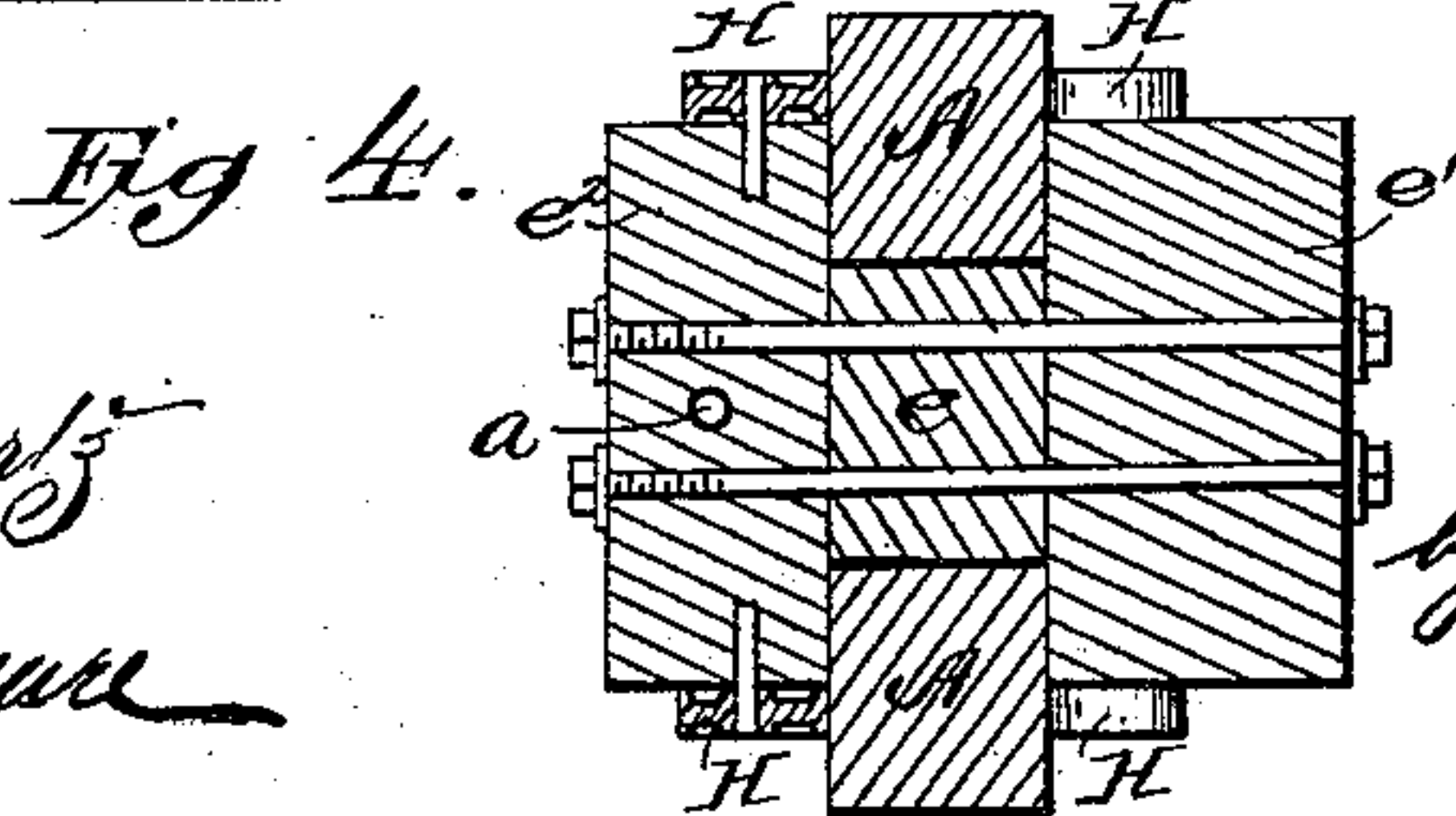
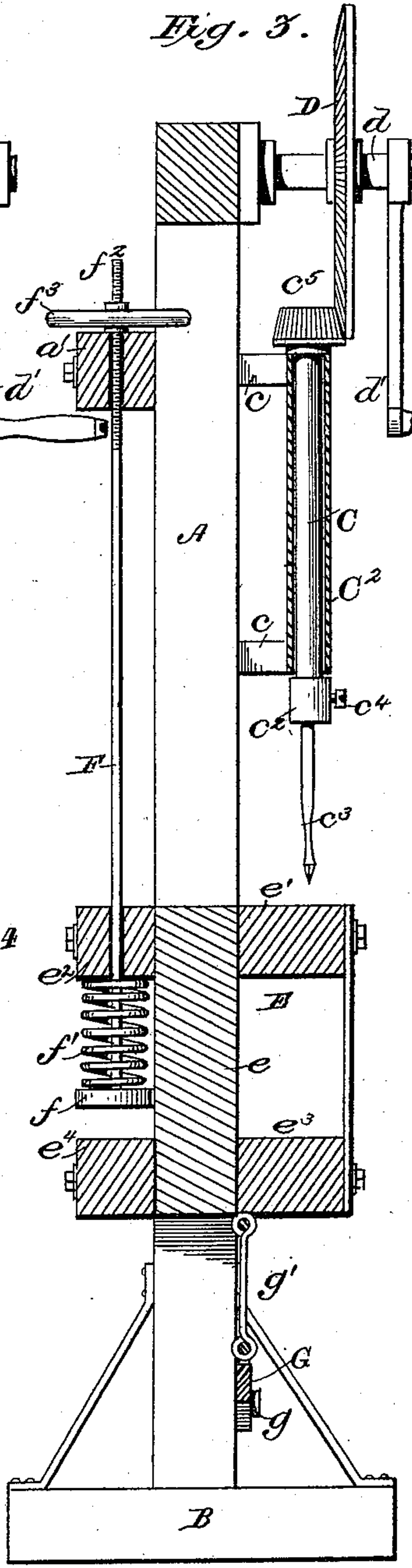
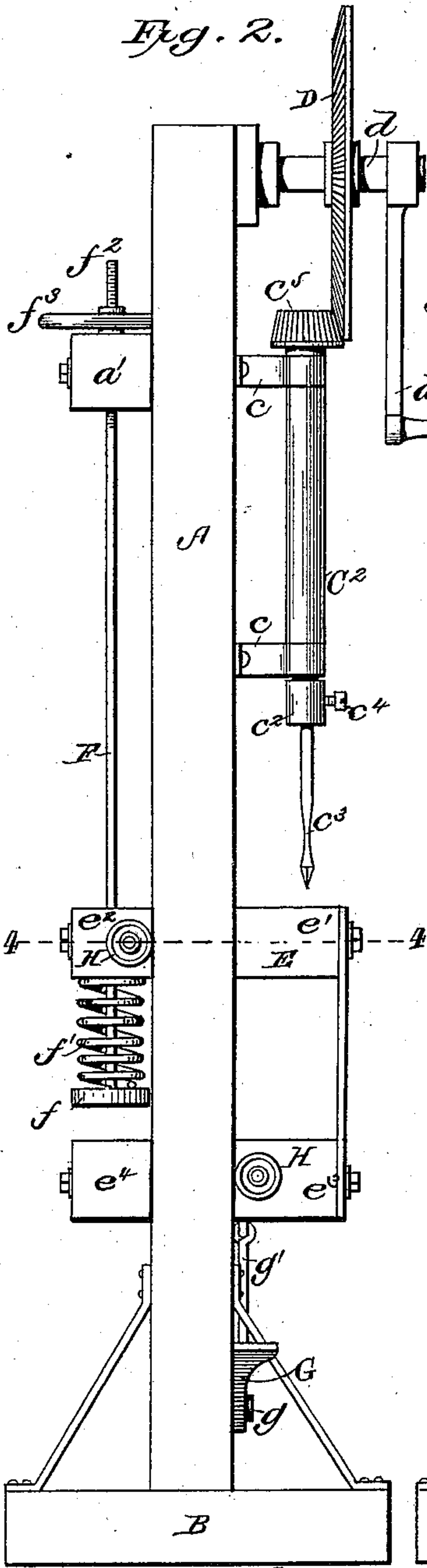
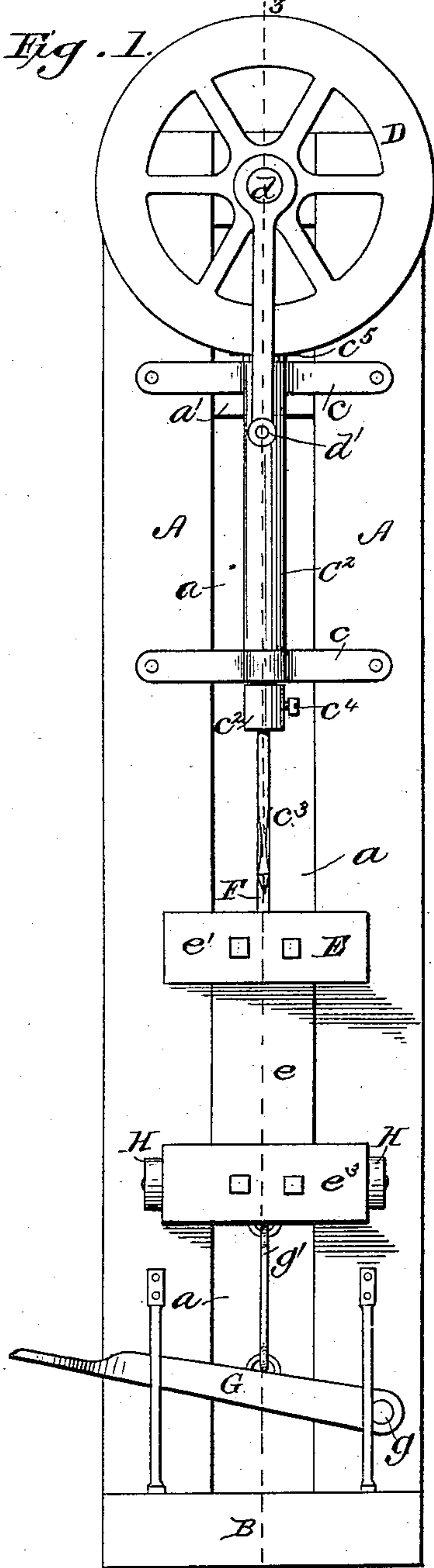


(No Model.)

T. FORSTNER.
DRILLING MACHINE.

No. 494,632.

Patented Apr. 4, 1893.



Witnesses
A. J. Schwartz
C. M. Lomas

Inventor
Thomas Forstner
by *Max Bergis*
his Attorney

UNITED STATES PATENT OFFICE.

THOMAS FORSTNER, OF NEW ULM, MINNESOTA.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,632, dated April 4, 1893.

Application filed October 6, 1892. Serial No. 448,046. (No model.)

To all whom it may concern:

Be it known that I, THOMAS FORSTNER, a citizen of the United States, residing at New Ulm, in the county of Brown and State of Minnesota, have invented certain new and useful Improvements in Drilling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for drilling or boring particularly metal, although the same may be also employed for operating on other material, such as wood and the like.

The object of my invention, among other things, is to provide a machine in which the work, or material to be drilled will automatically and readily follow up the drill as the drilling proceeds and in which the pressure of the work against the drill-bit can be adjusted as desired so as to regulate the speed of the drilling or boring operation according to the character of the work.

It is also my object to provide means whereby the work can be readily disengaged from the drill or boring-bit, as soon as the drilling or boring operation is completed. For this purpose a machine embodying my invention consists essentially, in a rotary drill, in combination with a work-table or platform adapted to slide longitudinally with relation to the drill and yieldingly held up against the drill by a spring whose tension may be adjusted according to the character of the work. This work-table is provided with means for withdrawing it from the drill against the stress of the spring, when the work has been completed, that is to say, when a hole or mortise has been drilled. And my invention consists in such other details, features and combinations of parts as will be hereinafter described and covered in the claims.

In order to more clearly explain the nature of my invention to those skilled in the art, reference is made to the accompanying drawings, in which—

Figure 1 represents a front elevation of a drilling or boring machine embodying my invention; Fig. 2 a vertical central section of the same; Fig. 3 a side elevation, and Fig. 4

a transverse horizontal section on line 3—3, Figs. 1 and 2.

In all the figures the same letters designate the same parts.

In the drawings, A, represents a standard, rising from the base B, of the drilling machine. The said standard carries all the working parts of the machine.

The drill proper, C, is mounted in brackets, c, c, screwed to or otherwise secured to the standard, A, as shown, and consists in a spindle, c', passing through a stationary sleeve C², secured between the two brackets, c, c, and provided at its lower end with a drill-head or socket-piece, c³, into which the various drill-bits, c³, may be interchangeably secured, in any usual or convenient manner, *e. g.* by the set-screw, c⁴, as shown. The upper end of the drill-spindle, C', is provided with a bevel-pinion, c⁵, meshing with a bevel-gear, D, suitably journaled in the standard, A, as shown, and to whose shaft, d, a crank, d', is secured. Or a pulley may be keyed to the shaft, d, and derive its power by a belt from any suitable motor.

Below the drill is arranged the longitudinally movable work-table, or bed-plate, E, which is yieldingly held up against the drill, preferably in the manner shown in the drawings, which will now be described. The work-table preferably consists of the center or guide block, e, adapted to engage and slide in a vertical guide-slot, a, in the standard A. At top and bottom of the guide-block, e, are attached the four horizontal blocks, e', e², e³, e⁴, which serve to hold the work-table in proper horizontal position, and the first of which, e', constitutes the work-table proper. In order to yieldingly hold the work, placed on table, E, against the drill so as to follow the same up as the work proceeds, I suspend the said work-table from a fixed bracket, a', by a rod F, yieldingly connected to the same, *e. g.* by passing loosely through the block, e², and provided at its lower end with a head or washer, f, between which and the block, e², is arranged a helical or other spring, f', which has a tendency to yieldingly force the table, E, upwardly against the drill C. In order to regulate the pressure with which the work is forced against

the drill, I screw-thread the upper end of the suspension rod F at f^2 , and thread onto this end a thumb-nut or screw wheel, f^3 , which rests on the bracket, a' . The upper end of
 5 rod, F, of course passes loosely through the said bracket, a' . In order to withdraw the work from the drill-bit, c^3 , when a hole has been drilled or for any other purpose, I pivot
 10 a lever or treadle, G, to the standard, at g , and connect the same with the work-table, E, by a link, g' , or otherwise. In order to overcome friction in the longitudinal movement of the work-table along standard A, and to prevent the said work-table from binding
 15 against the standard A, I provide the same at suitable points with anti-friction rollers H, preferably arranged as shown, that is to say, two rollers, H, at the top in the block, e^2 , on opposite sides of the slot, a , and two rollers,
 20 H, at the bottom on the opposite side of the standard, A, and also arranged respectively on opposite sides of slot, a .

The operation of the drilling machine thus shown and described, is obvious from the
 25 foregoing. When it is desired to drill a hole or a mortise into a piece of metal, the work-table, E, is depressed against the tension of spring, f' , by depressing treadle, G, and the work is then placed in the desired position
 30 on the table. The treadle is then released and the drill is caused to rotate by turning the crank, d' , or in any other desired manner. As the drilling proceeds the spring, f' , urges the table E, upwardly causing the work to
 35 follow up the drill. In order to increase or diminish the rapidity of the drilling operation the pressure of the table upwardly is varied by turning the screw-wheel, f^3 , in one or the other direction.

40 While I consider the machine thus shown and described the best embodiment of my invention, it is manifest that the same may be considerably modified in many particu-

lars, without departing from the spirit of my invention, and I do not therefore desire to be
 45 limited to the exact details described, but

What I claim, and desire to secure by Letters Patent, is—

1. In a drilling-machine, a drill, mounted in a standard, in combination with a work-
 50 table, a suspension-rod passing from a fixed part of the drill-standard to the work-table and a spring interposed between the work-table and the end of the suspension-rod, substantially as set forth.

2. In a drilling-machine, a standard, a drill
 55 mounted thereon, in combination with a work-table, a suspension rod passing from a fixed point on the standard loosely through the work-table and provided with a washer at its
 60 lower end, and a spring interposed between the washer and the work-table, substantially as set forth.

3. In a drilling machine, a standard, a drill
 65 mounted therein and a bracket, as a' , fixed thereto in combination with a work-table, a suspension rod passing loosely through the bracket and the work table, and provided at
 70 its lower end with a washer, a spring interposed between the washer and the work-table and a screw-wheel threaded on the upper end of the suspension-rod, substantially as set forth.

4. In a drilling machine, a single drill-stand-
 75 ard in combination with a work-table engaging the standard, anti-friction rollers mounted in opposite sides of the work-table and bearing against the standard and means for moving the work-table longitudinally on the stand-
 80 ards, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS FORSTNER.

Witnesses:

C. A. HAGLING,
 I. M. OLSEN.