

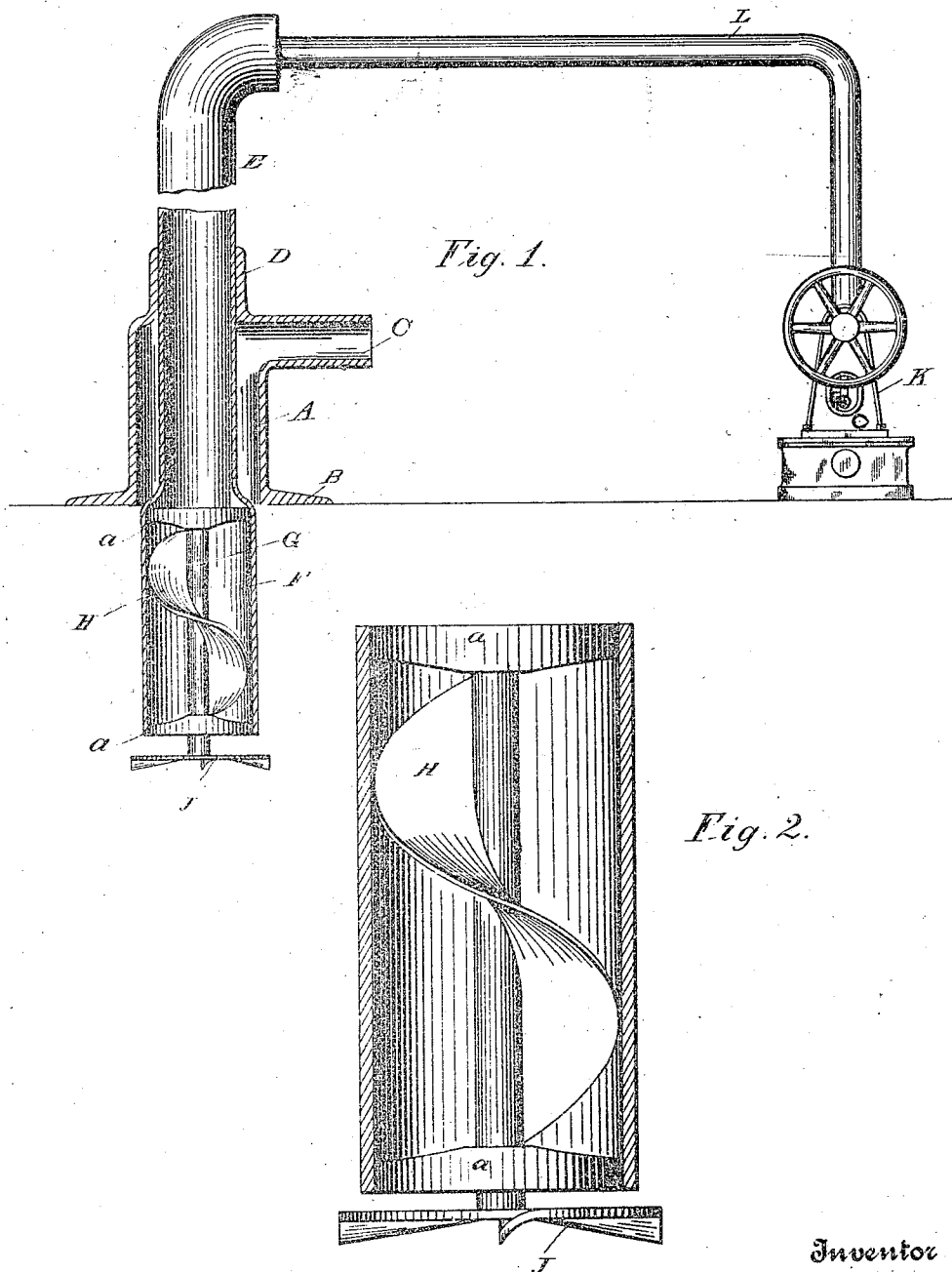
(No Model.)

2 Sheets—Sheet 1.

A. McDOUGALL.
BORING MACHINE.

No. 469,840.

Patented Mar. 1, 1892.



Witnesses

Arthur A. Erb.
J. S. Champion

Inventor

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by
Frank L. Iyer Attorney

(No Model.)

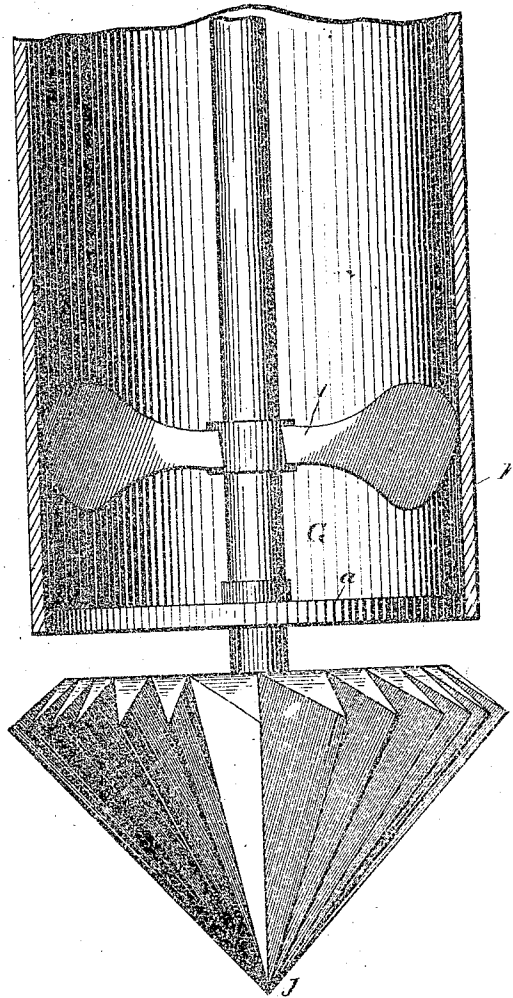
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Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

BORING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 432,840, dated March 1, 1892.

Application filed March 2, 1891. Serial No. 333,562. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Boring-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to an improved machine for boring holes either on land or under water for posts, piles, telegraph-poles, foundations, wells, and mining purposes.

The principal object of my invention is to provide a very portable machine for these purposes which can be operated very cheaply and wherein all dirt, rock, or material from the hole which is being formed will be removed during the operation of boring the same.

Another object of my invention is to provide a machine of the character mentioned wherein all shafting or mechanical appliances for connecting the boring-tool with the source of power are dispensed with.

Another object of my present invention is the production of such a machine wherein the boring-tool will not be broken in case an obstruction is encountered, but will come to rest although the source of power may continue to operate.

The principal novelties in my present invention consist of a casing having an outlet-pipe by preference, a straight pipe passing down through said casing and carrying a worm or propeller or screw wheel or equivalent device within its lower end, a boring-tool beneath said pipe and connected with and operated by the said worm or other device, a pump or other apparatus for forcing water in said pipe, and a flexible pipe connecting said pump with said straight pipe, all adapted to operate as will be more fully described and claimed herein.

For a better comprehension of my invention attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a sectional view of the apparatus; Fig. 2, an enlarged sectional view of the form of boring-tool and the operating-worm

therefor, and Fig. 3 an enlarged sectional view of a modification of the same.

In all of the above views corresponding parts are designated by the same letters of reference.

A represents a cylindrical casing made of metal and having an enlarged base B and adapted to sit firmly on the ground over the hole which is being bored. This casing A is preferably provided with a nozzle C for the discharge of the water through the casing. It should be understood, however, that this discharge-nozzle may be dispensed with, in which case the water would discharge out through the top of the casing. If the nozzle C is used, it is preferable to provide the casing with a cylindrical extension D, as shown, so that there can be no leakage of the water at this point.

E is a straight metallic pipe extending down through the casing A and provided with an enlarged head F at its lower end. This head F may be made integral with the pipe E, or it may be separated therefrom and secured to the pipe in any suitable manner. At the upper and lower portions of the head F are the spider-arms *a a*, which are mounted in place in any suitable way, or they may be cast integral with said head. Mounted within these spider-arms is a shaft G, having its lower end extending some distance below the bottom of the head F. Mounted on this shaft within the head F is a worm H. (Shown in Figs. 1 and 2.) Instead of a worm a propeller I may be used, as shown in Fig. 3. Both of these forms of devices have certain advantages, and I do not wish to be limited to either. A worm can be made cheaper than a propeller-wheel, but it occupies more space. It is to be understood that it is the intent of this specification to include as equivalents any mechanical devices for operating the boring-tool, which will be actuated by the passage of the water through the pipe E. By changing the pitch of the worm or propeller the speed of the same can be regulated, as will be evident. A boring-tool J is secured to the lower end of the shaft G, and is of a diameter slightly smaller than the interior of the casing A.

In Fig. 3 the form of boring-tool illustrated is simply a well-known burr, and in Figs. 1

and 2 the boring-tool consists simply of a circular plate having ears or lips cut or punched out therefrom, as shown, and to which I make no especial claim herein. The first form of boring-tool is more advantageous than the latter form, inasmuch as it will feed itself into the material to be cut.

K is a pump placed at any suitable point and may be of any suitable construction. A steam-pump is preferable for the reason that a much more powerful stream of water can be thrown by this variety of pump than by any other. It should be understood that a pump may be dispensed with if there is a sufficient natural water-pressure to the necessary work. The pump K is connected to the pipe E by means of a flexible pipe L, which is preferably a rubber pipe, so that the said pipe E will be free to move up and down.

The operation of my improved device is as follows: The casing A is placed in position over the point where the hole is to be bored, and the pipe E is allowed to drop by its weight, so that the boring-tool J will rest on the ground. The pump K is now started, and water is pumped through the pipes I and E and head F, and this water will escape up through the interior of the casing and out through the nozzle C, as will be evident. As the water passes through the head F it will cause the worm or propeller to revolve, and in this way the boring-tool will be operated and will bore into the earth to form the desired hole. The dirt which is cut up by the

boring-tool will be carried out through the nozzle C by the overflow of the water, and in this way there can be no accumulation of dirt. It will therefore be seen that the water not only operates the boring-tool, but that it removes the dirt from within the hole which is being formed.

It will be evident that the device might be operated by pumping the water in through the nozzle C and allowing it to escape through the pipe E, and I would have it understood that this specification contemplates such modification.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In a boring apparatus, the combination of a casing A, a pipe E, movable vertically within the same, a worm, propeller, or equivalent within said pipe and adapted to be operated by the downward flow of water through the same, and a boring-tool connected to said worm or equivalent, substantially as set forth.

2. In a boring apparatus, the combination of a casing A, a pipe E within the same, a worm, propeller, or equivalent within said pipe E, a boring-tool connected to said worm or equivalent, a pump K, and a pipe L, connecting the same and the pipe E, substantially as set forth.

ALEXANDER McDOUGALL.

In presence of—

M. J. MULLIN,

CHAS. W. LELAND.