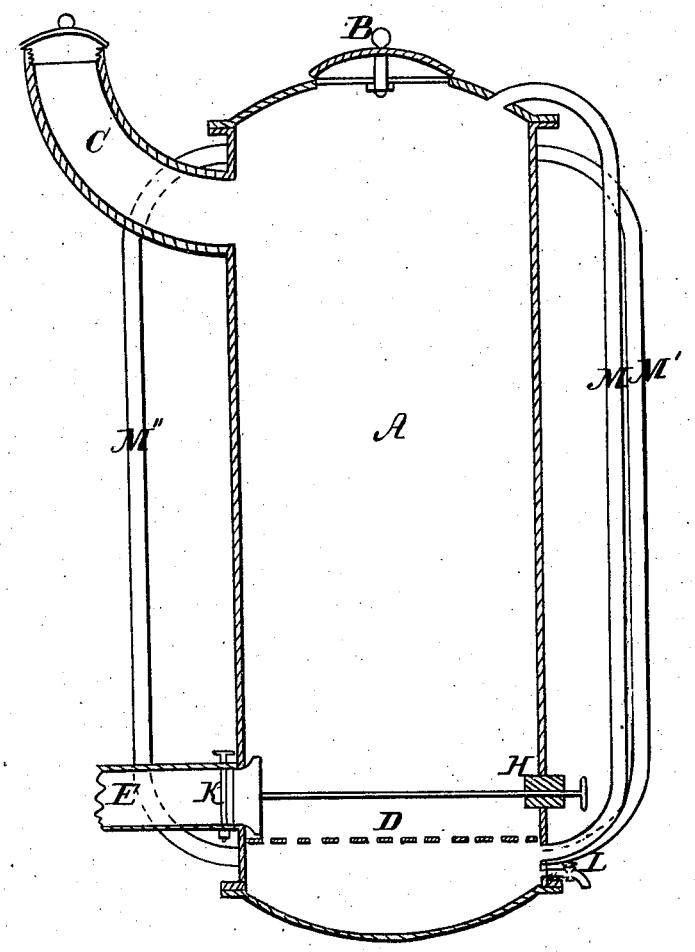
# J. W. Dixon.

## Pulp Digester.

No. 52,544. Patented Feb. 13, 1866.




Witnesses;
F. E. Shaw
Geo. Buckley

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# UNITED STATES PATENT OFFICE.

JOHN W. DIXON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN APPARATUS FOR MAKING PAPER-PULP.

Specification forming part of Letters Patent No. **52,544**, dated February 13, 1866.

*To all whom it may concern:*

Be it known that I, JOHN W. DIXON, of the city of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Making Paper-Pulp; and I do hereby declare the following to be a full and exact description of the same, reference being had to the annexed drawing, making a part of this specification, which represents a vertical section of my improved apparatus.

My improvement has for its object the digesting wood, straw, and other vegetable fibrous material for making paper-pulp, and may be also used for boiling rags or bleaching or preparing flax or similar matters.

A is a strong close boiler capable of resisting considerable pressure, and intended for a digester. It is provided with a man-hole, B, at the top, and also with a side tube or arm, *c*.

D is a perforated diaphragm placed near the bottom.

E is a tube passing off laterally above the perforated diaphragm, having either a plug-cock, F, inside, worked by a rod and screw, H, passing through a stuffing-box opposite, or a slide-valve, K, or other convenient valve arrangement.

L is a draw-off cock.

A series of circulating-tubes, M M′ M″ M‴, extend from below the diaphragm D to the upper part of the digester. The heat is to be applied to the bottom of the digester from a fire, so as to strike against the tubes M M′ M″ M‴, and thus establish a circulation of the digesting-liquor from below the diaphragm D, through M M′ M″ M‴, to the top of the material. The arrangement of the diaphragm D and lateral pulp-passage E may be used in connection with a circulating pump and tube extending from below D to the top of the digester, such as described by me in another application for a patent, and a steam-heating coil may be placed below D, if desired.

If it be desired to renew fresh water or fresh digesting-liquor while the digesting operation is progressing, it can be effected by having an auxiliary injection-pump or injector placed on the digester A and operated to force in fresh water or digesting-liquid, while the draw-off cock is opened to permit a corresponding escape of refuse liquid in the manner described by me in a former patent.

The operation is as follows: The man-hole being closed, the material and digesting-liquor, either water or alkaline or other solution, are to be fed in through the arm C, which is then closed by a tight-fitting cover. After the material has been pulped or digested it is drawn off through the tube E. The tube C may be extended above the level of the top of the boiler A to insure the boiler being kept full or nearly full of liquor. With this arrangement no upper perforated diaphragm is required, although it may be used, in which case it should be placed above the point at which the arm C branches from the main boiler.

Having thus described my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the digester A, the perforated diaphragm D, and the lateral pulp-passage E, arranged and operating as described.

2. The combination of the digester A and circulating-tubes M M′ M″ M‴, extending from the lower to the upper part of the digester, for causing a circulation of the digesting-liquor by the effect of the heat on these tubes.

3. The combination of the digester A, the tube C, and the lateral pulp-passage E, arranged and operating as described.

JOHN W. DIXON.

Witnesses:
J. E. SHAW,
GEO. BUCKLEY.