

No. 615,429.

Patented Dec. 6, 1898.

H. CHARLIER.
SMELTING FURNACE.

(Application filed Oct. 30, 1897.)

(No Model.)

Fig. 1.

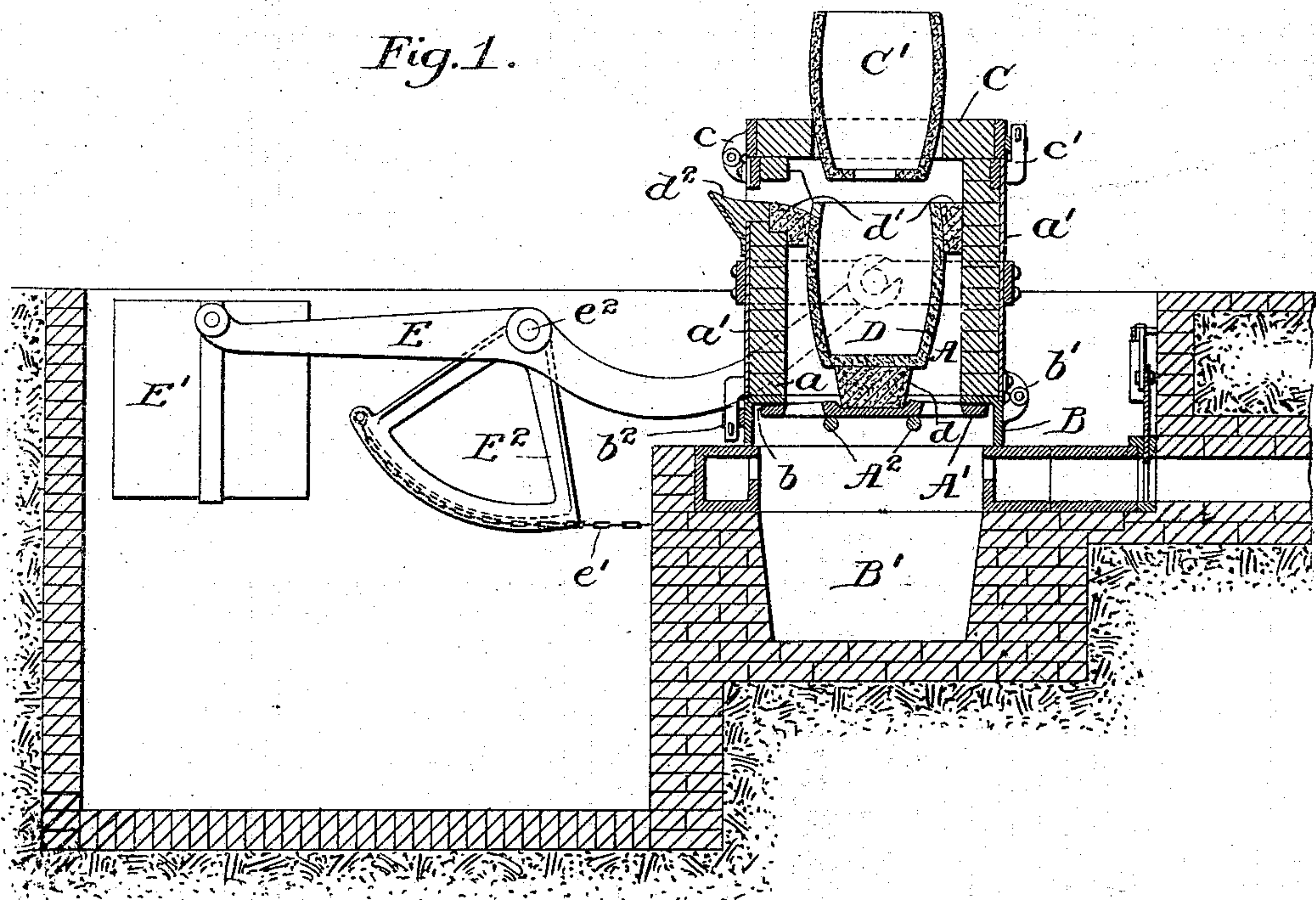
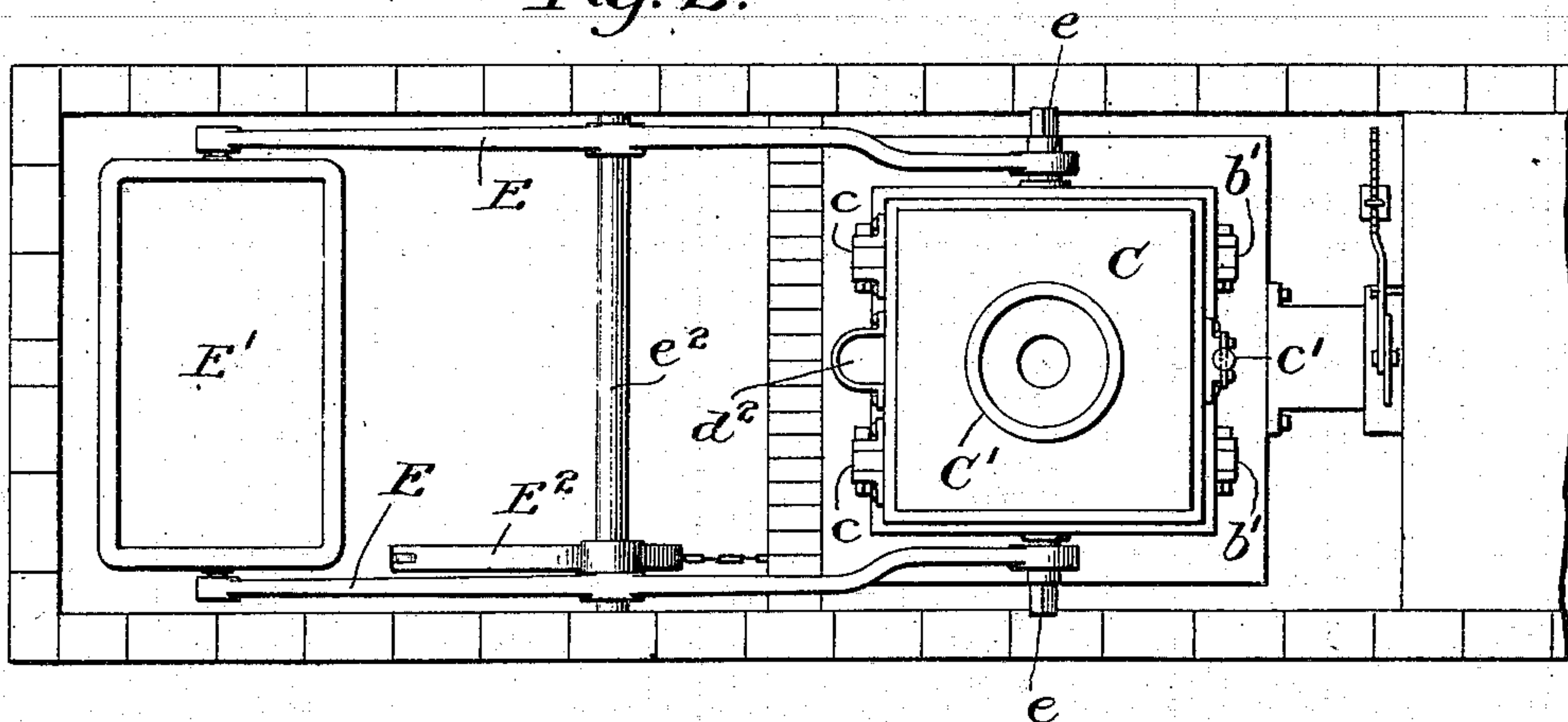


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRI CHARLIER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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SMELTING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 615,429, dated December 6, 1898.

Application filed October 30, 1897. Serial No. 656,873. (No model.)

To all whom it may concern:

Be it known that I, HENRI CHARLIER, a citizen of the Republic of France, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Smelting-Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to smelting-furnaces, and has particular reference to that class of furnaces in which the crucible containing the melted metal is not removed from the fire when pouring out the metal or recharging the crucible.

The objects of my invention are, first, to so construct the furnace that when any part of the brick lining of the fire-chamber needs renewing, the worn-out portion can be taken out and replaced by a new one without in any manner disturbing those parts of the brick lining that do not need renewing, and, second, to provide means whereby a broken or worn-out crucible may be easily and quickly removed through the top of the fire-chamber without disarranging the other parts of the furnace or allowing it to cool off.

To accomplish the desired results, I connect the lower part of the fire-chamber, in which the grate-bars are supported, and also the upper part or cover of said fire-chamber, to the main body of the furnace by a hinge that will allow these top and bottom portions of the furnace to be turned back out of the way when desiring to remove a worn-out crucible or to renew any part of the brick lining of the fire-chamber.

In the accompanying drawings, Figure 1 is a vertical sectional view through the middle of a furnace having my improvement therein. Fig. 2 is a plan view of the furnace and lifting mechanism.

A represents the fire-chamber, into which the fuel is placed.

a is the brick lining of the fire-chamber, and a' the iron jacket surrounding the brick lining and holding it in place.

B is the iron bottom portion of the fire-chamber, supporting the grate-bars and hav-

ing thereon an inwardly-projecting flanged portion b, that forms the base or support for the brick lining of the fire-chamber.

b' is a hinge connecting the bottom part B to the iron jacket a'. b² is a catch or lock for holding these parts together. This catch and hinge may be of any desired or convenient construction.

A' is the grate of the fire-chamber.

A² are two round bars, the ends of which project through the bottom part B and form the supports for the grate.

B' is the ash-pit.

C is the top or cover of the fire-chamber.

c is a hinge connecting the cover to the iron jacket a'.

c' is a lock or catch for securing the cover C in place.

d is a fire-brick block resting upon the grate A' and supporting the crucible D, that contains the melted metal.

d' d' are movable retaining-blocks placed around the outside of the crucible to hold it firmly in place.

d² is the spout through which the melted metal is poured out into molds.

C' is an open-bottom crucible fitting into a circular opening in the cover C directly over the crucible D.

The metal to be melted is placed in the top crucible C', and it is heated by the flames from the burning coal placed in the fire-chamber around the crucible D. As fast as the metal in the crucible C is melted it will fall into the crucible D and remain in a fluid condition until poured therefrom. The furnace being constructed as shown, the melted metal is poured from the crucible D by lifting and tilting the whole furnace by means of mechanism attached to the arms or levers E, the ends of which extend over the trunnions e e, located on the outside of the iron jacket inclosing the fire-chamber. The weight E' is made heavy enough to balance the weight of the furnace, and the whole device is operated in the manner described by the chain e', attached to the sector E², secured upon the shaft e².

When it is necessary to remove the fire-

brick lining in the bottom portion of the fire-chamber, the grate A' is first removed, after which the fire-chamber is turned upside down. The fastening b^2 is then removed and the part B turned back on the hinge b' , when the worn-out bricks can be easily removed and new ones put in their places. After this has been done the bottom B and grate A' are again secured in position and the furnace turned over.

When desiring to renew the upper portion of the fire-brick lining, the cover C is turned over and the burned-out bricks taken out and replaced by new ones.

When the crucible D is worn out or is broken from any cause, instead of dropping the fire and removing the crucible through the bottom of the furnace, as usually done in furnaces of this kind, the cover C is first unfastened and turned back, thus releasing the crucible and allowing it to be removed through the top without waiting for the furnace to cool down, as would otherwise be necessary.

I have shown the cover C and the bottom portion B removably secured to the fire-chamber A by means of a hinge and lock, which form I consider the most desirable; but any other desired mechanism that will answer the purpose may be used.

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

1. In a tilting or oscillating furnace of the character described, the combination of the fire-pot A, jacket a' , and the brick lining a therein, with a separable bottom B, hinge b' and catch b^2 , for securing said bottom to the furnace, bars A^2, A^2 , mounted within said bottom, and the grate A' supported on said bars, the brick lining in said fire-pot being adapted to rest upon the bottom B, and the said bottom being adapted to be swung away from

the said fire-pot to permit the removal and replacement of bricks therein, as set forth. 45

2. In a furnace of the character described, the combination of the fire-pot A, jacket surrounding said fire-pot and the brick lining therein, and a crucible D set in said fire-pot with a hinged bottom B, flanges b thereon for supporting the brick lining, and hinges and catch for securing said bottom to the fire-pot, bars A^2, A^2 , secured in said bottom, a grate A' supported thereon, a fire-brick block d mounted on said grate and adapted to support said crucible whereby the said hinged bottom may be swung away from the said fire-pot, exposing the brick lining, thus permitting the removal and replacement of the whole or any part of said lining without removal or disturbing of the crucible, as set forth. 50 55 60

3. In a tilting or oscillating furnace, the combination of the casing a' , and the lining a therein, with a hinged bottom B, having thereon an inwardly-projecting flanged portion b that forms the base or support for the brick lining, hinges and catch for holding said bottom to the casing, bars A^2, A^2 , secured in the bottom B, and a grate A', mounted on said bars, as set forth. 65 70

4. In a tilting furnace, the combination of the casing a' , brick lining a therein, a bottom hinged to said casing having therein an inwardly-projecting flange that forms the base or support for the lining a , a grate A' suitably mounted in said bottom, a crucible D, support d mounted on said grate and adapted to support said crucible, and the retaining-blocks d', d' , all constructed as and for the purpose set forth. 75 80

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

HENRI CHARLIER.

Witnesses:

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