E. E. HAUER.

STRAINER.

APPLICATION FILED MAY 15, 1916.

1,189,566.

Patented July 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

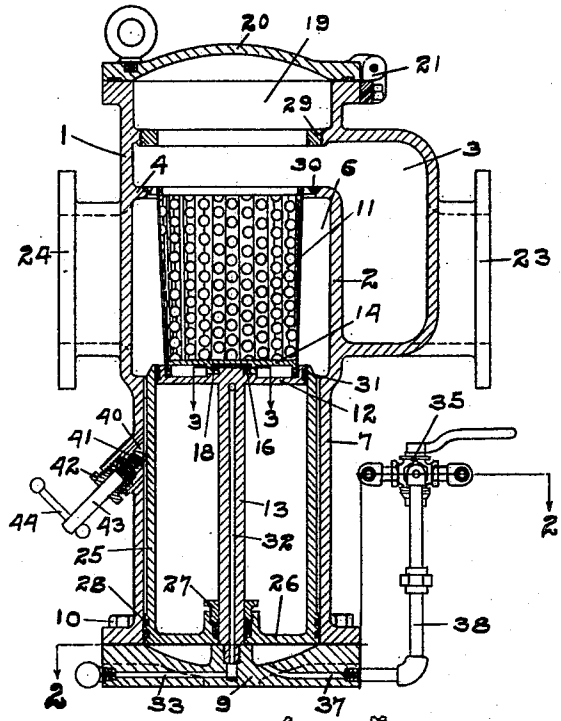


Fig. 2.

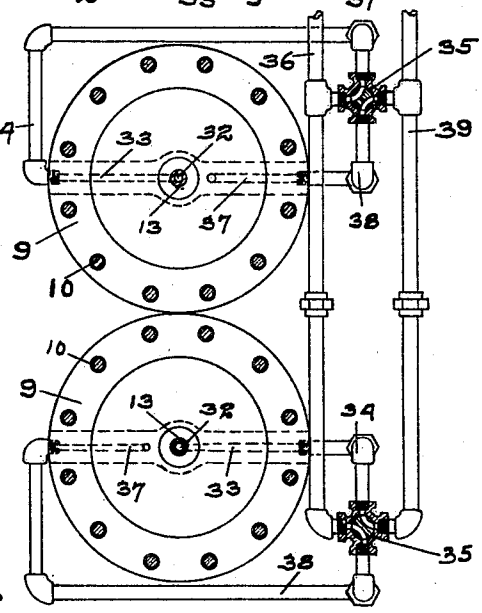
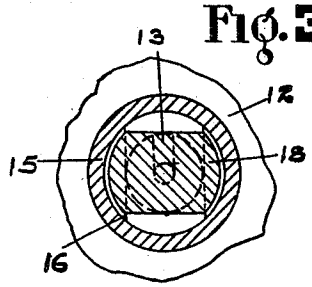


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

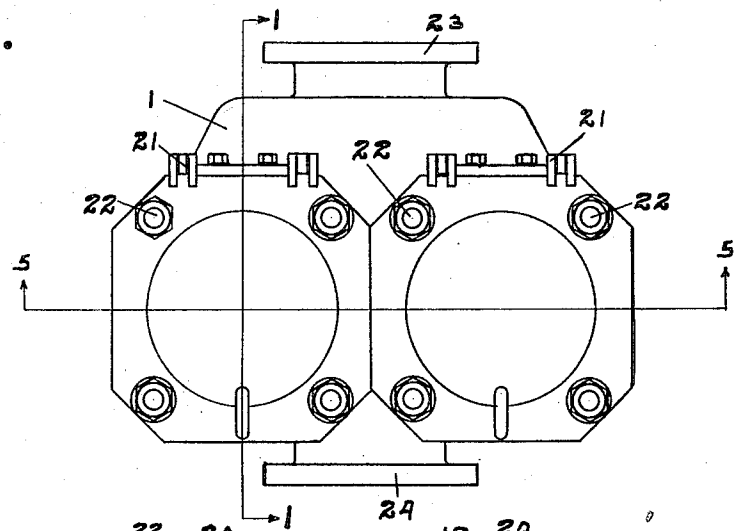
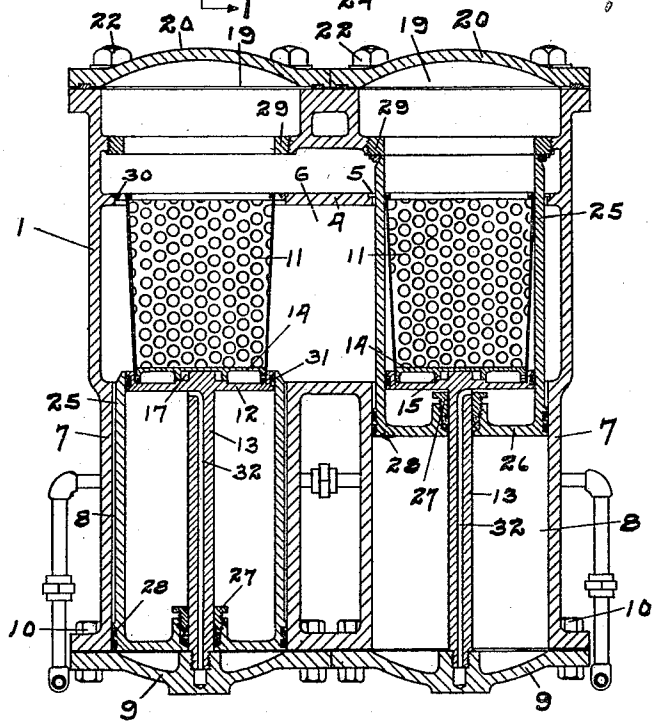


Fig. 5.



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STRAINER.

1,189,566. Specification of Letters Patent. Patented July 4, 1916.

Application filed May 15, 1916. Serial No. 97,725.

To all whom it may concern:

Be it known that I, ELMER E. HAUER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Strainers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to strainers and more particularly to strainers of the multiple type in which one of the strainer elements can be removed for cleaning or repairs while the other is in operative position although the improvements may be used in strainers having a single strainer element.

The object of my invention is to provide an improved strainer in which the strainer element remains stationary while the valve is moved to cut it off from the flow of the fluid to be strained.

A further object is to provide improved means operated by fluid pressure to open and close the valves.

With these and other objects in view my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings which form a part of this specification Figure 1 is a longitudinal section of a strainer embodying my invention, said section being taken on the line 1—1 of Fig. 4; Fig. 2 is a cross-section on the line 2—2 of Fig. 1; Fig. 3 is an enlarged section on the line 3—3 of Fig. 1; Fig. 4 is a plan view and Fig. 5 is a longitudinal section on the line 5—5 of Fig. 4.

In the drawings 1 represents a casing having a vertical partition 2 forming an inlet passage 3 and a horizontal partition 4 having openings 5 into a straining chamber 6. An extension 7 of the casing forms piston chambers 8 opposite the openings 5 in the partition 4 and each of said piston chambers is provided with a head or cover 9 secured thereto by bolts 10.

Strainer elements which are shown in the form of perforated cylinders 11 are provided for each of the openings 5 and extend therein as shown. Each of said strainer elements is seated on a support 12 having shafts 13 screw-threaded to the covers 9 of the piston chambers.

The cylinders 11 are provided with bottoms 14 having central cylindrical recesses 15 with oppositely disposed inwardly extending flanges 16 and the supports 12 have upwardly extending cylindrical portions 17 with outwardly projecting flanges 18 which when the cylinder bottom is seated on the support with the portion 18 extending into the recesses 15 by giving the cylinder 11 a quarter turn the flanges 18 will engage the flanges 16 and hold the cylinder in place.

The strainer elements can be removed from the casing through openings 19, said openings being provided with covers 20 hinged at 21 and secured in place by bolts 22. The casing has an inlet 23 and an outlet 24 with flanges adapted to be connected with a pipe line.

Piston valves each comprising a cylinder 25 and a disk 26 provided with a stuffing-box 27 and packing rings 28 are movable from the piston chambers into the straining chamber to seats 29 secured within the upper portion of the casing as shown.

To provide against excessive leakage through the space between the cylinders 11 and the walls of the openings 5 when the piston valve is below the partition 4 a ring 30 is normally seated in said opening reducing the space or opening so that it will not pass foreign matter to any greater extent than the perforations in the strainer element. The piston valve in its closing movement through the opening 5 carries the ring 30 with it and in its opening movement returns it.

The supports 12 are each provided with packing rings 31 and act as stationary pistons in the piston valves forming therewith chambers therein, to which a motive agent is admitted through passages 32 in the shafts 13 leading from passages 33 in the covers 9 which are supplied by pipes 34 through four-way cocks 35 from a suitable source of supply through a supply pipe 36. The motive agent is admitted to the piston chamber through passages 37 which are supplied from the cocks 35 through pipes 38. Said cocks have an exhaust pipe 39 secured thereto as shown.

When one of the piston valves is in its lowest position as shown at the left of Fig. 5 and it is desired to raise and close the same the cock for operating said valve is turned to the position shown by the lower

cock in Fig. 2 which admits the motive agent to the piston chamber and exhausts from the piston valve chamber through the passages and pipes heretofore described to the exhaust pipe. This movement causes the piston valve to move upward until it closes against its seat so that the strainer element can be removed for cleaning or repairs while the other strainer element is in operative position.

When one of the valves is in its upper position as shown at the right of Fig. 5 and it is desired to lower the same into open position the cock for operating said valve is turned to the position shown by the upper cock in Fig. 2 which admits the motive agent to the piston valve chamber and exhausts from the piston chamber through the passages and pipes heretofore described to the exhaust pipe.

When desired an auxiliary device for holding the piston valve in its upper or closed position independently of the pressure of the motive agent may be employed and for this purpose I have shown an opening 40 in the casing having screw-threads 41 and a stuffing-box 42 and a spindle 43 having a screw-threaded portion to engage the screw-threads of the opening and by turning the spindle with the handle 44 its inner end will engage and hold the piston valve to its seat.

Various modifications may be made in the form and arrangement of the parts without departing from the principle of my invention.

Having thus described my invention I claim:

1. The combination of a casing having an inlet and outlet, a strainer element and a piston valve adapted to inclose and cut off said strainer element from the flow of the fluid to be strained and means to admit and discharge a motive agent to operate said piston valve, substantially as described.

2. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid to be strained and means to admit and discharge a motive agent to operate said piston valve, substantially as described.

3. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid to be strained, means to admit and discharge a motive agent for the operation of said piston valve and a control for said means outside of said casing, substantially as described.

4. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid to be strained, said casing having an opening for the removal of said strainer element when said piston valve is in its closed position, a closure for said opening, means to admit and discharge a motive agent for the operation of said piston valve and a control for said means outside of said casing, substantially as described.

5. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid to be strained, means to admit and discharge a motive agent for the operation of said piston valve and devices independent of said motive agent means to tighten and hold said piston valve in closed position, substantially as described.

6. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve comprising a disk and cylinder in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid, a stationary piston secured to the casing and forming with said piston valve a chamber therein and means to admit and discharge a motive agent to and from said piston chamber and to and from said piston valve chamber for the operation of said piston valve, substantially as described.

7. The combination of a casing having an inlet and outlet, a straining chamber and a piston chamber, a strainer element in said straining chamber and a piston valve comprising a disk and cylinder in said piston chamber movable into said straining chamber and adapted to cut off said strainer element from the flow of the fluid, a support for said strainer element to which it is removably secured, said support also acting as a stationary piston within said piston valve forming with said valve a chamber therein and means to admit and discharge a motive agent to and from said piston chamber and to and from said piston valve chamber for the operation of said piston valve, substantially as described.

8. The combination of a casing having an inlet and outlet and a partition with an opening for the flow of the fluid to be

strained, a strainer element secured in a fixed position and extending into said opening, a ring seated in said opening outside of said strainer element and a valve movable through said opening and adapted to carry said ring and to cut off independently of said ring said strainer element from the flow of the fluid, substantially as described.

9. The combination of a casing having an inlet and outlet and a partition with an opening for the flow of the fluid to be strained, a strainer element secured in a fixed position and extending from said opening, a ring seated in said opening outside of said strainer element and free to move from its seat, a valve movable through said opening and adapted to carry said ring and cut off independently of said ring said strainer element from the flow of the fluid, said casing having an opening for the removal of the strainer element when said valve is in closed position and a closure for said opening, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ELMER E. HAUER.

Witnesses:
O. H. HAUSE,
V. H. BAKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."