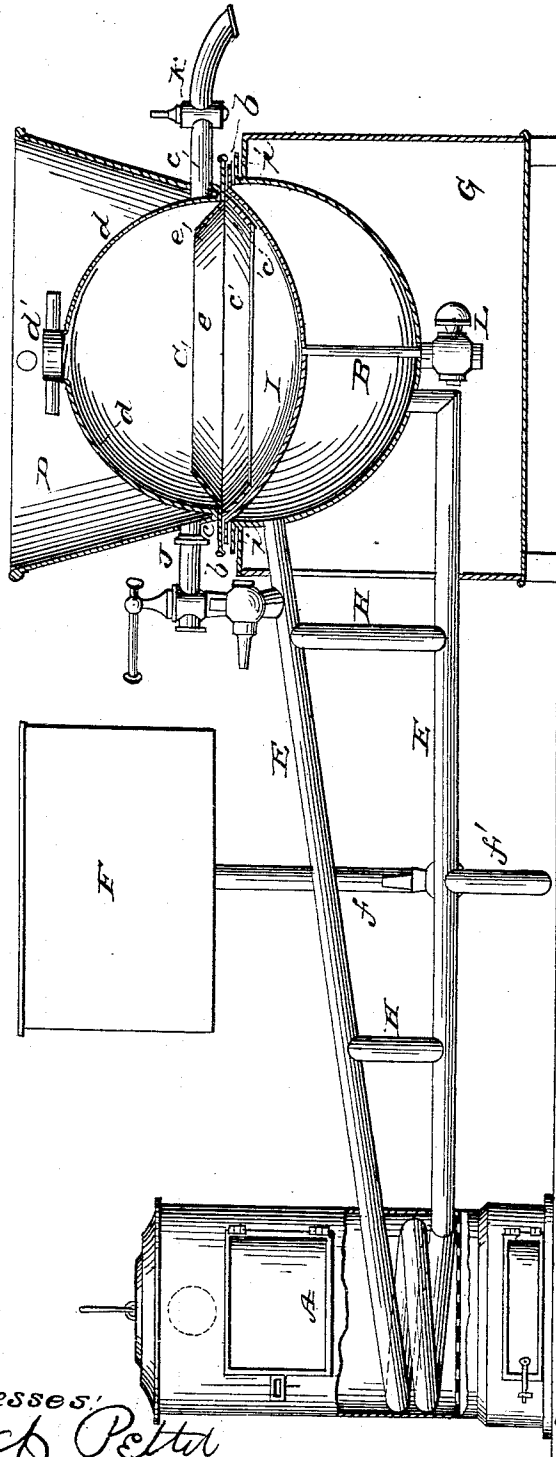


Making Extracts.

Patented Nov. 10, 1868.



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IMPROVED APPARATUS FOR MAKING EXTRACTS AND ESSENCES.

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

To all whom it may concern:

Be it known that I, EDWARD E. BURROUGH, of the city and county of Baltimore, and State of Maryland, have invented a new and improved Water-Bath Apparatus for Manufacturing Medical Extracts; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which my invention is represented by a side view, a part being shown in section.

This invention has for its object the construction of a simple, cheap, and convenient apparatus with which, by the application of hot water to the walls and bottom of the vessel that contains the materials to be treated, essences, medical extracts, &c., may be rapidly, conveniently, and thoroughly extracted from either liquid or solid substances.

To this end, the invention consists in the employment of a stove, coiled water-pipe, reservoir, heater, retort, and condenser, provided with suitable supply and exhaust-cocks, and arranged in a convenient manner, as shown by the drawing, and as I will now more particularly describe.

In the drawings—

A represents the stove.

B, a vessel filled with water.

C, a retort, fitting into the top of the vessel B.

D, a condenser, above and around the retort.

E, a water-pipe, extending from the bottom of vessel B to the stove, in the fire-chamber of which it is coiled, as seen in the drawing, and thence extending back to the vessel B, but entering the latter near its top, so that as the water of the pipe is heated by the stove, a continuous current from the vessel B to the stove, through the lower branch of the pipe, and from the stove back to the vessel, through the upper pipe, is established, and maintained during the whole process.

F is a reservoir, containing water, which, by means of a pipe, *f*, connected with the lower branch of pipe E, supplies water constantly to the apparatus.

This tank or reservoir is situated above the level of the top of vessel B, so that the latter will be kept full of water, and the pipe *f*, which connects it to pipe E, bends down under the latter before forming the connection, as seen at *f'*. The top of vessel F may be open.

By this means, a constant supply is maintained, and a sufficiently rapid circulation is kept up to insure the quick heating of the retort, while an escape-valve (the reservoir F) is provided for the relief of the steam-pressure, when too great, both by the escape of the steam into the open air, and by its condensation in the cold water flowing from the reservoir.

It will be observed that as the water is heated in the stove, it is forced directly against the bottom of the retort, whereby the greatest effect is exerted upon the latter.

The branches of pipe E may be connected and mutually braced by rods, H H, if preferred, and any arrangement of convolutions, coils, or other apparatus for increasing the heating-surface within the stove A may be employed.

The form which I prefer for the vessel B is that of a hemisphere, as shown in the drawing, and this may be surrounded by a jacket or outer shell, G, of any form, for the purpose of protection against the cool atmosphere, and to insure the most complete utilization of the heat. In this case the vessel B may, by means of a flange, *b*, around its rim, be supported by the casing G, as shown in the drawing.

The retort C is formed by means of a concave plate, I, supported by the vessel B in the same manner that the latter is supported by the casing G, viz, by a flange, *i*, around its rim, resting upon the flange *b*. The upper part of the retort is attached to the condenser D, forming the bottom of the latter.

In constructing it, the condenser is provided with a bottom, *d*, convex on its upper and concave on its lower side, with a horizontal outer flange, *c*, by which it is supported, this flange resting on flange *i*, with an inward-inclined flange, *c'*, projecting downward around its under edge, and fitting tightly into the upper part of the concave plate I; and with an inward-inclined flange, *e*, projecting upward from the lower edge of the concave bottom *d*. The bottom, *d*, may also be provided with a gate, or man-hole, *d'*, closed by a screw-plug, or other suitable stopple.

A faucet, J, serves to draw off the cold water from the condenser, when required, and when volatile extracts are being made, another, K, passing through the condenser into the annular space between the flange *e* and bottom, *d*, serves to withdraw such extracts or essence from the retort.

When preparing liquid extracts, medicines, &c., another faucet, L, extending from the bottom, I, of the retort down through the water-vessel B, serves to draw off the extract, while the volatile alcoholic vapors are condensed into the space between flange *e* and bottom, *d*, and drawn off by means of faucet K, as aforesaid.

m is a waste-pipe, which prevents the condenser from overflowing, when a constant stream of cold water is discharged into it by a supply-pipe, not shown in the drawings. By means of such pipe and waste-hole, the water in the condenser can be discharged, and renewed as fast as it becomes warmed, by the retort below.

This completes the construction of my apparatus. It only remains to describe its operation, which can be done very briefly.

The condenser, including the parts D, *d*, *c*, *e*, and *c'*, being removed, the materials to be used in the process are placed in the concave vessel I. The apparatus that has been removed is replaced, the reservoir and condenser filled with water, and a fire made in

the stove. The circulation of water, above described, will at once begin, and, as the mass in vessel I is heated, the essential oils and other volatile parts will pass off, be condensed to liquids by contact with the cold concave surface *d*, and run down into the space between the concave and the flange *e*, whence they may be withdrawn by cock K.

The removal of the condenser, preparatory to filling the retort before beginning the process, is of course no essential part of the process, as, by means of the orifice *d*, the retort might be filled without removing the condenser.

The apparatus above described can be made at very little cost, and can be conveniently employed in connection with any kind of stove.

In rapidity and thoroughness of operation it can hardly be equalled, while it has the obvious advantage of performing its work by means of hot water alone, which renders the scorching of the materials impossible.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The vessel D, constructed with the concave bottom *d*, plug *d'*, flanges *c c' e*, and cocks J K, all arranged to operate in the manner and for the purpose set forth.

2. The arrangement of said vessel with the vessels I and B, substantially as described,

3. The arrangement of said vessels D I B with the casing G, substantially as described.

4. The arrangement of the vessels D I B with the pipe E, substantially as described.

5. The arrangement of said vessels D I B and pipe E with the reservoir F and pipe *f*, substantially as described.

6. The arrangement of stove A, pipe E, vessels F G B I D, cocks J K L, plug *d'*, and flanges *c c' e*, substantially as described, and for the purposes specified.

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