E. J. WORCESTER.

Drilling Metals.

No. 99,803. Patented Feb. 15, 1870.

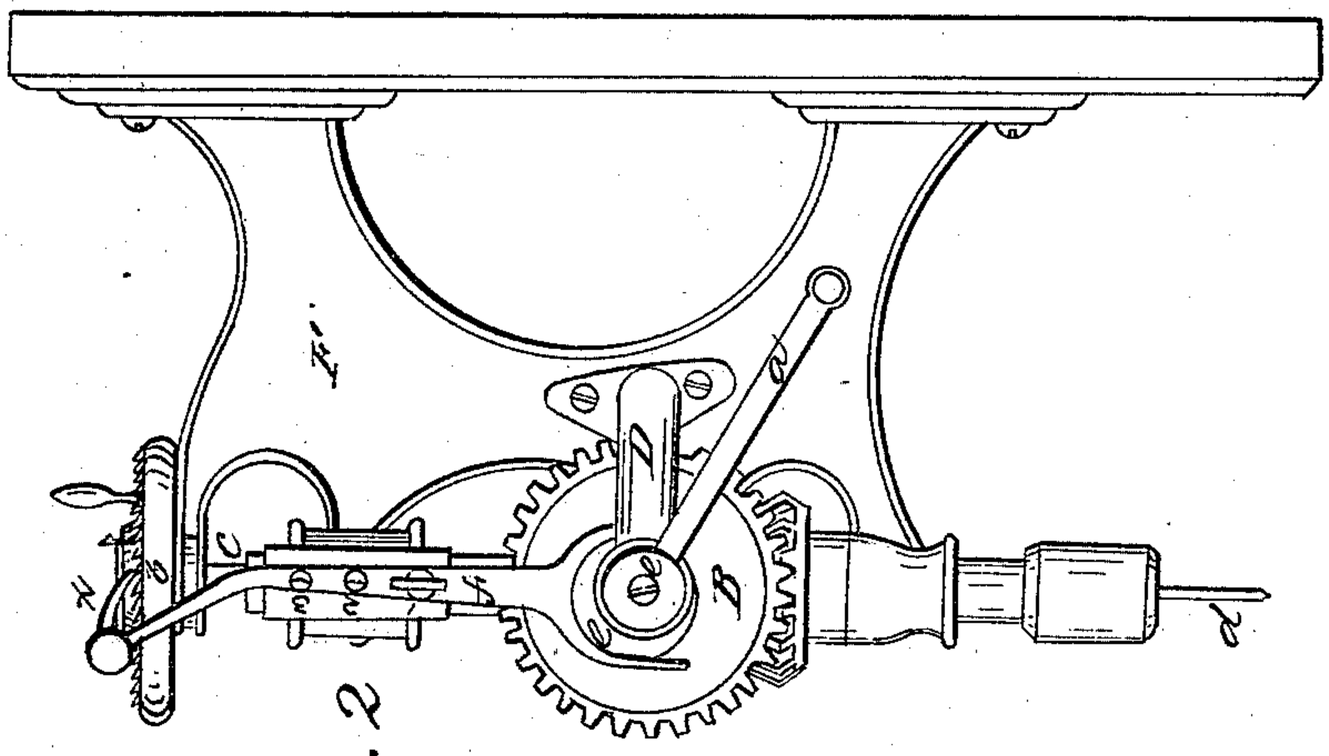

Fig. 2

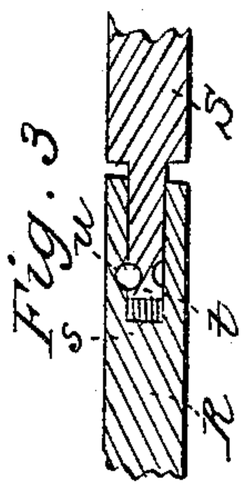

Fig. 3

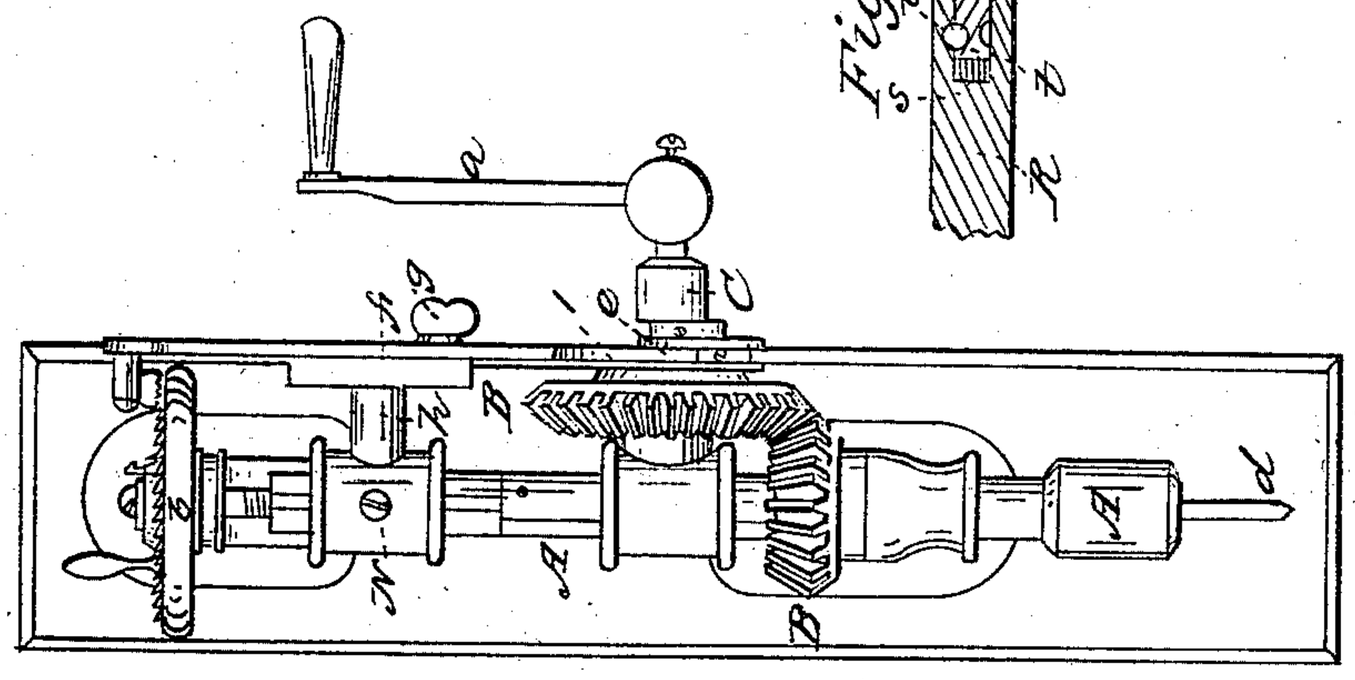

Fig. 1

Witnesses:

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EDWARD J. WORCESTER, OF WORCESTER, MASSACHUSETTS.

Letters Patent No. 99,803, *dated February* 15, 1870.

IMPROVED DRILLING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

I, EDWARD J. WORCESTER, of Worcester, in the county of Worcester, and State of Massachusetts, have invented certain Improvements in Drilling-Machines, of which the following is a specification.

Nature and Objects of the Invention.

The first part of my invention relates to a variation of the feed by the application and combination of a double adjustable eccentric with a ratchet-lever, adjustable at its fulcrum in such a manner that the machine can be regulated so as to advance the drill either rapidly or slowly, as required in the drilling of either soft or hard materials. By the combination and arrangement of the double adjustable eccentric, a wider range is given to the ratchet-lever, which can be still further increased by the adjustment of the lever itself in combination with the eccentric.

The second part relates to the ratchet-wheel in combination with the double adjustable eccentric and the ratchet-lever, for the purpose of raising and lowering the screw and shaft and spindle attached.

The third part relates to the upright shaft or spindle, and the manner of connection of the two sections of which it is composed, by means of which the lower one is made to revolve, while both at the same time are being raised or lowered.

Description of the Accompanying Drawings.

Figure 1 is a front view of a machine embodying my invention.

Figure 2 is a side view of the same.

Figure 3 is a view of the two sections of the upright shaft or spindle, and the manner of their connection.

General Description.

The machine consists of an upright shaft or spindle, A, composed of two sections, the lower one of which holds the drill *d*, and revolves by means of two bevel-wheels, B B, one of which is on the lower section, fastened by means of a wedge in a groove extending to the upper end of the section, and the other on an axis or horizontal shaft, C, running at right angles with the upright shaft, and which is supported by an arm, D, and turned by the crank *a*.

The other and upper section has also a groove on top, running the entire length of the section, into which a screw extends through the nut N, to prevent its revolving, but is raised and lowered by means of the ratchet-wheel *b* and the screw *c*, to which it is attached. This section also raises and lowers the lower section, to which the drill *d* is attached, and which revolves at the same time, as already stated.

The two sections are connected together by means of a socket in the upper end of the lower section and a joint on the lower end of the upper section, extending into the socket, and fastened by a pin running through the socket and a groove in the joint, as shown in fig. 3, R being the lower or revolving section, and S the upper or sliding section.

At the bottom of the socket is placed a thick rawhide, *s*, which forms the bearing and prevents friction.

At the end of the joint is a washer, *t*, made of steel, above which is a groove, admitting the pin *u*, which passes through the socket, and holds the two sections together, at the same time permitting the lower section to revolve while it is being raised or lowered by means of the screw in the upper section and the ratchet-wheel.

On the axis or horizontal shaft C, on the outside of the bevel-wheel B, is a double adjustable eccentric, *e e*, upon which rest the arms of the lever *f*, which is adjusted at its fulcrum by means of the screw *g* and holes 1, 2, 3, and is fastened to the frame F of the machine by the shank *h*. The frame F is made of iron, and supports the entire machine.

Claim.

I claim, as my invention—

In combination with the screw *c* and the ratchet-wheel *b*, the double adjustable eccentric *e e*, lever *f*, and dog *x*, in the manner described and for the purpose set forth.

EDWARD J. WORCESTER.

Witnesses:

GEO. N. LOWNDS,

H. J. ALVORD.