

June 2, 1925.

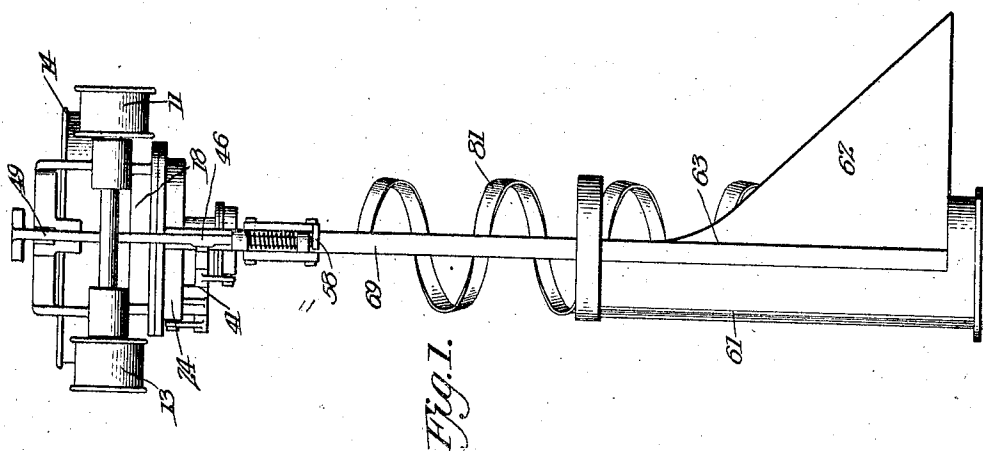
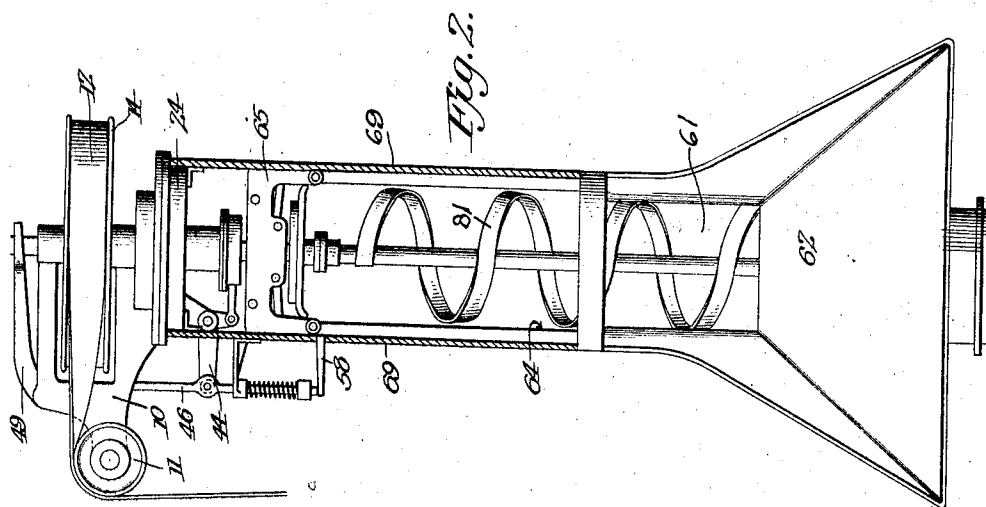
J. R. DREHER ET AL

1,540,682

POSTHOLE AUGER

Filed July 15, 1921

3 Sheets-Sheet 1



G. F. Baker

WITNESS:

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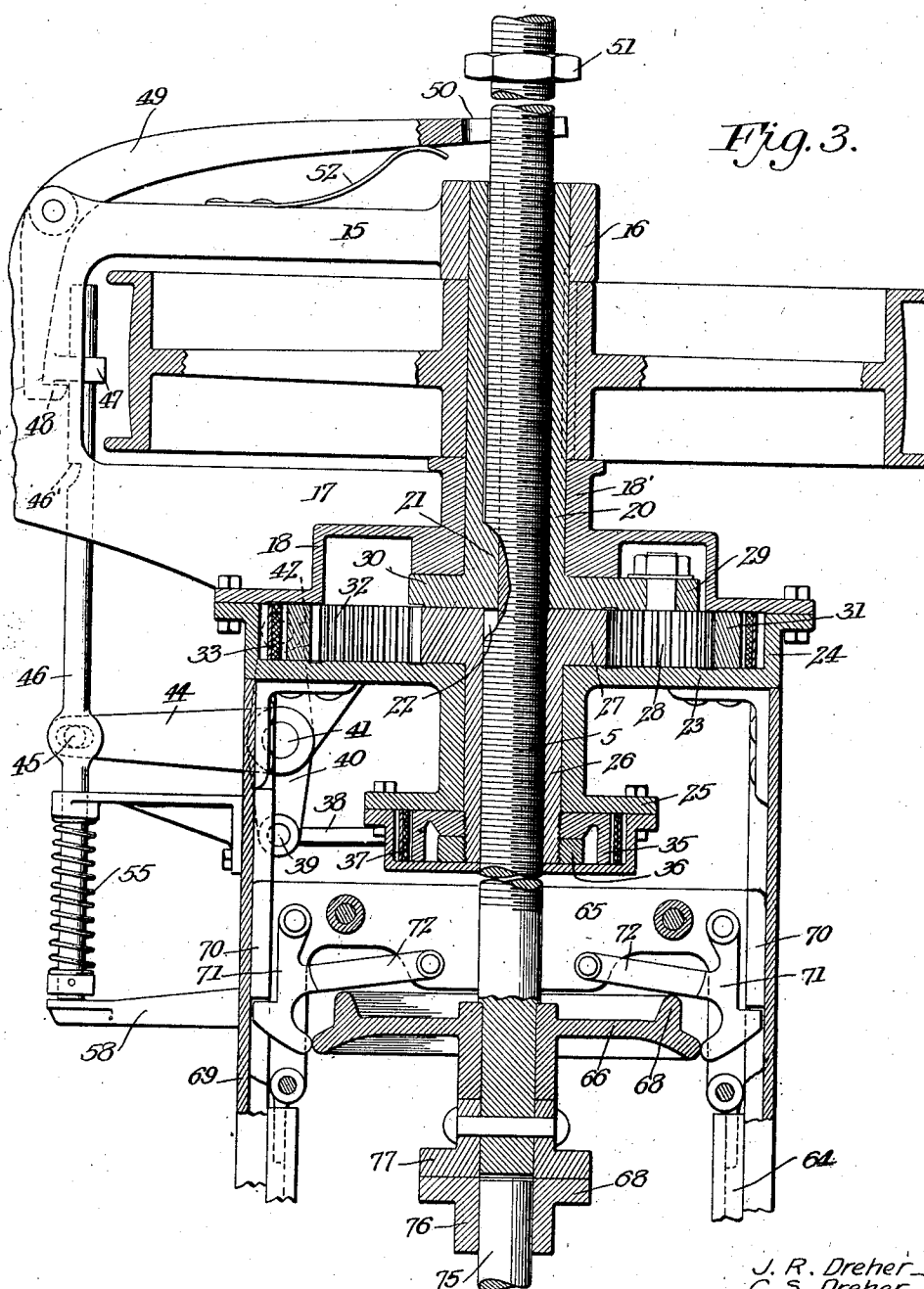
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Fig. 4.

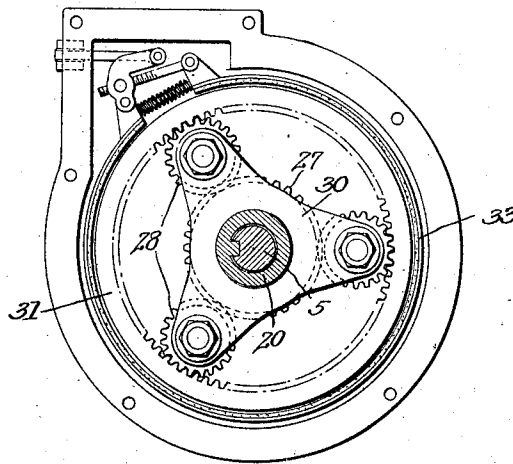


Fig. 5.

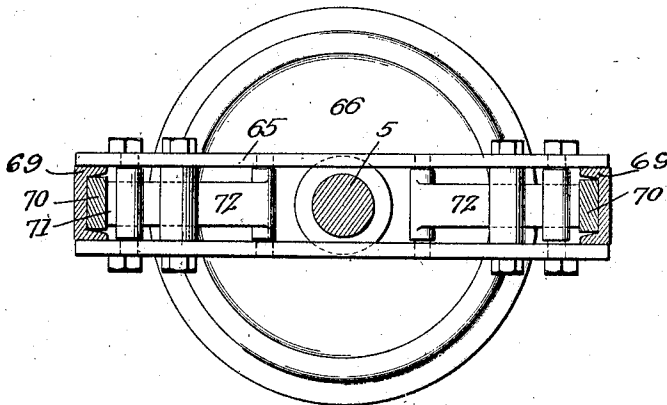
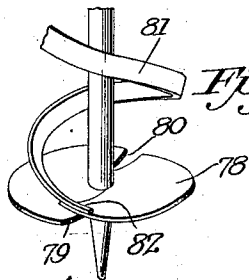


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN R. DREHER, CHRIS S. DREHER, AND GUS T. DREHER, OF ROSS, IOWA.

POSTHOLE AUGER.

Application filed July 15, 1921. Serial No. 484,970.

To all whom it may concern:

Be it known that we, JOHN R. DREHER, CHRIS S. DREHER, and GUS T. DREHER, citizens of the United States, all residing at Ross, in the county of Audubon and State of Iowa, have invented new and useful Improvements in Posthole Augers, of which the following is a specification.

This invention relates to a post hole auger, comprising a shaft and auger per se, a threaded sleeve for the shaft, and devices including a plurality of brakes, one of which serves to hold the sleeve stationary during the boring operation, permitting of the advance or downward movement of the auger;—and the other of said brakes and the associated element serving, when first named brake is released, to permit of the rotation of the sleeve for lifting the auger.

Means are provided for shifting the brakes automatically so that when the required depth is reached, the auger is withdrawn. A casing of certain novel construction receives the loose earth, the casing being provided with a discharge chute for depositing the earth to one side of the mouth of the hole.

In the drawings,

Figure 1 is a view of the device in elevation;

Fig. 2 is an elevation from another angle (frame 69 being in vertical section);

Figure 3 is a view of the upper portion of the structure in vertical section;

Figure 4 is a view in plan and horizontal section, the section being above the gear ring 31 which is engaged by brake band 33;

Figure 5 is a horizontal section through the channel frame 69 of Figure 3, the view showing the mounting of pivoted dogs in the cross-head;

Figure 6 is a detail in perspective, showing the cutting blades and spiral of the auger.

A frame 10 provides a bearing for a pulley 11 over which a belt 12 passes to the main pulley 14 of the auger, and belt passing thence over pulley 13 and around any suitable driven element from which the power is derived for imparting movement to the auger. The device may be conveniently driven from a motor vehicle.

The frame 10 includes an upper member 15 providing a bearing 16, and further includes an element 17 which carries or has

formed integrally therewith the upper portion 18 of a housing or casing for enclosing the operative members described below. The portion 18' of the element 18 serves as a bearing and receives a sleeve 20 on which the pulley 14 is keyed.

The sleeve 20 is provided with internal vertical ribs 21 cooperating with the vertical grooves or keyways 22 in opposite sides of the threaded shaft 5, on the lower end of which the auger is mounted.

The lower element of the housing is designated 23 and includes an upper flanged portion 24 and a lower flanged portion 25.

A sleeve 26 is internally threaded, the thread being engaged by the threads of the main screw or shaft, and the upper portion of the sleeve is provided with a series of teeth and constitutes a gear wheel 27 with which the pinions 28 mesh. These pinions are carried by stems 29 rigidly mounted in the flanged portion 30 of the sleeve 20.

The ring 31 is provided with internal teeth 32, the teeth engaging the pinions 28, and the ring cooperating with a brake band 33.

The lower end of the sleeve 26 has threaded thereon a wheel or disk 35 retained by a lock nut 36. Cooperating with the disk 35 is a brake band 37 controlled by an arm 38 pivoted at 39 to a lever 40. This lever moves about a central pivot 41 and the upper end is pivoted to an arm or rod 42 controlling brake band 33. The lever 40 is rocked by an arm 44 connected at 45 with a vertical rod 46, and this rod passes through a guide 47. Lever 49 includes a hook 48 and has a forked end 50, the forked portion extending around shaft 5 and passing beneath a nut or adjustable collar 51 on that shaft. A spring 52 tends to hold the forked end in an upper position when released. Vertical rod 46 is provided with notch 46' engaged by hook 48 when the rod 46 is in its upper position.

In the position shown in Figure 3, neither of the brake bands engages the element with which it is associated, but if vertical rod 46 is moved upwardly the lower end of the lever 40 moves to the left, and the lower brake band 37 is engaged. At this time the hook 48 engages the notch 46'. The sleeve 26 is held in a stationary position, and the rotation of the pulley 14 and sleeve 20 keyed thereto imparts rotary movement to the shaft 5, because of the engagement

between the vertical ribs of the sleeves and the keyways in the shaft, and the threads of the shaft engage the threads of the sleeve 26, and the shaft and auger move downwardly.

Owing to the connections with the lever 40, when brake band 37 was engaged, the upper brake band 33 was released, and this condition of the brakes must be reversed in order to elevate the auger. When the required depth is reached, the collar 51 engages the forked end 50 of the lever 49 and disengages the hook 48 from the notch 46' allowing the rod 46 to move downwardly under the influence of the spring 55. The upper end of the lever 40 is now rocked to the left, and brake band 33 engages the ring 31, while arm 38 connected with the other end of lever 40 releases brake band 37, disengaging the wheel or disk 35.

As the result of the engagement of the brake band 33 with the ring 31, that ring is held, and the pinions 28 engaging the inner series of teeth on the ring, and also engaging gear wheel 27, impart rotary movement to the sleeve 26, at a speed greater than the speed of the threaded shaft 5 with which the sleeve cooperates.

The shaft 5 will now move upwardly, raising the auger, until the laterally extending arm 58 engages the lower end of the rod 46, raising the latter to a neutral position—that is sufficiently to throw the lever 40 to a vertical position, both brakes being released.

The auger per se designated 81 is carried by threaded shaft 5 and operates within the tubular casing 61 having connected therewith a spout 62 for discharging the loose earth beyond the mouth of the post hole. The chute includes the side walls 62 flared as shown. The tube and the chute are connected at 63 with the frame 64 moving with the cross head 65, which carries arm 58 previously referred to, and these elements move vertically with reference to stationary frame 69.

A collar 66 carried by the auger shaft includes an annular projection 68. A stationary frame 69 of channel bars carries fillers 70 in the inner sides thereof and dogs 71 cooperate with elements 70, being held in operative position by pivoted devices 72, mounted as shown. These devices last named are thrown out of engagement with the dogs when the shaft moves upwardly and they are engaged by the collar 66.

The frame 64 moves upwardly, raising the cross head 65 and tube 61 above the ground. On the downward movement of the auger the tube 61, frame 64, and cross head move downwardly until the tube strikes the ground, the tube then dropping and the auger continuing its downward

movement. On the upward movement of the auger, the tube and other elements associated therewith do not move upwardly until the auger clears the post hole.

On the upward movement of shaft 5, collar 66 first releases the devices 72 pivoted on the cross-head 65, the dogs are unlocked, and the cross-head and frame 64 are carried upwardly by collar 66.

The shank 75 of the auger carries an upper flanged member 76 to be secured to the flanged ring 77 rigid with the shaft 5. The cutting blades 78 form together an approximately disk-like member, slotted radially at 79, 80, the edges of the slotted portions being deflected as shown. The spiral 81 extends from the point 82 and presents a surface continuous with the upturned edge of the blade at that point. The spiral extends thence in an upward direction, the lower edges thereof being inwardly turned. The auger is driven at sufficient speed to throw the earth outwardly by centrifugal force, and the upper outward flare of the spiral element tends to throw the earth upwardly while subjected to centrifugal action.

What is claimed is:

1. In a device of the class described, a threaded shaft for mounting an auger, means for rotating the shaft, a threaded sleeve surrounding the shaft, means for holding said sleeve stationary while the shaft is being rotated, and devices for rotating the sleeve upon the shaft and elevating the shaft when the sleeve holding means are released said devices for rotating the sleeve including a toothed ring and a brake therefor, a second brake for holding the sleeve stationary, a vertically movable spring-controlled rod through which the brakes are actuated, and devices controlling the movement of the rod by vertical movement of the threaded shaft.

2. In a device of the class described, a threaded shaft for mounting an auger, means for rotating the shaft, means for moving the shaft downwardly during rotation, and means automatically operated for moving the shaft upwardly while rotating continuously in the same direction a vertical rod, a lever controlled thereby, means for shifting the rod vertically and actuating the lever, and devices independently controlled by the lever for controlling the direction of vertical movement of the shaft.

3. In a device of the class described, a threaded shaft for mounting an auger, means for rotating the shaft, means for moving the shaft downwardly during rotation, means for moving the shaft upwardly while rotating continuously in the same direction, said means last named including a plurality of brakes, one of which is engaged while the other is disengaged, a lever controlling the brakes, a vertical rod and an arm controlling

the lever, locking means for the rod, and tripping means controlling the locking means.

4. In a device of the class described, a
5 shaft, an auger carried thereby, a tubular casing through which the auger passes, a discharge spout for the casing, means for rotating the shaft and imparting downward movement thereto, and means acting to
10 carry the casing downwardly with the shaft for a predetermined distance, the shaft continuing its downward movement after the casing contacts with the surface of the

ground, a cross head through which the shaft passes, dogs on the cross head for en- 15 gagement with stationary means, pivoted devices on the cross head for locking the dogs and preventing upward movement of the cross head, and means on the shaft for releasing the locking devices and dogs. 20

In testimony whereof we affix our signatures.

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