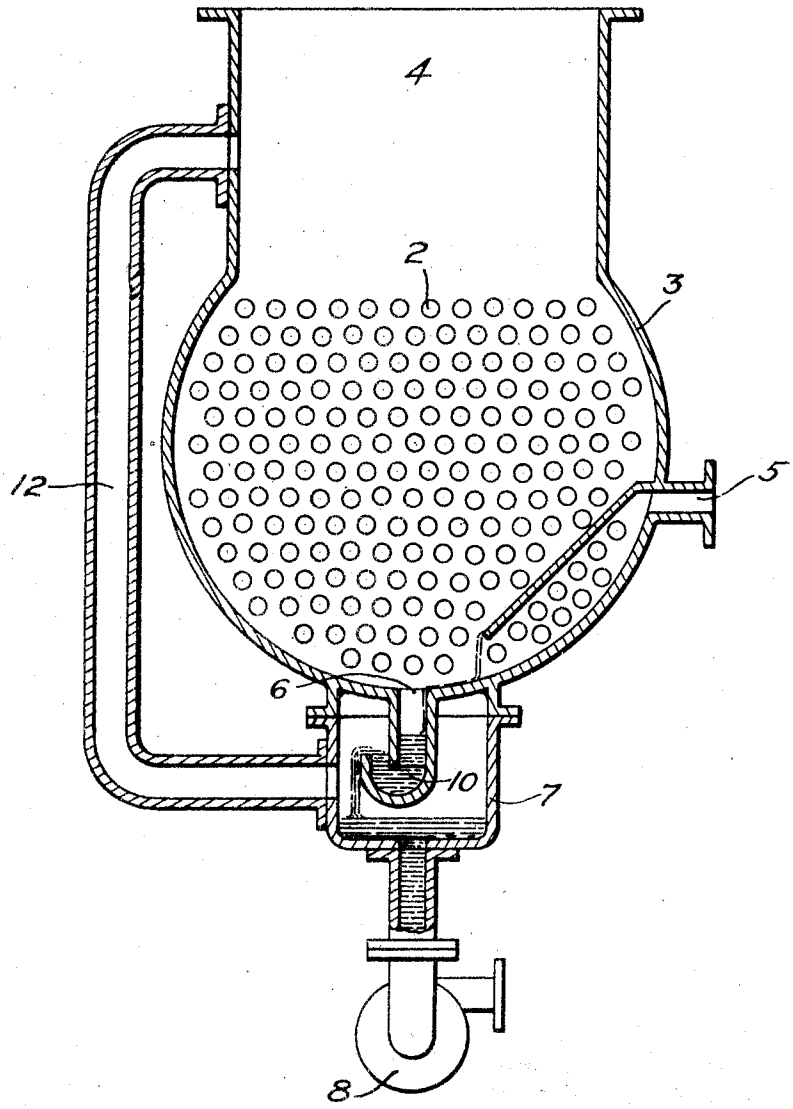
R. N. EHRHART.

CONDENSER.

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1,328,828. Patented Jan. 27, 1920



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CONDENSER.

1,328,828. Specification of Letters Patent. **Patented Jan. 27, 1920.**

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To all whom it may concern:

Be it known that I, RAYMOND N. EHRHART, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Condensers, of which the following is a specification.

This invention relates to condensers and has for an object to produce a new and improved condenser in which the condensate is heated to substantially the temperature of the fluid to be condensed.

A further object is to produce a condenser in which improved means are employed for heating the condensate as it is withdrawn from the shell of the condenser.

A further object is to produce a condenser, in which simple and effective means are employed for subjecting the condensate leaving the condenser to the heating action of the steam or hot vapors.

These and other objects are attained by means of a condenser embodying the features herein described and illustrated in the drawing accompanying and forming a part hereof.

The drawing is a diagrammatic sectional view of a condenser embodying my invention.

The condenser illustrated includes a nest of tubes 2, which is inclosed within a shell 3, and through which cooling water is circulated in the usual manner. The shell is provided with the usual inlet port 4, the usual air offtake port 5, and the usual condensate discharge port 6 which, as shown, is located in the bottom of the shell.

In the usual forms of surface condensers the condensate flows directly to a condensate or hot well 7 and is then withdrawn by a condensate pump 8. In the apparatus illustrated the condensate delivered through the port 6, first flows into and through a hydrostatic trap 10 and then drops into the condensate or hot well 7. In dropping from the trap 10 the condensate is exposed to and heated by steam which in the illustrated embodiment of the invention is delivered to the hot well 7 through a conduit 12 which communicates with the inlet port 4. As shown, this conduit is practically a by-pass around the condenser tubes and places the hot well 7 in open communication with the steam inlet of the condenser. The trap 10 prevents the steam from the hot well from entering the condenser through the port 6. It will, of course, be understood that there will ordinarily be a slight pressure drop between the inlet 4 and the hot well 7 which will be sufficient to draw steam through the conduit 12 into the hot well at such a rate as to thoroughly heat the condensate as it drops into the hot well.

As illustrated the trap 10 is so arranged that the condensate in dropping from it enters the hot well in a subdivided state, and consequently is readily heated to the temperature of the steam delivered to the hot well. The interchange of heat between the steam entering the hot well and the cooler condensate will of course occasion a condensation of the steam within the hot well so that the latent as well as the sensible heat of the steam entering the hot well will be delivered to the condensate leaving the well. This heating of the condensate is accomplished without in any way impairing the condensing efficiency of the condenser and with but a few simple and inexpensive changes in the construction of the condenser. It will, of course, be understood that the steam from any source may be delivered to the hot well, but this heating steam is preferably withdrawn from the steam passing to the cooling passages of the condenser.

While I have described and illustrated but one embodiment of my invention, it will be apparent to those skilled in the art that various changes, modifications, additions and omissions may be made in the apparatus described and illustrated without departing from the spirit and scope of the invention, as set forth by the appended claims.

What I claim is:

1. In a condenser, a shell having an inlet port formed therein, cooling elements inclosed by the shell, a hot well, a hydrostatic trap connecting the hot well with the shell through which condensate is drained to the hot well, and means for conducting fluids from the inlet port to the hot well for heating the condensate discharged from the trap.

2. A condenser having a steam inlet and a condensate outlet port, means for bypassing steam around the condenser to the outlet port in order to heat condensate issuing from said port, and means including a hydrostatic

trap for preventing steam bypassed around the condenser from entering the condenser through the outlet port.

3. A condenser having a condensate outlet port in the bottom thereof, a hot well communicating with said port, means for delivering steam to the hot well for heating the condensate delivered to the hot well from the condenser, and means including a hydrostatic trap for preventing said steam from entering the condenser through the outlet port.

4. In a condenser, a shell having a steam inlet port and a condensate outlet port, a nest of cooling elements located within the shell, a hot well for collecting the condensate withdrawn from the condenser, a hydrostatic trap for delivering the condensate to the hot well in a divided state and for preventing vapors from passing from the hot well into the condenser, and a conduit for delivering steam to the hot well from the steam inlet port of the condenser.

5. In combination with a condenser, a hot well for receiving condensate therefrom, a trap through which the condensate is delivered from the condenser into the hot well adapted to maintain a substantially uniform sealing pressure regardless of the condensate supply, and means for subjecting the condensate issuing from the trap to the direct action of steam within the hot well.

In testimony whereof, I have hereunto subscribed my name this 6th day of October, 1917.

RAYMOND N. EHRHART.

Witness:
C. W. McGHEE.