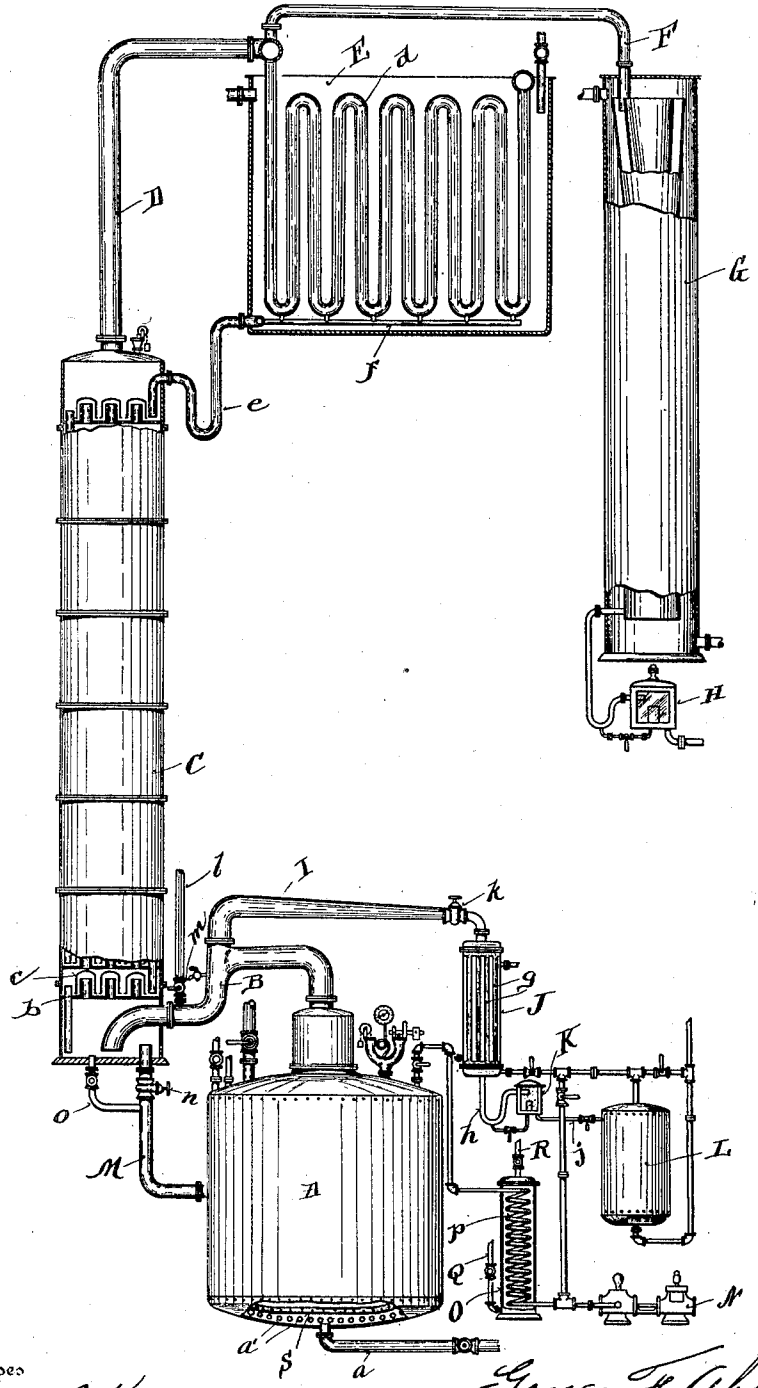
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G. F. AHLERS.

STILL.

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NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE F. AHLERS, OF COVINGTON, KENTUCKY, ASSIGNOR TO HOFFMAN, AHLERS & COMPANY, OF CINCINNATI, OHIO, A CORPORATION.

STILL.

SPECIFICATION forming part of Letters Patent No. 722,071, dated March 3, 1903.

Application filed October 30, 1902. Serial No. 129,355. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. AHLERS, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Stills, of which the following is a specification.

My invention relates to an improved apparatus for distilling ether and alcohol from spirits such as commercial high-wines.

The objects of my invention are, first, to separately recover the distilled ether at the beginning of the operation; second, to separately collect the alcohols of the different proofs absolutely free from contaminating ether, and, third, to rapidly and efficiently recover the low-proof alcohol remaining in the residue of the charge after the ether and higher-proof alcohol have been separately collected.

Other objects of my invention relate to the production of simple devices for accomplishing these objects incorporated into one continuously-operating system.

The features of my invention will be more fully set forth in the description of the accompanying drawing, forming a part of this specification, in which the figure is a side elevation of my apparatus with various parts shown in section.

A represents the ordinary rectifying apparatus, having the usual blow-off pipe *a* and steam heating-coil *a'*. B represents the conduit leading from the dome of this apparatus to the base of the ordinary refining-column C, having therein the ordinary series of boiling-pipes *b* and drip-pans *c*. From the top of this refining-column a pipe D leads to the usual goose-condenser E, in which *d* represents the goose-coil. *e* represents a return-pipe tapping the pipe *f*, which in turn taps the bottom of the goose-coil *d*, whereby the alcohol condensed in the chamber E returns to the dripping-pans in column C. F represents a pipe leading from the goose-coil *d* to the final condenser G, which discharges into the alcohol-separating box H. These parts and arrangements are of the ordinary construction in the present mode of refining high-wines. As the operation was conducted in this apparatus, at the beginning of a given operation there remains collected in the drip-pans of the column C the second grade of alcohol left over from the previous operation. At the beginning of this new operation the ether is first driven off and passes upwardly through the column C, boiling the alcohol held in the series of pans and being absorbed largely thereby. So much of the ether as is not absorbed in the column C and not condensed in the condenser E passes over and is condensed in the final vertical condenser G, where it is separated from the first-grade alcohol. As the result of this operation all the alcohol held by the column C is badly contaminated by the ether and the whole system is fouled with the ether-vapors. So much of the alcohol as becomes contaminated with the ether-vapor at this primary portion of the distillation is an impure mixture requiring redistillation at a constant loss to render it suitable for commercial uses. In order to avoid this loss of alcohol and the consequent loss of time, in order to keep the apparatus pure, and in order to separately collect the different products in condition suitable for commercial purposes and free from alcohol, I have provided the following instrumentalities:

I represents an ether-conduit leading from the top of the conduit B to the top of an ether-condensing tank J, having condensing-tubes *g* therein.

K represents a separating-box for the ether, communicating by means of a pipe *h* with the condenser J.

j represents a pipe leading from the separating-box to the ether-reservoir L, where it is stored under air-pressure for distribution as needed.

k represents a valve in the pipe I. The ordinary charging-pipes, gages, &c., of the distilling apparatus are shown, but need not be described.

l represents water-inlet pipes entering the pipe B and provided with the valve *m*.

M represents a water-pipe leading from the bottom of the column C into the distilling vessel A. It is provided with the cock *n*.

o represents a draw-off pipe leading from the bottom of the column C for draining.

Mode of operation: The old charge having

been blown off, a fresh charge is introduced into the vessel A in the ordinary manner, the valve *n* is closed, and water is admitted into the bottom of the column C through pipe *m* until the discharge ends of the pipes B and M in the bottom of column C are water-sealed. The water-level is raised in the column C and in the alcohol-conduit B to a level slightly below the level at which the ether-conduit I communicates with said conduit B. N represents an air-compressor communicating with the air-coil *p* in the steam-heating chest O, the said coil communicating with the vessel A through the top thereof. Q represents a steam-inlet to said chest, and R the steam-outlet. *s* represents a perforated distributing hot-air coil in the bottom of the vessel A, supplied with a pipe leading from the coil *p*. The valve *k* being open, *n* closed, and a water-level established as directed, heat is applied to the charge, and the compressed hot air from the coil *p* is supplied to the bottom of the charge, thoroughly agitating the same and supplying the oxidizing agent in a condition best adapted to liberate the ether. The ether being driven off at a lower temperature than the evaporating-point of alcohol is rapidly expelled from the charge, and being shut off by the water seal from entrance into the column C it enters the ether-condensing system through the pipe I. The condensed liquid is drawn off and tested from time to time, and the operation is allowed to continue as long as the tests show the ether to be pure. When these tests show that the ether is all driven off, the valve *k* is closed, the valve *n* opened, discharging the water from the column, and the alcohol, entirely free from ether, is allowed to pass though the alcohol-condensing system. When the operation has been continued until all of the high-proof alcohol has been eliminated from the charge, a small per cent. of low-proof alcohol remains, which as the operation was carried on heretofore was either wasted in the blow-off or driven at the expense of considerable time and heat. With my apparatus, when this stage of the operation is reached I again treat the charge to the agitation and oxidation of the hot compressed air, which quite rapidly and economically drives off the low-proof alcohol remaining in the charge, so saving all the alcohol without the loss of additional time, heat, and labor.

By this apparatus and operation I produce for the first time in one apparatus and one continuous operation a commercially-pure ether and a commercially-pure alcohol of two grades, these three products being separately collected.

Having described my invention, I claim—

1. In combination with a distilling vessel, an alcohol-condensing chamber, a conduit leading from the top of the distilling vessel to the bottom of the condenser, means for supplying water to and draining water from said condenser, an ether-condenser, a conduit connecting the said ether-condenser with the said alcohol-conduit, a valve in the said ether-conduit, means for separately collecting the condensed alcohol and the condensed ether, and means for establishing a water seal in the alcohol-condenser, whereby communication is shut off between the same and the distilling vessel during the primary operation in which the ether is supplied to its separate condensing system, substantially as described.

2. In combination with a distilling vessel, an alcohol-condensing chamber, a conduit leading from the top of the distilling vessel to the bottom of the condenser, means for supplying water to and draining water from said condenser, an ether-condenser, a conduit connecting the said ether-condenser with the said alcohol-conduit, a valve in the said ether-conduit, means for separately collecting the condensed alcohol and the condensed ether, and means for establishing a water seal in the alcohol-condenser, whereby communication is shut off between the same and the distilling vessel during the primary operation in which the ether is supplied to its separate condensing system, and means for supplying hot compressed air through the distilling vessel, substantially as described.

In testimony whereof I have hereunto set my hand.

GEO. F. AHLERS.

Witnesses:
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