





# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN BOILERS FOR PREPARATION OF PAPER-STOCK FROM WOOD.

Specification forming part of Letters Patent No. 117,427, dated July 25, 1871.

*To all whom it may concern:*

Be it known that I, MORRIS L. KEEN, of Jersey City, State of New Jersey, have invented a certain new and Improved Boiler for the Preparation of Paper-Stock from Wood, Straw, Cane, and other materials adapted for that use.

The boiler is made strong and capable of being worked at any desirable pressure to accomplish the object of thorough cooking or disintegration, and may be termed an upright rotary boiler revolving on its short axis, end over end.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawing forms a part of this specification, and represents a longitudinal section. Referring thereto, A is the general interior of boiler; B, a bowl-screen or perforated false internal bottom, fitted securely inside of one end of boiler, and forms a draining-screen when the boiler is in a vertical position. C is a ring of pipe, perforated with small holes, and forms a shower-pipe inside the upper end of boiler, or man-hole end, when the boiler is set in vertical position. Said shower-pipe is secured to inside of boiler by T-outlets, communicating through the bends R to pipes D<sup>1</sup> and D<sup>2</sup>, and passages M<sup>1</sup> and M<sup>2</sup> through the trunnions K<sup>1</sup> and K<sup>2</sup>. E<sup>1</sup> and E<sup>2</sup> are screw-valves commanding the communication through the pipes D<sup>1</sup> and D<sup>2</sup>. F is the man-hole bonnet or man-head of boiler. G<sup>1</sup> and G<sup>2</sup> are stationary inlet and outlet-pipes connected steam-tight to the stuffing-boxes L<sup>1</sup> and L<sup>2</sup> in the trunnions. H<sup>1</sup> and H<sup>2</sup> are pipes connecting between passage-ways M<sup>1</sup> and M<sup>2</sup> and the lower end, or that end of the boiler opposite to the man-head F. They are connected by bends R and R, and communicate with the space S under the false bottom E. I<sup>1</sup> and I<sup>2</sup> are valves in pipes H<sup>1</sup> and H<sup>2</sup>. J is a large blow-off or pulp-discharge valve connecting with inside of boiler through the short pipe T, which forms a passage through both the outside shell of boiler and the screen B. N is a large gear-wheel fixed on one trunnion, to which power is communicated by pinion O to revolve the boiler A. P is a pulley on counter-shaft Q, driven by any convenient power, not represented.

The boiler A is charged with materials for paper-stock, and is treated with steam, water, or

liquid chemicals, gases or air admitted to or forced in the boiler through the trunnion-passages by pipes G<sup>1</sup> and G<sup>2</sup>, leading thereto, and the pipes D<sup>1</sup> and D<sup>2</sup>, and H<sup>1</sup> and H<sup>2</sup>, separately or together. This may be done either while the boiler is revolving or standing still. It will be seen by the arrangement of pipes and valves that the stock can be subjected to treatment through shower-pipe, while the boiler is in a vertical position, through the trunnion K<sup>2</sup>, by opening the valve E<sup>2</sup> communicating with the shower-pipe, while the bottom valve I<sup>1</sup> is opened to passage through the opposite trunnion K<sup>1</sup>, and the waste liquids or washing discharged through it. By the arrangement of pipes and valves a great variety of manipulations of stock can be practiced, either in the upright or revolving condition of the boiler. The boiler can be discharged under pressure while in a vertical position by opening the large valve J, communicating with inside of boiler; or the steam can be blown out through the shower-pipe C, valve E<sup>1</sup>, pipe D<sup>1</sup>, trunnion K<sup>1</sup>, and outlet-pipe G<sup>1</sup>, after which the man-head F may be opened and the contents discharged while the boiler is reversed. The discharge-pipe leading, as shown, from the extreme bottom of the concave or dish-like perforated basin or strainer B, allows me to discharge the pulp completely and rapidly, by the force of the steam, when desired. The double connection D<sup>1</sup> D<sup>2</sup> H<sup>1</sup> H<sup>2</sup> allows the current to be reversed momentarily at intervals to clear the strainer. The elongated form of my boiler induces a marked difference in the effect as distinguished from a spherical boiler similarly revolved. When, as usual, the boiler is only partly filled the contents tumble, gather together, and tumble again, while in a spherical boiler there is no possible tumbling, but only a rubbing around on the spherical-recessed interior. The annular form and arrangement of the sprinkler C, extending in a ring around the seat of the man-head F, keeps it out of the way of the ready access, which is so highly important, through the man-head, and yet gives an effectual distribution of the water equally on all sides of the man-hole and over the whole mass of the pulp.

I claim as my invention—

1. The elongated boiler A, capable of being revolved on its short axis, and provided with the double set of connections D<sup>1</sup> D<sup>2</sup> H<sup>1</sup> H<sup>2</sup>, and the

proper controlling means for admitting and discharging fluids through the trunnions in the manner specified.

2. In such boiler so operated, the annular sprinkler C arranged as shown relative to the man-head F.

3. In such boiler so operated, the drain-pipe or discharge-pipe T and its controlling means, when the same leads out in line with the long axis of

the boiler from the concave interior surface of the strainer B, as specified.

In testimony whereof I have hereunto set my name in the presence of two subscribing witnesses.

MORRIS L. KEEN.

Witnesses:

C. C. LIVINGS,  
A. HOERMANN.