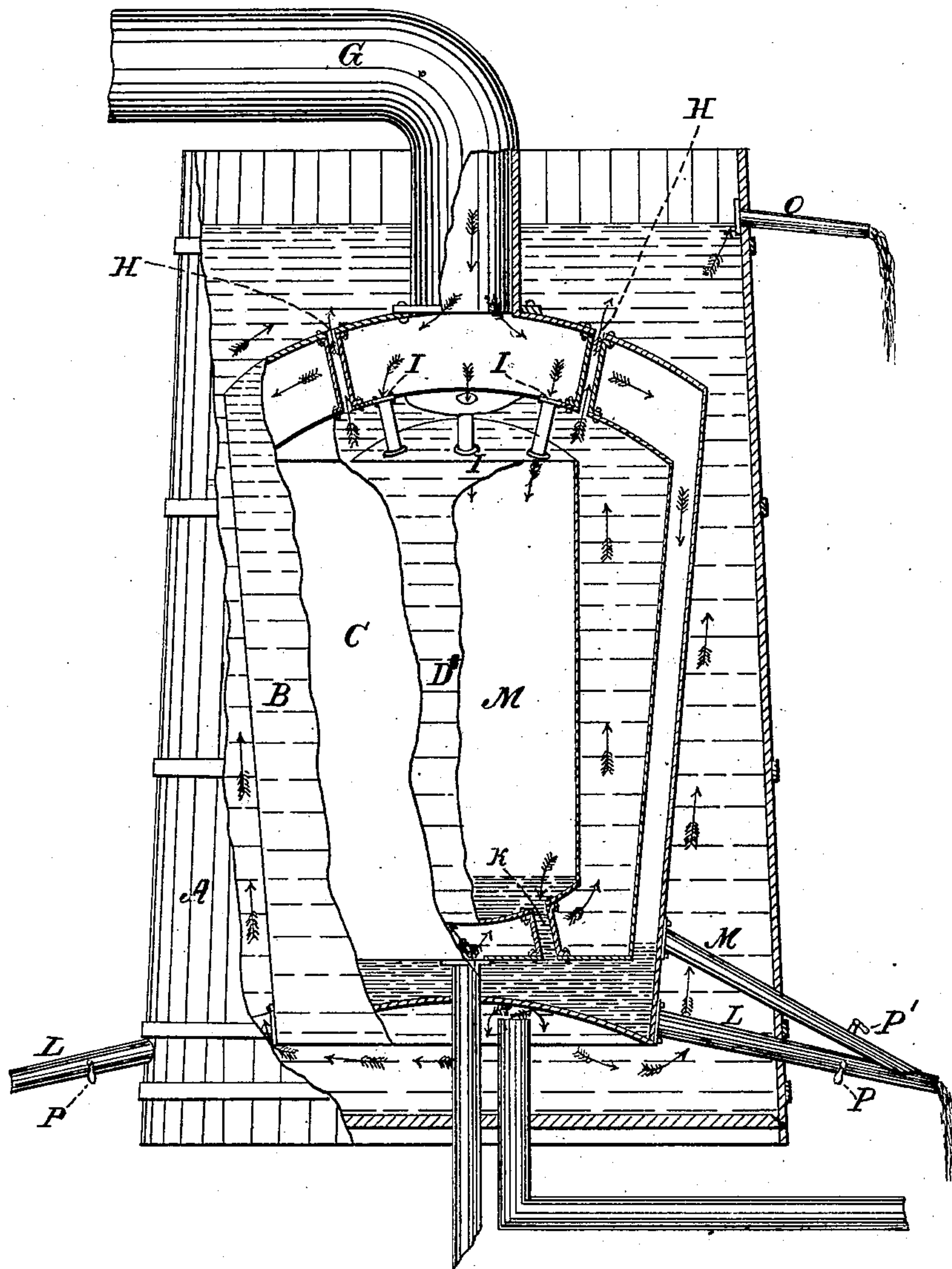


DAYTON & CHRISTIE.

Still Condenser.

No. 84,479.

Patented Dec. 1, 1868.



Witnesses.

E. D. Baldwin  
C. J. Corbin.

Inventor

Henry J. Dayton  
James Christie.



# United States Patent Office.

HENRY G. DAYTON, OF MAYSVILLE, KENTUCKY, AND JAMES CHRISTIE, OF ATLANTA, ILLINOIS.

Letters Patent No. 84,479, dated December 1, 1868.

## IMPROVED APPARATUS FOR CONDENSING, IN DISTILLING SPIRITS AND OTHER LIQUIDS.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that we, HENRY G. DAYTON, of Maysville, Kentucky, and JAMES CHRISTIE, of Atlanta, Illinois, have invented a new and useful Apparatus for the Condensing of Vapor, in the Process of Distillation of Liquors, Spirits, and Liquids generally, without the use of the usual spiral metallic worm or tube, which invention is called "Dayton and Christie's Condenser."

The nature of our invention consists in the substitution, for the ordinary worm or spiral metallic tube, used in the refrigeratory or tub in distillation, of two or more vapor-chambers, of copper, of peculiar construction, which will give a greater number of square feet of surface for the action of cold water upon the said chambers in the processes of condensation, than can be had by the use of the worm.

To enable others skilled in the art to make and use our invention, we will proceed to describe its use and operation.

We construct our refrigeratory in any of the usual forms, in the centre of the top of which the neck enters, which terminates within the refrigeratory in a double or two or more vapor-chambers of copper, one within the other, and communicating with each other by means of six copper tubes, marked in the accompanying diagram, respectively, I I I, &c., at the top, and by means of four copper tubes at the bottom, marked, in the accompanying diagram, K K, &c.

The exterior vapor-chamber B has a convex surface at either end. At the top it is about one-third larger in diameter than at the bottom, and has about twice the space at the bottom, between the walls of itself and tub, than it has at the top, and in general shape resembles a section of conic cylinder, having a space between its lateral walls of about four or more inches.

Next, within said outer vapor-chamber, is a chamber for water or an inner refrigeratory, of the same general shape as the outer vapor-chamber, and in the diagram is marked C; and within said inner refrigeratory is an inner vapor-chamber, D, which, in the diagram, is cylindrical in form, having its convex surface exposed to the action of water, both at its ends and side. These exterior and interior water-chambers communicate with each other by means of four copper tubes at the top, marked H H.

The outer vapor-chamber, at the side near the bottom, is pierced with two tubes or pipes, marked L, for drawing off the distilled liquor, which passes through an opening in the sides, near the bottom of the main tub or outer refrigeratory.

These tubes are furnished with stop-cocks, P, outside of the main tub, and near the end of said tubes. These tubes may be of any convenient length.

Above this tube, on one side of the refrigeratory, the outer vapor-chamber is pierced with another smaller test-tube, marked M, called a test-tube, which is also furnished with a stop-cock, P, and which, below said cock, connects with the tube M, above mentioned.

These tubes are used as follows: When the distilled liquor, settled in the bottom of the vapor-chamber B, rises to a sufficient height in said chamber to flow

through the test-tube M, which may be ascertained by turning the cock in said test-tube, the liquor may be drawn off by means of either tubes M above mentioned.

Water is forced into the outer refrigeratory by means of a pipe, F, which enters it at the bottom, and near the centre. The stream from this water-pipe strikes the concave surface of the outer vapor-chamber, where the distilled liquor first settles, and, as this stream is constantly flowing, the cooling of the liquor or vapor is much accelerated, and the liquor is cooled while still in the vapor-chamber, thus preserving much of its power which by the ordinary processes is lost.

By means of a second water-pipe, E, which enters the inner water-chamber from the bottom, and near the centre, passing through the outer refrigeratory, the outer water-chamber, and the outer vapor-chamber, water is forced into the inner water-chamber D, striking with a cold stream against the bottom of the inner vapor-chamber, where the distilled liquor first settles in this chamber, when the water is coldest, thus cooling the liquor while within the vapor-chamber, and preserving its quality and flavor.

It is usual to force the vapor into the condenser, in the old processes, with a high degree of heat. By the use of our process, fuel is saved at the retort, and the operation of distillation greatly accelerated.

This liquor is conducted through the pipes K K to the bottom of the outer vapor-chamber B, where it is again subjected to the cooling influence of the stream from the tube F, and is drawn off as above indicated.

The pipes H H, &c., permit the warm water from the inner water-chamber to escape into the outer water-chamber or tub A, and the pipe O conducts the same away.

The particular features of the above-named invention, of the benefit of which we claim to be the first and original inventors, and the benefits of which we desire to secure by Letters Patent, are the following:

1. The alternate chambers for water and vapor, which may be continued or repeated indefinitely, thus securing much greater surface for the action of water in cooling.

2. The concave surface of the bottom of the outer vapor-chamber, which permits the flow of water, striking it at or near the centre, to spread in every direction from the point of contact, thus cooling the entire bottom of said vapor-chamber.

3. The creation of a partial vacuum in the vapor-chamber by our superior means of cooling, which causes the vapor from the retort to flow promptly and readily into the vapor-chambers, substantially as described.

4. The tubes H H, I I, K K, L L, M, &c., for their various purposes and uses, in the manner substantially as set forth.

HENRY G. DAYTON.  
JAMES CHRISTIE.

Witnesses:

EDMUND W. PAUL,  
E. R. PAUL.