

1,305,489.

Patented June 3, 1919.

FIG. 1.

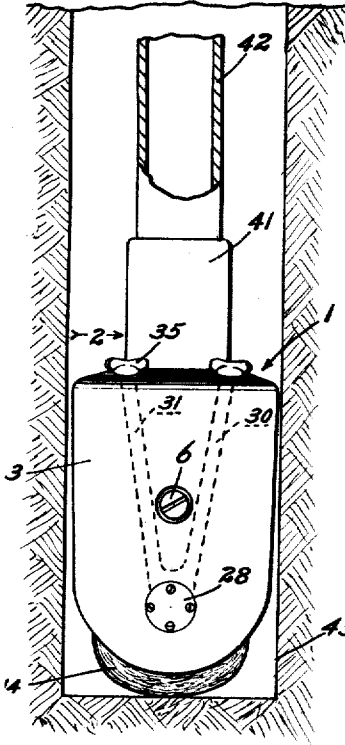


FIG. 2.

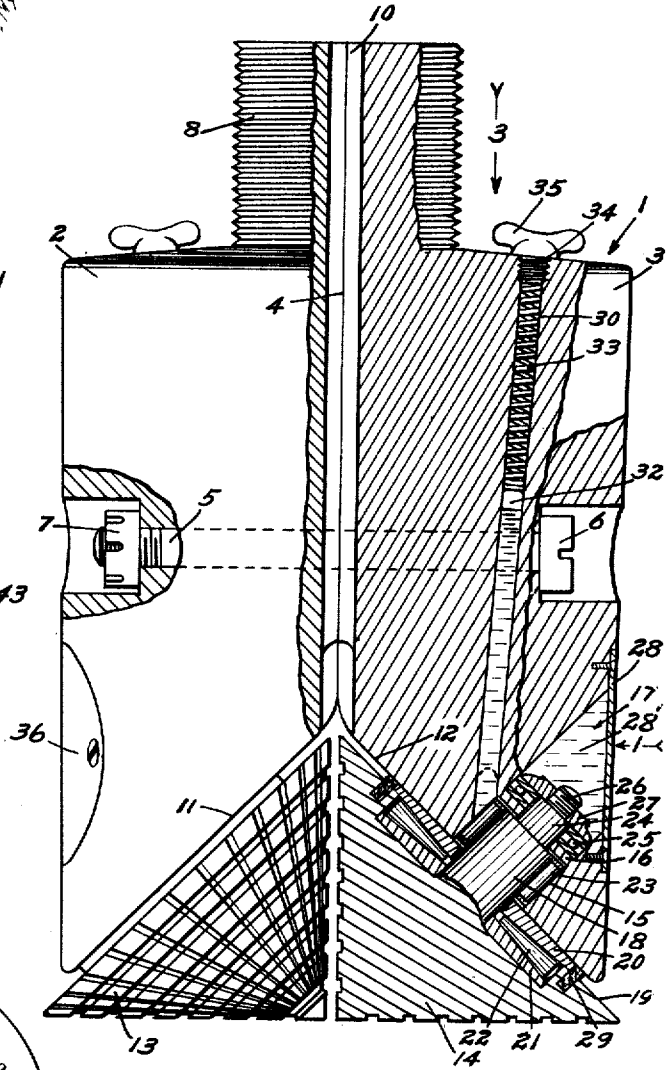
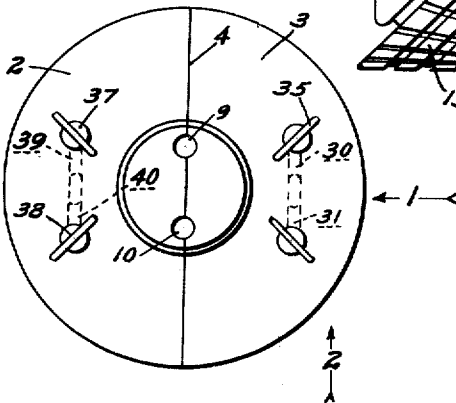


FIG. 3.



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THADDEUS PATIN, OF WHITTIER, CALIFORNIA.

ROLLER-BIT.

1,305,489.

Specification of Letters Patent.

Patented June 3, 1919.

Original application filed September 6, 1918, Serial No. 252,959. Divided and this application filed March 3, 1919. Serial No. 280,391.

To all whom it may concern:

Be it known that I, THADDEUS PATIN, a citizen of the United States, residing at Whittier, in the county of Los Angeles and State of California, have invented new and useful Improvements in Roller-Bits, of which the following is a specification.

My invention relates to roller bits and consists of the novel features herein shown, described and claimed.

The present application is a division of my application for roller bits, filed September 6, 1918, Serial No. 252,959.

In the former application I claimed the details of the mounting of the bits, and the present application relates specifically to the oiling system.

Figure 1 shows the bottom of a well in section, and shows my roller bit in side elevation as seen looking in the direction indicated by the arrows 1 in Figs. 2 and 3.

Fig. 2 is an enlarged elevation of the bit on a plane at right angles to Fig. 1 as indicated by the arrows 2 in Figs. 1 and 3, parts being shown in section.

Fig. 3 is a top plan view looking in the direction indicated by the arrow 3 in Fig. 2.

The bit head 1 is formed of the half bit head parts 2 and 3 meeting on the diametrical vertical line 4 and secured together by the bolt 5 having a head 6 recessed into the side of the part 3, and a nut 7 recessed into the side of the part 2, the body of the bolt passing diametrically through the parts 2 and 3 on a line at right angles to the line 4. The bit head 1 thus constructed is circular in plan and slightly tapered from top to bottom. A screw threaded nipple 8 extends upwardly from the center of the head 1, and water holes 9 and 10 extend downwardly from the upper face of the nipple 8 to the bottom of the head. The lower face 11 of the part 2 is flat and extends from the lower end of the line 4 downwardly and outwardly at an angle of 45°, and the lower face 12 of the part 3 is identical with the face 11. The cutting cone 13 fits against the face 11 and the cutting cone 14 fits against the face 12, said cones 13 and 14 being right angle triangles in cross section. A bearing opening 15 is formed from the face 12 to the flange 16, and a bearing opening 17 is formed from the periphery of the part 3 to the flange 16. The stem 18 extends from the axial center of the flat face

19 of the cutting cone 14. A bearing plate 20 fits against the face 12 and a similar bearing plate 21 is recessed into the face 19 and tapered bearing rollers 22 are placed between the plates 20 and 21. Bearing rollers 23 are placed in the bearing opening 15 around the stem 18. A pintle 24 extends through the flange 16. A ball bearing 25 is placed around the pintle 24 in the bearing opening 17. A screw threaded nipple 26 extends from the pintle 24 and a nut 27 is screwed upon the nipple 26 against the ball bearing construction 25. A housing plate 28 is fixed in position to cover the bearing opening 17, the plate 28 preferably being embedded into the periphery of the part 3, so as to make the head 1 smooth, and so as to make an oil chamber 28' inside of the plate 28. An annular packing 29 of asbestos, or the like, is recessed into the cone 14 from the face 19 around the bearing plate 21 and rollers 23, and the packing bears against the face 12. Grease or oil openings 30 and 31 are formed from the upper end of the part 3 downwardly to the bearing opening 15 and these openings are of considerable length and of considerable size to hold a considerable quantity of grease. The grease or oil may be inserted downwardly into the openings 30 and 31 and pressed to flow around the stem 18 and pintle 24, and through the bearing plate 20 to the rollers 22, the opening through the bearing plate 20 being larger than the stem 18 to allow the grease to flow. The grease or oil will also flow upwardly and fill the chamber 28'. Expansive coil springs 33 are attached to the plungers 32 and pressed downwardly into the openings against the plungers, the plungers pressing against the grease, and plugs 34 are screwed into the upper ends of the openings against the springs, there being wing handles 35 upon the plugs 34. As the cutting cone operates the grease will work around the parts and out to the packing 29, and as the grease is used up the springs 33 will expand to force the plungers 32 downwardly against the lubricant and continue the supply until the openings 30 and 31 and the chamber 28' are empty.

In a like manner the cutting cone 13 is mounted with relation to the face 11 in the part 2, the housing plate 36 corresponding to the housing plate 28 and the wing handles 37 and 38 controlling plugs in the openings

39 and 40, said openings 39 and 40 corresponding to the openings 30 and 31.

A coupling 41 is screwed upon the nipple 8 and the pipe drill stem 42 is screwed into the upper end of the coupling 41. The drill stem 42 is rotated and operated by the machinery at the top of the well, so as to rotate the head 1 and cause the cutting cones 13 and 14 to cut the rock at the bottom of the hole 43.

The bit head 1 is slightly smaller than the well hole 43. The cutting cones 13 and 14 will cut a hole slightly larger than the bit head 1, so that the water passing downwardly through the pipe stem 42 will pass through the holes 9 and 10 and wash the ground rock upwardly around the bit head 1 and upwardly around the pipe stem 42.

The roller bit thus constructed is simple to make and operate, easily taken to pieces for repair and reassembled and is strong and durable. The lubricating systems are well adapted to hold the lubricant and to hold a considerable supply of it, so that the bit will operate for a considerable length of time without a new supply of lubricant.

I consider the matter of forming the stems 18 integral with the cutting cones, and placing the roller bearings between the cutting cones and the flat faces of the bit head, and around the stems 18 of great importance.

With the rotary bit constructions heretofore in use it has been found difficult to properly lubricate the wearing parts and exclude sand and water, and in order to overcome this difficulty I have reconstructed the rotary bit wearing parts thereby producing the storage chamber 28' for holding the lubricant and the feed openings 30 and 31 for receiving and holding a considerable quantity of lubricant, and the packing 29 surrounding the bearing to hold the lubricant from wasting. The parts are securely housed to exclude sand and water and to hold the lubricant, and the construction provides for the reception of a considerable quantity of lubricant, so that the bit may be run a considerable length of time without removing, cleaning and reoilng.

Various changes may be made without departing from the spirit of my invention as claimed.

I claim:

1. In a roller bit, two half bit heads each having a flat inner face and a circular outer face, and an inclined flat lower face extending from the lower end of the flat face downwardly and outwardly to the circular outer face, there being a bearing opening formed from the inclined flat lower face, a second bearing opening formed from the circular outer face in line with the first bearing opening, and a flange between the inner ends of the two bearing openings; a bearing plate fitting the inclined flat lower face; bearing

rollers fitting the bearing plate; a cutting cone; a second bearing plate recessed into the cutting cone and fitting the bearing rollers; a stem extending from the axial center of the cutting cone through the bearing plates into the first bearing opening; bearing rollers around the stem; a pintle extending from the stem through the flange; a ball bearing upon the pintle in the second bearing opening against the flange; a nipple extending from the pintle; a nut upon the nipple against the ball bearing; the first bearing rollers being recessed into the cutting cone; an annular packing recessed into the cutting cone around the bearing plates and engaging the inclined flat lower face; and a housing plate secured to the circular outer face and covering the second bearing opening and forming a lubricant chamber, there being an opening leading downwardly from the top of the half bit head and communicating with the bearing opening, so that the bearing may be flooded and the lubricant chamber filled with lubricant.

2. In a roller bit, two half bit heads each having a flat inner face and a circular outer face, and an inclined flat lower face extending from the lower end of the flat face downwardly and outwardly to the circular outer face, there being a bearing opening formed from the inclined flat lower face, a second bearing opening formed from the circular outer face in line with the first bearing opening, and a flange between the inner ends of the two bearing openings; a bearing plate fitting the inclined flat lower face; bearing rollers fitting the bearing plate; a cutting cone; a second bearing plate recessed into the cutting cone and fitting the bearing rollers; a stem extending from the axial center of the cutting cone through the bearing plates into the first bearing opening; bearing rollers around the stem; a pintle extending from the stem through the flange; a ball bearing upon the pintle in the second bearing opening against the flange; a nipple extending from the pintle; a nut upon the nipple against the ball bearing; the first bearing rollers being recessed into the cutting cone; an annular packing recessed into the cutting cone around the bearing plates and engaging the inclined flat lower face; and a housing plate secured to the circular outer face and covering the second bearing opening and forming a lubricant chamber, there being openings leading downwardly from the top of the half bit head and communicating with the bearing openings, and spring pressed plungers in the openings, so that the bearing may be flooded and the lubricant chamber filled with lubricant.

3. In a roller bit, a half bit head having a flat inner face and a circular outer face, and an inclined flat lower face extending from the lower end of the flat face downwardly

and outwardly to the circular outer face, there being a bearing opening formed from the inclined flat lower face, a second bearing opening formed from the circular outer face
5 in line with the first bearing opening, and a flange between the inner ends of the two bearing openings; a plate secured against the circular outer face to cover the second bearing opening and produce a lubricant
10 chamber; there being an opening leading downwardly from the top of the half bit head and communicating with the lubricant chamber; a cutting cone in opposition to the inclined flat lower face; means forming a bearing connection between the cutting cone 15 and the half bit head in the bearing openings; and an annular packing around the bearing means between the cutting cone and the half bit head, so that the bearing means may be flooded with lubricant and the lubri- 20 cant held in place and sand and water excluded.

In testimony whereof I have signed my name to this specification.

THADDEUS PATIN.

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