S. H. BEVINS.
Boiler Furnace.

No. 202,981. Patented April 30, 1878.

Fig. 1.

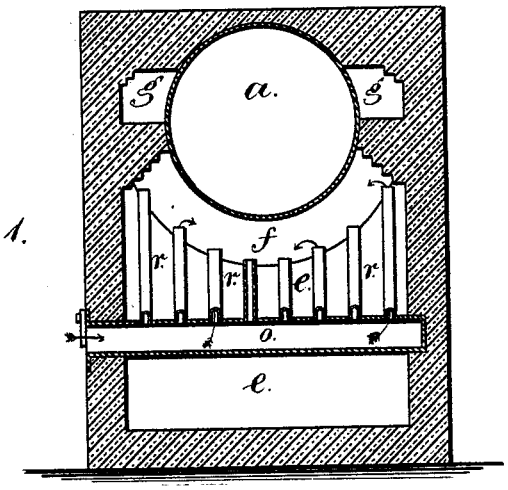
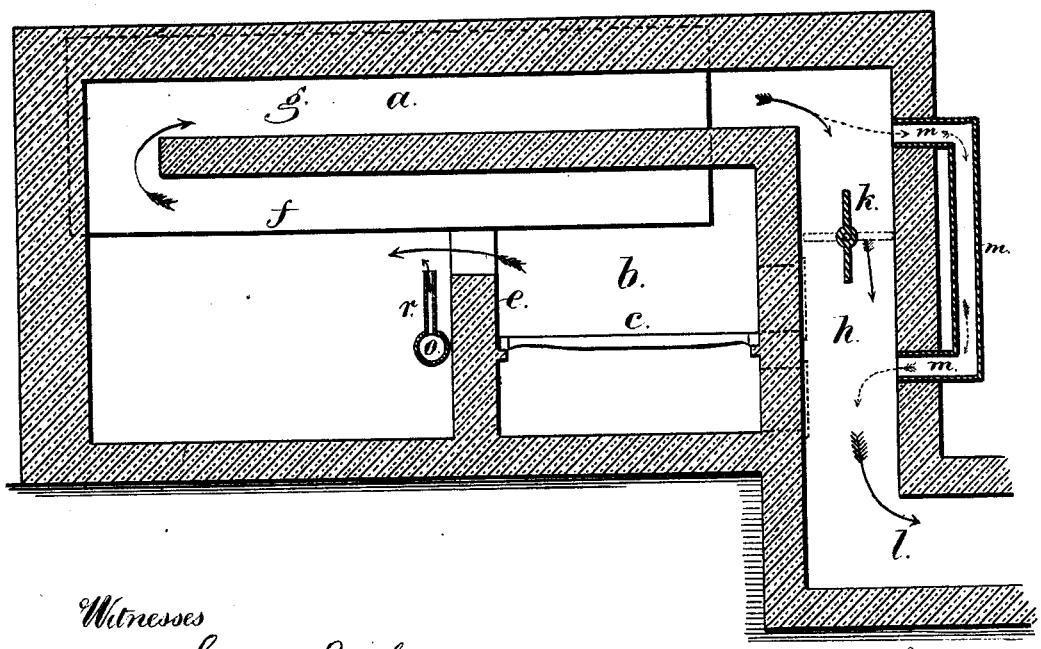



Fig. 2.




Witnesses
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN BOILER-FURNACES.

Specification forming part of Letters Patent No. **202,981**, dated April 30, 1878; application filed February 1, 1878.

*To all whom it may concern:*

Be it known that I, SETH H. BEVINS, of the city and State of New York, have invented an Improvement in Boiler-Furnaces, of which the following is a specification:

Air has been introduced at or near the bridge-wall of a furnace, to combine with unconsumed gases and promote combustion, and the products of combustion have often been carried through a descending flue before they rise into the chimney. In most chimney-flues there is a damper, and when this is closed, or nearly so, there is an accumulation of unconsumed gases—such as carbonic oxide—that is dangerous, as it often explodes when coming in contact with the atmosphere.

My improvement is made for insuring a more perfect combustion of the gases, and for preventing the accumulation of the gases under any of the ordinary conditions of use.

In the drawing, Figure 1 is a cross-section of the boiler at the rear end of the bridge-wall, and Fig. 2 is a longitudinal section through the flues of the boiler and mason-work.

The boiler *a* is of usual character. I have shown a round or tubular boiler, with the fire-chamber *b*, grate-bars *c*, and bridge-wall *e* near one end, and a flue, *f*, below the boiler, and a return flue or tubes, *g*, to the descending flue *h*, which may be at or near one end or side of the boiler, and in which is the damper *k*, to close or partially close the said descending flue *h*, and *l* is the flue leading to a chimney in any convenient position. The parts thus far described do not contain any novel feature of construction.

It often happens that the damper is entirely closed in checking the flue. To prevent the accumulation of unconsumed gases and the danger arising from explosion, I make use of the auxiliary flue-tube *m*, connecting from one part of the flue *h* to the same flue at the other side of the damper, thereby maintaining a constant circulation of the gases to the chimney, whether the damper is open or closed.

At the rear part of the bridge-wall I place a transverse flue, *o*, or air-pipe, with a regulating inlet-damper, and I employ tubular or jet nozzles *r*, rising from the said air-pipe *o* to the height, or near the height, of the bridge-wall, whereby atmospheric air will be admitted directly into the unconsumed gases as they pass away from the fire, and thereby the necessary oxygen is added to consume the carbonic oxide and intensify the heat.

The opening in the flue or tube *m* should be such as to provide for the escape of nearly the same amount of gases as air that passes through the flue *o* and tubular jet-pipes *r*.

I am aware that descending flues with dampers have been connected to boilers and heaters, but the risk remains, as aforesaid, of the dampers being improperly placed. My auxiliary flue has no dampers, and hence is unobstructed.

Boxes and tubes have also been introduced to supply air at the bridge-wall; but the same are liable to injury by the heat. In my improvement the air-pipe is at a distance below the bridge-wall, and is protected, and only the upper ends of the air-nozzles are exposed, and these can easily be replaced. Besides this, the descending and the auxiliary flues act, in conjunction with the air-tubes at the bridge-wall, to consume the gases passing from the fire when the air is shut off from the ash-pit and the chimney-flue closed. The gases then pass by the auxiliary flue, and the air-supply at the bridge-wall consumes the carbonic-oxide gases, and thus prevents any dangerous accumulation.

I claim as my invention—

The combination, with a boiler-furnace and bridge-wall, of the air-inlet pipes at the back of the bridge-wall, with openings near the top thereof, and the descending flue *h*, with a damper, and the unobstructed auxiliary flue, connecting with the flue *h* above and below the damper *k*, substantially as set forth.

Signed by me this 29th day of January, A. D. 1878.

SETH H. BEVINS.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.