(No Model.)

S. C. THRALL.

APPARATUS FOR MAKING EXTRACTS.

No. 449,603. Patented Mar. 31, 1891.

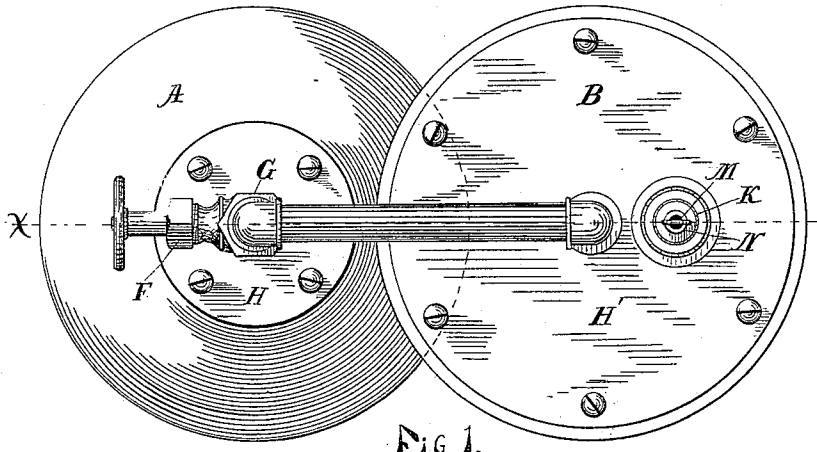


FIG. 1.

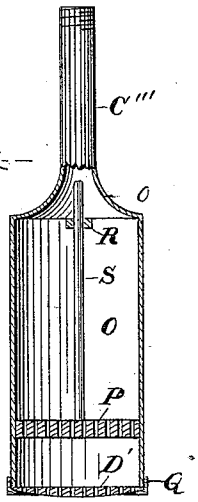


FIG. 3.

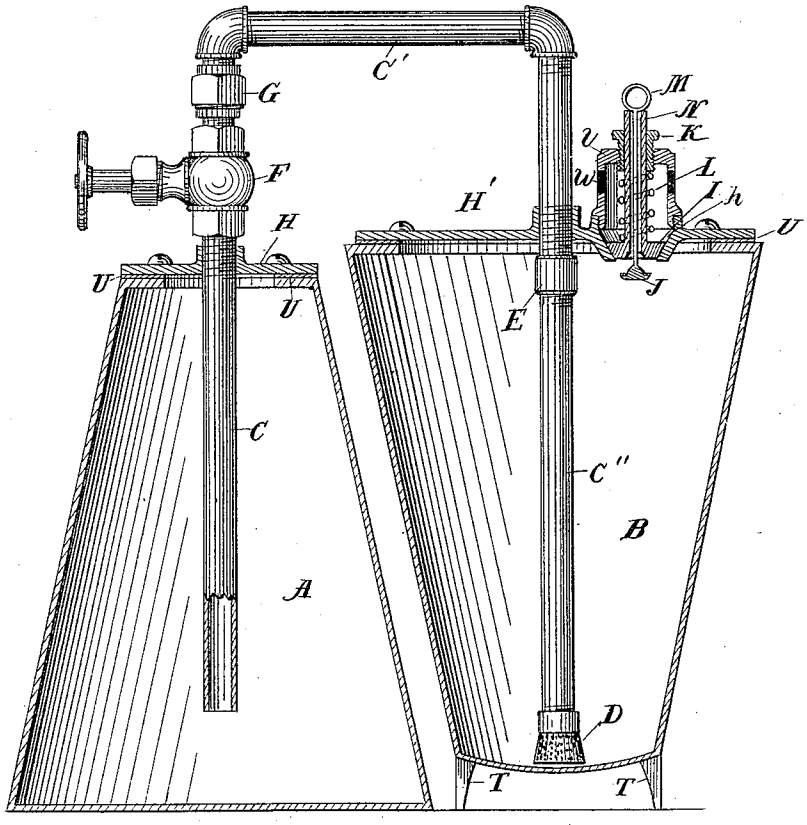


FIG. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

STEPHEN C. THRALL, OF ELK RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO WILLIAM B. CHANDLER, OF SAME PLACE.

APPARATUS FOR MAKING EXTRACTS.

SPECIFICATION forming part of Letters Patent No. 449,603, dated March 31, 1891.

Application filed June 23, 1890. Serial No. 356,499. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN C. THRALL, a citizen of the United States, residing at Elk Rapids, in the county of Antrim and State of Michigan, have invented certain new and useful Improvements in Apparatus for Making Extracts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of an apparatus for extracting from vegetable or other substances their essential soluble properties.

My object is to produce a simple apparatus adapted to perform this process in an expeditious and effective manner; and it consists in the construction, combination, and arrangement of the parts hereinafter described, and pointed out in the claims, reference being had to the accompanying drawings, wherein—

Figure 1 is a plan view of the apparatus. Fig. 2 represents a vertical section of the same on the line X X of Fig. 1; and Fig. 3 a detail of a bulb or enlarged end of the pipe for containing the material whenever it may be desirable to strain the extract.

A represents the heating-vessel, preferably conical, of sheet metal, and provided with a top which may be made air-tight by any suitable device, preferably having the cover H secured to an inwardly-turned flange with a packing U between them, and provided with an aperture having an interior-threaded boss, into which is screwed the end of a section of pipe C, having its lower end suspended a suitable distance from the bottom of the vessel to insure the retention therein of a sufficient quantity of liquid to make steam in sufficient volume to thoroughly heat the material. In this construction I use ordinary steam pipe, elbows, and fittings, and above the cover I place a valve F and above the valve F an ordinary union G, whereby, if desired, the vessel A may be closed air-tight, and, by unscrewing G, detached.

B represents the vessel provided for containing the material, and it is provided with feet T and relatively to A, is an inverted cone, and is provided with an air-tight cover H′, through which passes another section of pipe C″, which is joined to section C by section C′ and suitable elbows, and being provided with a coupling E, the lower portion is thereby detachable. This section is threaded where it passes through and is secured to the cover by the usual threaded boss. Within an opening *h*, in the cover H′, I place a valve which consists of an ordinary stemmed safety-valve with a hole bored vertically through the stem and provided with a countersink, to which is adapted a valve J, provided with a stem M.

I represents the steam-valve; N, the stem, provided with a spring L, and K a nut engaging with the valve-casing V, provided with the ports W. This device thus forms a combined steam and air valve, as will be readily appreciated.

At the lower end of pipe C″, I place a perforated strainer D.

It will now be seen and readily understood that if the material to be extracted is placed in the vessel B and the water or other solvent in vessel A and heat be applied to the latter, steam generated therein will force the liquid through the pipes into vessel B and the air will pass out through the air-valve J. As the vessel fills, and as soon as the water in A falls below the end of the pipe C, steam will be forced through into B, thereby heating the water in B, which will soon reach the boiling-point and begin to generate steam, the pressure of which will close the air-valve J. The process of steeping or extracting now proceeds at a much higher temperature under the back-pressure of the steam, which may be regulated by the safety-valve. When the liquid in vessel A is sufficiently evaporated, the heat is removed and the apparatus permitted to cool. The condensation of the vapor in A forms a vacuum, and as the vapor in vessel B condenses the valve J opens and the air being admitted the liquid in vessel B flows back through the pipes into vessel A. The valve F may now be closed and A detached, if desired. By the use of this apparatus whereby the delicate but highly volatile aroma is preserved, extracts of tea and coffee for domestic use of a highly superior quality can be produced, also of medical herbs, their potent

medicinal properties, which ordinarily escape by evaporation, being retained. To this process I make no claim in the present application, as the same is claimed in an application filed by me June 23, 1890, and numbered 365,500.

As it may be desirable to confine the material from which the extract is made, I have provided the device shown in Fig. 3, which device is interchangeable with the parts C'' and D shown in Fig. 2. Referring to Fig. 3, O designates a plain metal cylinder having a conical top *o*, terminating in or fastened to a section of pipe C''', which at its upper end screws into the union E. Within this cylinder is a perforated piston P, which is held in position by a small piston-rod S, which plays freely in the pipe C''', and on the bottom of the cylinder is a convex perforated cap D, which is held in place by a flanged ring Q. This cylinder is filled by removing the cap D inverting the cylinder to allow the piston to fall to the end *o* thereof, putting in the material and replacing the cap, after which it is connected with the pipes connecting the two vessels. By the use of this cylinder the water or other solvent is twice percolated through the material, besides subjecting it to the same steam-pressure as by the other method in extracting the soluble properties from the vegetable substances used.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for extracting from vegetable or other substances their soluble properties, the combination, with an air-tight heating-vessel, of an air-tight containing-vessel connected therewith and provided with a cover formed with an opening, a steam-valve in said opening having a hollow stem and an opening registering with the opening in said stem, and an air-valve closing the opening in said steam-valve and having a stem extending through the stem of said steam-valve, substantially as shown and described.

2. In an apparatus for extracting from vegetable or other substances their soluble properties, the combination, with an air-tight heating-vessel, of an air-tight containing-vessel connected therewith and provided with a cover formed with an opening, a valve-casing secured to said cover over said opening and having ports, and a threaded opening in its top, a nut within the opening in the top of said valve-casing and having threads engaging the threads thereof, a steam-valve within the opening in said cover, said valve having a hollow stem projecting through said valve-casing and an opening registering with the opening through said stem, a spring surrounding said valve-stem, and an air-valve closing the opening in said steam-valve and having a stem extending through the stem thereof.

3. An apparatus for extracting from vegetable or other substances the soluble properties thereof, consisting of an air-tight heating-vessel, an air-tight containing-vessel provided with air and safety valves, and a strainer located within said containing-vessel and having communication with the interior of said heating-vessel, said strainer comprising a cylinder having a perforated bottom and a perforated piston having a piston-rod located within said cylinder.

4. In an apparatus for extracting from vegetable or other substances their soluble properties, the combination of an air-tight heating-vessel A and an air-tight containing-vessel B, having safety and air valves, with an inverted-U-shaped pipe connecting the lower portions of the interior of said vessels, and a strainer within said containing-vessel and consisting of a cylinder having a perforated bottom, and a perforated piston and a piston-rod located within said cylinder.

5. In an apparatus for extracting from vegetable or other substances their soluble properties, the combination, with an air-tight heating-vessel A, and an air-tight containing-vessel B, provided with a safety-valve I and an air-valve J, of an inverted-U-shaped connection between said vessels, said connections comprising three pipes, one of which passes through the cover of vessel A, and is provided with a valve F, another passes through the cover of vessel B, and has its lower end located in a plane below that of the lower end of the section within the heating-vessel and provided with a strainer, and the other section connects together the upper ends of said sections of pipe.

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

STEPHEN C. THRALL.

Witnesses:

DENNIS L. ROGERS,

LUTHER V. MOULTON.