

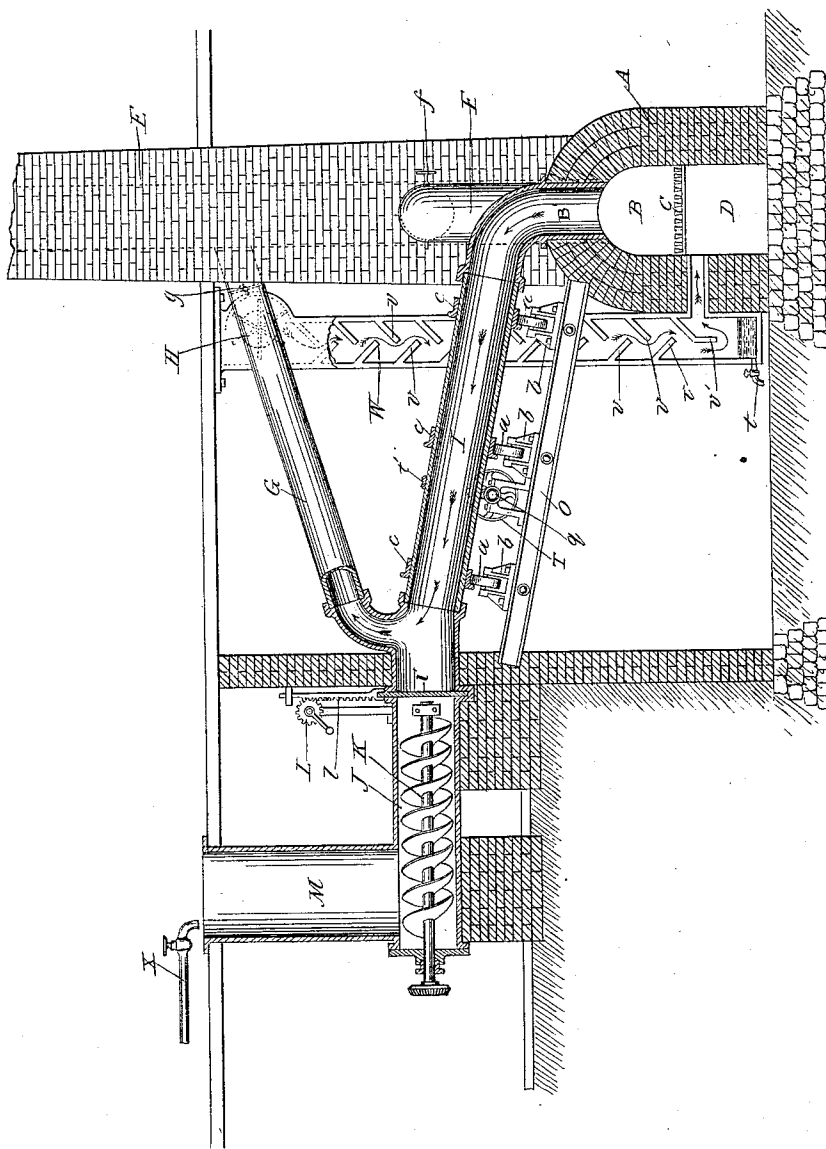
(No Model.)

P. HOGAN.

PROCESS OF AND APPARATUS FOR RECOVERING ALKALI.

No. 366,956.

Patented July 19, 1887.



Witnesses:
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UNITED STATES PATENT OFFICE.

PETER HOGAN, OF BALLSTON, NEW YORK.

PROCESS OF AND APPARATUS FOR RECOVERING ALKALI.

SPECIFICATION forming part of Letters Patent No. 356,956, dated July 19, 1887.

Application filed July 15, 1886. Serial No. 208,165. (No model.)

To all whom it may concern:

Be it known that I, PETER HOGAN, a citizen of the United States, residing at Ballston, in the county of Saratoga and State of New York, have invented a new and useful Process of and Apparatus for Recovering the By-Products of Spent Liquor, of which the following is a specification.

My invention relates to a new process of and apparatus for separating the soda and other by-products of the spent liquor in the manufacture of wood pulp and other materials and rendering the same capable of being utilized; and the object of my invention is to provide a new and economical mode of utilizing the valuable constituents of spent liquor from the manufacture of wood pulp or other source, when such liquor contains soda and other by-products. I attain these objects by the mechanism and by the process illustrated in the accompanying drawing, which shows the compartments, pipes, and machinery in and by which the liquor is treated in accordance with my process as arranged in a suitable building.

The vertical cylinder M opens into the horizontal cylinder J. In the horizontal cylinder J is arranged a propeller, K, journaled in the cylinder-head and operated by suitable gearing. The end of the horizontal cylinder J, opposite the end where the propeller is journaled, is closed by a valve, *l*, which may be raised or lowered by means of the rack and pinion L and *l*.

I place dry peat or other porous material into the vertical cylinder M, and then let the spent liquor run into the vertical cylinder M upon the peat from the pipe X. The dry porous material absorbs the liquor and becomes saturated with it. I then stop the flow of the liquor and force the saturated peat into the end of the cylinder J nearest the valve *l*, by means of the propeller K, and then place more peat into cylinder M and cause it to absorb liquor from the pipe X. I then raise the valve *l* and operate the propeller K, which forces the saturated peat into the revolving cylinder I. The cylinder I is caused to revolve slowly by means of a worm-gearing, *g g'*, and rests on trunnions *a a a*.

The revolving cylinder I is open at each end and communicates with the furnace B by means of the tube or pipe B'. The hot air from the

furnace B is thus made to pass through the revolving cylinder I, where it comes in contact with the saturated peat and the mass is dried. The peat containing by-products of the liquor drops from the revolving cylinder I into the furnace B, where combustion is maintained, and the ash containing the by-products of the spent liquor is recovered in the chamber D under the grate C.

The vapor from the drying peat in the revolving cylinder I passes into the tube G, and from thence into the chimney, or it may be forced into the condensing-flue by means of the fan-blower H. The condensing-flue W is provided with a convoluted tube, into which the vapor is received and through which it passes, and around this convoluted tube, is placed water, which cools the tube, and the various convolutions *v v v* allow the vapor to come into contact with the cool surface of the tube at a great many points, and thus condensation is readily obtained. The condensing-flue opens just beneath the grate C of the furnace into the ash-chamber D, where any carbon or other ingredient remaining is burned, and the draft aids the combustion in the furnace. The water generated by condensation is collected at the bottom of the flue and is drawn off by the cock *t*. This process, as well as the apparatus by which it is accomplished, is simple and inexpensive.

It is proposed to utilize by my process not only the spent liquor which is usually wasted at factories, but also peat, which is a very porous carbonaceous substance, and which is found in large quantities in various parts of our land, peat being peculiarly adapted for the purpose to which I put it in my process, because it contains so much carbon and is so porous.

The method now in use for recovering the by-products from spent liquor is to place the liquor in evaporating-pans and put the fire under a stack containing several layers of pans, the fire burning around and in the pans causing a most abominable stench and a great loss of fuel.

By my process the atmosphere is not contaminated, all the impurities being destroyed, and the minimum amount of fuel is required and all of the by-products recovered.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of recovering the by-product of spent liquor by saturating dry peat with the same, inclosing the saturated mass in a slowly-revolving cylinder, subjecting the saturated
5 peat to heat obtained from a furnace, the vapor arising being carried directly from the revolving cylinder by a tube to a fan-blower and forced into a convoluted condensing-flue, where the vapor is condensed and all obnoxious odor
10 removed, all substantially as described, and for the purpose set forth.

2. In an apparatus for recovering the by-products of spent liquor, the combination of the vertical cylinder M, having a pipe, X, opening
15 into it at or near its upper end and opening into the cylinder J at its lower end, the pro-

peller K, contained in said cylinder J, and the valve V, separating the cylinder J from the revolving cylinder I, all substantially as described, and for the purpose set forth. 20

3. In an apparatus for recovering the by-products of spent liquor, the combination of the revolving cylinder I, opening at one end into the furnace B and at the other end into the tube G, the fan-blower H, and the convo-
25 luted condensing-flue W, all substantially as described, and for the purpose set forth.

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Witnesses:

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