

No. 652,163.

L. T. BUCK.  
FURNACE.

Patented June 19, 1900.

(Application filed Aug. 17, 1899.)

(No Model.)

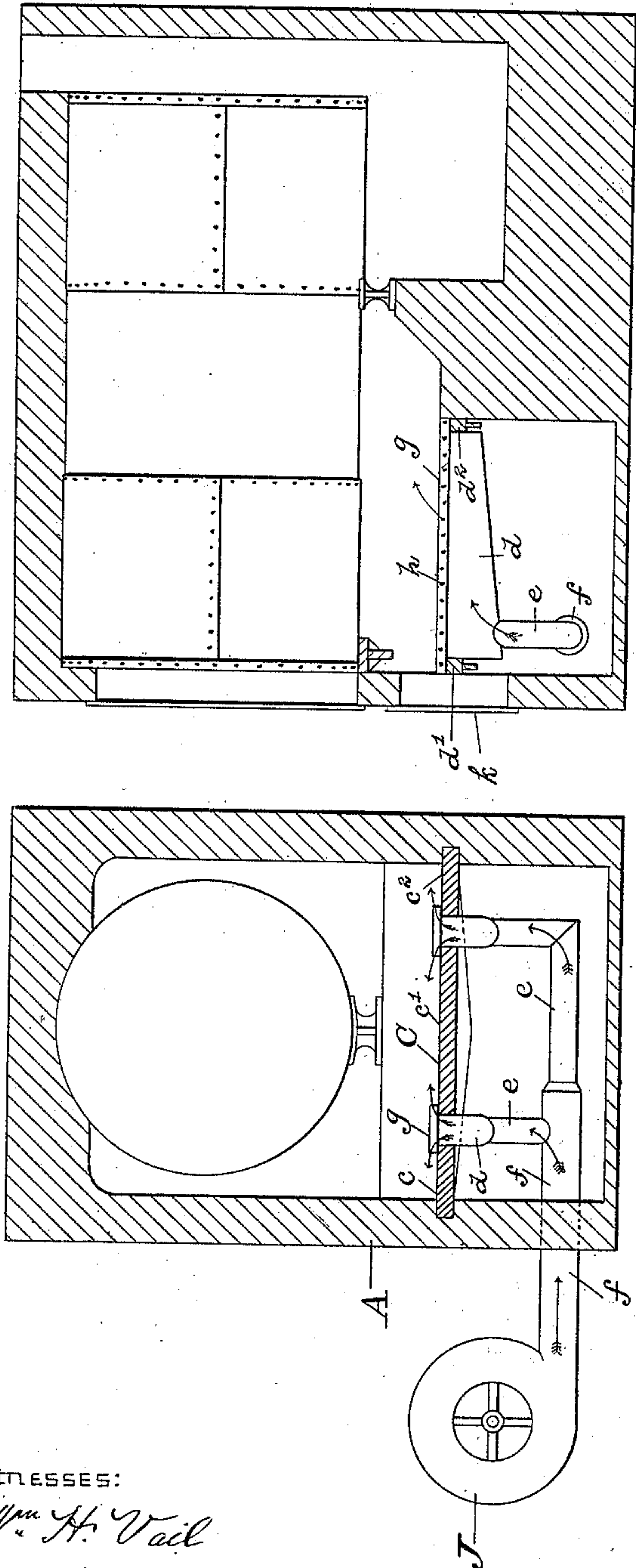


Fig. 1.

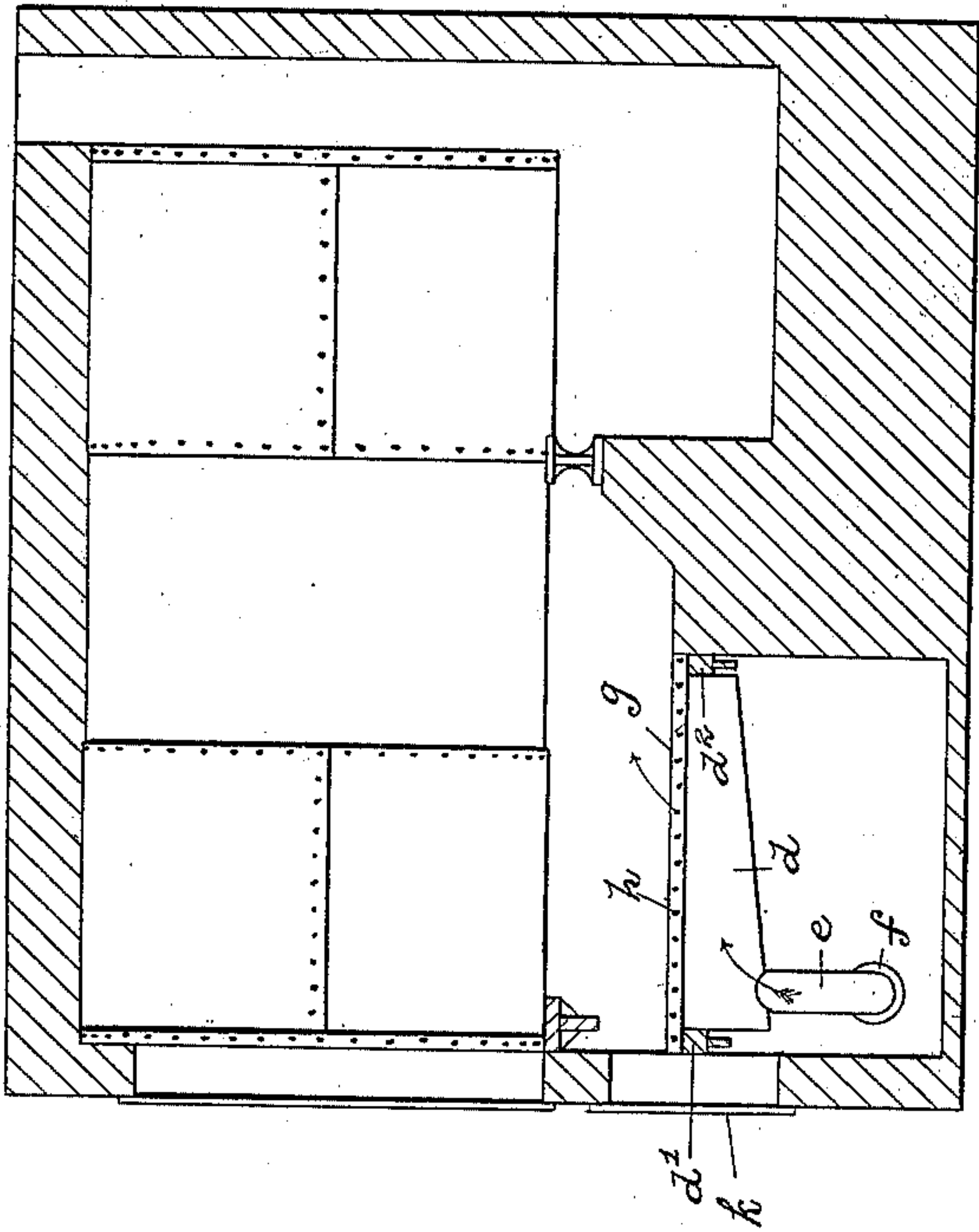


Fig. 2.

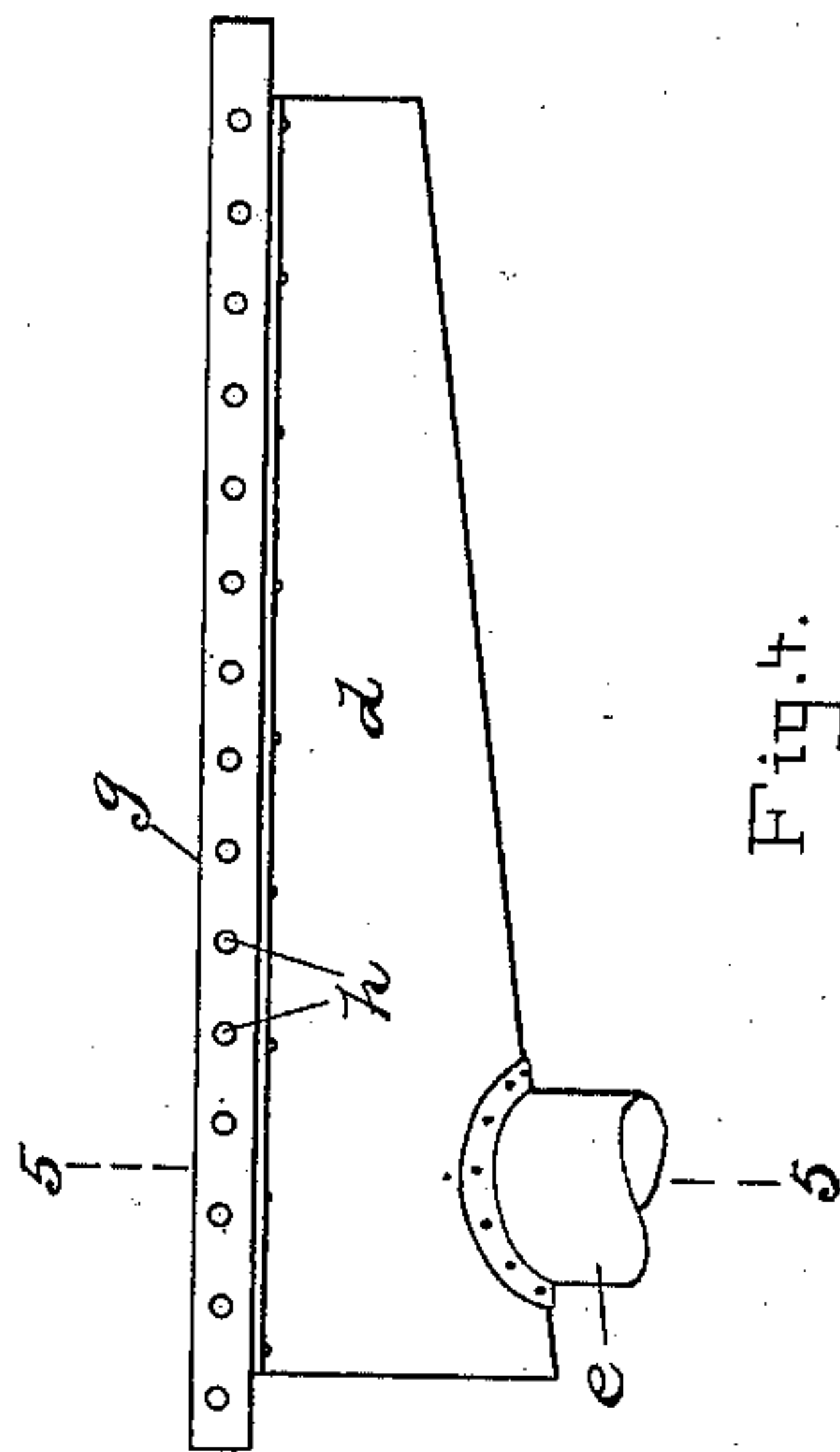


Fig. 4.

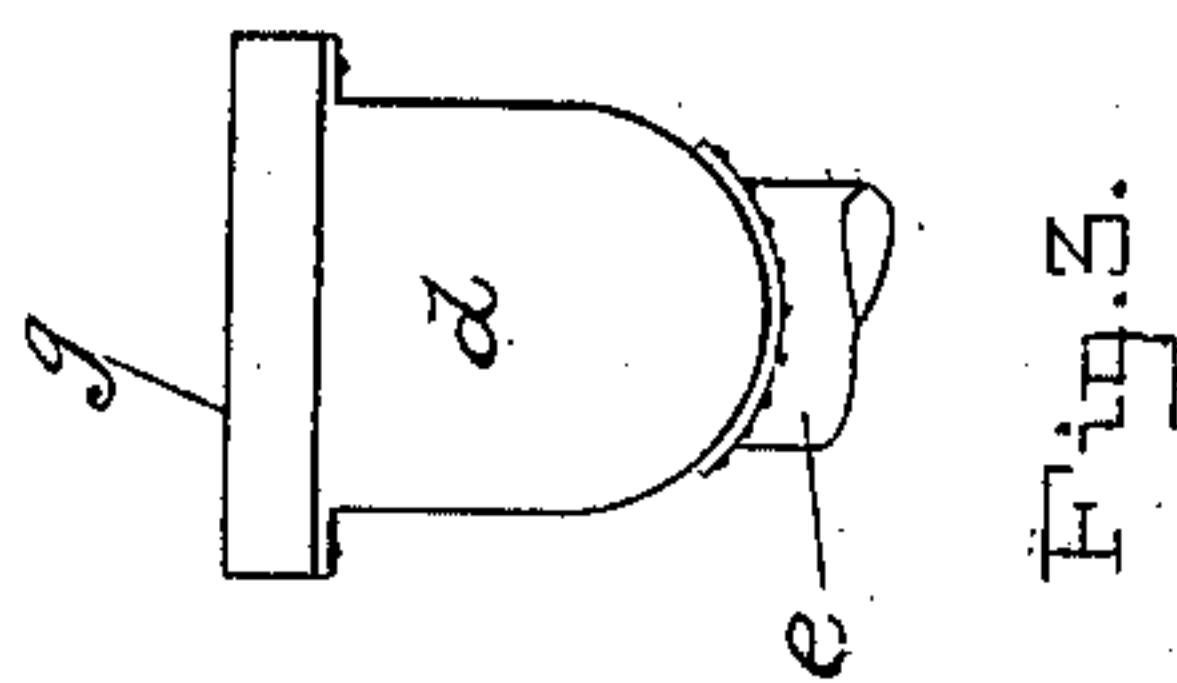


Fig. 3.

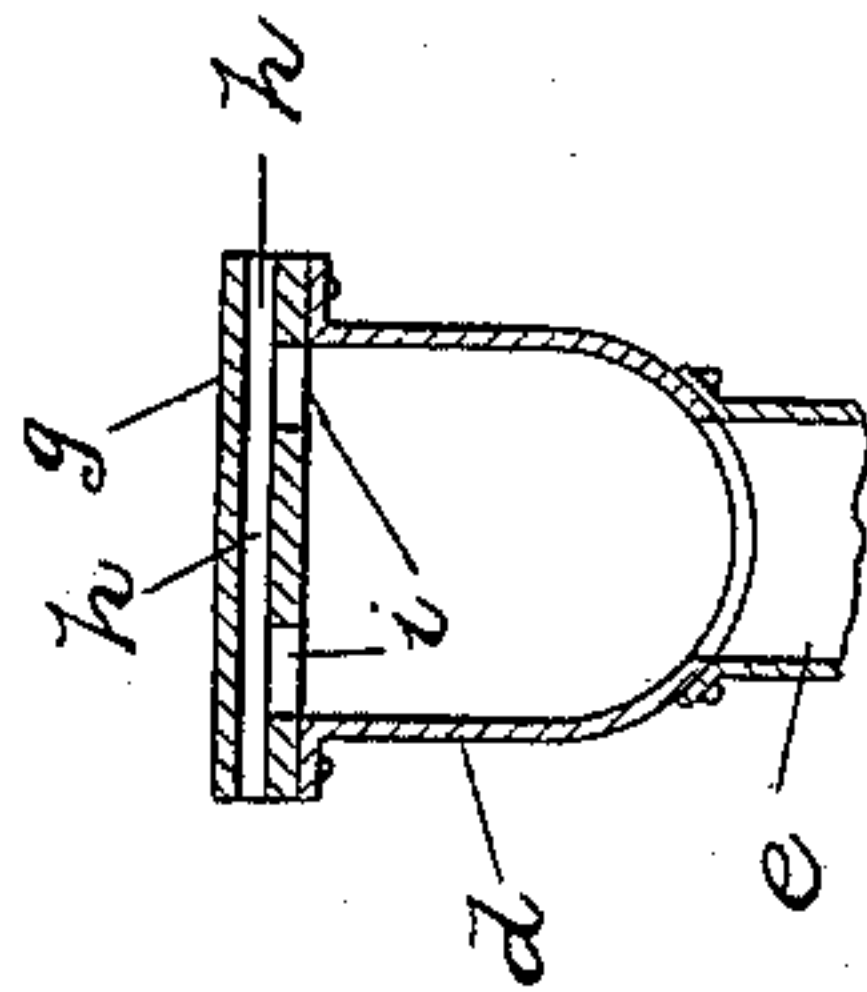


Fig. 5.

Witnesses:

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INVENTOR:

Levin T. Buck  
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# UNITED STATES PATENT OFFICE.

LEVIN T. BUCK, OF WEEMS, VIRGINIA.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 652,163, dated June 19, 1900.

Application filed August 17, 1899. Serial No. 727,497. (No model.)

*To all whom it may concern:*

Be it known that I, LEVIN T. BUCK, a citizen of the United States, residing at Weems, in the county of Lancaster and State of Virginia, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to improvements in furnaces; and the object of the invention is to provide an improved grate combined with a forced draft, whereby the fuel will be entirely consumed.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical cross-sectional view through a furnace provided with my improvements. Fig. 2 is a vertical longitudinal sectional view through same. Fig. 3 is an end view of the air-chamber. Fig. 4 is a side elevation of same. Fig. 5 is a vertical section on the line 5 5 of Fig. 4.

Referring to the drawings, the letter A designates the walls of a furnace, and B a boiler, which latter may be supported in any suitable manner.

In carrying out my invention I dispense entirely with grate-bars and provide a furnace-bed of a plate C, which latter may be supported in the walls A of the furnace or otherwise secured beneath the boiler. In the present instance the plate C is made in three sections  $c$ ,  $c'$ , and  $c^2$ .

An air-chamber  $d$ , made of a metal shell, has position in the furnace and separates each two sections of the furnace-bed C, and said air-chamber is supported by two cross-bars  $d'$  and  $d^2$ . In the present instance two air-chambers are employed, one of said chambers being interposed between the sections  $c$  and  $c'$  and the other chamber separating the sections  $c'$  and  $c^2$ . The air-chamber  $d$  is tapered from the front end to the rear end, and the large front end at the bottom is provided with an air-inlet pipe  $e$ , which connects with a supply-pipe  $f$ . A blower J of any suitable construction forces air through the pipes  $f$  and  $e$  into the chamber  $d$ .

A plate or cover  $g$  is secured to the top of the air-chamber  $d$ , which may be removed at will for cleansing purposes, and said plate protrudes in a horizontal plane above the surface of the fuel-plate C. This plate or cover

$g$  is provided with a series of horizontal cross passages or perforations  $h$ , designed to discharge air from either side of said protruding plate or cover onto the surface of the fuel-plate. This permits the air passing through the chamber  $d$  and into said horizontal passages  $h$  to escape and be supplied to that part of fire or fuel which is in immediate contact with the fuel-plate. This arrangement effects a total consumption of a mass of fuel resting on the fuel-plate.

I have found in carrying out my invention that where the air-supply pipe is attached to one end of the air-chamber  $d$  better results can be obtained if the air from all of the side passages  $h$  discharge onto the top surface of the plate C with equal force and volume. Without providing for this equal distribution of air the fuel would be consumed more rapidly at that point where the air is discharged in greatest volumes and less rapidly at the point where the volume of air is less. To avoid this result, I construct the air-chamber  $d$  longitudinally tapering or gradually reduced in size. It will thus be seen that the cross-area of the chamber is greatest at the air-receiving end and that thereby the force and volume of escaping air are equalized through all the passages  $h$  by reason of the diminished area of the chamber at the distant end.

The fuel is deposited on the furnace bed or plate C through the door  $k$  in the front wall.

The operation is simple. The fuel is placed on the plate C and ignited. Air is then forced by means of the blower through the pipes  $f$  and  $e$  into the chamber  $d$ , and the air passes through the openings  $i$  and is discharged through the passages  $h$  onto the plate C.

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

In a furnace, the combination with a flat, imperforate plate for supporting the fuel, and cross-bars  $d'$ ,  $d^2$ ; of air-chambers in said plate which are gradually reduced in size from one end to the other and have air-supply pipes entered at their large ends, each air-chamber having integrally formed therewith laterally-projecting imperforate side and end flanges by which it rests on the adjoining

edges of the said plate and on the cross-bars  
 $d'$ ,  $d^2$ , a flat cover above said flanges and hav-  
ing on imperforate top surface and a series  
of horizontal passages  $h$  extending entirely  
5 across it parallel with the top surface, and  
two vertical openings  $i$  leading from the  
chamber to each horizontal passage  $h$ , each  
vertical opening  $i$  being located close to the  
side of the chamber and extending at right  
10 angles to the horizontal passages  $h$ , and the

openings  $i$  on one side of the chamber being  
separated from the corresponding opening at  
the other side, all as shown and described.

In testimony whereof I affix my signature  
in the presence of two witnesses.

LEVIN T. BUCK.

Witnesses:

F. L. WAGNER,  
F. C. KIRKMYER.