

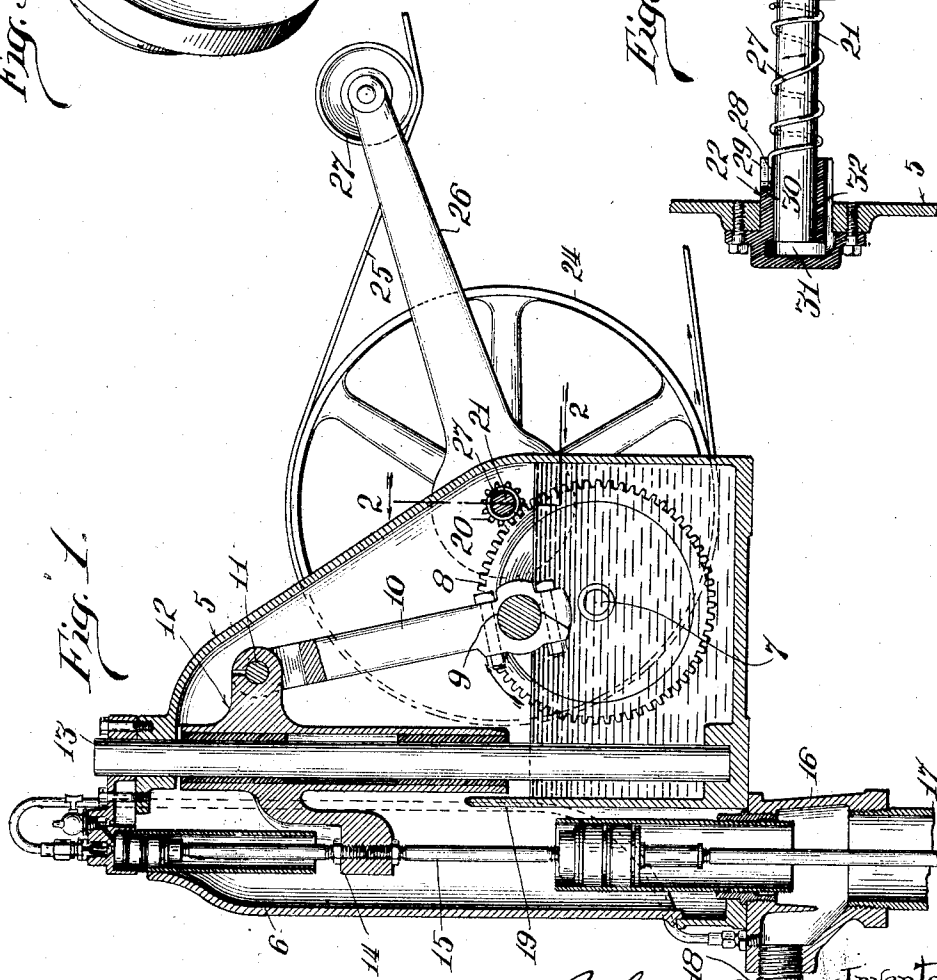
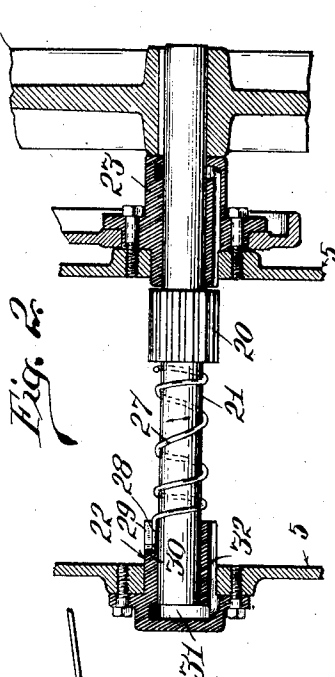
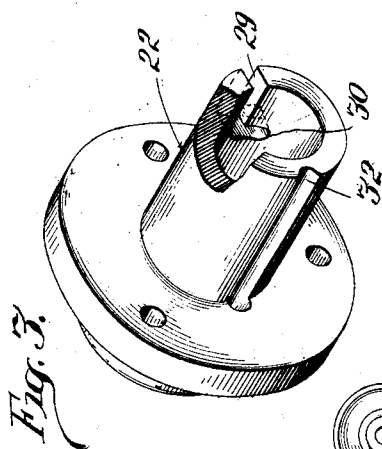
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POWER HEAD

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UNITED STATES PATENT OFFICE.

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POWER HEAD.

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This invention relates to improvements primarily designed and adapted for use in connection with the lubrication of the drive-shaft of a power head of a pumping apparatus used in the pumping of liquid from wells and is therefore here shown and described in connection with such an apparatus, although it is to be understood that the invention is not necessarily restricted to such apparatus. In power heads for pumping apparatus it is common practice to provide for the retention therein of a comparatively large body of lubricating oil in which rotates a gear member of the driving mechanism, such gear member being driven through a pinion fast on a shaft that is journaled in bearings seated in opposite walls of the casing member of the power head and located above the surface of the lubricant. The rotation of the gear referred to will carry up oil that will splash or fall upon the bearing that is adjacent to it and thereby provide sufficient lubrication for that bearing, but special provision must be made for lubricating the other bearing, and it is the object of my invention to provide improved means for lubricating such other bearing with some of the oil that is carried up by the gear member as stated. Briefly stated, I accomplish this object by providing around the rotating shaft a relatively-stationary spiral device having one end thereof connected with the bearing to be lubricated, whereby oil thrown against the shaft will be moved longitudinally thereof into the bearing. That which I believe to be new will be set forth in the claims.

In the drawing,—

Fig. 1 is a vertical section through the power head of a pumping apparatus embodying my invention, some parts being in elevation;

Fig. 2 is an enlarged vertical section taken at line 2—2 of Fig. 1; and

Fig. 3 is a perspective view of the shaft bearing shown at the left-hand side of Fig. 2.

Referring to the several figures of the drawing,—5 indicates the heavy casing member of a pumping mechanism power head, the front portion of which is closed by a removable cover member 6, the removal of which will at any time permit access to the interior of the head. Journaled in the side walls of the member 5 is a shaft 7 which has

secured to it a power transmitting device which in the construction shown is in the form of a large gear 8, to which gear is attached a wrist pin 9 on which is journaled one end of a pitman 10 that at its other end is pivotally connected at 11 with a crosshead 12 that is guided by a vertical rod 13 properly secured at its ends in the upper and lower walls of the casing member 5. The crosshead 12 carries a forwardly-projecting arm 14 that is engaged in any suitable manner by a pump shaft 15, such pump shaft being provided with pistons fitting closely in cylinders, as usual. 16 indicates a pump head lying beneath the lower part of the casing member 5 and its cover section 6, from which pump head extends downwardly to the desired depth in the well the usual well pipe indicated by 17, while branching laterally from such pump head is a discharge pipe 18. As shown in Fig. 1, the casing member 5 is provided with a front wall 19 that rises to a considerable distance above the bottom of the casing, so that there is thereby provided in the lower portion of the casing 5 a receptacle adapted to hold a considerable body of oil, as indicated in Fig. 1. As shown, the gear 8 is so located as to be at all times partially immersed in that body of oil. The construction so far described is well known, and further detailed description of such parts that have been briefly referred to is therefore not deemed necessary. It will, of course, be understood that as the gear is rotated the crosshead will be reciprocated on its guide rod 13, and by reason of its connection with the shaft 15 will reciprocate such pump shaft in the usual manner.

The gear 8 is located adjacent to one of the side walls of the casing 5 and is driven by means of a pinion 20 that is fast on a shaft 21 journaled in bearings 22 and 23, respectively, that are seated in openings in the side walls of the casing member 5 and there secured—the securing of the bearings, in the construction shown, being by means of bolts that pass through annular flanges formed on the bearings and resting against the outer surfaces of said side walls. To a projecting end of the shaft 21 is keyed or otherwise secured a large pulley 24 over which passes a drive belt 25 that is driven from any suitable source of power. An arm 26 is shown carrying at its outer end a

roller 27 that bears on the belt to keep the same in taut condition.

The gear 8 rotates in the body of lubricating oil and by its rotation a quantity of such oil will at all times be splashed up and dropped upon the shaft 21, and by reason of the proximity of the bearing 23 a sufficient amount of the oil to lubricate that bearing will always find its way into it, but, by reason of the comparative remoteness of the other bearing, 22, from the gear, special provision has to be made for lubricating it. I provide for the proper lubrication of such bearing 22 by encircling the shaft 21 with a spiral member that extends from a point closely adjacent to the pinion 20 to such last-named bearing—the spiral member shown being in the form of a coiled piece of spring wire 27 which hugs the surface of the shaft quite closely. At that one of its ends adjacent to the bearing 22 the spiral member is formed, in the construction shown, with a straight portion 28 that lies in a slot 29 cut in the upper side of the bearing and is then preferably turned at an angle to lie in a notch 30 (see Fig. 3) at the inner end of said slot. By this means the spiral member is held connected in place with the bearing 22 and is prevented from partaking of the rotary motion of the shaft that it surrounds. It will also be observed that by virtue of the engagement of the hooked end of the spiral member in the notch 30, the spiral member will follow the bearing 22 as a unit when the bearing is removed from the casing. The opening in the casing in which this bearing engages is amply large to permit of the passage of the spiral member therethrough. At the outer end of the bearing 22 is formed a recess 31, and in the under part of the outer face of the bearing is formed a groove 32 extending the full length of the bearing and communicating at its outer end with said recess.

When the pumping apparatus is in operation, the rotation of the gear 8 in the body of oil will cause oil to be constantly thrown up and against and onto the shaft 21, and by reason of the relatively close fit of the spiral member 27 on such shaft it is evident that a certain amount of the oil will necessarily be moved along the surface of the shaft and be guided into and thoroughly lubricate the interior of the said bearing. Indeed, there will be an excess of oil conducted to this bearing by the means stated, and it is because of such excess that there is provided the recess or cavity 31 for the reception thereof, such excess oil passing from that recess or cavity to the communicating groove or channel 32 from whence it will drop back into the body of oil in the bottom of the casing member 5.

By my invention I provide a very cheap

and simple means for effecting automatic lubrication of both bearings of the shaft.

While I have shown my invention as embodied in a power head having only a single gear 8 and pinion 20, obviously the application thereof to a power head in which the power transmission means comprises a plurality of gears rotating in a body of lubricating oil and meshing with pinions on a shaft the bearings of which are to be lubricated in the manner described, comes within the scope of my invention.

What I claim as my invention and desire to secure by Letters Patent, is—

1. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, a pinion within said chamber, mounted on said shaft adjacent to one of said bearings, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and means on said shaft between said pinion and the other shaft bearing and held against rotation for conducting oil from said pinion to the latter bearing, whereby when the shaft is rotated said gear and pinion operate to supply oil from said chamber to both of said bearings.

2. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, a pinion within said chamber, mounted on said shaft adjacent to one of said bearings, a recess communicating with the other bearing and adapted to drain into said chamber, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and a spiral device mounted on and closely fitting said shaft between said pinion and the other bearing, and held against rotation, whereby when the shaft is rotated said gear and pinion operate to supply oil from said chamber to both of said bearings.

3. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft extending through one wall of said casing and having a bearing therein, a bearing mounted in the opposite wall of said casing for the inner end of said shaft, both of said bearings being normally above the surface of the oil in said chamber, a pinion within said chamber, mounted on said shaft adjacent to said first-mentioned bearing, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and a spiral device mounted on and closely fitting

said shaft between said pinion and the inner shaft bearing and non-rotatably connected with the latter bearing, whereby, when the shaft is rotated, said gear and pinion operate to supply oil from said chamber to both of said bearings.

4. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft extending through one wall of said casing and having a bearing therein, a bearing mounted in the opposite wall of said casing for the inner end of said shaft and having a recess adapted to receive oil, said recess being arranged to drain into said chamber, both of said bearings being normally above the surface of the oil in said chamber, a pinion within said chamber, mounted on said shaft adjacent to said first-mentioned bearing, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and a spiral device mounted on and closely fitting said shaft between said pinion and the inner shaft bearing and non-rotatably connected with the latter bearing, whereby, when the shaft is rotated, said gear and pinion operate to supply oil from said chamber to both of said bearings.

5. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, a pinion within said chamber, mounted on said shaft adjacent to one of said bearings, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and non-rotating means on said shaft between said pinion and the other shaft bearing for conducting oil longitudinally along said shaft from said pinion to the latter bearing, whereby when said shaft is rotated said gear and pinion operate to supply oil from said chamber to both of said bearings.

6. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, first and

second bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, a pinion within said chamber, mounted on said shaft adjacent said first bearing, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and a spiral device mounted on and closely fitting said shaft between said pinion and said second shaft bearing, and held against rotation, whereby when said shaft is rotated said gear and pinion operate to supply oil from said chamber to both of said bearings, said spiral device being connected to said second bearing and being removable therewith as a unit when said bearing is removed from said casing.

7. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, a pinion within said chamber mounted on said shaft adjacent to one of said bearings, a gear mounted in said chamber to rotate through the oil therein, and meshing with said pinion, and a spiral device mounted on and closely fitting said shaft between said pinion and the other shaft bearing, and held against rotation, whereby when said shaft is rotated said gear and pinion operate to supply oil from said chamber to said other bearing.

8. The combination in a power head comprising a casing having a chamber in its lower portion adapted to contain a body of lubricating oil, of a rotatable shaft, bearings for said shaft at opposite sides of said chamber above the surface of the oil therein, power transmitting means mounted in said chamber and geared to said shaft adjacent to one of said bearings, and adapted to move through the oil in said chamber, and a spiral device mounted on and closely fitting said shaft between said power transmitting means and the other shaft bearing, and held against rotation, whereby when said shaft is rotated said power transmitting means operates to supply oil from said chamber to both of said bearings.

JOHN B. SPERRY.