S. B. ELLITHORP.

Vapor Condenser.

No. 52,277

Patented Jan. 30, 1866.

Fig. 1.

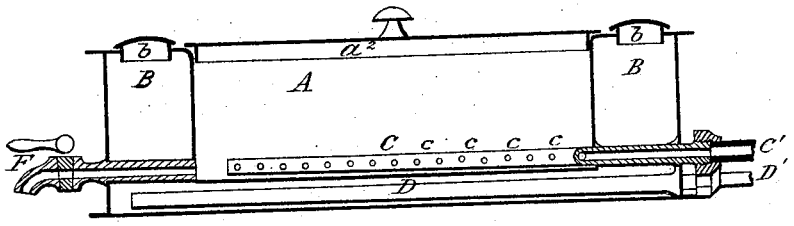


Fig. 2.

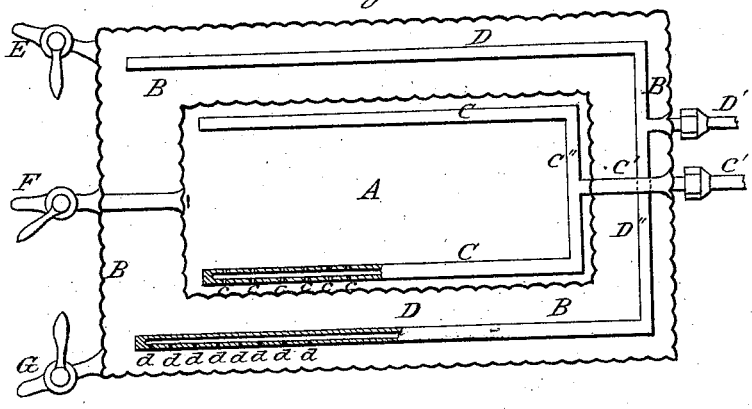
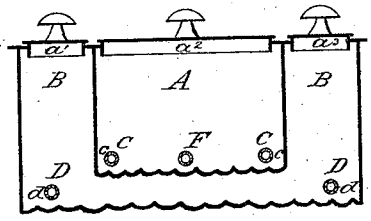


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

SOLOMON B. ELLITHORP, OF NEW YORK, N. Y.

IMPROVED REFRIGERATOR AND CONDENSER.

Specification forming part of Letters Patent No. **52,277**, dated January 30, 1866.

To all whom it may concern:

Be it known that I, SOLOMON B. ELLITHORP, of the city, county, and State of New York, have invented a new and Improved Refrigerator and Condenser; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a central longitudinal vertical section of my invention. Fig. 2 is a horizontal section of same in a plane passing through line *x x*. Fig. 3 is a central transverse vertical section of the same.

Similar letters of reference indicate corresponding parts in the three figures.

My invention consists in a novel arrangement and combination of perforated tubes and tight chambers in relation to each other, by the employment of which a very efficient refrigerator for cooling beer or other liquors or cooling apparatus for condensing vapors is produced.

Others skilled in the art may be enabled from the following description, having reference to the drawings, to construct and operate my invention.

This invention is composed, essentially, of two chambers, A and B. The former one arranges within the other in such a manner as to leave a space around its sides and bottom, and each chamber is provided with an inlet-tube and a series of perforated tubes to insure the proper distribution of the liquid to be cooled or the vapor to be condensed, and also a proper outlet-passage furnished with a suitable stop-valve or cock, for the purpose of withdrawing the liquid from either chamber.

As before stated, my invention is intended to be used either as a refrigerator for cooling beer or any other liquor or as a condenser for condensing the vapors of oleaginous or spirituous distillations.

The outlet-chamber B may be constructed either of plain or corrugated sheet metal, and is provided with an inlet-pipe, D′, which connects at right angles with a pipe, D″, extending across the end of the chamber B, near the bottom, and longitudinally near to each side of the shell of said chamber. This tube is perforated along its outer side, and has branching off from it two pipes, D D, on each side of the chamber B, said pipes D D running horizontally along and parallel with the sides of said chamber. The pipes D D are also perforated at short intervals along their outer sides. A portion of these pipes D D is represented in section in Fig. 2, in order to more clearly show the situation of the apertures or perforations *d d d*. The ends of the pipes D D are closed, and all the vapor or liquid which passes out from them must flow from the apertures *d*.

At the opposite end of the chamber B from which the pipe D enters, and nearly in a line with the ends of the pipes D D, there are two stop-cocks, E and G, each communicating with the interior of the chamber, and intended to withdraw the liquid condensed or otherwise accumulated in the said chamber when necessary.

The chamber B is provided on its top with four suitable covers, *b b a′ a³*, the two former of which are situated on the ends, and the two latter are situated longitudinally and parallel with the sides. These covers or lids are intended for the purpose of examination or the withdrawal or introduction of frigorific materials.

The inner chamber or box, A, having its sides, ends, and bottom of corrugated sheet metal, and provided with a removable lid or cover, a^2, is arranged within the chamber B, in such a manner as to leave a passage or space around its sides and under its bottom, in order to expose a great amount of surface to the action of the cooler without. The pipe C′ enters through the outer shell by a tight joint, and passes through a part of the chamber B, and then enters the chamber A, and has connected with it pipes C C″, arranged and perforated by the apertures *c c* in a similar manner to the pipes in the chamber B. There is also communicating with this chamber and extending through the outer shell of the chamber B a pipe, F′, furnished with a stop-cock, F, outside of the chamber B.

When I use this apparatus for the cooling of beer or other beverages I prefer that the frigorific materials be introduced into the outer chamber, B, and the liquid to be cooled be introduced into the inner chamber, A. If in a solid state, or of such character as not to require a constant flow through the chamber B, the frigorific materials are introduced through the openings in the top after closing the several stop-cocks in connection with that

chamber. The beer or other liquor intended to be cooled, being then introduced through the pipe C′, passes through the pipes C″ C C out into the chamber A, and is cooled by coming in contact with the corrugated surfaces of the chamber, and passes out through the cock F. The chamber A is intended to be kept full, and only drawn off when necessary, or kept running out only in such a quantity as will prevent the chamber from overflowing.

Instead of using a solid frigorific material in the outer space or chamber, B, a constantly running current of cold water may be introduced through the pipes D′ D″ D D and carried off through either or both of the cocks E and G, and in such case the water issuing from the perforations *d d* of the pipes is so distributed over the cooling-surfaces as to insure a uniform and effective cooling of the liquid in the chamber A.

In the use of my invention for the condensation of petroleum vapors or alcoholic distillations, I place the cooling substance in the inner chamber. Said substance may either be solid, as ice, or any of the known chemical mixtures with ice or snow, or a running stream of cold water passing through the pipes C′ C″ C C, and passing out at the cock F, may be used, and the vapor to be condensed is introduced through the pipes D′ D″ D D, and escapes by the perforations *d d* into the chamber B, where, after coming in contact with the cool outer surface of the corrugated chamber A, it is condensed and runs down into the lower portion of the chamber B, where the liquor or oil accumulates, and whence it is drawn off through either or both of the cocks E G. In this operation the vapor issuing from the perforations *d d* is at once distributed uniformly all over the cooling outer surface of the chamber A, and when water is used as the condensing medium as it issues from the perforations *c c* it is distributed uniformly all over the inner surfaces of the said chamber, and hence the perforations of the several pipes tend to produce a uniform and very effective condensation.

What I claim as my invention, and desire to secure by Letters Patent, is—

A refrigerator or condenser for cooling liquors or condensing vapors, consisting of an outer chamber, B, and an inner chamber, A, and a system of perforated pipes, substantially as herein specified.

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Witnesses:
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