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A. C. E. RATEAU.

VAPOR GENERATOR.

APPLICATION FILED MAY 21, 1903.

NO MODEL.

Fig. 1.

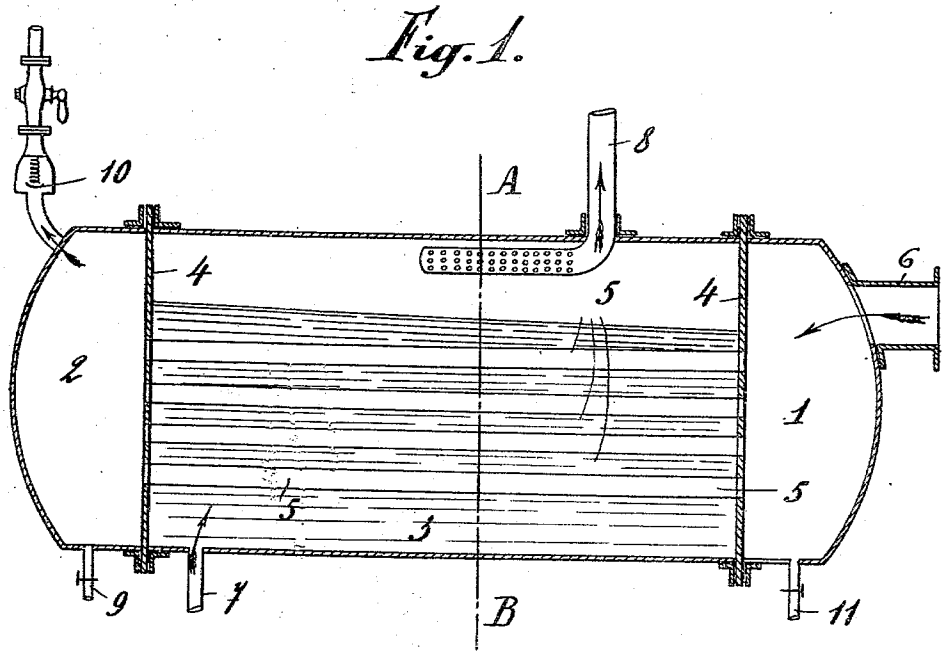
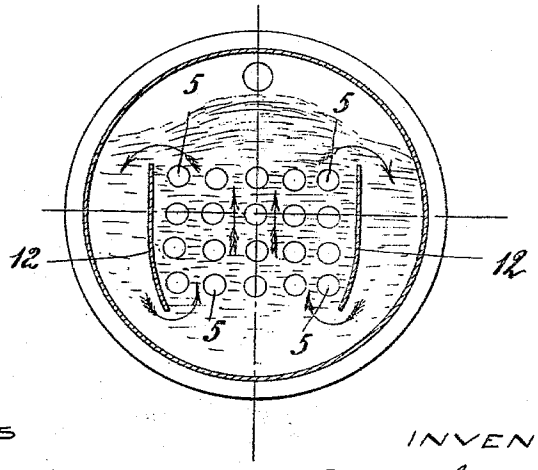


Fig. 2.



WITNESSES

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No. 751,998. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

AUGUSTE CAMILLE EDMOND RATEAU, OF PARIS, FRANCE.

VAPOR-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 751,998, dated February 9, 1904.

Original application filed March 25, 1902, Serial No. 99,923. Divided and this application filed May 21, 1903. Serial No. 158,131.

(No model.)

To all whom it may concern:

Be it known that I, AUGUSTE CAMILLE EDMOND RATEAU, engineer, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Vapor-Generators, of which the following is a specification.

My invention is an improvement in regenerative accumulators; and my object is to effect the exchange of heat between a body of intermittently-flowing steam and any suitable liquid capable of vaporizing, such as water and the like, and producing steam. To do this, it is necessary to separate the two fluids by means of a metal wall, and the apparatus is then based upon the principle of a surface condenser and arranged in order to vaporize the cooling liquid instead of simply heating it. It is well known that these condensers are composed of iron or brass tubes arranged in a group in a body of cylindrical or other suitable form. The escaping steam to be condensed is brought into the tubes, and I place round the tubes the liquid to be vaporized. As the apparatus has to serve as an accumulator, it must necessarily contain a great weight of liquid forming a heat-carrier, and as it is, on the other hand, convenient to let the temperature between the flowing steam and that supplied by the apparatus fall as little as possible it will be useful to have a relatively elevated surface of tubes.

The annexed drawings show a steam regenerative accumulator based upon the use of a construction similar to that of a surface condenser.

Figure 1 is a longitudinal section of a boiler having its longitudinal axis slightly inclined on the horizontal plane. Fig. 2 is a transverse section taken on line A B, Fig. 1.

The boiler is divided by aid of two walls 4 4 into three compartments 1, 2, and 3. The central compartment 3 is nearly completely filled up with a liquid to be vaporized and is fitted with a number of tubes 5, putting the two compartments 1 and 2 into communication. The intermittent current of steam escaping from a first machine enters into the compartment 1 through the inlet-pipe 6. The liquid to be vaporized regularly is introduced into the central compartment 3 through the pipe 7, and the generated vapor is conducted through the pipe 8, provided with a valve, to the machine which is to be actuated. The water resulting from the condensation of the steam in the tubes 5 flows into the compartment 2, out of which it is expelled through an outflow 9. The air may be expelled through an automatic valve 10.

11 designates an outflow for the compartment 1.

In order to increase the circulation of the vaporizing liquid around the tubes 5, a longitudinal plate 12, forming, as in my former application, a central shaft, is placed on each side of the group of tubes. The vapor generated in proximity of the tubes 5 in said central shaft causes the circulation of the vaporizing liquid as shown by the arrows on the drawings.

The accumulation of vapor takes place during the intermittences of the inlet of steam through pipe 6, owing to the weight of liquid contained in the boiler and to the variations of pressure and temperature.

It will be observed that in the above-described apparatus the intermittent current of steam is led into the tubes of the boiler, while the vaporizing liquid is contained in the boiler around the said tubes. It will be obvious that the apparatus could be indifferently used in this way or in an inverted manner, the vaporizing liquid being in this case introduced into the tubes, while the intermittent current of steam would be introduced into the boiler around the tubes. The result would be the same without any change to the apparatus.

What I claim is—

1. In a steam regenerative accumulator a boiler, two walls dividing the boiler into three compartments, a group of tubes placed in the central compartment and putting the end compartments in communication with each other, an inlet-pipe for the current of steam, an outlet-pipe for the generated vapor, and longitudinal plates on each side of the group of tubes, substantially as described and for the purpose set forth.

2. A steam regenerative accumulator, comprising a boiler the longitudinal axis of which is slightly inclined, two walls dividing the boiler into a central and two end compartments, a group of tubes placed in the central compartment and putting the end compartments in communication with each other, an inlet-pipe for the introduction of an intermittent current of steam into the group of tubes, an outlet-pipe for the vapor generated in the central compartment, longitudinal plates on each side of the group of tubes the said plates forming a central shaft in the central compartment so as to cause the circulation of a heat-carrier liquid around the tubular group and an outflow-pipe for the water condensed in the group of tubes substantially as described and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

AUGUSTE CAMILLE EDMOND RATEAU.

Witnesses:

M. ZEROLO,

J. ALLISON BOWEN.