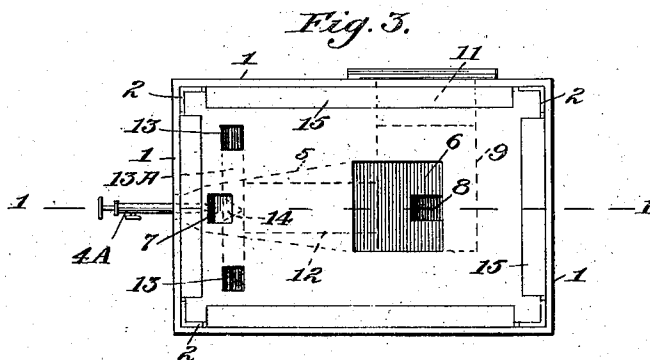
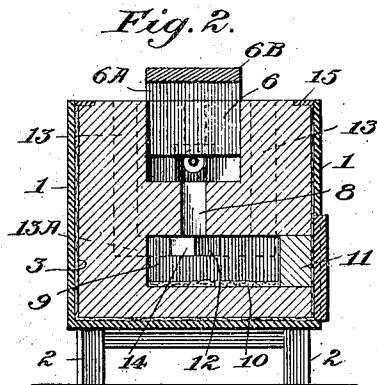


FURNACE OR FORGE.

936,573.



C. H. Potter

Inventor:

William Scrimgeour, Jr.

↳ Byrnes Townsend,

Att'ys.

UNITED STATES PATENT OFFICE.

WILLIAM SCRIMGEOUR, JR., OF PORTSMOUTH, VIRGINIA, ASSIGNOR TO MIRCS FUEL OIL EQUIPMENT COMPANY, OF NORFOLK, VIRGINIA, A CORPORATION OF VIRGINIA.

FURNACE OR FORGE.

936,573.

Specification of Letters Patent.

Patented Oct. 12, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM SCRIMGEOUR, Jr., a citizen of the United States, residing at Portsmouth, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Furnaces or Forges, of which the following is a specification.

This invention relates to furnaces or forges utilizing oil or gas as fuel, the object of the invention being the provision of a simple, inexpensive and efficient furnace, adapted for various purposes and more particularly for the working of metals.

For a full understanding of the invention reference is made to the accompanying drawing showing a preferred embodiment thereof, wherein—

Figure 1 is a longitudinal vertical section through the furnace on line 1—1 of Fig. 3; Fig. 2 is a transverse section on line 2—2 of Fig. 1; and Fig. 3 is a plan view of the furnace.

The furnace illustrated is constructed of refractory brick, incased by asbestos sheathing 3 or equivalent refractory material of low heat-conductivity, covered by a casing 1, usually of sheet or cast metal. Angle bars 2 serve to strengthen the corners and sides of the brickwork, and may also serve if desired as supporting legs for the furnace; the upper edges of the brickwork are shown as protected by coping-plates 15.

4 is an orifice in the forward end of the furnace for a suitable hydro-carbon or gas burner 4^a, the flame from which is directed into a combustion chamber 5. This combustion chamber is shown as substantially horizontally disposed within the brickwork, and communicates directly with a supplemental combustion chamber or heating chamber 6, which extends upwardly to the top of the brickwork and within or over which the article to be heated is placed. The combustion chamber 5 is preferably provided with a divergent throat for the burner, and its roof is preferably inclined downwardly to the heating chamber 6; and in order to avoid contraction of its cross sectional area the combustion chamber is

flared outwardly toward the heating chamber as indicated in dotted lines in Fig. 3.

7 is an ignition port which may serve also when required as a supplemental air-inlet for the combustion chamber.

9 is a slag box disposed transversely in the brick work below the supplemental combustion chamber 6 and communicating therewith by a flue 8, this flue serving as a slag hole and also as a vent for some or all of the products of combustion. While I have shown the flue 8 as communicating with the portion of the supplemental combustion chamber remote from the burner, the said flue may be disposed, more particularly in the case of large installations, at or near the center of the base of the chamber. The slag, scoria or the like are collected upon the sand bottom 10 of the slag box 9 to which free access is afforded through a side aperture closed by removable brickwork 11.

12 is a flue extending forwardly from the slag box 9 at or near its upper level, and communicating with a transverse flue 13^a. From the flue 13^a vents or uptakes 13, shown as two in number and as disposed on opposite sides of the combustion chamber 5, lead upwardly to the top of the brickwork. An angular brick 14 is preferably disposed at the point of junction between the flues 12 and 13^a to secure a proper distribution of the products of combustion.

6^a represent cross bricks, supporting a wide brick 6^b above the supplemental combustion chamber, the construction serving to retain the heat in the chamber and at the same time to provide a limited aperture for the escape of the flame or products of combustion.

By means of the vents or uptakes 13, the products of combustion are permitted to escape when desired, although in the regular operation of the furnace the flame and a portion of the combustion products may be ejected directly from the supplemental combustion chamber 6 containing or supporting the article to be heated. When heating large pieces of metal, the excess products of combustion pass from the supplemental combustion or heating chamber 6 downwardly

through the combined vent and slag hole 8 to the slag box 9, thence through the flue 12 and escape through the vents or uptakes 13, thus providing for the heating of the combustion chamber 5 by the waste heat from the gases passing under and around it, and thereby insuring the complete and economical utilization of the fuel.

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

1. The combination in an apparatus of the class described of a refractory setting, a supplemental combustion chamber, a horizontal combustion chamber connected therewith, the extended bottom of said combustion chamber forming the bottom of said supplemental combustion chamber, a gas and slag passage adapted to vent the supplemental chamber, a slag box or trap connected therewith and a plurality of L shaped flues connected to the slag box and adapted to partly surround said horizontal combustion chamber.

2. The combination in an apparatus of the class described, of a brick setting, a supplemental combustion chamber therein, a combustion chamber having horizontal bottom portions and a sloping upper surface, said combustion chamber having its extended bottom forming the bottom of said supplemental chamber, a gas and slag passage from the supplemental combustion chamber, a slag trap connected with said gas and slag passage, and having an outlet at or near its upper portion, and a plurality of flues connected therewith and adapted to partly surround said combustion chamber.

3. The combination in an apparatus of the class described, of a setting, a supplemental combustion chamber therein having its outlet at the surface of the setting, a combustion chamber having a sloping upper surface and having an extended bottom forming the bottom of the said supplemental combustion chamber, a vent from said supplemental combustion chamber, a slag trap or cavity connected therewith, a horizontal flue connected to the trap at its upper portion, a transverse flue connected therewith, and a U shaped flue connected to said transverse flue and adapted to partly surround said combustion chamber.

4. The combination in an apparatus of the class described comprising a setting, of a flame deflecting supplemental combustion chamber therein, a combustion chamber connected to the supplemental chamber, the extended bottom of the first named chamber forming the bottom of the supplemental chamber, a slag and gas passage from the supplemental chamber, a slag trap or pocket below the supplemental combustion chamber and connected with said slag and gas pas-

sage, a horizontal flue connected to said trap, a transverse flue connected to said horizontal flue and forming a T shaped outlet, and a plurality of vertical vents or flues connected to said T shaped flue, said vents or flues adapted to pass partly around said combustion chamber.

5. The combination in an apparatus of the class described comprising a supplemental combustion chamber, of a horizontal combustion chamber connected therewith and having openings at both of its ends, a slag box below the supplemental combustion chamber and disposed across the furnace, a removable stopper in one end of the box, a down draft flue connecting the said slag box with the supplemental combustion chamber, a horizontal flue from the box to one end of the furnace, a plurality of vertical branch flues or vents connected to the said horizontal flue, and means for directing an excess of flame and gases into the said branch flues.

6. The combination in an apparatus of the class described, of a brick setting, a supplemental combustion chamber therein, a horizontal combustion chamber having contracted open ends and an expanded interior between said ends, an inclined air and igniting orifice connected thereto, a slag box disposed partly across the setting, a stopper hole in one end thereof, a down draft combined vent and slag hole connecting said supplemental combustion chamber with the slag box, a vent flue from said slag box to near one end of the furnace, a wedge shaped deflector in the flue near one of its ends, and a plurality of branch flues on each side of the said vent flue and deflector and connected with said vent flue.

7. In a hydrocarbon furnace or forge, a refractory setting, a heating chamber therein, a horizontal combustion chamber connected with said heating chamber, a gas and slag passage adapted to vent the heating chamber, a slag box beneath said heating chamber and connected therewith, and a flue connected with said slag box and in position to maintain the temperature of said combustion chamber.

8. In a hydrocarbon furnace or forge, a refractory setting, a heating chamber therein, a combustion chamber communicating with said heating chamber, a vent flue communicating with the lower portion of said heating chamber, said vent flue extending directly beneath said combustion chamber and in position to maintain the temperature thereof, and a branch flue extending upwardly in proximity to said combustion chamber.

9. In a hydrocarbon furnace or forge, a refractory setting, a heating chamber therein, a combustion chamber communicating

with the lower portion of said heating chamber, a vent flue extending from the bottom of said heating chamber and in position to maintain the temperature of said combustion chamber, and a branch flue extending upwardly in proximity to said combustion chamber.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses this 25th day of July 1905.

WILLIAM SCRIMGEOUR, JR.

Witnesses:

WALTER B. BURROW,
CHAS. A. MCLEAN.