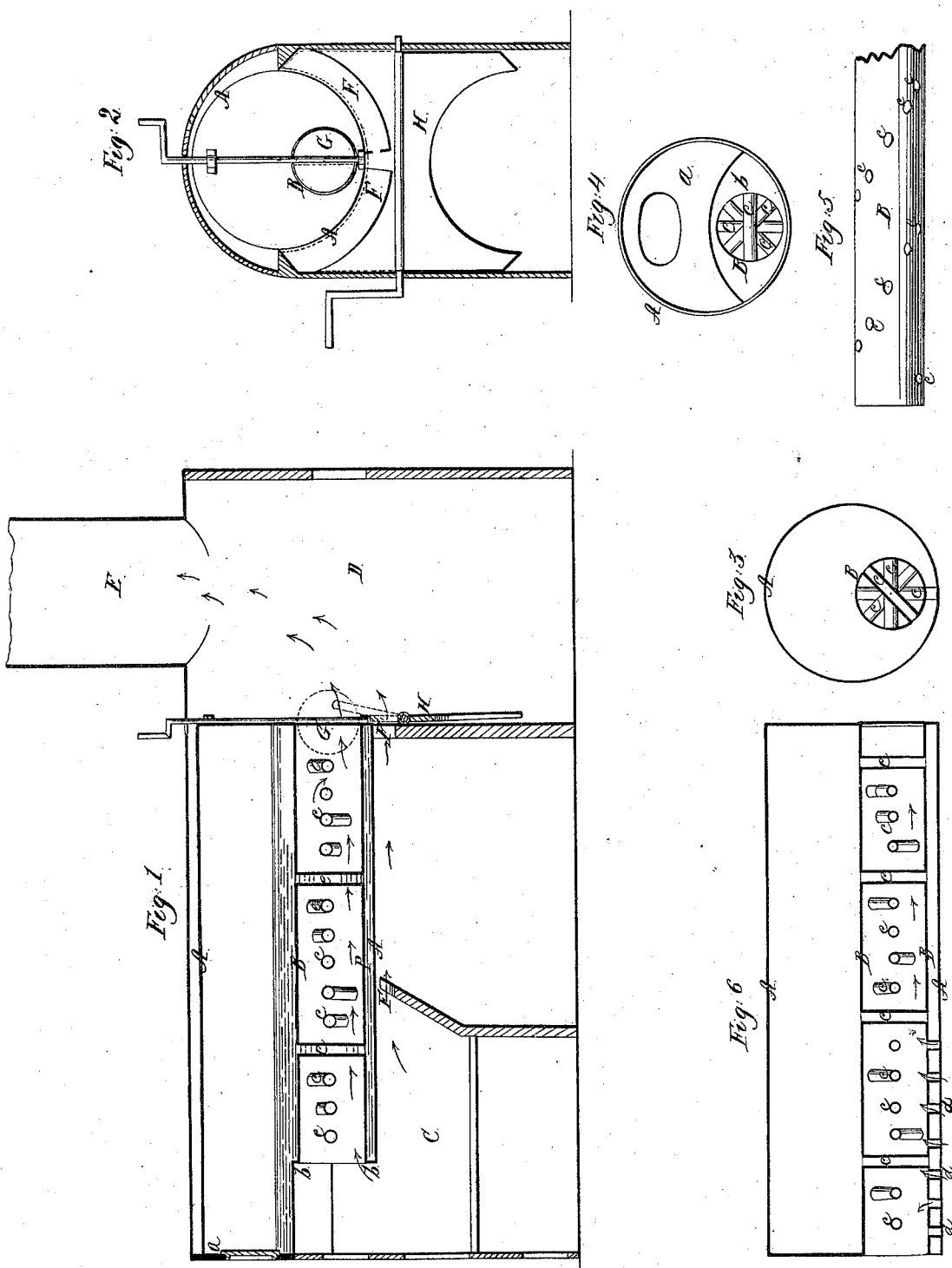


N. Johnson,
Boiler-Furnace Draft-Regulator.
N^o 17,042. Patented Apr. 14, 1857.



UNITED STATES PATENT OFFICE.

NELSON JOHNSON, OF JASPER, NEW YORK.

STEAM-BOILER.

Specification of Letters Patent No. 17,042, dated April 14, 1857.

To all whom it may concern:

Be it known that I, NELSON JOHNSON, of Jasper, in the county of Steuben and State of New York, have invented a new and useful Improvement in Flue-Boilers for Generating Steam; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a central longitudinal vertical section of a cylindrical flue boiler with my improvements, the same being represented in its setting. Fig. 2, is a transverse vertical section of the setting of the boiler taken immediately in rear of the boiler. Fig. 3, is a transverse section of the boiler without the setting. Fig. 4, is a front end view of the boiler without the setting. Fig. 5, is an outside view of the flue of the boiler. Fig. 6, is a longitudinal section of a boiler somewhat modified in its construction from that shown in Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in a certain arrangement of dampers employed in combination with proper means of communication from the fire place to the flue, and from the same to the bottom of the boiler, for the purpose of taking the products of combustion and heated air from the fire either through the flue to the chimney without their passing under the boiler, or under the boiler to the chimney without their passing through the flue, according to the level of the water in the boiler or as other circumstances may render desirable.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A, is the cylindrical shell of the boiler having the front head made in two parts *a*, and *b*, as shown in Fig. 4, the lower part *b*, in which terminates the main flue B, being set back some distance in order that the front end of the flue may be open to the fire place C, and yet the fire place be kept under the bottom of the boiler.

D, is the smoke chamber at the rear of the boiler and E, is the chimney on the top of the said chamber, and always in communication with it. The flue B, forms a means of direct communication from the fire place to the smoke chamber D, and the passage F,

at the back of the fire place forms a means of direct communication from the fire place under the bottom of the boiler to the smoke chamber. The flue B, is fitted with a damper G, at its rear end by which to close it and compel all the products of combustion to pass from the fire under the boiler and through the chamber D, to the chimney as indicated by black arrows in Fig. 1. Another damper H, is fitted to the back of the passage F, at the extreme rear of the boiler, said damper, which is shown open in black outline and closed in red outline in Figs. 1 and 2, being for the purpose of closing the passage F, and causing all the products of combustion to pass through the flue B, as indicated by the red arrows in Fig. 1.

As a general rule, I intend always to have the damper H, closed and use the boiler as a flue boiler, but in case of the water getting low, through accident or any unavoidable cause, I close the damper G, and open the damper H, and then the boiler operates as a common cylindrical boiler without any danger of burning the flue, which then constitutes merely a hot air chamber and cannot be very highly heated.

Instead of constructing the front head of the boiler in two parts *a*, and *b*, one behind the other, and not carrying the flue to the extreme end of the boiler, as shown in Fig. 1, the front head of the boiler may be constructed all in one sheet and the flue brought to the extreme front, as shown in Fig. 6, and a number of small upright flues *d*, *d*, may be used to convey the products of combustion from the fire place to the main flue where the damper G, is closed. Or instead of the flues *d*, *d*, an elbow pipe may be attached to the front end of the flue and brought down around the end of the cylinder into the fire place.

c, *c*, are the stays to the main flue B, consisting of tubes extending diametrically across the said flue and communicating at each of their ends with the water space of the boiler. These flues may be arranged in various ways relatively to each other, but I prefer to arrange them so that their openings stand in spiral lines described around the flue, as shown in Fig. 5. That arrangement of the stays provides for the staying of the flue in all directions and causes the least possible obstruction to the draft.

Having thus fully described my inven-

tion, I will proceed to state what I claim and desire to secure by Letters Patent—

In combination with the employment of a direct internal flue and a direct passage F, under the bottom of the boiler, both leading from the fire place to the chimney, I claim the arrangement of the two dampers G and H, substantially as herein described, for the

purpose of controlling the direction of the products of combustion and using the boiler as a direct draft cylinder boiler or direct flue boiler.

NELSON JOHNSON.

Witnesses:

W. E. CRAIG,
ANDREW B. CRAIG.