

June 19, 1923.

W. H. JOHNS

1,459,629

HEATING APPARATUS FOR LEACHES

Filed April 18, 1922

2 Sheets-Sheet 1

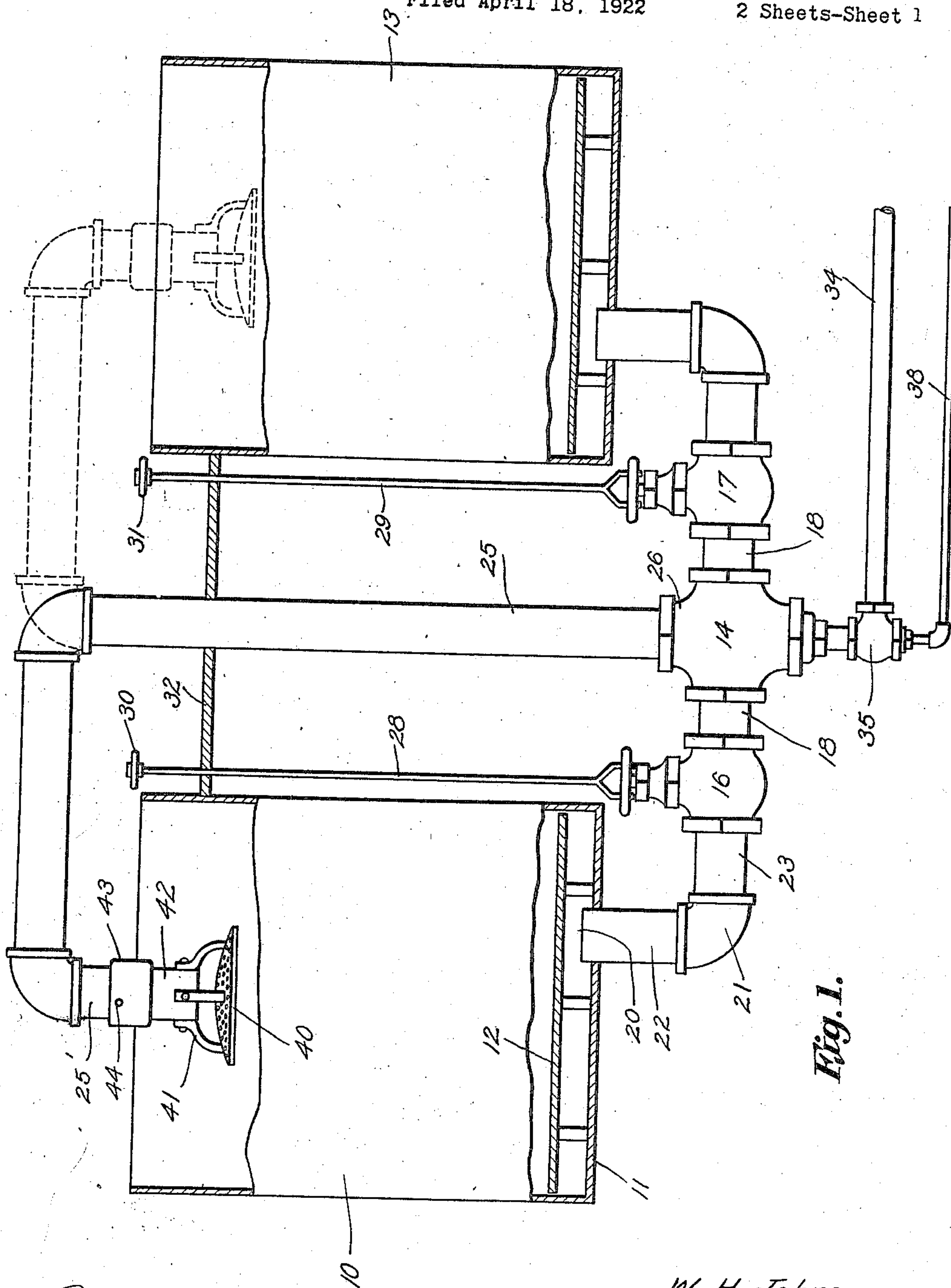


Fig. 1.

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WITNESS:

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Fig. 3.

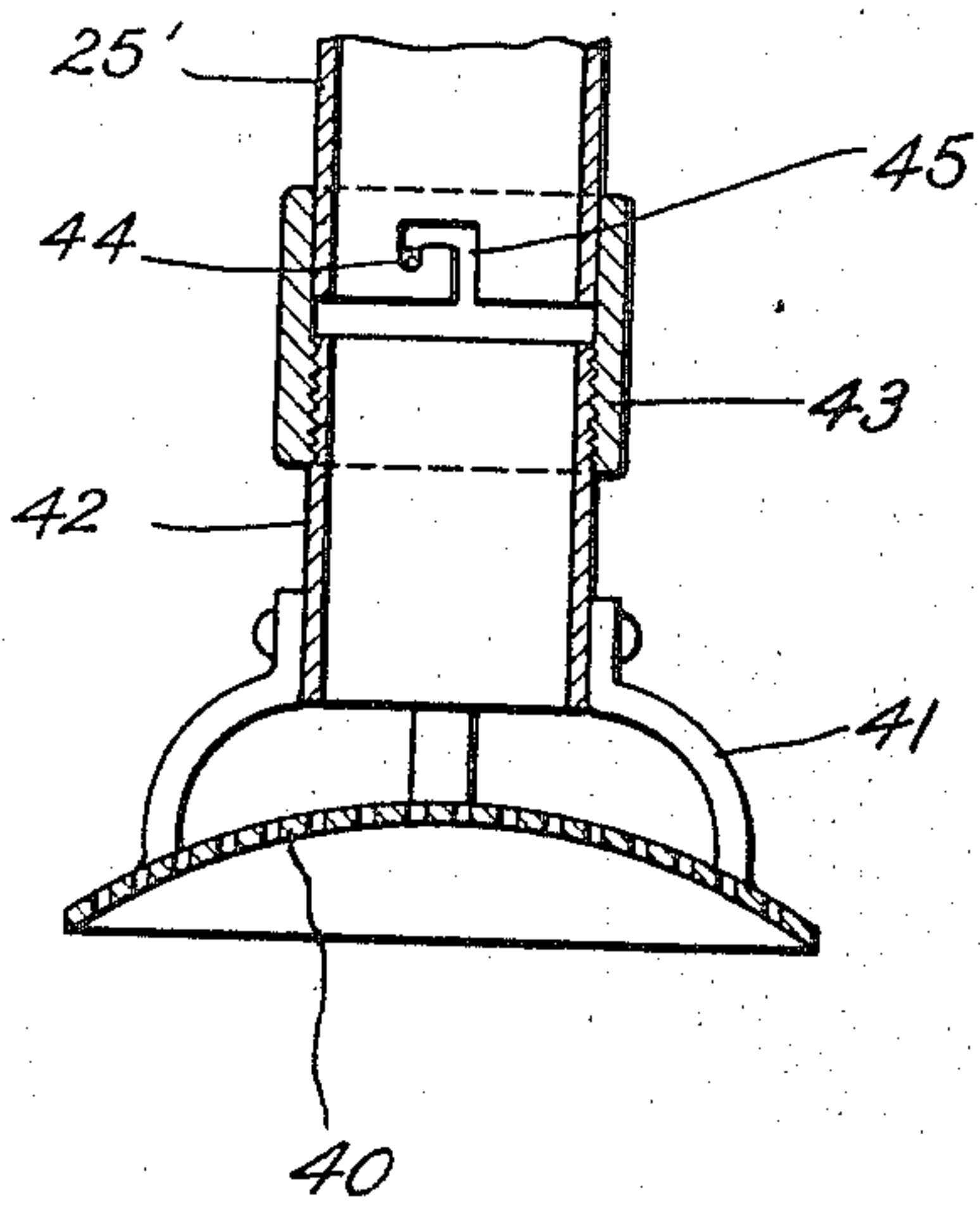


Fig. 4.

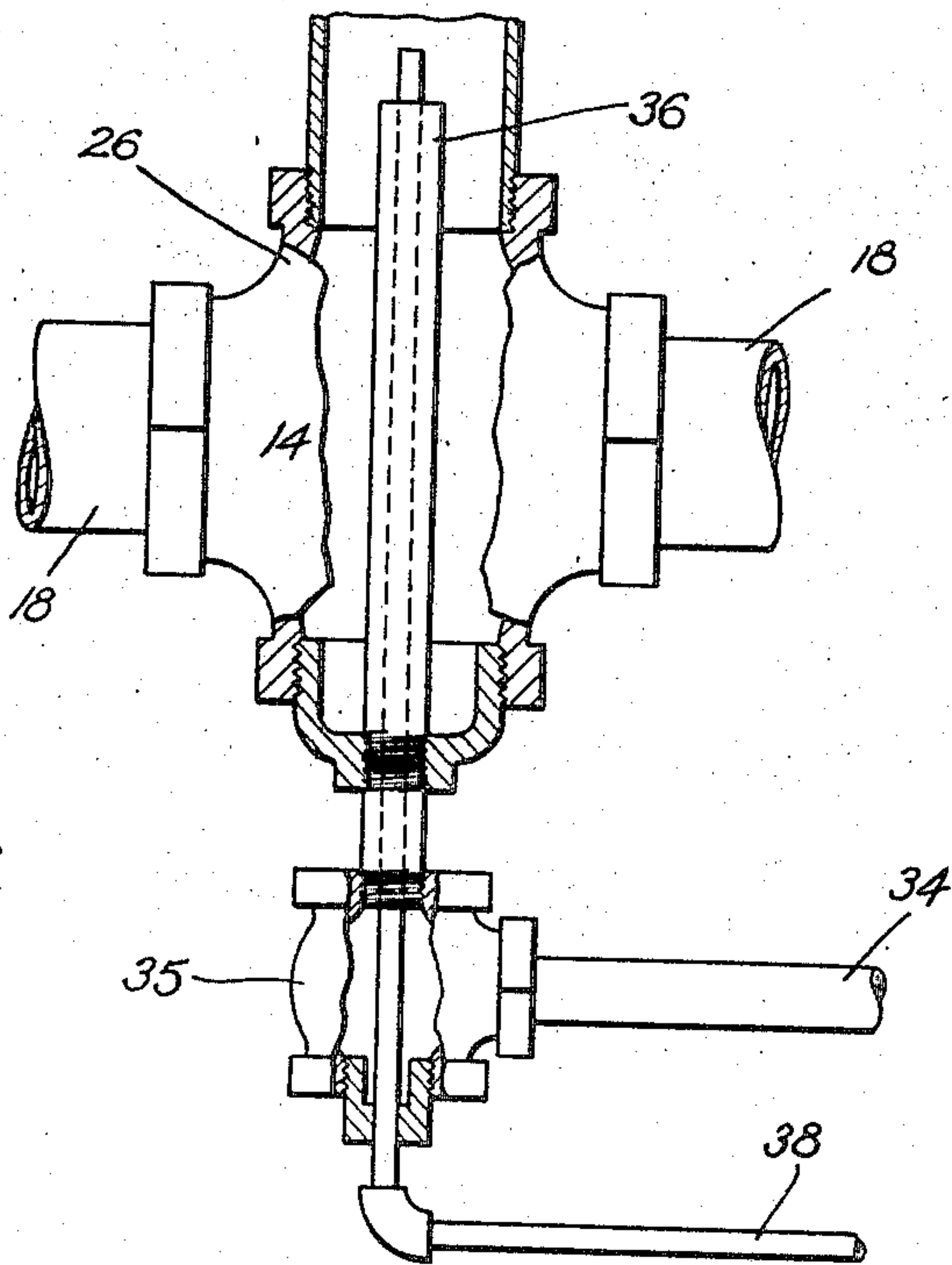
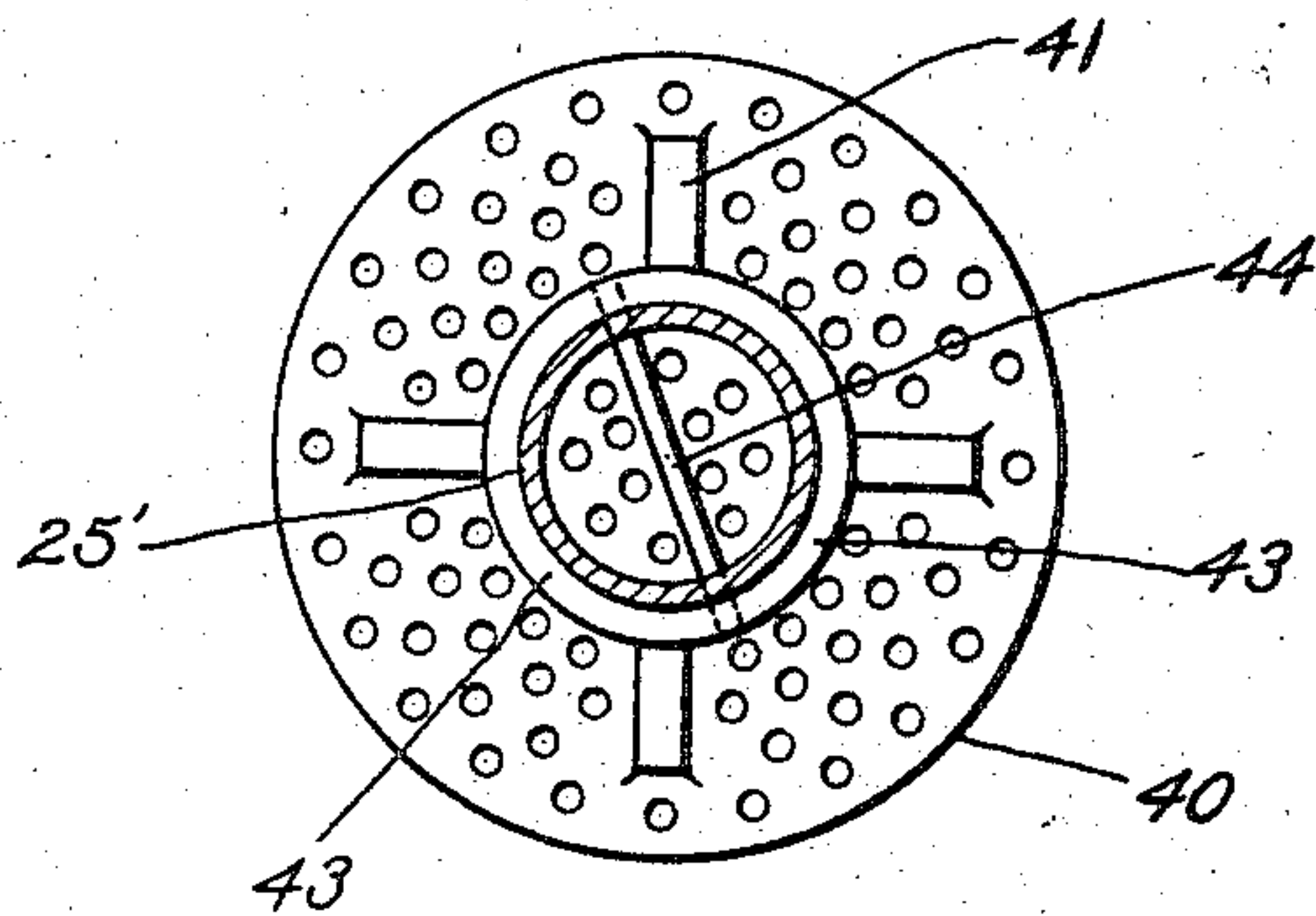


Fig. 2.

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Patented June 19, 1923.

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UNITED STATES PATENT OFFICE.

WILLIAM HENRY JOHNS, OF KINGSFORT, TENNESSEE.

HEATING APPARATUS FOR LEACHES.

Application filed April 18, 1922. Serial No. 554,500.

To all whom it may concern:

Be it known that I, WILLIAM H. JOHNS, a citizen of the United States, residing at Kingsport, in the county of Sullivan and State of Tennessee, have invented new and useful Improvements in Heating Apparatus for Leaches, of which the following is a specification.

This invention relates to a heating apparatus for use in leaching and especially in extracting liquor for tanning purposes.

One object is to provide a system of circulation which will eliminate all possibility of explosion, and which will produce a uniform heat with a minimum quantity of steam.

A further object is to introduce live steam and air into the liquor as it passes from one tub to another, avoiding the necessity of admitting the steam directly to the leach, which tends to cause the wood or bark around the live steam pipe to cook and form a non-soluble substance which will assume the form of sediment or mud in the tanning liquor.

A further object is to introduce live steam and air at a particular point in the pipe conveying the liquor from one tub to another, the fluid being carried to the second tub under steam and air pressure, in a constant stream, and will at the same time be uniformly heated.

A still further object is to provide for the extraction of tanning liquor from crushed wood or bark, the apparatus being equally adapted for other forms of leaching, rendering possible the even transmission of the liquor from the bottom of one tub to the top of the next tub, so that it will spread over the surface of the material in the tub last named, and prevent the substance from rising to the top at the beginning of the operation and before it has become saturated.

With the foregoing and other objects in view, the invention consists in the novel arrangement of elements described and claimed, it being understood that modifications may be made within the scope of the claims, without departing from the spirit of invention.

In the drawings, Figure 1 is a view of the apparatus in vertical section and elevation; Figure 2 is a view, with parts broken away, showing the air and steam intake elements; Figure 3 is a vertical section of the sprin-

gling device; Figure 4 is a transverse section thereof.

The tub 10 is provided with a bottom 11 and with a false bottom 12 spaced above the bottom first named, a second leach tub 13 being similarly constructed, and connected with tub 10 in the manner described below.

A four-way connection 14, sometimes termed a cross is mounted below the bottoms of the tubs, and at a point intermediate thereof. The flow of liquor to and through this four-way connection is controlled by means of valves 16 and 17. The casing of each valve is in communication with element 14 through connection 18, and is in communication with the outlet 20 of the corresponding tub through elbow 21 and connections 22 and 23.

A pipe 25 is connected with outlet member 26 of the element 14, this pipe passing upwardly to a point above the tubs, thence horizontally, and then downwardly into tub 13. The valves 16 and 17 are controlled by rods 28 and 29, these rods carrying hand wheels 30 and 31 above the platform 32.

Steam is introduced into pipe 25 through the four-way connection 14, the intake pipe being designated 34. This pipe has connection with a T 35, and the steam passes thence through discharge nozzle 36 into pipe 25, and at the point shown.

Air is admitted through pipe 38 which enters the lower side of the T-connection, and passes thence upwardly through pipe 36 and to a point slightly above the upper end of the pipe last named. The precise relation of the air and steam pipes with reference to each other and with reference to the volume of liquor flowing through pipe 26 is important, and it will be noted that the liquor flows by gravity through the four-way connection 14 and to a point slightly above the latter, the gravity pressure being uniform and constant, and the heating and propelling fluid being effective at the point where the best results are secured in the way of providing for an even and constant flow.

Detachably connected with the discharge end 25' of pipe 25, is a distributing element including a perforated plate 40 secured by brackets 41 with tubular element 42. The plate is convex, as shown, on the side to which the brackets are secured, this arrangement aiding in the distributing operation. Member 42 has threaded connection with a

sleeve 43, and the upper end of the bore of the latter is smooth, so that this element may telescope over the end portion 25' of pipe 25. A transverse rod 44 passes through element 43 engages bayonet slot 45, formed as shown and retaining the distributing device in position, when it has been slightly rotated and allowed to drop by gravity so that the rod rests in the downwardly turned end of the slot. This distributing device serves to spray the material in the tub, at the beginning of the operation, serving the purpose previously indicated. The distributing device may then be removed during the further operation of the apparatus.

The tub 10 is first employed, the valve 16 being open. The liquor flows from this tub through pipe 25 to the upper portion of tub 13, and when the operation is completed so far as the first tub is concerned, valve 16 is closed and valve 17 is open, so that the circulation is through pipe 25 downwardly through tub 13, through the outlet in the bottom of that tub, and thence through valve casing 17, four-way connection 14, returning through pipe 25, this circulation being maintained as long as required.

Having thus described my invention, I claim:

1. In a device of the class described, a leach tub, having an outlet opening in the bottom thereof, a second tub having a similar opening in the bottom, means connecting the outlet openings and including a plurality of valves and their casings, a casing between

the valve casings and connected therewith, a liquor outlet pipe leading from the upper portion of the casing and located between the valve casings, a steam intake pipe entering the bottom of the casing so located and discharging into the outlet pipe leading from that casing, at a point below the bottoms of the tubs, and an air intake pipe within the steam pipe and discharging at a point slightly above the discharge point of the steam.

2. In a device of the class described, a leach tub having an opening in the bottom thereof, a second tub having an opening in its bottom connecting said opening and including a plurality of valves and their casings, an intermediate casing, an outlet pipe leading from said intermediate casing to the top of the second named tub, a distributing and spraying device connected with the pipe, for spreading liquor over the mass of material in the second named tub, and steam and air intake pipe leading through the intermediate casing and into the lower portion of the pipe having communication therewith.

3. A distributing device for leaching apparatus, comprising a sleeve to be connected with a pipe, a tubular element connected with the sleeve, brackets extending radially from the tubular element, and a perforated plate, convex on one side, the brackets being secured to the plate near its edges and on the convex side thereof.

In testimony whereof I affix my signature.
WILLIAM HENRY JOHNS.