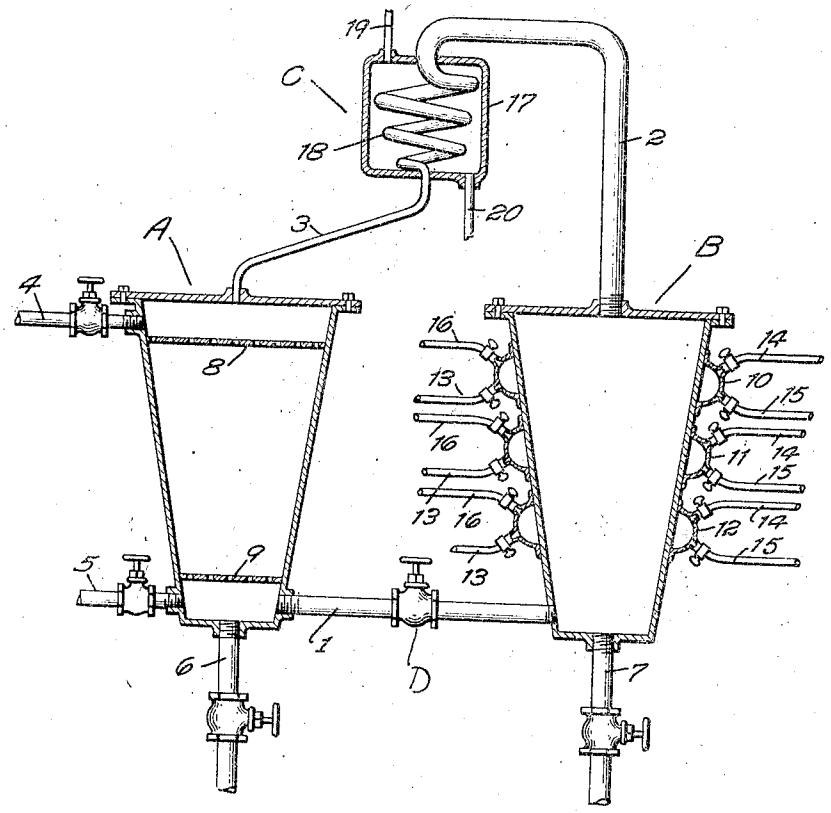
J. U. LLOYD.

PERCOLATING AND CONCENTRATING APPARATUS.

APPLICATION FILED JUNE 6, 1918.

1,332,908.

Patented Mar. 9, 1920



Inventor.

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By Walter [illegible]

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UNITED STATES PATENT OFFICE.

JOHN URI LLOYD, OF CINCINNATI, OHIO.

PERCOLATING AND CONCENTRATING APPARATUS.

1,332,908. Specification of Letters Patent. Patented Mar. 9, 1920.

Application filed June 6, 1918. Serial No. 238,577.

To all whom it may concern:

Be it known that I, JOHN URI LLOYD, a citizen of the United States of America, and resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Percolating and Concentrating Apparatus, of which the following is a specification.

An object of my invention is to produce an improved percolating and concentrating apparatus which is particularly designed for the manufacture of pharmaceutical preparations and which in its operation will prevent the precipitation of resinous materials as well as assure the proper alcoholic strength of the product.

This and other objects are attained in the apparatus described in the following specification and illustrated in the accompanying drawing in which my improved apparatus is shown in somewhat diagrammatic sectional elevation.

The apparatus illustrated as an embodiment of my invention, consists of a percolator A, a concentrator B, and a condenser C, which are connected with piping to be hereinafter described. At the bottom of percolator A a pipe 1 is located, which is connected also with the concentrator B at its bottom. In the top of the concentrator a vapor pipe 2 is located, which leads to condenser C, the lower end of which is connected with the top of percolator A by means of a pipe 3. In addition to these pipe connections I have provided a pipe 4 at the top of the percolator and a pipe 5 at the bottom of the percolator for purposes to be hereinafter more fully described, a pipe 6 also being provided in the bottom of the percolator for cleaning purposes. A pipe 7 is located in the bottom of the concentrator for emptying it.

The interior of the percolator is provided with screens 8 and 9, the former being provided for the even distribution of alcohol flowing from pipe 3, over the drug located in the percolator, and the latter for supporting the drug above the bottom and away from pipe 1.

Concentrator B is provided with a series of jackets 10, 11, and 12 through which steam or water may be passed for evaporating and cooling the extract in the concentrator during the concentrating operation. Pipes 13 and 14 are provided and may be used for admitting and discharging steam from each of the jackets, pipes 15 and 16 being provided for the admission and discharge of water if desired, or vice versa.

Condenser C is of usual form, a water casing 17 having a condensing coil 18, being shown, with water admission and discharge pipes 19 and 20 attached to the casing.

In the use of my improved apparatus the drug to be extracted is placed in the percolator upon the screen 9 and the proper quantity of menstruum is introduced into the percolator with the drug, cock D being closed. After the drug has been steeped the desired length of time, valve D is opened and the extract flows into concentrator B. Steam is admitted to one or more of the jackets 10, 11 and 12, cold water being introduced into the jacket beneath the steam heated jacket. The alcohol in the menstruum entering the concentrator is thus distilled from the surface and sent through pipe 2 into the condenser, from which it flows through pipe 3 and back through the drug in the percolator, thus carrying with it additional extract matter from the drug in the percolator, to the concentrator. This operation continues until the extract is of the required strength or until there can be no more extract derived from the drug in the percolator.

An advantage of connecting the bottom of percolator A with the bottom of the concentrator is that the precipitation of any resinous substances in the extract in the concentrator is avoided because of the continual agitation of the extract, created by the introduction of the menstruum from the percolator at the bottom of the concentrator.

The contents of concentrator B may be reduced to the required strength by the passage of steam through the one of the jackets which is located at the top of the liquid in the concentrator, water being passed through the next lower jacket to maintain all but the evaporating surface cool, if desired. Thus a large or a small quantity of extract may be evaporated and reduced to the required strength or bulk.

After the drug has been completely extracted the valve in pipe 7 is opened to empty the apparatus. The valve in pipe 1 is then closed and steam is passed through pipe 5 and allowed to pass off through pipe 4 which may be connected with a condenser to recover the alcohol,

I have shown the percolator and the concentrator upon the same level, with pipe 1 horizontal. This produces a moderately rapid flow of menstruum through the apparatus as when drugs of moderately finely divided condition are to be subjected to the menstruum. Should drugs of very finely divided condition be placed in the percolator, the circulation may be much more rapid. This increase in rapidity may be created by placing the percolator higher than the concentrator. Coarsely divided drugs necessitate slower circulation and for this purpose the percolator is placed lower than the concentrator.

Having thus described my invention, what I claim is;

1. A percolating and concentrating apparatus, comprising a percolator, a concentrator, a pipe connecting the percolator and concentrator at their bottoms, and means for creating a circulation of menstruum, through the pipe from the percolator to the concentrator.

2. A percolating and concentrating apparatus comprising a percolator, a concentrator, a pipe connecting the percolator and concentrator at their bottoms, means for creating a circulation of menstruum through the pipe from the percolator to the concentrator, and a series of jackets surrounding the concentrator, adapted to receive steam or water.

3. A percolating, concentrating and condensing apparatus comprising a percolator, a concentrator, a pipe connecting the percolator and concentrator at their bottoms, a condenser, a pipe connecting the upper ends of the concentrator and the condenser, and a pipe connecting the lower end of the condenser and upper end of the percolator.

4. A percolating, concentrating and condensing apparatus, comprising a percolator, a concentrator, a pipe connecting the percolator and concentrator at their bottoms, a condenser, a pipe connecting the upper ends of the concentrator and the condenser, a pipe connecting the lower end of the condenser and the upper end of the percolator, and a series of jackets surrounding the concentrator, adapted to receive either steam or water.

In testimony whereof, I have hereunto subscribed my name this 4th day of June, 1918.

JOHN URI LLOYD.

Witnesses:
WALTER F. MURRAY,
W. THORNTON BOGERT.