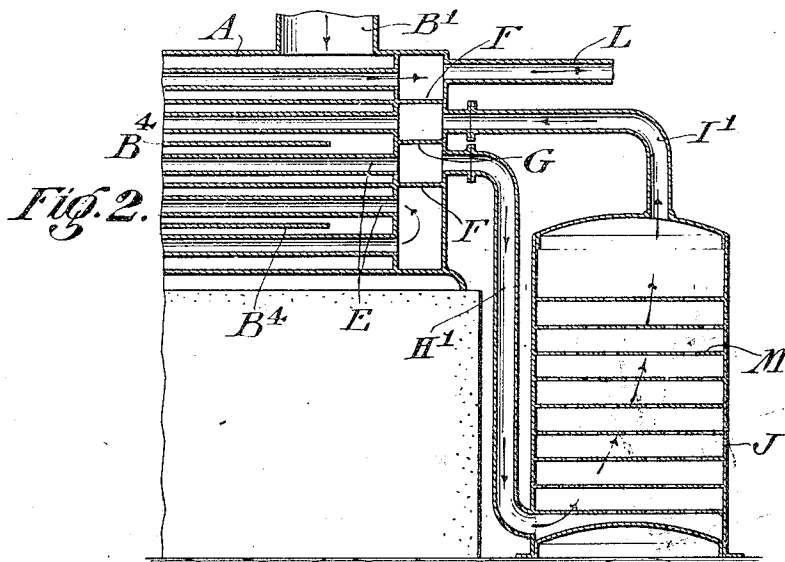
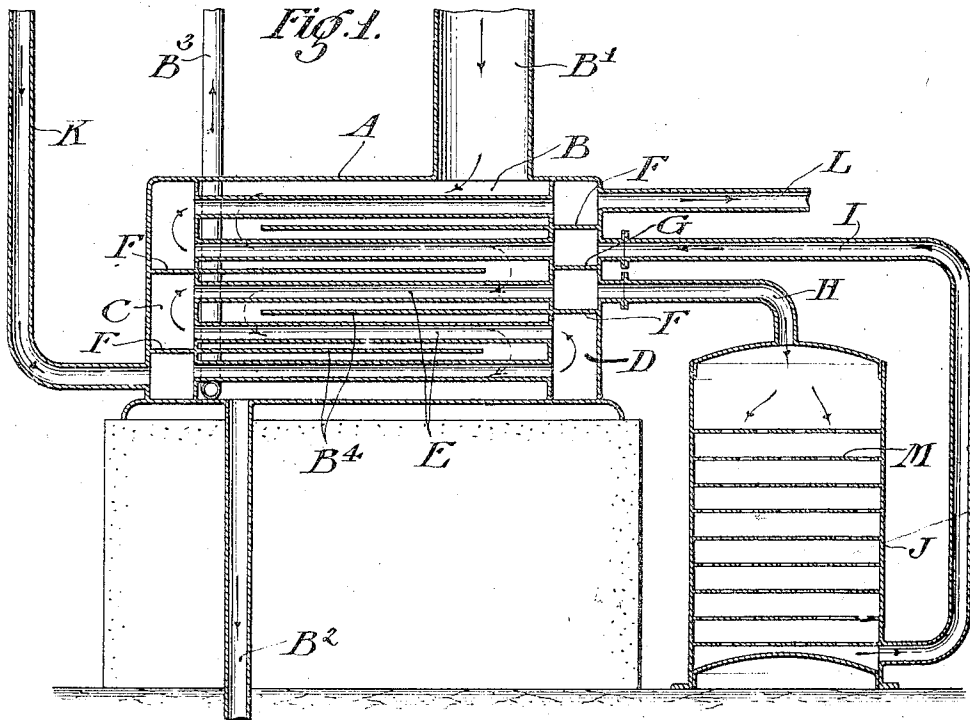


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CONDENSER.

APPLICATION FILED AUG. 12, 1910.

982,405.

Patented Jan. 24, 1911.



WITNESSES:

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CONDENSER

982,405.

Specification of Letters Patent. Patented Jan. 24, 1911.

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To all whom it may concern:

Be it known that I, EDWARD WIKI, a citizen of the Republic of Switzerland, residing in Lucerne, in the Canton of Lucerne, in the Republic of Switzerland, have invented a certain new and useful Improvement in Condensers, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention relates to condensers such as are employed for condensing exhaust steam from steam engines, and particularly to the condensers known as surface condensers.

The object of the invention is the production of a surface condenser which is simple in construction and reliable in operation, and is adapted to condense in an efficient manner a widely fluctuating supply of steam, with an economy in the size of the condensing apparatus.

In carrying out my invention I provide a condensing chamber or steam space with the usual connections, and provide in conjunction with the steam space a cooling water space separated from the steam space by thin walls of good heat conducting material, as is usual. In addition, I provide a tank or chamber which serves as an accumulator or reservoir as hereinafter described, and divide the cooling water space up into parts or portions which are so connected with each other and with the accumulator or reservoir tank that the cooling water is caused to flow first through a portion of the water space of the condenser into the reservoir, and from the reservoir passes through the remaining portion of the water space of the condenser. With this arrangement and with a fluctuating quantity of steam to be condensed, the reservoir tank or chamber gradually fills up with relatively cold water during each period in which the supply of steam to be condensed is relatively small. During a following period in which the supply of steam to be condensed is relatively large, the relatively cool water previously stored in the tank is discharged into the final portion of the water space and is effective in abstracting heat from the steam condensed in the latter. During this period the water which passes from the preliminary portion of the water space into the tank or reservoir is relatively hot, but the

relatively hot water accumulating in the tank during a period in which the supply of steam is large is naturally discharged into a basin through the final portion of the cooling space during a following period at which the supply of steam to be condensed is relatively small. During each period at which the supply of steam is relatively small, the steam can be effectively condensed by the water passing through the preliminary portion of the cooling water space, though usually, of course, the water passing into the final cooling water space from the reservoir is not hot enough to prevent it from serving to some extent as a condensing agent. It will, of course, be understood that the capacity of the accumulator or reservoir should be great enough so that the reservoir will hold all or practically all of the water passing into the accumulator during each of the periods of maximum steam supply. In some cases it may be desirable to make special provisions for insuring a relatively small intermixture of water passing into the accumulator or reservoir, with that already therein, so that the entering water acts as like a solid piston, so to speak, to directly push out the water already filling the accumulator or reservoir. The use of the invention is inherently adapted to produce suitable and efficient conditions of operation, with a fluctuating quantity of steam to be condensed. Moreover, where the steam supply is fluctuating, the use of the invention permits of the use of a smaller condenser than would otherwise be possible, since the condenser proper needs to be proportioned, not to the maximum supply of steam to be condensed but to the average steam supply. With a given rate of flow of cooling water into the condenser proper, the use of the invention practically doubles the amount of steam which can be condensed for short intervals with the maintenance of the desired vacuum, since as much water flows into the condenser from the reservoir as flows through the initial supply pipe.

The various features of novelty which characterize my invention are pointed out with particularity in the claim annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference may be had to the accompany-

ing drawing and, descriptive matter, in which I have illustrated and described forms in which the invention may be embodied.

Of the drawings: Figure 1 is a sectional elevation of a condenser embodying one form of my invention. Fig. 2 is a partial sectional elevation taken similarly to Fig. 1, and illustrating a modified form of the invention.

10 In the drawing, and referring first to the construction shown in Fig. 1, A represents the condenser; B the steam chamber thereof, to which steam from the reciprocating engine, turbine, or the like, is admitted through
15 the pipe B'. B² represents the discharge connection from the chamber B for water formed by the condensation of steam. B³, in the construction illustrated, represents the connection to the air pump for drawing
20 air out of the chamber B. As shown, the connection B³ leads from the chamber B at the coolest point of the chamber. B⁴ represents baffles for causing the steam to take a zig-zag course through the chamber B.

25 The cooling water space of the condenser is formed by chambers C and D at the ends of the chamber B, and by passages E, running through the chamber B, and connecting chambers C and D. The cold water
30 supply connection K runs to the lower end of the chamber C, and the cooling water finally leaves the condenser through the connection L, leading from the upper end of the chamber D. Barriers or partitions F in
35 the compartments C and D cause the cooling water to take a generally zig zag course through the chambers and passages of the condenser, and the water space of the condenser proper is divided into a lower preliminary portion and an upper final portion
40 by the barrier G. The two portions are connected through the accumulator or reservoir J by the pipe H leading from the compartment D just below the barrier G, to the upper
45 end of the accumulator J, and by the pipe I leading from the lower end of the accumulator J to the compartment D, just above the barrier G. To prevent water admitted to the top of the reservoir J from

falling through the body of the water in the 50 reservoir J to the outlet pipe I, perforated baffles M may be arranged within the reservoir, as shown. These baffles serve to cause the water in the reservoir to act like a piston, so to speak, to bodily force out the water 55 already in the reservoir, and thus prevent to a great extent any mixture between portions of water, within the reservoir of different temperatures. The accumulator J may be placed in any suitable location near 60 the condenser, or more or less remote as conditions may require. In some cases it may be desirable to place the accumulator or reservoir beneath the condenser. While in general I prefer to have the water pass into 65 the reservoir J at its upper end, in some cases it may be desirable to admit it at the lower end, and discharge it at the upper end, as shown in Fig. 2.

While, in accordance with the provisions 70 of the statutes, I have herein illustrated and described the best form of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of my invention without 75 departing from the spirit thereof.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

In a surface condenser the combination 80 with the steam space and connection thereto, of a water space divided into two portions, a reservoir and connections between said reservoir and said portions whereby the cooling water is caused to flow first through a 85 portion of the water space of the condenser, then through the reservoir, and then through the remaining portion of the water space of the condenser, and relatively cool water is stored in said reservoir during a 90 period in which the steam to be condensed is relatively small in amount, effective to assist in condensing the steam where a supply to be condensed is relatively large.

EDWARD WIKI.

Witnesses:

FRANZ WIDMER,
JULIUS HARTMANN.