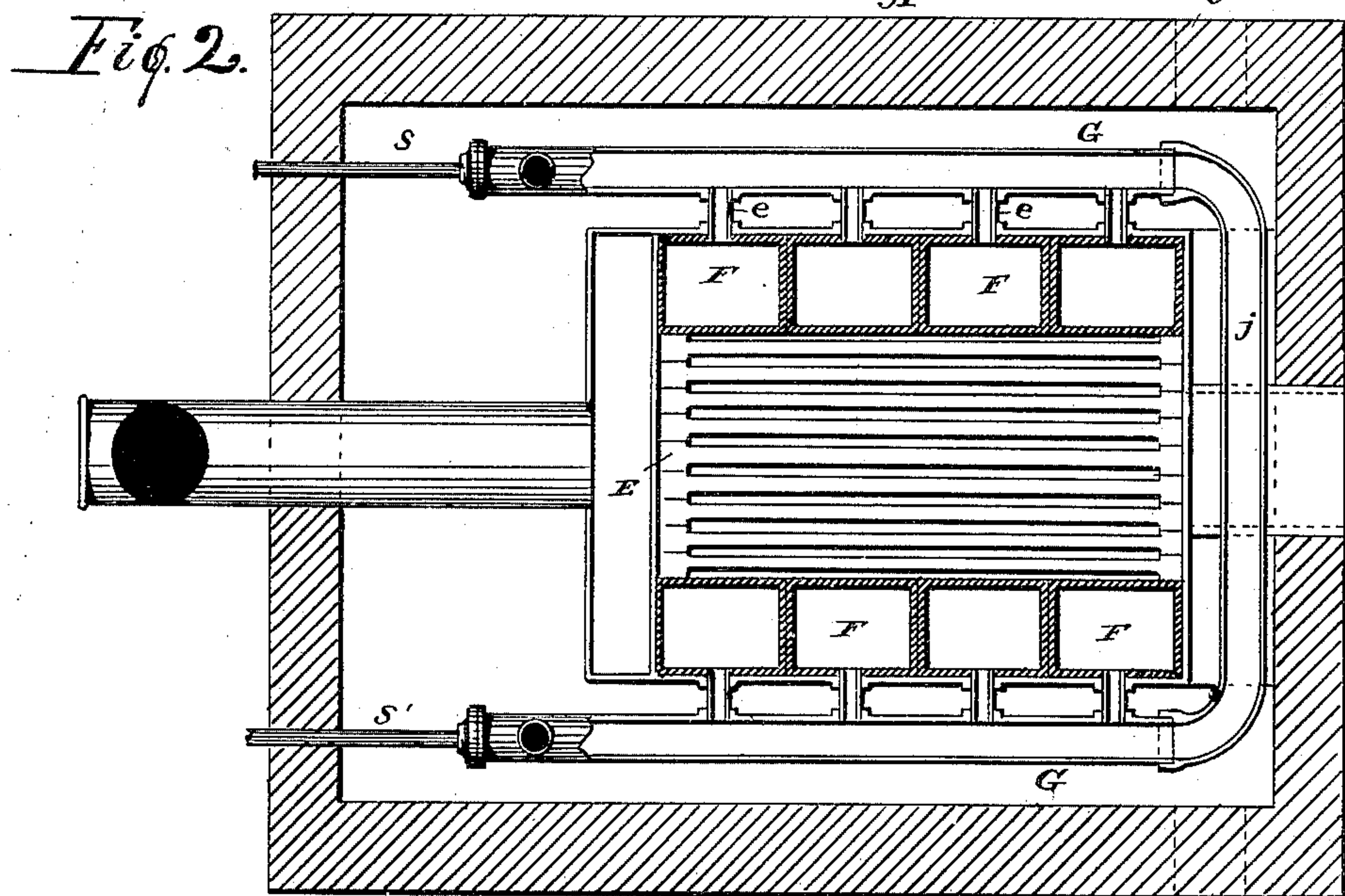
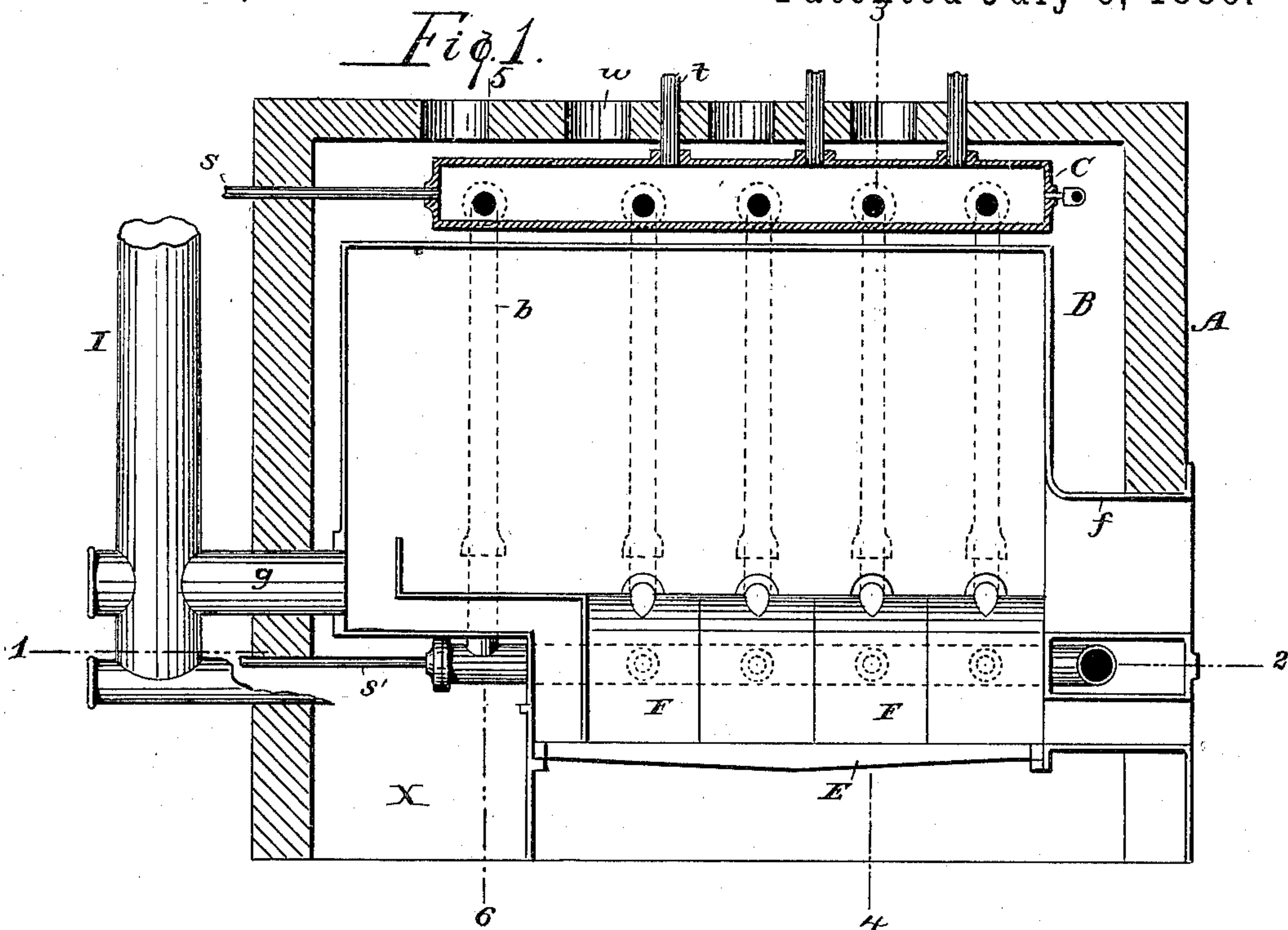


W. H. BROWNE.  
HEATER.

No. 344,812.

Patented July 6, 1886.



WITNESSES

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(No Model.)

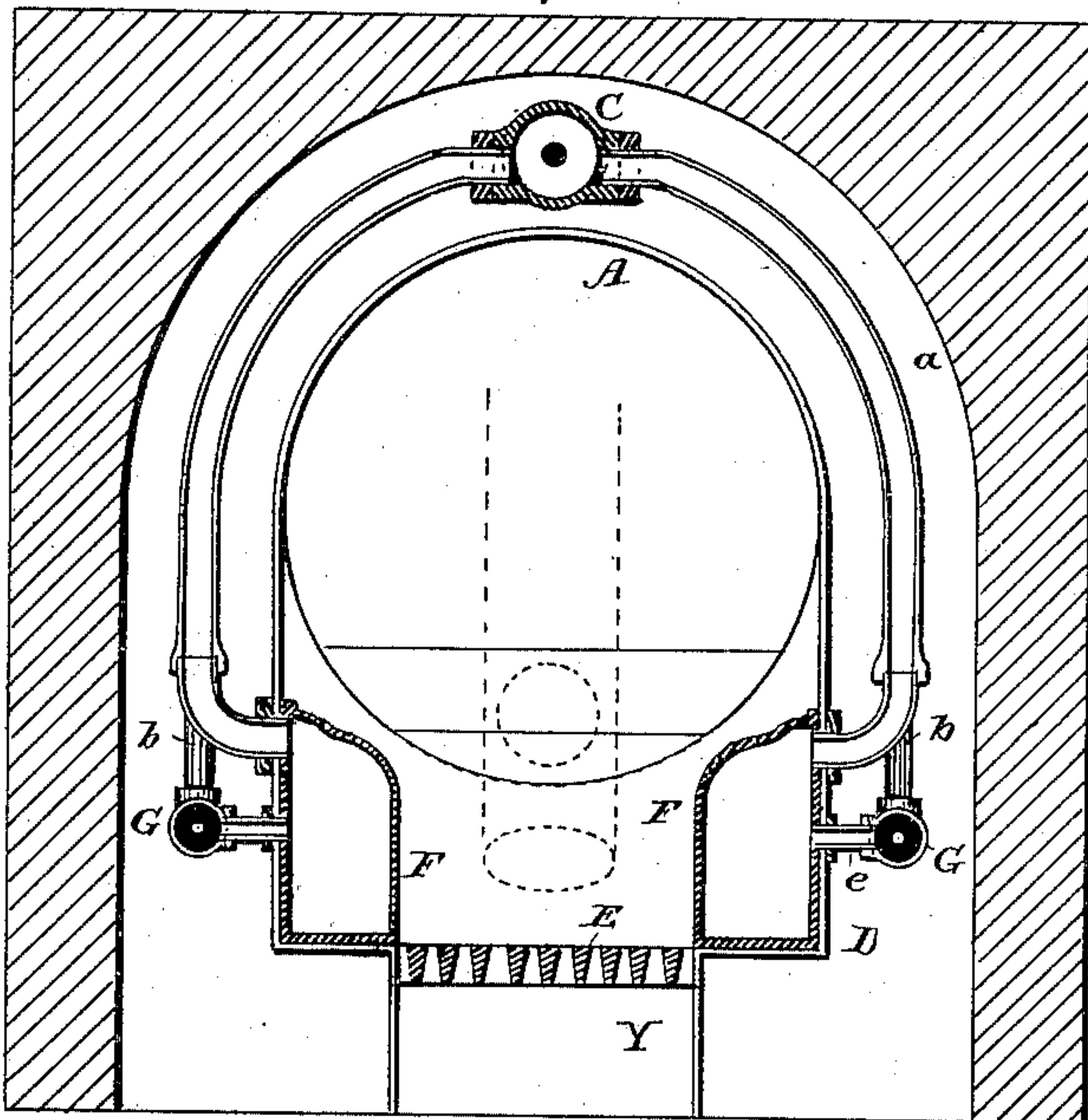
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W. H. BROWNE.  
HEATER.

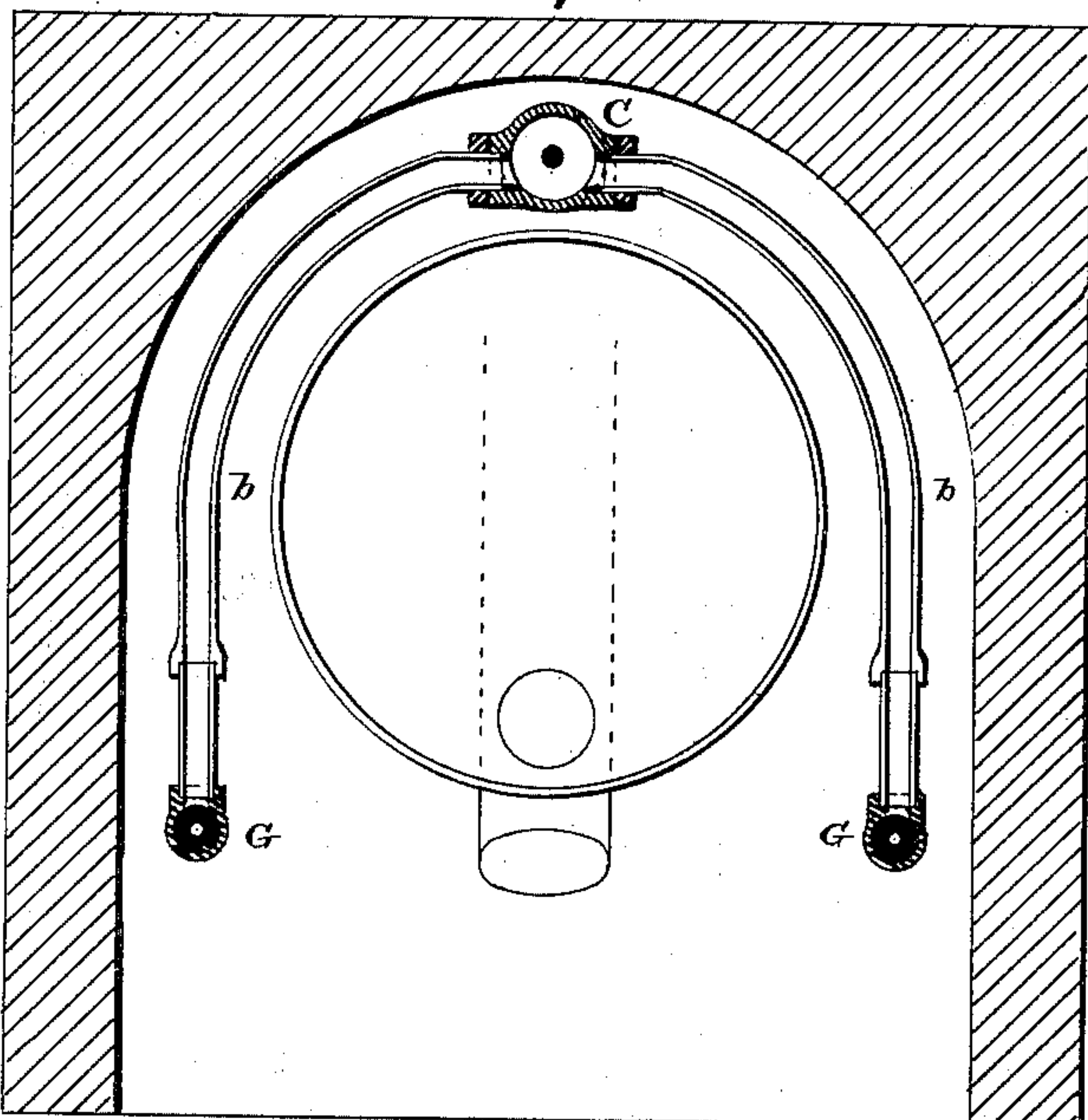
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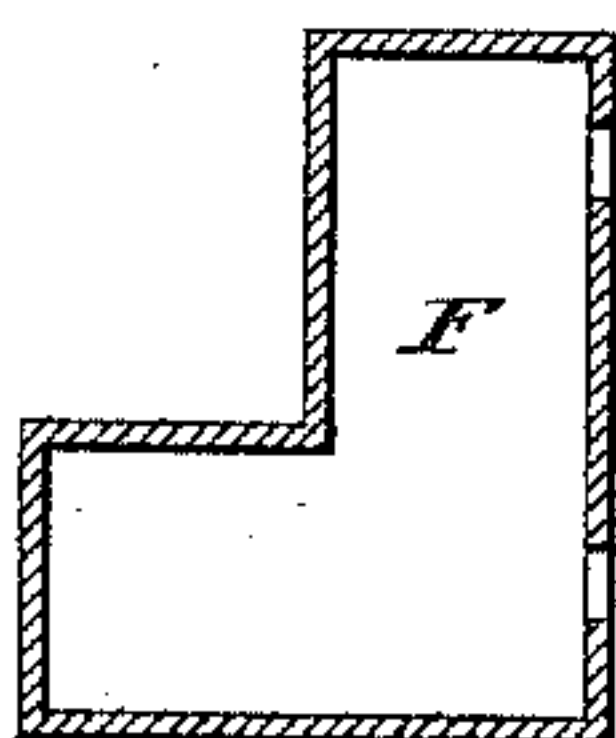
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

WILLIAM H. BROWNE, OF BROOKLYN, NEW YORK.

## HEATER.

SPECIFICATION forming part of Letters Patent No. 344,812, dated July 6, 1886.

Application filed June 2, 1885. Serial No. 167,430. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. BROWNE, of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

My invention is a heater consisting of an outer casing, an inner shell, and certain drums, and water-boxes arranged within the shell and communicating with the drums, all as fully set forth hereinafter, whereby I am enabled to circulate both steam and hot water through radiators, coils, &c., and to also supply apartments in addition with an abundant volume of hot air, the said heater being illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the improved heater; Fig. 2, a sectional plan on the line 1 2, Fig. 1; Fig. 3, an elevation on the line 3 4, Fig. 1; Fig. 4, an elevation on the line 5 6, Fig. 1; Fig. 5, a section illustrating a modified form of water-box.

A represents the outer casing, of masonry, sheet-iron, or other material, inclosing the hot-air chamber X of the heater, and within this chamber is arranged a metallic shell or casing, B, inclosing a grate, E, and which is provided with a neck, *f*, extending through the wall A, affording access to the fire-chamber above the grate, communicating through a pipe, *g*, at the rear with the uptake or flue I. The shell B is smaller than the chamber within which it is situated, but increases in diameter above the ash-pit Y, affording ledges upon which, within the shell and surrounding or on each side of the grate, rest a series of independent water-boxes, F, each preferably of cast metal, and communicating through a short pipe, *e*, extending through the shell D, with the longitudinal drum G, the two drums upon the opposite sides being connected by a pipe or drum, *j*. Each box also communicates at a point above the pipe *e* with the lower end of a pipe, *a*, extending upward, preferably outside the shell, to and communicating with a steam-drum, C, arranged above the shell; and the steam-drum C communicates through one or more pipes, *b b*, with the drums G. Pipes *s*, *s'*, and *t* lead from the drums G C to the radiators within the building, and the air is admitted to the chamber X through openings *v*, dotted lines Fig. 2, suitably arranged, and

passes through openings *w*, at the top of the outer casing, through pipes to the apartments to be heated. The boxes F are heated by contact with the fire, and the water which passes into the said boxes from the drums G becomes rapidly and thoroughly heated in the said boxes, and then circulates upward as hot water or steam, through the pipes *a*, to the drum C, and descends therefrom through the pipes *b*, again to the drums G G, so as to flow again into the boxes, whereby a continuous circulation is maintained between the boxes and drums, so as to heat the water with rapidity, and discharge the steam from the circulation as rapidly as it is formed, so that there is no interruption of the circulation. While the water becomes heated and passes into the circulation, and may be conducted as hot water or steam through the pipes *s t* to the radiators or coils within the chambers to be heated, it also heats the outer sides of the boxes F, which are in contact with the shell D, and heats the latter in connection with the gases from the fire, which also pass in contact with the shell, and thereby heats the air within the chamber X, so that an abundant supply of heated air is continuously discharged through the openings *w*, which heated air may be conducted either to the chambers within which the radiators are situated, so as to supplement the effect of the latter, or to other chambers, where it is not desired to have such radiators. Where steam-heat is required, the radiators are connected to the pipes *t*, leading from the top of the drum C, so as to carry the steam from the water in the said drum, while the drip-pipes from the radiators are put in communication with the pipes *s*, leading to the drums G. It will be noticed that the boxes F are comparatively limited in size, which not only facilitates the adjusting of the same in place, but also permits them to be cast readily, and facilitates repairs to the furnace in case it should be necessary to remove any of the parts. By making the boxes F small in size and wholly independent of each other the expense of the repair in case of one of the boxes becoming broken is greatly reduced, and by connecting all the boxes to a single drum at each side, but outside of the shell, I am enabled to maintain an abundant supply of water without putting them into direct communica-



tion with each other, and am enabled to obtain ready access to the connections when necessary for repairs. By putting the drums C G in communication with each other I prevent any clogging of the circulation.

In some cases the water-boxes may be carried completely around the fire-box, in which case the corner boxes may be of the angular shape shown in Fig. 5.

I am aware that furnaces have been provided with water-boxes and tubes, and do not claim them, broadly; but it will be observed that my water-boxes are wholly independent of each other, and have independent connections with the drums, as above described.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. A furnace provided with an outer casing, A, an inner shell, B, containing the grate, drums on each side of the shell within the casing, and with a series of independent water-boxes arranged within the shell in proximity to the grate, and each communicating through

circulating-pipes with the drums, substantially as set forth.

2. The combination, with the grate and shell of a furnace, of independent water-boxes arranged within the shell, drums C G, outside of the shell, pipes *e*, extending one from each box to one of the drums G, and pipes *a*, extending from each box to the central drum, C, and pipes *b*, constituting a communication between the drums C and G, substantially as described.

3. The combination of the outer casing, inner shell containing a fire-pot, independent water-boxes arranged within the shell, drums outside the shell, and pipes, whereby they communicate independently with the water-boxes and with each other, substantially as described.

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

WM. H. BROWNE.

Witnesses:

WM. LEWIS,

L. E. SPENCER.