

(No Model.)

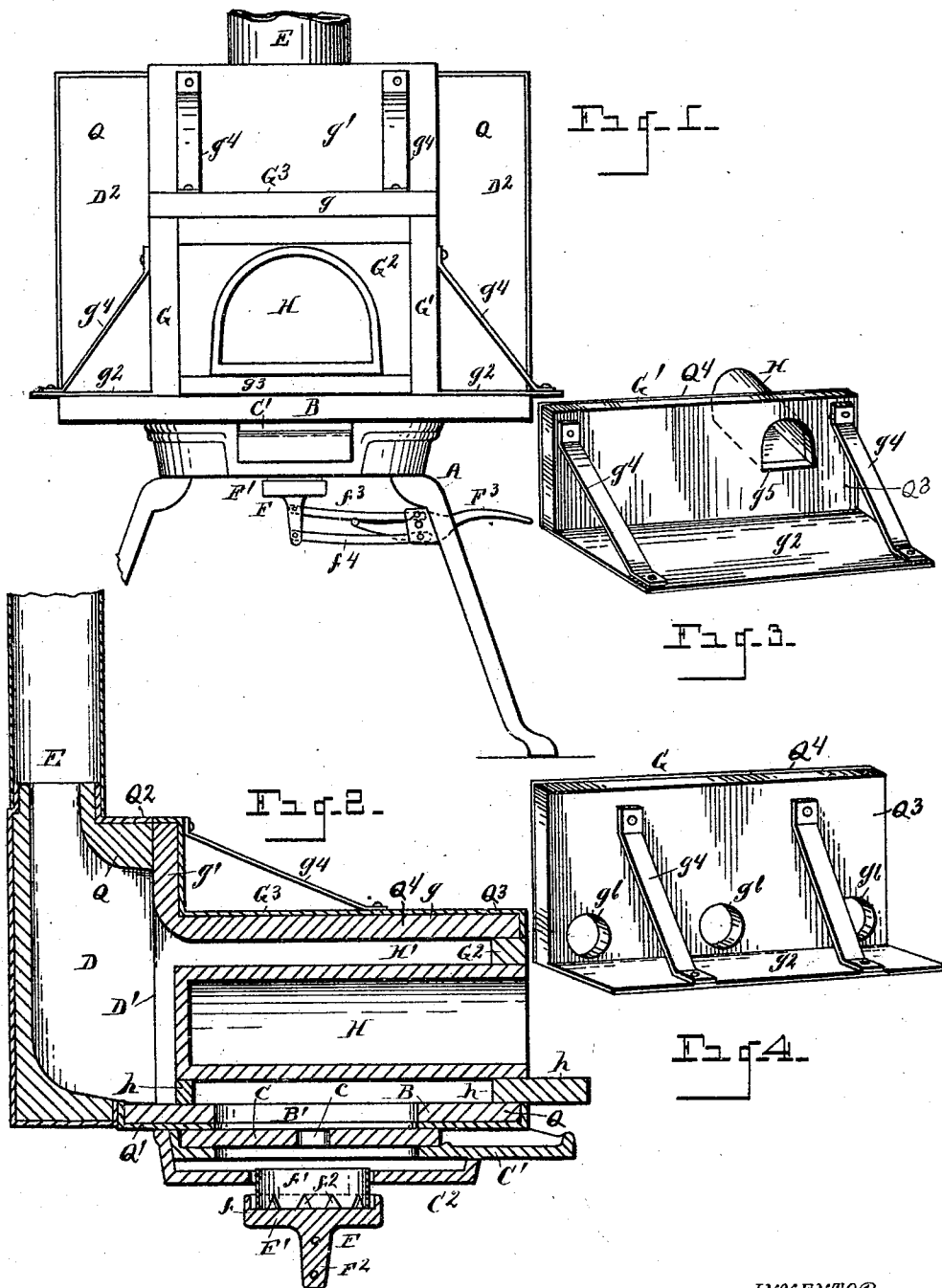
2 Sheets—Sheet 1.

C. H. LAND.

METALLURGICAL HEARTH AND ATTACHMENT.

No. 549,320.

Patented Nov. 5, 1895.



WITNESSES

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(No Model.)

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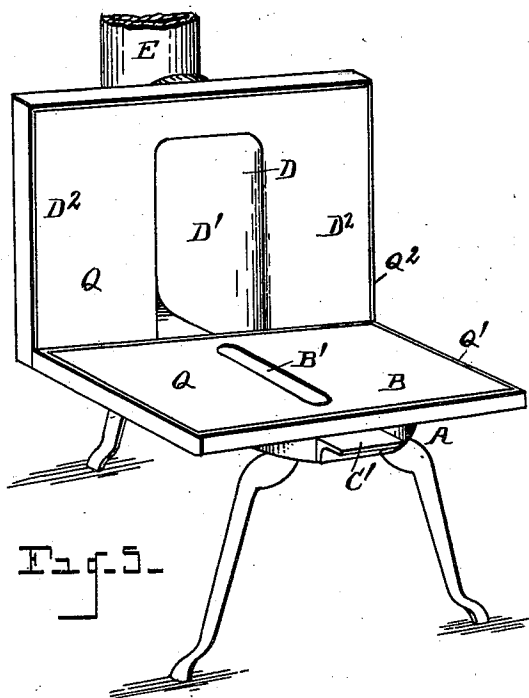


Fig. 5.

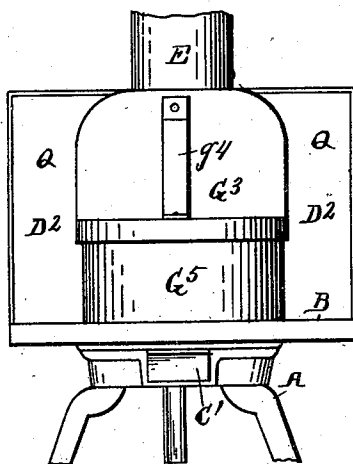


Fig. 7.

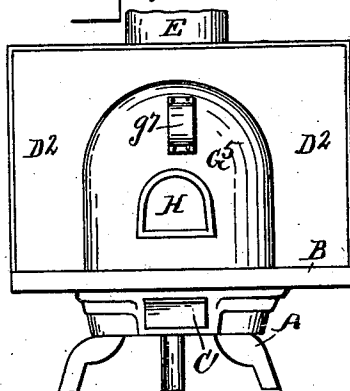


Fig. 8.

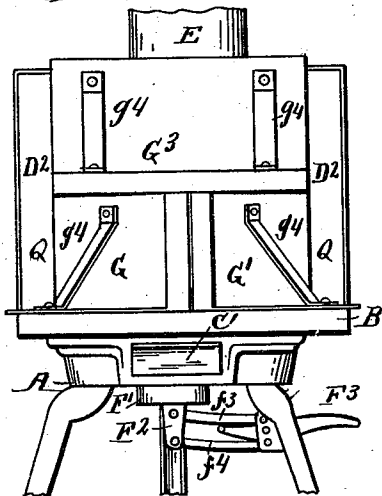


Fig. 6.

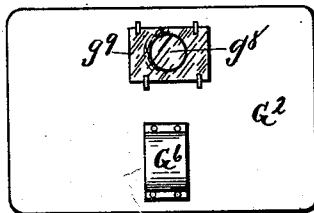


Fig. 9.

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METALLURGICAL HEARTH AND ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 549,320, dated November 5, 1895.

Application filed December 24, 1894. Serial No. 532,801. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. LAND, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in a Metallurgical Hearth and its Attachments; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention pertains to certain new and useful improvements in a metallurgical hearth and its attachments, the object of my invention being to secure greater economy, both in apparatus and facilities for securing metallurgical and chemical results, as well as to improve the methods of utilizing certain fuels for such purposes.

My invention consists of the construction, combination, and arrangement of devices and appliances hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation illustrating features of my invention. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a detail view of a convertible front wall. Fig. 4 is an analogous view of a convertible wall adapted to be used in heating soldering-irons. Fig. 5 is a view in perspective of the hearth proper separate from its attachments. Fig. 6 is a view in front elevation, showing a modified form of arrangement within the scope of my invention. Fig. 7 is a front view of still another modification, showing the cover in two parts. Fig. 8 is a similar view showing the wall and cover or top constructed in a single piece. Fig. 9 is a view in detail of a convertible front wall.

A chief feature of my invention lies in the construction of a hearth itself, (shown separately in Fig. 5,) with which a variety of attachments may be engaged for various kinds of work.

The hearth itself consists, essentially, of a supporting-frame A, of any desired construction, upon which is located a bed or table B. Underneath the bed B, I prefer to locate a removable diaphragm C, which may be sup-

ported upon a slide C', engaged upon a plate C², although the removable diaphragm may be supported in place in any suitable manner. The diaphragm C is constructed with a contracted orifice, (indicated at c, Fig. 2.) The bed B is constructed with an orifice B', preferably of elongated form. By making the diaphragm C removable a diaphragm of any desired size of aperture therein may be employed. To the rear of the bed B is located a chamber D, having a front opening D' rising above the bed B, the rear upper portion of the chamber D communicating with a flue E. Below the diaphragm C, I locate a burner F, of any suitable construction, said burner being preferably constructed for the use of a hydrocarbon fuel, either liquid or gaseous. As shown, the burner is formed of a basin or pan F', having a marginal rim f, within which is seated a foraminous collar f', said collar preferably consisting of sheet metal formed of a series of cut-away portions f² at its base. This burner I preferably make vertically adjustable in any suitable manner. To this end, as shown, the pan is formed with a downwardly-extended arm F², with which are engaged lever-arms f³ f⁴, said lever-arms having a pivotal connection with the arm F² at one extremity thereof and with the frame A at the opposite extremity thereof.

F³ denotes an operating-lever fulcrumed upon the frame A, the forward end thereof projecting between the lever-arms f³ and f⁴, whereby as the lever F³ is raised or lowered the pan F' will be correspondingly raised or lowered to focus the flame through the orifice in the diaphragm thereabove. It is of great importance in using this style of burner and to secure perfect combustion of hydrocarbon fuels especially to mix the air with the flame after primary ignition has taken place. This is done by passing the air through the foraminous collar, as well as by adjusting its relation to the base of the hearth thereabout, so as to admit more or less air thereabout upward to mingle with the flame. This focusing of the flame through the aperture at the base of the hearth is a point of especial importance to secure the desired results.

The hearth as so constructed is capable of many uses and for the application of a variety of attachments thereto for various pur-

poses and results. In Fig. 1, for example, I show arranged upon the bed B two convertible side walls G G', a front wall G², and a cover G³, formed with a horizontal portion *g* and a perpendicular portion *g'*. As so shown, the side walls G G' and the front walls G² may be arranged in rectangular form upon the bed B in front of the chamber D, surrounding the orifice B'. The horizontal portion of the cover forms the top of the chamber inclosed by the walls G G' G², and the portion *g'* of the cover closes the upper portion of the opening *d'* of the chamber D. Each of the side walls G G' is preferably formed with a flanged base *g*². The front wall G is also preferably formed with a flanged base *g*³, whereby said walls may be readily supported in an upright position. Braces *g*⁴ serve to strengthen the structure, and may also serve for the more convenient handling of the corresponding device.

The chamber D of the hearth is preferably constructed with laterally-projecting walls D² D², to afford ample room for the lateral adjustment of the side walls G G' to form an inclosing chamber therewithin of desired size.

In Figs. 1 and 2 I have shown the front wall G² provided with a muffle H, extending within the chamber H', formed by the inclosing convertible walls upon the hearth. The front wall may be cut away, thus to permit the insertion of a muffle into the chamber H'. I prefer to support the muffle within the chamber H' above the bed B, as upon any suitable supports *h*, to permit the passage of the products of combustion thereabout.

In Fig. 3 I have shown one of the side walls—as the wall G', for example—formed with an orifice, as at *g*⁵, to permit the insertion of a muffle H therein into the chamber H'. Either of the side walls G G' might thus be constructed for the insertion therethrough of one or more muffles extending across the chamber H'.

In Fig. 4 I have shown one of the side walls—as the wall G, for example—formed with orifices *g*⁶, through which soldering-irons might be inserted into the chamber H'.

In Fig. 6 I have shown the two side walls G G' brought together at their forward ends to form a triangular chamber therebetween, the front wall being omitted. A cover of corresponding form might be used or a cover with a rectangular horizontal portion. The convertible attachments may be arranged in the form shown in Fig. 6, when a chamber of suitable size may conveniently be secured thereby.

In Fig. 7 I have shown below the cover G³ an inclosing wall G⁵, forming the front and side walls upon the bed B. A chamber may thus be formed upon the hearth above the burner of the two removable portions G³ G⁵. My invention also contemplates, as indicated in Fig. 8, having an inclosing wall and cover formed of a single piece, as indicated at G⁵,

resting upon the bed B and against the walls D² in front of the chamber D. In the instance shown in Fig. 8 the wall G⁵ is constructed to receive a muffle H and is provided with a handle *g*⁷.

In Fig. 9 a front wall G² is provided with an observation-orifice, as indicated at *g*⁸, having a mica cover *g*⁹, and with a handle G⁶.

I have shown these various forms of convertible and removable walls to be applied to the hearth to form an interior chamber H' to illustrate the scope and utility of my invention, inasmuch as I contemplate attaching to the hearth walls of different forms, which may be removable and interchangeable, so that a chamber of desired size upon the hearth may be arranged and provided, as circumstances may require, in a ready and simple manner.

I would have it understood that the side and front walls, as well as the cover, may be formed of various sizes, inasmuch as the bed B and the side walls D² about the chamber D permit the chamber H' to be expanded laterally the full length of the bed and said side walls and to be brought forward to the very front edge of the bed B. At the same time a chamber of contracted size may as readily be provided upon the hearth for smaller work, thereby economizing in the amount of fuel required to do the work. Whatever the size of the chamber H' may be, as so formed it is obvious that the full power of draft through the flue E is secured close to the orifice B' above the burner, reducing frictional obstruction to the draft, thereby utilizing the force of the chimney-blast in the highest possible degree in securing proper combustion. It will readily be seen by reference to Fig. 2, for example, that by locating the aperture *c* in the diaphragm toward the center thereof or to the front or rear of the center we secure the full force of the chimney-blast upon the flame of the burner, either at the center of the orifice B' or forward of the center or to the rear thereof, by changing the diaphragm as may be desired.

The form of construction illustrated in Figs. 6 and 7 is well adapted for different sizes of crucibles to be located within the chamber H' or for the reception of a melting-pot. The device may readily be arranged for use in burning decorated china, for example, by making the two side walls G G' without perforations or orifices therein, employing a suitable cover and front wall. This construction and arrangement obviously provide, also, for forming a chamber H' of the desired height by simply providing side walls G G' and a front wall G³ of the height required. Neither the hearth nor the attachments are likely to get out of order, and if they do they may be easily repaired. The use of the attachments upon the hearth may thus be provided for many practical modifications, according to the work to be done, the prime factor being the hearth with its bed B

and chamber D and the burner beneath the bed with or without a removable perforated diaphragm. The orifice B' in the bed may be of any desired size or form, and a removable diaphragm might be dispensed with without departing from the chief features of my invention. In all the various capacities and adaptations of my invention the desired results may be secured with the ordinary draft of a chimney or the equivalent thereof by means of an exhaust-fan.

The chamber D is formed, as shown, of a jacket projecting vertically at the rear of the bed B. As shown, the opening D' of the chamber D, I prefer to have extended downward on a level with the surface of the bed B to provide for an uninterrupted and unhindered draft into the chamber from the surface of the bed and also to provide a maximum capacity of the chamber D. The jacket extends over the opening D', so that the vertical portion of the cover may rest thereagainst.

The hearth, with its attachments, as will be seen, is portable, and is every way convenient in its use.

The hearth B and also the front face of the jacket of the chamber D are preferably faced with fire-brick linings, (indicated at Q.) To this end the bed B and said jacket may each be constructed with exterior metal cases Q' and Q², respectively, having a facing of refractory material engaged therewith. So, also, the interchangeable side walls and front and cover portions may each be constructed in a similar manner, said side walls and front and cover portions being each constructed of a metal case Q³, the faces thereof adjacent to the chamber H' being provided with a lining Q⁴ of refractory material. The horizontal bases g² may simply be of metal. A hearth so constructed and arranged, with its attachments, may be used for a great variety of purposes—as, for example, for assaying, roasting of ores, melting, fusing, brazing, enameling, &c. The device is therefore peculiarly well adapted for the use of jewelers, dentists, chemists, assayers, china decorators, and others. The horizontal bed is normally open, as shown in Fig. 5, the chamber D being formed of a ver-

tical jacket having a permanent engagement upon one end of the bed.

The construction shown in Fig. 5, without any inclosing walls or attachments shown in the remaining figures, is adapted and designed in and of itself alone for many and different uses.

What I claim as my invention is—

1. The hearth herein described consisting of a horizontal bed constructed with an orifice therein, a flue, a supporting base, and a vertical jacket at one end of the bed forming a chamber D communicable with said flue and opening toward the bed, said hearth having in combination therewith a burner located beneath the orifice in said bed, said jacket constructed with walls D¹, D², projecting laterally on each side of said opening, substantially as set forth.

2. In combination, a hearth constructed with a horizontal base having an orifice therein, a permanent vertically extended jacket at one end of the bed forming a chamber D opening toward the bed, a flue communicable with said chamber and a detachable wall supported upon said bed in front of said jacket, said jacket constructed with walls D¹, D² projecting laterally on each side of said opening, substantially as set forth.

3. A hearth constructed with a horizontal bed having an opening therein, a permanent vertical jacket at one end of the bed forming a chamber opening toward the bed, a flue communicable with said chamber, said hearth having in combination therewith a burner below the opening in said bed, and detachable walls and cover therefor located in front of said jacket, said jacket constructed with walls D¹, D² projecting laterally on each side of said opening to permit the walls being located nearer to or farther away from said opening, substantially as and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES H. LAND.

Witnesses:

O. B. BAEUZIGER,
MARY A. MARTIN.