

Sept. 24, 1929.

C. G. MUNTERS

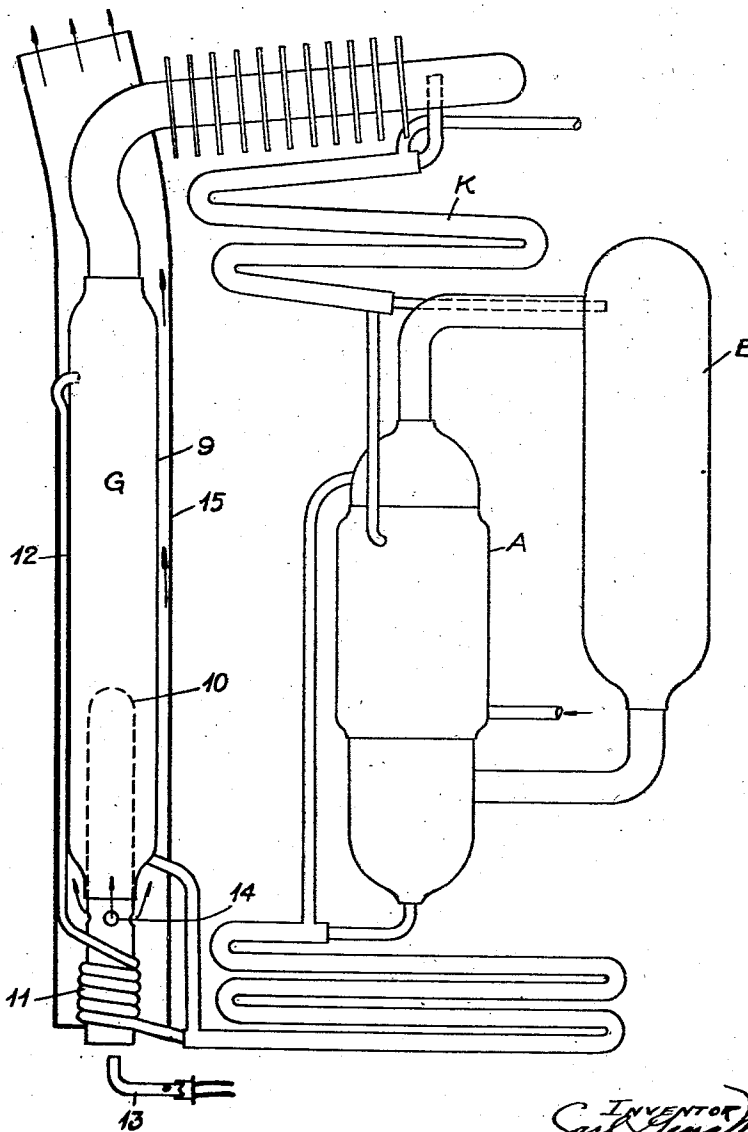
1,729,355

REFRIGERATING APPARATUS OF THE ABSORPTION TYPE

Filed March 16, 1927

2 Sheets-Sheet 1

Fig. 1



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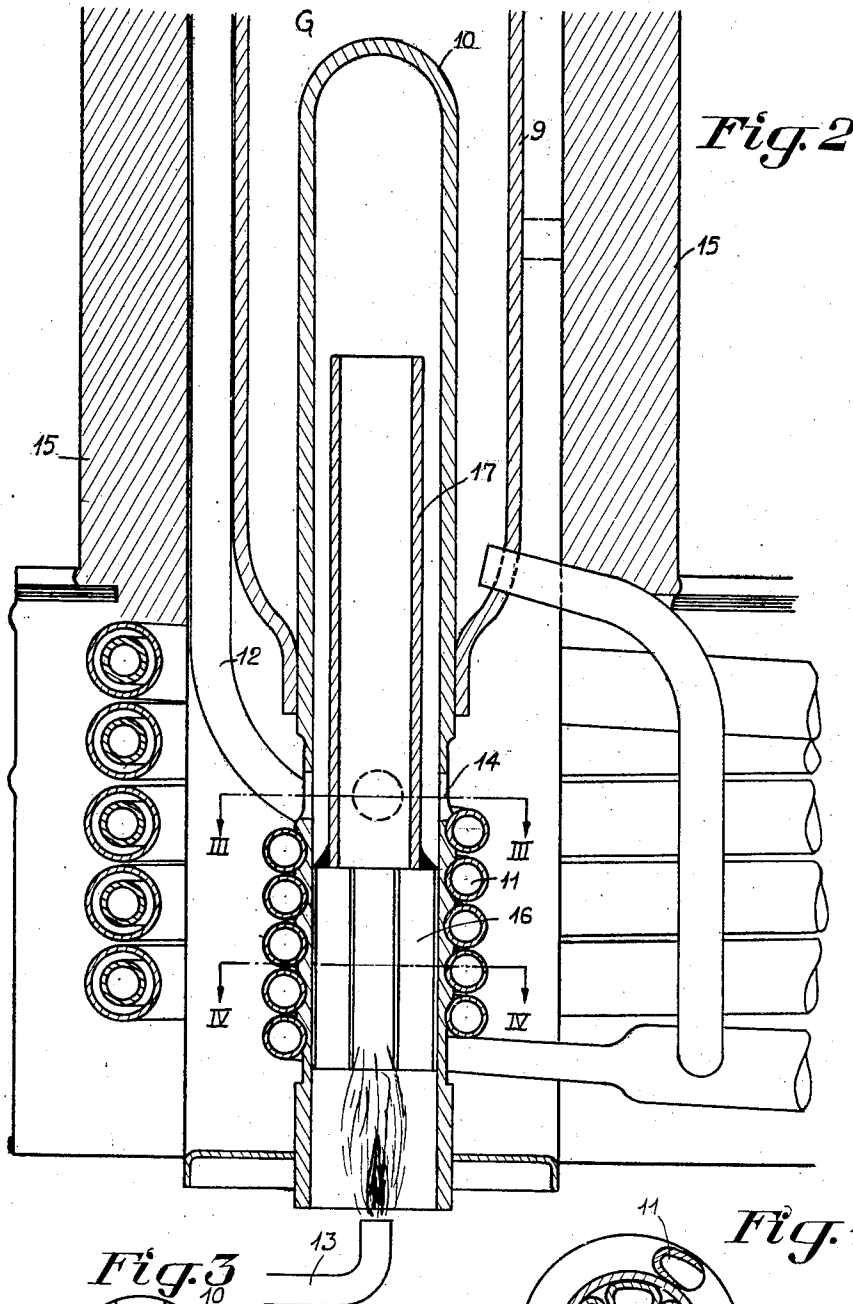


Fig. 2

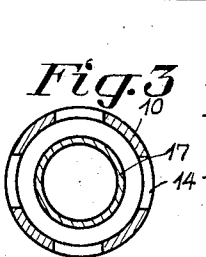


Fig. 3

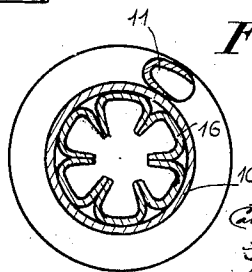


Fig. 4

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UNITED STATES PATENT OFFICE

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REFRIGERATING APPARATUS OF THE ABSORPTION TYPE

Application filed March 16, 1927, Serial No. 175,649, and in Sweden March 16, 1926.

My invention relates to refrigerating apparatus in general and more specifically to refrigerating apparatus of the type wherein an auxiliary agent is circulated between and through the evaporator and absorber for equalizing the pressure within the apparatus.

In particular, my invention relates to the arrangement of a generator for refrigerating apparatus wherein a hollow member extending within the generator serves as a flue for combustion gases when the apparatus is heated by a gas flame, which hollow member contains a removable baffle, the removability of which permits the heating of the generator by electricity. My invention further relates to baffling means in the flue of a generator for refrigerating apparatus.

The invention will be explained with reference to the accompanying drawings of which:

Fig. 1 shows, more or less diagrammatically, an absorption refrigerating system embodying the invention;

Fig. 2 is a cross-sectional view of part of the generator of the system of Fig. 1;

Fig. 3 is a sectional view taken on line III—III of Fig. 2; and

Fig. 4 is a sectional view taken on line IV—IV of Fig. 2.

The absorption refrigerating system shown includes a boiler or generator G, a condenser K, an evaporator E, and absorber A and pipes connecting these parts together. The type of system shown is that disclosed in U. S. Patent No. 1,609,334 granted December 7, 1926, which is known wherefore it is not necessary to describe the general process thereof.

The heating device for the apparatus comprises a hollow member 10 which is open at the bottom and closed at the top. Hollow member 10 projects into generator G through the lower part of generator shell 9. The lower part of hollow member 10 extends below the generator and constitutes a sleeve portion, around which extends a thermo-siphon heater element in the form of a coil 11. The upper part of coil 11 is connected to a pipe 12 which is connected to the gas space of the generator. Hollow member 10 projects into the liquid space of the boiler and thus is in direct con-

tact with liquid in the generator and with thermo-siphon coil 11. Hollow member 10 is so arranged that it can serve for heating the apparatus either by gas or electricity.

When the apparatus is heated by gas, a burner 13 is arranged below hollow member 10 so as to direct a flame up into the hollow member. Gaseous products of combustion leave hollow member 10 through openings or passages 14. Generator G and its heating device are surrounded by a casing 15 which extends from below the thermo-siphon coil 11 upwardly to above the generator and which is closed at the bottom and open at the top. Casing 15 is preferably made of insulating material or covered with insulating material. Products of combustion after passing through openings 14, sweep past the generator shell and heat the absorption liquid therein.

Fig. 2 shows the preferred arrangement for gas heating comprising a baffle composed of parts 16 and 17 which are welded together. Part 17 extends within the upper part of hollow member 10 forming a baffle for reversing the flow of products of combustion within the hollow member. Part 16 is constructed as shown in Fig. 4 and forms a central channel into which the flame from the burner 13 is directed. Part 16 is in direct contact with hollow member 10 and serves to conduct heat to coil 11. The gases of combustion flow upwardly through tubular member 17, flow downwardly within hollow member 10, around tubular member 17 and out through openings 14 into the space between casing 15 and the generator shell. The baffle 16—17 is of particular advantage when the heat equivalent of the gas is particularly high.

Hollow member 10 and the parts 15, 16 and 17 should be made of material which does not rust, for instance stainless steel, aluminum or the like.

When the apparatus is heated by electricity the baffle 16—17 is removed and an electric heating element is inserted into the hollow member 10. The electric heating element should be of such length that it extends well up into hollow member 10 so as to heat the liquid in generator G. It will be evident that the formation of part 16 gives a resiliency

which permits ready removal while at the same time gives good contact when the baffle is inserted in hollow member 10.

While I have described one form of my invention, it will be understood that variations are possible within the spirit and scope of the invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. Refrigerating apparatus of the absorption type comprising a generator, a condenser, an evaporator, an absorber, said generator having a hollow member projecting thereinto, said hollow member having a sleeve portion outside the generator, a gas burner directed into said hollow member and baffling means within said hollow member, said baffling means having a passageway therethrough for the passage of products of combustion.

2. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member projecting into said shell and having a closed end within the generator shell and a sleeve portion extending outside the generator shell, a thermo-siphon heater element in contact with said sleeve portion, a baffle within said hollow member and passages for products of combustion in said sleeve portion.

3. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member extending within said shell and having a sleeve portion extending outside said shell, a thermo-siphon heater element in contact with said sleeve portion, a gas burner directed into said hollow member, passages for products of combustion in said sleeve portion and a baffle within said hollow member having a portion in contact with the sleeve portion and a portion for directing products of combustion within the hollow member and out through said passages.

4. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member projecting into said shell and having a closed end within the generator shell and a sleeve portion extending outside the generator shell, a thermo-siphon heater element in contact with said sleeve portion, a baffle within said hollow member and passages for products of combustion in said sleeve portion, said baffle being removable and said hollow member being arranged and adapted to receive an electric heating element upon removal of said baffle.

5. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member extending within said shell and having a sleeve portion extending outside said shell, a thermo-siphon heater element in contact with said sleeve portion, a gas burner directed into said hollow member, passages for products of combustion in said

sleeve portion and a baffle within said hollow member having a portion in contact with the sleeve portion and a portion for directing products of combustion within the hollow member and out through said passages, said baffle being removable and said hollow member being arranged and adapted to receive an electric heating element upon removal of said baffle.

6. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member extending within said shell and having a sleeve portion extending outside said shell, a thermo-siphon heater element in contact with said sleeve portion, a gas burner directed into said hollow member, passages for products of combustion in said sleeve portion and a baffle within said hollow member having a portion in contact with the sleeve portion and a portion for directing products of combustion within the hollow member and out through said passages, the arrangement being such that the flow of products of combustion is reversed in its passage within the hollow member.

7. Refrigerating apparatus comprising a generator, an absorber, a condenser, an evaporator, means to circulate gaseous fluid between the evaporator and absorber for equalizing pressure, conduits connecting the condenser with the generator and with the evaporator, a conduit connecting the lower part of the generator with the upper part of the absorber, a conduit connecting the lower part of the absorber with the upper part of the generator comprising a thermo-siphon heater element, a hollow member projecting into said generator and having a sleeve portion extending outside said generator, said thermo-siphon heater element being arranged in contact with said sleeve portion, a gas burner directed into said hollow member, passages for products of combustion in said sleeve portion and a baffle within said hollow member having a portion in contact with said sleeve portion and a portion for directing and reversing the flow of products of combustion within the hollow member, said baffle being removable and said hollow member being arranged and adapted to receive an electric heating element on removal of said baffle.

8. A generator for refrigerating apparatus of the absorption type comprising a generator shell, a hollow member projecting into said shell and having a closed end within the generator shell and a sleeve portion extending outside the generator shell, a thermo-siphon heater element in contact with said sleeve portion, a baffle within said hollow member, passages for products of combustion in said sleeve portion and a casing surrounding and spaced from said generator shell and having an outlet for the discharge of products of combustion.

9. A generator for refrigerating apparatus

of the absorption type comprising a generator shell, a hollow member extending within said shell, a casing surrounding and spaced from said shell, a thermo-siphon heater element
5 within said casing, a passageway for products of combustion to pass from within said hollow member to within said casing and said casing having an outlet for the discharge of products of combustion.

10 In testimony whereof I affix my signature.
CARL GEORG MUNTERS.

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