J. HAAS & J. MANNING.
Well-Boring Apparatus.

No. 196,009. Patented Oct. 9, 1877.

Fig. 1.

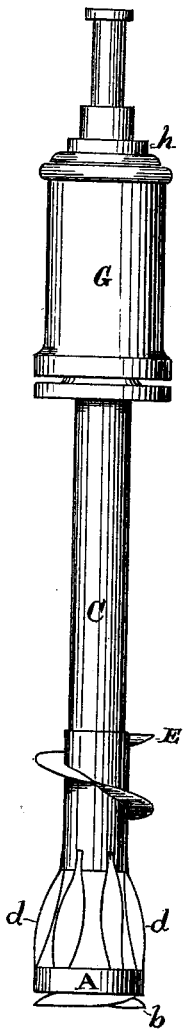
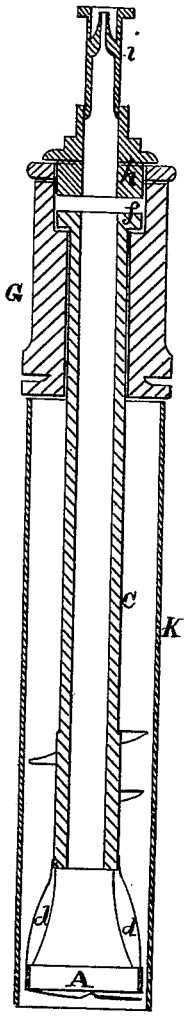


Fig. 2.



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UNITED STATES PATENT OFFICE.

JEROME HAAS AND JAMES MANNING, OF STOCKTON, CALIFORNIA.

IMPROVEMENT IN WELL-BORING APPARATUS.

Specification forming part of Letters Patent No. **196,009**, dated October 9, 1877; application filed June 18, 1877.

To all whom it may concern:

Be it known that we, JEROME HAAS and JAMES MANNING, of Stockton, county of San Joaquin, and State of California, have invented an Improved Well-Boring Apparatus; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

Our invention relates to a novel method and apparatus for boring wells and other holes in the ground; and it consists of a peculiarly-constructed boring-tool, in combination with a hydraulic stream, as hereinafter described.

Referring to the accompanying drawings, Figure 1 is an elevation of my invention. Fig. 2 is a vertical section of the same.

The boring-tool consists of a narrow band, A, the under side of which is covered with a metal plate, and this plate is cut radially in one or more places. A portion of the plate on one side of the cut is then bent downward, so as to form a spiral boring-lip, *b*, in the ordinary manner of forming an earth-boring auger, or an auger of any other approved pattern which cuts and raises the earth to the inside of the band A can be used. This band is connected with the lower end of a hollow shaft, C, by means of two or more plates, *d d*, each of which is bent spirally, as represented, leaving a space between each two connecting spiral plates, for the purpose hereinafter described.

A short distance above the lower end of the shaft C we secure a wide spiral flange, E, which may coil one or more turns around the tube. The upper end of the hollow shaft C is formed with a shouldered head, *f*. G is a cylinder, the lower half of which is provided with a central bore, through which the hollow shaft C passes, while its upper part is chambered out, so as to receive the shouldered head *f* of the tube, similar to a piston in a cylinder. A tubular plug, *h*, is then screwed into the upper end of the cylinder. This plug has a nipple, *i*, on its upper end, through which the bore passes, so that a flexible tube can be secured upon it.

It will now be evident that the hollow shaft C, with its boring-bit, can be rotated while the cylinder G remains stationary, and that a hole extends from the lower end of the tube up through the tube and cylinder, while the flexible tube forms a continuation of it.

In boring a well or hole in the ground, we use an outside tube, K, inside of which the auger or boring-bit and hollow shaft C are operated. This outside tube serves as the curbing of the well when it is completed.

In starting to bore, we place the boring-tool and hollow shaft C inside of the curbing-tube K, so that the bit *b* will rest upon the ground at the bottom of the tube. The cylinder G we secure in a suitable frame-work, and apply the power by a belt, or otherwise, to the shaft C above the tube, so that the hollow shaft and boring-bit will be rotated inside of the tube K.

The bits *b b* will cut the earth and direct it upward into the chamber between the band A and the lower end of the tube. We then direct a stream of water into the outside tube K, so as to keep it filled, or nearly so. The spiral flange E, on the rotating shaft C, will force this water down into the chamber, and against the bottom of the bore, and the pressure created will force it, together with the loosened earth, up the hollow driving-shaft C, and out through the flexible tube.

The spiral plates *d d*, which connect the band A with the lower end of the shaft, serve both as a disintegrator of the earth and as a central discharge-wheel of the turbine class, to keep the water and earth moving toward the lower end of the hollow shaft. Meantime, as the earth is removed, we apply a downward pressure upon the upper end of the tube K, and force it into the soil as fast as the boring-tool progresses.

The earth and water which are raised by the operation are conducted by the flexible tube to any point where it is desired to discharge them.

If desired, the stream of water could be forced down through the hollow driving-shaft, and the mud and water discharged through the outside tube K; but we prefer the former method.

A very effective boring implement could be obtained by leaving off the flange E, and allowing the plates *d d* to force the current of water.

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

1. The boring-tool, consisting of the band A, with its bits *b b*, connected with the hollow driving-shaft C by means of the spiral plates *d d*, substantially as and for the purpose described.

2. An earth-boring implement, connected, by spiral plates *d d*, with a hollow driving-shaft, C, in combination with the spiral flange E and outside tube K, substantially as and for the purpose described.

In witness whereof we have hereunto set our hands and seals.

JEROME HAAS. [L. S.]
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Witnesses:
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