

(No Model.)

W. D. BARTLETT.

FURNACE.

No. 363,977.

Patented May 31, 1887.

Fig: 1.

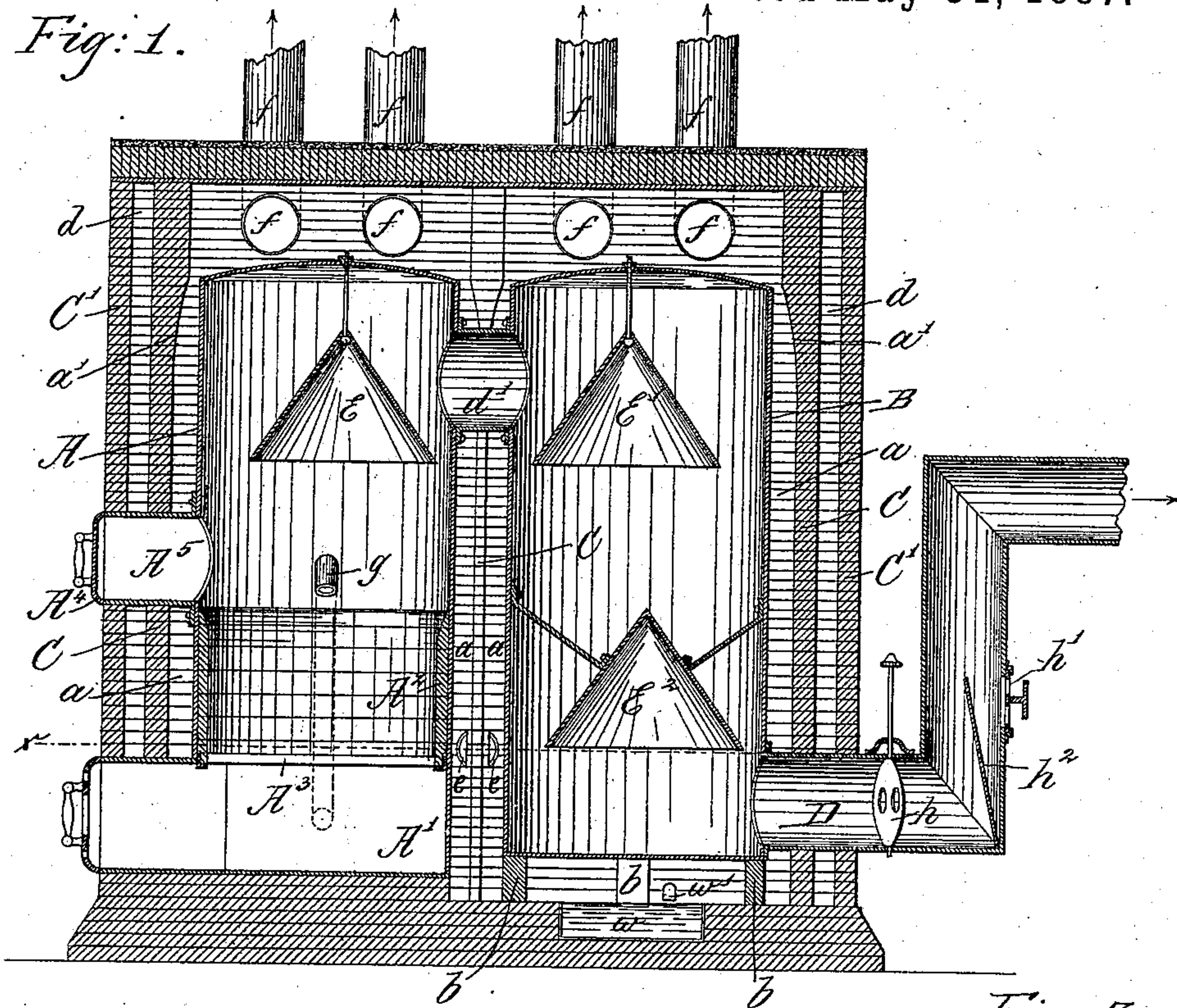


Fig: 2.

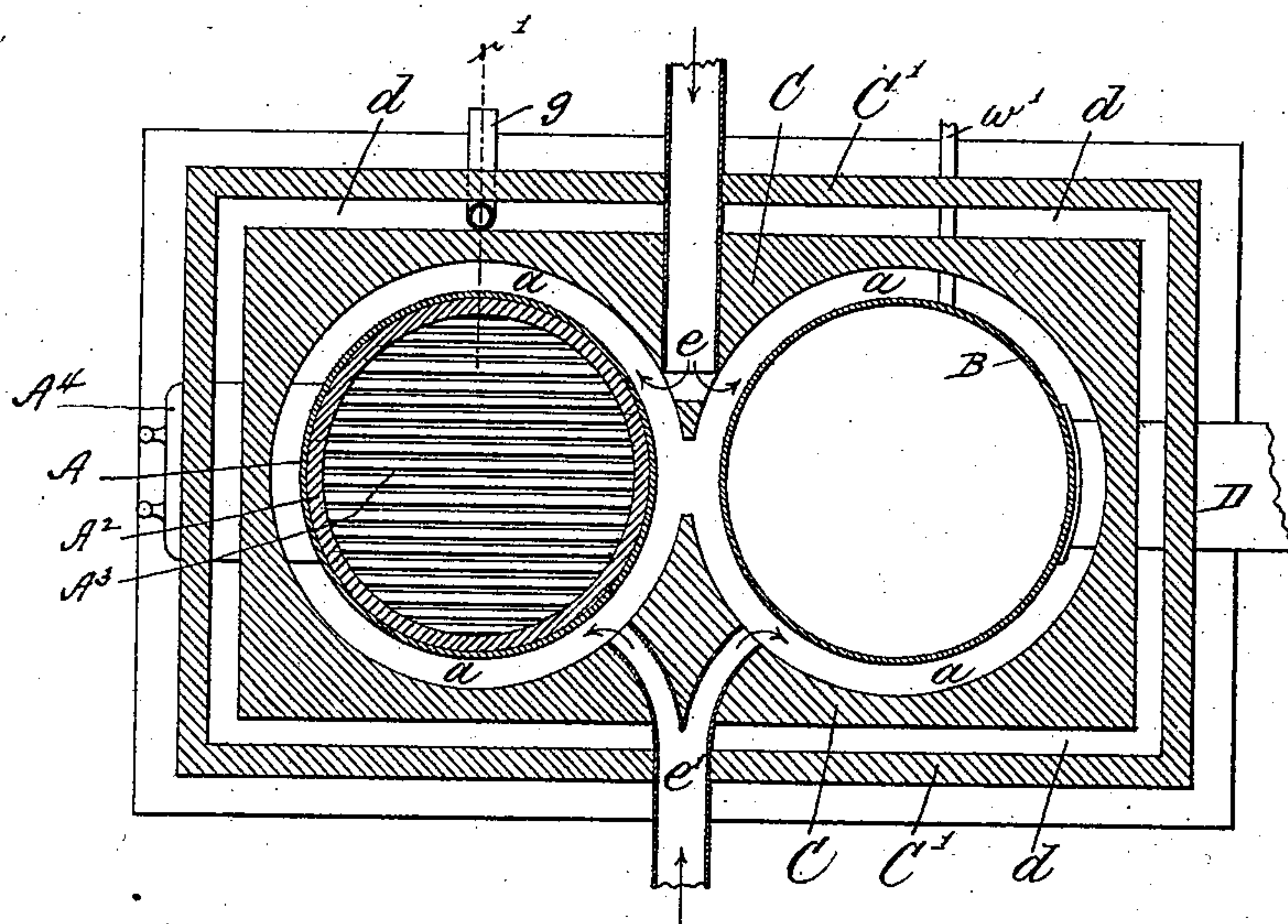
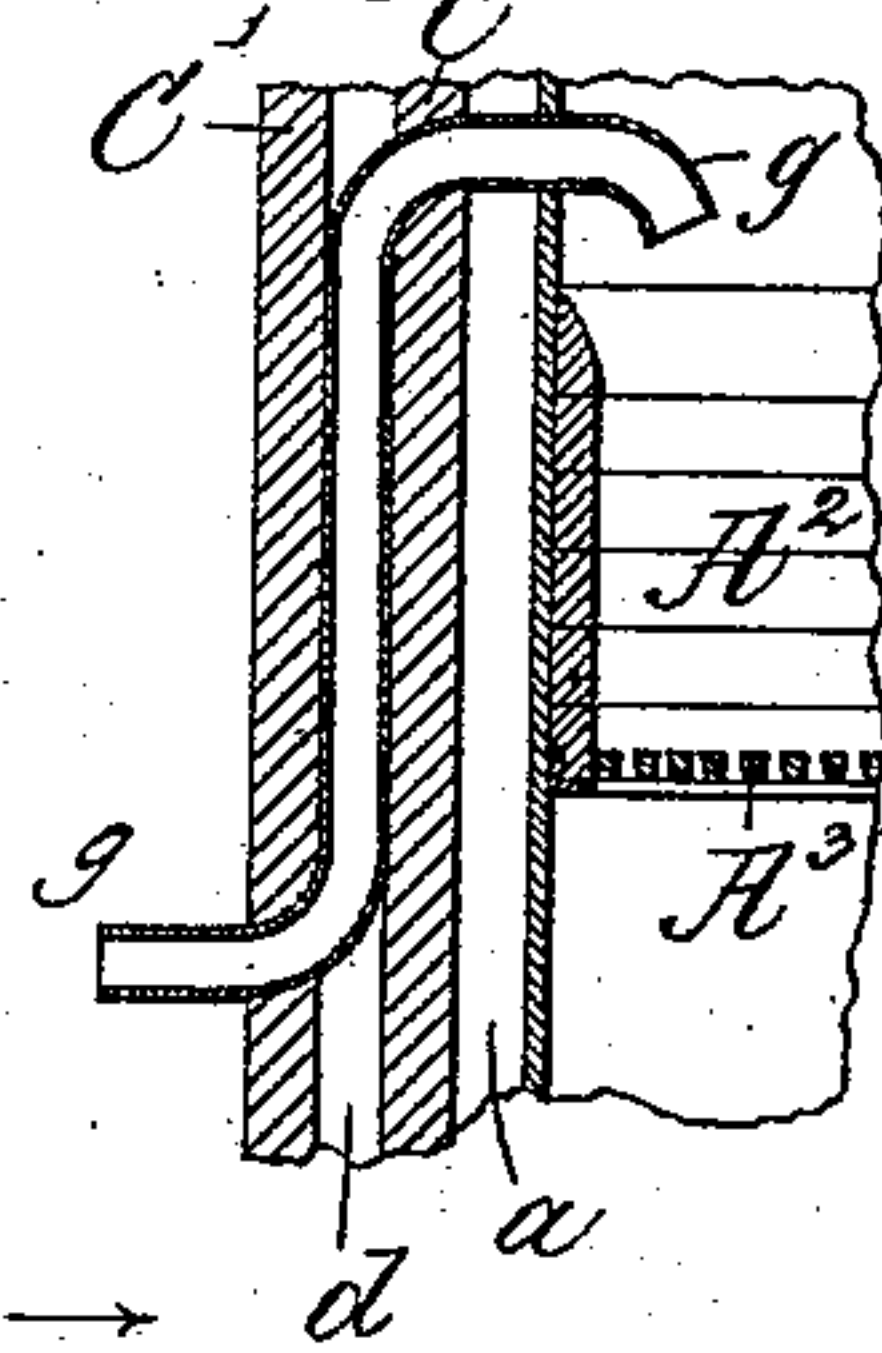


Fig: 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 363,977, dated May 31, 1887.

Application filed August 17, 1886. Serial No. 211,140. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. BARTLETT, of Amesbury, county of Essex, and State of Massachusetts, have invented an Improvement in Furnaces, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of furnaces for heating buildings, whereby the products of combustion are most completely controlled for the creation of heat, which may be utilized.

In accordance with my invention two metal cylinders are erected side by side in a furnace-chamber inclosed by brick-work, the two cylinders being connected by a suitable collar, so that the products of combustion set free in one cylinder after traversing it enter the next cylinder and also heat it. The furnace-chamber at its lower end is supplied with air, which, rising in the said chamber about the said cylinder, is heated by radiation from the said cylinders. The furnace-chamber at or near its upper end has connected to it the hot-air-conducting pipes. The products of combustion in their passage through the cylinders are diverted by spreaders toward and against the interior walls of the cylinders, or are prevented from passing directly through the center of the cylinders in the path that they would naturally take, and in this way the heat in the products of combustion is absorbed in heating the metal cylinders. The air entering the furnace-chamber, as well as the atmospheric air admitted to the fire-chamber, as will be described, may be heated before entering the fire-chamber by passing through flues in the brick-work, the flues being of greater or less length.

The invention consists in certain combinations and arrangements of parts, as I will now proceed to particularly describe and claim.

Figure 1 in vertical section shows a furnace embodying my improvements; Fig. 2, a horizontal section of one of my improved furnaces below the dotted line *x*, Fig. 1; and Fig. 3 is a sectional detail in the line *x'*, Fig. 2.

Referring to the drawings, A B represent two metal cylinders, preferably sheet-steel, put together by rivets, as in the manufacture of boilers.

The cylinder A, constituting the combustion-chamber, has at its lower end an ash-pit, A', which may be of any usual construction, it being provided with a door having any usual draft-regulating slide.

Above the ash-pit the cylinder is shown as lined with fire-brick, as A², to constitute a fire-pot, and is provided with a grate, A³, which in practice may be of any usual construction, so as to be tipped or shaken and overturned when desired, the particular construction of the grate whereby it may be shaken or overturned not being herein shown, because not of my invention.

The cylinder A has a door, A⁴, and a throat, A⁵, of usual construction, whereby coal or other material to be burned may be introduced into the fire-pot. The cylinders A and B are set at a little distance apart in a furnace-chamber, *a*, surrounded by a brick wall, C, which in turn is again surrounded by a second brick wall, C', so as to leave an air-chamber, *d*, between them. The cylinder B, constituting a heating-chamber, is joined to the cylinder A near its upper end by a short piece of pipe or by a collar, *d'*, to thus permit the products of combustion to pass from the cylinder A into and through the cylinder B and out from the said cylinder by the exit-pipe D, the products of combustion in their passage being diverted toward the walls of the said cylinders by the spreaders E E' E², supported therein as shown, the said spreaders being located, preferably, to one side of the center of the said cylinders, as shown, in order that the products of combustion may be diverted, as described, outwardly toward and directly against the interior walls of the said cylinders, instead of taking a direct central course through the said cylinders and out into the usual chimney through the exit-pipe D. The spreaders are preferably hollow cones of metal, and that one (E) suspended in the cylinder A intercepts in its interior the rising products of combustion, while the others, E' and E², in the cylinder B receive the descending current on their external surfaces. By this construction and arrangement of the spreaders the tendency to a direct outflow of the products of combustion is most effectually overcome and the heat is thrown against the walls of the cylinders.

The brick-work C (see Fig. 2) is thickened

or made wedge-shaped between the two cylinders, in order to make the furnace-chamber *a* of substantially equal size or area about the cylinders, and at or near the lower end of the said chamber the brick-work, as herein shown, is provided with ducts *e e'*, for the admission of atmospheric air into the chamber *a*. The ducts *e e'* will preferably be of such area as to admit air in excess of that to be taken from the said chamber by the hot-air pipes *f* when all are open; but the wall *C* will for the best results be contracted at and about the top of the cylinders *A B*, as shown at *a'*, the area of the space so left being, however, sufficient to supply all the pipes *f f*. The contraction of the furnace-chamber at *a'* causes the heated air to be forced upward above the top of the said cylinders.

The fire-pot is supplied with atmospheric heated air through a pipe, *g*, extended through the brick-work and the cylinder *A* at a point, as herein shown, above the fire-pot, the introduction of air by the said pipe affording fresh oxygen to combine with the products of combustion as they are eliminated from the coal, to thus make more complete combustion and more intense heat.

The cylinder *B* is supported upon feet *b*, and the furnace-chamber floor under it is provided with a water-chamber, *w*, supplied as desired or needed from a pipe, *w'*, having a funnel, *w''*.

The exit-pipe has a damper, *h*, by which to regulate the passage of the products of combustion or smoke from the heater, and a regis-

ter-damper to permit the admission of cold air into the said pipe at one side of the partition *h''* to reduce the draft when desired.

These dampers may be of any usual or suitable construction.

I claim—

1. In a heater, a fire-chamber, two cylinders located therein and constituting combustion and heating chambers, respectively, a pipe or collar connecting said chambers near their upper ends, and an outlet-flue connected with the heating-chamber near its bottom, combined with spreader *E* in the combustion-cylinder and the spreaders *E' E''*, suspended in the said heating-cylinder, the spreaders *E* and *E'* being arranged eccentrically with relation to said cylinders, substantially as described.

2. In a heater, the two cylinders *A B*, connected together at their upper ends, combined with the brick-work *C*, contracted at and about the top of the said cylinders and thickened or made wedge-shaped between the two cylinders to form a furnace-chamber of substantially equal size or area about the said cylinders, the said brick-work being provided with air-ducts leading into the furnace-chamber, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. D. BARTLETT.

Witnesses:

JOHN ROWELL,
CHAS. H. BANKS.