

(No Model.)

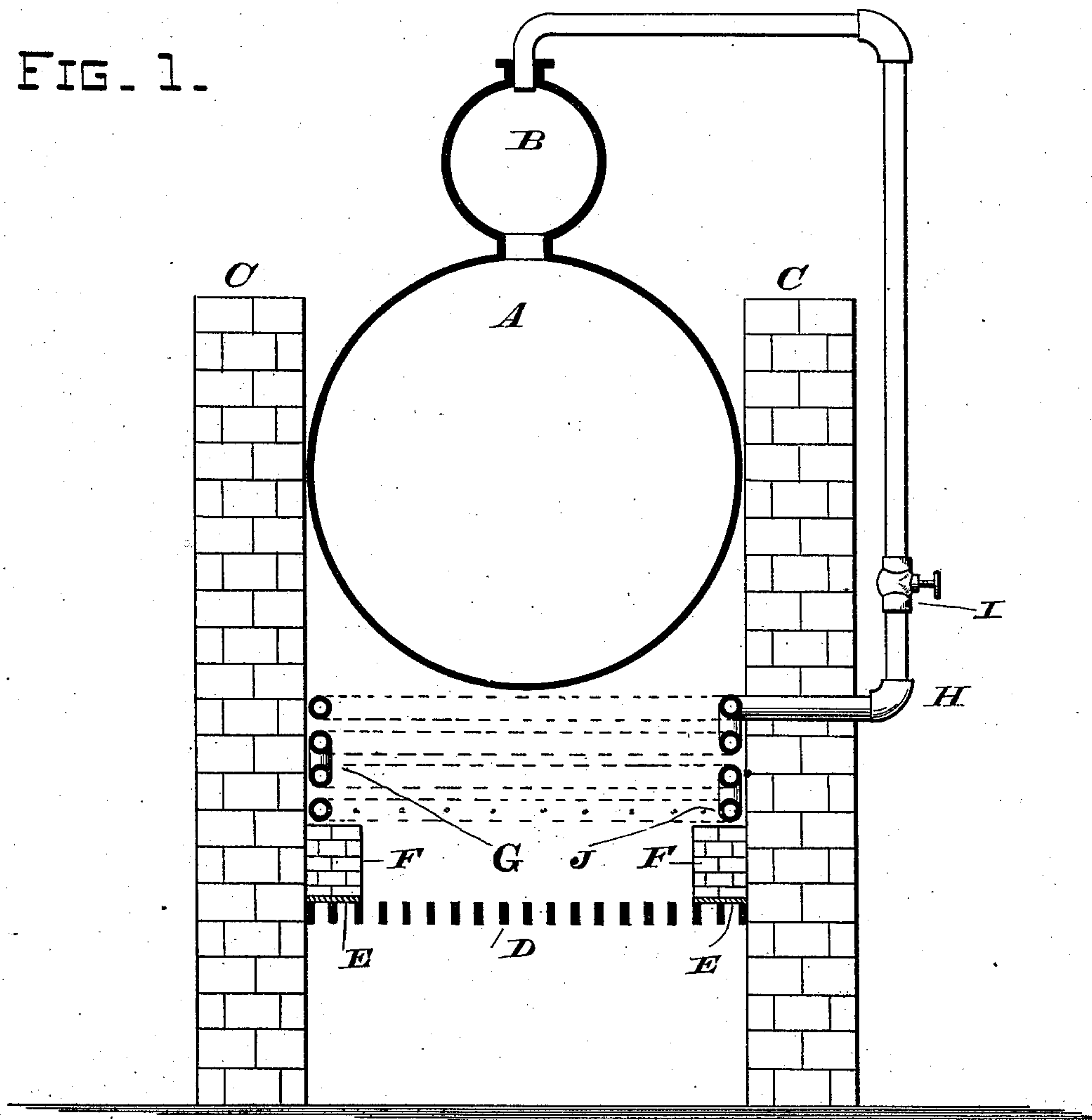
2 Sheets—Sheet 1.

I. L. MERRELL.
STEAM BOILER FURNACE.

No. 294,654.

Patented Mar. 4, 1884.

FIG. 1.



WITNESSES.

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Edwin Derby

INVENTOR.

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2 Sheets—Sheet 2.

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FIG. 2.

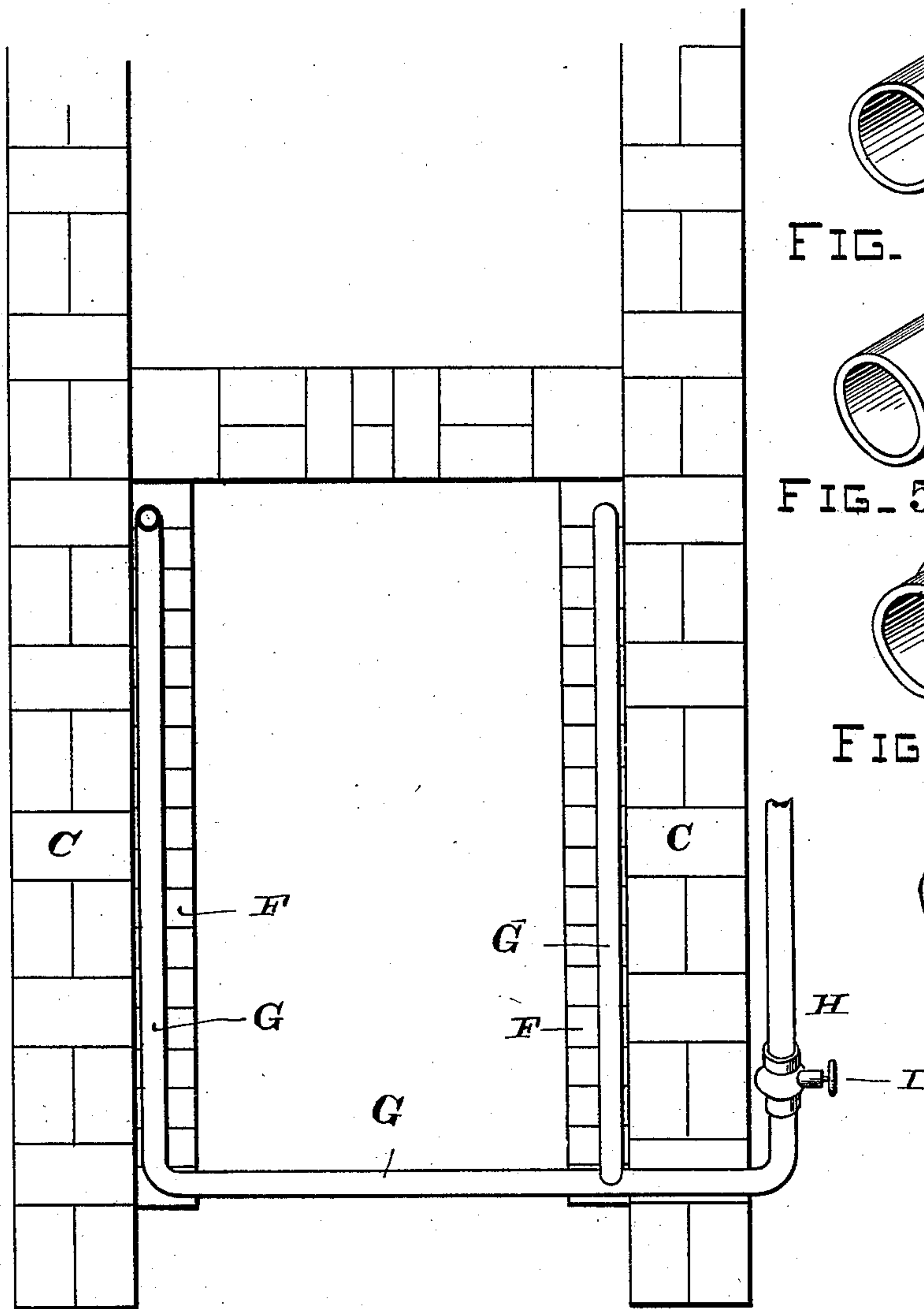


FIG. 3.

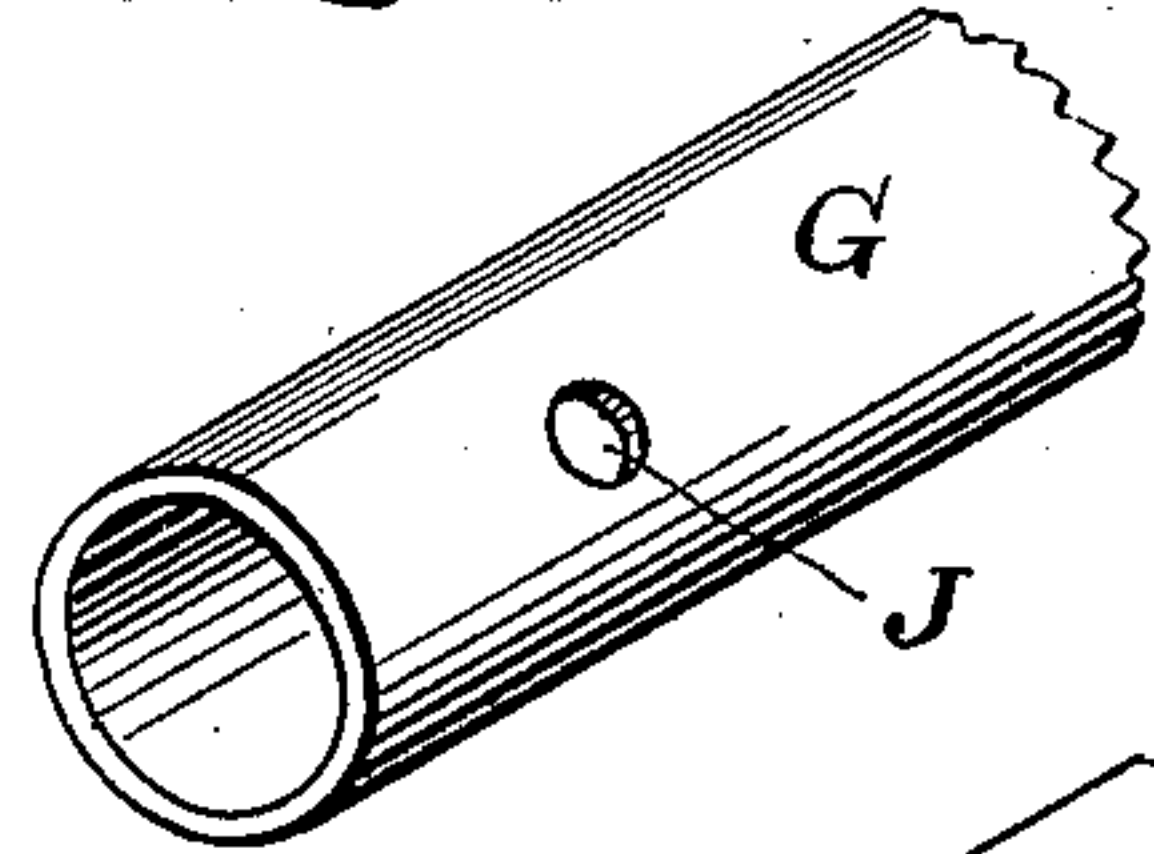


FIG. 4.

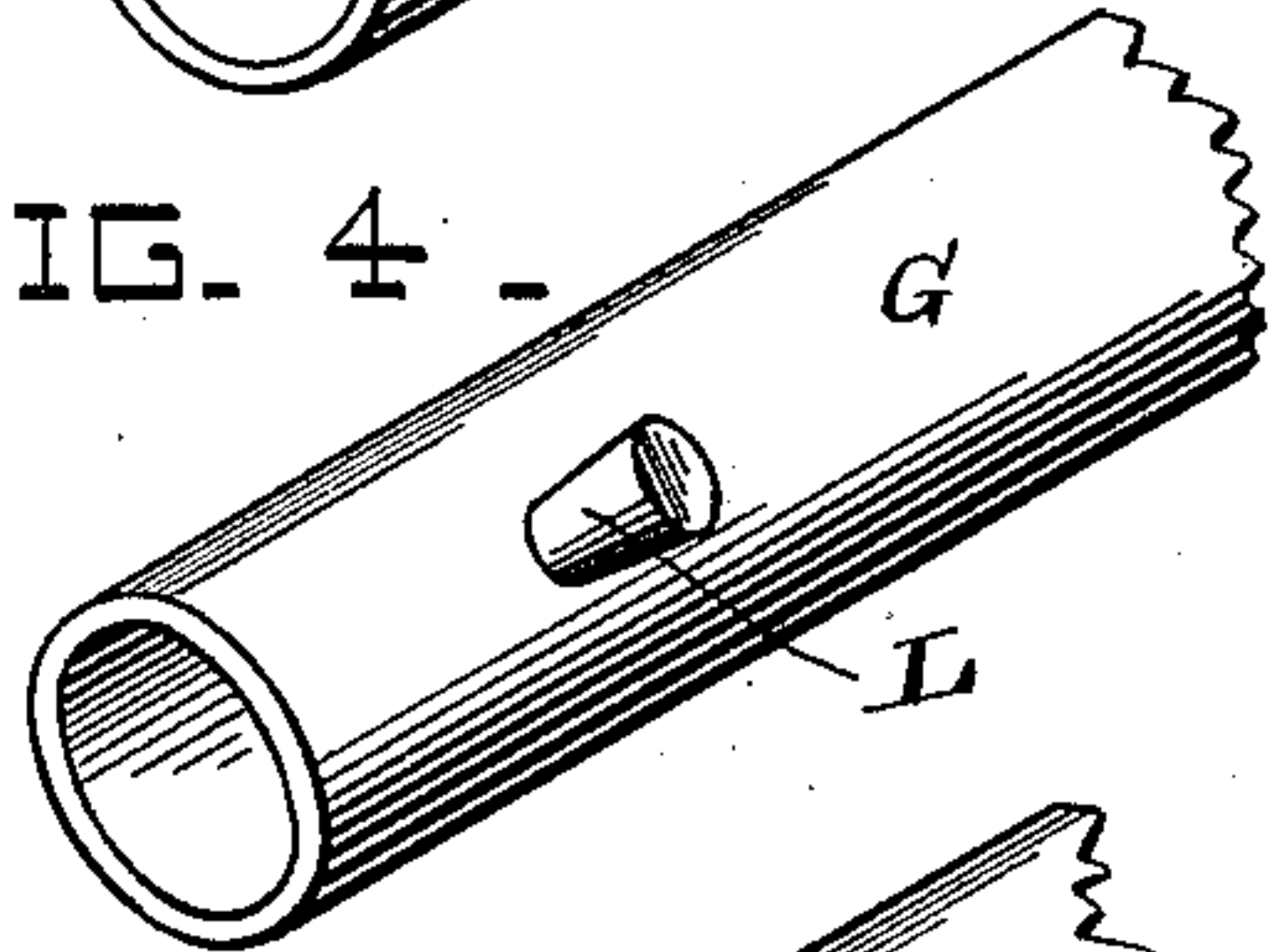


FIG. 5.

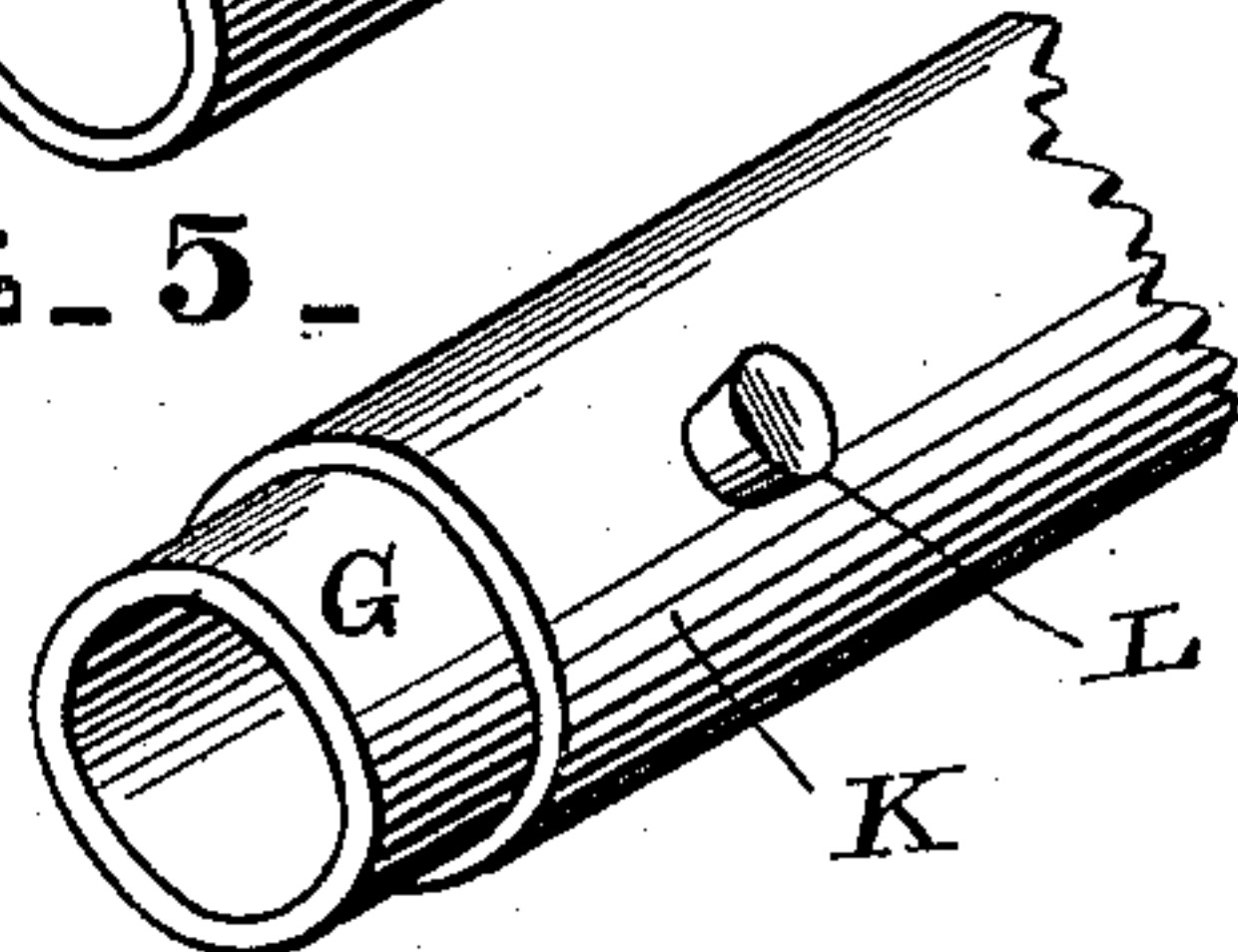
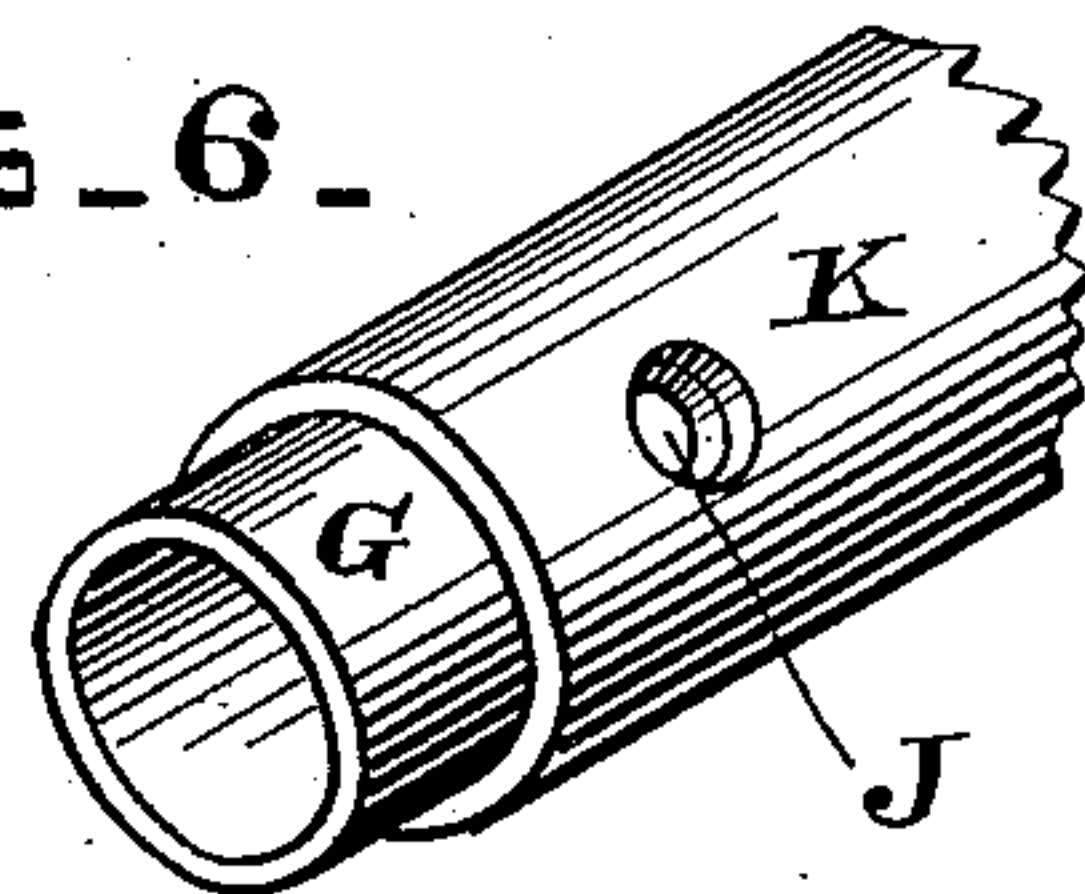


FIG. 6.



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UNITED STATES PATENT OFFICE.

ISAAC L. MERRELL, OF SAN FRANCISCO, CALIFORNIA.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 294,654, dated March 4, 1884.

Application filed August 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, ISAAC L. MERRELL, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

My invention relates to certain improvements in furnaces adapted for the heating of steam-boilers placed above the flame and combustion chamber; and the object of my invention is to provide a furnace with an interior coil of pipes or tubing, from which jets or sprays of superheated steam are thrown into the fire-box, for the purpose of increasing the degree of heat and consuming the gases, vapors, and other products of combustion arising from the burning fuel, and also to provide a means whereby the steam-coils may be protected from actual contact with the burning fuel and the flames arising therefrom. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a vertical cross-section through a steam-boiler and furnace having my improvements applied thereto; and Fig. 2 is a plan view of the same, the boiler being removed. Figs. 3, 4, 5, and 6 are detail views.

Similar letters of reference are used to designate like parts throughout the several figures.

The steam-boiler A is provided with the usual steam-drum, B.

CC are the side walls, and D the grate-bars, which are secured in place in the usual manner.

Upon either side of the combustion-chamber, and upon the grate-bars, I lay a narrow cast-iron plate, E, which extends the whole length of the said combustion-chamber, and upon these plates I build a low and narrow wall or bench-wall, F. The bricks which compose these walls may be of the ordinary fire-brick, or may be formed of crucible-clay, or may be of a mixture of clay and asbestos, and laid in a mortar or cement largely composed of asbestos, for the purpose of insuring a longer endurance or resistance to the action of heat. Upon the bench-walls I lay the steam-coil G, the lower section of which alone

rests upon the bench-wall, while the other sections rise above and are in vertical alignment with the lower section, and are secured to the furnace-walls by suitable hooks or clamps. It should here be remarked that these steam-coils do not extend across the face of the bridge-wall, as that would bring them into too direct contact with the flames passing over the said wall, but only extend along the side and front walls, as shown in plan in Fig. 2; and, also, that the bench-wall is not extended across the face of the front wall, because the natural draft of the furnace will blow the flames away from the front wall and toward the rear of the furnace; and as the principal object in employing these bench-walls is to protect the steam-coils as much as possible from the direct action of the flames, it will be readily seen that their employment at this point would be unnecessary. The upper steam-coil is extended through the side wall, and is connected by a pipe, H, having a suitable shut-off cock, I, with the steam-drum B, while the lower section of the coil is provided with a continuous series of perforations, J, facing the interior of the fire-box, and through which the steam, after having been superheated in its passage through the upper coils or sections, is blown into the combustion-chamber.

In order to increase the durability of the steam-coils, I cover them with a wrapping or coating of asbestos, K; and in order that the said coating may not obstruct the passage of the steam through the perforations J, I first stop up the said perforations with wooden plugs L L. The asbestos is then laid on the pipe and around the plug, as seen in Fig. 5, after which the plug is withdrawn, leaving a clear blow-hole, as seen in Fig. 6. By this construction it will be seen that I am enabled to provide a means whereby the degree of heat may be greatly increased, and the smoke, gases, vapors, and other products of combustion may be consumed before leaving the fire-box, through the medium of the jets or spray of superheated steam thrown into the fire-box; and, furthermore, that by means of the bench-walls herein described and the asbestos covering for the steam-coils I am enabled to greatly increase their durability.

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

5 In a steam-boiler furnace, the combination of the grate-bars D D, cast-iron plates E E, bench-walls F F, and perforated steam-coil G, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ISAAC L. MERRELL. [L. S.]

Witnesses:

WILMER BRADFORD,

CHAS. E. KELLY.