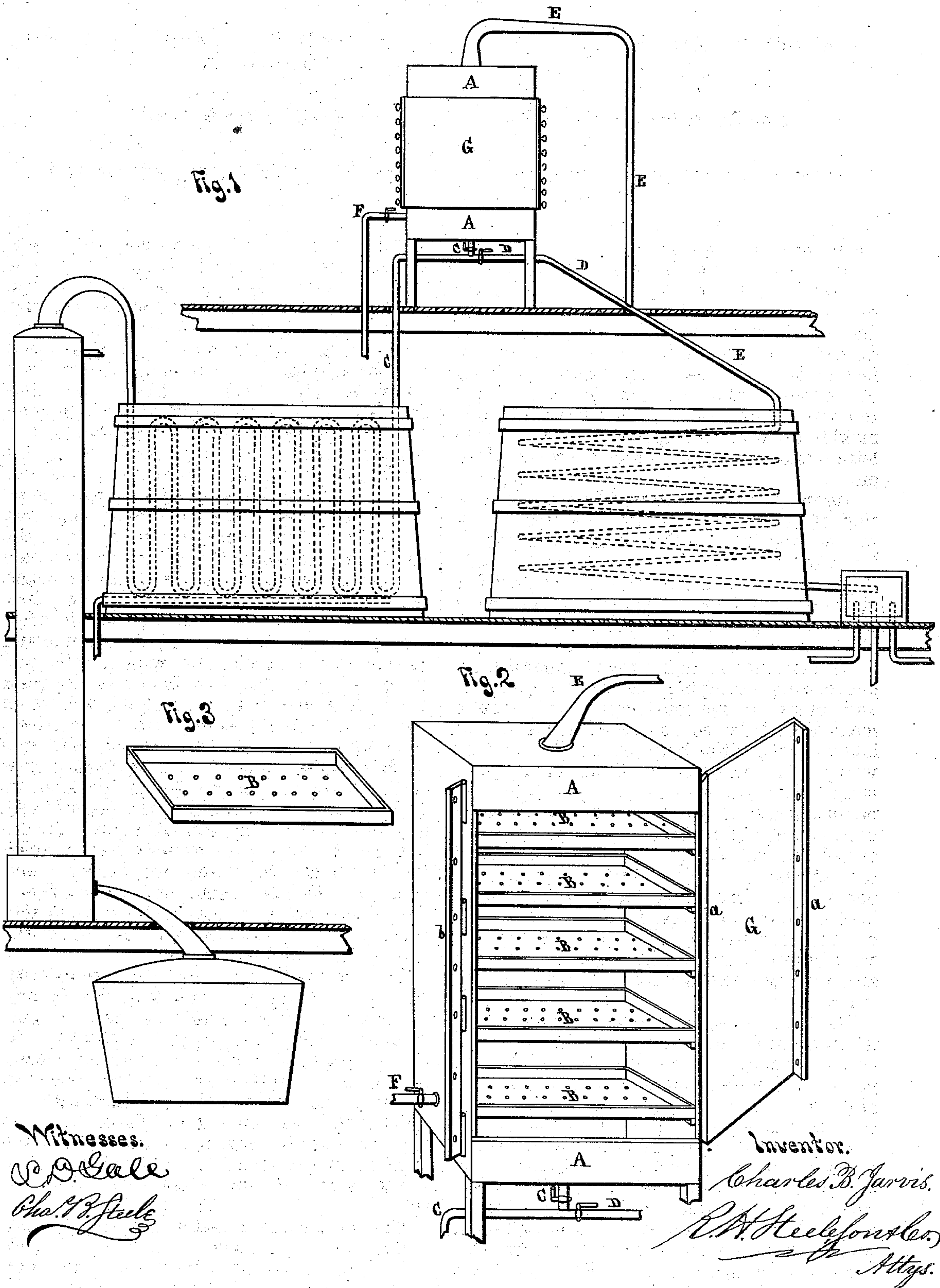


C. B. JARVIS.

Apparatus for Rectifying Spirits.

No. 156,253.

Patented Oct. 27, 1874.



UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN APPARATUS FOR RECTIFYING SPIRITS.

Specification forming part of Letters Patent No. 156,253, dated October 27, 1874; application filed January 28, 1874.

To all whom it may concern:

Be it known that I, CHARLES B. JARVIS, of Lyons, in the county of Clinton and State of Iowa, have invented a new and valuable Improvement in the Process of Rectifying Spirits; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of an elevation of the "rectifier" in its proper position, and in connection with a "goose," "worm," "column," and "still." Fig. 2 is a perspective view of the rectifier, showing the different parts of the same inside and out. Fig. 3 is a perspective view of one of the trays used within the rectifier.

My invention is an improved apparatus for deodorizing, rectifying, and flavoring spirits; and consists in the construction and arrangement of said device, and its adjustment in an intermedial position between the goose and the worm of an ordinary distilling apparatus—more suitably it may be in my distilling apparatus patented April 27, 1869—for the purpose thereby of producing the finest French or Cologne spirits, or, by processes hereinafter described, of making and flavoring Bourbon or rye whisky or gin, all of which is hereinafter more fully described and illustrated by the accompanying drawings, in which the same letters designate identical parts of the said apparatus in the different figures, respectively.

The letter A represents the rectifier, which is constructed and arranged as follows: It is either a square or cylindrical vessel, of copper, or its suitable equivalent, and of any suitable size. In this vessel, which has one open side, are placed trays B, of sheet copper—or, if a cylindrical vessel, baskets substituted, of the same metal—of any required number, and at suitable distances one above the other, with their outer edges resting upon cleats or any other suitable projections from the inner surface of said vessel, and upon which said trays may be slidden in or out through the said open side. The sides of said trays are of any suitable height—or, if baskets, of any

suitable depth—and perforated with holes through their bottoms of any desired number, and each about one-eighth of an inch in size. The letter C represents the vapor-pipe, leading from the goose to the rectifier A, said pipe having a branch pipe, D, leading directly from the pipe C into a pipe, E, which last-mentioned pipe is the one which leads from the rectifier into the worm or final condenser. The pipes C and D have suitable stop-cocks attached in positions indicated by the drawings, for purposes hereinafter mentioned. The letter F represents another small pipe, also furnished with a suitable stop-cock, as indicated, and leading directly from the boiler into the rectifier, by which direct steam may be introduced at any time into the latter.

For the convenience of sliding the aforesaid trays in and out of the rectifier, it is furnished, on the open side, with an opening and closing door, G, oscillating upon suitable and strong hinges. The said door has flanges *a a*, which tightly clasp around the corners on each side of the opening into the rectifier, when said door is closed. On the outer side of the rectifier, opposite to the closing edge of the door, is a hinged flange, *b*, which, together with the flanges *a a*, are pierced with suitable holes, of any desired number, for the purpose of inserting thumb-screws, with which the door G may be closely and strongly fastened over the said opening into the rectifier.

The door may be rendered still more closely steam-tight over said opening by any of the usual means for that purpose.

The aforesaid trays are filled evenly with charcoal, in lumps of sufficient size to prevent their passing through the aforesaid perforations. The filled trays are slidden into place, ranged as aforesaid upon the cleats, and the door tightly closed over the opening, when the rectifier is ready for adjustment.

Of course, the amount of charcoal used at any one time for charging the different trays must be proportioned to the quantity of vaporized spirit intended to come over from the still.

This proportion is, after the test of experience, about one bushel of charcoal to each and every ten barrels of the "run of the still."

The rectifier, constructed and arranged as above described, is placed between the goose

and the worm in any distilling apparatus, as aforesaid, and properly adjusted by attaching the pipe C, leading from the goose, either into the bottom of the rectifier, as indicated by Fig. 1 of the drawings, or into the top of the same, should circumstances so require, in which latter case the other pipes, hereinbefore named, must have suitably corresponding positions, adapted to said relative changes; also, by connecting the pipes E and D, the former leading directly from the rectifier into the worm, and the latter to lead from the pipe C into the pipe E, as indicated by said Fig. 1. The steam-pipe F is also connected as illustrated by the same figure.

The rectifier is now ready for the processes to be performed by its means, which are described as follows: High-wine or raw spirit—the result of a previous distillation—is first vaporized in the still—of any distilling apparatus which consists of a still, a column, a goose, and a worm or final condenser—by heat applied in any of the usual ways; and as said vaporized spirit comes over from the still, through the column and the goose, it parts with the fusel-oils (amylic alcohol) therein contained, said alcohol being passed back into the column by condensation in the goose. The vaporized spirit would then be ready for rectifying, but that the first portion of the run of the still is inseparably combined also with the rank flavors of the grain or other substances in the still, from which or when the aforesaid high-wine was distilled. Therefore, this said portion of the run—about one-tenth—is passed directly from the goose into the worm by means of said branch pipe D, and, being prevented from passing into the rectifier by closing the stop-cock in the pipe C, this running is allowed to continue until the vaporized spirit becomes pure and sweet—ascertained by testing—when the stop-cock in the pipe D is closed and the one in pipe C opened, and the said spirit passed directly into the rectifier. It is therein rectified by its passage through the layers of charcoal or any other equivalent material, and then passed through the worm or final condenser into a separate vessel prepared for the purpose, having been converted by the above process from a high-wine or raw spirit into the finest French or Cologne spirits.

Again, provision is made for another defect in rectifying, hitherto unremedied. After about two-thirds of the aforesaid pure vaporized spirit has been passed through the charcoal in the rectifier, the remainder, by reason of the force of the steam and the raised temperature, again takes on the aforesaid rank flavors. So soon as this is ascertained—by testing—the stop-cock in pipe C is shut and the one in the branch pipe D opened, and the said remainder of the vaporized spirit run directly through the worm into a separately-prepared tank as commercial alcohol.

Thus the above-described processes, by means of the aforesaid rectifier, constructed,

arranged, and adjusted as described, consist, first, in preventing the fusel-oils or amylic alcohol from reaching the rectifier; and, by condensation in the goose, passing said alcohol back into the column; second, in preventing the first portion of the run of the still from entering the rectifier to impregnate its contents with rank flavors; third, in passing the purely-vaporized spirit directly through the rectifier to be rectified or flavored, as may be required, and made into Cologne spirits; or, if desired, into certain other spirits, hereinafter named and described; and, lastly, in again preventing the last portion of the said run from entering the rectifier, but running it into a separate vessel, as hereinbefore described, as commercial alcohol. The peculiar features of the above-described processes, it will therefore appear, are fully combined in my rectifier and its attachments, which alone supplies the remedies for defects in rectification, hitherto considered irremediable.

Should it be desired to make Bourbon or rye whisky instead of the aforesaid Cologne spirits, the same process is used, with the addition of steam turned on directly from the boiler into the rectifier, by means of the pipe F, for the purpose of reducing the vaporized spirit to the required strength of the different grades of said whiskies.

Again, should it be required to make gin, the same process is used as for Cologne spirits, with the addition of placing one or more layers, by means of the aforesaid trays, of juniper-berries, or their equivalents, within the rectifier, and passing the vaporized spirit through them after coming through the charcoal, as hereinbefore described.

The following are the most material and desirable results obtained by the use of the hereinbefore-described rectifier: First, a great saving of rectifying materials; second, entirely preventing evaporation, which is the cause of great loss of material in most of the distilleries; third, the charcoal does not become impregnated with the essential oils or bad flavors, and therefore lasts much longer; fourth, a much smaller quantity of rectifying material is necessary to rectify a much larger quantity of vaporized spirit than by any other apparatus; fifth, a large amount of dead capital is saved, as hitherto a large quantity of spirit had to be used in soaking the charcoal before rectifying. Therefore—

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

The rectifier A, constructed, arranged, and adjusted in combination with the goose and worm of the usual distilling apparatus, substantially as and for the purposes specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES B. JARVIS.

Witnesses:

JOS. T. K. PLANT,
CHAS. B. STEELE.