

(No Model.)

E. JOLICARD.
FURNACE.

No. 523,579.

Patented July 24, 1894.

FIG. 1

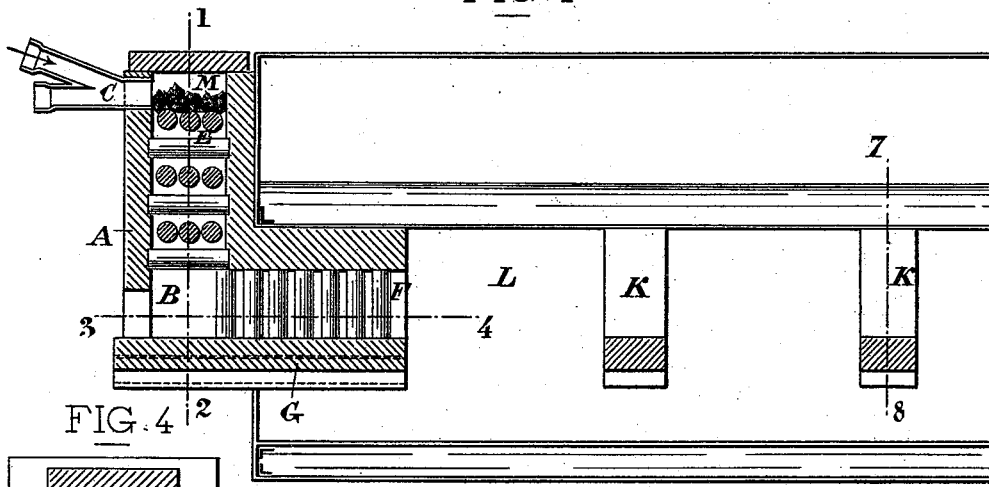


FIG. 4

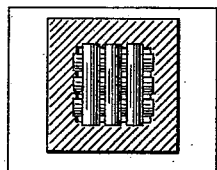


FIG. 3

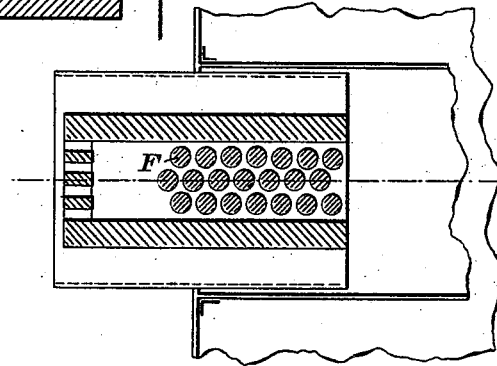


FIG. 2

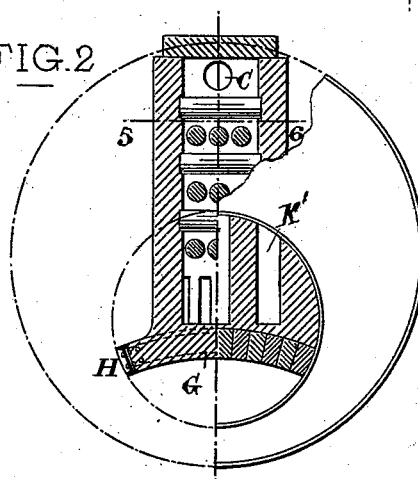
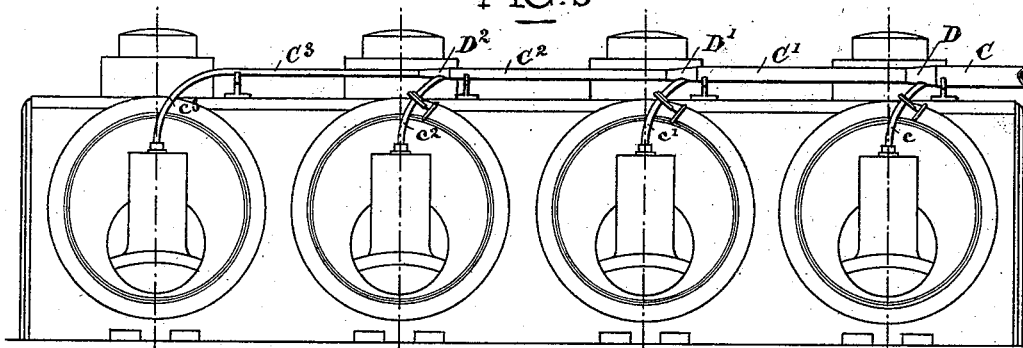


FIG. 5



Witnesses

Jules Jolicard
Jean Germain

Inventor

Emile Jolicard

UNITED STATES PATENT OFFICE.

EMILE JOLICARD, OF LYONS, FRANCE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 523,579, dated July 24, 1894.

Application filed March 20, 1894. Serial No. 504,431. (No model.) Patented in France August 5, 1893, No. 232,078.

To all whom it may concern:

Be it known that I, EMILE JOLICARD, engineer, a citizen of the Republic of France, residing at Lyons, in the Republic of France, have invented certain new and useful Improvements in and Relating to Furnaces, (for which I have obtained a patent in France, No. 232,078, dated August 5, 1893,) of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved arrangement of furnace for pulverized fuel, which is applicable to boilers, and gas generators and which may also be used for industrial purposes.

In the accompanying drawings Figure 1 represents a central longitudinal section of a furnace constructed according to my invention. Fig. 2 shows a partial section on the line 1—2 of Fig. 1 taken through the part situated on the left of its axis, and a section on the line 7—8 of the same figure taken through the other part situated on the right of the axis. Fig. 3 is a horizontal section on the line 3—4 of Fig. 1. Fig. 4 is a plan showing a section on the line 5 to 6 of Fig. 2. Fig. 5 shows the arrangement used when a series of furnaces are all fed by a single main pipe.

The improved furnace for pulverized fuel is substantially composed of the following parts:—a lighting chamber M for wood charcoal, wherein a current of air and pulverized coal arrives through the inlet pipe C. A vertical furnace portion A wherein are arranged in crossed rows, separated by a small space, horizontal round columns E leaving a small space between them. A horizontal furnace portion B, the longitudinal section of which is represented in Fig. 1 and the horizontal section in Fig. 3, which figures show other round columns F placed at short distances from each other in all directions and arranged in this part of the furnace. Combustion chambers L for the gases, provided behind the furnace proper and limited by walls K K pierced with vertical slits or openings K', as shown in Figs. 1 and 2.

This furnace may consist of refractory earth and be built upon a vault G bearing upon the boiler.

The operation of this improved furnace is

as follows:—In the case of a single furnace the current of cold air and pulverized coal arriving through the inlet pipe C is obliged to pass downward through the incandescent wood charcoal, thus determining the ignition of the fluid vein. The latter then passes still downward through the rows of bricks or columns, utilizing the passages open to it and the free space provided between two horizontal rows of these bricks or columns, thus creating an enlargement of section and causing whirling movements very favorable to the ignition of the gases. The wood charcoal burns while the whole of the columns and of the furnace gradually reaches a higher temperature, and when the wood charcoal has disappeared, the furnace, by its refractory material raised to a high temperature and presenting a large surface of contact to the gases, retains a considerable amount of heat which serves to ignite the current of air and coal dust which are continually renewed therein.

This furnace may comprise either a vertical part only, such as A, or a horizontal part only, such as B, or a vertical and horizontal part combined, as represented in the accompanying drawings.

At the outlet of the furnace one or more chambers L are provided for the combustion of the gases. In these chambers the gases already ignited react one upon each other and complete their combustion. Walls K, having either straight slits K', as in the accompanying drawings and as represented in vertical section on the right hand side of Fig. 2, or a simple opening, serve to diffuse the burning gases and are always heated to incandescence during the operation.

In case the inlet pipe C has to feed several furnaces use is made of a special arrangement enabling the distribution of the vein of air and coal to be effected into as many branch pipes as may be necessary for feeding the furnaces. Each of the branch pipes should have a sectional area proportional to the quantity of coal which is to be burned by the furnace. In a series of furnaces, such as for example boiler furnaces, all the elements are generally equal, that is to say each of the furnaces burns as much as the neighboring fur-

nace, so that all the branch pipes will have the same sectional area.

In Fig. 5 of the accompanying drawings I have represented only four furnaces. In this case the four branch pipes c c' c^2 c^3 are preferably curved and have each a sectional area equal to one-fourth of the sectional area of the main pipe C. At the points where these branch pipes leave the main pipe truncated cones D D' D² are provided in the latter, which cones have approximately the same length as the greatest diameter of the oblique section of this branch. The parts C' C² C³ of the main pipe C which follow these truncated cones D D' D² have each a smaller sectional area than the preceding by one quarter of the principal sectional area, that is to say C' has three quarters of a sectional area of C, while C² has one half of the sectional area of C, and C³ only one quarter of the sectional area of C. In each branch pipe c c' c^2 c^3 is included a valve enabling one or more of the furnaces to be completely shut off and each furnace to be regulated to the same pressure.

What I claim is—

1. In furnaces for pulverized fuel, the combination with the vertical furnace portion A having arranged therein the crossed rows of horizontally placed bars E separated by small spaces and forming a series of straight ver-

tical passages, of the lighting chamber M above said bars, a pipe C for introducing a current of air and pulverized fuel into said chamber, and a gas combustion chamber L in rear of and communicating with the furnace, substantially as shown and described.

2. In furnaces for pulverized fuel, the combination of the horizontal furnace portion B having a series of spaced apart vertical columns F arranged therein to form a series of straight horizontal passages, a lighting chamber M having an inlet pipe C for introducing a current of air and pulverized fuel, and a series of gas combustion chambers L separated by walls K pierced with vertical slits, substantially as shown and described.

3. In furnaces for pulverized fuel, the combination with the furnace chambers A and B each provided with a series of straight passages, of the lighting chamber M having an inlet pipe C for air and pulverized fuel, and a series of gas combustion chambers L alternating with walls K provided with vertical slits, substantially as shown and described.

In testimony whereof I have hereunto set my hand this 27th day of February, 1894.

EMILE JOLICARD.

Witnesses:

XAVIER JANICOT,
JEAN GERMAIN.