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ABSORBER FOR AMMONIA ABSORPTION REFRIGERATING MACHINES.

APPLICATION FILED JUNE 14, 1907.

983,731. Patented Feb. 7, 1911.

Fig.1.

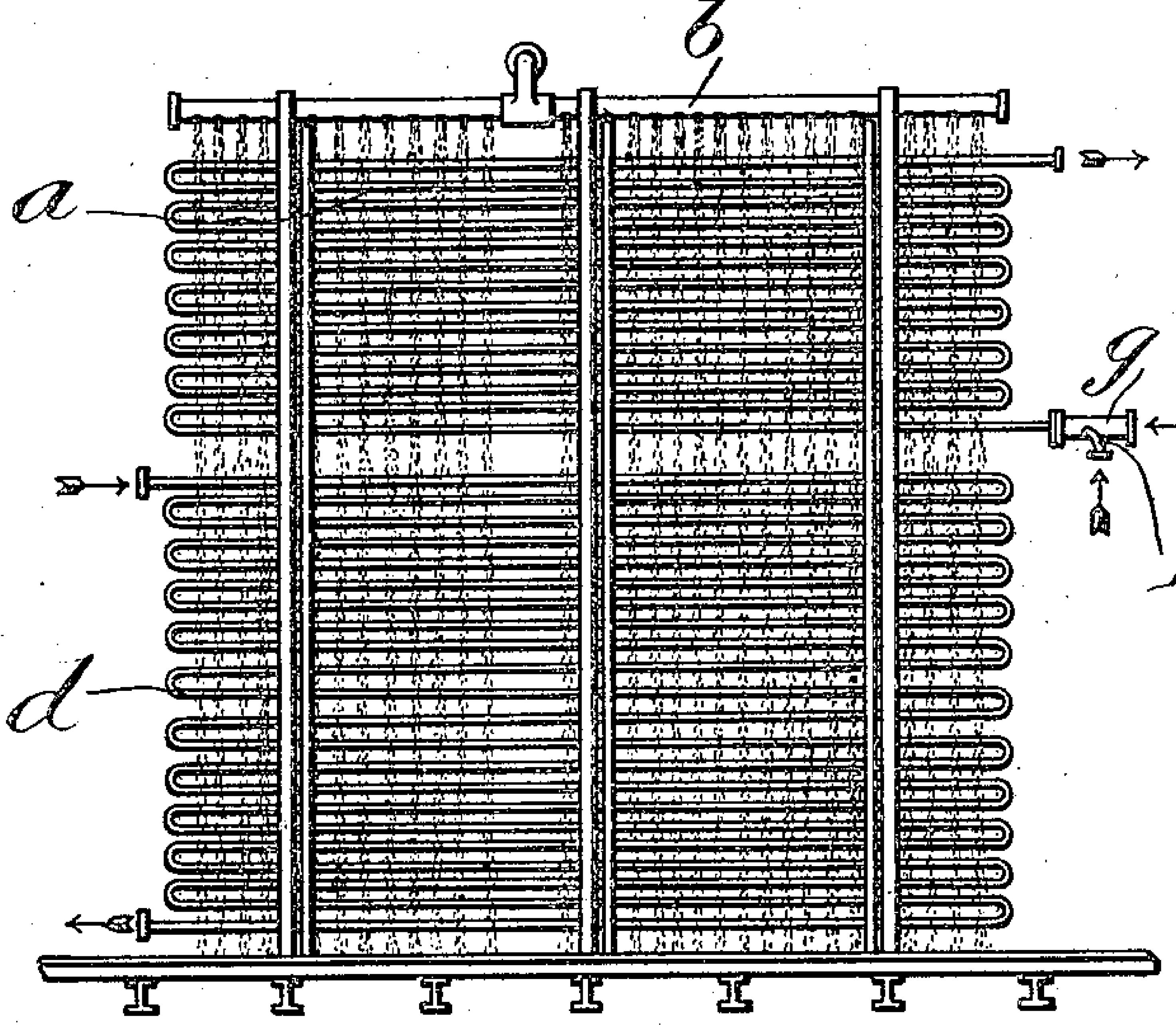


Fig.2.

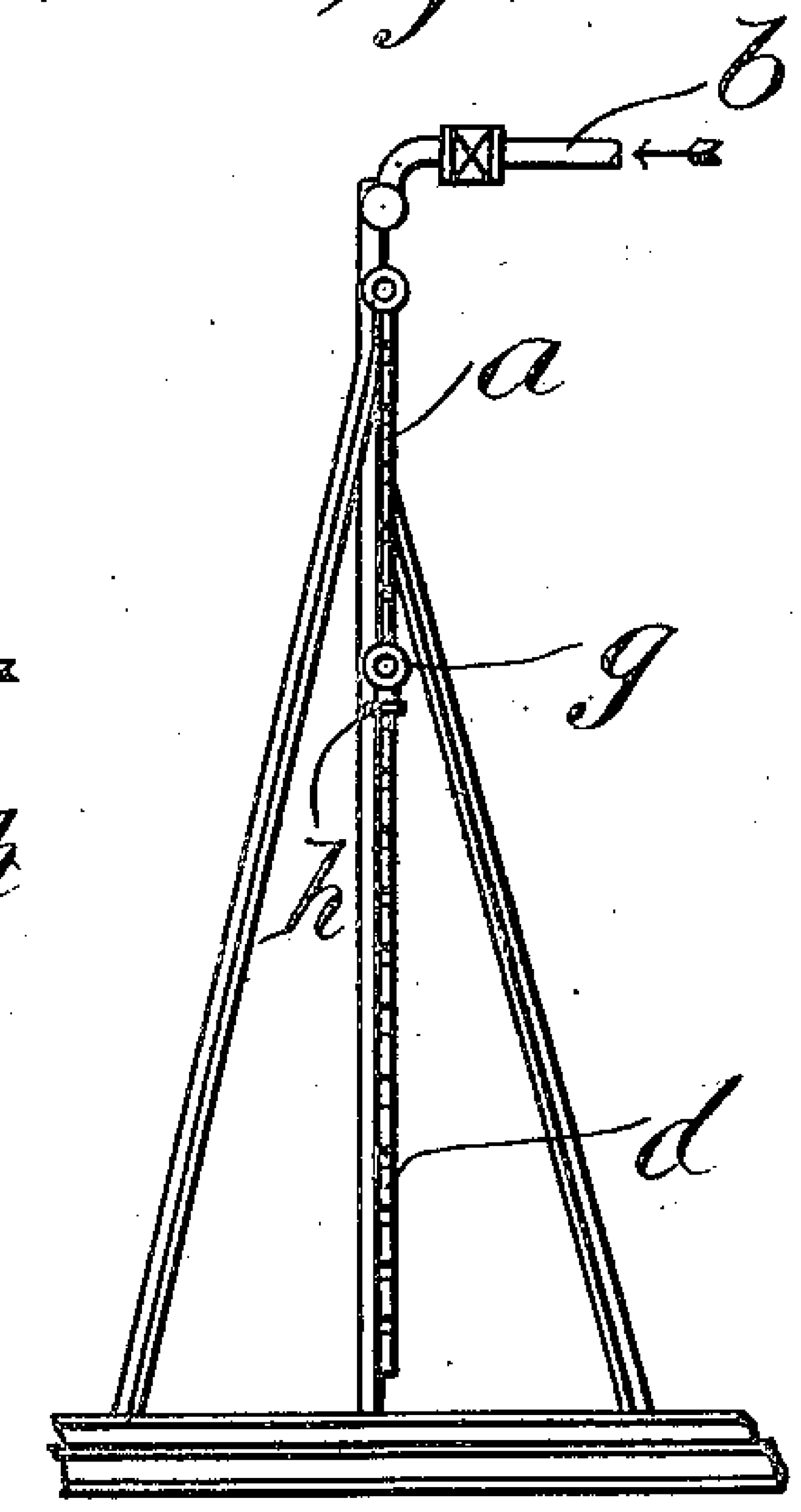
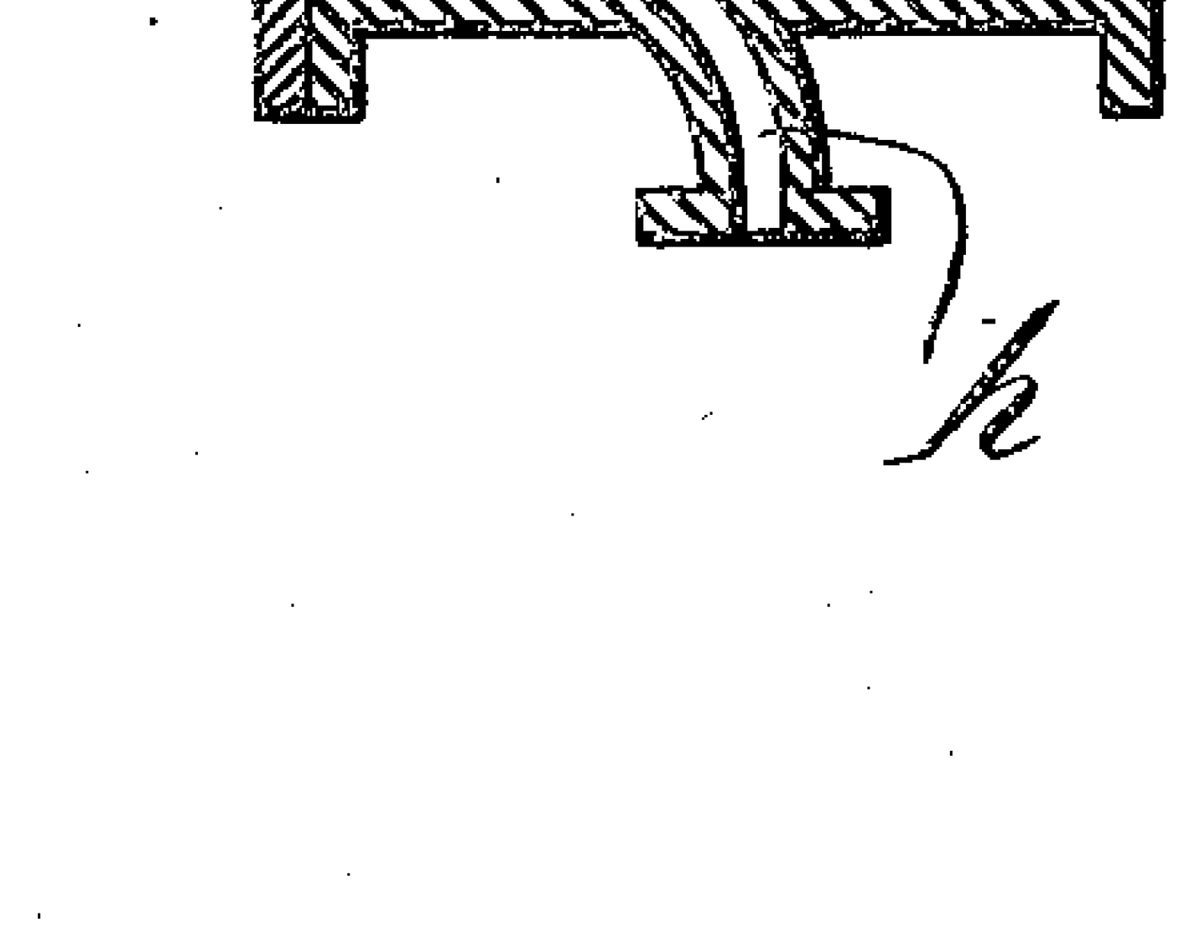


Fig.3.



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ABSORBER FOR AMMONIA-ABSORPTION REFRIGERATING-MACHINES.

983,731. Specification of Letters Patent. Patented Feb. 7, 1911.

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To all whom it may concern:

Be it known that I, OTTO LINDEMANN, a subject of the German Emperor, and resident of No. 1ª Averhoffstrasse, Hamburg, Germany, have invented certain new and useful Improvements in Absorbers for Ammonia-Absorption Refrigerating-Machines, of which the following is a specification.

The present invention relates to an absorber for ammonia-absorption refrigerating machines, and the object thereof is to produce a solution so highly saturated that the absorption machine can be operated with exhaust steam of 212° F.

The present invention consists of a single continuous length of pipe in which a mixture of ammonia gas and weak liquor is confined until the weak liquor has absorbed its full capacity of gas; a further feature of the invention consists of an absorber coil and a condenser coil arranged to have the same body of water flow over both.

Referring to the drawing; Figure 1 illustrates a front view of the preferred embodiment of my invention; and Fig. 2 illustrates a side view of the same; Fig. 3 is an enlarged detail sectional view of the supplying device of the absorber.

The absorber tube of my invention is disposed in the form of a coil *a*, and it is fed by a supplying device consisting of a short length of pipe *g* having a branch *h*. The pipe from a distilling boiler (not shown) is coupled to the branch *h* and a pipe from a vaporizer (not shown) is coupled to the short pipe length *g*, while the opposite end of this supplying device has one end of the coil *a* coupled thereto. A perforated pipe *b* located above this coil sprays water over the same. The weak solution which comes from the distilling boiler (usually under a pressure of about 150 pounds) enters into the tube *a* together with the ammonia-gas which comes (under a pressure of about 25 pounds) from the vaporizer, and are passed through the coil in an upward direction, while the cooling water flows downwardly from the pipe *b* at the top.

It is a well known fact that the lower the temperature of the weak solution the greater the amount of gas it will absorb, that this absorption takes place gradually until the weak liquor has obtained its full capacity, that the liquor requires more and more time to absorb the gas as it nears its full capacity, that heat is generated by the act of absorption, and that the longer the gas and weak solution are kept in close contact with each other the greater will be the tendency for the temperature to increase. Consequently by taking away the heat immediately it is generated the weak solution is kept cool and is therefore maintained in a condition to absorb its maximum quantity of gas. Furthermore by keeping the liquor and gas in intimate relation under the most effective cooling conditions for a long time the liquor will absorb its full capacity of gas. This is obtained, according to this invention, by causing the mixture to be subjected to a cooling medium the temperature whereof decreases as the liquor nears its full capacity. The effect is that the weakness of (absence of gas in) the liquor as it enters the coil enables it to absorb a relatively great amount of gas and therefore the cooling water at this point need not be at a very low temperature, whereas when the liquor nears its full capacity for the gas it absorbs more in proportion to the lowness of its temperature which result is attained by causing the cooling water to act first upon this end of the coil. By this counter-current arrangement therefore the gas is more readily absorbed by the weak solution without pressure being created at any point in the coil, and furthermore the absorption is uniform. The solution which comes out from the upper end of the coil is consequently very highly saturated and the gas therein can be separated from the liquor at a very low temperature such as that of exhaust steam (212° F.)

In order to utilize the water falling from this absorber in connection with a condenser, a condenser coil is located at *d* beneath the absorber coil and such water is thereby caused to fall thereon from the absorber, and condensation in the condenser is thus caused by the same water. The flow

through the pipes of the absorber is, as before mentioned upwardly, and through the condenser downwardly.

I claim:

A combined ammonia absorber and condenser consisting of an absorber coil, and a condenser coil the absorber coil being supported above the condenser and in the same vertical plane, and means for causing water to fall upon the absorber coil and therefrom upon the condenser coil.

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