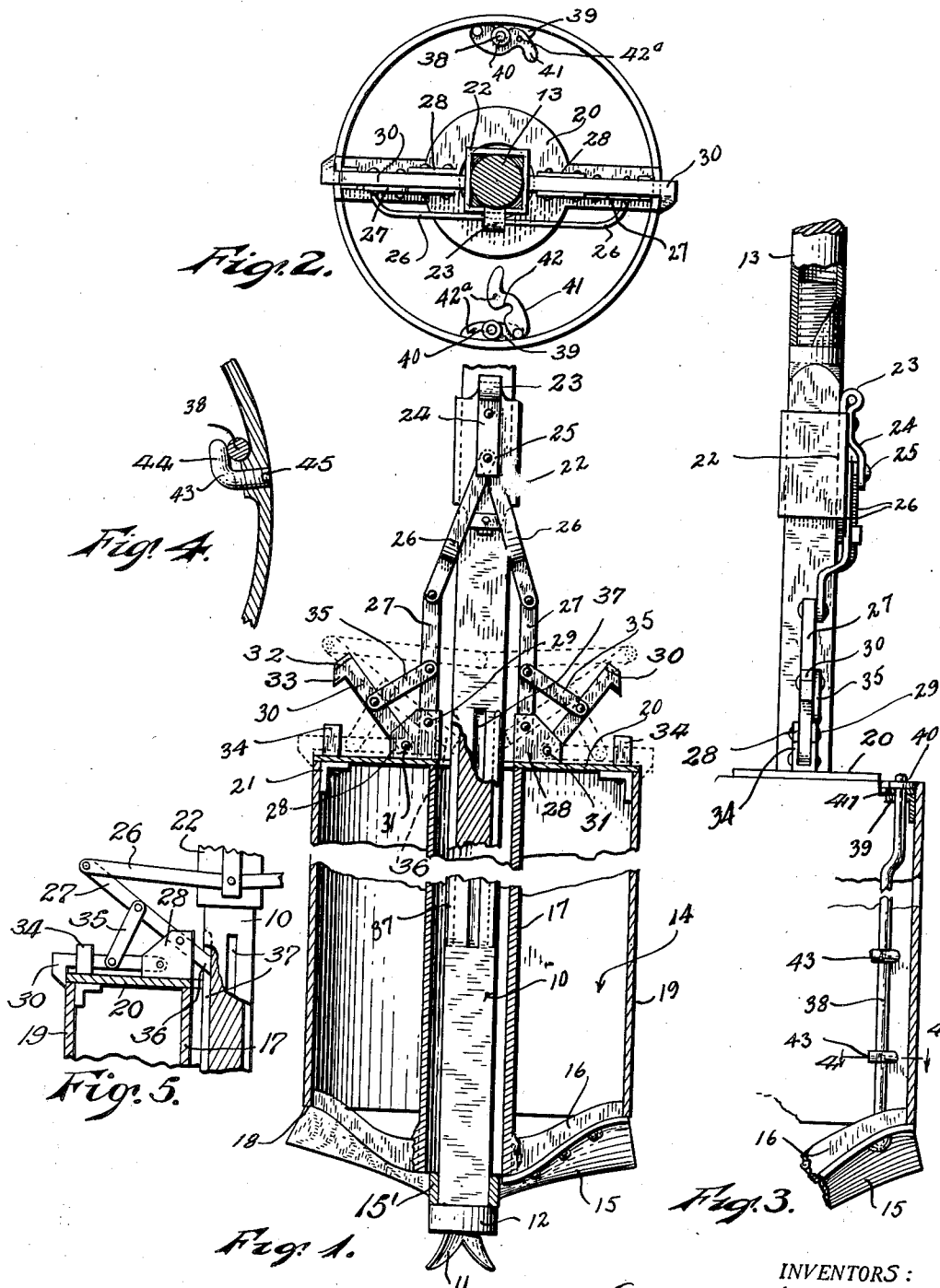


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CABLE LIFT WELL AUGER

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CABLE LIFT WELL AUGER

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3 Claims. (Cl. 255—67)

This invention relates to well augers and it consists in the constructions, arrangements and combinations herein described and claimed.

It is the cardinal purpose of the invention to provide an auger which may be removed from the well without necessity of uncoupling the drill pipe, which involves much labor and loss of time.

It is also an object of the invention to provide an auger which is slidably arranged upon a drill rod and movable to an operative position and locked to the drill rod automatically.

It is a still further object of the invention to provide a novel means for detachably mounting the cutter portion of the auger for discharge of material from the auger.

Additional objects, advantages and features of invention will be apparent from the following description and accompanying drawing, wherein—

Figure 1 is a vertical sectional view through an auger constructed in accordance with my invention.

Figure 2 is a top plan view thereof.

Figure 3 is a fragmentary sectional view at right angles to Figure 1.

Figure 4 is a cross section on the line 4—4 of Figure 3.

Figure 5 is a fragmentary section illustrating the operative position of the undercutting reamers.

In carrying out the invention use is made of a drill rod 10 of square formation, to the lower end of which there is secured as is customary, a fish tail 11 and an inwardly spaced shoulder 12. The upper end of the rod 10 has secured thereto a section of standard round drill rod 13, as shown in Figure 3.

The auger generally indicated at 14 comprises an auger bit portion 15 fixed to a head member 16, the bearing 15' for the bit having a square bore to admit the drill rod 10 therethrough to seat the bit upon the shoulder 12. This construction provides for rotation of the auger with the rod 10.

The head portion 16 has welded thereto a sleeve 17 and the outer edges of the head 16 stop short of the outer edges of the bit as at 18 forming a seat for the lower edge of a circular shell 19.

A mounting plate 20 is connected to the upper edge of the shell 19 by angle brackets 21, extending across the open end of the shell, and medially of the plate there is formed an aperture receiv-

ing the drill rod 10 freely therethrough, the sleeve 17 abutting the underside of the plate.

A slide collar 22 is arranged upon the rod 10 and includes an eyelet 23 at its upper end and a spaced bracket 24. The bracket 24 and the slide 22 have aligned apertures through which a pivot pin 25 is mounted, the pin 25 pivotally mounting a pair of links 26. A link 26 is positioned upon opposite sides of the vertical axis of the rod 10, at an angle, and to the lower end of each link 26 there is pivoted a link 27.

A U-shaped bracket 28 is secured upon the plate 20, at opposite sides of the rod 10, the legs of which are disposed upwardly in alignment with respective links 27. The links 27 each have an aperture inwardly of their lower ends and the legs of the brackets 28 are also apertured and aligned with the aperture of the links to receive pins 29.

An undercut reamer 30 is pivotally mounted between the legs of each bracket, as at 31, the reamers each having an outer cutting edge 32 and a downturned portion 33 adapted to engage the outer surface of the shell 19 when in operative position. A pair of upstanding lugs 34 are fixed to the plate 20 and receive respective reamers 30 therebetween affording rigidity to the reamers when in operation. A short link 35 is pivotally connected intermediate the length of the reamer 30 and the link 27.

As has been stated, the pivot 29 of the links 27 are spaced inwardly of the ends thereof, and this spacing should be such that the ends 36 of the links will be moved into longitudinally extended slots 37 formed in the drill rod 10, when in operative position.

In order to detachably mount the auger bit 15, a pair of rods 38 are provided, extending upwardly through the bit body and the head 16, and through respective open sided lugs 39 adjacent the upper end of the shell 19. The rods 38 will each include a head 40, and swingably mounted upon each lug there is a lever 41. It will be noted that the levers swing in a plane transversely of the rods and therefore the levers are provided with an arcuate slot 42, the slot being positioned so as to receive a rod 38 therein. The levers 41 will be disposed beneath the heads 40 of the rods and it will thus be seen that the bit 15 will be securely yet detachably held to the shell 19. If desired, a cotter pin may be inserted in the aligned apertures 42a for securing of the lever. However, in order to give further securement between the shell and bit, there are provided a series of rotatable lugs 43.

The lugs 43 having a right angular portion 44 adapted to engage an adjacent rod 38. Any suitable means may be provided for rotating the lugs and in the present instance, a slot 45 is shown for accommodation of a screw driver.

In use, the collar 22, the links 26, 27, 35 and the reamers 30 will be in the positions shown in dotted lines with the ends 36 of the link 27 engaged in respective slots 37. In such position of the parts, the bearing 15' will rest against the stop collar 12, and since the bore of the bearing conforms to the shape of the rod 10, the auger 14 will be rotated with the drill rod 10 for effecting a boring operation. When it is desired to remove the material from the auger, a suitable hoist line connected with eye 23 is drawn upwardly by a suitable windlass which moves the collar 22 and the levers 26—27 and 35 to the full line positions. This movement swings the end 36 out of the slots 37 and the auger 14 may be bodily withdrawn by continued operation of the windlass. The material being removed from the auger, it may be now lowered into the well for further drilling, and as soon as the auger comes to rest upon the collar 12, the hoist cable is slackened, allowing the collar, links and reamers to return to their dotted line positions, when it will be seen that the ends 36 of the levers 37 will be disposed in slots 37, thereby locking the auger to the drill rod 10.

While we have shown and described a preferred construction, this is by way of illustration only, and we consider as our own all such modifications in structure as fairly fall within the scope of the appended claims.

We claim:

1. A well auger comprising a square drill rod having a bit and a plurality of longitudinally extended slots, a stop collar fixed on the rod above the bit, said auger consisting of an annular shell, an auger bit fitted within the lower open end of the shell, the bit having a bearing for engaging said stop collar, a sleeve carried by the auger bit receiving the drill rod therethrough, a plate fixed to the upper end of the shell, the plate having an aperture to receive the drill rod therethrough, undercut reamers swingably mounted upon the plate, link members connected with the reamers, one of said links having an end swingable into a slot of the drill rod in the operative position of the reamers, and draft means connected with the links.

2. A well auger comprising a square drill rod

having a bit, and a plurality of longitudinally extended slots adjacent its lower end, a stop collar fixed on the rod above the bit, said auger consisting of an annular shell, a head member fitted within the lower end of the shell, an auger bit fixed to the head member, said bit having a bearing for engaging said stop collar, the bearing having a bore complementary to the drill rod, a sleeve carried by the head member receiving the drill rod therethrough, a plate fixed to the upper end of the shell, the plate having an aperture to receive the drill rod therethrough, open-sided lugs upon the interior of the shell member, rods extended through the auger bit and head member and respective open-sided lugs, the rods each having a head, a swinging lock plate on the open-sided lugs engageable beneath the head of the rod, clamp lugs on the shell intermediate the length thereof, the clamp lugs being movable to engage a rod, swingable links on the plate of the shell, one end of each link being movable to a position within a respective slot of the drill rod and draft means for swinging the levers to a position out of the slots and elevation of the auger.

3. A well auger comprising a square drill rod having a bit, a stop collar fixed on the rod above the bit, said drill rod having a longitudinally extended slot in each side thereof, the slots being positioned adjacent the lower end of the rod, an auger mounted on the rod for longitudinal movements, said auger having an annular shell, a head member fitted within the lower end of the shell, an auger bit fixed to the head member, said bit having a bearing for engaging said stop collar in one position of the auger, a plate fixed to the upper end of the shell and having an aperture to receive the drill rod therethrough, a pair of oppositely disposed upwardly swinging undercut reamers, brackets on the plate for pivotally mounting the reamers, a slide collar on the drill rod, a pair of links pivotally connected thereto, a link pivotally connected between respective links and respective brackets on the plate, a link connected between respective last named links and respective reamers, said second named links having an end portion movable into slots of the drill rod in the operative position of the auger reamers and an eyelet on the slide collar for securement of a hoist line.

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