(No Model.) 2 Sheets—Sheet 1.

D. KEGLER.

GAS FIRE ENGINE.

No. 524,111. Patented Aug. 7, 1894.

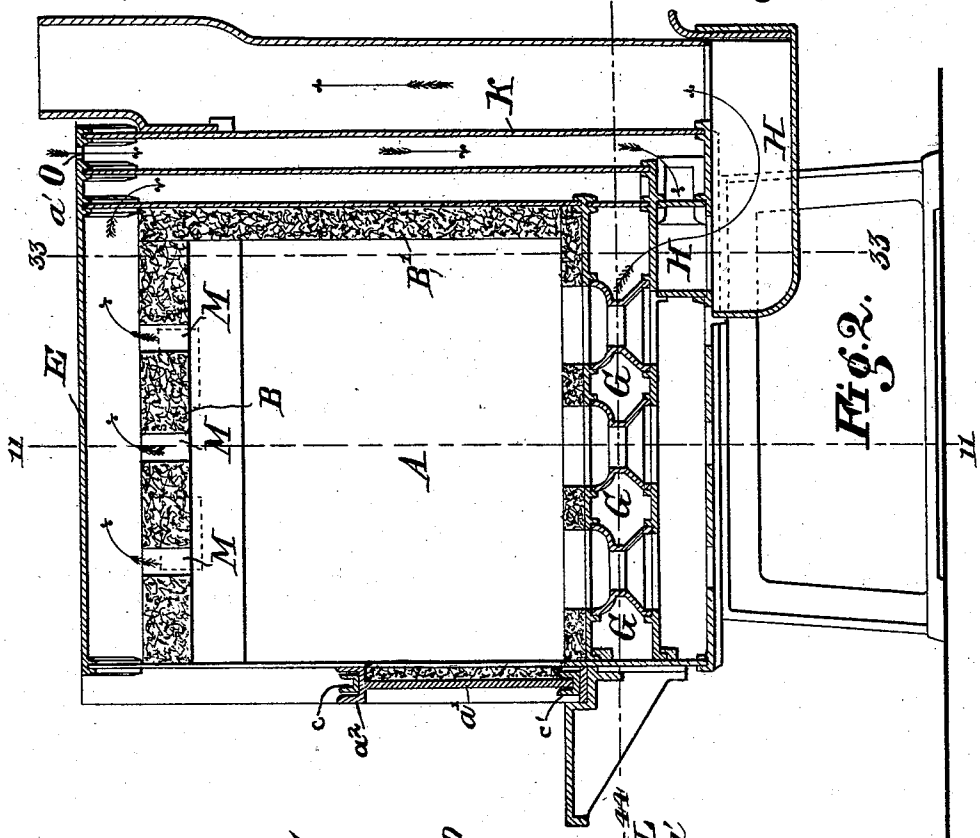

Fig. 2.

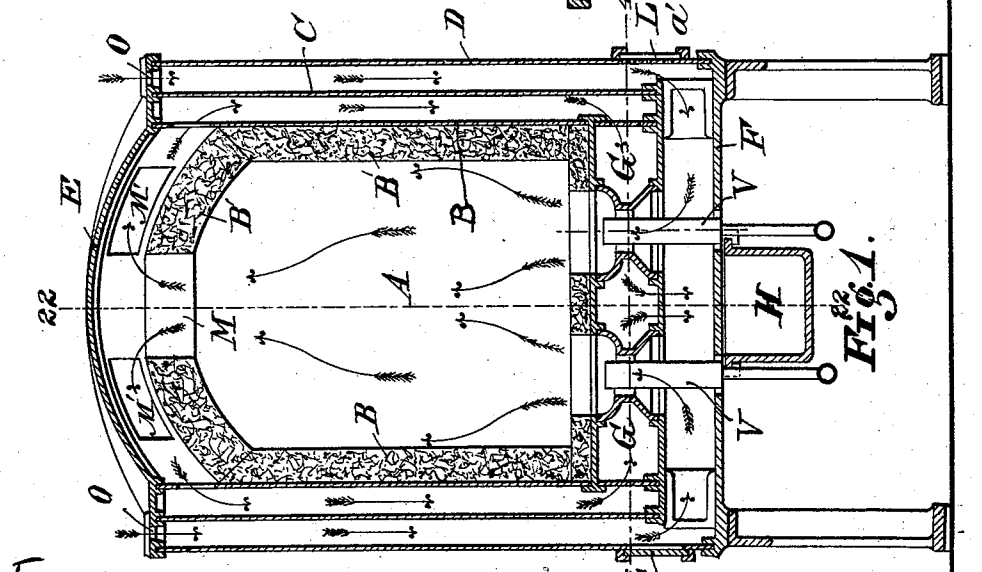

Fig. 1.

Witnesses —
J. Calvert Edmonds
J. B. Paige

Daniel Kegler
Inventor
By Clarence A. Seward
Atty

(No Model.) 2 Sheets—Sheet 2.

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GAS FIRE ENGINE.

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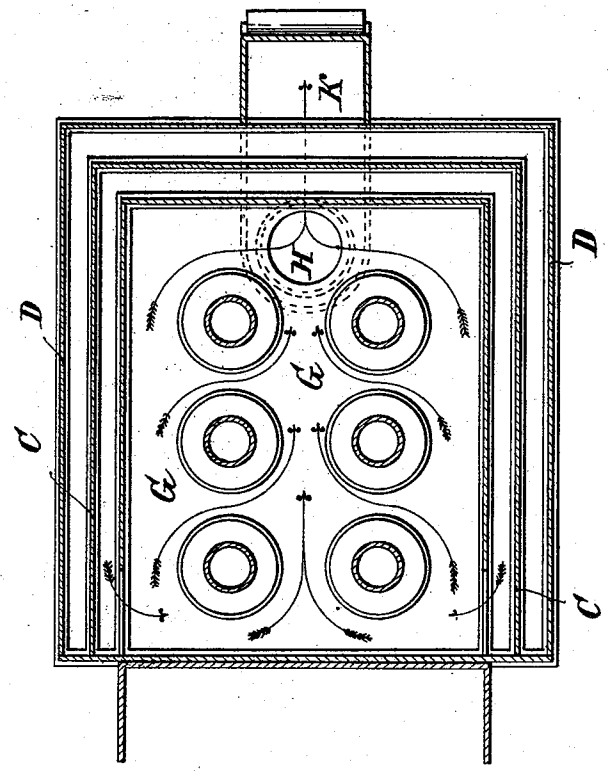

Fig. 4.

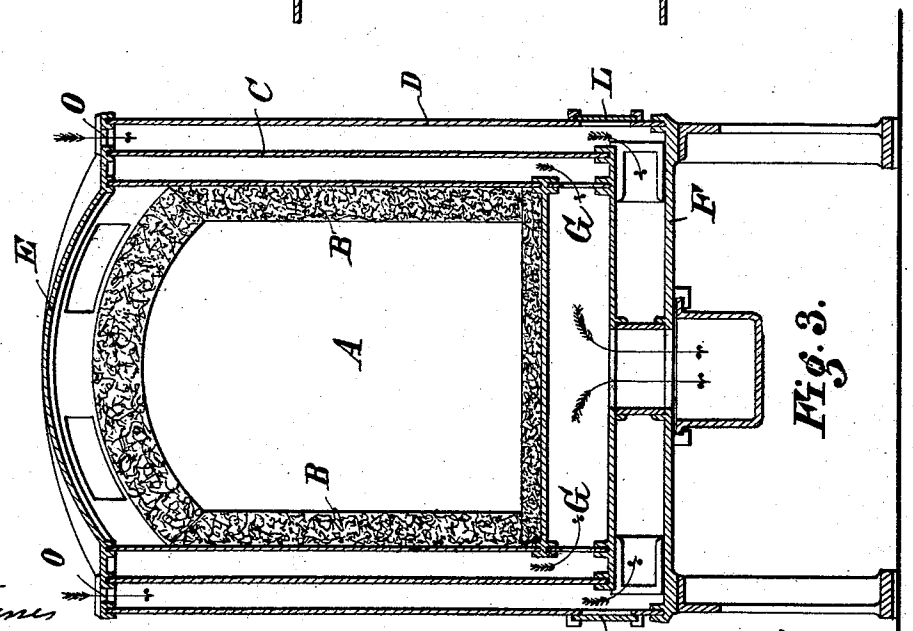

Fig. 3.

Witnesses
J. Albert Palmer
J. B. Paige

Inventor
Daniel Kegler
By Clarence P. Rodgers Atty

UNITED STATES PATENT OFFICE.

DANIEL KEGLER, OF MANNHEIM, GERMANY.

GAS FIRE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 524,111, dated August 7, 1894.

Application filed October 14, 1893. Serial No. 488,125. (No model.) Patented in England July 25, 1893, No. 14,344; in Switzerland July 27, 1893, No. 7,783; in Germany August 5, 1893, No. 11,005; in France August 10, 1893, No. 218,928; in Italy August 19, 1893, No. 271, and in Belgium August 23, 1893, No. 80,657.

To all whom it may concern:

Be it known that I, DANIEL KEGLER, merchant, a subject of the Emperor of Germany, resident at Mannheim, Grand Duchy of Baden, Germany, have invented new and useful Improvements in Gas-Fire Furnaces, (for which I have obtained Letters Patent in France, No. 232,098, dated November 15, 1893; in Belgium, No. 106,101, dated September 15, 1893; in Switzerland, No. 7,089, dated January 31, 1894; in Italy, XXVIII, 34,680, LXVIII, 94, dated August 24, 1893, and have filed applications for Letters Patent in Great Britain, No. 14,344, of 1893, and in Germany, K 11,005, IV/48,) of which the following is a specification.

The invention comprises various novel features in the arrangement of the induction and eduction flues and in the construction of the furnace, as will be hereinafter described in detail and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional front elevation of a gas furnace embodying my invention on the line 1 1, Fig. 2. Fig. 2 is a sectional side elevation of the same on the line 2 2, Fig. 1. Fig. 3 is a sectional front elevation on the line 3 3, Fig. 2. Fig. 4 is a sectional plan view on the line 4 4, Fig. 1.

Like letters of reference designate the same parts in the several figures.

I construct the furnace of three nested metallic cases, an inner case B, an intermediate case C, and an outer case D, the metallic plates forming the sides and the backs of which, and the vertical plates between the bottoms of the inner and intermediate cases, are fitted in grooves *a* in the top and bottom plates, as shown, so as to allow expansion and contraction.

The inner case B, I line with fire brick B', to form the combustion chamber A, the front of which is adapted to be closed by a sliding door *a'*, also lined with fire brick. The door *a'* has a V-shaped head part a^2 which slides on the guide rail *c*. The foot of the door is guided in a trough *c'*.

The top or crown of the combustion chamber A is formed by the fire brick, which is provided with passages M through which the gaseous products of combustion rise into the space between the said crown and the common top E of the intermediate and outer cases C D, which space thus forms an eduction flue, so that the crown of the combustion chamber will be additionally heated on the outside by the said products of combustion.

The products of combustion pass from said top eduction flue through openings M' in the side and back of the inner case B, as best shown by the arrows in Fig. 1, into the eduction spaces or flues formed between the sides and backs of the inner and intermediate cases B and C, thereby further heating on the outside the sides and back of the combustion chamber A. The heated gaseous products then pass from said side and back eduction flues through openings in the sides of the inner case B, as best shown in Fig. 4, into the eduction space or flue G between the bottoms of the inner and intermediate cases B and C, thereby further heating the bottom of the combustion chamber, and thence through escape flues H and K into the outer air.

The fresh air for combustion is led through openings O in the top E, into the eduction spaces or flues between the sides and backs of the intermediate and outer cases C and D, thereby enveloping the sides and back of the furnace with comparatively cool air and preventing outward radiation, while at the same time heating said air preparatory to its admission to the combustion chamber. The fresh air thus partially heated is thence conducted into the eduction space or flue between the bottoms of the intermediate and outer cases C and D, as best shown in Figs. 1 and 2, where it is further heated, and thence into the combustion chamber through passages extending through the bottom eduction flue G, in which passages the gas burners V are arranged, so that the heated fresh air enters around the said burners, to be consumed and then escape with the products of combustion, as before described.

Each burner V is connected with the gas

supply pipe, and is constructed, with a broad-lipped mouth piece Q, of porcelain or heat-resisting metal, held between the air tube R and the gas tube, so as to leave an annular air space around it, by an annular ring P, likewise of heat-resisting material.

With the described construction of furnace, the top and bottom as well as the sides of the combustion chamber are enveloped by the heated products of combustion, while the fresh air enveloping all the eduction flues prevents or counteracts the outward radiation of heat, so that it is possible to heat a furnace of one cubic meter measurement to a temperature of from 800° to 1,200° centigrade by varying the supply of gas, while leaving the outside temperature so as not to in the least in convenience persons standing near the furnace.

The initial draft required may be obtained by opening the front sliding door until the fire is well under way.

I claim—

1. A gas furnace provided with a fire proof combustion chamber having the burners at the bottom, eduction flues enveloping and extending beneath the combustion chamber, and induction flues enveloping the eduction flues, substantially as shown and described.

2. A gas furnace provided with a fire-proof combustion chamber, eduction flues enveloping the sides and bottom of the combustion chamber, and induction flues enveloping the side and bottom eduction flues, substantially as described.

3. A gas furnace provided with a fire-proof combustion chamber, eduction flues enveloping the top, side and bottom of the combustion chamber, and induction flues enveloping the bottom eduction flue, substantially as described.

4. A gas furnace provided with a fire-proof combustion chamber, eduction flues, leading from and enveloping the top of the combustion chamber, thence to and enveloping both the sides and bottom of the combustion chamber, and induction flues enveloping the sides and bottom of the combustion chamber and leading through passages in the bottom eduction flue into the bottom of the combustion chamber, substantially as described.

5. A gas furnace constructed of an inner, intermediate and an outer case, the inner case having the burners and the fire-proof lining, the space between the inner and the intermediate cases to conduct the products of combustion, and the space between the intermediate and the outer cases to conduct the fresh air for combustion, substantially as shown and described.

6. A gas furnace constructed of metallic plates connected by grooves and forming an inner, intermediate and an outer case, the inner case containing the burners and the fire-proof lining, the space between the inner and intermediate cases forming eduction flues, the space between the intermediate and the outer cases forming the induction flues, and a door to close the inner case, substantially as shown and described.

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

DANIEL KEGLER.

Witnesses:
RICHARD WIRTZ,
CARL BAUSS.