

No. 630,268.

Patented Aug. 1, 1899.

A. A. RICHARDSON.
STEAM BOILER FURNACE.

(Application filed Sept. 8, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig: 1.

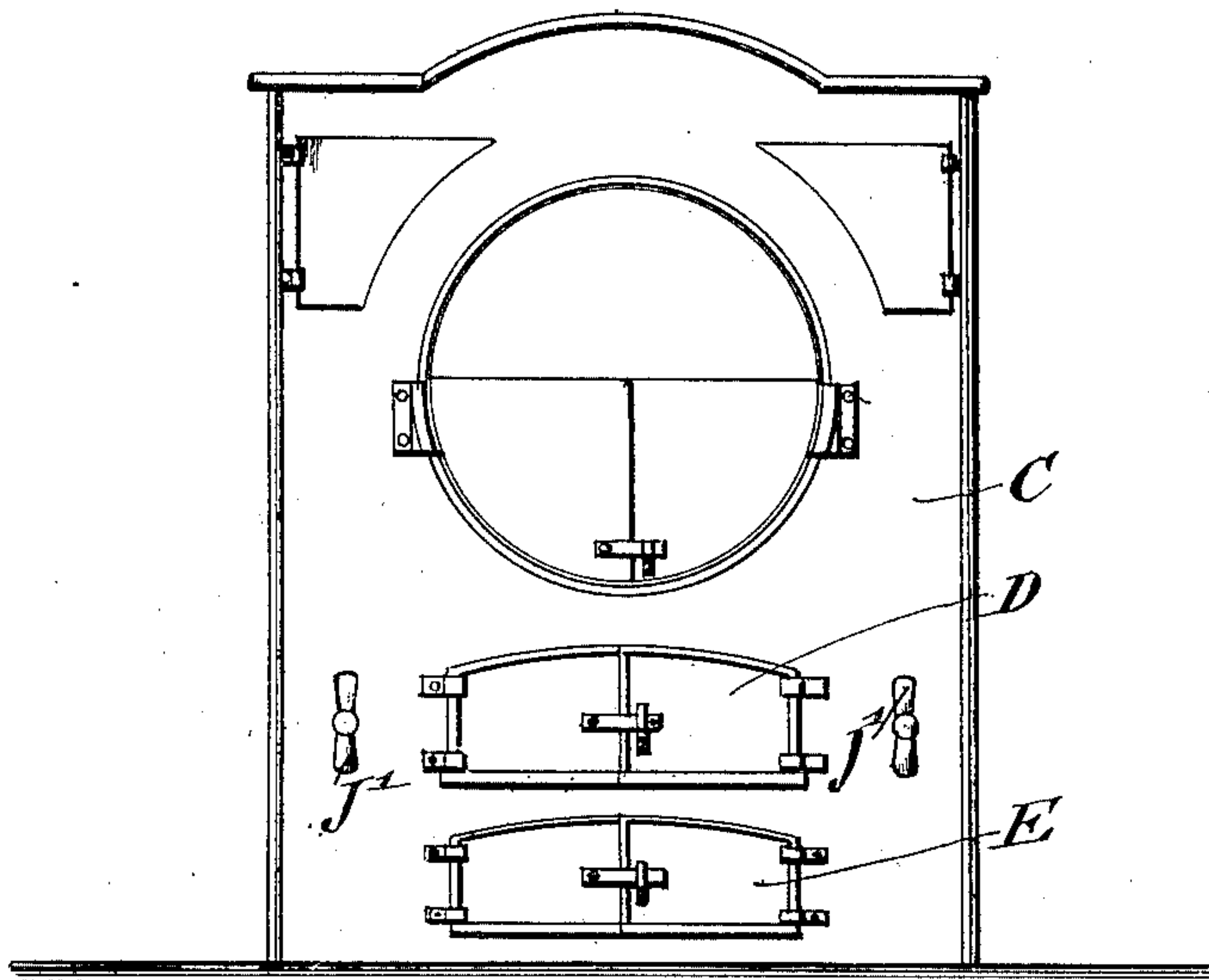
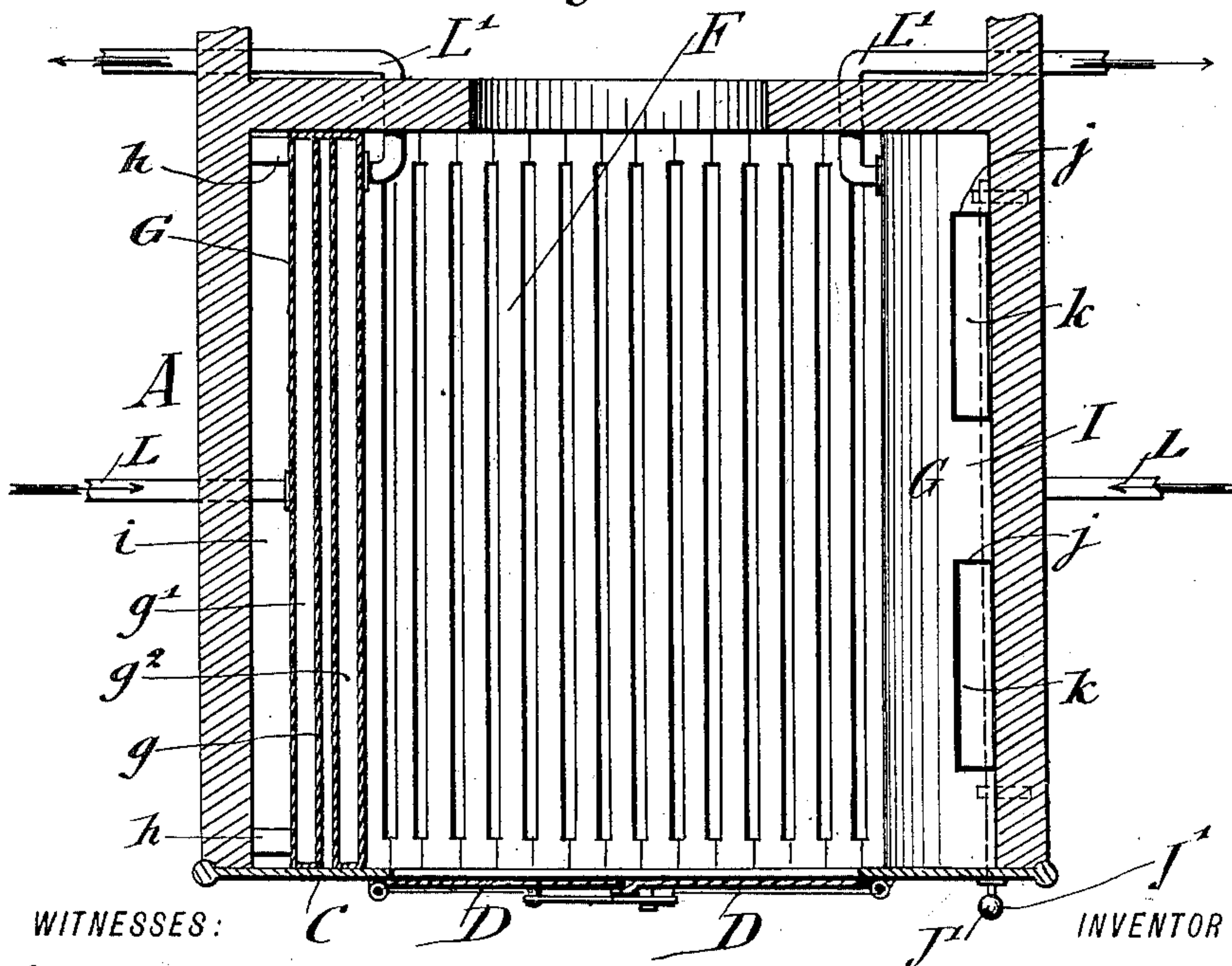


Fig: 2.



WITNESSES:

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Geo. C. Jaeger

INVENTOR

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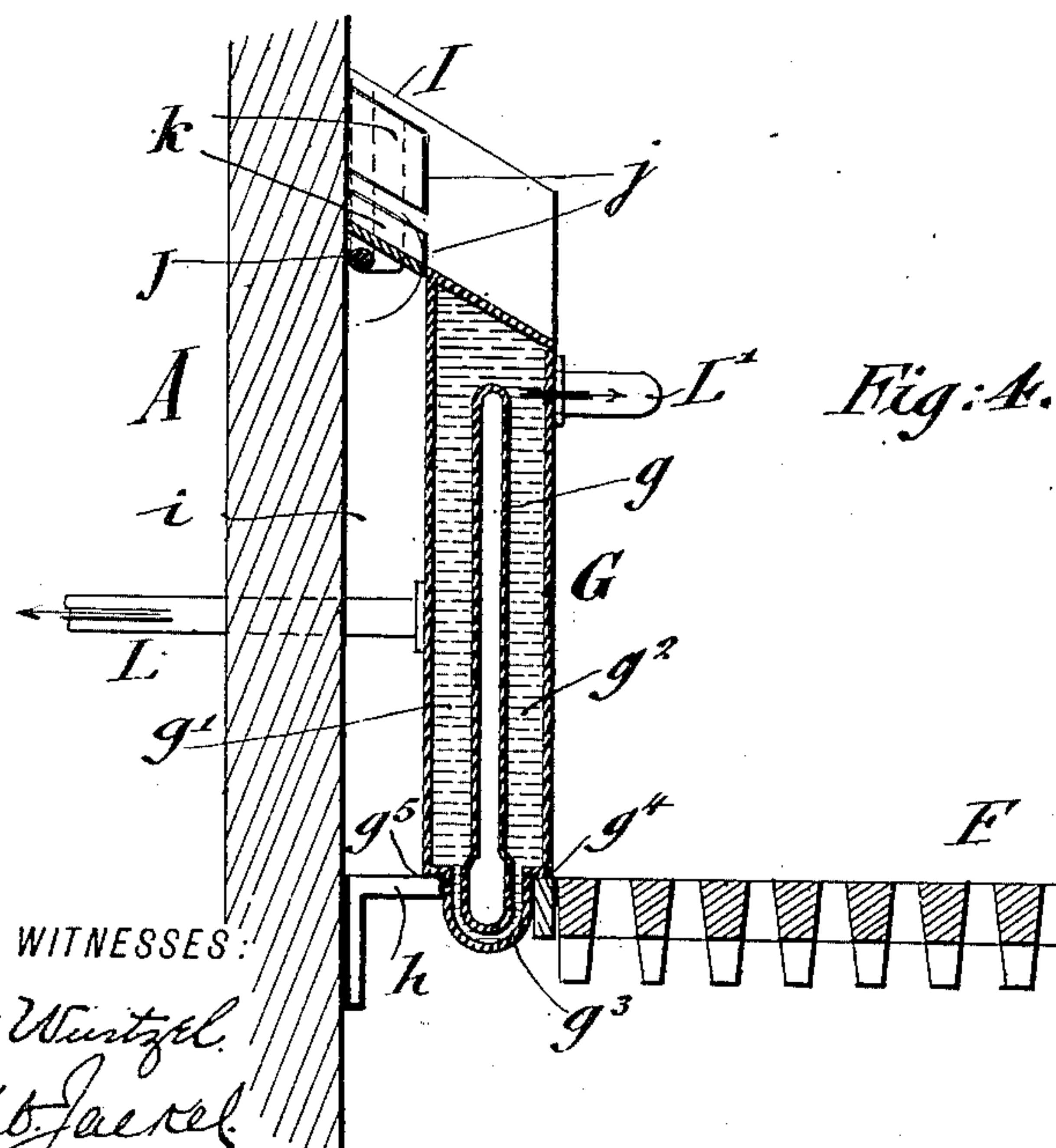
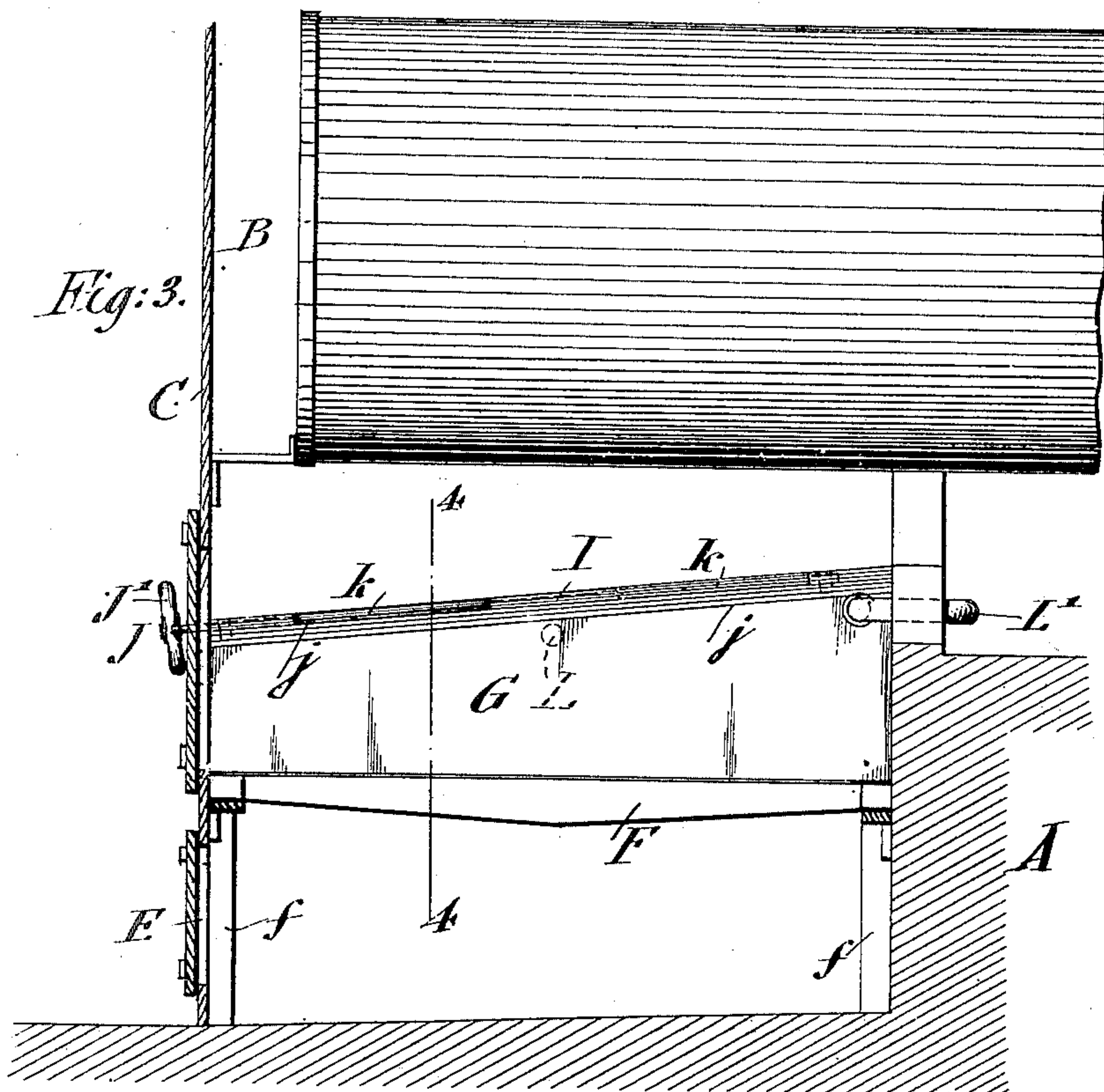
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UNITED STATES PATENT OFFICE.

ALFONSO A. RICHARDSON, OF NEW YORK, N. Y.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 630,268, dated August 1, 1899.

Application filed September 8, 1898. Serial No. 690,472. (No model.)

To all whom it may concern:

Be it known that I, ALFONSO A. RICHARDSON, a citizen of the United States, residing at New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Steam-Boiler Furnaces, of which the following is a specification.

This invention relates to steam-boiler furnaces; and the object of the same is primarily to protect the walls of a furnace from the great heat of the fire by means of a peculiarly-constructed water-bosh at opposite sides of the fire-chamber.

The invention consists of certain features of construction, to be hereinafter described and then particularly claimed.

In the accompanying drawings, Figure 1 is a front elevation of a steam-boiler furnace to which my improvement is applied. Fig. 2 is an enlarged horizontal section through the fire-chamber and the parts at the sides thereof. Fig. 3 is a vertical longitudinal section through the ash-pit and the fire-chamber, the boiler being shown in side elevation; and Fig. 4 is an enlarged transverse section on the line 4 4 of Fig. 3.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A indicates the walls of the furnace; B, the boiler of any approved tubular form.

C is the front plate.

D are the doors to the fire-chamber; E, the doors to the ash-pit.

F is the grate, supported in any suitable manner by means of legs or standards *f*, resting on the floor of the ash-pit, and G indicates at each side of the fire-chamber one of my peculiarly-constructed and adapted water-boshes. Each water-bosh G is formed, preferably, of cast-iron in one or more castings, as desired, and each of the said water-boshes is supported in any suitable manner above and at the sides of the grate F by means of brackets *h*, which are fastened to the side walls of the furnace. Each water-bosh is supported at a suitable distance from the side walls, so as to provide an air-space *i*, which communicates below with the ash-pit and above with the fire-chamber. For the purpose of establishing communication of said

air-space with the fire-chamber a flange I along the top of the water-bosh G is provided with a suitable number of air-inlet openings *j*, which can be closed or opened when desired by means of dampers *k*, which are carried by a rock-shaft J, that is supported in suitable bearings on the side walls of the furnace below the flange I, said rock-shaft extending forwardly through the front plate C and being there provided with a knob or handle J'. The flange I, as well as the top of each water-bosh G, is inclined from its outer edge toward the center of the fire-chamber, so as to shed the soot, cinders, &c., which would tend to accumulate thereon, and said parts furthermore slant from the rear end of the water-bosh toward the front end thereof, so as to increase the cross-sectional area of the water-bosh gradually from its front toward its rear end.

The water-boshes G are each provided with a longitudinal vertical partition *g*, of flattened tubular form, which divides each water-bosh into outer and inner chambers *g'* *g''*, respectively. The chambers *g'* *g''* are connected at the bottom by a suitable curved elbow or connecting portion *g'''*, that projects below the shouldered portions *g⁴* *g⁵* of the water-bosh, that rest, respectively, on the grate F or its supporting-frame and on the bracket-supports *h*. The upper part of the hollow partition *g* is separated at a suitable distance from the top of the water-bosh, so that when a fire is burning water may be introduced into the water-bosh through an inlet-pipe L and will be caused to find exit through the outlet-pipe L', due to the circulation established, in an evident manner. The inlet-pipe is located at the off side of the water-bosh, while the outlet-pipe is located on the near side of the same.

It will be seen that when water is let in through the inlet-pipe L it will displace the warm water in the bosh and flow down and be distributed throughout the lower part of the chamber *g'* of the water-bosh, and then, becoming heated, will flow through the elbow or connecting portion *g'''* and then up into the near water-chamber *g''*, where, being nearest to the fire, it will be heated to a high degree, and, rising in the same by reason of its increasing heat, will flow out through the outlet-pipe L at the upper rear corner of the bosh.

The water-supply is obtained from a suitable source, and the outlet-pipe leads off to any desired point. The water flowing into the water-boshes is introduced in a quite cool state, so
 5 as to keep the off chambers g' in the coolest possible condition, and thereby form a medium or obstacle between the other chambers g^2 and the side walls of the furnace for preventing the great heat of the furnace reach-
 10 ing and destroying the side walls. The supply of cooling-water is constantly kept up, so that a continuous circulation in the water-boshes will be established. The heat inside the fire-chamber increases from the front to-
 15 ward the back, and for that reason the water-boshes gradually increase in cross-section from the front toward their rear end, so as to allow the steam which is liable to be formed in the same to pass off through the outlet at
 20 the rear end. When it is desired to lower the heat in the fire-chamber, the valves or dampers k are opened, so that air will pass up through the air-space i and out upon the burning coals in the fire-chamber. This also lessens the
 25 draft directly through the grate when the ash-pit doors are open.

I am aware that it is not broadly new to equip a furnace with water-boshes along the side walls of the fire-chamber and to separate
 30 them from the side walls, so as to provide air-spaces, and I do not therefore claim the same; but what I do claim is the peculiarly-constructed water-bosh for use in protecting the side walls of the furnace, as described.

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

1. In a steam-boiler furnace, the combination, with the side walls and the grate, of
 40 water-boshes suitably supported in the fire-chamber between the side walls and the grate, and separated from the side walls so as to provide air-spaces, said water-boshes being

provided with two chambers, one located on the off side of the grate and the other on the
 45 near side, an inlet-pipe communicating with the chamber on the off side and an outlet-pipe leading from the chamber on the near side, substantially as set forth.

2. In a steam-boiler furnace, the combination, with the side walls and the grate, of
 50 water-boshes supported in the fire-chamber at a suitable distance from the side walls, between the same and the grate, and constructed with a longitudinal partition, whereby two
 55 chambers are formed, respectively on the off and near sides, and an inlet-pipe and an outlet-pipe leading to and from said boshes, respectively, substantially as set forth.

3. In a steam-boiler furnace, the combination, with the side walls, of water-boshes, suit-
 60 ably supported at the sides of and within the fire-chamber, and being provided with a vertical longitudinal partition separating said boshes each into two chambers, an inlet-pipe,
 65 and an outlet-pipe, each communicating with one of said chambers, substantially as set forth.

4. In a steam-boiler furnace, the combination, with the side walls, water-boshes suit-
 70 ably supported at the sides of and in the fire-chamber, said boshes being separated from the side walls to provide air-spaces, flanges extending from and along the tops of the wa-
 75 ter-boshes above said air-spaces and abutting against the side walls, and inlet and outlet pipes for said boshes, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in pres-
 80 ence of two subscribing witnesses.

ALFONSO A. RICHARDSON.

Witnesses:

GEO. L. WHEELOCK,
 M. HENRY WURTZEL.