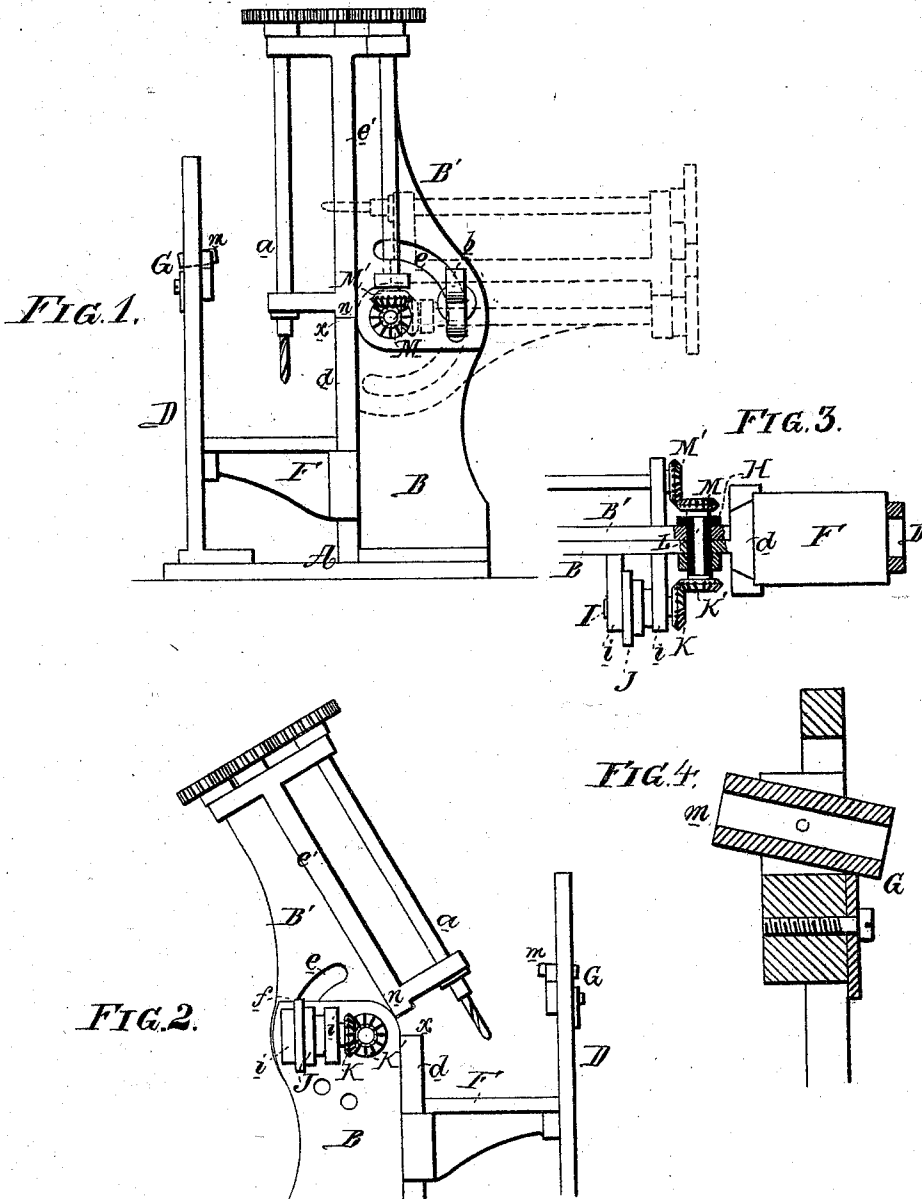


J. C. KELLER.
Metal Drilling-Machines.

No. 140,925.

Patented July 15, 1873.



Witnesses, Harry Smith
 Thomas McGowan

Jacob C. Keller
 by his Atty.
 Hawsen and Son

UNITED STATES PATENT OFFICE.

JACOB C. KELLER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN METAL-DRILLING MACHINES.

Specification forming part of Letters Patent No. 140,925, dated July 15, 1873; application filed May 24, 1873.

To all whom it may concern:

Be it known that I, JACOB C. KELLER, of Philadelphia, Pennsylvania, have invented certain Improvements in Drill-Presses, of which the following is a specification:

The object of my invention is to so construct a drilling-machine that it can be made to bore holes at right angles to, or parallel with, or at any intermediate angle in respect to, the table which supports the article to be drilled; and this object I attain by hinging a frame, B', carrying a drill-spindle, *a*, to a fixed standard, B, having a vertically-adjustable table, F, as shown in the side view, Figure 1, of the accompanying drawing, and in the opposite side view, Fig. 2, and sectional view, Fig. 3.

The permanent or fixed portions of the frame of the machine consist of the base A and standards B and D secured to the said base, and the adjustable portions consist of the frame B' carrying the drill-spindle *a*, and hinged to the standard B, the table F adjustable vertically on the standard B, and the slide G adjustable on the standard D. The latter may, if desired, be made detachable. The frame B' is hinged to the upper end of the standard B by a sleeve, H, best observed in Fig. 3, the said sleeve having at one end a head, and at the other a nut, so as to maintain the frame and standard in close contact with each other, and yet permit the frame to turn freely on the sleeve. The frame and standard are further secured together by a screw, *b*, passing through a curved slot, *e*, in the frame B' and into the standard. I is the driving-shaft, turning in projections *i i* on the standard B, and having the usual cone-pulley J, one end of this shaft having a bevel-wheel, K, gearing into a similar wheel, K', on a shaft, L, which passes through and is arranged to turn freely in the sleeve H, the opposite end of this shaft having a bevel-wheel, M, gearing into a similar wheel, M', from which the desired rotary motion is communicated to the drill-spindle *a* through the medium of the gearing shown in the drawing, or any other equivalent mechanism. The feeding of the drill-spindle may be accomplished by hand or automatically by the aid of appliances common to other drilling-machines. One end of the table F is so adapted to guides formed on the standard B as to

admit of vertical adjustment only by means of a screw or rack and pinion or other devices commonly used for the purpose. To a vertical slot in the standard D is fitted a slide, G, which can be raised or lowered at pleasure; and to this slide a bearing, *m*, is so hung as to be self-adjusting to any angle assumed by the drill-spindle, but is not permitted to have any other movement. On loosening the screw *b* the frame B' can be adjusted to any angle which the hole to be drilled may demand; but in most cases the holes to be drilled are either vertical and at right angles to the face of the table, or horizontal and parallel with the table; hence it is important that the frame should be promptly and accurately adjusted, so that the drill-spindle shall occupy either of these two extreme positions without resorting to any calculations or measurements, and this I accomplish in the following manner:

The top *x* of the guide *d* is in a horizontal line drawn through the center of the sleeve H, and when the projection *n* of the adjustable frame B' is in contact with this top of the guide the drill-spindle will be exactly at right angles to the face of the table, as shown in Fig. 1, and when the rib *e'* of the frame B' is in contact with the upper edge *f* of the standard B the drill-spindle will be parallel to the face of the table, as shown by dotted lines in Fig. 1; hence, after the machine has been used for drilling inclined holes it can be at once positively adjusted to drill holes at right angles to or parallel with the table.

When the machine is used for enlarging holes it is important that the outer end of the drill-spindle should be properly steadied, and this is accomplished by the bearing *m*, into which the boring-bar is introduced, as this bearing can vibrate on the slide G, and, as the latter can be adjusted vertically in the standard D, it will be evident that the said bearing will accommodate itself to the drill-spindle, whether the latter is in a horizontal position, or has been adjusted to any angle, the steadiment of the spindle, when it is in a vertical position, being effected by causing the boring-bar to turn in a hole in the table.

I claim as my invention—

1. A drilling-machine in which a frame carrying the drill-spindle is hinged to the perma-

ment frame or standard, having a vertically-adjustable table, all substantially as described, so that the drill-spindle can be adjusted to a position at right angles, or at any other angle, to or parallel with the table, as set forth.

2. The adjustable frame B' carrying the drill-spindle, the fixed frame B, and the connecting-sleeve H, in combination with a shaft, L, passing through and turning in the said sleeve, and the gearing described, or its equivalent, by which the said shaft derives its motion from the driving-shaft and transmits it to the drill-spindle.

3. Tops or shoulders *x* and *f* arranged on the fixed frame or standard B, in the manner

substantially as described, in respect to the adjustable frame B' and to the table F, so as to insure a proper adjustment of the drill-spindle at right angles to or parallel with the table, as set forth.

4. The combination of the adjustable frame carrying a drill-spindle with the slide G and its vibrating bearing *m*.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB C. KELLER.

Witnesses:

WM. A. STEEL,
HARRY SMITH.