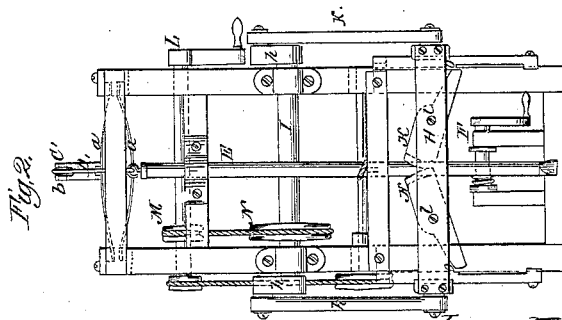
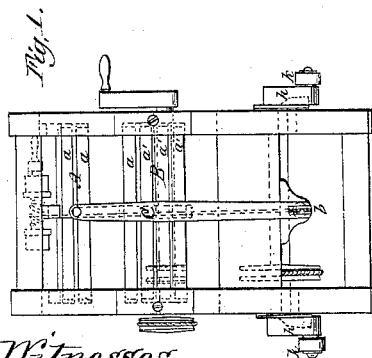
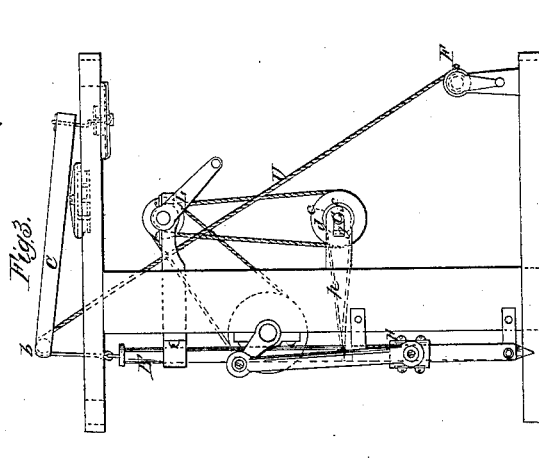
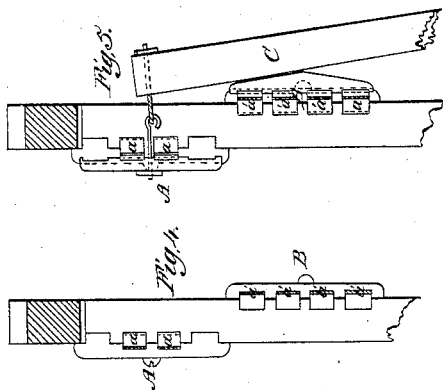
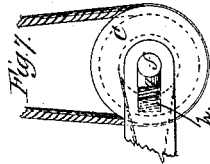
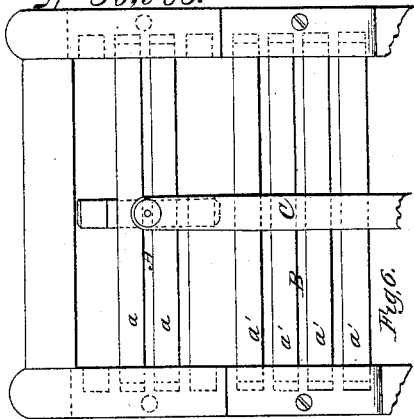


*J. Button,  
Boring Artesian Wells.*

*Patented Nov. 14, 1865.*

*N<sup>o</sup> 50,985.*



*Witnesses:  
H. D. Stevens,  
Joseph Brown*

*Inventor:  
Jesse Button  
by his attorney  
J. B. Gardiner*

# UNITED STATES PATENT OFFICE.

JESSE BUTTON, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND RICHARD F. HAWKINS, OF SAME PLACE.

## IMPROVED DRILLING-MACHINE.

Specification forming part of Letters Patent No. 50,985, dated November 14, 1865.

*To all whom it may concern:*

Be it known that I, JESSE BUTTON, of Springfield, Hampden county, Commonwealth of Massachusetts, have invented certain Improvements in Drilling-Machines for Artesian Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to letters of reference marked thereon.

In the drawings, Figure 1 is a plan view of my improved machine; Fig. 2, a front view, and Fig. 3 a side view of the same. Figs. 6, 4, and 5 are detail views, showing the arrangement of the spring-lightener; and Fig. 7 is a detail view, showing the automatic feed-motion.

This invention consists in applying to a drilling-machine of the kind above mentioned two improvements—viz., a lightener, formed by means of a peculiar spring, to be hereinafter described, and an automatic feed for giving a partial rotation to the drill at each stroke.

I will first describe the construction of the lightener. It consists of two springs, A B, of peculiar construction, each consisting of a number of leaves, *a a* and *a' a'*, and a beam, C, which is attached to the under side of the spring A and passes over the spring B. A rope, D, which is attached to the drill E, passes over a sheave or pulley, *b*, in the end of this beam and is fastened to the windlass F.

The automatic feed consists of a shaft, G, driven from the main shaft by the pulley *c*. This shaft has a pulley, *d*, over which a belt, *p*, passes, which passes around the shaft or drill E. On the end *f* of the shaft is a block, *g*, which is pressed up against the shaft by the spring *h*, so that when the belt is moved up and down with the shaft it may be always tight upon the same.

The general arrangement for working the drill is used on numerous other machines, and consists of a cross-head, H, moved up and down by the cranks *h h* on the shaft I, by means of the connections *k k*. In this cross-head are hung on the centers *l l* two pieces, K K.

The operation of this machine I will now describe.

Power being applied to the main shaft at L, it drives, by means of the pulleys M N, the shaft I. This shaft works the cross-head up and down, as before mentioned. As the cross-head moves down the levers K K slip

along the shaft or drill E without moving it, but when they begin to move up the friction on the shaft forces the ends *m m* of these levers downward, causing them to bind on the drill-shaft, and thus raise it up when it has reached a certain height, which is adjustable. The other ends, *n n*, of these levers K K strike projections O O, thus releasing the drill-shaft and allowing it to drop. Now, as the length of the drill-shaft E must increase as the depth increases, it will be seen that the weight which drops must increase as the well gets deeper, and soon it becomes inconveniently heavy, and if carried to a great depth the heavy weight injures the drill, and often causes breakage of this and other parts of the machine. To obviate this I attach my spring-lightener, constructed as I before described it, my springs *a a*, &c., being usually made of some hard wood. I commence by putting one leaf *a* into each spring A B, and gradually increase the number as the well goes deeper. In this way it will be seen that most of the weight is borne by the spring, and by turning the windlass I can increase or diminish the tension, and thus regulate the blow, and by putting in a sufficient number of leaves I can make a spring sufficiently strong to bear up any weight.

The operation of my feed is simply, by means of the spring *h*, to keep the belt *p* always tight around the shaft as it moves up and down, so that when it is released to drop it may give it a partial turn or rotation.

The principal advantage which I claim for this machine over others is that by means of the lightener before described I am able to drill quicker, deeper, and better than any other machine, while it is not liable to get out of order and is cheaply built.

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

1. The lightener consisting of the combination of the springs A B and beam C with the drill-shaft E, substantially in the manner and for the purpose described.

2. The automatic feed-motion, when constructed and applied to a drilling-machine in the manner and for the purpose herein set forth.

JESSE BUTTON.

Witnesses:

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M. DARWIN DREW.