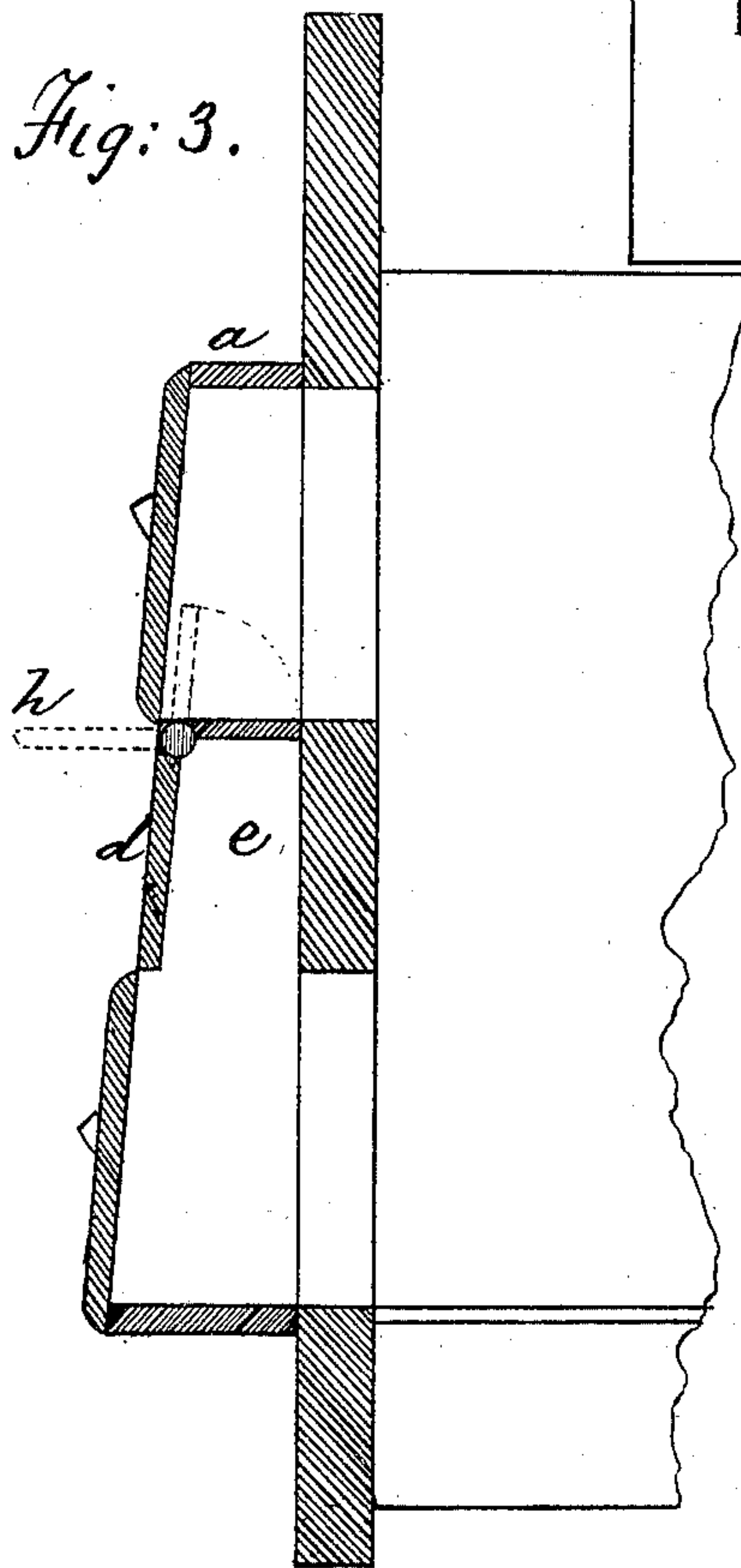
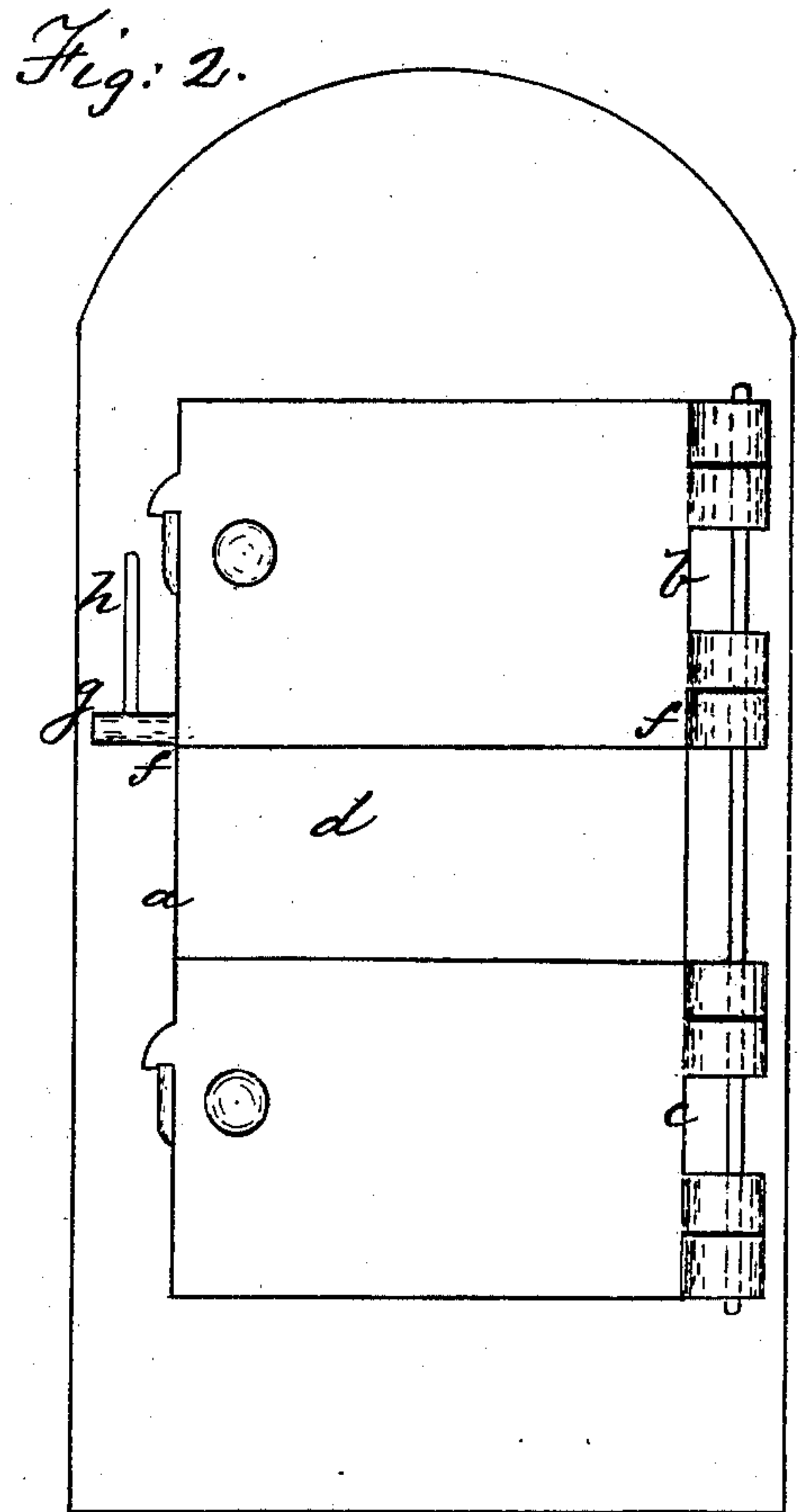
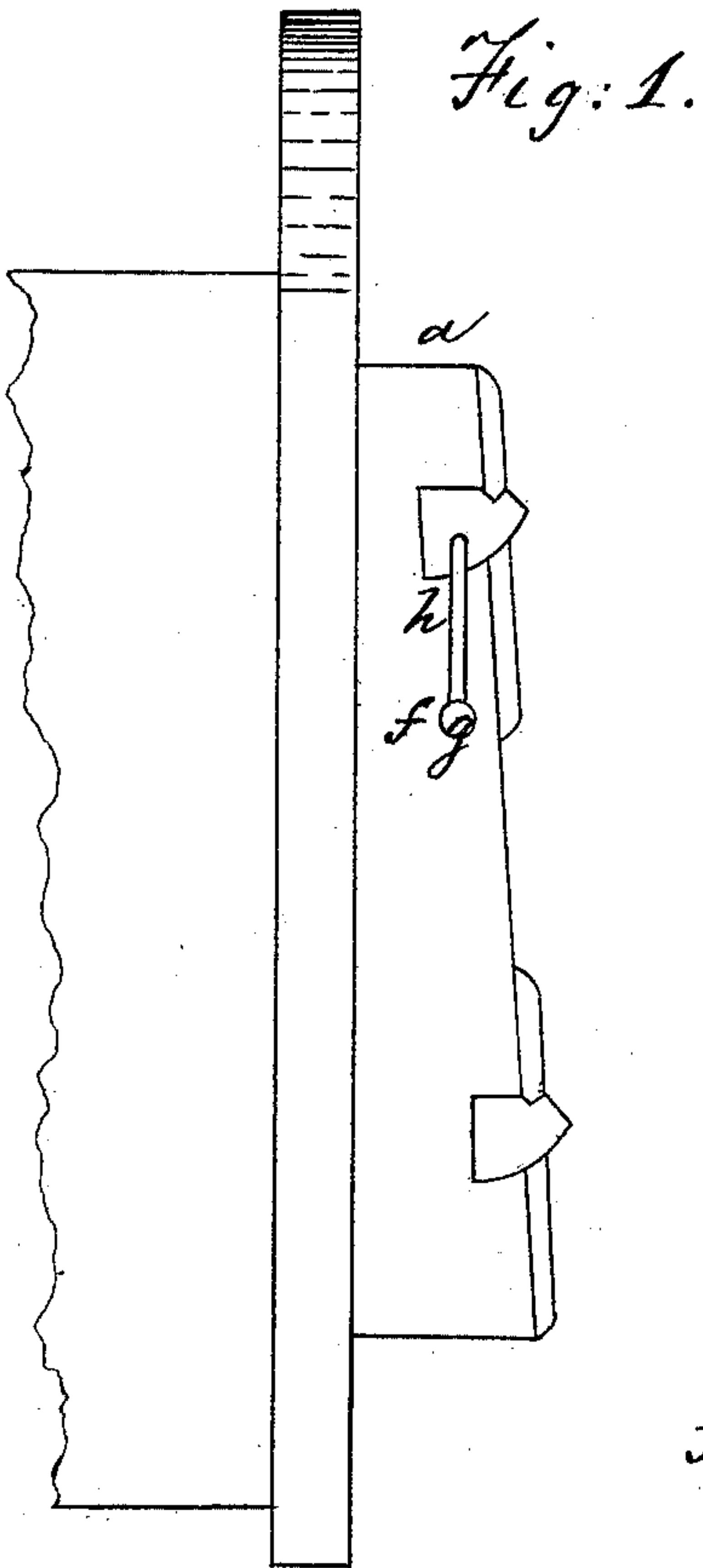


B. F. CAMPBELL.  
Hot-Air Furnace.

No. 112,122.

Patented Feb 28, 1871.



Witnesses  
A. M. Malcomson  
James B. Webster

Benjamin Campbell  
by Cochrane & Todd  
Attorneys

# United States Patent Office.

BENJAMIN F. CAMPBELL, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 112,122, dated February 28, 1871.

## IMPROVEMENT IN HOT-AIR FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. CAMPBELL, of the city of Boston, in the State of Massachusetts, have invented certain new and useful Improvements in Furnaces; and I hereby declare the following to be a true and exact description of the same, reference being had to the accompanying drawing, in which drawing—

Figure 1 represents a side view of my improvement;

Figure 2 a front view; and

Figure 3 a vertical section.

The object of my invention is to provide improved means which will obviate the escape of dust, of ashes and gas, while the fire is being raked or the grate shaken.

I am enabled to accomplish this by making a communication between the ash-pit and fire-chamber exterior to furnace proper, such as a channel or flue at or near the front end of the ash-pit; or it may be at the sides or rear of the ash-pit. In such channel or flue may be placed a damper, to interrupt communication when the channel or flue is not in use.

One way of attaching this flue and damper is shown in the accompanying drawing, and which I will proceed to describe.

Instead of hinging the doors directly onto the side of the ash-pit and feed openings, there is here placed an exterior casing around them both, as seen at *a*.

The feed and ash-pit openings have doors, which are attached to this exterior casing at *b* and *c*, the intervening space between the doors being covered by a piece of sheet metal, *d*, or is a portion of the exterior casing if all is cast in one piece.

This casing, when so constructed, provides a channel or flue, *e*, between the ash-pit and fire-chamber.

At the upper portion of this flue is placed a damper, resting upon bearings at opposite sides of the casing,

as seen at *f f*. Such damper when shut is flush with the lower portion of the feed-opening, so that the furnace may be fed as usual.

The end of one of the bearings projects through the side of the casing at *g*, and attached thereto is a lever or handle at *h*, which can be kept in an upright position and out of the way at the side of the casing when the damper is closed, all communication between the ash-pit chamber and the interior of the fuel-chamber being then cut off.

When it is desired to rake the fire, the damper is first opened, which, by the means shown in the drawing, would be by drawing forward the handle or lever *h*.

As the operation of raking commences and continues, the dust and gases, if any are emitted, will, instead of coming out of the open ash-pit into the room, ascend through the flue or channel and pass over the fire in the fuel-chamber into the smoke-pipe or chimney, the door of the feed-opening being kept closed.

When the raking ceases the damper can be closed, and the communication between the two chambers is cut off.

If the communication between the ash-pit and fuel-chamber is not interrupted, the channel or flue will act as a check-draught, whether the ash-pit door is opened or closed.

### *Claim.*

A casing, exterior to both the fuel and ash-pit openings of a furnace, provided with a channel or flue and damper, substantially as described.

BENJAMIN F. CAMPBELL.

Witnesses:

CHARLES W. NEWTON,  
HENRY A. GORHAM.