

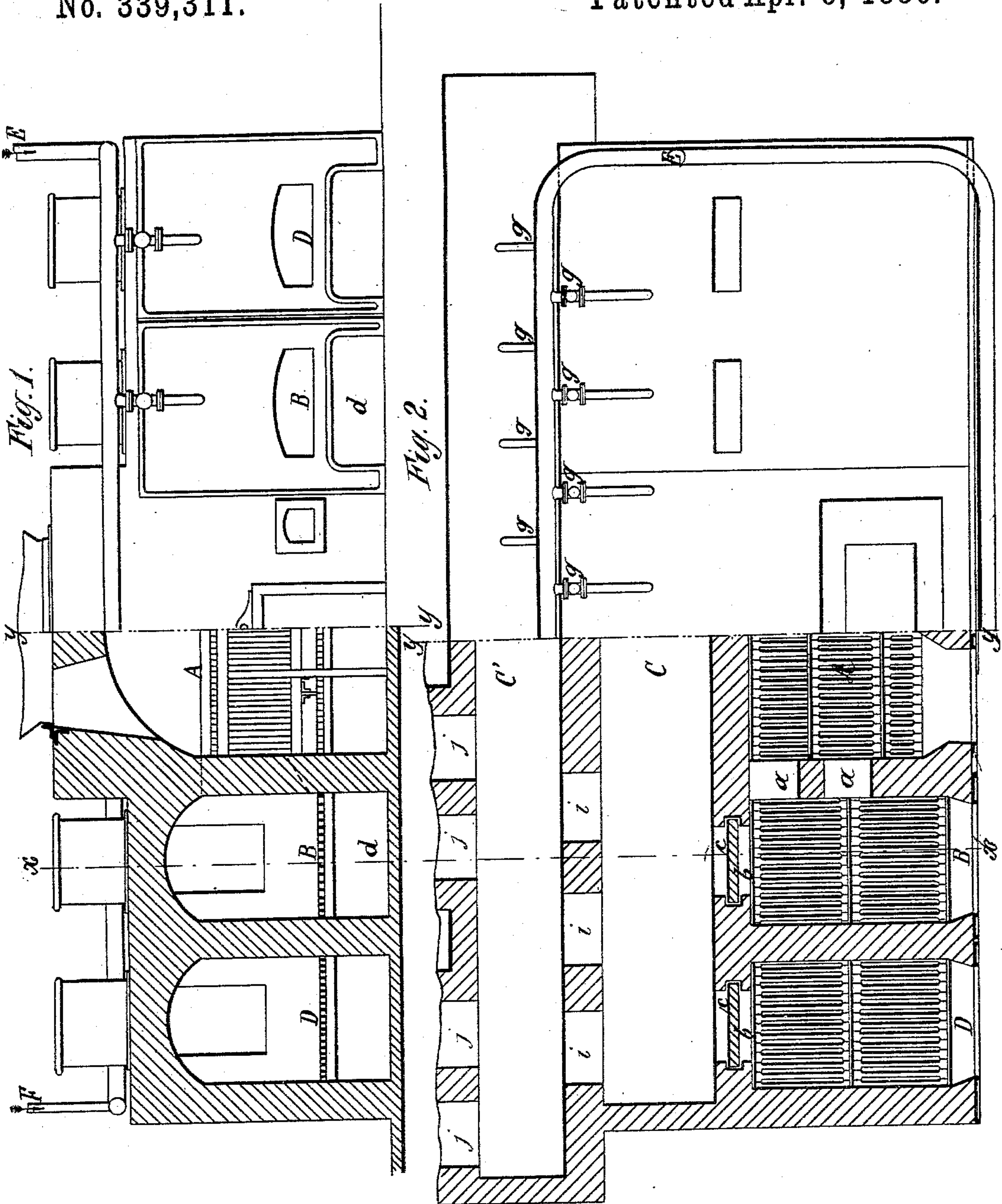
(No Model.)

3 Sheets—Sheet 1.

R. MARSA.
BAGASSE FURNACE.

No. 339,311.

Patented Apr. 6, 1886.



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Inventor:
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By his Attorneys
Brown & Hall

(No Model.)

3 Sheets—Sheet 2.

R. MARSÁ.
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Fig. 3.

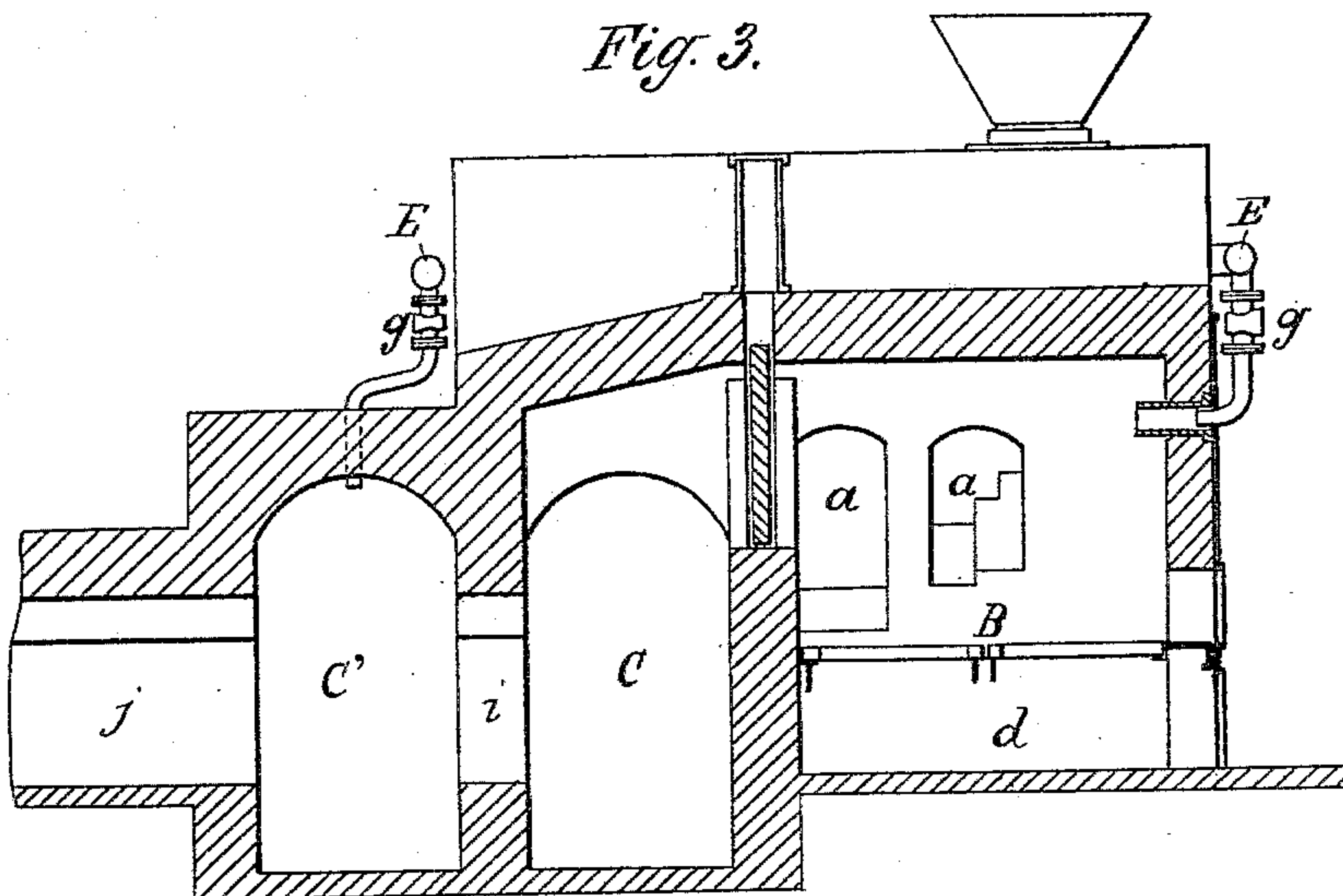
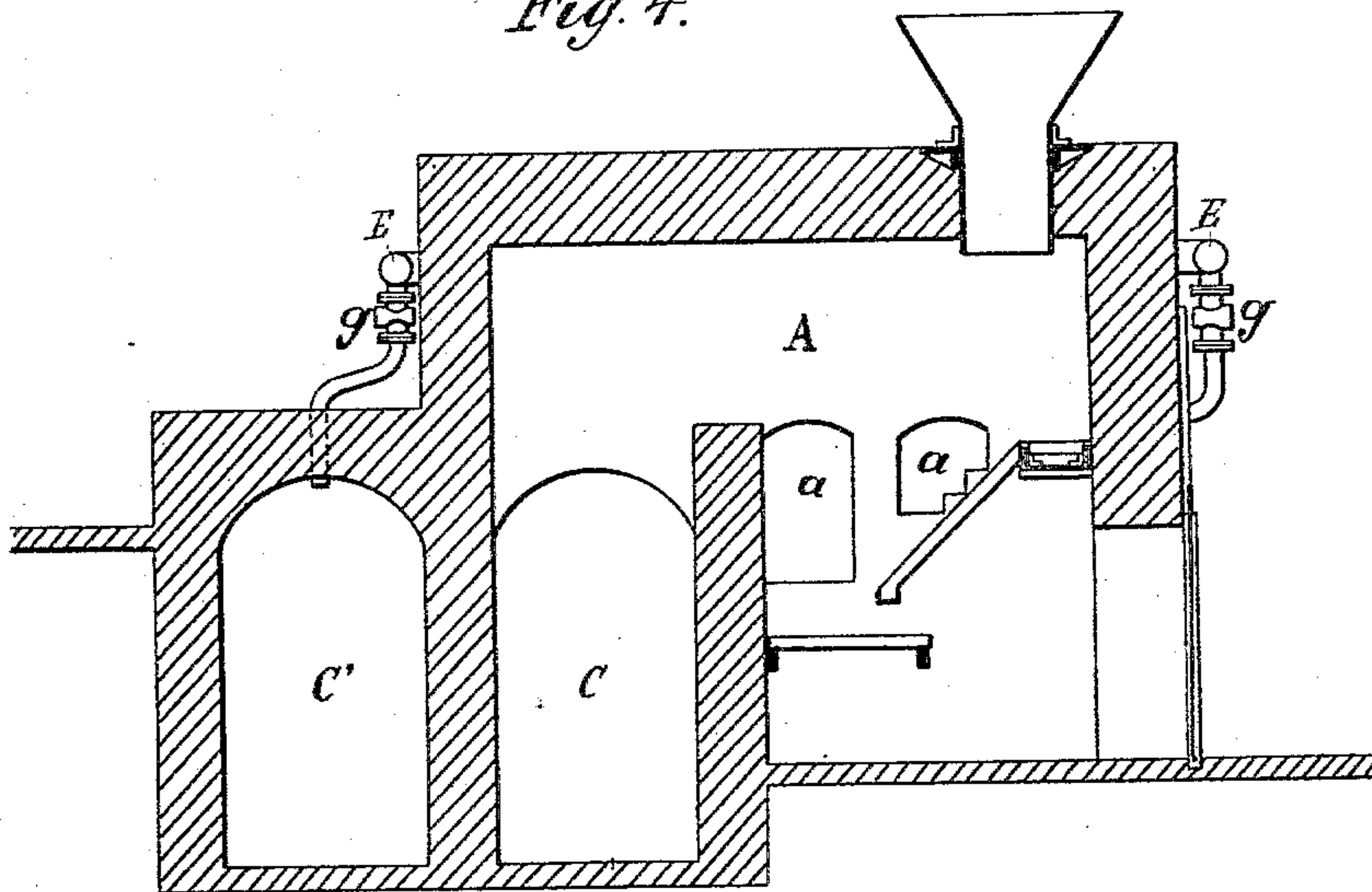


Fig. 4.



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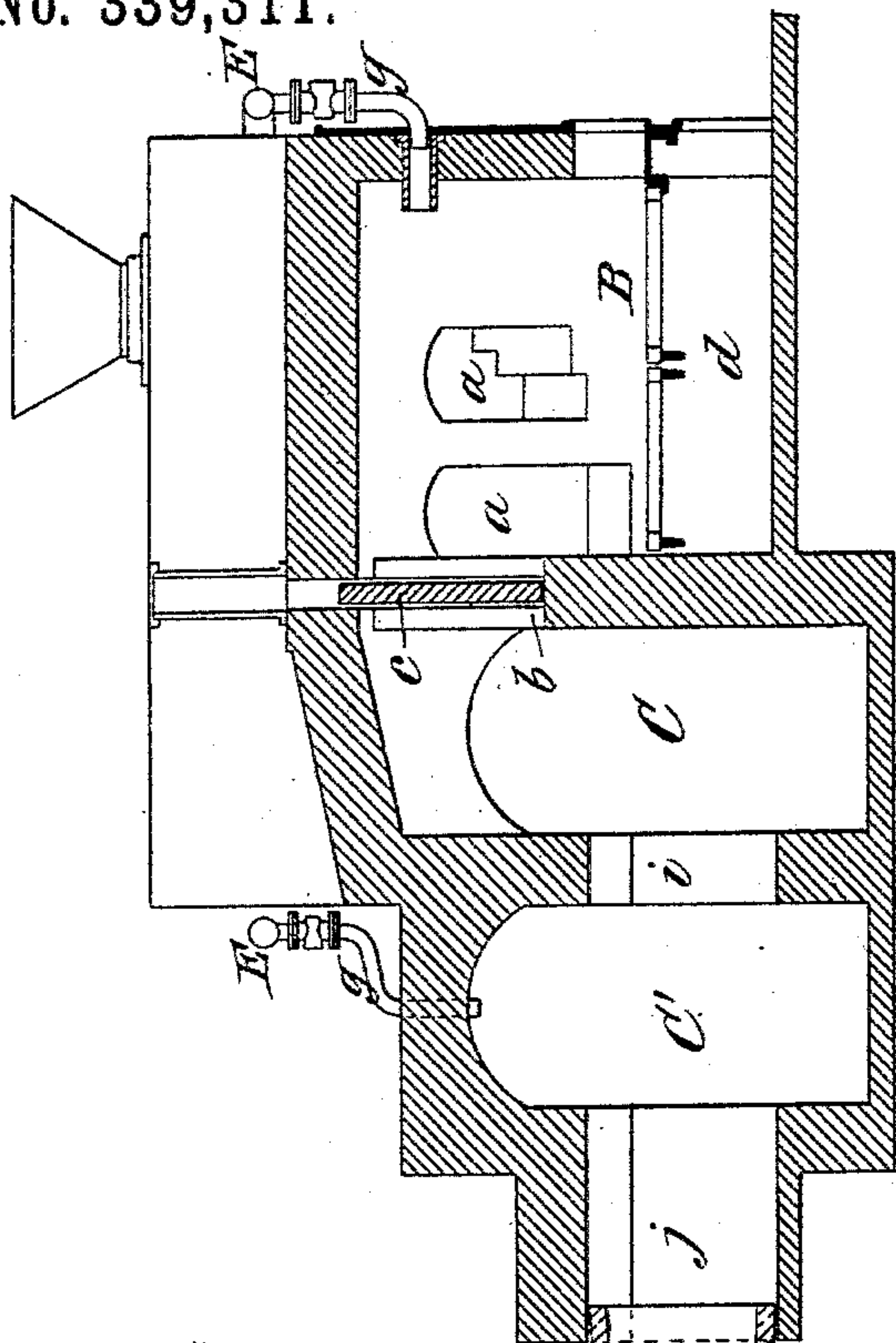


Fig. 5.

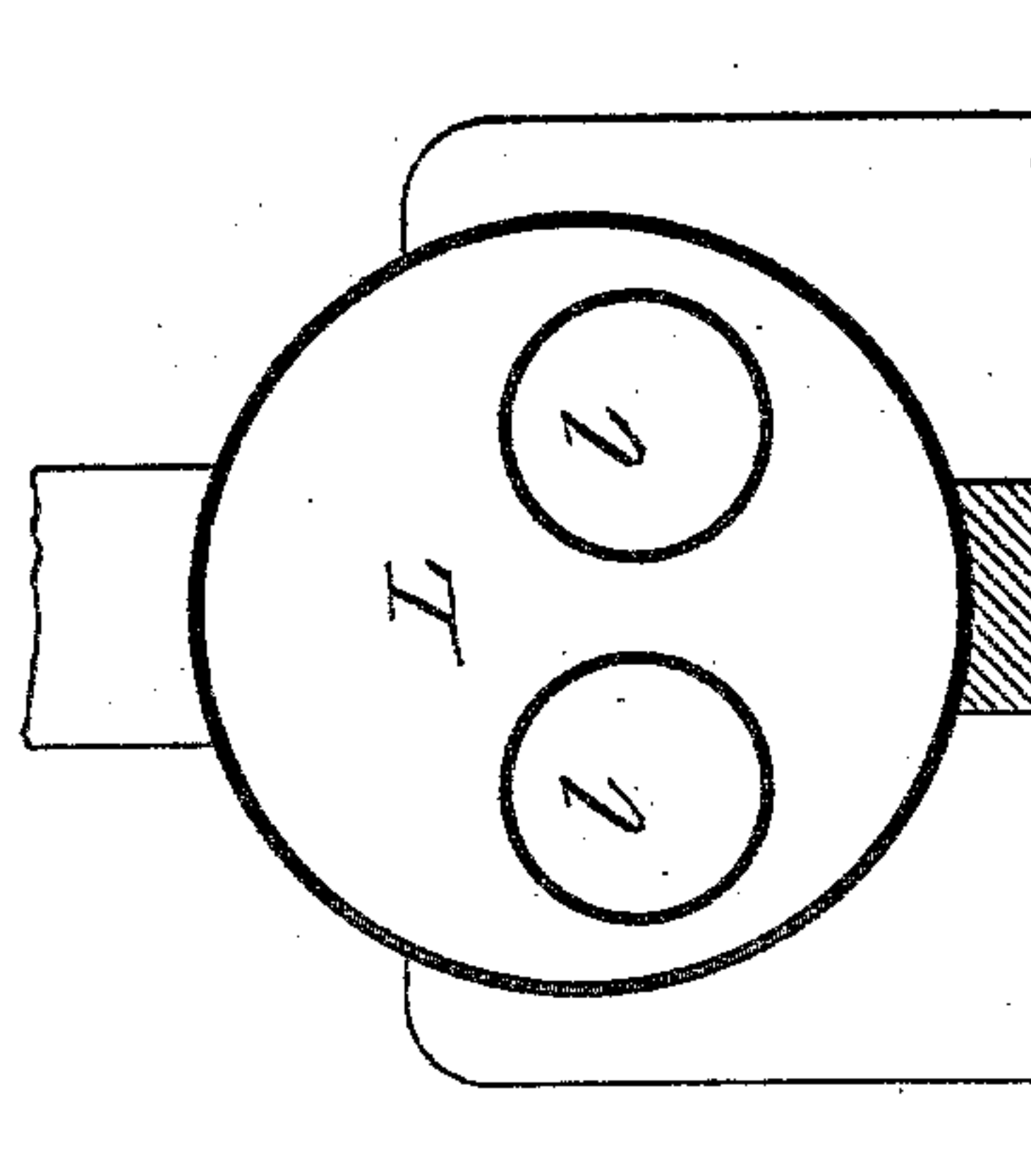
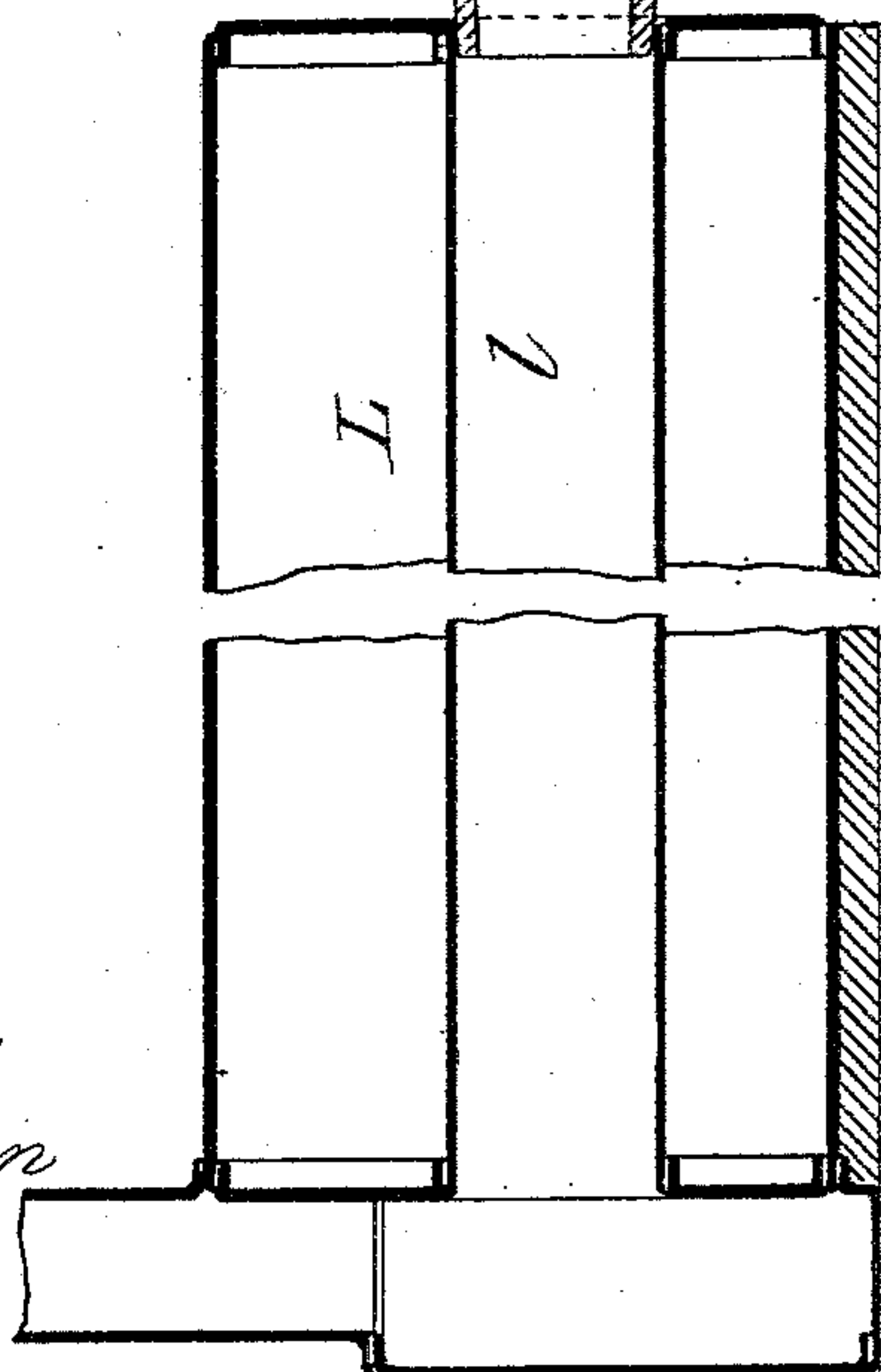


Fig. 6.



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UNITED STATES PATENT OFFICE.

RAMON MARSA, OF SALOBREÑA, SPAIN.

BAGASSE-FURNACE.

SPECIFICATION forming part of Letters Patent No. 339,311, dated April 6, 1886.

Application filed October 22, 1884. Serial No. 146,139. (No model.)

To all whom it may concern:

Be it known that I, RAMON MARSA, a citizen of the Kingdom of Spain, residing at Salobreña, in said Kingdom, have invented a new and useful Improvement in Furnaces for Burning Fresh Bagasse and other Damp Fuel, of which the following is a specification, reference being had to the accompanying drawings.

It is known that in cane-sugar houses, before bagasse can be used for fuel, it must be spread out in the sun and dried for a long time. This operation requires a great deal of room, time, and labor, which are not always available, and in wet weather the expense of preparing the bagasse is greatly increased.

Many experiments have been made to burn this bagasse without first drying it. Some inventors have tried to succeed in modifying the common kettle-furnaces. Other inventors have constructed special and independent furnaces in which they burned the damp bagasse, the accumulation of gas and flame being afterward directed under the boiler by means of flues arranged to this end. Heretofore none of these means have given very satisfactory results, and their application has always presented in practice grave objections, of which the principal are the following: First, they necessitate a peculiar draft, which in certain factories can only be obtained at great expense; second, even when a great draft is obtained, it is necessary to mix dry bagasse with the damp bagasse as it comes from the mill to keep up the activity of the furnace; third, the scoræ formed by the mineral components of the bagasse are so deposited on the walls of flues as to form stalactites, which in a short time stop up the passage, requiring frequent stoppages for their removal; fourth, in the system of introducing the bagasse into the furnaces the manipulations necessary to spread it on the grates involve the entry into the furnaces of strong currents of cold air, which occasions a notable loss of heat developed by the fuel, and which, cooling the furnace, produces the crystallization of the the scoræ into stalactites, which stop up the passage; fifth, it is impossible to burn coal on the special grates used for burning bagasse, which necessarily prevents the use of such grates for heating the boiler by use of coal.

The object of my invention is to provide a

new system of furnaces in which are employed the special grates commonly used for burning bagasse, but which are not subject to the objections hereinabove mentioned.

My new system of furnaces, combined in the manner hereinafter explained, are capable of operating under the following conditions, viz: first, with an ordinary draft; second, without adding dry bagasse to the damp bagasse as it comes from the mill; third, without often cleaning to remove the scoræ from the flues of the furnace; fourth, without any considerable admission of cold air through the charging-door; fifth, burning coal with the same facility as bagasse when the latter is all used up.

In the accompanying drawings, Figure 1 is a front elevation, partly in section, of a furnace constructed according to my invention. Fig. 2 is a plan of the same, also partly in section. Fig. 3 is a transverse vertical section of the same in the line *x x* of Figs. 1 and 2. Fig. 4 is a transverse vertical section of the same in the line *y y*, Fig. 1. Fig. 5 is a vertical section corresponding with Fig. 3, and showing also a steam-boiler connected with and heated by the said furnace, the boiler being in longitudinal section. Fig. 6 is a transverse vertical section of the boiler.

A designates an ordinary bagasse-furnace, which is represented as furnished with an inclined iron grate, but may have a grate of any other construction suitable for the burning of bagasse or like fuel. On each side of this furnace is arranged one of two furnaces, B B, furnished with common flat grates suitable for the burning of coal or other fuel which can be burned on such grates. These side furnaces, B, communicate each on one side by openings *a a* with the bagasse-furnace A, and communicate at the back by means of the openings *b b*, with the main flue or combustion-chamber C, in which the hot products of combustion from the several furnaces are collected, and whence the said products pass through openings *i i* in the rear into a second chamber or flue, C', in the rear of which there are openings *j j* for the passage of said products to the boilers which are to be heated by them. The openings *b b* are provided with dampers *c c*.

The ash-pits *d* of the furnaces B B are intended to be provided with doors, by means of

which the draft is regulated or cut off entirely at pleasure when the bagasse-furnace A works satisfactorily.

The operation of this furnace, as thus far described, is as follows: The bagasse-furnace, being fed in a suitable manner and operating regularly, the doors of the ash-pits *d d* of the side furnaces B B are closed, and the said furnaces are inoperative. When the supply of bagasse begins to fail or for any other reason the furnace A ceases to operate, the doors of the ash-pits *d d* are opened and coal-fires are lighted on the grates B B, the dampers *c c* being then opened, so that the flames may pass through the chambers or flues C C' and from the latter to the boilers without passing through the furnace A. When, on the other hand, the furnace A operates, but the combustion therein is not satisfactory, the dampers *c c* must be closed, and the flame, passing from the furnaces B B through the openings *a a* to the furnace A, furnishes the latter with the heat necessary for the effectual burning of the bagasse. Lastly, when the furnace operates with its usual efficiency and the help of the furnaces B B is not necessary, the fire in these latter is extinguished by closing the doors of their ash-pits.

It often happens in a sugar-house that there is not a sufficient quantity of bagasse to heat all the boilers ordinarily in use, and in such cases it is common to apply to some of the generators special grates placed under each, which involves a want of economy of fuel. To remedy this inconvenience I have added additional furnaces, D D, on each side, as illustrated in Figs. 1 and 2. By this means I obtain the advantage of assembling all the heating apparatus in one place, and, moreover, there is also great economy in different ways. In the first place, an economy in manual labor, owing to the facility of managing a number of furnaces concentrated in one place. Then the fuel is used to a better advantage, for, as will be understood, these side furnaces D D, which are heated with coal or other dry fuel, appreciably increases the temperature and draft in the flue or combustion-chamber C, and consequently in the other communicating furnaces. It thus results that the water vaporized in the bagasse, which otherwise would not have been decomposed into combustible oxygen and hydrogen, is formed in this chamber or flue in the presence of gas at a very high temperature, which produces the decomposition. If, as is nearly always the case, the two furnaces B B immediately adjacent to the

central bagasse-furnace are sufficient to decompose the water of the bagasse and to burn its hydrogen, it is possible in the farther furnaces D D to decompose and utilize as fuel the exhaust-steam or escaping vapor from the engines, boilers, or evaporating apparatus heated by the several furnaces. Such steam or vapor may be delivered to the furnaces B D above the grates thereof, and into the chamber C' by a pipe, E, and branches *g g* therefrom, the said steam or vapor entering the pipe E at F. (See Fig. 1.)

The supplemental furnaces D D can be connected with or disconnected from the flue or combustion-chamber C at pleasure by means of their dampers *b b*.

The method of forming communication between the outlets *j* of the furnaces and the boilers or other apparatus to be heated will vary according to the nature of the boilers or apparatus.

The arrangement of the outlets *j* in pairs, as shown in Fig. 2, is intended for a series of two-flue boilers, L, such as is shown in the transverse section, Fig. 6. From each outlet *j* there is a conduit or pipe, as *k*, Fig. 5, leading to the heating-space of the boiler or apparatus—as, for instance, to one of the flues *l* of the boiler represented.

What I claim as my invention is—

1. The combination, with the central bagasse-furnace and a flue or combustion-chamber with which it communicates, of side furnaces for dry fuel in communication with said central furnace, and passages and dampers for opening and closing communication between said side furnaces and said flue or chamber, substantially as herein described.

2. The combination, with the central bagasse-furnace, A, the main flue or combustion-chamber C, with which it communicates, the side furnaces B B in constant communication with the said central furnace, the additional side furnaces, D D, having no direct communication with the other furnaces, and the passages and dampers for opening and closing communication between the said furnaces B B and D D and said flue or chamber C, all substantially as herein described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

RAMON MARSÁ.

Witnesses:

ROBT. M. HOOPER,
C. CRÉMERS.