

June 3, 1930.

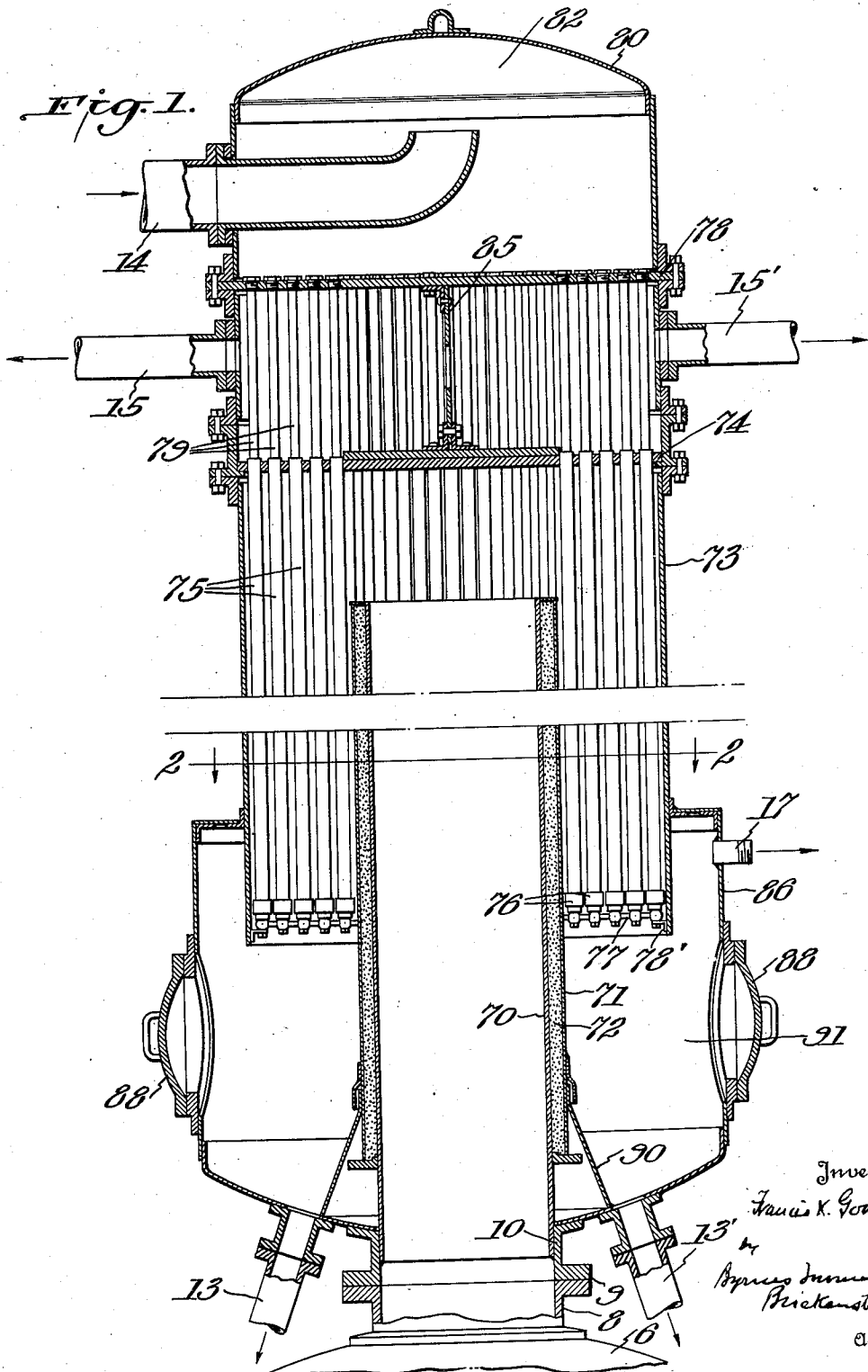
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CONDENSER

Filed Nov. 5, 1928

2 Sheets-Sheet 1



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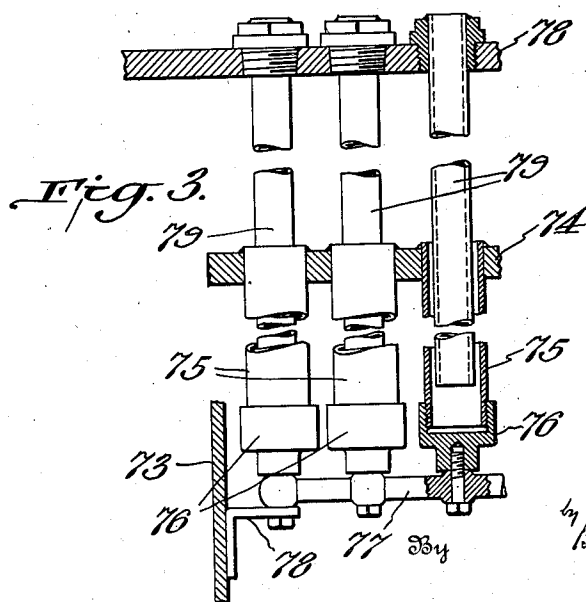
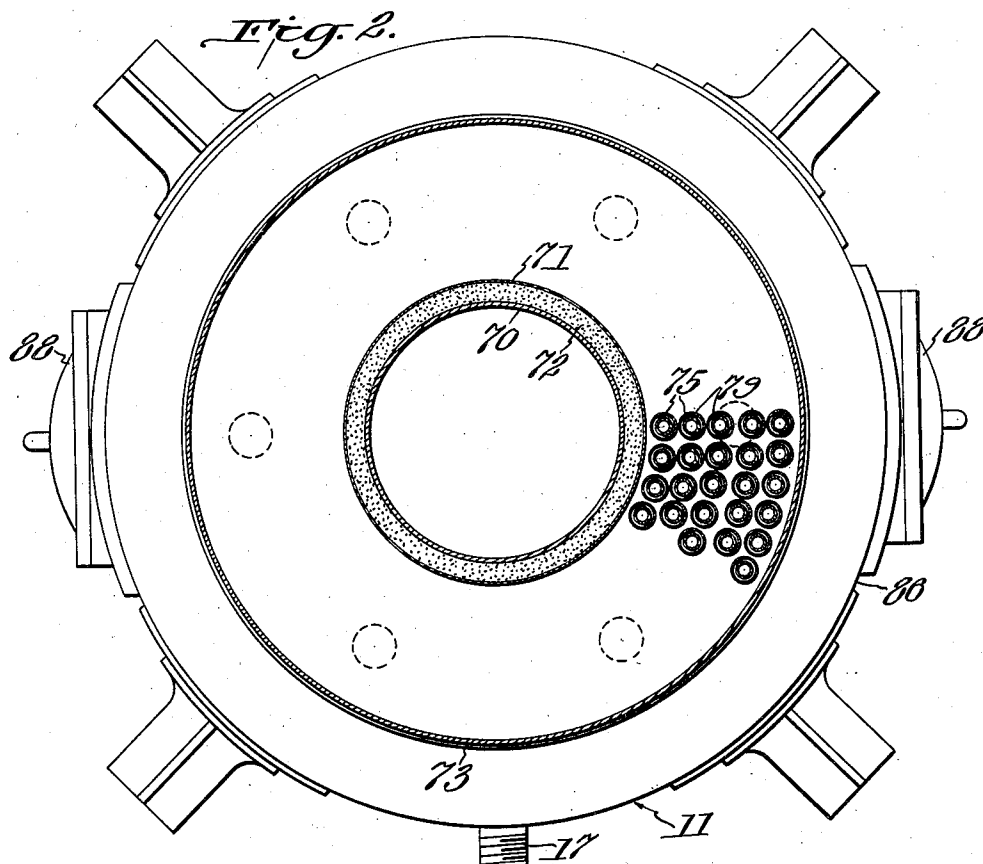
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CONDENSER

Application filed November 5, 1928. Serial No. 317,299.

This invention relates to a vapor-condensing apparatus capable of general application but particularly adapted for the condensation of oil vapors coming from a still.

In the accompanying drawings:

Fig. 1 is a sectional elevation;

Fig. 2 is a cross-section on plane 2—2 of Fig. 1; and

Fig. 3 is a detail showing the arrangement of the cooling tubes.

The condenser 11 as a whole is supported on a neck 10, by a flanged connection 9 to the outlet 8 of evaporator 6. Secured to the inner wall of the neck 10, as by electric welding, is an upwardly extending vapor pipe 70, around which is a casing 71, enclosing heat insulating material 72.

Extending across the shell 73, and above the outlet of vapor pipe 70 is a tube sheet 74, from which depend tubes 75, into the space between the vapor pipe and the shell 73. These tubes are closed at their bottoms by caps 76, secured to a grid 77, which is supported by angle irons 78' carried by shell 73.

A second tube sheet 78 extends across the shell above the tube sheet 74, and from this upper tube sheet 78 depend open-ended pipes 79, of smaller diameter than tubes 75, and extending to the lower ends thereof. Into the chamber 82 formed between this upper sheet 78, and the top 80 of the condenser extends a pipe 14 for cooling liquid, such as water. From this chamber 82 the cooling liquid flows down through pipes 79 and up through pipes 75, discharging from the upper ends of pipes 75 into the chamber between the two tube sheets, from which the liquid is discharged through pipes 15, 15'. The tube sheets are braced by a perforated diaphragm 85. At its lower portion, the condenser is provided with a shell 86, secured hermetically, as by welding, to shell 73. At the upper portion of the shell is a pipe connection 17, to which may be connected a vacuum producing apparatus. Covered manholes

88, 88, are provided in the shell 86 to afford means of access. One or more exit openings to which are connected pipes 13, 13', serve for discharge of the condensed liquid. Advantageously there is provided a hood 90 extending between the bottom of shell 86 and casing 71.

In operation, the hot vapors rising through the heat insulated tube are discharged against the surrounding cooled tubes and the condensed liquid collects in the bottom portion of the structure in the chamber 91.

As shown, this self-container condenser is mounted directly upon and in open communication with the vapor space of the still 6, and is thus free to expand and contract in accordance with variations in temperature.

I claim:

1. A condenser structure comprising an outer shell, a centrally arranged vapor tube extending upwardly thereinto, a tube-sheet extending across the shell above the upper end of the vapor tube, tubes open at their upper ends and closed at the bottom depending from said tube-sheet into the space between the vapor tube and the outer shell, a second tube sheet extending across the shell, but below its closed top, open ended tubes depending therefrom of less diameter than and extending into the tubes depending from the first tube-sheet, means for introducing liquid into and withdrawing said liquid from said tubes, and means for withdrawing liquid from the bottom of the condenser.

2. A condenser structure comprising an outer shell, a centrally arranged vapor tube extending upwardly thereinto, a tube-sheet extending across the shell above the upper end of the vapor tube, tubes open at their upper ends and closed at the bottom depending from said tube-sheet into the space between the vapor tube and the outer shell, a second tube sheet extending across the shell, but below its closed top, open ended tubes depending therefrom of less diameter than

and extending into the tubes depending from the first tube sheet, inlet means for introducing cooling liquid into the shell above the second tube-sheet, exit means for liquid connected to the shell between the tube sheets,
5 and means for withdrawing liquid from the bottom of the condenser.

3. A condenser as claimed in claim 1 in which the vapor tube is provided with heat
10 insulation.

4. A condenser as claimed in claim 1 in which the condenser is provided at its lower portion with a vacuum connection.

In testimony whereof, I affix my signature.
15 FRANCIS X. GOVERS.

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