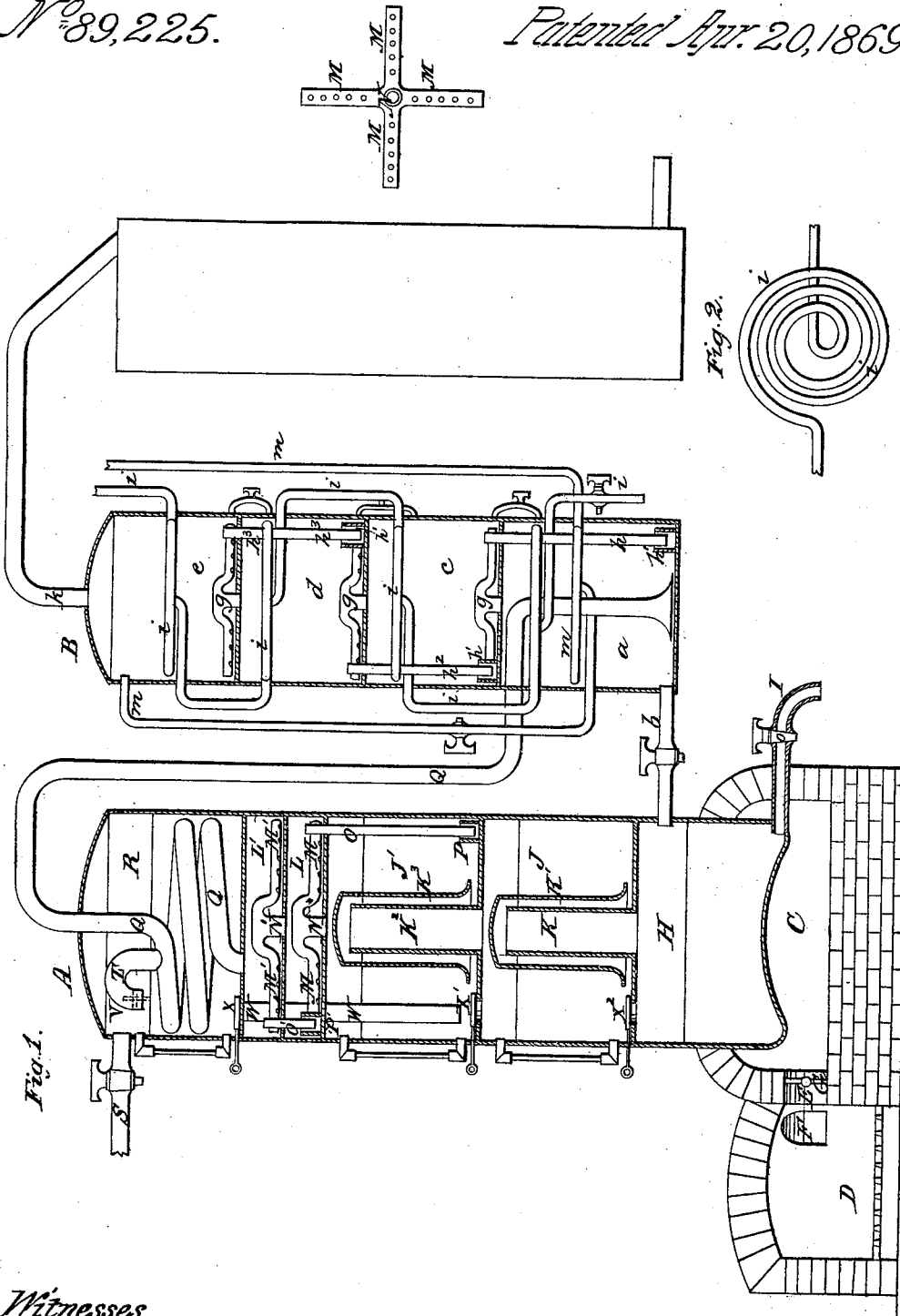


G. Johnston.

Still.

N^o 89,225.

Patented Apr. 20, 1869.



Witnesses.
Geo. H. Strong
J. L. Boone

Inventor.
George Johnston.
By Druey & Co.
his atty.

United States Patent Office.

GEORGE JOHNSTON, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 89,225, dated April 20, 1869.

IMPROVED STILL.

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

To all whom it may concern :

Be it known that I, GEORGE JOHNSTON, of the city and county of San Francisco, State of California, have invented an Improvement in Stills; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvement without further invention or experiment.

The nature of my invention consists of an improved construction for stills, designed more especially for the production of spirituous liquors, as brandy and whiskey, and it relates to an arrangement of the furnace with two discharge-flues, one of which connects with the space beneath the alembic, or retort, and the other with the chimney, so that by means of a slide, or damper, the current of heat may be directed into either passage at pleasure, and thus obviate the necessity of withdrawing the fires during the process of charging and discharging the still.

The retort has a series of horizontal diaphragms, or partitions, commencing near the bottom, and reaching to the top, which separate it into chambers, the lower ones being connected by means of hollow return columns, the next ones having distributions so contrived, as to thoroughly pass the hot vapors through the liquid contained within the chambers, while the upper chamber of all contains a number of coils of pipe, or other device, through which the vapors pass, and thus heat a charge of alcoholic liquid contained within this chamber.

Suitable valves are arranged to discharge the contents of this upper chamber into one of the lower ones, and from that to the next, and lastly to the lowest or heating-chamber.

Within this upper chamber is a short bent pipe, one end of which opens into the discharge-pipe, and the other into the chamber, and it has a self-acting valve, which relieves the chamber of any pressure due to overheating, and thus converts the heating-chamber into a chamber of the still.

The vapors are carried from this first vessel, or retort to the lowest chamber of the vessel B, and rise successively through all the chambers, through distributions similar to those within the first vessel, the heat of each being regulated by means of a water-pipe passing through each of the chambers successively in coils, thence discharging, the flow being regulated by a cock.

Another water-pipe enters the lowermost chamber, and is coiled a sufficient number of times to give the contained water the requisite heat, when it passes out and discharges its contents into the upper chamber of the vessel B, from whence they are conveyed by a series of traps, or valves to the lower chambers successively, so that the spirit may be cleansed from its fusel-oil, and other impurities at one distillation, in place of the two or more heretofore used, and in which

the water must be added in the retort at the subsequent distillation.

From the vessel B the spirit passes to the refrigerating-apparatus in the worm-tub, as usual.

To more fully illustrate and explain my invention, reference is made to the accompanying drawings, and letters marked thereon.

Similar letters of reference in each of the figures indicate like parts.

A is the retort, and B, the second chamber of the still.

The retort is set in brick-work, as shown, and has a fire-space, C, beneath it.

The furnace D may be of any desirable form and construction, and it has two flues, or passages, the one E connecting with the chamber C, and thence to the chimney, while the flue F opens directly into the chimney.

These two flues are opened or closed by a valve, or damper, G, so made, that when one is opened, the other may be closed.

By this arrangement, the heat of the fire may be made to pass beneath the retort, or it may be entirely shut off, and pass directly to the chimney while charging and discharging, and the necessity for withdrawing the fire is obviated.

The retort, or vessel A contains a number of chambers, the lower one, H, of which, holds the charge, and is subjected to the heat of the fire or steam.

This chamber may be discharged at any time by the pipe I.

Above this chamber are two other chambers J and J'.

A large hollow column, or pipe, K, opening into the chamber H, at the bottom, extends to near the top of the chamber J.

Over this chamber is placed an inverted bell-mouthed pipe, K', closed at the top, and extending to near the bottom of the chamber J, being large enough, so that as the vapors ascend from the chamber H, they rise to the top of the column K, then are returned downward outside of it, and between it and the case K', and are finally discharged from its mouth, and rise through the alcoholic liquid, with which the chamber J is filled, to near the level of the top of the column K.

From this chamber the vapor passes by a similar device to the chamber J', as shown, this chamber being also filled like the other with alcoholic liquid.

Above the chamber J' are two shallow chambers L and L'.

The chamber L contains a distributor, consisting of four hollow radial arms M M, pierced with small holes on their lower sides.

These arms meet at the centre, and are connected with the chamber J' by a short pipe, or passage, N.

An open pipe, O, passes through the bottom of the chamber L, and rises just high enough, so that the arms M will remain constantly covered, but any liquid

more than sufficient for that purpose, will flow down the pipe O, which extends to near the bottom of the chamber J', and has a short tube, P, encircling it, and rising around it to such a height as to form a trap, so that all vapors must pass through the distributor to reach the chamber L.

The chamber L' is connected with L, by a distributor, M', and has also a similar trap formed of the pipes O' and P', as shown.

From the chamber L' the vapors pass into the pipe Q, which is situated within the upper chamber R, and is coiled within it a number of times, so as to serve as a heater for the charge of alcoholic-liquid, which is introduced to this chamber through the pipe S. Any other form of heater, such as a cylinder, may be used if found desirable.

A short bent pipe, T, is placed with one end opening into the coiled pipe Q, and the other into the upper part of the chamber R.

A valve, V, is placed in this pipe, so that if the temperature of the charge in the chamber R be unduly elevated, any pressure therefrom, will raise the valve, and allow the vapor to enter the pipe Q, thus making the heating-chamber a chamber of the still.

The chamber R has a pipe, W, passing from its bottom through the two chambers L and L', and communicating with the chamber J', valve, a X, which is operated from the outside, controlling the passage.

The chambers J' and J have each a similar valve, X and X², so that when the charge in the chamber H has been marked off and discharged, the valve X² is opened, and the charge in J passes into H.

The charge in J' enters the chamber J, through the valve X¹, and the charge from R passes through the valve X and pipe W, to fill the chamber J, after which a new charge is let into R through the pipe S.

The vapor after passing through these different chambers and pipes, is carried by the pipe Q' out of the vessel A, and then down till it enters the lower chamber a of the vessel B, where the pipe opens with a bell-mouth close to the bottom.

The chamber a is connected with the chamber H, in the vessel A, by means of a pipe, b, and stop-cock, so that all the condensed vapors and other contents of a can be returned to H again.

The vessel B is divided by diaphragms, like the vessel A, into a number of other chambers c d e, each of which connects with the one below, by means of distributors g g, similar to that described in the chamber L in the vessel A, and each chamber has a trap, or pipes, h h', like those described, as connecting the chambers L' L and J' in the vessel A.

The vapors are kept at a temperature which gradually decreases in each of the chambers from the bottom up, by means of a water-pipe, i, which enters the upper chamber, and is coiled, as shown at Figure 2, then passes out and into the chamber below, within which it is coiled in a like manner, and thus through the whole, finally discharging after leaving the lowest chamber a, the water being elevated in temperature in each of the chambers as it descends, so that the heavier impurities are condensed in the chamber a, and the lighter ones in their order ascending, till the vapor thoroughly washed and purified, passes through the upper chamber at any desired temperature, to the worm-tub, or refrigerator, through the pipe k.

The water for purifying purposes is carried by a pipe, m, to the chamber a, within which the pipe is coiled a sufficient number of times to allow the water to be raised to the desired temperature, after which the pipe passes out of a, and rises to the upper chamber e, where it discharges into the chamber, the supply-pipe having a cock, by which the amount introduced may be regulated.

The water will fill the chamber e to the level of the top of the pipe h³, and the surplus will pass through this pipe to the chamber d beneath.

The pipe h² supplies the chamber e in the same manner, and so on to the lowest chamber.

The water may be regulated in quantity, and may be allowed to run continuously when the still is worked continuously, but when the still is working separate charges, an amount of water sufficient to cleanse the spirituous-vapors is introduced at each charge.

Water will cleanse the spirit of most of its fusel-oil and other impurities when used in sufficient quantity, and such is the practice in all redistillation, the impure spirit being with water and returned to the still.

With stills such as Coffey's, the spirit is partially purified by decreasing its specific gravity on its passage from the alembic to the worm, thereby freeing it from some of its fusel-oil.

My invention not only reduces its specific gravity at one operation, but also passes it through a sufficient quantity of water to absorb its impurities without any further heating.

In my device, the second column, or chamber B of the still, is charged with the amount of water necessary to cleanse the vapors, and it is kept at such a temperature, that the heavier impurities are all condensed or united with the matter in the lowest chamber, and from that to the upper one. e, within which the temperature is so regulated, that the spirituous-vapors may be passed to the refrigerator at any proof desired, and cleansed of nearly all impurities, this being effected at one operation, as before described.

Having thus described my invention,

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

1. The furnace D, with the two flues E and F, and the adjustable slide, or damper G, for transference, regulating, and stopping the heat, substantially as herein described.

2. The curved pipe T, and the valve V, or an equivalent device for converting the heating-chamber into a chamber of the still, substantially as described.

3. The device consisting of the heating-vessel A, together with the vessel B, with its chambers and passages intervening between the vessel A, and the refrigerating-apparatus, when constructed and operating substantially as herein described.

4. Regulating the temperature of the chambers of the vessel B, by means of water passing through the pipe i, or an equivalent device substantially, as described.

In witness whereof, I have hereunto set my hand and seal.

GEORGE JOHNSTON. [L. s.]

Witnesses:

GEO. H. STRONG,
J. L. BOONE.