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H. D. BROWN

3,155,372

HYDRAULICALLY ACTUATED POLE PULLER

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FIG. 1.

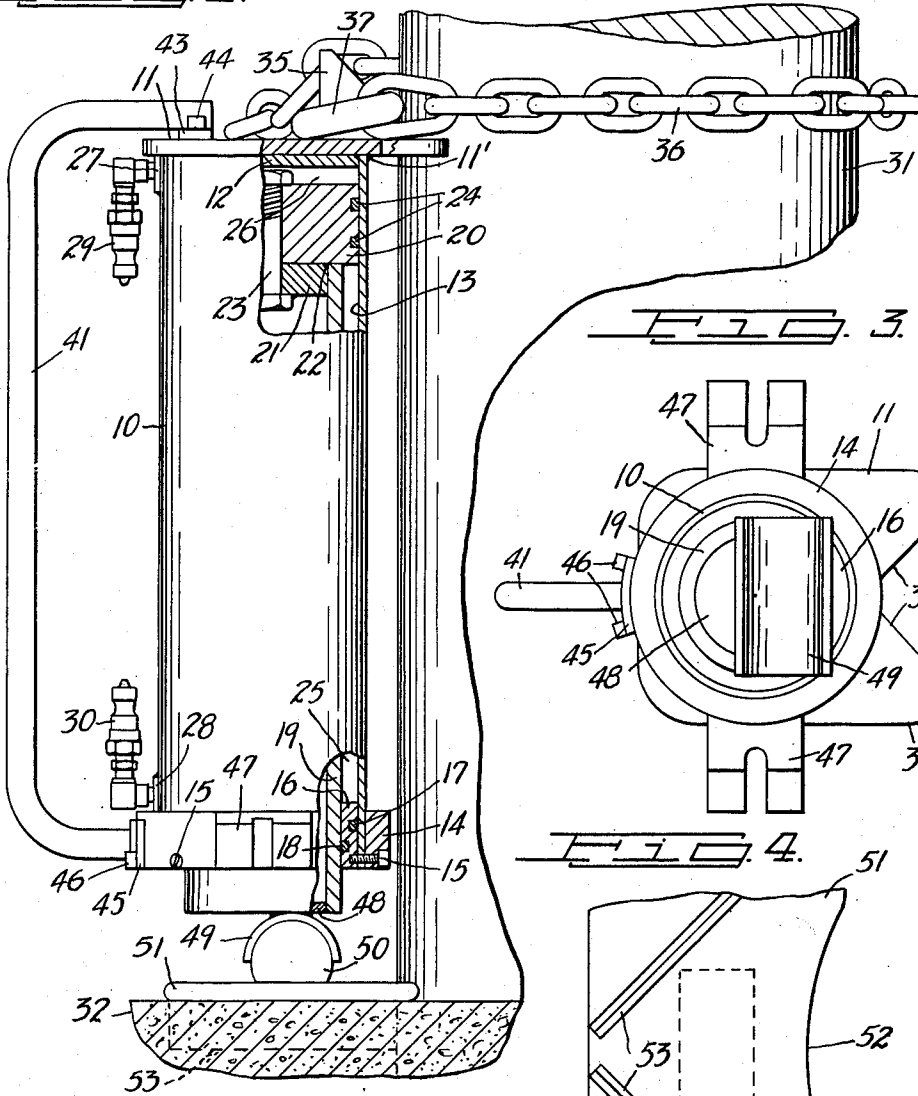


FIG. 3.

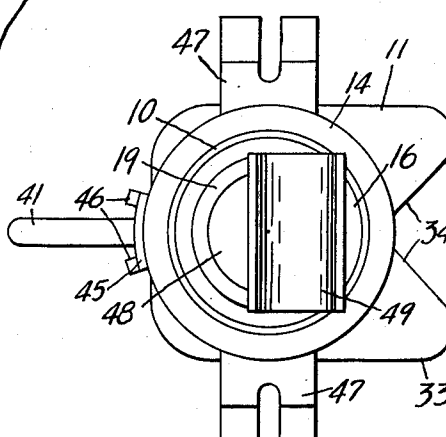


FIG. 4.

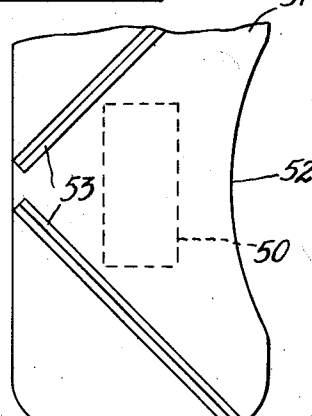
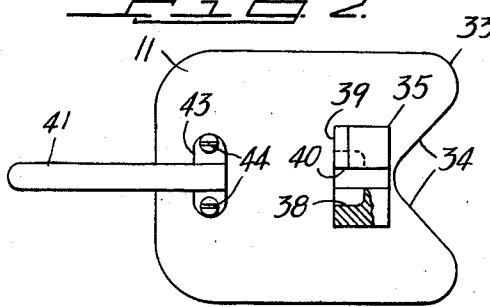


FIG. 2.



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HYDRAULICALLY ACTUATED POLE PULLER
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This invention relates to devices for use in pulling poles of any type or kind. More particularly, the invention deals with a puller comprising an outer movable cylinder, including means at end portions thereof for attaching a chain or cable therewith for engagement with a pole in the operation of pulling the pole by movement of the cylinder with the pole and longitudinally of a piston structure, said piston structure having, at its lower end, means for movably supporting the same on a bottom plate or foot mounted in the ground adjacent the pole to be pulled.

Still more particularly, the invention deals with a puller device of the character defined, including a handle member fixed to means at end portions of the cylinder structure to facilitate manual transportation of the puller and otherwise handling thereof.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

FIG. 1 is a side view of a puller, diagrammatically illustrating its mounting adjacent the pole and coupling therewith, with parts of the construction broken away and in section.

FIG. 2 is a top plan view of the device, omitting all background showing and with part of the construction broken away and in section.

FIG. 3 is a bottom plan view of the device and showing part only of the ground showing; and

FIG. 4 is a partial bottom plan view of a bottom plate or foot which I employ.

In illustrating one adaptation and use of my invention, I have shown in FIG 1 of the drawing a pole puller, comprising an outer cylinder 10, having a top plate 11 welded to the free end of the cylinder, as seen at 11'. The plate 11 includes an inner plate portion 12, which is welded to 11 and fits within the bore 13 of the cylinder 10.

The cylinder 10, in reality, comprises a one diameter tube and fixed to the outer surface of the lower end of the cylinder is a ring or collar 14, as by screws or other devices 15, which also engage and retain an inner ring 16 in the lower end of the cylinder, the latter ring having suitable packings, as at 17 and 18, to seal the ring 16 in the cylinder and to seal the ring 16 upon the tubular stem or rod 19 of a piston, the head of which is seen at 20 in the upper portion of the cylinder 10.

A disc 21 is welded to 19, as seen at 22, this weld being such as to establish an oil-tight seal. The head 20 is fixed to 19 and 21 by a bolt 23, as diagrammatically seen. The head 20 has piston rings 24 to effect a seal between the piston head and the bore 13, as the cylinder 10 moves upwardly and downwardly on the head 20 and the stem or rod 19.

As 19 is of a smaller diameter than the piston, a hydraulic chamber 25 is formed in the cylinder around 19 and a chamber 26 is formed in the cylinder above the piston head 20 in its several positions in the cylinder, as will be apparent. The upper and lower ends of the cylinder 10 have, at one side thereof, enlarged bearing portions 27 and 28, with which are coupled suitable piping, including quick couplings, as at 29 and 30, respectively, with which hydraulic tubular lines will be connected in introduction and discharge of a hydraulic

medium into chambers 25 and 26 in controlling operation of the cylinder 10. It will be understood that, when a hydraulic medium is introduced into 26 with a discharge from 25, the cylinder 10 will be moved upwardly on 19 and 20 to whatever degree is deemed necessary within end limits of the cylinder 10 to raise a pole 31, partially shown in FIG 1 of the drawing. In FIG. 1, 32 diagrammatically illustrates part of the ground into which the pole 31 is embedded and from which the pole is to be withdrawn by a series of operations of the puller device, as will be apparent. In the downward movement of the cylinder 10, the hydraulic medium will be exhausted from the chamber 26, permitting the downward movement of the cylinder on 19 and 20, as will be apparent.

Considering FIGS. 1 and 2 of the drawing, it will appear that the top plate 11 is generally of the peripheral contour shown clearly in FIG. 2 and has, at one side of the cylinder 10, an extension 33, with a V-shaped recess 34 therein to receive part of the pole 31, as diagrammatically illustrated in FIG. 1 of the drawing. On the upper surface of the plate 11, adjacent the recess 34, is what is generally referred to as a chain hook 35, with which a chain, diagrammatically seen at 36, is adapted to be coupled. The chain 36 has a ring end 37 adapted to engage 35. It will also appear, from a consideration of FIG. 2 of the drawing, that 35 includes a recess 38 on its inner surface 39 to receive part of a chain link when the chain is coupled with 35, as indicated in FIG. 1, a link of the chain or part thereof fitting in a slot 40 in the member 35. This slot 40 is clearly shown in FIG. 2 of the drawing.

Secured to the plate 11 is a long handle member 41, the upper end portion of which includes a welded bracket end 43, which is screwed or bolted to the plate 11, as at 44. The other end of the handle member 41 has a curved bracket portion 45 welded thereon and this bracket portion is fixed to the outer surface of the ring 14, as by screws or other fastenings 46, as clearly seen in FIG. 3 of the drawing.

The ring 14 has fixed to opposed sides thereof other hooks or chain engaging members 47, note FIGS. 1 and 3, to facilitate positioning the chain 36 at the lower portion of the cylinder to engage a pole which is nothing more or less than a stump or, in other words, a pole which projects above the ground only a short distance.

Welded within the lower protruding end of the stem or rod 19 is a disc 48, as clearly seen in FIG. 1, and to the outer surface of this disc is welded a semicircular saddle 49, which is adapted to be movably supported on a partially rounded cylinder 50 welded or otherwise secured to a bottom plate or foot 51 centrally thereof, as indicated in dotted lines in FIG. 4 of the drawing. The foot 51 has a rounded edge portion 52 to receive the pole or stump and to bring the pivot end of the piston structure in close proximity to the pole, so as to maintain as much as possible a pull on the pole longitudinally with respect to the axis of the pole and substantially parallel to this axis. It will be apparent that, in the initial movement of the puller, there may be a partial movement of the cylinder 10 along the pole before establishing a firm grip on the pole by the chain 36, but this movement will be minimized by adjustment of the chain on the pole within the limits of the coupling with 35 or 47, as will be apparent.

Returning now to the plate or foot 51, the lower surface of this plate has angularly disposed elongated depending grippers 53, the arrangement of which is clearly illustrated in FIG. 4, and these grippers are driven into the ground, as indicated in the dotted line showing of one of the grippers 53 in FIG. 1 of the drawing. This will definitely maintain the plate or foot 51 in position during the operation of the puller.

For purposes of description, the cylinder 10 and its associated parts can be generally identified as the lift unit; whereas, 19, 20 and associated parts can be referred to as the fixed unit, having the pivotal mounting as at 49, 50 to compensate for any inclination that a pole may assume, keeping in mind that the lift unit maintains a substantial parallelism to the axis of the pole at all times.

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

1. A puller device of the character defined comprising a fixed unit in the form of a single piston structure, a lift unit in the form of a single cylinder structure movable longitudinally of the fixed unit, the lift unit comprising a cylinder, a plate fixed to the upper end of the cylinder and having means for coupling a chain or the like therewith, said fixed unit comprising an elongated tubular rod slightly less in diameter than the bore of the cylinder, a piston head coupled with the upper end of said tubular rod and operating in the bore of the cylinder, the tubular rod being smaller in diameter than said head to form an annular hydraulic chamber between the tubular rod and cylinder, means coupled with the cylinder for admitting and discharging a hydraulic medium into opposed end portions of the cylinder to communicate with said chamber and the end of the cylinder beyond said piston head, a seal ring mounted in the lower end of the bore of the cylinder and fitting snugly on said tubular rod, a collar on the periphery of said lower end of the cylinder, means fixed to the lower end of said tubular rod for support of the fixed unit on a ground surface, said plate having an extension at one side thereof which extends laterally beyond the said collar toward an object encircled by the said chain and has a substantially V-shaped object engaging recess in the outer edge thereof, and said chain coupling means being secured to the upper surface of the said plate and extending upwardly there-

from inwardly of the said V-shaped recess so that portions of the said chain when coupled thereto will be supported on the said plate and associated extension.

2. A device as defined in claim 1, wherein an elongated handle member includes end portions coupled with said collar and the plate at the upper end of said cylinder.

3. A device as defined in claim 1, wherein said last named means comprises a foot, said foot including at its lower surface angularly disposed ground engaging grippers, and said foot including an object engaging recess vertically aligned with said V-shaped recess for disposing the cylinder in close proximity to the object being pulled.

4. A device as defined in claim 1, wherein said collar includes at sides thereof projecting chain engaging members.

5. A device as defined in claim 1, wherein the coupling of the piston head with said tubular rod comprises a disc arranged and fixed entirely within the upper end of the bore of said tubular rod, and means engaging said disc for coupling the piston head therewith.

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