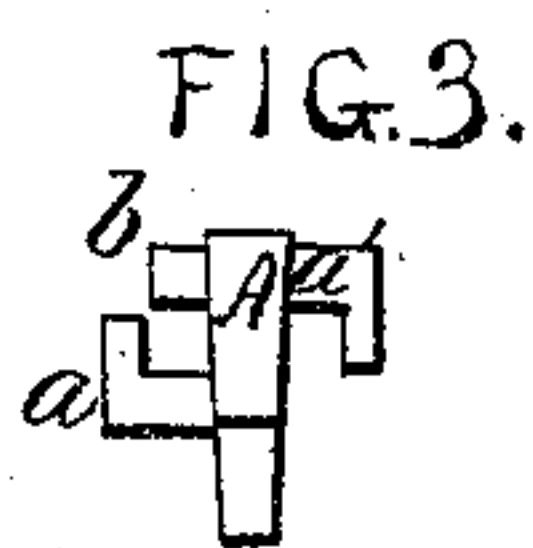
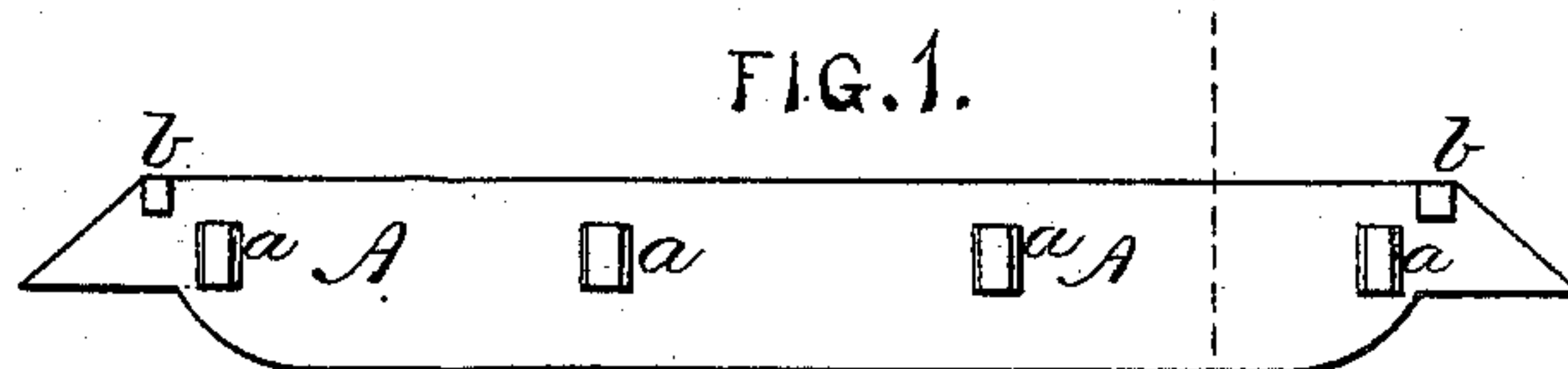


A. F. CROWELL.

Grate-Bars.

No. 143,224.

Patented September 30, 1873.



WITNESSES.

E. H. Johnson

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UNITED STATES PATENT OFFICE.

ALPHONSO F. CROWELL, OF HYANNIS, MASSACHUSETTS, ASSIGNOR TO
GEORGE H. CLARKE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **143,224**, dated September 30, 1873; application filed
September 9, 1873.

To all whom it may concern:

Be it known that I, ALPHONSO F. CROWELL, of Hyannis, Barnstable county, Massachusetts, have invented certain new and useful Improvements in Grate-Bars, of which the following is a specification:

My invention relates to furnace grate-bars, generally known as interlocking bars, which are cast separately, and then locked in a series to form the grate; and the invention consists in a novel construction, combination, and arrangement, which have for their object to produce a cheap and perfect bar, which is simple in its construction, and easily manipulated in putting together or taking apart the grate.

Figure 1 is a side elevation. Fig. 2 is a sectional view through *xx*. Fig. 3 is an end view of a single bar.

A A represent the bars, on each side of which are cast the hooks *a a'*.

By reference to Fig. 2 it will be observed that the hooks on one side of the bar are cast in the reverse direction of those on the other side—that is to say, the hooks *a'* commence at the top of the bar and extend downward, while those marked *a* on the other side commence about midway of the bar and extend upward; thus the hooks on one side are inverted as regards those on the other.

At each extremity of the bar, at its upper edge, and on that side from which the hooks extend upward, are cast small projections or stops *b*. (Shown in Figs. 1 and 3.)

When the bars are put together the hooks engage with each other, and prevent them coming apart; for, as the hooks on one side are reversed to those on the other, it is evident that the bar could not be withdrawn in either direction, while at the same time ample facility is afforded for lateral expansion and contraction. The stops *b b* prevent the bars from being disconnected by being drawn out in the direction of their length, the hooks *a'* on the adjacent bar coming in contact with them, and thus preventing the withdrawal of the bar.

I claim—

In combination with the bar *A*, the hooks *a* and *a'* upon opposite sides of the bar, and the stop-lugs *b*, constructed, arranged, and operated substantially as described.

ALPHONSO F. CROWELL.

Witnesses:

E. H. JOHNSON,
C. A. DURGIN.