

(No Model.)

3 Sheets—Sheet 1.

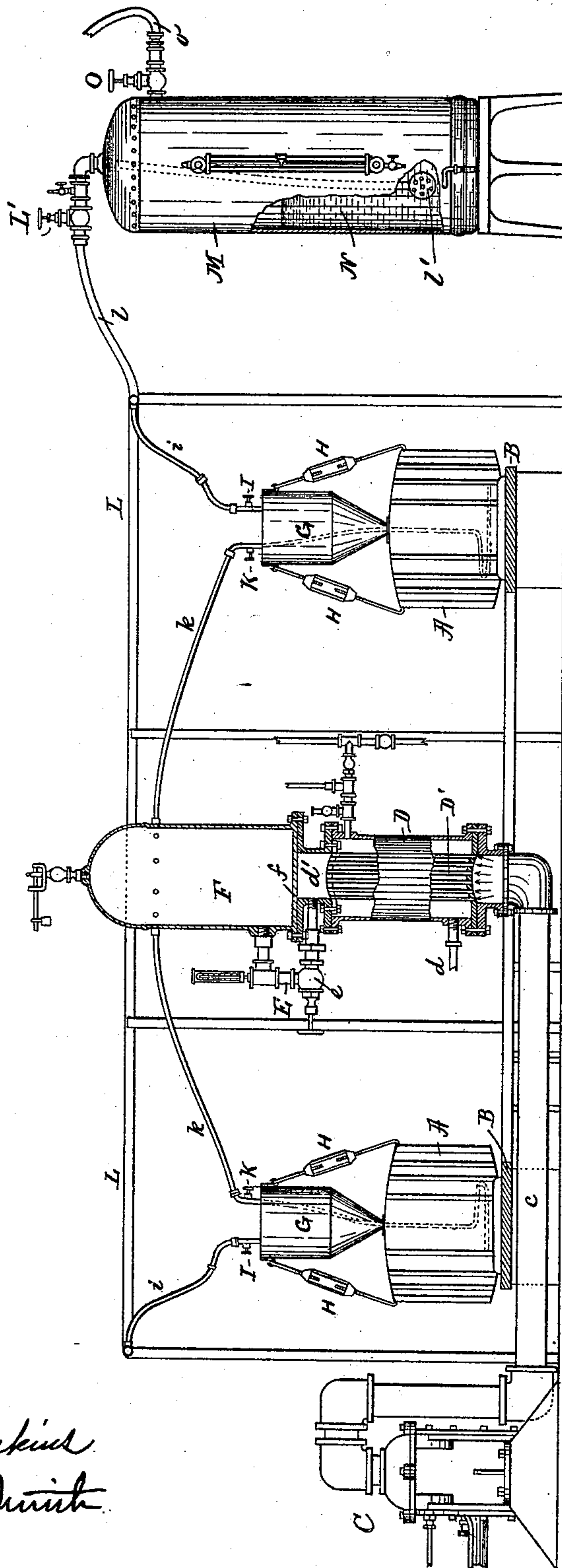
A. L. WOOD.

APPARATUS FOR AGING AND PURIFYING LIQUORS.

No. 488,104.

Patented Dec. 13, 1892.

Fig. 1.



Witnesses.

Miss A. Perkins
Emmery Smith

Inventor.

Amos L. Wood.
Wm. Andrew
his atty.

(No Model.)

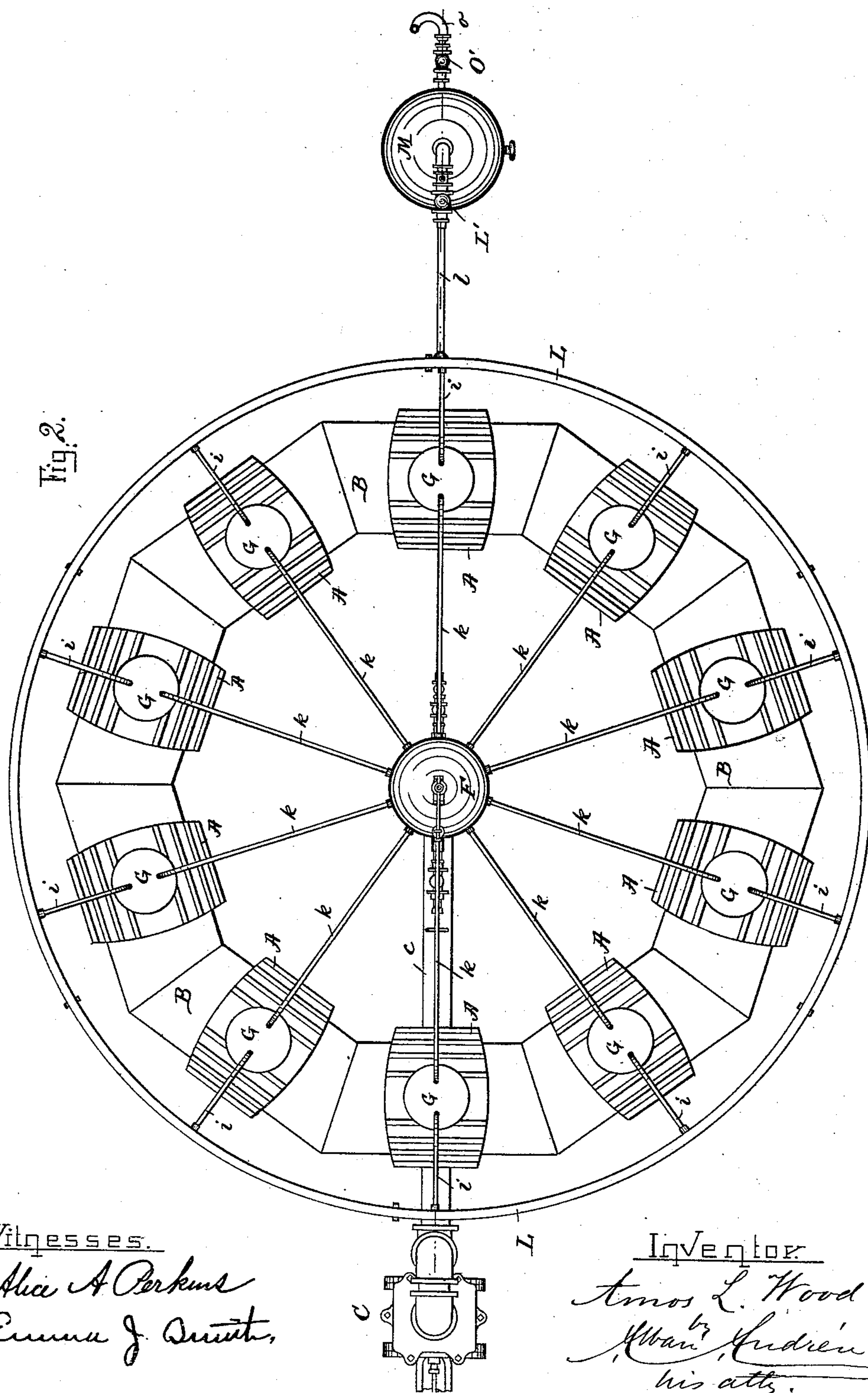
3 Sheets—Sheet 2.

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APPARATUS FOR AGING AND PURIFYING LIQUORS.

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Patented Dec. 13, 1892.



Witnesses.

Alice A. Perkins
Emma J. Smith.

Inventor

Amos L. Wood.
Wm. L. Linder
his atty.

A. L. WOOD.

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Fig. 3.

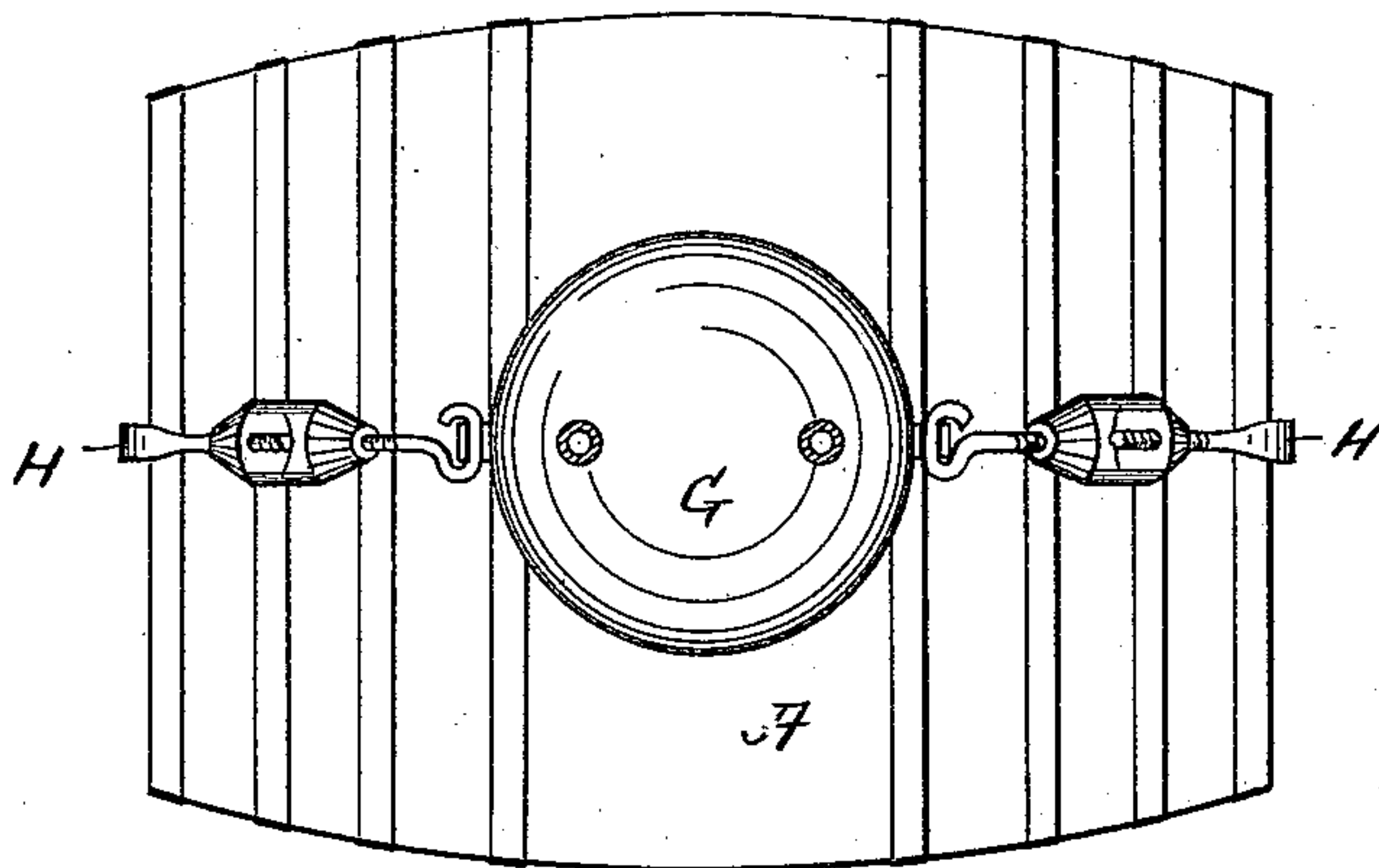
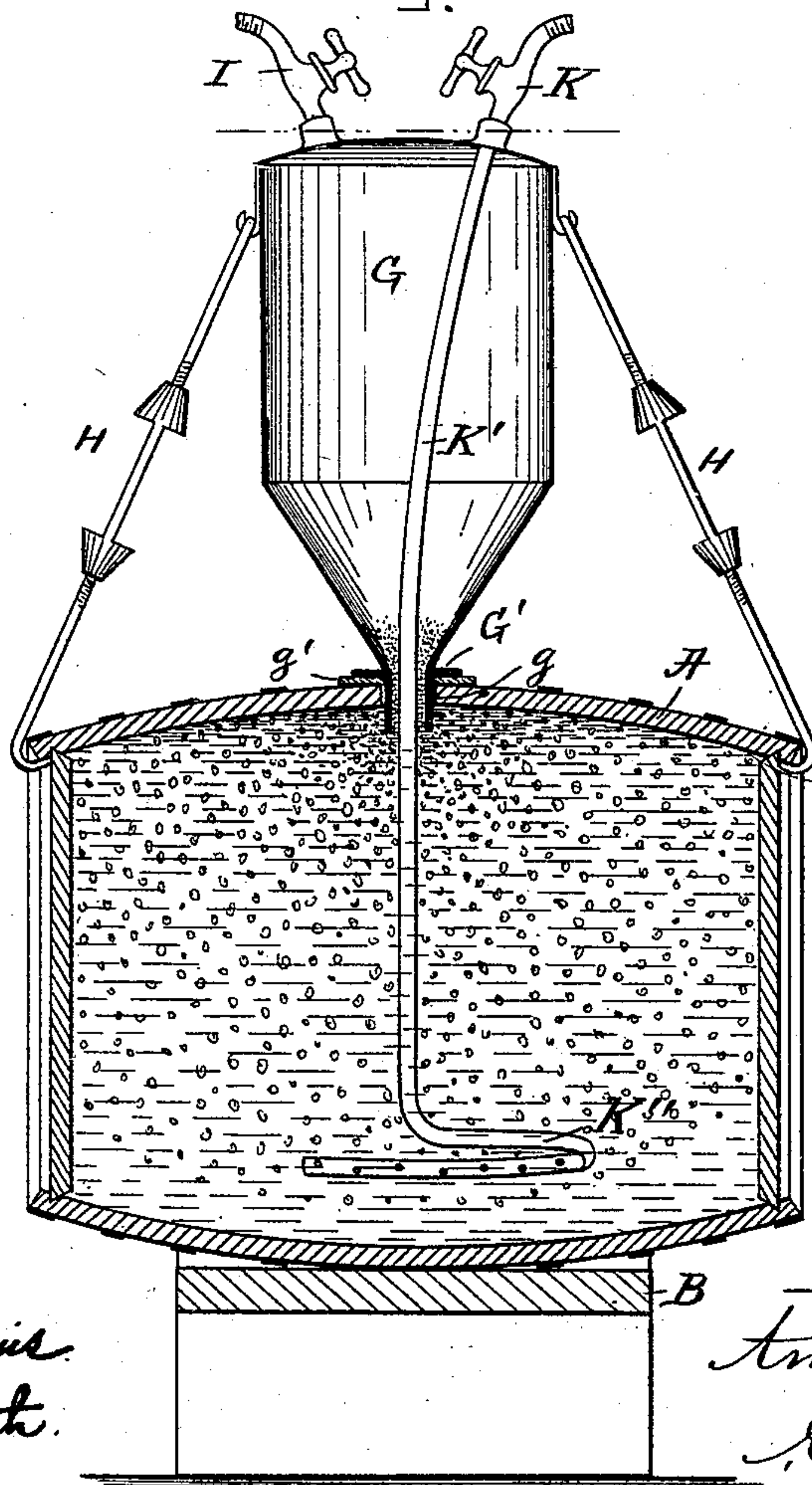


Fig. 4.



Witnesses.

Alice A. Perkins.
Emma J. Smith.

Inventor.

Amos L. Wood.
by
Alban Andren
his atty.

UNITED STATES PATENT OFFICE.

AMOS L. WOOD, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR AGING AND PURIFYING LIQUORS.

SPECIFICATION forming part of Letters Patent No. 488,104, dated December 13, 1892.

Application filed March 26, 1892. Serial No. 426,486. (No model.)

To all whom it may concern:

Be it known that I, AMOS L. WOOD, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Apparatus for Aging and Purifying Liquors, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in apparatus for aging and purifying alcoholic liquors; and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a side elevation of the improved apparatus, parts of which are shown in section. Fig. 2 represents a plan view of the same. Fig. 3 represents a detail plan view of one of the tanks or barrels containing the liquor to be aged and purified, and Fig. 4 represents a central longitudinal section of the same.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

A A represent the tanks or barrels containing the liquor *a*, Fig. 4, that is to be aged and purified, said tanks or barrels being preferably supported on a raised platform B. (Shown in Figs. 1, 2, and 4.)

C is the usual air-forcing apparatus, from which leads a pipe *c* to the air-heating device. The air-heating device consists of a steam-drum D, into which steam is admitted from a pipe *d*, leading from a steam-generator or other steam-supply. To the upper end of the drum D is secured a neck or branch *d'*, from which leads an exterior pipe E to the independent air-chamber F, arranged above the branch *d* and separated from the latter by means of non-perforated base or bottom *f*, detachably bolted to the drum, as shown in Fig. 1. Within the steam-drum D is arranged a series of tubes D', the upper and lower ends of which are in open communication, respectively, with the branch *d* and air-forcing pipe *c*, as shown. The air as it is being forced through the tubes D' is heated by the surrounding steam contained in the drum D, and after being heated the air passes through the branch *d* and pipe E into the air-chamber F, from which it is conducted by means of pipes through the liquor contained in the tanks or barrels A A, as will hereinafter be more fully described.

Heretofore in apparatus for this purpose the steam-drum and air-chamber have been made as a single shell divided by means of a partition or diaphragm into two compartments, the lower one of which constituted the steam-drum and the upper one being the air-chamber, which construction is objectionable on account of its liability to leakage where the diaphragm is connected to the shell or where the air-forcing pipe passes through said diaphragm, which leakage causes steam or steam-vapor to be admitted into the air-chamber and from it to the liquor that is to be aged and purified, and is therefore a very objectionable feature in devices of this kind. To repair such leakage from time to time, it was necessary to provide the steam-drum and air-chamber with manholes for the purpose of getting access to the interior of the shell when repairs were needed. Such objection is obviated by making the steam-drum and air-chamber independent of each other and connected by means of a pipe, as above described.

e is a valve or cut-off on the pipe E, by means of which the hot-air supply to the air-chamber F can be easily regulated or altogether cut off, as occasion may require.

G in the drawings represents a saving or overflow chamber, one for each tank or barrel A, which overflow-chamber has a lower open neck *g*, adapted to be inserted through the bung-hole of a barrel or perforation in a tank, and for the purpose of establishing an air-tight connection between said tank or barrel and the overflow-chamber G, I make a flange G' on the neck *g* or lower part of said overflow-chamber, as shown in Fig. 4, and between the under side of said flange and the top of the tank or barrel I introduce an annular elastic packing-ring *g'*, as shown in Fig. 4.

During the process of aging and purifying the liquor the chamber G is held in and secured to the tank or barrel in an air-tight manner by means of adjustable turnbuckles or hooks H H, one end of which is attached to the tank or barrel and the other end to the chamber G, as shown in Figs. 1, 3, and 4.

Each chamber G has attached to its upper end a pair of valves or cut-offs I and K, the former being in direct communication with the interior of said chamber G and the latter being connected to a pipe K', that passes through the neck *g*, and terminates within

the tank or barrel A as a perforated bend or coil K'', as shown in Fig. 4. The cut-off K is connected, preferably, by means of a flexible tube *k* to the hot-air chamber F, and the cut-off I is connected, preferably, by means of a flexible tube *i* to a preferably-circular pipe L, from which leads a pipe *l* through the top of the condenser M, such pipe terminating in its lower end within said condenser as a perforated bulb *l'*. (Shown in Fig. 1.) The said bulb *l'* is submerged in water N, contained in the lower portion of the said condenser M.

o is an exit-pipe leading from the upper portion of the condenser M to the outer atmosphere or to a suitable chimney, as may be most practical and convenient.

L' and O' are regulating stop-cocks or cut-offs on the respective pipes *l* and *o*, as shown in Figs. 1 and 2.

The cut-off K serves for the purpose of regulating the supply of heated air to and through the liquor contained in the tank or barrel A, and the cut-off I serves to regulate the escape of air from the chamber G, and consequently regulating the back-pressure on the liquor for the purpose of condensing any alcohol contained in the overflow-chamber G and to return it to the tank or barrel A. The regulating cut-offs L' and O' on the condenser M serve similar purposes to the respective cut-offs K and I—namely, the former to regulate the amount of air to and through the liquid N and the latter to regulate the escape of air from the condenser and consequent back-pressure on the liquid, so as to condense the alcohol contained in the upper part of said condenser M, and return it in liquid form to the lower portion of said condenser, thus preventing unnecessary escape of alcohol and lowering of the proof of the liquor during the process of aging and purifying it.

In my invention the air-chamber F surmounts the heater-drum D and is removable and replaceable and the top of the heater-drum is separated or cut off from the air-chamber by the imperforate wall or bottom *f* of the air-heater. This is an advantage over the construction shown in Letters Patent No. 235,840, issued to F. L. Wood December 21, 1880, where the air-chamber and heater are composed of a single vessel divided by a diaphragm, through which extends the coiled air-pipe in the heater. In the prior construction referred to it is difficult, if not impracticable, to repair the diaphragm and its pipe connection if leakage occurs, as hereinbefore explained; but this objection is avoided by my improved construction and arrangement.

The operation is as follows: The tanks or barrels A A, containing the liquor to be aged and purified, are placed in proper positions and the overflow and saving chambers G secured air-tight to said tanks or barrels, after which the cocks K are connected to the air-chamber F and the cocks I to the pipe L and condenser M, as shown in the drawings.

Steam is admitted to the drum D and air forced from the pump C and heated through the tubes D' and passed through the branch *d* and pipe E into the air-chamber F, from which the non-heated air is forced through the liquor in the tanks or barrels A by means of the pipes *k* K' K'', causing the liquor to be aged or purified and causing the impurities to pass off through pipes I L *l* into the liquid contents of the condenser and out through the exit-pipe *o*.

The liquid contents of the condenser M may be withdrawn from time to time and the alcohol contained therein recovered by any of the well-known processes for this purpose.

Having thus fully described the nature and operation of my invention, I wish to secure by Letters Patent and claim—

1. In an apparatus for aging and purifying liquors, the combination, with an air-forcing device and a heater-drum having vertical tubes communicating at one end with the air-forcing device and at the opposite end with an air-space in the drum, of an independent air-chamber surmounting the heater-drum and having an imperforate bottom wall detachably secured to the upper end of the heater-drum, an external pipe connecting the upper end of the heater-drum with the air-chamber and provided with a cut-off valve for controlling the flow of air from the air-space in the heater-drum to the air-chamber, a series of saving or overflow chambers for the barrels or vessels containing the liquor to be aged, and pipes leading from the saving or overflow chambers to the air-chamber surmounting the heater-drum, substantially as described.

2. In an apparatus for aging and purifying liquors, the combination, with an air-forcing device and a heater-drum having vertical tubes, all communicating at one end with the air-forcing device and at the opposite end with an air-space in the upper end of the heater-drum, of an independent air-chamber surmounting the heater-drum and having the imperforate bottom wall detachably secured to the upper end of the heater-drum, an external pipe connecting the air-space of the heater-drum with the air-chamber and provided with a cut-off valve for controlling the flow of air from the air-space of the drum into the air-chamber, a series of saving or overflow chambers for the barrels or vessels containing the liquor to be aged, and pipes leading from the air-chamber to the saving or overflow chambers, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 15th day of October, A. D. 1891.

AMOS L. WOOD.

Witnesses:

ALBAN ANDRÉN,
ALICE A. PERKINS.