the end of the lever with which it coacts in a depressed position until the carriage has moved to its lowest point of descent, and means for actuating the gripping mechanism to grip the drilling-stock simultaneously with the disengagement of the pitman from the end of said lever, substantially as set forth.

3. In a well-drilling machine, the combination with a vertically-reciprocatory, spirally-movable carriage, a drive-shaft, a pitman pivotally connecting the drive-shaft to the carriage, a lever pivoted to the carriage and having one end connected to an element of the gripping mechanism and having its other end projecting within the path of movement of the pitman to be engaged thereby and be depressed to release the gripping mechanism from the drill-stock, substantially as set forth.

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

SAMUEL J. REED.

Witnesses:

J. C. FLOYD,  
R. L. BERRY.