Oct. 13, 1953 H. C. OSBORNE 2,655,108

PUMP

Filed May 24, 1948 3 Sheets-Sheet 1

Fig. 1

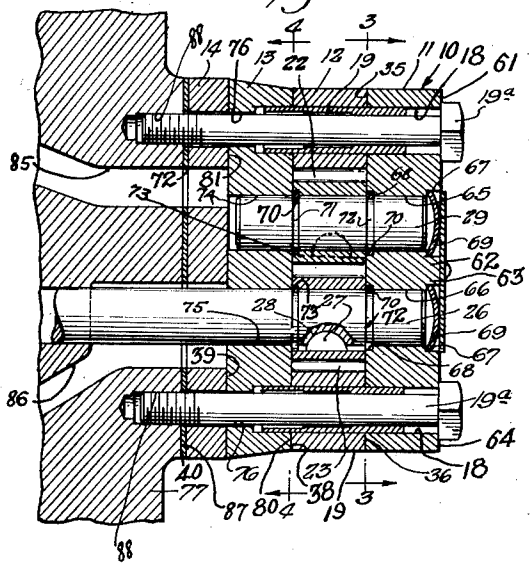


Fig. 2

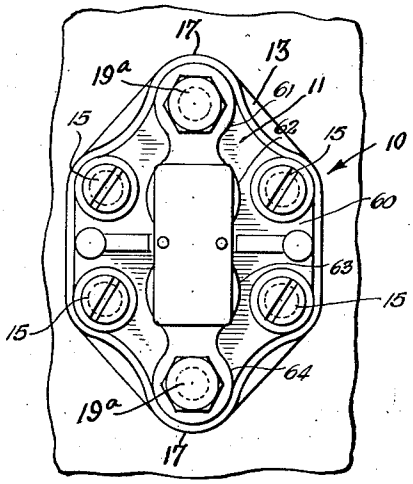


Fig. 3

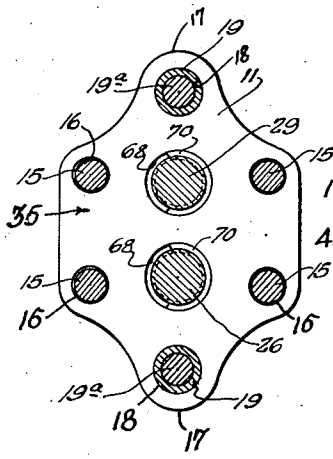


Fig. 4

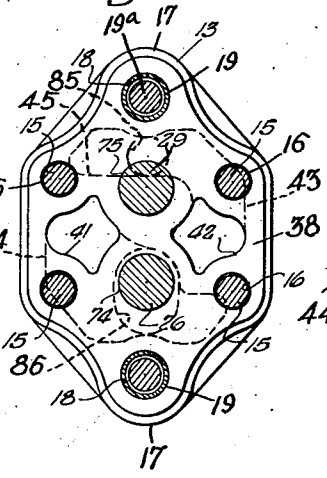
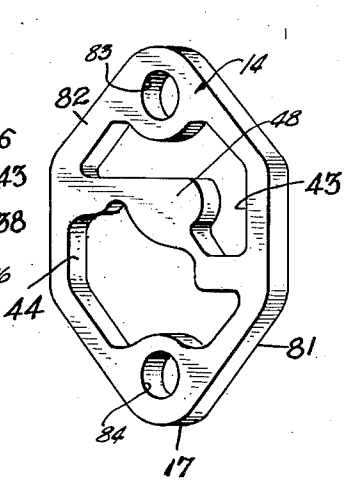


Fig. 5



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Oct. 13, 1953 H. C. OSBORNE 2,655,108

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Filed May 24, 1948 3 Sheets-Sheet 2

Fig. 7

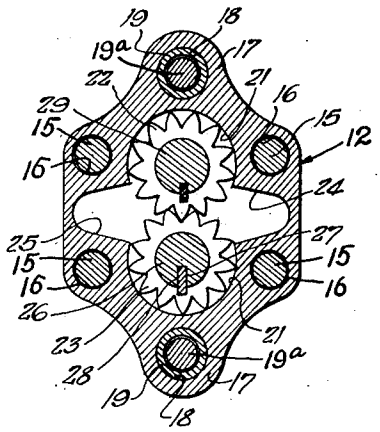


Fig. 6

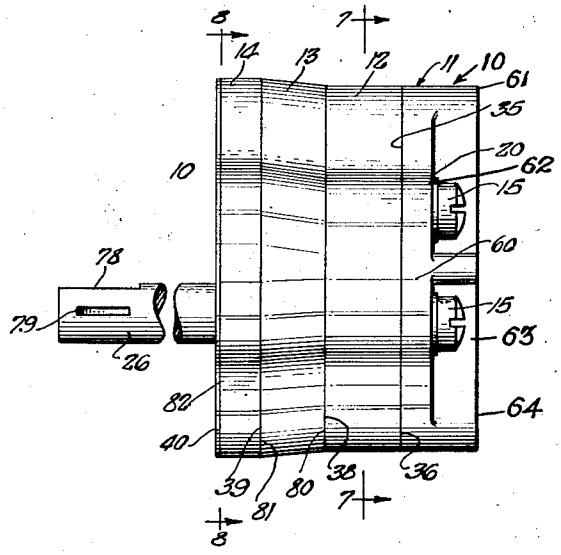


Fig. 8

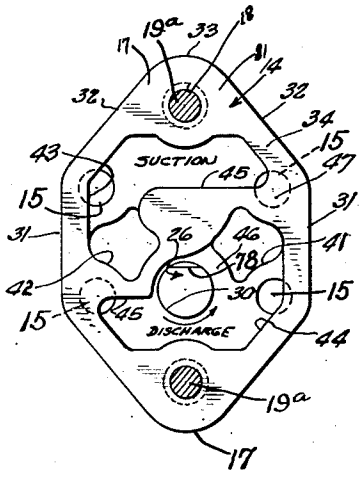
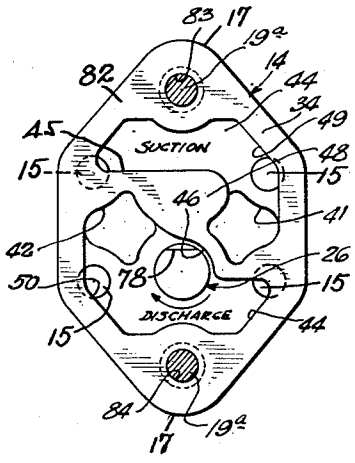


Fig. 9



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Oct. 13, 1953 H. C. OSBORNE 2,655,108

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Filed May 24, 1948 3 Sheets-Sheet 3

Fig. 10

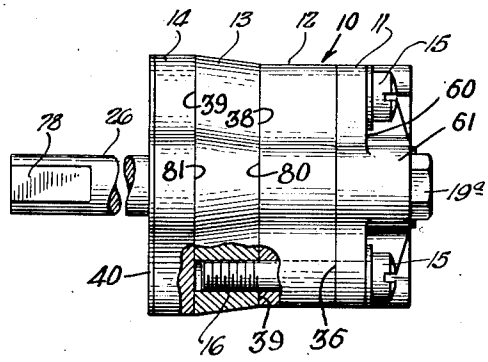


Fig. 11

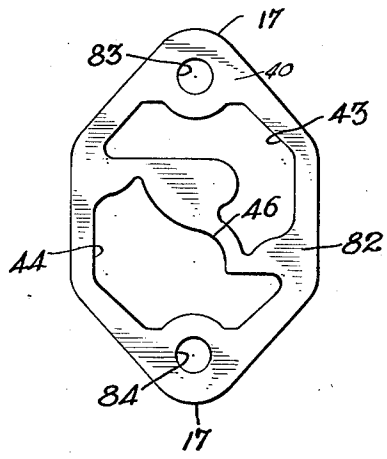


Fig. 12

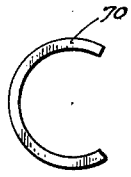


Fig. 13



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Patented Oct. 13, 1953 2,655,108

UNITED STATES PATENT OFFICE

2,655,108

PUMP

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Application May 24, 1948, Serial No. 28,891

11 Claims. (Cl. 103—3)

1

The present invention relates to pumps, and is particularly concerned with pumps adapted to be utilized for pumping liquids.

Such pumps may be utilized for many different purposes, which may require that the pump be arranged for right hand rotation or for left hand rotation.

Another possible requirement may be as to the location of the inlet to the pump and the location of the discharge of the pump, as certain manufacturers may desire the inlet on the right hand and others may desire it on the left hand side of the pump.

This makes four possible requirements of customers with respect to the arrangement of the parts of the unit, as they may require right hand rotation or left hand rotation with either the inlet on the right or the inlet on the left.

One of the objects of the present invention is the provision of an improved pump for pumping liquids, the elements of which may be so arranged that the pump is arranged for clockwise rotation of the shaft or for counterclockwise rotation of the shaft without interchanging the positions of the outlet and inlet ports, by merely changing the position of one of the elements.

Another object of the invention is the provision of an improved pump for pumping liquids, which is simple in construction, sturdy, has a minimum number of parts, and which is adapted to be manufactured at a low cost.

Another object of the invention is the provision of an improved pump for pumping liquids, which involves the manufacture of a minimum number of parts, and which is still adapted to take care of all the possible situations with regard to rotation or location of ports that may be required by purchasers of pumps.

Another object of the invention is the provision of an improved pump of the class described, adapted to be located in a lubricant sump, and which is adapted to be attached to a metal pad which is provided on the machine with which the pump is used, the inlet and outlet conduits to the pump passing through the pad and the drive shaft being located in one of these conduits so that there is no need to provide an oil seal on the rotating drive shaft.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the accompanying drawings, of which there are three sheets,

Fig. 1 is a side elevational view in partial section, showing the structure of a pump attached to a pad which is provided for its support on other machinery;

Fig. 2 is an end elevational view from the right end, showing the structure of the outside cover;

Fig. 3 is a sectional view taken on the plane

2

of the line 3—3 on Fig. 1, showing the inside surface of said cover;

Fig. 4 is another sectional view taken on the plane of the line 4—4 of Fig. 1, showing a front elevation of the other cover plate;

Fig. 5 is a view in perspective of the reversing plate;

Fig. 6 is a side elevational view of the pump unit, showing its exterior appearance;

Fig. 7 is a sectional view taken on the plane of the line 7—7 of Fig. 6, showing the pumping gears and the gear housing plate;

Fig. 8 is a sectional view, taken on the plane of the line 8—8 of Fig. 6, looking in the direction of the arrows, showing the arrangement of the reversing plate of the assembly when the pump is arranged for counter-clockwise rotation of the shaft;

Fig. 9 is a sectional view, taken on the plane of the line 8—8 of Fig. 6, looking in the direction of the arrows, showing the arrangement of the reversing plate in the assembly when the elements of the pump are arranged for clockwise rotation of the shaft.

Fig. 10 is a top plan view of the pump unit shown in Fig. 6;

Fig. 11 is a plan view of the gasket;

Fig. 12 is a side elevational view of the drive shaft retaining ring;

Fig. 13 is an end elevational view, which also shows the cross-sectional shape of the retaining ring.

Referring to Fig. 1, the pump unit 10 embodying my invention preferably consists of a plurality of plates 11–14, which may be secured together by means of a plurality of through bolts 15, which are located in the bores 16 (Fig. 10).

The bores 16 in the plates 11, 12 are cylindrical bores unthreaded, while those in the plate 13 may be threaded to receive the bolts; and the plate 14 is held in place by being secured between the pump unit 10 and the adjacent support.

The plates 11–14 may have any desired external shape; but for the purpose of saving material, these plates are substantially rectangular in shape, with a cylindrical formation 17 at each of the opposite ends. The cylindrical formation 17 is for the purpose of providing a pair of cylindrical bores 18, which receive the aligning members 19, consisting of a pair of dowel members, which are employed for assuring the accurate alignment of the parts of the pump; and are bored out for the purpose of permitting the use of additional bolts, which secure the pump to its supporting pad, such as, for example, the bolts 19a.

The dowels 19 extend into the cover plate 11, through the gear housing plate 12, and into the inside cover plate 13; but terminate short of the reversing plate 14, the bores of which need only be large enough to pass the bolts 19a. Thus the

alignment of the reversing plate with the other plates need not be as accurate as that of the two cover plates and gear housing plate.

Referring to Fig. 1, the outside cover member 11 may consist of a metal member which has the inner plane surface 35 for engaging a plane surface 36 on the gear housing plate 12, and which is provided with suitable bores for the bolts 15, the dowels 19, and for forming the bearings for the shafts.

The body of the cover plate 11 is provided (Fig. 2) with a plurality of joined, outwardly projecting, partially cylindrical lugs 61, 62, 63, 64, extending diametrically across the outside of the body 60 and providing sufficient material for elongated bearing surfaces in the bores 18 and bearings for the shaft. The end lugs 61, 64 are provided with the bores 18 for receiving the dowels 19 to align this plate with other plates 12 and 13.

The inner two lugs 62 and 63 on the body 60 of cover plate 11 are provided with the bores 65, 66, serving as bearings for the two shafts 26, 29. At each end the bores 65, 66 have larger counterbores 67, 68. The counterbores 67 on the outside of the cover 11 are used to receive expansion plugs comprising small, partially spherical, circular plugs 69 of sheet steel, which are pressed into the counterbores 67 to close the shaft bearing bores at the outside end.

The counterbores 68 on the inside of the cover 11 at each bearing bore 65, 66 are adapted to receive the rectangular snap rings 70, which prevent the two shafts from moving axially. These snap rings are preferably made of heat-treated spring steel, and their structure is shown in greater detail in Figs. 12 and 13.

Both of the shafts 26 and 29 are provided with circumferentially extending grooves 71, 72 for receiving the retaining rings 70. These grooves are preferably rectangular in section; and their width is sufficient to receive the snap rings 70 with a clearance. The depth of the grooves 71, 72 is such that they receive only part of the snap rings, such as, for example, half of each ring, so that the snap rings project from the shafts when located upon the shaft in the groove 71 or 72.

The snap rings 70 comprise heat treated spring steel members of partially circular form, which are substantially rectangular in cross-section; and they may extend far enough to go about the periphery of a shaft over more than 180 degrees, but considerably less than 360 degrees, since they need only to extend far enough to grip the shaft, as shown in Fig. 12.

The total clearance between the sides of the gears and the walls of the covers is preferably less than the individual clearance between either snap ring 70 and the end of its counterbore 68, so that endwise movement of the gears is prevented by the cover plates rather than the snap rings 70 on the shafts; and the snap rings are only employed for preventing axial movement of the shafts.

The plate 12 (Fig. 7) is the gear housing plate of the unit; and besides being provided with the bores 16 and 18, this plate is provided with the cylindrical gear recesses 21, 21 so arranged that they are adapted to receive the pump gears 22, 23 when the gears are meshed with each other in driving position.

The gear recesses 21, 21 also communicate with the laterally extending inlet and outlet recesses 24, 25 located to communicate with those portions of the gears that are in mesh with each other; and the recesses 24, 25 may serve as inlet or outlet, depending upon the direction of rotation of the gears.

The gears 22, 23 have a sliding fit in their cylindrical recesses 21, the apices of each tooth being provided with a transverse, partially cylindrical surface.

The width of the gears 22, 23 is substantially the width of the gear housing plate 12, so that when the mounting plate 13 is assembled with the gear housing plate 12 and cover plate 11, there are provided a pair of recesses of cylindrical shape, in which the gears have a sliding, rotating fit.

The gear 23 is the driving gear, and it is preferably secured to rotate with the driving shaft 26 by means of a key 27 in a key-way 28; and the gear 22 is similarly mounted on the idler shaft 29.

The idler shaft 29 comprises a cylindrical metal member (Fig. 1) preferably made of cold-drawn steel, which is short enough so that it will not engage the plug 69 nor the reversing plate 14; but it extends into bearing bores in both the cover plates 11 and 13. It is preferably chamfered at the outer edge at both ends; and is provided with the snap ring grooves 71, 72 like those located in the drive shaft 26, these grooves being spaced and located to hold the snap rings 70 in position to be located in the counterbores 68 of the cover plate 11 and the counterbores 73 in the gears 22 and 23.

Mounting plate 13 also has bearing bores 74, 75; and the dowel bores 18 terminate in the mounting plate 13 and communicate with smaller bores 76 for passing the bolts 19a.

The drive shaft 26 has its inner end portion substantially similar to the idler shaft 29, being provided with the same grooves 71, 72 and snap rings 70. The drive shaft 26 is elongated sufficiently to project through the mounting plate 13, reversing plate 14, and the pad 77; and it is provided with a flat surface 78 (Fig. 10) on one side adjacent its end and with a key slot 79 for receiving the key which secures this shaft in driven relation to some driving member.

The mounting plate 13, which is also a cover plate, is also provided with the inlet or outlet apertures 41, 42 located to register with the inlet or outlet recesses 24, 25 in the gear housing plate. It also has threaded bores 16 (Fig. 10) for receiving the securing bolts 15; and its end surfaces 38 and 39 are, of course, ground perfectly plane for engagement with complementary surfaces 80 and 81 on the gear housing plate 12 and reversing plate 14, respectively.

Thus the two plates 11 and 13 are secured on the gear housing plate 12 by means of the bolts 15, to form a pump unit, while the reversing plate 14 is a separate unit which is secured in place by means of the bolts 19a which fasten the pump to the pad.

The reversing plate 14 is shown in perspective in Fig. 5; and it comprises a metal member having a plane surface 81 for engaging the plane surface 39 on the mounting plate 13, and also having a plane surface 82 on its opposite side for engagement with a gasket 40, which engages the pad 77.

The gasket 40 may be made of any suitable gasket material; and it is of substantially the same shape as the reversing plate 14, which may be made of cast iron.

The reversing plate is provided with apertures 83, 84, which are concentric with the apertures 18 in the other plates, but smaller, being of a

size adapted to receive the bolts 19a. The plane surfaces 81, 82 of the reversing plate preferably extend completely around the outer portions of the plate and around the bolt apertures 83, 84; but the plate is provided with a pair of irregular apertures 43, 44, which serve as conduits for placing the outlet or inlet conduits 41, 42 in the mounting plate 13 in communication with conduits 85, 86 in the pad 77.

For this purpose each aperture 43, 44 has a portion which partially registers with the apertures 41, 42 in the mounting plate 13 in either position of the reversing plate, the two positions of the reversing plate being shown in Figs. 8 and 9. This plate 14 is adapted to be turned around until the surface 82, instead of the surface 81, engages the mounting plate 13.

The irregular apertures 43, 44 in the reversing plate 14 also extend from the portions which register with conduits 41, 42 upwardly and downwardly in Fig. 8, and have a transversely extending portion 45, which preferably extends fully across the upper and the lower portions of this reversing plate; but is spaced from each bolt hole 83, 84.

In addition to the foregoing portions of these irregular apertures 43, 44, the aperture 44, which is located on that side of the pump which has the drive shaft, also is enlarged at 46 to include space enough for the drive shaft 26, which it clears in either position, Fig. 8 or Fig. 9.

Referring to Fig. 1, this sectional view shows the pad 77 forming a part of a machine or support to which the present pump is adapted to be attached, the pump being preferably located in a sump. The pad had a plane surface 87 of external outline similar to that of the reversing plate 14 and gasket 40, against which the pump unit is to be secured.

Pad 77 is also provided with a pair of threaded bores 88 for receiving the screw bolts 19a which pass through all of the pump plates and the gasket inside the tubular dowels 19, and secure the pump unit to the pad 77. In addition, the pad has a pair of conduits 85, 86, the latter being large enough to pass the drive shaft 26 also; and these conduits terminate at the surface 87 of the pad and lead to the other portions of the system from which the oil is received, and to which it is pumped.

The arrangement of the reversing plate in its two alternate positions is shown in Figs. 8 and 9. The mounting plate 13 may be labeled with the legends "Suction" and "Discharge." When it is desired that the aperture 42 be the inlet to the pump, the reversing plate should be arranged as shown in Fig. 8 where, through the irregular aperture 43, conduit 42 communicates with the suction side.

In this case the drive shaft is arranged for counterclockwise rotation, as indicated by the arrow in Fig. 8; and it will be understood that the teeth of the gears separate adjacent the suction port 25 under these conditions, and the spaces between the teeth carry the liquid between the teeth around the gears, along the cylindrical surfaces 21, 22, until the teeth mesh in the outlet space 24, where the liquid is squeezed from the spaces between the teeth by the meshing teeth.

It will be noted that under these conditions the conduit 42 on the left is in communication with the aperture 43 in Fig. 8, the suction side of the pump. When the reversing plate is reversed from the position of Fig. 8 to that of Fig. 9, conduit 42 is still on the left in Fig. 9; and it now communicates with the discharge opening 44, while conduit 41 is still on the right, and communicates with the suction opening 43. In this position of the reversing plate the pump is arranged for clockwise rotation, as indicated by the arrow in Fig. 9. In Fig. 8, if the rotation were clockwise, the point indicated as the suction side would become the discharge side, and the now indicated discharge side would become the suction end of the pump.

Thus it will be observed that the present pump may be arranged for clockwise or counterclockwise rotation, while still maintaining its suction and discharge ports in the same position. The structure of the present pump is simple, and it may be manufactured at a low cost so that it can be economically used in many different forms of installations or assemblies.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a pump unit of the gear type, the combination of a support having a mounting surface provided with inlet and outlet conduits ending at said surface, a gear housing plate having two intersecting cylindrical bores for slidably receiving two meshing gears, a closed end plate for closing one end of said bores, and a mounting plate for closing the other ends of said bores and having an aperture to pass a drive shaft, a drive shaft in said latter plate and provided with a gear in said gear housing plate, a second gear in said gear housing plate, meshing with the first-mentioned gear, said mounting plate having apertures communicating with the opposite sides of the intermeshing gear teeth, and a connection plate adapted to be engaged by the mounting plate and said support, said connection plate having apertures enlarged with respect to the mounting plate apertures for communicating with these apertures which form inlet and discharge ports, said enlarged apertures extending also to the left and the right parts of the connection plate, whereby the pump may be arranged for right-hand or left-hand rotation while still maintaining the inlet and discharge apertures of said connection plate in position for engagement with said inlet and outlet conduits located anywhere in the area of said enlarged apertures.

2. In a pump unit of the gear type, the combination of a support having a mounting surface and provided with inlet and outlet conduits terminating at said mounting surface, a gear housing plate having two intersecting cylindrical bores for slidably housing two meshed gears, a cover plate for closing one end of said bores, and a mounting plate for closing the other ends of said bores and having an aperture to pass a drive shaft, a drive shaft in said latter plate and provided with a gear in said gear housing plate, a second gear in said gear housing plate, meshing with the first-mentioned gear, said mounting plate having apertures communicating with the opposite sides of the intermeshing gear teeth, and a reversing plate adapted to be engaged by the mounting plate and said support, said reversing plate having apertures for communicat-

ing with the mounting plate apertures which form inlet and discharge ports, and with said inlet and outlet ports located in said support, said reversing plate having one of its apertures formed to clear the drive shaft, whereby it may be reversed, to provide an inlet and outlet in substantially the same location with the shaft rotating in the opposite direction.

3. A pump assembly for attachment to a support having a mounting surface and having inlet and outlet conduits terminating at said mounting surface, comprising a gear housing plate, said gear housing plate being provided with a pair of cylindrical intercommunicating recesses for receiving pump gears, a pump gear in each of said recesses, said gears being of slightly less thickness in an axial direction as the thickness of the gear housing plate, a cover plate for closing one side of the said gear housing plate, a mounting plate for closing the other side of said gear housing plate, said mounting plate having an aperture for a shaft, a shaft in said aperture, and having a driving engagement with one of said gears, said mounting plate being provided with an inlet port and a discharge port communicating with the toothed recesses in the gear housing plate, threaded means for securing said plates together, aligning means located in aligned bores in said plates for holding the plates in alignment, and a reversing plate carried by said mounting plate, said reversing plate having apertures communicating with the inlet and discharge ports of said mounting plate, said apertures being substantially L-shaped at the surfaces of said reversing plate to communicate with said conduits upon said support, whereby the reversing plate may be reversed in position to provide conduits in the same location communicating with the outlet or inlet of the pump for either clockwise or counterclockwise rotation.

4. In a pump unit of the gear type, the combination of a support provided with a mounting surface and having inlet and outlet conduits terminating at said surface, a gear housing plate comprising a flat metal plate having two intersecting cylindrical bores for slidably receiving two meshing gears, a closed end plate comprising a metal plate for closing one end of said bores, a mounting plate comprising a flat metal plate for closing the other ends of said bores, said end plate and said mounting plate each having a pair of cylindrical bores to provide bearings for a drive shaft and a driven shaft, a pair of meshing gears mounted in said gear housing plate, a drive shaft passing through one gear and a driven shaft passing through the other gear, said drive shaft being connected to rotate the drive gear, said mounting plate being provided with apertures communicating with the opposite sides of the intermeshing gear teeth to act as inlet or discharge conduits as determined by the direction of rotation and a connection plate comprising a flat metal member to be mounted between the mounting plate and said support, said connection plate being provided with a pair of through apertures, a portion of each aperture communicating with one of the ports in said mounting plate and each aperture extending toward opposite edges of the pump unit relative to the axis of this unit so that the pump unit may be used with inlet and outlet conduits located on the support to either the left or the right side of the axis of the unit.

5. In a pump unit of the gear type, the combination of a support provided with a mounting surface and having spaced inlet and outlet conduits terminating at said surface, a gear housing plate comprising a flat metal plate having two intersecting cylindrical bores for slidably receiving two meshing gears, a closed end plate comprising a metal plate for closing one end of said bores, a mounting plate comprising a flat metal plate for closing the other ends of said bores, said end plate and said mounting plate each having a pair of cylindrical bores to provide bearings for a drive shaft and a driven shaft, a pair of meshing gears mounted in said gear housing plate, a drive shaft passing through one gear and a driven shaft passing through the other gear, said drive shaft being connected to rotate the drive gear, said mounting plate being provided with apertures communicating with the opposite sides of the intermeshing gear teeth to act as inlet or discharge conduits as determined by the direction of rotation and a connection plate comprising a flat metal member to be mounted between the mounting plate and said support, said connection plate being provided with a pair of through apertures, a portion of each aperture communicating with one of the ports in said mounting plate and each aperture extending to the left and right of the axis of the pump unit so that the pump unit may be used with inlet and outlet conduits located on the left or the right side of said support relative to the axis of the pump unit, and the said pump unit being operable for right-hand or left-hand rotation while communicating with inlet or discharge conduits located either on the right-hand or the left-hand side of said support.

6. In a gear pump, the combination of a plurality of plates, with the said plates having registering apertures for receiving a tubular aligning member, a tubular aligning member located in said registering apertures for holding the plates in alignment with each other, and threaded means passing through two of said plates and threaded into the third of said plates for holding the plates together, the first of said plates comprising a mounting plate, the second of said plates comprising a gear housing plate and the third of said plates comprising an end closing plate, the first and third of said plates being provided with a pair of aligned through bores forming bearings for a drive shaft and a driven shaft, means for closing the through bores in the end plate, a driven shaft in one of said aligned bores and a drive shaft in the other of said aligned bores, said drive shaft projecting from the mounting plate, said housing plate having a pair of intersecting cylindrical bores surrounding the drive shaft and the driven shaft, a gear on the driven shaft in said housing plate, a second gear on the drive shaft in said housing plate and meshing with the first gear, means for connecting the second gear to the drive shaft, the said mounting plate being provided with through apertures for inlet and outlet conduits, the said pump being operable during right-hand rotation of the drive shaft or during left-hand rotation of the drive shaft, the change in rotation causing the inlet port to become an outlet port and causing the outlet port to become an inlet port.

7. In a gear pump, the combination of a plurality of plates, with the said plates having registering apertures for receiving a tubular aligning member, a tubular aligning member located in said registering apertures for holding the plates in alignment with each other, and threaded means passing through two of said

plates and threaded into the third of said plates for holding the plates together, the first of said plates comprising a mounting plate, the second of said plates comprising a gear housing plate and the third of said plates comprising an end closing plate, the first and third of said plates being provided with a pair of aligned through bores forming bearings for a drive shaft and a driven shaft, means for closing the through bores in the end plate, a driven shaft in one of said aligned bores and a drive shaft in the other of said aligned bores, said drive shaft projecting from the mounting plate, said housing plate having a pair of intersecting cylindrical bores surrounding the drive shaft and the driven shaft, a gear on the driven shaft in said housing plate, a second gear on the drive shaft in said housing plate and meshing with the first gear, means for connecting the second gear to the drive shaft, the said mounting plate being provided with through apertures for inlet and outlet conduits, the said pump being operable during right-hand rotation of the drive shaft or during left-hand rotation of the drive shaft, the change in rotation causing the inlet port to become an outlet port and causing the outlet port to become an inlet port, and a reversing plate to be mounted on said mounting plate, said reversing plate having a pair of through apertures, one of which surrounds said drive shaft and each of the through apertures in said reversing plate extending into communication with one of the apertures in the mounting plate and also extending laterally across the reversing plate to communicate with inlet and discharge apertures terminating at the mounting surface of a support anywhere within the area of the apertures of the reversing plate so that the pump may rotate clockwise or counterclockwise, and in either event have its inlet or outlet on the left-hand or the right-hand.

8. In a gear pump, the combination of a plurality of plates, with the said plates having registering apertures for receiving a tubular aligning member, a tubular aligning member located in said registering apertures for holding the plates in alignment with each other, and threaded means passing through two of said plates and threaded into the third of said plates for holding the plates together, the first of said plates comprising a mounting plate, the second of said plates comprising a gear housing plate and the third of said plates comprising an end closing plate, the first and third of said plates being provided with a pair of aligned through bores forming bearings for a drive shaft and a driven shaft, means for closing the through bores in the end plate, a driven shaft in one of said aligned bores and a drive shaft in the other of said aligned bores, said drive shaft projecting from the mounting plate, said housing plate having a pair of intersecting cylindrical bores surrounding the drive shaft and the driven shaft, a gear on the driven shaft in said housing plate, a second gear on the drive shaft in said housing plate and meshing with the first gear, means for connecting the second gear to the drive shaft, the said mounting plate being provided with through apertures for inlet and outlet conduits, the said pump being operable during right-hand rotation of the drive shaft or during left-hand rotation of the drive shaft, the change in rotation causing the inlet port to become an outlet port and causing the outlet port to become an inlet port, the said closing means for the through bores in the end plate comprising arched sheet metal members pressed into counterbores in said end plate.

9. A pump assembly comprising a reversible pump unit having an end plate with a pair of spaced openings defining either inlet or outlet openings depending upon the direction of rotation of the pump, pump supporting structure having a pair of spaced openings constituting either inlet or outlet openings, and a detachable reversing plate adapted selectively and reversibly to be mounted between said end plate and supporting structure and having a pair of spaced apertures providing communication between said inlet and outlet openings in said supporting structure and either the inlet or outlet openings in said end plate depending upon the position of said plate.

10. A pump assembly comprising a reversible pump unit having an end plate with spaced openings defining either inlet or outlet openings depending upon the direction of rotation of the pump, pump supporting structure having spaced openings constituting either inlet or outlet openings, and a detachable selectively positionable plate mounted between said end plate and supporting structure and having spaced apertures providing communication between said inlet and outlet openings in said supporting structure and either the inlet or outlet openings in said pump unit depending upon the position of said detachable plate.

11. A pump assembly comprising a reversible pump unit having an end plate with spaced openings defining either inlet or outlet openings depending upon the direction of rotation of the pump, pump supporting structure having spaced openings constituting either inlet or outlet openings, a reversing plate adapted reversibly to be mounted between said end plate and supporting structure and having spaced apertures providing communication between said inlet and outlet openings in said supporting structure and either the inlet or outlet openings in said pump unit depending upon the position of said reversing plate, said pump unit including spaced tubular aligning members and said reversing plate including apertures aligned with said tubular members, and means including securing means extending through said tubular members and aligned apertures into said supporting structure for securing said pump unit and reversing plate to said supporting structure.

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