

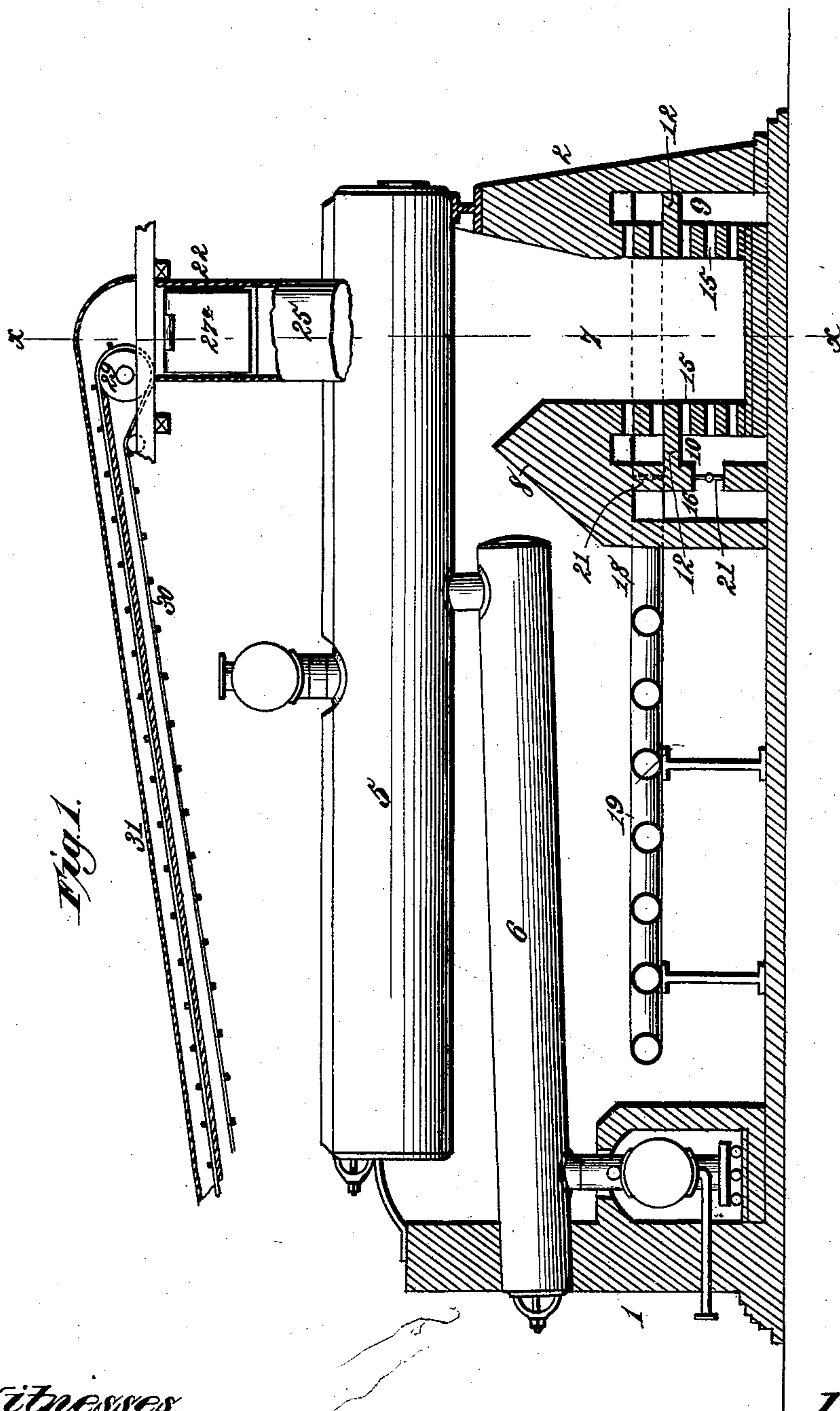
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3 Sheets—Sheet 1.

W. W. SUTCLIFFE.  
BAGASSE FURNACE.

No. 407,703.

Patented July 23, 1889.



Witnesses.  
Robert G. Smith.

J. A. Rutherford.

Inventor.

William W. Sutcliffe.

By

James L. Norris.  
Atty.

(No Model.)

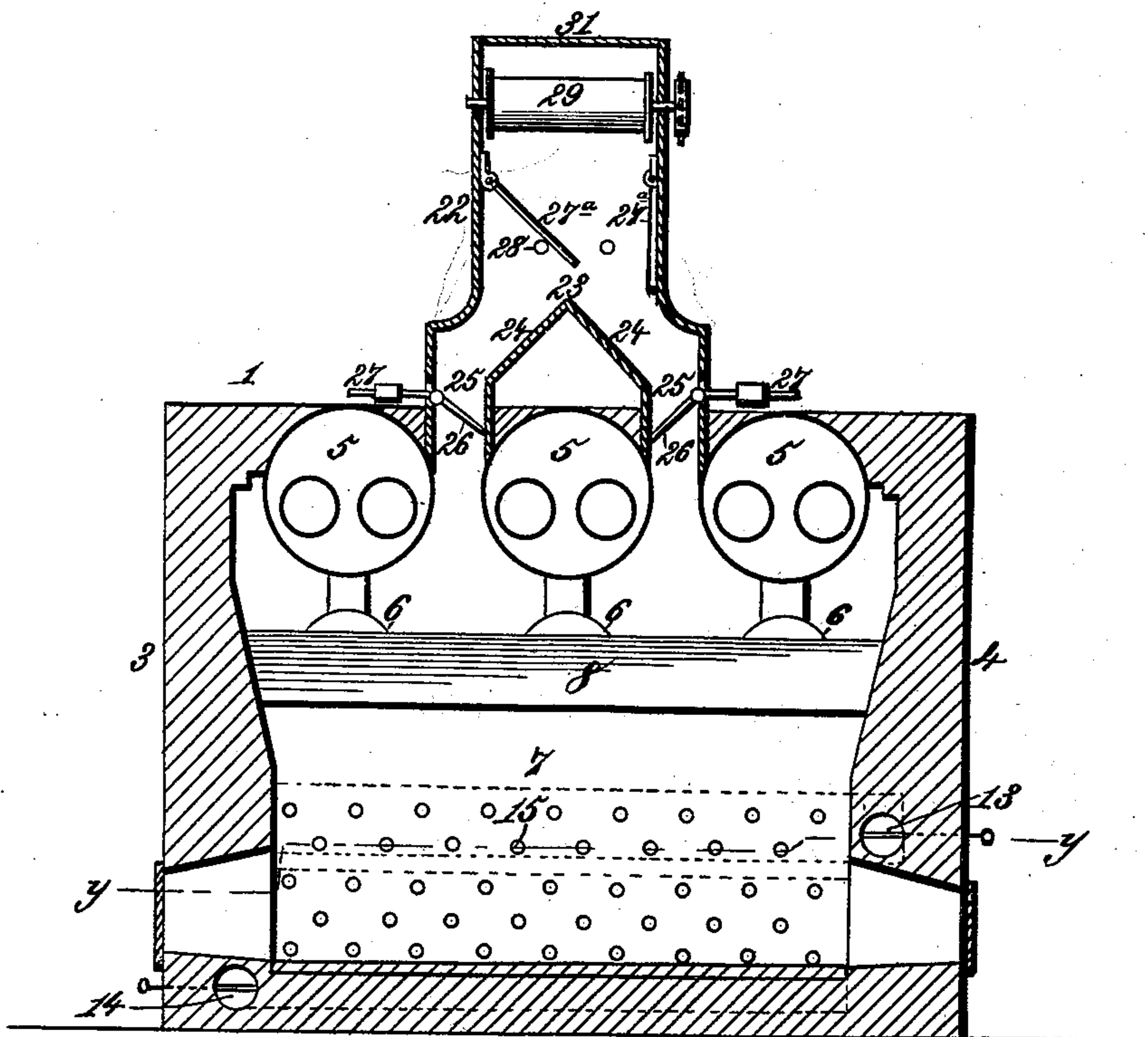
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*Fig. 2*



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(No Model.)

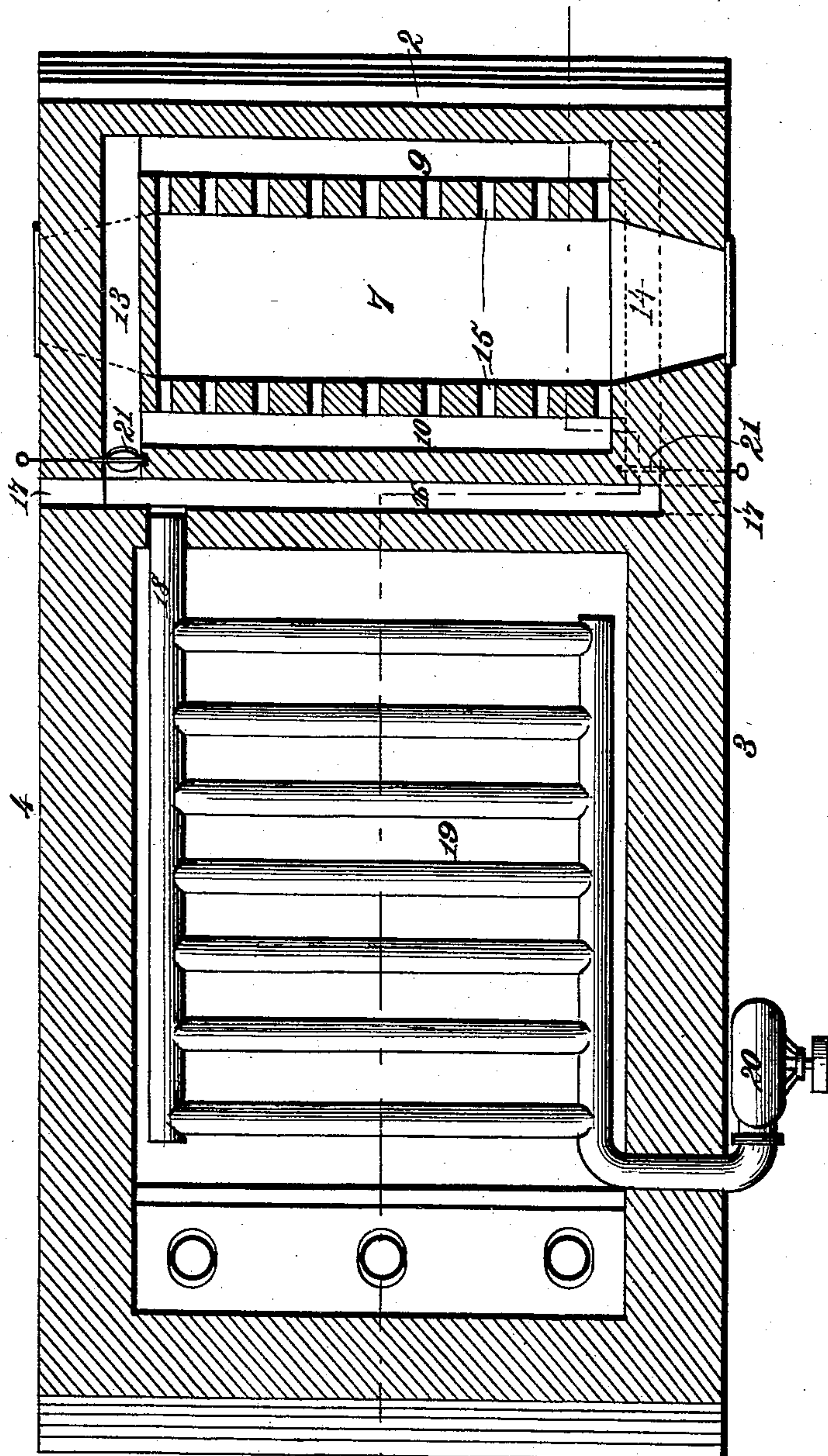
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Fig. 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM W. SUTCLIFFE, OF NEW ORLEANS, LOUISIANA.

## BAGASSE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 407,703, dated July 23, 1889.

Application filed March 14, 1889. Serial No. 303,287. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. SUTCLIFFE, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Bagasse-Furnaces, of which the following is a specification.

My invention relates to that class of furnaces adapted to the consumption of wet fuel, bagasse, diffusion-chips, sawdust, and similar material. It is the purpose of my invention to provide a furnace of this class wherein a divided fuel-feed may be effected to enable the operator to separate the feed from one hopper to the other and thereby enable him to clear the furnace without arresting its operation, thus avoiding a very considerable outlay of money caused by the non-action of the furnace and the arrest of the machinery, as well as the waste of fuel due to the slowing down and rekindling of the fires.

It is my purpose, also, to provide a simple construction and combination of parts, whereby the fuel may be automatically conveyed to the hopper supplying the fire-box and fed therefrom to different parts of the combustion-chamber, the supply chutes or openings being controlled by separate valves, whereby either one or both of said chutes may be used at the same time, thus enabling one side of the furnace to be cleaned while the other is in use, and thereby avoiding the slowing down of the fires for such purpose.

It is my object in this connection to combine with a front wall and bridge-wall containing air-tuyeres and separate upper and lower air-chambers suitable valves whereby said chambers may be used separately or jointly, and a hot-blast manifold in the fire-space communicating with said chambers and with cold-blast pipes or common air-flues, used separately or in conjunction with the hot-blast, as may be required, the combustion-chamber being fed by hoppers arranged upon opposite sides of a dividing-guide directing the feed between the boilers, in combination with independent valves arranged to divert the fuel to either side of said guide and exclude it from the other side.

The invention consists in the several novel

features of invention and new combinations of parts hereinafter described, and pointed out in the claims following this specification.

Referring to the accompanying drawings, Figure 1 is a central vertical section taken from front to rear of the furnace. Fig. 2 is a transverse section in the plane  $x x$ , Fig. 1. Fig. 3 is a horizontal section in the plane  $y y$ , Fig. 2.

In the said drawings, the reference-numeral 1 designates the masonry of the furnace composing a front wall 2 and side walls 3 and 4, within which are arranged the boilers 5, in battery, and provided, preferably, with the underhanging boiler-sections 6. Below the forward ends of the boilers is the furnace or combustion-chamber 7, inclosed between the front and side walls and the bridge-wall 8. In the front wall and bridge-wall are formed air-chambers 9 and 10, respectively, each chamber being divided into upper and lower portions by a division wall or plate 12. The upper portions of these chambers communicate by way of a lateral passage 13 formed in the side wall 4, while the lower sections are connected by a passage 14 beneath the floor of the furnace. The upper and lower sections of each chamber communicate with the combustion-chamber 7 by means of air-tuyeres 15.

Within the bridge-wall 8, in rear of the divided chamber 10, is formed a chamber 16, passing from end to end of the bridge-wall, and receiving atmospheric air at ordinary temperatures through openings 17 in the side walls.

Communicating with the chamber 16 is a pipe 18, which forms part of a hot-air manifold 19, lying in the fire-space behind the bridge-wall. The branches of the manifold are supplied by a blower 20, or other suitable means, for producing an air-circulation therein.

Within the air-passages leading from the common air-chamber 16 to the upper and lower sections of the chamber 10 are valves 21, whereby separate communication may be made with either of said chambers or with both jointly, and with either or both of the chambers 9 in the front wall.

Above the boilers and over the combustion-



chamber is arranged a feed-casing 22, placed centrally between the outer boilers. Arranged within this casing, over the central boiler of the battery, is a dividing feed-guide 5 23, having two inclining surfaces 24, which meet at an angle centrally, forming two passages 25 between the boilers, in which are placed feed-hoppers 26, of any suitable construction, having weighted levers 27, by which 10 they are automatically closed.

In the upper portion of the feed-casing 22 are pivotally mounted chutes 27<sup>a</sup>, swinging in a transverse plane, and either one capable of being so placed as to divert the fuel descending in the feed-casing from the passage 15 25 directly beneath the chute into the other passage. When raised into the inclined position the chute, may be held by pins 28.

In the top of the feed-casing is arranged a 20 drum 29, carrying a feed-belt 30, which moves in a covered way 31. This covered way closes the top of the casing and prevents the escape of sparks and other products of combustion.

The combustion-chamber may be provided 25 with grate-bars, though I have shown none, preferring to dispense with the same.

By this invention I am able to wholly avoid the loss of time consequent upon the necessity of drawing the fires and ceasing work 30 while either side of the furnace is being cleaned. By the use of ordinary man-holes I am able to clean one passage while feeding through the other, and thereby escape the serious loss resulting from interruption of 35 work. I have discovered, also, that in this class of furnaces it has been customary to supply the air to the combustion-chamber at a point so high in starting the fires, or during an interruption of the fuel-feed, that there is 40 considerable loss of time and reduction of steam. By my invention I am able to direct the blast high up or low down, or at both points simultaneously.

Doors 32 are provided in the side walls to 45 give access to the furnace.

What I claim as my invention is—

1. The combination, with a bagasse-furnace having a combustion-chamber, of a feed-casing above the furnace having a central dividing feed-guide forming side passages, 50 which extend through the top portion of the furnace above the combustion-chamber, valve-chutes pivotally mounted on the sides of the feed-casing and a pivoted and weighted automatically-closing hopper-valve in each side 55 passage, substantially as described.

2. The combination, with a bagasse-furnace having a combustion-chamber and a battery of boilers extending over the latter, of a feed-

casing arranged over the boilers and combustion-chamber, a central feed-guide having inclined surfaces forming separate passages, respectively extending down between the boilers and provided with hopper-valves, and valve-chutes pivotally mounted above the 65 feed-guide to divert the feed down between the boilers, substantially as described.

3. In a bagasse-furnace, the combination, with a combustion-chamber inclosed by the front, side, and bridge walls, the front wall 70 and bridge-wall having air-chambers divided into upper and lower sections communicating with the furnace by tuyeres, said upper chambers connected by a lateral passage in one side wall and the lower by a lateral side passage in the other side wall, of a hot-blast 75 manifold arranged in the fire-space and communicating with a common air-chamber in the bridge-wall, said chamber connected with the upper and lower air-chambers in the 80 bridge-wall by passages having valves, substantially as described.

4. In a bagasse-furnace, a combustion-chamber having an upper and lower air-chamber in its front wall and bridge-wall, respectively, the two upper chambers communicating by a lateral passage in the side wall above the furnace-door and the two lower by a lateral 85 passage in the other side wall below the furnace-door, said chambers having tuyeres communicating with the furnace, substantially as 90 described.

5. In a bagasse-furnace, the combination, with a battery of boilers, of a feed-casing arranged over the boilers and above the combustion-chamber, a central guide having inclined surfaces meeting at a central angle and forming passages between the boilers which are provided with hoppers, valve-chutes pivotally mounted above the feed-guide to 100 divert the feed from one passage to the other, and suitable feeding devices carrying the fuel to the casing, the combustion-chamber being supplied with upper and lower chambers in the front wall and bridge-wall, the 105 former communicating by a passage in the side wall above the door, and the latter by a passage in the opposite wall below the door, a hot-blast manifold supplying said chambers, and means for cutting off the blast in either 110 the upper or lower chambers in both walls, substantially as described.

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

WM. W. SUTCLIFFE.

Witnesses:

JOSEPH R. DE TRUJILLO,  
JOHN GRANER.