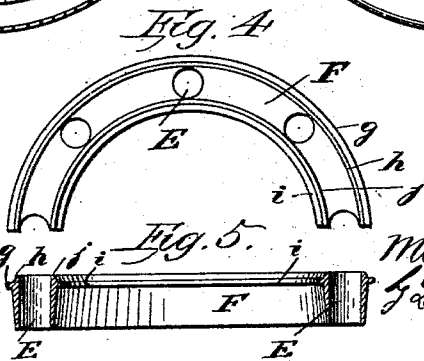
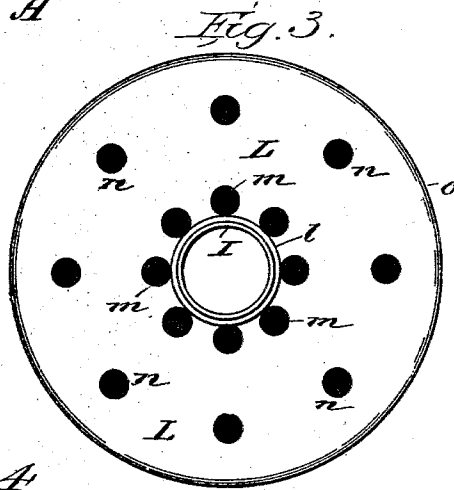
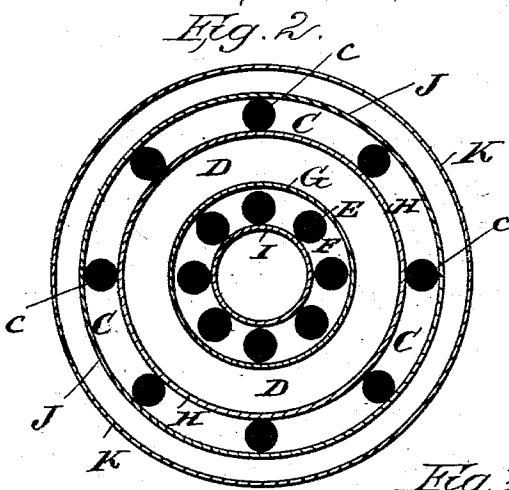
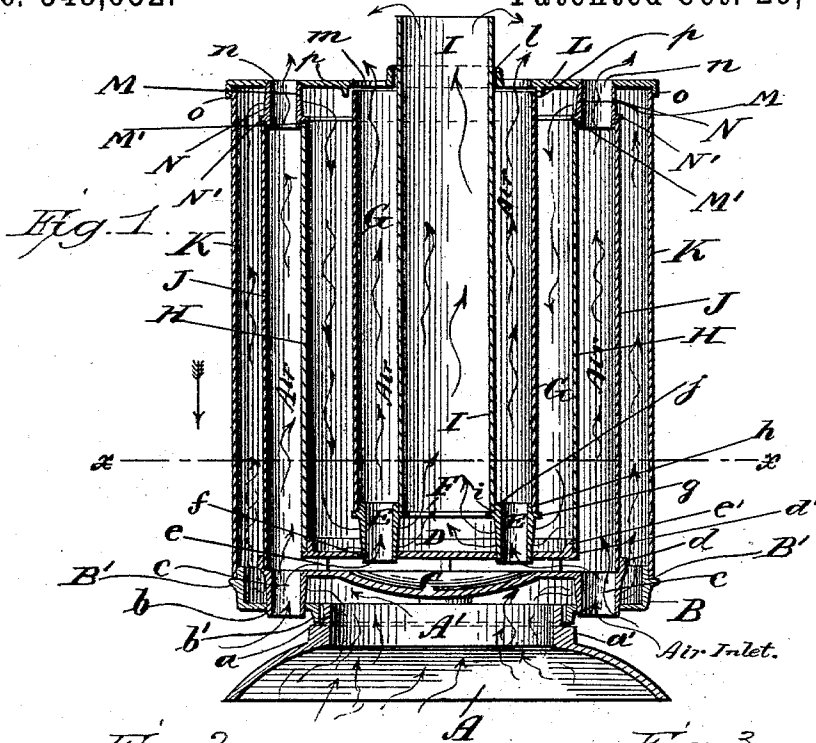


(No Model.)

M. L. NYBERG.
HEATING APPARATUS.

No. 548,652.

Patented Oct. 29, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

MATTS LEANDER NYBERG, OF ERIE, PENNSYLVANIA.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 548,652, dated October 29, 1895.

Application filed January 24, 1895. Serial No. 536,085. (No model.)

To all whom it may concern:

Be it known that I, MATTS LEANDER NYBERG, a citizen of the United States, and a resident of Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Heating Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a sectional view on a vertical plane through the middle of my improved heating apparatus. Fig. 2 is a transverse sectional view on the horizontal plane indicated by the broken line marked *xx* in Fig. 1. Fig. 3 is a top view or plan of the apparatus. Fig. 4 is a plan of a half part of the lower apertured annular seat F, which supports the central smoke-flue and its concentric drum; and Fig. 5 is a transverse sectional view through the center of the same, said Figs. 4 and 5 showing the ring-formed seat or annulus F as of larger diameter than it is represented in the other figures, in order to better illustrate the details of its construction.

Like letters of reference indicate corresponding parts in all the figures.

My improvement relates to heating apparatus in the nature of a combined "hot-air" and "radiating" attachment to stoves or fireplaces of that type which consists of a series of concentric drums or cylinders in combination with intermediate concentric series of chambers forming hot-air flues; and it consists in the detailed and specific construction and combination of the flanged and apertured annular seats for the concentric drums and flues, as hereinafter more fully described and claimed, whereby the heater may be readily taken apart for cleaning when desired, in addition to which other important advantages result from my improved construction.

On the accompanying drawings the reference-letter A denotes a metal (preferably iron) cap or hood of circular concavo-convex shape, adapted to be fitted over the open top of a stove or fireplace (not shown) so as to receive and converge the products of combustion.

This hood has a large central circular aperture A', encircled by a raised rim or flange *a*, which is made with an exterior offset or shoulder *a'*. Upon this circular ledge or shoulder rests an annulus B, which has a series of circular apertures *b*, and is also provided with a circular depending flange *b'*, adapted to rest upon the circular shoulder *a'* of the hood or cap A. Into the circular apertures *b* of the annulus B are dropped the lower slightly taper ends of short tubes *c*, which are cast upon and depend from a circular concavo-convex plate C, the depressed or dish-shaped middle part of which is immediately above the flanged central opening A' in the hood A. The flat outside rim of this dish-shaped base-plate C is made with an upwardly-projecting flange *d*, and is also provided, some distance inside of the flange, with a series of short pillars *e*, arranged in a circular row concentric with the short depending and tapering tubes *c*. This row of posts or pillars supports a flat circular plate D, having an exterior upwardly-projecting rim or flange *e'*, and also a circular row of apertures *f*, which receive the tapering lower ends of a set of short tubes E, cast in one piece with and depending from a ring-formed seat or annulus F which is supported upon, but some distance above, plate D by means of the depending short tubes E, the tapering lower ends of which are inserted and fit into the circular apertures *f* in plate D, as clearly illustrated in Fig. 1.

The ring-formed seat or annulus F is cast with four concentric circular flanges, (see the detail views of this ring-formed seat, Figs. 4 and 5,)—viz., the exterior horizontal ledge or flange *g*. Inside of that and on the same—i. e., outer—side of the tubes E another upright flange or shoulder *h*; then and on the opposite or inner side of the circular row of tubes E comes the vertical circular flange or shoulder *j*, corresponding to flange *h*, and, finally, the innermost flat or horizontal flange *i*, corresponding to and concentric with the exterior or outermost flange *g*. This innermost circular ledge or flange *i* forms the support for the central cylindrical smoke-flue I, the lower end of which impinges upon the raised flange *j*, which keeps it (flue I) in place. Another larger cylinder G is similarly supported upon the ex-

terior ledge or flange *g* of the ring-formed seat or annulus *F*, impinging with its lower end against the raised flange *h*. A third cylinder *H* of still larger diameter is placed outside of and concentric with the inner cylinders *G* and *I*, resting with its lower end upon the exterior circular flange or ledge *d'* of plate *D*, so as to impinge and encircle with its open lower end the circular-raised flange or shoulder *e'* appertaining to plate *D*. This cylinder *H* is in turn encircled by the still larger cylinder *J*, the lower end of which rests upon the circular offset formed on plate *C* by the setback of its raised rim or flange *d*, against which the outside of the lower open end of cylinder *J* impinges in alignment with the short tubes appertaining to plate *C*, so that air from the outside may freely enter the annular space or chamber between the concentric cylinders *H* and *J* through said tubes *c*, the tapering lower ends of which are inserted through and rest in the registering circular apertures *b* in the annular bottom plate *B*. Finally, and as a casing for the whole apparatus, I place the outside cylinder or jacket *K* upon the bottom ring *B*, with its open lower end resting upon the exterior projecting narrow ledge or flange *B'* of said ring or annular bottom plate *B*. This completes the building up of the heater as a whole, with the exception of the flat circular top plate or covering-plate *L*, which is of such a size and shape that it will fit tightly over the top of the entire apparatus, its exterior depending flange or rim *o* overlapping the upper open end of the outside cylinder *K*. This top plate or cover *L* has a central circular aperture, encircled by a raised flange *l*, for the insertion of the central smoke-flue *I*, and is further provided with two concentric rows of circular apertures—viz., an inner row of apertures *m*, which are in alignment with the annular space or air-chamber formed by and between the concentric inner cylinders *I* and *G*, registering with the corresponding inlet-tubes *E* at the lower end of said chamber or air-space, and another exterior row of similar circular apertures *n*, which are in alignment with the annular space or air-chamber formed by and between the concentric cylinders *H* and *J* and register with the inlet-tubes *c* at the lower end of said air-chamber. The top plate *L*, in addition to its central flange or rim *l* and exteriorly depending overlapping flange *o*, is provided with a concentric short depending flange *p* on its under side, which impinges against the upper end of cylinder *G* on the outside. In addition to this, it has two other deeper depending or downwardly-projecting webs or flanges *M* and *N* concentric with each other and with flanges *l* and *p* and provided, respectively, near their lower ends with lateral rims or side flanges *M'* and *N'*, the function of which will readily be understood by reference to Fig. 1, from which it will be seen that the circular deep depending web or flange *M* of plate *L* impinges with its lower end

against the upper end of cylinder *H*, its laterally-projecting flange *M'* overlapping the top rim of said cylinder *H*; and, similarly, the other outer deep depending web or flange *N* impinges with its lower end against the upper end of cylinder *J*, the upper rim of which abuts against the under side of the laterally-projecting flange or offset *N'* appertaining to flange *N*.

From the foregoing description, taken in connection with the drawings, the operation of my improved combination hot-air apparatus and radiator will readily be understood without further description, as I have indicated by arrows both the course of the atmospheric air which passes through the apparatus to be heated and also the course of the products of combustion.

It will be seen that the atmospheric air enters the heater through the circular row of air ducts or inlets *c*, part of this air passing up through the annular chamber between cylinders *H* and *J*, where it is heated and escapes as hot air out into the room in which the apparatus is placed through the apertures *n n* in the top plate, while another portion of the volume of air entering the apparatus from the outside through the ducts *c* is deflected to one side, and, passing through the narrow space between the horizontal plates *C* and *D*, (which are separated by the short posts or pillars *e* on the bottom plate *C*), enters the tubes *E*, and through these the annular heating-chamber between the concentric cylinders *G* and *I*, from where, after becoming thoroughly heated, it escapes on top through the circular series of apertures *m* in the top plate *L*. The smoke and products of combustion escape through the tortuous passage afforded by and between the several concentric cylinders and central smoke-flue *I*, the top of which is extended beyond or above the apertured flat top plate *L* and connected by an elbow or smoke-pipe with the chimney. A damper of any desired construction (not shown) may be placed within the extended upper end of the central smoke-flue *I*, so that the draft may be easily and conveniently regulated from the outside.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

The combination, in a heating apparatus of the class described, with the convex hood *A* having a large central flanged opening provided with an exterior offset or shoulder *a'*; of the flanged bottom annulus *B* having circular shoulder *B'* and a circular row of bottom apertures *b*; concavo-convex bottom plate *C* provided on its upper side with a circle of short pillars *e* and on its under side with a concentric series of depending tubes or inlet ducts *c*; flanged and apertured plate *D*; ring-formed seat or annulus *F* having flanges *g, h, i*, and *j*, and provided with a circular series of depending tubes *E*; concentric cylinders *I, G, H, J*, and *K*; and the top-plate *L* having

a central circular flanged opening and two concentric rows of circular apertures coinciding respectively with the bottom inlets c and E; said several elements being constructed
5 and combined substantially in the manner and for the purpose herein shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

MATTS LEANDER NYBERG.

Witnesses:

GEO. F. DIEHL,
HENRY E. FISH.