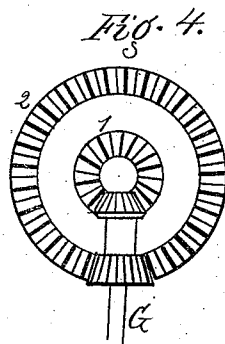
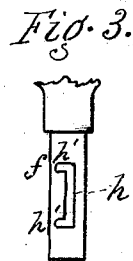
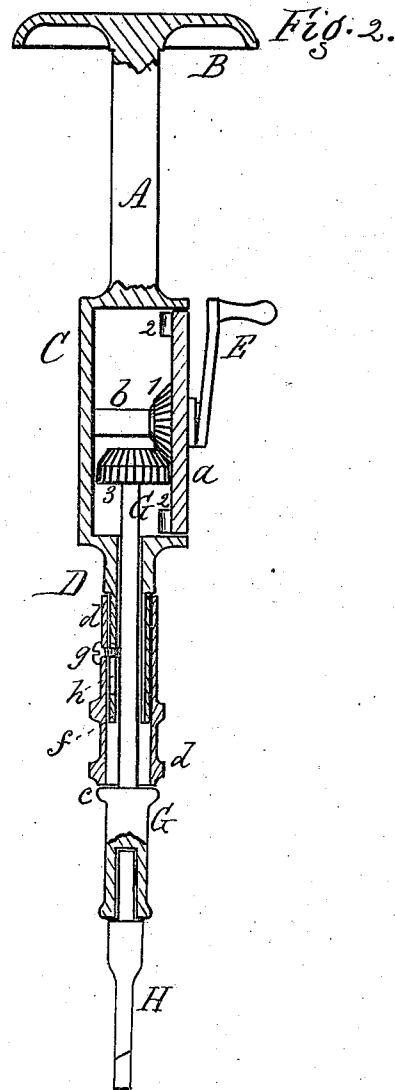
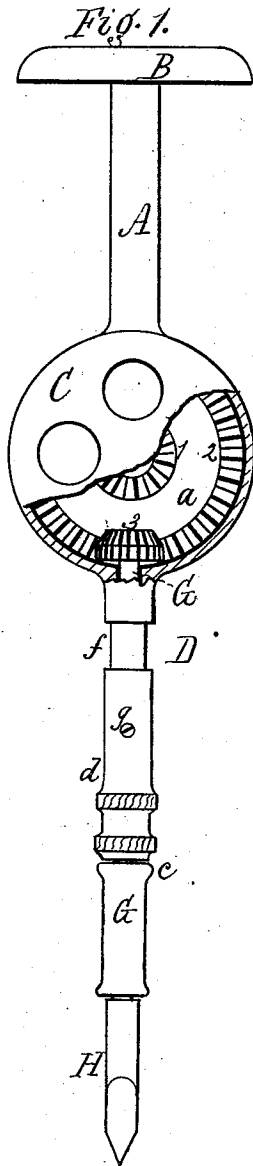


J. SARGENT.

Drills for Drilling Metal.

No. 155,337.

Patented Sept. 22, 1874.



Witnesses.
E. B. Scott.
Jacob Spahr

Inventor.
James Sargent,
per R. F. Osgood,
Att'y.

UNITED STATES PATENT OFFICE.

JAMES SARGENT, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN DRILLS FOR DRILLING METAL.

Specification forming part of Letters Patent No. **155,337**, dated September 22, 1874; application filed June 20, 1874.

To all whom it may concern:

Be it known that I, JAMES SARGENT, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Boring-Instruments; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same.

This invention relates to boring-tools, in which the boring-shaft is capable of a rapid or slow revolution for the purpose of operating on metal and wood.

The improvements are fully hereinafter described, and pointed out in the claim.

In the drawings, Figure 1 is an elevation with a portion of the center bearing broken away, showing my improvement. Fig. 2 is a central vertical section. Figs. 3 and 4 are detail views.

A represents the stock, and B the head, of the instrument, by which the pressure is applied in boring. C is a central chamber or bearing, connecting the stock A and the shank D, and serving to hold the gearing by which the instrument is driven. It may be either open or closed. In the latter case it has a cover or head, *a*, which turns on a stud, *b*, by means of the crank E, and carries on its inner side two cog-rims, 1 2, of unequal diameter, one within the other. With these cog-rims engages a bevel-pinion, 3, attached to the end of a shaft, G, which extends through the hollow shank D, and carries at its outer end the tool H, by which the work is done.

The shaft slides endwise, so as to bring the pinion 3 in connection with either of the cog-rims, 1 2. When engaged with the inner one the motion is slow, and when engaged with the outer one the motion is rapid. This is necessary to accommodate different kinds of work—as in boring wood or iron—or to adapt the motion to tools of different sizes or kinds.

The shaft G at its lower end has a shoulder, *c*, which rests against an adjusting-sleeve, *d*, which forms a part of the shank. The upper end of this sleeve rests loosely upon a bearing, *f*, of the fixed upper part of the shank. A stop, *g*, consisting of a screw or other device, passes through the sleeve, and enters a longitudinal slot, *h*, of the bearing *f*. At the

upper and lower ends the slot has offsets *h' h'* at just such a distance apart as will allow the pinion 3 to slide to engage with the respective cog-rims 1 2.

The shaft G, being connected with the sleeve *d*, slides up and down with it to engage with the cog-rims, and the motion is gaged by the length of slot *h*. At the extent of each movement the sleeve is turned, so as to carry the point of the stop *g* into the offsets *h' h'*, which locks the parts, so that the tool may be turned in either position.

Other arrangements of the shaft and adjusting parts might be used to shift the pinion, and the latter might be made to slide up and down on a permanent shaft, the pinion adjusting instead of the shaft. Two pinions, as shown in Fig. 4, might also be employed, engaging, respectively, with the two rims 1 2, the one running free, while the other is locked to the gear, and vice versa, the change being made by any suitable shifting arrangement.

A boring-instrument provided with the differential gear above described is very useful, as it is thereby adapted to both slow and rapid work, and the change can be made in a moment's time, and without removing the pinion or removing the casing in which the gear rests. It is compact, and the gearing does not occupy any extra space.

A socket may be employed at the end of the shaft for the reception of tools, so that they may be changed at pleasure.

I am aware of the patent to James Smith, dated May 24, 1870, and I disclaim the construction of drilling-machine therein shown.

Having thus described my invention, I do not claim a boring-instrument driven by a crank and gear; nor do I claim a differential gear in which the pinion is removed from place by hand to change the motion.

What I claim as new is—

1. The combination, with the stationary casing and revolving cap, having the cog-rims of varying diameter, of the vertical shaft, carrying a pinion at its upper end, and capable of a vertical adjustment to bring said pinion in gear with either of the cog-rims on the revolving cap, as and for the purpose described.

2. The combination of the stationary box C, having the slotted shank D, and the re-

volving cap *a*, having the cog-rims 1 and 2 of varying diameter, with the boring-shaft G, having the pinion or pinions 3, and the adjusting-sleeve *d*, said boring-shaft having a vertical adjustment, substantially as herein described, for the purpose specified.

In witness whereof I have hereunto signed

my name in the presence of two subscribing witnesses.

JAMES SARGENT.

Witnesses:

R. F. OSGOOD,

E. B. SCOTT.