

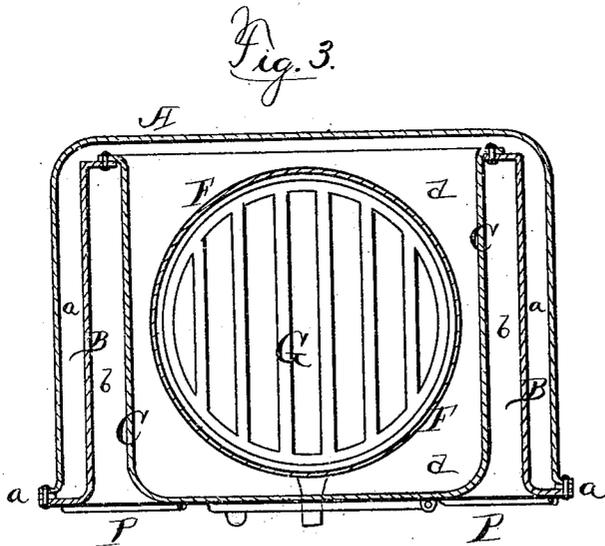
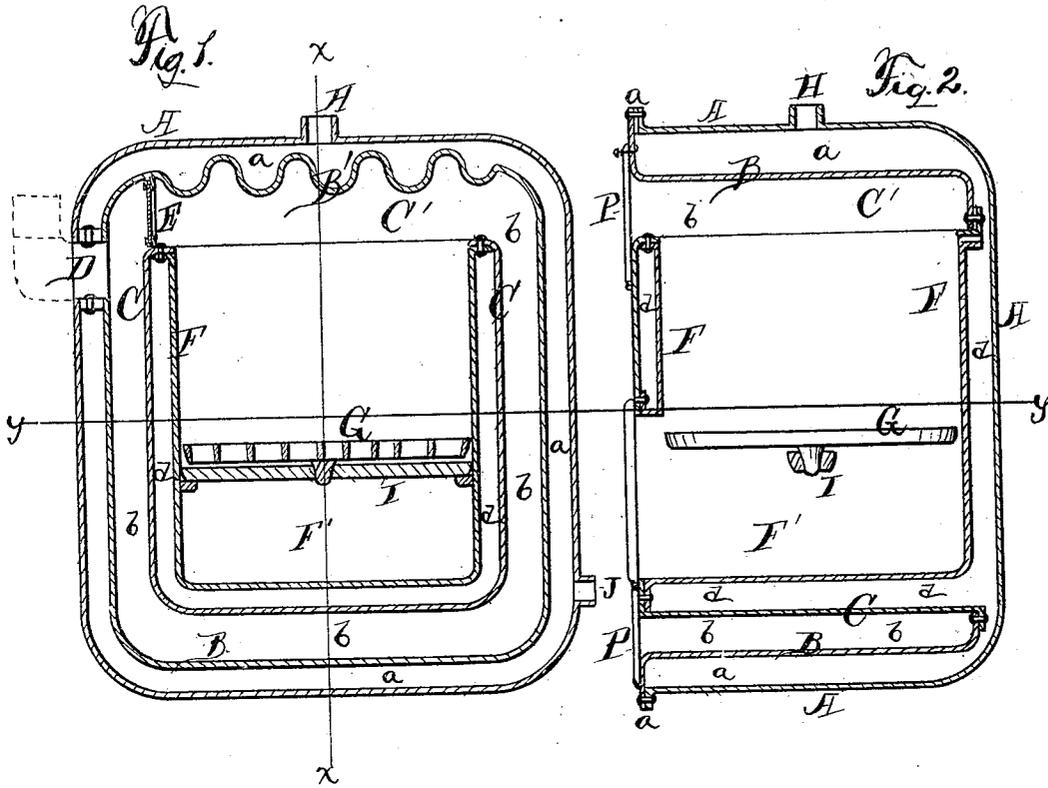
(Model.)

E. A. GAY.

BOILER FOR HEATING BUILDINGS.

No. 273,718.

Patented Mar. 13, 1883.



Witnesses:
 W. K. Carson.
 J. R. Drake.

E. A. Gay,
 Inventor, by
 J. R. Drake, Atty.

UNITED STATES PATENT OFFICE.

EDGAR A. GAY, OF BUFFALO, NEW YORK.

BOILER FOR HEATING BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 273,712, dated March 13, 1883.

Application filed March 13, 1882. (Model.)

To all whom it may concern:

Be it known that I, EDGAR A. GAY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have made certain Improvements in Boilers for Heating Buildings, &c., of which the following is a specification.

The object of this invention is to get a simple and comparatively inexpensive device that will present a large heating-surface for the action of the fire on the water chambers and spaces in connection therewith; and the invention consists in the construction and arrangement of the boiler, as hereinafter fully described.

In the drawings, Figure 1 is a front vertical section through the center of the entire device. Fig. 2 is a side vertical section through line of *x*, Fig. 1. Fig. 3 is a horizontal plan in cross-section through line of *y*, Figs. 1 and 2.

The boiler is of metal, either cast or wrought, and is in four sections or parts.

A A represent the outside walls or shell which incloses the whole device, excepting the front.

B B is an inner shell, jointed to the outside shell, A, at the front, and extending to within a few inches of shell A at back, thus giving a water-space, *a a a*, at sides, top, and bottom of the device. The top of this shell is heavily corrugated or waved, as at B', so as to give greater fire-surface to the action of heat on the water therein. Shell C is jointed to B at the back, (see Figs. 2 and 3,) both sides of fire-pot, and extends entirely to the front, or may form part of the front of the boiler. Between shells B and C a large space, *b b*, is left at sides, top and bottom, forming the indirect flue, that at the top making the heating-chamber C'. An exit to this is provided at D, and a damper provided in the plate E, by use of which the products of combustion may escape directly from the fire-chamber C' through opening D, (see Fig. 1,) or else be made to traverse the entire length of the indirect flue *b b* before leaving the boiler. Shell C is flanged at the top, leaving a circular opening into the fire-pot or coal-magazine, which is made by shell F, and to which shell C is jointed. This gives a connection and escape of fire, &c., into the chamber C'. A lower horizontal opening is made to get at the ash-pit.

G is the grate, set in bar I at a suitable

distance above the bottom of ash-pit. The grate may be square as well as round. Between the walls of the circular shell F and shell C is left a water-space, *d d*, Figs. 1 and 2, making a large and valuable water-heating space at front, sides, and bottom, and with the shell A at back. (See Figs. 2 and 3.) The openings left in front of the boiler by the heating-chamber, return-flue, and ash-pit are covered by removable front pieces, P P P, (having proper doors for the heating-chamber and ash-pit,) for cleaning the return-flue. These pieces P are all lined with non-conducting cement or other fire-proof material to retain the heat inside the boiler.

Instead of the joints to unite shells B and C, they may perhaps be cast together, if found desirable; but I prefer the joints.

The working of this heating-boiler is as follows: The water-spaces are kept supplied with water through the side opening, J, by suitable connections therewith. After the fire is well under way the damper in plate E is closed, forcing the draft through indirect flue *b b b*. All the heat from the ash-pit is absorbed by water-space *d*, and at no point can there be any wasteful radiation of heat before it has had opportunity to communicate with the water. The construction of the whole is such that the various shells are free to expand from their fixed points, so as to obviate danger of cracking the plates by any unequal expansion. The surfaces forming the fire-chamber and flue may be corrugated or not, as desired. The top opening, H, connects with the heating-pipes.

The advantages of my construction are, great compactness, the whole boiler, ash-pit, and flues being contained in one inclosure, occupying but little space; surrounding the ash-pit by a water-space, which absorbs heat from the pit and also from the flue; the arrangement of flue *b* and fire-chamber C', making them accessible for inspection or cleaning by the removable pieces P P; also, the application of the downdraft principle, and without using flues or tubes, and which are liable to become foul and choked.

The shell B may be of one continuous piece or made of several pieces joined together.

I claim—

1. A boiler provided with the indirect flue *b*, passing down the side thereof, crossing un-

der the water-space *d*, surrounding the ash-pit, and extending up the opposite side of the boiler to the exit *D*, said flue being provided with a damper to give direct or indirect flue draft, substantially as set forth.

2. In a boiler, the combination of the outer casing, *A*, and inner shell, *B*, provided with an interlying water-space, *a*, and having an indirect flue, *b*, passing down the side of the boiler and crossing under the water-space *d*, surround-

ing the ash-pit, and extending up to the exit *D*, and provided with a damper in the plate *E*, substantially as herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses,

EDGAR A. GAY.

Witnesses:

J. R. DRAKE,
T. H. PARSONS.