Nov. 19, 1929. G. NIEMKOFF 1,736,415

OIL BURNING FURNACE

Filed Aug. 19, 1921

Fig. 2.

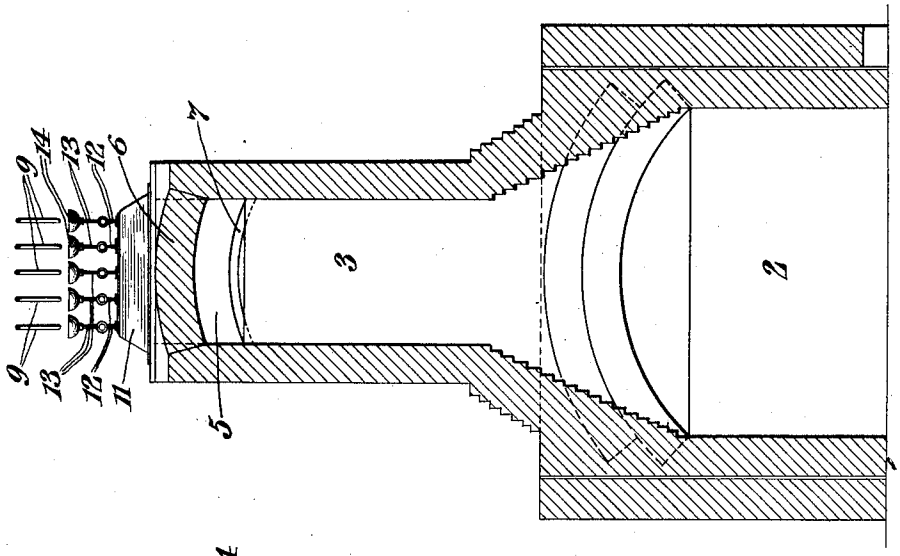
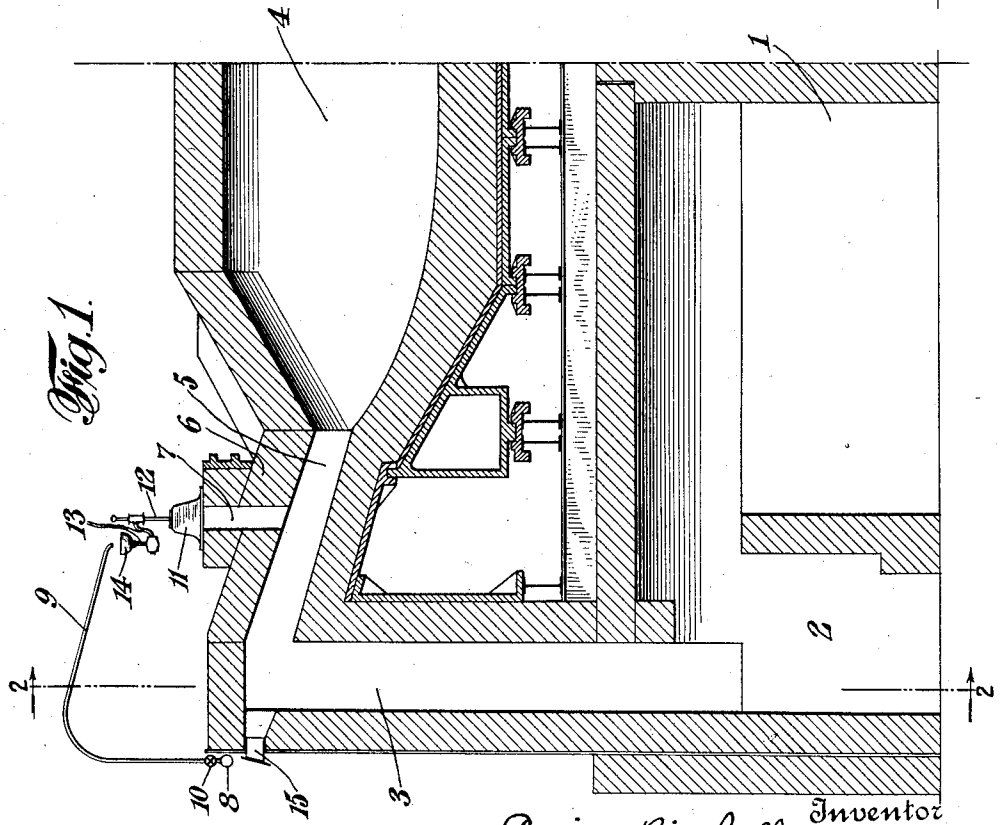


Fig. 1.



Inventor

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By his Attorneys

Prindle, Knight & Small

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UNITED STATES PATENT OFFICE

GREGOIRE NIEMKOFF, OF PARIS, FRANCE, ASSIGNOR TO SOCIETE ANONYME DES APPAREILS DE MANUTENTION ET FOURS STEIN, OF PARIS, FRANCE, A CORPORATION OF FRANCE

OIL-BURNING FURNACE

Application filed August 19, 1921. Serial No. 493,736.

The invention has for an object to simplify the construction and operation of metallurgical furnaces, particularly in regard to the fuel supply, by feeding oil or similar combustible liquid directly into a column of preheated air as the latter moves into the heating chamber, thus eliminating the step of preheating the fuel employed, in such manner the regenerators or recuperators need be provided only for the air used to support combustion.

Another object of the invention is to provide a simple and inexpensive fuel feeding apparatus which readily may be incorporated into the furnace structure without costly modifications thereof, and which will be capable of easy adjustment as desired.

Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention; such embodiment, however, is to be considered as merely illustrative of its principle.

In the drawings,

Fig. 1 is a longitudinal vertical section of one end of a furnace adapted to be operated in accordance wtih the invention;

Fig. 2 is a transverse section taken on line 2—2 of Fig. 1.

The invention is disclosed as applied to an open hearth furnace of the regenerative or reversing type; one end only of such a furnace is illustrated in Fig. 1, and which consists generally of a regenerator 1 for preheating the air supply, a dust trap 2, and a preheated air intake passage 3 leading upwardly from the regenerator and in communication with the heating chamber or hearth 4 through a laterally directed port way 5. As the detailed structure of the furnace as a whole is not essential to the invention it will not be further described, it being understood that the air is preheated in the regenerator at either end of the furnace according to the direction in which the furnace is being operated, and the products of combustion passed through the remaining regenerator to transfer their heat to the checker work thereof for preheating the air supply when the furnace is reversed, all in the usual manner.

In accordance with the present invention the fuel supply for the furnace is obtained by projecting oil or similar combustible liquid into the column of preheated air as the latter passes to the heating chamber 4. It is preferred to feed the liquid fuel to the preheated air column by gravity, the oil coming in contact with the air in the form of small drops which are readily carried along and ignited so that the products of combustion travel along the heating chamber 4. As shown, the top wall 6 of the port way 5 is provided with a transverse opening 7 extending substantially across the same, and the fuel is fed through such opening in the form of drops which fall by gravity into the column of preheated air.

For a furnace of the reversing type, it will be understood that the port way 5 at each end of the furnace is provided with a fuel-feeding device, and that such devices are employed alternately, depending upon the direction in which the furnace is being run.

I prefer to employ a fuel-feeding device of such character that the gases passing through the port way 5 may not escape through the opening 7 either during the use of the feed or when it is shut off. As shown, the oil comes to the furnace in a supply line 8, and passes through one or more feed pipes 9 having therein valves 10 to shut off the fuel supply or regulate the rate of feed, as may be desired. The outer end of the opening 7 is covered by a cap 11, through which lead one or more drip tubes 12, in such manner that the oil may fall from these tubes into the current of air passing through the port way 5. In order to prevent the escape of gases through the feed system, the tubes 12 are provided with a U-shaped portion 13 which forms a liquid seal for the gases inside of the furnace. Also, the device preferably is made sight feeding, as by providing cups 14 underneath the feed pipes 9 and connected to the respective drip tubes 12, so that the feed of the oil may be observed as the oil drops from the pipes 9 into the cups 14. The portions 13, as previously men-

tioned, seal the interior of the furnace against the escape of gases through the oil-feeding device when a sight feed system is employed.

Thus the oil vaporizes when it meets the current of preheated air passing through the port way 5, and its combustion is completed within the chamber 4.

The furnace therefore is exceedingly simple in structure and method of operation particularly as regards the fuel supply since no preheaters for the fuel are required, nor are any special parts to accommodate the incoming fuel necessary to insure its combustion, beyond an elementary fuel-feeding device of the character described. The operation of the furnace may be observed through a sight hole 15, and in starting, the temperature within the port way 5 may be brought up to the point necessary to ignite the fuel in any suitable manner, as by the insertion of a torch into the hole 15. After the furnace is started the oil fed through opening 7 may constitute the sole fuel supply, the amount of oil fed being regulated by adjustment of the valves 10, the heat of the exhaust gases passing through the regenerator 1 being utilized to preheat the incoming air to a temperature high enough to ignite the oil in port way 5.

While a specific embodiment of the invention has been disclosed, it is obvious that many changes may be made therein without departing from the spirit of the invention as defined in the following claim.

I claim:

In a metallurgical furnace, a combustion chamber, an intake passage leading thereto, the top wall of said intake passage being provided with an opening, and a liquid fuel-feeding device provided with a cap covering said opening, a drip tube leading through said cap and having a U-shaped portion therein adapted to provide a liquid seal, and a sight feed device interposed between said U-shaped portion and the fuel supply, whereby the fuel may be fed by said device by gravity into the said passage.

In testimony that I claim the foregoing, I have hereunto set my hand this 25th day of July, 1921.

GREGOIRE NIEMKOFF.