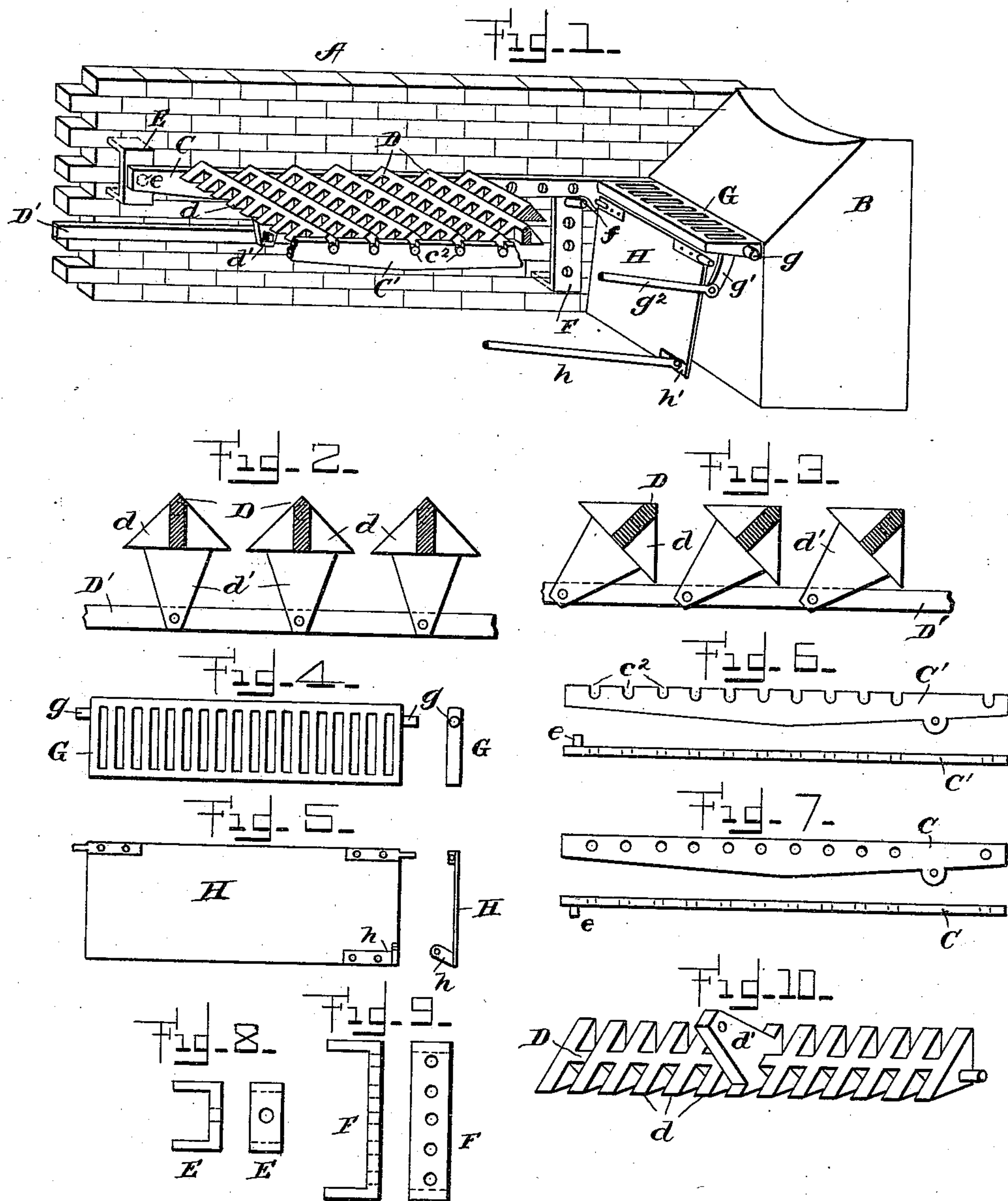


(No Model.)

H. L. WILSON.
FURNACE GRATE.

No. 549,988.

Patented Nov. 19, 1895.



Witnesses:

Bessie Sommerville
John L. Smith

Inventor.

Harry L. Wilson,
By A. M. Smith & Son,
Attorneys.

UNITED STATES PATENT OFFICE.

HARRY L. WILSON, OF ERIE, PENNSYLVANIA.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 549,988, dated November 19, 1895.

Application filed April 17, 1895. Serial No. 546,115. (No model.)

To all whom it may concern:

Be it known that I, HARRY LAMBERT WILSON, a citizen of the United States, and a resident of Erie, county of Erie, and State of Pennsylvania, have invented a new and useful Improvement in Furnace-Grates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a novel arrangement or combination of rocking grate-bars, supplemental drop-grate, and an adjustable apron or cut-off with adjustable side bars, in which said parts are journaled, whereby the angle of inclination of the grate as a whole can be adjusted as required; and to the construction of the rocking grate-bars whereby the operative faces of the ribs thereof when in use are formed at opposing angles of about forty-five degrees each to a horizontal plane, thereby increasing the burning or fire surface of the bars and also their dumping capacity or the openings between the bars when they are rocked for clearing the grate of ashes and clinkers.

It further relates to the means for pivoting and effecting the adjustment of the grate side bars, cut-off, and drop-grate, and to certain details of construction and arrangement of parts, all as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a grate partly broken away to show my improvements and with the adjacent side wall of the furnace removed for the same purpose. Fig. 2 shows several of the rocking grate-bars in section in the position they occupy in use; and Fig. 3, a similar section showing the bars rocked downward to dump the ashes, &c. Fig. 4 shows the drop-grate in front and end elevations, and Fig. 5 similar views of the cut-off apron. Figs. 6 and 7 show side and plan views of the grate side bars; Fig. 8, side and face views of one of the angle-irons in which said side bars are pivoted, and Fig. 9 similar views of the angle-irons permitting the adjustment of the grate. Fig. 10 is a perspective view showing the lower face of one of the rocking grate-bars.

A indicates a portion of the brickwork of a furnace, and B the fire wall or bridge in rear of the furnace-grate, said brickwork and

bridge-wall being of any usual or suitable construction.

C C' indicate the side bars of the grate, one of which C is perforated at regular intervals in its length to receive the pivots or journals at one end of the rocking grate-bars D and in rear thereof for the trunnions or pivots of the cut-off and drop-grate, the other bar C' having sockets or slots c^2 on its upper face correspondingly arranged to receive the pivots or journals at the other ends of the grate-bars, drop-grate, and cut-off for permitting the ready removal and replacement of said parts.

The forward ends of the side bars C and C' are provided with laterally-projecting pins or trunnions e, which are journaled in angular or U-shaped irons or plates E, the arms of which are solidly set in the brickwork, and near their rear ends the bars C and C' rest upon pins f, adjustable up and down in series of perforations in angular irons or plates F, also set in the brickwork. By this arrangement the angle of inclination of the bars C and C', and therewith of the grate as a whole, including the rocking grate-bars, the drop-grate, and the cut-off, can be adjusted as desired to adapt it to the varying conditions of draft and feed required.

The grate-bars D extend across between the bars C and C', and are provided at their ends with trunnions which rest in the bearings in said bars. The bars D, *per se*, between the bars C and C' may be of any suitable form; but the ribs *dd* formed thereon are made preferably in form approximating a right-angled triangle with the right angle forming the apex of the ribs and bars and the hypotenuse thereof the base of the triangle, giving to the grate-bar as a whole the triangular form shown with its upper face composed of the oppositely-inclined sides of the angle each at an angle of about forty-five degrees to a horizontal longitudinally drawn line. The journals at the ends of said bars are located preferably near the apex of the angle, giving to the top of the bars merely a rolling movement when the bars are rocked and causing the oppositely-inclined sides of opposing ribs to rest in close proximity to each other when in operative position, as shown in Fig. 2, and to swing away at their lower angles so as to leave wider spaces between them when the

bars are rocked to discharge or dump the ashes and cinder, as shown in Fig. 3. By this construction an increased burning surface is given to the coal on the grate-bars and the discharge of ashes and cinder is greatly facilitated. Each bar is provided with a pendent lever-arm d' for rocking it, and these several arms are connected with a longitudinally-arranged bar D' , which extends to the front of the furnace and may be operated by any suitable means.

G indicates a supplemental dumping or drop grate also extending across between the bars C and C' at the rear lower ends thereof and provided with end journals g , pivoted in said bars. This grate, which may be of any suitable construction, is preferably pivoted near its rear edge and is provided with a pendent arm or lever g' , from which a rod g^2 extends to the front of the furnace for controlling or dumping, resetting, and holding the grate. This grate is important as facilitating the discharge of any accumulation of ashes and cinder which may pass over and beyond the action of the rocking grate-bars.

H indicates a cut-off or apron pivoted at its ends in the bars C and C' and preferably slightly below the plane of the rocking bars D and just forward of the drop-grate G , as shown. Its object is to cut off the draft from the drop-grate while the latter is being dumped, and it is controlled by means of a rod h , pivoted to a lug h' on the apron and extending thence to the front of the furnace into convenient position to be operated by the attendant.

The drop-grate and cut-off being both pivoted in the bars C and C' are adjusted therewith, and so always maintain the same working relation to the rocking grate-bars or main body of the grate.

Parts of the furnace not particularly de-

scribed may be constructed and arranged in any usual manner.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The side bars or bearers carrying the main grate pivoted at their forward ends and made adjustable at their rear ends for varying the angle of the grate, in combination with the dumping, tail grate pivoted in said rear ends and adjustable with the bearers and the main grate for maintaining its working relation thereto, for the purpose and substantially as described.

2. The combination with the adjustable side bars or bearers carrying the main grate, of the dumping, tail grate pivoted in said bars, and the draft damper or cut-off also pivoted in said side bars, at a point intermediate the main and dumping grates and adjustable therewith, substantially as described.

3. In a furnace grate, the pivoted grate bars made substantially triangular in cross-section and having their fuel-bearing, upper surfaces composed of opposing inclines forming substantially right-angled apices to said bars, said bars being pivoted to rock in or nearly in the horizontal plane of said apices and with the lower angles of adjacent bars brought into close proximity, whereby a greatly increased burning surface is obtained for the fuel and said lower angles are made to swing away from each other when the bars are rocked on their pivots, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 7th day of December, A. D. 1894.

HARRY L. WILSON.

Witnesses:

C. B. HAYES,

P. H. McMAHON.