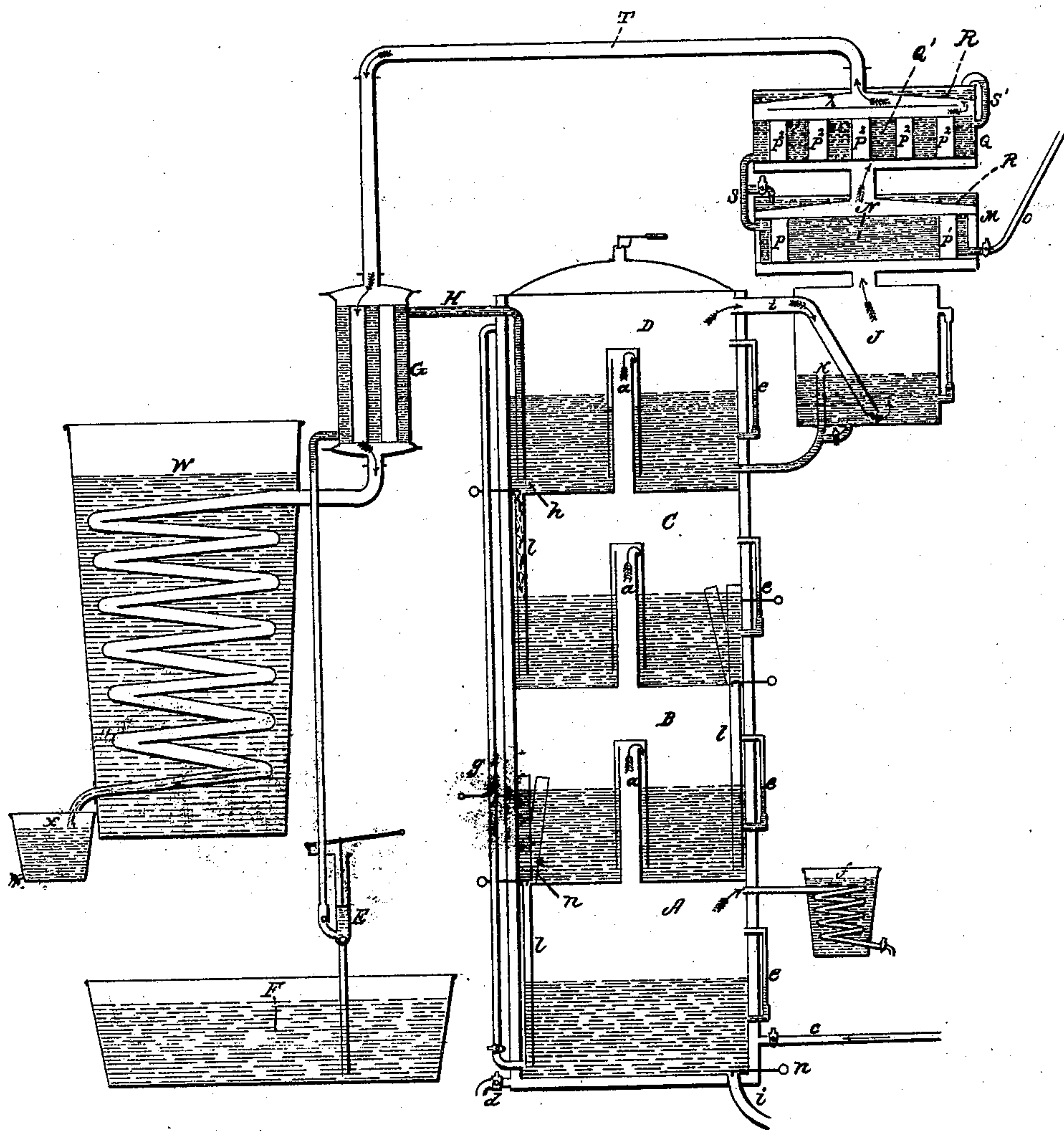


C. E. WERNER.

Alcohol Still.

No. 10,305.

Patented Dec. 6, 1853.



UNITED STATES PATENT OFFICE.

CARL E. WERNER, OF NEWCASTLE, ILLINOIS.

IMPROVEMENT IN CONDENSERS FOR STILLS.

Specification forming part of Letters Patent No. 10,305, dated December 6, 1853.

To all whom it may concern:

Be it known that I, CARL E. WERNER, of Newcastle, Logan county, Illinois, have invented new and useful Improvements in Apparatus for Distillation; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the annexed drawing, making part of this specification, in which my apparatus is represented in section.

My improvement consists in an improved apparatus for condensation, whereby I am able, with facility, to eliminate spirit of any determinate strength.

My apparatus consists of a cucurbit of a cylindrical form surrounded by a steam-jacket which imparts the required degree of heat without the admission of steam into the beer. This cucurbit is divided by diaphragms into four chambers, A B C D, of equal height. The beer is pumped up by the pump E from the beer-back F, and is passed through the heater G, where it retains a temperature of about 144° Fahrenheit. It is then discharged through the tube H into the upper chamber, D. In the floor of each chamber is inserted a tube, *l*, passing downward and discharging nearly to the floor below. This discharge is continuous from floor to floor, and is graduated by a slide, *n*, on the floor at the upper end of each tube. The spent beer passes out at the pipe *l'* in the bottom of the lower chamber, A. Communication for the vapor evolved is afforded from each of these chambers into the one above it by a tube, *a*, and the passing vapor enters the chamber above, near the bottom, so that it shall diffuse itself through the liquid therein. The temperature of each chamber is held as nearly as possible at a determinate point about as follows: A, 223° Fahrenheit; B, 200° Fahrenheit; C, 189° Fahrenheit; D, 174° Fahrenheit. The alcoholic vapor passes from the head of the upper chamber into the neck L, and thence is discharged from the mouth of the same, which is submerged in the low beer or singles which have collected in the rectifiers J. The low beer is discharged from the rectifier as it accumulates through the pipe K back again into the cucurbit. The pipe L serves to empty the rectifier when necessary. From the rectifier the vapor, which has sufficient volatility,

passes into the surface-condenser M, which is a cylindrical chamber having a slightly conical roof. In the inside of this chamber is a second chamber, N, of a smaller height and diameter, (or of a smaller height only,) and having communication by a pipe, *o*, passing across the intervening space, with a water-tank, by which it is kept constantly full. The inner cylinder is also traversed by two or more upright tubes, P P', which, passing through it and being secured to each head, serve to strengthen it against the hydrostatic pressure of the water, and at the same time afford additional condensing-surface. From this condenser the vapor passes into another, Q, placed above, of a similar form and construction, with the exception of the inner water-cylinder, Q', being traversed by a large number of tubes, P² P², through which the vapor passes, and which afford a greater condensing-surface and still more thorough condensation. These cylindrical chambers are prolonged above the heads, so as to form troughs R R', which are filled with water—the lower one, R, by the pipe S, which is supplied immediately from the pipe O or from the inner water-cylinder, N, this pipe S being prolonged upward, and passes into and fills the cylinder Q'. From thence a pipe, S', passes out, and, being curved upwardly, supplies the trough on the head of the upper condenser. The tank supplying these pipes and chambers is located at a sufficient height to supply all these points on the connection being made. The vapor in the upper condenser, after passing through the tubes, is deflected by a circular plate, *h*, toward the periphery of the cylinder, and thus caused to impinge upon the roof, which, as has been said, is in contact with water. The vapor then passes off into a neck, T, which conducts it to the beer-heater G, and thence to a worm in a refrigerator, W, from whence it is discharged into any suitable vessel—say X—and the alcohol is obtained at one operation at a strength of ninety-two per cent. over proof.

The steam is admitted into the jacket by the pipe *c*. The faucet *d* is for returning the water of condensation to the boiler. *e e e e* are gage-tubes for indicating the height of the beer in the respective chambers. *f* is a worm communicating with the lower chamber for testing, as occasion may require, the strength

of the vapor therein contained. *g* is a pipe for the introduction of steam into the beer in the lower chamber should it become necessary under any circumstances.

The continuous system of distillation has the advantages of avoiding the loss of heat by the cooling of the apparatus, the loss of time in charging, the loss of time, heat, and alcohol in running the still to waste until the air is expelled from the chambers; further, as no air is admitted in contact with the beer, it is less liable to turn sour, the beer of maize being extremely sensitive.

Having thus fully described my improved apparatus for distillation, what I claim therein as new, and desire to secure by Letters Patent, is—

The construction of the condenser, consisting of an outer upright cylinder with its upper chine projecting above the head, so as to form a circular trough, and an inner refrigerating-cylinder traversed by vertical tubes, which connect the vapor spaces above and below, the whole being situated above and discharging the condensed fluid back into the rectifier.

In testimony whereof I have hereunto set my hand before two subscribing witnesses.

C. ERNST WERNER.

Witnesses:

E. H. PUGH,
EDWARD A. KNIGHT.