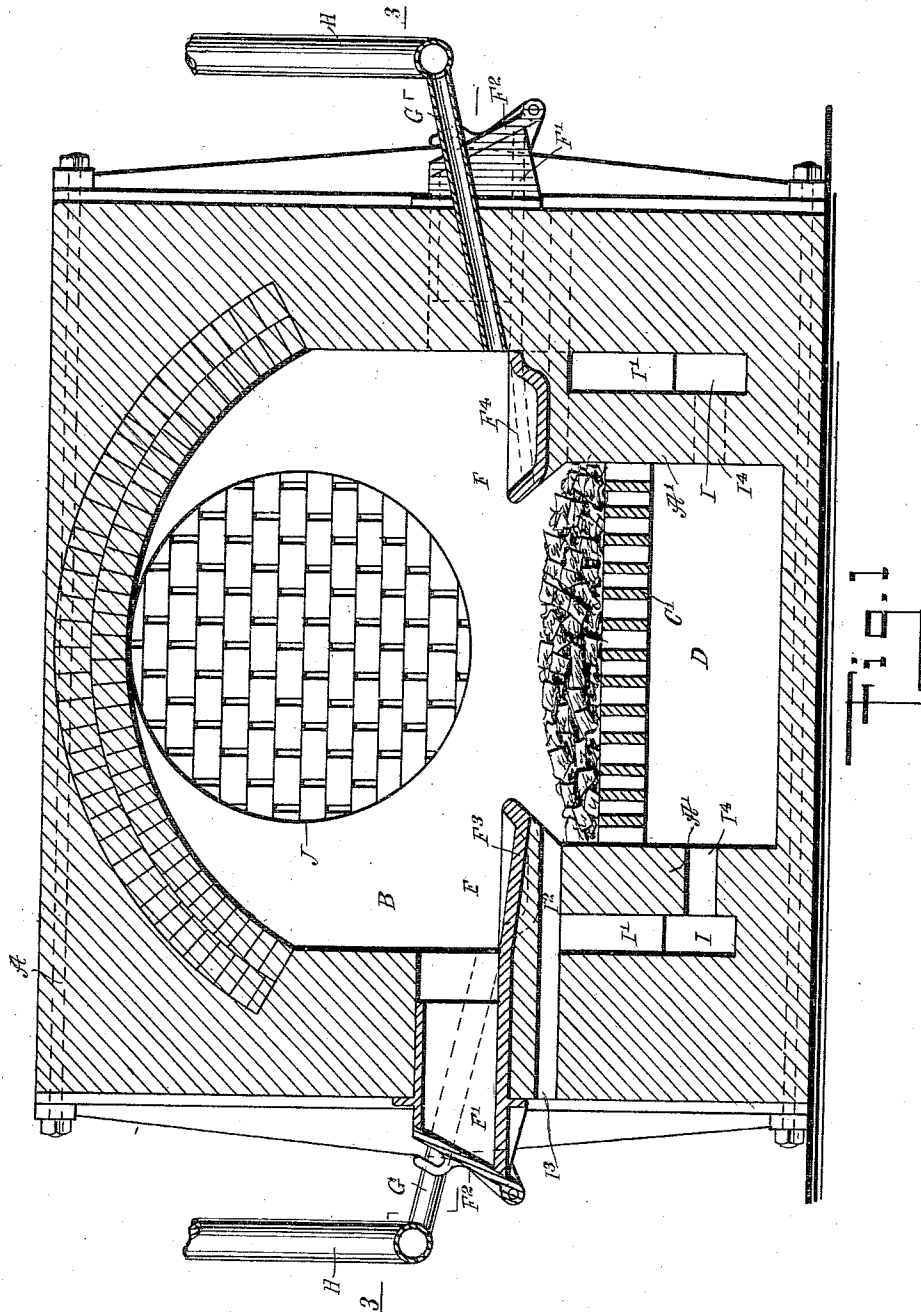


973,273.

H. HAAS.
FURNACE.
APPLICATION FILED MAR. 22, 1910.

Patented Oct. 18, 1910.

2 SHEETS—SHEET 1.



WITNESSES:
John Bergstrom
Rev. H. H. H.

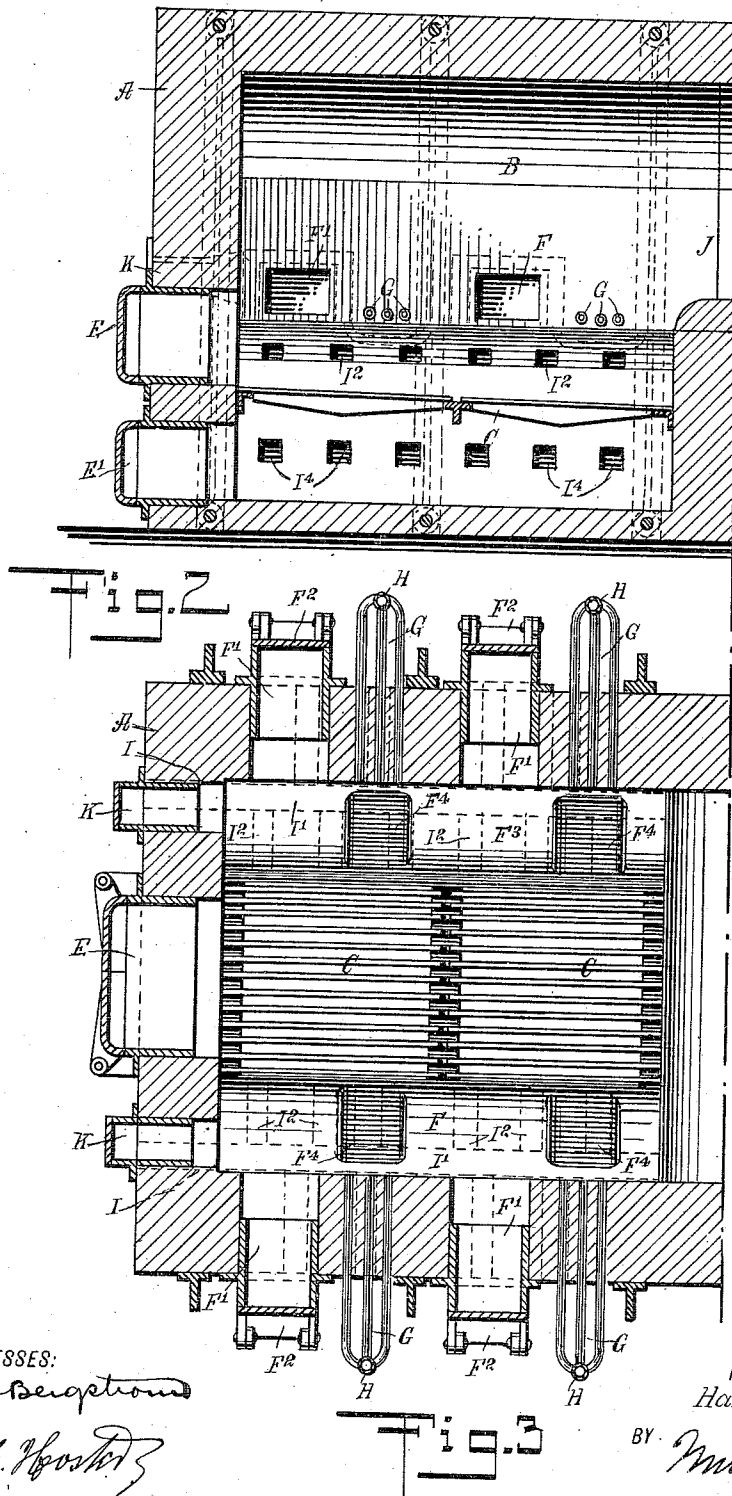
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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FURNACE.

973,273.

Specification of Letters Patent.

Patented Oct. 18, 1910.

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To all whom it may concern:

Be it known that I, HANNA HAAS, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Furnace, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved furnace, more especially designed for burning asphalt and like materials as the fuel, and arranged to insure complete combustion and to produce a high heat, to be utilized for generating steam and for other purposes.

In order to accomplish the desired result, use is made of a tray extending within a combustion chamber and adapted to receive the semi-fluid fuel, to be acted on by a blast or a jet, to atomize the fuel, and to form a mixture to be burned in the said combustion chamber.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross section of the furnace; Fig. 2 is a reduced longitudinal section of the same; and Fig. 3 is a reduced sectional plan view of the same, on the line 3—3 of Fig. 1.

In one end of a suitably constructed brick work A is arranged a combustion chamber B, provided in its bottom with a grate C, below which is arranged an ash pit D, access being had to the combustion chamber B and the ash pit D by doors E, E', arranged on the front end of the brick work A, as plainly indicated in Figs. 2 and 3.

Within the combustion chamber B and ranging lengthwise on the sides thereof are trays F, extending above the grate C and supported on ledges A' forming part of the sides of the brick work A. Each of the trays F is provided with spaced inlets F', extending through the sides of the brick work A to the outside thereof, and the outer ends of the inlets F' are normally closed by doors F², which when open permit of introducing the asphalt or other similar fuel into the inlets F', to pass down the inclined bottoms F³ of the trays F, to then flow into pockets F⁴ formed in the trays between adjacent inlets F', as will be readily understood by reference to the drawings. The

asphalt or other similar semi-fluid fuel passing into the pockets F⁴ is subjected therein to the action of blasts of air, steam or other fluids, introduced through blast pipes G, extending in the sides of the brick work A in a downward and inward direction, as plainly shown in Fig. 1. The outer ends of the blast pipes G are connected with pipes H, leading to a suitable source of compressed air, steam or other fluid, used for atomizing the fuel in the pockets F⁴, and for blowing the same into the combustion chamber B, to form an inflammable mixture to be burned within the said combustion chamber B.

Longitudinally-extending air admission channels I are arranged in the ledges A', and are connected by vertical channels I', with transverse openings I², extending under the trays F and opening into the combustion chamber B, at points between the grate C and the inner ends of the trays F (see Figs. 1 and 2). The openings I² have outward extensions I³, leading to the outer face of the sides of the brick work A, and openings I⁴ lead from the channels I into the ash pit D, and when the furnace is in use air can readily pass into the combustion chamber B and the ash pit D by way of the channels I, I' and the openings I², I³ and I⁴, so as to insure complete combustion of the burning mixture in the combustion chamber B. The outer ends of the channels I and the extensions I³ may be connected with a blower, to force the air into the combustion chamber B and ash pit D. Ordinarily, however, a natural flow of air produced by the draft in the furnace is sufficient for producing complete combustion of the vaporized mixture in the combustion chamber.

From the combustion chamber B extends a duct or channel J leading to a boiler or other apparatus to be heated, and the said duct or tube J is preferably filled with staggered or checker firebrick, to retain the products of combustion in the fire box until complete combustion has taken place.

On the front end of the brick work A are arranged holes K, leading to the combustion chamber B above the trays F (see Figs. 2 and 3), to permit of observing the burning of the fuel, so that the person in charge can regulate the feeding of the proper amount of fuel, the force of the blasts and the admission of air, to insure complete combustion.

In starting the furnace a fire of coal or

other fuel is first produced on the grate C to heat up the combustion chamber, trays F and the fire brick in the duct J, and then the asphalt or like fuel is fed through the doors 5 F² into the openings F', loose fire brick is placed on the grate C and the fans or blowers are started to produce the desired air blasts in the pipes G. The introduced asphalt is quickly rendered sufficiently fluid to 10 flow into the pockets F⁴, to be acted on by the blast coming through the pipes G, to insure the quick and thorough atomizing of the fuel, with a view to forming a highly inflammable mixture, which is readily burned 15 in the combustion chamber B. By the influx of air through the openings I² a complete combustion of the burning mixture takes place, and any liquid fuel that flows over the inner edges of the trays F readily drops 20 down onto the loose fire brick held on the grate C, and as the said fire brick is heated and air comes up from the ash pit D, the said fuel is readily vaporized and burned in the combustion chamber B. The heat de- 25 veloped in the combustion chamber B finally passes through the duct J to a boiler or other apparatus to be heated.

Having thus described my invention, I claim as new and desire to secure by Let- 30 ters Patent:

1. A furnace for burning semi-fluid fuels, comprising a combustion chamber, a tray in the said combustion chamber, charging 35 means for charging the said tray with semi-liquid fuel, means for directing a blast on the said semi-liquid fuel to atomize the same within the combustion chamber, and air ad- mission channels in the wall of the furnace 40 and discharging into the combustion chamber underneath the said tray.

2. A furnace for burning semi-liquid fuels, comprising a combustion chamber, op- 45 positely-disposed trays within the said combustion chamber and ranging lengthwise on the sides of the furnace, the said furnace being provided with normally closed inlets ex- tending through the sides thereof for charg- ing the trays with the semi-fluid fuel, pipes 50 in the sides of the furnace for directing a blast into the fuel in each tray in a down- ward and inward direction to atomize the fuel and to form a mixture passing into the combustion chamber to be burned therein.

3. A furnace for burning semi-liquid 55 fuels, comprising a combustion chamber hav- ing a grate at its bottom, an ash pit below the grate, trays ranging lengthwise on the sides of the combustion chamber, means for delivering the fuel through the sides of the 60 furnace to the said trays, and pipes in the sides of the furnace and inclined down- wardly and inwardly to discharge blasts onto the surface of the fuel in the trays to atomize the fuel and form a mixture to be 65 burned in the said combustion chamber.

4. A furnace for burning semi-fluid fuels, comprising a combustion chamber having a grate at its bottom, an ash pit below the said grate, doors leading to the said combustion chamber and ash pit, trays ranging length- 70 wise on the sides of the furnace within the said combustion chamber and having pocket- ets for the semi-fluid fuel to flow in, blast pipes arranged in the sides of the furnace and extending downwardly and inwardly 75 in the direction of the said pockets to force blasts onto the fuel in the pockets, and air admission channels in the sides of the fur- nace and discharging into the combustion chamber underneath the said trays. 80

5. A furnace for burning semi-fluid fuels, comprising a combustion chamber having a grate at its bottom, an ash pit below the said grate, doors leading to the said combus- 85 tion chamber and ash pit, trays ranging lengthwise on the sides of the furnace with- in the said combustion chamber and having pockets for the semi-fluid fuel to flow in, blast pipes arranged in the sides of the fur- 90 nace and extending downwardly and in- wardly in the direction of the said pockets to force blasts onto the fuel in the pockets, air admission channels in the sides of the furnace and discharging into the combus- 95 tion chamber underneath the said trays, the said channels extending to the end of the furnace, and branch channels leading from the outer faces of the furnace sides into the said air admission channels.

6. A furnace for burning semi-fluid fuels, 100 comprising a combustion chamber having a grate at its bottom, an ash pit below the said grate, doors leading to the said combustion chamber and ash pit, trays ranging 105 lengthwise on the sides of the furnace with- in the said combustion chamber and having pockets for the semi-fluid fuel to flow in, blast pipes arranged in the sides of the fur- nace and extending downwardly and in- 110 wardly in the direction of the said pockets to force blasts onto the fuel in the pockets, air admission channels in the sides of the furnace and discharging into the combustion chamber underneath the said trays, and 115 charging doors in the sides of the furnace and having the door openings leading to the said trays at one side of the pockets.

7. A furnace for burning semi-fluid fuels, comprising a combustion chamber having a grate at its bottom, an ash pit below the 120 said grate, doors leading to the said combustion chamber and ash pit, trays ranging lengthwise on the sides of the furnace with- in the said combustion chamber and having 125 pockets for the semi-fluid fuel to flow in, blast pipes arranged in the sides of the fur- nace and extending downwardly and in- wardly in the direction of the said pockets to force blasts onto the fuel in the pockets, and air admission channels in the sides of 130

the furnace and discharging into the combustion chamber underneath the said trays and into the said ash pit.

8. A furnace for burning semi-liquid fuels, comprising a combustion chamber having a grate at its bottom, an ash pit below the grate, trays ranging lengthwise on the sides of the combustion chamber, means for delivering the fuel through the sides of the furnace to the said trays, pipes in the sides of the furnace and inclined downwardly and inwardly to discharge blasts onto the surface of the fuel in the trays to atomize the fuel and form a mixture to be burned in the said combustion chamber, means for admitting air into the said ash pit, and loose fire brick on the said grate.

9. A furnace for burning semi-liquid fuels, comprising a combustion chamber, a tray

within the said combustion chamber for receiving the semi-liquid fuel to be burned, a means for directing a blast on the said semi-liquid fuel for atomizing the said fuel in the said combustion chamber to be burned therein, an air admission channel in the wall of the furnace and discharging into the combustion chamber underneath the said tray, a duct leading from the said combustion chamber to carry off the heat, and checker bricks in the said duct.

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

HANNA HAAS.

Witnesses:

THEO. G. HOSTER,
PHILIP D. ROLLHAUS.