(No Model.)

J. C. GODWIN.

DRILL.

No. 385,111. Patented June 26, 1888.

Fig. 1

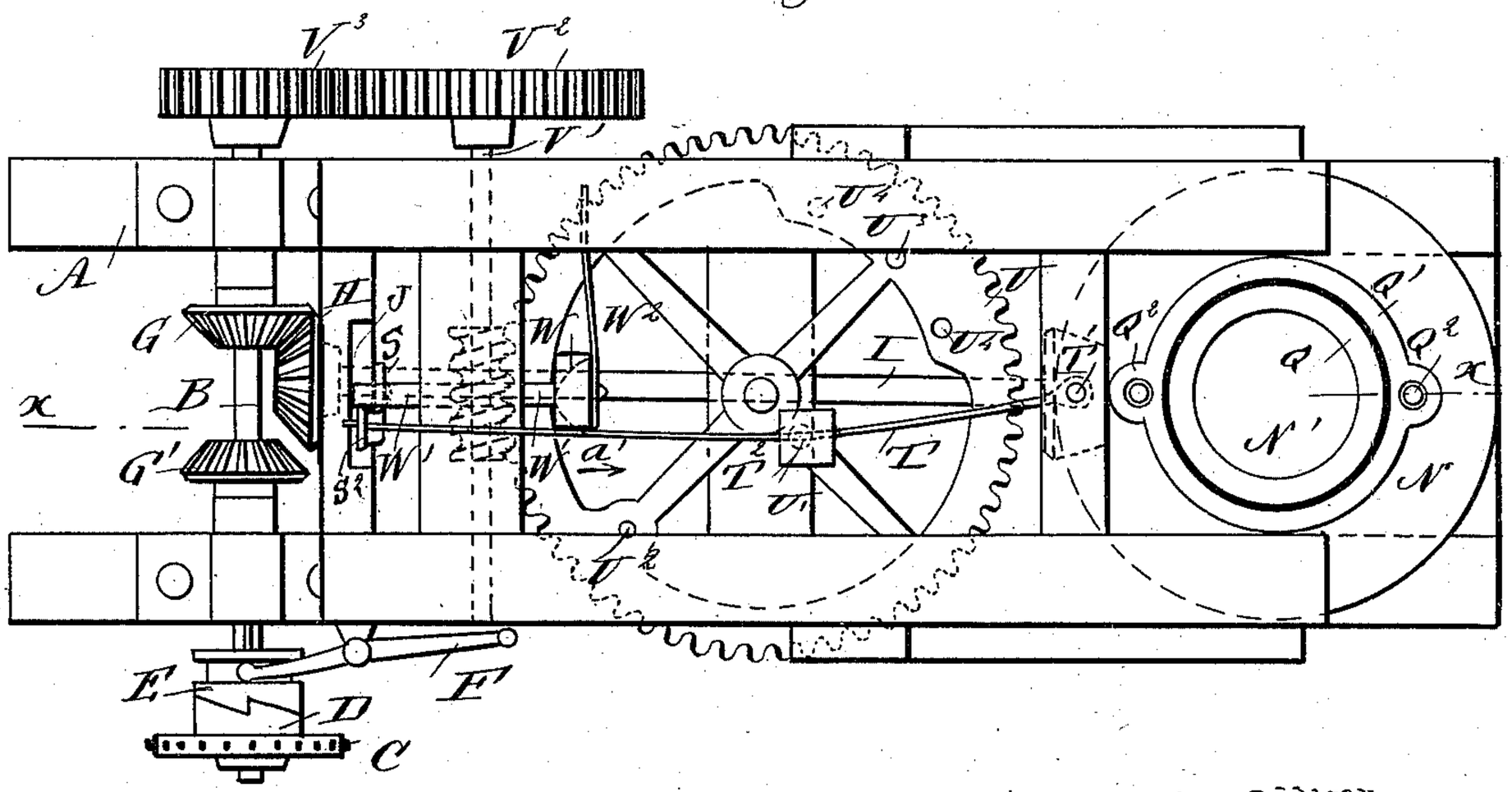

Fig. 2

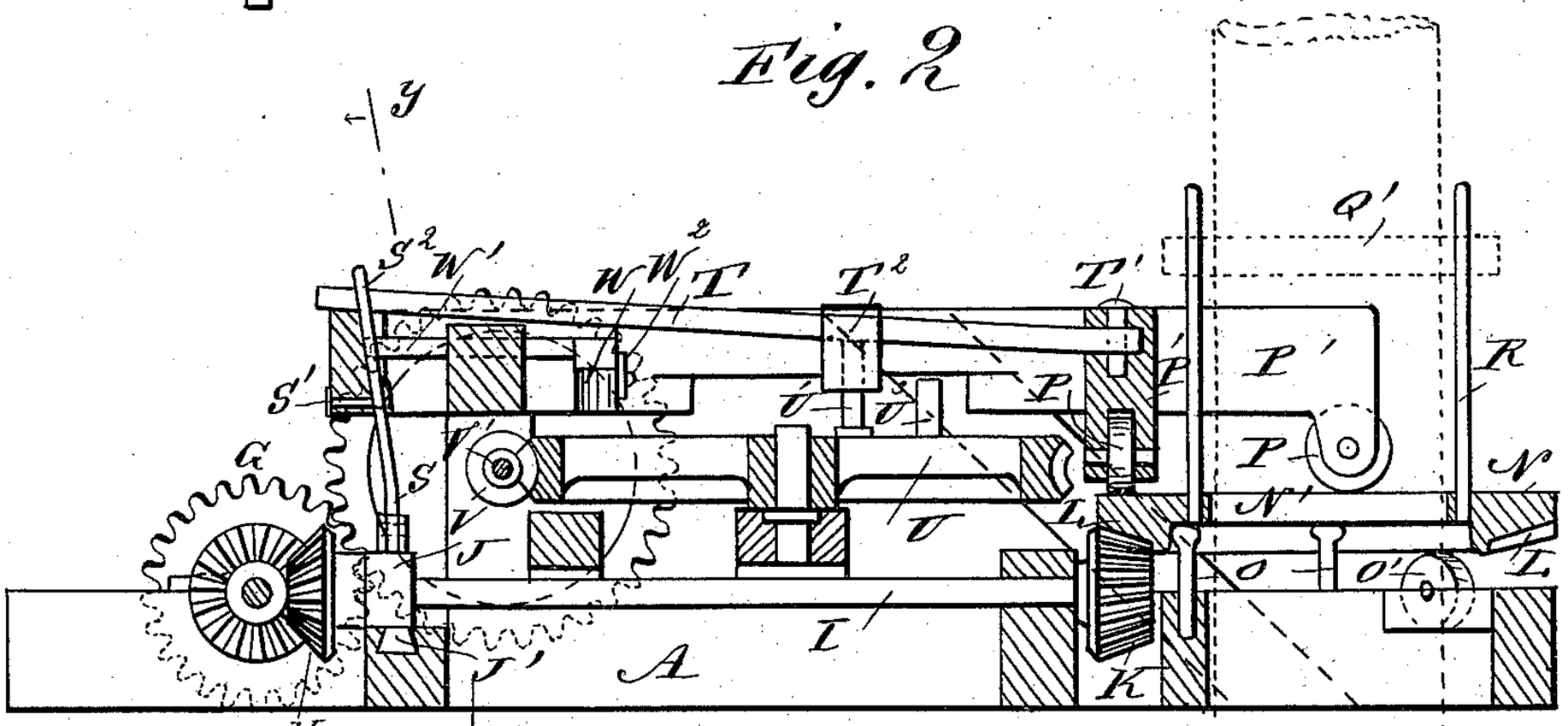

Fig. 3

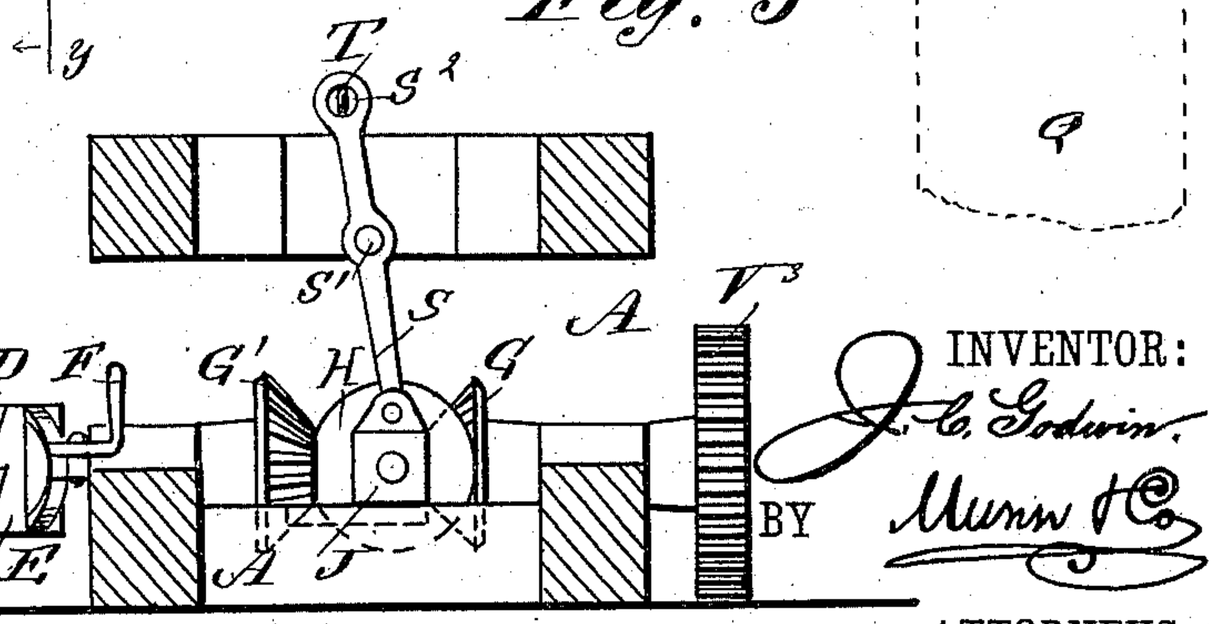

Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN C. GODWIN, OF ROYSE CITY, TEXAS.

DRILL.

SPECIFICATION forming part of Letters Patent No. 385,111, dated June 26, 1888.

Application filed November 11, 1887. Serial No. 253,963. (No model.)

To all whom it may concern:

Be it known that I, JOHN CALHOON GODWIN, of Royse City, in the county of Rockwall and State of Texas, have invented a new and Improved Drill, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved drill specially adapted for turning the drill-tool for boring Artesian wells and for prospecting purposes.

The invention consists of a disk connected with the drilling-tool and having a forward and backward turning motion imparted by an especial mechanism.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

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

Figure 1 is a plan view of my improvement. Fig. 2 is a sectional side elevation of the same on the line *x x* of Fig. 1, and Fig. 3 is a vertical cross-section of the same on the line *y y* of Fig. 2.

On a suitably-constructed frame, A, is mounted a driving-shaft, B, on which turns loosely a sprocket wheel or pulley, C, connected with a suitable mechanism for imparting motion to the said wheel C. On the hub of the latter is formed a clutch, D, adapted to be engaged by a clutch, E, mounted to slide on and turn with the main shaft B, and also connected with a lever, F, for moving said clutch E in and out of contact with said clutch D, so that the motion imparted to the wheel C is transmitted to the main shaft B or interrupted whenever desired.

On the main shaft B are secured two bevel gear-wheels, G and G′, between which is held a bevel gear-wheel, H, adapted to be thrown in mesh alternately with said gear-wheels G and G′. The bevel gear-wheel H is secured to one end of a shaft, I, having its bearing near the said gear-wheel H in a sidewise-sliding box, J, provided with a dovetail, J′, fitting in a corresponding groove formed on the main frame A. The other end of the shaft I is provided with a bevel-pinion, K, meshing into a bevel gear-wheel, L, formed on the under side of a disk, N, provided in its center with an opening, N′, for the admission of the drill-tool Q, and the said disk N is supported at its under side by studs O, secured to the main frame A, and by friction-rollers O′, mounted to rotate on the said main frame A. The upward movement of the disk N is prevented by friction-wheels P, engaging the top of the said disk N, said friction-wheels P being mounted in arms or brackets P′, extending from the main frame A.

The drilling-tool Q, which passes through the opening N′ of the disk N, is provided with a clamp, Q′, having apertures Q^2, through which pass the rods or pins R, secured to the disk N and extending upward, as illustrated in Fig. 2. The pins R permit an up-and-down movement of the drilling-tool Q, but prevent a turning movement of the tool Q, unless such movement is imparted by said pins R.

To the sliding box J of the shaft I is pivotally secured one end of a lever, S, fulcrumed at S′ to the main frame A, and provided at its upper outer end with an aperture, S^2, through which passes loosely a spring-bar, T, fulcrumed at T′ to the main frame A. On the spring-bar T is held to slide a block, T^2, engaging a pin, U′, secured to one of the spokes of a worm-wheel, U, mounted to rotate horizontally on a suitable stud secured to the main frame A. The worm-wheel U meshes into a worm, V, secured to a shaft, V′, mounted transversely in suitable bearings on the main frame A, and carrying on its outer end a gear-wheel, V^2, meshing into a gear-wheel, V^3, secured to the main shaft B.

On the top of the worm-wheel U are secured the pins U^2 and U^3, placed diametrically opposite each other and at right angles to the pin U′, engaging the sliding block T^2. The pin U^3 can be placed out of the diametrical line with the pin U^2 and inserted in one of the apertures U^4, formed in the worm-wheel U at each side of the diametrical aperture containing the pin U^3, as illustrated in the drawings. The pins U^2 and U^3 are adapted to engage alternately inclines formed on the under side of a block, W, fastened on one end of a bar, W′, adapted to slide longitudinally in a suitable bearing formed on the main frame A.

The outer free end of said bar W′ is adapted to engage one edge of the lever S, so as to lock the latter in position. A spring, W^2, is secured to the main frame A, and its free end presses against the said block W, so as to hold the bar W′ in an inward position—that is, in contact with one edge of the lever S.

The operation is as follows: A rotary motion is imparted to the main shaft B, as above described, whereby the gear-wheel V^3, meshing into the gear-wheel V^2, imparts a similar rotary motion to the shaft V′, so that the latter, by the worm V meshing into the worm-wheel U, imparts a rotary motion to the latter. The bevel gear-wheel H is in mesh with one of the bevel gear-wheels G or G′, and is held in mesh by the lever S moving the sliding box J to one side, so that while one gear-wheel, G, is connected with the gear-wheel H the other gear-wheel, G′, is disconnected, as shown in Fig. 1. The rotary motion of the shaft B is thus transmitted to the shaft I, and the latter imparts, by the pinion K, a rotary motion to the gear-wheel L, formed on the disk N, so that the latter, by its pins R, turns the drill-tool Q. The position of the sliding box J is changed, however, as soon as the worm-wheel U makes a half-revolution—that is, when one of the pins U^2 or U^3 engages the inclines of the block W, so as to pull the said block, with its bar W′, longitudinally inward in the direction of the arrow *a′*, so that the bar W′ disengages the lever S, and the latter is moved by the action of the spring-bar T in an opposite direction, so that the box J slides to the opposite side, and the bevel gear-wheel H is thus thrown out of contact with the bevel gear-wheel G and thrown in contact with the bevel gear-wheel G′. The rotary motion of the shaft I is thus reversed, as the said gear-wheel H is rotated in the opposite direction by the gear-wheel G′, which engages said gear-wheel H on the side from the gear-wheel G. The pin U′, carrying the sliding block T^2, imparts the necessary tension to the spring-bar T on account of being placed at right angles to the diametrical line in which the pins U^2 and U^3 are placed, so that on the rotation of the worm-wheel U the block T^2 travels to both sides of the longitudinal center line of the machine, whereby the tension of the spring-bar T is first to one side and then to the other side, so that the pressure exerted by the spring-bar T against the lever S causes the box J to slide first to one side and then to the other, thus throwing the gear-wheel H alternately in contact with the gear-wheels G and G′. The motion of the shaft I being reversed, as above described, also reverses the turning motion of the disk N, so that the drilling-tool Q, connected by the pins R and the clamp Q′ with said disk N, is turned forward and backward, thus changing the line of the cutting-edge of the drilling-tool in the bottom of the hole to be bored. An up-and-down motion is imparted to the drilling-tool Q in the usual manner, the pins R and the clamp Q′ permitting said motion.

The turning motion of the disk N can be increased or diminished in extent by inserting the pin U^3 into one of the apertures U^4, so that the pins U^3 and U^2 are not opposite each other, and the moving of the block W be accomplished after more or less than half a revolution of the worm-wheel U. The spring W^2 always forces the block W and its bar W′ in the inverse direction of the arrow *a′* whenever the respective pin U^2 or U^3 is disengaged from said block.

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

1. In a drill, a centrally-apertured drill-operating disk provided with pins projecting parallel with its axis for engaging the drill and directly rotating it, substantially as set forth.

2. In a drill, a centrally-apertured drill-operating disk provided with pins projecting parallel with its axis, in combination with a drill clamp or collar having apertures through which said pins freely pass, substantially as set forth.

3. In a drill, a disk having a forward and backward motion and provided with a central aperture, through which passes a drill-tool, in combination with pins secured to said disk and a clamp fastened to the drill-tool and having apertures through which pass said pins, so that the drill-tool can be moved freely up and down, but is turned forward and backward by the said disk, substantially as shown and described.

4. In a drill, a disk provided with pins and engaging a clamp secured to the drilling-tool, in combination with a gear-wheel formed on said disk, a pinion meshing into said gear-wheel, a shaft carrying said pinion, and a second pinion fastened on the said shaft and engaging alternately gear-wheels on its sides, so as to rotate said shaft in opposite directions, substantially as shown and described.

5. In a drill, the combination, with the main shaft carrying two bevel gear-wheels, of a shaft carrying a bevel gear-wheel adapted to be connected alternately with the two bevel gear-wheels on said main shaft, a pinion secured on the said shaft, and a disk provided with a bevel gear-wheel meshing in the said pinion, said disk being connected with the drilling-tool, so that the latter can move freely up and down, but is turned by the said disk, substantially as shown and described.

6. In a drill, the combination, with a main shaft carrying two bevel gear-wheels, of a shaft carrying a bevel gear-wheel held between said two bevel gear-wheels on the main shaft, a box adapted to slide and in which said shaft is mounted, a lever pivotally connected with said box, a spring-bar connected with said lever, and a block held to slide on said spring-bar and having a rotary motion, substantially as shown and described.

7. In a drill, the combination, with a main shaft carrying two bevel gear-wheels, of a shaft carrying a bevel gear-wheel adapted to be en-

gaged alternately by the said bevel gear-wheels on the main shaft, a sliding box in which the said shaft is mounted, a lever pivotally connected with said box, a spring-bar connected with said lever, a block sliding on said spring-bar, and a worm-wheel receiving its rotary motion from the main shaft and carrying a pin engaging said block, substantially as shown and described.

8. In a drill, the combination, with a main shaft carrying two bevel gear-wheels, of a shaft carrying a bevel gear-wheel adapted to be engaged alternately by said bevel gear-wheels on the main shaft, a sliding box in which said shaft is mounted, a lever pivotally connected with said box, a spring-bar connected with said lever, a block sliding on said spring-bar, and a worm-wheel receiving its rotary motion from the main shaft and carrying a pin engaging said block, and a bar for locking said lever in position, substantially as shown and described.

9. In a drill, the combination, with a main shaft carrying two bevel gear-wheels, of a shaft provided with a bevel gear-wheel adapted to engage alternately said bevel gear-wheels on the main shaft, a box adapted to slide and in which said shaft is mounted, a lever pivotally connected with said box, a spring-bar connected with said lever, a block adapted to slide on said spring-bar, a worm-wheel carrying a pin engaging said sliding block, said worm-wheel being operated from the main shaft, pins held on said worm-wheel, a block having inclines and engaged by said pins, and a bar connected with said block and adapted to lock said lever in position, substantially as shown and described.

JOHN C. GODWIN.

Witnesses:
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