

A. G. COLLINS.
WELL BORING TOOL.
APPLICATION FILED NOV. 15, 1911.

1,065,294.

Patented June 17, 1913.

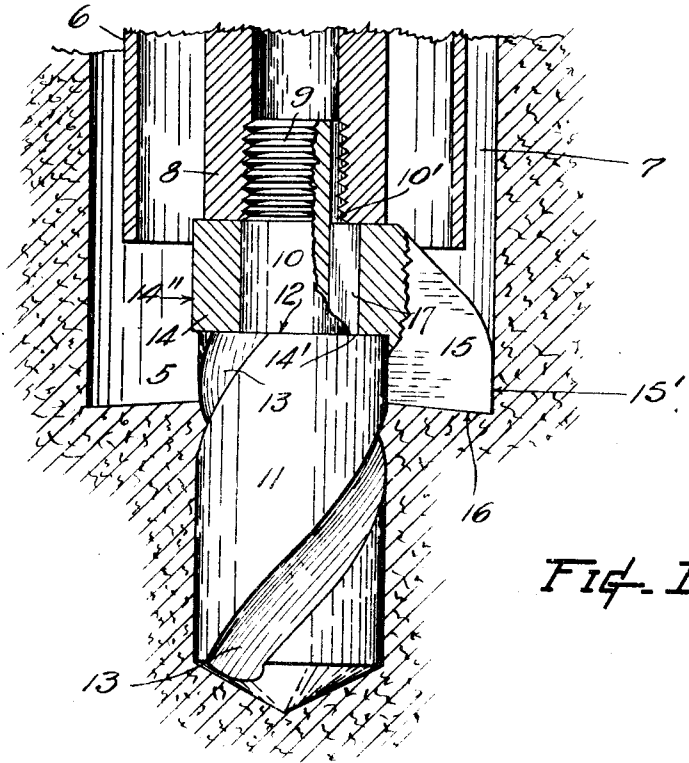
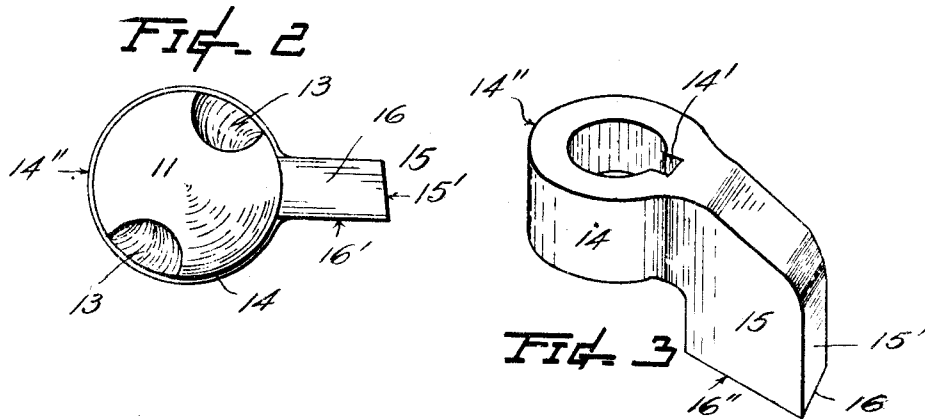


Fig. 1



WITNESSES:

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WELL-BORING TOOL.

1,065,294.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed November 15, 1911. Serial No. 660,409.

To all whom it may concern:

Be it known that I, ASA G. COLLINS, a citizen of the United States, residing at Everett, in the county of Snohomish and State of Washington, have invented certain new and useful Improvements in Well-Boring Tools, of which the following is a specification.

This invention relates to well-drills and is particularly designed for use with devices such as shown in Patent No. 993,507, issued to me May 30, 1911, and wherein water is introduced into the well bore about the outside of a pipe and through the interior of which the water is withdrawn accompanied by the material excavated at the bottom of the bore. With certain characters of material, the same may not only be removed from the well through the agency of water but the excavations can also be performed thereby.

Where the material to be bored, or a strata thereof, is such as to withstand the action of water for carrying on the boring operations, the same must be performed by a drilling operation, and to meet these conditions is the purpose of the present invention—that is to say, to furnish a drill or boring tool which will provide a bore below the end of a pipe extending into the well and of a diameter greater than that of the pipe to afford space about the latter for the inflow of water.

A further object of the invention is to provide a boring tool which can be rigidly secured to the drill stock above the ground surface and thus inserted through the pipe of less diameter than the hole which will be produced by the drill.

With these ends in view, the invention consists in the novel construction and combination of devices, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical transverse sectional view of a boring tool embodying my invention and illustrated as applied to boring a well. Fig. 2 is an underside view of the boring tool. Fig. 3 is a perspective view of the reaming member shown detached.

The reference numeral 5 designates a well bore and 6 is a pipe of less diameter than such bore and extending thereinto, with a consequent space 7 about the latter.

8 represents a hollow tool stock which at

its lower end is interiorly screw threaded for engagement with the threaded end 9 of the shank 10 of an auger or drill 11. This drill is of greater diameter than that of the shank 10 to afford an annular shelf or shoulder 12. The spiral grooves 13 of the drill extend from the lower end of the same to or within a short distance of the shoulder 12. Fitted to the shank 10 is a collar 14 of a reamer having a cutter arm 15 extending radially or approximately so therefrom and of an angular shape in vertical section so that the lower extremity 16 of the arm will be below the level of the upper ends of the drill grooves 13. The extremity 16 of said arm is ground, swaged or otherwise brought to a cutting edge 16'. The drill shank 10 and said collar are respectively provided with ways 10' and 14' to receive a key 17. The distance from the outer end 15' of the arm to the remote part, as 14'', of the collar 14 is less than the internal diameter of the pipe 6 so that the drill together with the reamer may be moved with the stock 8 as a single piece through the pipe.

In practice, a well 5 may ordinarily be sunk to a considerable depth by the agency of water supplied through the annular space 7 about the pipe 8 and after detaching the material at the bottom of the well, the material thus removed is withdrawn with water from the well through the interior of said pipe. When a stratum of hard or refractory material is encountered that withstands the corrosive action of water then the devices comprising the present invention are utilized to mechanically remove the material for the water to convey through the pipe from the well. The assembled parts of the drill, reamer and stock are then introduced through the pipe to the bottom of the well and the drill 10 is brought into position to have its axis correspond with the axis of the well. Power is then applied to the stock for rotating the drill to cause it to bore into the well bottom. When the drill has been thus sufficiently advanced the reamer will become operative to perform its function of enlarging the bore afforded by the drill to a definite diameter.

The borings, or material removed by the drill, are elevated upwardly by the spiral grooves 13 within the orbital path of the cutter arm and whereby such material is mixed with the water to facilitate the con-

veyance of the mass through the pipe to be discharged.

What I claim as my invention, is—

In a well boring tool, the combination
5 with an internally-threaded hollow tool
stock, of a drill provided in its periphery
with spiral grooves and having a terminal
threaded and an intermediate smooth shank
portion, a reamer having a collar of greater
10 diameter than the drill, said reamer being
provided with a key-way and seated about
the smooth portion of the drill shank, a cut-
ter arm extending laterally from the collar

and below the top of the grooved portion of
the drill and contacting the periphery of the 15
latter, said threaded and smooth shank hav-
ing a longitudinal key groove extending
their entire lengths, and a key seated within
said groove of the smooth shank adapted for
securing the reamer against independent ro- 20
tation with respect to said drill.

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Witnesses:

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