June 16, 1942. L. R. SHOUP 2,286,583

POWER DRIVEN POST-HOLE BORING MACHINE

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FIG. 1

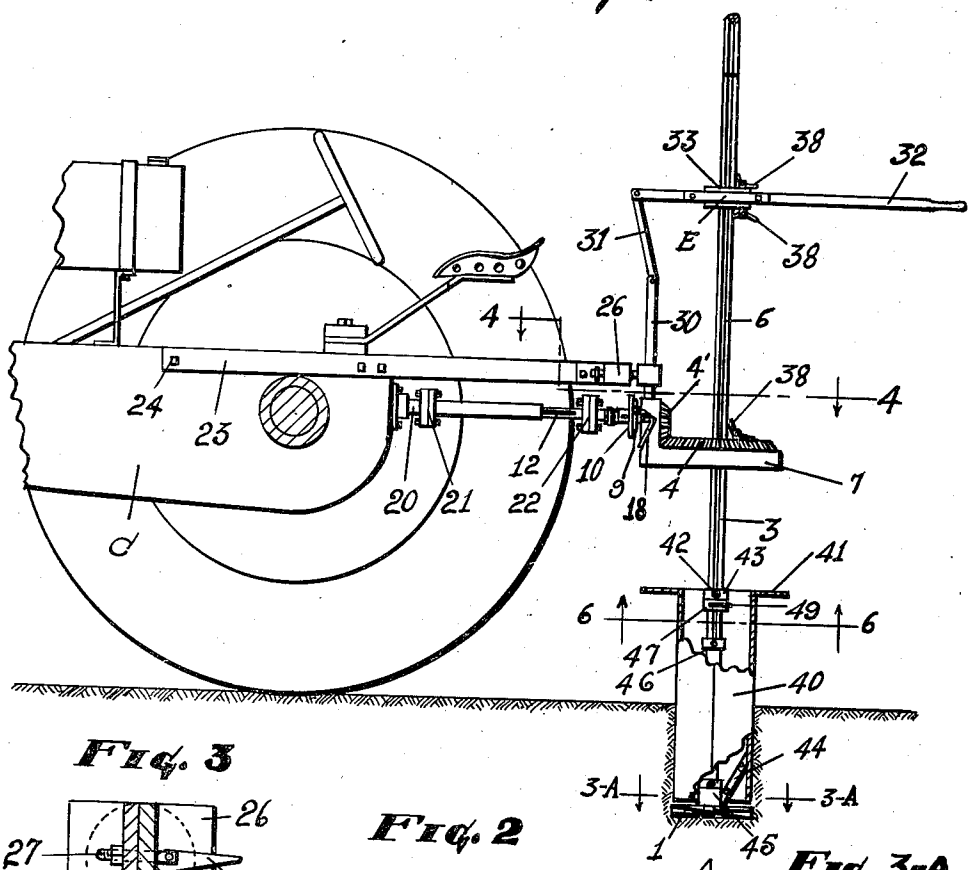


FIG. 3

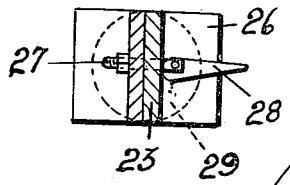


FIG. 2

FIG. 3-A

FIG. 2-B

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Fig. 4

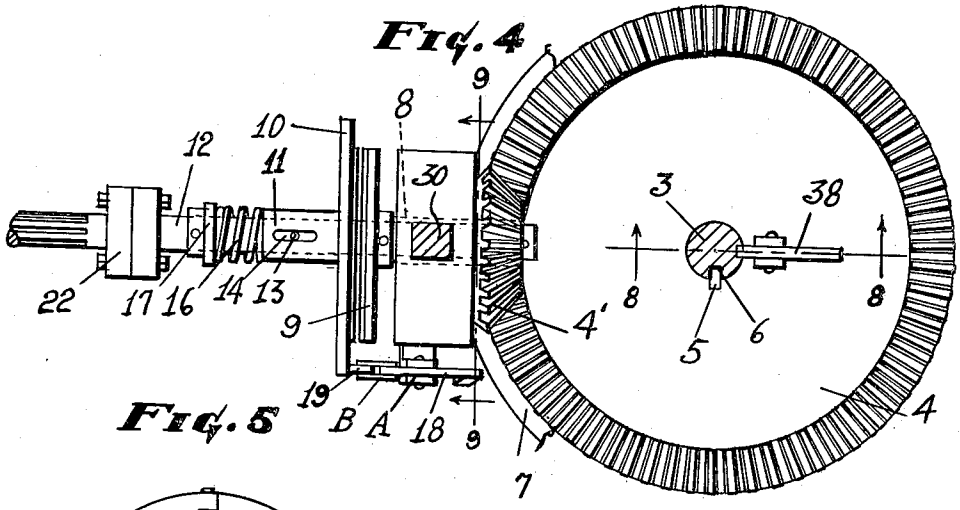


Fig. 5

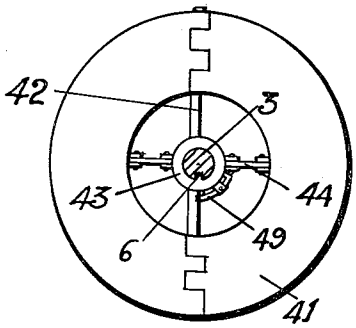


Fig. 6

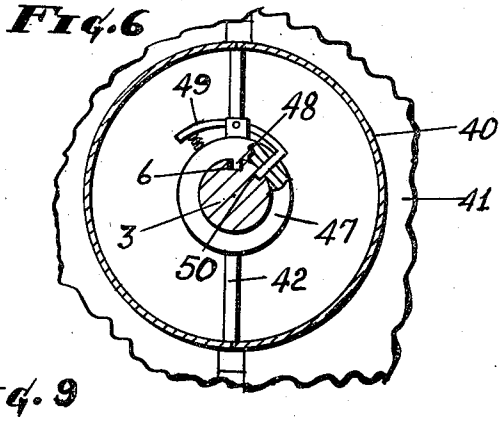


Fig. 7

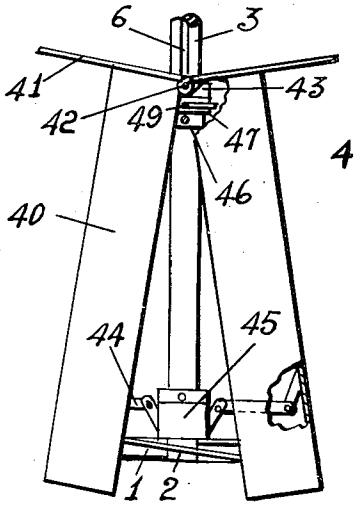


Fig. 9

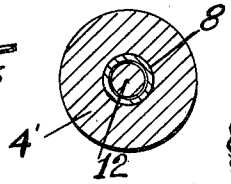
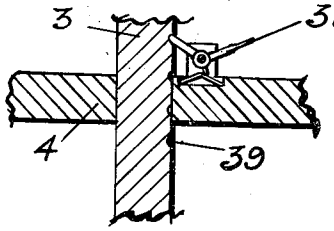


Fig. 8



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POWER DRIVEN POSTHOLE BORING MACHINE

Lloyd R. Shoup, Udall, Kans.

Application July 8, 1940, Serial No. 344,402

2 Claims. (Cl. 255—19)

My invention relates to a power driven post-hole boring machine, and has for its principal object a boring mechanism adjustably carried and operated by a motor driven vehicle, preferably of the tractor type.

A further object of my invention is to provide a casing for the auger of the machine, said casing insertible in the ground with the auger as the post-hole is bored, the casing as a container for the dirt and removing means therefor.

A still further object of my invention is to construct a boring machine for post-holes or the like that is efficient in its performance and easily operated.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawings, forming a part of this specification, in which like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a side view of the near portion of a motor driven vehicle and post-hole boring machine thereto attached, parts removed for convenience of illustration.

Fig. 2 is an enlarged plan view of the post-hole boring machine, parts removed for convenience of illustration.

Fig. 2—B is a reduced fragmentary plan view of the carrying bar adjacent the socket.

Fig. 3 is a front view of the socket clamp, the bars in cross section.

Fig. 3—A is a plan view of the auger blades, taken on line 3A—3A in Fig. 1.

Fig. 4 is a plan view of the machine taken on line 4—4 in Fig. 1.

Fig. 5 is a plan view of the casing.

Fig. 6 is a sectional view of the casing taken on line 6—6 in Fig. 1, the flange partly removed.

Fig. 7 is a side view of the auger casing collapsed.

Fig. 8 is a sectional view taken on line 8—8 in Fig. 4.

Fig. 9 is a sectional view taken on line 9—9 in Fig. 4, illustrating the sleeve structure.

My invention consists of a pair of cutting blades 1, each being semicircular in form, and having an appropriate twist to cut and raise the dirt, and being secured oppositely to a hub 2 that is axially bored and threaded to engage on the threaded end of a vertically disposed shaft 3, said shaft engaging through the axis of a bevel gear 4, adapted to slide therein longitudinally of the shaft and secured to rotate with the gear by a key 5 integral with the gear that engages in a groove 6 that extends longitudinally of the shaft, whereby said shaft may be moved longitudinally through the gear during rotation thereof or during periods of idleness. The said gear is trunnioned on a bearing 7, said bearing having a right angled upward extension in which is trunnioned a beveled pinion 4' to mesh with the teeth of the first said gear as turning means therefor, the pinion having a sleeve 8 axially extending therefrom, the outer end of which is secured to a disc 9 as one side of a friction clutch, while the other side consists of a circular disc 10 that is secured to its respective sleeve 11 that slideably engages on a shaft 12, and being secured against rotation by a pin 13 secured to said shaft and adapted to engage in an elongated slot 14 through a side of the said sleeve, whereby last said disc is free to move to and from engagement with the first said disc, whereby a friction clutch is formed to drive the pinion when the clutch is engaged.

At the outer end of the last named sleeve is a coil spring 16 wound about the shaft, the end of said spring to abut with the end of the sleeve and a collar 17 secured to the shaft, whereby the last named disc is tensioned to engagement with the first said disc. To disengage the clutch, there is provided an L-shaped lever 18, one portion of which, from its angle, functions as a handle to rock the lever on its pivot point as at A, the other portion of said lever being bifurcated as at B, and having a roller 19 trunnioned between the legs thereof, said roller to engage on the marginal outer edge portion of the last named disc as said disc is greater in diameter than the first named disc to force the disc toward the spring for disengagement of said discs, and by rocking movement of the lever in the opposite direction will permit closing of the clutch to drive the auger.

In Fig. 1 is illustrated the rear portion of a conventional type of tractor having a power take-off shaft 20, in which is provided a universal joint 21 to accommodate for a rocking movement of the post-hole boring machine later described. The said shaft 20 is hollow to function as a sleeve in which shaft 12 will slideably engage longitudinally, and being turned thereby as said shafts are spleened together. The sliding movement is also to accommodate for the rocking movement above referred to, and in said shaft 12 is provided a universal joint 22 as a further accommodation for the said rocking movement.

As a means to carry the said boring machine, I have arranged a bifurcated carrying bar 23 comprised of two members, each functioning as a leg and adapted to straddle the gear housing

C of the tractor, and being secured by bolts 24, the rearward convergent portions of said bar members where they meet being secured together by a bolt 25, and each have a socket 26 confronting each other and adapted to flex toward and from each other as tensioned together by a bolt 27, having a cam lever 28 on one end thereof, rockably arranged to move the jaws toward each other to clamp the same to a ball 29, having a neck D and means to secure the same to a vertically disposed standard 30, the lower end of which is integrally joined to said pinion bearing as a rigid supporting means therefor, to which at its upper extremity is pivotally connected one end of a rockable link 31, the other end of said link being pivotally connected to a lever 32 as raising and lowering means for the said auger shaft. The lever, intermediate of its ends, has a circular portion E in which is rockably mounted arcuate members 33 through the medium of their respective pivot lugs 34, the outer ends of which are carried by the said circular portion, and the said arcuate members each having a groove in the concave sides thereof, extending therealong, whereby a circular frame is formed by abutting the terminal ends of the segments, and in which is positioned a disc 35 having an annular tongue 36 to engage in the grooved segment above described. The said disc is bored axially to slideably engage on said auger shaft and turned therewith through the medium of a key 37 secured to the disc, and slideable in the groove of the shaft.

Secured to the upper and lower sides of said disc 35 are spring tensioned pawls 38 adapted to engage in notches 39 spaced along the said auger shaft, the arrangement of which is to raise and lower the auger. To raise the shaft, the lower pawl is disengaged by pressing its lever inward while the upper pawl frictionally engages in its respective notches, and vice versa, for the pawl for a downward tension of the auger.

As a means to secure the auger in an elevated position for transportation, there is placed a similar pawl on the upper side of gear 4 as carrying means for the lower extremity of the auger from the ground.

Carried by the shaft and in working relation to the auger is a cylindrical casing comprised of two parts 40, diametrically divided its entire length, each half of said casing having a flange 41, outwardly extending at right angle, to function as a gauge for the depth of the hole and as a guard should the dirt overflow the casing while boring the hole, and furthermore, to space the dirt from the hole at the time of raising the auger and casing on completion of the hole.

The said casing, being divided on its diametrical axis, is means for collapsation to discharge the dirt contained therein when rocked from alignment with the post hole, said casing halves being hingedly connected by pins 42 diametrically positioned at its upper extremity, the pins functioning as hinge bolts, each of sufficient length to extend inward and secured to a collar 43, through which the shaft extends, said collar adapted to slide downward on the shaft at the time of collapsing the casing, which is accomplished by a toggle arm 44 for each half positioned near the lower end of the casing. The said arms are rockably joined at their inner ends to a collar 45, in which the shaft will turn, while the outer ends are rockably connected to ears that are secured to their respective half of the casing; being so connected and slanting upward and outward, as shown in Fig. 1, is means, when the casing is dropped independent of the shaft, whereby said arms will rock their respective halves outward, as shown in Fig. 7, to unload its contents, and when raised, the arms will rock the halves to a closed position, as shown in Fig. 1. To restrict the downward movement of the casing there is secured to the shaft a stop collar 46 and an idle collar 47 secured thereon, and on which collar 43 will seat as the casing openings, the idle collar being spleened to the shaft by a tongue 48 secured to the collar, while its inner end engages in the groove; being so anchored is means for the engagement of a pawl 49 in an aperture 50 positioned in the shaft between the stop collar and carrying collar for the casing when the latter is moved to its upper extremity. The said collar 47 and its pawl rotates with the shaft while serving as a lock for the closed position of the casing during the time of boring or transportation, and to rock the casing to its open position, the said pawl is released from the shaft, at which instant it is free to move downward, seating on the stop collar.

During transportation of the vehicle to and from a point of service of the boring machine, the said machine may be rocked in a variety of directions, selectively, to clear the lower extremity of the casing from the roadway, and locked in such position by the cam lever adjacent the ball and socket, on which the boring machine will rock.

Such modifications may be made as lie within the scope of the appended claims.

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

1. In a power driven post-hole boring machine of the class described comprising a shaft vertically disposed operatively, and having an auger secured on the lower end thereof, and power means to turn the shaft, a pair of semi-circular flanged casings, the flanges being at the upper ends of their respective halves of the casing and outwardly extending therefrom, said flanges being hingedly connected to each other and to a collar to permit rocking movement of the lower ends of the casing halves outward from each other a restricted distance, the collar being slidably mounted on the shaft and in which said shaft will turn, another collar positioned on the shaft adjacent the auger, a pair of toggle joint acting arms oppositely disposed with respect to the shaft and rockably carried by the said collar, the other ends of said arms being rockably connected to their respective halves of the casing a spaced distance from the lower ends thereof to open and close the casing as the same is moved reciprocatingly, longitudinal of the shaft, and means to lock the casing when rocked to its closed position.

2. In a power driven post-hole boring machine of the class described comprising a shaft having a post-hole auger axially secured to one end of the shaft and power means to turn the shaft, a cylindrical casing having an annular flange secured to one end of the casing and extending outward at right angle from the wall of the casing, said casing and flange being divided diametrically, the flange of each half where they meet being hingedly connected for rocking movement of the other ends of the casing halves toward and from each other, a collar to which the flanged end of the casing is rockably connected, the shaft to engage in the collar rotat-

ably and axial therewith when the casing halves are normally rocked together, a stop collar secured to the shaft to engage with said collar to position the auger and rockable ends of the casing equal, and the casing being free to move reciprocatingly along the shaft, an annular collar through which the shaft extends rotatably and means to secure the collar adjacent the auger, and a pair of arms, each having one end thereof rockably connected to the collar oppositely extending therefrom, each of which is rockably connected to its respective half of the casing to rock the casing halves toward and from each other as the casing is moved reciprocatingly on the shaft.

LLOYD R. SHOUP.