E. G. STARCK.

DISTILLING COLUMNS.

No. 195,852. Patented Oct. 2, 1877.

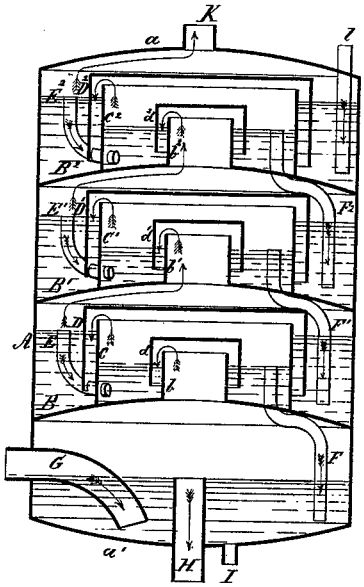

Fig: 1.

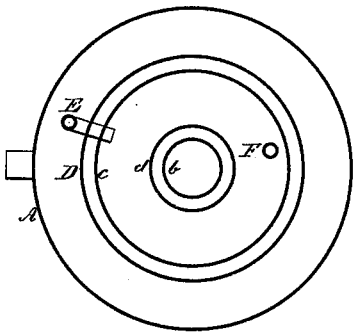

Fig: 2

Witnesses
S. N. Fuller
F. A. Thomason

Inventor.
Ernst G. Starck
by Geo. W. Dzerold
Atty.

UNITED STATES PATENT OFFICE.

ERNST G. STARCK, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DISTILLING-COLUMNS.

Specification forming part of Letters Patent No. **195,852**, dated October 2, 1877; application filed August 7, 1877.

To all whom it may concern:

Be it known that I, ERNST GOTTLIEB STARCK, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Double-Acting Still-Column, of which the following is a specification:

The nature of my invention relates to still-columns which are employed for continuous distillation, and for producing the finest cologne-spirits, alcohol, or high wines of a very high grade.

The invention consists of a vessel containing a series of chambers placed one above another, which are arranged with two or more annular partitions and two or more hoods, in such a manner that the vapor from the still is compelled to descend and pass through the liquid contained in each chamber several times before it can pass to the chamber next above, whereby the column can be built more compactly, is heated up sooner with less fuel, and the charge is run off in less time than usual with the old column.

In the drawing, Figure 1 is a vertical section through center, and Fig. 2 is a sectional plan of the column.

A is a cylindrical vessel, having bulged top *a* and bottom *a'*, and being vertically divided into a series of chambers by partitions B, B^1, and B^2, each of which has a central opening, with a vertical annular wall, *b*, b^1, and b^2, joined upon the edge thereof.

At about half distance between the exterior casing of vessel A and the walls *b* b^1 b^2, annular walls *c*, c^1, and c^2 are placed upon said partitions B B^1 B^2, being proportionally higher than the walls *b* b^1 b^2.

d d^1 d^2 are hoods placed over walls *b* b^1 b^2 in such a manner that the bottom edges of their rims reach to near the partition-plates B B^1 B^2, whereto they are secured by suitable braces.

D D^1 D^2 are hoods of proportionally larger dimensions, which are placed and secured over the partitions *c*, c^1, and c^2 in similar manner to hoods *d*.

Return-pipes E are projected through the lower portion of walls *c*, and are turned upward into the annular chamber, outward of hood D, to a height at which the liquid is to remain therein, any surplus being conducted by said pipe into the chamber inside of wall *c*.

The return-pipes F commence from an elevated point between the walls *b* and *c*, and project through the partition B into the next chamber below, terminating near the bottom thereof, and outside of wall *c*.

Pipes G and H connect with a common copper still, G admitting the vapor, and H discharging the surplus liquid back into the still again, while the pipe I is to be provided with a faucet for drawing off the liquid from the lower chamber whenever desirable.

The pipe K on top of the vessel is to conduct the escaping vapors into the worm-condenser, while pipe *l* will return the weak liquor into the column.

The operation is as follows, to wit: The several chambers being filled with liquid from above, and vapor being admitted from the copper still through pipe G, it will pass up through the central opening of partition B, will fill the space in hood *d*, whence it will have to pass through the liquid under the lower edge of hood *d;* thence it will fill hood D, and will pass under the lower edge of the same through the liquid, and will rise into the next chamber above, where it has to pass through the same evolutions again, and so on, from chamber to chamber, until it escapes into the worm-condenser through pipe K; and while thus passing through the liquid in the several chambers, the watery portions of the vapor are condensed and left behind, while the pure and refined alcoholic vapor only will reach the pipe K.

The continuous condensation of a large portion of the vapor in the column would soon fill the whole column with liquid if the return-pipes did not continuously conduct the surplus downward again from chamber to chamber, thereby causing, however, the uppermost chamber to hold a liquid of considerable alcoholic strength, while the liquid in the chambers below becomes weaker in proportion as they are lower down. The uppermost chamber also collects the fusel-oil, which may be drawn off separately, if desired.

Heretofore still-columns had but one hood, and therefore they had to be built very tall, so that they reached through several stories in the building, for having the required capacity, while with the column described I obtain the same capacity with half the height; and where it is an object to decrease the height of the

column still more, I can augment the number of walls and hoods in the chambers by increasing the diameter of the column proportionally.

What I claim as my invention is—

1. A still-column consisting of the vessel A, vertically divided into chambers by partitions B, B^1, and B^2, intersected by two or more walls, *b c*, and two or more hoods, *d* D, in combination with the return-pipes E F, all constructed and arranged substantially as herein described, to operate as specified.

2. The vessel A, having horizontal partitions B B^1 B^2, vertical annular walls *b c*, hoods *d* D, return-pipes *l*, E, F, and H, and vapor-pipes G and K, all constructed, arranged, and operating substantially as described, for the purpose herein set forth.

ERNST GOTTLIEB STARCK.

Witnesses:
WM. H. LOTZ,
EMIL H. FROMMANN.