E. G. HELANDER.

CONDENSER.

APPLICATION FILED OCT. 2, 1913.

1,144,197.

Patented June 22, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

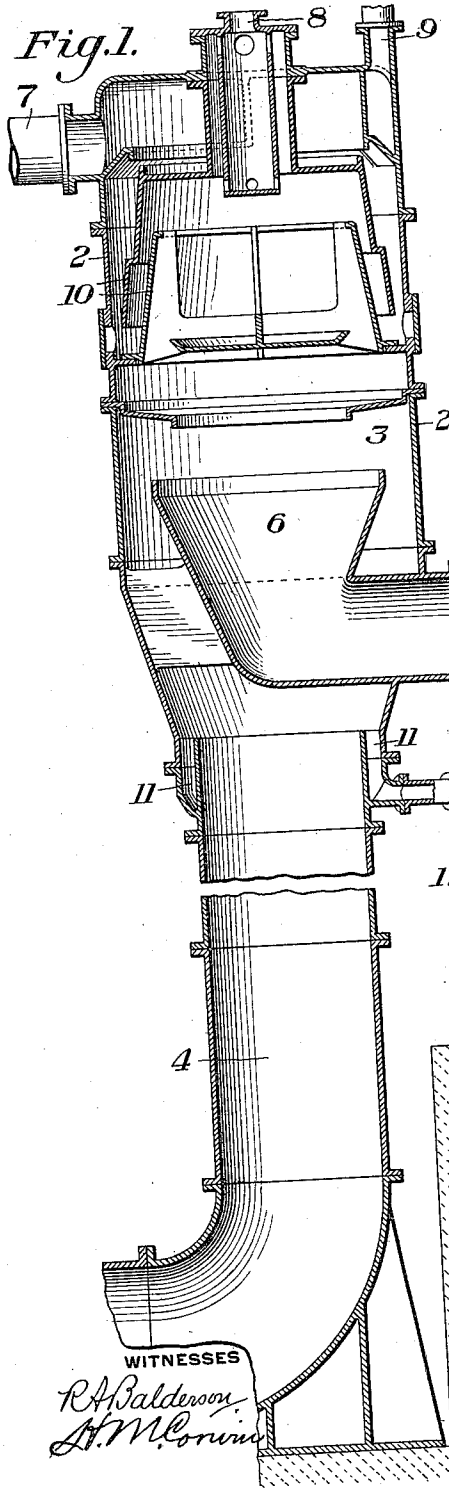


Fig. 2.

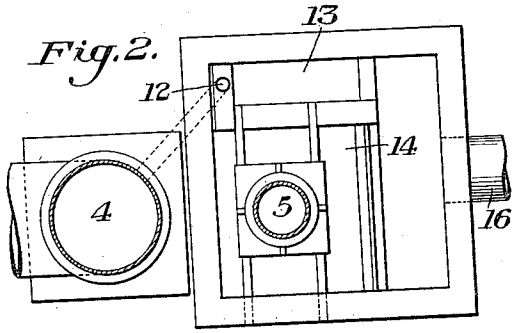
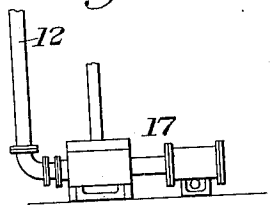


Fig. 3.



WITNESSES

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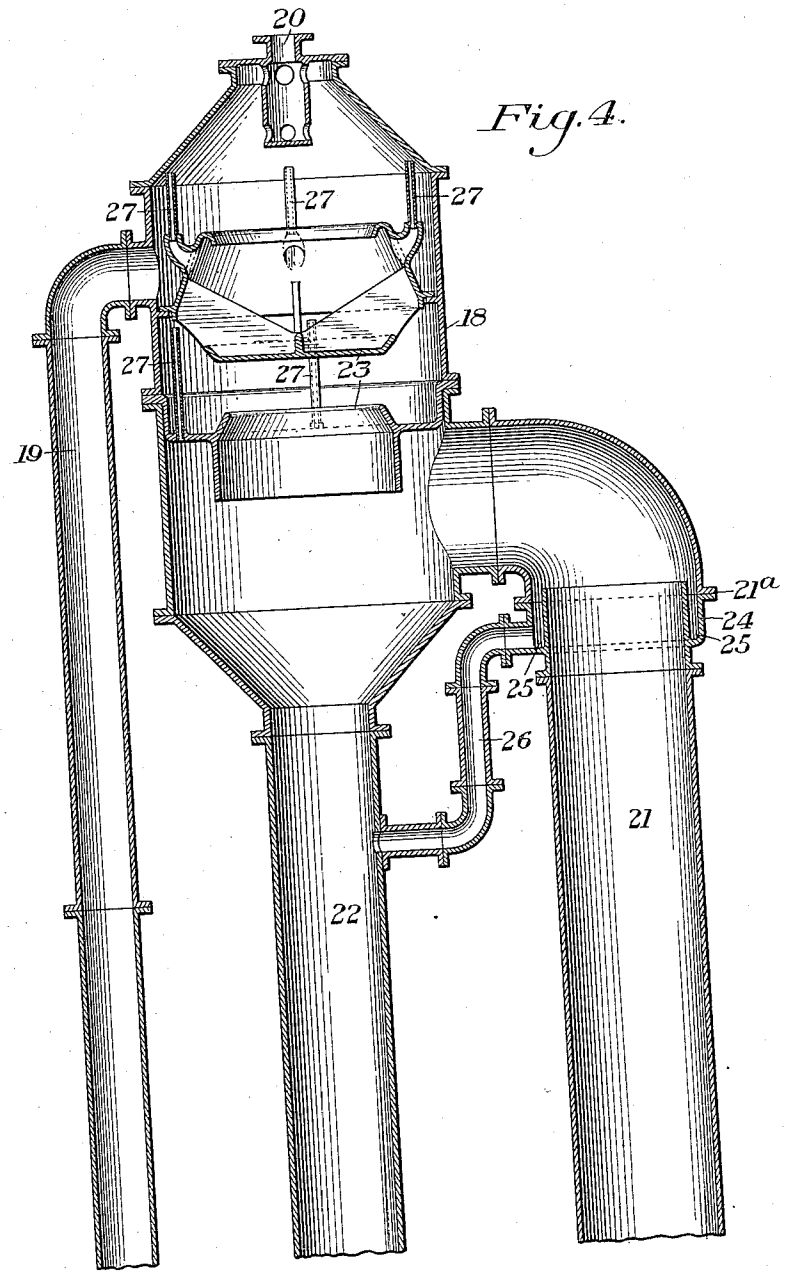
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Fig. 4.



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UNITED STATES PATENT OFFICE.

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CONDENSER.

1,144,197. Specification of Letters Patent. Patented June 22, 1915.

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To all whom it may concern:

Be it known that I, ERNST G. HELANDER, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented a new and useful Improvement in Condensers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section partly broken away of one form of condenser having my invention applied thereto; Fig. 2 is a sectional plan view of the same; Fig. 3 is a detail view showing a modification; Fig. 4 is a view similar to Fig. 1, but showing the invention applied to another form of condenser.

My invention has relation to improvements in condensers, and more particularly to elevated condensers, in which the steam pipe enters the lower portion of the condenser head. In this type of condenser, there is usually some condensation of steam before the steam reaches the cooling water, due to the steam coming in contact with the walls of the condenser. Under ordinary operating conditions, this condensation is picked up and entrained by the incoming steam. At times, however, there may be much less than the normal amount of steam to be condensed, and the shell of the condenser being relatively cold, some of the condensed steam may work down into the steam pipe from which it must be removed by some means, such as a vacuum trap or pump.

One object of the present invention is to prevent any water from passing back into the steam pipe.

A further object of the invention is to provide means for preventing air or non-condensable vapors from pocketing in the condenser head.

In the accompanying drawings, Fig. 1, the numeral 2 designates a condenser head containing the condensing chamber 3.

4 is the steam pipe entering the lower portion of the chamber 3, and 5 is the tail pipe which enters the head 2 above the upper end of the steam pipe and terminates within the chamber 3 in the funnel-shaped end 6.

7 designates the usual water supply connection for the condenser head, and 8 and 9 the connections leading to suitable air-exhausting means.

10 indicates any suitable arrangement of baffles within the upper portion of the chamber 3, which act to properly distribute water within said chamber.

The parts thus far described are well known in the art and need not be described in detail. It will be understood that these parts can be changed in various ways, as my invention is not limited in its application to the particular structure of condenser shown.

According to my invention, I provide a collecting chamber 11, at the lower portion of the chamber 3, and around the upper end of the steam pipe 4.

12 is an auxiliary tail pipe which communicates with the lower portion of the chamber 11, and is arranged to discharge into a hot well 13 at a lower level than the discharge of the main pipe 5, into its hot well 14. The lower end of the auxiliary tail pipe is shown as provided with a foot valve 15. The water which collects in the hot well 13 forms a seal for the auxiliary tail pipe and the overflow may be carried off by gravity through a suitable drain connection, such as indicated at 16, where the height will permit this. In cases where the height of the apparatus will not permit this gravity discharge, any suitable means, such as the pump 17, illustrated in Fig. 3, may be provided, drawing the water of condensation from the auxiliary tail pipe.

By the provision of the collecting chamber 11 and of the auxiliary pipe, I effectively prevent any water of condensation from working back into the steam pipe.

In Fig. 4, I have shown my invention applied to a type of condenser in which the steam pipe enters the condenser head above the tail pipe. In this figure, 18 designates the condenser head, 19 the water supply pipe, 20 the air exhaust connection, 21 the steam inlet pipe, and 22 the tail pipe. The steam inlet pipe enters the condenser head at the side above the tail pipe 22.

23 designates any suitable interior arrangement of baffles for the purpose of properly distributing the water.

In this construction, I provide the steam inlet pipe 21 with a joint at 21^a, the lower section of the pipe being extended upwardly within the upper section and a surrounding flange 24 being provided to thereby form a collecting chamber 25 around the upper end of the lower pipe section. 26 is an auxiliary

tail pipe leading outwardly from this collecting chamber. This tail pipe may have an independent discharge, as shown in Fig. 1, or it may be connected into the main tail pipe, as shown in Fig. 4.

In this form of my invention, I have also shown the water distributers 23 as being provided with a plurality of upwardly extending vent pipes 27. The water distributers divide the condenser head interiorly into a number of different chambers. The form of the distributers is such that, without the provision of some venting means, air or non-condensable vapors tend to collect and pocket within these chambers. The vent tubes 27 serve to connect the chambers in a manner to permit the air to rise to the top of the chamber and be drawn off by the pump, thus very considerably facilitating the action of the pump and increasing the degree of vacuum which can be maintained.

I claim:

1. An elevated jet condenser having a condenser head, a steam pipe entering said head, a tail pipe connected to the lower portion of said head, a collecting chamber formed around the steam pipe, and an auxiliary tail pipe leading from said chamber to carry off water condensed from the steam before the steam comes in contact with the cooling water in the head, substantially as described.

2. In a jet condenser of the counter-current type with a steam inlet at its lower portion, a baffle plate above the steam inlet and having a circular opening over the edge of which the cooling water falls in a sheet, said baffle plate also having a plurality of vent pipes leading from the under side thereof upwardly to a point considerably above the plate, said pipes being placed between the said opening and the inner wall of the condenser shell, substantially as described.

3. In a jet condenser of the counter-current type having a head, a steam inlet pipe entering the head horizontally, a baffle plate above the steam inlet and having a circular opening for the falling cooling water, said baffle plate forming a continuation of the upper wall of the discharge portion of the steam pipe, and vent pipes in the baffle between its said opening and the inner wall of the condenser shell, substantially as described.

In testimony whereof, I have hereunto set my hand.

ERNST G. HELANDER.

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