

S. B. GOFF.
FURNACE.

APPLICATION FILED JAN. 14, 1910.

Patented Jan. 16, 1912.

3 SHEETS-SHEET 1.

1,015,014.

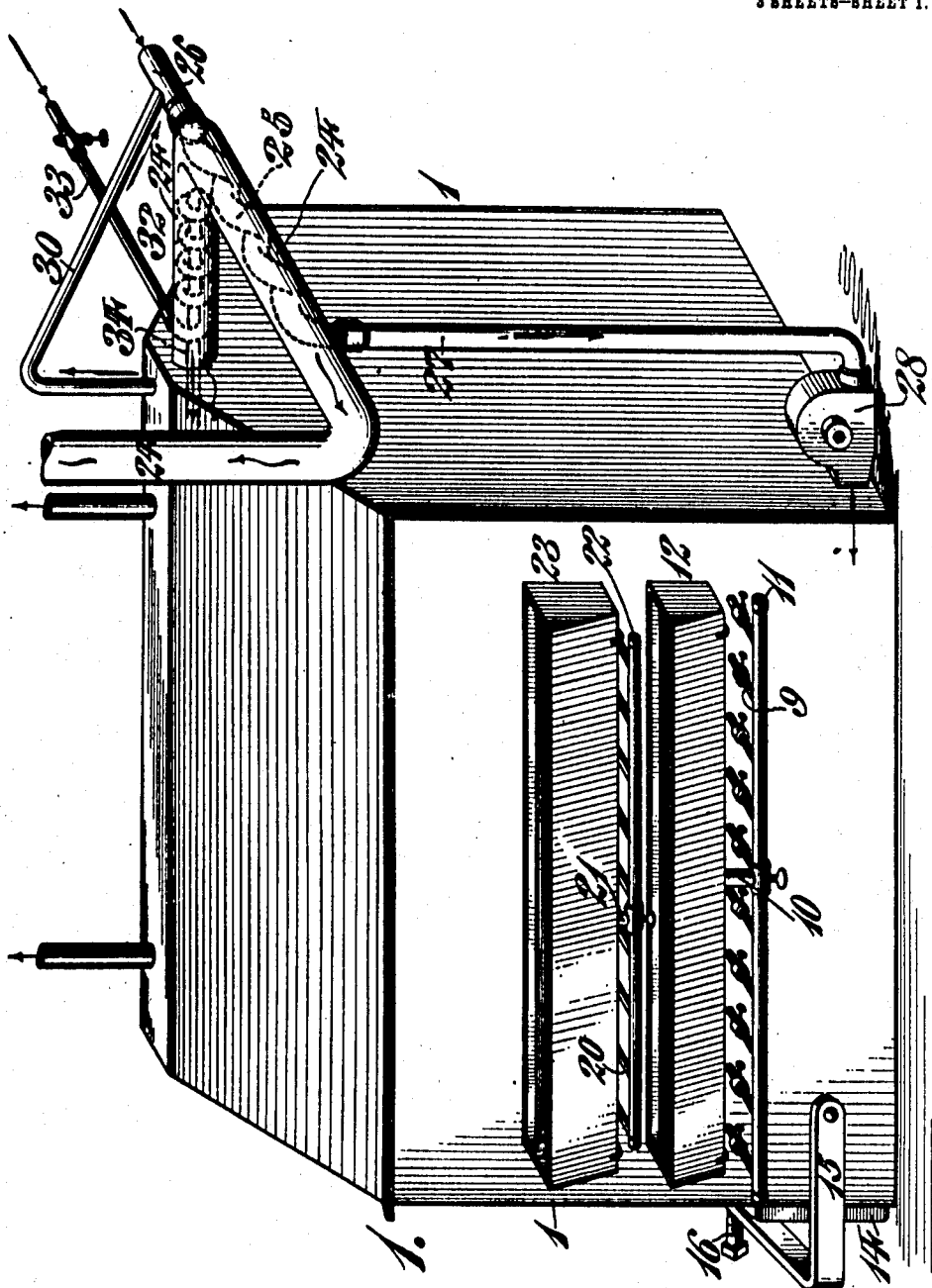


Fig. 1.

WITNESSES

L. Douville,
P. F. Nagle.

BY

Samuel B. Goff,
Inventor
Riedelmeier & Tarkenton

ATTORNEYS

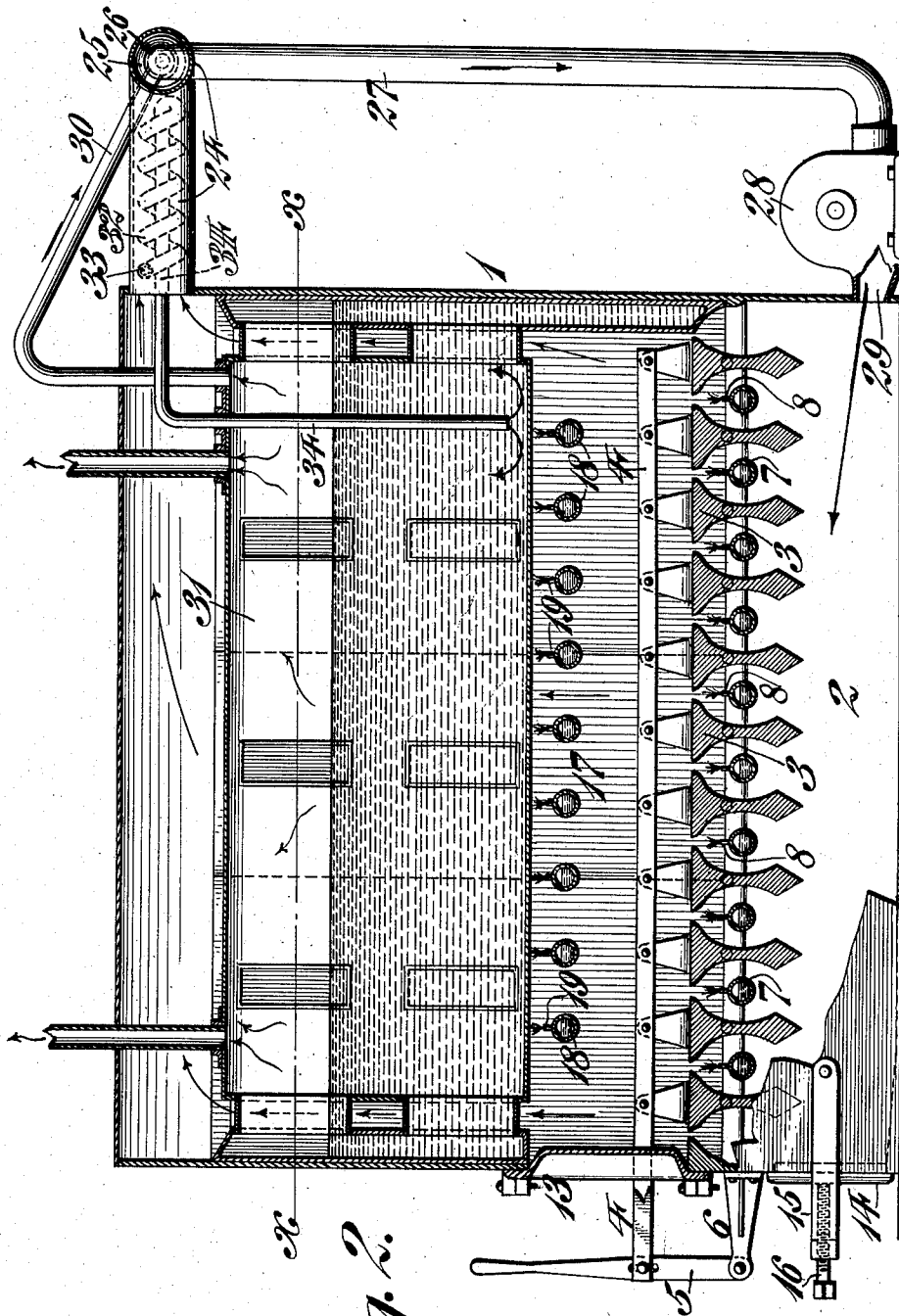
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3 SHEETS—SHEET 2.



WITNESSES

L. Couville,
P. F. Nagle.

Fig. 2.

BY

Samuel B. Coth.
Giesenheim & Fairbank,
ATTORNEYS

ATTORNEYS

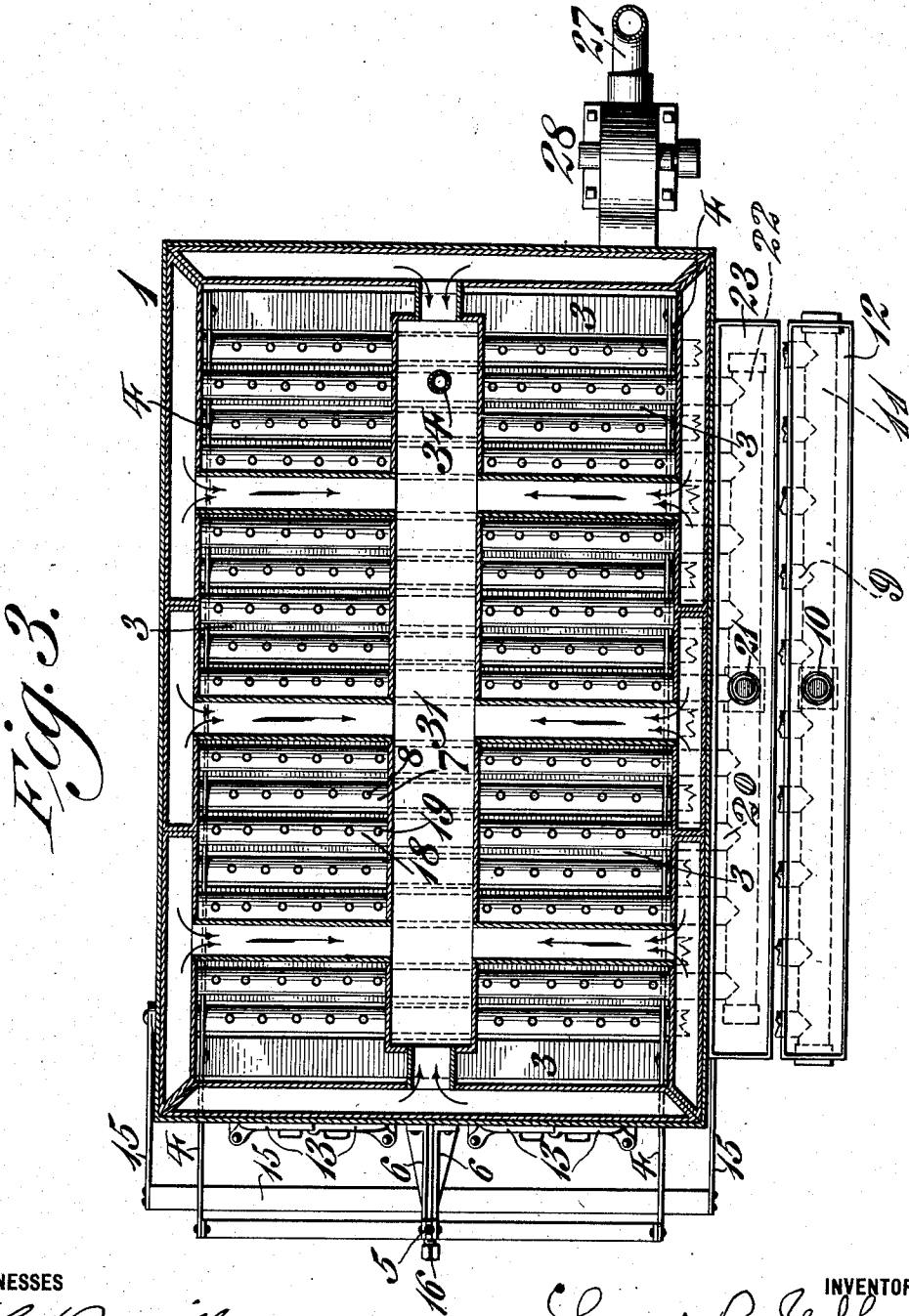
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3 SHEETS—SHEET 3.



WITNESSES

L. Couville,
P. F. Nagle.

BY

INVENTOR
Samuel B. Goff.
Niederhain & Baird,
ATTORNEYS

UNITED STATES PATENT OFFICE.

SAMUEL B. GOFF, OF CAMDEN, NEW JERSEY.

FURNACE.

1,015,014.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed January 14, 1910. Serial No. 538,006.

To all whom it may concern:

Be it known that I, SAMUEL B. GOFF, a citizen of the United States, residing in the city of Camden, county of Camden, State of New Jersey, have invented a new and useful Furnace, of which the following is a specification.

My invention consists of a furnace more particularly for a steam boiler or generator adapted to burn comminuted or other fine coal or fuel, provision being made to supply the latter with combustible vapor above and below the bed of fuel, so as to cause more perfect combustion and a high degree of heat; provision being made also for combining air and steam and directing the same to the fire as a powerful draft of combustible vapor, and furthermore of means for utilizing the products of combustion in the smoke flue, heating said air and steam, and for heating the water from which said steam is produced prior to admission into the generator.

For the purpose of explaining the invention, the accompanying drawing illustrates a satisfactory reduction of the same to practice, but the important instrumentalities thereof may be varied, and so it is to be understood that the invention is not limited to the specific arrangement and organization shown and described.

Figure 1 represents a perspective view of a furnace embodying my invention. Fig. 2 represents a vertical section thereof. Fig. 3 represents a horizontal section on line *x-x* Fig. 2.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the casing of a furnace, 2 the ash pit thereof, and 3 the grate bars thereof, the latter being pivotally mounted on the casing 1, and connected with and coupled by the stringers 4, which are provided with the lever 5, whereby the said stringers and consequently the grate bars may be operated for raking purposes, said lever being mounted at 6 on the exterior of the casing 1, and thus convenient of access.

Interposed between the bars 3 and supports on the wall of the casing, are pipes 7, having jets 8 on the upper side thereof, said pipes having connected with them the tubes 9 which extend through the side of the casing and communicate by means of the

pipes 10 and 11, with the tank 12, the latter being secured to the exterior of the casing and adapted to contain hydrocarbon or other fluid which is to be vaporized being injected against the fuel on the grate bars and burned therewith, thus intensifying the resultant heat, said pipes 7 being heated by the fire and hot air injected into the ash pit, as will be hereinafter more fully described.

The furnace has doors 13 above the grate bars for usual purposes; and the plate 14 for closing the ash pit air tight, the same being held in position by the yoke 15, which is pivotally connected with the casing 1, and the screw 16 which is fitted to the front of said yoke and adapted to tighten against said plate. When the screw 16 is loosened, the yoke 15 may be made to allow the plate 14 to be withdrawn, thus uncovering the openings of the ash pit and permitting access to the interior of the latter.

In the combustion chamber 17 are the pipes 18, which are supported on the wall of the casing, the same having jets 19 on the upper side thereof, said pipes having connected with them the tubes 20 which extend through the side of the casing and communicate by means of the pipes 21 and 22 with the tank 23, the latter being secured to the exterior of the casing and adapted to contain fluid or material which may be converted into a combustible vapor in the pipes 18 and injected by the jets 19 into the chamber 17, where it is consumed with the products of combustion, thus further intensifying the heat of the furnace.

24 designates the smoke flue the same extending from the top of the casing and having an elbow which opens to the atmosphere, one limb of the elbow containing the coil 25 shown in dotted lines Fig. 1, one end of said coil having connected with it the air supply pipe 26, and the other end having connected with it the air conveyer pipe 27, the latter extending to the blower or blast apparatus 28, which opens as at 29 into the ash pit 2.

A pipe 30 is connected with a source of steam, in the present case, the boiler or generator 31 and is connected with the air pipe 26 and whereby steam and air are directed into the coil 25, and as the latter is contained in the smoke flue 24 which is heated by the products of combustion, the steam is

superheated and this with the hot air is discharged by the blower or blast apparatus 28 into the ash pit, thus supplying the furnace with a powerful draft and a vapor 5 which is directed to the fuel, to assist the combustion thereof to a high degree while also highly heating the pipes 7 for vaporizing the hydrocarbon fluid therein.

10 In the smoke flue 24 is a coil 32 with one end of which is connected the pipe 33 for directing water into the steam generator, the other end of said coil having connected with it the pipe 34 which passes through said flue and the adjacent wall of the casing 15 into the generator, it being noticed that the products of combustion in said flue 24 are utilized to heat the coil 32 and adjacent portion of the pipe 34 thus heating the feed 20 water of the generator before entrance into the latter.

Having thus described my invention,

what I claim as new and desire to secure by Letters Patent, is:—

A furnace having grate bars, a tightly closed ash pit, means for supplying a blast 25 of air and steam below said grate bars, means for heating said air prior to its entrance to said blast-supplying means, oil vaporizing tubes situated between said grate bars constructed and arranged to deliver the vapors of the oil therefrom to the solid fuel, oil vaporizing tubes in the combustion chamber above the grate bars disposed to cause the vapors of the oil therefrom to intermingle with the gases arising 35 from the solid fuel, and means for supplying liquid fuel to both sets of the vaporizing tubes.

SAMUEL B. GOFF.

Witnesses:

JOHN A. WIEDERSHEIM,
C. D. McVAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."