

E. E. HAUER.
 APPARATUS FOR STRAINING LIQUIDS.
 APPLICATION FILED NOV. 14, 1910.

1,001,027.

Patented Aug. 22, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

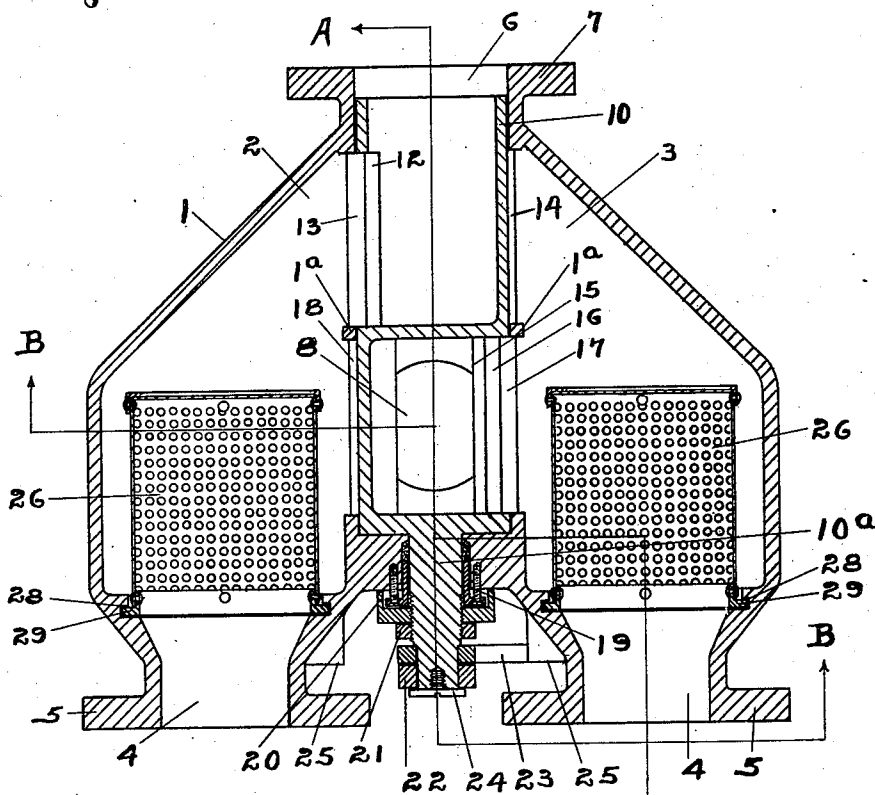


Fig. 6.

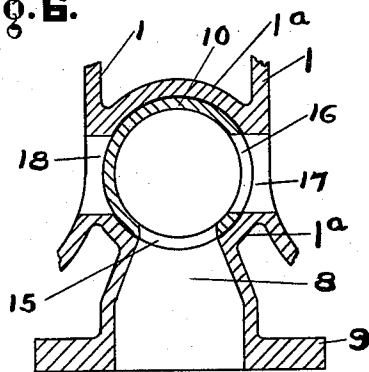
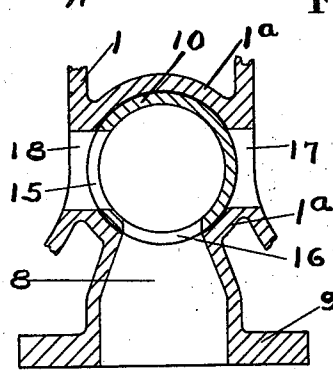


Fig. 7.



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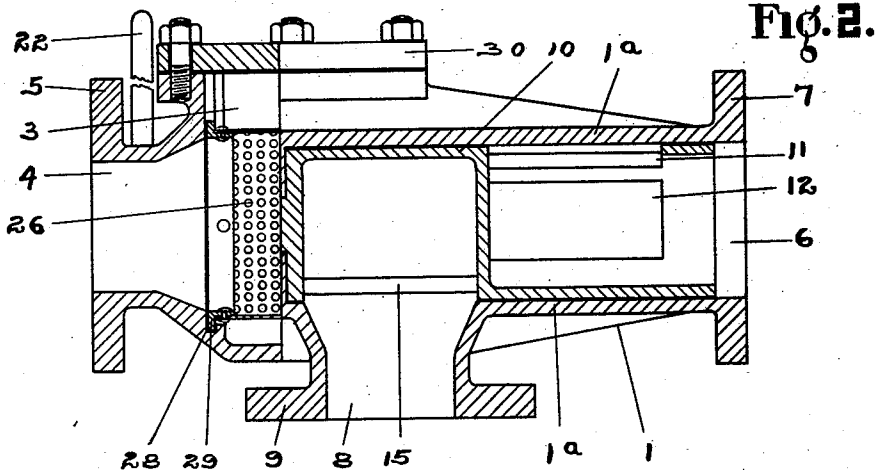


Fig. 2.

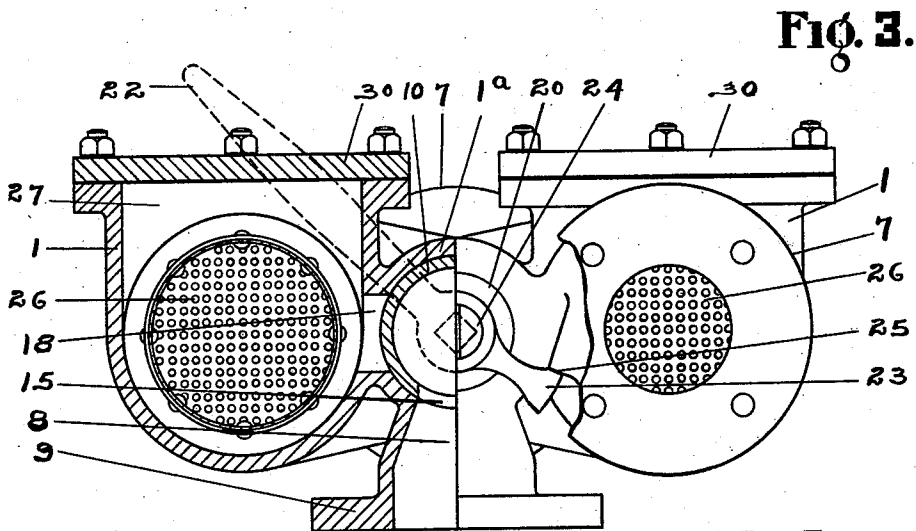


Fig. 3.

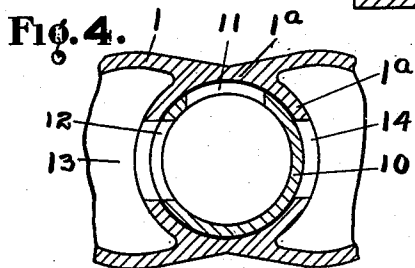


Fig. 4.

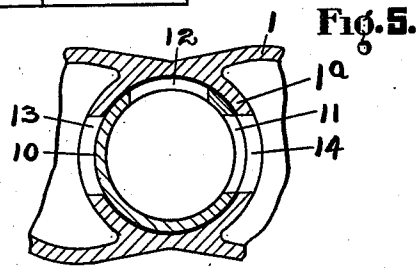


Fig. 5.

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3 SHEETS—SHEET 3.

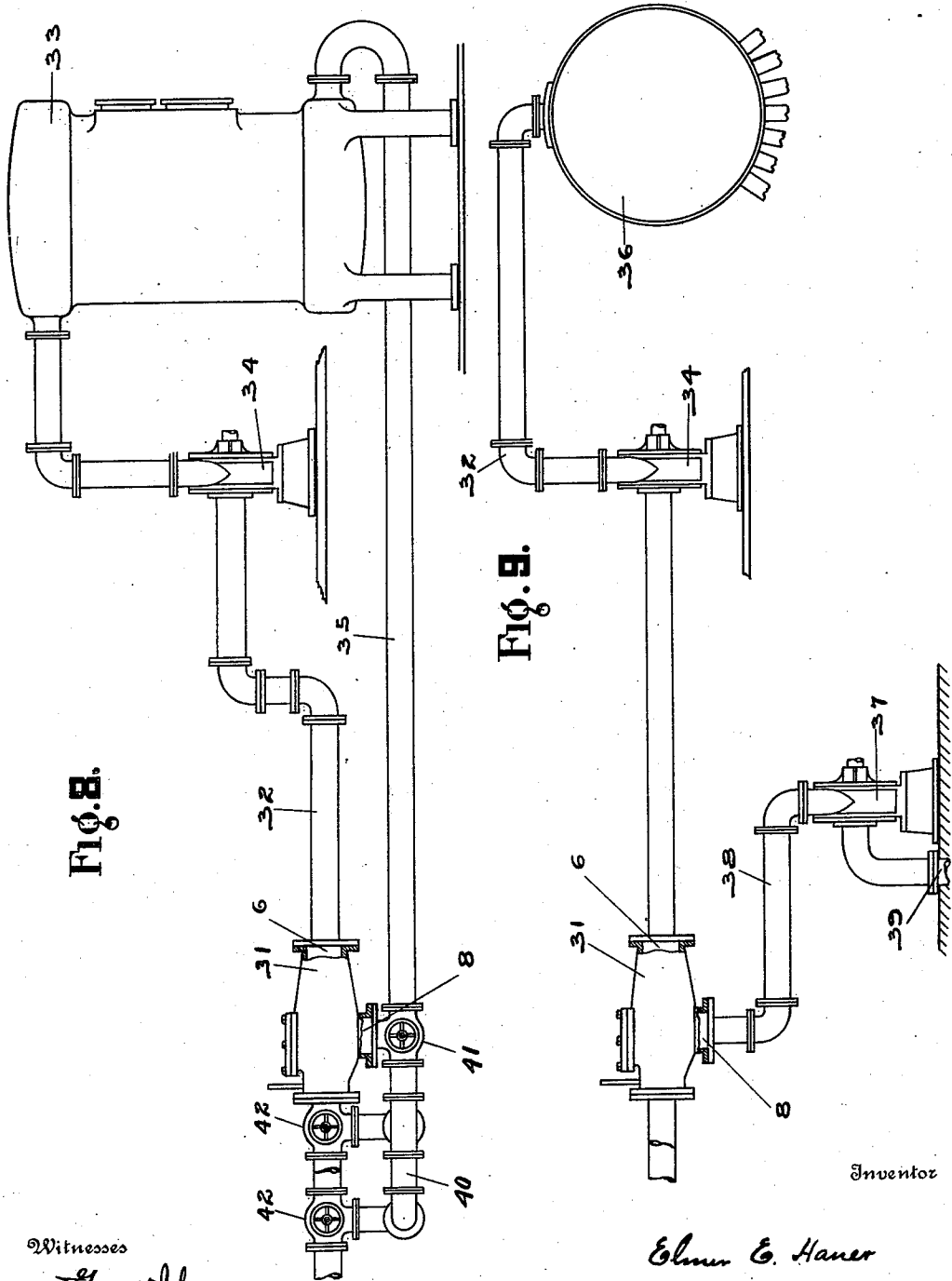


Fig. 8.

Fig. 9.

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334

UNITED STATES PATENT OFFICE.

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APPARATUS FOR STRAINING LIQUIDS.

1,001,027.

Specification of Letters Patent. **Patented Aug. 22, 1911.**

Application filed November 14, 1910. Serial No. 592,175.

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 Apparatus for Straining Liquids, of which the following is a specification, reference being had therein to the accompanying drawings.

10 My invention relates to an apparatus for straining liquids and more particularly to an apparatus of this character arranged in such manner as to render the strainer element self-cleansing.

15 The object of my invention is to provide an apparatus for straining liquids in which the strainer element does not have to be removed from its casing for cleansing but is cleansed by a reverse flow of fluid. It is particularly adapted for use in straining the water supply to condensers and to blast furnaces, and is so arranged that the discharge from the condenser, the cooling device of the furnace or like vessel or receiver is utilized for cleansing the strainer element.

20 A further object is to provide a strainer having a plurality of strainer elements with means to direct the flow through any one of the strainer elements while a reverse flow is cleansing the others.

25 A further object is to so arrange the device that the flow of the fluid will be uninterrupted.

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

35 In the accompanying drawings Figure 1 is a longitudinal section of a straining apparatus embodying my invention. Fig. 2 is a section on the line A A of Fig. 1. Fig. 3 is a section, partly in elevation, on the line B B of Fig. 1. Figs. 4 and 6 show ports of valve in position to direct the flow to strain the liquid in one of the strainer elements and flush or wash out the refuse matter from the other strainer elements, and Figs. 45 5 and 7 show the ports of the valve in position to reverse the operation. Fig. 8 shows an outline of strainer, pump, condenser or other receiving vessel with direct and return connections and Fig. 9 is a like outline except that the return connection is to an independent source of supply.

Like numerals represent the same parts in the several views.

40 In the drawings 1 represents a casing having partition walls 1^a forming straining chambers 2 and 3 with openings 4 and flanges 5 adapted to be connected with the source of supply; and an opening 6 with flange 7 is provided, adapted to be connected with a condenser or other vessel or device in which the liquid is to be employed; and I further provide an opening 8 with a flange 9 adapted to be connected with the condenser or other vessel for a return flow. The partition walls 1^a of the casing also form a chamber or opening in which a hollow plug valve 10 is seated having a double set of ports, the upper set 11 and 12 being adapted to register with ports 13 and 14 in the partition wall 1^a; and the lower set of ports 15 and 16 being adapted to register with the ports 17 and 18 and the opening 8 of the casing. The lower end of the valve 10 has a projection 10^a extending through an opening in the casing, a stuffing box 19 being provided as shown; and a nut 20 screw-threaded to the projection 10^a and abutting the casing holds the valve plug in its seat, a jam nut 21 also being shown. The lower end of the projection 10^a is square to receive a lever 22 and a stop 23 secured thereto by a cap-screw 24. Said lever is employed to turn the valve plug and the stop 23 engages projections 25 on the casing to limit the movement of the valve plug.

40 The strainer elements I have shown in the form of baskets 26, one for each straining chamber, having their open ends opposite the supply openings. These baskets are introduced into the straining chambers through openings 27 in the casing, the casing having grooves 28 which engage flanges 29 of the baskets to hold them in place. Covers 30 bolted to the casing close the openings 27, and these covers can be removed to take out the baskets for renewal or repairs.

45 The pump will ordinarily be placed in the pipe line connecting opening 6 of the strainer casing to the condenser or other receiving vessel and the flow will be through the same and back to the opening 8 of the strainer casing through a pipe connection from said opening to the condenser; but in

the event the strainer is employed to strain the supply to a receiver or vessel from which no return can be taken an independent line can be connected to the opening 8 leading from any suitable source of supply by gravity or by the use of a pump.

In Fig. 8 I have shown the strainer designated as a whole by the numeral 31, the opening 6 of the strainer casing being connected by a pipe 32 with a condenser 33, a pump 34 being placed in this pipe line; and a return pipe 35 connects the condenser with the opening 8 of the strainer casing. In Fig. 9 I have shown the strainer 31, the opening 6 of the strainer casing being connected by the pipe 32 with a boiler or other receiving vessel 36 the pump 34 being placed in this pipe line; and the reverse flow is in this case supplied to the opening 8 of the strainer casing by a pump 37 having a pipe 38 secured to the casing, the suction pipe 39 for said pump being connected to any suitable source of supply. It will be seen that when the valve is turned to the position shown in Figs. 4 and 6 the flow will be through the left-hand basket from the opening 4 for said basket, through the ports 13 and 12 and thence through the valve and opening 6; and the reverse flow will be through the opening 8, ports 15, 16 and 17, thence through the right-hand basket and the opening 4 for said basket; and when the valve is turned to the position shown in Figs. 5 and 7, the flow will be through the right-hand basket from the opening 4 for said basket, through the ports 14 and 11 and thence through the valve and opening 6; and the reverse flow through the opening 8, ports 16, 15 and 18 and thence through the left-hand basket and the opening 4 for said basket. The pipe connections extending from the openings 4 of the strainer casing to the supply will preferably be opened into the supply at a suitable distance from each other to avoid the discharge from one being taken up by the other. In Fig. 8 I have also shown a by-pass 40 controlled by a three-way cock 41 in the pipe line 35 and three-way cocks 42 to each of the connections to the source of supply of the liquid to be strained, whereby the reverse flow can be directed outside the strainer casing, when it is desired to remove a strainer element for renewal or repairs.

Having thus described my invention I claim:

1. In a strainer, the combination of a plurality of stationary strainer elements, each adapted to be connected with a direct and reverse flow and means to confine the direct flow through one of said strainer elements while the other strainer element is open to the reverse flow, substantially as described.

2. In a strainer, the combination of a casing having a plurality of stationary strainer elements, each adapted to be connected with

a direct and reverse flow, means to confine the direct flow to one of said strainer elements, said means being adapted to simultaneously open the other strainer element to the reverse flow, substantially as described.

3. In a strainer, the combination of a plurality of stationary strainer elements, each adapted to be connected with a source of supply of the fluid to be strained and each also being adapted to be connected with a source of supply for flushing and means to direct the flow to be strained through any one of said strainer elements while the other strainer element is open to the flow for flushing, substantially as described.

4. In a strainer, the combination of a casing having a plurality of straining chambers, each having a stationary strainer element therein and means to reverse the flow of the fluid through any one of said strainer elements, substantially as described.

5. In a strainer, the combination of a casing having two straining chambers, each having a strainer element therein adapted to be connected with a source of supply, each chamber also adapted to be connected with a flow in the opposite direction and means to reverse the flow through the respective strainer elements, substantially as described.

6. In a strainer, the combination of a casing having two straining chambers, each having a strainer element therein adapted to be connected with a source of supply and further adapted to have a direct and return connection with a receiving vessel and means to reverse the flow through the respective strainer elements, substantially as described.

7. In a strainer, the combination of a casing forming a plurality of straining chambers and a valve chamber, a valve in said valve chamber, strainer elements in each of said straining chambers, said valve being adapted to reverse the flow through any one of said strainer elements, substantially as described.

8. In a strainer, the combination of a casing having a plurality of straining chambers and a valve chamber, said straining and valve chambers having inlets and outlets to the source of supply and to a receiving and discharging vessel and a valve in said valve chamber adapted to reverse the flow of the fluid, substantially as described.

9. In a strainer, the combination of a casing having a plurality of straining chambers therein, each having inlets and outlets adapted to be connected with the source of supply and with a receiving vessel, said casing also having a valve chamber and a valve in said chamber adapted to reverse the flow of the fluid, substantially as described.

10. In a strainer, the combination of a casing having two straining chambers therein and a valve chamber, each of said straining chambers having an opening to the

source of supply and to said valve chamber, said valve chamber having a direct and return opening adapted to be connected with a receiver or vessel to be supplied, a hollow plug valve in said valve chamber with ports adapted to register with the openings to the straining chambers and to said receiver or vessel whereby the flow of the fluid can be directed from the source of supply through either one of said strainer elements to said receiver or vessel and back through the other strainer element to the source of supply, substantially as described.

11. In a straining apparatus, a plurality of strainer elements, each having inlet and

outlet connections to the source of supply of the liquid to be strained and inlet and outlet connections for a reverse flow, means to reverse the flow through the strainer elements and means to by-pass the reverse flow outside of said strainer elements, substantially as described.

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

ELMER E. HAUER.

Witnesses:

OLIVER H. HAUSE,
GROVER ILGEN.

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