R. Deering Sr. Sheet 1. 2 Sheets.

Pulp Digester.

No. 4,093. Patented Jun. 25, 1845.

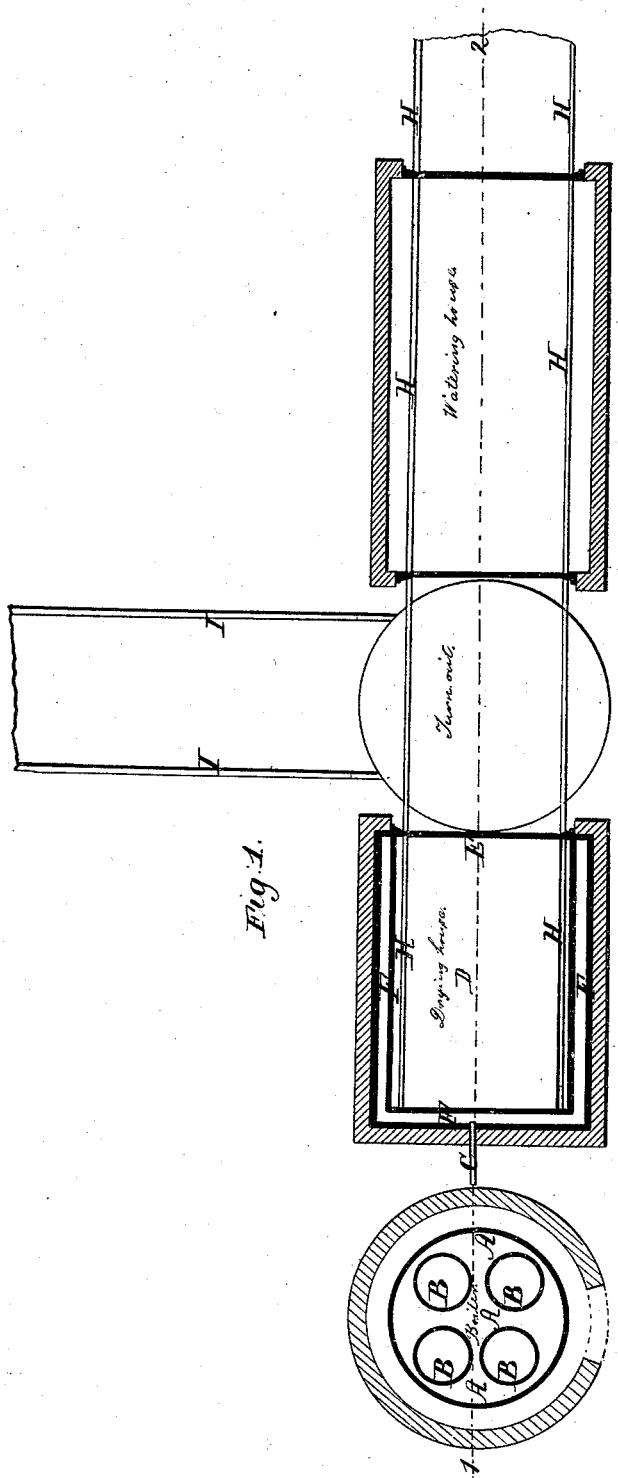

Fig. 1.

R. Deering, Sr. Sheet 2. 2 Sheets.

Pulp Digester.

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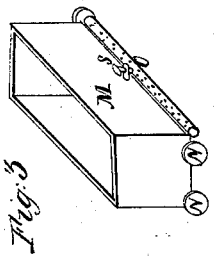

Fig. 3

Fig. 2.

UNITED STATES PATENT OFFICE.

RICHARD DEERING, SR., OF LOUISVILLE, KENTUCKY.

PREPARATION OF HEMP.

Specification of Letters Patent No. 4,093, dated June 25, 1845.

To all whom it may concern:

Be it known that I, RICHARD DEERING, Sr., of the city of Louisville and State of Kentucky, have invented a new, expeditious, and economical mode of water rotting, bleaching, drying, and managing or manner of handling hemp or any similar fibrous substance preparatory to bringing it to the machine for breaking and cleaning it and also for preparing the fiber of hemp, &c., by heat or steam after it has been separated from the boon in its unrotted condition; and I, the said RICHARD DEERING, Sr., do declare the nature of my said invention consists in the construction and arrangement of suitable houses, cars, boiler, and furnace and other necessary apparatus, by the proper management of which the great labor, irregularity, and uncertainty of the present modes of dew and water rotting will be almost entirely overcome, the preparation be greatly expedited, and the equality of the fiber greatly improved.

My invention is particularly described by the following description thereof, reference being had to the drawing hereunto annexed.

Figure 1 is a ground plan, shows the boiler above the grate; and a horizontal section of the drying and watering houses, &c., at the surface of the ground. Fig. 2 is a longitudinal section at the line 1, 2. Fig. 3 is a perspective view of the cistern, &c.

The steam boiler marked A is for generating heat; it may be about 20 feet high and three and a half feet diameter, having four cylindrical flues B, B, B, B, within the boiler, and attached to it in the same manner as the flues of the common horizontal cylindrical boilers. The boiler is set perpendicularly on one end; the lower half of the boiler and flues are to be boiler iron, and the upper half of cast iron. Gage cocks marked P, to indicate the quantity of water are fixed about the middle of the boiler, say at or near the point of connection of the lower and upper halves; and a suitable safety valve marked R, is also attached to the upper part of the boiler. The boiler is set in a suitable furnace, and inclosed with brick work, so as to leave a sufficient space (between the boiler and brickwork) to form a flue around the boiler, from the bottom to the top, so as to permit the fire and heat to ascend through the flue so formed, as well as through the flues formed within the boiler. The furnace and ash pit doors when shut are to exclude the atmosphere from the fire in the furnace, as much as possible; and a damper is to be fixed in the chimney above the boiler, so as to regulate the temperature of the steam in the boiler to any required degree.

A steam pipe marked C is attached to the top of the boiler, and conveys the steam under the floor of the drying house, in which the hemp is to be prepared. This drying house marked D, is to be made of either cast or wrought iron plates forming a double floor, walls, and covering of iron plates, with a hollow space F, between, and put together so as to be steam tight, and permit the steam to come in contact with and surround the house (except at one end E, which is left open, and fitted with large double doors, so as to be closely shut up, or opened at pleasure). This iron house is to be inclosed (except at the end where the doors are) with some nonconducting material.

The house for watering the hemp, marked G, is near to, but not connected with, the drying house; the outer ends of the watering house are also open, and fitted with large doors, so as to be opened and shut at pleasure. Both the watering and drying houses may be of such dimensions as will be found most convenient; and the heating apparatus is to be so managed by the dampers, &c., as to keep the drying house heated to a temperature of three hundred degrees, or more if required, while the temperature of the watering house (which is to be heated by a steam pipe from the boiler,) may be only one hundred degrees, or less if necessary.

A railway track H, H, H, is laid through the drying and watering houses, and extends outside of the houses, to where the hemp is to be put on the cars. Connected with tis track is a turnout and branch railway *l*, *l*, *l*, to bring the cars with the prepared hemp, from the drying house to the hemp brake. A suitable number of cars, to be filled with unrotted hemp, are placed on the railway. The hemp is set up closely and nearly perpendicularly in the cars; and by suitable standards J, J, J, J, and cross pieces K, K, K, K (that can be slipped in and out at pleasure) the hemp is kept in an upright position. The cars thus loaded, are then run into the houses, to be subjected to the process or rotting, &c.

Within the watering house (and at a suitable height above the cars containing the

hemp,) a railway track L, L, is constructed; extending from one end to the other; throughout the whole length of the house. A suitable car N, N, with a cistern M, for containing water; (or the liquid intended for bleaching) is placed on this upper railway. A perforated pipe O, connected with or attached to the bottom of the cistern, is so arranged with a valve or stop cock as to be supplied with water from the cistern, at pleasure. The car N, and cistern M, are moved backward, and forward, on the railway, by power from an engine, and the water to supply the cistern is pumped up by the same power. When the cars are moved along the railway the valve or cock S is opened and the water passes from the cistern through the perforated tube; and is sprinkled on the hemp in the cars below; and by a repetition of the sprinkling; the hemp may be moistened to any degree that may be necessary. The number of cars are to be sufficient (and they are to be so managed) that one or more car loads per day shall have been subjected to this watering process a sufficient length of time to be properly rotted and prepared so as to be run into the dry house. The succeeding cars are then moved forward; and another car load of unrotted hemp is run into the watering house. If unbroken hemp is to be prepared by heat (without rotting) it should be placed on the cars in the manner above described; and kept in the dry house for such periods of time as may be necessary for its preparation. And to prepare unrotted hemp, that has been previously broke, and cleaned; it should be suspended in a loose manner, on cords, or strips, attached to the upright standards of the cars; and kept in the drying house, until it is properly seasoned and prepared, which seasoning is effected in a very short time; when the temperature of the drying house exceeds, one hundred and sixty degrees.

If steam is to be employed for rotting the hemp the steam from the boiler is admitted through the floor of the drying house, and ascends or passes up among the hemp through a sufficient number of small holes perforated in the bottoms of the cars.

The drying house and apparatus when used for preparing unbroken hemp by a bleaching process is designed to be constructed in the same manner as above described;—except in the following particulars viz. The floor is to be inclined so as to collect the water (after it has passed the hemp) into a reservoir in one corner of the house; from which it is pumped again into the cistern above; and so passed again, and again; through the hemp as many times as may be necessary.

The temperature of the house is to be regulated by the furnace, as may be required; and a suitable preparation composed of water; and bleaching ingredients; such as chlorin, lime, ashes, salt, &c., in proper proportions is to be used for bleaching; and rotting the hemp.

What I claim and desire to secure by Letters Patent is—

1. The arrangement and combination of the furnace and boiler; or other similar heating apparatus; with the drying and watering houses, railways, and watering apparatus, as above described.

2. I also claim as new, and as my invention; the peculiar construction of the watering house; and the mode of managing the hemp by putting in an upright position on railroad cars, and subjecting it to the process of preparation (either in watering houses; or in pools of water) and while on the cars; and in an upright position.

I do not claim to be the discoverer of the mode of preparing unrotted hemp by the heating process; this is claimed by Mr. James Anderson, of Louisville, Ky., and I have referred to this method of preparation; in the manner above described with his permission.

RICHD. DEERING, SEN.

Witnesses:
CLEMT. T. COOTE,
E. G. SMITH.