

No. 633,466.

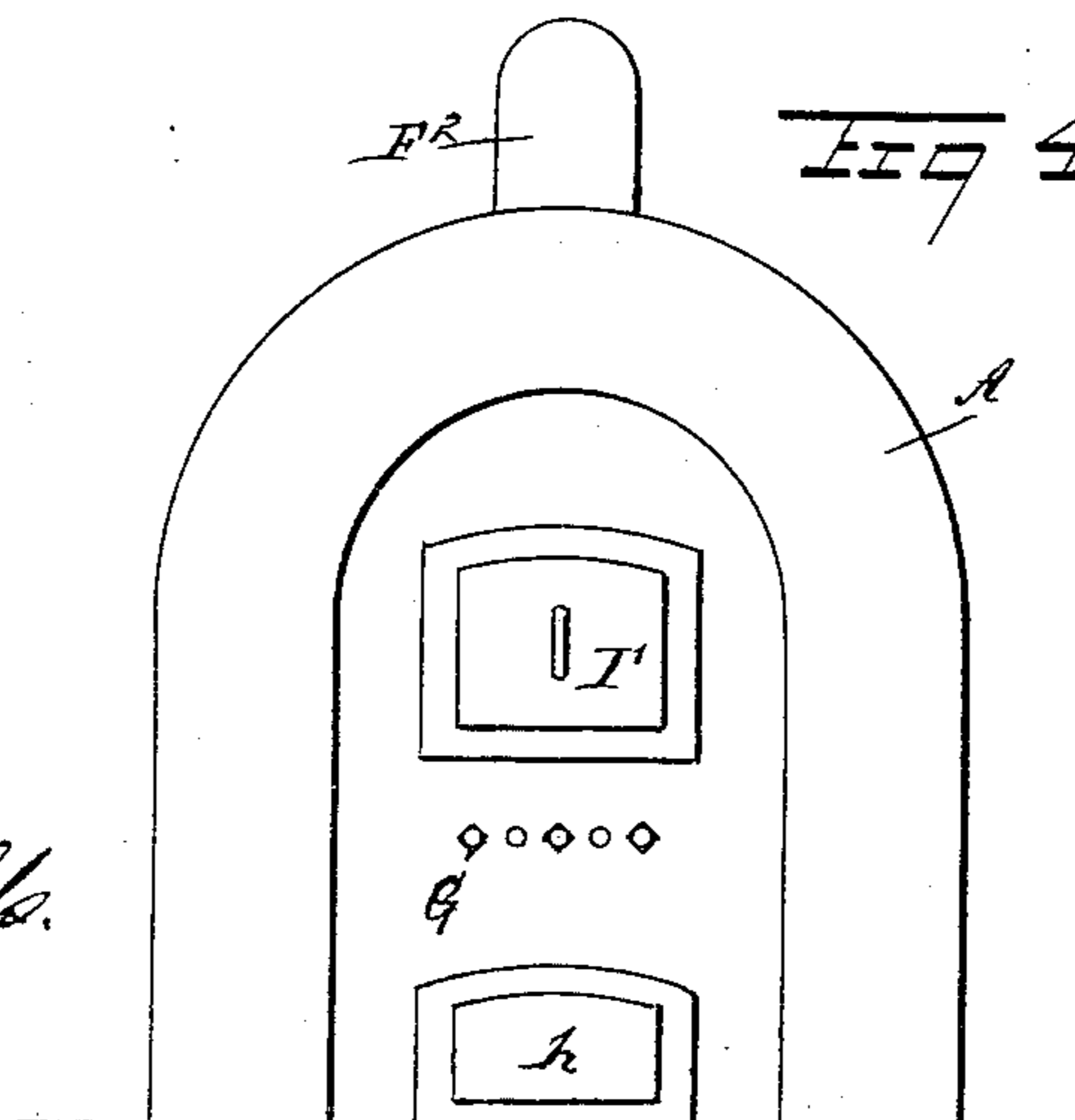
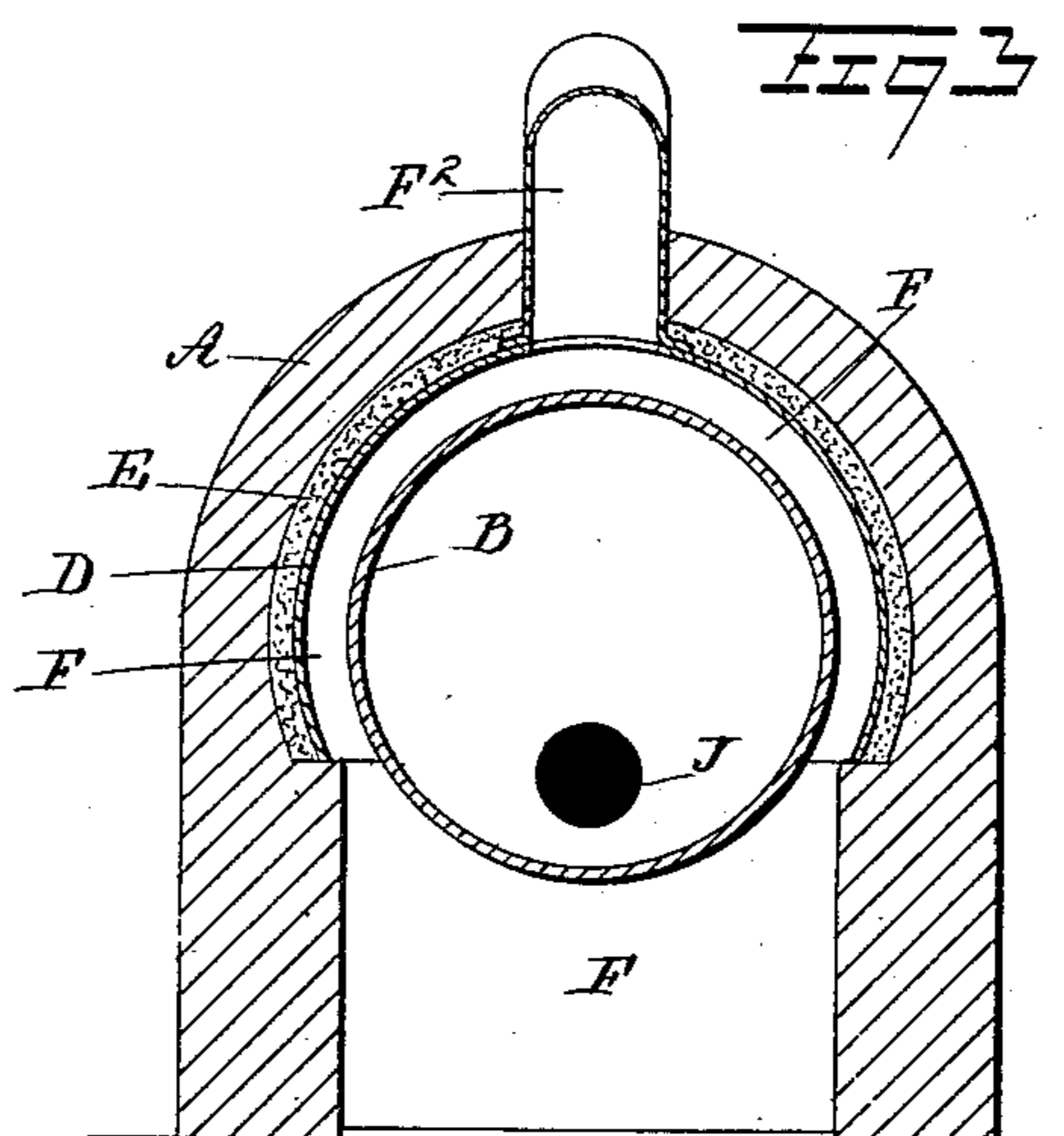
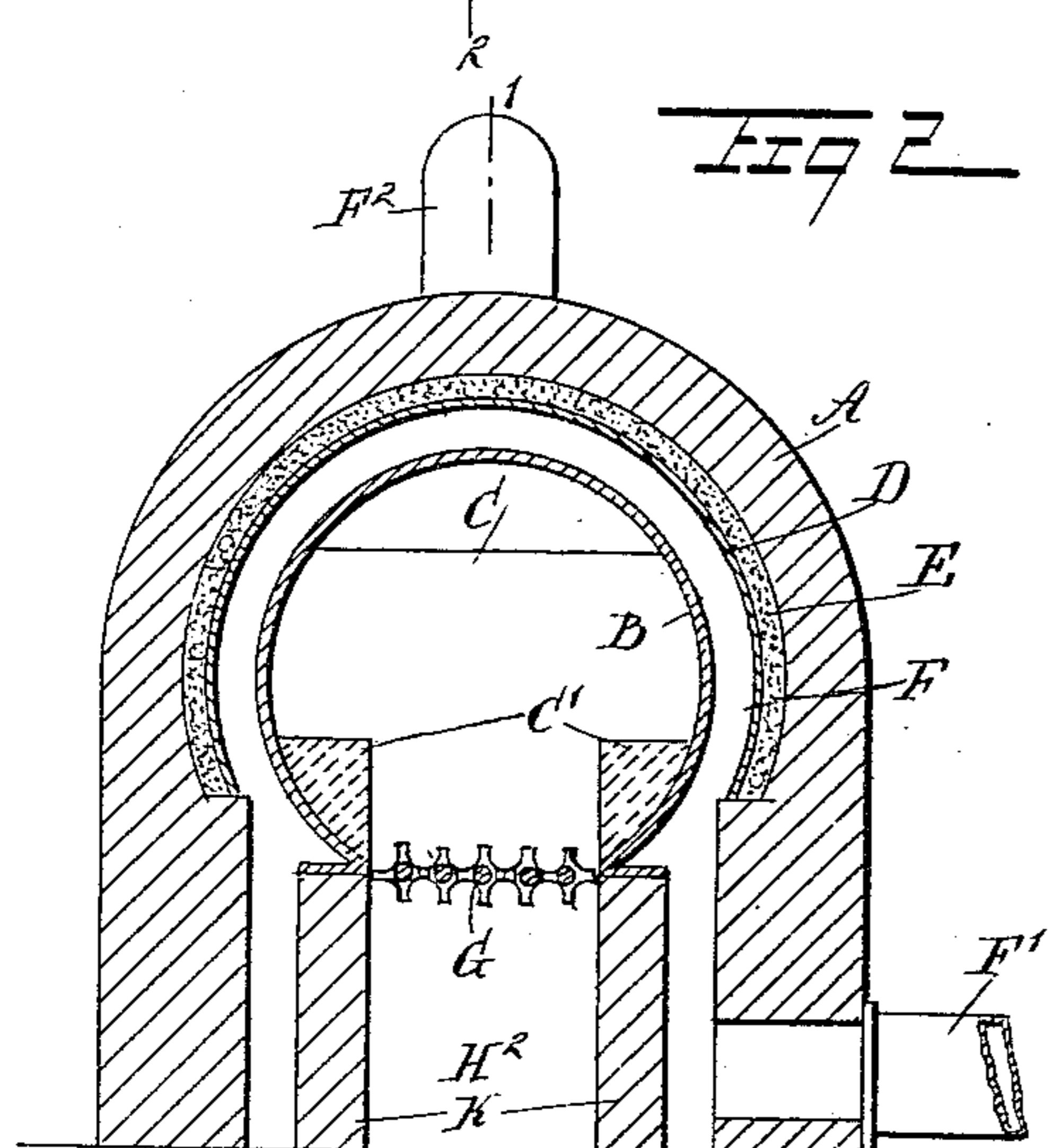
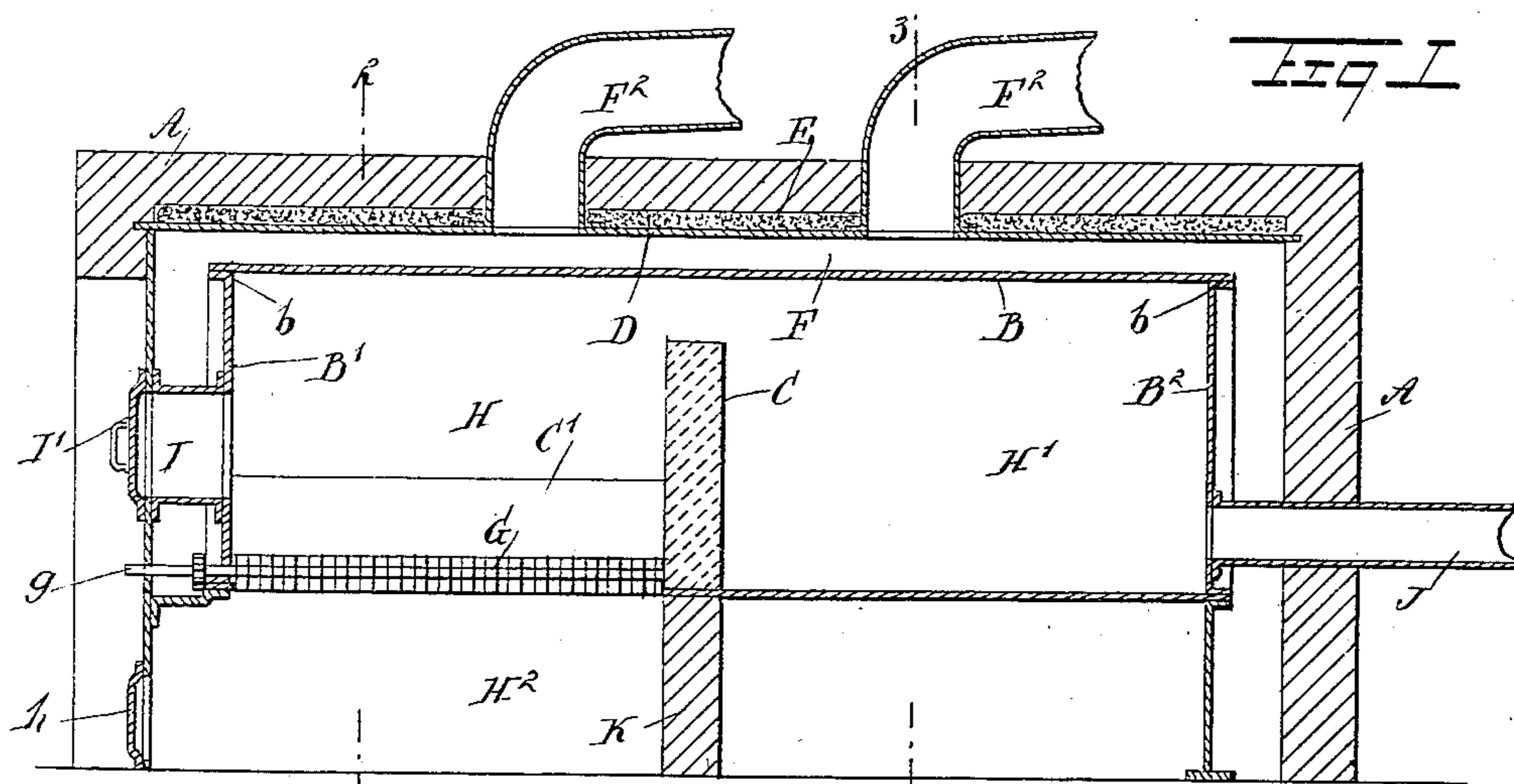
Patented Sept. 19, 1899.

G. W. MISKIMEN, JR.

HOT AIR FURNACE.

(Application filed Oct. 20, 1897.)

(No Model.)



WITNESSES:
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UNITED STATES PATENT OFFICE.

GEORGE W. MISKIMEN, JR., OF NEWCOMERSTOWN, OHIO.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 633,466, dated September 19, 1899.

Application filed October 20, 1897. Serial No. 655,763. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. MISKIMEN, Jr., of Newcomerstown, in the county of Tuscarawas and State of Ohio, have invented
5 a new and Improved Hot-Air Furnace, of which the following is a full, clear, and exact description.

My invention relates to certain improvements in hot-air furnaces intended for use in
10 connection with heating buildings, and has for its object the production of a furnace of such shape and material that it may be cheaply made and be efficient in operation. It comprises, essentially, a cylindrical shell
15 divided into two parts by a partition and having a grate in one end thereof, the whole being surrounded by an air-heating chamber having supply and delivery pipes for conducting air through the same.

20 The invention consists of certain improvements, which will be hereinafter described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification,
25 in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my device. Figs. 2 and 3 are cross-sectional elevations taken, respectively, upon
30 the lines 2 2 and 3 3 of Fig. 1; and Fig. 4 is a front elevation.

In constructing my device I first form a cylindrical shell or boiler B, preferably made of wrought-iron, although cast-iron might be
35 used. This shell is provided with front and rear heads B' and B², the front head having a projecting tube I of such a size that it may be used as a door through which the fuel may be placed upon the grate. This tube is provided
40 with a door I', closing the same.

The shell is divided into two chambers H and H' by a central partition or bridge C, constructed of fire-brick or similar material and extending nearly to the top of the shell.
45 Sufficient room is left above said partition or bridge to afford an ample passage-way for the products of combustion between the partition and the top of the shell.

At the rear end and lower part of the combustion-chamber H', located back of the
50 bridge C, is the smoke-flue J, which carries the products of combustion away from the

furnace. This construction compels the gases to all pass over the bridge or partition C and then downward through the combustion-chamber H' to the smoke-flue J, thus insuring a
55 thorough combustion and affording ample time for the gases to give off their heat to the air in the chamber surrounding the shell B.

In the bottom portion of that part of the
60 shell forming the furnace is formed an opening or slot adapted to receive the grate G. This grate may be of any suitable form and in width extends over a portion only of the bottom of the shell. At each side of the grate
65 and within the shell are formed ledges C', built of fire-brick or similar refractory material, and which prevent direct contact of the heated fuel with the shell of the furnace, thus preventing the corroding action incident to
70 overheating of iron.

The ash-pit H² beneath the grate is surrounded by a wall K upon three sides. The front end of the ash-pit is closed by a plate
75 which forms the front of the furnace and is provided with a door h, through which the ashes may be removed from the ash-pit and the air-draft for combustion may be admitted thereto. The bars of the grate G are preferably pivoted, so that they may be rotated
80 or oscillated for cleaning, and the pivots g are extended outside the furnace-front, where they may be engaged for oscillating the grate-bars. The entire furnace is inclosed in a casing A, arched over the shell B in such a
85 manner as to form an air-space between the shell B and the casing A, which shall be of uniform thickness. On the inner side of the casing A is placed a layer E of mineral wool or similar non-conducting material, which is
90 held in place by an inner lining E of iron or suitable material which sustains the mineral wool and keeps it in place. By this means a narrow air-space F is formed of uniform thickness and extending about the larger part
95 of the shell B, within the surrounding casing A, protected by non-conducting material, so that very little of the heat from the furnace will escape through the casing A.

The casing A is located at a short distance
100 from the walls K, forming the ash-pit, thus insuring a free circulation of air about the ash-pit and the shell B. An air-supply pipe F' is introduced into the air-heating cham-

ber F at the bottom thereof, and air-delivery pipes F² are connected with the top of the air-heating chamber. The air is thus conducted entirely about the shell B and receives its heat from all parts of the shell. This, in connection with the protection afforded by the casing A and the layer of non-conducting material located over the shell B, will prevent any considerable amount of heat from escaping through the casing A. The air-heating chamber F being of uniform thickness at all points will tend to heat the air uniformly.

The heads B' and B² are inserted into the shell B by flanging the heads outwardly and of such a diameter that they will slip within the shell B. The rivets are thus upon the outside of the shell B, where they are not exposed directly to the heat of the furnace. This enables a tight joint to be better maintained than where the rivets are directly exposed to the heat of the furnace and liable to the corrosion caused thereby.

The device as a whole is so constructed that it is practically impossible for gases of combustion to become mixed with the air being heated. This is due to the shape of the shell B and to the fact that the furnace is located within this shell. This construction requires but few joints, and consequently presents little chance for leakage of gas. This is an important matter, as gases of combustion rising with the heated air will vitiate the atmosphere of a building.

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

1. The combination of the inner shell forming an elongated body, a transverse wall within the shell about midway of its length and extending up to a distance from the top of the said shell, the side walls of brick or like material extending within the shell from the front end thereof to the said transverse

wall, a grate located at the bottom of the shell between the forward end thereof, the above-mentioned side walls and the said transverse wall, walls located under the shell and in substantially vertical alinement with said side walls and transverse wall, thus forming an ash-pit below the grate, a smoke-flue connected to the lower portion of the shell at the rear end thereof, an exterior casing spaced from the shell and from the side walls of the ash-pit, forming a surrounding air-chamber, and pipes or channels for the inlet and outlet of air to and from said chamber.

2. The combination of the inner shell forming a horizontally-disposed elongated cylinder, a transverse wall within the shell about midway of its length and extending up to a distance from the top of the said shell, side walls of brick or like material extending within the shell from the front end thereof to the said transverse wall; a grate located at the bottom of the shell between the forward end thereof, the above-mentioned side walls, and the said transverse wall, walls located under the shell and in substantially vertical alinement with said side walls and transverse wall, thus forming an ash-pit below the grate, a smoke-flue connected to the lower portion of the shell at the rear end thereof, an exterior casing spaced from the shell and from the side walls of the ash-pit, forming a surrounding air-chamber, said casing being cylindrically recessed adjacent to the inner shell, a bad conductor of heat in the recess of the shell, and a cylindrical lining supported upon the casing and engaging the inner surface of said bad conductor of heat, and pipes or channels for the inlet and outlet of air to and from said chamber.

GEORGE W. MISKIMEN, JR.

Witnesses:

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