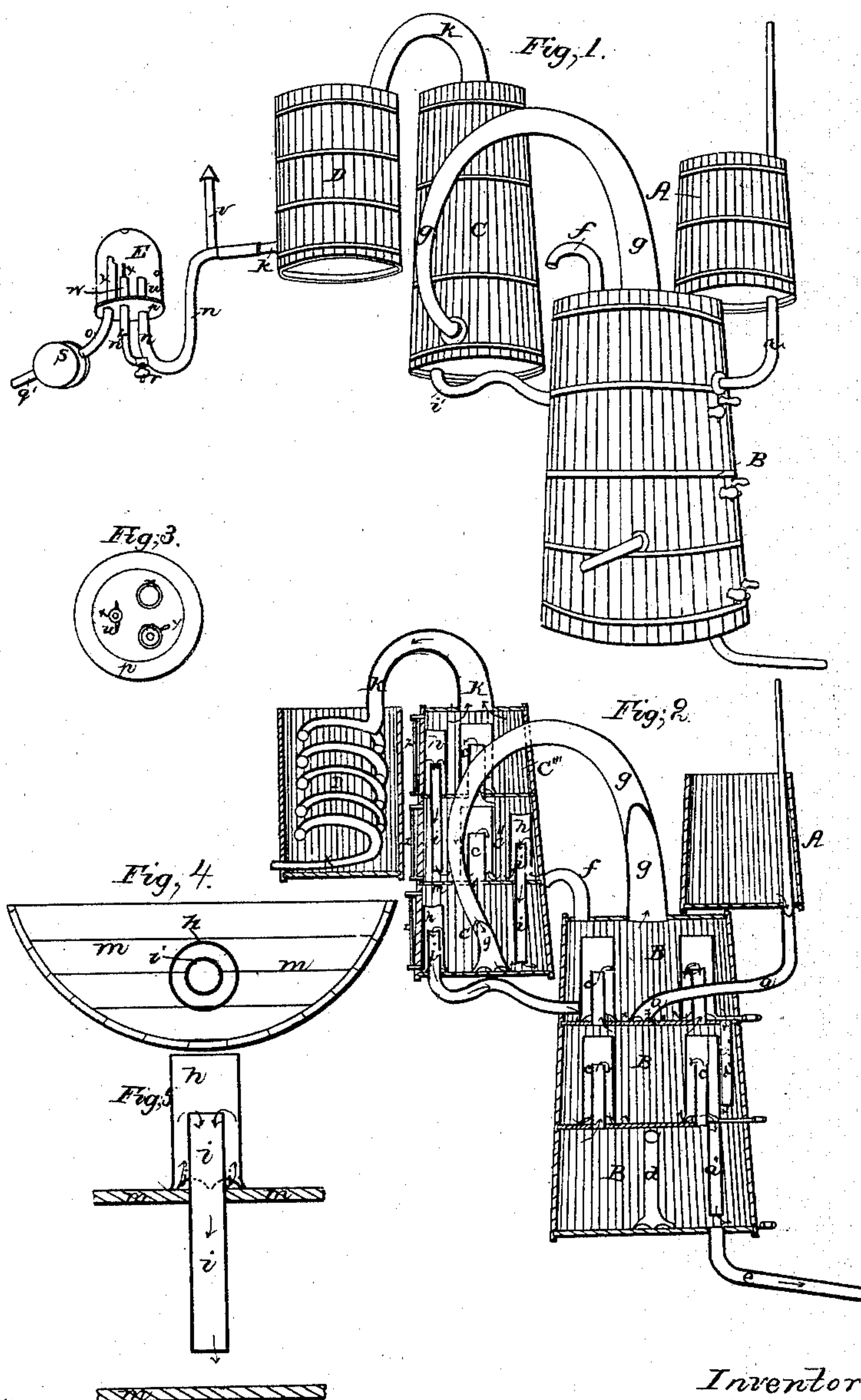


J. B. BEEBE & T. F. LLOYD.
APPARATUS FOR DISTILLING GRAIN.

No. 60,327.

Patented Dec. 11, 1866.



Witnesses;

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IMPROVED APPARATUS FOR DISTILLING GRAIN.

J. W. BEEBE AND T. F. FLOYD, OF ALBANY, NEW YORK.

Letters Patent No. 60,327, dated December 11, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, J. W. BEEBE and THOMAS F. LLOYD, of the city and county of Albany, in the State of New York, have invented an improvement in Grain-Distilling Apparatus, whereby the high wines are drawn direct from the worm and conducted into the receiving cistern; and we do hereby declare that the following is a full and exact description thereof.

The nature of our invention consists in this:

We dispense with that portion of the distilling apparatus called the doubler, and use in its place an apparatus which we call the generator. The construction and internal arrangement of this generator is as follows: We construct a vessel of shape and material similar to the doubler now used, and make in it two or more chambers. The vapor from the still is conducted by the ordinary steam-pipe, and received into the lower chamber of the generator, where the heavier and weaker portion is condensed and returned to the still by its own gravity through a return-pipe which we provide for that purpose, while by the use of another pipe or tube, that encloses the top of the return-pipe and projects above it, the stronger and lighter parts of the vapor pass up into the next chamber above through a bonneted plunger similar to those used in the still. The vapor, being received in this chamber, its heavier and weaker parts are again further condensed, and are returned through a drop-pipe into the chamber below. This drop-pipe is similar in principle, though different in form to the return-pipe from the lower chamber to the still. It consists of a metal tube of suitable diameter, running at right angles to the face of the bottom of the chamber, the lower end reaching within about one and a half inch from the bottom of the chamber below, and the upper end rising above the bottom of the chamber to between four and six inches, which should be the depth of the liquor contained in the chamber. This end of the pipe is enclosed by an encasing-pipe similar to that of the return-pipe. This encasing-pipe, surrounding the drop-pipe, rises from the bottom of the chamber and is open at both ends; the lower end by proper feed-holes, through which the water and sediment pass down, while the steam or spirit-vapor escapes through its top into the chamber above. When the vapor is received in this upper chamber a portion is again condensed and is returned to the chamber below by a drop-pipe, as has been described, while the lighter portion, which is now spirit-vapor, is passed up and through into the worm, where it is condensed in the usual manner and discharged.

The advantages of this method are these:

1. In making the high wine we make no low wine, as is now the case in the present manner of distilling, where two gallons of low wines are made to one gallon of high wines; and as the low wines are to be returned again to the doubler before another charge is made it necessarily consumes time, which time is not lost in our process.

2. As by our process the less spirituous parts are continually being returned for re-evaporation we dispense with pumping back two-thirds of the liquid that is discharged through the worm, which pumping consumes considerable power as well as time.

3. Less steam is needed to heat and evaporate, as the low wine, which was about two-thirds of the discharge from the worm, being cooled by the old way, is again to be heated to boiling before another charge is drawn, while, by our process, we have no low wines of low temperature to boil a second time, and thus save the expense of fuel for reheating.

4. By our process only one-third the capacity of the worm is required, and one-third the water to be used condensation is needed, as we have but one-third of the vapor to condense.

5. By our process less labor, care, and watchfulness are required for the charges and discharges of the still, as it continually regulates itself in each flow, both of the high wines and return of (what would be the low wines by the old process) the less spirituous liquors in the processes of their evaporation and condensation.

The second part of our invention consists in attaching to the discharge end of the worm an apparatus which we call the indicator, to test the spirits both in temperature and strength and registering its flow without handling or touching. This indicator is constructed as follows: A suitable metal disk of sufficient size and strength is perforated with three holes, one in front and two back; through the two back holes are passed two pipes; an end of each pipe projects above the upper surface of the disk. One of the pipes we call the flow-pipe, which drops down and turns like the letter U, and again turns and connects with the end of the worm; while the other

pipe, which we call the hydrometer-pipe, drops down and turns toward and connects with the flow-pipe. In the end of the hydrometer-pipe, above the top of the disk, is placed a hydrometer, and when the spirits are to be tested a cock below is turned to shut the flow through the hydrometer-pipe. In the front orifice of the disk is another pipe, called the exit-pipe, which rises only to the top surface of the disk and drops down and connects with a meter or enclosed vessel provided with a registering-tube. Over the end of the exit-pipe is placed a thermometer to tell the temperature. The whole is encased with a glass dome, which is securely bolted down to the disk. This dome has in its top an air-hole to aid the flow of the liquor, which rises up over the top of the disk through the flow-pipe and passes out through the exit-pipe to the meter or closed vessel, and from thence to the receiving-cistern.

To enable others skilled in the art to make and use the same we will proceed to describe our invention, reference being had to the accompanying drawings and the letters of reference marked thereon, the same letters referring to like parts.

Figure 1 is a perspective view of still, generator, worm, tube, and indicator.

Figure 2 is a transverse section.

Figure 3 is a top section of indicator.

Figure 4 is a top section of encased drop-pipe.

Figure 5 is a longitudinal cross-section of encased drop-pipe.

A, figs. 1 and 2, is an ordinary charge-tube, which connects with the still B, constructed and operated as now in use; *g*, figs. 1 and 2, is the steam-pipe connecting the still B to the generator C. This generator is constructed in its shell the same as the doubler now used, though it may be smaller, and has within two or more chambers, C' C'' C'''. The vapor from the still is conducted into the lower chamber, C', through the pipe *g* in direction shown by the arrows. Into this chamber the vapor is partly condensed. The parts condensed are the weaker or more watery liquid, which is returned to the still by its own gravity through the return or drop-pipe *i*, fig. 2. This drop or return-pipe *i* has a peculiar bend, so as to always contain in one of its parts liquid. The upper end of the pipe rises above the bottom of the chamber from four to six inches, which should be the depth of the liquid contained in the chamber. This drop-pipe *i* is encased by another pipe or tube *h*, figs. 2, 4, 5, which rises above the upper end of the drop pipe *i*, and is open at both ends, the lower end resting on toes on the bottom of the chamber and furnished with openings or feed holes *j*, fig. 5, through which the heavier liquids and sediment pass, as shown by the arrows, and rising to the top of the pipe *i* and overflowing it run down and out, leaving on the bottom of the chamber *m*, fig. 5, a sufficient depth of liquid. The steam or spirit vapor, which is being continually made, rises from the top of the encasing-pipe *h* and enters the chamber above through the bonneted-plunger *c*, the same as in the still. When in this chamber C'' the vapor is again partially condensed, and is returned to the chamber C' below through the drop-pipe *i*, to be re-evaporated, while the more volatile parts are carried upwards by the encasing-pipe *h*, as operated in the lower chamber C'. When other chambers are added to the body of the generator this process is repeated as often, and the condensed parts carried down and spirituous vapor upwards by means of the encased drop-pipe *i h* provided in and on the bottoms of the several chambers. When the vapor reaches the upper chamber C''' its stronger and lighter parts are passed out into the worm *k* and condensed in the usual way by running cold water acting on the outer surface of the worm, while the weaker is passed back to the chamber below to be returned in vapor. Thus the process is continued, the stronger parts of the vapor in each chamber rising up and into the chamber above and its weaker parts condensed and returned to the next below or the still, to be heated and evaporated again, while the final escape of the spirituous vapor by condensation through the worm is in the form of high wines only.

In order to test the liquor we attach to the end of the worm *k*, fig. 1; the indicator E by means of the pipe *n*, which turns down and bends up like the letter U and passes through a disk, *p*. This pipe we call the flow-pipe. Connected with this flow-pipe *n* is another, the hydrometer pipe *n'* which branches off from the flow-pipe. In this branch is a cock, *r*, which is to be closed when the liquor is being tested by a hydrometer, *x*, placed in the open end of the pipe *n'*, figs. 1 and 3. Forward of these two pipes *n n'* is placed a thermometer, *t*, to test the temperature of the flow; and under the bulb of the thermometer is an outlet through which the liquor passes out into the conduct-pipe *q* into a registering meter, S, or a closed vessel with registering gauge, and then is conducted to the receiving-cistern through the conduct-pipe *q'*. The ends of the pipes *n n'* and *q* are enclosed by the glass dome *o*, which has an air-hole in its top. This dome or bell glass is firmly secured by proper rim of metal and bolts to the disk *p*; and the testing of the liquor can be accomplished without handling, save the shutting the cock *r*.

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

1. The generator C, constructed with two or more chambers, C' C'' C''', for the purpose set forth, substantially as described.
2. We claim the drop-pipe *i*, in combination with the encasing-pipe *h*, for the purpose set forth substantially as described.
3. We claim the indicator E combining the pipes *n n'* and *q*, together with the permanent hydrometer *x* and thermometer *t*, the bell glass or dome *o*, and the cock *r*, for the purpose set forth substantially as described.
4. We claim the combination of the registering meter *s* or its equivalent with the indicator, for the purpose set forth substantially as described.

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Witnesses:

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