

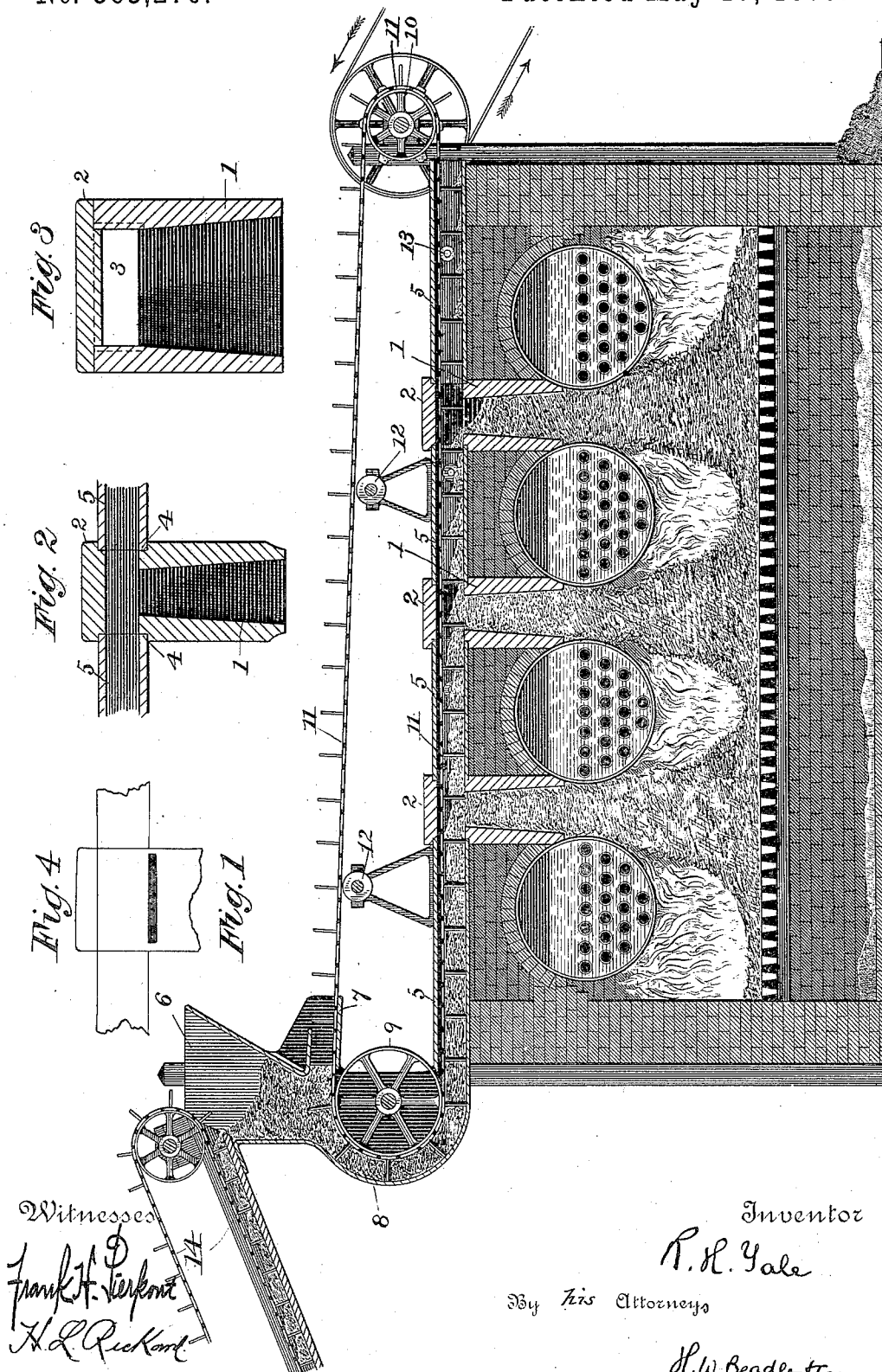
(No Model.)

R. H. YALE.

APPARATUS FOR BURNING BAGASSE OR OTHER WET MATERIAL.

No. 363,270.

Patented May 17, 1887.



UNITED STATES PATENT OFFICE.

RICHARD H. YALE, OF NEW ORLEANS, LOUISIANA.

APPARATUS FOR BURNING BAGASSE OR OTHER WET MATERIAL.

SPECIFICATION forming part of Letters Patent No. 363,270, dated May 17, 1887.

Application filed February 7, 1887. Serial No. 226,736. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. YALE, of New Orleans, parish of Orleans, and State of Louisiana, have invented new and useful
5 Improvements in an Apparatus for Burning Bagasse or other Wet Material as Fuel in Furnaces; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying
10 drawings, and to the letters of reference marked thereon.

My invention relates to the drying, distributing, automatically feeding, and burning of bagasse or other wet material as fuel in an
15 ordinary furnace; and the object of my invention is, first, to provide a means by which bagasse or other wet material can be partially dried, distributed, and automatically fed and burned in the furnaces as rapidly as it may be
20 produced, thus obtaining a large amount of heat, and at the same time keeping the refuse material from accumulating; second, to afford facilities by which bagasse can be burned in an ordinary furnace, thus obviating the necessity
25 of building an expensive bagasse-burner and an additional set of boilers, as is now the general practice; third, to provide a means by which a battery of boilers can be fired by the bagasse when the cane-mill is in operation and by coal
30 or wood when the cane-mill is not running, which renders a duplicate set of boilers unnecessary, as also avoids the trouble, expense, and deterioration attending the "letting down" of the battery every time that the mill stops, as
35 also to provide a means by which coal or wood can be easily fed and economically used in the furnace to facilitate the combustion of green or very wet bagasse or other fuel. I attain these objects by the mechanisms illustrated in the accompanying drawings, forming part of
40 this specification, in which—

Figure 1 is a longitudinal section of my improved apparatus. Fig. 2 is an enlarged longitudinal view of the mouth-piece forming
45 the opening over the top of the furnace; Fig. 3, an enlarged transverse section of the same, and Fig. 4 a side view of modified form of construction.

To enable others skilled in the art to make
50 and properly use my improved apparatus, I

will proceed to describe the construction of the same and the manner of its operation.

For convenience and clearness, the description will be given under several heads, as follows: first, the furnaces, boilers, and the
55 mouth-pieces employed in connection therewith; second, the boxes or troughs employed in connection with the mouth-pieces and the receiving-hopper; third, the endless carrier-chain by means of which the bagasse is delivered to the mouth-pieces, and, fourth, the
60 endless chain by means of which the bagasse is taken from the mill and delivered into the receiving-hopper.

First, the furnaces, boilers, and mouth-pieces.—
65 In Fig. 1 is shown an ordinary battery of boilers having furnaces of the usual construction, which boilers are preferably set about sixteen inches apart and about thirty inches from the top of the grate-bar. A partition-wall nine
70 inches thick is erected between the boilers from front bridge-wall to rear, and also cascade-walls to confine the flames and direct them against the boilers.

1 represents a mouth-piece of special construction located between the boilers, as shown
75 in Fig. 1, the lower end of each of which rests on the shell of the boiler at a point just below the water-line. These mouth-pieces are preferably made of fire-clay, and their inner walls
80 diverge from each other as they extend from top to bottom. By means of this construction the area of opening increases from the top downward, as shown in Figs. 1, 2, and 3.

2 represents a top plate, which is removably
85 secured to mouth-piece by luting or otherwise.

3 3, Fig. 3, represent openings in what may be termed, for convenience, the "longitudinal
90 sides of the mouth-pieces," which openings are adapted to permit the passage of the endless carrier-chain through the upper part of the mouth-piece, as will be hereinafter described.

4 4, Fig. 2, represent recesses formed in the
95 portion of the mouth-piece about the openings for the purpose of receiving the adjacent ends of the boxes or troughs 5.

Second, the boxes or troughs employed in connection with the mouth-pieces and the receiving- 100

hopper.—5 represents a box or trough of proper length and size, which extends from one mouth-piece to another, the adjacent ends of each being set into the corresponding recesses of the mouth-piece.

6 represents a receiving-hopper constructed, generally, in any proper manner, but preferably provided with a platform, 7, and a curved surface, 8, which is concentric with the curved surface of the sprocket-wheel 9 of the endless carrier-chain, hereinafter referred to.

Third, the endless chain by means of which the bagasse is delivered to the mouth-pieces.—9 and 10 represent sprocket-wheels located at the proper point, about which wheels the endless carrier-chain 11 turns in a manner well understood.

12 12 represent rollers by means of which the upper portion of the endless chain is properly supported in its return movement.

13 13 represent rollers or other appliances journaled in the boxes or troughs 5, by means of which the lower portion of the endless chain is properly supported in its forward movement.

Fourth, the endless chain by means of which the bagasse is taken from the mill and delivered into the receiving-hopper.—14 represents an auxiliary endless chain supported at its ends by means of sprocket-wheels located at the proper points, by means of which the bagasse delivered from the mill is taken and discharged into the receiving-hopper 6, before referred to.

The general operation is substantially as follows: The bagasse, when discharged from the mill, is taken by the endless chain 14 and discharged into the receiving-hopper 6. By the action, then, of the endless carrier-chain 11, which moves into the hopper upon the platform 7, the bagasse in the hopper is carried about the wheel 9 and delivered into the entrance-opening of the first box or trough, 5, which connects properly therewith. By the continued movement of the chain the bagasse is carried to the first mouth-piece, and is discharged thereinto until the mouth-piece is filled, and is then conveyed through the next box or trough to the next mouth-piece until that is filled, then onward in like manner until all the mouth-pieces are filled. If a greater quantity of bagasse is made than can be consumed by the furnace, the excess is delivered through the last box to the ground. By means of the diverging forms of the mouth-pieces described the clogging of the same is effectually prevented. As the fuel in the first mouth-piece burns down it is automatically filled up again, as also all the others. The wet fuel being thus allowed to remain a short time in the mouth-pieces, which are, of course, highly heated, gives the same a chance to dry out, so that as it falls down it is in a better condition to burn, and it will be seen that no green bagasse can get to the furnace without being more or less dried out, except when the apparatus is first started and the furnaces are first filling up. I would emphasize this point by

stating that when the bagasse can be thus practically dried out it burns very readily without any coal or wood to assist the combustion, and the same burns more readily than if not dried; hence it can be readily burned as fast as produced; also, the properties of the refuse materials are by this means made of value and are entirely utilized. It will thus be seen that my burner dries, automatically feeds, and distributes the bagasse or other wet fuel, and must of necessity improve the value of all refuse substances as a fuel.

Should the furnace become choked, or from want of draft or other reason the bagasse is produced in larger quantities than the furnace can economically burn, then the surplus will be pushed out of the back end of the continuous iron box outside the boilers, and when it is desired to stop the production of the wet fuel then the same boilers are fired in front with wood or coal in the usual manner. Thus it will be seen that one battery of boilers will answer to furnish steam at all times and burn the refuse material as well, instead of having a separate battery merely to burn the refuse, as is now the practice. This is an important point on account of the expenses of a separate furnace and boiler and the cost of maintaining, as also of space.

With my apparatus very wet material may be burned as fast as the combustion of the same can be easily and economically assisted by firing moderately with wood or coal from the front. Further, if the producing capacity of a plant is desired to be increased, the apparatus for burning the refuse is also increased by erecting the additional boilers alongside of those existing and extending the continuous box and endless chain carrier.

The mouth-pieces, if desired, may be provided with a slot, as shown in Fig. 4, for the purpose of introducing a plate when it is desired for any purpose to shut off the delivery of the bagasse to any given mouth-piece.

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

1. As an apparatus for burning bagasse or other wet material, the combination of the mouth-piece 1, of fire-clay or other refractory material and shaped as shown on the drawings and placed between the boilers, with the continuous iron box or trough 5 and the endless chain carrier 11, provided with blades operated by the sprocket-wheels 9 and 10 and passing over the platform 7, and through the continuous iron box 5, over the rollers 12 and 13 and hopper 6, all substantially as set forth, and for the purpose specified.

2. In an apparatus for burning bagasse or other wet refuse material, the conveyers consisting of the continuous iron box 5 and the endless chain carrier 11, provided with blades and operated by the sprocket-wheels 9 and 10 and passing over the platform 7, through the box 5, and over the rollers or other appliances 12 and 13, all substantially as described.

3. In an apparatus for burning bagasse or other wet refuse material, the mouth-piece 1, of fire-clay or other refractory material, shaped as shown and provided with a covering, 2, all
5 substantially as set forth.

4. In an apparatus for burning bagasse or other wet refuse material, the mouth-piece 1, of fire-clay or other refractory material, shaped as shown and provided with a covering, 2,

and openings 3 3, these openings being adapted to permit the passage of the endless chain, as described.

This specification signed and witnessed this 29th day of January, 1887.

R. H. YALE.

Witnesses:

A. J. EDMUNDS,
J. BORLAND.