March 1, 1932. E. H. McHARDIE ET AL 1,847,885

WELL TESTING

Filed Jan. 6, 1930

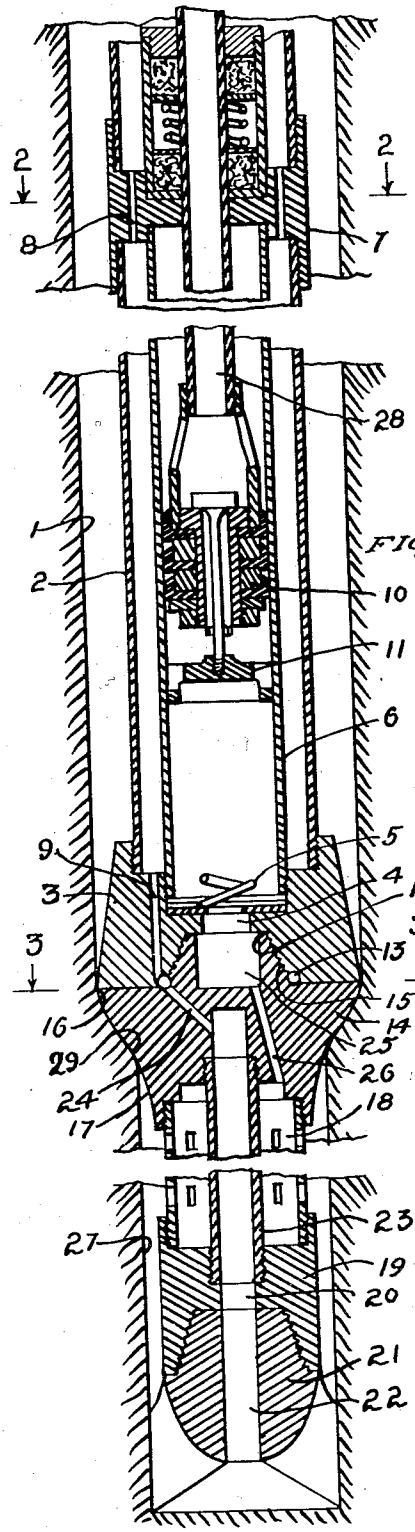


FIGURE 1

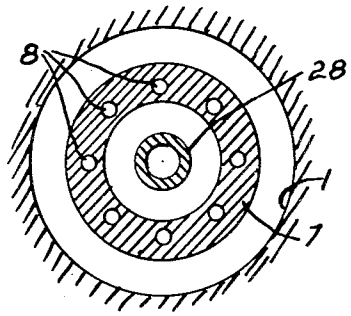


FIGURE 2

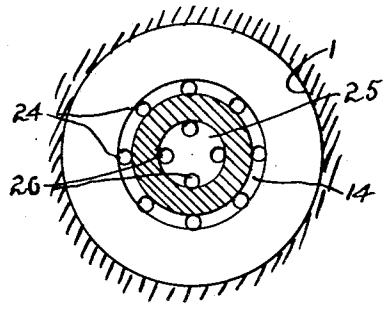


FIGURE 3

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WELL TESTING

Application filed January 6, 1930. Serial No. 418,919.

This invention relates particularly to a means and method of sampling the liquid content of the several strata through which the well is being driven.

It is one object of the invention to provide a method whereby samples of liquid from a given stratum may be obtained without becoming contaminated by an admixture of liquid from an overlying stratum.

It is another object of the invention to provide a method whereby the liquid content of any given stratum may be obtained as the boring of the well progresses and without becoming contaminated by an admixture of liquid from overlying or underlying strata.

It is also an object of the invention to provide a means for sealing off the lowermost portion of the well from the upper portion and means for extracting liquid from the sealed off portion without permitting its admixture with liquid in the said upper portion of the well.

It is still a further object to provide a means for washing out the sealed off portion of the well independently of the upper portion.

In the drawings:

Figure 1 is a sectional view of one embodiment of the invention positioned in a well, parts broken away.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1.

In the embodiment of the invention as herein disclosed we show at 1 a bore of any suitable size and depth such as commonly made when boring for water. It being assumed that it is desired to secure a sample of the water immediately below the bottom of this bore, the procedure is as follows:

We provide a casing of somewhat less diameter than the bore 1 as shown at 2, and on the lower end of this casing is mounted a head 3. The head 3 has an orifice 4 formed in the center thereof controlled by a flap valve as 5. Concentrically mounted on the head 3 and within casing 2 and spaced a distance therefrom is a second casing 6, both casings passing upwardly to the top of the well, the sections being connected by bearing members as 7. The bearing members and the head are provided with conduits as 8 and 9 respectively so that water may be fed downwardly between the casings and through the head 3. In the casing 6 is mounted a lift pump 10, its valve being indicated at 11. The bottom of head 3 has a centrally disposed threaded recess formed therein as at 12, and around the edge of the recess is formed a channel 13.

At 14 we show a complementary head portion having threaded engagement with portion 3 as at 15, the upper and outer edge 16 aligning with the opposing edge of the head portion 3, and the outer surface of the portion 14 curving inwardly and downwardly as at 17 to form an annular curved seat for the purpose hereinafter set forth. In the bottom of part 14 is mounted a perforated casing as 18, this casing being concentrically disposed relative to the axis of revolution of the member 14 and having a diameter substantially less than that of the member 14 at its widest part. Mounted upon the lower end of the casing 18 is a head member 19 having an orifice 20 formed therein and carrying a drill 21 which also has a passage 22 formed therethrough to align with the orifice 20. A conduit 23 is seated in the head members 14 and 19 and within the casing 18 to form a continuation of the conduit 20—22, this conduit communicating with the channel by means of conduits 24, so that water fed down through conduits 9 will flow through the conduits 23—22—20 and into the well. In the upper surface of part 14 is formed a pocket 25 communicating with the orifice 4, and at 26 are conduits connecting the pocket 25 with the chamber between conduit 23 and perforated casing 18.

By means of the foregoing construction water may be fed into the bottom of the well during the final drilling and cleaning operation without mixing it with water from the overlying strata, and a discharge line is provided that is completely closed off from the well and the feed line, through the use of a hollow pump rod 28.

Assuming that the bore 1 has been driven

to some depth and it is desired to secure a sample of the water in the stratum immediately below before the bore is carried therethrough, the procedure is as follows.

The structure 2—26 having been assembled as hereinbefore described the drill 21 is put to work to form the bore 27 of less diameter than the bore 1. This operation is continued until the head portion 14 reaches the beginning of the smaller bore where its rotary movement causes it to form a shoulder 29 and to seat itself tightly thereon in such a manner as to effectually seal off the bore 27 from the bore 1. During this drilling operation water is fed down through conduits 9, 24, 23, 20, and 22 and into the well, and thence upwardly to discharge at the top of the well in the usual manner until the head 14 is seated to seal off the bore 27 as above set forth. When the seating of head 14 has been effected the pump 10 is put into operation and the liquid contents of bore 27 is raised to the top of the well. It is obvious that after the mixture made by the drilling operation has been pumped out the operator will obtain water flowing in from the strata through which the smaller bore 27 passes, uncontaminated by water from any other stratum, and consequently enabling him to determine positively the quality of the water to be obtained at that point.

It is to be understood, of course, that while we have herein shown and described but one specific embodiment of the invention, changes in form, construction, and method of assembly and operation may be made within the scope of the appended claims.

We claim:

1. In a device of the character described, a head member adapted to be lowered into a well and movable into intimate contact with the wall of the well to form a seal, a pair of conduits passing therethrough and extending to the top of the well and closed off from the water in the well above said head and from each other, a pump mounted in one conduit, a perforated casing depending from said head, a drill mounted on the bottom of said casing, the said casing communicating with the conduit in which the pump is mounted, and a conduit mounted within the casing and communicating with the exterior of the drill and with the other of said first mentioned conduits and closed off from the perforated casing.

2. In a device of the character described, a head member adapted to be lowered into a well and movable into intimate contact with the wall of the well to form a seal, a pair of conduits, one within the other, seated in each end of said head, a passage connecting the inner conduit on one end of the head with the outer conduit on the other side of the head, pumping means mounted in a conduit on one side of said head, and drilling means mounted on the conduits on the other side of the head.

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