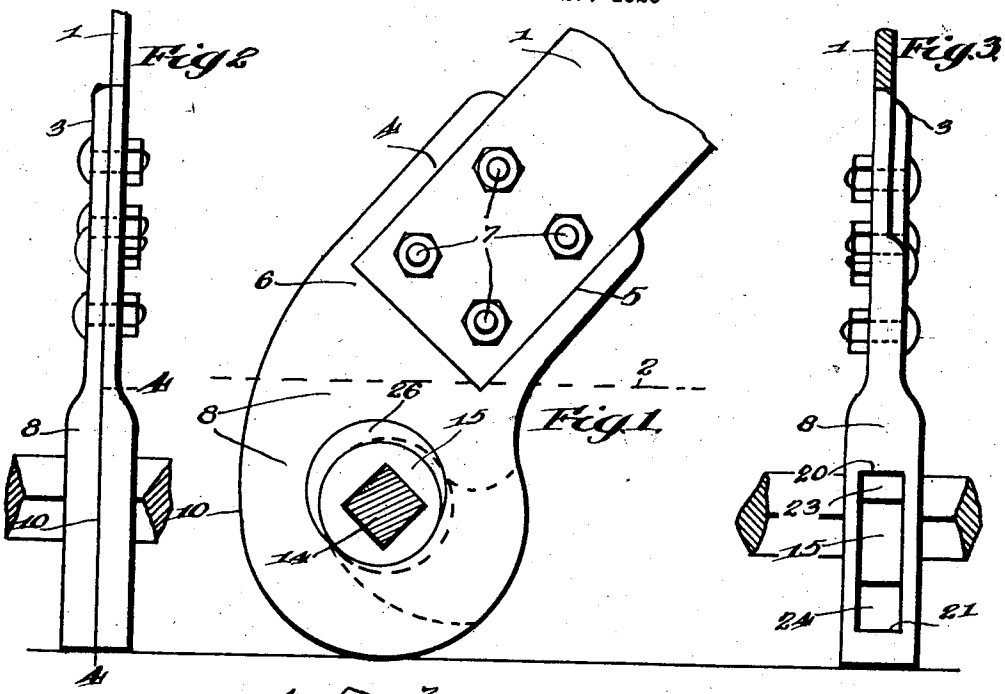
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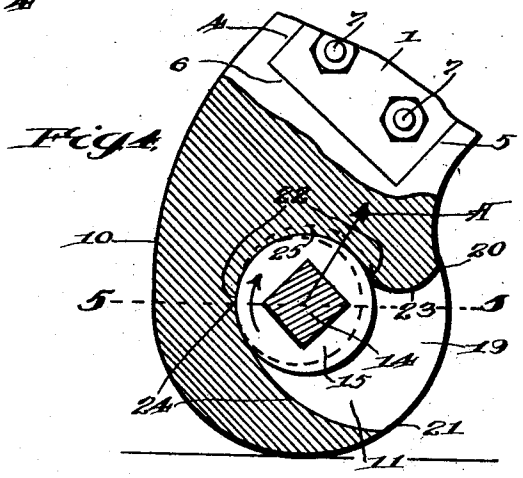
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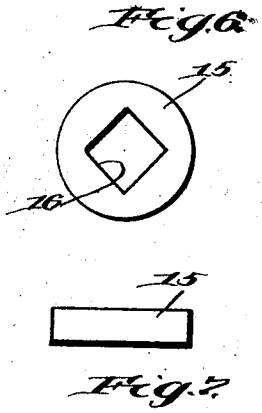
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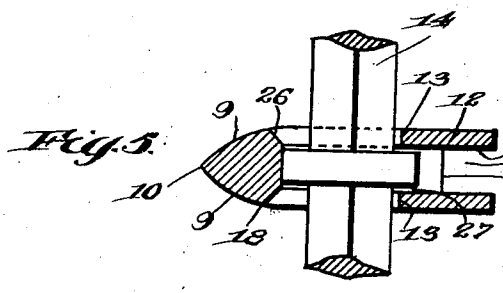
UNDERGROUND BEARING

Filed Nov. 27, 1926









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UNITED STATES PATENT OFFICE.

ANDREW E. BERGLOFF, OF CHENEY, WASHINGTON, ASSIGNOR TO WOLFE IMPROVED ROTARY ROD WEEDER, OF CHENEY, WASHINGTON, A CORPORATION OF WASHINGTON.

UNDERGROUND BEARING.

Application filed November 27, 1926. Serial No. 151,219.

This invention relates to improvement in rotary rod weeders and has to do more particularly with an improved bearing for the rotary rod.

In weeders of this type, the rod is rotated beneath the soil surface as the rod is advanced, and as no lubricant can be employed, provision must be made for journalling the rod in such a manner as to free the same and the bearing from the binding action of dirt and sand. Further provision must be made to facilitate renewal of worn parts, and also to localize wear in such a manner that such renewal will not involve parts of a costly nature.

It is a feature of my invention to form such bearing in the shoe type, and to provide a shoe of integral construction, provision being made for assembly and dissembly notwithstanding the one piece construction of the shoe.

A feature of the invention is to provide the fore part of the shoe with a vertically disposed soil dividing prow so as to reduce the resistance of advancing the shoe through the soil.

A further feature consists in providing a rotatable bearing ring in a cavity of the shoe in such a manner that the stress imposed on the ring by the rod, will act to rotatably hold the ring in position.

The invention has many other features and objects which will be more fully described in connection with the accompanying drawing and which will be more particularly pointed out in and by the appended claims.

In the drawing:

Fig. 1, is a view in side elevation of the improved shoe showing the same connected to be advanced beneath the soil surface.

Fig. 2, is an edge view looking from the left of Fig. 1.

Fig. 3, is an edge view looking from the right of Fig. 1.

Fig. 4, is a sectional view on line 4—4 of Fig. 2.

Fig. 5, is a sectional view on line 5—5 of Fig. 4.

Fig. 6, is a view of the bearing ring in side elevation.

Fig. 7, is an edge view thereof.

Like characters of reference designate similar parts throughout the different figures of the drawing.

I have shown an arm 1, depending from the carriage of the wheeled machine, not shown, and which arm constitutes means for holding the shoe in position and advancing the shoe in a partly submerged position through the surface soil, such surface being indicated by dotted line 2. The shoe has an extension 3, disposed in such angular relation to the vertical as to coincide with the angular disposition of arm 1, and said extension is suitably recessed to receive said arm, as shown. The recessed extension provides shoulder abutments 4, 5 and 6, and the arm 1 may be secured to said extension as by means of bolts 7. It will be understood that a weeder of this type will be provided with as many shoes as the length of the rod justifies but it is only necessary for purposes of illustration to show one shoe.

The shoe proper, is indicated generally at 8 and the same is horizontally converged from its maximum thickness, as shown in Fig. 5, at 9, to form a relatively sharp and vertically disposed prow-edge 10, that will subdivide the soil and greatly reduce the resistance offered in advancing the shoe through the soil. Rearwardly of this prow-edge, the shoe is widened and is provided with a ring cavity which I will generally designate at 11, and through the side walls 12, formed by said cavity, I provide alined openings 13. Before describing the shoe further, I will briefly refer to the weeder rod.

The weeder rod is indicated at 14, the same being in some cases cylindrical and in some cases polygonal in cross section dependent upon the type of machine and the ground conditions under which the machine is working. In the present construction, I have shown the rod 14 square in cross section. This rod 14, is projected

through the openings 13 of each shoe and is suitably connected up for or with such driving connections as may be employed (not shown) for rotating said rod 14 about its own axis, and in most cases, the rod 14 will be rotated in a clockwise direction with respect to the direction of advance of the shoe as shown in Fig. 4, and which advance will be toward the left of said figure. Now it will be clear that by reason of the fact that the rod is projected beneath the soil surface, and for the further reason that the rod rotates in a rearward direction with respect to the direction of advancing movement, the soil thrust on the rod resulting from the resistance of the soil to advancing movement, and because of the rotation of the rod, will combine to exert an upward and rearward thrust on the rod 14 in the general direction indicated by the arrow A. It will be clear that if the rod 14 was rotated in a contra-clockwise direction, referring to Fig. 4, the tendency would be for the rod to "dig itself down." However, with the direction of rotation shown, there is a marked tendency of the rod to seek to come to the surface, and that is why the general direction of thrusts on the rod combine to take the direction indicated by arrow A.

I will next refer to the improved means for supporting the rod in the shoe in a manner to free the latter from any wearing or other engagement by the rod.

As shown, I employ what I will term a bearing ring 15, which is of generally disc shape and which is provided with a bore or opening 16 of a shape conforming to the rod. In the present construction, where the rod is polygonal in cross section, the ring 15 will be non-rotatively connected with the rod when the parts are assembled, and will be turned therewith and thereby. In the present construction, it is a feature of the invention to employ a bearing ring that is larger in diameter than the diameter of either of the openings 13 for the purpose of holding the ring 15 against lateral discharge through either of said openings.

I will next refer specifically to the novel formation of the ring holding cavity in the shoe.

The walls 12, constitute the side walls of the cavity and said walls are shown parallel, as will be seen by reference to Fig. 5. I will designate the inner faces of said walls at 17, and it will be seen that the side walls of the cavity extend from their forward extremity 18 backwardly to the rear of the shoe and terminating at a rearwardly disposed assembly opening indicated at 19. The upper and lower walls of this opening 19, are indicated at 20 and 21, respectively. The cavity is arranged and constructed to peripherally hold the bearing ring in place, or in other words, what I will term a track wall is provided against which the ring 15 peripherally rolls. Said track wall has or comprises in part, an upper pocket section 22, adapted to engage substantially the upper half of ring 15. Said track wall includes a ring retaining shoulder section 23, which extends from the rear terminal of the pocket section to point 20, and which projects downwardly in the rear of the ring 15. Said track also includes a releasing section 24, forming a lower wall and extending from the forward terminal of section 22, to the rearward terminal 21. The releasing section 24, is spaced sufficiently from shoulder 23, so that the ring 15, if not otherwise restrained, could roll by gravity out of the position shown in Fig. 4, out through opening 19 and entirely out of relation to the shoe. Likewise, the arrangement is such that the ring 15, can readily be inserted through said opening and into the position shown in Fig. 4. Irrespective of whether the ring 15 is of softer or harder material than the shoe, the wear will be localized on the shoe track section 22 and after some use, said section will wear upwardly, as shown in dotted lines 25, thereby increasing the effectiveness of the shoulder section 23.

By reason of the fact that both the rod 14 and ring 15 will be below the surface of the soil, when the weeder is in an operative adjustment, it would be impossible to keep the dirt from entering the ring cavity and therefore, it is a feature of the invention to provide such ready egress of the dirt and sand as will preclude the same from packing and wedging in between the ring and cavity walls and causing resistance and clogging of the machine.

Thus, I flare the shoe at 26 so that the stock merges toward the upper periphery of the ring affording free access thereto, a portion of the flare being clearly shown in Fig. 5. This flared portion intersects the side edges of the track so that any sand and dirt that may find ingress between the track and ring, will also find ready egress and will not be retained. Further, the sloping releasing section 24, and the free spaces at 27, between the sides of ring 15 and inner faces 17, afford easy outlet for dirt. Thus, in actual practice, it is found that the shoe structure does not clog at all.

In assembling the device, the rings 15 are first inserted and then the rod 14 is projected through the rings 15, or through the openings 16 therein, and of course through the shoe openings 13. Thus, after assembly, the rings 15 cannot fall out of place by reason of their engagement with the rod 14, and because the latter is held by the openings 13, assembly of parts will be retained.

even before the weeder is operated. At this point it will be noted that I have rear portions of openings 13 overlap the rear peripheral portions of ring 15, not the forward or upper portions, and by this arrangement, these overlapping portions keep the rod 14 from slipping to the rear far enough to prevent the ring 15 from getting out of operative relation to shoulder 23.

Should one or all of the rings wear too much, or in other words sufficiently for the rod to bear against openings 13, then, it is an easy matter to withdraw the rod 14 and insert new rings, the latter being very inexpensive.

It will now be clear that by means of this improved construction, I am able to make the shoe of a single integral casting which is obviously a very great advantage in a device of this character.

While I have herein shown one specific form of my invention, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In an under-ground weeder rod bearing, a shoe, horizontally converged to form a vertically disposed prow-edge, said shoe having a bearing ring cavity within its side walls and said side walls having alined openings for projection therethrough of a weeder rod, a bearing ring peripherally mounted to rotate in said cavity and having a rod journalling opening for supporting said rod free from engagement with said shoe.

2. In an under-ground weeder rod bearing, a shoe provided with a forward and vertically disposed prow-edge and having a bearing ring cavity in the rear of said prow-edge forming side walls in said shoe and said shoe having an assembling opening for said cavity disposed rearwardly of said shoe, said side walls having alined openings for projection therethrough of a weeder rod, and a rod journalling bearing ring insertable through said assembling opening and having a bore for projection therethrough of the weeder rod, the walls of said cavity being shaped to peripherally support said ring to hold said weeder rod free from engagement with said shoe during rotation of said rod.

3. In an under-ground weeder rod bearing, a shoe provided with a forward and vertically disposed prow-edge and having a bearing ring cavity in the rear of said prow-edge forming side walls in said shoe, said side walls having alined circular openings for projection therethrough of a weeder rod of polygonal cross section, and a rod journalling bearing ring peripherally rotatable in said cavity and having a polygonal opening corresponding to the cross section of the weeder rod and rotatable therewith.

4. In an under-ground weeder rod bearing, a shoe provided with a bearing ring cavity and openings laterally thereof for projection of a rotating weeder rod therethrough, and a rod supporting ring in said cavity having a diameter greater than the diameter of either of said openings whereby said ring will be retained in said cavity against lateral discharge therefrom, said ring having a rod supporting opening therein, and the wall of said cavity being shaped to rotatably support said ring in a position to maintain said rod free from enagagement with said shoe.

5. In an under-ground weeder rod bearing, a shoe provided with a bearing ring cavity and having openings laterally of said cavity for projection of a weeder rod therethrough, and a rod supporting ring rotatable in said cavity, the rear portions of said openings having flanges overlapping corresponding portions of said ring, and the forward edge portions of said openings intersecting the side walls of said shoe, thereby freeing egress of dirt from between said ring and said openings.

6. In an under-ground weeder rod bearing, a shoe connected to be advanced in a partly submerged relation to the soil surface and having a rod bearing ring cavity and rod openings laterally thereof, and a rod supporting ring peripherally rotatable in said cavity and having a bore through which the rod projects and is supported, the thrust of said rod being rearwardly and upwardly, said cavity having a wall receiving the upward and rearward thrust from said ring thereby leaving forward and lower peripheral portions of said ring substantially free for egress of dirt.

7. In an under-ground weeder rod bearing, a shoe connected to be advanced in a partly submerged relation to the soil surface and having a rod bearing ring cavity and openings laterally thereof through which a weeder rod is adapted to be projected, and a rod bearing ring having a bore for projection therethrough of a weeder rod and said ring being disposed in said cavity and the rod thrust on said ring being in a rearward and upward direction, said cavity having a ring bearing wall for peripheral engagement by said ring and said wall comprising an upper pocket section for engagement by substantially the upper half of said ring, a ring retaining shoulder section terminating at the rear of said shoe, and a releasing section extending below said ring and terminating at the rear of said shoe and forming with the terminal of said shoulder section an assembly opening for insertion or withdrawal of said ring when the latter is free from said rod.

8. In an under-ground weeder rod bearing, a shoe connected to be advanced in par-

tial submergence to the soil, a rod supporting ring, and said shoe having a ring cavity for said ring and said cavity having parallel walls provided with rod openings therein and said walls extending rearwardly to the rear of said shoe and forming the side walls of an assembly opening in said shoe, said cavity having a track wall peripherally engaging a portion of said ring and said track wall having upper and lower sections extending rearwardly and forming upper and lower walls of said assembly opening.

In witness that I claim the foregoing as my own, I hereby affix my signature.

ANDREW E. BERGLOFF.