W. E. REMBERT.

SAMPLE TAKING DRILL.

APPLICATION FILED JULY 3, 1920.

1,386,802. Patented Aug. 9, 1921.

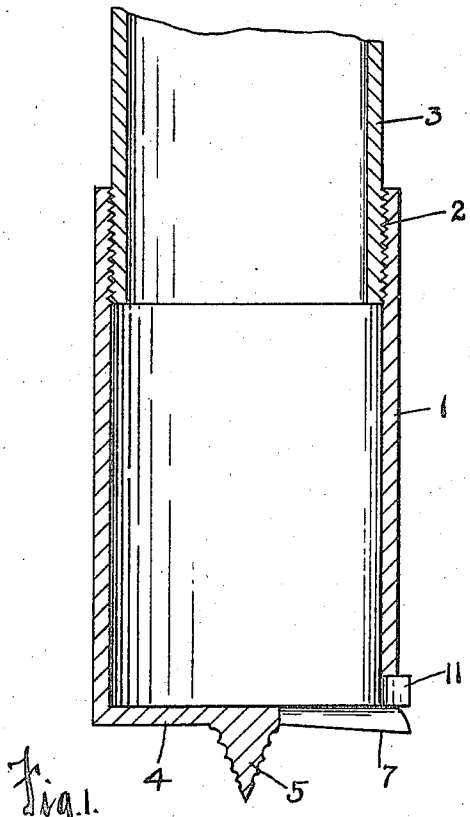



Fig. 1.

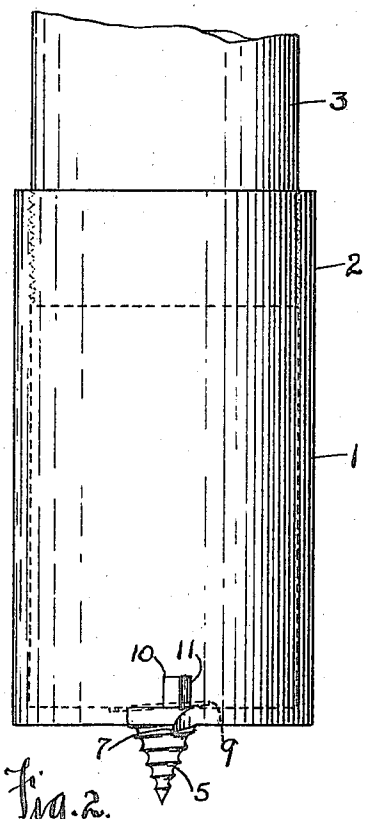



Fig. 2.

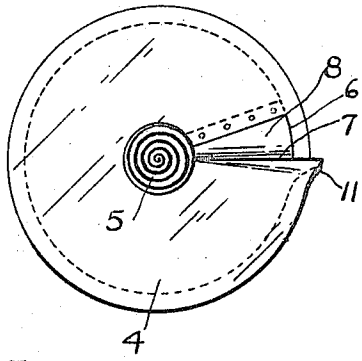



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## SAMPLE-TAKING DRILL.

1,386,802. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed July 3, 1920. Serial No. 393,836.

*To all whom it may concern:*

Be it known that I, WILLIAM E. REMBERT, a citizen of the United States, residing at Gilliam, Caddo parish, Louisiana, have invented a certain new and useful Improvement in Sample-Taking Drills, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to drill bits for use in obtaining samples of material being drilled. It has particular application to rotary earth boring drills for use in boring wells for water, oil, sulfur, etc.

An object of my invention is to provide a drilling bit, which is especially adapted to shear, or cut away, a sample of the material at the bottom of the well, and to retain this material intact while the drill is withdrawn from the well.

Another object is to provide an especially efficient means to prevent the loss of the sample thus obtained while the drill is being withdrawn to the surface.

Referring to the drawings forming a part of this specification, and wherein like numerals are applied to like parts throughout the several views, Figure 1 is a central longitudinal section through my improved sample-taking drill; Fig. 2 is a side elevation of the same; and Fig. 3 is a bottom plan view thereof.

The drill bit disclosed in the drawings is not devised for performing the operation of drilling a well, for such a drill can not be repeatedly withdrawn from the well whenever a small portion of the material is obtained. It will readily be seen that in deep wells, the greater part of the time in drilling would be consumed in going into and coming out of the hole. My device is designed to be used to obtain samples of the material, at suitable intervals, so that an accurate log of the well may be preserved. It will ordinarily be used in coöperation with a fish tail bit, which bores a hole with a flat bottom.

The sample taking bit shown in the drawing is cylindrical in shape, The body of the bit comprises a tubular member 1, threaded interiorly at 2, adjacent the upper end, for attachment to the drill stem 3. The lower end is closed by a plane bottom member 4 made integral with the member 1. Centrally of the bottom face of the bit is formed a tapered screw member 5, having a spiral thread thereon. This member is adapted to center the bit in the hole.

The cutting blade on this sample-taking device is formed by cutting a sector-shaped opening 6 in the bottom and bending one of the radial edges thereof outwardly and sharpening the bent edge to form blade 7. This blade extends slightly downwardly from the lower bottom face 4 and acts to cut the bottom of the hole.

The sector-shaped opening 6 allows passage of the material, thus sheared from the bottom of the hole, into the interior of the drill. To prevent the loss of this material when the bit is withdrawn from the hole, a thin resilient diaphragm 8 of metal, shaped to cover the opening, is fitted over the same and secured to the bottom at the side of said opening opposite the blade 7. This diaphragm is normally bent upwardly at the edge 9 adjacent the blade 7 so that the material can bend the same upwardly and find an easy entrance to the bit.

To provide proper clearance for the bit in its operation, a short vertical cut is made in the side wall of the bit, at 10, adjacent the blade 7. The slit thus formed is cut laterally at its upper end and a portion of the wall thus cut is bent outwardly to form a blade 11 sharpened at its outer edge. This side blade 11 projects forwardly in the direction of rotation of the bit, as does the blade 7, and acts to shear a small clearance from the side wall of the hole.

In the operation of this sampler, the drill used in cutting the hole—ordinarily a fish tail bit—is operated until a stratum is reached of which a sample is desired. The fish tail bit is then withdrawn from the hole and my sampling bit is substituted therefor. The device is then introduced into the hole and a current of flushing water is used to wash out the hole. After the hole is properly cleaned, the bit is rotated in the usual right-hand direction until a sufficient sample of the material is obtained. The device is then withdrawn from the hole. The weight of the material rests upon the bottom of the device and forces the diaphragm over the opening 6 so as to securely close the same and prevent the loss of any portion of the sample thus removed. When the drill is drawn to the surface, it is unscrewed and removed from the pipe and the sample is thus obtained. The drilling may then proceed in the usual way until a further sample

is desired. The sample taking device thus formed is simple and rugged in construction and adapted to withstand the heavy strains to which it is subjected in deep well drilling. Its flat bottom especially adapts it for use with the type of drill ordinarily employed and not only enables the cutting blade 7 and closure 8 to be cheaply made, but produces a structure adapted to operate with great efficiency.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A sample taking bit comprising a tubular member having an integral flat bottom thereon, said bottom having a sector-shaped opening therein, a radial cutting blade formed by bending one edge of said opening outwardly and sharpening the same, a short blade at the lower side adjacent the bottom to cut the side of the hole and means to close said sector-shaped opening for the purpose described.

2. A sample-taking bit comprising a tubular member, a flat bottom thereon having a radial opening therein, a blade at one edge thereof formed integral with said bottom, a resilient diaphragm adapted to close said opening and means at the lower end of said tubular member to cut clearance for the same.

3. A sample taking bit for well drilling comprising a cylindrical member, a flat bottom therein having a radial opening, one edge of which is turned downwardly and sharpened, a short laterally extending blade at the outer end of said opening, and a resilient diaphragm closing said opening, said diaphragm being secured at one side of said opening and adapted to be opened upwardly by the pressure of the work in the manner described.

In testimony whereof I hereunto affix my signature, this the 15 day of June, A. D. 1920.

WM. E. REMBERT.