

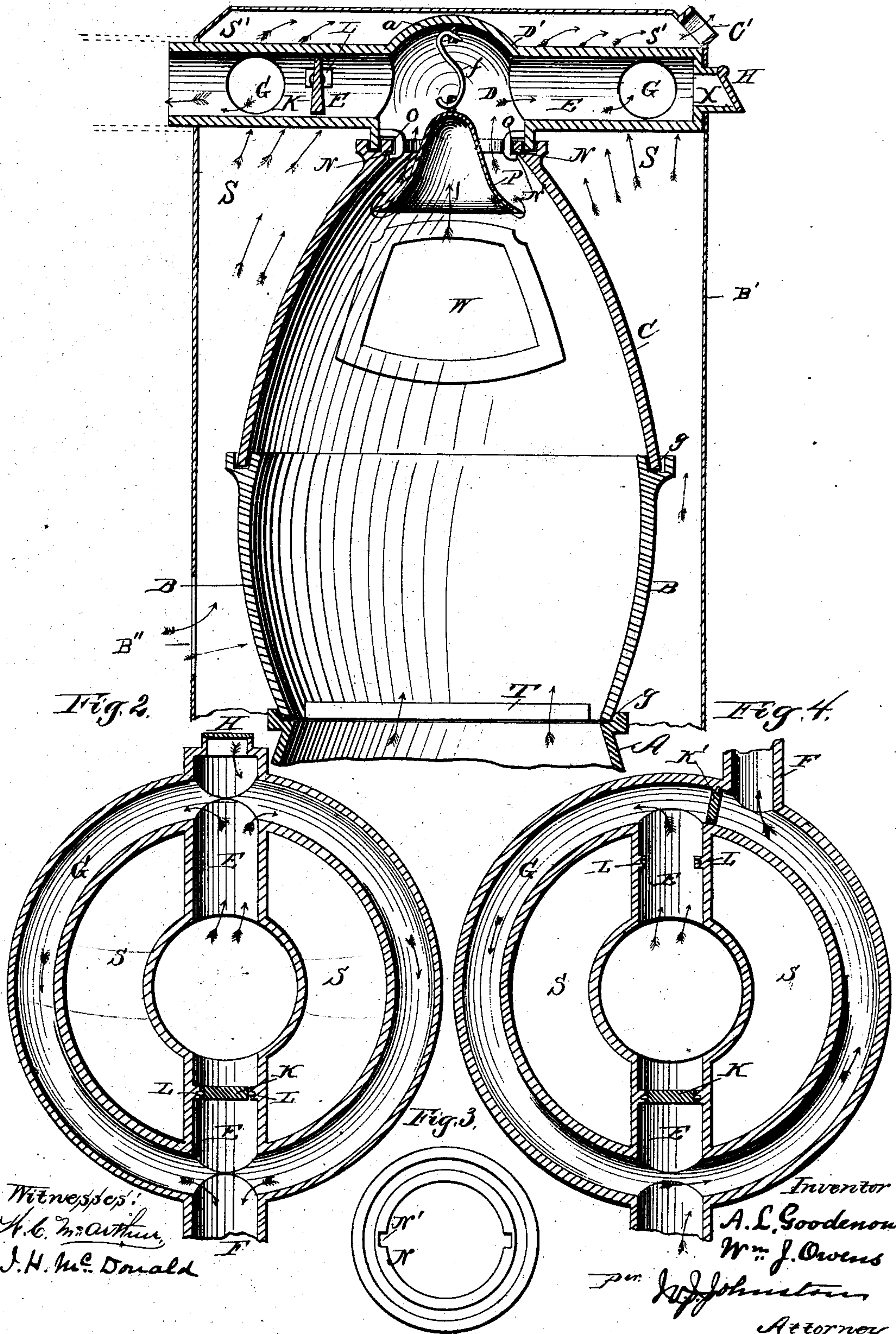
(No Model.)

A. L. GOODENOW & W. J. OWENS.  
HEATING FURNACE.

No. 245,158.

Fig. 1.

Patented Aug. 2, 1881.





# UNITED STATES PATENT OFFICE.

ALBERT L. GOODENOW AND WILLIAM J. OWENS, OF UTICA, NEW YORK.

## HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 245,158, dated August 2, 1881.

Application filed April 20, 1881. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT L. GOODENOW and W. J. OWENS, citizens of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Heating-Furnaces; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in hot-air furnaces; and it consists, first, in providing the top of the furnace-dome with a flange having slots to receive a lug in the bottom edge of the gas-dome of the radiator; secondly, in a furnace having a detachable radiator with one or more flues opening into a dome leading to the furnace and to a circular or elliptical hot-air chamber, the flues and chamber being provided with suitable automatic and stationary dampers; thirdly, in a furnace provided with a radiator having a gas-dome and a bell suspended from the top of said dome; and, lastly, in details of construction that will be hereinafter more fully set forth in the specification and claims and pointed out in the drawings, in which—

Figure 1 is a vertical section of our device; Figs. 2 and 4, horizontal sections of the radiator, and Fig. 3 a plan view of the flange on the furnace-dome.

Referring more particularly to the drawings, A is the base of the furnace. B is the ordinary fire-pot, having the annular flange *g*, in which rests the bottom of the furnace-dome C. This dome C is provided at its top with a flange, N, extending outwardly and inwardly, as shown, and having the slot N' for the passage of the lug O secured to the radiator-dome and passing underneath the flange, thereby securely locking it in place in any position. This flange N is provided with slots N', by which, when the lugs O are brought opposite the slots, the radiator can be lifted from the furnace.

D' represents the dome of the furnace, and is raised sufficiently above the top of the ra-

diator-flues to allow a hollow space beneath for the purpose of forming an inner gas-chamber, D, from the interior of which is suspended a bell or deflector, P, by means of the hook *f*, attached to the bell, and a lug, *a*, in the chamber.

The object of the dome is to prevent any sudden and undue amount of gas evolved in the furnace-dome from entering the radiator, for the bell or deflector P, being loosely hung in the upper part of the furnace-dome, will receive the impact of the gas-pressure, and will adjust itself and cause the hot air or gases to enter the radiator in their normal condition. This deflector, in connection with the lugs O, fitting the flange, prevents the radiator being lifted off the top of the furnace by an explosion of gases in the furnace, for the deflector, when located and hung as described, prevents any undue and sudden rush of gas to the radiator. Suppose, for instance, the gas rushes from the right side, it will cause the deflector to vibrate toward the left and take up the force of the impact, and thus break up the gas-stream. After this is accomplished the deflector will settle back to its normal position.

E is the main flue for the passage of the gases as they come from gas-chamber D. This flue E may consist of either one or two arms.

G is the outer chamber of the radiator, and is made preferably in an elliptical form; but it may be square, octagonal, or circular.

K is a wedge-shaped automatic damper hung in lugs L secured to the sides of flue E. The damper K' is hung off its center, and any undue pressure of gas in the flue E will cause the damper to open and allow the gas to escape, and as soon as the pressure is over the damper will close itself automatically.

X is a cold-air passage, leading from draft-check H into the chamber G.

In operation the gases pass upward, as indicated by arrow 1, into the deflector or bell P, when they are deflected back to the dome and into the chamber D, imparting their heat to dome C in their upward passage. The bell, being dependent from the dome D', can vibrate either way and allow a ready exit into chamber D, and, as before stated, in case of an over-pressure of gas, will give from one side to the other and allow a free passage of the air into chamber D, where



it imparts heat to dome D', and is then carried into the flues E, being divided so as to pass one half through each arm of the outer chamber, G; but by inserting a fixed damper, K', in the outer chamber, G, as shown in Fig. 4, the hot gases are caused to pass entirely around the chamber G before passing out of exit-pipe F, thereby imparting the maximum amount of heat to the currents of air passing up through the air-space S.

By placing the bearings L in both passages of flues E we may remove the fixed damper K', and by changing the position of damper K cause the gases to pass through chamber G in both directions on its way to the exit-pipe.

The air-space S is formed by incasing the furnace in a metallic casing, B', which extends entirely around the furnace and radiator, close to chamber G, thereby forcing the currents of air through and around the space S, and causing the air in the chamber S' above the radiator to become heated to a high temperature before entering the hot-air pipe C', by which the rooms are heated. The air enters through the casing at B'', Fig. 1, and passes upward around the fire-pot B and dome C, taking up their heat on its way to chambers S S. The casing rests in an ordinary base-ring at the bottom of the furnace. When necessary the chamber G can be filled with cold air by simply opening the draft-check H, which allows the cold air to enter and repel the heated gases in flues E, and causes them to circulate in chamber D and give off their heat to dome D'.

It is not always necessary that a check-valve should be used, and in that case there need be but one arm to flue E.

It will be seen from the foregoing that the radiator can be turned around flange N to any angle, and thus allow the exit-pipe to be placed in any convenient position to fit a chimney-opening.

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

1. A furnace having secured thereto a detachable radiator which is provided with one or more horizontal flues opening from a dome leading from the furnace, and a circular or elliptical hot-air chamber having air-passages leading from the horizontal flues to the smoke-nozzle or exit-pipes, substantially as and for the purpose set forth.

2. A furnace having secured thereto a detachable radiator which is provided with one or more horizontal flues opening from a dome leading from the furnace, and a circular or elliptical hot-air chamber having air-passages leading to the horizontal flues and smoke-nozzle, one of the horizontal flues being provided with an automatically-moving damper for controlling the pressure of gas in said flue, substantially as and for the purpose set forth.

3. A furnace having secured thereto a detachable radiator which is provided with one or more horizontal flues opening into a dome leading from the furnace, a circular or elliptical hot-air chamber having air-passages leading to the horizontal flues and smoke-nozzle or exit-pipe, an automatic damper in one of the horizontal flues, and a fixed damper in the outer chamber, substantially as set forth.

4. A furnace provided with a detachable radiator having one or more horizontal flues, a circular or elliptical hot-air chamber, G, a dome, D', forming on its inside a gas-chamber, D, having a bell-shaped deflector hung in said gas-chamber, substantially as and for the purposes set forth.

5. A furnace-dome, C, provided with a seat for the reception of the bottom edge of the radiator, and a slotted flange, N, for the passage of lugs O secured to the bottom of the radiator, substantially as set forth.

6. In a furnace provided with a radiator, a bell-shaped deflector, P, pendent from the dome D' and located within the upper part of the dome D, whereby it will automatically adjust itself to changes in pressure of the gases, substantially as and for the purposes set forth.

7. In a furnace provided with a detachable radiator, as described, the combination, with the dome D' and flue E, of the wedge-shaped damper K, resting in lugs secured to the sides of said flue and hung off its center, whereby it is rendered automatic in its action, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT L. GOODENOW.  
WILLIAM J. OWENS.

Witnesses:

J. F. HENLEY,  
HENRY THOMAS.