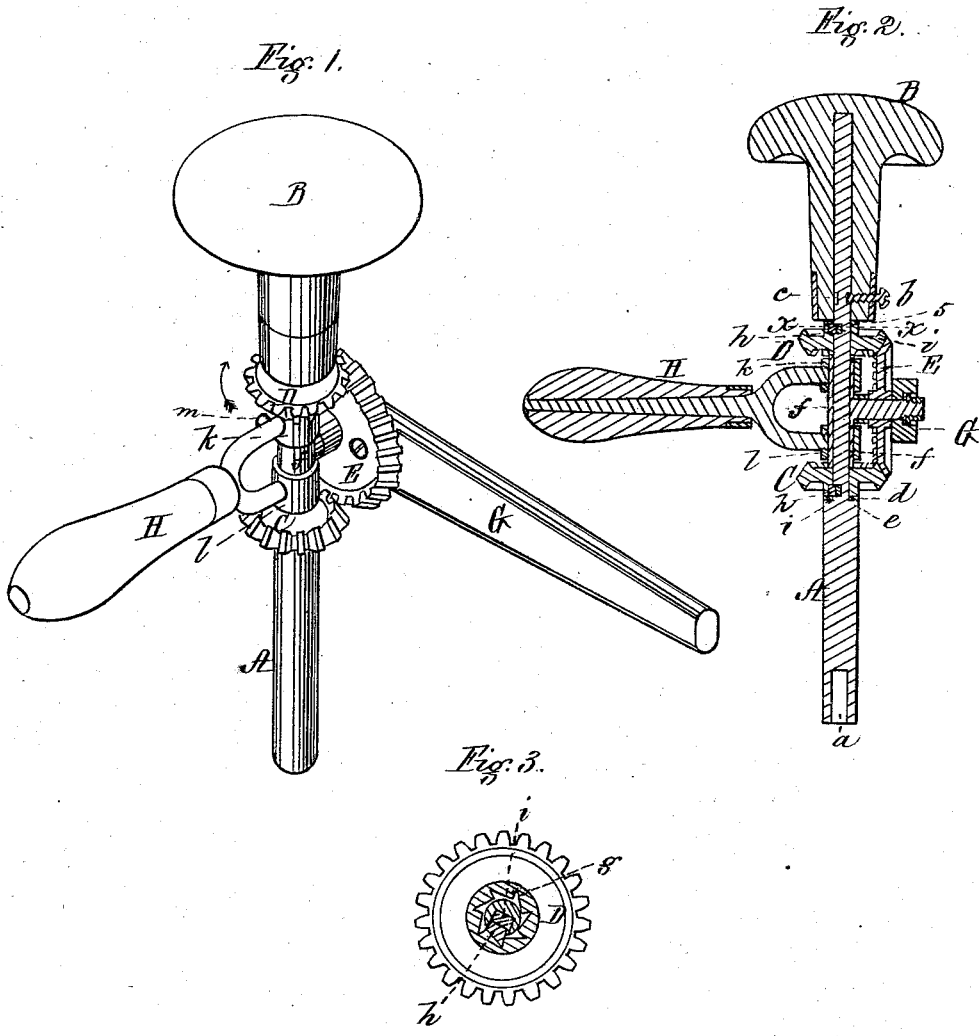


D. L. TOPPAN.
Drill for Drilling Metal.

No. 163,342.

Patented May 18, 1875.



Witnesses,
W. J. Cambridge
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UNITED STATES PATENT OFFICE.

DANIEL L. TOPPAN, OF SOMERVILLE, ASSIGNOR TO HIMSELF, DAVID C. MELOON, AND HOPKINS H. MELOON, OF EAST CAMBRIDGE, AND GARDNER B. CHAPIN, OF MEDFORD, MASSACHUSETTS.

IMPROVEMENT IN DRILLS FOR DRILLING METAL.

Specification forming part of Letters Patent No. 163,342, dated May 18, 1875; application filed April 1, 1875.

To all whom it may concern:

Be it known that I, DANIEL L. TOPPAN, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Ratchet-Drills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved drill. Fig. 2 is a longitudinal vertical section through the same. Fig. 3 is a transverse section, enlarged, on the line *xx* of Fig. 2.

In ratchet-drills as ordinarily constructed two movements of the lever, one back and the other forward, are required to produce a partial revolution of the drill-spindle, which remains stationary while the lever is being moved back to take a fresh hold; furthermore, as the lever is operated in a plane at right angles to that of the axis of the spindle, it is impossible to employ the drill in many places, owing to the want of space in which to work the lever.

My invention has for its object to overcome these objections, and to produce a drill in which each movement of the lever will partially rotate the drill-spindle in one and the same direction, thus greatly increasing the efficiency of the tool and effecting a great saving in time and labor.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the drill shaft or spindle, which is provided at its lower end with a socket, *a*, to receive the drill, and at its upper end with a handle, B, within which it is free to turn, being held in place therein by a screw, *b*, the inner end of which enters an annular groove, *c*. C D are two bevel-gears, which fit over the smaller portion of the spindle A, the gear C resting on a washer, *d*, which fits up close against the shoulder *e* of the spindle, another washer, *f*, being interposed between the gear D and the handle B. These gears C D both engage with

a larger bevel-gear, E, supported on a stud projecting from a sleeve, *f*, which fits over the spindle and occupies all of the space between the gears C D, the spindle being free to turn within the sleeve. The interior of the aperture, through the center of each of the gears C D, is provided with ratchet-teeth *g*, Fig. 3, with which engage a pawl, *h*, consisting of a small piece of steel fitted into a recess in the spindle and kept up in contact with the teeth by a spring, *i*, placed behind it. To the outside of the large gear E is secured a hand-lever, G, by means of which it is partially rotated, first in one direction and then in the other, which causes the smaller gears C D to be partially rotated alternately in opposite directions, each movement of the gear C or D in the direction of the arrow being imparted by the ratchet mechanism to the spindle A, and, consequently, each movement of the lever G up or down causes the drill-spindle to be rotated in one and the same direction, its motion being interrupted only at the instant when the direction of the motion of the lever is being reversed. The drill is thus caused to perform its work with great rapidity, and much time and labor are thereby saved. Projecting out at right angles from the spindle A is a handle, H, the bifurcations at the inner end of which are secured to short sleeves *k l*, which surround or fit over the sleeve *f*, around which the handle can be turned to vary its position with respect to the lever G, after which the handle is secured by a set-screw, *m*. This handle H is used to steady the drill when employed on light work, and where the breast of the operator is placed against the large handle B to press the drill against the work. Where, however, large holes are to be drilled, the handle B is removed, and an ordinary clamp is employed having a screw-feed.

It will be seen that as the gear E is much larger than the gears C D, a very small movement of the lever will rotate the drill-spindle. The size of the gears may, however, be varied, as desired.

I do not confine myself to the construction of the ratchet mechanism shown, as any suit-

able ratchet or clutch mechanism which will allow the gears C D to slip on the spindle when rotated in one direction and drive it when revolved in the opposite direction may be employed. As the lever G works in a plane parallel with the axis of the spindle A, and is operated like the handle of a pump when the spindle is in a vertical position, the drill can be used in inaccessible places where a want of space on either side of the spindle would render it impossible to employ a drill of the ordinary construction having a lever operated in a plane at right angles to that of the axis of the spindle.

My improved drill can be used to advantage as a bit-brace by carriage-makers and

other wood-workers to hold a bit or screw-driver, and is of simple construction and not liable to get out of order.

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

The adjustable handle H, in combination with the sleeve f, spindle A, lever G, and bevel-gears C D E, substantially as and for the purpose set forth.

Witness my hand this 27th day of March, A. D. 1875.

DANIEL L. TOPPAN.

In presence of—

P. E. TESCHEMACHER,
W. J. CAMBRIDGE.