(No Model.) 2 Sheets—Sheet 1.

L. P. D. YOST.

HEATING FURNACE.

No. 524,370. Patented Aug. 14, 1894.

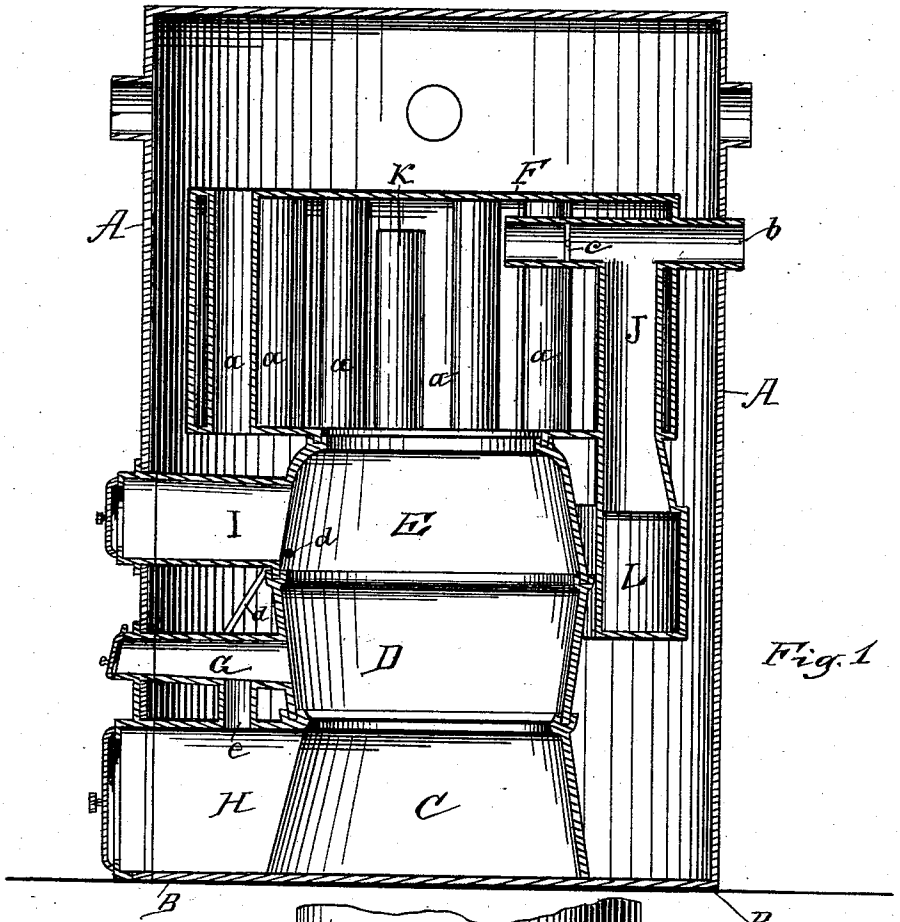

Fig. 1

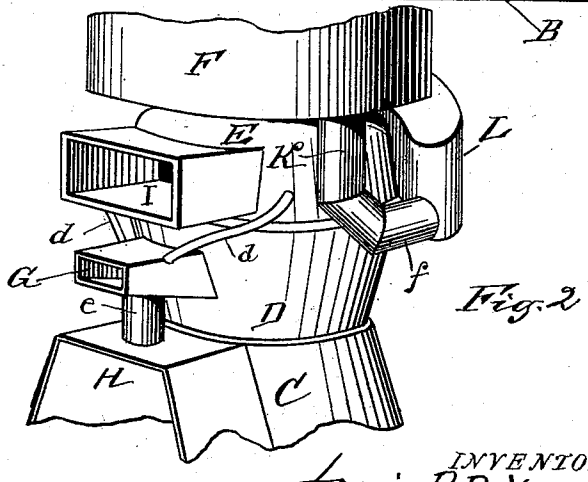

Fig. 2

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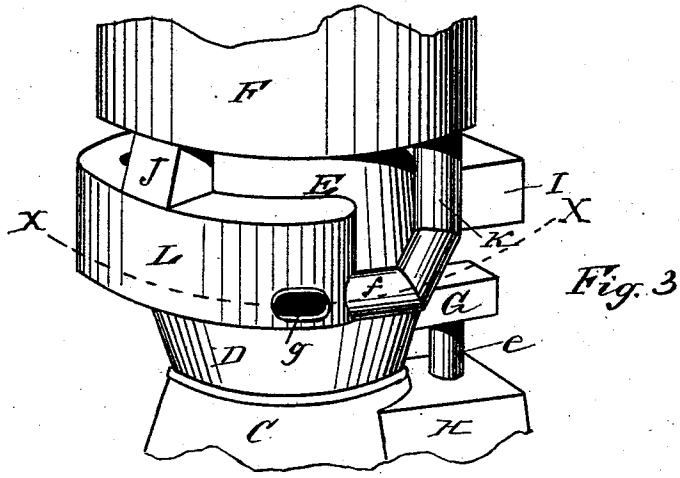


Fig. 3

Fig. 4

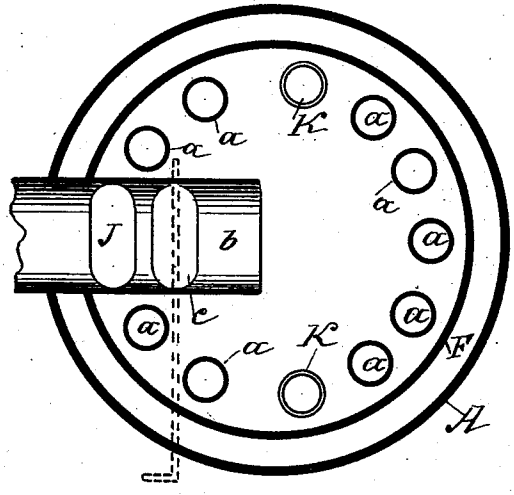
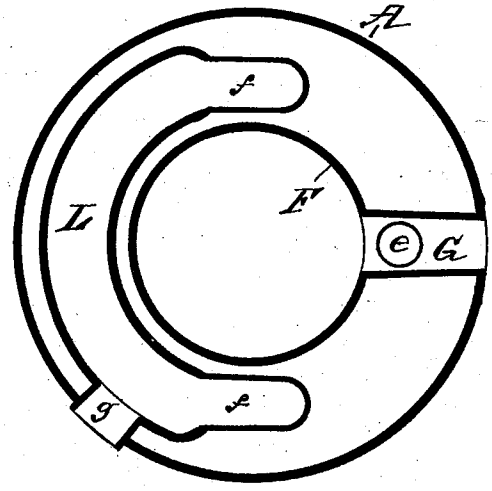


Fig. 5



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS P. D. YOST, OF CANTON, OHIO.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 524,370, dated August 14, 1894.

Application filed April 30, 1894. Serial No. 509,490. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. D. YOST, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Heating-Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1, is a vertical central section, showing the different parts properly arranged and adjusted. Fig. 2, is a detached view of the fire pot, showing a portion of the base, and illustrating a portion of the inner heating drum, also showing the position of the auxiliary heating drum. Fig. 3, is a similar view, showing the rear part of the portions shown in Fig. 2. Fig. 4, is a transverse section of the inner heating drum showing the chimney pipe or flue properly located, and illustrating the position of the casing or jacket. Fig. 5, is a transverse section on line *x x* Fig. 3.

The present invention has relation to heating furnaces and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

In the accompanying drawings A, represents the casing or jacket, which is attached at its bottom or lower end to the base B in the ordinary manner, which base may be of any desired form. The casing or jacket A, is formed of sufficient height to inclose the different parts designed and calculated to be placed within said jacket, and at the same time provide a suitable heating chamber at its top or upper end.

To the casing or jacket A, are attached in the ordinary manner, any desired number of heating pipes. The ash pit C, is attached or seated to the base B in the ordinary manner, and to the top or upper end thereof is attached the fire pot D, which fire pot is to be provided with ordinary grate bars or if desired, the grate bars may be attached to the top of the ash pit C. The top or upper end of the fire pot D is provided with the dome-shaped top E, which dome-shaped top is provided with the inner heating drum or cylinder F, said drum or cylinder being located substantially as shown in Fig. 1.

The drum or cylinder F is provided with the pipes or tubes *a*, which pipes or tubes are open at their top and bottom ends, and are so formed for the purpose of allowing the heat generated below the cylinder or drum F, to enter the top or upper end of the casing or jacket A, from whence it is to be conducted to the desired part of the building.

Within the cylinder or drum F, is located the horizontal flue, which leads to the chimney, and is constructed in the ordinary manner, reference being had to properly attaching the different parts to said horizontal flue *b*. The horizontal flue *b* is provided with the damper *c*, which damper is operated in the ordinary manner.

The front or forward side of the fire pot D is provided with the cold air conduit G, which conduit leads from the fire pot to the outside of the casing or jacket A, substantially as shown in Fig. 1. This cold air conduit is formed of such a size that it will admit a bar or poker to be passed through said conduit for the purpose of agitating the fuel and the breaking of cinders.

The cold air conduit G, is so located and arranged that the inlet of cold air will be directly over and above the grate-bars. For the purpose of providing for increased combustion, the air pipes *d* are provided, which air pipes lead from the cold air conduit G to the dome-shaped top E, thereby bringing the inner ends of the air pipes *d* above the fire pot D. The object and purpose of providing the air pipes *d* are to supply cold air to the combustion chamber proper above the bed of fuel. For the purpose of dividing the inlet of cold air two cold air pipes *d* are provided, and are entered upon opposite sides of the dome-shaped top E.

For the purpose of preventing the furnace proper from puffing, all of the air inlets are located upon the front side of the combustion chamber. Another object and purpose of lo-

cating all of the cold air inlets upon the front side, is to bring said inlets into such a position that they can be easily cleared should they become choked or clogged.

The bottom or under side of the cold air conduit G, is provided with the pipe *e*, which pipe connects with the ash chamber or receptacle H, by which arrangement fine ashes and dust are permitted to fall to the ash chamber.

For the purpose of supplying fuel, the feeding-spout I is provided, which feeding spout is constructed in the ordinary manner. In use when it is desired to provide a direct draft from the combustion chamber to the chimney, the damper *c* is turned so as to open the horizontal flue *b*, thereby providing a strong draft, which is necessary when a fire is first started or built in the furnace proper, but it will be understood that when the damper *c* is open that much of the heat contained in the heating drum F, will be permitted to escape to the chimney, thereby decreasing the heating capacity of the furnace.

After the fire is well under way, the damper *c* is turned so as to close the horizontal flue *b* in front of the vertical pipe J, thereby causing the smoke and a portion of the heat to enter the top or upper end of the short tubes K, which tubes K are connected with the auxiliary heating chamber L, by means of the connecting pipes *f*.

It will be understood that when the damper *c* is closed that no heat will be permitted to enter the chimney, except so much thereof as enters the short tubes K, and that the heat that enters the short tubes K, will heat the auxiliary chamber L, and inasmuch as said auxiliary chamber is located within the casing or jacket A, and below the heating drum F, and a number of the tubes *a*, the heat generated by said auxiliary chamber will enter the top or upper end of the casing or jacket A, from whence it is conveyed to the desired part of the building.

It will be understood that by my construction I am enabled to utilize for heating purposes substantially all of the heat generated, and that very little of the heat will reach the chimney. The auxiliary chamber L is supported by attaching said chamber to the bottom or lower end of the pipe J, or in any other convenient manner.

The top or upper end of the pipe J is connected to the horizontal flue *b*, between the chimney and the damper *c*. For the purpose of providing a means for removing the accumulations of soot and ashes from the auxiliary chamber L, the opening *g* is provided, which opening is to be connected by a short pipe leading through the jacket A.

It will be understood that the cold air conduit G, the feeding spout I, and the ash chamber H, are all to be provided with doors or slides, as well as the opening leading to the auxiliary chamber L.

For the purpose of providing a furnace that will burn anthracite coal, all that is necessary to be done is to close the air tubes *d*, thereby cutting off the supply of air above the bed of fuel which is necessary when anthracite coal is used. It will be understood that by this peculiar arrangement I am enabled to provide either a bituminous or anthracite coal burning furnace without any additional expense.

By locating the cold air conduit G, above the ash pit, cold air can be admitted into the fuel combustion chamber above the ashes, thereby providing for the introduction of cold air irrespective of the amount of accumulated ashes. It will also be understood that by providing the short tubes *e* and locating the same as shown, that when the fire is agitated during the time the damper *c* is opened the fine ashes will be drawn up through said short tubes and into the combustion chamber, thereby preventing the ashes from escaping from the outer end of the cold air conduit, and in the event the draft is not strong enough, to elevate the fine ashes they will be permitted to fall as above specified.

By providing the auxiliary chamber L and locating the same within the jacket the heat generated in said chamber will be utilized for the purpose of heating inasmuch as the heat so generated is conveyed to the pipes leading to the radiators. By this arrangement the smoke and heat are passed through the tubes K, or at least a portion of said heat finds its way to the auxiliary heating chamber, thereby increasing the heating surface to the extent of the surface of the auxiliary heating chamber.

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

1. The combination of a fuel combustion chamber, having located on the top or upper end thereof a heating cylinder or drum provided with the tubes *a* and K, the auxiliary heating chamber L, located upon the outside of the fuel chamber, and within the jacket, and connected with the tubes K, and the horizontal flue *b*, provided with a damper located upon the inner side of the tube connecting the heating chamber L with said horizontal flue, substantially as and for the purpose set forth.

2. The combination of the fire pot D having attached thereto the cold air conduit G, the air pipes *d*, leading from the cold air conduit to the dome shaped top E the pipe *e*, communicating with the conduit G, and the ash chamber H, a heating drum located above the fuel chamber and a jacket surrounding the fuel chamber and heating drum, substantially as and for the purpose specified.

3. The combination of the casing or jacket A, having located therein a fuel combustion chamber, a heating chamber provided with the long and short tubes, *a* and K, the auxil-

iary heating chamber L, located below the chamber F, and within the jacket and connected with the tubes K and the horizontal flue *b*, the cold air conduit G, leading to the fuel combustion chamber, and provided with the air pipes *d* and the pipe *e*, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

LOUIS P. D. YOST.

Witnesses:
E. A. C. SMITH,
F. W. BOND.