G. M. HILGER.

VAPOR CONDENSER.

APPLICATION FILED JUNE 28, 1913.

1,105,430. Patented July 28, 1914.

Fig. 1.

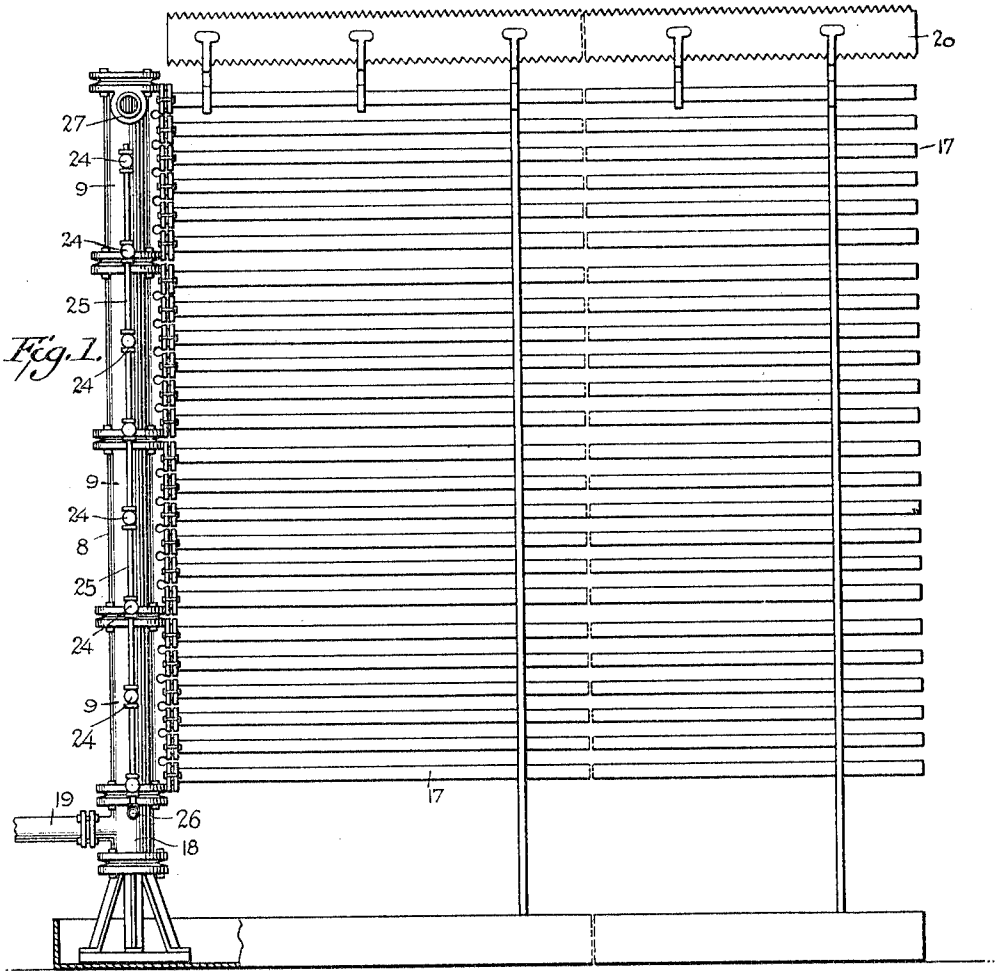


Fig. 2.

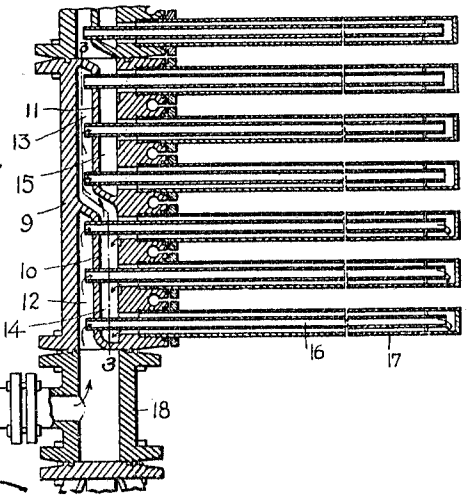
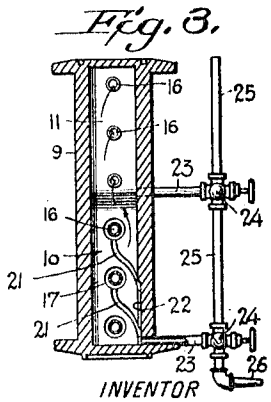


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE MICHAEL HILGER, OF CHICAGO, ILLINOIS.

VAPOR-CONDENSER.

1,105,430. Specification of Letters Patent. Patented July 28, 1914.

Application filed June 28, 1913. Serial No. 776,307.

To all whom it may concern:

Be it known that I, GEORGE M. HILGER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Vapor-Condenser, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: To provide a condenser constructed and arranged to cause the liquid vapor to travel in a current or direction counter to the flow of a cooling fluid; to provide means for separating the condensed vapors from contained gases; and to provide means whereby the products of condensation are conveyed out of the path of the flowing gas, to avoid being carried over by suspension therein.

One embodiment of the present invention is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a condenser constructed and arranged in accordance with the present invention; Fig. 2 is a vertical section, on an enlarged scale, showing the inlet head, one of the manifolds of the distributing column, and in broken and condensed form a plurality of the distributing and cooling pipes extended from said distributing column; Fig. 3 is a detail view, on an enlarged scale, showing in section taken on the line 3—3 in Fig. 2, a manifold and fragment of a drainage pipe therefor.

In a former patent of the United States, No. 980,637, for vapor condenser, granted to me under date of January 3, 1911, I employ a distributing column resembling that shown in the accompanying drawings and designated by the numeral 8. The manifolds 9 in the present invention are provided with partitions 10 and 11, dividing the lower and upper halves of the manifolds vertically, to form distributing chambers 12 and 13, and receiving chambers 14 and 15. As described in the former patent to which reference has been made, the partitions 10 and 11 support distributing pipes 16, both ends of which pipes are open, one end communicating with the chambers 12 and 13 and the other end opening into laterals 17. The laterals 17 are in open communication with the receiving chambers 14 and 15 in the manifold 9. In the present construction, the receiving head 18 is secured to the column 8 at the bottom thereof, the return pipe 19 of the gas system entering the head 18 at the lower end of the column.

A water-cooling system is employed in conjunction with the condenser, to deliver the water on a spreader blade 20, suitably mounted above the laterals 17 to guide the water thereover. As the water thus delivered drips from lateral to lateral, it will be seen that the heat of the gas flowing through the pipes 16 and laterals 17 is reduced in proportion as it approaches the last or topmost of the laterals 17. In this manner, it will be noted, the transference of heat is more perfectly provided for, as thereby the gas of the lowest temperature is brought in contact with the water at its lowest temperature. As the degree and rate of transfer of heat is in direct ratio to the variation in temperature between the two elements, the gas by this method is in its final delivery refrigerated to a greater degree than provided for in the former construction.

During the radiation of heat from the gas, as above described, moisture contained therein is condensed, and is carried by the laterals 17 to the distributing column 8 and manifolds 9 thereof to the receiving chambers 14 and 15 of said manifolds. The liquid thus condensed is conveyed by curved channels 21 formed in the walls of the chambers 15, to avoid the delivery openings in said chambers. The condensation is of such a character that were not such provision made, it would readily atomize or be carried over by the gas flowing upward from the lowermost of the openings into the chambers 14 and 15. The channels 21 unite with and deliver into a vertical channel 22, which delivers to the bottom of the chambers 14 and 15. The chambers 14 and 15 are tapped by small drainage pipes 23, to convey the products of condensation through valves 24 to a leader 25, which at the lower end connects with a waste drain 26.

By means of the construction above described, the gas returned by the pipe 19 from the system is conveyed upward in the presence of a downward flowing stream of cooling water, and the products of condensation are concentrated in the manifolds and drained therefrom, to be carried away as waste, or preserved as liquor. The cooled and purified gas is carried off by a pipe 27 to a compressor or other element in the system of which the condenser forms a part.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A vapor condenser, comprising a vertical distributing column having an inlet at the lower end thereof and an outlet at the upper end thereof, said column being provided with a plurality of gas-receiving and gas-distributing chambers; a plurality of superposed circulating pipe laterals operatively and progressively connecting said receiving and distributing chambers, said receiving chambers each being provided with a series of guide grooves leading from the openings of said laterals in said chamber to the bottom of said chamber; and a water-cooling system arranged to deliver water initially upon the uppermost of said laterals.

2. A vapor condenser, comprising a vertical distributing column having an inlet at the lower end thereof and an outlet at the upper end thereof, said column being provided with a plurality of gas-receiving and gas-distributing chambers; a plurality of superposed circulating pipe laterals operatively and progressively connecting said receiving and distributing chambers, said receiving chambers each being provided with a series of guide grooves leading from the openings of said laterals in said chamber to the bottom of said chamber; a series of drain pipes opening from each of said receiving chambers, at the bottom thereof, to drain the condensed liquid therefrom; and a water-cooling system arranged to deliver water initially upon the uppermost of said laterals.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE MICHAEL HILGER.

Witnesses:
WILLIAM S. LESLIE,
WM. MACASKILL.

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