E. N. BOYNTON, G. M. COBURN & T. F. CARVER.

Metal-Drilling Machine.

No. 209,646. Patented Nov. 5, 1878.

Fig: 1.

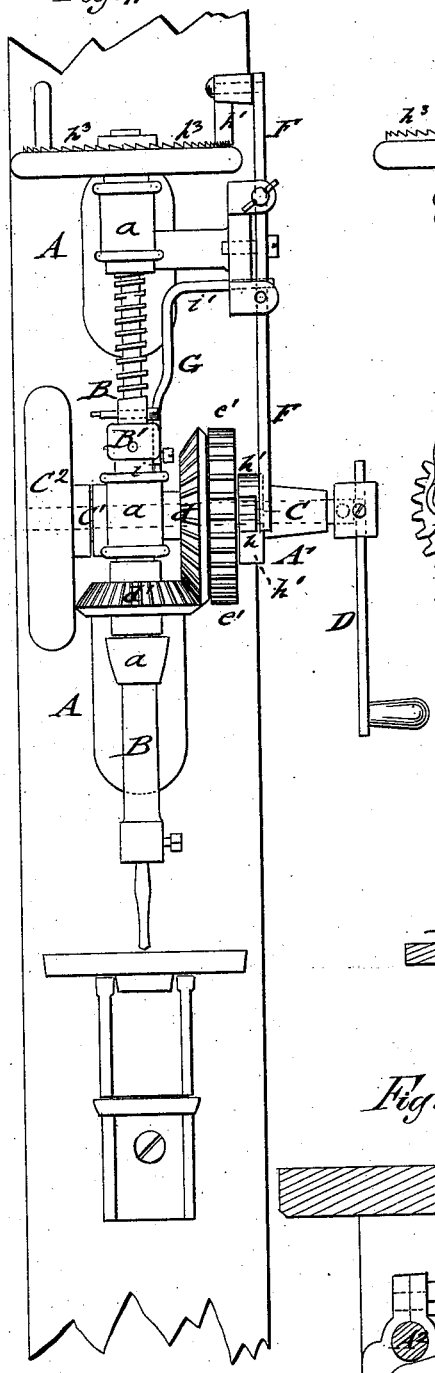


Fig: 2

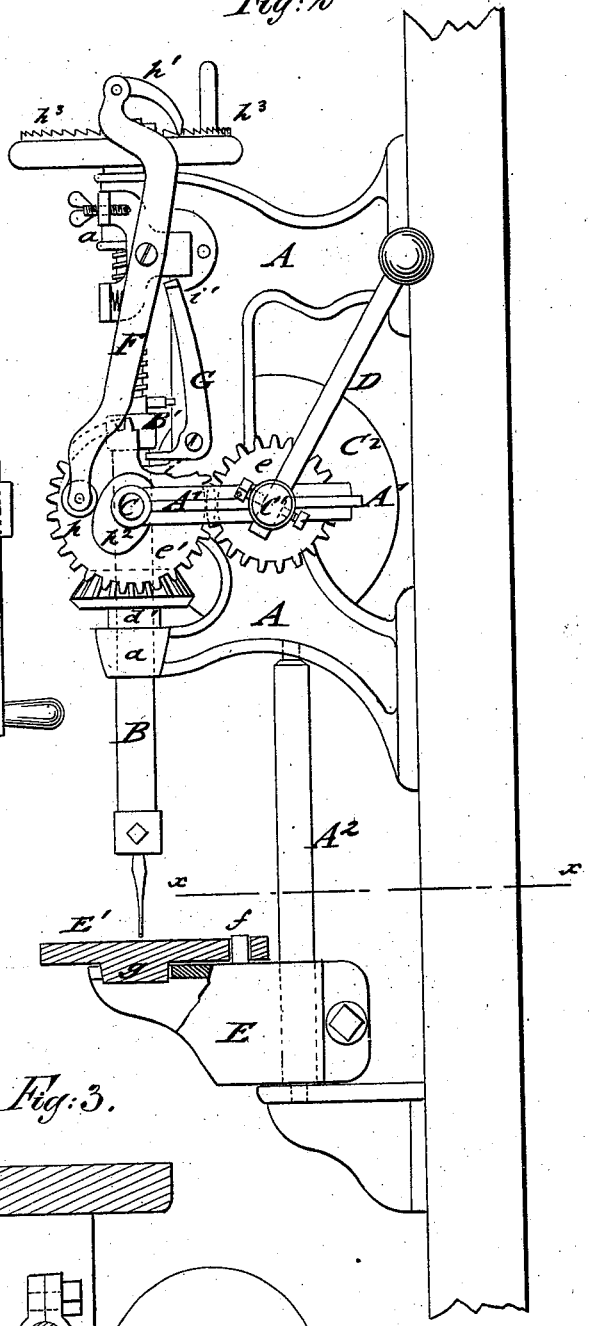
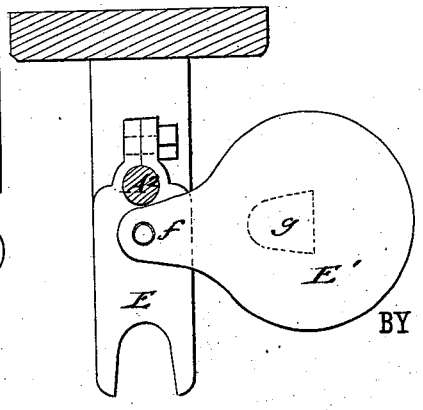


Fig: 3.



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UNITED STATES PATENT OFFICE

EDWIN N. BOYNTON, GEORGE M. COBURN, AND THOMAS F. CARVER, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO EDWIN N. BOYNTON, OF SAME PLACE.

IMPROVEMENT IN METAL-DRILLING MACHINES.

Specification forming part of Letters Patent No. **209,646**, dated November 5, 1878; application filed August 6, 1878.

To all whom it may concern:

Be it known that we, EDWIN N. BOYNTON, GEORGE M. COBURN, and THOMAS F. CARVER, all of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and Improved Drilling-Machine, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a front elevation, Fig. 2 a side elevation, partly in section, and Fig. 3 a horizontal section on line *x x*, Fig. 2, of our improved drilling-machine.

Similar letters of reference indicate corresponding parts.

This invention has reference to improvements in hand drilling-machines, by which a fast or slow motion can be readily obtained, at the will of the operator, the slower motion being especially advantageous in drilling large holes, as more power is obtained, and the holes are drilled with greater ease.

The drill is adapted for work of all kinds, and the feed mechanism is thrown out of operation automatically when the spindle arrives at its lowest position, so as to prevent the grinding out of the nut or collar on the top of the spindle.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

Referring to the drawings, A represents the upright main frame of our improved drilling-machine, which guides, in vertical bearings *a*, the spindle B of the drill, while a horizontal side frame, A^1, forms, in connection with the main frame, the bearings for the two driving-shafts C C^1. The front or driving shaft, C, revolves, by bevel-gears *d d'*, the spindle directly when the actuating-crank D is affixed to the end of the same, while a secondary set of gear-wheels, *e e'*, connects the second or rear shaft, C^1, with the front shaft, and operates thereby the spindle. The rear shaft, C^1, is extended at both sides—at one side to receive the crank D, at the other side for a fly-wheel, C^2.

As the crank D may be attached to the ends of the front or rear shaft, two different speeds may be obtained. When the crank is applied to the front or driving shaft proper, a fast speed is obtained, while when it is attached to the rear or balance-wheel shaft a slower motion, but more power, is obtained. The slower motion is more desirable when large holes are to be drilled, as this can be done with greater ease than in the common drills.

The foot-piece E of the drill is fitted and clamped to a vertical post, A^2, of the main frame, and provided with a round or other table, E', that is either pivoted to a fixed stud or pin, *f*, of the foot-piece or to the post A^2, as desired. The front part of the table is locked rigidly to the recessed or forked front part of the foot-piece by a bottom ledge, *g*, of corresponding shape, so as to be retained reliably in position for holding the work placed thereon.

When tires of wheels or other articles are to be drilled in which the table is not wanted, it is raised clear of the foot-piece and swung out of the way, as shown in Fig. 3, the tires or other work being placed for drilling over the recessed or forked part of the foot-piece.

The drill is fed by the usual feed mechanism, that is operated by a fulcrumed and spring-acted lever, F, with an anti-friction roller, *h*, at the lower end, and a pivot-pawl, h^1, at the upper end. The anti-friction roller is engaged by a cam, h^2, keyed to front shaft, C, so as to oscillate the lever F, and thereby the pawl, so that the latter engages the ratchet h^3 of the feed-wheel F', and turns it thereby. The feed-wheel works by an interiorly-threaded nut the threaded upper part of the spindle, and feeds thereby the drill down to the work.

The feed mechanism is automatically thrown out of action when the spindle is down to its full extent by means of a fulcrumed releasing-lever, G, having a lower forward-extending arm, *i*, and an upper side arm, *i'*. A nut or collar, B', on the top of spindle bears on the lower arm of the lever G and throws the lever forward, so that the upper side arm presses on the feed-lever F and supports the same clear of the cam, so that the feed is interrupted.

The action of the lever G protects the nut or collar of the spindle against being worn or ground out in course of time by the careless-

ness of the workmen, as they go on drilling without paying attention thereto. The automatic action of the spindle-collar and lever thows out the feed mechanism in a reliable manner, and secures the effective work of the drill without the premature wearing out of the spindle, nut, or collar.

In this manner a hand-drill that is adapted to all kinds of work, and is durable and effective in use, is furnished for wood and metal workers of all kinds.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The combination of the lever G, having arms *i i'*, the spindle B, having collar B', and the feed-lever F, as and for the purpose specified.

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Witnesses:
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