

No. 820,130.

PATENTED MAY 8, 1906.

D. S. RICHARDSON.
HEATING FURNACE.

APPLICATION FILED OCT. 22, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

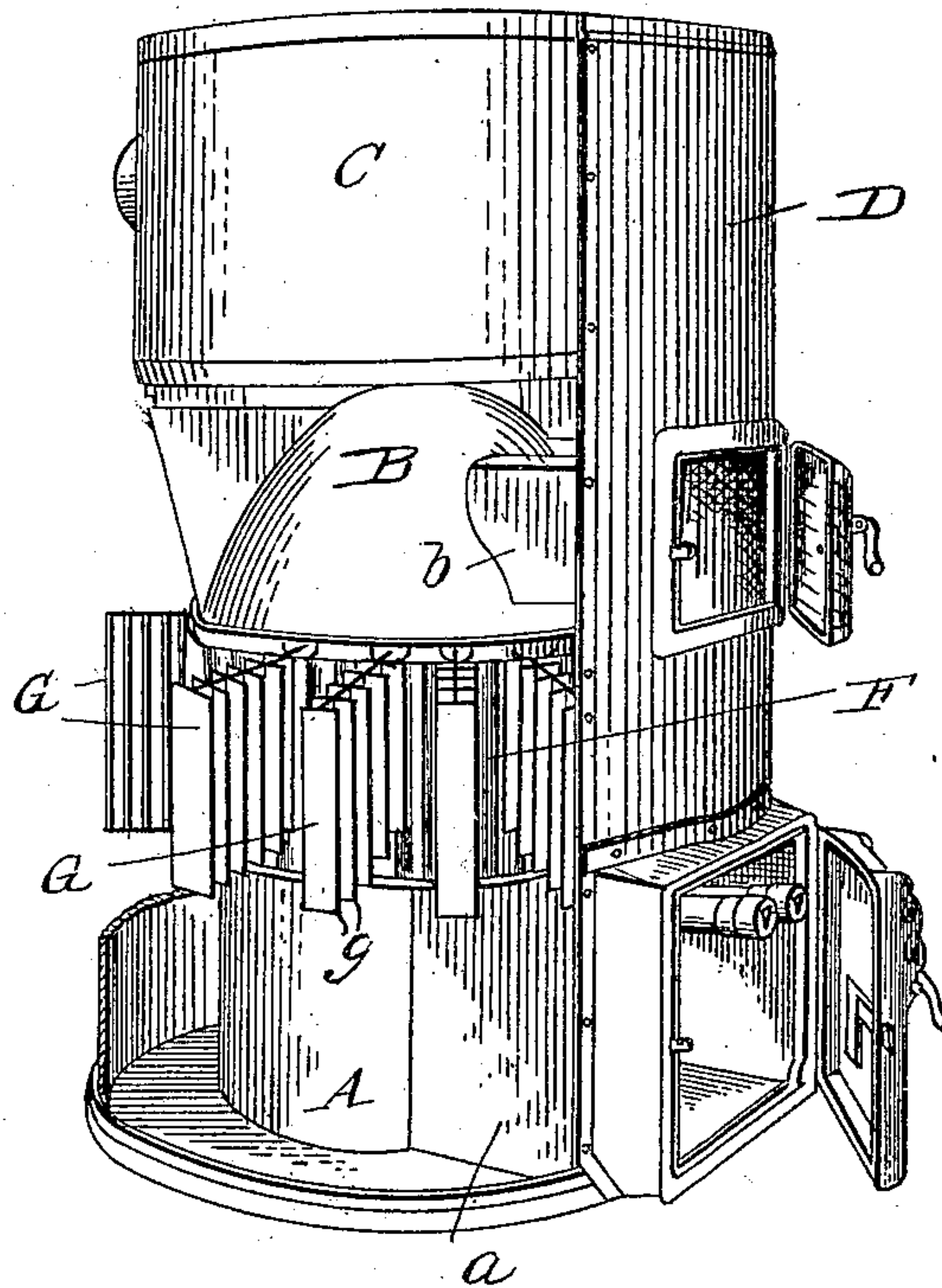
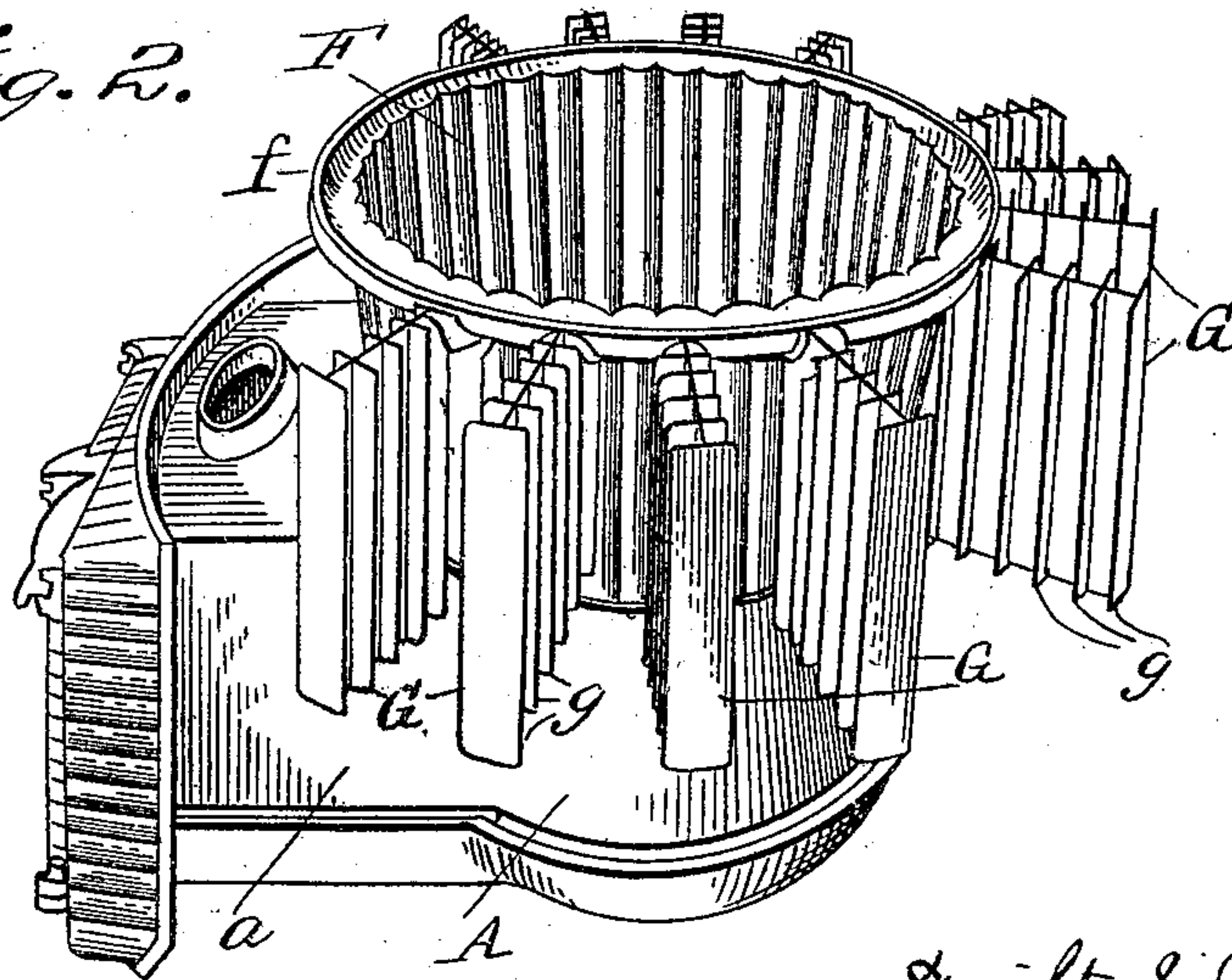


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

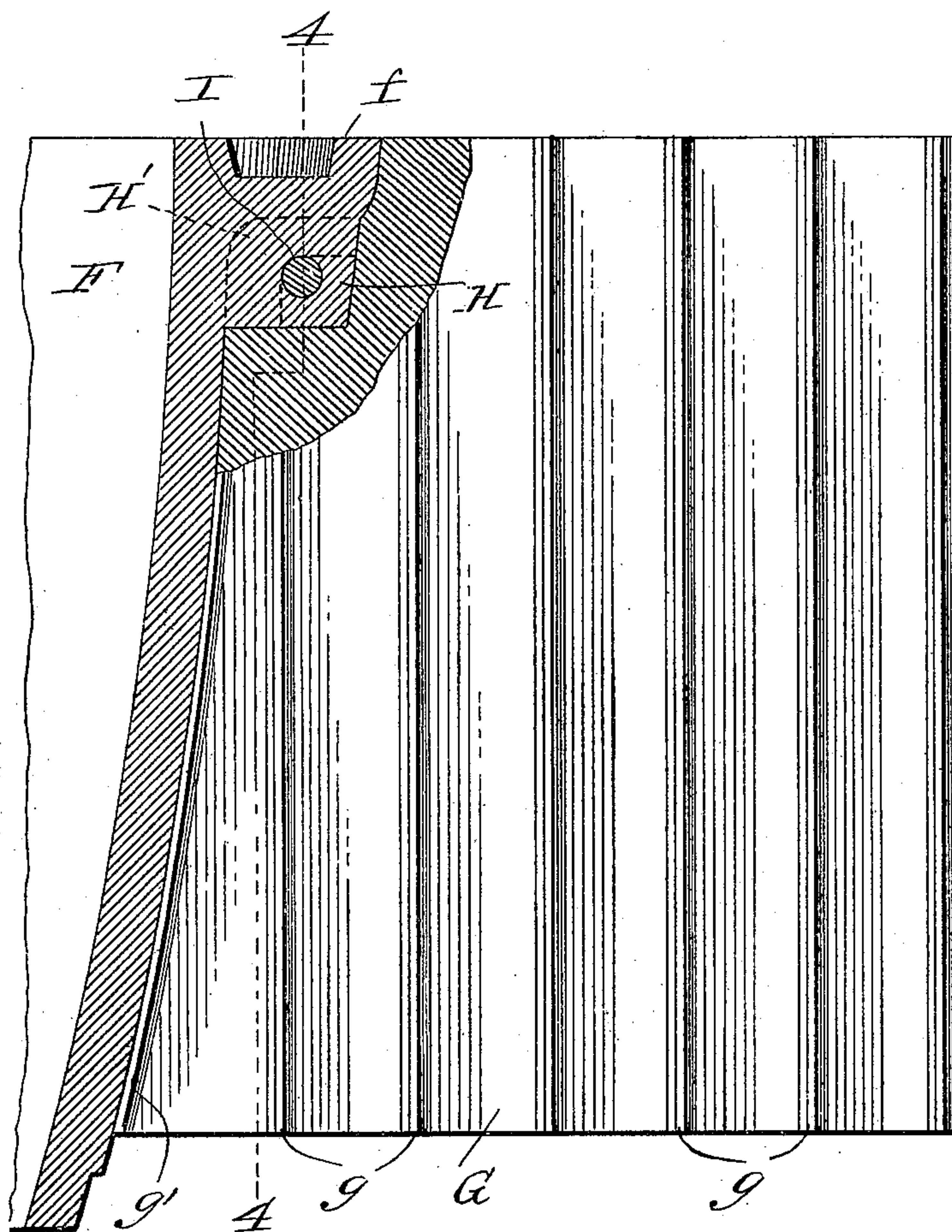
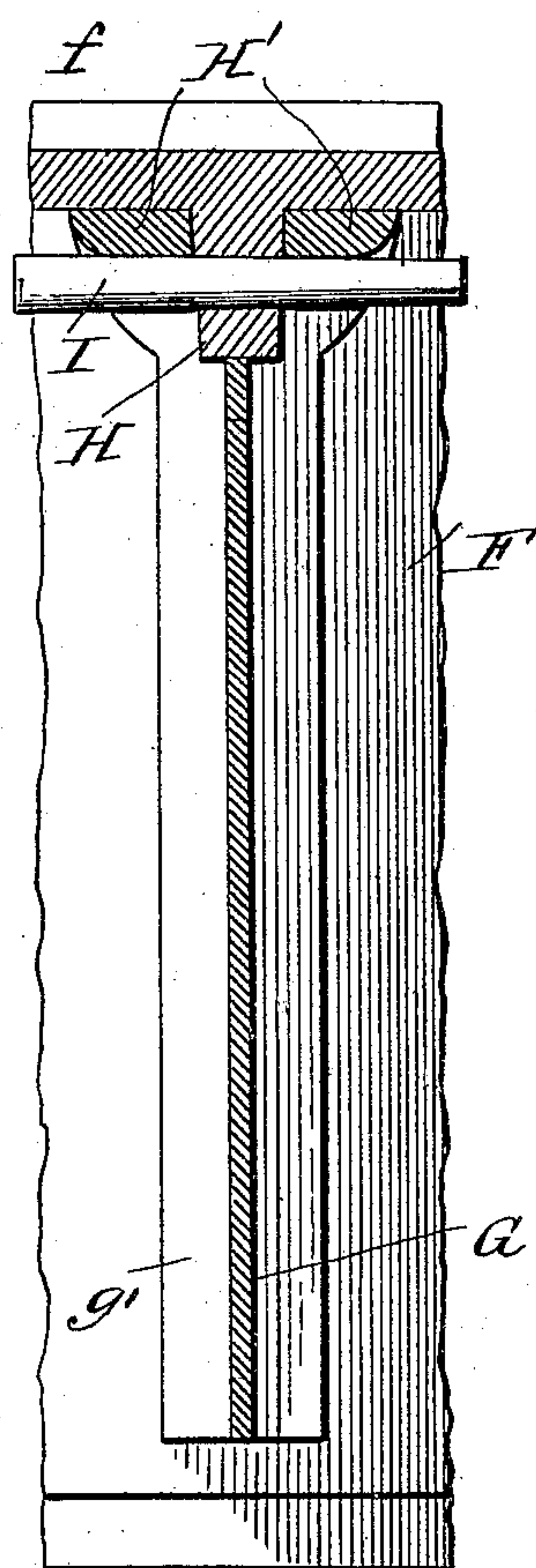


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HEATING-FURNACE.

No. 820,130.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed October 22, 1904. Serial No. 229,595.

To all whom it may concern:

Be it known that I, DWIGHT S. RICHARDSON, of New York, in the State of New York, have invented certain new and useful Improvements in Heating-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to heating-furnaces, and more especially to the construction of the fire-pot and its associated parts, the objects of the invention being to increase the radiating-surface of the fire-pot, prolong the service-life of the pot, reduce the cost of production, and provide a structure which may be shipped conveniently without danger of breakage.

The invention consists, primarily, in a cast-iron fire-pot in the form of an integral casting, having its wall of substantially uniform cross-section to permit of expansion and contraction without distortion or breakage due to excessive variations in temperature, and a series of vertical or substantially vertical radially-arranged radiating-flanges contacting along their inner edges with the outside of the fire-pot, but not integral therewith.

The invention further consists in a cast-iron fire-pot having its wall vertically corrugated and vertically-extending radiating-flanges removably secured to and with their inner edges contacting with the outer face of the fire-pot.

The invention further consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a view of a furnace embodying the present invention, the casing being removed. Fig. 2 is a perspective view of the fire-pot and ash-pit. Fig. 3 is a detail vertical section radially of the fire-pot. Fig. 4 is a detail vertical section on the line 4-4, Fig. 3.

Similar letters of reference in the several figures indicate the same parts.

In so far as the general construction of the furnace is concerned it may be of any preferred or usual type, and for the purposes of illustration I have adopted a well-known type of hot-air furnace embodying an ash-pit A, a combustion-chamber or dome B, between which and the ash-pit the fire-pot to be

presently described is located. Above the combustion-chamber is a drum or radiator C, the whole of these parts being inclosed in a casing which in the drawings is shown broken away with the exception of a small section at D. In this particular furnace the combustion-chamber B and ash-pit A have forward extensions *b* and *a* opening out at the front of the casing and constituting the openings for the admission of fuel and the withdrawal of ashes, said openings being adapted to be closed by the usual doors.

The fire-pot of the furnace holding, as it does in use, the mass of incandescent fuel constitutes the hottest part of the structure, and therefore its exterior surface is the most direct and efficient radiating-surface. Heretofore many efforts have been made to increase this radiating-surface; but in the practical solution of the problem many difficulties have been encountered. The difficulties heretofore encountered are overcome in the present invention, and the fire-pot itself (lettered F in the accompanying drawings) is cast in accordance with the best modern practice, usually in a single uniform casting, although, as usual, it may be in several rings one above the other, the upper edge being provided with a flange and seat *f* for the lower edge of the dome or combustion-chamber.

Arranged radially around the fire-pot are a series of radiating-plates G, preferably cast separate from the fire-pot, but mounted with their inner edges in contact with the exterior surface of the pot, so as to be heated by conduction from the pot itself. These radiating plates or flanges are preferably relatively thin and have lateral vertically-extending ribs *g*, which serve to vastly extend their surface area. The inner edges of the plates conform to the surface contour of the fire-pot, so as to make close contact therewith, and the contacting-surface is increased by widening or forming an edge flange *g'* thereon. Various means may be employed to retain the plates or flanges in place, an efficient, cheap, and convenient means consisting of lugs H on the fire-pot, located below and braced by the flange *f* and cooperating lugs H' on the plates or flanges, through which lugs transverse pins I are passed to hold the flanges in place and draw their inner edges against the surface of the fire-pot.

The radiating plates or flanges are arranged around the fire-pot in the path of the air passing up within the casing, but are pref-

erably omitted from the front of the pot where the ash-pit and fuel extensions are located, so as to permit the air to circulate freely across the front of the fire-pot. As shown, the fire-pot is of the ordinary corrugated type and the inner edges of the flanges are usually arranged to fit in the depressions or hollows, as shown. The number of radiating plates or flanges is optional, and in practice it is customary to employ a relatively large number and to make them of sufficient width to extend out into proximity to the casing in order that every part of the ascending arm may be brought into intimate relation to a surface which is heated by conduction.

In shipping a furnace embodying the present invention the radiating plates or flanges are packed separate from the fire-pot and are mounted on the fire-pot after the latter is set and the work so far finished that there is little or no danger of breakage by the workmen setting the other parts of the structure. Sufficient space is left between the inner edges of the flanges to permit of the insertion of the holding-pins. Thus each plate or flange is separately mounted and each may be removed or renewed should occasion require without disturbing any of the others.

It will be noted that with the present invention the fire-pot is free to expand and contract uniformly. Thus the pot is not cracked or broken, as experience has demonstrated will be the case where radiating flanges or projections are cast integral with the pot, so as to make the wall thick at the flanges or projections and thin between the same. Furthermore, all danger of the parts being broken during transportation is overcome, and the cost is no greater than that of the ordinary fire-pot plus the cost of casting the separate radiating plates or flanges, and the latter is a

simple and inexpensive proposition, especially where, as is usually the case, the plates or flanges are duplicates and may be cast from a single pattern or gate of patterns.

Aside from the fire-pot construction I do not wish to be understood as limiting the invention claimed to the particular type of furnace adopted for illustration, and hence in the claims, where a "furnace of the character described" is referred to, it is to be understood as meaning all heating-furnaces of this general class where the fire-pot constitutes or may be made to constitute a radiator heated by conduction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a fire-pot, vertical radiating-plates arranged radially with respect to the fire-pot and means for suspending the plates in contact with the outer surface of the fire-pot, said suspending means being connected with the said plates above and on the fire-pot side of the center of gravity thereof, whereby said plates will be held by gravity in close contact with said fire-pot.

2. The combination of a fire-pot, vertical radiating-plates arranged radially with respect to the fire-pot and means interposed between the top portion of the fire-pot and plates for suspending the plates in contact with the outer surface of the fire-pot, said suspending means being connected with the plates on the fire-pot side of the center of gravity thereof, whereby said plates will be held by gravity with one edge in close contact with the fire-pot.

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Witnesses:

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