(No Model.)

F. COOK.

BAGASSE FURNACE.

No. 408,587. Patented Aug. 6, 1889.

Fig. 5

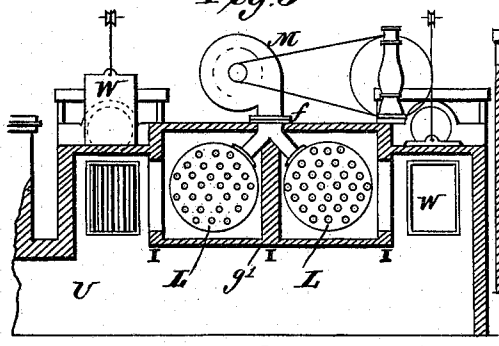


Fig. 6

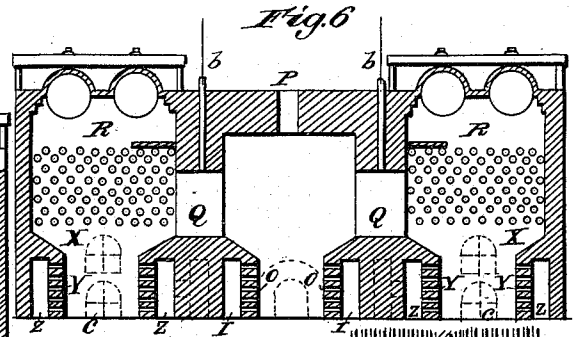


Fig. 1.

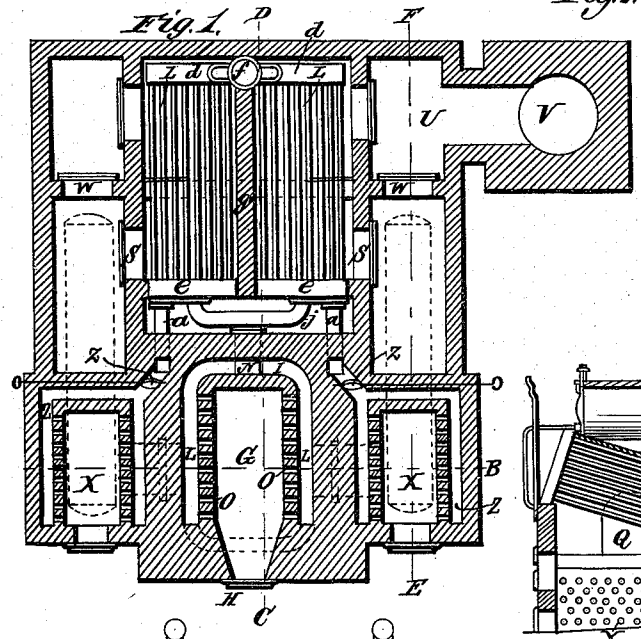


Fig. 7.

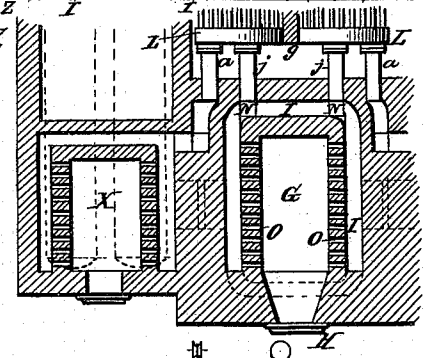


Fig. 4.

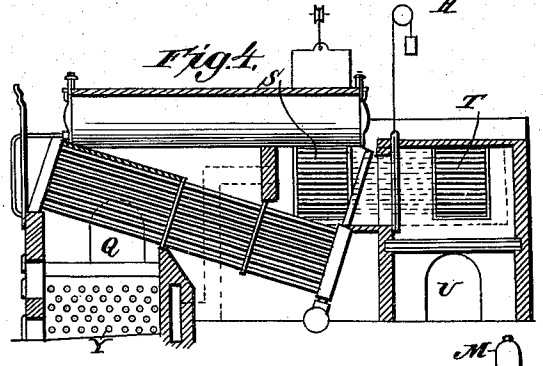


Fig. 2.

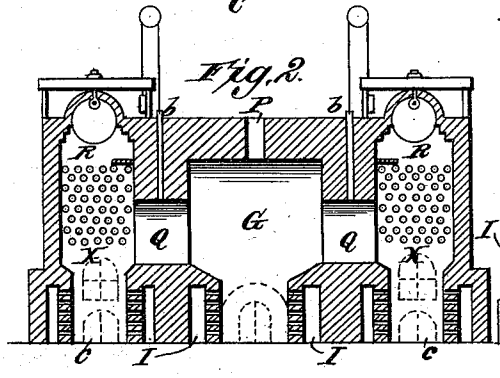
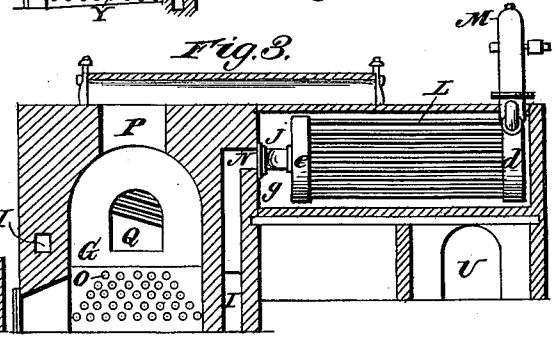


Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERIC COOK, OF NEW ORLEANS, LOUISIANA.

BAGASSE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 408,587, dated August 6, 1889.

Application filed November 15, 1888. Serial No. 290,962. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC COOK, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Bagasse-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The object of my invention is to produce an improved apparatus for burning bagasse without previous drying in a bagasse-furnace. This bagasse-furnace is placed centrally between a divided battery of boilers of two or more and discharges its heat under both parts of the battery. In combination with the bagasse-furnace I use an auxiliary furnace or furnaces for supplying wood or dry fuel by hand directly under the boilers. This furnace is constructed somewhat like the bagasse-furnace, with side tuyeres and air-passages to receive a forced cold or heated air-blast from an air-heater, or to work with natural draft through a draft-door, and it may be used independently of the bagasse-furnace when that furnace is not working, or it may be used at the same time. Both the bagasse-furnace and the auxiliary furnaces are arranged to receive a blast of either cold or hot air that has been heated by the waste heat from boilers passing among the pipes of a heater situated in the course of the waste heat from boilers on its passage to the smoke-stack.

It is the purpose of my invention to provide means whereby steam may be generated quickly and at any time without depending upon the slower process of firing the green bagasse, the combustion of the latter being dependent, in part at least, upon a hot forced draft.

To this end the invention consists in a central bagasse-burner having a boiler-furnace upon each side thereof, the bagasse-burner communicating with said furnace by lateral openings, and being provided with dampers whereby either or both of the boiler-furnaces may be cut off from the bagasse-burner, both boiler-furnaces being without grate-bars, and being so arranged that when combustion is fully established in the bagasse-burner no fuel need be supplied to the boiler-furnaces.

I attain these objects by the arrangement of parts shown on the drawings, in which—

Figure 1 is a horizontal section. Fig. 2 is a vertical cross-section through line A B of Fig. 1. Fig. 3 is a longitudinal section through line C D of Fig. 1. Fig. 4 is a longitudinal section through line E F of Fig. 1. Fig. 5 is a rear view in section of heater and flue. Fig. 6 is a cross-section through furnaces showing application to larger boilers than shown at Fig. 2. Fig. 7 is a part horizontal section through furnaces of Fig. 5.

At G is a central bagasse-furnace with contracted base and tuyeres for forced air-blast in its side walls.

At H is the clean-out door.

I are air-passages connecting to hot or cold blast-pipes J, and at Fig. 7 to similar pipes J′. The blast-pipes J, Fig. 1, and J′, Fig. 7, are provided with blast-gates to turn on, shut off, or regulate the blast to bagasse-furnace G.

At L is the heater for heating the air by means of the waste heat.

M is an air-forcer which forces cold air into the heater-pipes L, which air (after being heated by the waste heat passing around and among the heater-pipes L) then passes at N to the air-passages I and to furnace G through tuyeres O. The damp bagasse enters through opening P, which is provided with a suitable feeder. The products of combustion pass out at openings Q under the boilers R. Thence, after passing in the usual way among the boiler-tubes, the waste heat passes to the air-heater through dampered openings S, thence out from heater through dampered openings T to flue U and to smoke-stack V. Dampers at S can be shut and dampers W opened, when the waste heat escapes direct to flue U and the blast becomes a cold blast.

At X are auxiliary furnaces for wood or other dry fuel. They have side tuyeres Y in the furnace-walls and a plain hearth. The tuyeres Y connect to air-passages Z, thence to air-heater at *a*, where blast-gates *z* are provided to shut off, turn on, or regulate the blast. These auxiliary furnaces can be used with wood when bagasse-furnace is not in operation, or the furnaces can be used simultaneously. If it is wished to use the furnaces

X independently of the bagasse-furnace G, the dampers *b* can be shut down and the furnaces X be fired under the boilers by hand with wood or other dry fuel, and either natural draft be used through doors *c* or cold or hot blast, as may be desired.

The heater L is composed of straight pipes connected to two air-boxes *d* and *e*. The air is forced in at *f*, and, passing through the heater-pipes L, passes out at air-box *e* wherever it may be required at either furnaces X or G.

At *g* is a division-wall separating the two heaters L, and at *h* are deflecting-plates dividing about half the heaters to compel the heat to a good distribution around the heater-pipes in passing through the heater. It has been found that the heat from a separate bagasse-furnace passing over the grate-bars under the boilers in course of a short time injures the grates from being constantly exposed to a high temperature of about 1,500° to 1,800°, and if any air is admitted under them in the ash-pit while the bagasse-furnace is in operation the temperature under the boiler falls, so that it injures the production of steam.

I believe it to be a new and useful improvement in an apparatus to burn damp bagasse and dry fuel in separate furnaces to provide an auxiliary furnace for wood to be fed by hand under the boilers, the said furnace to be provided with side tuyeres in its walls for cold or hot blast, and a draft-door for natural draft. This auxiliary furnace for wood or other dry fuel is to be constructed under the boilers, in combination with a bagasse-furnace for burning the damp bagasse.

I arrange the bagasse-furnace and auxiliary furnace as shown and described, or I place the bagasse-furnace in front of the boilers (not shown) and the auxiliary furnace under the boilers, with the fire-doors in the side walls.

In my pending application of even date, Serial No. 290,963, I have shown a divided battery of boilers arranged upon each side of a central bagasse-burner, whereby I effect a large and important economy in the application of heat generated by the bagasse to the production of steam. I secure the same advantages in the invention herein shown, with the additional facility of being able to use the side furnaces, either or both, and either in conjunction with the bagasse-burner or without it. By omitting grate-bars I avoid the speedy destruction of such parts, which is invariably produced by the great heat generated by the bagasse.

I make no claim to a bagasse-furnace having a boiler-furnace arranged upon one side; nor do I claim in this case a divided battery of boilers arranged upon both sides of a bagasse-burner, as this forms the subject of my pending application referred to; but

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

1. A bagasse-burner having a boiler upon the side thereof, said boiler-furnace being without grate-bars and provided with tuyeres in its side walls, the bagasse-burner having openings in its side walls communicating with the boiler-furnace and provided with dampers or gates adapted to close said openings, substantially as described.

2. In an apparatus to burn damp bagasse, the combination of a bagasse-furnace between the boilers, auxiliary furnaces under the boilers, having side tuyeres in the furnace-walls, a draft-door and furnace-door, an air-heater, and dampers to turn on or off the waste heat from heater, and thereby change the blast from hot to cold, or the reverse.

3. In a bagasse-burner having openings in its side walls, in combination with boiler-furnaces, with which said openings communicate, said boiler-furnaces being arranged each beneath a battery of boilers and having no grate-bars, all of said furnaces being supplied with tuyeres in their side walls, an air-heater, and dampers whereby the waste heat may be driven over said heater or diverted therefrom and carried directly to the stack, substantially as described.

4. The combination of a bagasse-furnace with auxiliary furnaces for forced blast, each furnace being connected by distinct air-passages to a reservoir of compressed air provided with blast-gates to regulate supply of air to each furnace, substantially as described.

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

FREDERIC COOK.

Witnesses:
O. L. LE BLANC,
JAS. D. COLE.