

(No Model.)

2 Sheets—Sheet 1.

T. REESE, Jr.
FURNACE GRATE.

No. 562,196.

Patented June 16, 1896.

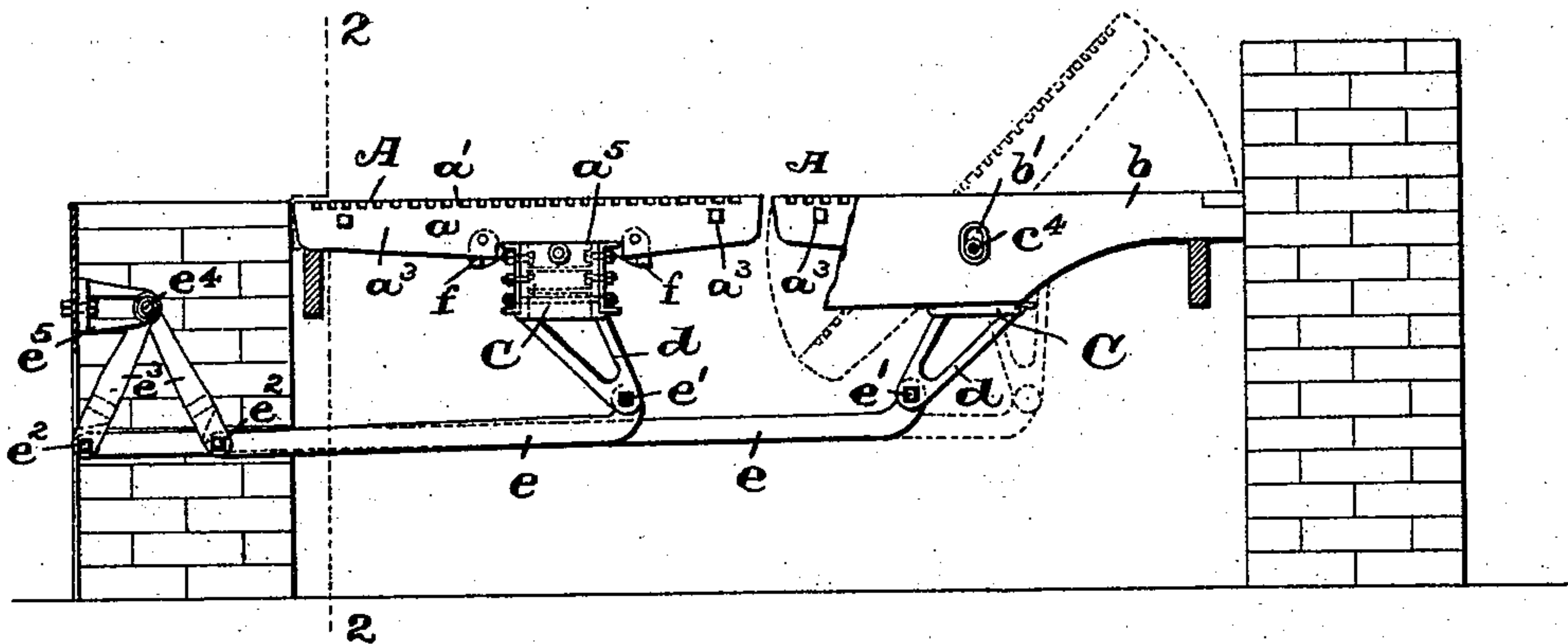


FIG. 1

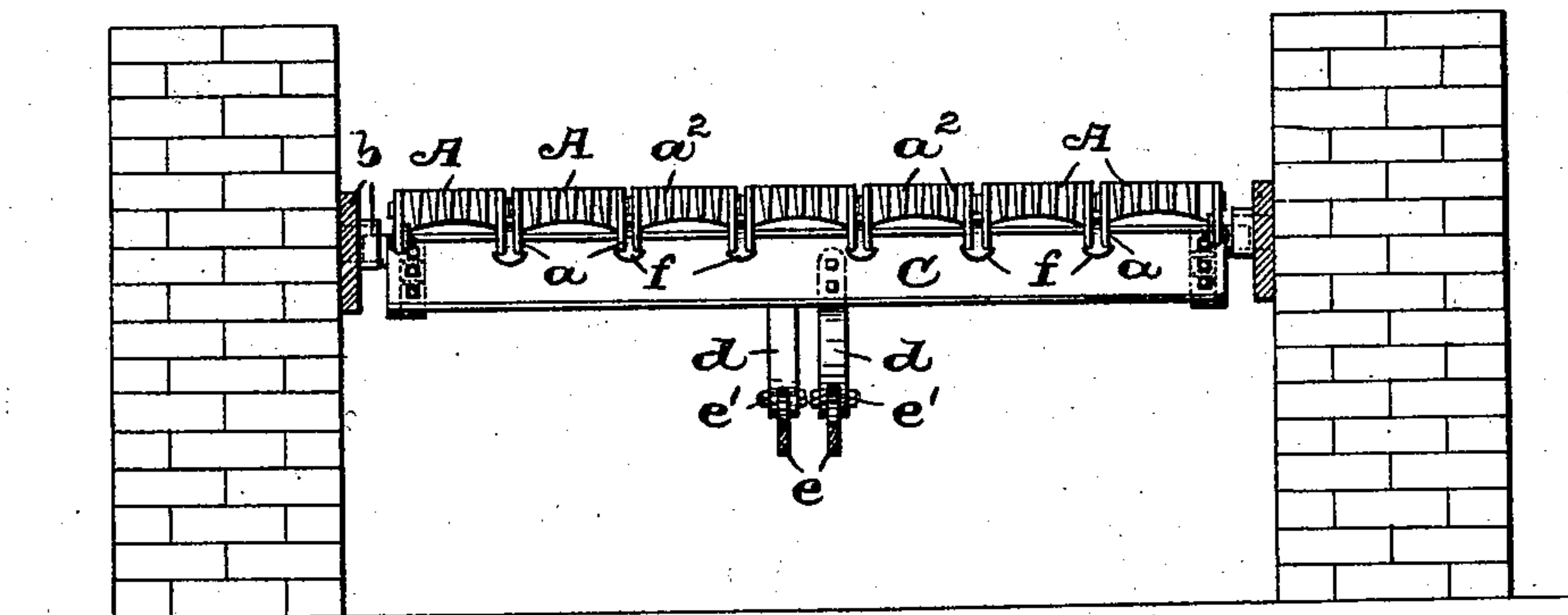


FIG. 2

WITNESSES:

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INVENTOR:

THOMAS REESE, JR.

BY

Fred C. Fraentzel,
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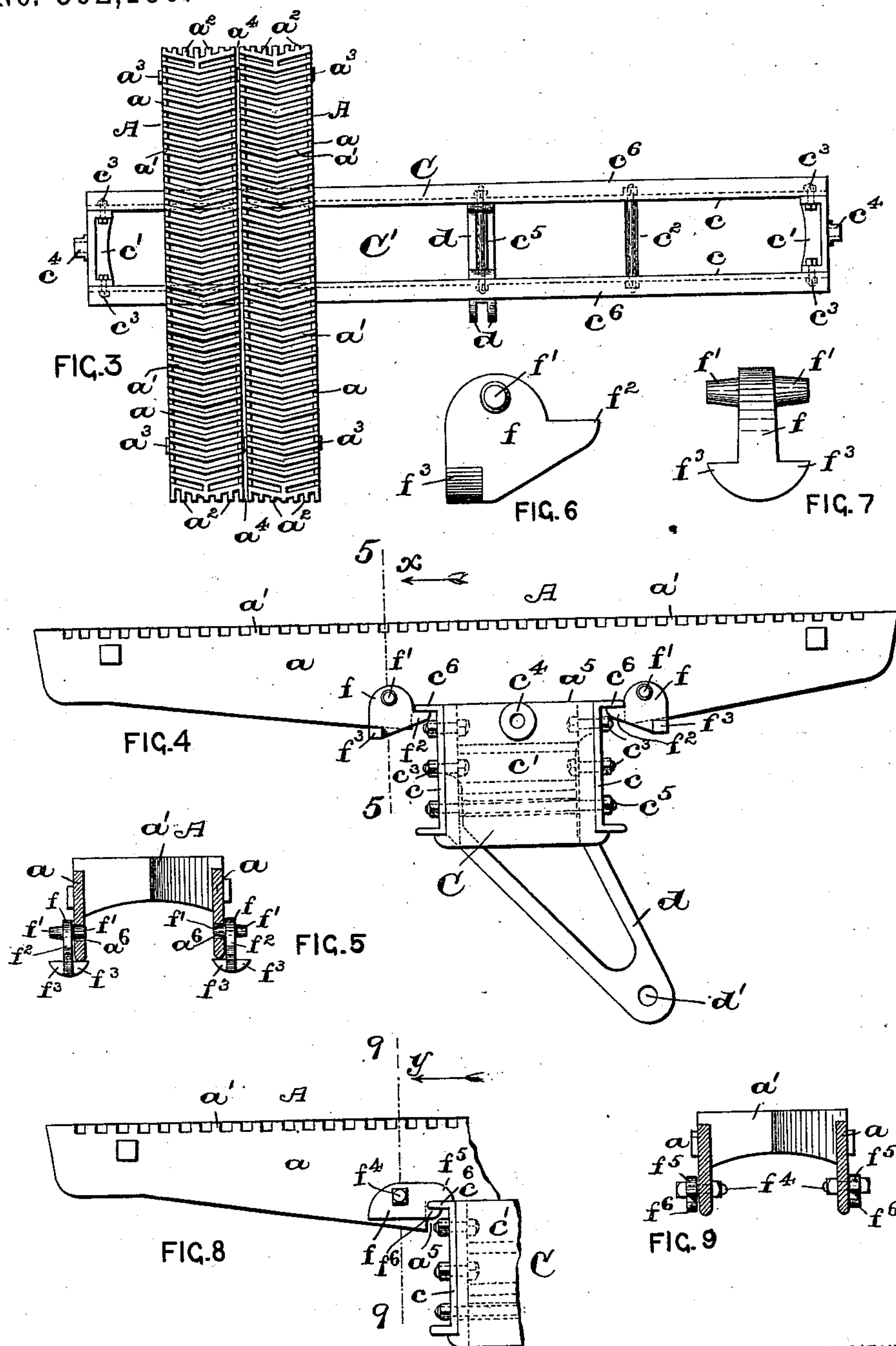
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2 Sheets—Sheet 2.

T. REESE, Jr.
FURNACE GRATE.

No. 562,196.

Patented June 16, 1896.



WITNESSES:

Wm. H. Kaufeld, Jr.
A. B. Fraentzel.

INVENTOR:

THOMAS REESE, JR.

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UNITED STATES PATENT OFFICE.

THOMAS REESE, JR., OF NEWARK, NEW JERSEY.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 562,196, dated June 16, 1896.

Application filed September 26, 1895. Serial No. 563,740. (No model.)

To all whom it may concern:

Be it known that I, THOMAS REESE, Jr., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Furnace-Grates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention is in the nature of improvements in dumping-grates for furnaces and the like; and it consists, essentially, in the pivotal arrangement of certain channel bars or beams and means for operating these bars or beams, on which the grate-bars are arranged. The invention consists, furthermore, in the arrangement and combination of one or more channel bars or beams, having a wide bearing-surface, on which the grate-bars can be arranged, and suitable locking devices, to be used in connection with said beams and the grate-bars, to prevent the displacement of the latter, when the grate is to be dumped or when it is suddenly brought into position in its framework in the furnace.

The objects of the invention are, first, to provide a simple and operative device for the purposes stated; secondly, to provide a large bearing-surface for the grate-bars on the dumping mechanism, that the heat, when in use, will be less destructive to the several parts, and cause the grate-bars to set level and with greater rigidity; and lastly, to provide a suitable locking device to hold the grate-bars in place when the grate is dumped. By means of my novel construction and arrangement of the grate-bars on the channel beams or bar, the grate-bars will be more serviceable, and at the same time will not interfere with the passage of the air to the fuel on the grate.

My invention is clearly illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a longitudinal vertical section of a portion of a furnace, with the grate-frame partly broken away to illustrate in side elevation the arrangement of one of the channel beams or bars and the operating mechanism

connected therewith, with the grate-bars in position on the channel-beams. Fig. 2 is a vertical cross-section, taken on line 2 2 in Fig. 1, but the grate-bars being represented in end elevation. Fig. 3 is a plan view of one of the channel beams or bars, and a pair of grate-bars in position thereon. Fig. 4 is a side view of one of the grate-bars in position on the channel beam or bar, illustrating, in connection therewith, one form of holding or locking device, said view being on an enlarged scale; and Fig. 5 is a vertical section, taken on line 5 5 in said Fig. 4, but looking in the direction of the arrow *x*. Figs. 6 and 7 are a side and an end view, respectively, of the holding or locking device illustrated in connection with the parts shown in said Fig. 4. Fig. 8 is a side view of a portion of one of the grate-bars and the channel beam or bar, illustrating in connection therewith a modified form of construction of locking or holding device; and Fig. 9 is a vertical cross-section taken on line 9 9 in Fig. 8, but looking in the direction of arrow *y*.

Similar letters of reference are employed in all of the above-described views to indicate like parts.

In said drawings, A designates any suitable form of grate-bar, but preferably of the construction illustrated in the several figures, and in which *a a* are longitudinal ribs extending from end to end of each grate-bar. Upon the top of these ribs and cast integral therewith are transverse bars *a'*, which project above the upper edges of the ribs *a* so as to support the bed of fuel entirely above the upper edges of said ribs, and to allow a free passage of air above the said ribs.

The ends of each grate-bar may be provided with short projections *a²*, which extend from the transverse bars *a'*, and parallel, or approximately so, with the longitudinal ribs *a*. Said transverse bars *a'* are preferably made V-shaped, but they may be straight or of any other desirable shape, as will be clearly evident.

In the form of grate-bar shown more especially in Fig. 3 it will be observed that the transverse bars *a'* extend out even with, but not beyond, the outer sides of the longitudinal ribs *a*, said ribs being provided with small lugs or projections *a³* on their outer surfaces,

so that, when the grate-bars are placed side by side, as indicated in Figs. 2 and 3, said lugs a^3 will prevent said ribs a from contacting with each other, and a longitudinal air-space a^4 will be formed between any two consecutive grate-bars. By this construction and arrangement of the grate-bars, the greatest amount of air-space is obtained, and I am enabled to present equal and uniform openings at all points of the grate-surface, thus admitting the air equally at each and every point upon the transverse bars a' and the short longitudinal end bars a^2 , entirely out of contact with any portion of the longitudinal ribs a , and when two or more grate-bars are placed side by side, or end to end, the openings remain the same as though no separation has been made. Hence the draft is not obstructed at the joints by a solid bar or plate, which is liable to burn out and constitutes in all grates the weakest point and is the first to give away.

As will be seen from an inspection of Figs. 1, 2, and 4, each grate-bar is provided in the lower surfaces of the longitudinal ribs a , near the middle thereof, with the recessed or cut-away portions a^5 , whereby any desirable number of grate-bars can be arranged side by side on the dumping bar or beam C, which snugly fits into the said recessed or cut-away portions a^5 of the grate-bars, substantially as illustrated. Said channel beams or bars C, as will be seen from Fig. 3, are made in the form of a girder, consisting, essentially, of the side beams c and the end pieces c' , said parts being suitably secured together by bolts c^2 and c^3 . Each end piece c' is provided with an outwardly-extending pivot or pintle c^4 , which fits in the openings b' of the usual form of grate-frame b , as clearly shown in Figs. 1 and 2. To oscillate said channel beams or bars C in their bearings b' in the frame b , I have secured to the side bars c , by means of bolts c^5 , or in any other well-known manner, suitable brackets d , which are provided at the bottom with perforations or holes d' . Pivotaly secured to said brackets d , by means of bolts or pins e' , are forwardly extending connecting rods or bars e , which are pivotaly connected by pins or bolts e^2 to suitable rocker-arms e^3 , secured on a rock-shaft e^4 , and which is operatively arranged in suitable bearings e^5 in the brick setting and is operated in the usual manner.

From Fig. 1 it will be seen that when the rock-shaft is operated to move the connecting-rods e forwardly or backwardly, as the case may be, the channel beams or bars C can be made to oscillate on their pivots in the bearings b' to cause the grate-bars to assume an inclined position, as indicated in dotted outline, and the ashes on the grate-bars can be readily dumped into the ash-pit, as will be clearly evident.

To avoid the possibility of displacement of the grate-bars A on the beams C, when the

dumping device is quickly and roughly manipulated, I have secured to the longitudinal ribs of each grate-bar certain holding or locking devices f , which are constructed and operate in the following manner:

As will be seen from Figs. 6 and 7, these locking devices consist of the body f , from which extends on opposite sides the posts or pintles f' . A nosing or holding-jaw f^2 is formed on one edge of the body f and at the lower portion and on opposite sides of the body f are two outwardly-extending projections or teats f^3 .

When one of the grate-bars A has been placed in position on one of the beams C, the post or pintle f' on one side of the body f is arranged in a perforation or hole a^6 in the longitudinal rib a and the nosing or jaw f^2 forced under a longitudinal flange c^6 on the side bars c of the beam C, while the projections or teats f^3 are firmly forced beneath the lower edge of the longitudinal rib a of the grate-bar, as will be clearly seen from Figs. 4 and 5. The device f having thus been secured in position on the rib a of the grate-bar and its jaw f^2 firmly gripping the flange c^6 of the beam C, a second grate-bar A is slipped alongside of the first grate-bar, causing the post or pintle f' and the teat f^3 on the opposite side of the device to be operatively connected in like manner with the adjacent longitudinal rib a of said second grate-bar. In this manner any suitable number of grate-bars can be securely arranged in place on the channel-beam C to form the grate, and no amount of shaking and rough handling can displace any one of the grate-bar sections during the dumping operation.

In lieu of the construction of the holding device f , just described, I can use the form of holding or locking device illustrated in Figs. 8 and 9. In this construction the body f of the device is permanently secured by means of a bolt f^4 to the sides of the longitudinal ribs a of the grate-bars, the device being formed with two oppositely-extending holding-jaws f^5 and f^6 , formed with a recess between them. Said jaws f^5 and f^6 can be arranged on the opposite sides of the longitudinal flange c^6 on the beam C, as illustrated in Fig. 8, and in this manner the grate-bar is firmly secured in its position on the beam C. As will be noticed from Figs. 3, 4, and 8, said flanges c^6 on each channel-beam C are made comparatively wide on their upper faces and therefore provide an excellent bearing-surface for the grate-bars A on the beams C.

Owing to the special construction of the channel-beams C, formed with the comparatively large open space C' , the flow of air to the grate-bars is not interfered with, thus admitting the air equally to all points of the grate-bars, and very efficient results are obtained.

I do not wish to be understood as limiting my invention to the exact arrangements and

details of construction of the parts herein shown, as I am fully aware that I may employ any desirable forms of grate-bars, and the arrangement of the side bars *c* and the end pieces *c'* of the beams *C* may be altered without departing from the scope of my present invention.

Having thus described my invention, what I claim is—

10 1. In a furnace-grate, the combination, with a pivoted dumping-beam in the form of an open girder, consisting essentially, of a pair of channel-beams, end pieces *c'*, and bolts for securing said parts together, said parts being
15 constructed and arranged to form a large open space *C'* to admit air equally to all parts of the grate-bar, longitudinally - arranged flanges *c⁶* on said beams, a grate-bar having cut-away portions *a⁵*, adapted to fit over said
20 flanges on said beams, and holding or locking devices on said grate-bar adapted to en-

gage with said flanges, substantially as and for the purposes set forth.

2. In a furnace, the combination, with a dumping-beam, having longitudinal flanges, 25 as *c⁶*, of a grate-bar thereon having a rib *a*, and locking or holding devices on said bar to secure the same on said beam, consisting, essentially, of plates *f*, having posts or pin- 30 tles *f'*, a nosing or jaw *f²*, adapted to engage with said flange *c⁶*, and oppositely-extending projections or teats *f³*, adapted to engage with said rib *a* of the grate-bar substantially as and for the purposes set forth.

In testimony that I claim the invention set 35 forth above I have hereunto set my hand this 24th day of September, 1895.

THOMAS REESE, JR.

Witnesses:

FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.