

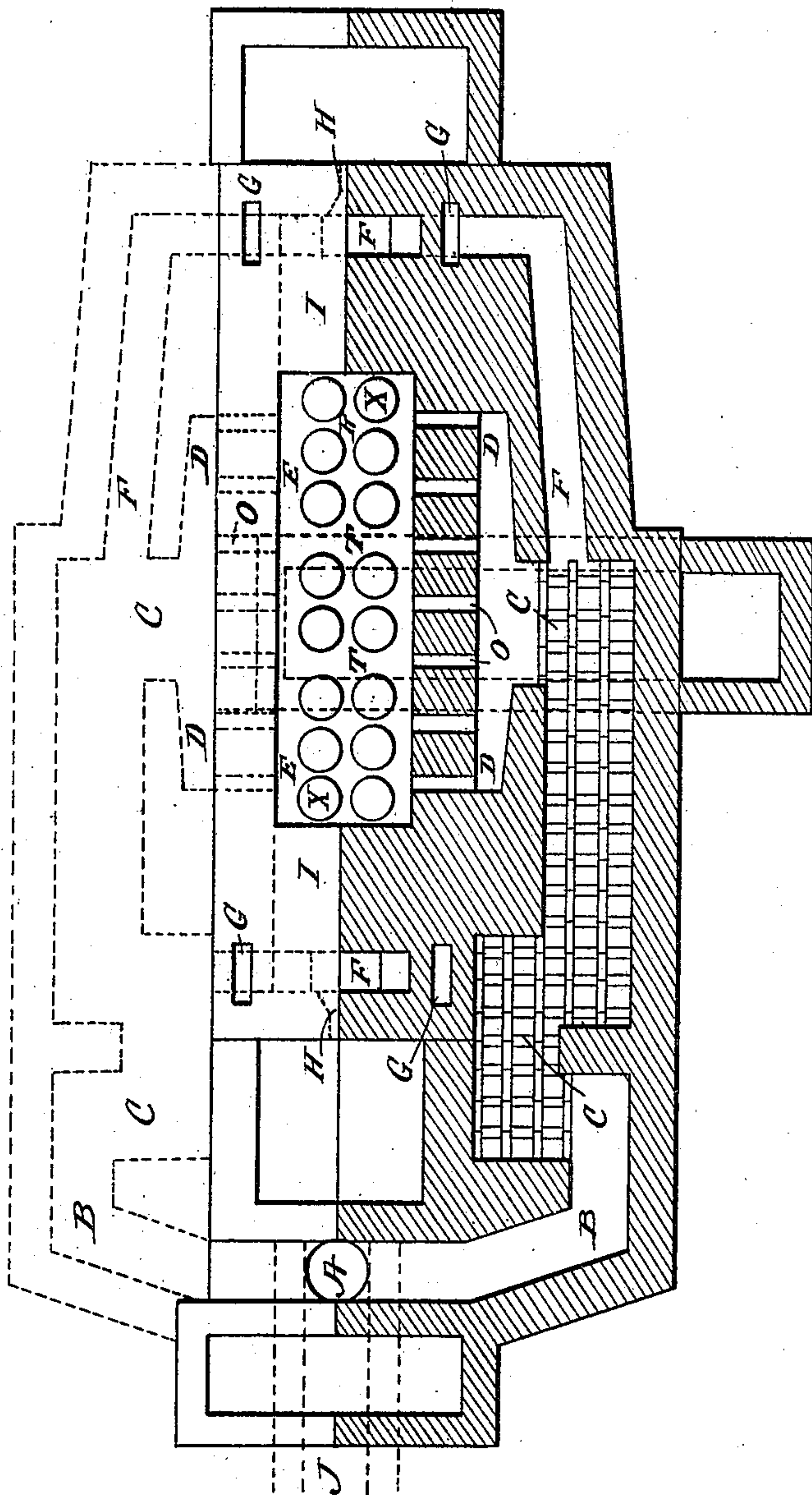
C. SMERLING.
CRUCIBLE MELTING FURNACE.
APPLICATION FILED MAY 7, 1908.

914,609.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

L. H. Schmidt.
W. E. Lawson

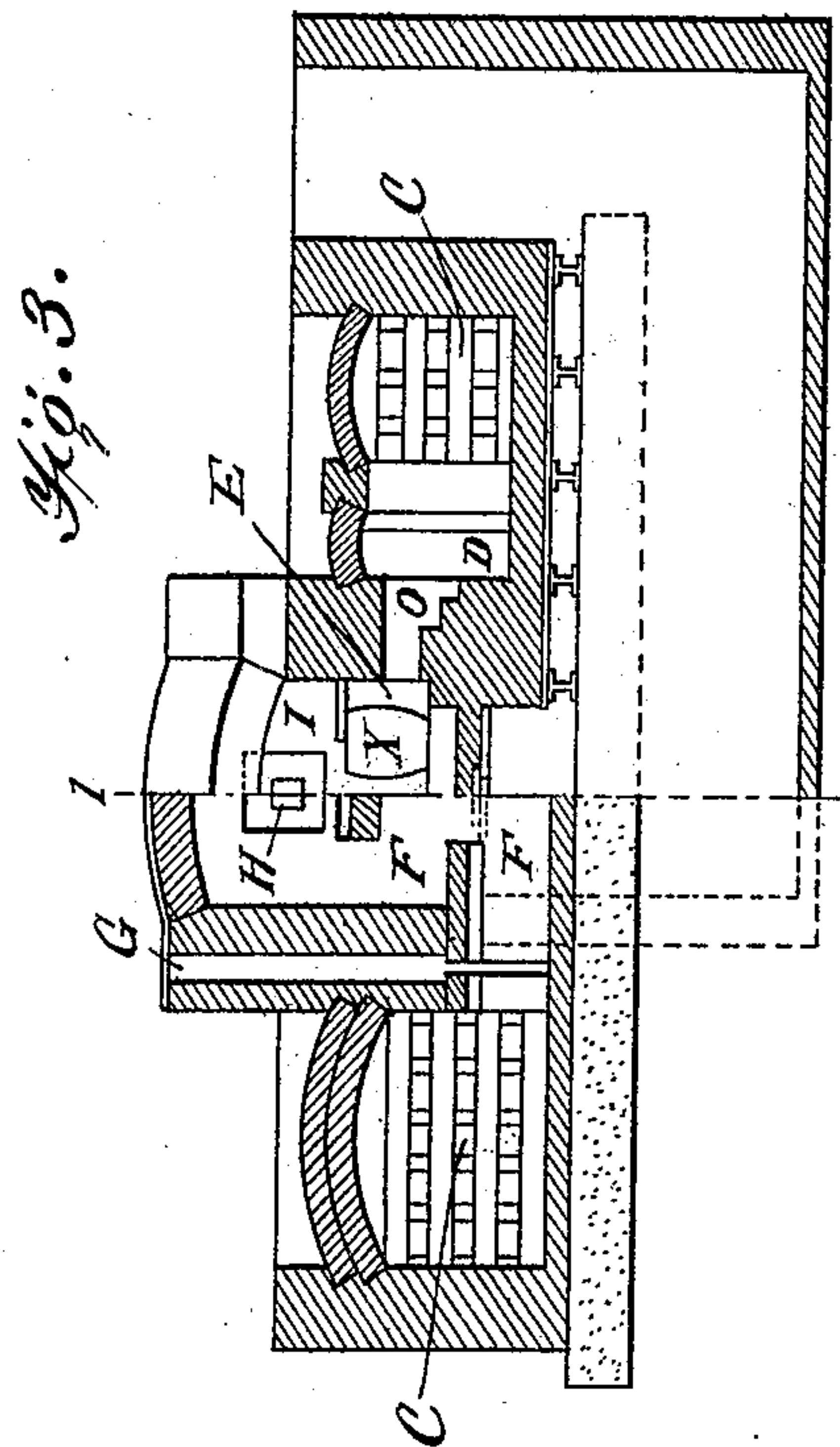
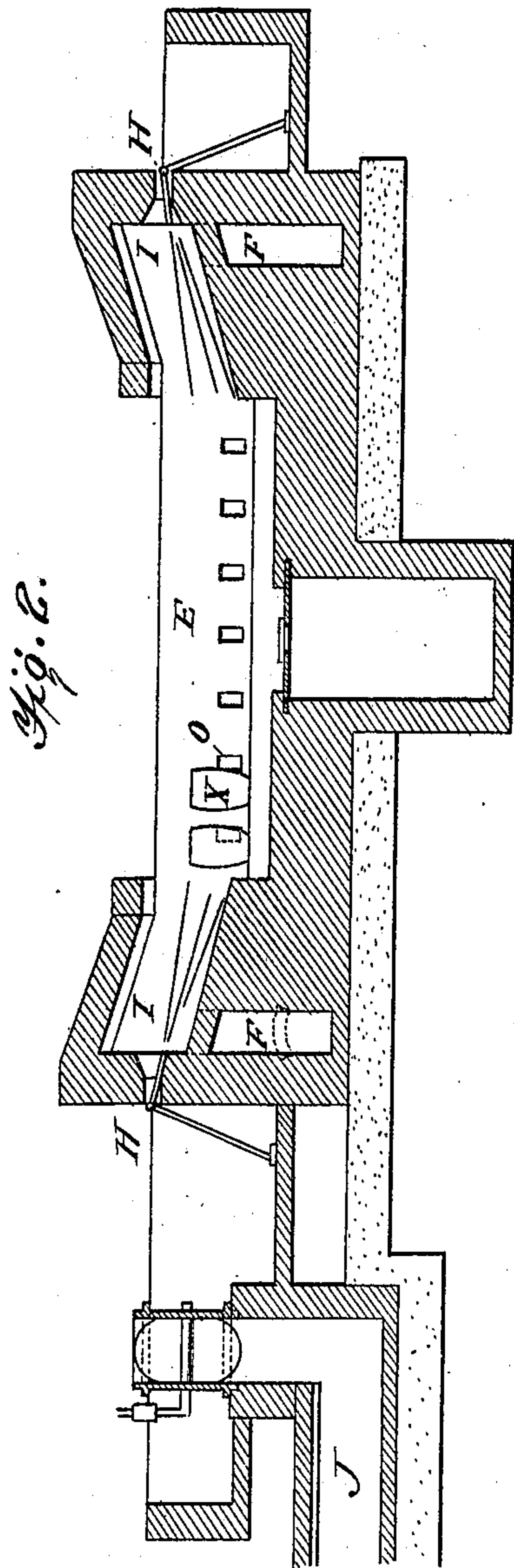
INVENTOR

Carl Smertling,
J. H. Brandenburg
ATTORNEY

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L. H. Schmidt
W. Lawson

INVENTOR

Carl Smerling,
BY
J. F. Brauerberg
ATTORNEY

UNITED STATES PATENT OFFICE.

CARL SMERLING, OF LYNN, MASSACHUSETTS.

CRUCIBLE MELTING-FURNACE.

No. 914,609.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed May 7, 1908. Serial No. 431,488.

To all whom it may concern:

Be it known that I, CARL SMERLING, a citizen of the United States, residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented a new and Improved Crucible Melting-Furnace, of which the following is a specification, reference being made to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification in explaining its nature.

My invention relates to improvements in fuel oil fired crucible melting furnaces, for melting materials requiring high melting temperatures, and the objects of my invention are: 1st. To utilize combustion air, and to provide a means of heating the incoming air current before it reaches the combustion chamber. 2nd. To transform, in a gas firing chamber, the fuel oil spray from oil burners into a fixed gas. 3rd. To equally distribute the highly heated combustion air around all crucibles within the melting chamber. 4th. To produce equal and complete combustion around each and every crucible through the means of a fixed gas and highly heated equally distributed combustion air. 5th. To produce high temperatures through quick combustion. 6th. To attain a desired temperature at a great saving of fuel over present methods and usages. And to secure other advantages and results some of which may be referred to hereinafter in connection with the description of the working parts.

Referring to the accompanying drawings in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a plan of the main melting furnace, partly a top view and partly section on the line 1—2 in Fig. 3; Fig. 2 is an elevation section on the line 3—4 in Fig. 1; Fig. 3 is a cross section, on line, 5—6—7—8 in Fig. 1.

The furnace is of a type, wherein the combustion air is regenerated, and is constructed with duplicate sets of flues, dampers, and regenerating chambers, one set on each side of the melting chamber.

In Fig. 1, A is a reversing valve, directing the combustion air, which is forced through it by stack draft or fan pressure, to the right or to the left as desired, through the flue B, into the regenerating chamber C which is

filled with checker brick and wherein the air becomes highly heated. The heated air then passes on partly through the flues F (and enters through openings P) into the combustion and gas fixing chamber I, in each end of the furnace, and partly through the distributing chamber D and flues O to the melting chamber E. The air in flues F is regulated by dampers G in each of the flues; which dampers are operated in such a way, that when the air flow is to the left of the valve, the two right hand dampers are closed, and the two on the left are open and vice versa. The highly heated air passing through the flues F, is regulated to the amount required to combust such certain part of oil spray from the atomizing burners H as is needed to raise the temperature in the combustion or gas fixing chambers I, to the extent that the balance of the oil fuel spray, from said atomizing burners H, is converted into a heated gas. This gas spreads from both ends of and fills the melting chamber E, in which chamber are the charged crucibles, and there meets the on rushing, highly heated, combustion air from the regenerating chamber C, distributing chamber D and the flues O, (there being as many flues O as there are spaces R between the crucibles). Combustion of the gasified fuel oil is thus secured in the chamber E and the heat thereof is equally distributed around each crucible.

The products of combustion then leave the melting chamber E through the corresponding flues O on the opposite side; passing on through distributing chamber D, regenerating chamber C, flue B and reversing valve A, to flue J (see also Fig. 5), on its way heating the checker work in chamber C. It will be readily seen that this heated checker work of brick in chamber C will in turn heat the incoming air when the reversing valve is changed and the current turned the other way.

My furnace may be built of any desired size for any number of crucibles, and the regenerating chambers may be placed under the melting chamber if desired.

I am aware that prior to my invention there have been made and used melting furnaces other than crucible furnaces wherein fuel oil, introduced through spraying burners, runs intermittently from one end of furnace or the other in conjunction with re-

versed, regenerated, combustion air. I do not therefore claim such general combination, but:—

What I claim as my invention and desire to secure by Letters Patent is:—

The combination with the casing of a crucible melting-furnace, of a melting-chamber therein having a gas-fixing-and-combustion-chamber at both ends thereof, duplicate regenerating-chambers disposed on opposite sides of said melting-chamber and in communication therewith through the medium of duplicate air-distributing-chambers disposed on opposite sides of said melting-chamber, said regenerating-chambers also communicating with said gas-fixing-and-regenerating-chambers by means of duplicate flues, an air-supply flue leading to said regenerating-

chambers, a reversing-valve in said latter flue for directing a current of air into either one of said regenerating-chambers, and a damper in each of said duplicate flues operatively connected whereby, when the reversing-valve directs a flow of air into one regenerating-chamber and from thence into the corresponding communicating air-distributing-chamber and damper-containing-flue, the damper in the other flue will be closed, and vice versa.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CARL SMERLING.

Witnesses:

ELSA M. SMERLING,
CHARLES W. LOVETT.