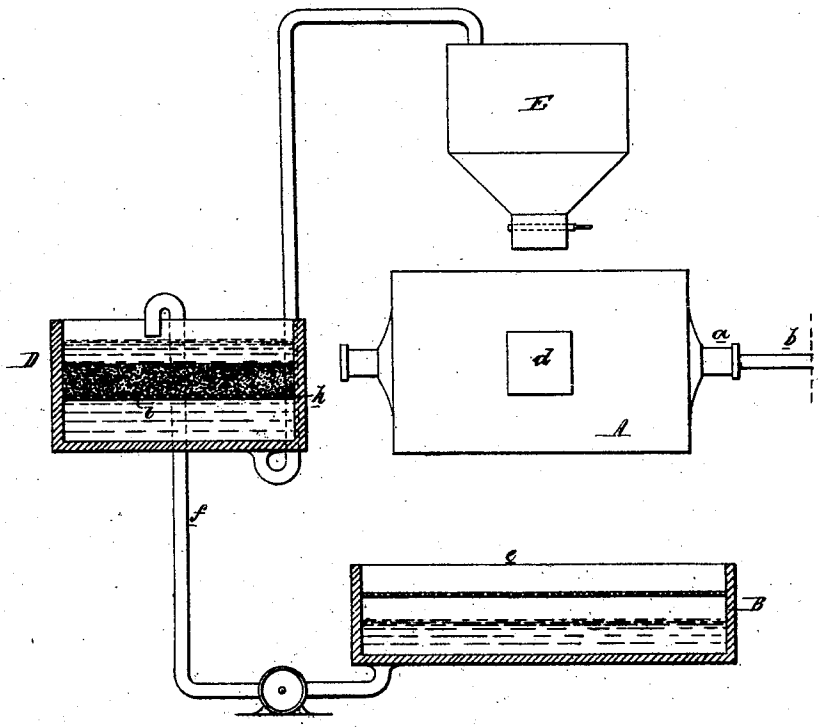
J. H. DUGAN.

Reusing Alkaline Solutions from Treating Straw.

No. 145,409. Patented Dec. 9, 1873.



James H. Dugan
by his Attys.
Howson and Sons.

WITNESSES. Thomas McIlvain
John K. Rupertus.

UNITED STATES PATENT OFFICE.

JAMES H. DUGAN, OF BLOOMFIELD, NEW JERSEY.

IMPROVEMENT IN REUSING ALKALINE SOLUTIONS FROM TREATING STRAW.

Specification forming part of Letters Patent No. **145,409**, dated December 9, 1873; application filed October 26, 1872.

To all whom it may concern:

Be it known that I, JAMES H. DUGAN, of Bloomfield, Essex county, New Jersey, have invented an Improvement in the Reuse of Alkaline Solutions, of which the following is a specification:

The object of my invention is to economize the consumption of caustic alkali in the treatment of fibrous material with the same for the manufacture of paper-pulp; and this object I attain by collecting the alkaline solution, after it has been used in a pulp-digester for the treatment of one batch of fibrous material, together with the water with which said material has been washed, and, after filtering the solution, restoring it to the digester for the treatment of another batch of fibrous material.

In carrying my invention into effect, I employ apparatus, substantially as illustrated in the accompanying drawing, in which A represents a cylindrical tank, having trunnions *a a* adapted to bearings on a suitable frame. Into this tank I place the vegetable fibrous material to be treated, together with a suitable quantity of a solution of caustic alkali. While the tank revolves a jet of steam from a pipe, *b*, is introduced to it through one of the trunnions *a*. After the material has been treated for a suitable length of time, the cover *d* of a man-hole in the tank is removed, and the contents are permitted to fall onto a slotted or perforated platform in a tank, B, the fluid contents flowing through the platform into the tank, while the stock remains on the platform, where it is thoroughly washed preparatory to its removal, the water with which the material is washed taking up the alkali which remains in the fibers, and falling into the tank below. From the tank B the alkaline solution is forced through a pipe, *f*, into a reservoir, D, having a perforated diaphragm, *h*, supporting suitable filtering material *i*, through which the fluid percolates, leaving behind all particles of fibrous material and other foreign matter which it had held in suspension. The filtered liquid is, consequently, in the requisite pure condition to be restored to and re-used in the revolving digesting-tank. It is, however, first pumped into the reservoir E during the time the digesting-tank is in operation, so that when this tank is emptied there will be a supply from which it can be at once replenished. The alkaline solution necessarily loses much of its strength from the time it leaves the digesting-tank until it reaches the reservoir E; hence, it becomes necessary to re-enforce it with a proper quantity of fresh caustic alkali before it is returned to the digesting-tank.

I do not claim, broadly, the re-enforcing of alkaline solutions in the manufacture of paper-pulp; but

I claim—

The combination, with a tank, A, of a draining-tank, B, and filtering-reservoir D, operating together, as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. DUGAN.

Witnesses:

ABRAHAM MANNERS,

DANIEL E. DUGAN.