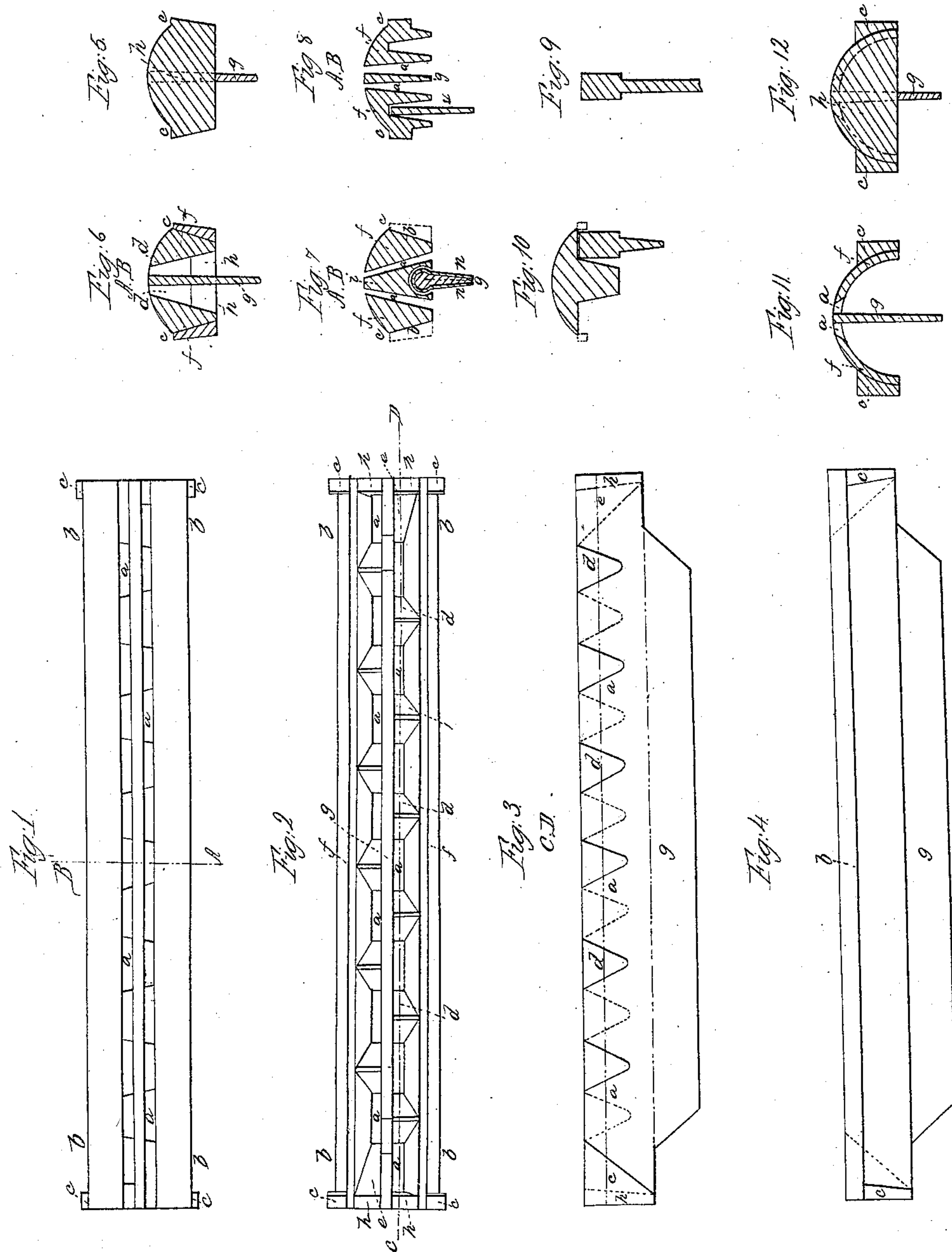


M. L. Roucoult,
Furnace-Grate Bar.

N^o 9,758.

Patented May 31, 1853.



UNITED STATES PATENT OFFICE.

MARIE LOUISE ROUCOUT, OF PARIS, FRANCE.

GRATE-BAR.

Specification of Letters Patent No. 9,758, dated May 31, 1853.

To all whom it may concern:

Be it known that I, MARIE LOUISE ROUCOUT, of No. 6 Rond Point des Champs Elisés, Paris, in France, have invented a new Mode of Constructing the Bars of Furnaces and other Grates, and that the following is a full, clear, and exact description of the principle or character which distinguishes the same from all other things before known and of the usual manner of working, modifying, and using the same, reference being had to the drawing hereunto annexed and to the letters and figures marked thereon—that is to say:

The invention consists in constructing the bars of furnaces and other grates of an arched or partly arched form and with a double row of parallel air-holes made in the length of the bars, which combined with the arrangements hereinafter described prevent the clogging of combustible to the bars, greatly improves the combustion and produces an important economy of fuel.

The necessity of a good system of burning fuel has long been felt, more especially in large works and factories, where a serious loss occurs by the escape into the air, in the form of smoke, of a large proportion of the combustible employed, occasioned by an incomplete combustion thereof.

Now the object of this invention is to avoid in a great measure this loss of carbon by a greater and continuous supply of oxygen into the interior of the burning mass, by which the caloric principle of the gases is developed in a higher degree before their escape from the furnace and the combustible itself is entirely exhausted.

I will now proceed to describe the different parts of the new bar by means of the drawing annexed, in which the same letters of reference represent parts which are similar.

Figure 1, plan of the upper surface of the bar in the form of an arch: *a, a*, orifices in the length of the bar, which may be of any desired form, for the passage of air; they are parallel and alternate and are wider at the bottom than at top; *b b*, side openings for the supply of air formed by the tenons or projections *c, c*; the sides of the bars are also inclined inward toward the bottom part; *c c*, tenons or projections made in both sides of the bar for keeping them at a convenient distance apart when set up and in a longitudinal direction.

Fig. 2, plan of the bar seen underneath *d*, inclined parts widening from the top toward the bottom.

Fig. 3, longitudinal section taken through *C, D*, of Fig. 2: *e*, inclined prolongation at each end of the arch for closing the intervals alternately by a row of air-holes.

Fig. 4, longitudinal elevation of the bar seen sidewise: *g*, nerve, seen sidewise.

Fig. 5, elevation of the front and back of the bar.

Fig. 6, longitudinal section through *A B*: *f*, side pieces forming the arch; *g*, nerve in the middle of the arch and on the axis of the bar; *h*, the part that closes the two extremities of the arch and forms the end of the grate bar. These extremities may be curved at their lower part, like a rocker in a convex form, causing the bar to bear upon its own axis and allow of its being shaken or partially turned sidewise to remove the cinders, either by the direct motion of a moving apparatus of any description set in the hearth of the furnace, by a rod adapted to the nerve of the bar, or by agitating the nerve with the cinder pan or by means of a poker. In lieu of a permanent nerve a movable nerve may be employed.

Fig. 7, second section through the line *A B*: *i*, grooved part of a greater diameter than the nerve *g*, made in the arch to receive a movable nerve, which engages in it, but in such wise as to be easily withdrawn. The nerve may be united to the grooved part *i* in the manner described or similarly to the supports *x*, seen at the section through *A B* of Fig. 8. Instead of a movable nerve an ordinary bar may be employed for a support.

Fig. 8, a third section through *A B* showing the support serving instead of a movable nerve.

Fig. 9 shows the plan of an ordinary grate bar; Fig. 10, elevation of the two ends of the bar, showing the bar of Fig. 9 applied with my improvement; Fig. 11, section through *A B* of a bar hollow at both sides of the nerve; Fig. 12, elevation of the two extremities of the bar with a hollow arch. The hollow arch may be made if required of the same form as seen in Figs. 6 and 7, so as to narrow the extent of the arch. The form of an entire arch may be replaced in some cases by that of a quarter of an arch, more or less, according to the distance it is requisite to set between the grate and the roof of the furnace. The arched form of the

bar serves to give it more strength and render it more durable.

The nerve or prolongation when made movable in some cases may be dispensed with, which decreases the weight of the bar.

When the bars are constructed of sheet iron, the arch is composed of three separate longitudinal parts as shown in the section Fig. 11 and end view Fig. 12. This arrangement permits me to increase or diminish the dimensions of each part of the bar and also the number of rows of air-holes or to modify the form and dimensions of the said air holes according to circumstances.

The bars are made of sheet or cast iron and are cast in one or more pieces according as the nerve or prolongation is intended to be fixed or movable and are afterward set up in the usual manner and with the same facility as ordinary bars.

The dimensions and proportions of the bars may be varied according to circumstances and the nature of the application and are subject to the general rules observed for the construction of furnaces or other grates. The length of the bars is regulated according to the length of the fire place. The breadth of the bars increases or diminishes, and the number of bars and air holes is multiplied according to the breadth of the fire-place and the quantity of air con-

sidered requisite for obtaining the necessary activity of combustion. The thickness and strength of the arch of the bars and the size of the nerves, or the suppression of the nerves, is determined according to the size and nature of the fire places and combustible or the intensity of the heat which the grate may have to support.

The furnaces constructed with this system of bars are applicable to all kinds of fuel and present invariably the advantage either of consuming less fuel or producing a greater amount of heat proportionately with other systems of grates, according to the nature of the application.

And having now described the nature of my said invention and the manner of carrying the same into execution I wish it to be understood that what I claim as my invention and desire to be protected by the said Letters Patent is:

The construction of bars of furnaces and other grates of an arched or partly arched form provided with the parallel rows of air-holes, substantially as herein described.

Paris, February 5th, 1853.

MARIE LOUISE ROUCOUT.

Witnesses:

ALEX R. WHITELOCKE,
W. A. GILBEE.