

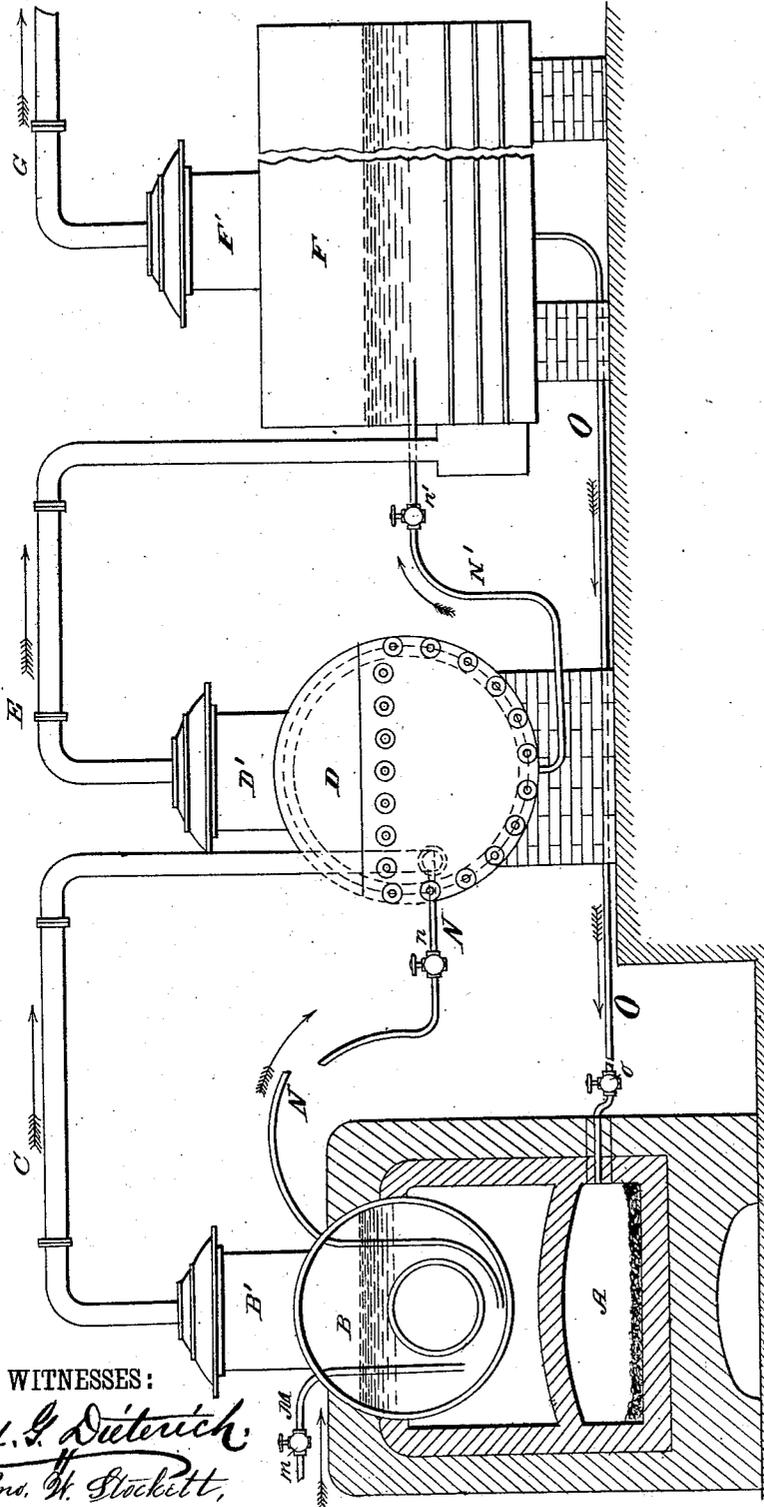
(No Model.)

H. C. F. STÖRMER.

APPARATUS FOR THE RECOVERY OF SODA.

No. 266,915.

Patented Oct. 31, 1882.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRIK C. F. STÖRMER, OF PARIS, FRANCE.

APPARATUS FOR THE RECOVERY OF SODA.

SPECIFICATION forming part of Letters Patent No. 266,915, dated October 31, 1882.

Application filed March 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRIK C. F. STÖRMER, a citizen of the Kingdom of Norway, residing at the city of Paris, in the Department of Seine and Republic of France, have invented certain new and useful Improvements in Apparatus for Recovering the Soda and other Lyes Used in the Manufacture of Wood and Straw Pulp; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

In treating wood fiber, straw, corn-husks, Spanish grass, and other materials capable of forming pulps for the manufacture of paper, soda or potash is used, in a manner well known, to make the pulp of homogeneous consistency, the lye being afterward washed out and drawn off from the mass of pulp, as it would operate to deteriorate the quality of paper or board made from the pulp. The object of my invention is to recover the soda or potash used in the lye in a calcined state, so that it may be used over and over again in the treatment of successive batches of pulp, thus effecting a great saving in the manufacture of the pulp by reducing the actual loss or waste of lye to a minimum.

In the accompanying drawing, which represents an elevation of the complete apparatus, B denotes a boiler, which may be of any desired construction or shape, and is heated by a reverberatory furnace, A, of suitable construction.

B' is the steam dome or drum, from which a steam-pipe, C, leads to a second boiler, D, which has likewise a steam-dome, D', from which a steam-pipe, E, leads to a third boiler, F, having a steam-dome, F'. A fourth and fifth boiler may be used, if desired; but, as a rule, a series of three boilers, only the first one of which is set over a furnace, will be found sufficient.

The "black lye," as it is called, which has been washed from the pulp, and contains particles of wood, straw, or other pulp fiber in a finely comminuted state, is fed to the boiler

B through a pipe, M, the flow being regulated by a faucet or stop-valve, *m*. In this boiler the water contained in the lye is partly evaporated, and passes as steam through pipe C into the second boiler, D, the concentrated lye entering the same boiler through pipe N, which has a valve, *n*. In boiler D the lye is further concentrated by further evaporation by the heat of the steam in the boiler, the volume of steam passing through pipe E into the third boiler, F, in the series, while the concentrated lye enters boiler F through the pipe N', which is provided with valve *n'*. Here further concentration of the lye takes place, the steam engendered in this boiler, as well as the heating-steam carried into it from boilers B and D, finally escaping through the outlet or blow-off pipe G. From this boiler, in which the lye has assumed a highly-concentrated state, containing a minimum of water, it is carried by a pipe, O, back into the reverberatory furnace A, where the impurities contained in the lye are reduced to ashes, while the soda or potash is calcined by the heat and ready for use, after cooling, in the treatment of another batch of pulp.

By the combination and arrangement of a series of boilers or evaporators in the manner herein described I avoid a high pressure in any one of the boilers, besides utilizing the heat of the steam of evaporation to its fullest extent, the steam, as it escapes from the last boiler in the series, being comparatively "cold" or dead steam. The concentration of the lye takes place successively and by degrees, avoiding incrustation of the boilers or pipes, while the reverberatory furnace A serves the double purpose of raising steam from the black lye in the initial boiler B and calcining the soda in the highly-concentrated lye fed to it through pipe O.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

The herein-described apparatus for recovering soda and other lyes used in the manufacture of wood pulp, straw pulp, and other fiber pulps for paper-manufacture, the same consisting of a set or series of boilers, B D F, connected by steam-pipes C and E, and having

escape-pipe G, in combination with the reverberatory furnace A, feed-pipe M, connecting-pipes N and N', and pipe O, for returning the concentrated lye from the last boiler in the series to the reverberatory furnace under the first, substantially as and for the purpose herein shown and set forth.

In testimony whereof I have hereto affixed my signature in presence of two witnesses.

HENRIK CHRISTIAN FREDRIK STÖRMER.

Witnesses:

L. GUDMAN,
ROBT. M. HOOPER.