

No. 664,616.

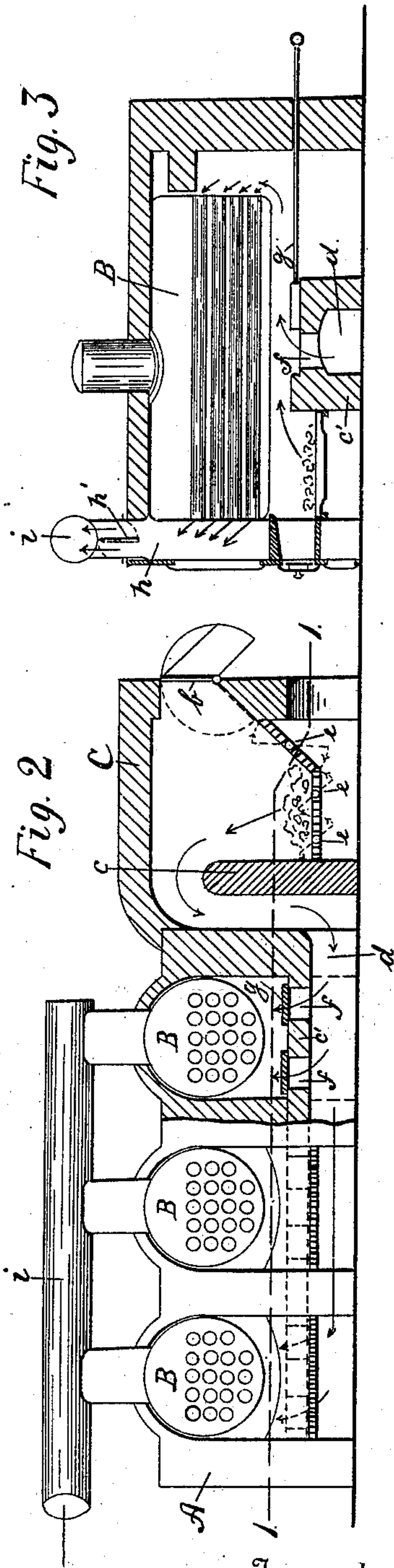
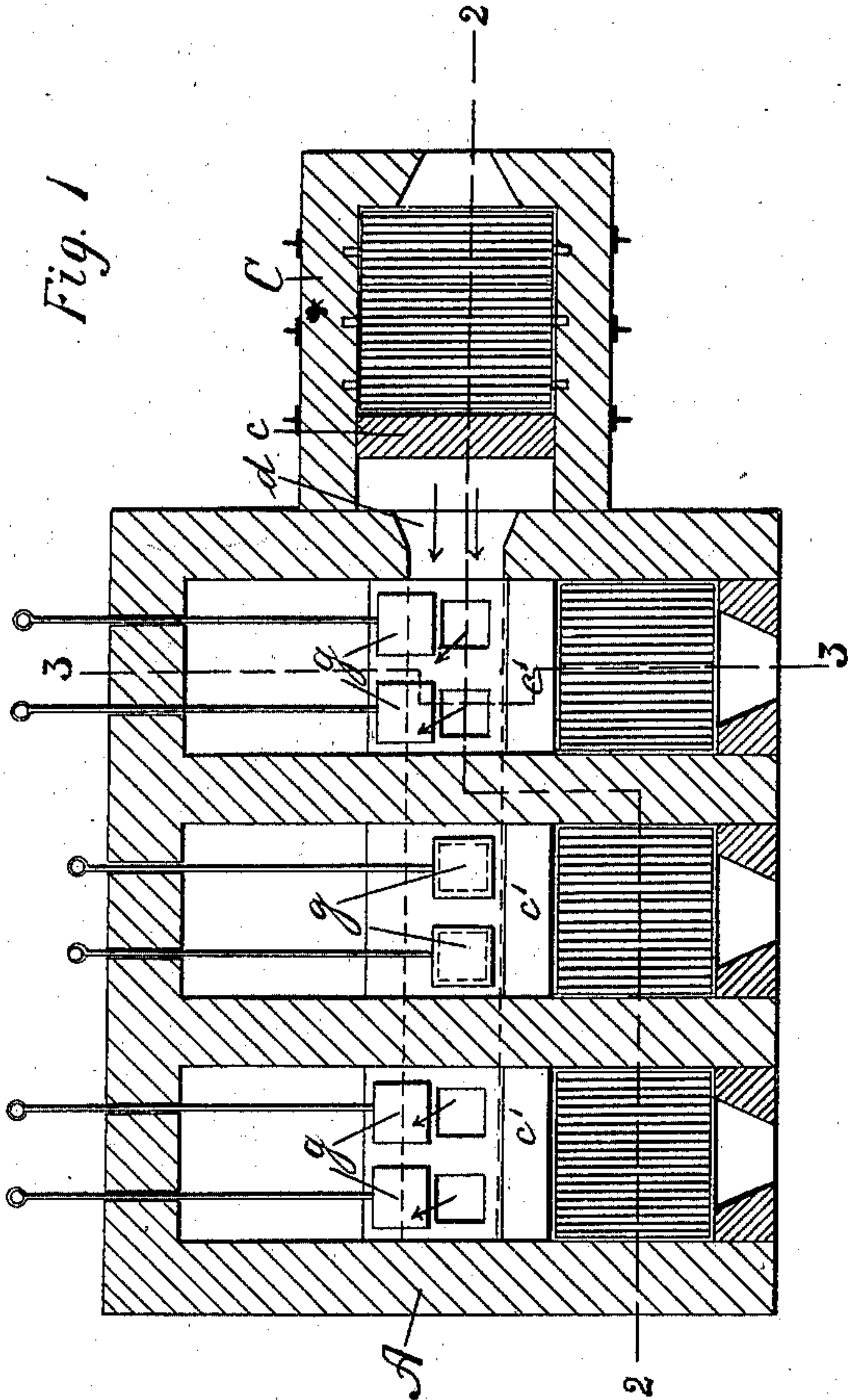
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W. J. BALDWIN.

SUBSIDIARY FURNACE FOR STEAM BOILERS.

(Application filed July 2, 1900.)

(No Model.)



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SUBSIDIARY FURNACE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 664,616, dated December 25, 1900.

Application filed July 2, 1900. Serial No. 22,277. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. BALDWIN, a citizen of the United States of America, and a resident of the borough of Brooklyn, in the city of New York and State of New York, have invented certain new and useful Improvements in Subsidiary Furnaces for Steam-Boilers, of which the following is a specification.

This invention relates to subsidiary furnaces for steam-boilers, by which I mean furnaces provided with a combustion-chamber entirely separate from and independent of the combustion-chamber of the main boiler-furnace, but which is so connected with the flame passages or chambers of the latter that its flames or hot products of combustion can be employed to heat a boiler or any one or more of the boilers of a battery when desired and without interfering with or injuring the fire on the grates of the said main boiler-furnace. Such a subsidiary furnace will be of great importance in connection with the steam-plants of many modern businesses as a means of disposing of refuse material and economizing fuel. For instance, in the great department stores there is daily a considerable accumulation of refuse paper and wooden boxes and scraps, which up to the present time has caused much trouble and expense in disposing of it. It has hitherto been unavailable as fuel, because, first, it cannot be burned in the main boiler-furnaces which are adapted for coal without destroying the coal fire, and, second, the supply of this refuse material is not constant. There may be at some times too much and at other times not enough to maintain the fire if it alone is relied on. Consequently the main furnaces cannot be built for such refuse alone, for if they were there would be times when the fire could not be maintained for want of fuel. It is therefore necessary to keep the main fire with doors and dampers closed while the refuse fuel is burning, but in readiness for heating the boilers whenever the refuse-fuel fire is unavailable. Finally, even where there is a considerable and relatively constant supply of refuse material there may yet be too little to alone maintain the boiler-fire. Where this is the case with present boiler plants, the whole of the refuse material is wasted, because, as

above stated, it cannot be burned in the main furnace without destroying the coal fire; but my invention overcomes these difficulties and enables all the refuse material whether much or little to be burned and so much of its heat value as may be desired to be availed of for heating the boilers, for this invention provides a subsidiary furnace suitable for the refuse fuel in which that fuel can be so perfectly consumed that almost no smoke is produced and that furnace connected with the flame space or passages of the main furnace, so that the flames and hot products of combustion of the subsidiary furnace enter said space or passages and heat the boilers without injuring or interfering with the fires in the main furnace, which main furnace is operated and controlled as readily as in the present plants.

Referring to the drawings which accompany this specification to aid the description, Figure 1 is a horizontal section on line 1 1 of Fig. 2, but with the fronts omitted and showing the subsidiary furnace combined with the furnaces of three horizontal tubular boilers. Fig. 2 is a vertical section on the line 2 2 of Fig. 1, but showing the boilers in full. Fig. 3 is a vertical section on the line 3 3 of Fig. 1.

Referring to the drawings, A is the brick-work of the main furnaces, B B the boilers, and C the subsidiary furnace. Said subsidiary furnace C is provided with any suitable door *b*, which is shown as a hopper that receives the refuse fuel and dumps it into the combustion-chamber of furnace C. *c* is the bridge-wall, and *e e* are any suitable grates of said subsidiary furnace. The flame chamber or passage behind bridge-wall *c* is connected with a duct or passage *d*, which is in turn connected with the flame space or passage of each of the main furnaces by openings *f*, which are preferably controlled by suitable means, as the dampers *g*, said dampers *g* being operated by rods and handles that pass out of the rear furnace-wall, as shown. A convenient mode of constructing said duct *d* is to carry it out through the bridge-wall *c* of the main furnaces, there being, in fact, one long bridge-wall extending under all the three boilers (seen in Figs. 1 and 2) and the openings *f* being made through the top of said bridge-wall, as seen in Fig. 3.

In the drawings the dampers *g* of the first and third furnaces are shown open and of the middle furnace closed.

In operation a low fire will be kept on the 5
grates of the main furnaces of the boilers which are in use, so as to be ready for any emergency; but the principal source for heating the boilers and making steam will be the refuse fuel in the subsidiary furnace C. This 10
furnace being constructed of suitable refractory and non-conducting materials, as fire-brick, and being separate and independent from the main furnace, very perfect combustion can be obtained in it and almost complete 15
combustion of smoke. The flames and hot products of combustion pass over the bridge-wall *c*, then down to the duct *d*, and thence to the flame-passages of the several furnaces, the passage of the flames and products of combustion being controlled by the 20
dampers *g*. If at any time the supply of refuse fuel runs short or for any cause the subsidiary furnace cannot be used, the main fires are brightened up and used to make steam.

25 Now, having described my improvements, I claim as my invention—

1. The combination of a main steam-boiler furnace provided with a bridge-wall and a 30
flame-space, a subsidiary furnace for refuse fuels, a flue behind said bridge-wall and op-

eratively connecting said subsidiary furnace with said flame-space, and means for controlling the connection between said flue and said flame-space, substantially as described.

2. The combination with a battery of boilers and main furnaces provided with flame-spaces and bridge-walls, of a subsidiary furnace, a flue operatively connecting said subsidiary furnace with the flame-spaces of each 40
main furnace behind the bridge-wall thereof, and independently-shiftable dampers adapted to control the connection of said flue with each of said flame-spaces, substantially as described.

3. The combination of a main steam-boiler 45
furnace provided with a hollow bridge-wall and a flame-space, a subsidiary furnace for refuse fuels, a flame-passage leading from the subsidiary furnace to the hollow bridge-wall, an opening connecting said hollow bridge- 50
wall with the said main furnace, and means for controlling said opening, substantially as described.

Signed at New York city, New York, this 27th day of June, 1900.

WILLIAM J. BALDWIN.

Witnesses:

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