No. 622,438. Patented Apr. 4, 1899.

W. BEAM.

METALLURGICAL FURNACE APPLIANCE.

(Application filed July 18, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

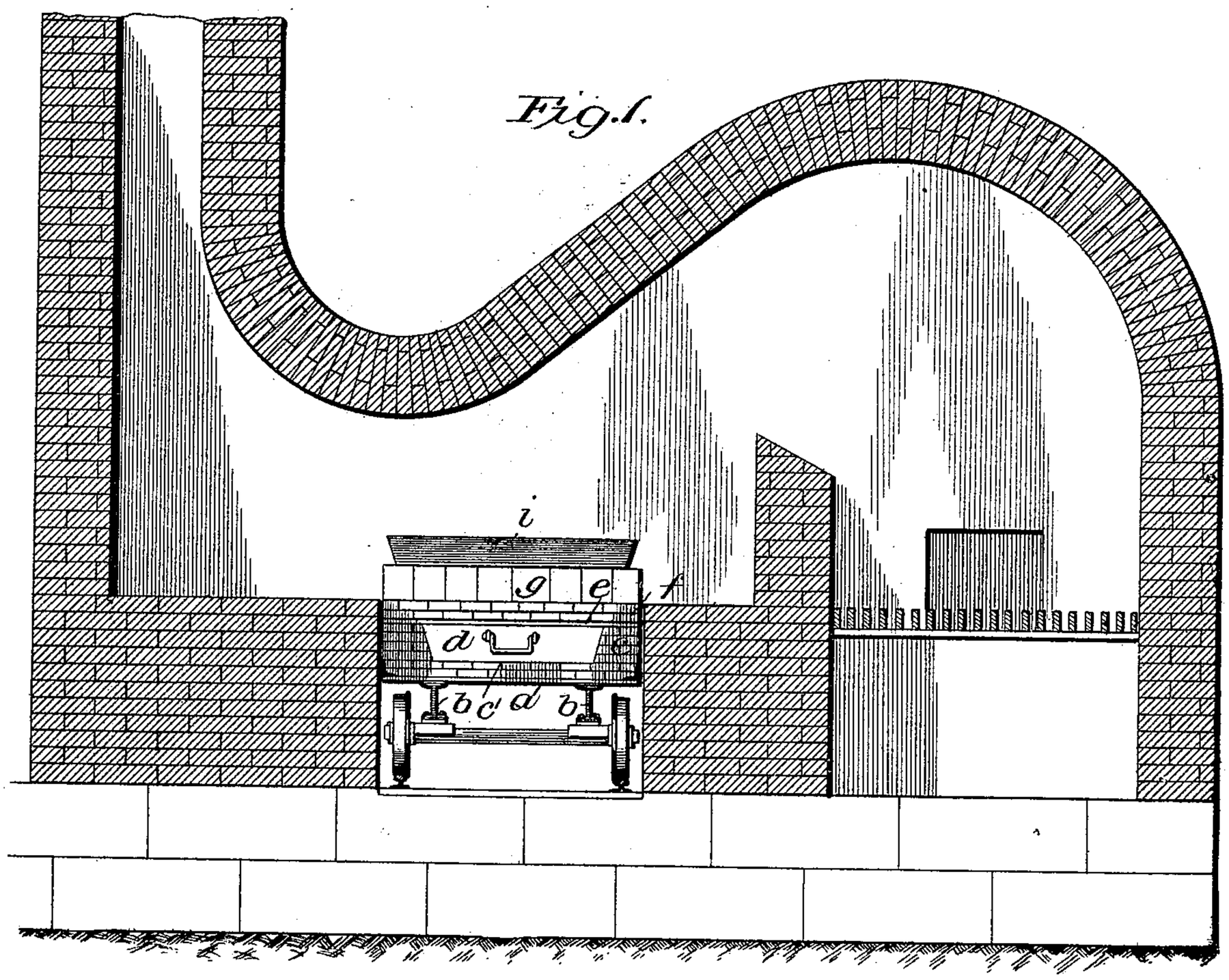

Fig. 2.

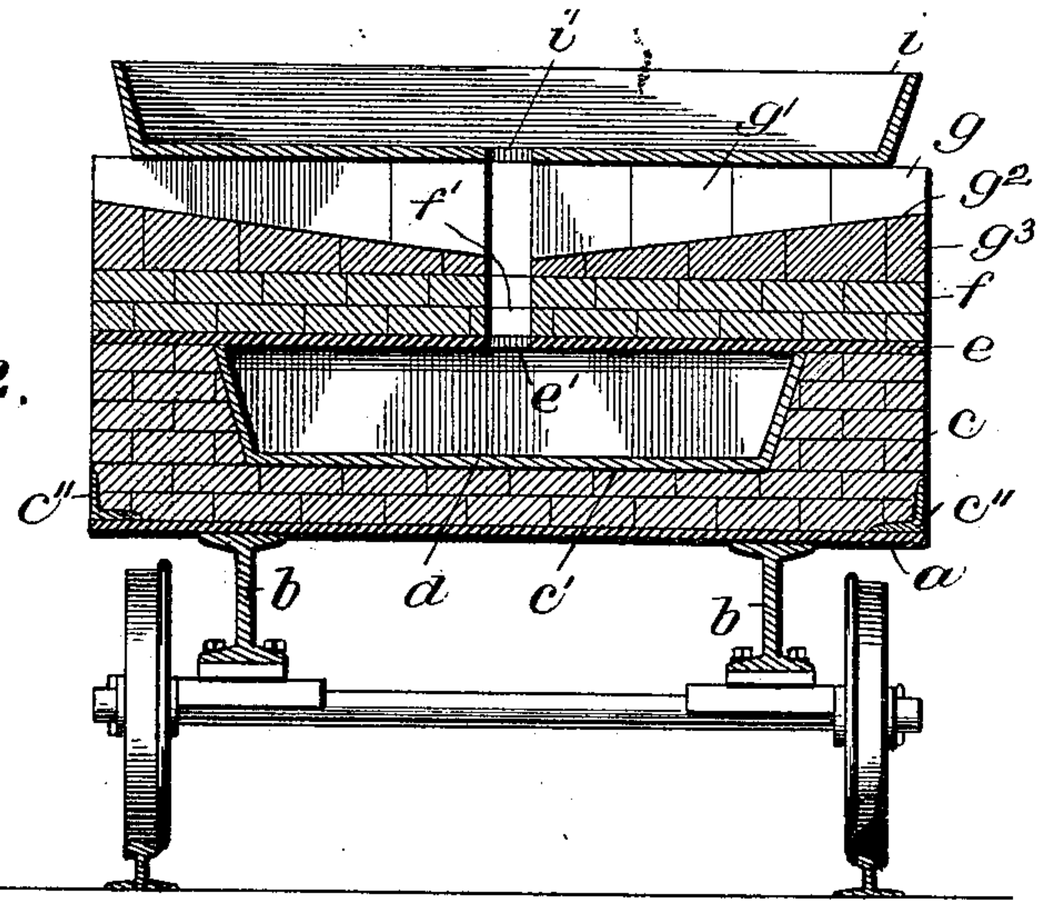

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Fig. 3.

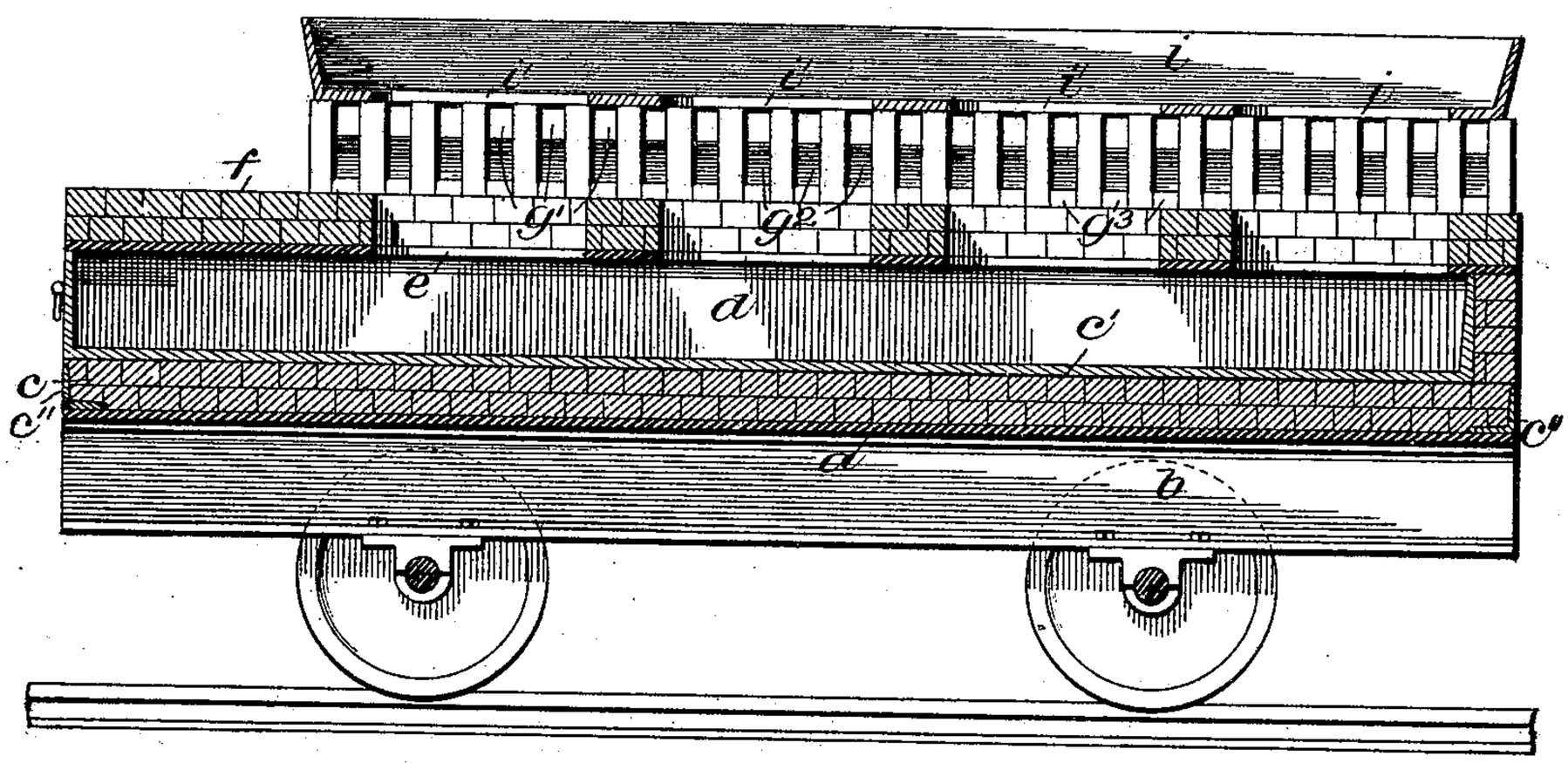
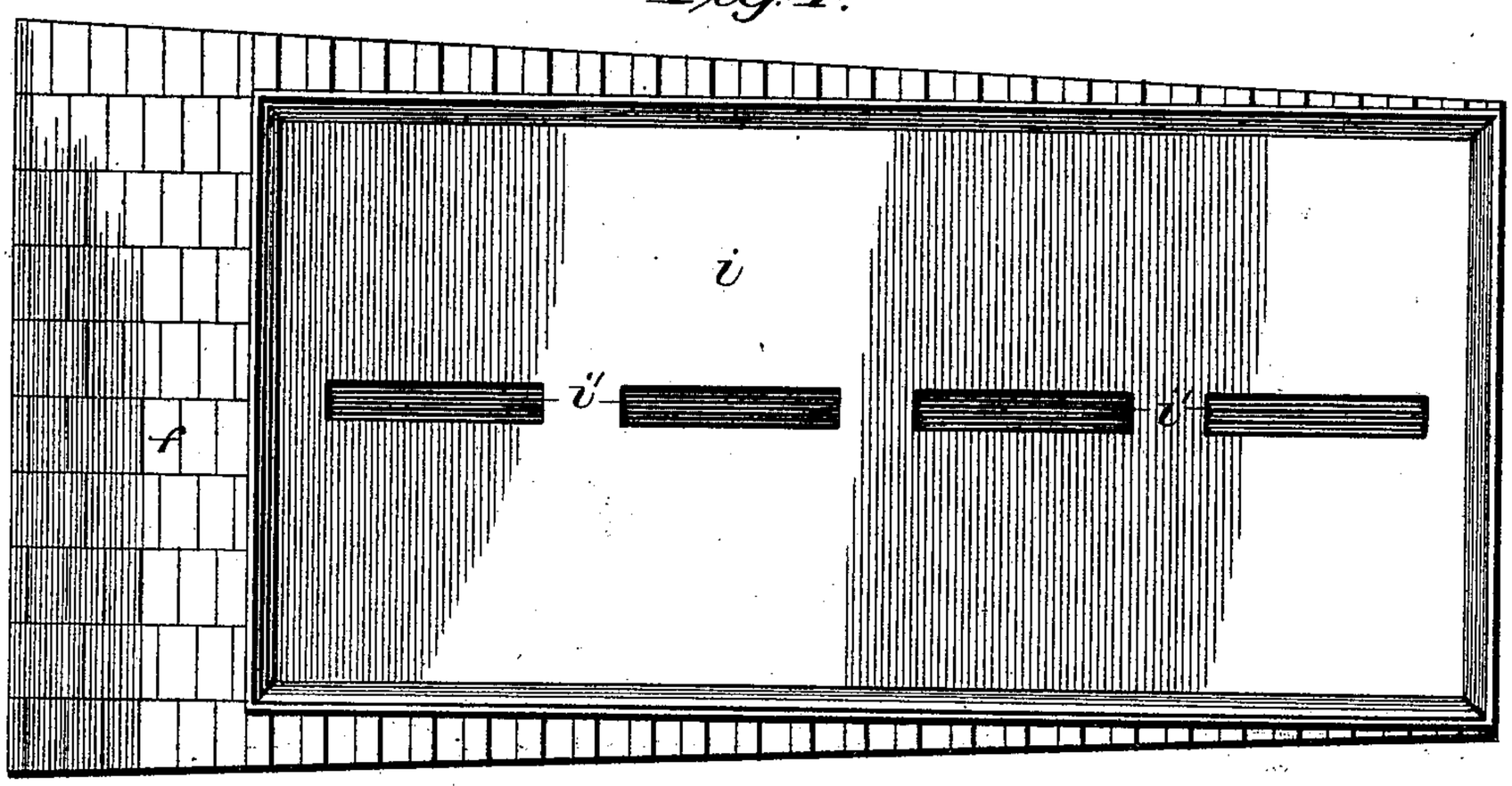


Fig. 4.



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UNITED STATES PATENT OFFICE.

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METALLURGICAL-FURNACE APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 622,438, dated April 4, 1899.

Application filed July 18, 1898. Serial No. 686,245. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BEAM, a citizen of the United States, residing at Gill Hall, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Metallurgical-Furnace Appliances; 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.

This invention relates to metallurgical-furnace appliances such as employed in the welding of metals or the melting down of scrap for the recovery of valuable material therefrom.

The invention pertains particularly to the construction of trucks for carrying the metal while under treatment; and the object is to provide an improved truck superstructure which will insure a more extensive and effective action of the products of combustion upon the crucible containing the metal and also provide for the recovery of molten metal in the melting of scrap and also in the event of breakage of the crucible while welding is in progress.

With the above stated objects in view the invention consists in certain novel features of construction and combinations of parts recited in the appended claims and a preferred form of embodiment of which is illustrated in the accompanying drawings and specifically described hereinafter.

Of said drawings, Figure 1 represents a furnace in section with the truck in end elevation. Fig. 2 represents the truck in cross-section on an enlarged scale. Fig. 3 represents the truck in longitudinal section, and Fig. 4 represents the truck in plan.

The furnace may be of any suitable type, and as it forms no part of the present invention no specific description of it is necessary. The truck runs upon suitable tracks made in a passage-way provided through an appropriate portion of the furnace, and said truck comprises running-gear of any suitable or well-known form and a metal foundation-plate *a*, (or it may be a series of metal bars,) supported by beams *b*, erected on the running-gear of the truck. Upon this plate or series of bars there is built a base structure of refractory material, preferably made up of several courses of fire-brick *c*, with angle-irons *c''* extending along the sides at the bottom, and in this base portion there is provided a longitudinally-extending opening or chamber *c'*, which is adapted to receive a removable drawer *d*, suitably equipped for manipulation. A metal plate *e* (or it may be a series of bars) is mounted upon the base portion *c* and extends over the drawer-space *c'*, said plate or series of bars being preferably removable and being provided centrally with one or more apertures *e'*, coming over the middle of the drawer-space. The refractory structure is continued above this cover-plate *e* by additional courses of fire-brick, as shown at *f*, openings *f'* being left to coincide with the openings *e'* in said cover-plate, and transverse rows of fire-brick *g*, set upon edge on the structure *f*, constitute risers between which spaces *g'* are left to provide passages for products of combustion, the bottoms of these passages being formed by the beveled top edges g^2 of intervening rows of fire-brick g^3.

In pursuing welding operations a crucible with an imperforate bottom is used and rests upon the risers *g;* but in melting scrap for the recovery of valuable metal therefrom a crucible such as shown at *i* in the drawings will be employed, the same having one or more apertures *i'* in its bottom to correspond with the opening *e'* in the cover-plate *e* and the coinciding openings *f'* in the upper refractory structure.

It will be seen that by the construction of truck above described provision is made for supporting a crucible well up in the path of the products of combustion and that passage-ways are provided for the latter underneath the crucible, as well as over the top and around the sides of the same. Thus by building the superstructure of the truck with the transverse passages *g'* I provide for a much more extensive and effective action of the products of combustion upon the crucible, and thereby economize in time as well as in the use of fuel.

In the event that the crucible should break

while welding is in progress the molten metal is not wasted, but will flow down the sloping bottoms of the passages g' and through the openings f' and e' into the drawer d. This feature of the invention is also of great utility in melting scrap, when the molten metal can flow through openings in the bottom of the crucible and thence down into the drawer, where it collects.

It is obvious that the chamber in the lower portion of the superstructure need not constitute a slideway for a drawer and that the drawer is not a necessity, as another kind of receptacle might be effectively used in its place.

It is evident that the form of embodiment of the invention here shown is susceptible of modification, and hence in the claims which follow the essential elements of the invention are recited without restriction to details of construction.

In practice the brick of the superstructure, including the risers, are laid in fire-clay mortar, which when it becomes set prevents displacement of the brick. In handling very heavy work it is best to make the crucible of fire-brick lined with black-lead, and such a crucible employed with the apparatus of my present invention will be laid in mortar in the risers, and hence will constitute practically part of the superstructure. The advantage of the interposed removable plate e will be apparent in this connection, for should a crucible such as just mentioned break or crack it is a great convenience to be able to remove the crucible-bed.

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

1. A refractory crucible-supporting furnace structure having a chamber with a longitudinally-extending top opening, and transverse rows of risers with open-ended passages between them having bottoms sloping toward the said top opening, the crucible resting upon the risers and bridging the same.

2. A crucible-supporting structure for furnaces, the same comprising a refractory base portion having a chamber, a removable cover resting on said base portion and apertured over the chamber, and a refractory crucible-bed built upon said cover and apertured to correspond therewith.

3. A crucible-supporting structure for furnaces, the same comprising a refractory base portion having a chamber, a removable cover resting on said base portion and apertured over the chamber, and a refractory crucible-bed built upon said cover and apertured to correspond therewith, said bed having risers with passages therebetween for products of combustion, substantially as described.

4. A crucible-supporting structure for furnaces, the same comprising a refractory base portion having a chamber, a removable cover resting on said base portion and apertured over the chamber, and a refractory crucible-bed built upon said cover and apertured to correspond therewith, said bed having risers with passages therebetween for products of combustion, and the bottoms of the passages sloping toward the apertures in the bed, substantially as described.

5. The combination with a furnace structure comprising a refractory base portion having a drawer-space, a removable cover resting on said base portion and apertured over the drawer-space, and a refractory crucible-bed built upon said cover and apertured to correspond therewith, said bed having risers with spaces therebetween for passage of products of combustion; of a crucible resting on said bed and apertured in its bottom, and a drawer in the space of the refractory-base portion, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM BEAM.

Witnesses:
HARRY GERMAN,
W. S. FRYE.