

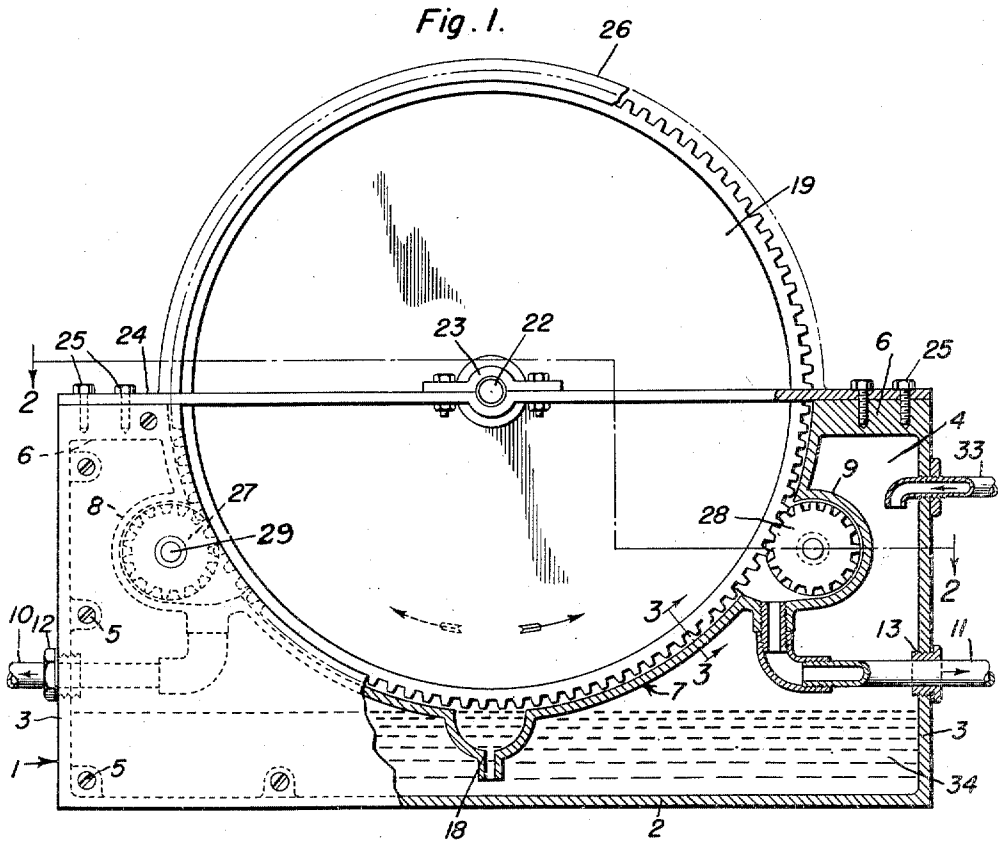
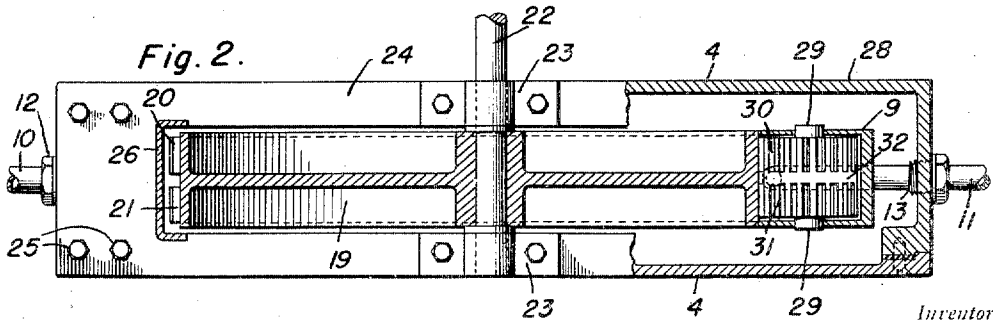
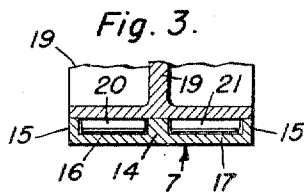
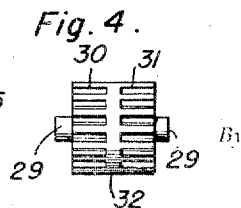
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GEAR PUMP FOR PRESSURE LUBRICATION PURPOSES

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GEAR PUMP FOR PRESSURE LUBRICATION PURPOSES

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2 Claims. (Cl. 103—126)

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My invention relates to improvements in gear pumps for pressure lubrication purposes, especially, although not necessarily.

The invention is designed with the primary objects in view of providing a simply constructed, lightweight, dependable gear pump adapted for direct connection to a prime mover to supply lubricating oil under pressure, in proportions required, and which is especially constructed for lower cost of manufacture, installation and maintenance, than present-day pumps provided for similar purposes.

Other and subordinate objects, also comprehended by my invention, together with the precise nature of my improvements will be readily understood when the succeeding description and claims are read with reference to the drawing accompanying and forming part of this specification.

In said drawing:

Figure 1 is a view in side elevation, partly broken away and shown in section, of my improved gear pump, in a preferred embodiment thereof;

Figure 2 is a view in horizontal section taken on the line 2—2 of Figure 1;

Figure 3 is a view in transverse section taken on the line 3—3 of Figure 1;

Figure 4 is a detailed view of one of the twin gears.

Reference being had to the drawing by numerals, according to my invention, in the illustrated, preferred embodiment thereof, a pump is provided comprising an elongated, rectangular, narrow casing 1, of any suitable size, having a flat bottom 2 with ends 3 integral therewith, and flat sides 4, one integral with the bottom 2 and ends 3, and the other bolted to said bottom and ends, as at 5.

A substantially semi-circular, arcuate and flat-bottomed trough 7, relatively narrower than the casing 1, depends into the casing with its concave side uppermost from top extension webs 6 on the ends 3 of the casing 1, said trough 7 extending longitudinally co-planar with said casing 1 and being spaced from the bottom 2, as well as from the ends 3 and sides 4 of said casing.

At a level in the casing 1 above the low point of the trough 7 suitable for a purpose presently seen, said trough 7 is formed with a pair of external pockets 8, 9, in part semi-circular, and which are arranged co-planar with the trough 7 with open sides facing.

Discharge pipe lines 10, 11 extend from the bot-

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oms of the pockets 8, 9 out of the ends 3 of the casing 1 through bushings 12, 13.

A central, internal, circumferential rib 14 in the trough 7 and longitudinal side flanges 15 on said trough divide the same into a pair of side-by-side channels 16, 17 extending between the pockets 8, 9 and communicating with the open sides of said pockets.

A depending, bottom, inlet nozzle 18 on the trough 7, in the vertical and transverse center thereof communicates with both channels 16, 17.

A gear wheel 19 is fitted in the trough 7 with side-by-side, divided series of gear teeth 20, 21, adapted to revolve in the channels 16, 17 with a working clearance, said gear wheel 19 having its periphery at the root of the series of gear teeth 20, 21, engaged with the rib 14 and side flanges 15 to seal the channels at the sides thereof.

The gear wheel 19 is fixed, in any suitable manner, on a drive shaft 22 suitably journaled in bearings 23 on a skeleton top plate 24 on said casing 1 and which surrounds said gear 19 and is bolted, as at 25, to the webs 6 with a semi-circular channel guard 26 arising therefrom and fitted over the gear wheel 19 above said plate 24.

Twin gears 27, 28 are provided in the pockets 8, 9 and which are rotatably fitted in the circular portions of said pockets 8, 9 and are rotatably mounted in the sides of said pockets by axial studs 29 thereon. The twin gears 27, 28 each comprise a pair of side-by-side series of teeth 30, 31 meshing with the series of teeth 20, 21, and a circumferential tooth high flange 32 fitting in between said series of teeth 20, 21 against the periphery of the gear wheel 19.

An oil supply line 33 extends into one end 3 of the casing 1 and for supplying under any suitable control, not shown, lubricating oil 34 to the casing 1 and maintaining the same at a level slightly higher than the low point of the trough 7.

Referring now to the operation of the described pump, the gear wheel 19 is designed to be driven in opposite directions, respectively, from a prime mover, not shown, through the medium of reduction gearing, not shown, the direction of drive depending upon whether the prime mover is operating forwardly, or reversely. Assuming that the gear wheel 19 is being rotated in the direction indicated by the full line arrow in Figure 1, suction will be created in the channels 16, 17 on one side of the transverse center of the trough 7, in a manner which will be clear, whereby oil will be drawn into the channels 16, 17 through the inlet nozzle 18 to be carried by the series of teeth 20, 21 up said channels to the twin gear

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28. The twin gear 28 being rotated oppositely, relatively, by said gear wheel 19, the series of teeth 30, 31 thereof will coast with the series of teeth 20, 21 to force oil carried by and between the teeth of the series 20, 21 out of the spaces between the same to fall into the pocket 9 and issue out of the discharge pipe 11, under pressure, for conveying away from the pump for lubrication purposes. If the gear wheel 19 is rotating in the opposite direction, indicated by the dotted line arrow in Figure 1, the operations just described will take place on the other side of the transverse center of the trough 7 to effect discharge of oil, under pressure, out of the discharge pipe 10.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention, without further explanation.

Manifestly, the invention, as described, is susceptible of modification, without departing from the inventive concept, and right is herein reserved to such modifications as fall within the scope of the appended claims.

What I claim is:

1. In a pump, a casing adapted to contain oil, an arcuate trough in said casing having side flanges and a longitudinal dividing rib therein, an oil inlet in the trough at a point midway between the ends of said trough for admitting oil into the trough from said casing upon suction being created in the trough, a gear wheel with divided side by side series of teeth fitting in said trough between said flanges and rib, said wheel being journaled on said casing for rotation in opposite directions, respectively, to create suction in said trough and carry oil from said inlet toward opposite ends of the trough alternately upon rotation of said wheel in opposite

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directions, respectively, and means located between each end of said trough and said inlet operative by said wheel alternately in accordance with the direction of rotation of said wheel to force oil from between the teeth of said series out of said casing.

2. A pump according to claim 1, wherein the circumferential portion of said wheel runs on said flanges and rib to close and seal said trough, said last-named means comprising pockets on said trough with discharge ports for catching the oil forced from between the teeth of said series and discharging the oil out of said casing, and gear wheels smaller than the first-named wheel rotatable in said pockets and having divided side by side series of gear teeth meshing with the gear teeth of said first-named wheel, said smaller gear wheels having tooth high flanges thereon running against the circumferential portion of the first-named wheel to prevent oil from passing between the first-named wheel and said smaller gear wheels.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,835,851	Duffing	Dec. 8, 1931
2,277,270	Schmitter	Mar. 24, 1942

FOREIGN PATENTS

Number	Country	Date
283,951	Great Britain	Apr. 26, 1928
297,860	Great Britain	Sept. 28, 1928