

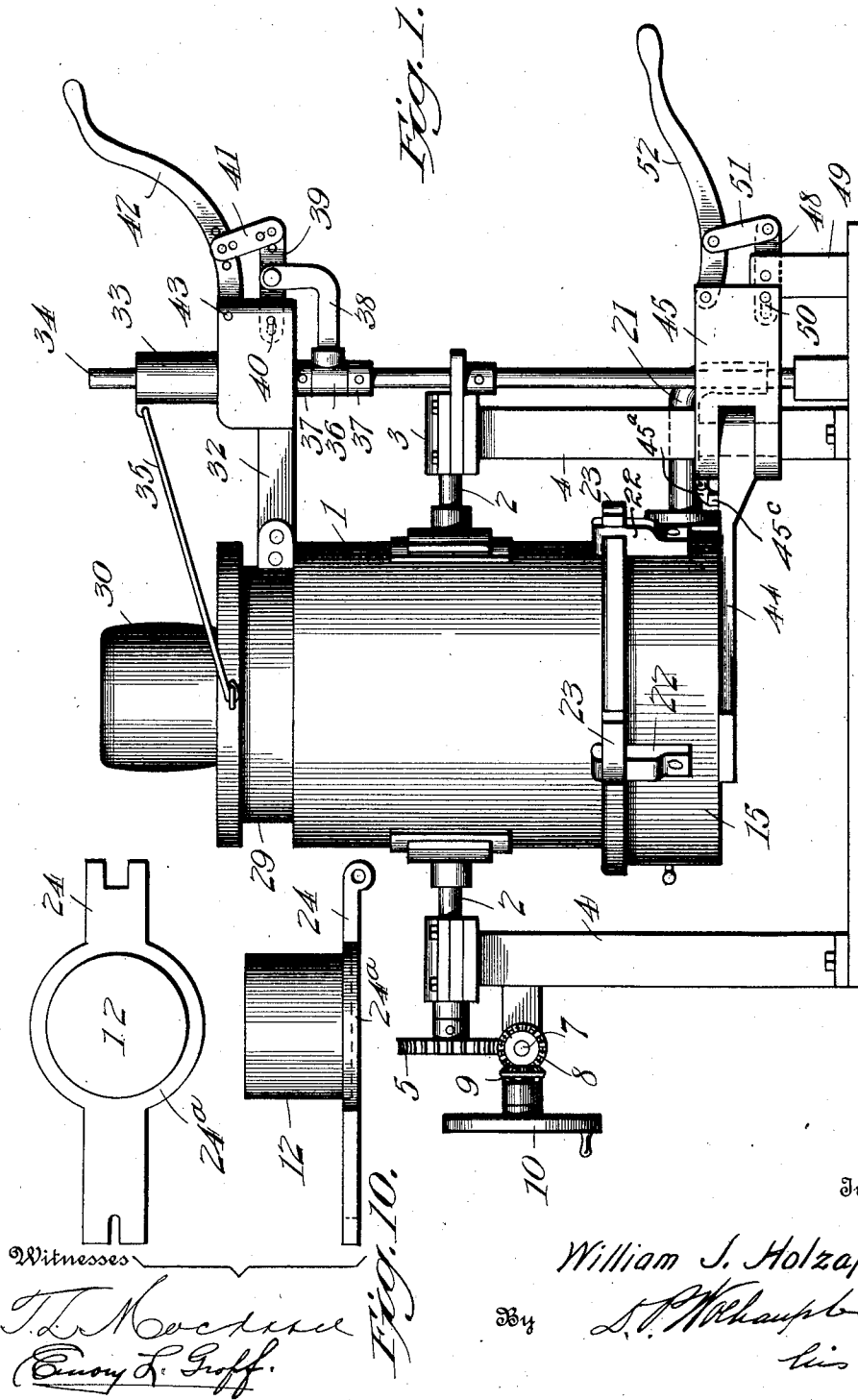
W. J. HOLZAPFEL.
MELTING FURNACE.

APPLICATION FILED JUNE 6, 1911.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 1.

1,037,768.

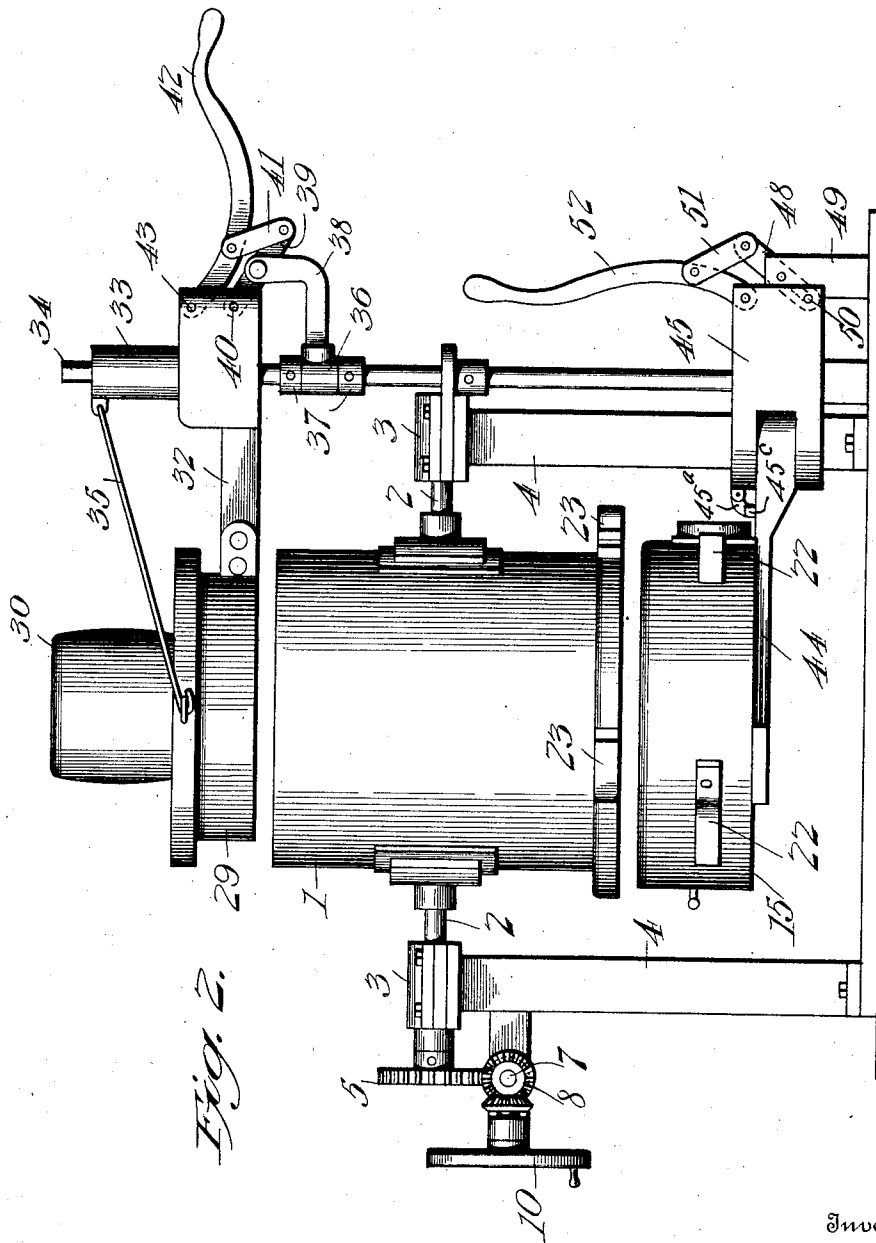


1,037,768.

W. J. HOLZAPFEL.
MELTING FURNACE.
APPLICATION FILED JUNE 6, 1911.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 2.



Witnesses

T. Mochman
Emory L. Guff.

Inventor

William J. Holzappel.

By

J. P. Holzappel.

Attorney

W. J. HOLZAPFEL.
MELTING FURNACE.

APPLICATION FILED JUNE 6, 1911.

1,037,768.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 3.

Fig. 3.

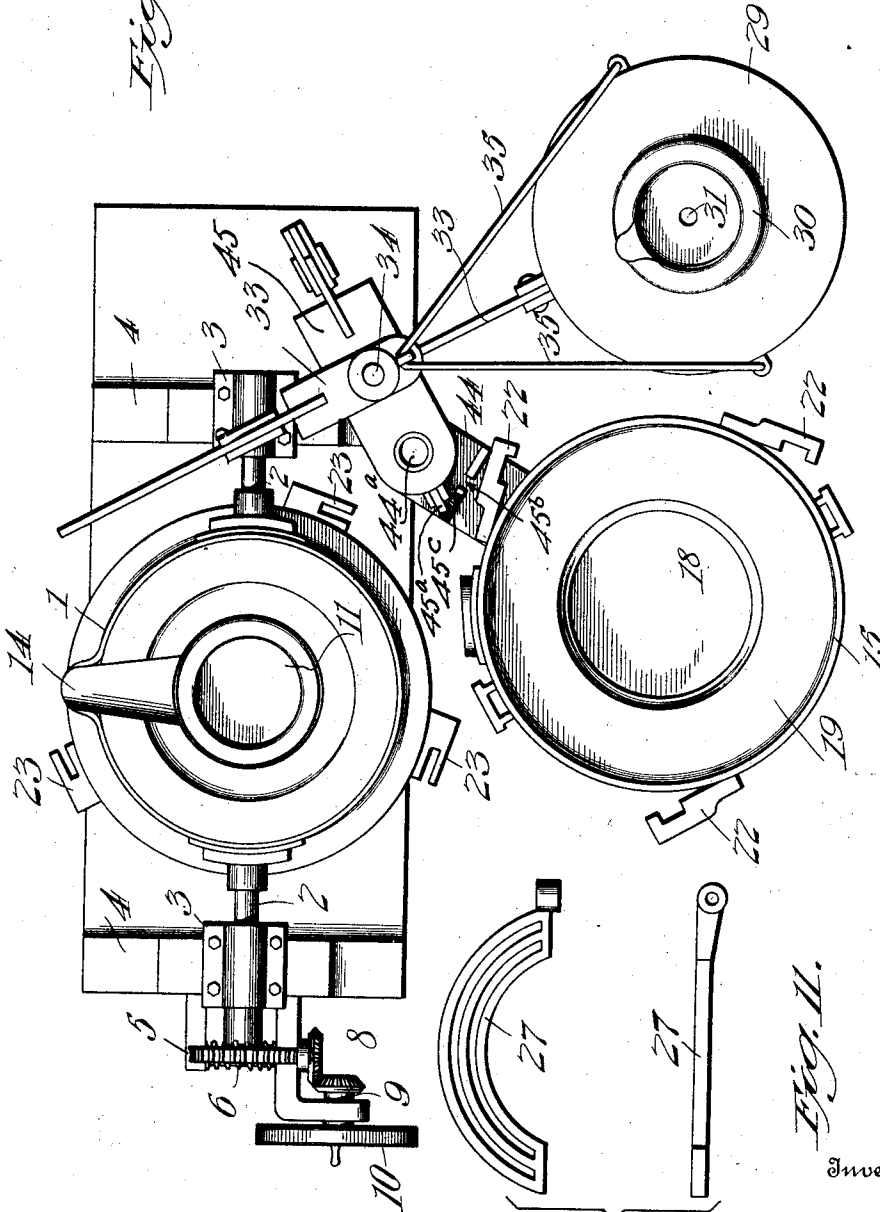


Fig. 11.

Inventor

William J. Holzappel

By

S. P. Holzappel

his Attorney

Witnesses

J. H. Ketchum
Emory L. Groff.

W. J. HOLZAPFEL.

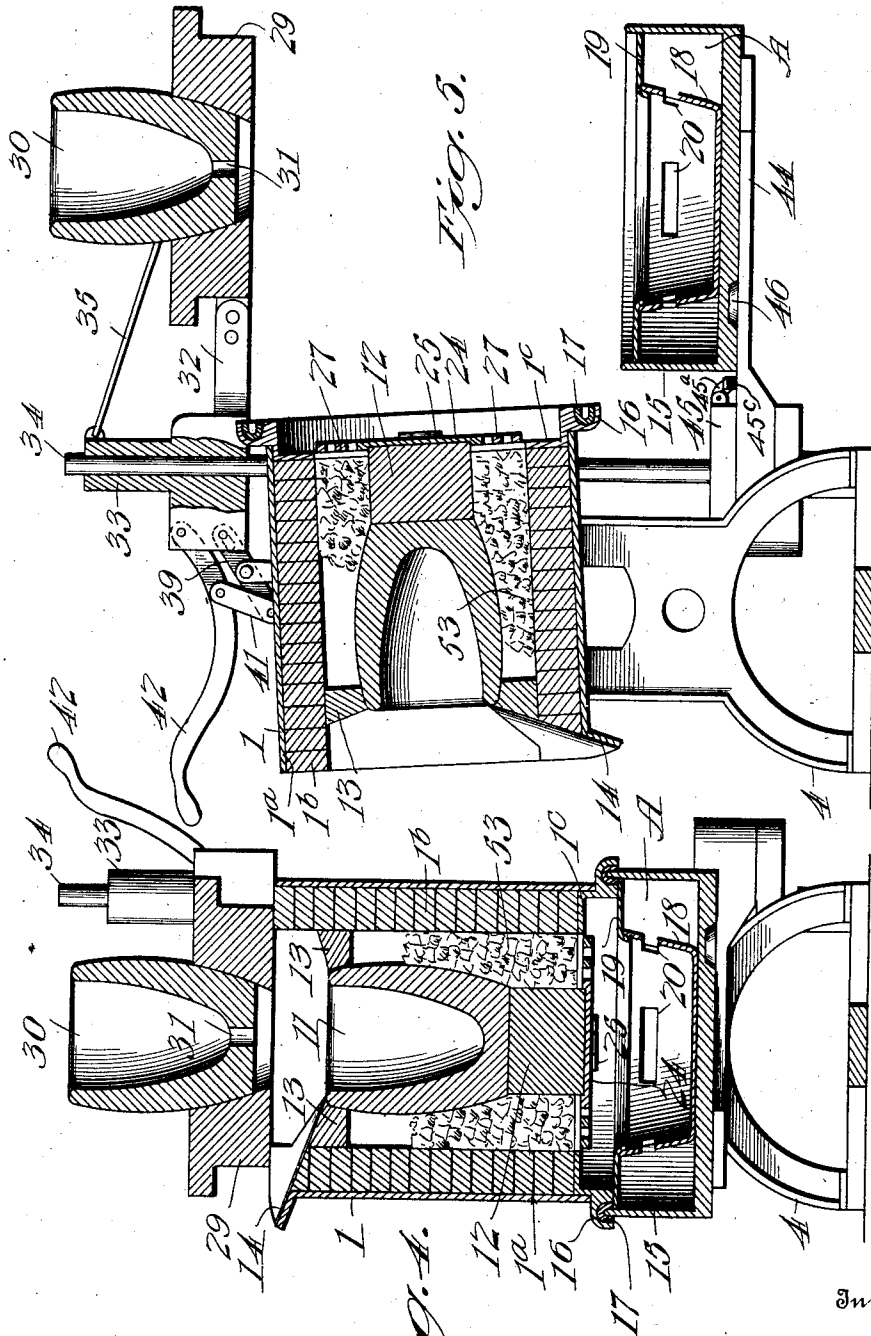
MELTING FURNACE.

APPLICATION FILED JUNE 6, 1911.

1,037,768.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 4.



Witnesses

T. H. Macnam
Conroy L. Groff

Inventor

William J. Holzappel

By

S. P. W. Chaplin

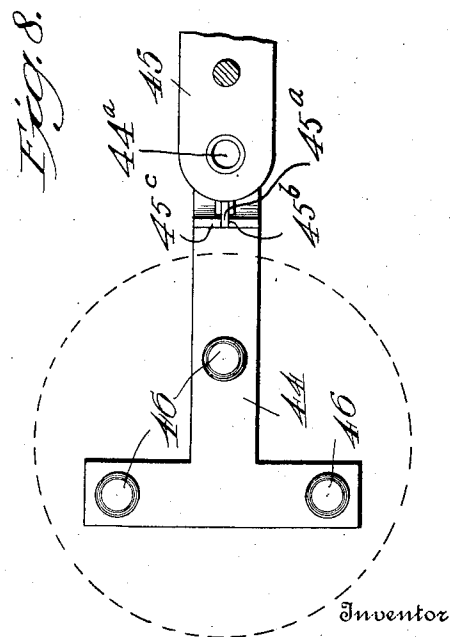
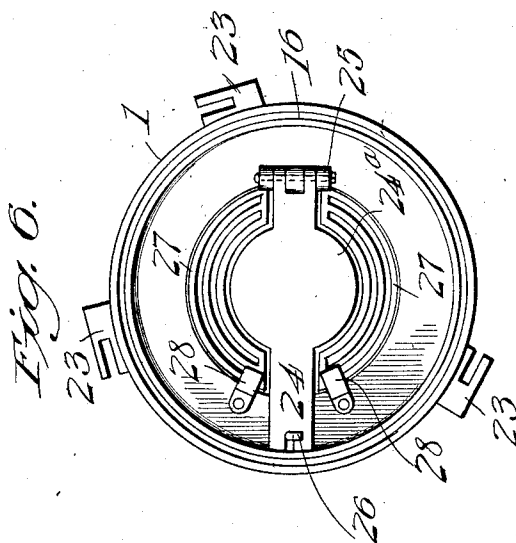
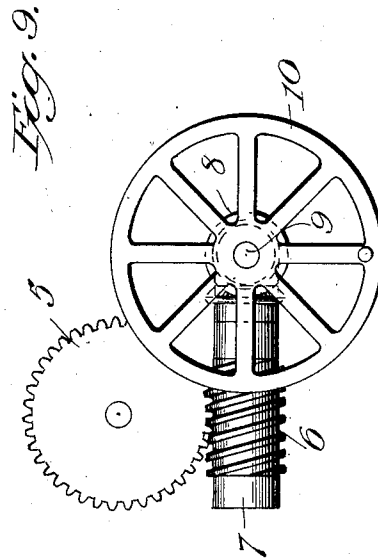
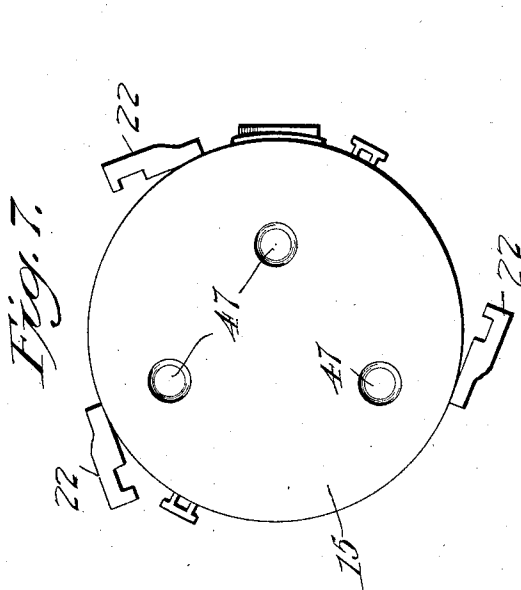
his Attorney

W. J. HOLZAPFEL.
MELTING FURNACE.
APPLICATION FILED JUNE 6, 1911.

1,037,768.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 5.



Witnesses

T. H. Moore
Emory L. Giff

William J. Holzappel.

By

S. P. Walhampton
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM JOSEPH HOLZAPFEL, OF EDDYSTONE, PENNSYLVANIA.

MELTING-FURNACE.

1,037,768.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed June 6, 1911. Serial No. 631,653.

To all whom it may concern:

Be it known that I, WILLIAM J. HOLZAPFEL, a citizen of the United States, residing at Eddystone, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Melting-Furnaces, of which the following is a specification.

The present invention relates to certain new and useful improvements in furnaces of that general type which are employed for melting brass and other metals, the primary object of the invention being the provision of a melting furnace which embodies novel features of construction whereby the furnace body and other parts associated therewith can be easily and quickly manipulated as may be found necessary in the operation of the furnace.

A further object of the invention is the provision of a tiltable melting furnace including a detachable air feeding base adapted to move with the furnace body when the latter is tilted to pour out the contents of the crucible contained therein.

A still further object of the invention is the provision of a melting furnace including a movable base and top for the furnace body, and novel lifting mechanism for bringing the said top and base into and out of engagement with the furnace body.

With these and other objects in view, the invention consists in certain novel combinations and arrangements of the parts as will more fully appear as the description proceeds, the novel features thereof being pointed out in the appended claims.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:—

Figure 1 is a side elevation of a melting furnace constructed in accordance with the invention, the top and base being shown in operative engagement with the furnace body. Fig. 2 is a similar view with the base lowered away from the furnace body and the top elevated from the furnace body. Fig. 3 is a top plan view of the furnace with the top and base moved out of engagement with the furnace body and swung laterally into and out of the way position. Fig. 4 is a vertical sectional view through the melting furnace showing the furnace body in an upright position with the base and top in engagement therewith. Fig. 5

is a similar view showing the furnace body tilted to pour out the molten metal from the crucible, the top and base being swung laterally to one side. Fig. 6 is a bottom plan view of the furnace body. Fig. 7 is a similar view of the air feeding base. Fig. 8 is a top plan view of the supporting arm for the air feeding base. Fig. 9 is a detail view of the gearing for tilting the furnace body. Fig. 10 is a detail view of the crucible supporting bar, and Fig. 11 is a detail view of one of the grate members.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawing the numeral 1 designates the furnace body which is shown as having a substantially cylindrical configuration, the said furnace body normally assuming an upright position and being provided upon opposite sides thereof with trunnions 2. These trunnions are journaled in bearings 3 carried by standards 4, one of the trunnions having a worm wheel 5 applied thereto and the said worm wheel meshing with a worm 6 upon a transverse shaft 7 which is connected by the bevel gearing 8 to a short shaft 9. A hand wheel 10 is applied to this short shaft 9, and it will be obvious that when the furnace body has been released it can be readily tilted by turning this hand wheel.

The furnace body may be of any suitable construction, and is shown in the present instance as comprising a metallic shell 1^a provided with a lining 1^b of fire brick or other refractory material, the said fire brick resting upon a ring 1^c at the bottom of the furnace body. A melting crucible 11 of graphite or the like is supported within the furnace body, the bottom of the crucible resting upon a block 12, while the upper end thereof is engaged by suitable positioning means 13. A pouring spout 14 is provided at the top of the furnace body and leads to the edge of the crucible so that when the furnace body is tilted the molten contents of the crucible will run through the pouring spout.

An air feeding base 15 is detachably applied to the bottom of the furnace body, the upper edge of the air feeding base being received within an annular groove 16 in the ring 1^c. Suitable packing 17 may be provided in this groove 16 so as to insure a

tight joint between the parts when the base is in position. A pan 18 is arranged within the air feeding base 15 and serves to collect the ashes dropping through the grate. The upper edge of the pan is engaged by a flange 19 projecting inwardly from the sides of the air feeding base, the said flange coöperating with the pan to provide an annular air chamber A which communicates with the interior of the pan through suitable openings 20 in the sides thereof. When the furnace is in operation a twyer 21 is connected to the air feeding base 15 and admits air under pressure into the air chamber A. From this air chamber the air enters the pan 18 through the openings 20 and then passes upwardly through the furnace so as to produce an intense heat. For the purpose of locking the air feeding base to the furnace body a series of swinging latch members 22 are shown as pivoted upon the exterior thereof, the said latch members being adapted to engage latch arms or keepers 23 upon the furnace body. The block 12 upon which the crucible 11 rests is supported by a cross bar 24 applied to the ring 1^a, one end of the cross bar being pivoted to the ring as indicated at 25, while the opposite end of the cross bar is detachably engaged by a latch member 26. The middle portion of this cross bar is shown in the present instance as formed with a circular enlargement 24^a having a pocket therein for the reception of the block 12. Curved grate members 27 are arranged upon opposite sides of the cross bar 24 and extend around the enlarged portion 24^a thereof. One end of each of the grate members is also hinged to the ring 1^a at 25, while the opposite end is engaged by a supporting lip 28. These supporting lips are adapted to be swung into inoperative position and both the grate members and the cross bar 24 can be swung outwardly to admit of access being readily had to the interior of the furnace body when cleaning out the same or starting a new fire.

The upper end of the furnace body is designed to be closed by a top 29 when the furnace is in operation, the said top being shown as formed with a central opening within which a charging crucible 30 is fitted, the said crucible having an opening 31 in the bottom thereof through which the metal receives a preliminary heating. This top 29 is connected by an arm 32 to a slide 33 mounted upon an upright post 34, suitable brace members 35 being shown as extending between the top of the slide and the furnace top 29 so as to positively prevent any sagging of the furnace top when moved away from the furnace body. A sleeve 36 is rotatably mounted upon the post 34 between the two set collars 37 and can turn freely upon the post, although it is held

against sliding movement thereon. A bracket 38 projects from the sleeve 36 and has a lever 39 pivoted thereon, one end of the lever having a pin and slot connection with the slide 33, as indicated at 40, while the opposite end of the lever has an upwardly extending link 41 pivotally connected thereto, the said link constituting a fulcrum upon which the operating lever 42 is pivoted. This operating lever is also pivoted to the slide 33 at 43, and it will be obvious that these levers and the parts associated therewith constitute a lifting mechanism by means of which the furnace top 29 can be raised from the furnace body. It will also be obvious that since the slide 33 and sleeve 36 are rotatably mounted upon the post 34, the top 29 can be swung laterally away from the furnace body after it has been lifted out of engagement therewith, as indicated in Fig. 3.

The air feeding base 15 is adapted to rest upon a supporting arm 44 which is pivoted upon a slide 45 so as to swing laterally away from the furnace, as indicated in Fig. 3, the slide 45 being mounted for vertical movement upon the post 34. The supporting arm 44 is shown as having a T shaped construction and provided with positioning lugs 46 adapted to engage corresponding depressions 47 in the bottom of the air feeding base. When the air feeding base is locked in engagement with the furnace body by means of the latch members 22, the supporting arm 44 can be moved downwardly away therefrom and then swung laterally to admit of the furnace body and base tilting together. However, when it is desired to remove the air feeding base from the furnace body, the latch members 22 are thrown out of engagement with the keepers 23 and the slide 45 lowered by means of a lifting mechanism similar to that previously described in connection with the furnace top 29. After the slide has thus been lowered the arm 44 and base 15 can be swung laterally into an inoperative position. The lifting mechanism comprises a lever 48 which is pivoted between its ends upon a bracket 49, one end of the lever having a pin and slot connection with the slide 45, as indicated at 50, while the opposite end of the lever has a link 51 pivotally connected thereto, the said link constituting a fulcrum support for the operating lever 52.

In the operation of the furnace the fuel 53 is placed within the furnace body 1 so as to surround the melting crucible 11 and the block 12, as indicated in Fig. 4. Both the top 29 and air feeding base 15 are applied to the furnace body and the twyer 21 connected to the air feeding base. Air is thus forced upwardly through the fuel so as to produce an intense heat, the metal being first placed within the charging cruci-

ble 30 so as to receive a preliminary heating from the heat given off from the previous melting operation, before it is emptied into the melting crucible 11. The furnace body is locked securely in an upright position by means of the top 29 and the supporting arm 44 for the air feeding base, and when it is desired to tilt the furnace body for the purpose of turning out the molten metal, the arm 44 is swung to one side and the top 29 also lifted and swung laterally. The furnace body can then be tilted without the necessity of detaching the air feeding base 15 therefrom and exposing the bottom of the furnace. However, when it is necessary to obtain access to the interior of the furnace, the base 15 can be lowered away from the furnace body and then swung laterally preparatory to tilting the furnace body into the position indicated upon Fig. 5.

With the above construction, it will be obvious that the various parts of the furnace can be easily and quickly manipulated, gearing being provided for tilting the furnace body, and lifting mechanisms being provided for handling the furnace top and air feeding base.

In connection with the foregoing operation, it should be observed that the pivotal mounting of the arm 44 on the slide 45 permits the said arm 44 with the air feeding base thereon to be swung on the pivotal connection 44^a as far as may be necessary to place the air feeding base in a position entirely out of the way. However, in order to lock the arm 44 to the slide 45 in alignment with the latter so as to prevent relative displacement of parts while the air feeding base is being elevated to the furnace body, there is employed a pivotal lifting dog 45^a adapted to engage a keeper notch 45^b in a flange 45^c on the arm 44. At one side of the notch 45^b the said flange is beveled as shown by the shade lines in Fig. 3 to permit the dog to automatically ride up to its locking position when the air feeding base is swung to its position beneath the furnace body, preparatory to being lifted.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a furnace of the character described, the combination of an upright tiltable furnace body, members fitting against opposite ends of the furnace body when the furnace is in operation, and means for moving the said members vertically away from the furnace body and then laterally to one side thereof.

2. In a furnace of the character described, the combination of an upright tiltable furnace body, a top removably applied thereto, mechanical means for lifting the top away from the furnace body and swinging

it laterally to one side thereof, a base detachably engaging the furnace body, and mechanical means for lowering the base away from the furnace body and swinging it laterally to one side thereof.

3. In a furnace of the character described, the combination of a tiltable furnace body, an air feeding base detachably applied to the furnace body and adapted to tilt therewith, and means for moving the air feeding base away from the furnace body to admit of the latter being tilted independently thereof.

4. In a furnace of the character described, the combination of a tiltable furnace body, a base member detachably applied to the furnace body, a post, a slide mounted upon the post, and means carried by the slide for engaging the base member to admit of the same being moved into and out of engagement with the furnace body.

5. In a furnace of the character described, the combination of a tiltable furnace body, a base member detachably applied to the furnace body, a post, a slide mounted upon the post, an arm projecting from the slide for engaging the base member, and a lever for moving the slide to bring the base member into and out of engagement with the furnace body.

6. In a furnace of the character described, the combination of a tiltable furnace body, a base member detachably applied to the furnace body and adapted to tilt therewith, means for locking the base member with the furnace body, a post, a slide mounted upon the post, an arm projecting from the slide and adapted to detachably engage the base member, the said arm serving to support the base member when it is released from the furnace body, and mechanism coöperating with the slide to move the base member toward and away from the furnace body.

7. In a furnace of the character described, the combination of a tiltable furnace body, a post, a pair of slides mounted upon the post, a furnace top carried by one of the slides, means for moving the said slide to bring the furnace top into and out of engagement with the furnace body, a base member for the furnace, supporting means for the base member carried by the opposite slide, and means for moving the said opposite slide to bring the base member into and out of engagement with the furnace member.

8. In a furnace of the character described, the combination of a tiltable furnace body, a post, a pair of slides mounted upon the post, one of the said slides having both a vertical and rotary movement upon the post and the other of said slides having only a vertical movement on the post, a furnace top carried by the former of said slides and locking the furnace body against tilting when

brought into engagement therewith, means for moving the said slide to lift the furnace top away from the furnace body and then swing it laterally to one side, a base member
5 applied to the furnace body and adapted to tilt therewith, locking means for holding the base member in engagement with the furnace body, an arm pivoted upon the slide having only a vertical movement and adapted
10 to engage the base member when it is unlocked from the furnace body, and means for moving the slide having only a vertical movement to shift the base member vertically toward or away from the furnace body,
15 the supporting arm being adapted to be swung laterally about its pivotal connection with the slide to move the base member to one side of the furnace body.

9. In a furnace of the character described, the combination of a furnace body, a furnace top detachably engaging the furnace
20 body, an air feeding base detachably engaging the furnace body, and means for moving both the top and air feeding base vertically away from the furnace body and then
25 swinging them laterally to one side thereof.

10. In a furnace of the character described, the combination of an upright furnace body, a post, a pair of slides mounted
30 upon the post, a furnace top detachably engaging the furnace body and supported by one of the slides, an air feeding base detachably engaging the furnace body and supported by the opposite slide, and means for

moving the slides for bringing the furnace top and air feeding base into and out of engagement with the furnace body.

11. In a furnace of the character described, the combination of a furnace body provided at the bottom thereof with a grate
40 construction and an annular groove, an air feeding base detachably applied to the furnace body and engaging the said annular groove, locking means for holding the air feeding base in engagement with the furnace
45 body, supporting means for the air feeding base when disengaged from the furnace body, and means cooperating with the said supporting means to move the air feeding base toward or away from the furnace body. 50

12. In a furnace of the character described, the combination of a furnace body, an air feeding base detachably applied to the furnace body, locking means for holding
55 the air feeding base in engagement with the furnace body, supporting means for the air feeding base when disengaged from the furnace body, and means cooperating with the said supporting means to move the air feeding
60 base toward or away from the furnace body and also swing it laterally to one side thereof.

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

WILLIAM JOSEPH HOLZAPFEL.

Witnesses:

NELLIE A. BLAKELEY,
JOHN J. STETSER.