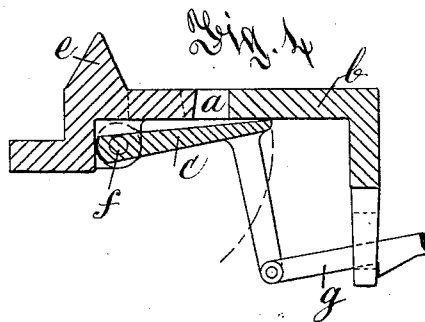
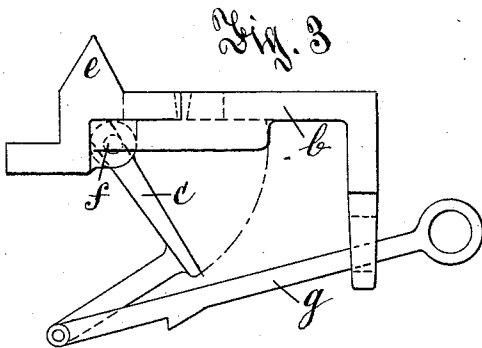
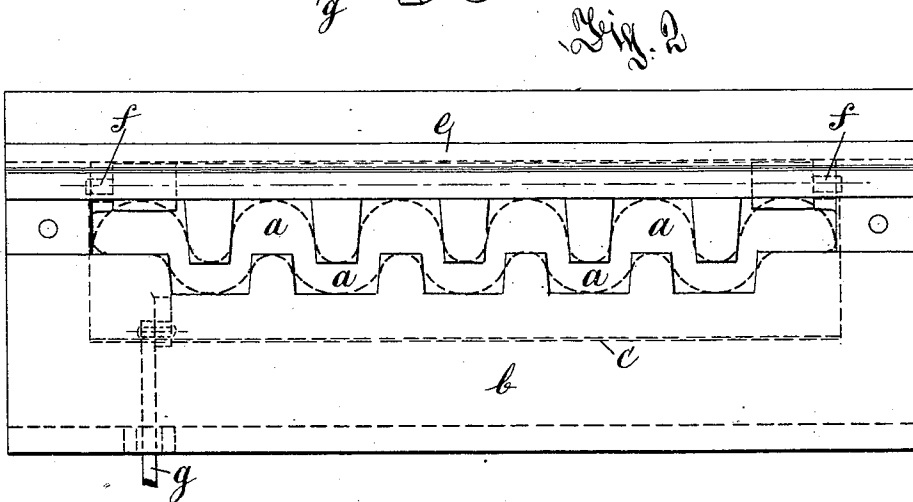
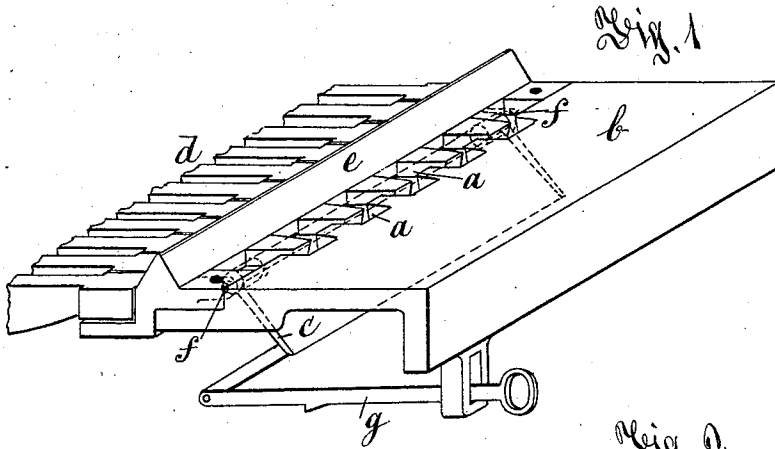


(No Model.)

E. F. PADDON.
FURNACE.

No. 475,603.

Patented May 24, 1892.



Witnesses:
J. C. Wilson.
W. H. Graham.

Inventor:
Edwin F. Paddon
by Whitman & Milken
Attys.

UNITED STATES PATENT OFFICE.

EDWIN FAULKNER PADDON, OF LONDON, ENGLAND.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 475,603, dated May 24, 1892.

Application filed August 31, 1891. Serial No. 404,261. (No model.) Patented in England June 2, 1890, No. 8,523, and in France April 1, 1891, No. 212,491.

To all whom it may concern:

Be it known that I, EDWIN FAULKNER PADDON, a subject of the Queen of Great Britain, residing at London, in the county of Middlesex, England, have invented a new and useful Improvement in Furnaces, (for which I have obtained a patent in Great Britain, No. 8,523, bearing date June 2, 1890, and in France, dated April 1, 1891, and numbered 212,491,) of which the following is a specification.

My invention relates to improvements in furnaces of all kinds, and more especially to the furnaces of steam-boilers; and the objects of my improvements are, first, to effect the complete combustion of the fuel in the furnace and the prevention of smoke, and, second, to provide means for the regulation of the quantity of air admitted or to shut it entirely off. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a general view of the entire apparatus. Fig. 2 is a plan; Fig. 3, an end view, and Fig. 4 a transverse vertical section.

Similar letters refer to similar parts throughout the several views.

b is a dead-plate, upon which the fuel is supplied in the usual way through the fire-door, and *a* is a transverse opening or air-space extending across and through the dead-plate *b*. This opening or air-space is not straight, but has its two opposite edges notched, the projecting parts between the notches in the front edge entering into the notches in the back edge, and vice versa, but leaving a narrow continuous air-space between their ends and sides, the projecting parts tapering at their lower ends so as to leave free space below for the admission of air.

The opening or air-space *a* through the dead-plate *b*, as described, is shown formed by a separate serrated bar arranged and fixed by bolts to the front edge of the dead-plate *b*, the projections and recesses in the bar and in the plate entering one another, as already described. Allowance may be made for expansion by heat. The inner edge of the bar may be without projections and notches.

Behind the continuous notched opening described and at a sufficient distance from the

latter a second similar opening may be made in the same way through the dead-plate; or, instead of two, three or any desired number of such openings may be made.

On the inner side, in front of the transverse opening *a* through the dead-plate *b*, a plate or feather *c* is arranged, inclining downward or outward toward the front of the furnace. This plate *c* turns upon pivots *f f* at its ends, and its position can be adjusted by the bar and handle *g* from the front of the furnace, so that the admission of air through the opening *a* can be regulated, or it can be entirely closed, as shown in Fig. 4.

The improved dead-plate may be used with longitudinal fire-bars *d* of any of the ordinary kinds, as shown in the drawings, or with transverse rocking or other fire-bars of the kind described in the Letters Patent of the United States of America granted to James George Galley, dated January 16, A. D. 1883, and numbered 270,582, or of other kinds, and it may be made in one piece or in two or more parts, as may be convenient.

Across the front or inner edge of the dead-plate *b* I make a continuous transverse shallow rib *e*, triangular in cross-section, the apex being uppermost and projecting for a short distance above the level of the dead-plate. This shallow rib serves as a guide to the attendant in supplying fuel, as it is necessary that the latter should be pushed forward beyond the rib *e*, in order to prevent the possibility of the air opening or passage *a* being stopped. At the same time the triangular section of the rib *e* prevents it from catching or preventing the free movement of the implements used in firing. Instead of being continuous, the rib described may have angular or other notches or spaces formed in its length.

The projections and notches which form the transverse opening or passage *a* for air through the dead-plate *b*, as described and shown, instead of being made angular, may be rounded at their corners, so that the shape of the opening is more or less undulating or waving in plan, as shown in dotted lines in Fig. 2.

Instead of one opening *a*, two or more may be used, and its shape and the shape, propor-

tions, and method of arrangement of the several parts may be varied more or less, as may be found convenient, to suit different circumstances.

- 5 My present invention may be applied to furnaces of all kinds, and more especially to the furnaces of steam-boilers, and by its use perfect combustion of the coal or other fuel is promoted and the production of smoke prevented, while the apparatus is simple, cheap,
10 and not likely to get out of order.

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

1. In a furnace, the air space or channel *a*
15 through the dead-plate *b*, having its side notched or serrated or curved to receive corresponding projections upon the opposite side, the air-space being left between them, substantially as described, and shown in the drawings.
20

2. In a furnace, in a device for admitting air in front of the grate-bars, the combination, with a dead-plate *b*, having a serrated

aperture *a* therein, and rib *c* beyond said aperture *a*, of a pivoted plate *c*, with means for
25 altering the position of the same, the said pivoted plate *c* being adapted to control the supply of air admitted through the aperture *a*, substantially as described.

3. In a furnace, in a device for admitting a
30 regulated supply of air in front of the grate-bars, the combination, with a dead-plate having a serrated aperture therein and an inclined rib in the rear of said aperture, of a pivoted plate adapted to wholly or partially
35 close said aperture, and a hand-rod connected to said pivoted plate, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of the two subscribing
40 witnesses.

EDWIN FAULKNER PADDON.

Witnesses:

GEORGE HENRY HALLIWELL,
ARTHUR ERNEST EDWARDS.