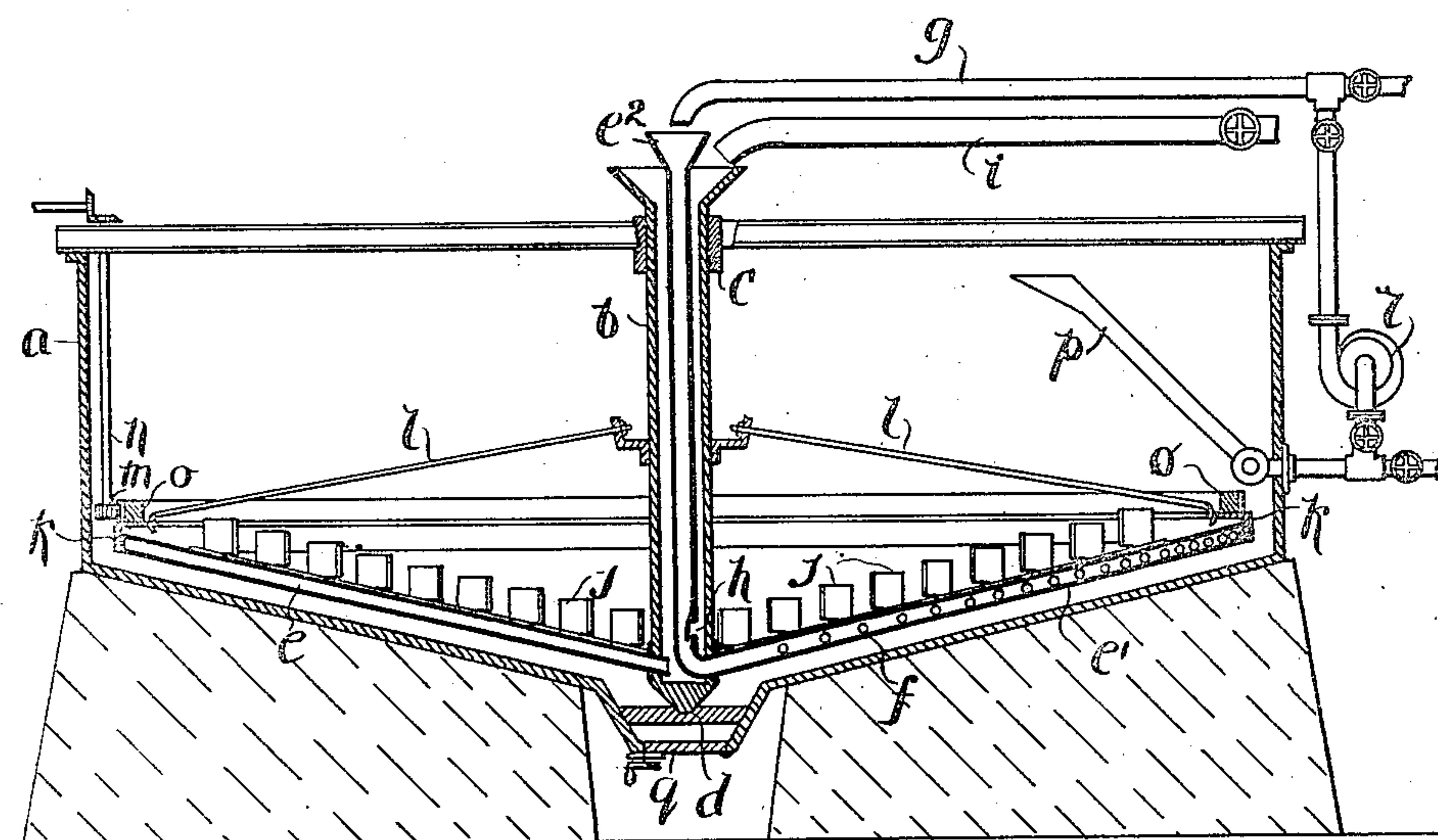


No. 860,775.

PATENTED JULY 23, 1907.

C. E. D. USHER.
SLIMES TREATMENT.

APPLICATION FILED JAN. 5, 1907.



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UNITED STATES PATENT OFFICE.

CHARLES E. D. USHER, OF JEPPESTOWN, JOHANNESBURG, TRANSVAAL.

SLIMES TREATMENT.

No. 860,775.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed January 5, 1907. Serial No. 350,998.

To all whom it may concern:

Be it known that I, CHARLES EDWIN DRAPER USHER, a British subject, residing at Kelly's building, Commissioner street, Jeppestown, Johannesburg, in the Colony of the Transvaal, have invented certain new and useful Improvements in Slimes Treatment, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to the wet treatment of finely comminuted ores, or slimes as they are generally termed, for the extraction of their metallic contents and particularly to the treatment of auriferous ores by cyanid; the principal object being to provide a cheap and quick process for this purpose whereby a very thorough contact of the solvent with the ore, with consequent high extraction, is effected; another object is to enable the several steps of solution, washing and drawing off of the liquids to proceed continuously without stoppages for settlement or otherwise and without transference of the slimes.

A further object is to avoid loss of metal by enabling the slimes to be more readily and completely washed than heretofore.

A further object is the provision of apparatus as hereinafter described for carrying out such process.

According to the present process the solvent solution or wash water is caused to percolate upwards through the slimes which latter are maintained by suitable means in a uniform and practically constant state of diffusion throughout the suspending liquid, the rate of flow and manner of distribution of the solvent or wash being such as not to materially disturb the homogeneous suspension of the slimes and to allow the solvent or wash to collect in a clear state above the slimes, whence it may be withdrawn as desired.

In carrying the invention into effect the apparatus shown in vertical section in the accompanying drawing may be employed.

In the drawing, *a* indicates a circular vat preferably cylindrical in order that the solvent may rise therein at a uniform rate. *b* is a hollow trunk pivoted at *c* and *d* to revolve centrally within the vat. Radiating from the base of the trunk are several hollow arms *e* which lie close to the vat bottom. The arms are perforated as at *f* for the ejection of liquid and such perforations may be provided with suitable non-return valves to prevent the ingress of slimes into the arms. In the example one arm *e*¹ only is adapted to pass solvent in order that the distribution may be effected slowly and accordingly such arm is carried up through trunk *b* and terminates above the trunk in a funnel *e*² to which solvent is supplied by a pipe *g*. An inwardly opening

non-return valve *h* permits the passage of liquid from the trunk to the continuation of pipe *e*¹ and the remaining arms open directly into the trunk, so that in washing the slimes or flushing out the vat, water or other liquid supplied for this purpose by pipe *i* to the trunk will be ejected from all the arms simultaneously. The arms carry agitating vanes *j* preferably so arranged that those upon one arm move the surrounding liquid oppositely to those upon the next. The ends of the arms are secured to an angle iron ring *k* which again is supported from the central trunk by ties *l*. Means are provided for slowly rotating the trunk and arms, such for example, as a pinion *m* driven through shaft *n* by suitable gearing and meshing with teeth *o* secured to the ring *k*.

p is a decanting pipe of the usual type and *q* is a central discharge door for discharging the contents of the vat, towards which door the bottom of the vat may be slightly sloped.

In operation the vat is filled to the desired extent with the mixture of slimes and water whereupon the arms are revolved with just sufficient velocity to maintain the slimes in suspension. Upon a homogeneous state being reached, the solvent is fed into the funnel *e*² and passing along the arm *e*¹ issues therefrom and rises slowly through the mass of slimes, the steady revolution of the arms insuring its uniform distribution. The rate of feeding is such as to permit the collection of a layer of clear liquid above the slimes, which layer may after a short time be continuously drawn off by the decanting pipe. The solvent is followed by wash water according to the procedure usual in cyaniding, and finally the whole vat contents are discharged through the door *q*, a water flush being meanwhile supplied through the arms if considered desirable. In some cases it may be desirable to return the solution after withdrawal from the vat for further percolation through the slimes and to this end there may be provided a pump *r* by means of which liquid may be passed from the decanting pipe *p* back to the pipe *g*.

I claim as my invention:—

1. Apparatus for the wet treatment of metalliferous slimes, consisting of a vat, means for maintaining the slimes therein in a substantially uniform state of suspension and means for passing a liquid from the bottom of the vat upwardly through the contained slimes, means for continuously drawing off clear liquid from above the slimes and means for returning the liquid for further percolation through the slimes.

2. Apparatus for the wet treatment of metalliferous slimes, consisting of a vat, means for maintaining the slimes therein in a substantially uniform state of suspension, perforated arms arranged at the bottom of the vat, means for slowly revolving the same, means for sup-

plying solvent or wash thereto and means for continuously drawing off clear liquid from above the slimes.

3. Apparatus for the wet treatment of metalliferous slimes, consisting of a vat, a discharge door for the same.
5 means for maintaining the slimes therein in a substantially uniform state of suspension, perforated arms arranged at the bottom of the vat, means for slowly revolving the same, means for supplying solvent or wash to one or more of such arms, agitating vanes secured to the arms,

means for continuously drawing off clear liquid from above 10 the slimes and means for ejecting wash or flushing water from the whole of the arms simultaneously.

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

CHARLES E. D. USHER.

Witnesses:

W. HILLMAN VINCENT,
ALFRED L. SPOOR.