

(No Model.)

C. IREDELL.
APPARATUS FOR LEACHING TAN BARK.

No. 602,331.

Patented Apr. 12, 1898.

Fig. 1.

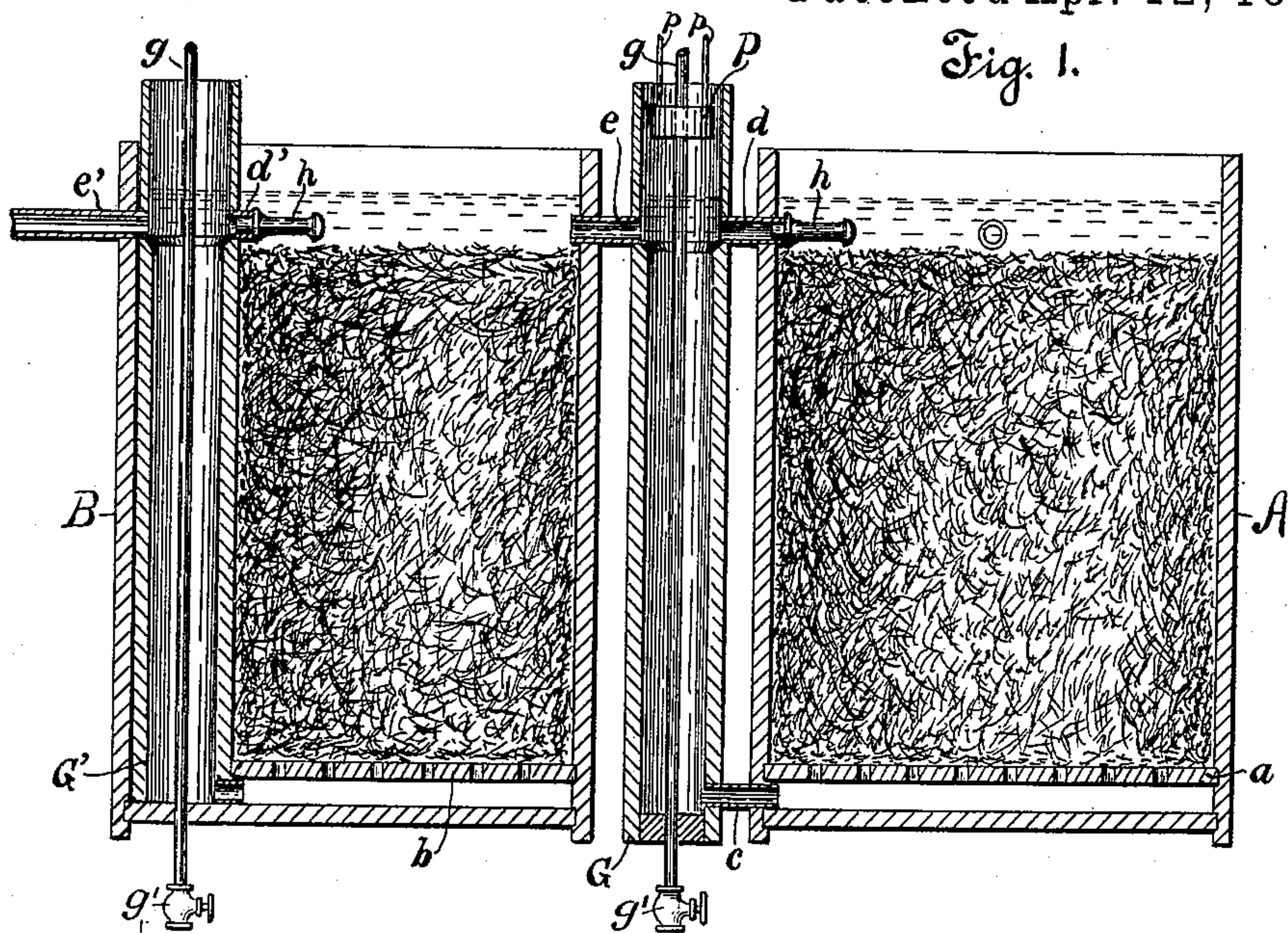
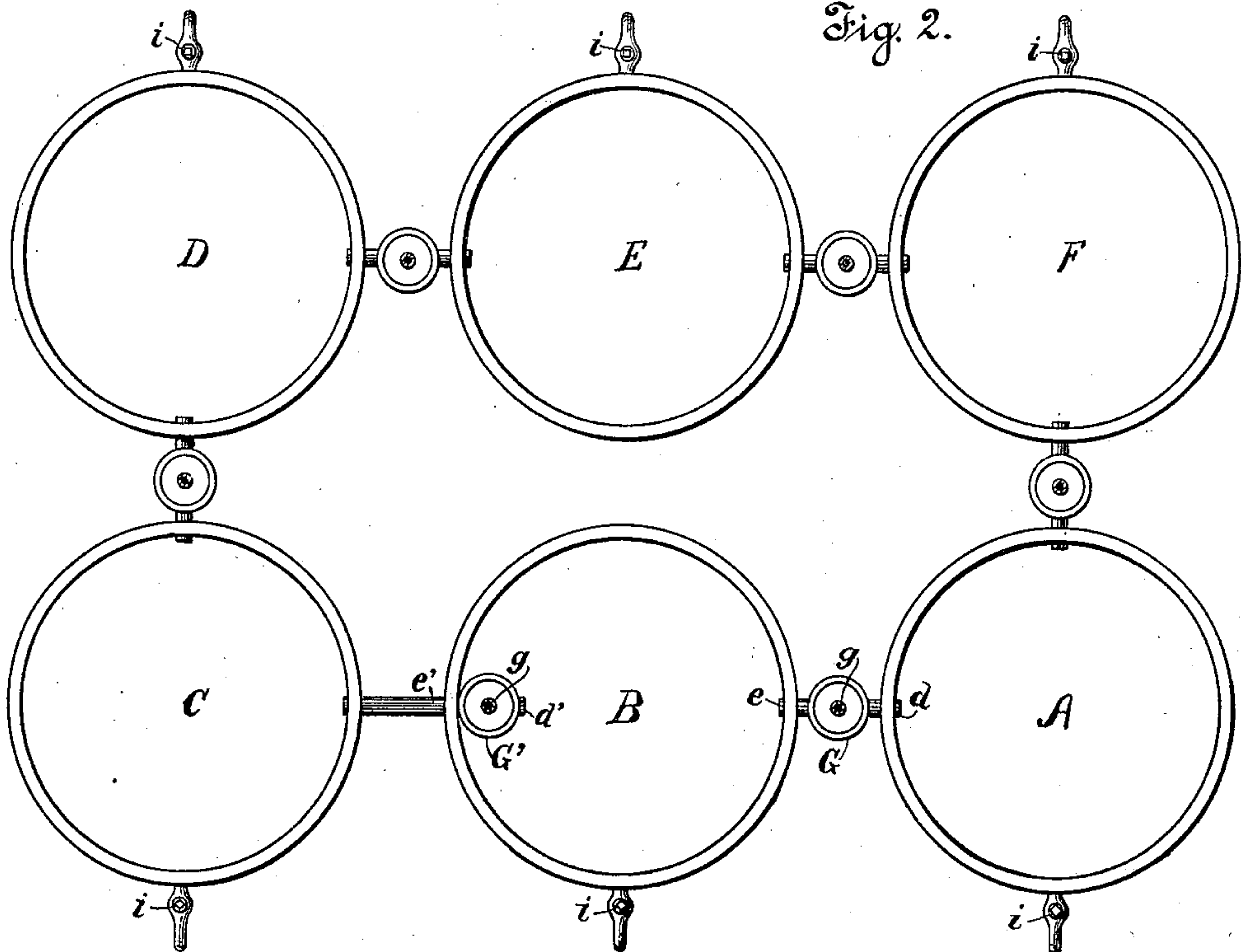
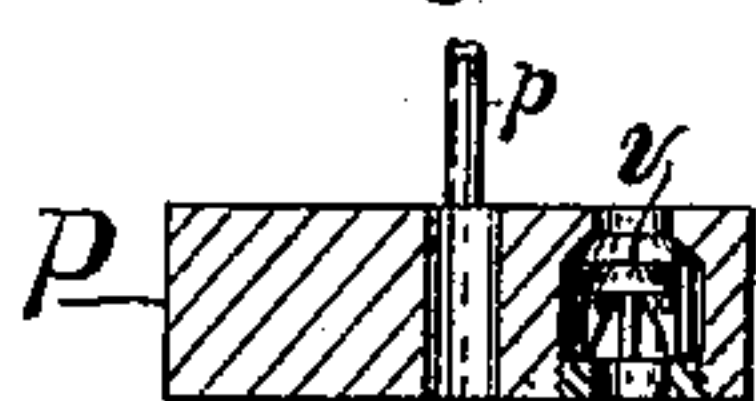


Fig. 2.



Witnesses
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Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR LEACHING TANBARK.

SPECIFICATION forming part of Letters Patent No. 602,331, dated April 12, 1898.

Application filed March 22, 1897. Serial No. 628,700. (No model.)

To all whom it may concern:

Be it known that I, CHARLES IREDELL, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Apparatus for Leaching Tanbark, Dyewoods, &c., of which the following is a specification.

My invention relates to apparatus in which the leaching of tanbark, dyewoods, &c., is carried out by allowing water to percolate by gravity through the bark, chips, &c., in suitably-constructed vats; and the object of my invention is to provide means to facilitate the economical working of such vats when used either independently as circulating leaches or in a series or circuit of any required number of vats, whereby the extracting liquid is caused to pass from the bottom of the vat to its top or the top of the next one in the series without the use of pumping machinery, and whereby the heat necessary to be imparted to the liquid in its passage is maintained without the necessity of providing steam-coils in each of the leaching-vats.

A further object is to provide means for causing a backflow through the vats under pressure, whereby the perforations in the false bottoms may be cleansed from time to time of obstructions which will accumulate therein.

I attain these objects by the apparatus illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section through the center of two leaching-vats supplied with my improvements; Fig. 2, a plan view of six vats connected in a circuit, and Fig. 3 a cross-section of a piston used in carrying out the second object of my invention.

Similar letters refer to similar parts throughout the several views.

A, B, C, D, E, and F indicate the several vats in a circuit, each vat being provided with a false bottom, as indicated at *a* and *b* in Fig. 1. Upon these false bottoms rest the tanbark or dyewood chips, the bottoms being provided with perforations, through which the extracting liquid may descend into the bottom of the vat. Between vats A and B is a stand-pipe G, of wood or other suitable material, or this stand-pipe may be located in-

side one of the vats, as indicated at G' in vat B. From beneath the false bottom in vat A runs a pipe *c* to the bottom of the stand-pipe G, and from the upper portion of said stand-pipe pipes *d* and *e* connect with vats A and B, respectively, at or near the water-level therein and above the tanbark or chips. *c' d' e'* indicate similar pipes which connect tanks B and C with the stand-pipe G'. Through the center of the stand-pipes I run the steam or hot-water pipes *g*, which are provided with valve *g'* below the bottom of the stand-pipe. While I have shown these pipes as running straight through the stand-pipes, I do not confine myself to this, as it may be preferable to run them through in coils to give more heating-surface. Wooden plugs *h* may be provided for stopping the orifices in pipes *e d e' d'*, &c., as required, or these pipes may be provided with plug-cocks or other suitable valves.

In operation and with the vats arranged as in Fig. 1 water poured into vat A will percolate through the bark or chips contained therein and accumulate below the false bottom as a liquid in weak solution. From thence it flows through pipe *c* into stand-pipe G and rises therein until it flows over through pipe *e* into vat B, where again it percolates to the bottom, becoming stronger in solution, thence flowing into stand-pipe G' and through pipe *e'* into the next vat of the circuit. In this manner the liquid flows from one vat to the next in the circuit, becoming stronger in solution in each until it reaches vat F, whence it is drawn off from plug-cock *i* at the bottom of said vat. If the water were allowed to pass from vat to vat in this manner by the force of gravity alone, the operation would be very slow, and heretofore it has been hastened through by forcing the water from the top of the vats to the bottom by hydraulic pressure or by pumping from one vat to the next in the series, and this has necessitated expensive machinery. I accomplish the same results by passing the steam or hot-water pipes through the liquid in the stand-pipes, thus heating the liquid and causing the heated column by its expansion to ascend more rapidly. Sufficient heat may be imparted to these columns to cause them to boil, and to prevent the water at such times from being too violently agi-

tated at the top of the columns I enlarge the tops of the stand-pipes, as indicated in Fig. 1, so that the water will spread out as it reaches the top of the columns and become more quiet.

5 Not only is the liquid in these columns caused to circulate more rapidly by the heat imparted to it, but at the same time the heat thus imparted to the liquid avoids the necessity of placing heating-coils within the vats themselves, and by properly manipulating the temperature of the steam or water in the pipes *g*, either by regulating the admission of steam or water from above or by regulating the discharge of condensed steam or water below by the valves *g'*, any desired degree of temperature may be imparted to the liquid as it passes through the stand-pipes, and different degrees of temperature may be imparted between the different vats, so that, if desirable, water may be poured into vat A at a high temperature and the temperature of the liquid as it passes from vat to vat gradually decreased until it reaches the last vat in the circuit.

Each vat of the series is provided with a draw-off cock *i* at its bottom below the false bottom, and by properly arranging the plugs *h* the fresh water may be charged into any one of the vats in the circuit and the strong liquid taken out from any one of the other vats—for instance, after the tannic acid, coloring-matter, &c., has all been extracted from the bark or chips in vat A this vat may be shut off from the remainder of the series and recharged with fresh tanbark, &c., while fresh water is poured into the vat B. As soon as A has been recharged the draw-off cock in vat F is closed, and the liquor is caused to flow through the fresh bark, &c., in vat A and drawn off from this vat as the last of the series. In this way each of the vats is shut off from time to time and recharged with fresh material, after which it becomes the last in the series and the saturated liquor is drawn off from it. It may be desirable to isolate one or more of the vats and to cause a circulation of the extracting liquid through such individual vats—as, for instance, vat A—in which case the plug *h* will be removed from pipe *d* and inserted in pipe *e*, the entrance from vat F also being plugged. After the water has been poured into A and rises in stand-pipe G to the level of pipe *d* it will then be caused to circulate from the bottom of the vat to the top and so around again and again by the expansion of the heated column in G until it becomes a strongly-saturated liquor, after which it is drawn off by the cock *i* or run into the next vat in the series.

As it frequently occurs that the openings through the false bottoms become clogged up by small particles of tanbark, chips, or sediment, and the flow of the liquid through the vats is much retarded thereby, I place pistons P around the steam-pipes *g*, shaped to fit closely the bore of the stand-pipes G and provided with rods *p p*, running to a source of manual or other power. When these aper-

tures in the false bottoms become clogged, by forcing this piston down into the stand-pipe a backflow is produced with more or less pressure, according to the force exerted upon the piston, which will effectually force out the obstructions from the said apertures. A valve *v*, Fig. 3, in the piston is so arranged as to give an open passage through the piston on its upstroke, thus allowing the superincumbent air or liquid to pass through the piston and preventing the formation of a vacuum below the piston, which would tend to undo the work performed by the piston on its downstroke. In case the steam-pipes *g* are provided with coils within the stand-pipes G, I locate these coils near the bottom of the stand-pipes and leave the pipes straight and central for some distance near the top of the stand-pipes in order that the pistons P may have the amount of stroke necessary to cause backflow enough to cleanse the apertures in the false bottoms in the manner above set forth.

It will be seen from the above that I utilize the steam or hot-water plant which is required to heat the extracting liquid and cause it to do double work in assisting the circulation of the liquid through the vats in the manner set forth, and this by the addition of very simple and inexpensive apparatus which may readily be attached to most types of leaching apparatus now in use, thus doing away with expensive pumping or forcing machinery.

I am aware that leaches have been arranged in which the liquid is caused to flow by gravity from the bottom of one vat up through a stand-pipe into the top of the next vat, and I do not claim this as my invention.

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

1. In a leaching apparatus, the combination, with a vat provided with a perforate false bottom, of a stand-pipe having communication at the top with the upper portion of the vat at or near the water-level therein, and at the bottom with the vat below the false bottom, a pipe passing through the stand-pipe adapted to be supplied with steam or hot water, a valve in the pipe below the stand-pipe, whereby the flow through the heater-pipe may be controlled and any desired temperature imparted to the liquid in the stand-pipe and a circulation upward through the stand-pipe and downward through the vat produced substantially as described, and a draw-off pipe leading from the vat below the false bottom.

2. In a leaching apparatus, the combination, with a series of vats having perforate false bottoms, of intermediate stand-pipes, each of said stand-pipes having communication at the bottom with one vat in the series below its false bottom and at the top with the upper portion of the next adjacent vat at or near the water-level therein, pipes passing through the stand-pipes adapted to be supplied with steam or hot water, means for controlling the flow therethrough, whereby the

liquid as it passes through the series of vats is maintained at the required temperature and a circulation of the liquid from vat to vat is produced or augmented substantially as set forth, and draw-off pipes leading from the vats below their false bottoms.

3. In a leaching apparatus, the combination, with a series of vats provided with false bottoms, of intermediate stand-pipes, each of said stand-pipes having communication at the bottom with one vat of the series below its false bottom, and at the top with the upper portion of the same vat and of the next adjacent vat at or near their respective water-levels, pipes leading through the stand-pipes adapted to be supplied with steam or hot water whereby the liquid is maintained at the required temperature and an upward circulation of the liquid through the stand-pipes produced or augmented, means for opening and closing the communications at the top of

the stand-pipes in order that one vat may be operated separately or in any number operated in series as may be desired, and draw-off cocks leading from the vats below the false bottoms.

4. In a leaching apparatus the combination of a vat, a stand-pipe connected therewith, a steam or hot-water pipe passing through the center of the stand-pipe, and a piston adapted to fit into the stand-pipe and around the steam or hot-water pipe and to be forced downward into the stand-pipe in order to produce a backflow in the vat for the purpose set forth.

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

CHAS. IREDELL.

Witnesses:

HOLLIS H. MILLS,
EUGENE DIVEN.