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 DUPLEX OIL STRAINER
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Fig. 1.

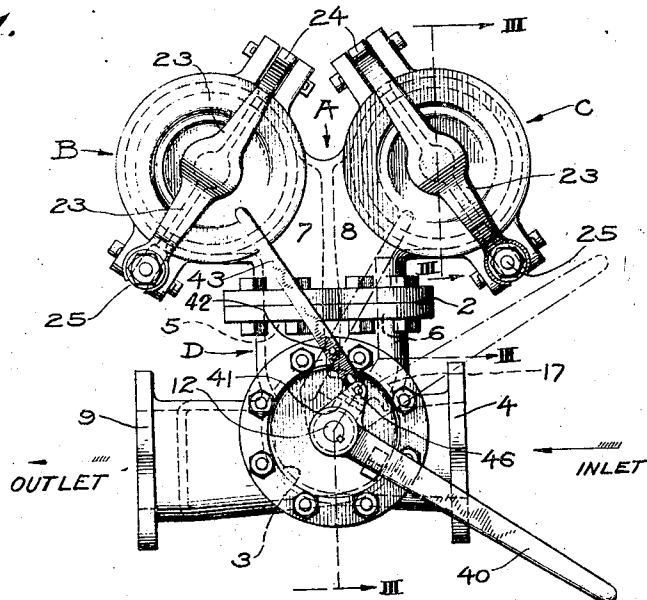


Fig. 2.

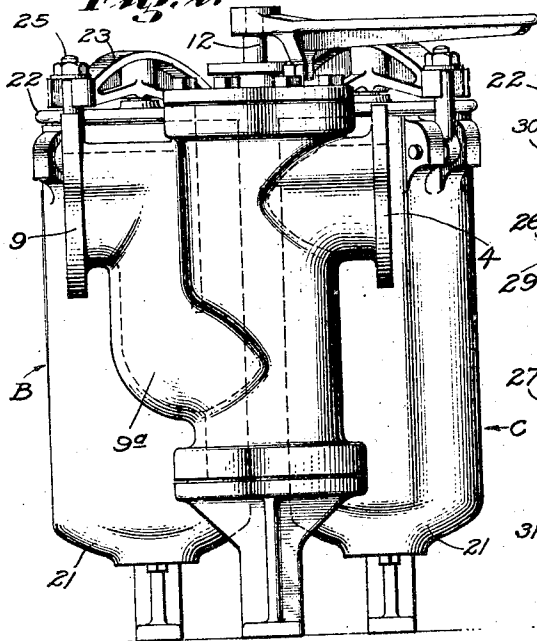
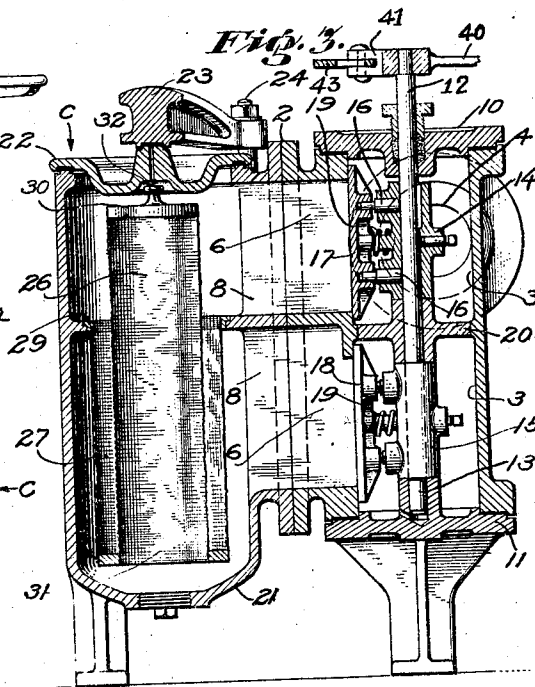


Fig. 3.



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DUPLEX OIL STRAINER.

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This invention relates to oil strainers and especially to a duplex form thereof.

The object of the present invention is to generally improve and simplify the construction and operation of oil strainers; to provide a casing having three cylinders formed therein, two for the reception of strainers and one for the reception of a valve mechanism; to provide means whereby the strainers and valves may be readily and quickly removed for cleaning, inspection, repair, etc.; to provide a valve mechanism which is adapted to direct the oil flow through one strainer or the other, thereby leaving one strainer free at all times for removal and cleaning, while the other is in operation; to provide valves which will automatically compensate for wear; to provide means which will visibly indicate the position of the valve mechanism, or, in other words, the strainer through which the oil is passing; and further, to provide an arrangement of strainers, valves, etc., which permits compact assembly and ready installation wherever required.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a plan view of the duplex strainer and the valve mechanism employed in conjunction therewith.

Fig. 2 is a front view of the same.

Fig. 3 is a vertical cross-section on the line III—III of Figure 1 only one valve being shown in section.

Referring to the drawings in detail, and particularly to Fig. 1, A indicates a casing constructed of cast-iron or any other suitable material in which are formed two cylindrical chambers generally indicated at B and C. The forward face of the casing is flanged, as shown at 2, and it serves as a support for a second casing, also constructed of cast-iron or similar material, which is generally indicated at D. This casing has a cylinder chamber formed therein as at 3, this chamber being provided for the reception of a valve mechanism hereinafter to be described, while the cylinders B and C are provided for the reception of strainers through which the oil is passed for the purpose of removing sand or other impurities.

The oil to be strained enters the cylinder

3 through an inlet port generally indicated at 4. It is then directed by the valve mechanism through one or another of a pair of ports indicated at 5 and 6 which are in direct communication with ports 7 and 8 formed in the casing A. These ports deliver the oil to the upper ends of the strainer cylinders B and C. The oil then passes downwardly through the strainers and returns to the valve cylinder through lower ports 5, 6, 7 and 8 and finally discharges through the outlet or discharge connection on the cylinder casing generally indicated at 9. This is accomplished in the following manner:

By referring to Fig. 3 it will be noted that the valve cylinder 3 is provided with upper and lower removable heads such as shown at 10 and 11 respectively. Extending through the upper head is a valve stem or shaft 12. This shaft is supported by the lower head and is journaled therein as at 13. Secured on the upper end of the shaft is a valve hub 14 and similarly secured on the lower end of the shaft is a valve hub 15. These hubs are provided with projecting pins 16 and each set of pins serves as a support for a segmental shaped valve, the upper valve being indicated at 17 and the lower valve at 18. These valves are maintained in contact with the inner surface of the valve cylinder, as springs 19 are interposed between the valves and the valve hubs. In other words, a pair of floating valves is employed so that any wear which may take place will be automatically compensated for.

The valves are mounted in direct alignment, one above the other, and they thus serve the function of closing the upper and lower ports 6 when they assume the position shown in Fig. 1 and that of closing the upper and lower ports 5 when the valve is turned to the dotted line position, also shown in Fig. 1.

To prevent short-circuiting of the oil while passing through the valve cylinder and the strainer cylinders, or, in other words, to prevent the oil from passing directly from the port 4 to the discharge port 9, a floating diaphragm is employed. This is indicated at 20 and is secured against vertical movement by being placed between the valve hubs 14 and 15. It is free on the shaft 12 and it is also free with relation

to the interior surface of the valve cylinder and it may thus turn with the shaft 12 or remain stationary as the case may be. This is exceedingly important as it permits quick and ready removal of the shaft 12 and the entire valve mechanism by merely removing the upper head 10. A fixed diaphragm would not permit such removal and would obviously necessitate removal of both the heads indicated at 10 and 11, but such is not the case where the diaphragm may be removed with the shaft and the valves.

The strainer cylinders are provided with fixed or integral bottom portions, as shown at 21, but removable heads are employed, as shown at 22, these heads being secured by clamping arms 23. These arms are hingedly supported to the casing A, as indicated at 24, and their opposite ends are forked to straddle bolts 25. These bolts are provided with nuts which, when tightened down, securely clamp the heads in position and similarly permit ready removal.

The strainers positioned within the respective cylinders are perhaps best illustrated in Fig. 3. They are of the basket or cylindrical type and are indicated at 26 and 27. They may be constructed of any suitable material and are supported one within the other, both the strainers being supported from an annular interior flange such as shown at 29. The inner strainer is provided with a head member 30 which prevents admission of oil at that point. The lower end is open at 31, thus permitting free escape of the oil which passes through. In other words, the oil enters from the exterior surface and discharges from the interior and lower end. The exterior strainer receives the oil at the upper end and on its interior surface and discharges it freely into the lower passage 6 when strained.

The head 30 may be provided with a knob extension or handle 32 and the strainers may thus be readily removed in unison whenever it is desired to clean the same.

In actual operation, it is obvious that the strainer may be employed for any purpose desired; for instance, for straining the oil in oil burning plants before the oil is delivered to the nozzles of the burners. The oil from the pumps enters the intake port 4. If the valves assume the position shown in Fig. 1, the oil entering will escape through the ports 5 and 7 and will thus enter the straining cylinder B. The oil will here pass through the respective strainers and will then escape through the lower ports 5 and 7 and re-enter the lower part of the valve cylinder 3. It then passes upwardly through a port 9^a and finally discharges through the outlet 9. While the strainer B is in operation, it is obvious that no oil can enter the strainer cylinder C. The clamping arm 23 may thus be released and the head, together with the

strainers, removed for cleaning, inspection, repair or otherwise, after which the parts may be replaced and the valve mechanism changed to close the ports 5 and 7. The oil will then pass through the upper ports 6 and 8, then through the strainers, and will finally discharge through the lower ports 6 and 8, which are in communication with the outlet connection 9; it being obvious that during this period it is possible to open the strainer cylinder B for cleaning or otherwise.

By referring to Fig. 1, it will be noted that the several cylinders are arranged in somewhat triangular formation. This is particularly important as it permits compact assembly, which will require a minimum of space, and which permits installation wherever required. This arrangement also considerably reduces the diameter of the valve cylinder as it permits the ports 5 and 6 to be arranged in parallelism.

The provision of the floating diaphragm 20 is another important feature as it permits complete removal of the entire valve mechanism by merely taking off the upper head 10.

Another important feature of the present invention is the provision of an indicating mechanism which will at all times visibly indicate the position of the valves, or, in other words, the strainer through which the oil is passing. This is accomplished by securing a lever 40 on the upper end of the valve shaft, the main function of this lever being that of turning the valve shaft or of moving the valves from one set of ports to another. Formed on the inner end of the lever is a short crank arm 41. Pivotaly mounted, as at 42, on the head member 10 is an indicating arm 43. The inner end of this arm is slotted and a pin 46 carried by the crank arm 41 projects therethrough. Hence, when the main lever 40 assumes the full line position shown in Fig. 1, the indicating arm will assume the position shown in full lines at 43. This immediately indicates to the operator that the valves are closing the ports 6 and 8 and that the oil is flowing through the strainer cylinder B. When the main lever 40 is thrown to the dotted line position shown, the position of the indicating arm 43 is reversed, thereby indicating to the operator that ports 5 and 7 are closed and that the oil is passing through the strainer cylinder C. No mistake is therefore liable to occur when removing the heads 22 for the purpose of cleaning the strainers.

While certain features of the present invention are more or less specifically illustrated, I wish it understood that various changes in form and proportion may be resorted to within the scope of the appended claims. I similarly wish it understood that the materials and finish of the several parts

employed may be such as the experience and judgment of the manufacturer may dictate or various uses may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A valve mechanism for regulating the flow of a liquid through two separate strainer-containing cylinders, said valve mechanism comprising a cylinder having a pair of ports formed therein adapted to communicate with the upper ends of the respective strainer cylinders, and a second pair of ports adapted to communicate with the lower ends of the respective strainer cylinders, said valve cylinder also having inlet and outlet connections in communication with the respective ports to permit inflow and discharge of the liquid to be strained, a shaft in the valve cylinder and extending through one end thereof, a pair of valves on the shaft cooperating with the respective pairs of ports to open and close the same, means for transmitting a turning movement to the shaft to cause the valves to swing into or out of alignment with the respective ports, and a removable partition member in the cylinder between the valves and dividing the valve cylinder into upper and lower compartments.

2. A valve mechanism for regulating the flow of a liquid through two separate strainer-containing cylinders, said valve mechanism comprising a cylinder having a pair of ports formed therein adapted to communicate with the upper ends of the respective strainer cylinders, and a second pair of ports adapted to communicate with the lower ends of the respective strainer cylinders, said valve cylinder also having inlet

and outlet connections in communication with the respective ports to permit inflow and discharge of the liquid to be strained, a shaft in the valve cylinder and extending through one end thereof, a pair of valves on the shaft cooperating with the respective pairs of ports to open and close the same, means for transmitting a turning movement to the shaft to cause the valves to swing into or out of alignment with the respective ports, and a disk carried by the shaft and interposed between the valves to divide the valve cylinder into upper and lower compartments.

3. A valve mechanism for regulating the flow of a liquid through two separate strainer-containing cylinders, said valve mechanism comprising a cylinder having a pair of ports formed therein adapted to communicate with the upper ends of the respective strainer cylinders, and a second pair of ports adapted to communicate with the lower ends of the respective strainer cylinders, said valve cylinder also having inlet and outlet connections in communication with the respective ports to permit inflow and discharge of the liquid to be strained, a shaft in the valve cylinder and extending through one end thereof, a pair of valve-supporting members secured on the shaft and turnable in unison therewith, a floating valve carried by each valve-supporting member, means for transmitting a turning movement to the shaft to cause the valves to swing into or out of alignment with the respective ports, and a disk carried by the shaft and interposed between the valves to divide the valve cylinder into upper and lower compartments.

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