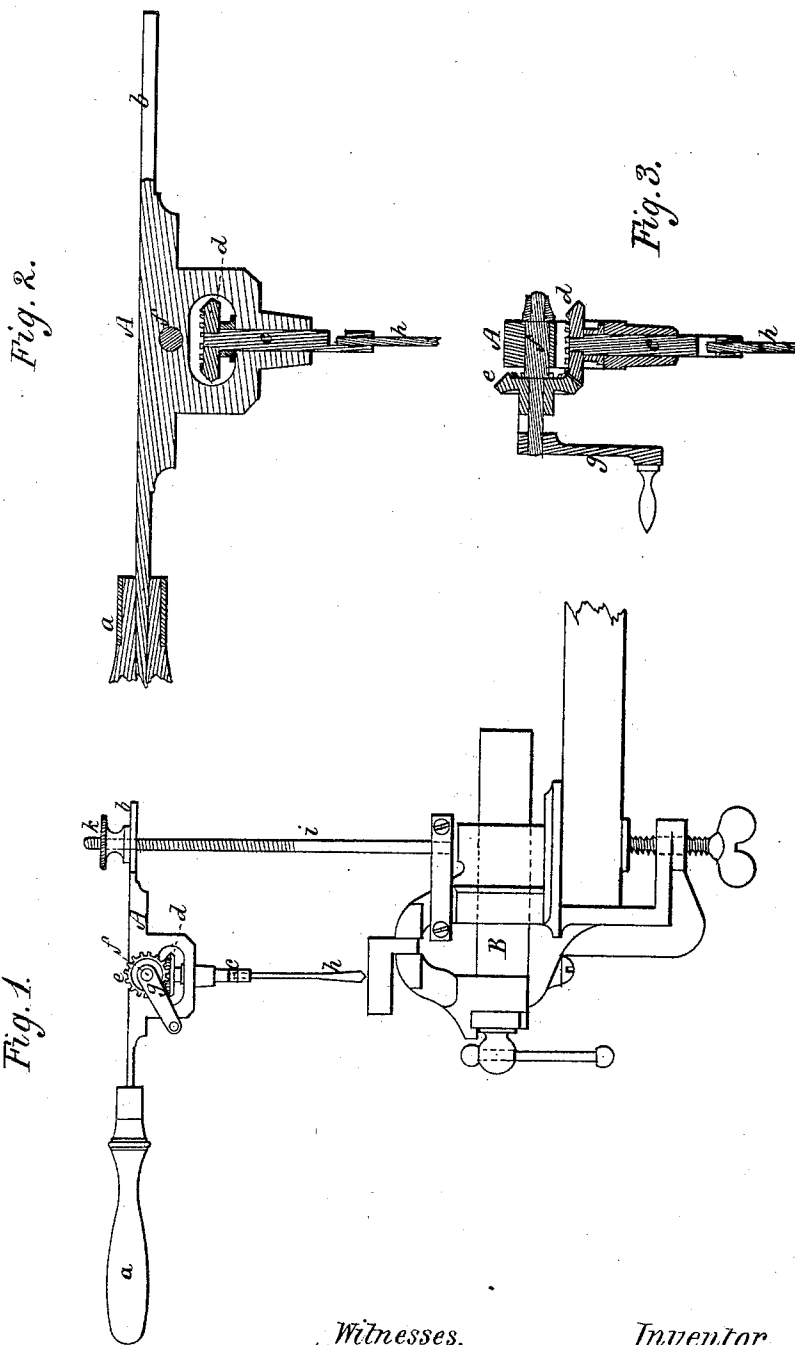


D. GOODNOW, Jr.

HAND-DRILLS FOR DRILLING METAL.

No. 175,969.

Patented April 11, 1876.



Witnesses.
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UNITED STATES PATENT OFFICE.

DANIEL GOODNOW, JR., OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN HAND-DRILLS FOR DRILLING METAL.

Specification forming part of Letters Patent No. **175,969**, dated April 11, 1876; application filed March 4, 1876.

To all whom it may concern:

Be it known that I, DANIEL GOODNOW, Jr., of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Hand-Drills, of which the following is a specification:

My present improvement relates to hand-tools or implements for drilling metal, by which I am enabled to relieve the workman of much of the labor and inconvenience now requisite in this class of work, and, at the same time, to exert much greater pressure or power upon the drill, and enable the work to be accomplished in a fraction of the time which has heretofore been occupied.

My improvement consists, mainly, in forming the stock of the drill of a bar or lever by which I can exert great pressure upon the drill; and in arranging the drill and its operative mechanism in such manner that the former stands and operates at right angles to the longest plane of the drill-stock, the whole being substantially as hereinafter explained.

The drawings accompanying this specification represent, in Figure 1, a side elevation; and in Figs. 2 and 3, sections of an implement embodying my improvements.

In these drawings, A represents a metallic bar or lever, which constitutes the stock of the implement, and is of such size as will be found most convenient to adapt it to the particular work required, one end of such lever being, preferably, provided with a handle, *a*, and its opposite end or base *b* furcated, or otherwise formed or provided, to enable it to retain hold of or be attached to any stationary object to obtain the desired leverage.

Centrally, or thereabout, of the bar A, and revolving in suitable bearings therein, and at right angles to the longest plane thereof, I dispose an arbor, *c*, to the upper end of which I secure a beveled pinion, *d*, while engaging and driving this pinion is a second beveled pinion, *e*, which is affixed to and revolved by a cross-shaft, *f*, such shaft being mounted in a bearing in the upper part of the lever A, and disposed at right angles to the longest plane of such lever and of the axis of the arbor *c*, and at its outer end being provided with a crank, *g*, by which it may be conveniently rotated.

With his left hand grasping the handle *a* of the implement, the workman with his right rotates the crank *g*, and thus imparts rotary motion to the arbor *c* and the drill *h*, which may be applied to the latter.

In practical use of the implement, the bar A is, as before premised, to be used as a lever, of which its outer end *b* is the base and the drill *h* is the fulcrum; therefore, a convenient abutment must be provided or improvised against which to rest the said end *b*.

I have shown in the accompanying drawings one method of using my improved drill in machine-shops, or other localities, in which a vise is convenient.

In this instance, I secure to the vise shown at B, in any suitable manner, an upright rod or post, *i*, upon which is cut a screw-thread; and I screw upon this threaded post a nut, *k*, beneath which the base of the lever or bar A is placed.

The object to be drilled is secured within the vise at such a height with respect to the post *i* and nut *k* that the lower end of the drill shall rest upon it.

As the workman rotates the drill with his right hand he bears down upon the handle *a* with his left, and with the leverage thus obtained he exerts great power to feed the drill and execute rapid drilling. As the drilling proceeds the drill would, but for some provision to the contrary, be thrown out of the direction in which it started; and to compensate for this the nut *k* is to be lowered in accordance with the advance of such drill.

I do not, in any sense, restrict myself to the use of the vise B and post *i* as a means of adapting the drill to use, and my object in representing them is to illustrate one practical manner in which my invention may be employed.

I claim—

The combination of the lever-bar and the rotary drill-shaft at right angles to and intermediate between the ends of the bar, the parts being arranged for joint operation, substantially as set forth.

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Witnesses:

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