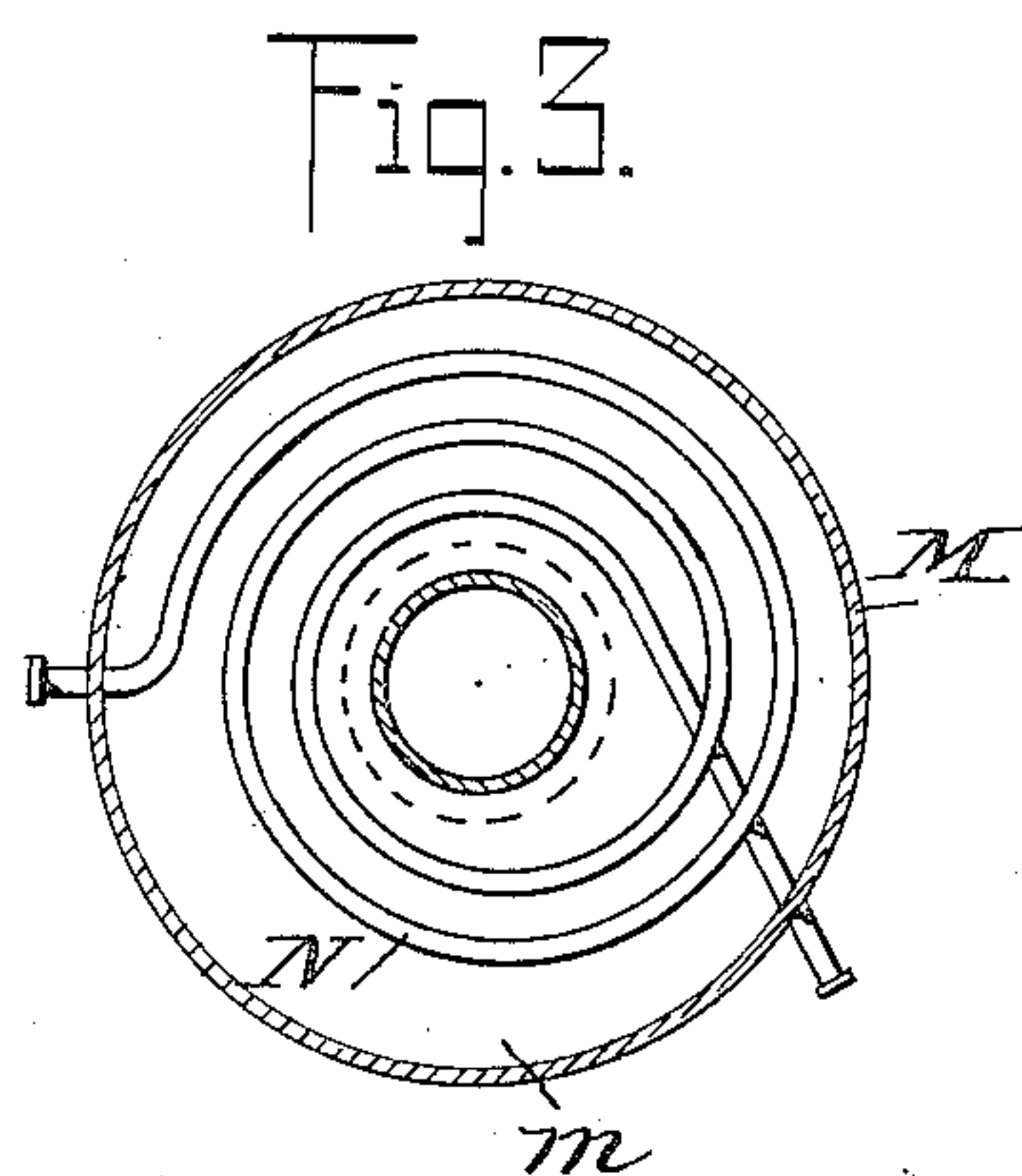
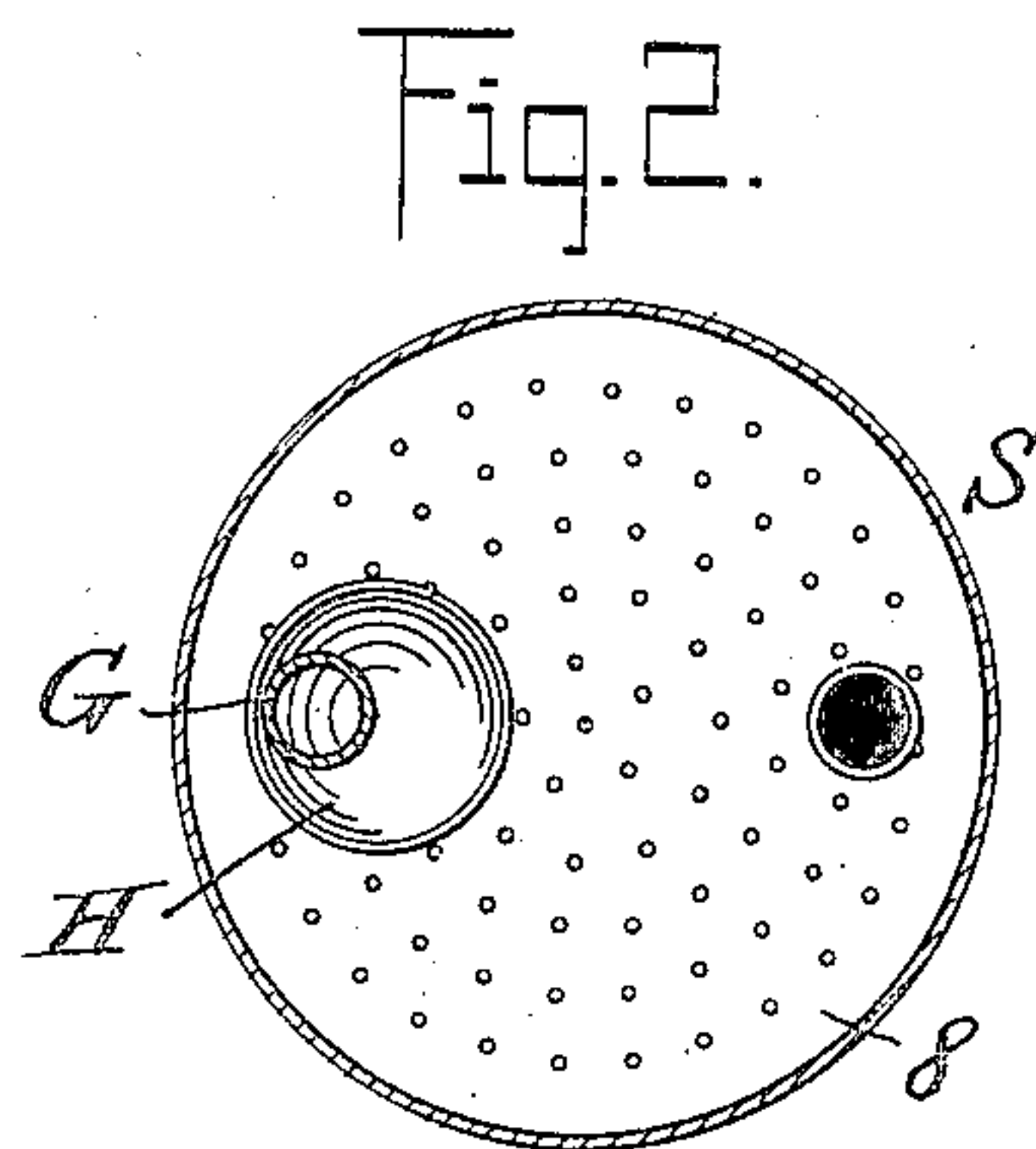
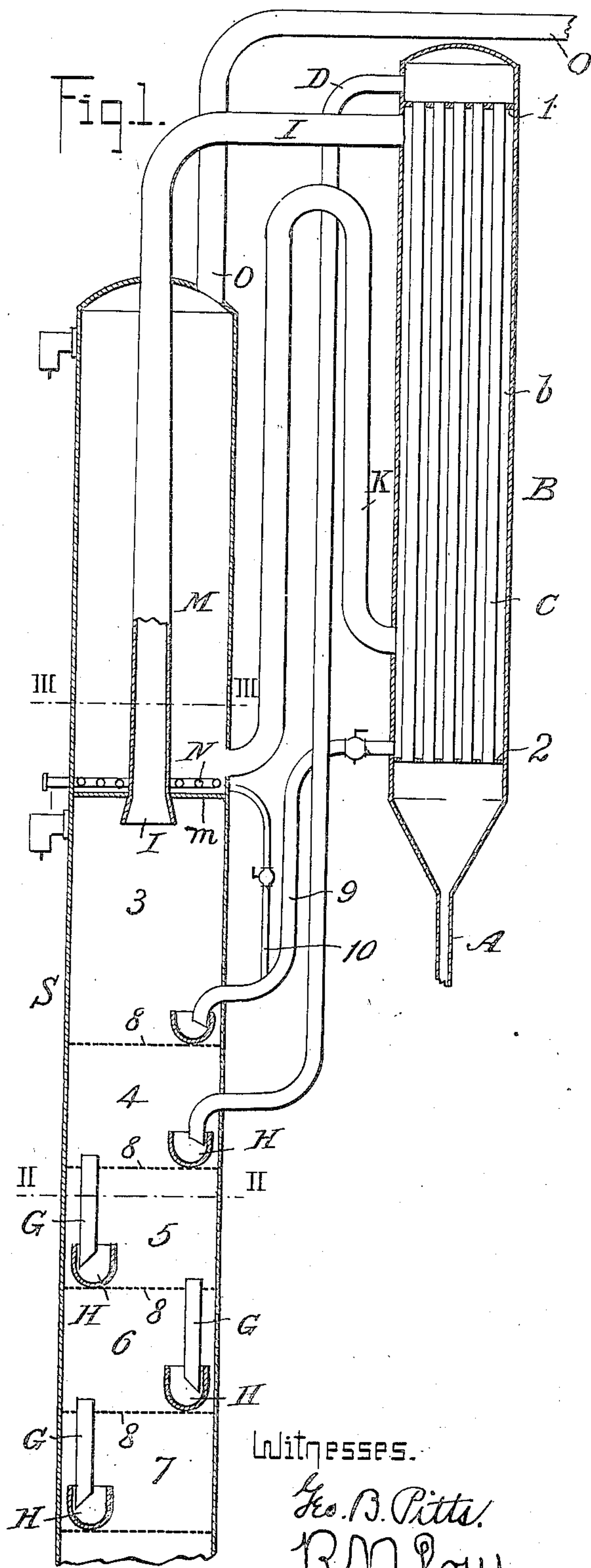


No. 822,574.

PATENTED JUNE 5, 1906.

J. J. BRENNAN.  
APPARATUS FOR DISTILLATION.

APPLICATION FILED JULY 24, 1905.



Witnesses.

Geo. B. Pitts.  
R. M. Low.

Inventor.

John J. Brennan.  
by H. H. Low.  
attorney.



# UNITED STATES PATENT OFFICE.

JOHN J. BRENNAN, OF LOUISVILLE, KENTUCKY, ASSIGNOR OF ONE-HALF  
TO THOMAS J. HINES, OF LOUISVILLE, KENTUCKY.

## APPARATUS FOR DISTILLATION.

No. 822,574.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed July 24, 1905. Serial No. 271,008.

*To all whom it may concern:*

Be it known that I, JOHN J. BRENNAN, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Apparatus for Distillation, of which the following is a specification.

My invention has for its object to simplify the apparatus required for the distillation of whisky and other liquids and to make the process of distillation more closely continuous and rapid, producing a larger yield and a higher proof of the finished product in proportion to the amount of material used, also to more fully utilize and economize the heat required in the process.

The invention consists in the parts and combinations thereof hereinafter set forth and claimed.

In order to make the invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect without limiting my improvements in their useful applications to the particular construction which for the sake of illustration I have delineated.

In said drawings, Figure 1 is a vertical sectional view of a distilling apparatus embodying my improvements, the illustration being to some extent diagrammatic. Fig. 2 is a horizontal section on line II of Fig. 1. Fig. 3 is a sectional view on line III of Fig. 1. Figs. 2 and 3 are on a somewhat larger scale than Fig. 1.

Referring to the drawings, B indicates a heater which may be of any preferred construction. As illustrated, it is formed with a somewhat elongated cylindrical casing into the lower end of which the beer or liquid to be distilled is forced or pumped through the pipe A. The heater is provided with longitudinal pipes C, through which such liquid passes to the upper end of the heater, where it passes out through the pipe D. The main chamber *b* of the heater surrounding the pipe C is heated by vapor from the still, which enters by pipe I at the top of the heater. The chamber *b* is inclosed at its ends by diaphragms 1 and 2, through which the pipes C open.

S indicates the still proper, which is divided into successive chambers 3, 4, 5, 6, and 7 by perforated diaphragms 8. The chamber 4 is

connected with the chamber 5 for the downward passage of liquid by discharge-pipe G, which delivers the liquid into a hemispherical or other receiving and overflow cup H, the said pipe delivering, preferably, by a lateral opening formed by cutting off the lower end of the pipe at an angle, as indicated in Fig. 1. A similar connection is made from the chamber 5 to the chamber 6, from the chamber 6 to the chamber 7, and so on, according to the number of successive chambers which the still contains. A known means for delivering steam or other heating fluid to the lower end of the still S will be employed, the illustration of such means not being necessary to an understanding of my invention.

The said pipe D, passing downward from the top of the heater, enters the chamber 4 and delivers into a receiving-cup H, the pipe D, having, preferably, a lateral opening and the cup an upwardly and outwardly inclined bottom, as shown. From the chamber 4 the beer or liquid to be distilled works itself downward from chamber to chamber, as is usual in stills of this character, the resulting distillate rising through the still, through the chamber 3, and into the vapor-pipe I. The pipe I is connected with the upper portion of the heater-chamber *b*, in which chamber the vapor of distillation heats the liquid rising through the pipes C and is more or less cooled thereby. In some stills heretofore known this partially-cooled vapor passes from the chamber *b* into a condenser; but by my improvements I have eliminated this condenser with advantageous results.

K is a discharge-pipe leading from the chamber *b*, preferably in the directions and shape illustrated and delivering the vapor into the chamber M, which I term a "doubler." The chamber M is superposed upon the topmost chamber of the still S, so as to be in immediate contact therewith, but is separated therefrom by a tight or solid partition *m*. The chamber M also surrounds a portion of the vapor-pipe I.

By the heat which is imparted from the pipe I to the chamber M the vapor in the latter is redistilled and a material amount of heat for this purpose is imparted from the still S by conduction through the partition *m*.

I may also employ in the chamber M additional heating-pipes N of suitable arrangement, for instance, as shown in Fig. 3, which



additional pipe or pipes are supplied with steam or other heating fluid.

By heating the vapor in the doubler M the precipitation of the lighter parts of the vapor of higher proof is prevented, the lighter high-proof vapors are more or less separated from the lower-proof or more watery vapors, and the higher-proof vapors are caused to rise in the chamber M in the doubler to the top of the latter and pass out by the pipe O for condensation into finished liquor of high proof. Such condensation of the watery and saturated vapor as takes place in the lower part of the doubler is returned by the pipe 10 for redistillation, as described. Any spirits that have been condensed by contact with the watery or low-proof vapors are again liberated by the heat in the doubler M.

From the chamber M the vapor of distillation passes by pipe O to a condenser of known character for final condensation into the finished product.

It will be observed that by my improvements I attain several material advantages. The necessity for a first condenser between the still and the doubler is done away with, the process of distillation is continuous, and the second distillation does not require as much additional heat as in the ordinary still and process of distillation, thereby saving a large proportion of the fuel ordinarily required. A material amount of heat is saved because the vapor is not fully condensed and reduced in temperature as much between the first and second distillation as in the ordinary process and also because the largest part of the heat or in most cases all of it for the second distillation is procured from the still itself in which the first distillation takes place and from the vapor-pipe passing through the doubler and carrying the heated vapor from the first distillation, by which sufficient heat is ordinarily supplied to redistill the vapor coming back to the doubler from the heater, and, finally, by not condensing the vapor between the first distillation and the second distillation I produce a larger yield and a higher proof of the finished product in proportion to the amount of material used.

Any liquid of condensation in the heater-chamber b is returned by pipe 9 to the still-chamber 3 for distillation. A pipe 10, leading from the doubler to the pipe 9, serves to

draw off from the doubler any liquid condensed therein for distillation in the chamber 3.

I do not in this application claim the construction and arrangement of the receiving-cups H, diaphragms 8, and pipes which deliver to said cups, the same being claimed in my application, Serial No. 271,007, filed July 24, 1905.

What I claim is—

1. In a distilling apparatus the combination of a still, a doubler in immediate contact therewith, a heater for the incoming beer or liquid to be treated, said heater having a vapor-chamber in which the product of the still is divided into a liquid and a vapor and having also a separate space for the incoming beer, means for conducting the heated beer from the said heater to the still for distillation, a vapor-conduit leading from the still through the doubler to the vapor-chamber of the heater, a pipe for liquid leading from the lower part of the vapor-chamber of the heater to the still, and a vapor-pipe leading from the vapor-chamber of the heater to the doubler, substantially as set forth.

2. In a distilling apparatus, the combination of a still, a doubler in immediate contact therewith, a heater for the incoming beer, said heater having a vapor-chamber in which the product of the still is divided into a liquid and a vapor, and having also a separate space for the incoming beer, means for conducting the heated beer from the said heater to the still for distillation, a vapor-conduit leading from the still through the doubler to the vapor-chamber of the heater, a pipe for liquid leading from the lower part of the vapor-chamber of the heater to the still, the pipe K leading from the vapor-chamber of the heater near the lower part of the latter and thence passing upward and then downward and communicating with the lower part of the doubler, and means for conducting the vapor of high proof from the doubler for condensation into finished spirit, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. BRENNAN.

Witnesses:

E. MARTIN,  
A. M. MASON.