No. 730,786. PATENTED JUNE 9, 1903.

T. MURPHY.

DRILLING TOOL.

APPLICATION FILED NOV. 8, 1902.

NO MODEL.

Fig. 1.

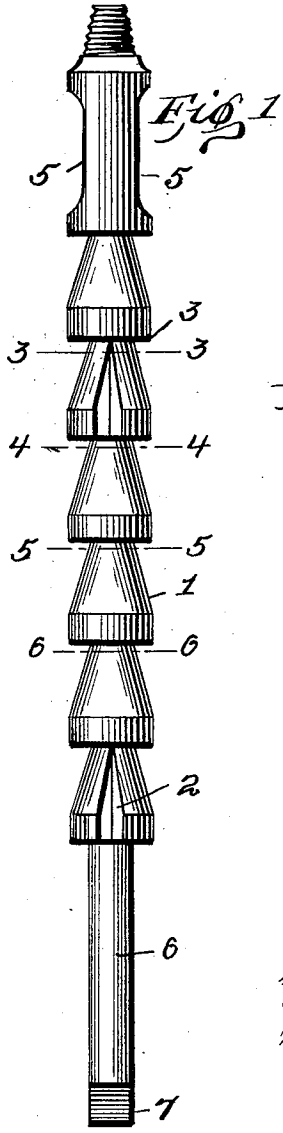


Fig. 2.

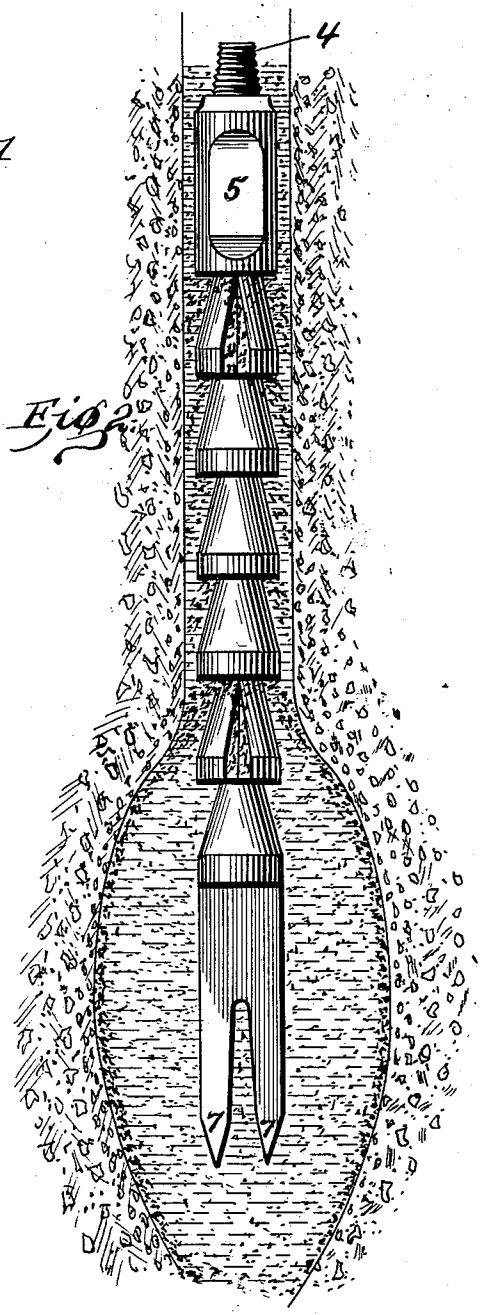


Fig. 3.

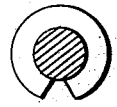


Fig. 4.

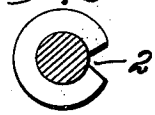


Fig. 5

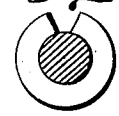
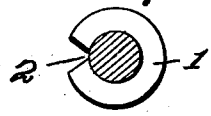


Fig. 6.



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No. 730,786. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

THOMAS MURPHY, OF ALLEGHENY, PENNSYLVANIA.

DRILLING-TOOL.

SPECIFICATION forming part of Letters Patent No. 730,786, dated June 9, 1903.

Application filed November 8, 1902. Serial No. 130,506. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MURPHY, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Drilling-Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in drilling-bits, and relates particularly to such bits as are employed in the drilling of Artesian wells, gas-wells, oil-wells, and the like, and the invention is particularly adapted to be employed as a bit which is inserted into the well-hole for the purpose of stirring or agitating the sand in such a manner as to thoroughly disintegrate or loosen the same, whereby the sand-bailer when dropped into the well-hole will more readily penetrate through the sand in order to accumulate or gather a greater quantity of the sand or water in the well-hole to remove the same.

Heretofore and before my invention it has been the practice after the drilling-bit has been operated in the hole to perform the drilling operation to drop what is known in the art as a "sand-bailer" into the well-hole to gather the sand and water and remove the same from the hole in order to give clearance and free action of the drilling-bit in the further operation of the latter. As the drilling-bit frequently leaves the sand packed in such a manner that it is oftentimes difficult to cause the sand-bailer to penetrate the same to a sufficient depth to gather any quantity thereof at each operation, it is the object of my invention to provide a device which may be inserted in the well-hole for the purpose of loosening the sand and stirring the same in such a manner that the bailer when dropped into the hole will readily penetrate and loosen the mass and collect a much greater quantity thereof than where the bailer is dropped into the hole without this loosening or stirring operation. While the device is primarily designed as a supplemental bit to be inserted into the well-hole after the withdrawal of the drilling-bit, yet it may in many instances be employed as a drilling-bit, and where so employed will of course perform the functions of loosening or stirring the sand or other substance, as heretofore described, to more readily receive the sand-bailer or like device employed for loosening the substance.

Briefly described, the invention comprises a bit consisting of a shank embodying a plurality of integral frusto-conical members disposed one above the other, with the smaller ends extending upwardly and each conical member provided with passage-ways or grooves which extend throughout the length of the conical members. These passage-ways or grooves are staggered with respect to each other, whereby the sand and water forced through one of the grooves strikes against the annular shoulder at the upper end of the groove which is formed by the bottom of the next section. At its upper end the bit is provided with a taper screw for connecting with the stem of the drilling-tools, and also has adjacent to its upper end a suitable wrench-receiving portion. At its lower end the tool is formed with a suitable bit, which may be made so as to be particularly adapted for use as a supplemental tool employed in connection with the ordinary drilling-bit, or the bit of my improved tool may be so shaped as to perform the functions of the ordinary drilling-bit.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a detail side elevation of my improved bit. Fig. 2 is a like view thereof, showing the bit in position in the well-hole and showing the manner in which the sand and water contained therein is agitated by the bit. Fig. 3 is a cross-sectional view taken on the line 3 3 of Fig. 1. Fig. 4 is a like view taken on line 4 4 of Fig. 1. Fig. 5 is a like view taken on the line 5 5 of Fig. 1. Fig. 6 is a like view taken on line 6 6 of Fig. 1.

My improved bit comprises a series of integral frusto-conical members 1, each of which is provided throughout its length with a tapering groove or passage-way 2, widest at the lower end thereof and tapering gradually to the point at the top of each member.

These members are disposed all in the same direction, with the smaller end upwardly, and the larger end of the sections consequently forms the annular shoulder 3, which is at a point directly above the upper end of the grooves or passage-ways 2. These grooves or passage-ways 2 are staggered with respect to each other, and in practice are preferably arranged on the quarter—that is, the groove in the section or member 1 directly above the lowermost section or member, which will be arranged one-quarter way around the bit from the position of the groove or passage-way 2 in the lowermost section, and so on throughout the series of sections. This arrangement is clearly shown in Figs. 3 to 6, inclusive, of the drawings, wherein the grooves are shown in this quarter-way arrangement. At its upper end the drill or bit is provided with a conical screw of the usual form of construction and adapted to engage in the socket provided therefor in the stem of the well-tools. (Not shown.) Adjacent to its upper end the tool or bit is provided with flat faces 5 on opposite sides thereof to form a convenient wrench-receiving surface. At its lower end the tool is formed into a penetrating-bit 6, which in the present instance I have shown as bifurcated at the lower end to form points 7, though it will be apparent that if desired to use the bit as a drilling-bit proper the bit end may be shaped in accordance with the ordinary drilling-bit. However, where the tool is used as a supplemental bit for loosening the sand in order to facilitate the action of the sand-bailer I preferably construct the bit end as shown, in which the thickness of the bit in one direction is only about one-half the thickness of the bit in the other direction.

In operation the bit is dropped into the hole, and as it reaches the point which is to be operated upon by the drilling-bit the sand and water striking against the annular shoulders 3 is stirred or agitated and forced upwardly through the grooves or passage-ways 2 on each section 1, striking the annular shoulders 3 and being forced back, so as to further stir the sand and water as the bit descends or is actuated vertically in the well-hole. By the staggered arrangement of the grooves or passage-ways the sand and water is prevented from having an uninterrupted passage throughout the length of the stem, but is engaged and agitated by each of the annular shoulders 3 of the bit.

The use of this device loosens the sand which has been packed against the walls of the hole by the action of the drilling-bit as the latter descends, so that when the sand-bailer is inserted into the well-hole the substance will be in such a condition as to permit the more ready passage of the sand-bailer into the same in order to gather or collect a greater quantity thereof at each insertion of the bailer.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, a tool of the class described comprising a shank embodying a series of integral frusto-conical sections each provided with a vertical groove or passage-way, and a bit formed integral with the lowermost frusto-conical section of the shank, substantially as described.

2. A bit of the class described, comprising a shank consisting of a series of integral frusto-conical sections provided with grooves, the vertical groove in each section being staggered with respect to the groove in the other sections and a bit carried by the lower end of the shank, substantially as described.

3. In a tool of the character described, a shank embodying a series of frusto-conical sections or members each provided with a groove extending throughout its length, said shank terminating in a screw at its upper end, and an integral drilling-bit carried by the shank at the lower end, substantially as described.

4. In a tool of the character described, a shank comprising a plurality of frusto-conical sections disposed one above the other with the smaller ends of the sections projecting upwardly, a bit formed integral with the lowermost section, and a screw formed integral with the upper end of the shank, substantially as described.

5. In a tool of the character described, a shank comprising a plurality of frusto-conical sections or members, each provided with a groove, the groove in each section being staggered with respect to the other sections, as and for the purpose described.

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

THOMAS MURPHY.

Witnesses:
A. M. WILSON,
H. C. EVERT.