

936,221.

Witnesses
Geo. A. Bepue.
Mr. Map. Durrall.

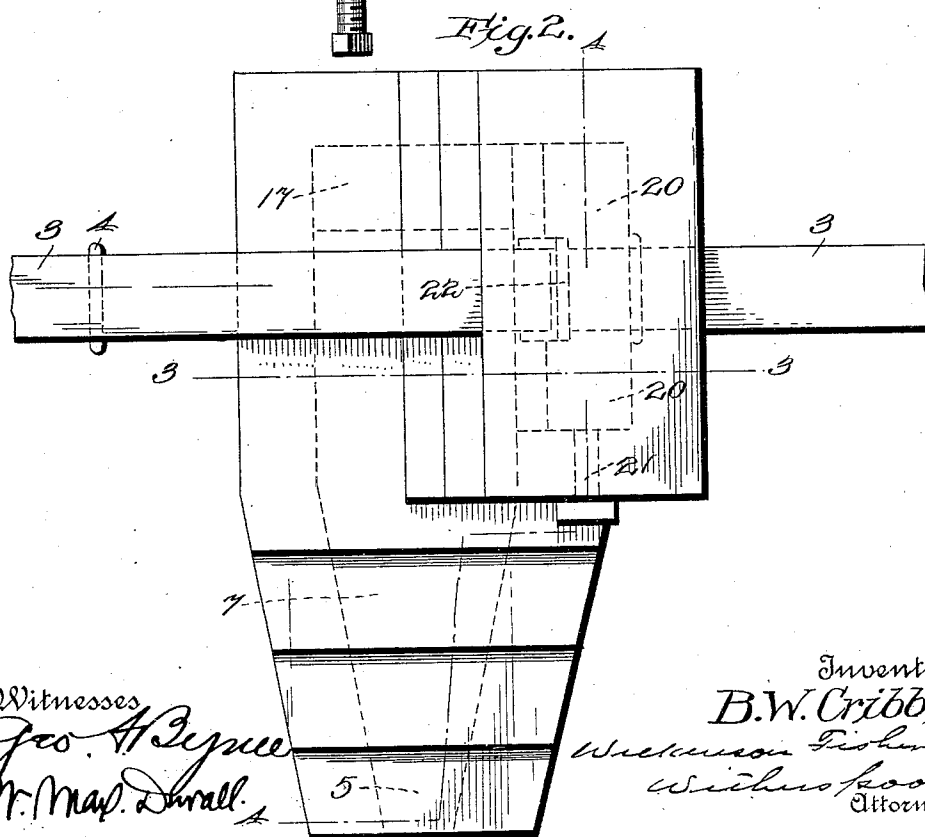
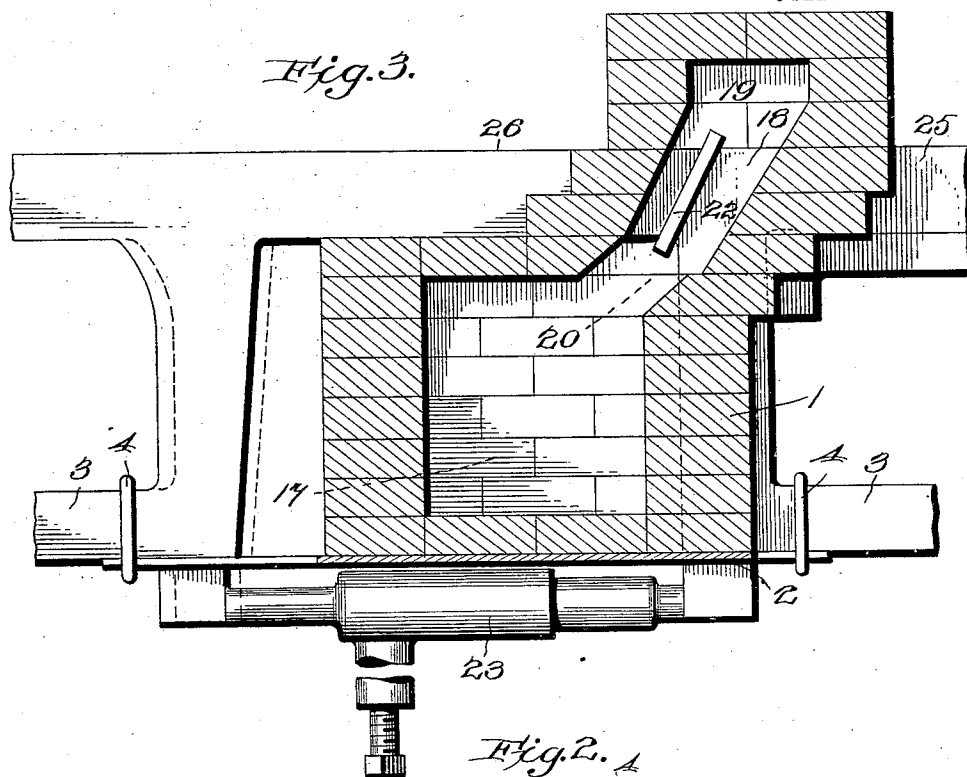
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B. W. CRIBB.
WELDING FURNACE.
APPLICATION FILED JAN. 20, 1909.

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Patented Oct. 5, 1909.

3 SHEETS—SHEET 2.



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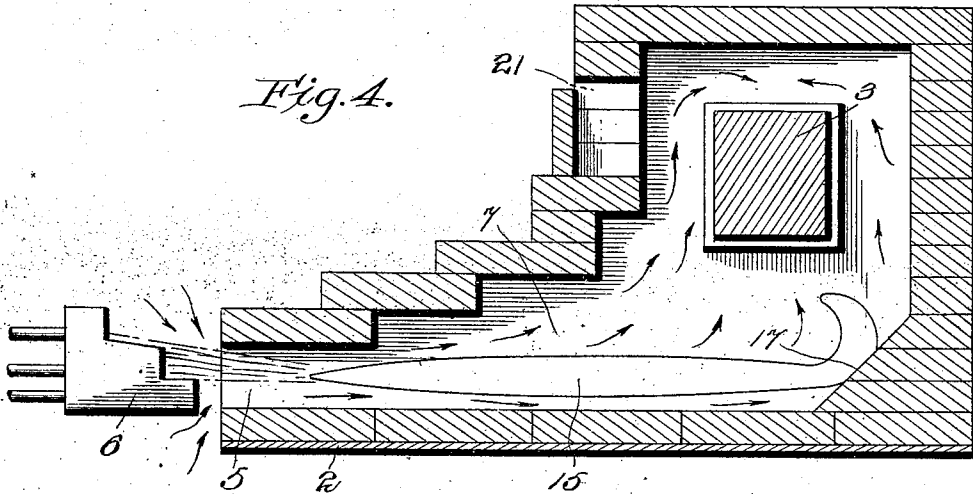
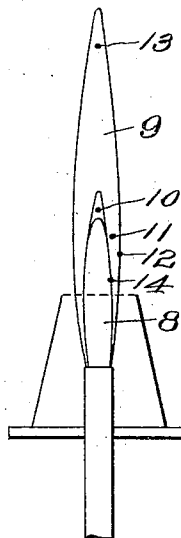


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WELDING-FURNACE.

936,221.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed January 20, 1909. Serial No. 473,279.

To all whom it may concern:

Be it known that I, BREWSTER W. CRIBB, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have
5 invented certain new and useful Improvements in Welding-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to
10 which it appertains to make and use the same.

This invention relates to welding furnaces, and has for its object to produce a cheap, simple and efficient portable furnace which
15 can be readily built around the casting or other body to be welded.

To these ends the invention consists in the novel combinations of parts and details of construction more fully hereinafter disclosed
20 and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals refer to like parts in all the views:—Figure 1, is a perspective view of
25 my furnace supported by the body to be welded; Fig. 2, is a plan view thereof; Fig. 3, a sectional view of the same on the line 3—3 of Fig. 2; Fig. 4, a sectional view on the line 4—4 of Fig. 2; and Fig. 5, an eleva-
30 tional view of the well known blow pipe flame.

1, represents the walls of the furnace composed of brick or other material preferably temporarily secured together; 2, a metal
35 plate or other support for said furnace; 3, the frame-work or other body to be welded and from which the plate 2 and walls 1 are supported by the fastening means 4, which in the instance shown consists of rings
40 shaped to fit the supporting frame 3.

5, represents the mouth of the furnace through which the flame enters; 6, a suitable nozzle for delivering a flame thereto; and 7, a combustion chamber.

In Fig. 5, is illustrated the well known blow pipe frame in which 8 is the dark cone of CO gas; 9, the mantle formed by the
45 oxidation of this gas to CO₂; 10, the luminous tip of the dark cone which is only formed when the air supply is deficient, and which when formed constitutes the well known upper reducing zone; 11, the fusing zone which is the hottest part of the flame,
50 and often reaches to a temperature of 2300° C., and which lies about mid-way between

the inner and outer edges of the mantle; while 12 indicates the lower oxidizing zone, which lies below the fusing zone and very close to the outer edge of the mantle 9. The upper oxidizing flame is located at 13; and
60 the lower reducing zone at 14. The burner is provided with means not shown by which the pressure of the jets issuing therefrom may be so adjusted as to cause the dark cone 15 of the flame in the furnace (which corresponds
65 to the dark cone 8 in Fig. 5) to be reflected from the inclined back wall 17 of said furnace; and the fusing and reducing portions of the furnace flame corresponding to the
70 parts 10 and 11 of the flame in Fig. 5, to play around and in the fracture of the frame or other piece to be welded. It results from
75 this that oxids are kept out of the fracture which is supposed to be located in the frame illustrated between the parts 18 and 19. In
80 order that the reflected portions of the flame shall play around all sides of the parts to be welded, the chamber 20 is provided, which permits the flame to pass up and around two
sides of the parts 18 and 19 and to be re-

flected back on to its upper surface. The furnace is provided with a suitable peep hole 21 through which the operations of the flame may be observed, and with opposite holes through which project the parts
85 25 and 26 of the frame not being heated.

22, represents metal that is placed in the fracture between the parts 18 and 19 after said parts have been forced apart by the hydraulic jack 23 in order to open the
90 fracture.

In operation the plate 2 is firmly secured to the body to be welded; the bricks are assembled on said plate and around the fracture so as to produce the chambers 7 and 20,
95 the reflecting back wall 17, and entrance 5; and the bricks as well as the holes in the furnace walls through which project the parts 25 and 26 not to be heated, are luted with clay or some other temporary cement-
100 ing material, care being taken to so proportion the chambers as to conserve the heat, and as to cause the fusing and reducing zones of the flame to surround the fracture. Some little experience and care is necessary
105 to accomplish the best results, because, of course, the dimensions of the furnace and its parts are dependent upon the size of the parts 18 and 19 of the metal body to be heated; as well as the pressure and supply
110

of fuel that is available in the burner; but after a few trials success is easily accomplished, especially if the flame is carefully watched through the peep hole 21.

5 The amount of metal 22 inserted in the fracture is so proportioned as to supply that portion of metal which is extruded from the fracture, when the jack 23 is released and the parts of the frame are permitted to resume
10 their normal position indicated by dotted lines in Fig. 3. The reducing and fusing flames being permitted to play on the fracture and metal 22 until the parts are fused together, the jack is released; the parts resume
15 their normal position; the furnace is quickly dismantled, and the metal extruded from the fracture is hammered down and the joint finished off.

It will be observed that the foregoing
20 operations may be carried on without dismantling more of the machine to which the fractured frame belongs than is necessary to permit this small furnace to be built. In the case of fractured locomotive frames, the
25 saving in labor and in time over the older methods which required the whole locomotive to be dismantled has proved in actual practice to be very great.

Of course, where a propeller shaft or other
30 large body is to be welded while in position the furnace will be correspondingly changed.

What I claim is:—

1. In a welding furnace, the combination of means to support the furnace from the
35 body to be welded; walls supported from said plate provided with holes through which parts of said body project; a combustion chamber; and a second restricted chamber extending around four sides of said
40 body and leading to one side of said combustion chamber, substantially as described.

2. In a welding furnace, the combination of the walls thereof provided with apertures through which parts of the body to be welded
45 may project; and a plate supporting said

walls; said furnace also provided with a combustion chamber; a reflecting back wall, and with a restricted chamber communicating with said combustion chamber and extending around four sides of the parts to
50 be welded, substantially as described.

3. In a portable welding furnace, the combination of the walls thereof provided with a peep hole, a mouth and an aperture through which the body to be welded may project; a
55 plate supporting said walls; and means supporting said plate from said body; and said furnace further provided with a combustion chamber, an inclined back wall from which the products of combustion may be reflected
60 on said body, and with a restricted chamber communicating with said combustion chamber and extending around four sides of the parts to be welded, substantially as described.

4. A portable welding furnace adapted to
65 be built around the body to be welded, provided with a mouth; a combustion chamber leading from said mouth; a reflecting back wall; an aperture through which the body to be welded may project; and a second re-
70 stricted chamber extending on four sides of said body, substantially as described.

5. A portable welding furnace adapted to be built around the body to be welded, provided with a mouth; a combustion chamber
75 leading from said mouth; an inclined reflecting back wall; a plurality of apertures through which the body to be welded may project; a peep hole; and a second restricted chamber communicating with, located above,
80 and to one side of said combustion chamber and extending on four sides of said body, substantially as described.

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

BREWSTER W. CRIBB.

Witnesses:

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