

J. C. THOMPSON.

Improvement in Spirit-Still.

No. 130,336.

Patented Aug. 6, 1872.

Fig. 1.

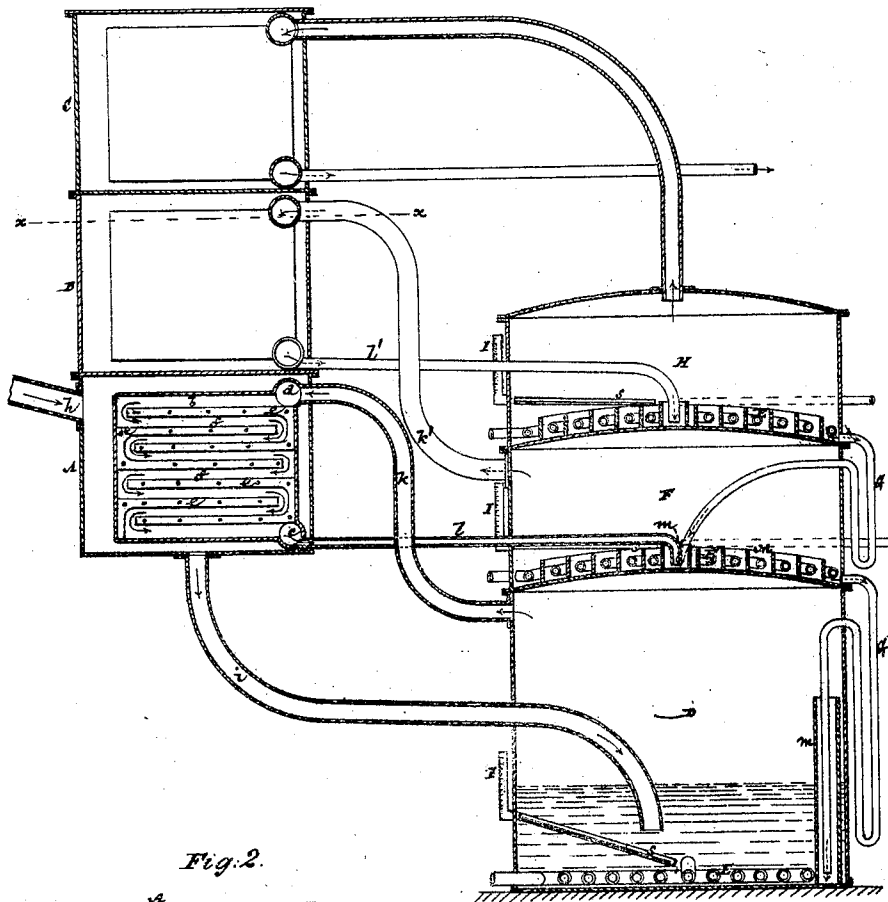


Fig. 2.

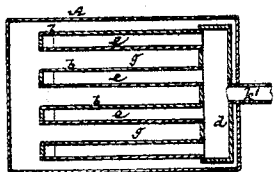
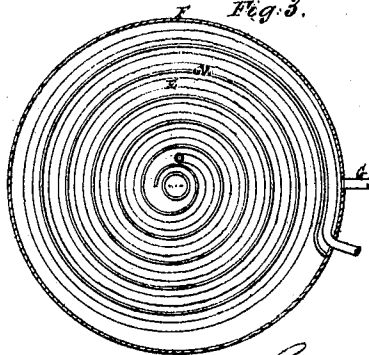


Fig. 3.



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IMPROVEMENT IN SPIRIT-STILLS.

Specification forming part of Letters Patent No. 130,336, dated August 6, 1872.

To all whom it may concern:

Be it known that I, JOHN C. THOMPSON, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Stills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification.

This invention relates to apparatus for distilling alcoholic liquids by a process of redistillation, whereby the vapor rising from one distillation is condensed and afterward returned for distillation over again, to separate the more highly volatile particles from those which are less so. The improvements consist, first, in a novel construction of the still, with one or more spirit-chambers having curved bottoms to facilitate drawing off from said chambers. The improvements also comprise a novel arrangement of a scroll or fence, edge uppermost, within each or certain of the spirit-chambers, said scroll commencing at a point near the center of the chamber, and traversing in an equal or unequal manner the bottom of the spirit-chamber, for the purpose of causing a circulation of the spirits to be distilled. The improvements likewise include the application of a drop-pipe to the spirit-chambers, arranged to convey the impurities from an upper chamber to the center of the chamber beneath it, said pipe being so constructed as to prevent the vapors from the lower chamber passing up it to the chamber above. A novel feature also consists in a combination, with each or any of the spirit-chambers, of a thermometer, arranged and constructed to connect with the center of the chamber, for the purpose of indicating the temperature of the latter at its center, where the heat is the greatest, to dictate the necessary regulation of heat required. The improvements furthermore comprise a system of separate condensers for the separate spirit-chambers; likewise a novel and advantageous construction of the condensers, the same preferably being made of an inner and outer sheet-metal case, the inner one of which is composed of pockets fitted with reversely-arranged return strips or blocks for circulation of the vapors to be condensed in a serpentine manner through the pockets, while the cooling liquid enters between the pockets and spaces, separating them from the

outer case, thus obtaining a very efficient condensing-surface.

Having thus specified the object and nature of the invention, its description will be proceeded with in reference to the accompanying drawing.

Figure 1 represents a mainly sectional vertical view of a still with the improvements applied to it; Fig. 2, a horizontal section through one of the condensers at the line *x x*; and Fig. 3, a sectional plan of one of the spirit-chambers.

Similar letters of reference indicate corresponding parts throughout the several figures.

The still illustrated in the drawing only shows three spirit-chambers, arranged one above the other, and a corresponding number and arrangement of condensers, but any greater number of both may be used. The lower condenser of the series may be cooled by the beer or wash in its way to the spirit chamber or boiler, while the other condensers may either be cooled by the beer or by water. A, B, and C represent three condensers, arranged as described. These condensers are each made up of an outer sheet-metal case and inner shell or case, the latter being formed of sheet-metal pockets *b b*, disposed vertically in parallel courses at a suitable distance apart, and communicating, top and bottom, at the same side or end, by cross-chambers *c d*, with the pipes by which the vapor is passed to, and returned, when condensed, from the condenser. These pockets are fitted with a series of reversely-disposed metal strips or blocks, *e e*, secured by rivets passing through them and the pockets, and of an elongated-U description, entering one within the other so as to form return-strips to establish a serpentine course or channel, *f*, for the vapor or liquid, while the spaces *g* between the pockets *b b* and the spaces separating them from the outer case contain the cooling liquid. This forms an easily made and very efficient condenser. The beer or mash to be distilled enters the lower condenser A by the pipe *h*, and, circulating as a cooling liquid about and between the inner case, as described, passes off by a pipe, *i*, to the lowest spirit chamber or boiler D, which is provided with a steam-coil, E, for boiling and evaporating the beer. The vapor generated in this chamber D passes off by a pipe,

k, to the condenser A, from whence the condensed product or spirits passes, by a pipe, *l*, to a spirit-chamber, F, arranged above the boiler D, and constructed with a curved bottom, which may either be convex or concave on its upper surface, accordingly as the pipe *l* is arranged to deliver at the center or periphery of the chamber. The object of thus curving the bottom is to facilitate the drawing of the spirit from the chamber and to promote its circulation over the bottom of the latter, subject to the action of the steam-coil E, with which each spirit-chamber is provided to effect the boiling of the spirit. The bottom of said spirit-chamber F is also fitted with an open scroll or fence, M, having its edge uppermost, said scroll commencing at a point near the center of the chamber and traversing in a regular or irregular manner the bottom of said chamber, whereby an extended circulation of the spirits over the bottom of the chamber and about the steam-coil is produced, thus expediting evaporation. The pipe *l* is immersed at its delivery-end in a tube or receiver, *m*, containing spirits or water, and arranged to form a liquid trap on the bottom of the chamber F to prevent back pressure or escape of the vapors generated within said chamber. The condensed products of the chamber F are returned, by a siphonic drop-pipe, G, to a similar fluid-trap in the lower boiler D for redistillation, while the volatile matter in said chamber F passes, by a pipe, *k'*, to the second condenser B, from whence the product of condensation and vapor passes, by a pipe, *l'*, to the next upper spirit-chamber H, that is of like construction with the chamber F, and is similarly provided with a scroll or fence, steam-coil, siphonic drop-pipe G' for returning impurities or unevaporated matter back to the center of the spirit-chamber below it, and an escape-pipe for the vapor to the next condenser C, from whence the process may be continued as before, or where it may terminate. The siphonic drop-pipes connecting each spirit-chamber with the one below it prevent any passage of vapor from the one chamber to the other; and each

chamber is a separate still, heated by a separate heater, and provided with a separate condenser, but operating successively upon higher distillations, and returning unevaporated matter for redistillation, whereby a high-proof spirit may be obtained in a most economical and perfect manner. To regulate the temperature of the several spirit-chambers each one is provided with an outside thermometer, I, the tube *s* of which is arranged to project into the central portion of the chamber, where the heat is greatest, especially when the spirit to be distilled has its travel over the bottom of the chamber extended, as is here the case, by the scroll or fence.

What is here claimed, and desired to be secured by Letters Patent, is—

1. In a still having one or more spirit-chambers, the curved or convex bottoms, in combination with the open scroll or fence M, substantially as specified, for the purpose set forth.

2. The connection of an upper with a lower spirit-chamber by a siphon-shaped drop-pipe, G', arranged to convey the impurities from the upper spirit-chamber to the center of the one beneath it, essentially as specified.

3. The arrangement in the spirit-chamber of the thermometer I, having its tube *s* extending into the central portion of said chamber, substantially as and for the purpose described.

4. In a still composed of a series of spirit-chambers for successive operations, as described, the application of a separate condenser to each chamber, essentially as specified.

5. A condenser composed of an outer case or shell, A, and inner case, consisting of a series of pockets, *b b*, and reversely-arranged return-strips *e e*, having cross-connecting tubes or passages *c d* and inlets and outlets *k l*, all arranged for operation substantially as shown and described.

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Witnesses:

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