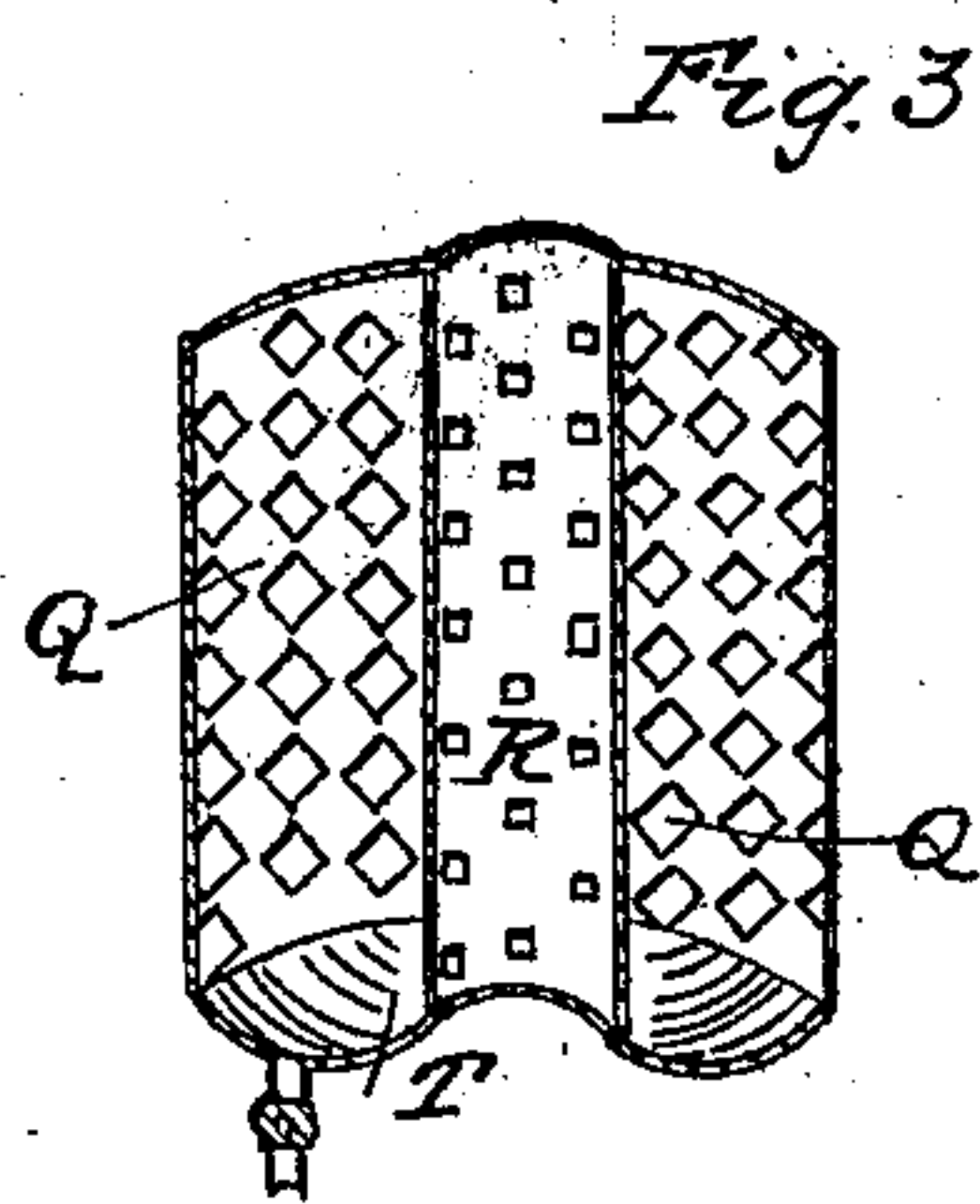
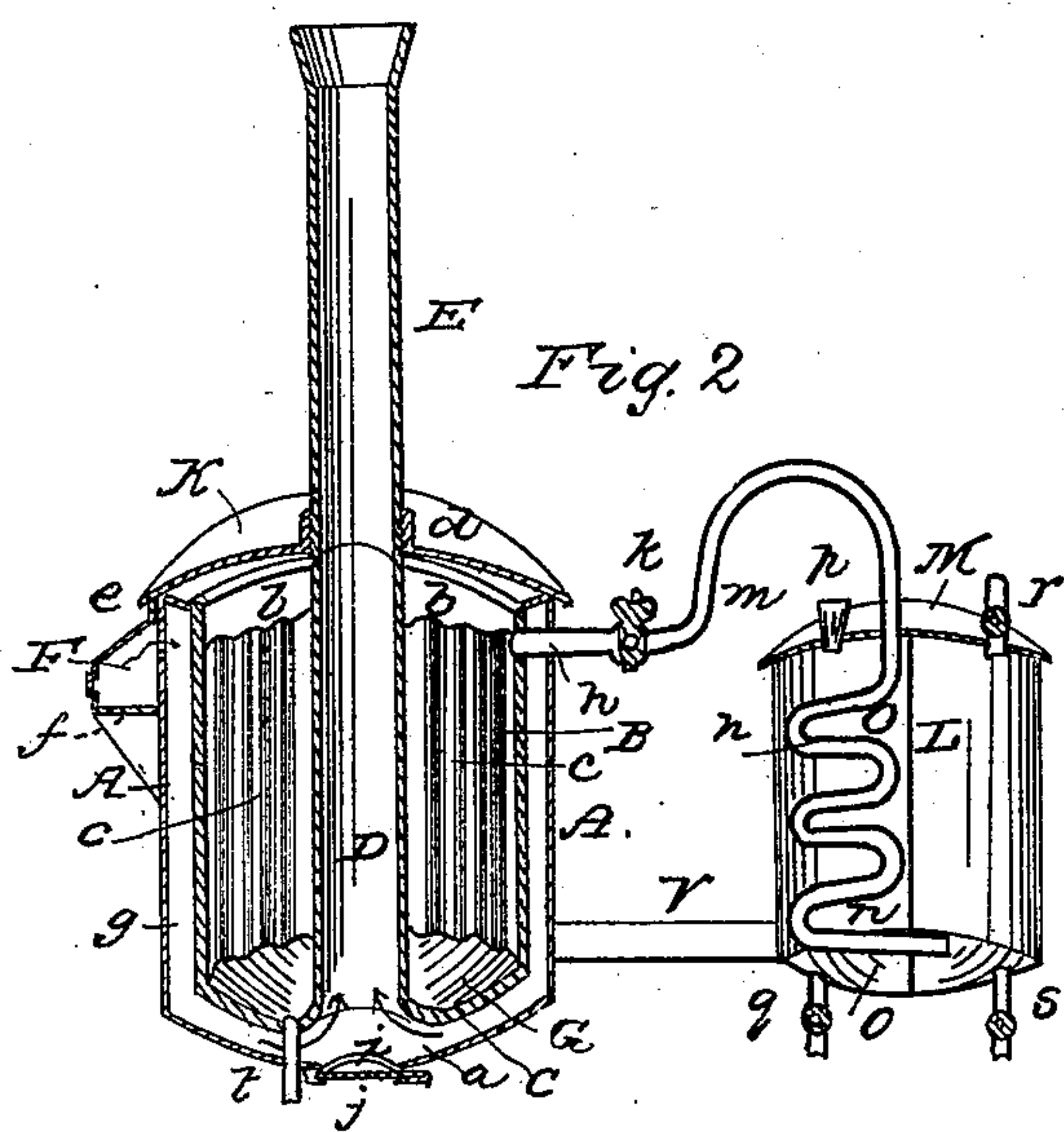
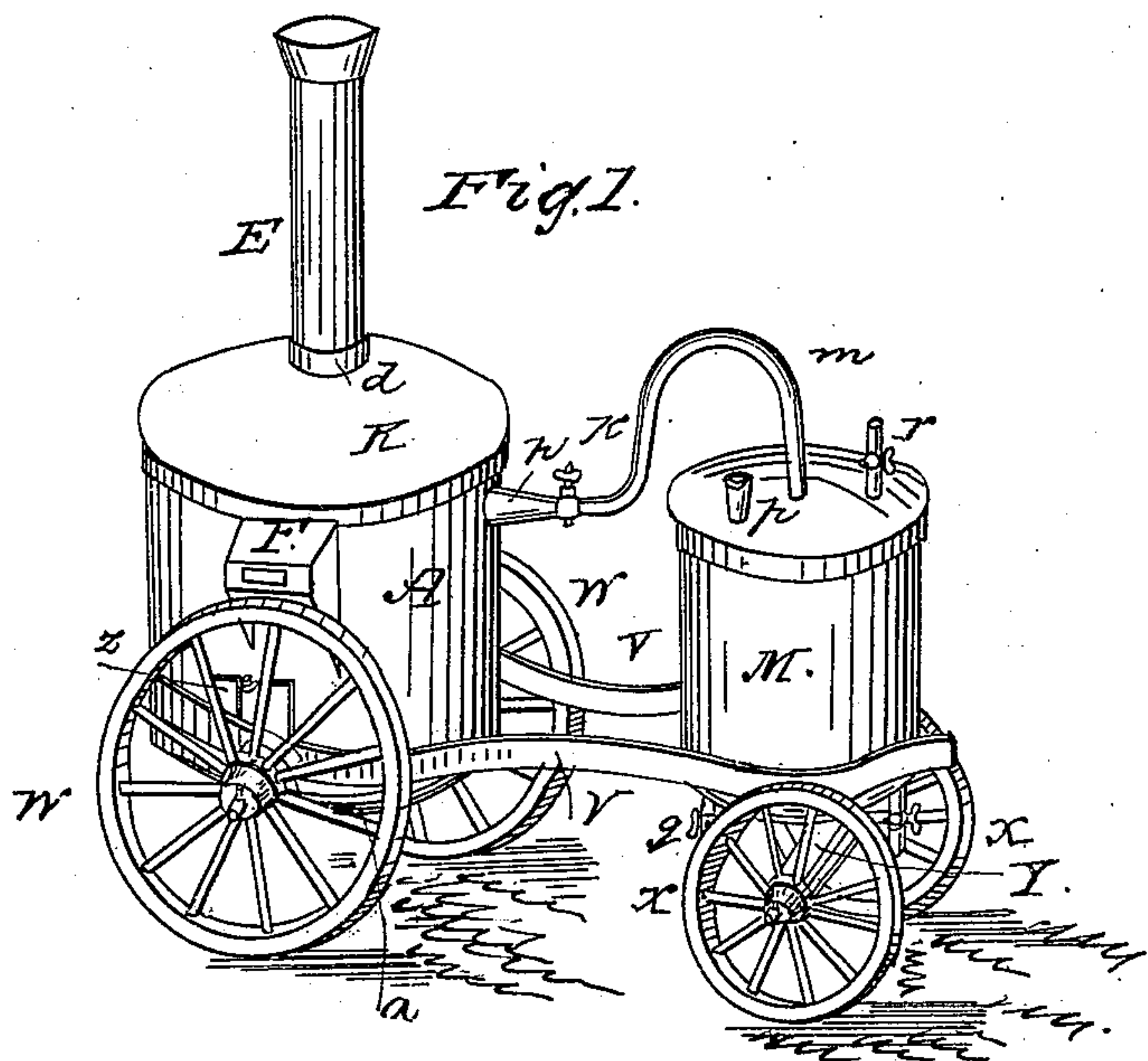


Apparatus for Distilling Wood.

Patented March 29, 1864.



Witnesses
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UNITED STATES PATENT OFFICE.

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IMPROVED PORTABLE APPARATUS FOR DISTILLING WOOD, &c.

Specification forming part of Letters Patent No. 42,101, dated March 29, 1864.

To all whom it may concern:

Be it known that I, GEORGE E. MILLS, of the city, county, and State of New York, have invented a new and useful Apparatus for the Distillation of Fibrous and Woody Substances and other Vegetable Matter; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents the apparatus, in perspective, mounted on wheels for moving about. Fig. 2 shows a vertical section through the center of the apparatus. Fig. 3 shows a detached sectional view of the receiver or crate in which the material is put for distillation.

The object of my invention is to furnish a movable apparatus for extracting and distilling liquids, gums, and other substances from pine and other wood, sugar-cane, or any fibrous or vegetable matter; and it consists in the arrangement of a corrugated metal cylinder placed in a vertical position and surrounded by an iron casing, at or near the top of which, on the outside, are secured two or more fire-boxes communicating with the space or flue which surrounds the cylinder, so that the heat will be distributed around the surface and under the bottom, up through the pipe in the center to the smoke-stack. Inside of the corrugated or inner cylinder I place a receiver or crate, the sides having diagonal openings, and a pipe fitting over the central pipe or fire-flue, the bottom being sunk or recessed to receive the residuum, and provided with a spigot or cock for drawing it off through the bottom. At or near the top of the cylinder I place a funnel-shaped pipe to convey the evaporation to the condenser, the same being divided into two compartments which operate to condense and clarify the liquids at the same time.

To enable others skilled in the art to make and use my invention, I will proceed to describe it more fully, referring to the drawings, and to the letters of reference marked thereon.

I make my portable distilling apparatus of boiler-iron, of any desirable dimensions, so that it can be moved from place to place. The outer cylindrical casing, A, is made plane, with a concave or sunken bottom, *a*, and is placed in a vertical position. In the casing A is also

placed an inner cylinder, B, the sides of which are corrugated up from the bottom about three-fourths of the height, as seen in Fig. 2, *b b* and *c c*. This cylinder has a sunken bottom, C, in the center of which is a pipe or flue, D, standing vertical and extending up above the top of the outer and inner cylinders a sufficient height to secure the smoke-stack E.

On the outside of the casing A, I secure two or more fire-boxes, F F. They may be placed near the top, or in any other position convenient for supplying with fuel, the fire-boxes having grates *f* in their hearths to admit the atmosphere freely and discharge the ashes. There is an opening or flue, *e*, in the cylinder or casing A, in the back of each of the fire-boxes F, to admit the flame into the passage or space *g g*, which surrounds the corrugated inner cylinder, B, and under the bottom C, and up through the pipe D in the center, the current of the flame being in the direction indicated by the arrows, so that a strong uniform heat may be easily produced and kept up for any desired length of time. The corrugations in the cylinder present more fire-surface, and at the same time allow of the expansion and contraction, and keep the interior, where the receiver *a* is placed, gas and air tight.

Underneath, in the center of the cylinder *c*, is an opening, *i*, the same having a cover or lid, *j*, so that the soot, ashes, or any accumulated matter can easily be removed from the surrounding flue *g g* by opening the lid *j*. The jarring of the apparatus while taking it from place to place will effect the purpose.

Near the top of the front side of the cylinder A is a funnel-shaped pipe, *h*, which connects with the retort or chamber G, where the heating or roasting of the material is effected.

To the pipe *h* is arranged a stop-cock, *k*, and a continuous pipe, *m*, forming an arch, which rises above the top of the retort A and enters into the top of the condenser M, where it is bent into a zigzag, *n*, or it may be coiled in the manner of an ordinary still-worm, the end of it opening into a separate compartment, N, there being a division of the condenser M by placing a partition, L, in the center. The portion of the condenser *o* in which the worm *n* is coiled is provided with a funnel, *p*, at the top and a spigot, *q*, at the bottom, so that a current or a fresh supply of water can be kept

in it for condensing, and should always be kept full when the still is running.

The receptacle N is for the purpose of clarifying and separating the liquids, gums, oils, and gases at the same time they are being distilled, and is provided with a stop-cock, *r*, in the top to take off and save the gas for heating or illuminating or other purposes. It is also provided with a spigot, *s*, to draw off the sediment. The receptacle N should be about one-half filled with water when in operation. The properties that rise from the heated materials which form the essential oils are conducted by the pipe *m* into the condenser *o*, where they are condensed while passing through the worm or zigzag pipe *n*, and are discharged into the other compartment, N, at or near the bottom, where they commingle with the water or other such preparation as may be required for the purpose of clarifying.

The receiver or crate Q, into which the substances are put to be distilled, I make of sheet metal of such size as to nearly fill the corrugated chamber G. The sides of the crate I make with diamond-shaped openings; or it may be constructed of wicker-work or iron rods woven together diagonally. There is also a casing, R, similarly constructed to surround the central pipe or flue, D, to keep the vegetable matter from coming in close contact with the flue while in the process of distillation. The crate Q has a sunken or concave bottom, T, to correspond with the bottom of the retort or chamber G, into which the drippings or residuum is deposited, to run or be drawn off at the spigot *t*.

The crate or receiver Q is made so as to be lifted out of the retort G for the purpose of replenishing, and also discharging the charred contents. Over the top of the crate and the retort there is a movable cap or cover, H, which has a hole through its center to admit the pipe D, onto which the smoke-stack E is fitted to slide, so that it can be taken off. Around the pipe and smoke-stack there is a stuffing-box, *d*, on the cover K, so that the retort or chamber may be closed air or gas tight by screwing the cover to the cylinder. The condenser has also a cover, which may be put on and secured in a similar manner.

For the purpose and convenience of taking my apparatus into such sections of the country

as supply the material in abundance for which I have mostly designed it, I make a frame of bar-iron, V, bent round, so as to inclose both the retort A and the condenser M, the same being placed at a convenient distance apart, so as to bring the weight of each to about balance over the wheels W W and X X, the condenser being placed forward over the axle Y, and the retort being hung in between short axles or arms *y y*, which are secured to the iron frame V. The cylinder A is secured in the iron frame V by ears Z Z and a single pin or bolt, & &, so that it can be taken in pieces for shipping or sending off by other modes of transportation, and it can be put together and mounted, ready for use, without requiring any great degree of mechanical skill. Thus it will readily be seen that the advantages of taking the distilling apparatus to the wood will be very great, as you thereby reduce the transportation of the crude material, and only have the rectified and clarified manufactured article to move any distance, and all the refuse stuff connected with the operation of manufacturing turpentine, resin, pitch, tar, and the essential oils of other fibrous and vegetable substances will be left on the field out of the way, to enrich the soil for further growth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A portable apparatus mounted on wheels, constructed and arranged in the manner herein described, for the purpose of distilling woody, fibrous, and vegetable substances.

2. The corrugated cylinder surrounded by an iron casing, to which the fire-boxes are attached, with the surrounding space between and under for distributing the heat uniformly throughout the mass, the center pipe or flue connecting with the smoke-stack, and the movable crate, all in combination in the manner herein described.

3. A condenser, in combination with a portable apparatus for distilling vegetable matter, the same being divided into two compartments, for the purpose of condensing and clarifying the essential oils produced therefrom.

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Witnesses:

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