

H. P. MARSHALL.
 APPARATUS FOR MAKING CASTINGS.
 APPLICATION FILED DEC. 5, 1911.

1,065,326.

Patented June 17, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

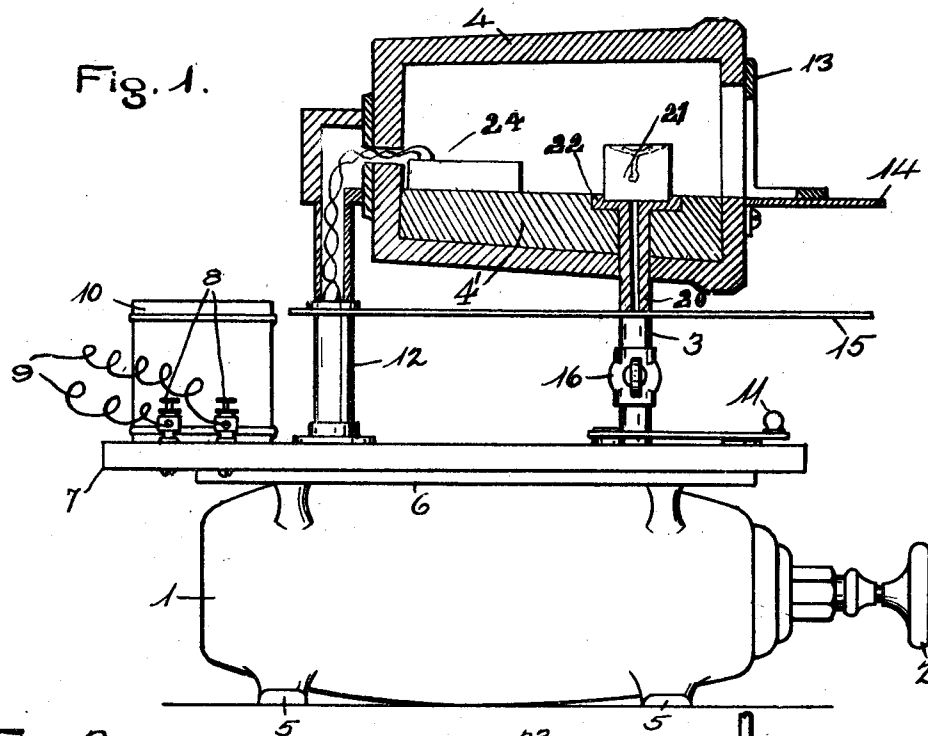
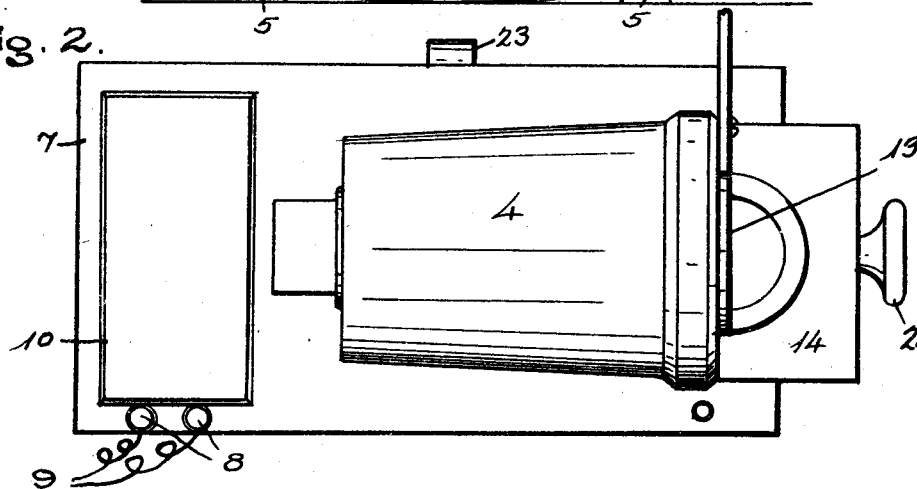


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

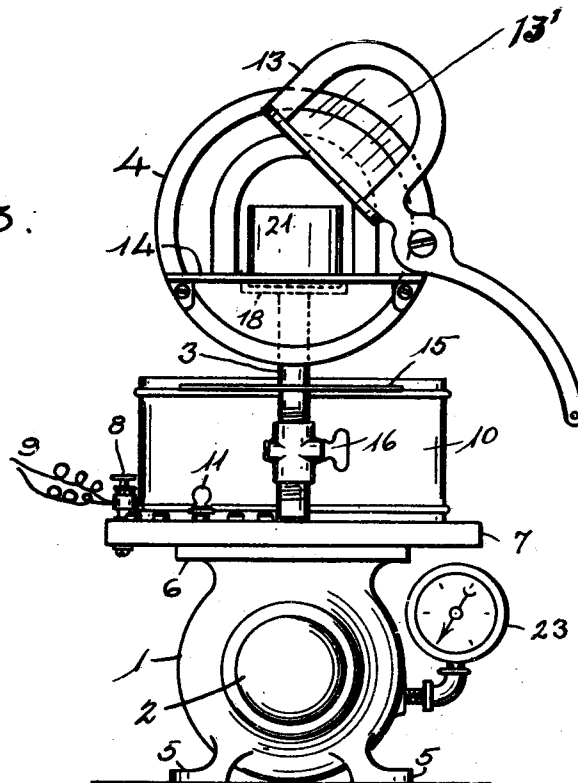
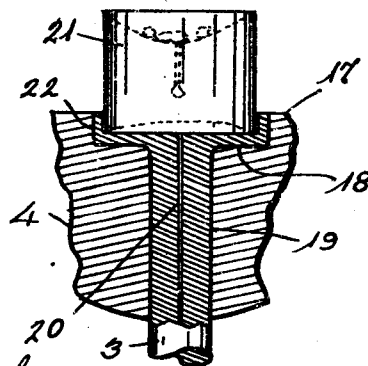


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY P. MARSHALL, OF GLEN RIDGE, NEW JERSEY.

APPARATUS FOR MAKING CASTINGS.

1,065,326.

Specification of Letters Patent. Patented June 17, 1913.

Application filed December 5, 1911. Serial No. 663,988.

To all whom it may concern.

Be it known that I, HARRY P. MARSHALL, a citizen of the United States, residing at Glen Ridge, in the county of Essex and State of New Jersey, have invented certain Improvements in Apparatus for Making Castings, of which the following is a specification.

This invention relates more particularly to the making of dental castings, jewelry castings, or other small castings demanding fine work, where the pattern is usually burned out or destroyed by heat and molten metal forced into the cavity by air-pressure or otherwise, although of course the invention can be used in any place or for any purpose to which it is adapted and I do not wish to be understood as restricting myself at all in that respect.

The objects of this invention are to provide improved means for simultaneously subjecting a mold to the heat of a furnace and exhausting air from it; to enable a furnace to be utilized for this purpose which can also be used for other purposes; to provide a construction for the furnace which shall adapt it to each of said uses without interfering with its other uses; to secure a compact and convenient apparatus, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several figures, Figure 1 is a view in side elevation of an apparatus of my improved construction showing the furnace and supports above the shelf 15 in section; Fig. 2 is a plan of the same; Fig. 3 is a front end view, with the furnace door open, and Fig. 4 is a detail section through the mold ring seat in the floor of the furnace.

In said drawings, 1 indicates a pump having a piston adapted to be operated by the handle 2 to exhaust air through the pipe 3, which pipe in the specific embodiment of the invention shown in the drawings extends upward from the pump 1 and forms the forward support for a furnace 4 above the pump, and which furnace I have shown as an electric furnace containing an electric heating medium 24, although I do not wish to be restricted to that kind alone. The pump 1 has feet 5 and a flattened top 6 which receives a plate 7, preferably of insulating material which has the binding

posts 8 for the electric wires 9, a rheostat or resistance box 10 and switch 11 for manipulating the same. From this plate 7 a tubular support 12 extends upward to the rear end of the furnace 4. The furnace itself is of the usual tubular form with an interior flattened floor, and has a door 13 which is adapted to close against a ledge 14, substantially flush with the said floor, as is common. The door has an opening 13' which may be covered by any suitable material such as glass, mica, etc. A shelf 15 may be arranged upon and connect the furnace supports 3 and 12, as shown, and the forward support 3 which forms the suction pipe of the pump is preferably provided with a valve 16 between said shelf and a plate 7.

While the construction and arrangement of parts above described is compact and convenient and is at the present time the preferred construction and arrangement, it should be considered only as illustrative of various constructions and arrangements which could be adapted to my purpose, and I do not wish to be understood as restricting myself in this respect except as the state of the art may require or as is expressly and positively stated in the claims.

In the floor 17 of the furnace 4 is a flat metal seat 18, which is integral with and forms the top of the upper section 19 of the pipe 3, the bore 20 of said pipe opening through the center of said seat 18, as shown in detail in Fig. 4 of the drawing. Said seat 18 provides a ground surface to receive the correspondingly-ground end of a mold ring 21, so as to form an impervious joint therewith, and to conveniently guide the mold ring into proper position upon said seat, the seat is provided with a peripheral flange 22. This flange is shown in the drawing as substantially flush at its upper edge with the floor 17, although obviously the relation of said parts might be otherwise if desired.

It will be understood that the mold ring 21 is open at both ends, and that in use it is filled transversely with plaster of Paris or any other known investing substance in which the mold cavity has been formed in any suitable manner, said cavity communicating with a cup-like or hollowed depression in the investing substance at one end of the mold ring, which depression is adapted to receive the material to be melted and run into the mold cavity. In using my im-

proved apparatus, a mold ring thus prepared is set firmly upon the seat 18 of the furnace with the hollowed end of the investing substance containing the material to be cast of course at the top. The furnace is then heated or brought to the proper temperature to melt the material in the upper end of the mold ring so that it will run or flow suitably to form the casting. By opening the valve 16 in the pipe 3 the lower end of the mold ring is placed in communication with a partial vacuum produced by the pump 1, and thus atmospheric pressure at the upper end of the mold ring assists in causing the molten material to run or flow downward into the mold cavity and form a perfect casting.

In practice, the valve 16 is opened, after the material to be cast has become molten in the top of the mold ring, so as to place the mold ring in communication with a partial vacuum, which has been previously produced by pumping, but it will be noted that both material and mold are by my improved apparatus subjected simultaneously to the unbalanced atmospheric pressure and the heat, said heat being uniform and unvaried, even when the molten material flows into the mold cavity. As a result, I obtain a certainty of perfect castings, which is of the greatest advantage in saving time, labor and material, and furthermore I can make such castings in large sizes and of any material known for such purposes.

A pressure gage 23 is provided for the vacuum chamber of the pump 1, and any suitable and well-known means can be provided in connection with the furnace for registering the temperatures or degrees of heat attained by it.

It will be noted that the sunken or depressed seat 18 is located convenient to the door 13 of the furnace, so that the mold ring 21 can be conveniently placed thereon, the said seat serving to position the mold ring

with respect to the exhaust duct 20. By this arrangement the furnace is conveniently and advantageously used for casting, and at the same time the mold ring 21 can be removed and the furnace used for any other purpose. The shape and size of the furnace chamber thus makes no difference, since when used for casting the mold ring can readily be inserted and positioned with respect to the exhaust duct.

Having thus described the invention, what I claim is:

1. In an apparatus of the character described, the combination of a furnace, a sunken or depressed seat in the floor of the furnace having a peripheral flange projecting upward substantially flush at its top with the floor of the furnace, said seat adapted to receive a mold ring inside said flange, a vacuum pump, a duct leading from said pump to said seat, and a valve in said duct.

2. In an apparatus of the character described, the combination of a vacuum pump having a suitable base, a plate on the top of said pump, a suction pipe leading upward through said plate from the pump and having at its upper end a seat for a mold ring, a tubular support on said plate, an electrical furnace mounted on said support and pipe with said seat in its chamber, binding posts on said plate, and a valve in said pipe.

3. In an apparatus of the character described, the combination of a furnace, an air exhaust duct opening through the floor of the furnace chamber, and a sunken seat in the floor of the furnace chamber around said air exhaust duct adapted to receive a mold and position the same with respect to said air exhaust duct.

HARRY P. MARSHALL.

In the presence of—

CORNELIUS ZABRISKIE,
FRANCES E. BLODGETT.