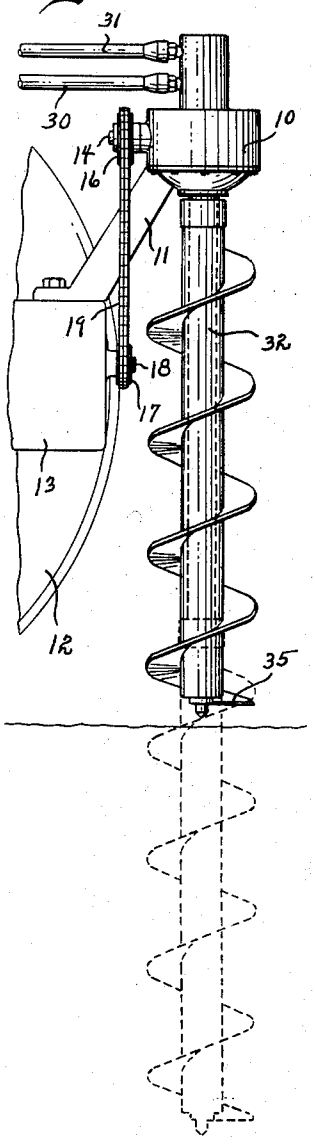
Aug. 12, 1958 T. R. WILTSE 2,847,188

HYDRAULIC EXPANDING AND RETRACTING ROTATING MEMBER

Filed July 29, 1955 2 Sheets-Sheet 1

Fig. 1.



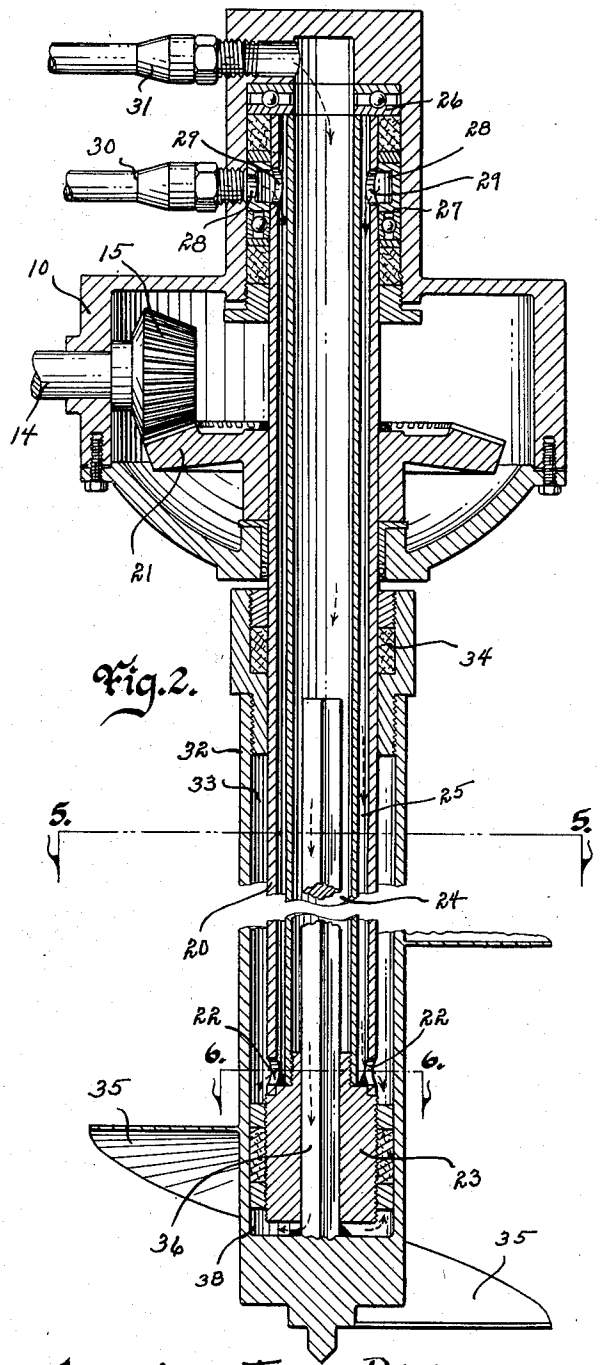


Fig. 2.

Witness
Edward P. Seeley

Inventor: TRACY R. WILTSE
by Talbert Dick & Adler
Attorneys

Aug. 12, 1958 T. R. WILTSE 2,847,188

HYDRAULIC EXPANDING AND RETRACTING ROTATING MEMBER

Filed July 29, 1955 2 Sheets-Sheet 2

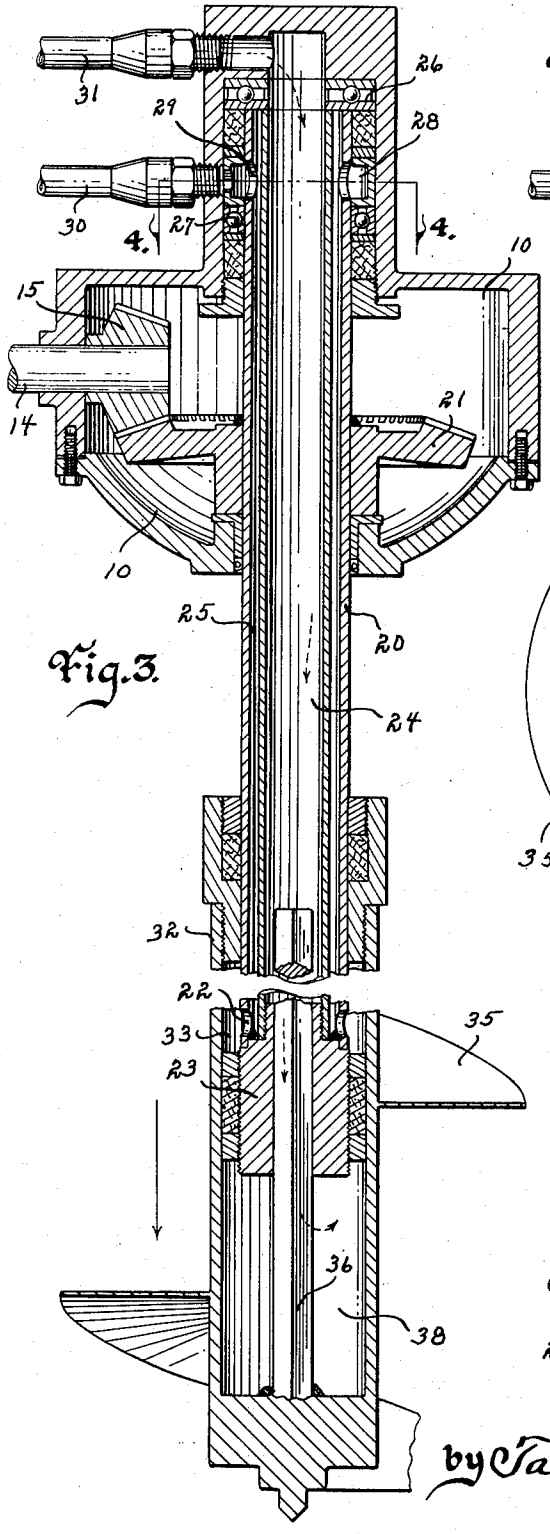


Fig. 3.

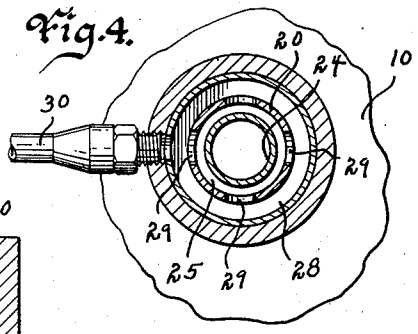


Fig. 4.

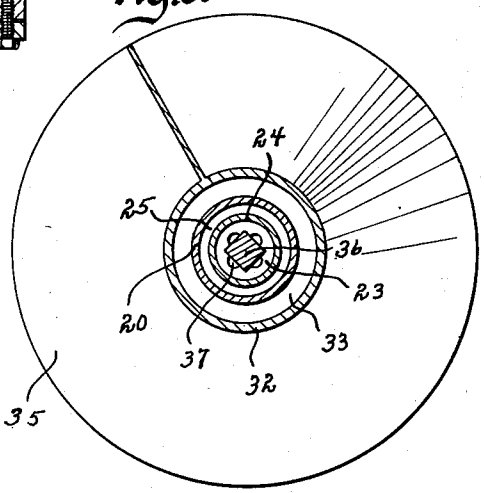


Fig. 5.

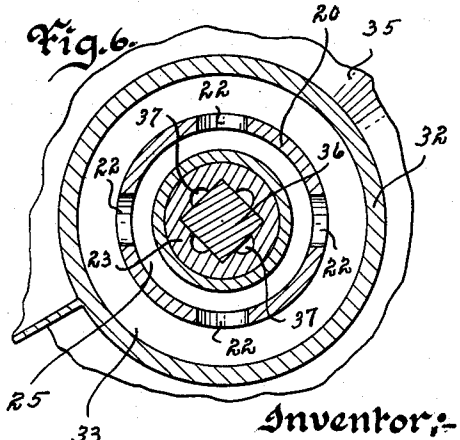


Fig. 6.

Inventor:-
TRACY R. WILTSE
by Talbert & Dick & Adler
Attorneys

United States Patent Office 2,847,188
Patented Aug. 12, 1958

2,847,188

HYDRAULIC EXPANDING AND RETRACTING ROTATING MEMBER

Tracy R. Wiltse, Marshalltown, Iowa

Application July 29, 1955, Serial No. 525,204

1 Claim. (Cl. 255—22)

This invention relates to a rotating means that is hydraulically controlled for expansion and contraction, and more specifically to the art of drilling holes.

Augers, bits and like are universally used for producing holes in the ground, in wood, and other types of material. Obviously, as the drilling proceeds, the bit point must be accordingly forced further into the hole and after the hole depth has been reached the unit must be withdrawn. In the case of drilling earth holes, such as for fence posts, the machinery is rather heavy and complicated. The wall diameter of the hole, however, is the same as that of the diameter of the auger, and, therefore, such a structure could not successfully operate.

Therefore, the principal object of my invention is to provide a hydraulic lifting and lowering means for hole drills that has its two hydraulic power source conduits entering the upper portion of the device.

A further object of this invention is to provide a hydraulic jack means for augers and like that may be operated at the same time the auger is rotating.

A still further object of my invention is to provide a hydraulically controlled drill that is economical in manufacture, durable in use and refined in appearance.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in my claim, and illustrated in the accompanying drawings, in which:

Fig. 1 is a side view of my device ready for use,

Fig. 2 is an enlarged vertical sectional view of my unit in contracted condition.

Fig. 3 is an enlarged vertical sectional view of the unit in expanded condition,

Fig. 4 is a horizontal cross sectional view of the device taken on line 4—4 of Fig. 3,

Fig. 5 is an enlarged horizontal cross sectional view of my device taken on line 5—5 of Fig. 2, and

Fig. 6 is an enlarged horizontal cross sectional view of the unit taken on line 6—6 of Fig. 2 and more fully illustrates its construction.

In the drawings I have used the numeral 10 to designate a gear housing having a supporting arm 11. This arm extends to a prime mover 13. Journalled through the gear housing is a shaft 14 having a bevel gear 15 inside the gear housing. The numeral 16 designates a sprocket wheel on the other end of the shaft and outside the gear housing. The numeral 17 designates a sprocket wheel on the shaft 18 of the prime mover. The numeral 19 designates an endless chain embracing the sprocket wheels 16 and 17. The numeral 20 designates a vertical tube shaft rotatably extending through the bottom of the housing 10. The numeral 21 designates a large bevel gear journalled for rotation inside the gear housing, fixed by any suitable means such as welding around the tube shaft 20 and in mesh with the bevel gear 15. The bevel gear

21 has its lower end riding on the inside bottom of the housing 10 and thereby limits the downward movement of the tube shaft 20 relative to the housing 10. The numeral 22 designates holes in the lower portion of the tube shaft 20. The numeral 23 designates a piston element secured by any suitable means such as by welding on the lower end of the tube shaft 20. The numeral 24 designates a conduit pipe inside the tube shaft 20 and which is threaded onto a neck of the piston element 23, and thus is connected to the piston element 23. The numeral 25 designates space between the inside of the tube shaft and the conduit pipe as shown in Fig. 2. The numeral 26 designates a seal bearing washer ring at the top of the members 20 and 24 for sealing the top of the space 25 and limiting the upward movement of the tube shaft 20 relative to the housing 10. The numeral 27 designates packing bearing means embracing the upper portion of the tube shaft 20 and which has a passageway 28 communicating with port openings 29 in the tube shaft 20 as shown in Fig. 4. The numeral 30 designates a hydraulic conduit communicating with the inside of the ring groove 28 and adapted to be in communication with a controllable source of hydraulic fluid power. The numeral 31 designates a second hydraulic conduit communicating with the inside top of the pipe conduit 24 and adapted to be in communication with a controllable source of hydraulic fluid power. The numeral 32 designates a cylinder slidably embracing the tube shaft 20 and the piston element 23 which is of a diameter greater than the diameter of the tube shaft 20. Inasmuch as the piston element 23 is of a diameter greater than that of the member 20, a space is provided between the member 20 and the cylinder 32 which I have designated by the numeral 33. The numeral 34 designates a packing between the top of the member 32 and tube shaft 20. An auger 35 is on the lower end portion of the member 32 and may be integrally formed thereon as shown in Fig. 2. A shaft 36, rectangular in cross section is secured to the bottom of the member 32 by any suitable means such as by welding, and extends upwardly slidably through the piston 23. The practical operation of the device is as follows: With the shaft 14 rotating the tube shaft 20 will also be rotated. Inasmuch as the shaft pipe 20 is operatively connected to the piston 23, the rectangular shaft 36 will also be rotated which in turn will rotate the cylinder 32 which carries the auger. When it is desired to contract or withdraw the auger it is merely necessary to introduce hydraulic fluid under pressure through the conduit 30. The amount of contraction of the device will be relative to the amount of fluid injected, and, therefore, the position of the auger is under the complete control of the operator. The fluid will pass into the ring area 28, thence through the ports 29, thence downwardly in the space 25, thence through the port holes 22, then into the space 33 causing the cylinder 32 to slide upwardly and in a direction toward the housing 10. To expand the device, hydraulic fluid under pressure is introduced through the conduit 31. This fluid will flow into the pipe 24, through passageways 37, in the piston 23 and into the space 38 between the bottom of the piston 23 and the inside bottom closed end of the cylinder 32 as shown in Fig. 3. Thus by controlling the fluid pressure through the conduits 30 and 31, the auger portion 35 may be placed in any desired position relative to the supporting equipment 12 which may be one side of a tractor. With two spaces for the separate selective flow of fluid, the conduits 30 and 31 are in elevated out-of-the-way positions. Neither extends into the hole being drilled.

Some changes may be made in the construction and arrangement of my hydraulic expanding and retracting rotating member without departing from the real spirit and purpose of my invention, and it is my intention to cover

by my claim, any modified forms of structure or use of mechanical equivalents which may be reasonably included within its scope.

I claim:

In a device of the class described, a housing, a pipe shaft rotatably mounted in and extending downwardly from said housing, a second pipe shaft inside and spaced apart from said first pipe shaft, a piston element secured to the lower ends of said first and second pipes, a closed cylinder slidably embracing said piston element and said first pipe shaft; said pipe shaft and said cylinder creating a closed space between them by the central portion of said cylinder having an inside diameter substantially greater than the outside diameter of said pipe shaft, a passageway in said first pipe shaft communicating with the space between said first pipe shaft and said second pipe, and the space between said cylinder and said first pipe shaft; said piston element having a passageway communicating with the inside of said second pipe and the forward inside of said cylinder, a conduit adapted to be connected to a source of hydraulic fluid under pressure communicating with the inside of said second pipe, a conduit adapted to be connected to a source of hydraulic fluid under pressure communicating with the space between said first and second pipes, a means for rotating said first pipe, and a drive shaft, rectangular in cross section secured to said closed cylinder and slidably extending through a rectangular passageway in said piston element, whereby the said drive shaft will rotate with said piston element.

References Cited in the file of this patent

UNITED STATES PATENTS

978,484	Prellwitz	Dec. 13, 1910
2,598,203	Acker	May 27, 1952