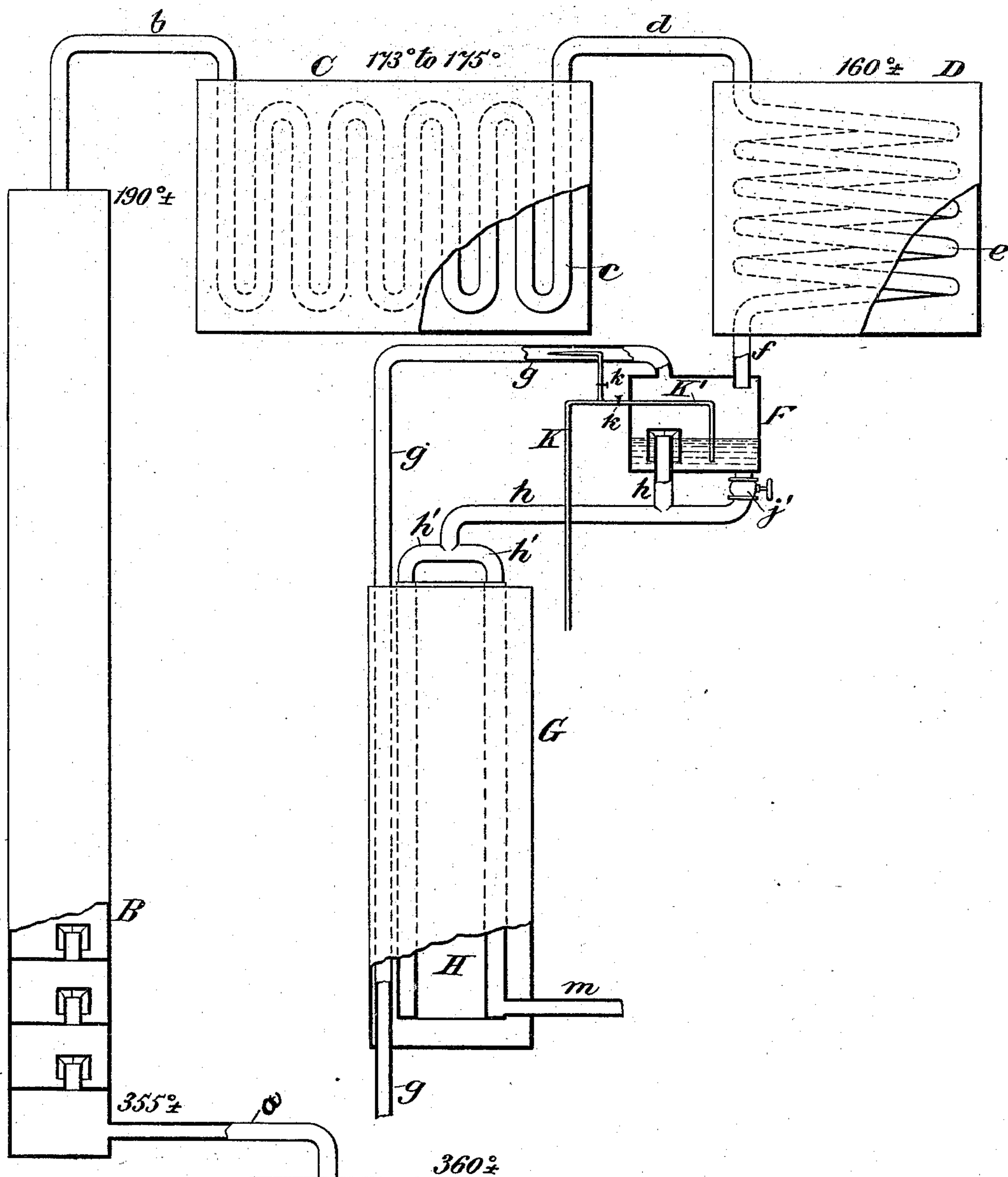


(No Model.)

H. CLEMENTSON.
APPARATUS FOR DISTILLING SPIRITS.

No. 526,437.

Patented Sept. 25, 1894.



Witnesses:-

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UNITED STATES PATENT OFFICE.

HENRY CLEMENTSON, OF BROOKLYN, NEW YORK.

APPARATUS FOR DISTILLING SPIRITS.

SPECIFICATION forming part of Letters Patent No. 526,437, dated September 25, 1894.

Application filed December 8, 1893. Serial No. 493,194. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLEMENTSON, a citizen of the United States, and a resident of Brooklyn, in the county of Kings, State of New York, have invented a new and useful Improvement in Apparatus for Distilling Alcohol, of which the following, taken in connection with the accompanying drawing, is a specification.

The object of my invention is to improve the quality of alcoholic spirits by obtaining a purer product than that which is produced by the means now in use. It relates especially to an apparatus by which the ether contained in ordinary distilled alcoholic spirits is effectually extracted. The invention consists of the construction hereinafter pointed out.

It is well known that distilled alcoholic spirits in its purest form, as heretofore known, contains a certain percentage of ether. This contained ether is an impurity which it is highly desirable should be separated from such spirits; but heretofore no means have been known which would effectually accomplish the desired result. By my apparatus I am able to extract nearly every trace of ether, which not only thus improves the quality of the spirits; but also saves the ether as a by-product.

The drawing represents diagrammatically one form of an apparatus embodying my invention.

From the still A, a pipe *a* leads to the lower end of the well known column B, from the upper end of which a pipe *b* leads to the goose C. This goose, which is of ordinary construction, comprises a chamber filled with water, and the pipe *c* folded back and forth, communicating at one end with the pipe *b* and at its other end with a pipe *d*. The pipe *d* leads to a secondary goose D comprising a chamber filled with water and a coiled pipe *e* communicating at one end with the pipe *d* and at its other end with an outlet pipe *f*. The pipe *f* opens into a chamber F near its top. From the top of this chamber another pipe, *g*, leads down through a cooler G and out to a suitable tank or receptacle. The cooler G is of ordinary construction and comprises a chamber filled with water and an inclosed annular chamber H of less diameter than the outer casing of the cooler so that the water

may have free circulation all about the chamber H. The chamber H has an outlet pipe *m* leading out to a suitable tank or receptacle. From near the bottom of the chamber F a pipe *h*, provided within the chamber with an ordinary siphon outlet, leads through the branches *h'*, *h'* to both sides of the annular chamber H of the cooler. An outlet pipe *j*, provided with a valve *j'*, leads from the bottom of the chamber F to the pipe *h*. An air pipe K, leading from an air pump or from any suitable means for forcing air under pressure, is provided at its upper end with an injector nozzle located within the pipe *g* near the chamber F. From the pipe K a branch pipe K' leads into the chamber F, terminating near the bottom of the chamber. The pipes K and K' are provided with valves *k* and *k'* respectively to cut off the air supply when desired.

The operation of this apparatus is as follows: The still A is filled with wort or with proof alcohol which consists ordinarily of about equal parts of pure alcohol and water and a varying amount of ether. The still is raised to a temperature of about 360° so that the liquid is vaporized. As this vapor rises through the column B it is gradually cooled, the temperature of the column gradually diminishing from about 355° at its bottom to about 190° at its top. From that part of the column where the temperature is a little below 212° to the top of the column the vapor of water is condensed into water which collects in the chambers of the column. The vapors of alcoholic spirits and ether which condense at a lower temperature of course pass on and into the goose C. This goose is kept at a temperature of about 173° to 175° and allows the vapors passing through it to cool down to this temperature. The vapors then pass into the goose D which is kept at a temperature of about 160°. Vapor of alcoholic spirits condenses to a liquid at about 173° and liquid alcoholic spirits therefore collect in the goose D. Vapor of ether condenses at from about 120° to 143° and consequently the vapor of ether in the goose D does not condense. Alcoholic spirits in liquid form and ether in vapor form therefore pass through the goose D into the chamber F which I call a separator. This separator is

maintained at about the same temperature as the goose D so that the ether is still in the form of vapor and fills the upper part of the separator while the liquid alcoholic spirits fill the bottom of the separator rising to the mouth of pipe *h*. While the ether vapor and liquid alcoholic spirits are entering the separator, the valves of the air pipes are opened. The jet of air escaping from the nozzle within the pipe *g* draws the ether vapor into this pipe down through the cooler G where it is condensed and from it is led off to a suitable receptacle. The air which escapes through the branch pipe *K'* is delivered near the bottom of the alcoholic spirits in the separator, and serves to agitate the liquid alcoholic spirits so as to free it from any ether vapor that may be occluded in it. By providing the pipe *h* with a siphon outlet the alcoholic liquid is led off from near the bottom of the separator at a point farthest from the ether vapor and diminishes the possibility of carrying off any of the ether in the spirits.

When it is desired to cleanse the apparatus steam is passed through it and the water of condensation collecting in the separator is carried off by the drain pipe *j'* into the chamber H of the cooler.

While I have herein shown and described my invention as applied to an efficient form of apparatus adapted to distill alcoholic spirits from molasses, yet it could of course be used in connection with distilling apparatus of any description. Moreover, the particular arrangement and construction of the elements comprising my invention, could of course be widely varied without departing from the spirit of the invention.

Any means found desirable may be employed for separating the ether vapors from the liquid alcoholic spirits when once they are obtained. For instance, besides the means herein shown and specifically described, a current of air might be driven over or through the vapor and liquid, while the liquid is permitted to fall in a spray or shower into a re-

ceptacle, or an exhaust pump might be employed to draw off the ether vapor, by displacing the vapor by air drawn into a separator through an aperture on the opposite side thereof from the pump. Again, various means may be employed for agitating the liquid alcoholic spirits to free it from any ether vapor that might be occluded in it.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus for distilling alcoholic spirits, the combination of a goose through which the vapor of alcoholic spirits and its contained ether vapor are passed, a secondary goose in communication therewith for condensing the alcoholic spirits and retaining the ether in the form of a vapor, a separator chamber communicating with the secondary goose for collecting the ether vapor and alcoholic spirits, a cooler communicating with the said chamber near its bottom, an outlet from said chamber for the ether vapor, and means for agitating the liquid alcoholic spirits in said chamber, substantially as set forth.

2. In an apparatus for distilling alcoholic spirits, the combination of a goose through which the vapor of alcoholic spirits and its contained ether vapor are passed, a secondary goose in communication therewith for condensing the alcoholic spirits and retaining the ether in the form of a vapor, a separator chamber communicating with the secondary goose for collecting the ether vapor and alcoholic spirits, a cooler communicating with the said chamber near its bottom, a vapor outlet leading from the said chamber through the cooler, and an air pipe having a discharge orifice within the vapor outlet and a second discharge orifice within the separator chamber near its bottom, substantially as set forth.

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