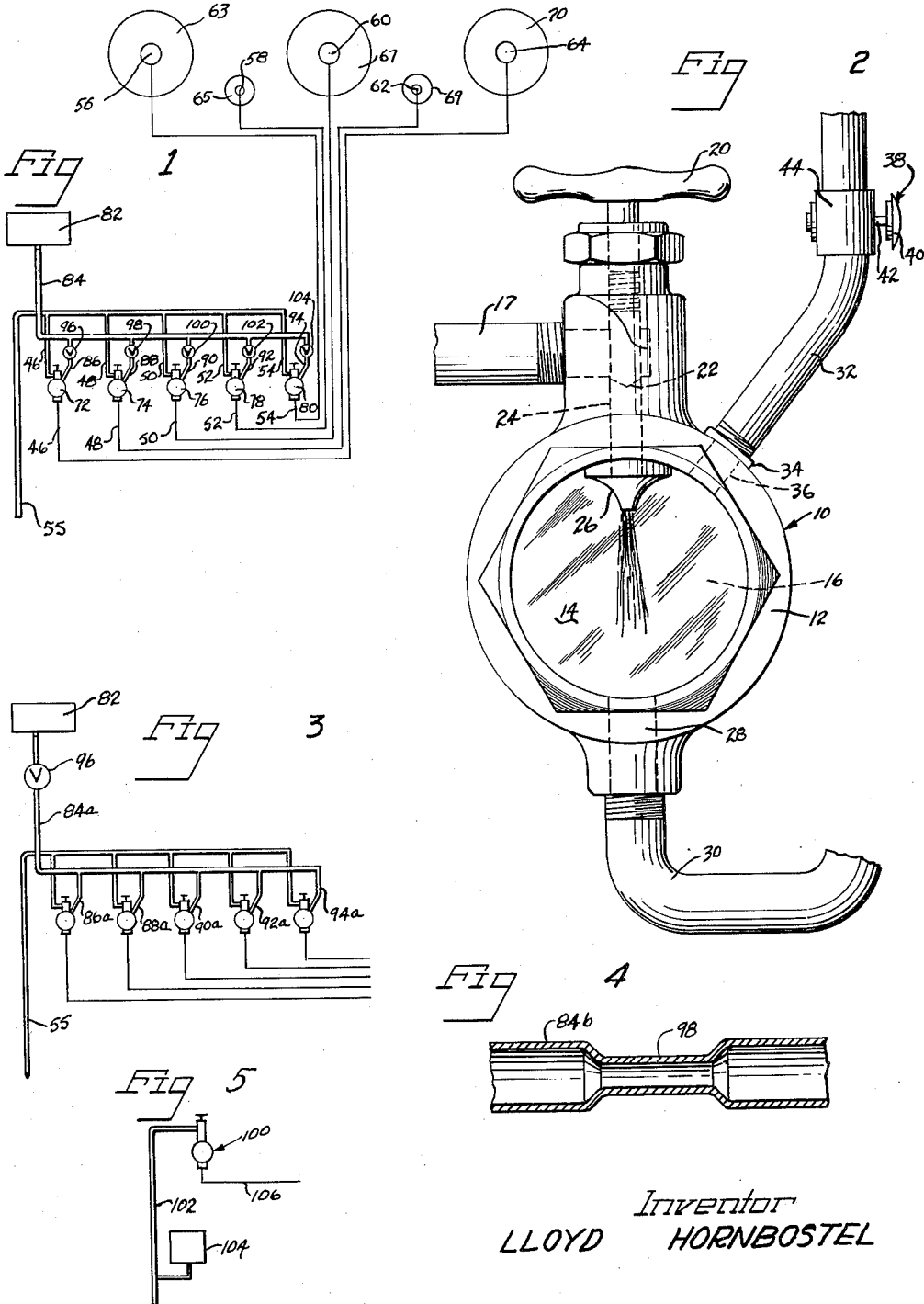


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SIGHT FEED DEVICE
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SIGHT FEED DEVICE

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This invention relates to a sight feed oiler for pressure lubricating systems and more particularly to a sight feed oiling regulator which utilizes air pressure to clear the sight feed chamber for inspection.

Heretofore, lubrication of paper machinery and similar large scale equipment has been difficult to regulate and inspect. Thus gravity sight feed lubricators are necessarily placed at the maximum elevation possible and require complex piping systems. Furthermore, it is necessary with such systems to have an attendant climb up to a walkway at frequent intervals for inspection.

Pressure sight feed lubricators, on the other hand, cannot be depended upon over long periods of use, and tend to become plugged, dirty, or to show false indications of flow. With paper machinery and similar equipment, however, it is requisite that lubrication devices be completely dependable.

The present invention solves these problems by adapting the gravity sight feed "bull's eye" to a pressure lubricating system to permit ready inspection without complex piping or the like and to eliminate any likelihood that the device would become plugged or show false indications of flow. The invention accomplishes these results by providing for delivery of air or other gas to the "bull's eye" chamber at a pressure just sufficient to balance the pressure head of the oil in the delivery lines. Suitable air conduit means may be provided for this purpose. However, where air is entrained in the oil delivered to the bull's eye, the drop in pressure as the air enters the chamber thereof is often sufficient to clear the chamber, as is the case where an air-loaded surge chamber is utilized in the oil conduit prior to the bull's eye. Where air conduit means supply the bull's eye, control of the flow of air may be accomplished either by manually operable valve means effective to clear the bull's eye chamber when desired by moving oil therefrom to a bearing or the like, or by air flow restriction means affording constant inspection. In either case, the air conduit means may be a manifold for supplying a plurality of sight feed indicators, with the air flow control means in either the main supply line thereof or in individual branch lines for the indicators.

Accordingly, it is an object of the present invention to provide a sight feed inspection device which may be cleared by air pressure to give a visual indication of the rate of oil flow through a pressure lubricating system, and which is also effective to signal blocking in the line by the failure of the indicator to clear.

Another object of the invention is to provide a device as described which may be utilized with either push-button or restrictive orifice means for controlling the air supply to the bull's eye chamber.

Another object of the invention is to provide air supply and control means as described for use in a manifold system wherein a plurality of oil conduits have sight feed indicators therein.

Another object of the invention is to provide a device as described which is self-sealing with respect to the escape of air from the sight feed indicator so that flow of oil is continuous therethrough.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings in which:

On the drawings:

FIGURE 1 is a schematic view of an oil manifold sys-

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tem for lubricating paper machinery and air-controlled sight feed indicators therein;

FIGURE 2 is an enlarged front elevational view of a sight feed indicator and air-control means therefor;

5 FIGURE 3 is a schematic view of an oil manifold system and air-controlled sight feed indicator therein according to another embodiment of the invention;

10 FIGURE 4 is an enlarged sectional view of a restricted orifice control for an air supply conduit for supplying air to a sight feed indicator such as is shown in FIGURE 2; and

FIGURE 5 is a schematic view of another embodiment of the invention wherein oil is supplied under pressure to an indicator of the type shown in FIGURE 2.

15 Referring now to the drawings, a sight feed indicator 10 is shown according to the present invention, which is of a conventional gravity feed type and comprises a body portion 12 which may be of cast iron or the like having a transparent plate 14 to form a chamber 16 in conjunction with the body portion 12. Oil, or other liquid, is introduced under pressure through a pipe 17 into the "bull's eye" thus formed, and through a pipe-receiving conduit 18 to the chamber 16, as controlled by throttle valve means including a handle 20 actuating a valve 22, via a conduit 24 terminating in a nozzle 26. The nozzle 26 is disposed in predetermined spaced relation to the bottom of the chamber 16, and oil is permitted to leave the body 12 through an outlet passage 28 in communication with a pipe 30 leading to machinery to be lubricated as understood by those skilled in the art.

25 In accordance with one embodiment of the invention, means are provided to clear the chamber 16 comprising a gas pressure system including a conduit 32 communicating with a source of a gas such as air which may be pressurized by a suitable compressor or the like (not shown) and connected to the body 12 at a boss 34 so as to introduce the gas through a conduit 36 into the upper portion of the chamber 16.

35 Control of the air or other gas is provided by a push-button valve 38 which may be located at any suitable position along the conduit 32, but is preferably adjacent the body 12 for ready accessibility by an inspector. The push-button valve 38 may be of any suitable type, but preferably includes a button 40 connected to a shaft 42 which is spring biased by suitable means (not shown) to an inoperative or closed position to prevent the gas from flowing through a body portion 44 of the valve which is provided with a suitable valve closure for this purpose (not shown).

40 In operation, oil will flow through the conduit 18 into the chamber 16 and will tend to fill the chamber 16 as a result of the resistance to flow in the system. When it is desired to inspect the flow of oil through the system, or to determine whether a condition of blockage exists therein, the valve button 40 is pressed to open the conduit 32 and to admit air into the chamber 16 under a pressure which is just sufficient to overcome the resistance to flow of the oil in the system. Thus, the chamber 16 will be cleared for inspection by forcing oil in the lower portion of the chamber into the outlet conduit 30 and to a lubrication point. Although the air pressure itself may be used to effect lubrication periodically, the oil pressure in the system is desirably such as to effect continuous flow. In the event that a blockage condition exists, the chamber 16 will not clear when the button 40 is pressed and this will give a definite indication of such condition to the operator.

45 In accordance with the invention and as seen in FIGURE 1, a manifold system may be utilized wherein a plurality of oil or liquid conduits are provided such as indicated at 46, 48, 50, 52 and 54 which lead from a

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source of supply and from a conduit 55 to machinery bearings such as are indicated at 56, 58, 60, 62 and 64 for paper rollers or the like of a paper making machine indicated diagrammatically by reference numerals 63, 65, 67, 69 and 70. The conduits 46-54 are provided with sight indicators 72, 74, 76, 78 and 80 respectively, which are controlled by air pressure means comprising a source of compressed air 82 supplying air through a main conduit 84 to a manifold system including conduits 86, 88, 90, 92 and 94 which lead to the respective sight feed indicators 72 through 80. The air pressure supply means operates substantially in the manner described with respect to the preceding embodiment and may be controlled by individual valves 96, 98, 100, 102 and 104 for each of the conduits 86 through 94, and which may be of the push-button type shown at 38 in FIGURE 2.

In a preferred embodiment of the invention, a single valve may control the supply of air to sight feed indicators in a manifold, as shown in FIGURE 3 wherein similar parts are designated by similar reference numerals. Thus the conduit 84a leading from the air supply source 82 has a valve 96 which may also be of the push-button type shown in FIGURE 2, and is adapted to clear the sight feed indicators 72 through 80 simultaneously so that the inspector may be spared the effort of operating individual valves for each of the indicators and may also compare the flow through the conduits 86a through 92a.

The operation of the air-controlled sight feed indicator means of the invention may be further simplified by restricting air flow to indicators such as shown in the embodiments of FIGURES 1-3, by providing an air-flow constricting orifice or passage 98, illustrated as being formed in a conduit 84b for supplying a plurality of air conduits in accordance with the construction of FIGURE 3. It will be understood, however, that the flow control restriction 98 may also be utilized in the embodiments of FIGURES 1 and 2 in place of the push-button type of control hereinabove described. The restriction 98 is calibrated in relation to the pressure from the air supply source and to the pressure or resistance in the lubrication system so as to just balance the pressure head of oil in the delivery lines and to keep the indicator continuously cleared.

Referring now to FIGURE 5, yet another embodiment of the invention is shown wherein the air control is further simplified by supplying oil under pressure to a sight feed indicator 100 which is generally of the gravity feed type of construction such as shown in FIGURE 2. The oil is introduced to the indicator 100 through a conduit 102 which may have an air-loaded surge chamber 104 therein prior to the indicator 100. The oil passes from the indicator to a lubricating site through an outlet conduit 106; and, as a result of the pressure drop produced when the oil enters the indicator, air which has been entrained in the oil by the surge chamber means 104 will be released from solution within the indicator and will be effective to clear the chamber to afford a high degree of visibility of the flow condition in the system as hereinbefore described. Release of air from the oil may also occur even in the absence of an air surge chamber prior to the indicator, as a result of the pressure differential between the pressurized conduit 102 and the indicator 100.

In this connection it may be noted that although a slight amount of gas may escape through the oil delivery lines from the respective sight feed indicators in each of the several embodiments of the invention, this will be obviated by the fact that only a small amount of air need be fed to the indicator in the first instance in order to overcome the pressure condition in the chamber and clear the chamber. Furthermore, if such a slight amount of air does escape, this will tend to reduce the pressure in the chamber and thereupon the oil level will raise in the chamber, since the air pressure on the oil in the bottom of the chamber will have been diminished, and the

oil will close the outlet in the chamber against further air escape.

Accordingly, there has been provided a sight feed system for paper making machines or the like, which eliminates the problem inherent in conventional gravity feed devices wherein the indicators must be placed at a maximum elevation and which also eliminates the tendency to clog in pressure lubricating systems and affords a clear inspection condition whenever desired. The device is extremely simple and not subject to breakdown, and is therefore advantageous with respect to manufacturing costs, as well as labor costs.

Although the device is particularly suitable for paper machinery lubrication, it may also be employed in numerous other applications to reduce the complexity of lubricating conduit systems and controls.

Although I have herein set forth and described my invention with respect to certain specific principles and details thereof, it will be understood by those skilled in the art that these may be varied without departing from the spirit and scope of the invention as set forth in the hereunto appended claims.

I claim as my invention:

1. A sight feed indicator for affording inspection of the rate of flow through an oil conduit comprising a sight feed flow indicator of the gravity feed type, oil inlet means in said indicator, oil outlet means in said indicator, conduit means for introducing gas under pressure into said indicator, and a continuously open, reduced-diameter portion in said conduit means calibrating the flow of gas to said chamber to a level such as to provide a continuously cleared condition in said indicator while affording continuous flow into said indicator through said inlet means.

2. A sight feed indicator system comprising an oil supply manifold having a plurality of branch conduits for supplying oil to a device to be lubricated, a sight feed indicator in each of said branch conduits receiving oil therefrom at an upper end and passing oil thereto by gravity feed at a lower end, a gas supply manifold supplying gas under pressure to said sight feed indicators and having a branch conduit for each of said sight feed indicators entering into said sight feed indicators in spaced relation to the oil branch conduit therefor and normally closed manually operable valve means in each of said branch conduits for controlling the introduction of pressurized air into the sight feed indicator thereof whereby to selectively clear the indicator for inspection.

3. A sight feed indicator system comprising an oil supply manifold having a plurality of branch conduits for supplying oil to a device to be lubricated, a sight feed indicator in each of said branch conduits receiving oil therefrom at an upper end and passing oil thereto by gravity feed at a lower end, a gas supply manifold supplying gas under pressure to said sight feed indicators and having a branch conduit for each of said sight feed indicators entering into said sight feed indicators in spaced relation to the oil branch conduit therefor, said gas supply manifold having a main conduit portion and a normally closed valve for selectively controlling the introduction of pressurized air into said indicators.

4. A sight feed indicator system comprising an oil supply manifold having a plurality of branch conduits for supplying oil to a device to be lubricated, a sight feed indicator in each of said branch conduits receiving oil therefrom at an upper end and passing oil thereto by gravity feed at a lower end, a gas supply manifold for supplying gas under pressure to said sight feed indicators and having a branch conduit for each of said sight feed indicators entering into said sight feed indicators in spaced relation to the oil branch conduit therefor and a reduced diameter portion in each of said air manifold branches for maintaining a supply of pressurized air to the respective sight feed indicators such as to provide a continuously clear

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condition in the indicators without preventing the flow of oil therethrough.

5. A method of flow control comprising the steps of introducing a liquid under pressure to the chamber of a sight feed indicator body and introducing a gas under pressure to the chamber with the pressure of the gas being above atmospheric and such as to clear the chamber and move the liquid through an outlet in the body.

6. A device for indicating the rate of flow in a lubricating line comprising a sight feed indicator of the gravity flow type and means introducing gas into the sight feed indicator under pressure above atmospheric to clear the indicator for inspection and maintain the indicator in condition for flow of lubricant therethrough.

7. A sight feed indicator system comprising a sight feed indicator of the gravity flow type having a body, a transparent plate forming a chamber with said body and a nozzle in an upper portion of the chamber, means for introducing oil to said nozzle, means for removing oil from the chamber below said nozzle, and means introducing gas into said chamber under pressure above atmospheric to maintain a clear condition of the chamber to afford inspection of flow through said chamber.

8. A sight feed indicator for affording inspection of the rate of flow through an oil conduit comprising a sight feed flow indicator of the gravity feed type and means introducing gas under pressure into said indicator under pressure above atmospheric to clear the indicator.

9. A sight feed indicator for affording inspection of the rate of flow through an oil conduit comprising a sight feed flow indicator of the gravity feed type, means introduc-

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ing gas under pressure into said indicator, a manually operable valve in said means for introducing gas under pressure into said indicator, and means biasing the valve to closed position.

10. A device for indicating the rate of flow in a conduit for liquids, comprising a sight feed indicator body having a chamber with an inlet and an outlet, means for introducing a liquid under pressure to the chamber through the inlet thereof, and means for introducing a gas under pressure above atmospheric to the chamber so that the pressure of the gas clears the chamber and moves the liquid through the said outlet.

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