

(No Model.)

L. McKELVEY.
Furnace Door.

No. 230,958.

Patented Aug. 10, 1880.

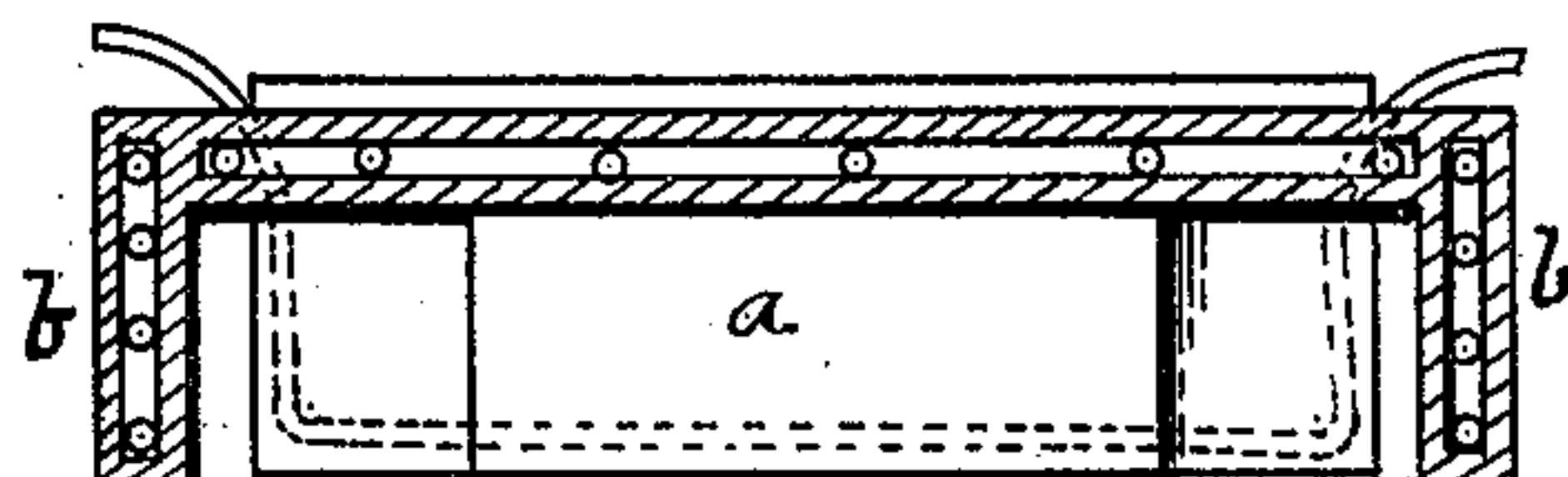
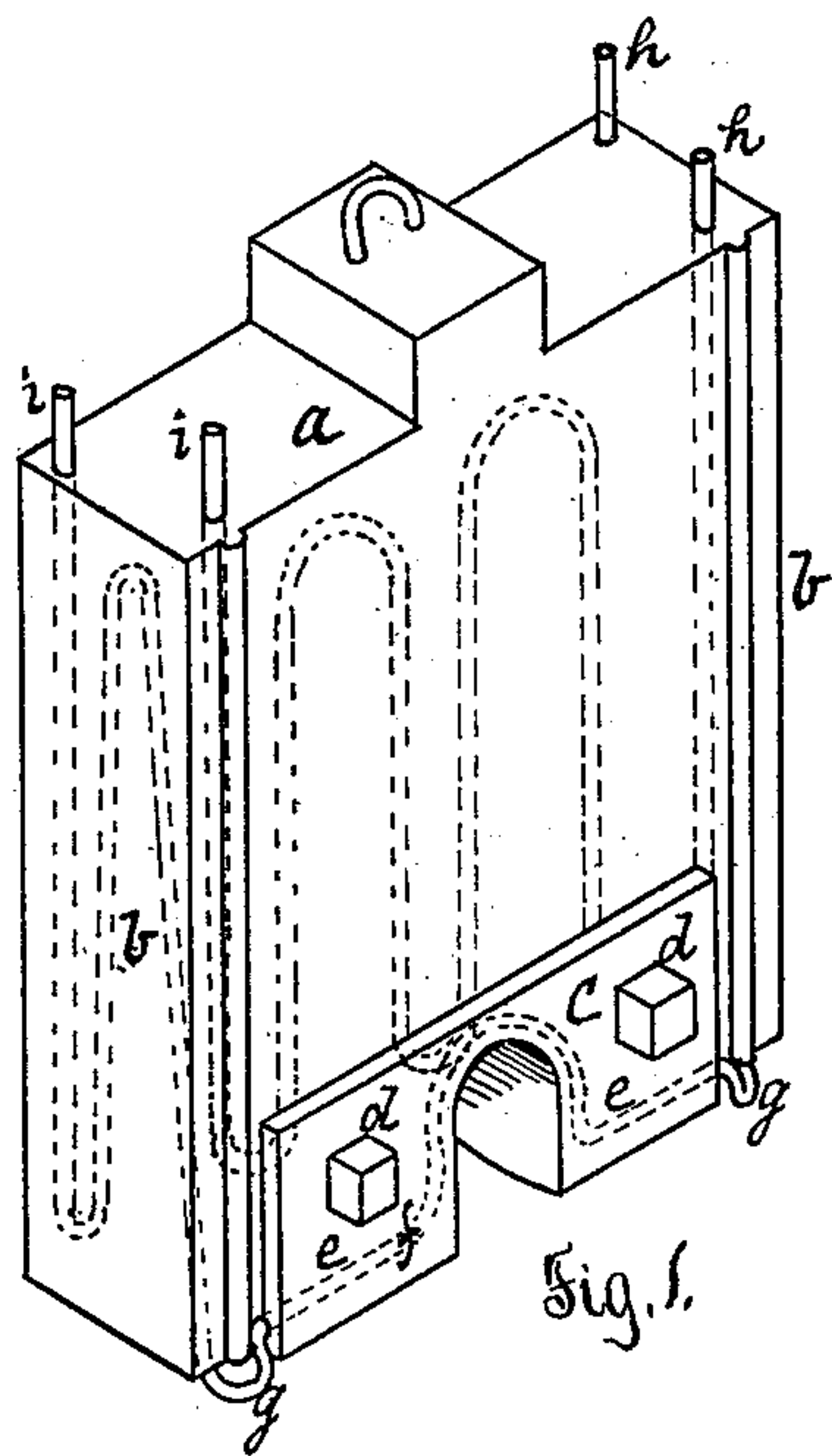


Fig. 2.

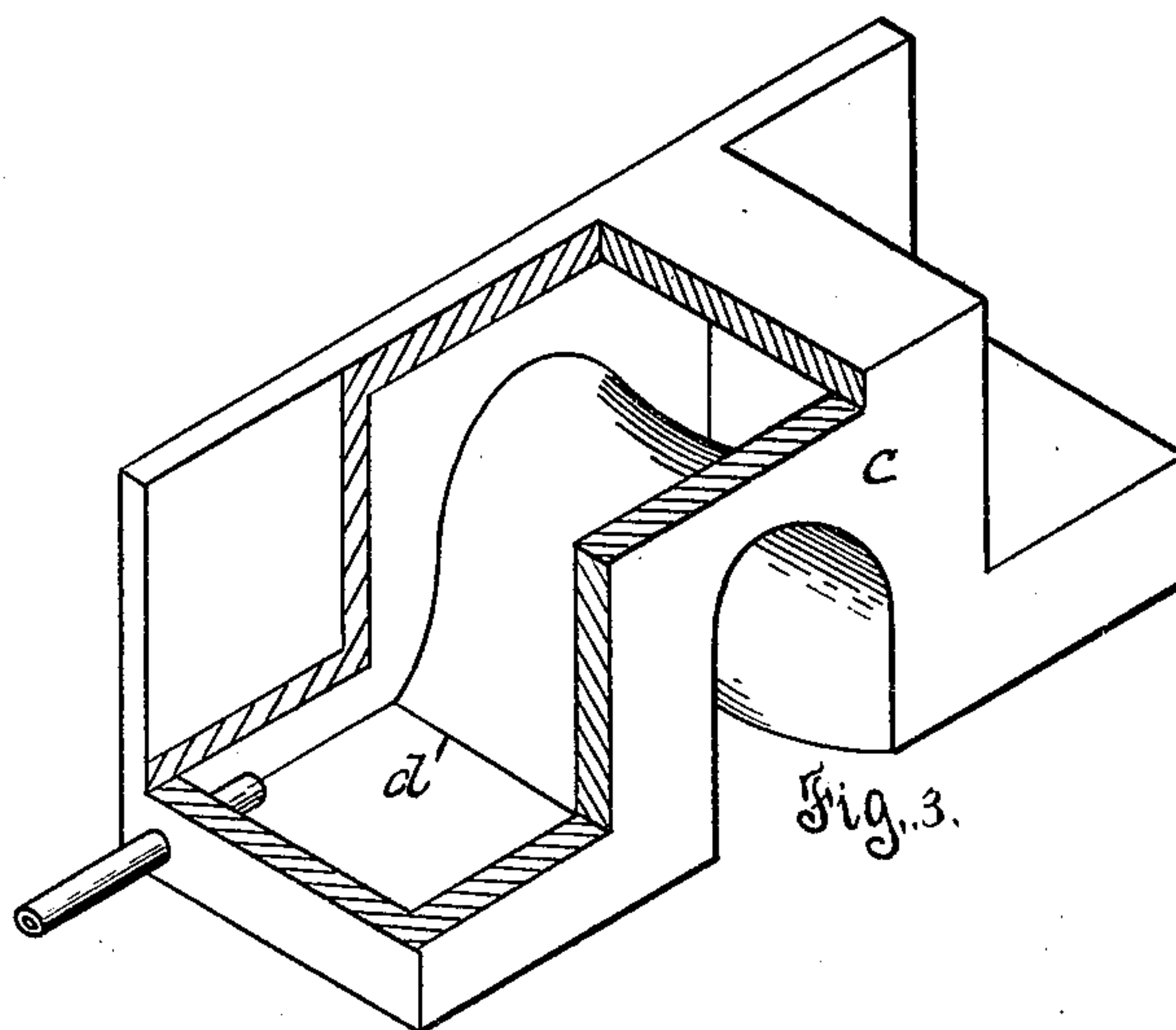


Fig. 3.

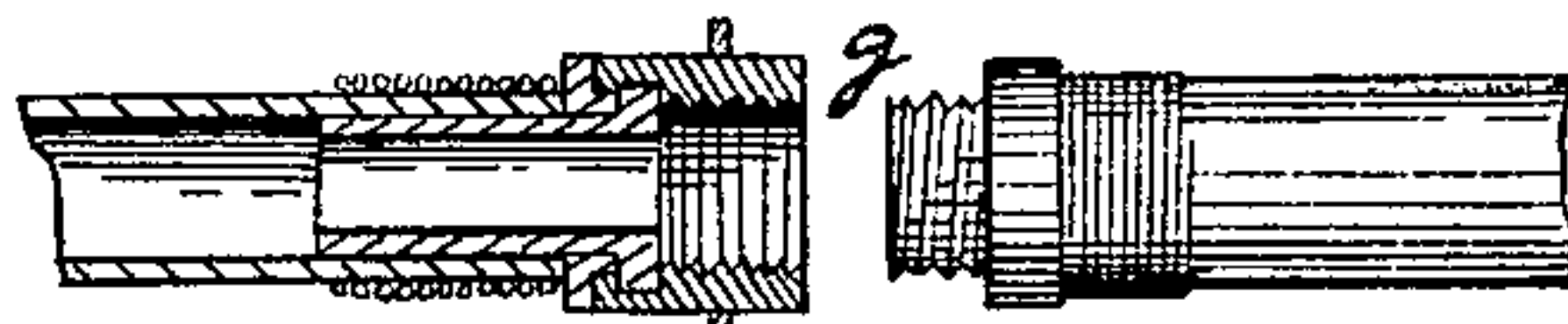


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

LEWIS McKELVEY, OF PITTSBURG, PENNSYLVANIA.

FURNACE-DOOR.

SPECIFICATION forming part of Letters Patent No. 230,958, dated August 10, 1880.

Application filed May 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, LEWIS McKELVEY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Furnace-Doors; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view; Fig. 2, a cross-section; Fig. 3, a perspective view, partly in section, of a hollow bit; and Fig. 4, a view of a coupling.

Like letters of reference indicate like parts in each.

Heretofore furnace-doors have been made of iron castings, some of which were brick-lined, while others were made hollow and protected from the effects of the intense heat by means of a stream of cold water flowing through them. An objection to this construction is that the effect of the cold water in the metallic door upon the furnace chills the iron at that point, while, in order to overcome this chilling effect, the heat has to be raised to a temperature which is destructive to the iron in other parts of the furnace.

My invention consists in a metallic door having an inner lining or filling of brick-work or other refractory material, and with the flanges of the iron part which inclose the brick-work either hollow or provided with water-pipes extending through them, and communicating by suitable connections with a bit, which is either hollow or provided with water-pipes extending through it.

By this construction the only parts of the water-cooled casting which are presented to the chamber of the furnace are the edges of the flanges and the small bit portion, and the chilling effect of the cold casting is prevented by the fusion and running down of the refractory material over the surface of the bit, so that, in fact, after the first few hours' use of the door little or no water-cooled metallic surface is presented to the inside of the furnace.

The advantage of this construction is that it preserves the bit of the door for a long time, and as the bit as at present constructed will burn out within a week or two, and is made of chilled iron, which commands a high price,

the saving effected is very great. A door of my construction will last nine or ten months.

To enable others skilled in the art to make and use my invention, I will now describe it with specific reference to the drawings.

The metallic portion of the door is composed of the casting *a*, having side flanges, *b*, which are either hollow, as shown in Fig. 2, or are provided with water-pipes running through them, as shown in Figs. 1 and 2. The lower end is formed for the reception of the bit *c*, which is attached to the door by bolts *d* in the usual way, and made hollow, as shown at *d'*, Fig. 3, or provided with water-pipes, as at *f*. Connection is made for the passage of the water from the side flanges, *b*, to the bit by means of suitable couplings *g*, which may be of any desired shape or construction.

In case of the burning out of the bit it is easily replaced by simply unloosening the couplings and the bolts by which it is attached to the door *a*.

The inlet-pipe is shown at *h* and the outlet-pipe at *i*. These pipes may be supplied with suitable cocks.

I am aware that furnace-doors have been constructed of hollow castings lined with fire-brick and other refractory material, that water-cooled furnace-doors are not novel, and that detachable bits have heretofore been employed, and therefore do not herein claim such subject-matter; but

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

1. The combination of the metallic door, lined with a refractory material, and a water-cooled bit, substantially as and for the purpose described.

2. A metallic furnace-door having side flanges which are either hollow or provided with water-pipes, in combination with the bit, which is also either hollow or provided with water-pipes, and suitable couplings for connecting the water-courses of the two pipes, substantially as and for the purposes described.

In testimony whereof I, the said LEWIS McKELVEY, have hereunto set my hand.

LEWIS McKELVEY.

Witnesses:

OLIVER FULTON,
JNO. K. SMITH.