I. HALL.

MELTING FURNACE.

APPLICATION FILED NOV. 13, 1913.

Patented Nov. 17, 1914.

1,117,666.

Fig. 1.

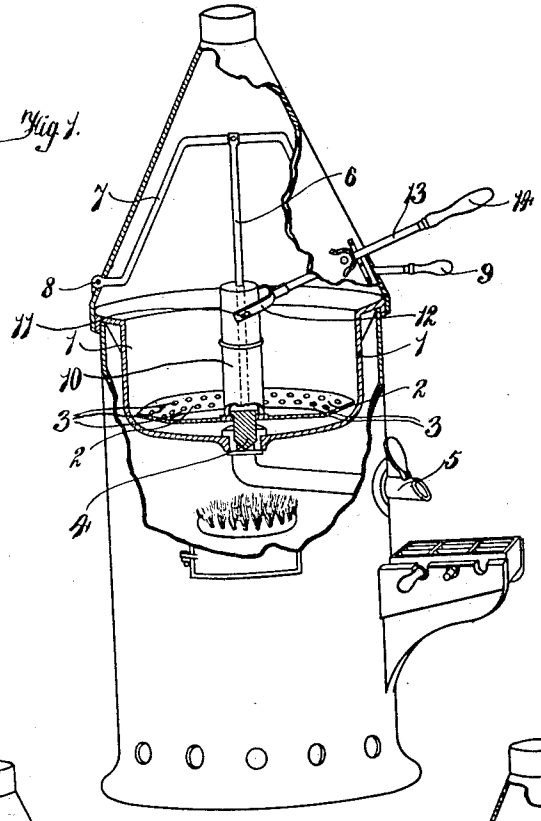


Fig. 2.

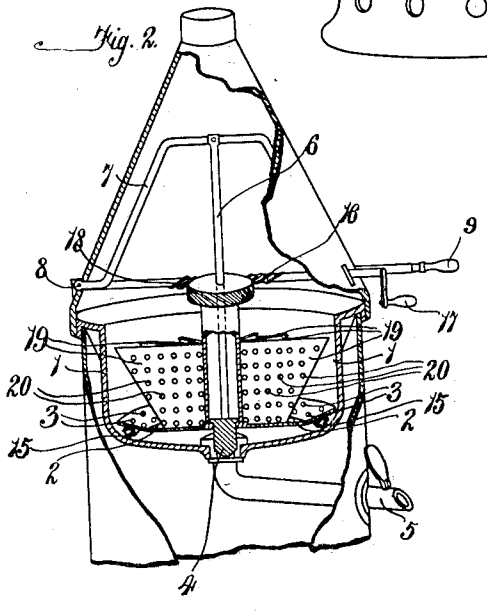
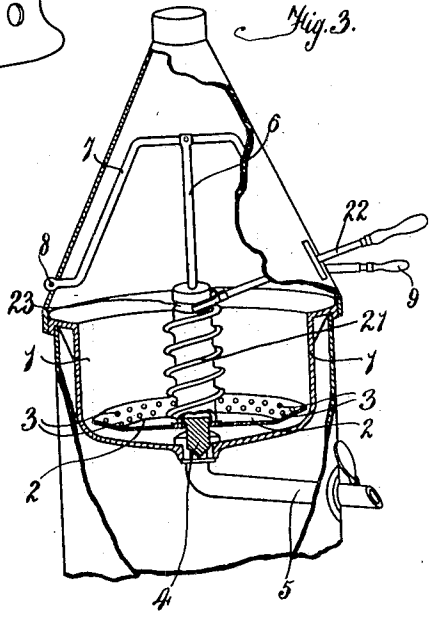


Fig. 3.



WITNESSES

F. K. Logan

Cornelius Lovering.

INVENTOR

ISAIAH HALL

BY Wm. Glasmann

ATTORNEY

UNITED STATES PATENT OFFICE.

ISAIAH HALL, OF BIRMINGHAM, ENGLAND.

MELTING-FURNACE.

1,117,666. Specification of Letters Patent. Patented Nov. 17, 1914.

Application filed November 13, 1913. Serial No. 800,864.

To all whom it may concern:

Be it known that I, ISAIAH HALL, a subject of the King of Great Britain, residing at Exchange Buildings, New street, Birmingham, in the county of Warwick, England, have invented a new and useful Melting-Furnace; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to melting furnaces and has for its object to provide an improved furnace wherein better means are provided for stirring or mixing molten material within a melting pot.

According to my invention I provide within the melting pot a horizontal plate-like member preferably turned up near its periphery and perforated at or near the turned up portion, a vertical sleeve or other member attached to the said plate-like member, and means for moving the member within the molten material for the purpose of mixing the same. In addition to the above parts I may provide further stirring blades movable together with or separately from the said parts, as may be most convenient in any particular case.

Referring to the accompanying drawings:—

Figure 1. represents a melting furnace made in accordance with my invention, the form shown being particularly applicable to the melting of type or other soft metal and casting the same into ingots. Fig. 2. represents a modified form of stirring apparatus with additional blades, and Fig. 3. represents a further modified form having additional stirring means of spiral form.

The melting pot 1 contains the plate-like stirring member 2 which is preferably made to fit approximately in the bottom of the pot. The edge of this member is turned upward and rows of holes 3 are disposed in or near the upturned portion.

The valve 4 which regulates the flow of molten material to the pouring spout 5 is provided with a vertical stem 6 controlled by means of a rod 7 pivoted at 8 and provided with a handle 9.

Surrounding the stem 6 and attached to the stirring member 2 is a member or sleeve 10 extending preferably to above the level of material in the pot and provided near its upper end with pins or projections 11 by means of which it is attached to the fork 12 of the lever 13, which has a handle 14 by means of which the stirring member may be given an up and down motion in the material in the pot. Preferably when type metal or the like is the molten material the plate-like member is not raised sufficiently high on the stroke to disturb the "skin" or "dross" on the surface of the metal, which is allowed to remain to protect the rest of the metal from oxidation.

Fig. 2. shows a form in which additional blades of radial nature are employed, the sleeve, valve, stem and valve regulating means remaining substantially the same. In the case of the device illustrated in this figure the plate-like member 2 is arranged to rest upon some form of antifriction devices such as the balls 15 illustrated in the figure, and for imparting motion to the device a worm 16 is shown actuated by the crank handle 17 and gearing in the worm wheel 18 by means of which the sleeve blades and plate-member are rotated. The blades 19 are provided with holes 20 for the passage of the metal. This form of mixer I employ more especially with the larger sizes of melting furnaces in cases where the mixing member is too heavy to be conveniently lifted, but it will be clear that the elements of the member could be made capable of being operated independently, or that means might be provided for imparting a vertical or combined vertical and rotary motion to the mixing member as desired.

In the form shown in Fig. 3 the additional stirring means are in the form of a spiral 21 attached to the vertical sleeve, and the arms of the lever 22 may be provided with rollers or the like bearing in the groove 23 on the sleeve. In this construction the action of the spiral against the material in the pot as the sleeve is raised or allowed to fall tends to give to the mixing member a rotary movement in addition to the vertical motion.

It will be clear that the various modifications may be moved in any suitable manner either by hand or power.

What I claim then is:—

1. In a furnace, the combination of a melting pot; means for heating the same; a dished plate-like member disposed horizontally within the melting pot having a solid center portion and having its outer periphery turned upwardly and provided with a row of holes disposed around the plate-like member near the bottom of the upturned portion; and means for moving the said plate-like

member within the molten material in the pot for the purpose of mixing the same.

2. In a furnace, the combination of a melting pot; means for heating the same; a valve having a vertical stem for regulating the flow of molten material; and a dished plate-like member disposed horizontally within the melting pot and having its outer periphery turned upwardly and provided with a row of holes near the bottom of the upturned portion; a central vertical tube attached to the said plate-like member surrounding the vertical stem of the valve and extending above the level of the molten material in the pot; and means for moving the said plate-like member within the molten material in the pot for the purpose of mixing the same.

3. In a furnace, the combination of a melting pot; means for heating the same; a perforated plate-like member disposed horizontally within the melting pot; additional stirring means disposed within the molten material; a central vertical sleeve attached to the said plate-like member; and means operatively connected to said sleeve for moving the said plate-like member within the molten material in the pot for the purpose of mixing the same.

4. In a furnace, the combination of a melting pot; means for heating the same; a dished plate-like member disposed horizontally within the melting pot having a solid center portion and having its outer periphery turned upwardly and provided with a row of holes disposed around the plate-like member near the bottom of the upturned portion; and means for moving the said plate-like member up and down within the molten material in the pot.

5. In a furnace, the combination of a melting pot; means for heating the same; a plate-like member disposed horizontally within the melting pot; the said member having its rim turned upward, and being provided with a plurality of holes in the upturned portion; a pouring spout leading from the bottom of the pot; a valve having a vertical stem for regulating the flow of molten material to the pouring spout; a central vertical sleeve attached to the said plate-like member and surrounding the vertical stem of the valve; and means for moving the said plate-like member within the molten material in the pot for the purpose of mixing the same.

6. In a furnace, the combination of a melting pot; means for heating the same; a pouring spout leading from the bottom of the pot; a valve having a vertical stem for regulating the flow of molten material to the pouring spout; a stirring member; a central vertical sleeve having a spiral formed upon it attached to the said stirring member and surrounding the vertical stem of the valve; and means for moving the said stirring member within the molten material in the pot for the purpose of mixing the same.

7. In a furnace, the combination of a melting pot; means for heating the same; plate-like member disposed horizontally within the melting pot; a vertical spiral disposed within the molten material; means for moving the said plate-like member within the molten material in the pot for the purpose of mixing the same; and means for moving the said vertical spiral.

8. In a furnace, the combination of a melting pot; means for heating the same; a pouring spout leading from the bottom of the pot; a valve having a vertical stem for regulating the flow of molten material to the pouring spout; a plate-like member disposed horizontally within the melting pot, the said member having its rim turned upward, and being provided with a plurality of holes in the upturned portion; a central vertical sleeve having a spiral formed upon it attached to the said stirring member and surrounding the vertical stem of the valve; and means for moving the said stirring member within the molten material in the pot for the purpose of mixing the same.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ISAIAH HALL.

Witnesses:
HAROLD HONESTER,
EVAN L. W. BYRNE.