July 8, 1952 M. HAEBERLEIN 2,602,583

LUBRICATION MEANS FOR SERVICE PUMP DRIVE ON COMPRESSORS

Filed May 6, 1949 3 Sheets-Sheet 1

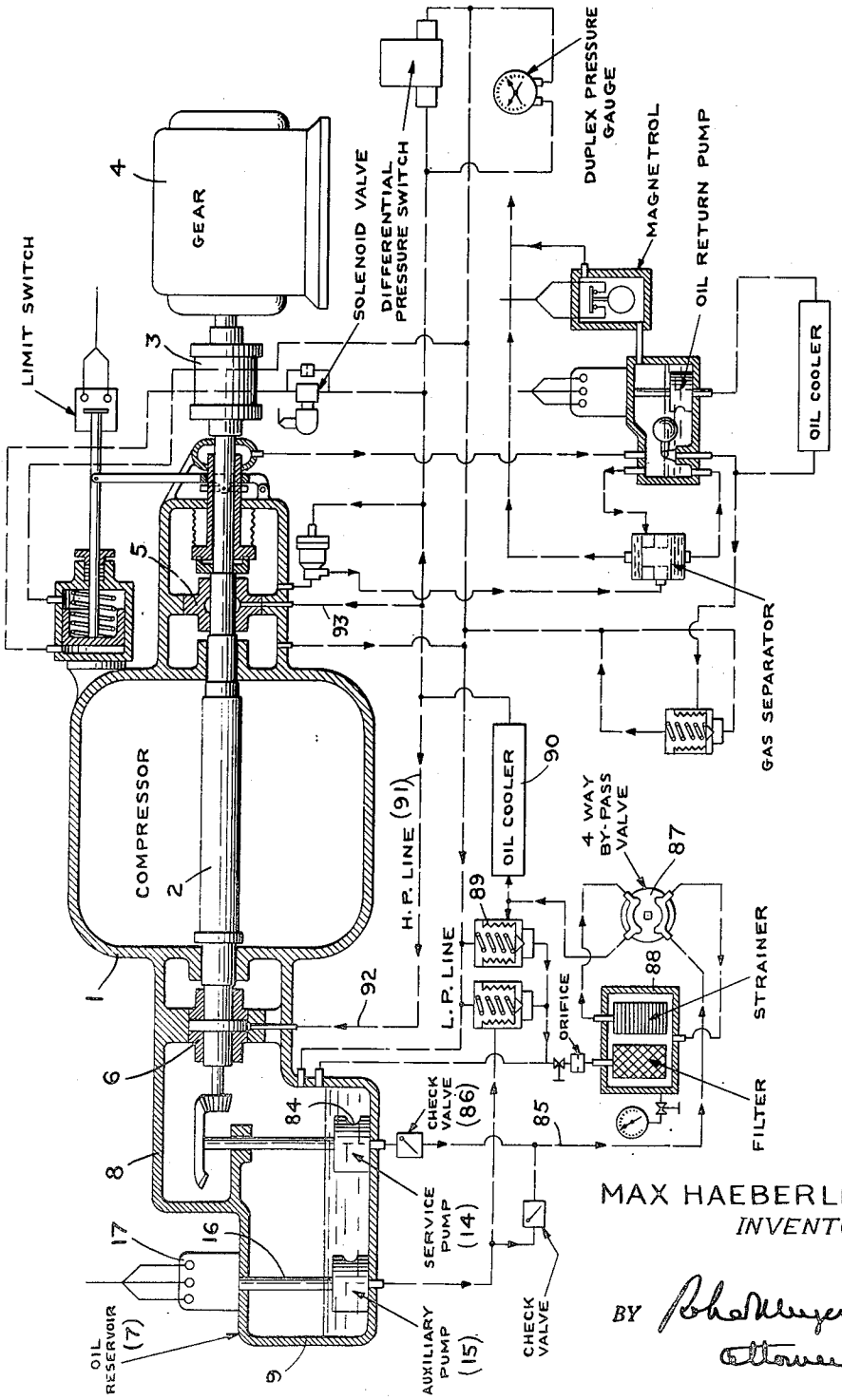


FIG. 1

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LUBRICATION MEANS FOR SERVICE PUMP DRIVE ON COMPRESSORS

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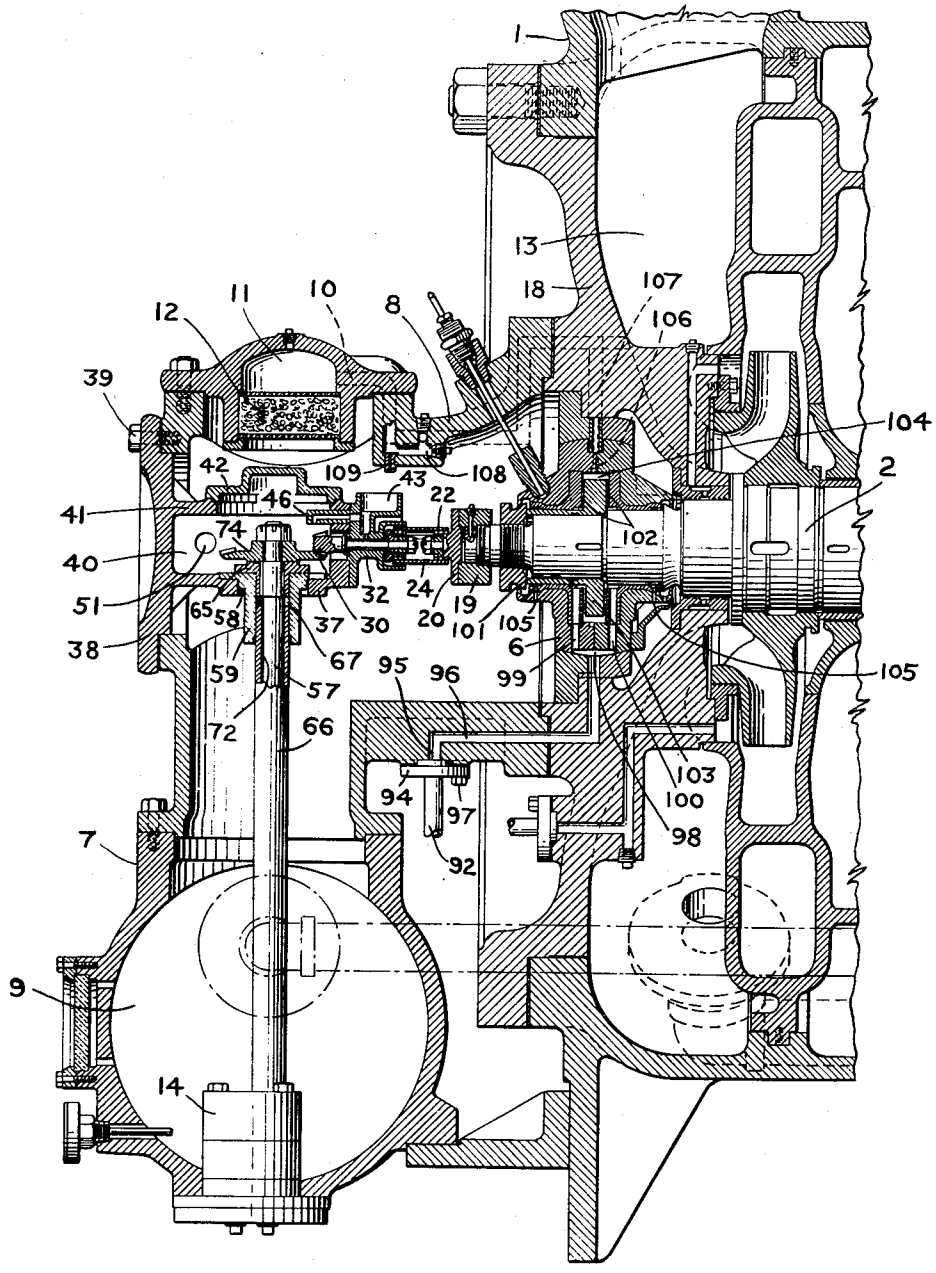


FIG. 2

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LUBRICATION MEANS FOR SERVICE PUMP DRIVE ON COMPRESSORS

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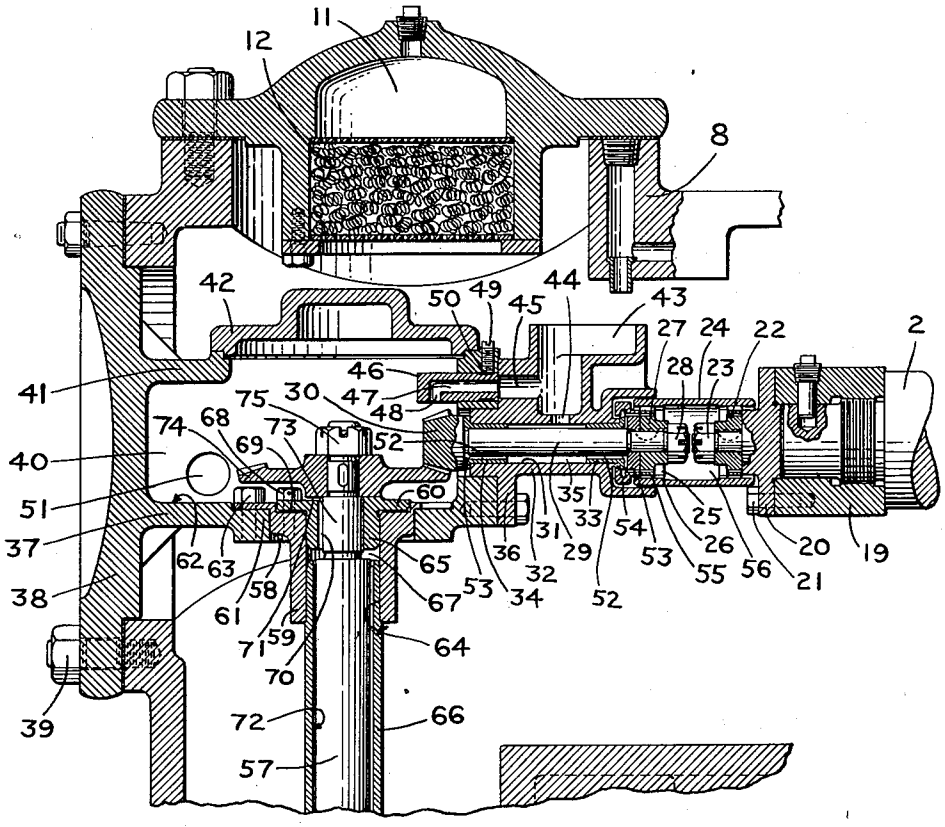


FIG. 3

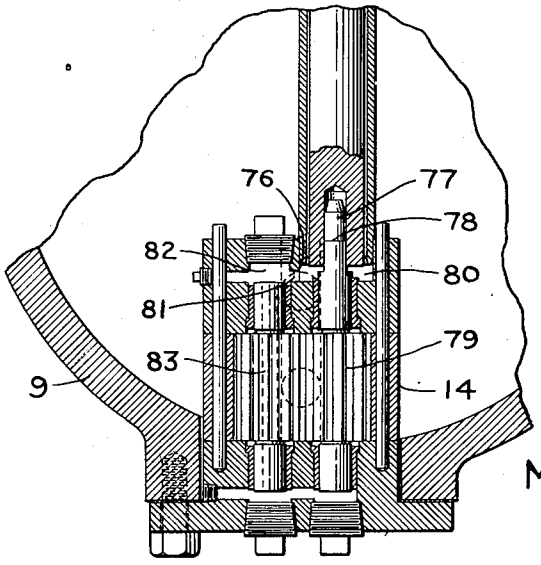


FIG. 4

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UNITED STATES PATENT OFFICE

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LUBRICATION MEANS FOR SERVICE PUMP DRIVE ON COMPRESSORS

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Application May 6, 1949, Serial No. 91,707

8 Claims. (Cl. 230—207)

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This invention relates generally to elastic fluid compressors and in particular to lubricating means for the driving and coupling means for the service pump thereon.

Lubrication for many compressors on the market and particularly for centrifugal compressors used in refrigerating systems is usually one of two general types, splash feed systems or force feed systems. Most force feed systems include a main pump of the rotary gear type which is driven off the end of the compressor rotor by suitable driving and coupling means between the end of the compressor rotor and the pump itself.

The present invention embodies lubrication means for the said driving and coupling means by utilizing lubricant being returned for recirculation and lubricant being forced upward from the pump itself.

Accordingly, it is an object of the present invention to provide a simple lubricating means for the service pump drive in a compressor.

It is another object of the present invention to provide lubrication for the service pump drive wherein the return lubricant operates to furnish a portion of the lubrication for the more inaccessible parts thereof.

It is another object of the present invention to provide a means for lubricating the service pump drive which utilizes the return lubricant acting by gravity flow through proper chambers and passages to lubricate all portions thereof properly.

It is a further object of the present invention to utilize the service pump itself to furnish means for forcing lubricant upwardly along that portion of the drive which is connected directly to the pump.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a lubrication means for service pump drive on compressors of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a diagrammatic sketch showing a typical compressor system.

Figure 2 is a partial section of the outboard end of a centrifugal compressor.

Figure 3 is an enlarged section of the invention.

Figure 4 is an enlarged section of the lower portion of the invention.

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Referring to the drawings, Figure 1 illustrates a diagrammatic sketch of a typical compressor system showing generically a casing 1 having a rotor shaft 2 connected by a coupling 3 to step-up gears 4 connected in turn to a prime mover (not shown) which may be any suitable type for operating the compressor 1. The step-up gears 4 and the coupling 3 may also be of any suitable type easily purchasable on the open market and are therefore generically indicated. The rotor shaft 2 provided for the compressor 1 has a line bearing 5 at the inboard end and a thrust bearing 6 at the outboard end to allow for relatively frictionless rotation of the rotor shaft 2 and to provide inner sealing means during operation. It being understood that while this type of compressor is shown and described that any typical compressor utilizing a lubrication system having a similar form of driving means as hereinafter described would suffice to describe this invention.

The lubrication means for the service pump drive operates in conjunction with the lubrication system for the compressor which is indicated in Figure 1, and forms an integral part of the supporting structure and passages of the driving and coupling means for the service pump as hereinafter described.

Figure 2 shows a fully enclosed oil or lubricant reservoir 7 formed by an upper portion 8 and a lower or sump portion 9 mounted on the outboard or thrust bearing end of the compressor 1. A balance line 10 is provided to balance the oil pressure in the reservoir 7. It communicates at one end with a filter chamber 11 having a strainer 12 therein which is located in the upper portion 8 of the reservoir 7, and at the other end opens into the suction inlet 13 of the compressor 1. The strainer 12 preventing the escape of oil vapor which develops in the reservoir 7, due to escape of the gas compressed in the compressor and trapped in the lubricant where it comes in contact therewith and the whirling of the driving and coupling means therein.

The lower or sump portion 9 carries the service pump 14 and the auxiliary pump 15 utilized for supplying oil or other lubricant therein at high pressure to the lubrication system hereinafter described. The service pump 14 and the auxiliary pump 15 are preferably rotary pumps as shown in Figure 4 of the drawings although other types of pumps suitable for this purpose may be used.

Auxiliary pump 15 is driven by a shaft 16, connected to an electric motor 17 and is utilized to provide lubricant at high pressure to the lubrication system when starting up, shutting

down or in case of failure of the service pump 14. An automatic pressure switch (not shown) being provided to start the auxiliary pump motor 17 when the pressure in the service pump 14 falls below a predetermined level.

The driving and coupling means for the service pump 14 is clearly shown in Figures 2, 3, and 4 of the drawings. The axial portion being illustrated in Figures 2 and 3 showing a fragment of rotor shaft 2 passing through the casing 18 of the compressor 1 at the outboard or thrust bearing end and extending into the upper portion 8. The end of the rotor shaft 2 is threadably engaged by a nut 19 to which an adapter plate 20 is fixedly connected by suitable means such as bolts 21. A first toothed coupling member 22 is in turn fixedly connected to the adapter plate 20 by suitable means such as a nut 23, and engages one end of a flexible tube-like sleeve 24 having lands 25 and downs 26 for contact with the toothed portion of the coupling member 22. A second toothed coupling member 27 engages the other end of said flexible sleeve 24, being in turn fixedly connected by suitable means such as a nut 28 to a pinion shaft 29 having a first spiral bevel gear 30 formed in the outer end thereof.

The pinion shaft 29 passes through a bore 31 substantially larger than said shaft 29 formed in a pinion support member 32 and is supported therein by identical thrust bearings 33 and 34 mounted at either end of said bore 31 whereby an elongated annular space 35 will be formed in the said bore.

Pinion support member 32 is substantially cylindrical in construction and is provided with a flange-like portion 36 for engagement with a U-shaped cuplike horizontal support 37 struck from an outer disc cover plate 38 connected by suitable means such as bolts 39 in fluid tight engagement to the upper portion 8 of the reservoir 7 and forming an integral part thereof whereby the cover plate 38, horizontal support 37 and the pinion support 32 will form a lower chamber 40. A short horizontal upper support 41 spaced above said U-shaped support 37 is also struck from the cover plate 38 and forms means whereby a closure member 42 supported by the upper support 41 and the U-shaped support 37 will close the lower chamber 40 and prevent oil vapor, or excess oil from being thrown up into the strainer 12 in the filter chamber 11. It being understood that while the support members 37 and 41 are shown as being struck from the cover plate 38 that they may be formed as an integral part of the upper portion 8 to accomplish the same purpose.

An upper chamber 43 is mounted on the pinion support member 32 in a substantially vertical plane above the bore 31 inwardly of the flange-like portion 36 and having a portion thereof formed by the flange itself. The upper chamber 43 will receive lubricant therein from the lubrication system by means hereinafter described.

The upper chamber 43 is provided with a vertical passage 44 extending downwardly and opening into the elongated space 35 above described for passing lubricant by gravity flow thereto and a horizontal passage 45 extending outwardly through the flange-like portion 36. An elongated member 46 is slidably and adjustably mounted in that portion of the U-shaped support member 37 in the axial line of the horizontal passage 45 and is provided with a bore 47 which communicates at one end with the horizontal passage 45 and has an opening 48 at the other end into the lower chamber whereby lubricant fluid will also pass by gravity flow from the upper chamber to the lower chamber.

Elongated member 46 may be adjustably set at a desired axial position by a set screw 49 threadably mounted in the U-shaped support 37 for engagement with a groove 50 on the outer circumference of the elongated member 46 so that lubricant fluid will flow out of opening 48 over the first spiral bevel gear 30 which is formed on the end of the pinion shaft 29 which extends through the bore 31 whereby the first spiral bevel gear 30 will be in the lower chamber. Thus lubricant fluid will collect in the lower chamber to further lubricate additional portions of the driving and coupling means. An overflow 51 is provided to prevent the level of the lubricant from rising in the lower chamber as this would place the lubricant in the path of the gear train in the lower chamber and cause the lubricant to be whipped into a froth, overflow the chamber and prevent proper lubrication.

To lubricate the pinion shaft 29 thrust bearings 33 and 34, identical in construction, are provided with longitudinal slots 52 on the inner contacting surface which communicate with the elongated annular space 35 at their inner ends and with radial slots 53 at their outer ends.

Thrust bearing 33 operates to furnish lubrication for the flexible coupling sleeve 24 and the coupling members 22 and 27. The radial slots thereon communicating with an annular groove 54 in the second coupling member 27 which is in turn connected to a series of axial passages 55 opening into the inner portion 56 of the flexible sleeve 24 to provide the lubrication needed therein.

Thrust bearing 34 operates to pass lubricant fluid by gravity flow through the longitudinal slots 52 and the radial slots 53 to the lower chamber 40 in addition to the opening 48 in the elongated member 46 above described.

The vertical portion of the driving and coupling means is clearly shown in Figures 3 and 4 of the drawings and includes an intermediate shaft 57 held in position as hereinafter described.

Figure 3 shows the U-shaped support member 37 with an opening 58 having a step bearing support 59 mounted therein by means of a flange 60 thereon engaging an annular recess 61 on the inner or chamber surface 62 of the U-shaped support member, by suitable means such as bolts 63.

The step bearing support 59 is substantially cylindrical in shape and is provided with a vertical bore 64 therethrough. The upper portion of the vertical bore 64 receives a step bearing 65 and the lower portion of the bore receives the upper end of an oil pump sleeve 66 which extends upwardly into the bore 64 just short of the step bearing 65 whereby an annular passage 67 will be formed therebetween.

The step bearing 65 is fixedly connected to the step bearing support 59 by suitable means such as bolts 68 to prevent movement thereof. Annular shims 69 are provided to position the step bearing 65 at the most desirable point for holding the shaft 57 in position. Step bearing 65 is further provided with vertical slots 70 and transverse slots 71 communicating with the annular passage 67 at one end and opening into the lower chamber 40 at the other end to allow lubricant fluid to flow from the lower chamber

40 by gravity flow to the annular passage 67 between the step bearing 65 and the upper portion of the oil pump sleeve 66.

Intermediate shaft 57 passes loosely through oil pump sleeve 66 extending upwardly and downwardly therewith whereby a cylindrical passage 72 will be formed having the upper end communicating with the annular passage 67 formed in the bore 64. Lubricant fluid can, therefore, by gravity flow, pass from the lower chamber 40 through the transverse passages 71 and vertical passages 70 into the annular passage 67 to pass thence downwardly into the cylindrical passage 72 providing lubrication for the more inaccessible portions of the driving and coupling means.

The shaft 57 extends upwardly past the oil pump sleeve 66 in the bore by means of a continuous upper extension 73 of a lesser circumference than the shaft 57, in substantially surface-to-surface engagement with the step bearing 65 into the lower chamber 40 where a second spiral bevel gear 74 is fixedly connected thereto by suitable means such as a nut 75 threadably engaging the upper extension 73 of the shaft 57.

The second bevel gear 74 is positioned to be engaged and rotated by the first spiral bevel gear 30 and by adjusting the setting of the step bearing 65 by means of the annular shims 69 will be securely positioned on the upper surface by contact with the first spiral bevel gear 30 and on the under surface by contact with the step bearing 65. Accordingly, the shaft 57 which is fixedly connected to the second spiral bevel gear 74 will also be held in position obviating the necessity of having a fixed lower connection with the service pump 14.

Shaft 57 and oil pump sleeve 66 extend downwardly through the lower or sump portion 9 of the reservoir 7, to be received in an elongated cylindrical space 76 provided in the main service pump 14. A tongue and slot arrangement 77 or other suitable means is provided so that the shaft 57 will be connected to the rotary gear shaft 78 of rotary gear 79 which extends upwardly into the cylindrical space 76 and into a portion of the oil pump sleeve 66 to meet the shaft 57.

A portion of the cylindrical space 76 forms a small chamber 80 in the upper portion of the service pump 14, which communicates with the cylindrical passage 72 formed around the shaft 57 by the oil-pump sleeve 66. A cross passage 81 in the service pump 14 opening at one end into the chamber 80 communicates with the bearing chamber 82 of a second rotary gear 83 so that lubricant fluid forced therein by the rotation of the rotary gears 79 and 83 will be forced through the cross-passage 81 into the chamber 80 and thence upwardly into the cylindrical passage 72 to contact the lubricant fluid descending therealong by gravity flow to provide lubrication for shaft 57 and the working parts connected thereto.

Thus, when the compressor is started the rotor shaft 2 will transmit rotary motion in the axial line thereof through the flexible sleeve 24 and the coupling members 22 and 27 to the pinion shaft 29 and accordingly to the first spiral bevel gear 30. First spiral bevel gear 30 will in turn engage and drive the second spiral bevel gear 74 which in turn transmits the motion to the vertical portion comprising the upper extension 73 and the shaft 57 in contact with the rotary gear 79 by means of the tongue and slot arrangement 77 with the rotary gear shaft 79 whereby rotary

motion is imparted to the rotary gears to drive the service pump 14.

When the service pump 14 is rotated as above described, lubricant fluid in the reservoir 7 will be drawn into the opening 84 on the service pump 14 shown in Figure 1, and delivered to the lubrication system at high pressure entering conduit 85 provided with a check valve 86 therein for controlling the direction of flow in the said conduit. Lubricant is forced through the conduit 85 to a four-way by-pass valve 87 into a filter member 88. It is returned from the filter member 88 to the by-pass valve 87 and is then passed simultaneously to a pressure control assembly 89 provided to by-pass a quantity of oil back to the reservoir to maintain a fixed quantity therein to protect the bearings of the service pump 14 and to an oil cooler 90. It is led from the cooler 90 to the high pressure fluid line 91. High pressure line 91 conducts the lubricant to various portions of the compressor which utilize the high pressure lubricant such as the thrust bearing 6, line bearing 5, etc., which are supplied by their respective lines 92 and 93, etc., all of which is clearly shown in Figure 1 of the drawings.

Line 92 leading high pressure lubricant to the thrust bearing 6, is connected by means of a flange 94 to the inlet end 95 of a passage 96 by suitable means such as bolts 97. Passage 96 communicates with a milled recess 98 in the thrust bearing 6 which is provided with two drilled holes 99 and 100 connected to an annular groove 101 on the inner or surface contacting portion of the thrust bearing 6. Oil grooves 102 are provided between the thrust collar 103 and the thrust bearing 6 which communicate between the annular groove 101 and an annular space 104 whereby lubricant will pass from the passage 96 which receives the lubricant from line 92 to the annular space 104 via the milled recess 98, the drilled holes 99 and 100, annular grooves 101 and oil grooves 102.

Lubricant received in the annular grooves 101 will also pass along the inner surface of the thrust bearing 6 to provide lubrication for the rotor when the compressor is operating. Exit ports 105 are provided in the thrust bearing 6 for returning this lubricant to the reservoir by gravity flow as is clearly shown in Figure 2 of the drawings.

On the upper side of the annular space 104 an outlet port 106 is provided which communicates with a return passage 107 which receives lubricant therein from the annular space 104 passing it to the connecting passage 108 communicating in turn with the discharge passage 109 opening over the upper chamber 43 whereby lubricant is delivered to the upper chamber 43 and flows by gravity flow to the various portions of the driving and coupling means as above described.

While one form of the invention has been illustrated, it will be understood that the invention is not to be limited to the specific construction or arrangements of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In a lubricating means for the service oil pump drive on elastic fluid compressors, a casing for said compressor with a rotor shaft therein, an enclosed lubricant reservoir connected to said casing including an upper portion and a lower portion forming said reservoir, and means providing communication with the suction side of the

compressor, the rotor shaft passing through said casing into the upper portion of the reservoir, a thrust bearing for said rotor shaft where it passes through said casing, said compressor having a lubrication system including a service oil pump carried by the lower portion of the reservoir, driving and coupling means mounted in said upper portion and extending into said lower portion of the reservoir to connect said rotor shaft to said service oil pump for driving said pump when the compressor is in operation to furnish lubricant at high pressure to the lubricating system, a conduit in said lubricating system for supplying lubricant to the lower side of said thrust bearing, means on the upper side of said thrust bearing to allow lubricant to pass to the driving and coupling means in the upper portion of the reservoir, an oil pump sleeve about that portion of the driving and coupling means connected to said service oil pump and forming an annular cylindrical passage therebetween communicating at one end with said second mentioned means, to receive lubricant fluid therein by gravity flow, and passages in said service oil pump adapted to receive lubricant fluid under pressure therefrom communicating with the lower portion of said annular cylindrical passage to force oil upwardly to meet the lubricant fluid flowing downwardly therein for lubricating the portion of the driving and coupling means connected to said service oil pump.

2. In a lubricating means for the service oil pump drive on elastic fluid compressors, a casing for said compressor with a rotor shaft therein, an enclosed lubricant reservoir connected to said casing including an upper portion and a lower portion forming said reservoir, and means providing communication with the suction side of the compressor, the rotor shaft passing through said casing into the upper portion of the reservoir, a thrust bearing for said rotor shaft where it passes through said casing, said compressor having a lubrication system including a service oil pump carried by the lower portion of the reservoir, driving and coupling means mounted in said upper portion and extending into said lower portion of the reservoir to connect said rotor shaft to said service oil pump for driving said pump when the compressor is in operation to furnish lubricant at high pressure to the lubricating system, a conduit in said lubricating system for supplying lubricant to the lower side of said thrust bearing, an annular passage about said thrust bearing connected at the lower side thereof to said conduit for receiving lubricant fluid therein, passage means formed in said upper portion of the reservoir communicating with said annular passage at one end, chamber means mounted on said driving means communicating with the other end of said passage means to receive lubricant fluid therefrom, distributing means coacting with said chamber means for lubricating the driving and coupling means in the upper portion of said reservoir, an oil pump sleeve about that portion of the driving and coupling means connected to said service oil pump and forming an annular cylindrical passage therewith communicating at one end with said distributing means to receive lubricant fluid therein by gravity flow, and passages in said service oil pump adapted to receive lubricant fluid under pressure therefrom communicating with the lower portion of said annular cylindrical passage to force oil upwardly to meet the lubricant fluid flowing downwardly therein for lubricating the portion of the driving and coupling means connected to said service oil pump.

3. In a lubricating means for the service oil pump drive on elastic fluid compressors as claimed in claim 2 wherein said chamber means mounted on the driving and coupling means in the upper portion of the reservoir includes, a first chamber to coact with said passage means to receive lubricant therein, supports for said driving and coupling means adapted to form a second chamber disposed to receive lubricant by gravity flow from said first chamber, distributing means between said first chamber and said second chamber to pass lubricant from said first chamber to said second chamber and disposed to lubricant over said driving and coupling means by gravity flow, means to direct lubricant from said second chamber to lubricate a portion of said driving means extending downwardly therefrom, and overflow means in said second chamber to regulate the level of lubricant therein.

4. In a lubricating means for the service oil pump drive on elastic fluid compressors as claimed in claim 2 wherein said distributing means includes vertical and horizontal exit ports in said first chamber, at least one of said horizontal exit ports adjustably mounted on said first chamber to deliver lubricant flow directly to said second chamber by gravity flow, and at least one of said vertical exit ports adapted to furnish lubricant fluid to said driving and coupling means by gravity flow.

5. In a lubricating means for the service oil pump drive on elastic fluid compressors, a casing for said compressor with a rotor shaft therein, an enclosed lubricant reservoir connected to said casing including an upper portion and a lower portion forming said reservoir, and means providing communication with the suction side of the compressor, the rotor shaft passing through said casing into the upper portion of said reservoir, a thrust bearing for said rotor shaft where it passes through said casing, said compressor having a lubrication system including a service oil pump carried by said lower portion of the reservoir, driving and coupling means mounted in said upper portion and extending into said lower portion to connect said rotor shaft to said service oil pump for driving said pump when the compressor is in operation to furnish lubricant at high pressure to said lubrication system, a conduit in said lubrication system for supplying lubricant to the lower side of said thrust bearing, an annular passage about said thrust bearing connected at the lower side thereof to said conduit for receiving lubricant fluid therein, passage means formed in said upper portion of the reservoir communicating with said annular passage to allow lubricant to be passed to the upper portion of said reservoir, a first chamber to coact with said passage means to receive lubricant therein, supports for said driving and coupling means adapted to form a second chamber disposed to receive lubricant by gravity flow from said first chamber, vertical and horizontal exit ports in said first chamber, at least one of said horizontal exit ports adjustably mounted on said first chamber to deliver lubricant fluid to said second chamber directly by gravity flow, at least one of said vertical exit ports adapted to furnish lubricant fluid to said driving and coupling means disposed in the upper portion of said reservoir, an oil pump sleeve connected at one end to said second chamber and at the other end to said service oil pump, said pump sleeve loosely surround-

ing said driving means extending downwardly into the lower portion of the reservoir whereby an annular cylindrical passage is formed about said driving means, a thrust bearing for said driving means extending downwardly into said lower portion mounted in said second chamber, passages in said thrust bearing having one end communicating with said second chamber and the other end communicating with said annular cylindrical passage to allow lubricant to pass by gravity flow downwardly into said annular chamber to lubricate said driving means extending downwardly, passages in said oil pump communicating with the lower portion of said annular cylindrical passage adapted to receive lubricant under pressure from said service oil pump whereby the lubricant will be forced upwardly into the lower portion of said annular cylindrical passage to meet lubricant flowing downwardly therein for lubricating the driving and coupling means connected to said service oil pump, and an overflow opening in said second chamber to control the level of returning lubricant and to provide means for returning excess fluid to the lower portion of the reservoir.

6. In a lubricating means for the service oil pump drive on elastic fluid compressors, a casing for said compressor with a rotor shaft therein, an enclosed lubricant reservoir connected to said casing including an upper portion and a lower portion forming said reservoir, and means providing communication with the suction side of the compressor, the rotor shaft passing through said casing into the upper portion of said reservoir, a thrust bearing for said rotor shaft where it passes through said casing, said compressor having a lubrication system including a service oil pump carried by said lower portion of the reservoir, driving and coupling means mounted in said upper portion and extending into said lower portion to connect said rotor shaft to said service oil pump for driving said pump when the compressor is in operation to furnish lubricant at high pressure to said lubrication system, a conduit in said lubrication system for supplying lubricant to the lower side of said thrust bearing, an annular passage about said thrust bearing connected at the lower side thereof to said conduit for receiving lubricant fluid therein, passage means formed in said upper portion of the reservoir communicating with said annular passage to allow lubricant to be passed to the upper portion of said reservoir, a first chamber to coact with said passage means to receive lubricant therein, supports for said driving and coupling means adapted to form a second chamber disposed to receive lubricant by gravity flow from said first chamber, vertical and horizontal exit ports in said first chamber, at least one of said horizontal exit ports adjustably mounted on said first chamber to deliver lubricant fluid to said second chamber directly by gravity flow, at least one of said vertical exit ports adapted to furnish lubricant fluid to said driving and coupling means disposed in the upper portion of said reservoir, an annular chamber formed in said support structure about the driving means to receive lubricant fluid from at least one of said vertical exit ports, means communicating with said annular chamber on one side thereof to allow lubricant fluid to pass to said coupling structure, means communicating with the other side of said annular chamber to allow fluid to pass to said second chamber by gravity flow, an oil pump sleeve about that portion of the driving and coupling means connected to said service oil pump and forming an annular cylindrical passage therebetween communicating with the second chamber at the upper end thereof to receive lubricant fluid by gravity flow from said second chamber, passages in said service oil pump adapted to receive lubricant fluid under pressure therefrom communicating with the lower portion of said annular cylindrical passage to force oil upwardly to meet lubricant fluid flowing downwardly therein for lubricating the portion of the driving and coupling means connected to the service oil pump, and an overflow opening in said second chamber to control the level of lubricant fluid and to provide means for returning excess fluid to the reservoir.

7. In a lubricating means for the service oil pump drive on elastic fluid compressors, a casing for said compressor with a rotor shaft therein, an enclosed lubricant reservoir connected to said casing including an upper portion and a lower portion forming said reservoir, and means providing communication with the suction side of the compressor, the rotor shaft passing through said casing into the upper portion of said reservoir, a thrust bearing for said rotor shaft where it passes through said casing, said compressor having a lubrication system including a service oil pump carried by said lower portion of the reservoir, support members formed in the said upper portion of the reservoir, driving and coupling means in axial alignment with said rotor shaft and connected thereto mounted in said support structure, driven means vertically mounted in said support structure and connected between said driving means and said pump to transmit rotatory motion to said pump for operation in the lubrication system, a conduit in said lubrication system for supplying lubricant to the lower side of said thrust bearing, an annular passage about said thrust bearing connected at the lower side thereof with said conduit for receiving lubricant fluid therein, passage means formed in said upper portion of the reservoir communicating with said annular passage to allow lubricant to be passed to the upper portion of said reservoir, a first chamber to coact with said passage means to receive lubricant therein, a second chamber substantially adjacent said first chamber formed by said support members disposed to receive lubricant by gravity flow from said first chamber, vertical and horizontal exit ports in said first chamber, a first portion of said axial driving means mounted in said upper portion of said reservoir outside of said second chamber, a second portion of said axial driving means mounted inside said second chamber, said vertical exit ports for lubricating said first portion outside said second chamber, said horizontal exit ports for lubricating said second portion inside said second chamber an oil pump sleeve about said driven means connected to said service oil pump and forming an annular cylindrical passage therebetween communicating at its upper end with said second chamber to receive lubricant fluid by gravity flow therefrom, passages in said service oil pump adapted to receive lubricant under pressure therefrom communicating with the lower portion of said annular cylindrical passage to force oil upwardly to meet the lubricant fluid flowing downwardly therein for lubricating the driven means connected to the service oil pump, and an overflow opening in said second chamber to control the level of lubricant fluid and to provide means for returning excess fluid to the reservoir.

8. In a lubricating means for the service oil pump drive on elastic fluid compressors as claimed

in claim 7 wherein at least one of said horizontal exit ports will be adjustably mounted on said first chamber to reach inaccessible portions of said axial driving means inside said second chamber.

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