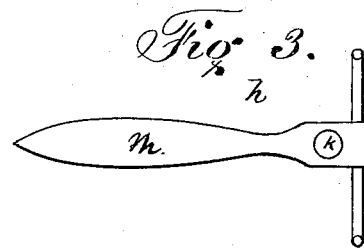
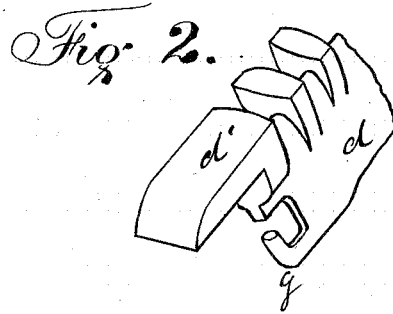
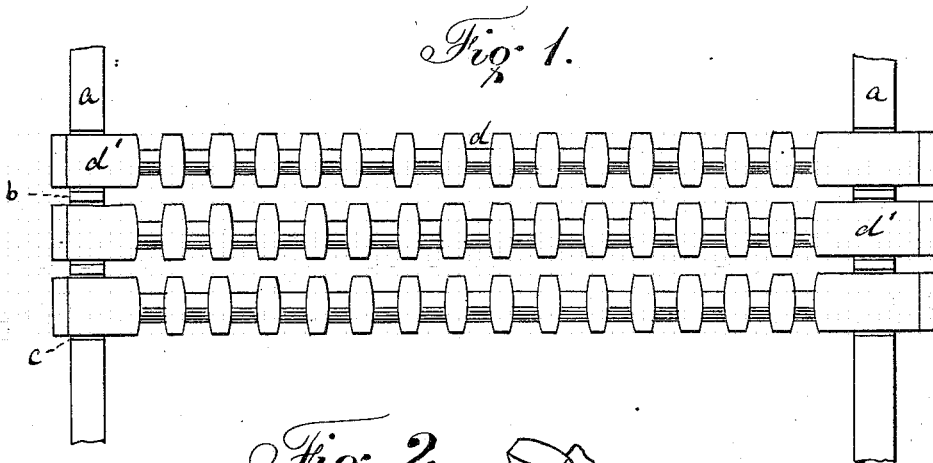


J. A. SINCLAIR.

Grate-Bars.

No. 164,401.

Patented June 15, 1875.



Witnesses
Benjamin C. Pole
John D. Patterson

Inventor
James A. Sinclair
by
C. S. Whitman
attorney

UNITED STATES PATENT OFFICE.

JAMES A. SINCLAIR, OF BRIDGEPORT, OHIO, ASSIGNOR TO ABRAM LASH
AND ADONIRAM D. NEWLAND.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **164,401**, dated June 15, 1875; application filed
September 24, 1874.

To all whom it may concern:

Be it known that I, JAMES A. SINCLAIR, of Bridgeport, county of Belmont and State of Ohio, have invented Improvements in Grate-Bars.

The following description, taken in connection with the accompanying plate of drawings hereinafter referred to, forms a full and exact specification, wherein are set forth the nature and principles of the invention, by which the same may be distinguished from others of a similar class, together with such parts thereof as are claimed as new and are desired to be secured by Letters Patent of the United States.

My invention relates to that class of grates in which the bars are made to reciprocate in reverse directions; and the nature thereof consists in certain improvements in the details of the construction of the same, and novel combinations of the parts thereof, hereinafter shown and described.

In the accompanying plate of drawings, in which corresponding parts are illustrated by similar letters, Figure 1 is a top view. Fig. 2 illustrates in detail one of the bars. Fig. 3 is a view of the operating-lever.

A designates the grate, which is arranged, in the ordinary manner, over the ash-box, and is provided with projections *b*, which form a series of slots, *c*, in which are placed the bars *d*. The said bars are of the form clearly shown in Fig. 2, and are provided with upwardly-projecting lugs, having intervals between them, which shield the bar from the intense heat. The said bar is also provided with projections *d'*, the under sides of which may be either

parallel with the top of the bar or at an angle therewith. In the latter case the movement of the bar will be not only in the horizontal direction, but also in the vertical plane. The end of the said bar is provided with a projecting lug, *g*, of proper size to fit the apertures in the operating-lever.

The operating-lever *h* consists of a plate provided with apertures *k*, and having a handle, *m*. The lugs *g* are inserted in the apertures *k*, and the handle *m* is moved backward and forward. This movement causes the bars on each side of the handle to reciprocate in reverse directions alternately, and effects the removal of the ashes and clinkers with the greatest facility.

Bars of this construction can be placed on the same bearing as that occupied by common bars without change of construction, and have about twenty-five per cent. more air-space than the common bars.

Having thus described the construction and operation of my invention, I claim and desire to secure by Letters Patent of the United States—

The bars, having bearings *d* and projecting lugs *g*, in combination with the operating-lever *h*, having a handle, *m*, and aperture *k*, into which the lugs *g* are inserted, as and for the purposes described.

In testimony that I claim the foregoing, I have hereunto set my hand this 6th day of July, 1874.

JAS. A. SINCLAIR.

Witnesses:

T. C. ROWLES,
S. OPPENHEIMER.