(No Model.)

J. GARDNER.

WELL DRILLING APPARATUS.

No. 313,821. Patented Mar. 10, 1885.

Fig. 1.

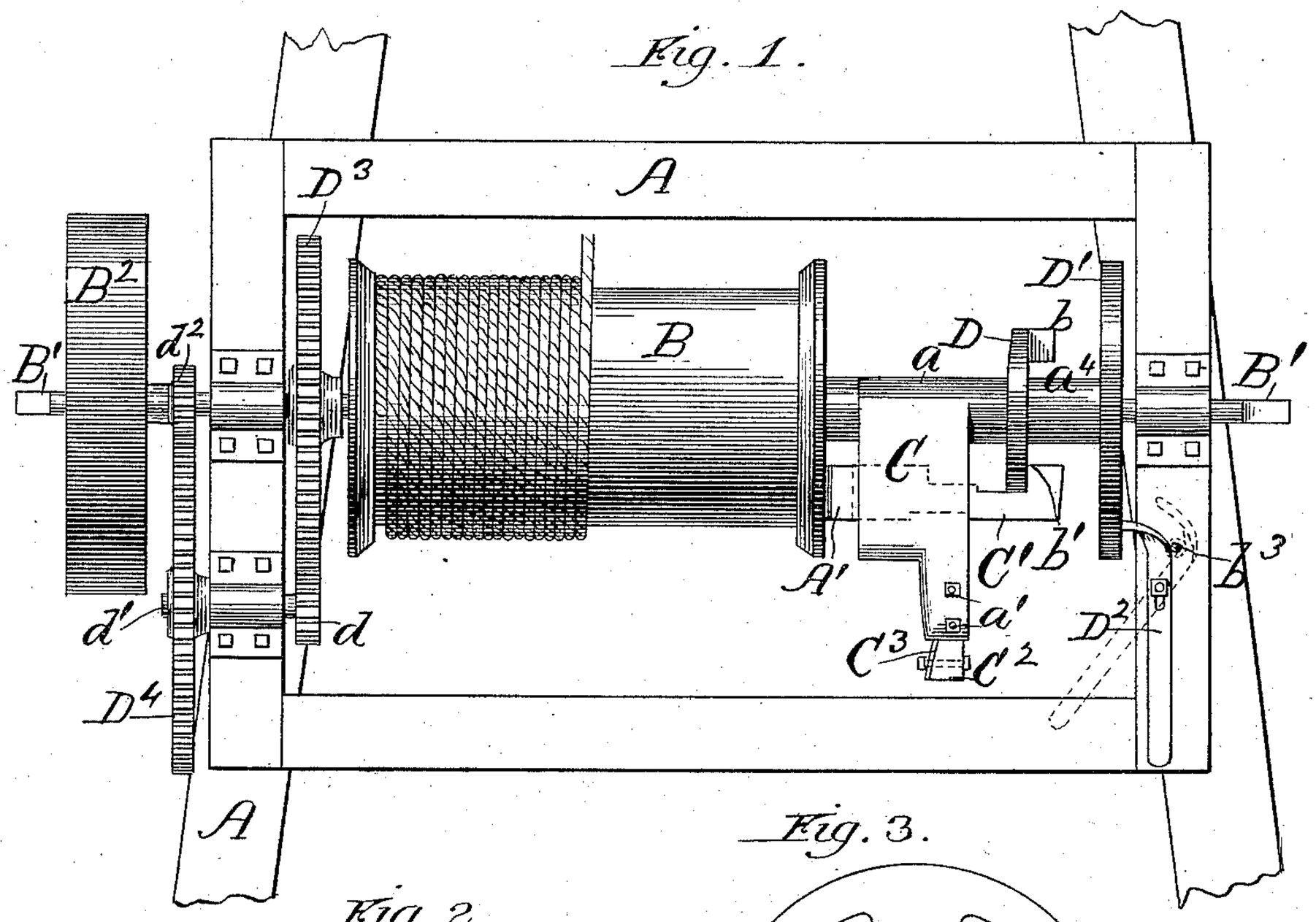


Fig. 2.

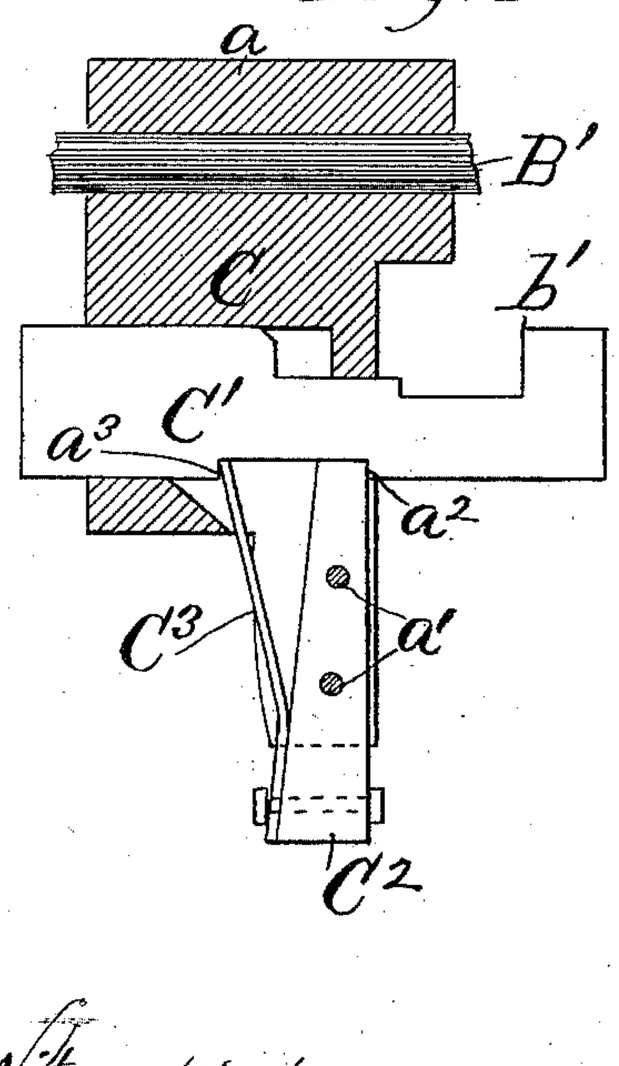


Fig. 3.

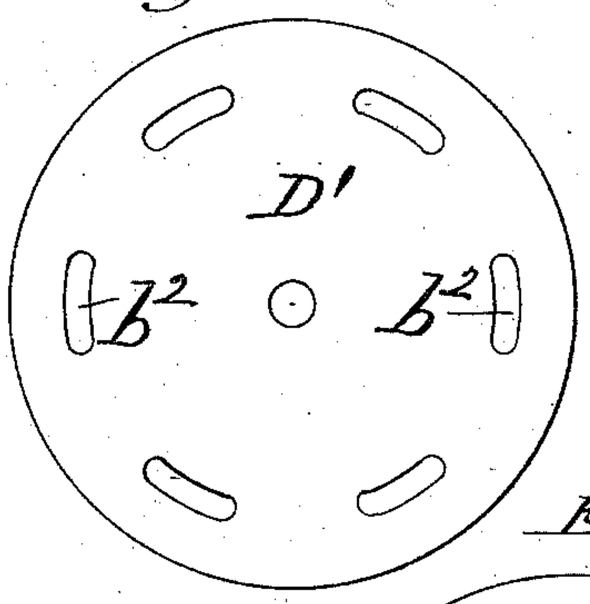


Fig. 4.

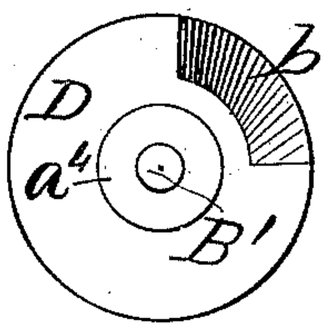
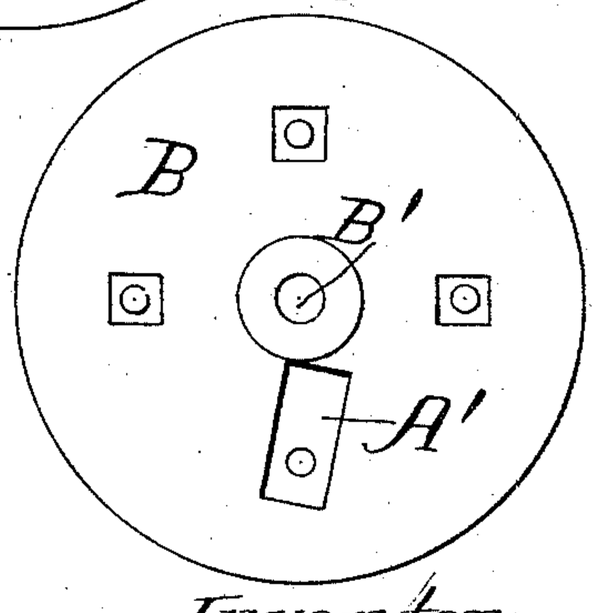


Fig. 5.



Witnesses:
Frank L. Blanchard
V. S. Tannecog.

Inventor:
John Gardner.
By L. B. Coupland & Co
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN GARDNER, OF BLOOMINGDALE, ILLINOIS, ASSIGNOR OF ONE-HALF TO RODGER RYAN, OF SAME PLACE.

WELL-DRILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 313,821, dated March 10, 1885.

Application filed November 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN GARDNER, of Bloomingdale, in the county of Du Page and State of Illinois, have invented certain new and useful Improvements in a Well-Drilling Apparatus, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of this invention is to provide means for preventing the back jar on the mechanism incident to the sudden stop in dropping the drill and also for regulating and adjusting the drop of the drill; and it consists of certain novel features in the construction, combination, and operation of parts, as will be hereinafter more fully set forth and claimed.

Figure 1 is a side elevation of the parts of a well-drilling apparatus embodying my improved features. Fig. 2 is a detached sectional view of the arm carrying the dog, and also shows the spring which serves the purpose of returning the dog to a normal position. Fig. 3 shows the outer side of the adjusting disk-wheel; Fig. 4, a side elevation of a cam-wheel, and Fig. 5 a view of the inside end of the winding-drum.

Referring to the drawings, A represents the different parts of the supporting frame-work; B, the winding-drum; B′, the main shaft, and B^2 the fly-wheel mounted loosely on the same. The winding-drum B is loose on the shaft B′, and is provided on the inner flanged end with the projecting catch A′. (Shown in Figs. 1 and 5.) The rotating arm C is provided with the sleeve *a*, and is rigidly mounted on the shaft B′. This arm is of the form shown in Fig. 1, and is provided with an opening for the insertion of the dog C′, which is adapted to have a longitudinal movement therein. The post C^2 is inserted from the outer end of this arm, and is rigidly secured in relation thereto by means of the bolts *a*′. The inner end of this post is set into the cut-out edge of the dog C′, as shown in Fig. 2, and when the dog is in a normal position the shoulder a^2 bears against the inner end of said post. The outer end of the flat spring C^3 is bolted to the post C^2, while the inner loose end is adapted to engage with the shoulder a^3 on the dog C′.

The cam-wheel D and the disk-wheel D′ are connected by means of the sleeve a^4, which is mounted loosely on the shaft B′. The cam-wheel D is provided on one side with the rising step *b*, which is adapted to intermittingly engage with the shoulder *b*′ on the outer end of the dog C′, and cause an endwise movement of the same, the spring C^3 returning the dog to its normal position when released from contact with the step *b* on the cam-wheel. The disk-wheel D′ is provided with a number of elongated apertures, b^2, arranged at intervals in the circumference of the same, as shown in Fig. 3 of the drawings. The locking-lever D^2 is pivoted to the frame, the curved end being adapted to engage with the apertures in the disk-wheel, for the purpose of locking the same and the cam-wheel against a rotary movement when drilling.

The dotted lines indicate the position of the locking-lever during the time of raising or lowering the tools, the disk and cam-wheel rotating with the shaft. The pin b^3 serves to secure the locking-lever in either position to which it is capable of being adjusted. When the shaft B′ is set in motion, the arm C turns around until the inner projecting end of the dog C′ comes in contact with the catch A′, which causes the winding-drum to rotate and raise the drill until the step *b* on the cam-wheel engages with and forces the dog C′ endwise and far enough to release the same from engagement with the catch A′ on the end of the winding-drum. The drill then drops and the spring C^3 throws the dog C′ back into position to engage again with the catch on the winding-drum. The drop of the drill is regulated by adjusting the disk-wheel to different positions, so as to bring the step on the cam-wheel nearer to or farther away from the catch A′ in a circular plane. The gear-wheel D^3 is rigidly mounted on the shaft B′, and engages with the pinion *d* on the shaft *d*′, the gear-wheel D^4 being mounted on the opposite end of the same shaft and engaging with the pinion d^2 on the main shaft. The latter pinion is formed on the same hub with the fly-wheel, and both are loose in position on the main shaft B′. By this arrangement the back jar incident to the intermittent action of the drill and winding-drum is in a great measure prevented, as the fly-wheel, being loose on the shaft, is caused to continue its forward movement.

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

1. The combination, with the winding-drum B, provided on the inner end with the catch A′, of the rotating arm C, the dog C′, and the cam-wheel D, substantially as and for the purpose set forth.

2. The combination, with the rotating arm C, of the dog C′, the post C^2, and the spring C^3, substantially as and for the purpose set forth.

3. The combination, with the cam-wheel D, of the disk-wheel D′, provided with a number of apertures, b^2, and the locking-lever D^2, substantially as set forth.

4. In a well-drilling apparatus, the combination, with the gear-wheel D^3, rigidly mounted on the shaft B′, of the pinion d, the shaft d', the gear-wheel D^4, the pinion d^2, and the fly-wheel B^2, the two latter being loosely mounted on the main shaft B′, substantially as and for the purpose set forth.

JOHN GARDNER.

Witnesses:
J. I. DONALSON,
R. RYAN.