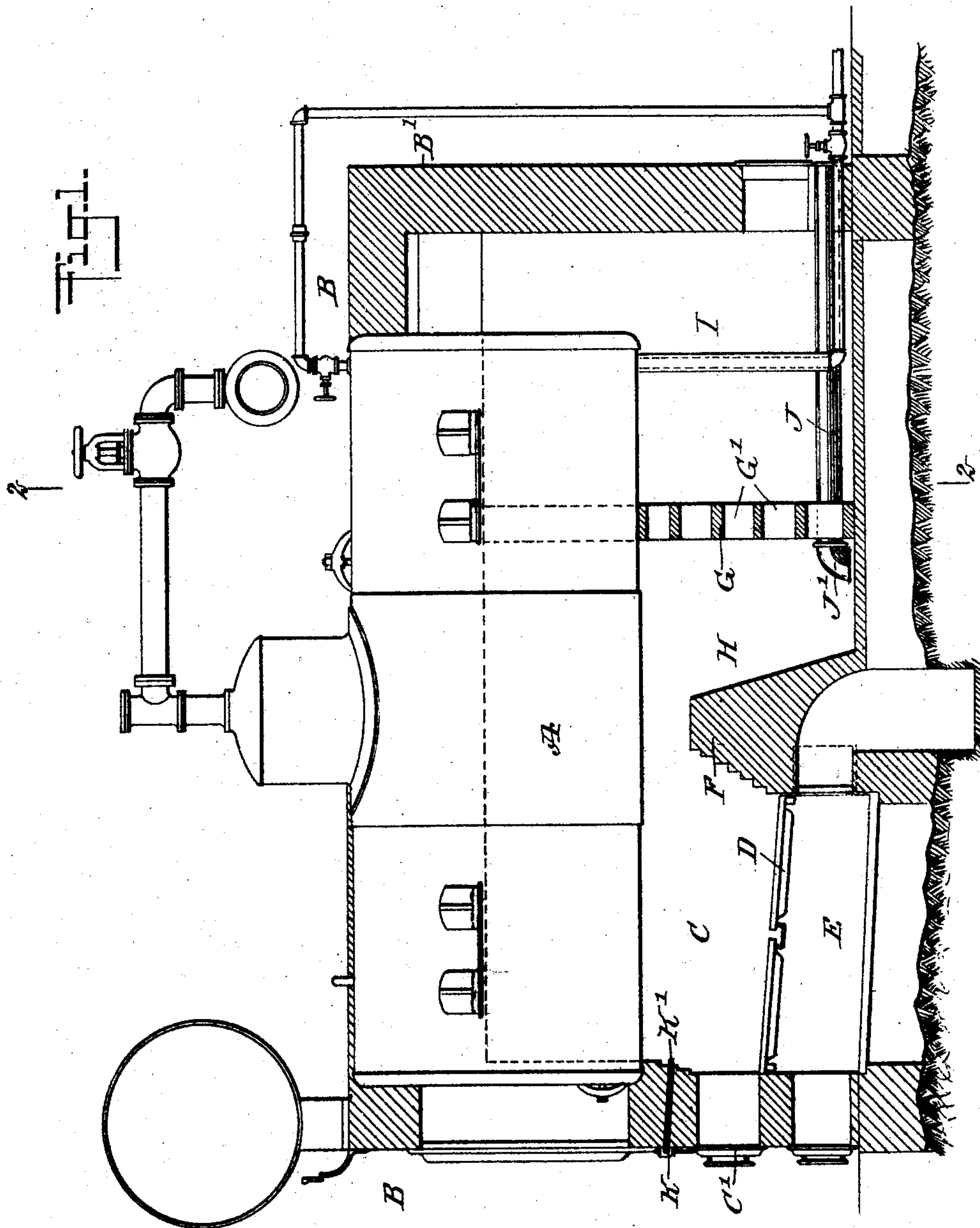


BOILER FURNACE.

908,879.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.



WITNESSES

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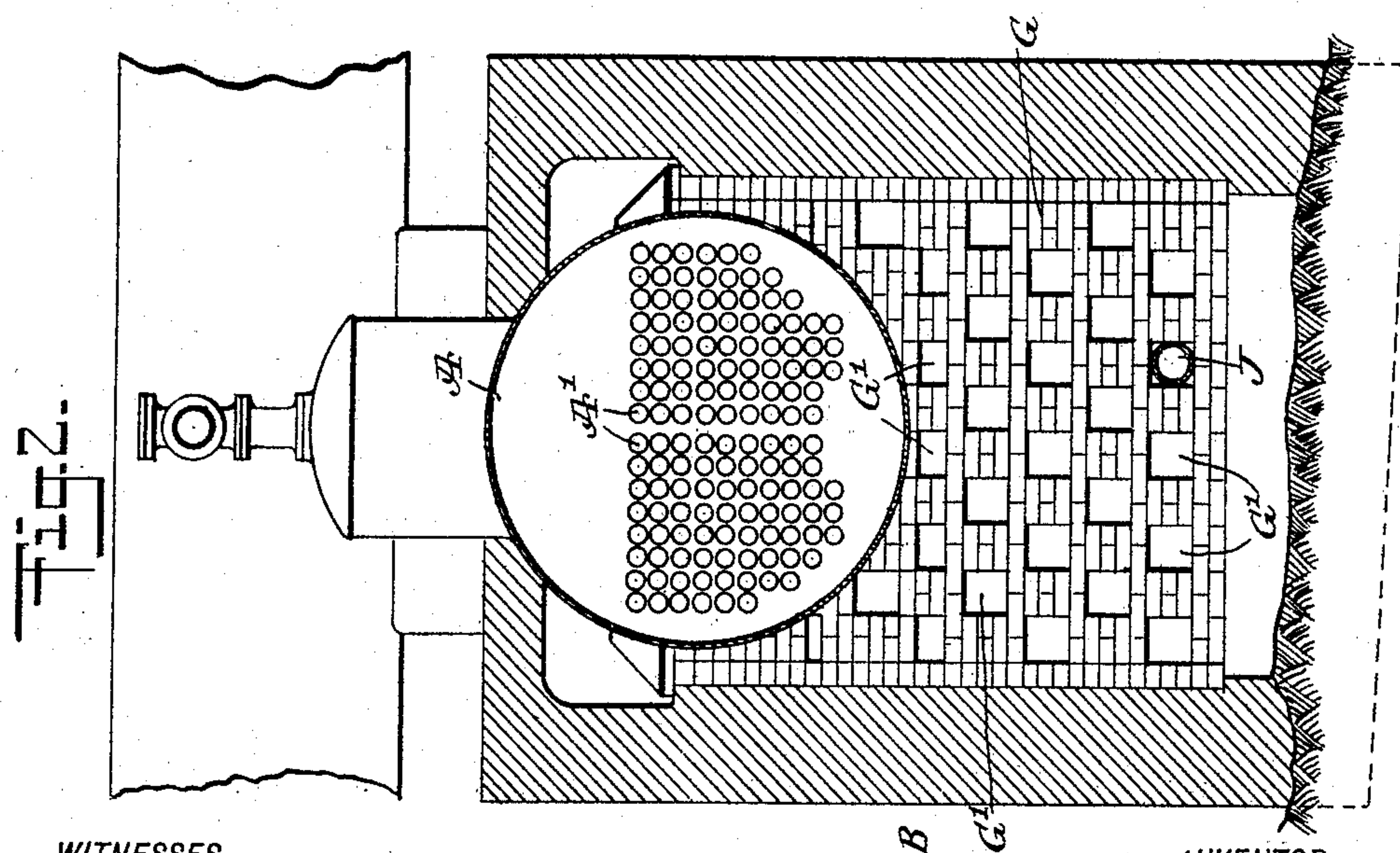
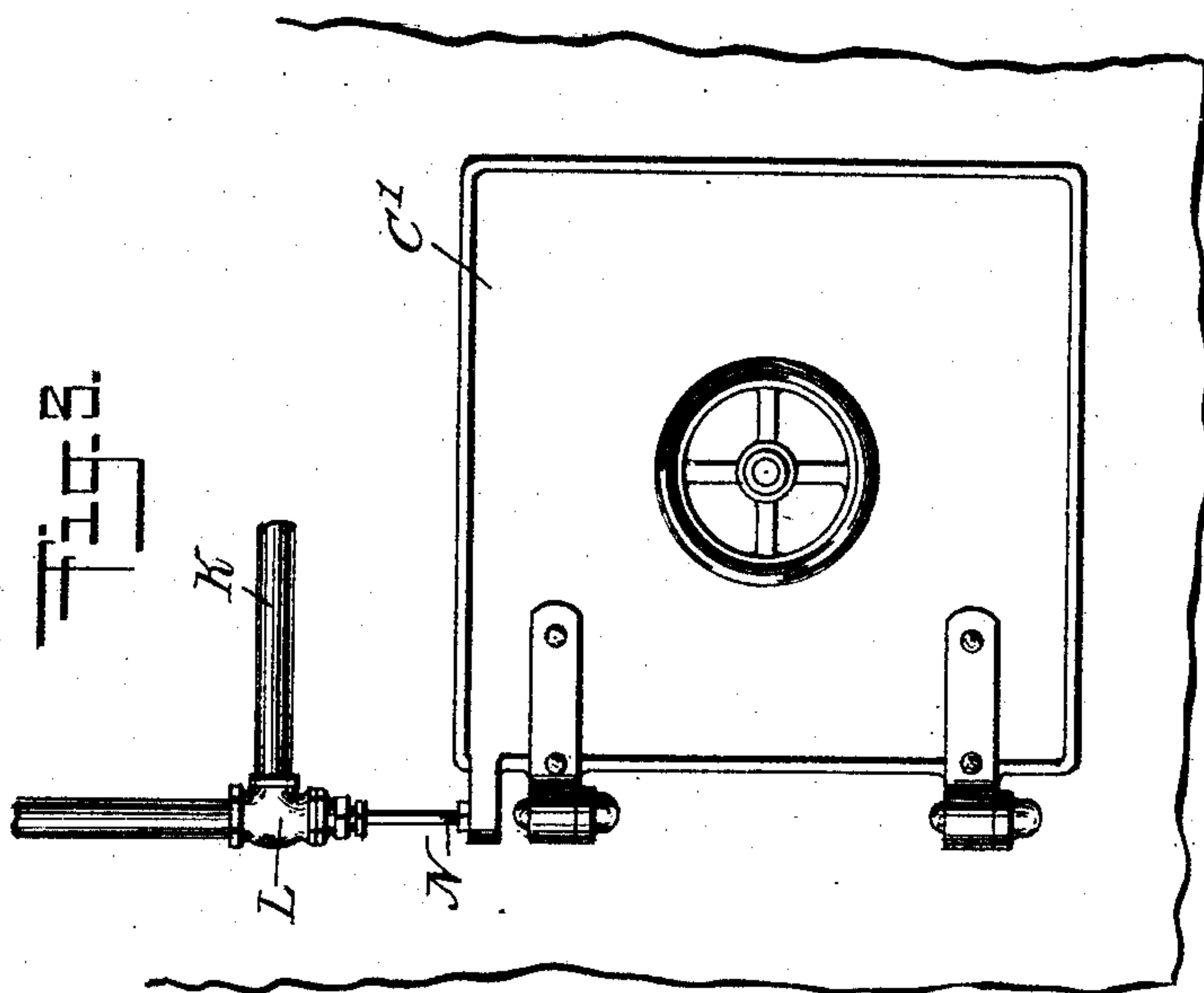
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BOILER FURNACE.
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2 SHEETS—SHEET 2.



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BOILER-FURNACE.

No. 908,879.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed August 26, 1908. Serial No. 450,275.

To all whom it may concern:

Be it known that I, PATRICK HENRY MCGIEHAN, a citizen of the United States, and a resident of Garnerville, in the county of Rockland and State of New York, have invented a new and Improved Boiler-Furnace, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved boiler furnace, which is simple and durable in construction and arranged to insure complete combustion of the fuel especially when the latter is soft coal, thus utilizing the fuel to the fullest advantage and preventing smoke from passing into the chimney.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

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 longitudinal sectional elevation of the improvement as arranged for a horizontal return tubular boiler; Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1; and Fig. 3 is a front elevation of the means for opening and closing the steam valve on opening and closing the firing door.

The return tubular boiler A, is mounted in the usual manner in the brickwork B, and beneath the front portion of the boiler A is arranged a fire-box C, having a grate D leading to the ash pit E.

The bridge wall F is of usual construction, and a distance from the bridge wall F is arranged a transversely - extending checker wall G forming with the bridge wall a main combustion chamber H, for the burning of the gases and smoke passing from the fire-box C over the bridge wall F into the said main combustion chamber. The wall G is provided with perforations G', for the passage of the gases into the second or rear combustion chamber I, extending from the wall G to the rear end wall B' of the brickwork B, and which combustion chamber I connects with the ends of the flues A' in the boiler A.

An air supply pipe J, extends from the outside through the wall B', and lengthwise through the second combustion chamber I and through the perforated wall G into the main combustion chamber H, the inner end

J' of the air supply pipe J being bent downward to deliver the air as near the bottom of the main combustion chamber as possible. The pipe J and the air passing through same, is heated by the heat in the rear combustion chamber I, and thus heated air is passed into the main combustion chamber H to insure complete combustion of the smoke and gases passing into the said main combustion chamber H from the fire box C.

In front of the boiler furnace is arranged a steam supply pipe K, having nipples K' opening into the fire box C above the firing door C' and extending in the direction of the upper end of the bridge wall F, so that when steam passes through the nipples K', it forms a sheet of steam above the burning fuel in the fire box C, to prevent smoke from passing over the bridge wall F into the main combustion chamber H while firing. The pipe K is provided with a valve L, connected by a suitable mechanism N with the firing door C', so that when the latter is opened, the valve L is opened to allow the steam to pass by the nipples K' into the fire box as above described, and when the firing door C' is closed, the valve L closes to shut off the steam from the fire box C. Thus, when the firing door C' is opened and fresh fuel is fed into the burning fuel and a large volume of smoke arises suddenly, then the sheet of steam prevents cold air from rushing over the bridge wall and through the checker wall and the smoke is prevented from passing into the combustion chambers, the boiler flue, and chimney and escaping unburned, and when the firing door is closed, the draft is reduced and the steam is shut off and the smoke is burned, especially as the heat of the checker wall is not reduced.

It is understood that when the furnace is in use, the checker wall G becomes very hot (from cherry heat to a white heat), and by admitting air into the main combustion chamber H, in front of the said checker wall, a complete combustion is had of the smoke passing from the fire box C over the bridge wall F into the main combustion chamber.

By reference to Fig. 1, it will be seen that the bottoms of the combustion chambers H and I are on a level with the floor on which the furnace is mounted, so as to provide considerable depth for the combustion chambers H and I, and to bring the outlet end of the air supply pipe J as far down from the top of the bridge wall F as possible, to insure thorough commingling of the fresh air and gases

in the large chamber H, and consequent burning of the gases.

Having thus described my invention, I claim as new and desire to secure by Letters
5 Patent:

1. A boiler furnace, comprising a brick-work for supporting the boiler, a fire box in the said brick-work underneath the front end of the boiler, a bridge wall, a perforated transverse wall a distance in the rear of the bridge wall, to form with the latter a main combustion chamber, and to form with the rear end of the brick-work a second combustion chamber leading to the boiler flues, and an air pipe
10 extending through the said second combustion chamber and through the said perforated wall into the main combustion chamber to supply the latter with heated air said pipe having its discharge opening directed downward, and below the level of the fire box.
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2. A boiler furnace, comprising a brick-work for supporting the boiler, a fire box in the said brick-work underneath the front end of the boiler, a bridge wall, a perforated transverse wall a distance in the rear of the bridge wall, to form with the latter a main
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combustion chamber, and to form with the rear end of the brick-work a second combustion chamber leading to the boiler flues, an air pipe extending through the said second
30 combustion chamber and through the said perforated wall into the main combustion chamber to supply the latter with heated air said pipe opening below the level of the fire box and discharging downward onto the bottom of the main combustion chamber, a steam supply pipe having steam jets opening into the said fire box at the front thereof and arranged to direct the steam across the fire box onto the upper end of the said bridge
35 wall, a valve in the said steam supply pipe, and a connection between the said valve and the firing door of the fire box for opening and closing the valve on opening and closing the said firing door.
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In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PATRICK HENRY MCGIEHAN.

Witnesses:

C. S. WOOFFINDALE,
ALBERT EDWARD HUNT.