

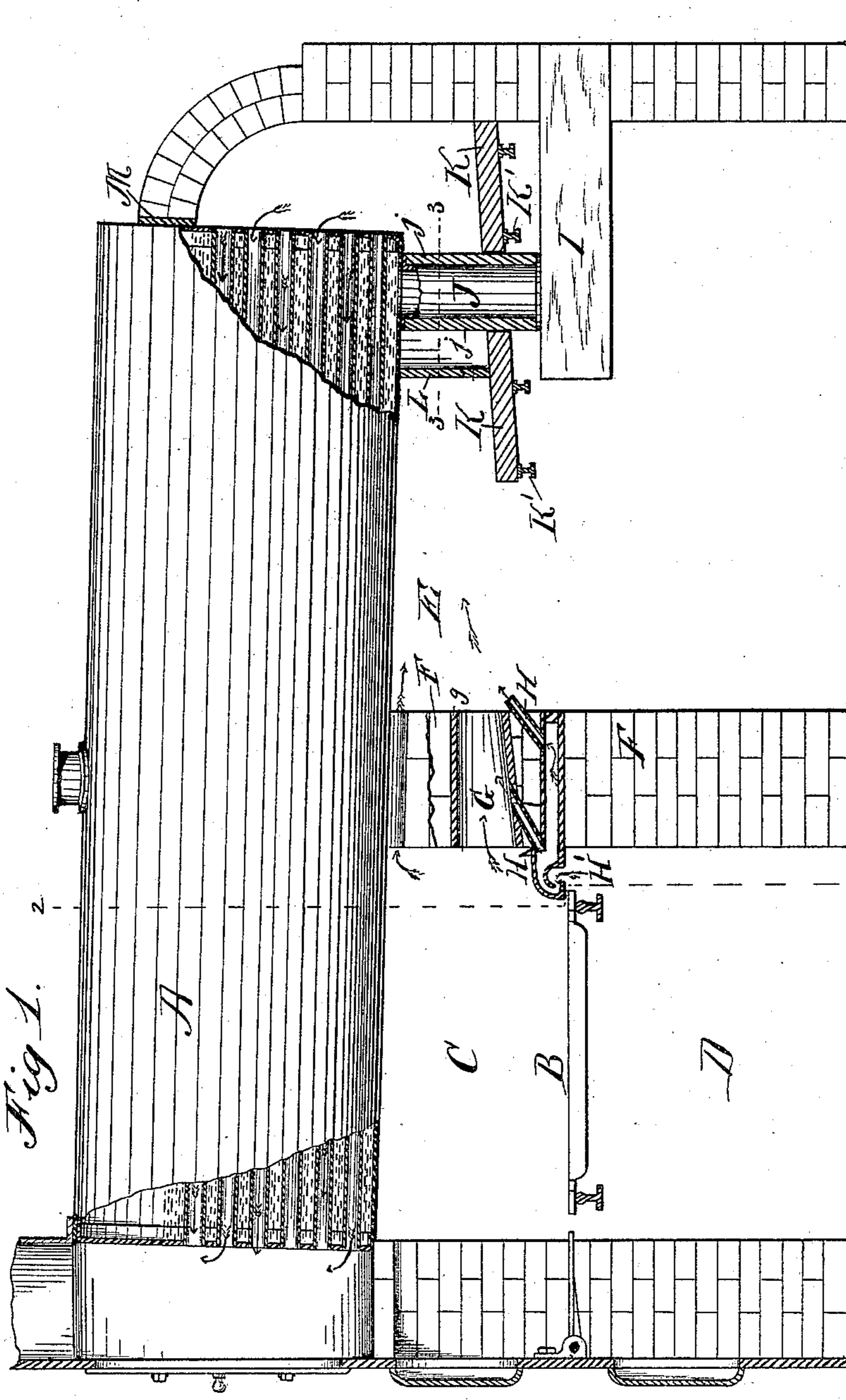
(No Model.)

2 Sheets—Sheet 1.

G. GULICKSON.
FURNACE.

No. 310,582.

Patented Jan. 13, 1885.



Witnesses:
Lew. C. Curtis,

Taylor E. Brown

Inventor:

George Gulickson

By Munday, Evarts & Adcock

his Attorneys.

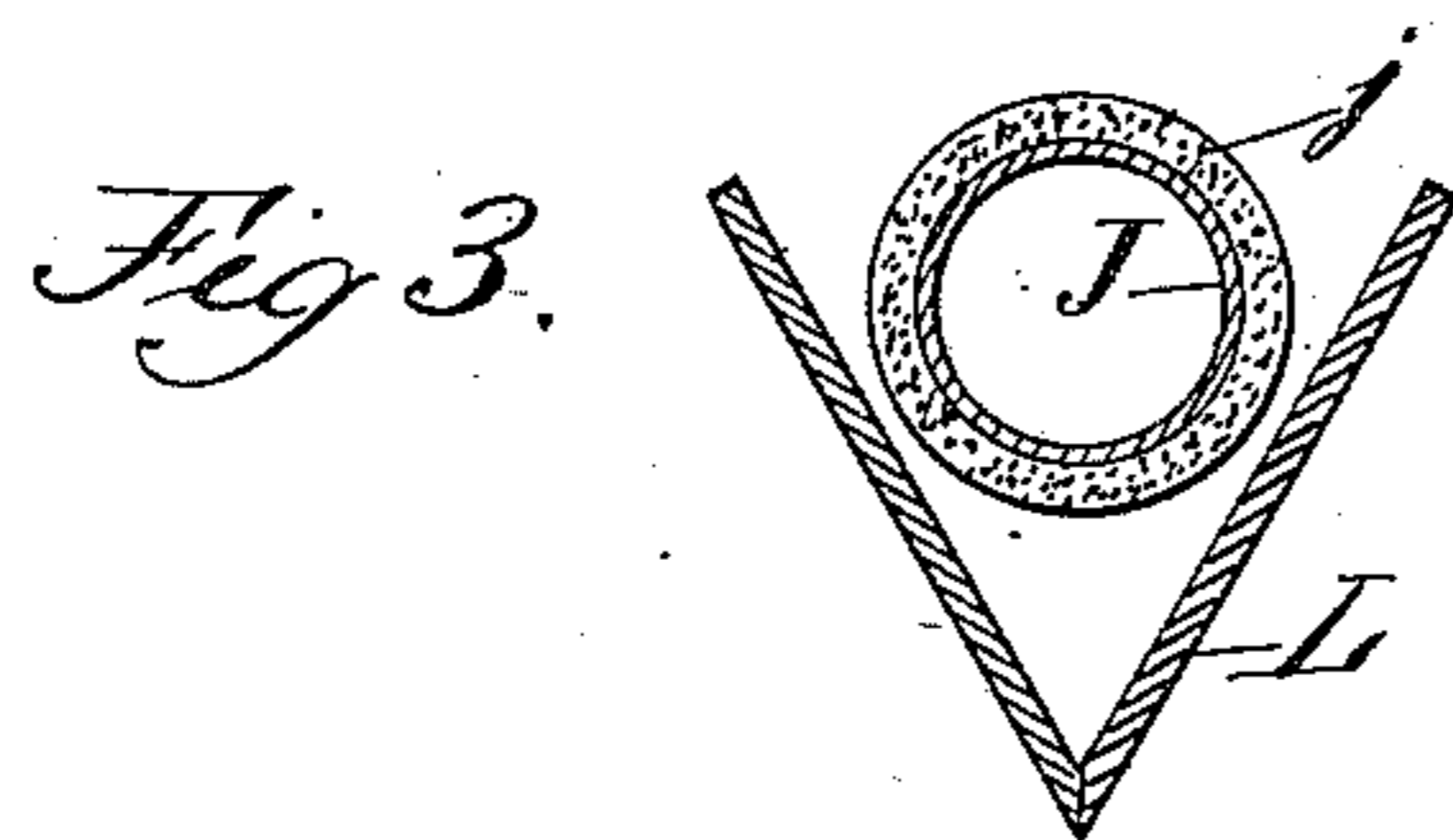
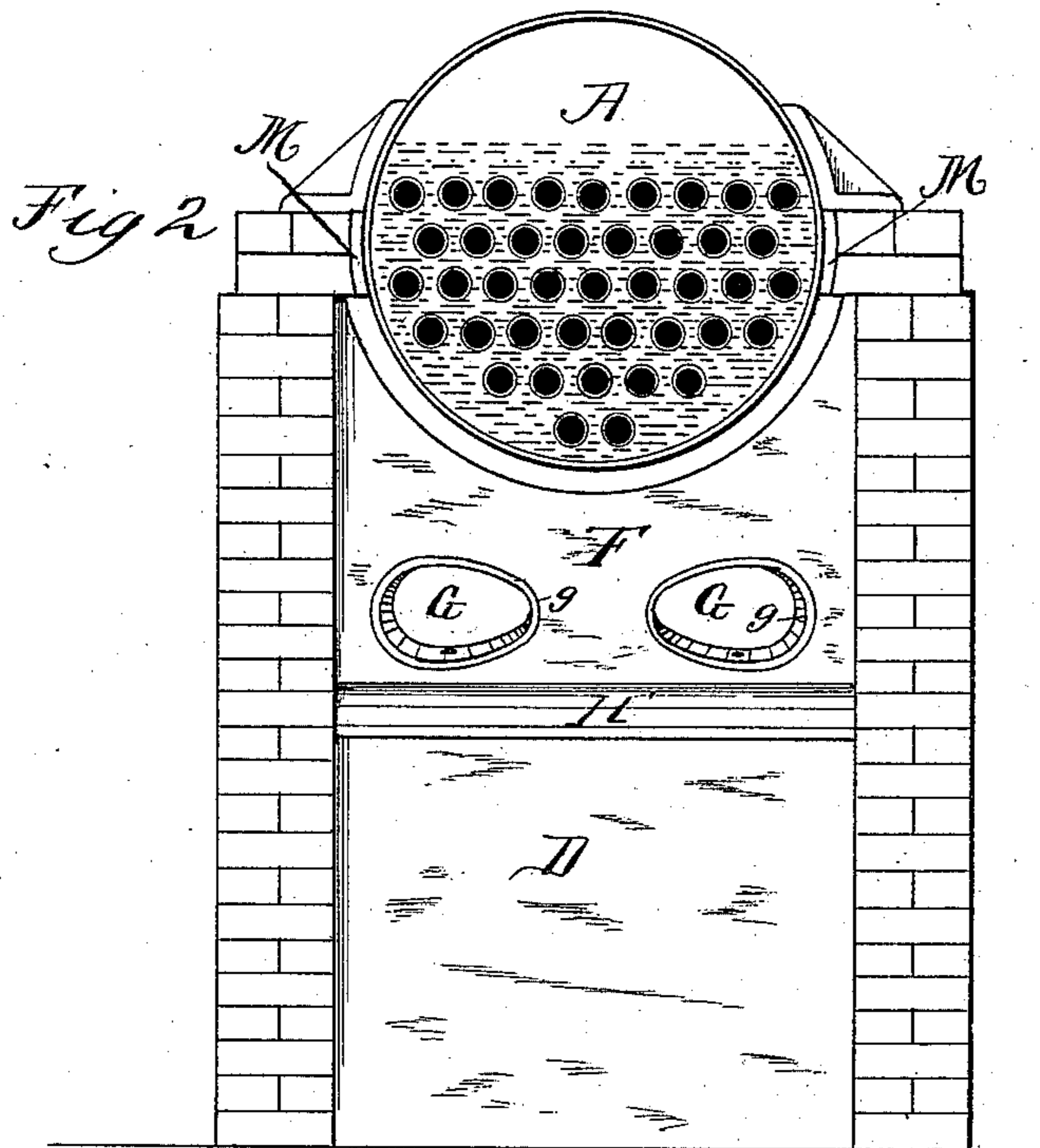
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UNITED STATES PATENT OFFICE.

GEORGE GULICKSON, OF CHICAGO, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 310,582, dated January 13, 1885.

Application filed August 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GULICKSON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Furnaces, of which the following is a specification.

This invention relates to furnaces for steam-boilers, and its object is to effect a more complete consumption of the smoke and products of combustion and provide a furnace of simple and durable construction.

The invention consists in the novel devices and novel combinations of devices herein shown and described.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a sectional side elevation of a device embodying my invention. Fig. 2 is a cross-section on line 2 2 of Fig. 1, and Fig. 3 is a horizontal section on line 3 3 of Fig. 1.

In said drawings, A represents the boiler, which is or may be of any usual construction; B, the grate; C, the fire-box; D, the ash-pit, and E the combustion-chamber, which is separated from the fire-box by the bridge-wall F. The bridge-wall F extends nearly up to the boiler, the space between the top surface of the bridge-wall and the boiler preferably being only one or two inches.

G G are a pair of egg-shaped tapering passages or ports leading from the fire-box through the bridge-wall into the combustion-chamber, the larger end of these oval holes being turned outward, so as to better direct and distribute the heat to the sides of the boiler. As these ports G G are necessarily subjected to great heat, I provide them with an asbestos lining, g, which serves to protect the fire-clay or masonry.

In order to completely burn the smoke and products of combustion as the same issue into the combustion-chamber through these ports G G, I conduct a supply of hot air from the ash-pan through the air-passages H H, which meet the passages G G at or near their mouths, so as to commingle the air-supply with the products of combustion. In order to superheat this supply of air, I conduct it through a hollow convoluted-iron casting or tail-block, H', which is supported in the masonry of the

bridge-wall, and projects out over the end of the grate-bars into the fire-box, so that this curved or convoluted passage, being in contact with the fire, will become highly heated. The air-passages H H connect with this hollow casting H'. By this means the supply of fresh air from the ash-pit will be highly heated by the time it meets the products of combustion issuing through the ports G G.

I is the mud-drum, connected to the boiler by the vertical pipe J. K is a shield or deflecting-plate, located above the mud-drum, and extending in front thereof on an incline, for the purpose of protecting the same, and also to deflect the flame up against the boiler. This deflecting-plate K may preferably be constructed of fire-clay or other refractory material, which may be supported on the iron beams K', extending across the furnace and sustained by the side walls thereof.

As the mud-drum nozzle or tube J, which leads from the lowest point of the boiler to the mud-drum, is necessarily exposed to great heat, I surround it with a protecting covering of asbestos, j, and I also place in front of it—that is to say, between it and the fire-box—a wedge-shaped hood or deflector, L, preferably made of fire-clay or like material, which will serve to divide the flame or heat and distribute it to the sides of the boiler and shield the pipe.

To prevent the expansion and contraction of the metal boiler from rocking and moving the walls or masonry of the furnace, I insert a lining or packing of asbestos cloth or other elastic non-combustible material, M, at the joints between the metal and masonry, so that this elastic lining may take up the expansion or contraction, and thus keep the joints tight without endangering the integrity of the masonry.

The hollow tail-block H', projecting out over the end of the grate-bars, not only serves to superheat the air which is delivered therefrom into the combustion-chamber, but it also serves to close the opening between the ends of the grate-bars and the bridge-wall, and thus prevent any coals or cinders falling down between the same.

I claim—

1. The combination, in a furnace, of the fire-box C with ash-pit D, combustion-chamber E,

bridge-wall F, provided with egg-shaped tapering ports G G, extending through said bridge-wall, and having their larger ends turned outward, so as to distribute the heat to the sides of the boiler, and an air-passage leading from the ash-pit through the bridge-wall into the combustion-chamber at or near the mouth of said ports G G, substantially as specified.

2. The combination, in a furnace, of the fire-box C with ash-pit D, combustion-chamber E, bridge-wall F, provided with ports G G, convoluted air conductor and heater H', projecting from the bridge-wall into the fire-box, and air-passages H, leading from said heater-passage H' into the combustion-chamber near the ports G G, substantially as specified.

3. The combination, with the fire-box, ash-pit, and combustion-chamber, of the bridge-wall between the same, ports G G, a curved air-heater passage or casting projecting into the fire-box and leading from the ash-pit to the combustion-chamber at the mouth of said ports G G, and a deflecting-plate, K, located in the rear part of the combustion-chamber, to direct the heat and flame against the boiler, substantially as specified.

4. The combination, with the fire-box, ash-pit, and combustion-chamber, of the boiler, mud-drum, and connecting-pipe, said pipe being provided with an asbestos covering, and a deflecting-plate located above said mud-drum, substantially as specified.

5. The combination, with the fire-box, ash-pit, and combustion-chamber, of the boiler, mud-drum, and connecting-pipe, said pipe being provided with an asbestos covering, and a deflecting-plate located above said mud-drum, and a wedge-shaped hood or deflector, L, located in front of said connecting-pipe, to divide the flame and shield the pipe, substantially as specified.

6. The combination of fire-box C, ash-pit D, combustion-chamber E, bridge-wall F, passages or ports G G, leading through the same, and provided with asbestos lining g, air-heater casting or passage H', projecting into the fire-box, and air-passage H, leading therefrom to the combustion-chamber, substantially as specified.

7. The combination of grates B, fire-box C, ash-pit D, combustion-chamber E, bridge-wall F, and hollow tail-block H', projecting over the ends of the grate-bars into the fire-box, its hollow space communicating with the ash-pit and combustion-chamber for the purpose of conveying superheated air into the latter, substantially as specified.

GEORGE GULICKSON.

Witnesses:

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TAYLOR E. BROWN.