

No. 614,150.

Patented Nov. 15, 1898.

G. WATSON.
FURNACE.

(Application filed Feb. 21, 1898.)

(No Model.)

Fig. 1.

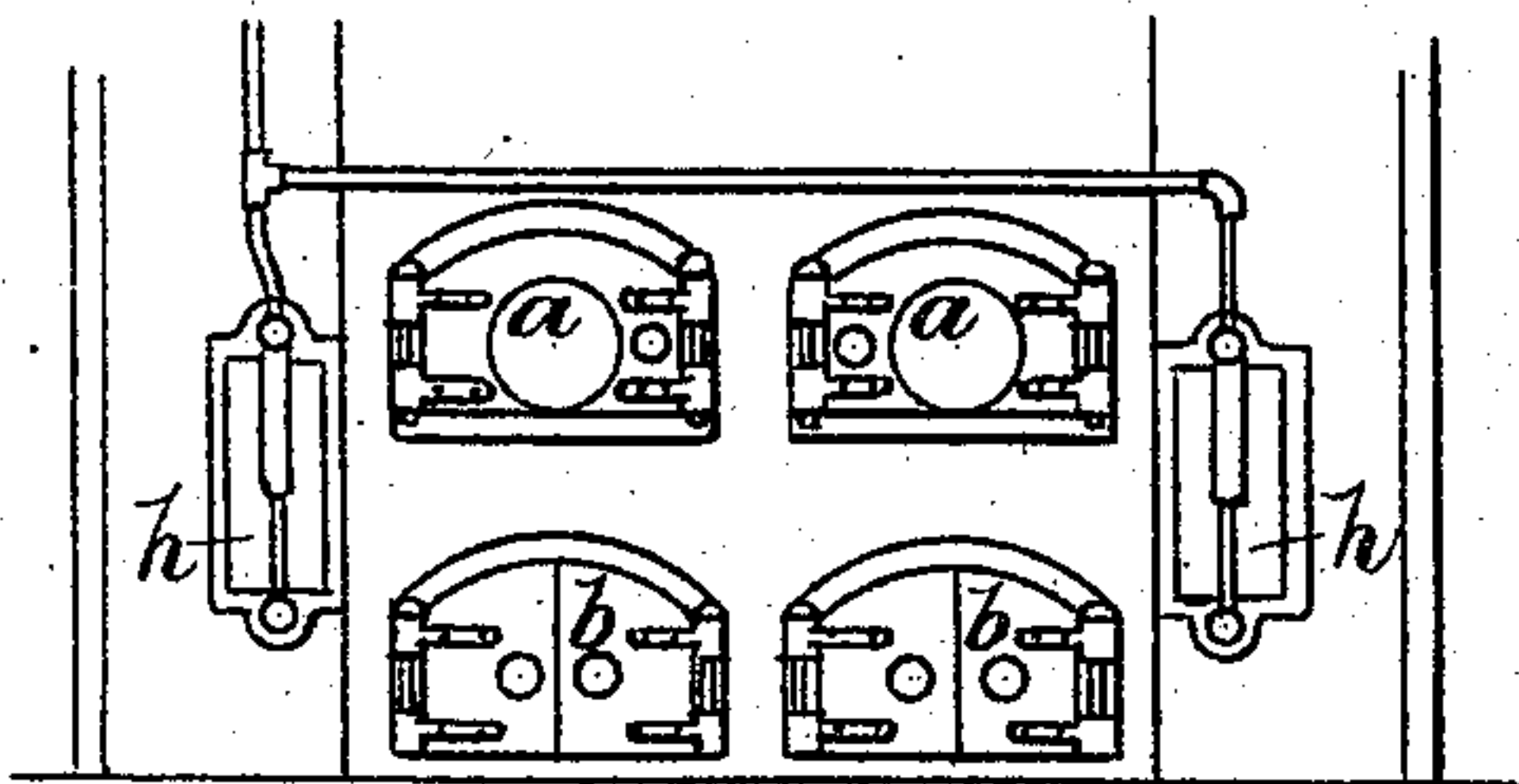


Fig. 2.

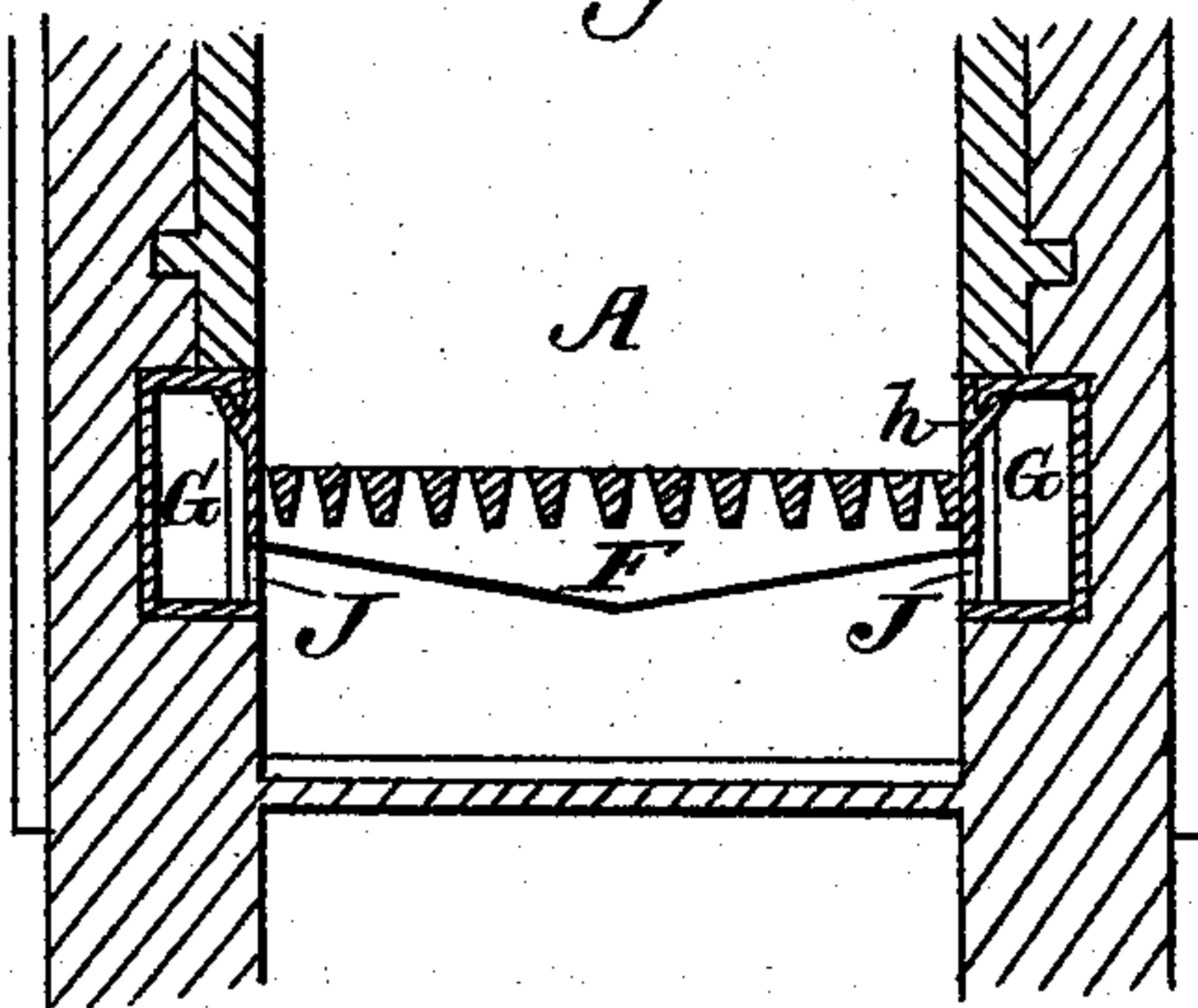


Fig. 3.

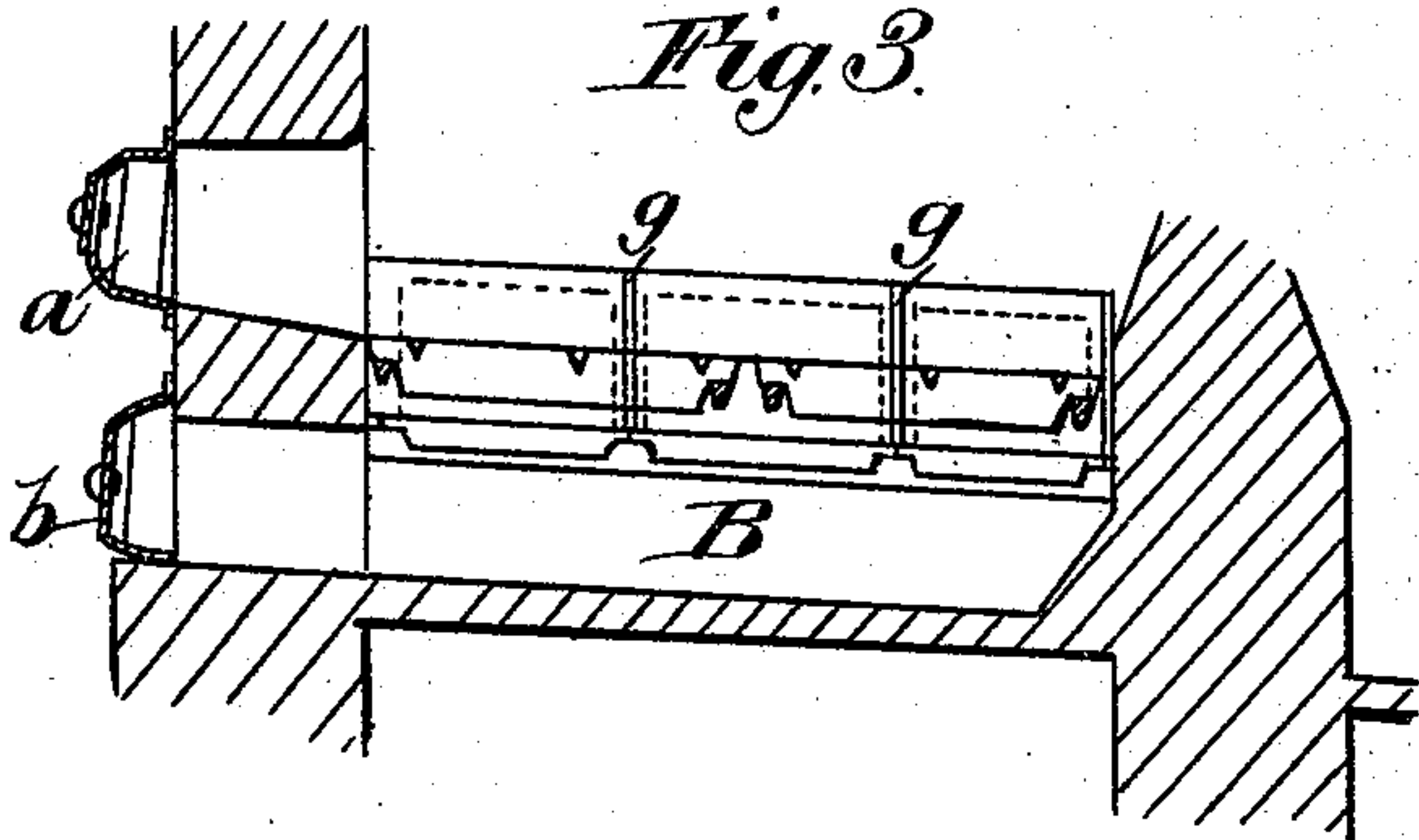


Fig. 4.

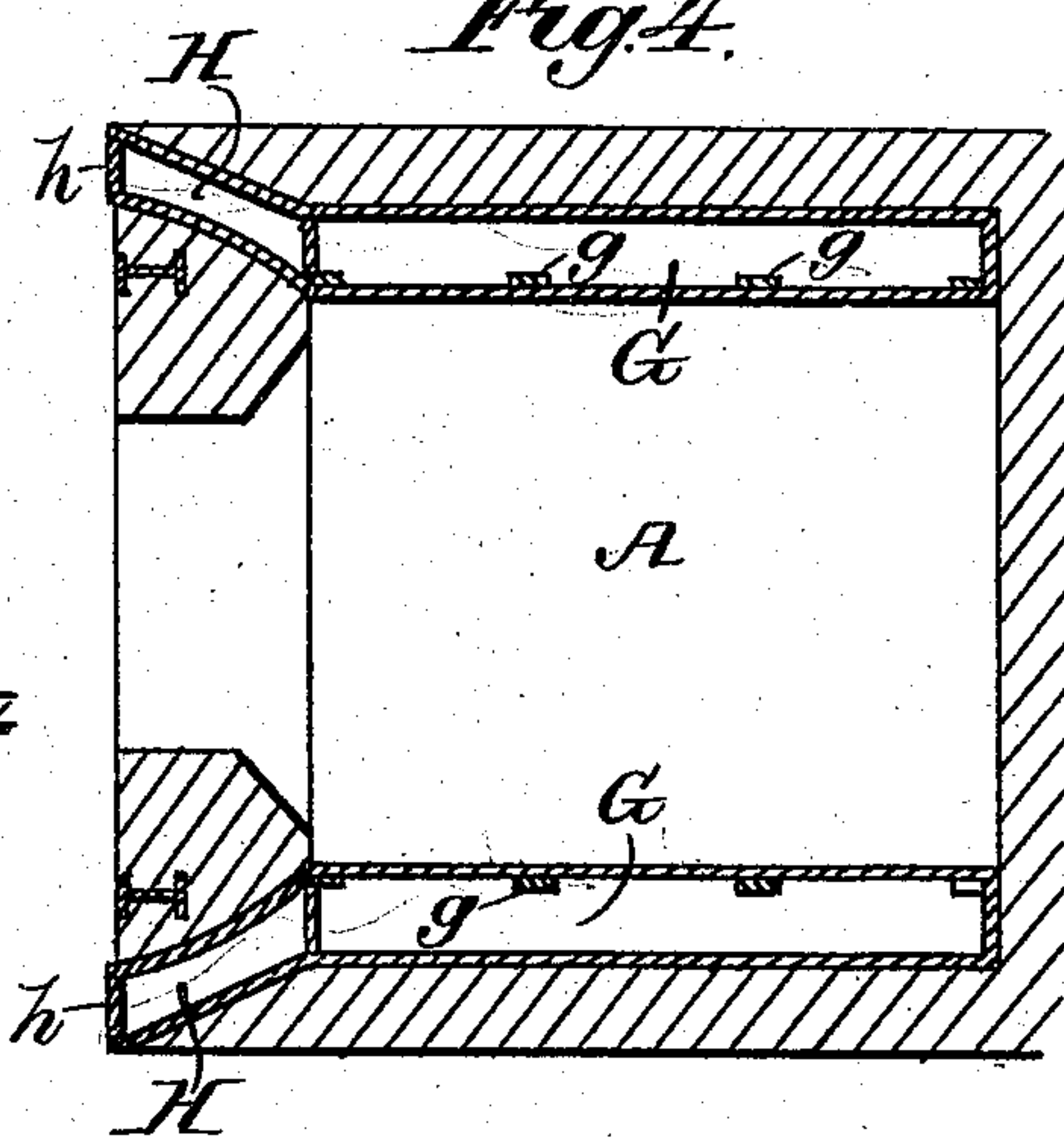
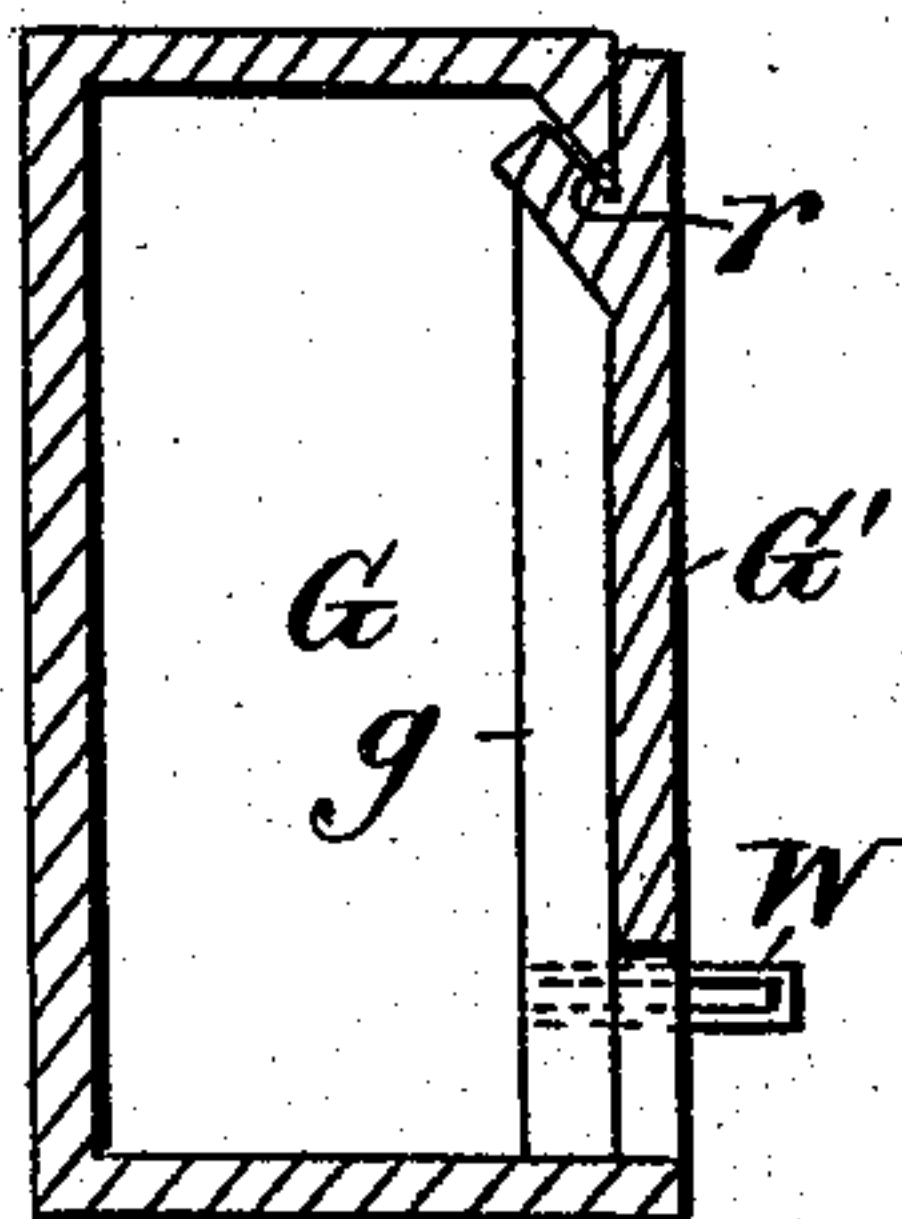


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE WATSON, OF LEEDS, ENGLAND, ASSIGNOR TO THE HORSFALL
FURNACE SYNDICATE, LIMITED, OF SAME PLACE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 614,150, dated November 15, 1898.

Application filed February 21, 1898. Serial No. 671,172. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WATSON, engineer, a subject of the Queen of Great Britain, residing at 21 Springfield Mount, in the city of Leeds, England, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

In furnaces whose sides are formed of brick-work the sides are subject to rapid deterioration and destruction because of the adhesion of clinker and the subsequent detachment thereof by the stoker or fireman. The object of my invention is to obviate such deterioration and destruction and at the same time and by in part the same means to provide a supply of heated air to the furnace.

My invention is applicable to furnaces in general, but is more particularly designed for use in connection with a water-tube boiler, and in the following description and in my drawings I shall describe it as used with such a boiler.

My invention consists in providing air-chambers of iron or other metal (one on each side of the furnace) and causing all air required by the furnace for combustion to pass through them. These air-chambers take the shape of boxes, corresponding with the length of the furnace, of rectangular cross-section, built into the side walls of the furnace. The depth or vertical dimensions of the side boxes are such that the boxes stand partly above the level of the grate-bars and also extend below them, and they are provided with perforations or holes or openings in their lower parts to allow of the egress of air therefrom to the space beneath the grate-bars. I prefer to force the air for combustion into the side boxes by means of steam-jets or other blowers through openings preferably at one end of the side box, the other end being closed; but the air may be drawn in by suction created either by chimney-draft or by suction apparatus between the boiler or furnace fire and the chimney.

In order to provide an easy and economical way of renewing the sides of the air-chambers exposed to the action of the fire, I make those parts detachable by the following means, namely: I form the side of the box exposed to the fire of detachable plates, and I pre-

fer to attach these by forming near the top of the box a wedge-shaped flange, with the thin edge depending downward; but at intervals I provide ribs from top to bottom to strengthen the box. I use plates of a length calculated to extend from rib to rib, and at the back, near the top thereof, I form ridges with V-shaped grooves. The wedge-shaped flange fitting into the V-shaped groove holds the plates in position at their upper edges. They are secured at their bottom edges by wedges, which are preferably so formed as to be elastic to allow for the expansion of the plate under heat. The sides of the air-chambers may be used to support the cross-bearers to carry the grate-bars.

In the accompanying drawings, Figure 1 is a front elevation of a furnace. Fig. 2 is a sectional elevation. Fig. 3 is a side elevation in section, showing the front portion of a furnace. Fig. 4 is a plan, and Fig. 5 is a cross-section, to illustrate the method of forming and fixing the detachable sides of the air-chambers.

A is the furnace, and *a a* are the firing-doors.

B is the ash-pit, and *b b* are doors closing up the front thereof.

F represents the grate-bars, supported by cross-bearers bolted to the sides of the air-chambers G.

G G are the air-chambers, G' G' being the detachable sides.

g g are the ribs supporting the detachable plates G' G'. *r r* are the grooves at the back thereof, and W W are the wedges holding the detachable sides in position.

H H are tubes or trumpets fitting into the front ends of the air-chambers G G for the admission of air thereto.

h h are the front ends of the tubes or trumpets, showing bolt-holes for affixing steam-jets. (Not shown in the drawings.)

J J are the perforations in the air-chambers on the under side of the grate-bars.

I am aware that Letters Patent in England, No. 14,245, dated July 24, 1893, were granted to William Horsfall for the use and construction, in furnaces for the destruction of towns' refuse, of air-chambers, open at the outer end to the atmosphere and provided with outlet-apertures to the under side of the grate-

bars. I therefore do not claim the use of air-chambers as therein described in connection with furnaces of the character described; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In furnaces whose sides are formed of brickwork or other non-metallic substances, and in combination therewith air-chambers of iron or other metal built into the side walls of the furnace provided with holes below the grate-bars for the egress of air and made with detachable sides.

2. In a furnace whose sides are formed of brickwork, or other non-metallic substances, and in combination therewith, air-chambers of iron or other metal built into the side walls of the furnace provided with holes below the grate-bars for the egress of air and having detachable sides, means for securing said

sides at the top, and elastic wedges for holding said sides at the bottom, substantially as and for the purpose described.

3. In furnaces whose sides are formed of brickwork or other non-metallic substances and in combination therewith air-chambers of iron or other metal built into the side walls of the furnace provided with holes below the grate-bars for the egress of air and made with detachable sides held in position by flanges fitting into V-shaped grooves at the back and near the top edge of such sides and by wedges at the bottom thereof as and for the purpose hereinbefore and as in the drawings described.

GEORGE WATSON.

Witnesses:

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