

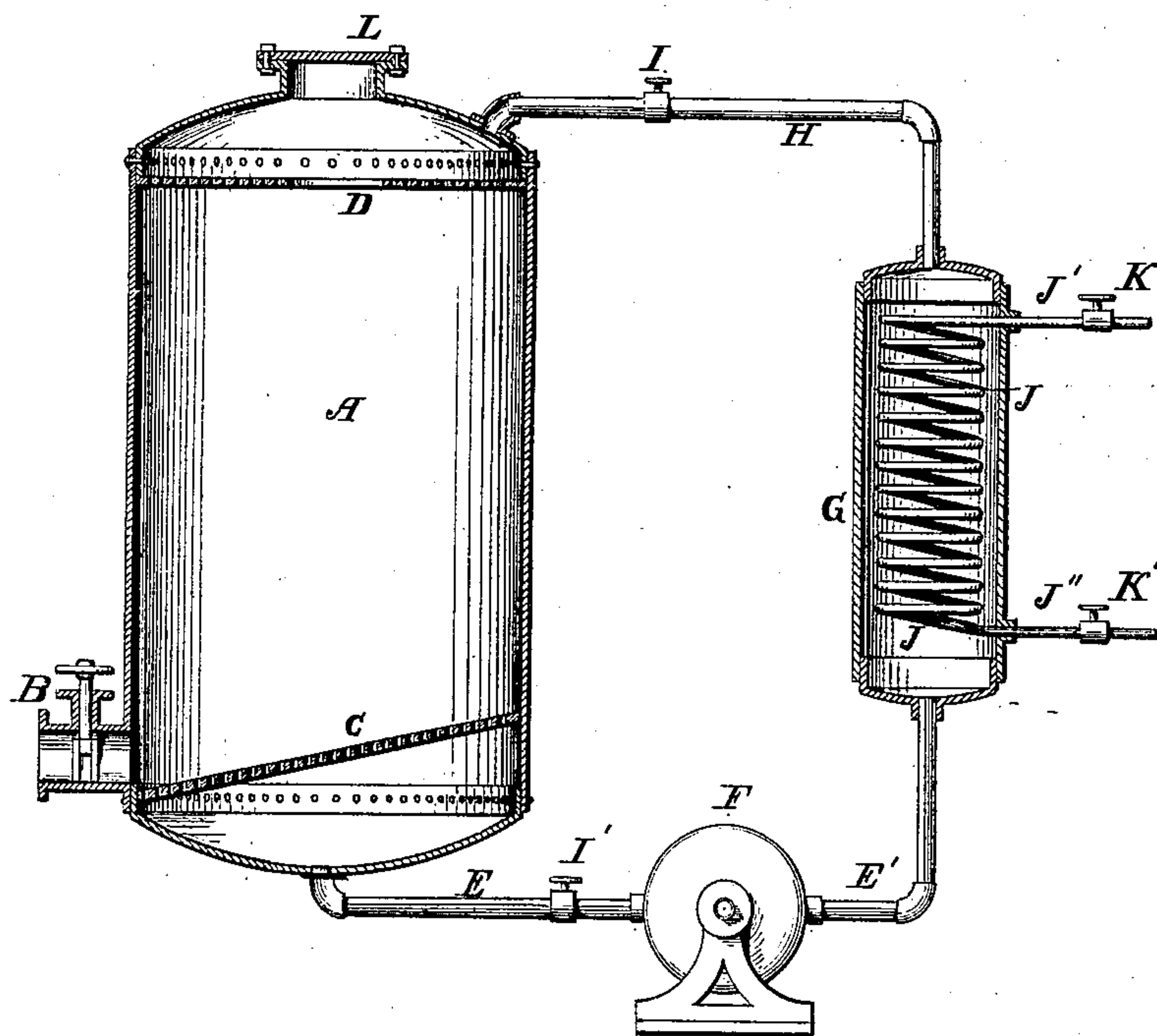
(No Model.)

J. W. DIXON.

APPARATUS FOR THE REDUCTION OF PAPER PULP.

No. 276,163.

Patented Apr. 24, 1883.



WITNESSES:

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APPARATUS FOR THE REDUCTION OF PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 276,163, dated April 24, 1883.

Application filed November 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. DIXON, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Apparatus for the Reduction of Paper-Pulp from Wood, Straw, and other Vegetable Fiber, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part hereof.

My invention consists of a digester for reducing fiber to paper-pulp, a supplemental chamber connected with the same by means of pipes, a pump located upon the said pipes for circulating the alkaline liquor from the bottom of the digester through said pipes and supplemental chamber back to the interior upper part of said digester, and a steam-coil or steam chamber or chambers within said supplemental chamber to heat the alkaline liquor in the course of its passage back to the digester.

I will describe the construction and operation of my device.

The drawing represents a vertical longitudinal section of an upright paper-pulp digester, the supplemental chamber, the pipes connecting the latter with the digester, the fan or other pump for circulating the liquor, suitable cocks for checking the flow of the alkaline liquor, and a steam-coil or spiral chamber within the supplemental chamber, to heat the alkaline liquor in its passage through the latter.

A is a closed pulp-digester, in which the pulp is "cooked" under pressure; B, a sliding valve for discharging the contents of the same; C, a perforated diaphragm to sustain the vegetable matter or pulp, and yet allow a free circulation of the liquor through it; D, an upper perforated diaphragm for spreading the alkaline liquor over the pulp as said liquor enters the top of the digester in the course of circulation.

E is a pipe leading from the bottom of the digester A to the fan or other pump, F.

E' is a pipe leading from the pump F to the bottom of the supplemental chamber G.

H is a pipe leading from the top of the supplemental chamber G back to the digester A.

I I' are suitable cocks for regulating the flow of the alkaline liquor.

J is a steam-coil of pipe passing from a steam-generator or boiler into the supplemental chamber G, to heat the contents of the latter in their passage through it. The steam enters at the point J', and has its exit, together with any condensation that may occur, at the point denominated J''.

K K' are cocks or valves to regulate the flow of steam. The end J' of the coil J is connected directly with the steam-space of a boiler or generator. The end J' is also connected with the steam boiler or generator by means of a pump or ordinary trap, through which the waste or condensed steam is conducted back to the said boiler. Instead of steam, hot water may be used in the coil J. The ends J J' in such case may be connected with a coil or chamber or chambers, which latter may be heated by direct fire heat, the water being driven through these chambers and coil J by means of a pump, whereby the circulation of the hot water may be maintained through the coil J and through the coil or chambers heated by the fire, to thoroughly and continuously heat the contents of supplemental chamber G.

The coil J may be substituted by or supplemented with a series of steam-conduit chambers or a single chamber, as I consider the coil J to be a continuous spiral chamber and the substitutes which I have mentioned to be equivalents of such chamber or chambers.

The operation is as follows: The digester A is first filled with wood or other vegetable fibrous material through the man-hole L, the cock I' being closed. The alkaline liquor is then pumped into the digester through the man-hole L, in the proportion of about eighteen hundred gallons, of a strength of about 6° Baumé, to two cords of wood. The man-hole L is then closed, the cocks I and I' are opened, and the pump F is started. This circulates the liquor, (by a pump, F,) through pipe E', supplemental chamber G, pipe H, digester A, and pipe E, back to the pump again, and so on continuously during the operation of cooking. In the meantime, at the beginning of the operation of pumping or circulating, the cocks or valves E E' are open, and steam or hot water, as above described, entering at the point J', is continuously circulated through the coil or spiral chamber J, whereby the contents in

passage through the chamber G are heated. The continuous circulation of the alkaline liquor through the digester A and its contents is maintained throughout the operation of
5 pulping by means of the pump F, and the continuous circulation of the steam or hot water through the coil J is also continuously maintained by the means already described.

I am well aware of the Letters Patent No.
10 168,382, formerly granted to myself, together with the other United States Letters Patent granted to me during the period elapsing from 1864 to the present time, for various processes and apparatus for reducing wood and other
15 vegetable fiber to paper-pulp; but I do not claim any of these in this above-described invention; but

What I claim as new is—

The combination of the digester A, adapted

for the reduction of vegetable fiber to paper- 20 pulp, supplemental heating-chamber G, connected with said digester by suitable pipes, E, E', and H, pump F, located upon one of these pipes, to circulate the liquor from the bottom of the digester through the supplemental heat- 25 ing-chamber to the top of the digester again, and a heating coil or chamber, J, within said supplemental chamber G, said chamber J being adapted for the passage of steam or hot water through it, whereby the alkaline liquor 30 in course of circulation through chamber G may be heated, substantially as and for the purpose described.

JOHN W. DIXON.

Witnesses:

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