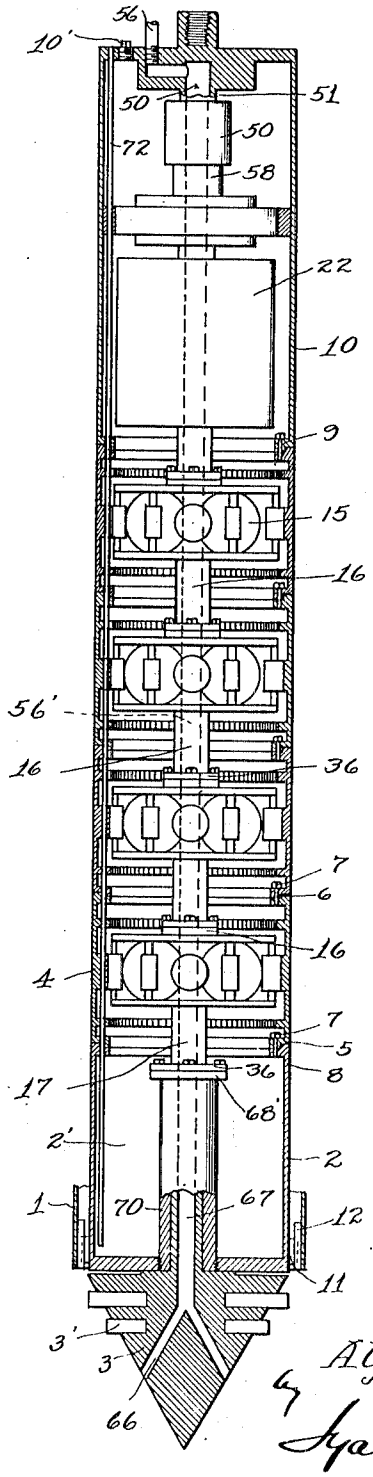
A. C. STEWART.

WELL DRILLING MACHINE.

APPLICATION FILED MAR. 11, 1912.

1,084,762. Patented Jan. 20, 1914.



Witnesses:

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UNITED STATES PATENT OFFICE

ALFRED C. STEWART, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROBERT WATCHORN, OF LOS ANGELES, CALIFORNIA.

WELL-DRILLING MACHINE.

1,084,762. Specification of Letters Patent. Patented Jan. 20, 1914.

Application filed March 11, 1912. Serial No. 683,102.

To all whom it may concern:

Be it known that I, ALFRED C. STEWART, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Well-Drilling Machine, of which the following is a specification.

The main object of the present invention is to provide for drilling wells by a hydraulically operated drill and to utilize the water issuing from the drill operating means in hydraulicking the well during the drilling operation.

A further object of the invention is to provide for protecting the drill operating mechanism from the abrading action of grit or dirt in the water.

The accompanying drawing is a vertical section of a well drilling tool embodying my invention.

1 designates a well casing within which the drilling device is supported in any suitable manner, said drilling device comprising, for example, a lower member 2 on which the drilling tool 3 is mounted, and any desired number of driving elements secured to the lower member 2, there being shown a plurality of such elements arranged one above another in a vertical series and connected to operate the drilling tool 3. Each driving element comprises an annular outer case 4, said cases 4 being connected together by rabbeted flanges 5 and 6 at their lower and upper ends respectively, and by bolts 7 securing said flanges together. The lowermost case 4 is secured by bolts 7 to a flange 8 on the upper end of the member 2 and the uppermost member 4 is secured by bolt 7 to a flange 9 on top member 10, the several members 2, 4 and 10 being secured together in this manner so as to form a cylindrical body of uniform diameter throughout, adapted to slide down through the well casing and to be retained from rotation when in position at the lower end of the casing by suitable means such as lugs 11 on the member 2 engaging against lugs 12 on the casing 1. Each driving member further comprises a rotary member 15 mounted to rotate within the corresponding fixed case 4, and said rotary members being connected together by couplings 36 on hollow shafts 16 connected to the respective members 15, the lower end of the series of hollow shafts 16 being connected to the tubular stem of the drilling tube, and the upper end of the series of tubular shafts being connected to a tubular member 58 adapted to rotate within a fixed bearing 51 at the top of the upper case member 10. A supply pipe 56 communicates with a passage 50 in said upper bearing member 51. Rotary members 15 have central bores 56′ forming a continuous passage connecting through the bore of tubular member 58 with pipe 56, and also connecting with a bore 67 in the drilling tool to form an outlet or waste passage for the water.

22 designates a fluid accumulator interposed in the communication between the supply pipe and the respective rotary motive devices 15. Said rotary motive devices 15 may be of any suitable construction adapted to receive operating fluid from the fluid accumulator 22 in such manner that the pressure of the fluid rotates the said members 15 and causes rotation of the drilling tool 3. The construction of such rotary motive devices forms no part of my invention and is herein not described in detail.

The drilling tool 3 may be of any usual or suitable construction comprising, for example, a head of conical form provided with cutters 3′ and with internal passages 66 communicating with the bore 67 in an upward extension 68 from said head, said upward extension being connected by a flange 68′ thereon and bolts 7′ to the flange 36 of the lowermost rotary driving member 15. The tubular member 68 serves as a shaft for the drilling tool or head and is journaled in a vertical bearing 70 on the bottom member 2. Said bottom member 2 and top member 10 are formed as shells or chambers and a pipe 72 extends through the top of the top member 10 and down through the entire string of driving units to the bottom of the chamber 2′ in the bottom member 2.

In operation, the chamber and top member 10, the spaces within the annular casing members and the chamber 2′ in the bottom member 2 are all flooded with oil supplied through an opening in top member 10, normally closed by a plug 10′, forming a continuous body of oil so that any water which leaks from the water communications into this body of oil will find its way to the bottom of the bottom chamber 2′ and on accumulation of water under the pressure of the supply, any excess of water will pass out through the pipe 72, this pipe extending into

the water which collects at the bottom of said chamber 2′. The loss by leakage is therefore wholly of water, the oil being retained within the casings. By thus flooding the entire space within the casings with oil, water is prevented from gaining access to the working parts and they are kept well lubricated.

What I claim is:

In a rotary drilling tool, the combination of a casing, a drilling tool rotatably mounted at the lower end of said casing, hydraulically operated rotary driving means within said casing connected to operate said drilling tool, said casing being provided with an opening at its upper portion whereby said casing may be filled with oil so as to flood the working parts therein, removable means for closing said opening, means for supplying water to the hydraulically operated rotary driving means, and a pipe extending from near the bottom of said casing to the upper end thereof and opening at its upper end outside of the casing to drain off water leaking from said hydraulically operated rotary driving means.

In testimony whereof, I have hereunto set my hand at Los Angeles, California this 5th day of March, 1912.

ALFRED C. STEWART.

In presence of—
ARTHUR P. KNIGHT,
GLADYS RUSSELL.