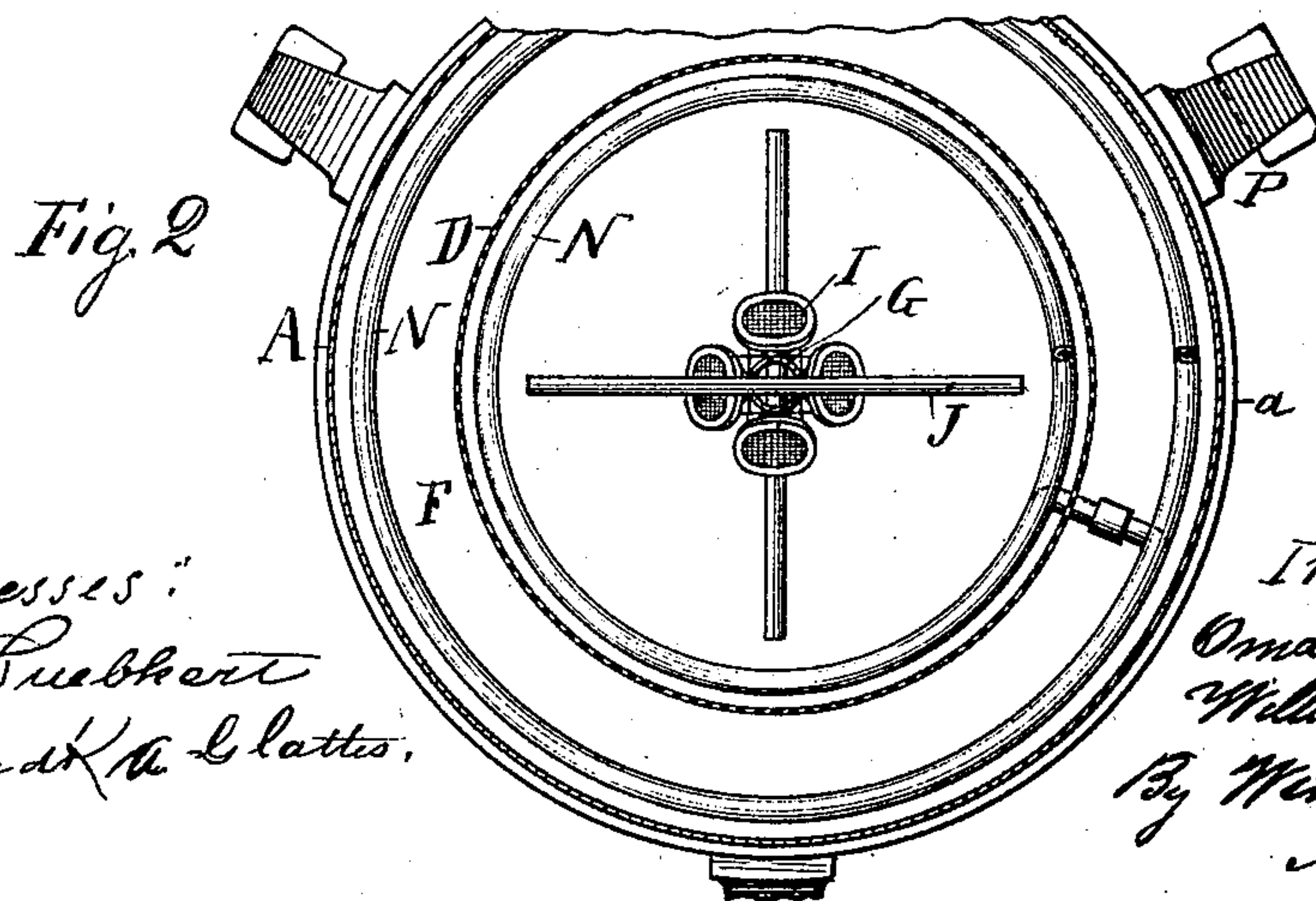
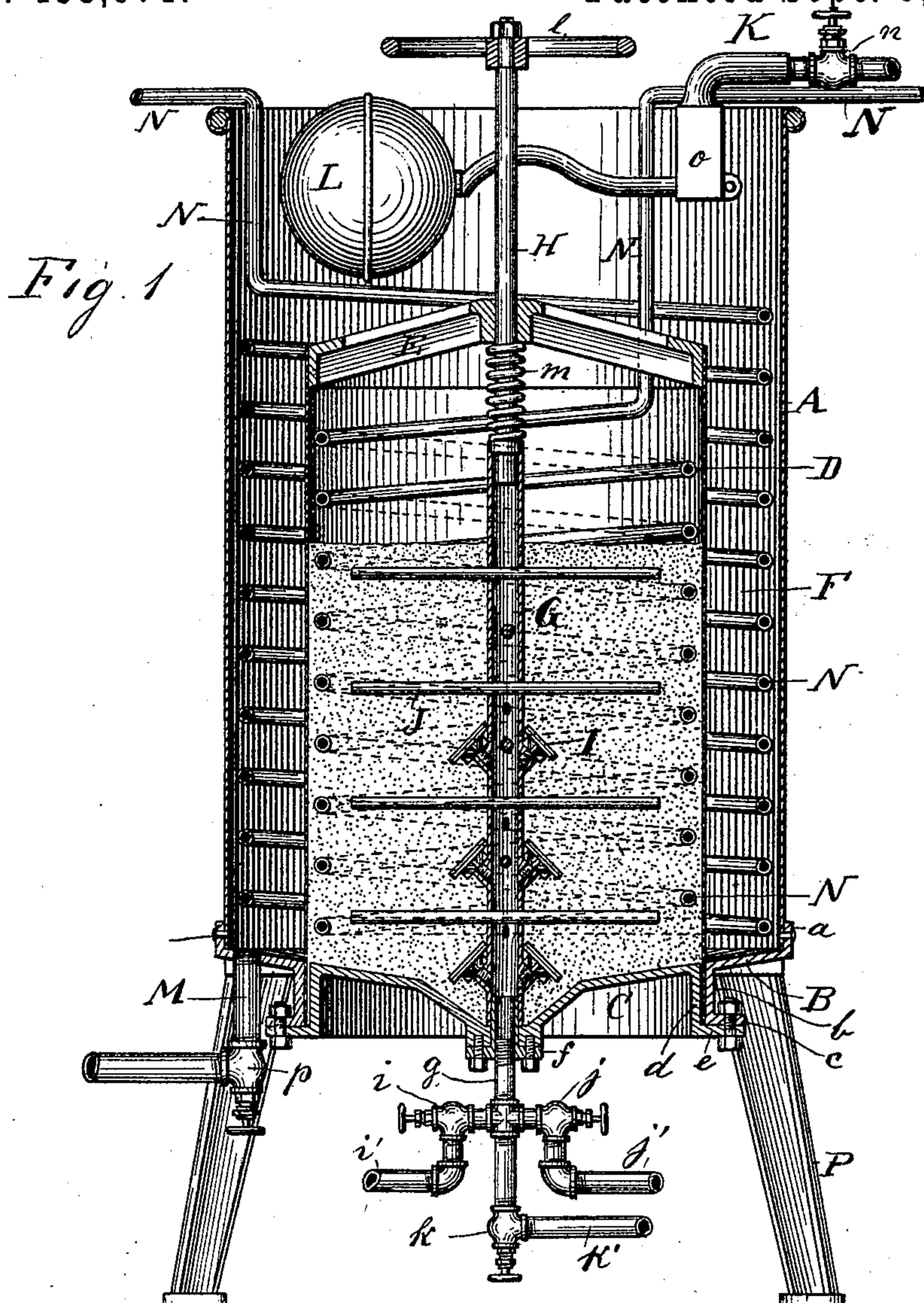


(No Model.)

O. H. & W. M. JEWELL.
SIRUP FILTER.

No. 435,971.

Patented Sept. 9, 1890.



Witnesses:
Otto Liebhart
Fred W. Clatter.

Inventors
Omar H. Jewell
William L. Jewell
By Wm. B. Rutz
Attorney

UNITED STATES PATENT OFFICE

OMAR H. JEWELL AND WILLIAM M. JEWELL, OF CHICAGO, ILLINOIS.

SIRUP-FILTER.

SPECIFICATION forming part of Letters Patent No. 435,971, dated September 9, 1890.

Application filed May 28, 1890. Serial No. 353,499. (No model.)

To all whom it may concern:

Be it known that we, OMAR H. JEWELL and WILLIAM M. JEWELL, citizens of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sirup-Filters, of which the following is a specification, reference being had therein to the accompanying drawings.

This our invention has for its object to provide an apparatus for filtering sirups; and with that object in view our invention consists of the novel devices and combinations of devices hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 represents a vertical section through the center of the apparatus, and Fig. 2 a sectional plan of the same.

Corresponding letters of reference in both figures of the drawings designate like parts.

The tank we use for our purpose is open on top, and it is composed of an iron cylindrical shell A, secured with its bottom edge in the exterior flange *a* of a ring-shaped casting B, providing an inwardly-slanting annular surface with an interior downwardly-extended cylindrical flange *b*, and with an outward flange *c* to the lower edge thereof.

In the ring-shaped casting B is secured the casting C, provided with a cylindrical flange *d*, entering the flange *b* of casting B, and having an exterior flange secured by bolts against flange *c* of casting B. The upper surfaces of both castings B and C thus connected form the concaved bottom of the tank, which bottom in its middle is conically recessed and provided with a central hole and with a gland *f* fitted therein and secured with its flange against the under side of casting C by tap-screws.

Between the surfaces of flanges *b* and *d* is secured the lower end of a cylindrical shell D of perforated sheet metal, having secured in its upper end a spider-frame E with a central hub. An annular chamber F is thus provided between the shells A and D.

Into the bottom of gland *f* is screwed a pipe *g*, having connected a star-coupling *h*, communicating through valves *i*, *j*, and *k* with pipes *i'*, *j'*, and *k'*, the pipe *i'* being the discharge-pipe for the filtered sirup, the pipe *j'*

for admitting hot water, and the pipe *k'* for admitting steam into the filter.

Over the upper end of gland *f*, extending through the bottom C, is sleeved the lower end of a pipe G, the upper end of which is secured upon the lower end of a spindle H, passed through the central eye of the hub of spider E, and having mounted upon its upper end a wheel *l*. A spiral spring *m* is placed over spindle H between pipe G and the central hub of spider E, which tends to prevent the lower end of pipe G from disengaging the gland *f*. The pipe G has a series of upwardly-inclined bosses with tapped holes that communicate with the exterior of such pipe for securing the screw-threaded necks of strainer-cups I, each being covered with a woven wire or perforated metal plate.

Through holes in pipe G are passed and secured therein a series of radial bars J, that will be rotated with such pipe by turning hand-wheel *l*.

K is the feed-pipe having stop or regulating valve *n*, and connecting with a suitable valve *o*, controlled by a lever and float L, and M is a discharge-pipe tapped through the ring-casting B to communicate with annular chamber F, and this pipe M is provided with a stop-valve *p*. A steam-pipe N entering from the top extends downward inside of perforated cylindrical shell D and close to the wall thereof in form of a coil, which pipe near the bottom C is passed through such shell D, and thence in form of a coil near the inside surface of shell A extends upward again, finally discharging over the upper edge of tank A. This filtering-tank is supported on legs P, secured to bottom casting B.

The *modus operandi* is as follows, to wit: The inner shell D being filled with crushed quartz or coarse sand or fine gravel to about three-quarters its height, and the valves *j*, *k*, and *p* being closed and the valve *i* opened, the apparatus is filled with sirup to a line the float-controlled valve *o* will permit, whereby the annular chamber F, as well as the space over the filtering material, will be occupied by the sirup. Steam circulated through pipe N will warm the sirup to render it highly fluid, and will also warm the filtering material, so that the sirup will not be chilled while filtering through the same from the top, as well as

through the perforations of shell D. The purified sirup will pass off through strainer-cups I into pipe G, and thence through pipe *g* and valve *i* into pipe *i'*, that will conduct it to the intended receptacle. All impurities thus separated must be washed out from time to time, which is accomplished by closing valves *n* and *i* and by opening valves *j*, *k*, and *p*. Through valve *j* hot water is admitted and through valve *k* steam is admitted into pipe G, which, passing through strainers I and through the filtering material in a reversed direction, will escape through the perforations of shell D into the annular chamber F, thence will be carried off through pipe M, thereby dissolving all impurities to be carried off with the hot water, and for the purpose of facilitating the washing of the filtering material by the steam and water thus passed through it the hand-wheel *l* is turned during this washing process, whereby the arms J will be rotated through such filtering material, thereby stirring and agitating the same and rubbing the particles composing it against each other for liberating impurities adhering thereto to pass off with the water.

What we claim is—

1. In a filtering-tank for the purpose described, the combination of a perforated shell holding the filtering material, of a vertical pipe extended into the filtering material and provided with strainer-cups and connecting with a discharge-pipe, and of a steam-circulating pipe within and around such filtering material, all substantially as set forth.

2. In a filtering-tank for the purpose described, the combination of a perforated shell holding the filtering material and providing a surrounding open chamber between the walls and the perforated shell, of a vertical pipe having strainer-cups within the filtering material and communicating with a discharge-pipe, hot-water pipe, and steam-pipe, and of a waste-pipe to the bottom of the surrounding chamber, each having a stop-valve, and

of a coiled steam-circulating pipe within and around the perforated shell, all substantially as set forth.

3. In a filtering-tank for the purpose described, the combination of a perforated shell holding the filtering material and providing an open chamber around such perforated shell, of a vertical pipe extended through the filtering material and arranged to be rotated therein by means of a wheel or crank on top, of strainer-cups to such vertical pipe for admitting the filtered sirup into such pipe, of radial arms to such vertical pipe for stirring the filtering material during a washout, of a waste-pipe to the bottom of the surrounding chamber, and of a discharge-pipe, and a hot-water and a steam pipe, all communicating with the lower end of the vertical pipe and each having a stop-valve, all substantially as set forth.

4. In a filtering-tank for the purpose described, the combination of a perforated shell holding the filtering material and providing an open chamber around such perforated shell, of a coiled steam-circulating pipe within and exterior of the perforated shell, of a vertical pipe extended through the filtering material and arranged to be rotated therein by means of a wheel or crank on top, of strainer-cups to such vertical pipe for admitting the filtered sirup into such pipe, of radial arms to such vertical pipe for stirring the filtering material during a washout, of a waste-pipe to the bottom of the surrounding chamber, and of a discharge-pipe, and a hot-water and a steam pipe, all communicating with the lower end of the vertical pipe and each having a stop-valve, all substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

OMAR H. JEWELL.

WILLIAM M. JEWELL.

Witnesses:

WILLIAM H. LOTZ,

OTTO LUEBKERT.