Aug. 19, 1924. 1,505,460

G. GRIESCHE

WELL DRILL

Filed Sept. 26, 1923

Fig. 3

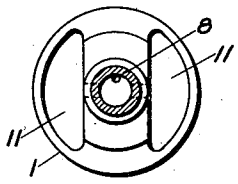


Fig. 5

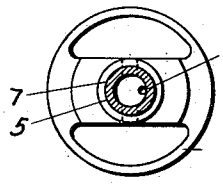


Fig. 1

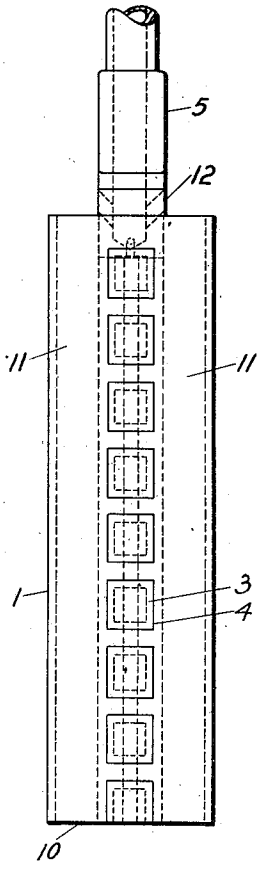


Fig. 2

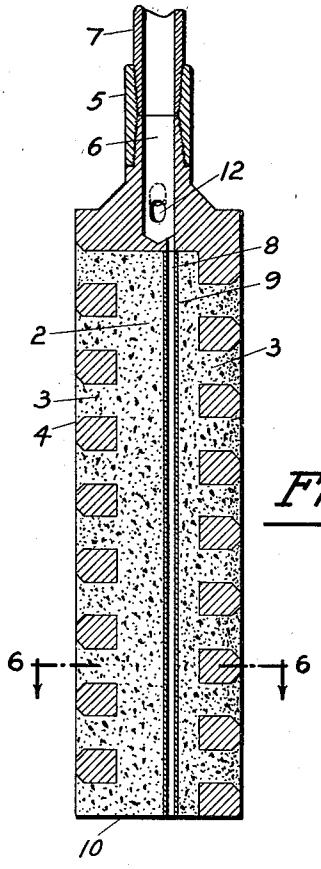


Fig. 4

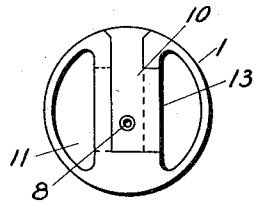
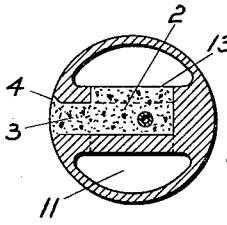


Fig. 6



INVENTOR

Gustav Griesche

Patented Aug. 19, 1924. 1,505,460

UNITED STATES PATENT OFFICE.

GUSTAV GRIESCHE, OF BERKELEY, CALIFORNIA.

WELL DRILL.

Application filed September 26, 1923. Serial No. 664,927.

To all whom it may concern:

Be it known that I, GUSTAV GRIESCHE, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented new and useful Improvements in Well Drills, of which the following is a specification.

This invention relates to rotary well-boring tools, and in particular to the drill for the boring of the well.

Some of the principal objects of my present invention are: the provision of a rotary drill having as an integral part thereof, a longitudinal core of abrasive material as the cutting agent of the drill; to form the said core with branches of the same abrasive material, for ensuring peripheral clearance of the drill as the drilling of the well advances; to form the core with a hole therethrough to feed a water supply to the cutting face of the drill; to form the drill as a shell or housing, having one or more longitudinal ports for the passage and delivery therethrough of the resultant drill cuttings; and to provide flushing means to carry the said cuttings to the top of the well and out.

I attain the above objects by the novel construction of my drill, and other objects and advantages of the invention will appear in the subjoined description of the accompanying sheet of drawings, in which:

Figure 1 is a view in elevation of the drill in its normal position.

Fig. 2 is a vertical elevation in section taken on a plane through the axis of the drill and at right-angles to the view of Fig. 1.

Fig. 3 is a top plan of Fig. 1, and Fig. 4 a bottom plan of it.

Fig. 5 is a full top plan of Fig. 2, and Fig. 6 a full transverse section of Fig. 2 along the line 6—6 thereof.

Referring to the drawing and figures thereon: The numeral 1 designates the body of the drill, here shown as a cylindrical shell housing the elements of the invention. The body is preferably made of soft cast steel for a purpose to be later described. The casting has a series of transverse holes cored therein communicating with a central longitudinal cavity shown to advantage in Fig. 2.

Into the cavity and holes an abrasive mass may be formed as a fixed integral part of the drill. This mass constitutes an abrasive longitudinal core 2 with lateral branches 3 to the outside of the shell as at 4. Here the transverse holes may flare outwardly, to form a larger abrasive area in the nature of spot-faces for clearance-cutting in the operation of the drill.

The abrasive core is the cutter of the drill, and consists preferably of a mixture of crushed steel, granite chips and Portland cement; the latter in combination with the proper amount of water is the binder for mass.

The head of the drill may be connected to the string of boring tools (not shown) by any of the well-known means, such for example as with the threaded coupling 5.

The drill-head has a central hole 6, which is a continuation of the hole in the drive-stem 7, and the drill has a smaller hole 8 cored through the abrasive core 2 and which communicates with the drill-head hole 6. To form the hole 8 in the core 2, a tube 9 or the like may be placed in the desired position in the cavity and the abrasive mass compacted around it. It is desirable to have the latter hole 8 off the axis of the drill, as shown clearly in the top plan views, for eccentric motion in cutting while water is fed through the hole to the cutting face 10, otherwise, if centrally positioned an uncut core would remain and which would plug the liquid supply hole.

Within the shell of the drill, one or more ports 11 are cast to serve as passageways for the delivery of the cut materials from the well. The ports are spaced apart and positioned on opposite sides of the column of staggered branches.

Near the top of the drill and at the exit of the ports 11 are holes 12, preferably in an upwardly sloping position as shown in Fig. 1, and which holes communicate with the central water supply hole 6. The purpose of these holes will be presently set forth in the operation of the drill.

It will be observed from Fig. 6 that the abrasive core extends to the wall of a port as at 13, but the branch above and below this section extends to the opposite wall, thus a staggered column is formed effecting an eccentric cutting face as the drill wears in service.

In operation, the assembled boring rig is positioned over the chosen spot to be drilled

and the rotary drill set in motion, water being forced through the drill stem and core 2 to the cutter-face 10.

This action causes a hole to be ground on the said spot, the hard abrasive and soft cast steel wearing evenly, and slowly liberating particles of themselves but always presenting a fresh cutting-face throughout the length of the drill as it wears away.

In the rotation of the drill the ground-away material is swept into the ports 11, whose mouths are in the plane of the eccentric cutting-face 10, sufficient spent water entering the said mouths to carry the fluid materials to the top of the ports; here a sufficient and bigger volume of circulating water is forced in an upwardly direction through the holes 12, boosting and carrying the said materials to the top of the well and out.

From the foregoing description taken in connection with the accompanying drawing the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains, and while I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made, when desired, as fall within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is the following:

1. A well boring tool comprising a body having discharge ports therethrough and an abrasive cutting core therebetween, said core having an eccentric hole therethrough, and said body provided with a central hole at its top with branches leading therefrom to the eccentric hole and to the discharge ports, for effecting the feed to the cutter and the discharge of the cut material from the tool and well.

2. A well drill comprising a cylindrical body provided with a plurality of through discharge ports within the cylinder, the said ports having therebetween a cavity adapted to receive abrasive material, the said material being the cutting agent of the drill.

In testimony whereof, I affix my signature.

GUSTAV GRIESCHE.