

This pressure on the tanks upon the dissolving, leaching, or filtering liquid with which the tanks E and E¹ are nearly filled forces said liquid into circulation, as directed by the regulation or adjustment of cocks or valves as herein set out. In the ordinary process the liquid passes from tank E into tank A, thence into tank A¹, and finally into tank E¹. From there, by closing valves or cocks N N¹ and opening valves or cocks X X¹, the liquid, by turning on the steam pressure from pipe L¹, is forced through pipe V into tank E, from which (cocks X X¹ being closed and cocks N N¹ opened) it again is forced through the circuit before detailed as often as may be wished, and until the desired result is obtained. The full-line arrows show the course of the liquid through tanks E A A¹ to tank E¹, whilst the dotted arrows show its course from tank E¹ to tank E. O O¹ are drain-taps to drain off solutions from the ends B¹ before emptying the solid contents which may be in tanks A A¹. From tanks E and E¹, or either of them, by means of steam pressure applied as before described, the liquid may be forced through pipes P and P¹, or one of them, as the case may be, to where desired for subsequent treatment. S S¹ are charging man-holes. T T¹ are pipes through which tanks E and E¹ are filled; they may also be used as steam-escape pipes. W W¹ are gauge-glasses to show levels of liquids. We do not confine ourselves to any one special material in the construction of the before-described apparatus, as the material employed in the construction may be suited to the character of the solution or solutions used in the operations to be performed; for example, iron may be used alone or lined with any material not appreciably acted on by the solution employed.

In the drawings an air-vessel R is shown, which may be fitted if and as desired, and a spreader Y may also be fitted into tanks of the style of A if wished. Tank A¹ is shown with a tapered top B², similar to tops H and H¹, which construction of tank is especially suitable for a type of apparatus in which it is desired to have only one tank to which the steam-pressure may be applied directly, but other apparatus may, if desired, have several tanks similar to tank A, with top B², worked in series.

It can easily be seen that, working as explained, various combinations of parts may be arranged to fit varying conditions. Where washing is required, the same procedure as with dissolving solutions is employed. If solutions or liquids containing insoluble or suspended matters require filtering, they may be filtered directly through filter-beds G G¹, the solutions or liquids being forced through from tank E.

We would have it understood that, though we have described our method and apparatus as carried out by means of steam-pressure, they may be operated with compressed air or other suitable expansible gas or vapour capable of giving the required pressure to act upon the non-compressible fluids.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is,—

1. The improved method of dissolving, leaching, and filtering, the essential feature of which is the admission of steam, gas, or vapour under pressure into a closed vessel or tank containing non-compressible fluid, whereby said fluid is forced through the material under treatment, or through filtering media, as the case may be, substantially as herein described and explained.

2. The improved method of dissolving, leaching, and filtering, in which steam, gas, or vapour under pressure is admitted into one or more closed tapered vessels or tanks upon non-compressible fluid therein, to force said fluid into circulation through other closed vessels or tanks containing material for treatment or filtering media, as the case may be, substantially as herein described and explained.

3. In apparatus for dissolving, leaching, and filtering by the method set forth, the construction of operating vessel or tank with a tapered end (preferably tapering 75° from the horizontal), and connected with the primary source or reservoir of pressure, substantially as herein described and explained.

4. In apparatus for dissolving, leaching, and filtering by the method set forth, the combination and arrangement with an operating-tank such as A¹, E, or E¹, having a tapering receiving end such as B², H, or H¹, of a tapered (preferably 75° from the horizontal) pressure-distributor such as J, having inlets such as K, substantially as herein described and explained, and as illustrated in the drawings.

5. In apparatus for dissolving, leaching, and filtering by the method set forth, the combination and arrangement with an operating-tank having tapered receiving end, such as B, of a pressure-distributor such as Y, substantially as herein described and explained, and as illustrated in the drawings.

6. In apparatus for dissolving, leaching, and filtering by the method set forth, the combination and arrangement with operating-tanks, such as A and A¹, of hinged or removable bottoms such as B¹, and devices for lowering and raising said bottoms substantially as herein described and explained, and as illustrated in the drawings.

7. Apparatus for dissolving, leaching, and filtering, by the method set forth, of the particular combination and arrangement all together of mechanical parts substantially as herein described and explained, and as illustrated in the drawings.

Dated this 7th day of October, 1893.

JOHN STORER.

BENJAMIN THOMAS LACY

(By his Attorney, FRED. WALSH).

IMPROVEMENTS IN AND CONNECTED WITH COAL-CUTTING AND LIKE MACHINES.

I, Frederick Hurd, of Manygates Park, Wakefield, Yorkshire, and of 11, Grittleton Road, St. Peter's Park, in the County of Middlesex, England, mining, civil, and mechanical engineer, do hereby declare the nature of my invention for "Improvements in and connected with Coal-cutting and Like Machines," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement.