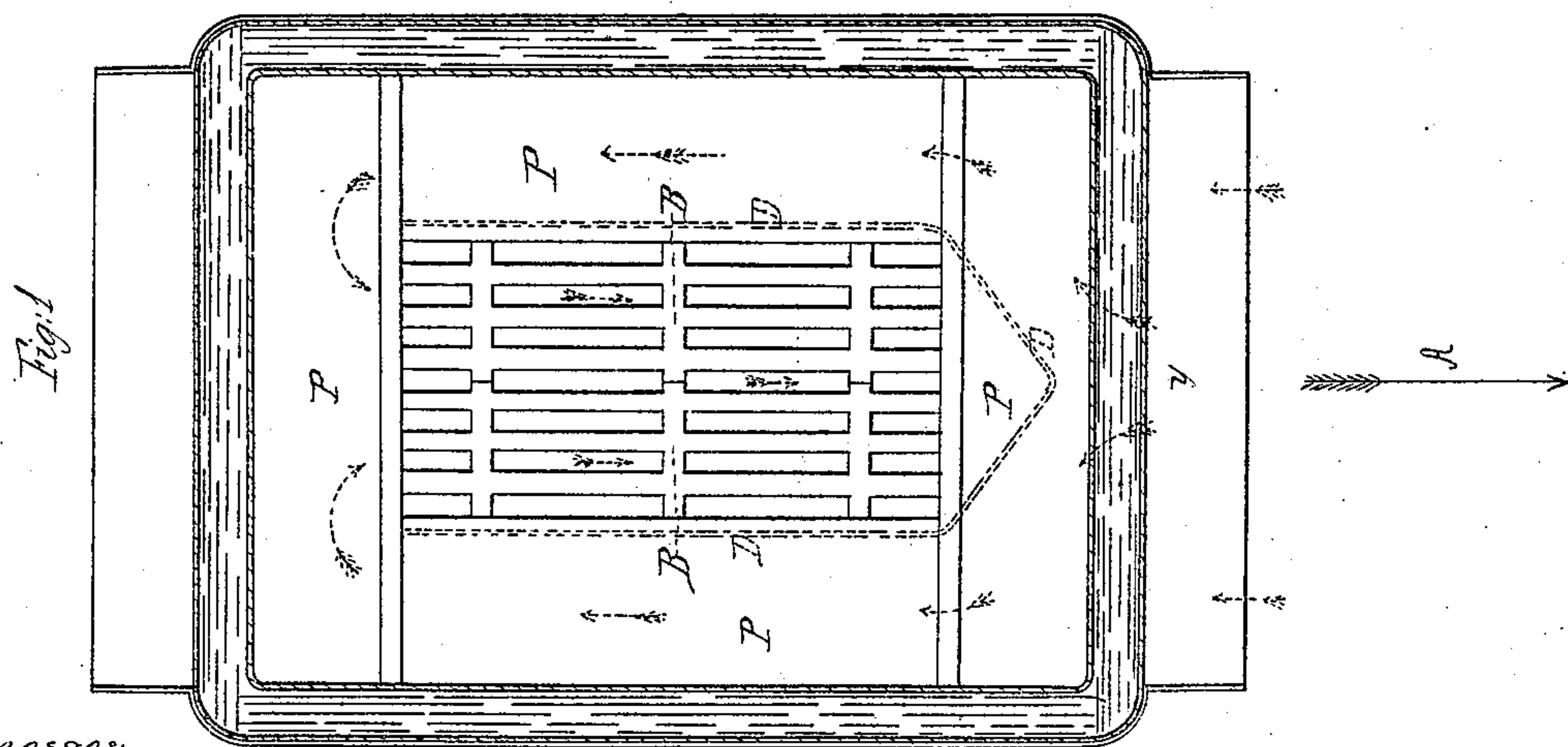
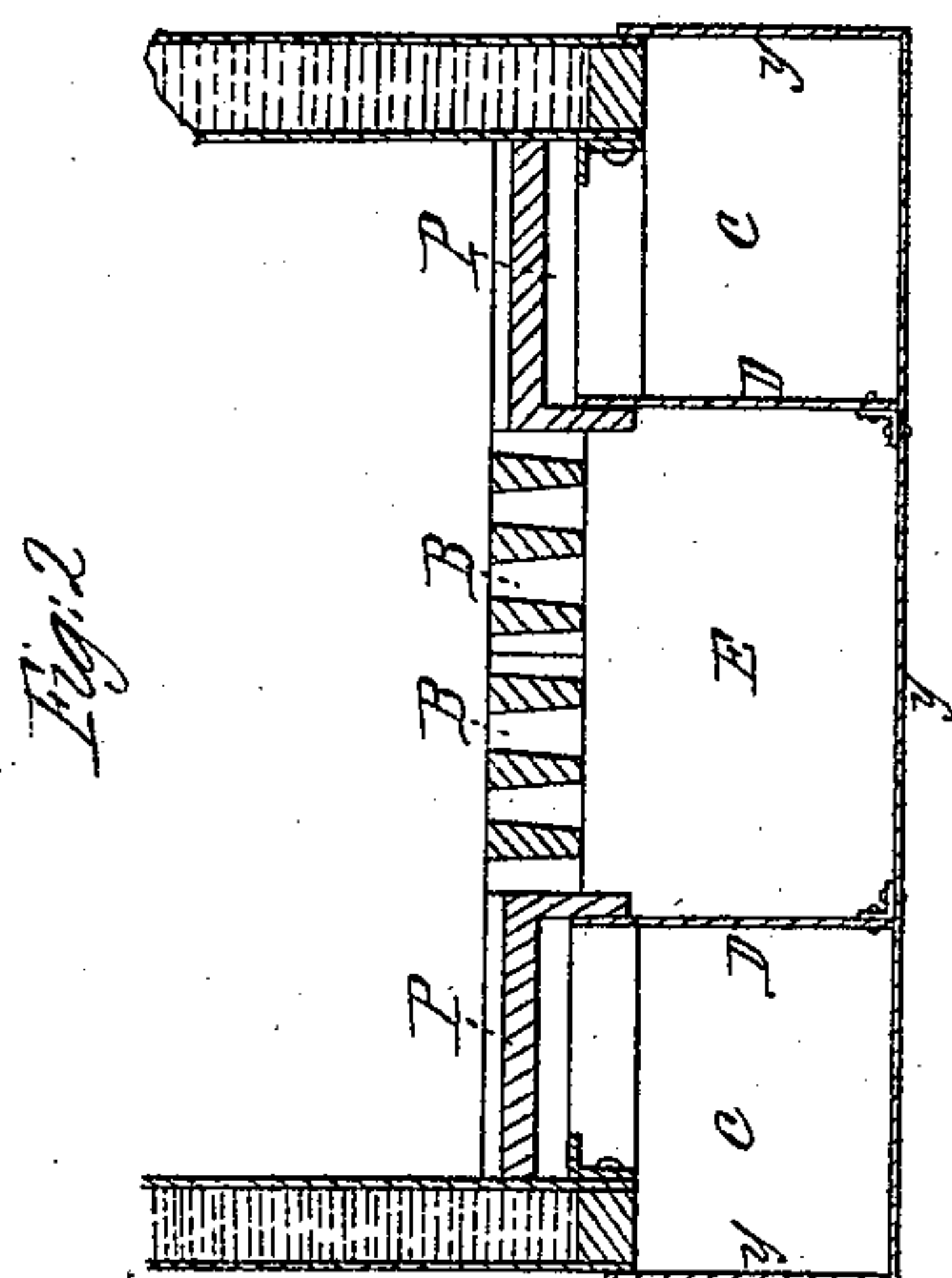


Unton & Nichols,

Furnace Grate.

N^o 62,787.

Patented Mar. 12, 1867.



Witnesses:
W. S. Loughborough
P. J. Turner

Inventors
David Asplund
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DAVID UPTON, OF ROCHESTER, NEW YORK, AND CYRUS H. NICHOLS, OF
BUFFALO, NEW YORK.

Letters Patent No. 62,787, dated March 12, 1867.

ASH-PAN AND FIRE-GRATE FOR LOCOMOTIVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, DAVID UPTON, of Rochester, in the county of Monroe, and State of New York, and CYRUS H. NICHOLS, of Buffalo, in the county of Erie, and State aforesaid, have invented certain new and useful improvements in the construction of the "Ash-Pan and Grates of Locomotive Engines;" and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a top view or plan of our improved fire-box bottom and grate, showing the lower portion of the ordinary fire-box of locomotive engines.

Figure 2 is a transverse vertical section of the same.

Like letters indicate corresponding parts in both figures.

The heavy black arrow A indicates the direction of the travel of the engine, and the small red arrows show the direction of the draught currents.

This invention relates more especially to that class of locomotive engines called "wood-burners," and its nature consists in contracting or reducing the area of the grate surface about two-thirds, more or less, by means of tight plates placed at the sides and in front and rear, and in the employment of draught-plates so arranged in the ash-pan as to divide the induction current of atmospheric air, causing it to pass under the contracting plates at each side to the rear of the ash-pan, where the two currents are concentrated, and, returning, pass up through the contracted grates in the centre of the fire-box, the air being heated in its passage under the side plates.

To enable others to make and use our invention, we will describe its construction and operation.

Our invention is intended to be used in locomotive engines more particularly, though it may be applied with a good effect to stationary or other engines.

We reduce the area of the fire-grate about two-thirds by placing tight plates P at each side and end of the fire-box bottom, leaving an open space in the centre of only about one-third or one-fourth of the area of the fire-box bottom. The grate bars B are then fitted in the open space. The draught-plates D are arranged as shown by the dotted lines D in fig 1, and are made to fill the space, vertically, from the ash-pan Y to the inner edge of the side contracting plates P. They may be attached to the ash-pan by angle irons or otherwise. There should be a space left at the rear end of these division or draught-plates, between them and the rear damper-plate, sufficient to permit the free passage of the volume of air taken in at the front when that damper is wide open, the rear damper generally being kept closed, except when the engine is being backed. Our ash-pan, as well as those of ordinary locomotives, is provided with a damper at the front and rear, either or both of which may be opened or closed, as may be desired. As the air current passes through the side flues C and is forced into the centre passage, or flue E, it becomes heated so as to effect the necessary chemical combination with the gases to produce a perfect combustion. It is found that when the draught is established through these flues C and E a much steadier and more uniform current is maintained than can be effected with the ordinary ash-pan and fire-grate. Even when the engine is backing, the effect is quite as good with this as it is with the former construction.

We have demonstrated, by actual experiment, that the same engine, provided with our improvements, will generate more steam, with a saving of a large percentage in fuel, than was possible before our invention was applied.

The flues C and E are always kept clear by the draught, which prevents the possibility of the escape of sparks or coals from the ash-pan, and, consequently, wholly avoids the necessity of using netting or screens over the damper-openings, as heretofore required. The liability of these screens to choke up with weeds, grass, &c., renders their use very objectionable to engineers on account of obstructing the draught to a serious extent.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The application of the draught or flue-plates D, substantially in the manner and for the purposes herein shown and described.
2. In combination with the said draught-plates D, the contracting plates P, and grates B, substantially as and for the purposes set forth.

DAVID UPTON,
C. H. NICHOLS.

Witnesses:

WM. S. LOUGHBOROUGH,
P. T. TURNER.