

G. S. G. SPENCE.
Hot Air Furnace.

No. 24,590.

Patented June 28, 1859.

Fig. 1,

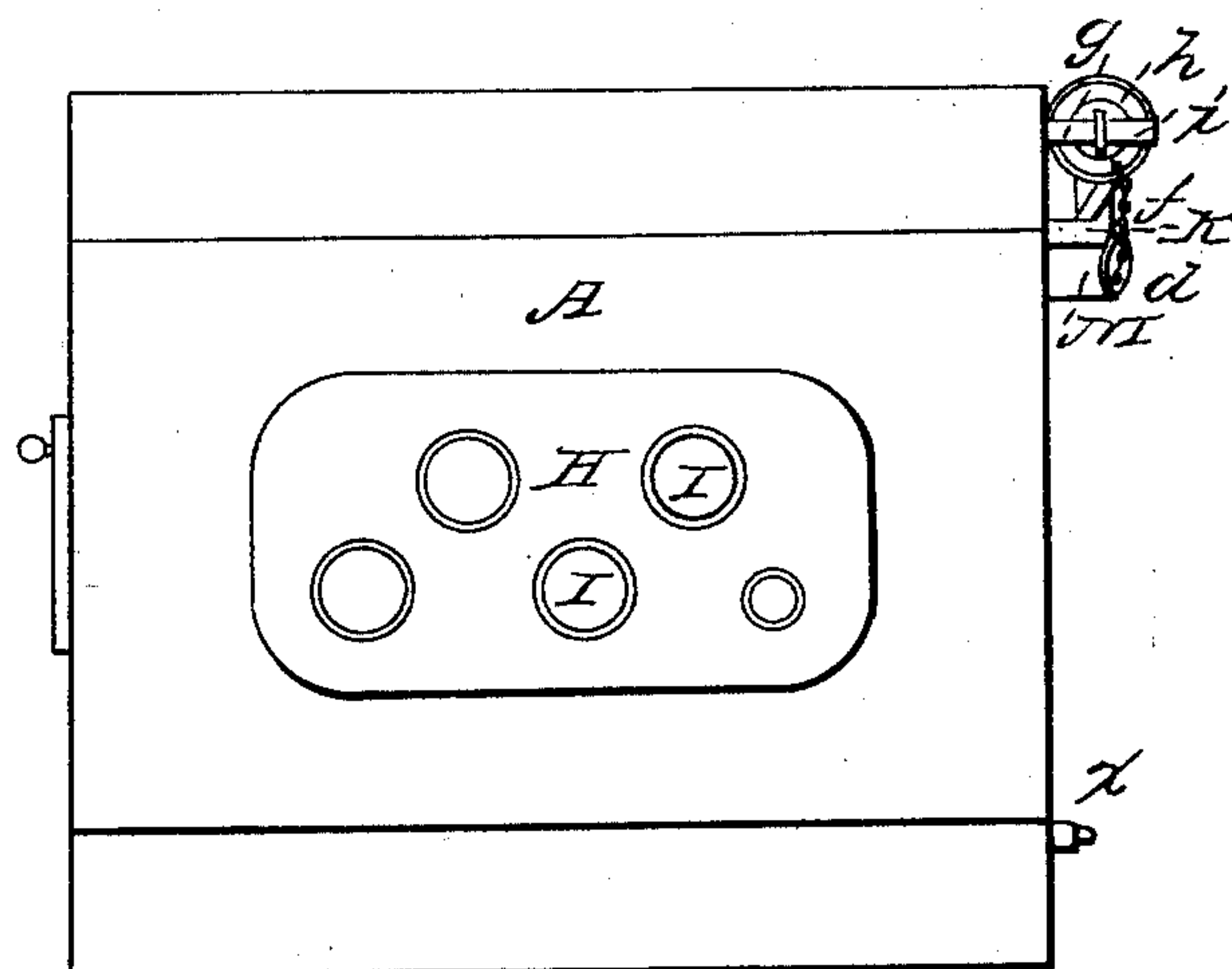
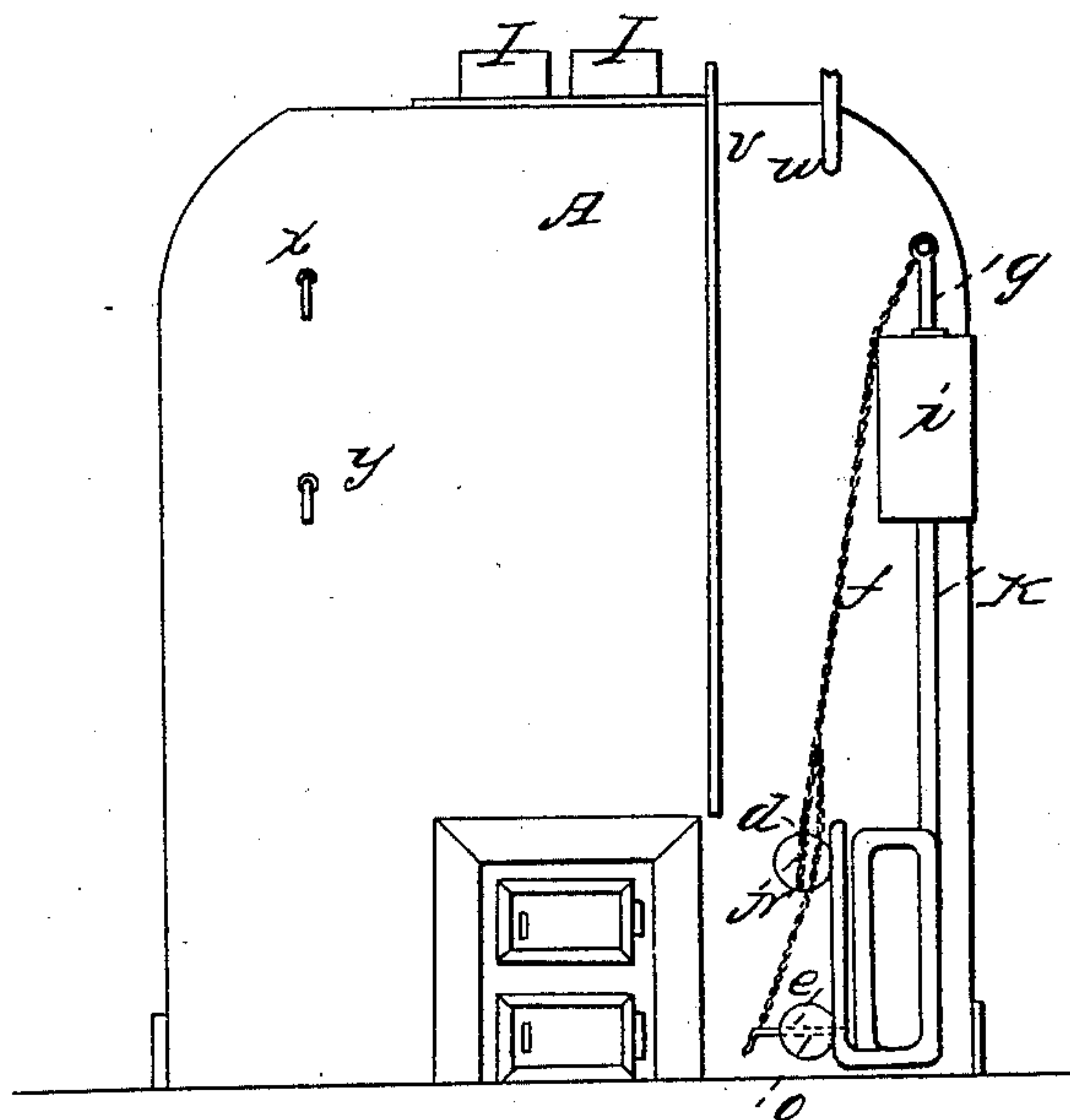


Fig. 2,



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Fig. 3,

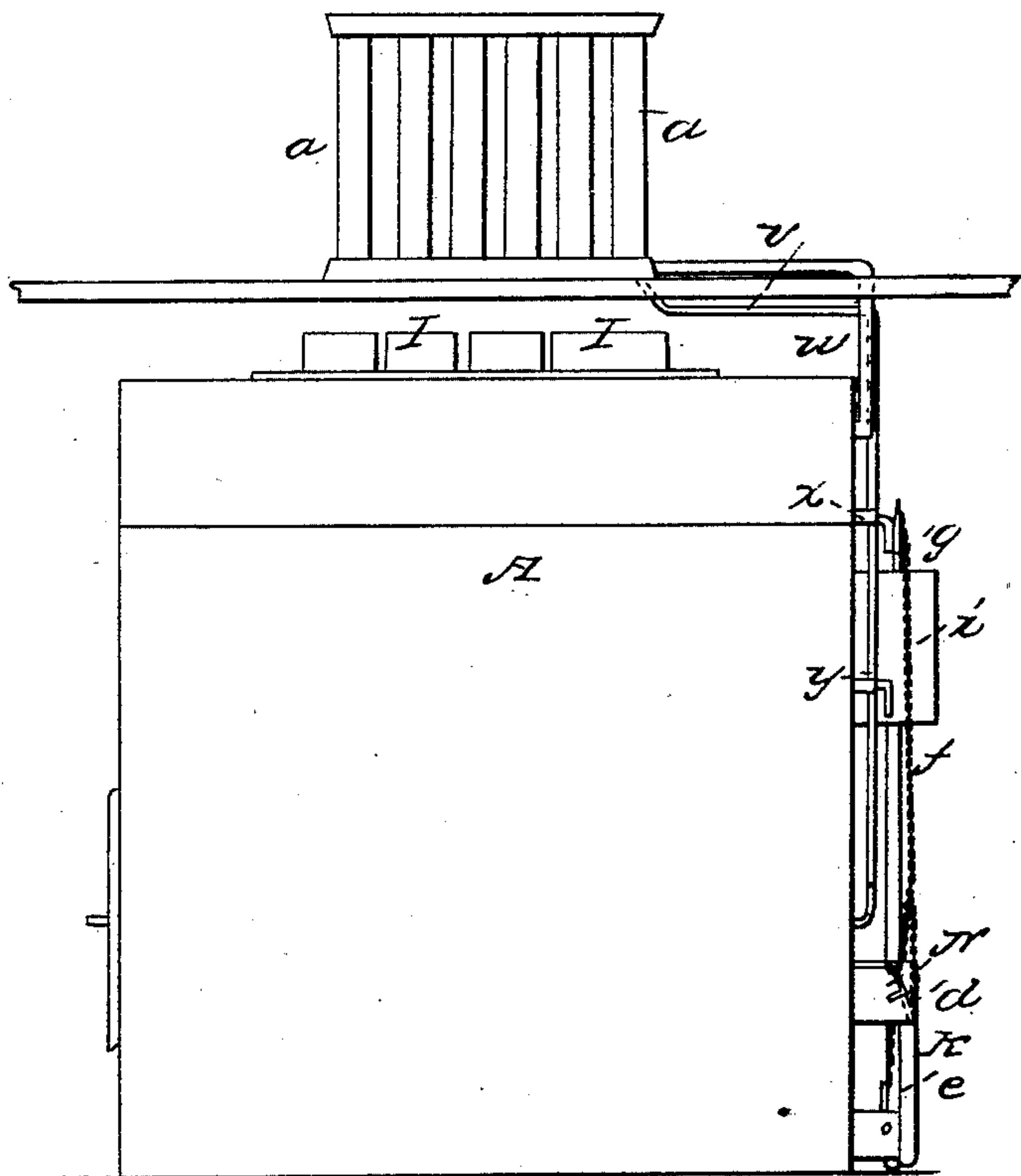
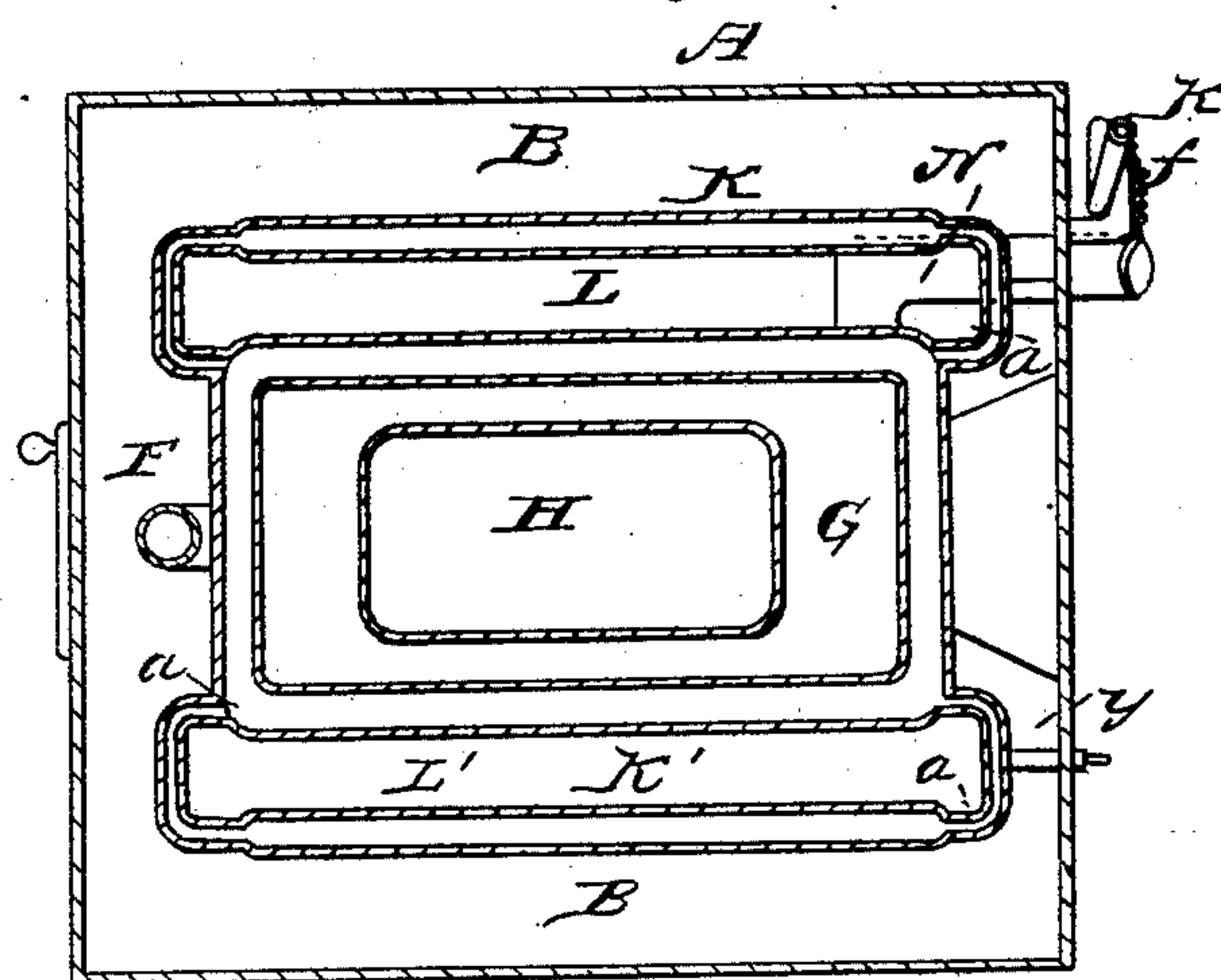


Fig. 4,



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Fig. 5,

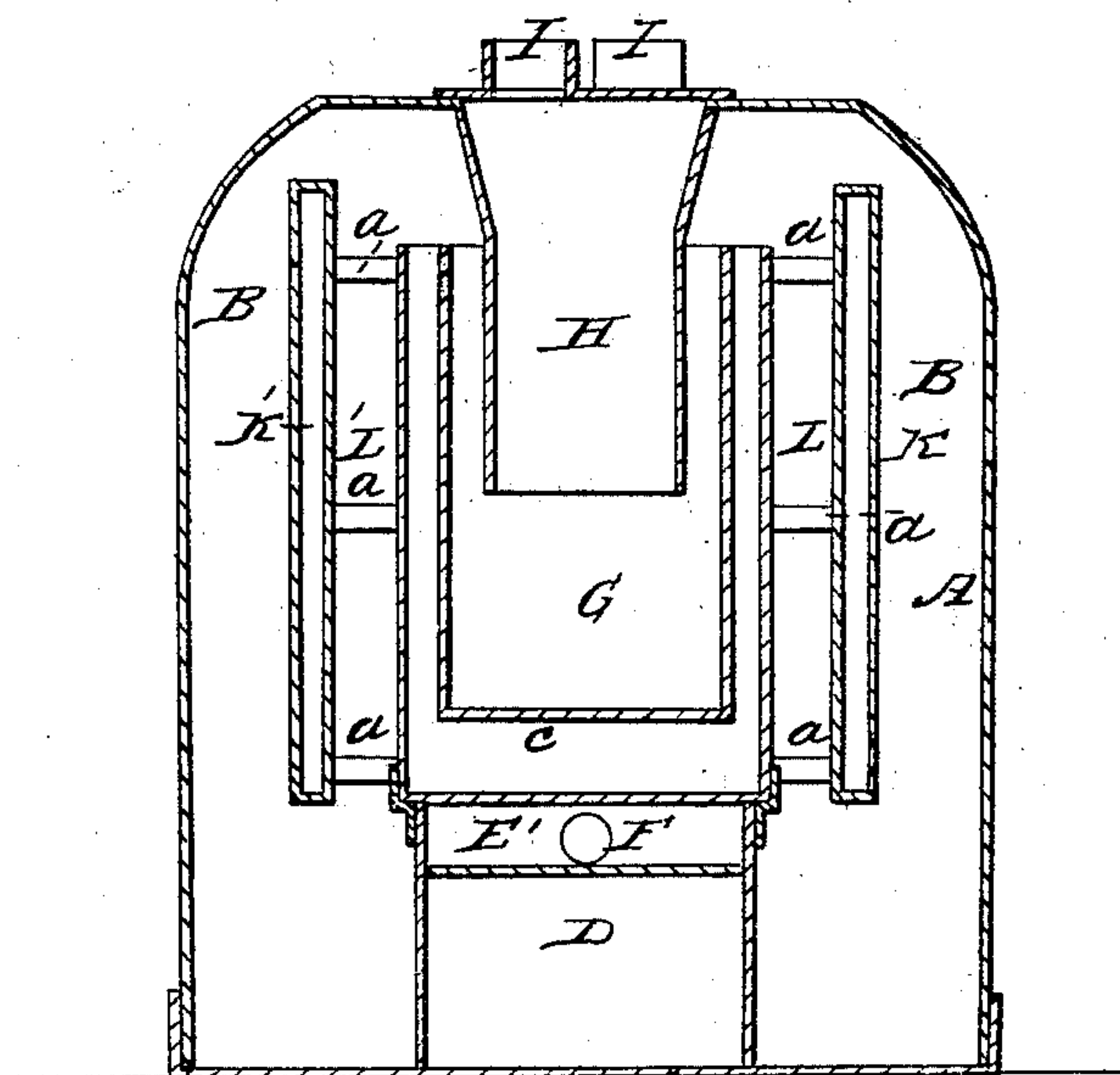
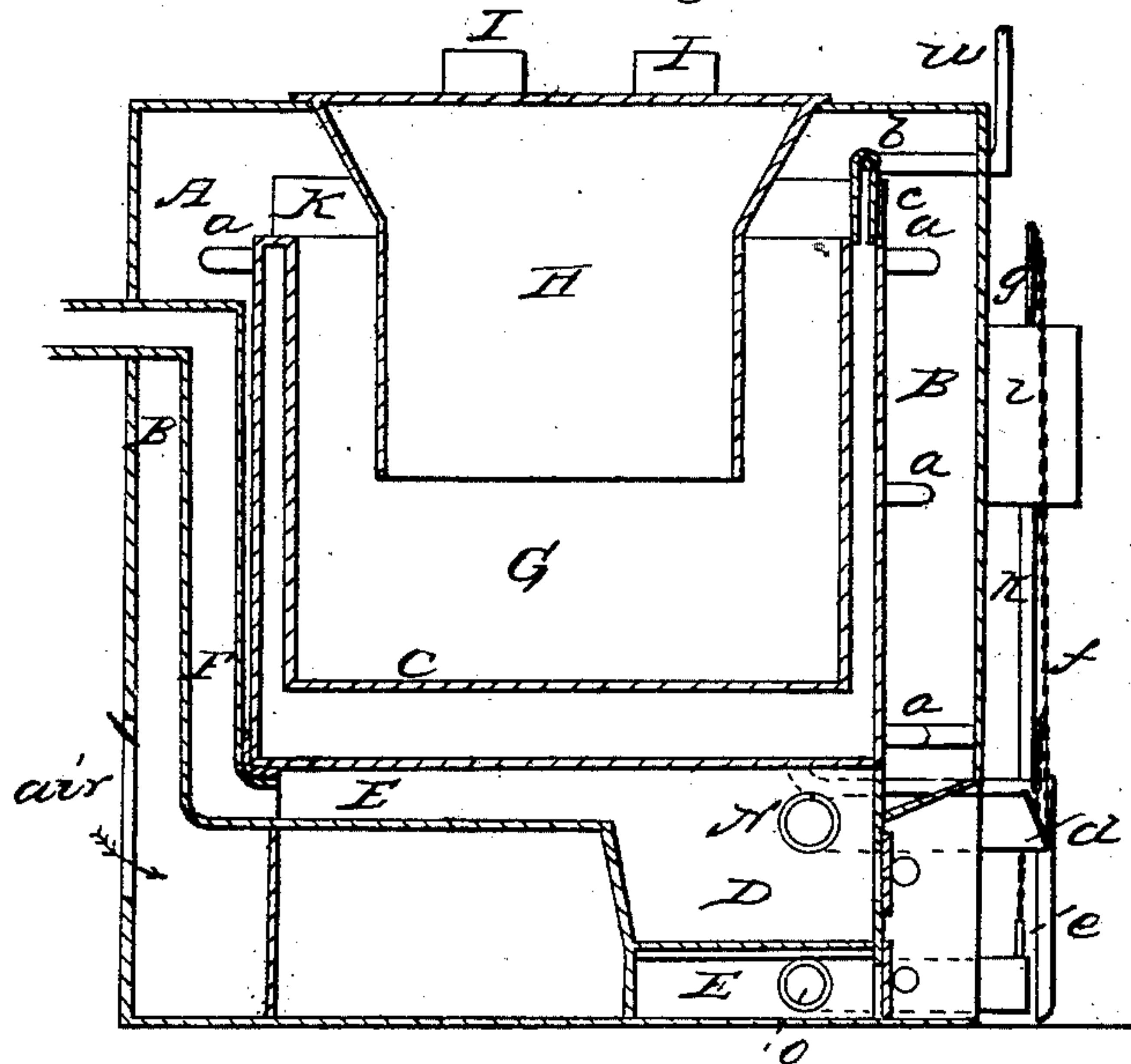


Fig. 6,



UNITED STATES PATENT OFFICE.

GEO. S. G. SPENCE, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR HEATING BUILDINGS.

Specification of Letters Patent No. 24,590, dated June 28, 1859.

To all whom it may concern:

Be it known that I, GEORGE S. G. SPENCE, of Boston, in the county of Suffolk and State of Massachusetts, have invented an
5 Improved Apparatus for Heating Buildings by Hot Water and Steam as Auxiliary Thereto; and I do hereby declare that the same is fully described and represented in the following specification and the accom-
10 panying drawings, of which—

Figure 1, is a top view; Fig. 2, a front elevation; Fig. 3, a side elevation; Fig. 4, a horizontal section, Fig. 5, a vertical and transverse section and, Fig. 6, a vertical and
15 longitudinal section of it.

The nature of the invention consists in the peculiar form of the boiler; first, having a large horizontal surface below to receive heat from the fuel chamber, and on its up-
20 per surface to discharge into the discharge hot air pipe; second, having in its vertical part an internal and external radiating surface for heating the cold air passing over the same.

25 In such drawings, A, denotes the outer case, which may be constructed of metal or brickwork and so as to form a chamber, B, for the reception of the air and heat radiating apparatus to be hereinafter described.

30 A boiler, C, with its fire place, D, and ash pit, E, are arranged within the chamber, B, as shown in the drawings, particularly in Figs. 5 and 6, thereof, the external surface of the fire-place and the smoke chamber, E',
35 as well as that of the smoke discharge pipe F, being so arranged as to radiate heat into the chamber, B, while the boiler is heated by the fire on the fire place and also radiates heat into such chamber.

40 The boiler, C, is an upright vessel, constructed with its opposite sides parallel and with an air chamber, G, recessed in it or extending down vertically into it, as shown in Figs. 4, 5, and 6, such air chamber being
45 open at top to receive a hot air concentrator and deflector, H, which is a metallic box projecting downward from the top of the case, A, and made open at bottom and so arranged in the air chamber, G, and con-
50 nected with one or more air discharge flues, I, I, as to cause air from the chamber, B, while the apparatus is in use to pass down between such deflector and the sides of the chamber, G, and from thence into the de-
55 flector where it will be concentrated and delivered into the escape pipes to be dis-

tributed by them to the different apartments to be warmed.

Arranged on each side of the boiler, C, and so that there may be an air space, L, 60 or, L', between it and the boiler is a thin vertical auxiliary heater, K, or, K', which extends somewhat above the boiler and is connected with it by a series of horizontal bent pipes *a, a, a*, which not only open com- 65 munication with the boiler and heater but serve to support the latter in place. Furthermore, a horizontal pipe, *b*, connects the auxiliary heaters, K, K', at their tops and is connected with the boiler by a vertical 70 pipe, *c*.

Steam and water trial cocks *x, y*, may lead from the steam and water spaces of one of the auxiliary heaters so as to enable a per- 75 son to ascertain at any time whether or not there is sufficient water in the boiler.

Besides being able to heat apartments by hot air distributed through pipes leading from the concentrator, my apparatus is also calculated to heat by means of steam carried 80 through pipes and radiators. The drawings show at *w*, the carrying steam pipe. They also show at *v*, the return pipe or that which takes back to the boiler the steam which may be condensed in the leading pipes and ra- 85 diators. The pipe *w*, extends to a radiator *u*, from which, the pipe, *v*, leads to the boiler or one of the lower pipes thereof.

From the above, it will be seen that my said apparatus combines the advantages of 90 a common hot air furnace, a hot water heating apparatus, and a steam heater. By means of it, I can not only heat pure air taken from the outside of a building, but introduce such air into a room from the hot 95 air chamber of the apparatus, and should not such air be sufficiently warm, I can add to its heat when in the room by supplying it with more heat by the steam heating pipes or apparatus which may be in such room 100 and be connected with the boiler. I also can heat the lower or nearer part or parts of a house by the hot air pipes and supply heat to more distant parts by means of the steam distribution pipes. 105

In the operation of the said heating ap- paratus, cold air is to be led into the lower part of the chamber, B. By circulating within such chamber it becomes heated, by the caloric radiated from the external sur- 110 faces of the boiler, the fire-place and smoke flue. It will rise in the said chamber and

pass into the chamber G, and from thence into the deflector or concentrator H, and escape therefrom into the discharge pipes thereof.

5 From the above it will be seen that I not only produce a very economical means of heating a building, but one which will be perfectly safe.

What I claim as my invention and desire
10 to secure by Letters Patent is—
The arrangement of the elevated sides of

the boiler, in combination with the pipe H or its equivalent, depressed within the same for heating and distributing the air in the manner and for the purpose set forth. 15

In testimony whereof I have hereunto set my signature.

GEO. S. G. SPENCE.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.