(No Model.)

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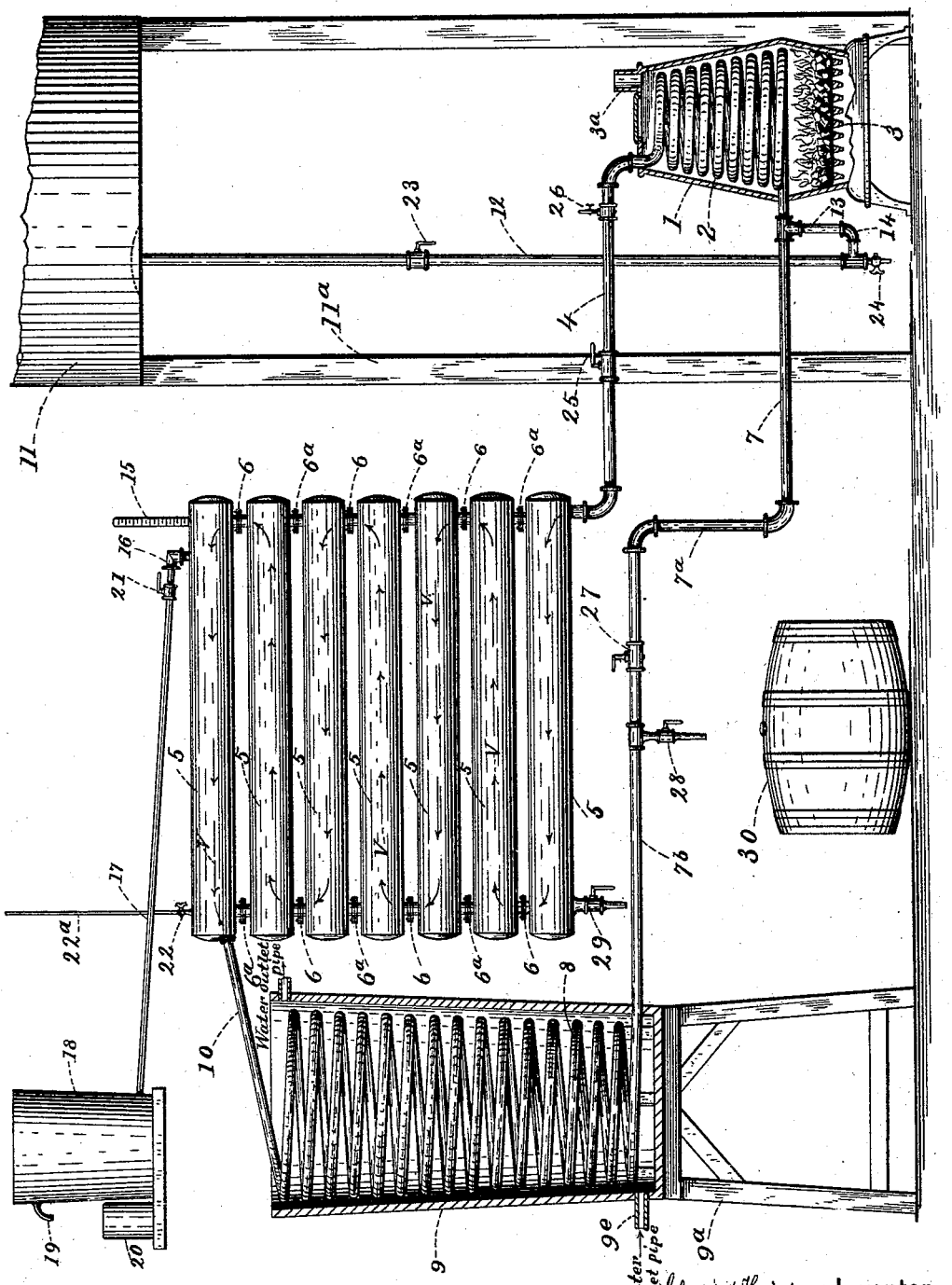
METHOD OF AND APPARATUS FOR PURIFYING AND SOFTENING LIQUORS.

No. 492,542. Patented Feb. 28, 1893.



Witnesses.

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METHOD OF AND APPARATUS FOR PURIFYING AND SOFTENING LIQUORS.

SPECIFICATION forming part of Letters Patent No. 492,542, dated February 28, 1893.

Application filed December 16, 1892. Serial No. 455,386. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN HEINTZ, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Methods of and Apparatus for Purifying and Softening Liquors, of which the following is a specification.

My invention relates to an improvement in the method of and apparatus for purifying and softening liquors or distilled spirits for which Letters Patent No. 482,843, were granted to me September 20, 1892, and it will be fully and clearly herein described and claimed, reference being had to the accompanying drawing, in which:

1 represents a suitable heating device, it is made in the form of an ordinary stove but any other device adapted for the same purpose may be used.

Within the heating device is secured a coil of pipe 2. This coil 2 is located above the fire grate, 3, a sufficient distance to allow room for fuel.

3ª, represents the usual collar for the smoke pipe.

To the top of the coil, 2, is a pipe, 4, extending substantially horizontally to and connecting with a series of liquor holding vessels or tanks, 5. These tanks, 5, are shown as arranged horizontally one above the other and are connected together by short pipes each having flanges 6 and 6ª, through which bolts are passed for rigidly fastening them together in the usual and well known way, but if desired they may be arranged vertically. Between all the flanges 6ª, is placed a diaphragm made in any well known way for the purpose of closing the opening through the pipes at these points. The object being to force the liquid to move through the entire length of the tanks, substantially as indicated by the arrows V.

The tanks, 5, may be constructed of copper, iron or other metal, for some purposes iron is preferable. They should be sufficiently strong to stand the great pressure required while the apparatus is in operation.

The lower portion of the coil 2 is connected with a pipe, 7, which (by means of pipes 7ª and 7ᵇ) extends to and connects with a condensing coil, 8. This coil is located within a tub, 9, supported by a frame 9ª. The tub, 9, is intended to be supplied with cold water from the inlet pipe 9ᶜ. The upper part of the condensing coil, 8, is connected by a pipe, 10, with the top liquor tank, 5, so as to communicate therewith.

A feed tank or reservoir 11, is located above the apparatus and is supported upon a suitable frame work, 11ª. From the reservoir, 11, is a downwardly projecting pipe, 12, which connects by a pipe 13, and elbow 14 with the pipe, 7, so as to communicate with the coil 2 and the rest of the apparatus.

To the top tank 5 is attached a thermometer, 15, to indicate the temperature; any suitable thermometer being used for this purpose. To the top tank 5 is also connected by an elbow, 16, a pipe, 17, which extends to and connects with a condensing vessel, 18, having a small outlet pipe, 19, to allow the overflow, if there should be any, to drip into the small vessel 20. The bottom of the condensing vessel, 18, is placed on the same level with the reservoir, 11, and should be of the same height, so that when communication is made with all parts of the apparatus the liquid will rise to the same level in each. But the bottom of the vessel is above the upper tank 5, and the pipe 17 is so small and of such a length that the heat from the liquor passing through it to the vessel 18, is absorbed by the surrounding atmosphere and consequently the temperature of the liquor in the vessel 18, is never increased above a certain point which is far below that of the temperature in the tank 5. As the bottom of the vessel 18 is on a level with the reservoir, it is evident that the liquor will not rise in the vessel 18, to any great extent except in case of too great a pressure in the tank 5, when the liquor will be forced up through the pipe 17, and the vessel 18 will act as a safety valve by permitting the escape of liquor which will be forced up through the pipe by the increase of temperature.

In the pipe, 17, is placed a stop cock, 21, and the upper tank or liquor vessel, 5, is provided with an air cock, 22. The liquor in the pipe 17, being above the general circulation, through the tanks 5, of the liquor, and the coils 8 and 2 and their connecting pipe, it is not circu-

lated but acts as a seal for the liquor that is passing through the pipes below it whereby the stop cocks can be left open for the passage of the liquor in case of excesses within the tank 5. The pipe, 12, extending down from the reservoir, 11, is provided with a stop cock 23 and at the bottom end with an outlet cock, 24.

To the pipe, 4, is connected a stop cock, 25, and an air cock, 26. The pipe, 7^b, is also provided with a stop cock 27, and an outlet cock, 28, an outlet cock, 29, is also connected with the lower tank, 5.

This invention is adapted for treating distilled spirits of all kinds, or medicines or other liquors, and submitting them to a very high heat and pressure without loss of proof.

In spirituous liquors the fusel oil or other impurities, are quickly changed or destroyed by the high heat obtained in this device.

The operation of the device is as follows—The tank 11 being filled, the cocks 21,—23—25 and 26 27, also air cock 22 being opened, the liquor will flow down through the pipe, 12, into the pipe, 7, coil 2 and pipe, 4, and from thence into the liquor tanks, 5, the liquor flowing through the pipes 7—7^a and 7^b will fill the condensing coil, 8. The liquor will continue to rise until it flows through the pipe, 17, and then fills the condensing vessel 18, even with the level in the tank 11. A fire now being started in the heater, 1, will cause the liquor to flow from the upper part of the coil, 2, through the pipe, 4, and up through the tank, 5, and from thence downward through the pipe, 10, into and through the condensing coil and from thence it flows back through the pipes, 7^b—7^a and 7, to the lower part of the coil. This construction enables me to use a much greater heat in the heating coil as the condensing coil, 8, being cooled by the ever changing water (supplied from a city water works or other suitable source) surrounding it, produces a much more rapid circulation than could be produced without the condenser, 8, and thereby proportionately keeps down the pressure in the apparatus, as it allows more heat to be applied to the heating coil because the expansion in the heating coil is counterbalanced by the contraction that continually takes place in the condensing coil. Any vapor that should pass up through the pipe, 17, into the liquid in the condensing vessel, 18, is condensed before it reaches the top of the liquor in said vessel, so that no strength or proof escapes during the operation of the device, the flavor and strength of the liquid operated upon being wholly preserved during the operation of heating and boiling by this means.

When it is desired to draw off the liquor after having passed through the condenser, 8, and being cooled the air cock 22 is opened, the stop-cock 27, is closed (also the air cock 21 is closed), and the outlet cock, 28, opened after a barrel, 30, for instance, has been placed under it and a rubber connected at one end with the outlet cock, 28, its opposite end being inserted in the bung hole of the barrel. In this way the liquor may be drawn cold or nearly so. If hot liquid is required to be drawn off, the air cock, 22, is opened (this air cock, 22, is provided with a pipe, 22^a, at the top so as to prevent an overflow from the liquids in the tank 11 and 18, when opened) a barrel, (or other receiving vessel) is placed in position and connected to a pipe or rubber tube with the outlet cock, 29, which is then opened until a sufficient quantity is taken out.

When it is desired to empty the coil, 2, for repairs, or for other purposes, the stop cocks 23—25 and 27, are closed, the air cock 26, is opened and then the outlet cock, 24, is opened, and the liquid drawn out into a suitable receptacle.

It will be noticed that as the pipes 4—7 and 10, are all of much smaller diameter than the tanks, 5, the circulation of the liquids through the pipes will be very rapid and proportionately slower in the tanks, 5. This construction gives room enough for a large quantity of liquor to be treated and at the same time provides for a sufficient circulation of the liquids in the tanks 5 while being treated.

The liquor is heated in the coils, 1, to over 300° Fahrenheit, which is reduced to about 220° more or less when the liquor reaches the upper tank, 5, at the thermometer 15.

All parts of the apparatus should be made very strong to stand the heavy pressure.

I claim as my invention—

1. The herein described process of aging and purifying liquors without loss of proof or liquor, consisting in filling a system of heating pipes, liquor tanks, and condensing pipes with liquor until it runs up into a vapor condensing vessel, then hermetically closing said pipes and tanks against the escape of any of the liquor or vapor, then applying a strong heat of 220° or more, to the heating pipes and a cooling medium to the condensing pipes, thereby causing the liquor to be greatly heated in one portion of the apparatus and rapidly cooled in another portion, and to circulate with great rapidity under great pressure without loss of liquor or proof, substantially as described.

2. In an apparatus for aging and purifying liquors, the combination with a supply tank a feed pipe a heating coil, a series of connected liquor tanks, a pipe of less diameter than said tanks, provided with a stop and outlet cock, connected with the upper portion of the heating coil and extending to and connecting with the lower one of the series of connected liquor tanks a condensing coil, a pipe extending from the upper liquor tank to and connecting with the upper end of the condensing coil, a water tank for holding the condensing coil, a pipe provided with an outlet and shut off cock, extending from the lower end of the condensing coil to the lower end of the heating coil, and a suitable heating device, substantially as and for the purposes described.

3. In an apparatus for aging and purifying

liquors the combination of a tank a feed pipe a heating coil inclosed within a suitable heating device, a series of liquor tanks, a pipe of less diameter than said tanks provided with a stop cock and extending from the upper portion of the heating coil to and communicating with the series a condensing coil, a pipe extending from the upper liquor tank and communicating with the upper end of the condensing coil, a water tank for holding the condensing coil, a pipe provided with an outlet and shut off cock extending from the lower end of the condensing coil, a vapor condenser and a pipe connected and communicating with the upper liquor tank and extending to and connected with the vapor condenser the whole combined for joint operation substantially as and for the purposes described.

4. In an apparatus for aging liquors, the combination with a supply tank a feed pipe provided with a stop cock of a heating coil inclosed in a suitable heating device, a pipe provided with a stop cock a series of connected liquor tanks, a pipe provided with an outlet and a stop cock, a condensing coil located in a water tank and having its upper end connected with the upper liquor tank, an air cock connected with said liquor tank a vapor condenser located upon a level with the feed reservoir or tank and a pipe extending from the top of said tank to and communicating with the vapor condenser, substantially as and for the purposes described.

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