

(No Model.)

F. J. McLAREN.
BLOW PIPE FURNACE.

No. 383,971.

Patented June 5, 1888.

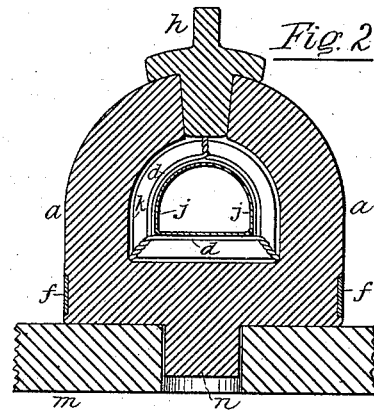
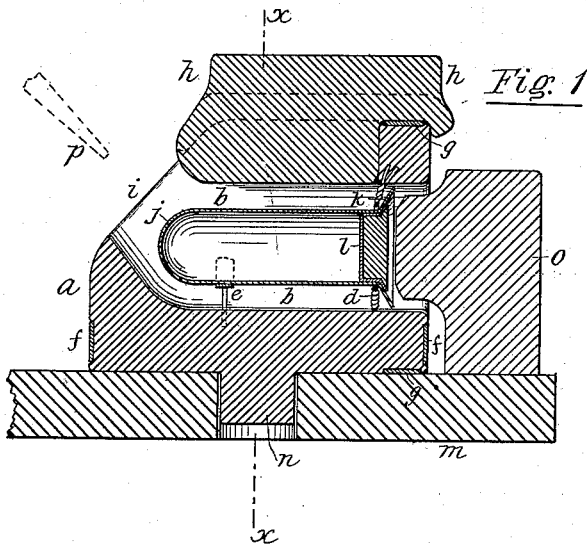
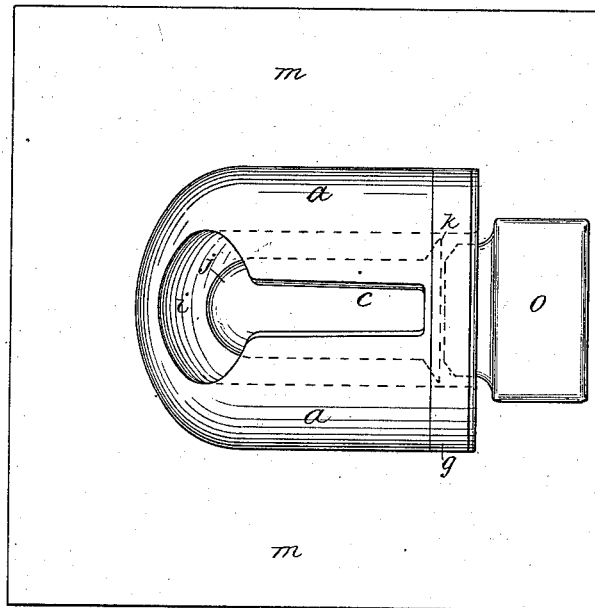


Fig. 3



Witnesses.

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UNITED STATES PATENT OFFICE.

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BLOW-PIPE FURNACE.

SPECIFICATION forming part of Letters Patent No. 383,971, dated June 5, 1888.

Application filed July 26, 1887. Serial No. 245,313. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. McLAREN, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Blow-Pipe Furnaces, of which the following is a specification.

This invention relates to that class of furnaces in which the work or material to be treated is inclosed in a muffle; and it comprises a muffle made of suitable metal, as platinum or an alloy of platinum or iridium, and a jacket composed of a refractory earth, in which the muffle is held. The flame is supplied by an ordinary blow-pipe or other suitable external burner, and is caused to impinge directly upon the muffle through an opening in the jacket. To allow of the perfect action of the flame upon the muffle, a longitudinal opening extending from the muffle-chamber through the upper and rear parts of the jacket is provided, through which the flame is directed upon the upper side of the muffle to primarily heat the same. A cover is then placed upon the jacket to close the upper part of the longitudinal opening, leaving an opening in the rear, through which the flame is directed to complete the heating of the muffle and its contents. An opening is provided in the front of the jacket for the insertion and removal of the muffle in and from the jacket, and a deflector is placed in front of this opening to retard the escape of the products of combustion and heat of the flame as they issue from the furnace by deflecting them back against the muffle, the mouth of which is closed by a suitable plug or cover. For convenience of manipulation the jacket is mounted upon a slab or base-piece and adapted to be rotated thereon.

My improved muffle is simple and compact, has high heating capacity, more fully utilizing the heat applied thereto than other furnaces of this class, may be readily manipulated, and avoids all liability of gassing the material or work under treatment by reason of the metallic muffle.

In the accompanying drawings, Figure 1 is a central longitudinal section of my improved furnace. Fig. 2 is a transverse section on the line *x x*, and Fig. 3 is a plan view with the cover removed.

The body or jacket *a* of the furnace is made of fire-clay or other suitable refractory earth or composition cast or molded into the desired form. It has an opening, *b*, extending entirely through it and through part of the upper side, forming the longitudinal slot *c*, as clearly shown in Fig. 3. In the opening *b*, near its front end and embedded in the jacket, is the light frame *d*, preferably made of platinum wire, and near the rear end of this opening *b* is another frame, *e*, also embedded in the jacket. Metal binding-bands *f* and *g* are placed around the jacket to strengthen it. The cover *h*, also made of refractory material, closes the longitudinal slot *c* in the upper part of the jacket, leaving the rear opening, *i*, as shown at Fig. 1. This cover *h* is removed in preliminarily heating the muffle, allowing the flame of the blow-pipe to be directed through the slot *c* onto the top of the muffle. When uniformly heated, the said cover *h* is placed in the slot *c* and the heating of the muffle and its contents completed by directing the flame through the rear opening of the jacket, as shown at Fig. 1.

The metallic muffle *j*, placed inside the jacket *a*, is supported by the frames *d* and *e*, so as to leave spaces between the muffle and the interior of the jacket. This muffle is composed of a refractory metal, as platinum or platinum and iridium. It is entirely closed at its rear end and provided at its front end with the flange *k*. A stopper or plug, *l*, is provided, consisting, preferably, of a shell of the refractory metal shaped to fit the mouth of the muffle and filled with fire-clay or other suitable material.

The muffle is preferably made from one piece, as it is requisite that no opening occur in it, and it may be shaped by a drawing or a pressing process. The outer surface of the muffle may be wholly or partly roughened or corrugated to increase the heating-surface. The jacket *a* may be provided with a handle, or held by any suitable means; but for easy manipulation, in most cases, I place it upon a slab, *m*, a lug, *n*, on the jacket fitting into a hole in the slab, thus allowing the jacket to be turned into any desired position.

It is advantageous to restrict the discharge-opening of the furnace. With this object I place in front of the muffle and front opening of the jacket a block or slab, *o*, which may be

formed to enter a short distance into the jacket, as shown.

In operating my improved furnace the work or material to be treated is placed within the muffle *j*, which is then closed by the stopper *l*. The flame from the blow-pipe or other source of heat employed is directed through the longitudinal slot *c* onto the top of the muffle, thus initially heating the same and its contents uniformly. The slot *c* is then closed by the cover *h* and the flame directed through the rear opening, *i*, so as to surround the muffle *j* and pass along all sides of the same through the chamber in the jacket. The block *o* is generally placed in position in front of the furnace in the final stage of the heating operation. The dotted lines *p*, Fig. 1, represent the nozzle of the blow-pipe in position to direct the flame through the rear opening, *i*. As the flame comes in contact with the flange *k* of the muffle, its passage from the heating-chamber is retarded, so that the full effects of its heat are utilized in the muffle. This is further enhanced by the slab *o*, which deflects the flame and heat and reflects the same back against the muffle.

The heat of a blow-pipe or other flame is by means of this furnace concentrated on the muffle, the operation being quickly and economically performed, and the closed metallic muffle avoids all liability of the gases from the source of heat coming in contact with the material contained in the muffle. Where the ordinary muffles are used, these gases often permeate the muffle and injure the material under treatment.

The furnace is adapted for treating porcelain and other substances which require a closed muffle, and is especially designed to bake porcelain in the manufacture of artificial teeth. It is generally made of such dimensions that it can be conveniently manipulated by one hand of the operator, while the operator's other hand may be used to direct the flame upon the muffle.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a muffle-furnace, in combination, a refractory jacket or body-piece having a chamber with a front opening and a longitudinal opening extending through the upper side and the rear end, a muffle supported within the chamber, and a cover for closing the upper part of the longitudinal opening, whereby the muffle is preliminarily heated through the upper part of the longitudinal opening, which is

then closed by the cover, and the operation completed by the heating-flame being directed through the rear opening, substantially as set forth.

2. In a muffle-furnace, in combination, a refractory jacket or body-piece having a chamber extending entirely through it, a muffle provided with a stopper supported within the chamber, and a deflecting-block placed in front of the chamber, partly closing the exit end of the same, substantially as set forth.

3. In a muffle-furnace, in combination, a refractory jacket or body-piece having a chamber extending entirely through and provided with a central stud, a muffle supported within the chamber, and a slab provided with a hole into which the stud of the jacket extends, whereby the jacket is held free to rotate on the slab, substantially as set forth.

4. In a muffle-furnace, in combination, the refractory jacket or body-piece *a*, provided with the chamber *b*, extending entirely through it, the muffle *j*, supported within the chamber on the frames *d* and *e*, and the flange *k*, extending from and around the front end of the muffle, so as to nearly close the chamber, substantially as set forth.

5. In a muffle-furnace, in combination, the refractory jacket or body-piece *a*, having a chamber, *b*, extending entirely through it, the muffle *j*, supported within the chamber on the frames *d* and *e*, the flange *k*, extending from and around the front end of the muffle, so as to nearly close the chamber, and the deflector *o*, placed in front of the chamber and extending partly within the same, substantially as set forth.

6. In a muffle-furnace, in combination, a refractory jacket or body-piece having a chamber with a front opening and a longitudinal opening extending through the upper side and the rear end, a muffle supported within the chamber and provided with a flange extending from and around its front end, a cover for closing the upper part of the longitudinal opening in the jacket, a deflector placed in front of the chamber, and a slab upon which the jacket is held free to rotate, substantially as set forth.

Signed at New York, county and State of New York, this 20th day of July, 1887.

FRANCIS J. McLAREN.

Witnesses:

HENRY T. BRENNAN,
JAS. W. DONOVAN.