J. W. Dixon.

Making Paper Pulp.

No. 51,433. Patented Dec. 12, 1865.

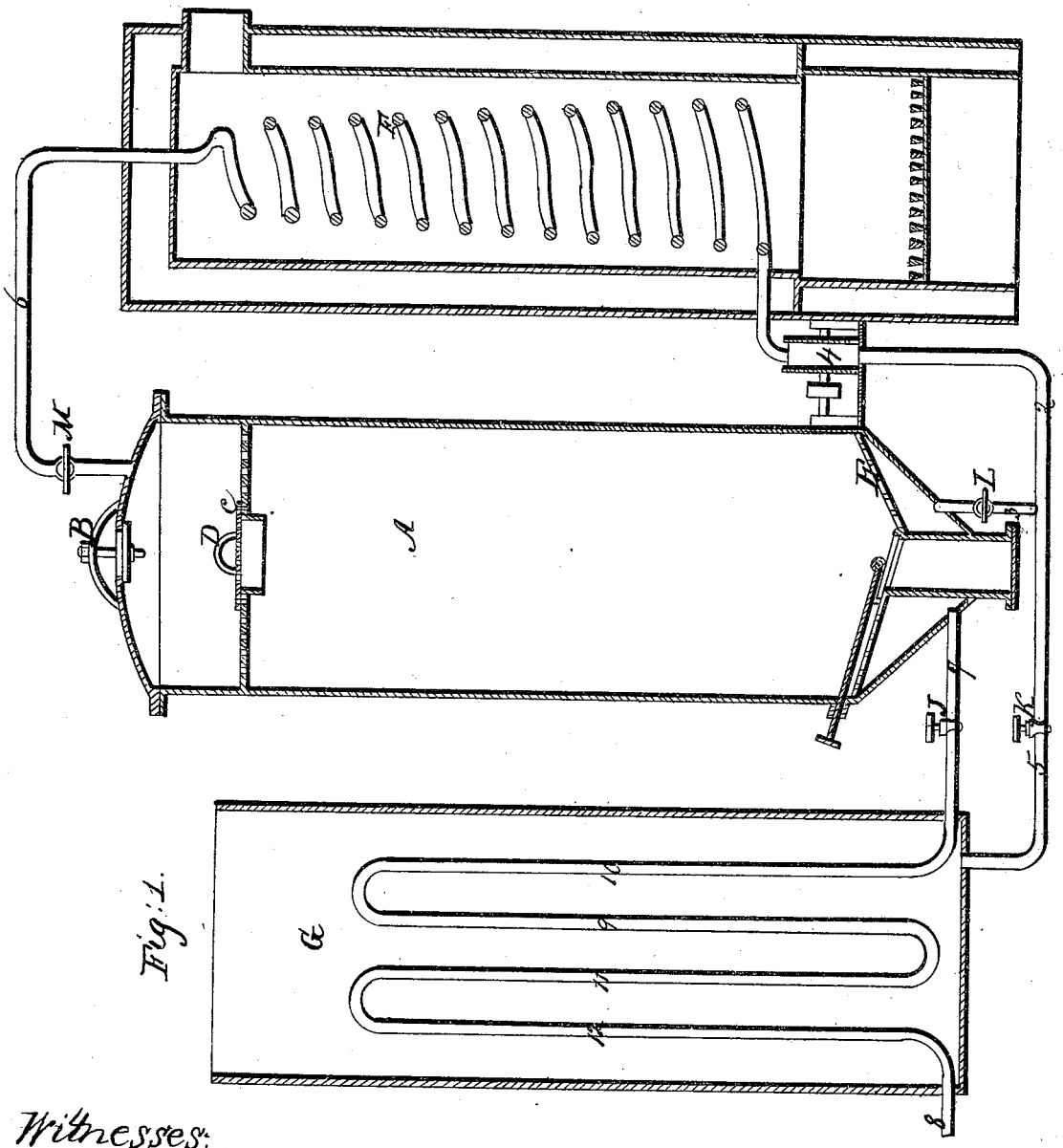

Fig. 1.

Witnesses:

George Ockshaffer

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UNITED STATES PATENT OFFICE.

JOHN W. DIXON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED PROCESS FOR MAKING PAPER-PULP.

Specification forming part of Letters Patent No. **51,433**, dated December 12, 1865.

To all whom it may concern:

Be it known that I, JOHN W. DIXON, of the city of Philadelphia, State of Pennsylvania, have invented a new and useful Process of Making Paper-Pulp from Wood, Straw, and Vegetable Fibrous Materials; and I do hereby declare the following to be a full and exact description of the same.

My process consists in treating straw, wood, or other vegetable fibrous materials by highly-heated water in a liquid state under pressure forced by a pump to pass into and through the vegetable matter to be pulped, as a process or preparatory process for making paper-pulp; and also in forcing into the digester at intervals fresh water, highly heated and under pressure, for the purpose of more effectually acting upon and dissolving the glutinous and other matters contained in the vegetable matters usually used for making pulp, by means of a pump; and I now proceed to describe the same, reference being had to the annexed drawing, which represents, by way of illustration, one convenient form of carrying on my process.

A represents the pulp-digester, which is a boiler made of strong iron, (capable of resisting a pressure of from one hundred to three hundred pounds,) say four feet diameter and twelve feet high. It is furnished with a man-hole cover, B, and a perforated diaphragm, C, a central removable cover, D, and a lower perforated diaphragm, E, with a sliding valve, as described fully in a former application for patent made by me.

F is a conical coil built in a furnace, and connecting at its lower extremity with the lower part of the pulp-digester A by means of the tubes 1, 2, and 3. At 4 a rotary pump is placed in the course of this tube. The upper part of the coil F is connected by the tube 6 with the interior of the digester A at its top.

G is an iron or wooden tank—say four feet diameter and ten or twelve feet high—open or closed. The tube 7 passes from the lower part of the digester A through the walls of the tank G, and thence coils up and down a number of times in that tank, and passes out through the wall of the tank at 8. The interior of the tank is connected by the tube 4 with the tube 2 and the pump.

The operation of this apparatus is as follows: The digester A is to be filled with the vegetable fibrous matter to be pulped through the man-hole B. The cocks J and K are closed and the cocks L and M opened. A fire is made under the coil F and the digester and coil filled with fresh water. Fire is then applied under the coil F and maintained until the desired pressure—say from eighty pounds to two hundred and fifty or three hundred pounds—is obtained, according to the nature of the substance to be acted upon. The pump 4 is then started and made to circulate the highly-heated water from the bottom of the digester through the heating-coil F into the top. After this liquid has circulated some time the cock L is to be closed and the cock J is opened. Thus the liquid will pass through the coil of pipe 9, 10, 11, and 12 and escape at 8. The tank is filled with fresh water, which is heated by the liquid passing through the coil. The cock K being opened, the water thus heated in the tank passes on through the tubes 5 and 2, the pump 4, and the coil F into the top of the digester A. By this means the water filled with gummy and other matters can be freely removed and its temperature imparted to a fresh supply of water as it passes out. After the contents of the boiler A have been thus changed the cocks J and K are to be closed and the cock L opened, whereupon the circulation produced by the pump will be resumed, as at the first, from the bottom to the top, and so continued until the liquid becomes again surcharged with the gummy matter.

By this means the vegetable material can be pulped without mechanical aid in from five to twelve hours, depending on the material operated on and the pressure used.

Good results with this apparatus can be obtained with straw at one hundred and twenty-five pounds pressure, and perhaps less. With wood and other harder materials it would be preferable to use a higher temperature—say one hundred and fifty to three hundred pounds—although wood can be pulped to a considerable extent at 125° Baumé, and lower, by prolonging the time.

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

The process of treating wood, straw, and similar vegetable substances by forcing highly-heated water under pressure to circulate continuously through the mass to be pulped by means of a pump, as a process or preparatory process for making paper-pulp, substantially as described.

Witnesses: JOHN W. DIXON.

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