Jan. 7, 1930. E. B. FUQUA 1,742,205

POWER HEAD FOR PUMPS

Filed Sept. 24, 1928 2 Sheets-Sheet 1

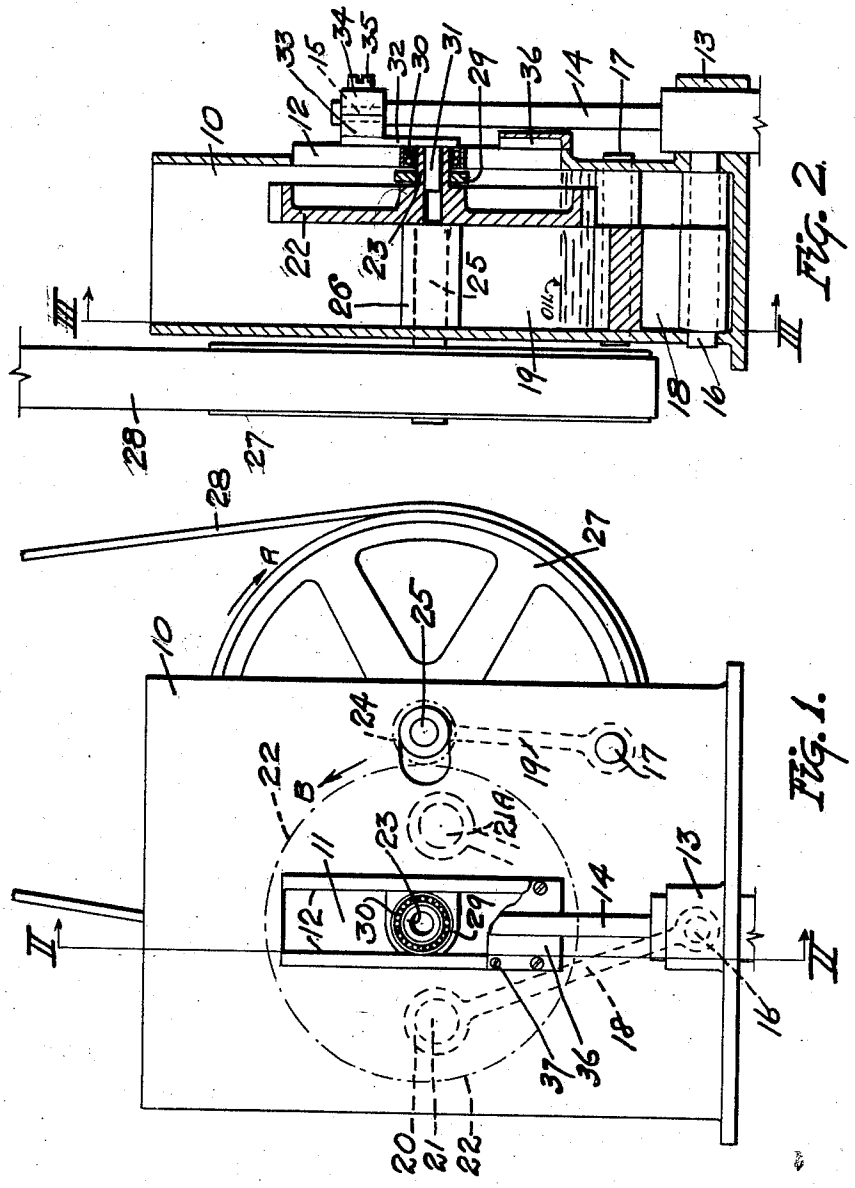


Fig. 2.

Fig. 1.

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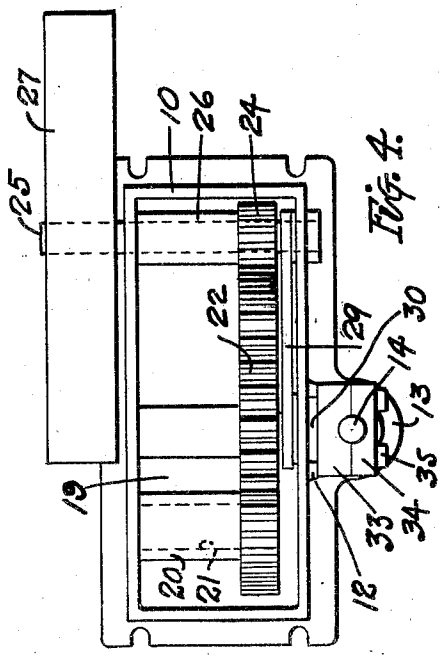


Fig. 4.

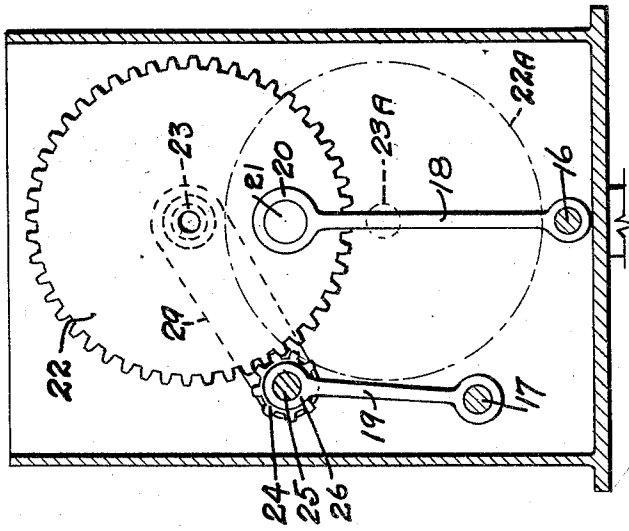


Fig. 3.

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UNITED STATES PATENT OFFICE

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POWER HEAD FOR PUMPS

Application filed September 24, 1928. Serial No. 308,021.

This invention relates to improvements in power heads for pumps and especially to a power head for operating a vertically disposed reciprocating pump.

Among the objects of this invention are:

(*a*) To provide a casing in which oil may be retained to efficiently lubricate the device;

(*b*) To provide means for vertically guiding the parts carrying the pump rod head;

(*c*) To provide means for compensating a slight lack of parallelism in the movement of the power head parts and the pump rod;

(*d*) To provide a slow upward movement and quick return downward movement or the reverse;

(*e*) To provide means whereby the pump rod may be removed or replaced without disturbing the power head; and

(*f*) To provide a simple and efficient mechanism having a minimum number of working parts, which parts are so assembled as to give the greatest possible efficiency.

The means by which the foregoing and other objects are accomplished and the manner of their accomplishment will readily be understood from the following specification on reference to the accompanying drawings, in which:

Fig. 1, is a front elevation of the pump casing and parts with the upper end of the pump rod broken away in order that the vertical guiding action may be more clearly shown.

Fig. 2, is a sectional side elevation taken on the line II—II of Fig. 1, looking in the direction of the arrows.

Fig. 3, is a sectional rear elevation taken on the line III—III of Fig. 2, looking in the direction of the arrows.

Fig. 4, is a plan.

Referring now to the drawings, 10 is a hollow casing preferably rectangular in plan, in the front of which casing is a vertically disposed slot 11, having guideways 12 disposed on the sides thereof. 13 is a hollow boss preferably integral with the casing in which the upper end of the pump pipe may be secured. 14, is the pump rod which preferably has a reduced section 15, adjacent its upper end.

Disposed in the lower portion of the casing are pins 16 and 17 on which pins swinging arms 18 and 19 respectively are journalled. The upper end of the arm 18 carries a bearing 20 in which bearing is journalled a pin 21 which projects from the rear of a gear 22 and is eccentrically disposed relatively to the center of the gear. 23 is a tubular hub projecting forwardly from the gear 22 substantially flush with the front of the guides 12. 24 is a pinion meshing with the gear 22, which pinion is secured to a shaft 25. The shaft 25, is journalled in a bearing 26 carried by the upper end of the arm 19, projects beyond said bearing, and carries a belt pulley 27 which may be driven through a belt 28 from any suitable source of power. 29 is a radius arm, one end of which is journalled around the hub 23 and the other end around the pin 25 to hold the gear and pinion in mesh.

30 is a collar preferably in the form of a ball bearing which encircles the front of the hub 23 and serves to guide the hub in the guideways 12. 31 is a pin which may be removably placed in the tubular hub 23, which pin is preferably integral with and projects rearwardly from a vertically disposed plate 32, from the upper end of which plate, a boss 33 projects forwardly. This boss 33 together with a cap 34 preferably held in place by set screws 35 forms a head or clamp for engaging the upper end of the pump rod 14. 36 is a cover plate which may be secured to the guideways 12, as by the cap screws 37, which cover plate forms a pocket into which the lower end of the clamp plate 32 may descend.

Preferably the lower portion of the case, up to substantially the bottom of the slot 11, is filled with oil and this cover plate serves as a splash plate to prevent loss of the oil from splashing.

In use, the power head casing is set up with the boss 13 disposed about the pump rod 14 and the pump pipe connected to the boss in such a manner as may be desired. The pulley 27 is belted to a suitable source of power and the lower portion of the casing filled with oil.

When power is turned on, the pulley is re-

volved in the direction of the arrow A, causing the gear to turn in the direction of the arrow B. During this turning, the gear revolves around the pin 21, raising the gear hub in so doing, the gear hub being constrained by the guideways 12 to travel in a vertical path. As the hub rises, the pin 21 swings laterally toward the guideways until the hub reaches its upper limit of travel being then in the position shown in Fig. 3, with the pin directly beneath the gear hub. As the rotation continues, the pin swings laterally until it reaches the position 21A (Fig. 1) at which time the hub 23 will have descended to the original central position shown in Fig. 1. Further rotation of the gear causes the hub to descend to its lowest position substantially the position 23A of Fig. 3, and immediately to begin to rise again. During this movement the pinion 24 is held in mesh by the radius arm 29, the lateral movement of the pinion being taken care of by the swinging arm 19.

It will be especially noted, that during the up stroke the distance from the pin 21, around which the gear turns, to the pinion 24 is greatest, whereas on the down stroke this distance reaches a minimum, so that a slow upward motion of the pump rod is obtained and a quick downward motion. Should it be desirable to reverse this action and obtain a slow downward stroke and quick upward stroke it is only necessary to reverse the direction of rotation of the pulley 27. During these movements the swinging movement of the arms 18 and 19 provides a laterally shifting bearing for each of the two pins used.

It will be noted that the gear dips low in the oil when the hub is at the position 23A, its lowest position, and that the oil picked up by the gear will be effectually carried upward and lubricate all the parts of the device within the casing.

Should the casing and pump rod be laterally slightly out of alignment, the pin 31 may turn in the hub to compensate for such lack of alignment.

It will be noted that the swinging arms 18 and 19, the bearings about which they turn, and the bearings carried by them, are of relatively great depth, so that such rigidity as may be desired may be obtained by them.

Having fully described my invention, what I claim is:

1. A power head for a pump, including a casing having a vertically disposed slot through the front thereof providing a guideway, a gear, having a tubular hub projecting through said opening and guided by said guideway, an eccentrically disposed pin projecting from said gear, a laterally shiftable bearing for said pin and means for rotating said gear, whereby said hub will be vertically reciprocated.

2. A power head for a pump, including a casing having a vertically disposed slot through the front thereof providing a guide way, a gear, having a tubular hub projecting through said opening and confined to a vertical path by said guide way, an eccentrically disposed pin projecting from said gear, a laterally swinging bearing for said pin and means for rotating said gear, whereby said hub will be vertically reciprocated.

3. A power head for a pump, including a casing having a vertically disposed opening through the front thereof providing a guide way, a gear, having a tubular hub projecting through said opening and confined to a vertical path by said guideway, an eccentrically disposed pin projecting from said gear, a laterally shiftable bearing for said pin, a pinion meshing with and laterally disposed with reference to said gear, and means for rotating said pinion, whereby said hub will be vertically reciprocated at unequal upward and downward speeds.

4. A power head for a pump, including a casing having the lower portion thereof forming an oil reservoir and having a vertically disposed slot through the front thereof providing a guideway, a gear depending into said reservoir and having a tubular hub projecting through said opening and confined to a vertical path by said guideway, an eccentrically disposed pin projecting from said gear, a laterally shiftable bearing for said pin and means for rotating said gear, whereby said tubular hub will be vertically reciprocated.

5. A power head for a pump, including a casing of which the lower portion forms an oil reservoir, said casing having a vertically disposed slot through the front thereof providing a guideway, a cover disposed around the lower portion of said slot, a gear having a tubular hub projecting through said opening and confined to a vertical path by said guideway, an eccentrically disposed pin projecting from said gear, a laterally shiftable bearing for said pin and means for rotating said gear, whereby said tubular hub will be vertically reciprocated, a pump rod clamp, an integral plate behind and projecting downward from said clamp and an integral pin projecting rearwardly from said plate into said hub.

6. A power head for a pump, including a casing of which the lower portion forms an oil reservoir, said casing having a vertically disposed slot through the front thereof providing a guideway, a gear, having a tubular hub projecting through said opening and confined to a vertical path by said guideway, means for rotating said gear, whereby said hub will be vertically reciprocated, a pump rod clamp, a plate behind said clamp, secured thereto and projecting downward therefrom,

and a pin projecting rearwardly from said plate and disposed in said hub.

7. A power head for a pump, comprising a casing having a vertically disposed slot through the front thereof providing a guideway, a gear having a hub projecting through said slot and confined to a vertical path by said guideway, a pump rod clamp carried by said hub, a pinion meshing with said gear, a radius arm holding said pinion and gear in mesh, an eccentrically disposed pin projecting from said gear, a bearing for said pin, a laterally swinging arm carrying said bearing, a bearing for said pinion, a laterally swinging arm carrying said bearing and means for rotating said pinion, whereby said clamp will be vertically reciprocated at unequal upward and downward speeds.

8. A power head for a pump, comprising a casing having a vertically disposed slot through the front thereof providing a guideway, a gear having a hub projecting through said slot and confined to a vertical path by said guideway, a pump rod clamp carried by said hub, a pinion meshing with said gear, a radius arm holding said pinion and gear in mesh, an eccentrically disposed pin projecting from said gear, a bearing for said pin, a laterally swinging arm carrying said bearing, a pinion shaft to which said pinion is secured, a bearing for said pinion shaft, beyond which said shaft projects, a laterally swinging arm carrying said bearing, and a pulley secured on said pinion shaft, whereby said clamp may be vertically reciprocated at unequal upward and downward speeds.

9. A power head for a pump, comprising a casing having a vertically disposed slot through the front thereof providing a guideway, a gear having a hub projecting through said slot and confined to a vertical path by said guideway, a pump rod clamp carried by said hub, a pinion meshing with said gear, a radius arm holding said pinion and gear in mesh, an eccentrically disposed pin projecting from said gear, a bearing for said pin, means for swinging said bearing laterally, a bearing for said pinion, means for laterally swinging said bearing, and means for rotating said pinion, whereby said hub will be vertically reciprocated with a slow upward and rapid downward motion.

In testimony whereof I hereunto affix my signature.

EDWARD B. FUQUA.