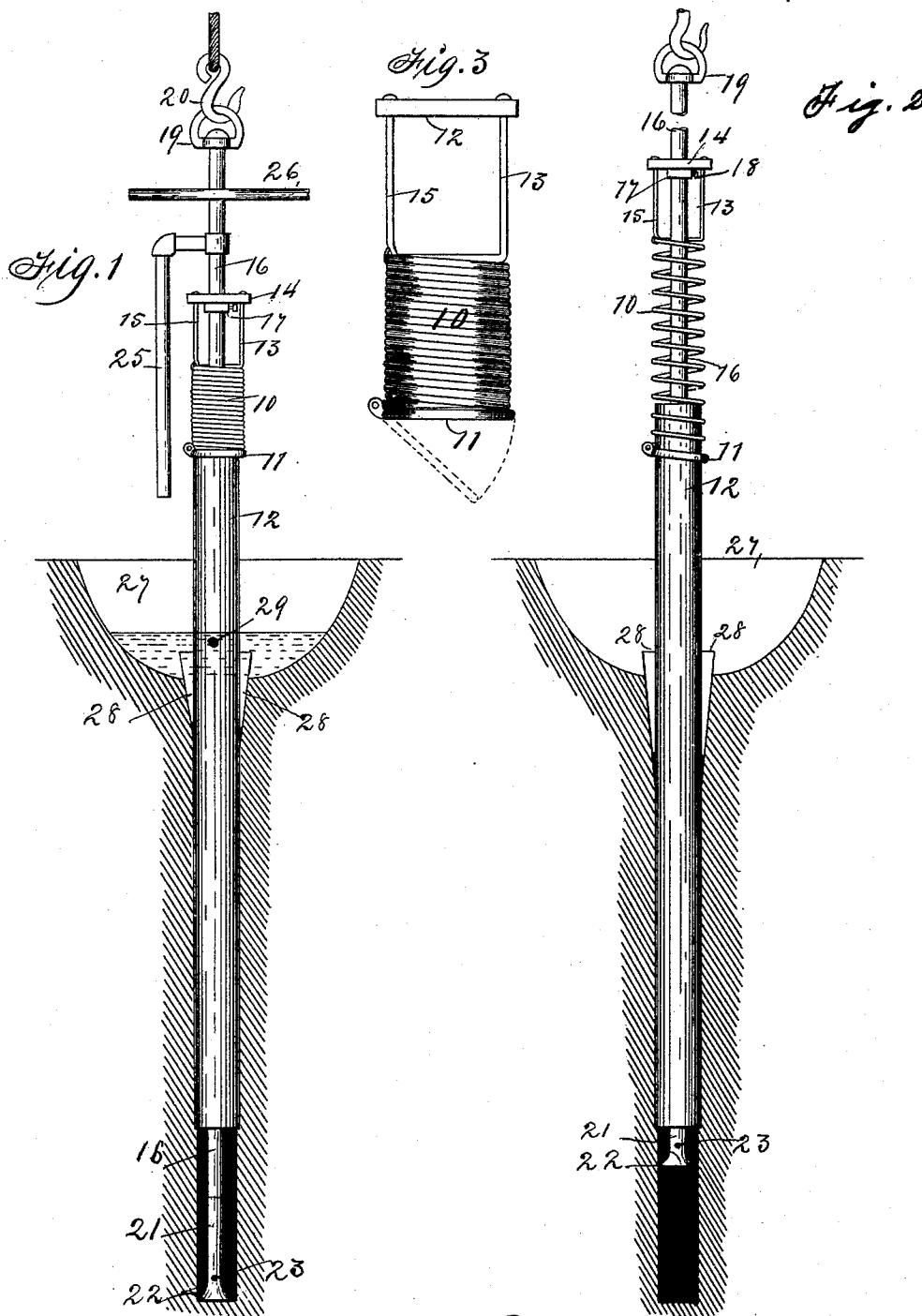


(No Model.)

W. LEWIS.
WELL DRILLING MACHINERY.

No. 489,021.

Patented Jan. 3, 1893.



Witnesses. } Inventor: William Lewis,
W. S. Sankley. }
R. H. Orrig } By Thomas G. Orrig, Attorney

UNITED STATES PATENT OFFICE.

WILLIAM LEWIS, OF DES MOINES, IOWA.

WELL-DRILLING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 489,021, dated January 3, 1893.

Application filed April 26, 1892. Serial No. 430,789. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LEWIS, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented certain new and useful Improvements in Well-Drilling Machinery, of which the following is a specification.

The object of my invention is to provide improved means for drilling wells or other small vertical openings in the earth, the means and mechanism employed being cheap in point of construction, convenient and effective in operation.

My invention consists in the combination with a well casing and a drill mounted therein, of a retractile spring, one end of which spring is connected to the drill rod, the remaining end of said spring being automatically attached to the well casing.

My invention consists further in the construction arrangement and combination of parts, hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which;

Figure 1 is a vertical elevation showing my complete device in the position assumed after a blow is struck by the drill. Fig. 2 is an elevation showing my complete device in the position assumed before a blow is struck with the drill. Fig. 3 is a detail view showing my device detached from the drill and casing.

In the construction of the device as shown, the numeral 10 designates a spiral spring of great force, to the lower coil of which a clutch collar or band of metal 11 is hinged. The clutch collar 11 is of greater inside diameter than the outside diameter of the well casing 12, about which casing said collar is adapted to be mounted. The end of the upper coil 13 of the spring 10 is turned upward and secured to a yoke bar 14, the other end of which yoke bar is connected to the upper end of a rod 15, the remaining end of which rod is attached to the coil 13 opposite to the upwardly extending portion thereof. The yoke bar 14 is apertured at its center and the tubular drill rod 16 passes through said aperture. A collar 17 is mounted on the drill rod 16 below the yoke bar 14, and is adjustably secured thereto by means of a set screw 18. A swivel 19 is secured on the upper end of the drill rod 16,

and a hook 20 is mounted therein, which hook is connected to mechanism (not shown) by means of which a vertical reciprocating motion is imparted to the drill rod. A tubular drill shank 21, carrying a drill 22 on its lower end, is secured to the lower end of the drill rod 16, and a perforation 23 is formed in said drill shank at a point adjacent to the said drill, through which water may escape into the well 24 during the process of drilling. A feed pipe 25 is secured to and has communication with the drill rod 16 at a point above the yoke bar 14, through which pipe water is introduced into the drill rod 16. A cross-head 26 is secured to the drill rod 16 at a point above the pipe 25, by means of which cross-head a rotary movement is manually applied to the drill rod as required to turn the drill. An excavation 27 is formed about the mouth of the well being drilled, which excavation is partially filled with water at all times. Wedges 28 interposed between the casing 12 and the earth at the mouth of the well, prevent the said casing from accidentally sinking into said well. A perforation 29 is formed in the casing 12 at a point within the excavation 27, through which perforation water may enter the casing from the excavation and flow into the well.

In the practical use of my invention, vertical reciprocatory motion is applied to the drill rod 16 to elevate said rod, and the collar 17 on said drill rod acts upon and lifts the yoke bar 14, thus expanding the spring 10 and storing power therein, the lower end of said spring being held stationary by the clutch collar 11 gripping the casing 12 in the manner illustrated in Fig. 2, the said collar being in a somewhat inclined position and binding on said casing. When the power applied to elevate the drill rod is relaxed, the resilience of the spring 10 exerted upon the drill rod through the medium of the collar 17 will drive the drill downward with great force, and in so doing the clutch collar 11 will fall a short distance on the casing 12 and secure a new grip thereon upon the next elevation of the drill rod. These movements are indefinitely repeated until the well is drilled to the desired depth, a rotary motion being applied to the drill rod after each stroke by power manually applied to the cross-head 26.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States therefor, is;

5 1. In well drilling machinery, the combination with the drill rod and mechanism for elevating the same, of a bar adjustably secured to said drill rod, a spiral spring secured to said bar, a collar hinged to the lower end of
10 said spiral spring, and a well casing about which said collar is mounted, said collar being adapted to clutch said casing in the upward movement of the drill rod.

15 2. In well drilling machinery, the combination with a drill rod and mechanism for elevating the same, of a spiral spring mounted upon said drill rod, the upper end of which spring is connected with said drill rod, and clutch mechanism secured to the lower end of
20 said spring and acting upon the well casing.

25 3. In well drilling machinery, the combination with a drill rod, a casing inclosing said drill rod, and mechanism for elevating said drill rod, of a spiral spring mounted upon said drill rod, a yoke formed on the upper end of

said spring and connected with said drill rod, and a clutch collar hinged to the lower end of said spring and adapted to automatically engage the well casing.

4. In well drilling machinery, the combination with a tubular drill and mechanism for elevating the same, of a tubular casing surrounding said drill and projecting above the surface of the ground, a spiral retractile spring mounted about the drill rod, a yoke bar
35 secured to the upper end of said spring and surrounding the drill rod, a collar adjustably secured upon said drill rod beneath said yoke bar, and a collar hinged to the lower end of
40 said spring and encircling the casing, the diameter of said collar being materially greater than the outside diameter of said casing.

In testimony whereof I hereunto have set my hand, this 2d day of April, A. D. 1892, in
45 the presence of two witnesses.

WILLIAM LEWIS.

In presence of—

C. P. RITCHHART,
THOMAS G. ORWIG.