S. C. MONBERG.

HYDRAULIC DRILLING MACHINE.

APPLICATION FILED OCT. 11, 1912.

1,092,075. Patented Mar. 31, 1914.

Fig. 1.

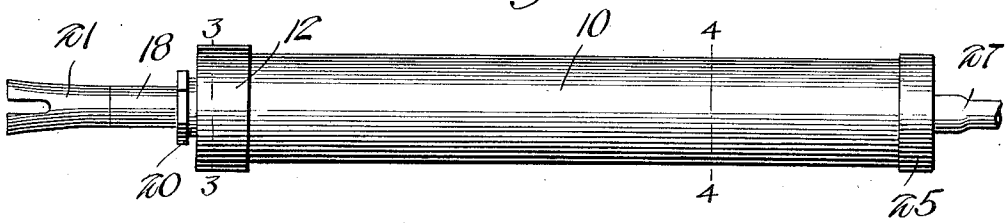


Fig. 2.

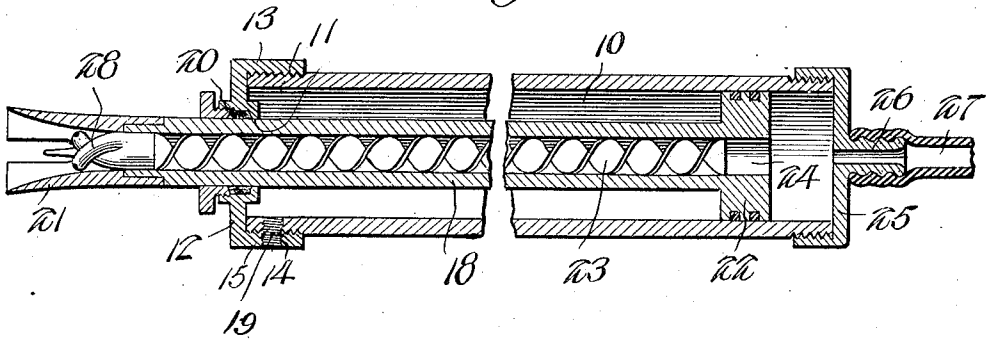


Fig. 3.

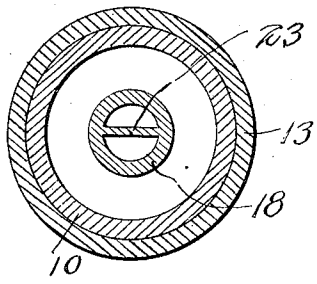


Fig. 4.

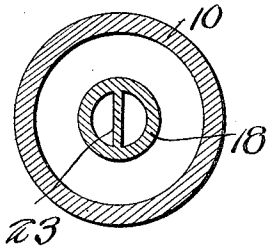
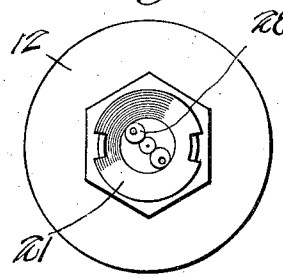


Fig. 5.



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HYDRAULIC DRILLING-MACHINE.

1,092,075. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed October 11, 1912. Serial No. 725,342.

To all whom it may concern:

Be it known that I, SOREN C. MONBERG, a citizen of the United States, residing at Leadville, in the county of Lake and State of Colorado, have invented new and useful Improvements in Hydraulic Drilling-Machines, of which the following is a specification.

The invention relates to boring machines and more particularly to the class of hydraulic rock drilling or boring machines.

The primary object of the invention is the provision of a machine of this character wherein the drilling bit or auger will be rotated through the medium of water pressure the latter being deflected through a sinuous course or waterway formed within the body of the machine.

Another object of the invention is the provision of a machine of this character wherein hydraulic pressure is used both for rotating the tool, advancing the drill shank and also for spraying the jet about the working end of the tool so that the material acted on will be softened and thereby make easier the cutting action of the tool.

A further object of the invention is the provision of a drilling machine of this character wherein the drilling tool or bit may be reciprocated for the lengthening or shortening of the same, and also which will rotate under the action of fluid pressure for operating upon a piece of work for the drilling thereof.

A still further object of the invention is the provision of a machine of this character which is simple in construction, strong, durable, reliable, efficient and easy in operation, and inexpensive in manufacture.

With these and other objects in view the invention consists in the construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a side elevation of a machine constructed in accordance with the invention. Fig. 2 is a vertical longitudinal sectional view through the same. Fig. 3 is a sectional view on the line 3—3 of Fig. 1. Fig. 4 is a sectional view on the line 4—4 of Fig. 1. Fig. 5 is an end elevation of the tool.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings by numerals, the drilling machine comprises a main cylinder barrel 10, which may be of any suitable length and constructed from any suitable material, the said barrel or cylinder being formed at its outer end with an internal seat 11 receiving an end cap or closure disk 12, the inturned circular flange 13 of which suitably telescopes within the said seat 11, and is fastened therein in any suitable manner. Formed in the flange 13 is an aperture 14, adapted for registration with a nipple 15 formed on the casing or barrel 10, for permitting the discharge of fluid therefrom, and also allowing the inflow of fluid within the casing or barrel at the forward end thereof. Telescoping within the cylinder or barrel 10 is a hollow drill shank 18, the same working through a suitable central aperture 19 formed in the outer contracted end of the cap or disk 12, the said aperture being provided with suitable packing 20 to form a fluid tight joint between the shank and the said cap or disk. The outer end of the shank 18 is provided with a cutter head 21 of any approved form, while the inner end of the shank has fixed thereto a piston head 22, adapted to work within the cylinder or barrel 10 longitudinally thereof under the pressure of fluid admitted thereto.

Integrally formed within the shank 18 for a greater portion of its length is a spiral partition or vein 23, which affords a spiral water course interiorly of said shank, the water being introduced at the inner end of the shank 18 to the said water course through a central aperture 24 formed in the piston head 22 and on the admission of said water thereinto the shank 18 by reason of the impact of the water against the spiral vein or partition 23 will rotate thereby driving the cutter head 21, so that the same may act upon the earth or rock strata for the boring or drilling of the same.

Threaded or otherwise mounted on the cylinder or barrel 10 at the inner end of the same is a cap 25 formed with an externally threaded nipple 26, to which is adapted to be connected a hose supply pipe 27 adapted to be connected with any suitable water pressure apparatus so as to force the water under pressure into the cylinder or barrel 10 rearwardly of the piston head 22, thus oper-

ating the shank 18 and its cutter head 21 for drilling purposes. The pressure of water against the piston head 22 will effect the extending of the shank 18 for sustaining the cutter head 21 in cutting relation to the material operated upon thereby. The shank 18 at its outer end and within the head is formed with reversely curved discharge nozzles 28, which permit the water passing through said shank to be discharged through the cutter head 21 during the working thereof and in this manner the loose material will be washed away and prevented from clinging to the cutter head during its action, and also will effect the softening of the material being acted upon, so as to assure the positive cutting thereof by the cutter head, the water being discharged through the nozzles and is directed thereto from the water course formed by the spiral vein or partition 23 within the said shank.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be clearly understood, and therefore, a more extended explanation has been omitted.

What is claimed is:—

1. A drilling machine comprising a cylinder, a piston reciprocatingly movable within the cylinder and having a hollow drill shank projected exteriorly through one end of the cylinder, the bore of the shank being extended through the piston, a spirally arranged partition formed integrally with the shank and extending throughout a greater portion of the length thereof within the bore of the same, a cutter head mounted on the outer end of the shank, a nipple mounted within the outer end of the bore of the shank and having reversely curved discharge nozzles, and means for admitting fluid to the cylinder at one side of the piston.

2. A drilling machine comprising a cylinder, a piston reciprocatingly movable within the cylinder and having a hollow drill shank projected exteriorly through one end of the cylinder, the bore of the shank being extended through the piston, a spirally arranged partition formed integrally with the shank and extending throughout a greater portion of the length thereof within the bore of the same, a cutter head mounted on the outer end of the shank, a nipple mounted within the outer end of the bore of the shank and having reversely curved discharge nozzles, and means for admitting fluid to the cylinder at one side of the piston, the said cylinder being provided with a port to permit the inflow and out-flow of fluid to and from the cylinder at the other side of the piston.

In testimony whereof I affix my signature in presence of two witnesses.

SOREN C. MONBERG.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."