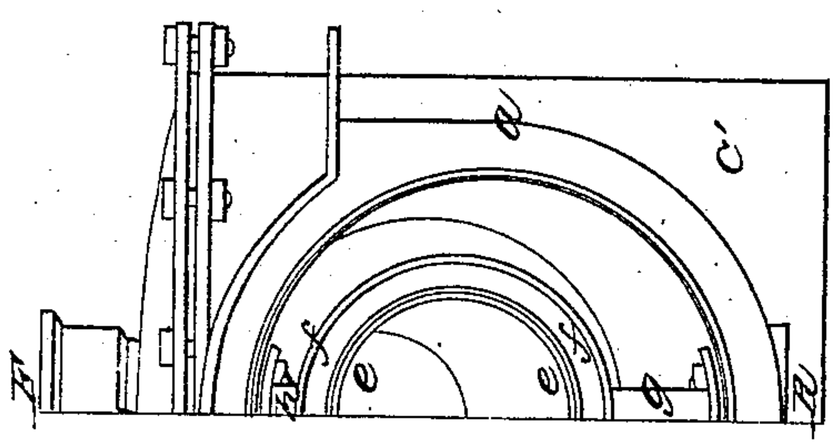
No. 29,241.

PATENTED JULY 24, 1860.

J. BROWN.

BOILER FOR HOT WATER WARMING APPARATUS.

Fig. 2.



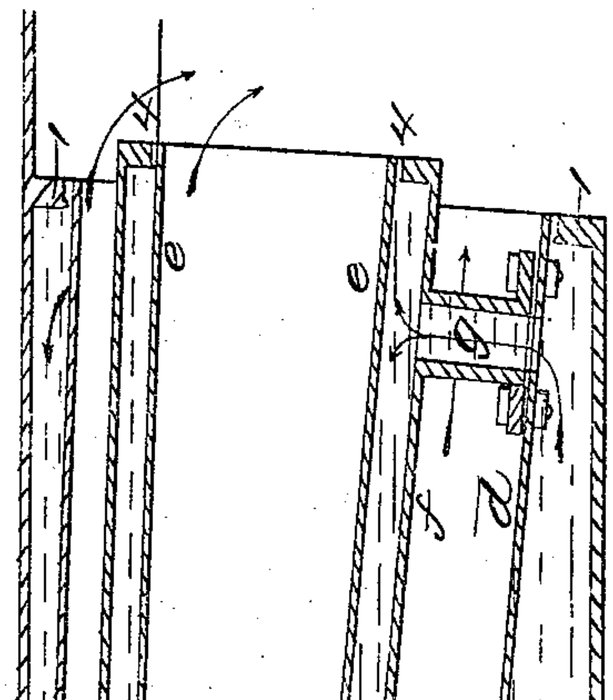
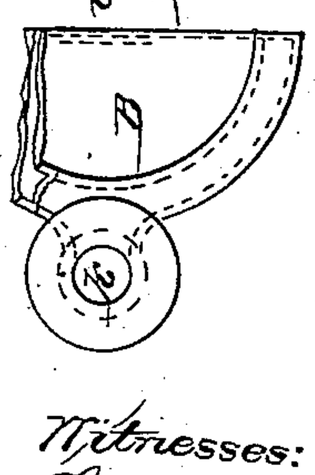


Fig. 1.

Fig. 3.



Witnesses:

Lemuel W. Serrell

Thomas G. Harvold

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Inventor:

John Brown

UNITED STATES PATENT OFFICE.

JOHN BROWN, OF NEW YORK, N. Y.

STEAM-BOILER.

Specification of Letters Patent No. 29,241, dated July 24, 1860.

To all whom it may concern:

Be it known that I, JOHN BROWN, of the city, county, and State of New York, have invented, made, and applied to use certain new and useful Improvements in Boilers for Hot-Water Warming Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, wherein—

Figure 1, is a vertical section of my improved boiler, Fig. 2, is a partial end view of the same, and Fig. 3, is a plan of the water flue-guard.

Similar marks of reference denote the same parts.

My improvements are in boilers used in circulating hot water warming apparatus, in which ranges of pipes containing the circulating hot water, are used, and the whole apparatus placed within a suitable inclosure and the heated air conveyed therefrom to registers at various points in the building. In this character of apparatus the boiler is simply subjected to hydrostatic pressure, the water box being open to the atmosphere, hence the boiler is made of cast iron.

My invention relates to the manner of constructing this boiler, whereby I am enabled to obtain far more surface for heating the water, greater facility in fitting the parts together and packing the joints tightly, and also in preventing coal as thrown onto the fire from passing into the heating flues.

In the drawing R, is the opening into the outer casing *a*, to which the pipe is attached that brings the returning circulation from the ranges of pipes into the boiler, and F, is the ascending or flow pipe out of which the hot water passes:

The arrows on the blue spaces *w*, represent the direction of the current of water; and the smoke spaces *s*, have also arrows denoting the direction of the draft:

b, *b*, are the grate bars, and *c*, is the opening to which the coal chute and fire door are connected.

The casing *a*, is formed nearly cylindrically with flanges to rest on the masonry, and the fire box *c* is made nearly square as a double casing, and cast with the casing *a*.

The rear end of the boiler is left open (as at 1, 1) and an opening is also provided at the back part of the fire box (at 2, 2,) into these openings the flue *d*, is slid and packed at said points 1, 1 and 2, 2, with suitable cement. The boiler thus far is no more than has heretofore been used, but in order to increase the heating surface, I introduce the flue A, within the flue *d*, before the same is put into the boiler. This flue A is composed of an inner casing *e*, and an outer casing *f* and the two casings are packed at the points 3, 3 and 4, 4. To obtain a circulation of water through this flue A, I provide a pipe *g* near the back end on the under side, and a similar pipe *h*, near the front end on the upper side, whereby a circulation is induced as seen by the arrows. By placing this flue A, within the flue *d*, before said flue *d*, is entered within the boiler, I am enabled to make perfectly tight joints at said pipes by bolts and suitable packings; and the surface thus presented for absorbing the heat of the fire is greatly increased and is in a favorable position within the flue *d* for receiving heat and imparting the same to the circulating water.

In throwing fuel into the fire pieces of coal are apt to pass into the flue *d*, and the dust and ashes draw over into the same, speedily obstructing it; to avoid this difficulty I make use of a water flue-guard B, see Figs. 1 and 3, which allows the draft to pass up over its edge and descend into the flues (A, *d*) as shown. This flue guard being hollow contains water and is made a heating apparatus by allowing a circulation through from the pipes *i*, and *k*, as shown; the joints being made tight and the guard attached by the bolts 5, 5, having bridge-heads and a nut as shown.

Having thus described the nature and operation of my invention I remark that by the construction set forth I obtain a very large extent of heating surface, and that within a small space; also all the joints are of such a character that they are accessible for packing whenever required, and the parts are durable and easily kept clean.

I do not claim a boiler containing a flue or flues, but

What I claim and desire to secure by Letters Patent is—

1. The circulating pipes *g* and *h*, formed with the casing *f* of the flue A, and connected to the casing *d*, the said flue and casings being constructed and arranged in the manner specified to afford access for packing the joints, as set forth.

2. Arranging the water flue guard B, within the furnace in the manner specified, when fitted with the circulating pipes *i* and *k*, connecting the same to the respective parts of the boiler for the purposes and as specified.

In witness whereof I have hereunto set my signature this twenty first day of July 1858.

JOHN BROWN.

Witnesses:

LEMUEL W. SERRELL,

THOMAS. G. HAROLD.