L. BEDILION.

ROLLER BORING DRILL.

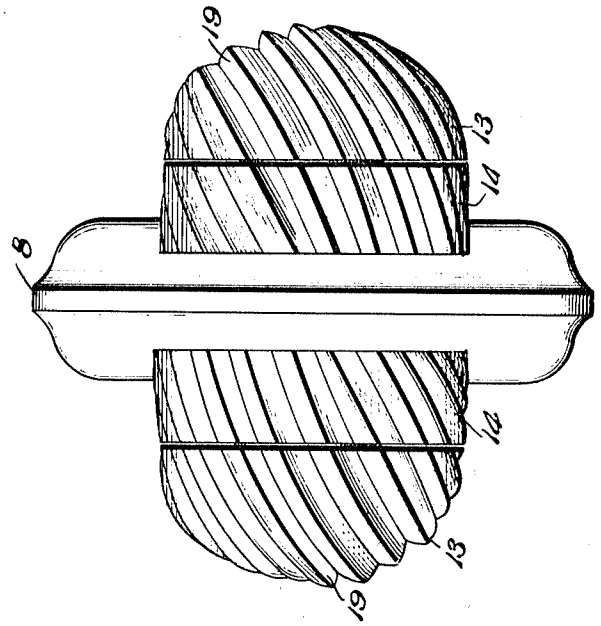
APPLICATION FILED JUNE 23, 1911.

1,012,315.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.

Fig. 2.



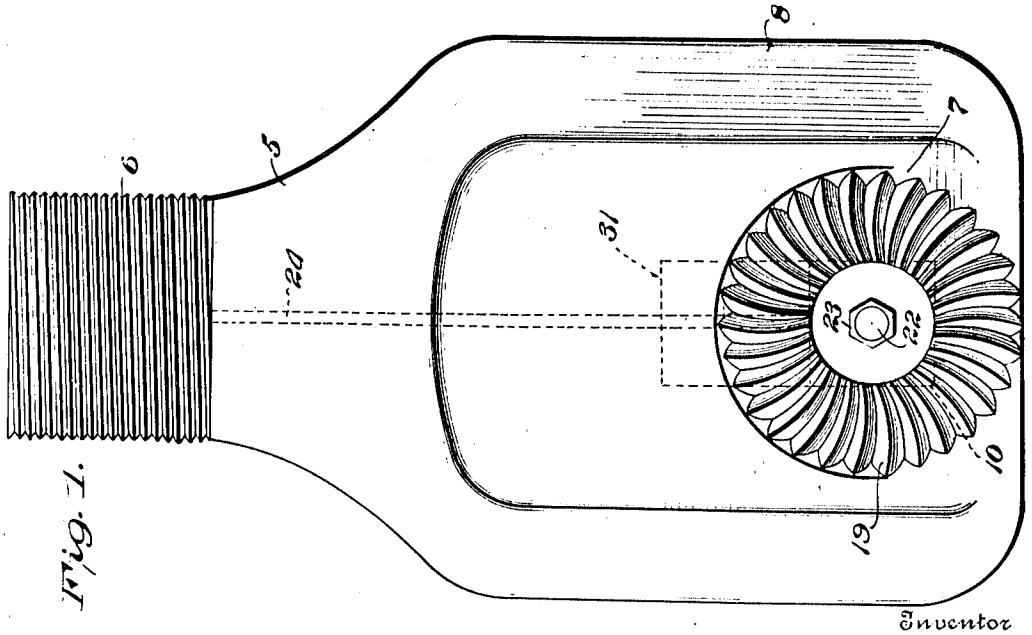


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 4.

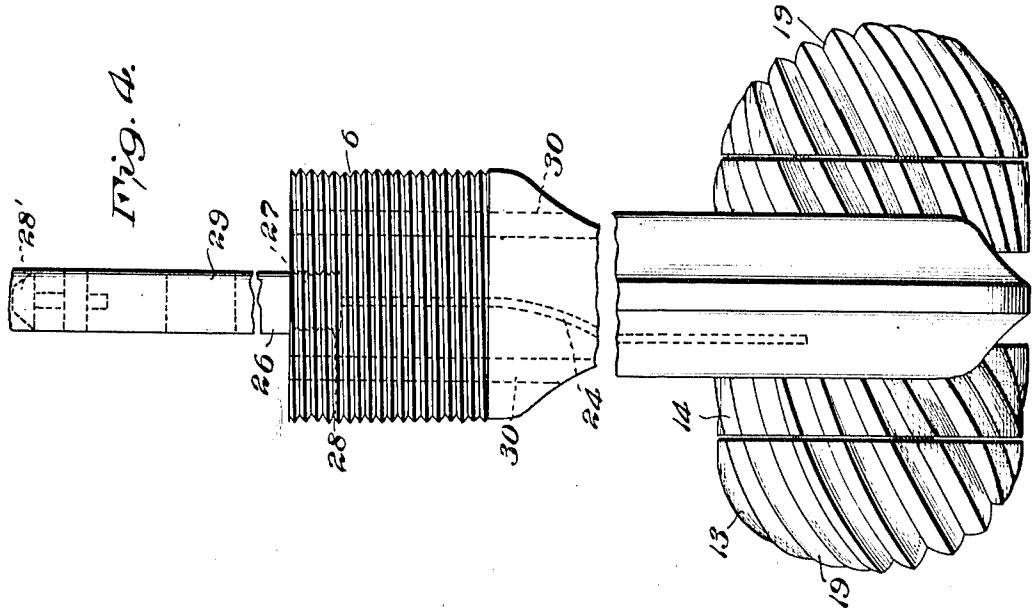
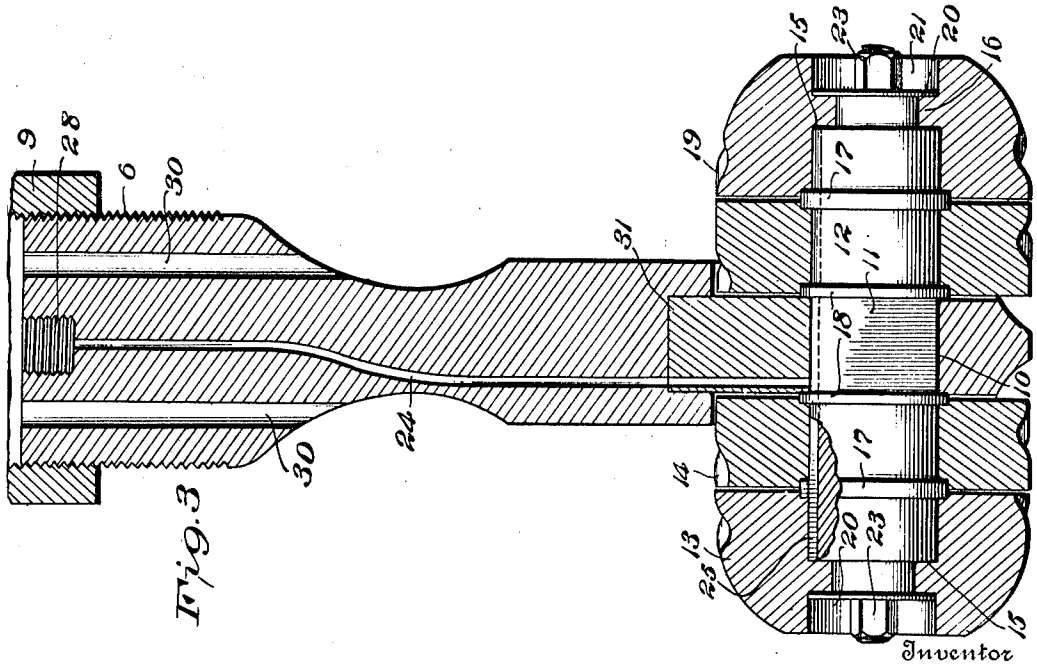


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEONARD BEDILION, OF SHREVEPORT, LOUISIANA.

ROLLER BORING-DRILL.

1,012,315. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed June 23, 1911. Serial No. 634,845.

To all whom it may concern:

Be it known that I, LEONARD BEDILION, a citizen of the United States, residing at Shreveport, in the parish of Caddo and State of Louisiana, have invented new and useful Improvements in Roller Boring-Drills, of which the following is a specification.

The invention relates to boring drills, and more particularly to the class of roller boring drills.

The primary object of the invention is the provision of a drill in which soft and hard strata of the earth may be pulverized or disintegrated for the boring of holes in the earth in the formation of oil or gas wells.

Another object of the invention is the provision of a drill of this character in which earth, rock, concrete, or other hard or soft substance may be cut into for the formation of holes, without the possibility of the breaking of the drill or excessive working away of the same when in action.

A further object of the invention is the provision of a drill of this character in which the cutting rollers thereof will be thoroughly lubricated during the continued operation of the drill.

A still further object of the invention is the provision of a drill which is simple of construction, strong, durable, thoroughly reliable and efficient in operation, and inexpensive in manufacture.

The invention consists generally in a solid bit and rollers journaled at opposite sides of the same, the rollers being provided with exterior cutting teeth, so that upon the turning thereof, the rollers will cut up soft and hard strata in the earth for the disintegration thereof, whereby such material may be washed away and carried off in the ordinary method adopted in the boring of oil or gas wells.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a side elevation of a boring bit constructed in accordance with the invention. Fig. 2 is an end elevation thereof. Fig. 3 is a vertical longitudinal sectional view of the same. Fig. 4 is an edge elevation of the bit.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, the boring bit comprises a solid head 5 provided with a reduced screw threaded portion 6, the opposite faces of the head being flattened, as at 7, and the edges thereof beveled to provide cutting edges 8. The threaded portion 6 of the head is connected with a tubular shaped operating member or barrel 9, in the usual well-known manner, which is adapted to be rotated in boring a well.

Formed centrally in the head 5, near its free end, is a squared opening 10, in which is engaged the squared medial portion 11 of an axle or spindle 12, the latter projecting at right angles to the axis of movement of the head laterally beyond opposite flat side faces 7 thereof, the squared medial portion 11 of the spindle or axle 12 being correspondingly shaped to the opening 10 for effecting a close fit therein. The end portions of the spindle or axle 12 are of cylindrical shape and have rotatably journaled thereon outer and inner cutting rollers 13 and 14, respectively, the outer ends of the spindle 12 being reduced to form abutment shoulders 15, the same being engaged by means of annular flanges 16 formed interiorly of the outer rollers 13, the latter and the said inner rollers 14 being spaced apart by means of washers 17 interposed therebetween, and surrounding the cylindrical ends of the said spindle 12. Also interposed between the inner rollers 14 and the flat side faces 7 of the head 5 are washers 18 which hold the said inner rollers 14 spaced therefrom, the washers being designed to prevent frictional contact of the adjacent faces of the inner rollers 14 with the faces 7 of the head, and likewise the washers 17 prevent the contact of the adjacent faces of the said inner and outer rollers, when rotating upon the spindle. The outer rollers 13 are outwardly tapered, while the inner rollers 14 are of a diameter corresponding to the diameter of the inner faces of the said outer rollers, and both the inner and outer rollers 13 and 14 are formed with external spirally arranged ribs forming cutting teeth 19. The rollers 13 and 14 are held against displacement longitudi-

nally upon the spindle or axle 12 by means of washers 20 arranged within counter seats 21 formed in the outer ends of the outer rollers 13, the washers surrounding threaded portions 22 of the spindle, and on which are engaged nuts 23 of the usual form.

Formed longitudinally in the head 5 is an oil pipe 24, the same leading to a branch oil pipe 25 arranged within the spindle 12, which is extended longitudinally therein, the pipe 24 being joined to the branch pipe 25 in any suitable manner, and is adapted to supply oil to the rollers for lubricating the same when the bit is in operation.

The oil pipe 24 communicates with an oil tube or cup 26 having a threaded end 27 engaged in a threaded socket 28 formed centrally in the threaded portion 6 of the head, the oil cup 26 being adapted to be filled with oil and extends upwardly through the operating pipe 9, the upper end of the oil cup being provided with a suitable inlet valve 28′ adapted to be opened when pressure is exerted against the same by a force pump (not shown), ordinarily used in well boring apparatus.

Arranged within the oil cup 26 is a float piston 29 which is adapted to be advanced in the said oil cup through the medium of mud entering the outer end of the said oil cup, when the valve 28′ is opened, thereby forcing the oil contained within the said oil cup by pressure for the proper lubrication of the rollers 13 and 14, when the bit is in action.

Formed in the threaded portion 6 of the head are mud ducts or passages 30, the latter opening into the operating pipe 9 and exteriorly of the head, so that mud, when being forced through the operating pipe 9, will be discharged through the ducts or passages 30 about the said head for the washing away of disintegrated strata cut by the rollers 13 and 14 and the head 5. As the disintegrated material is taken up by the mud, the latter is let out or exhausted through the bore in the well, as such mud rises in the said bore to the surface of the earth.

Mounted in a suitable recess is a wearing block 31, which latter contacts with the squared medial portion 11 of the spindle 12, the block being locked in adjusted position within the recess in any suitable manner, and is adapted to take up wear when the squared portion becomes loose in the opening in the head 5 of the bit.

The diameter of each of the inner rollers 14 is of a size, so that its periphery will project to and even with the lower cutting edge 8 of the head, thereby permitting the said rollers to contact with rock strata or other hard substance in the earth, at the same time the lower cutting edge 8 contacts therewith.

What is claimed is:

1. A boring drill, comprising a head, inner and outer cutting rollers mounted for rotation at opposite sides thereof in a plane at right angles to the axis of movement of said head, the said outer cutting rollers being tapered, cutting edges formed on the said head, a spindle fixed in the head for supporting said rollers, and means mounted in the head for taking up wear on the spindle.

2. A boring drill, comprising a head, inner and outer cutting rollers mounted for rotation at opposite sides thereof in a plane at right angles to the axis of movement of said head, the said outer cutting rollers being tapered, cutting edges formed on the said head, a spindle fixed in the head for supporting said rollers, means mounted in the head for taking up wear on the spindle, and means on the spindle for spacing the rollers apart and also spacing the inner rollers from the said head.

3. A boring drill, comprising a head, inner and outer cutting rollers mounted for rotation at opposite sides thereof in a plane at right angles to the axis of movement of said head, the said outer cutting rollers being tapered, cutting edges formed on the said head, a spindle fixed in the head for supporting said rollers, means mounted in the head for taking up wear on the spindle, means on the spindle for spacing the rollers apart and also spacing the inner rollers from the said head, and means on the head for lubricating said rollers.

4. A boring drill, comprising a head, inner and outer cutting rollers mounted for rotation at opposite sides thereof in a plane at right angles to the axis of movement of said head, the said outer cutting rollers being tapered, cutting edges formed on the said head, a spindle fixed in the head for supporting said rollers, means mounted in the head for taking up wear on the spindle, means on the spindle for spacing the rollers apart and also spacing the inner rollers from the said head, and means on the head for lubricating said rollers, the said head being formed with mud passages.

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

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Witnesses:
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