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CONDENSER

Filed August 20, 1925

2 Sheets-Sheet 1

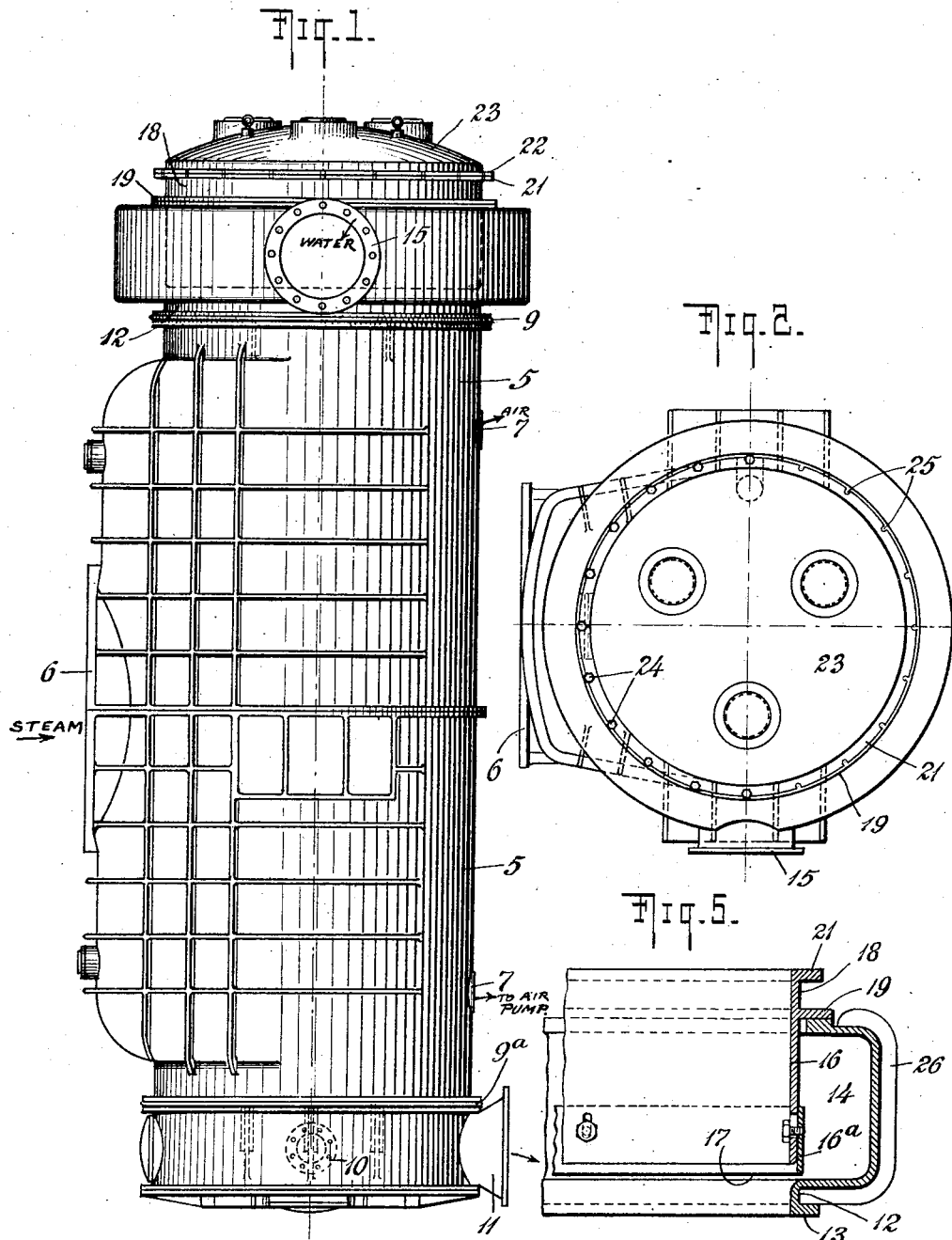


Fig. 5.

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Fig. 3.

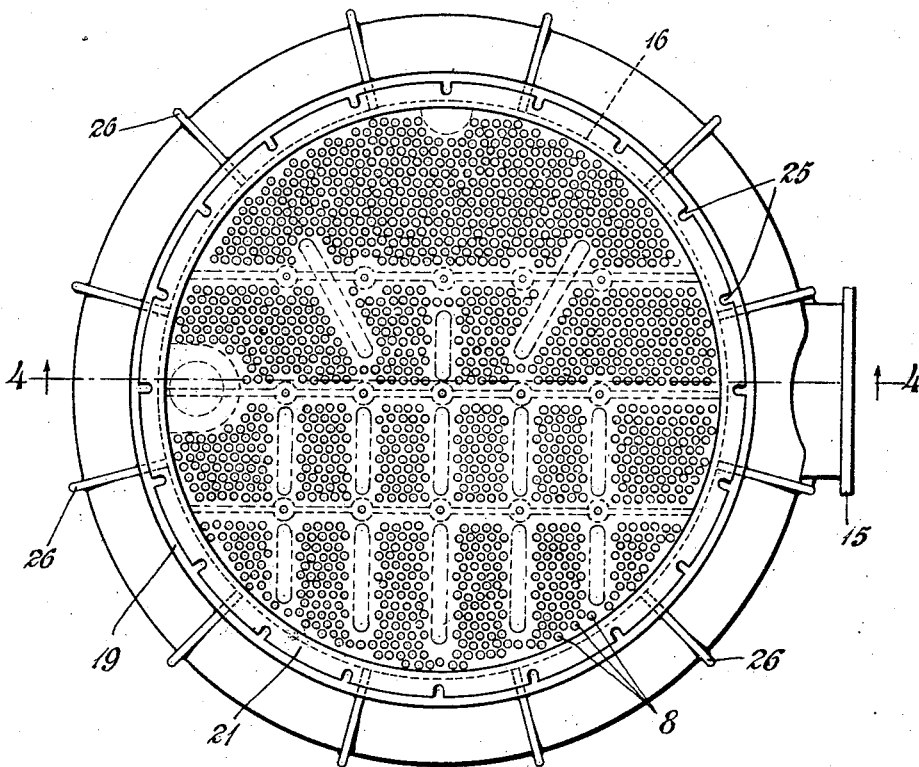
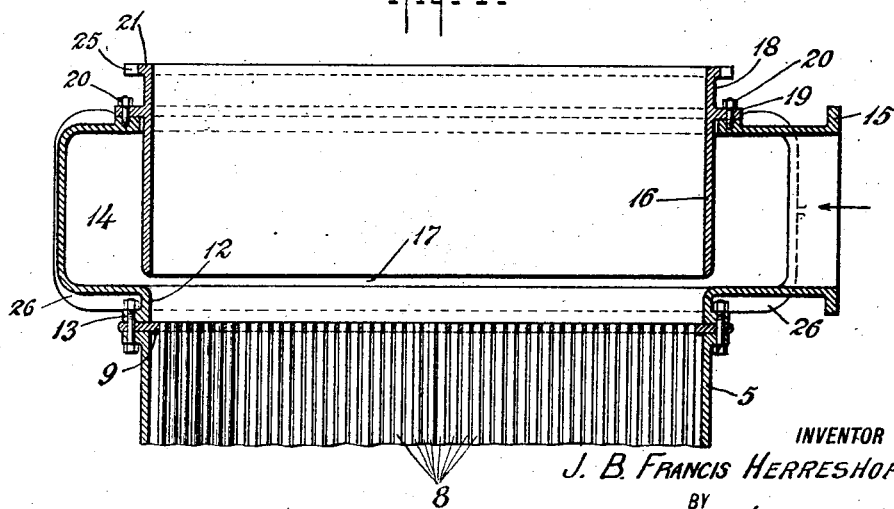


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## CONDENSER.

Application filed August 20, 1925. Serial No. 51,284.

My invention relates to condensers and more particularly to vertical surface condensers.

One of the objects of the invention is to provide in a surface condenser a novel form of water passage construction whereby the efficiency of the condenser for its intended purposes is increased and whereby cleaning of the condenser may be accomplished without interfering with the operation thereof. Other more specific objects will appear from the description hereinafter.

In the accompanying drawings which illustrate one example of the invention without defining its limits.

Fig. 1 is an elevational view of a vertical condenser embodying the invention,

Fig. 2 is a plan view thereof,

Fig. 3 is a similar view on an enlarged scale and with the cover plate removed,

Fig. 4 is a detail sectional view taken substantially on the line 4-4 of Fig. 3, and

Fig. 5 is a fragmentary sectional view illustrating another embodiment of the invention.

The condenser as shown in the drawings comprises an upright drum 5 or its equivalent provided with the customary exhaust steam inlet 6 and connections 7 adapted for communication with a suitable air exhausting means. A plurality of tubes 8 extend lengthwise of the drum 5 and have their opposite ends passing through and fixed in end walls 9, 9<sup>a</sup> of the drum 5. At its lower end the latter is provided with an outlet 10 for the condensate and an outlet 11 for the cooling water or other cooling medium which passes through the tubes 8, it being understood that the exhaust steam inlet 6 and the outlet 10 for the condensate communicate with the interior of the drum 5 which surrounds the tubes 8. At its upper end the drum 5 is provided with a head 12 having a flange 13 whereby it is attached as by means of bolts to said drum 5. The head 12 is hollow to form a water chamber 14 into which water is introduced through an inlet connection 15. In order to control the inward flow of the water an apron or baffle 16 projects into the chamber 14 from above and terminates at a distance above the bottom thereof to form a restricted annular passage 17 as shown in Fig. 4. In its preferred form the apron or baffle 16 comprises an integral part of a tubular

member 18 having a flange 19 for the accommodation of bolts 20 whereby the tubular member is secured to the head 12. The ring 18 may be provided with a second flange 21 upon which rests a flange 22 of a customary form of cover plate 23, the two flanges being secured together by means of bolts 24. To permit the ready and quick removal of these bolts the flanges 21 and 22 may be provided with outwardly open recesses 25 as shown in Figs. 2 and 3. External reinforcing webs 26 may be provided at spaced intervals upon the exterior of the head 12 as shown in the larger view of Fig. 3.

In the operation of the device the cooling water passes through the inlet 15 and flows against the apron or baffle 16 by which it is distributed uniformly around the periphery of the water chamber 14. The water then passes through the annular passage 17 and over and into the intake ends of all of the tubes 8 at the end wall 9 of said drum 5. After passing through the tubes 8 the water flows out of the outlet 11 in the customary way. At the same time the exhaust steam passes through the inlet 6 into the drum 5 and circulates through the spaces between said tubes 8 so as to be condensed by contact therewith, the products of condensation passing out through the outlet 10. Air and vapors may be removed in the customary way by suction through the connections 7.

With existing constructions the water passes unrestrained from the inlet 15 to the space above the upper ends of the tubes 8 and there accumulates to a depth which requires that the condenser be completely shut down each time during cleaning thereof. With the apron or baffle 16 the entering stream of water is uniformly distributed within the chamber 14 from which it passes, as previously stated, to the space above the tubes 8. In practice this space may at times or continuously be filled with water. When it is desired to clean the condenser the level of the water in said space, by suitable regulation of a valve controlling the outlet 11 or otherwise, is lowered until it is of such a depth as to permit an attendant to stand therein and to pass a brush or other cleaning implement therethrough into the tubes 8. In this way it is possible to thoroughly clean the condenser without danger to the attend-

ant and without necessitating the stoppage of the operation of said condenser. The efficiency of the latter in its capacity for work is thus materially increased in that losses due to shutting down to permit cleaning are entirely avoided.

In some cases it may be desirable to adjust the passage 17 so as to regulate the water passing therethrough. For this purpose a shutter 16<sup>a</sup> may be provided upon the apron or baffle 16 so as to be capable of adjustment lengthwise thereof toward and away from the bottom of the chamber 14. The size and dimensions of the passage 17 may thus be controlled, an example of this arrangement being diagrammatically illustrated in Fig. 5.

It is not desired to limit the invention to the details or the particular examples herein described since it will be obvious to those skilled in the art, after understanding my invention, that various modifications and substitutions may be made without departing from the scope of the invention, and I aim therefore in the appended claims to cover all such modifications.

What is claimed as new and is desired to be secured by Letters Patent is:

1. In a condenser, an end plate of substantial area having the intake ends of a plurality of cooling water tubes fixed therein, a water chamber member of larger area than said plate and surmounting the plate, said chamber member having a central opening substantially coextensive with the effective area of said plate, and a tubular baffle member fixed to the chamber member and extending into said opening, said baffle member cooperating with a bottom wall of the cham-

ber member to form an annular passage at the periphery of the end plate for admitting water to the space over said plate.

2. In a condenser, an end plate of substantial area having the intake ends of a plurality of cooling water tubes fixed therein, a water chamber member of larger area than said plate and surmounting the plate, said chamber member having a central opening substantially coextensive with the effective area of said plate, a tubular baffle member fixed to the chamber member and extending into said opening, said baffle member cooperating with a bottom wall of the chamber member to form an annular passage of uniform capacity at all points around the periphery of the end plate for admitting water to the space over said plate, and an adjustable extension means on said baffle member for adjusting the dimensions of said passage.

3. A vertical condenser comprising an upright drum having an exhaust inlet, a condensate outlet and an outlet for the cooling water, a plurality of tubes extending lengthwise of said drum, a water chamber at the upper end thereof having a space communicating with said tubes, an apron extending into said water chamber and defining therein a restricted passage about said space for uniformly distributing the flow of cooling water to said space, and an adjustable shutter on said apron for adjusting the dimensions of said passage to regulate the rate of flow of water to said space.

In testimony whereof I have signed my name to this specification.

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