# DIVINE & SEELY.

## Oil Still.

No. 55,071. Patented May 29, 1866.

Fig. 5.

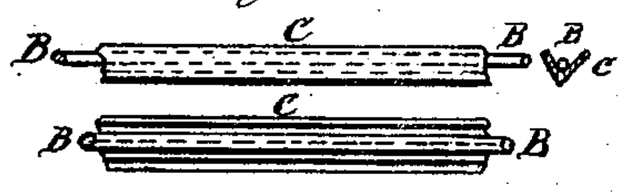



Fig. 1.

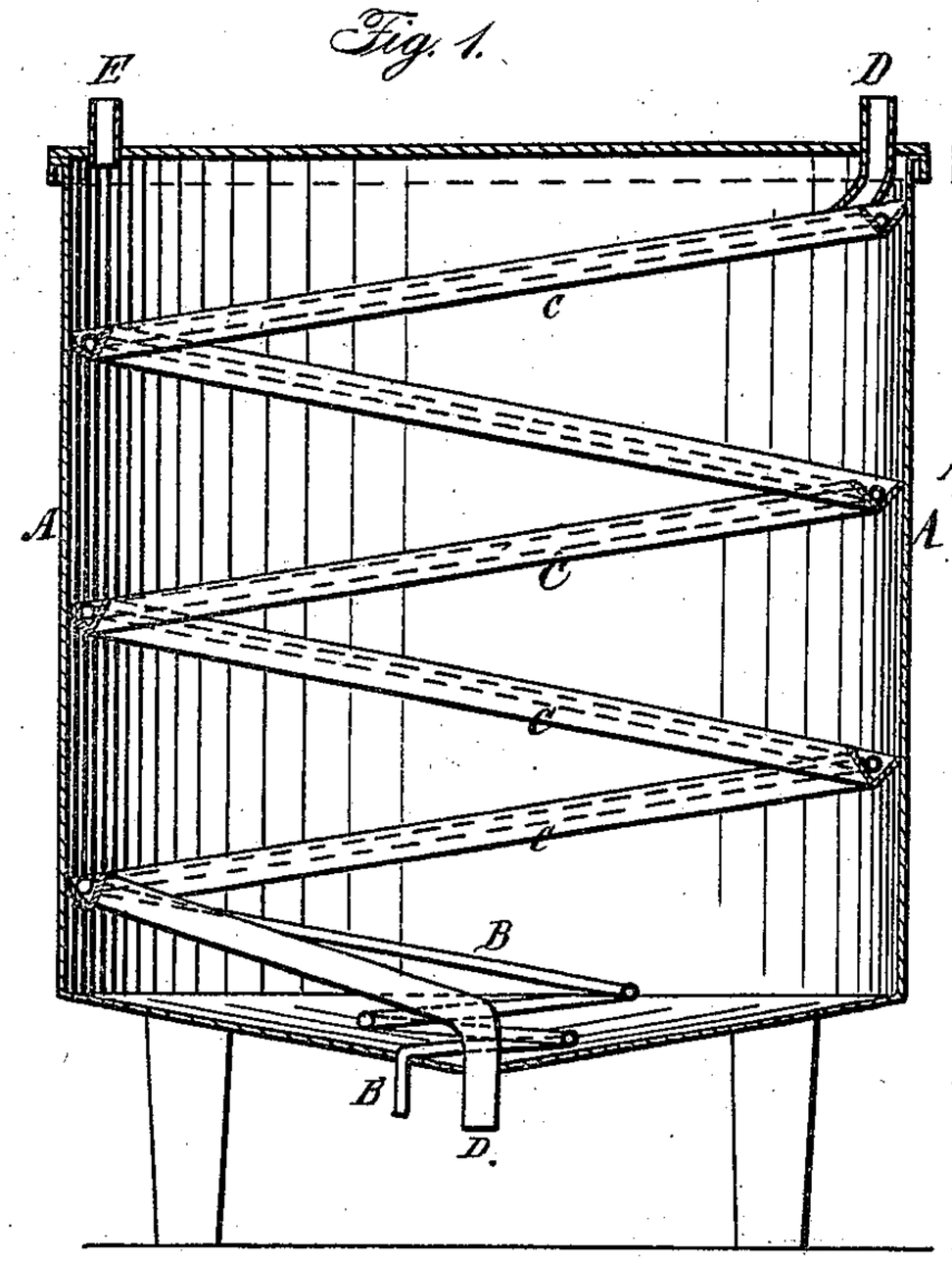



Fig. 2.

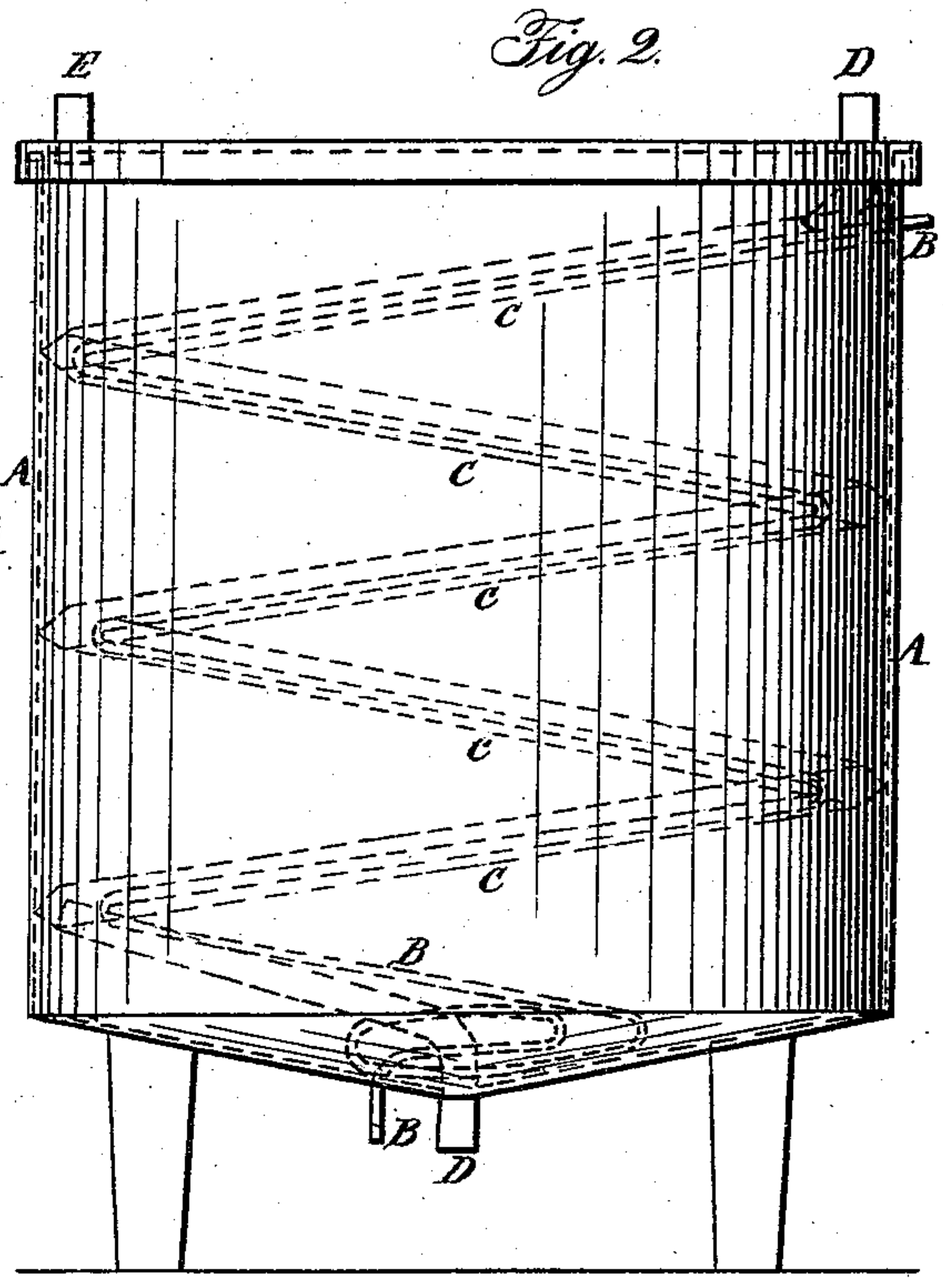



Fig. 3.

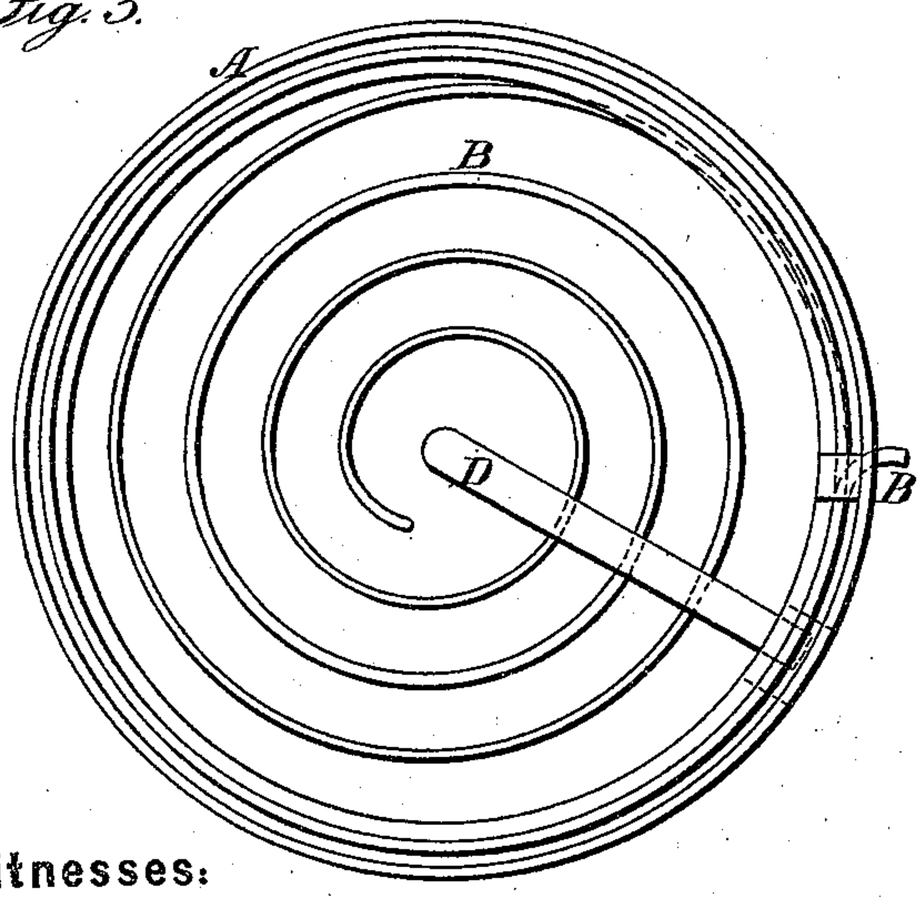
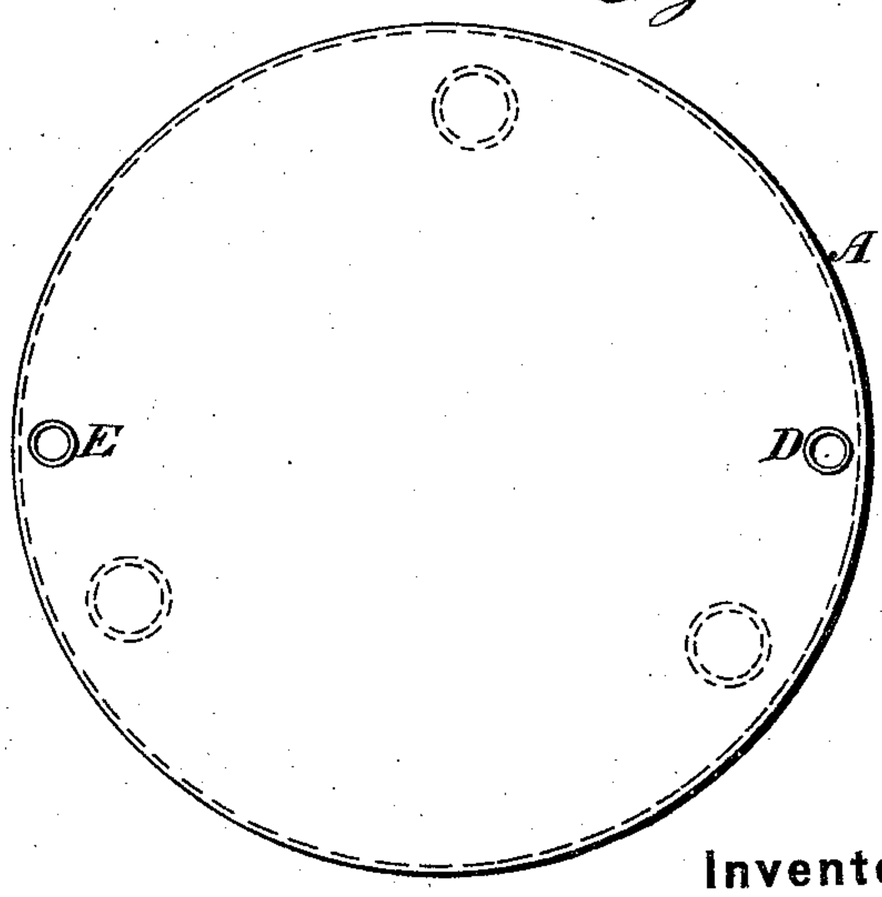



Fig. 4.




Witnesses:

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# UNITED STATES PATENT OFFICE.

SILAS R. DIVINE AND CHARLES A. SEELY, OF NEW YORK, N. Y.

## IMPROVEMENT IN APPARATUS FOR DISTILLING.

Specification forming part of Letters Patent No. **55,071**, dated May 29, 1866.

*To all whom it may concern:*

Be it known that we, SILAS R. DIVINE and CHARLES A. SEELY, both of the city, county, and State of New York, have invented a new and Improved Apparatus for Distillation and other Similar Purposes; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of our invention consists in providing the interior of the body or shell of the still with a pipe leading gradually to the bottom of the still, said pipe acting as the heating-surface, and being wholly or partly surrounded with a channel along which the liquid to be vaporized shall flow.

Figure 1 is a vertical projection. Fig. 2 is a perspective view. Fig. 3 is a view of the bottom, and Fig. 4 of the top, of the apparatus. Fig. 5 represents certain special parts.

The same letters apply to like parts in the different figures.

A A are the vertical sides of a cylindrical vessel, which has a top and bottom provided with openings for pipes of inlet and outlet. B is a pipe which enters at the top of the apparatus, and, gradually descending in a coil, has an outlet at the bottom. C is a gutter or trough containing or inclosing the pipe B while within the apparatus. D D are the outlet and inlet of the gutter C. E E are outlets for vapor.

The operation of the apparatus may now be understood, and in order that it may be plain we illustrate it by the simple process of distilling fermented liquors.

The pipe B is connected with a steam-boiler, and the steam traversing it heats it through its whole extent. At the same time the fermented liquor is let into the trough C at its upper inlet, D. The liquor flowing along and down the trough C, and being constantly in contact with the pipe B, the alcohol is volatilized from it, and the water flows out of the apparatus at the outlet of the trough at the bottom. The vapor of alcohol, on the other hand, escapes at the outlet E, and is carried to a suitable condenser.

It will readily be seen that this process of distillation is continuous and constant. The fermented liquor is continually fed into the gutter, and its alcohol escapes at E and the water at the outlet of the gutter.

The apparatus, as described, is suitable for the distillation of many other liquids besides fermented liquors, for which the heating by steam has been found practicable. The modifications in it which would be advisable to make for any such specific distillation will readily occur to any one familiar with the nature of the liquid to be distilled.

When a greater heat than that which it is practicable to obtain from steam is required we make the pipe B a part of the flue of a fire, allowing the products of combustion to pass through it, or we make the pipe B a channel for heated oil, paraffine, quicksilver, &c. We regulate the intensity of the heat for the specific purpose in view by any of the known methods, and we are thus enabled to use our apparatus for any kind of distillation, including even the destructive distillation of resins, oils, tars, &c., where the object is to produce oils or gases.

Besides the use of our apparatus for distillation, properly so called, we find it admirably adapted for generating steam. By making the shell stronger and using the pipe B as the flue of a fire we transfer our apparatus into a steam-boiler which has the qualities of safety and quickness in raising steam. When used as a steam-boiler the apparatus is of course provided with the usual appurtenances of safety-valve, gages, &c.

Also, our apparatus is well adapted to the concentration of certain acids and solutions where the object is to separate water or other solvent from the substance dissolved. When used for this purpose care must be taken that the apparatus be constructed of such material as will not be affected by the liquid to be heated.

We find, also, that our apparatus may often be used with advantage as a refrigerator for liquids. When so used cold water is made to circulate or flow through the pipe B, while the liquid to be cooled flows down the gutter C.

We have alluded above to certain modifications of our apparatus, and there are others which seem to us plainly a part of our invention, or equivalents of it.

We have described the pipe B as being coiled; but this form in the direction of the pipe is not essential. The pipe B may be so arranged as to have right angles or any other angles. It may be made to traverse to and fro, so that it

may all lie in the same vertical plane, or it may be arranged into one or more nearly-flat concentric whirls or spirals, like a watch-spring. Of course the channel C must partake of the general direction and form of the pipe B. The gutter C is represented in the drawings as inclosing the pipe B; but the gutter may be built on the top of the pipe B, or may be formed by fastening strips on the sides of the pipe B and extending upward. The essential features of the pipe B are, that it shall be gradually descending and that it shall be provided with a gutter.

The shell A need not be cylindrical, but should partake of the general form of the direction of the pipe B. It will readily be seen that the shell A may be globular or cubical, &c. We also find that in certain cases it is advisable that the shell shall be a tube inclosing the pipe B and the gutter C, and concentric with the pipe B.

For certain distillations the body of the still may be divided into compartments by horizontal partitions for the purpose of taking off vapors of different strengths. Such compartments will be especially desirable in the distillation of alcoholic liquors and petroleum-oils.

Instead of drawing off the vapor at the top it may be drawn from the side or bottom of the shell. Also, the shell may serve as a condenser, in which case the condensed vapors may be drawn from the bottom.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The apparatus and its modifications, substantially as herein described.

2. The combination of the shell A with the pipe B and the gutter C, substantially as described.

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