

No. 642,965.

Patented Feb. 6, 1900.

L. M. DAVIS.
DRILLING MACHINE.

(Application filed Mar. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.

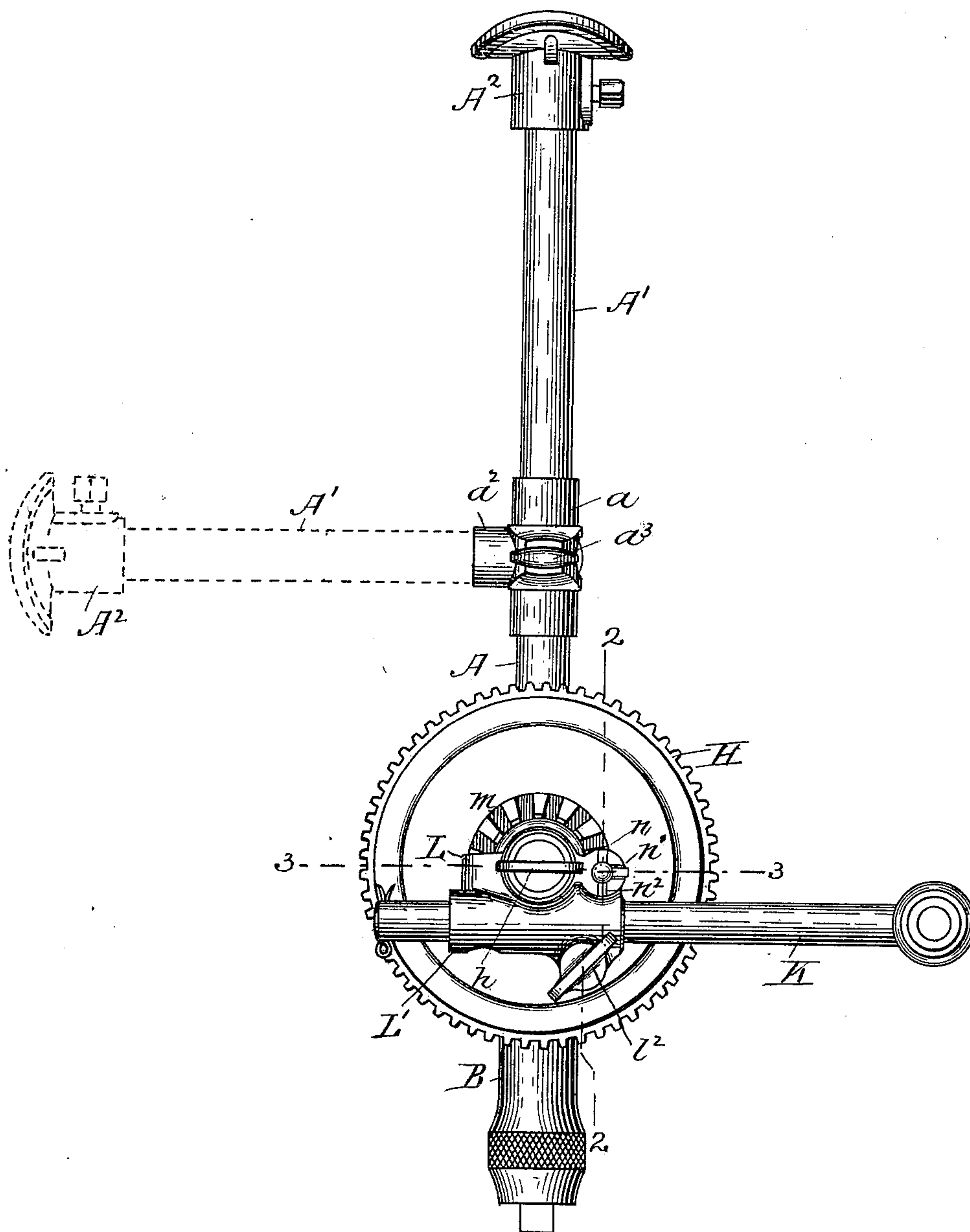


Fig. 1.

WITNESSES

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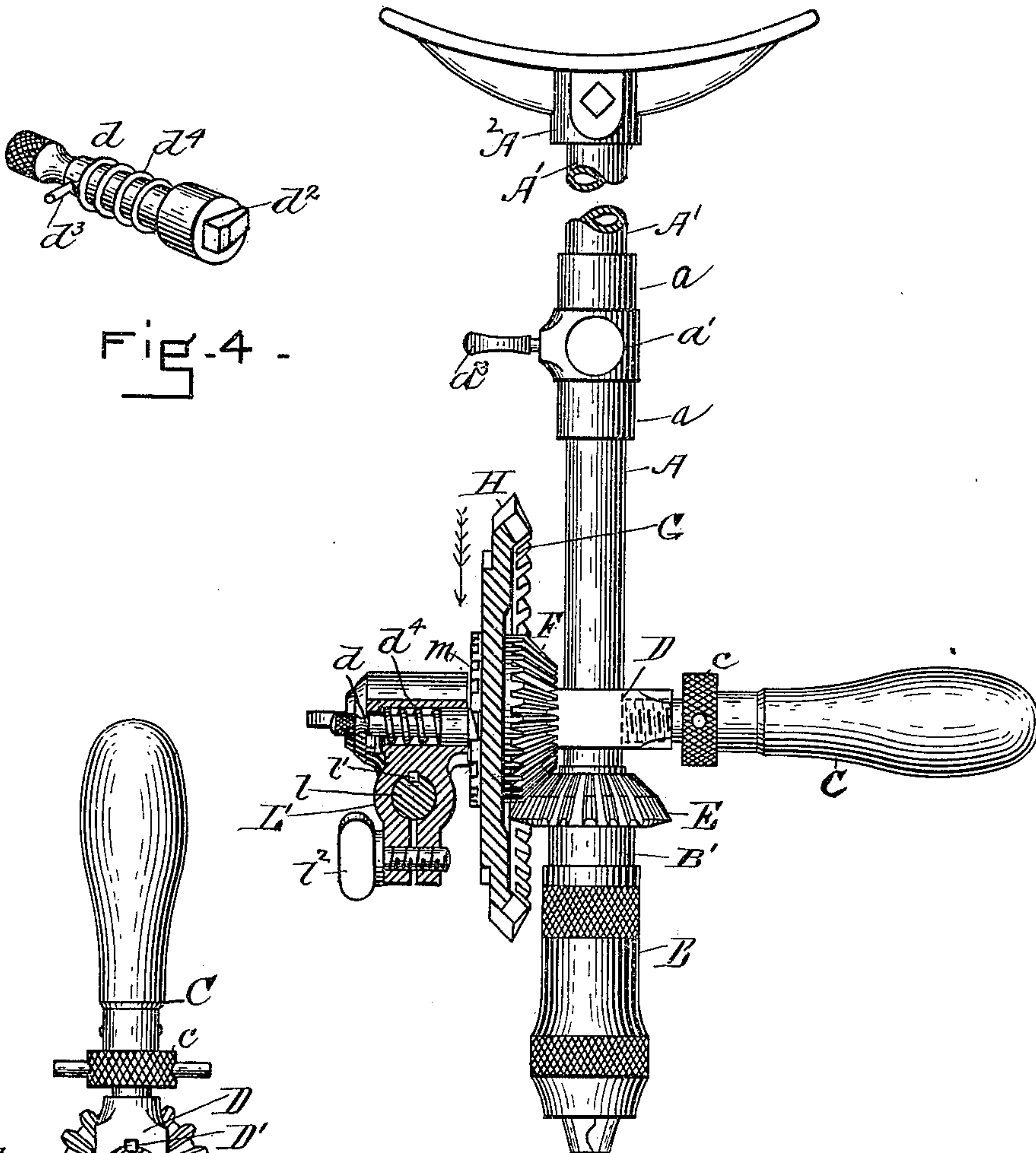


Fig. 4.

Fig. 2.

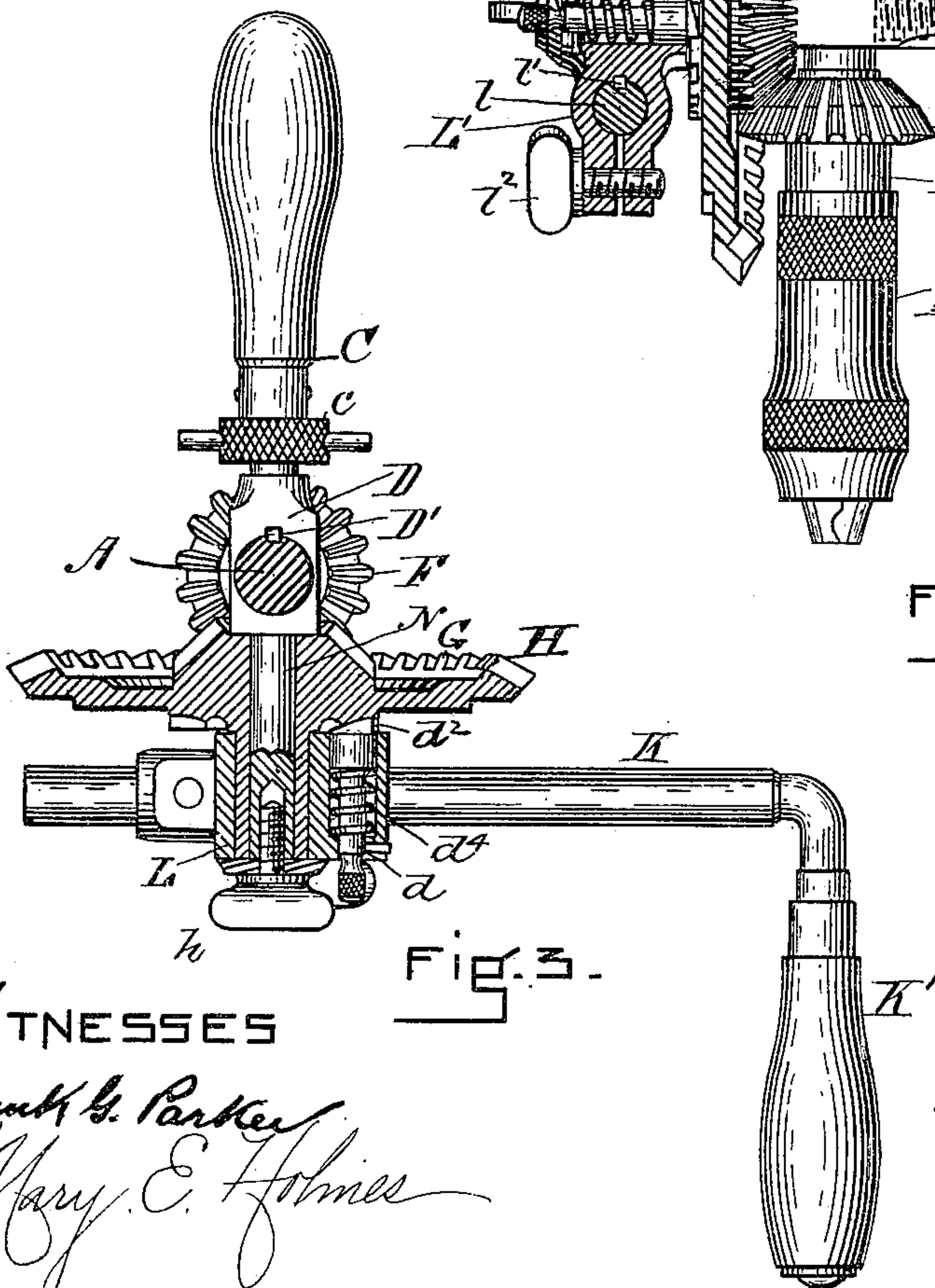


Fig. 3.

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UNITED STATES PATENT OFFICE.

LEONARD M. DAVIS, OF MILLER'S FALLS, MASSACHUSETTS, ASSIGNOR TO
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DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 642,965, dated February 6, 1900.

Application filed March 20, 1899. Serial No. 709,730. (No model.)

To all whom it may concern:

Be it known that I, LEONARD M. DAVIS, of Miller's Falls, in the town of Erving, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a specification.

My present invention relates to that class of mechanics' tools called "breast-drills."

In the drawings, Figure 1 is an elevation of the drill. Fig. 2 is an elevation, partly in section, on the line 2 2 of Fig. 1. Fig. 3 is a view, partly in section, on the line 3 3 of Fig. 1. Fig. 4 represents the dog and its spring detached.

My present invention has more particular regard to certain details of construction operating in combination with the general parts of the tool already in use and which details will hereinafter be specially described.

In the drawings, A is the main stationary drill-spindle, having at its lower end the movable spindle B', suitably united to the same and arranged to revolve the chuck B, with the usual jaws. The upper part of the spindle is detachable and is represented by A', the breast-piece being secured to the upper end of A' by means of its socket A² and held by a set-screw or in any convenient way.

At the upper end of the main spindle A is formed the socket part a, which socket has the projecting part a² and through which projection and also through the socket part a is a hole of suitable size to receive the lower end of the detachable part of the spindle A'. The position of this piece A' when placed in the projecting part a² is shown by the dotted lines in Fig. 1. The detachable part is secured to the main spindle in the socket a by the set-screw a³. This device for shifting the upper part of the spindle enables the breast part to be used either in the ordinary way or at right angles to the main spindle. This is quite important in using the tool in certain positions and for special purposes.

On the main stationary spindle is placed the slide D, which moves up and down on spindle A. It is prevented from turning around by a key or spline D' and is held in place either high or low by the thumb-screw c, which screw part passes through the side

of the slide and presses against the side of the spindle A. Just below the slide is placed a small gear-wheel E, secured to the movable spindle B'. The slide D has also on one side the handle C, which is provided with a screw part to enter a thread formed in the thumb-screw c. Where it is necessary, the handle C can be detached. In ordinary work it is very useful in holding and steadying the tool. On the opposite side from the handle C, secured to or forming a part of the slide, is the short arbor N, on which is loosely journaled the gear-wheel H and also the crank-holder L, both the gear-wheel and the holder being held in place by the threaded thumb-screw h, which is provided with a slight flange, which when screwed up against the outer end of the holder brings all the parts together and holds them in position. The gear-wheel H is provided with two sets of gear-teeth on the inside of the wheel, as indicated by G and F. Either of these sets of teeth may mesh with the teeth of the gear E, secured to the spindle B'.

By slightly turning outward the thumb-screw h the gear-wheel H will be detached from the gear E, and by loosening the set-screw c the slide can be moved upward, carrying the gear-wheel H and other parts, and the gear-wheel E can be meshed with teeth G instead of teeth F, thus giving two motions, one fast and the other slow, according to the requirements of the work, the parts being held in contact by the thumb-screw h, while the position of the slide is secured by the set-nut c.

On the outer face of the wheel H and preferably near the arbor are formed the notches m. In connection with the holder L is placed the dog d. The dog is shown in Fig. 4. It is operated, preferably, by the spiral spring d⁴, and its inner end is formed with one part of the end d² beveled. Now when the dog is placed in its position in the holder L, as shown in Fig. 3, the force of the spring d⁴ will press the inner end of the dog against the notched part m of the gear-wheel H and when an opening is reached will drop in, thus securing the holder L to the gear-wheel H, and when the crank K, with its handle K', is placed in the holder L and secured in position by set-screw l² and is turned or revolved the power will of

course be communicated to the gear-wheel H and thence to the gear E, and so the spindle of the machine. On the outer end of the holder, where the dog d is placed, are formed
 5 three slots or notches, which are indicated by $n\ n'\ n^2$, Fig. 1. The pin d^3 , Fig. 4, fits into the slots or notches $n\ n'\ n^2$. This prevents the turning of the dog d . It will be seen that
 10 when the pin d^3 rests in slot n' the end of the dog will be held tightly between the notches, and thus the tool can be operated in either direction. When the dog is withdrawn and turned to the right and the pin d^3 drops into notch or slot n^2 , the inner end of the dog will
 15 be presented to the notches m , so that the thick end will catch and turn the wheel H; but on account of the bevel d^2 of the end of the dog d the notches m will not catch, but will slide over. When the dog is reversed
 20 and the pin d^3 rests in slot n , the end of the dog will engage the notches m in exactly the reverse manner from that next previously described. Thus it is that by the simple adjustment of the dog d in relation to its end
 25 having the bevel part d^2 the machine can be operated backward or forward without change or operated forward only and the parts forming a sort of a ratchet attachment, or the machine can be operated backward only. In
 30 either of the two latter cases the dog would not operate except in one direction. By this means the operator is enabled to make a part of a revolution of the crank K.

35 In some positions it is impossible to have room enough to move the crank, for operation of the tool, but a slight distance, and in these cases the present device works perfectly.

The crank part K is preferably held from twisting in the holder by the use of a key or
 40 spline, (represented by l' , Fig. 2.)

The details of the tool are so clearly shown in the drawings that the whole will be understood without a more extended description.

45 I am aware that breast-drills are not new, also that gears for providing two different

speeds have been used before, and that chucks and jaws of various kinds have been employed, and I do not claim them; but

What I do claim as new, and for which I desire to secure Letters Patent of the United States, is—

1. The combination, in a breast-drill, of the main spindle A, provided with the socket a , having the projection a^2 , and the thumb-screw a^3 , with the detachable spindle A', adapted
 55 to fit into the socket a , either in prolongation of the main spindle or at right angles thereto, substantially as and for the purposes set forth.

2. The combination of the stationary drill-spindle A; the movable spindle B', provided
 60 with the beveled gear-wheel E; the slide D, movably secured to the said spindle A, and having the arbor N; the gear-wheel H, having the internal gear-teeth G, the bevel-gear-wheel attachment F, and the exterior teeth
 65 m , the said wheel H, loosely journaled on said arbor N; the crank and operating holder L, provided with suitable apertures for receiving the crank K, and the dog d , and also having suitable means for holding or securing
 70 the said crank and dog in said holder; the said holder loosely journaled on arbor N; the dog d adapted to be movable and reversible in connection with its operation with teeth m , and having the spring d^4 ; and the securing
 75 set-screw h , adapted to hold the said wheel H, and the holder L, together; and also, to hold the said wheel H, in operative connection with the gear-wheel E, and also to enable the said parts to be disconnected and read-
 80 justed, all substantially as and for the purposes set forth.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 13th day of March, A. D. 1899.

LEONARD M. DAVIS.

Witnesses:

M. E. SHEPARD,
 GEO. W. NIMS.