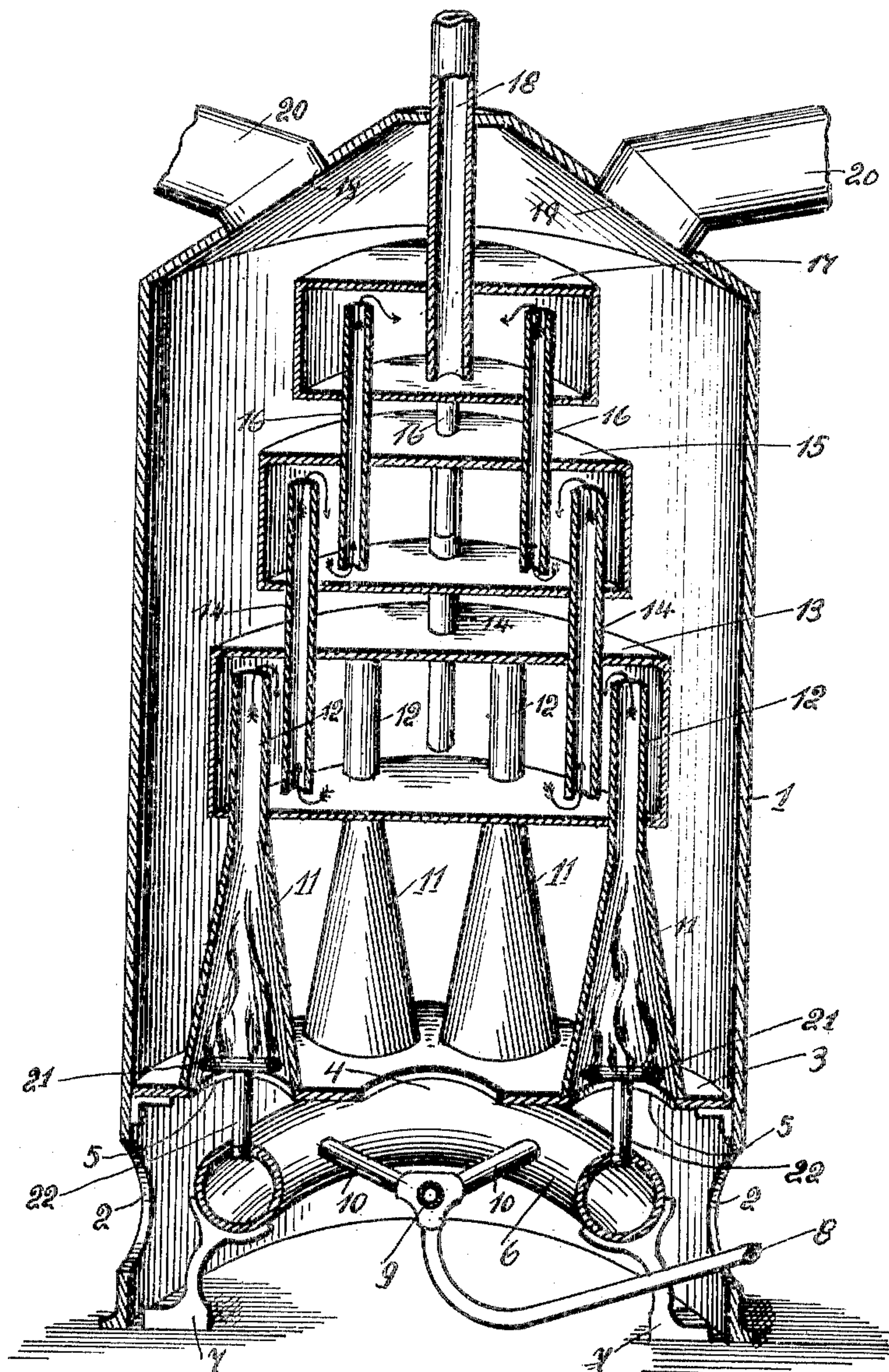


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PATENTED JULY 4, 1905.

J. LEPLA.
HOT AIR FURNACE.
APPLICATION FILED MAR. 8, 1905.



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UNITED STATES PATENT OFFICE.

JOHN LEPLA, OF KNOXVILLE BOROUGH, PENNSYLVANIA.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 793,943, dated July 4, 1905.

Application filed March 8, 1905. Serial No. 249,051.

To all whom it may concern:

Be it known that I, JOHN LEPLA, a citizen of the United States of America, residing at Knoxville borough, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention has relation to hot-air furnaces, and relates in particular to furnaces of this class in which gas is used as a fuel.

The object of the invention is to provide a hot-air furnace wherein the air will be heated
15 by the consumption of a minimum amount of gas.

Briefly described, my invention comprises an outer casing, a series of cylindrical drums mounted in the casing and in communication
20 with one another, the drums being disposed one over the other and of gradually-decreasing size from the lowermost to the uppermost drum, a series of cone-shaped combustion-tubes communicating with the lowermost
25 drum, and a gas-conduit which is disposed beneath the lower ends of the combustion-tubes and provided with a supply-pipe and with a series of burners, one of which projects into each combustion-tube.

30 Certain details in the construction and combination of parts will be hereinafter fully set forth and claimed.

In the accompanying drawing the single figure is a sectional perspective view taken on
35 the vertical plane extending through the center of a furnace constructed according to my improvement.

In the drawing, 1 designates the exterior casing, which is of cylindrical form and rests
40 upon a floor, this casing being made of any suitable material—such, for instance, as heavy sheet metal. The casing 1 is provided with a number of holes 2 near its lower edge, and just above the tops of these holes I mount a
45 horizontal partition 3, which is provided with a central orifice 4 and a plurality of holes 5, the latter being disposed in a circle near the edge of the partition 3. Below the partition 3 a gas-conduit 6 is arranged, being mounted
50 on legs 7 7, and gas is supplied to this con-

duit by means of a gas-supply pipe 8, which is furnished with a valve 9, from which valve branches 10 10 lead to the conduit 6. Upon top of the partition 3 a plurality of cone-shaped combustion-tubes 11 are mounted, 55 their number being dependent upon the size of the furnace and the desired heating capacity of the same. These cone-shaped combustion-tubes are mounted over the holes 5 5 and are fixed in position in any suitable manner upon
60 the partition 3, and their upper ends 12, which are cylindrical in form, project into a large cylindrical sheet-metal drum 13 and extend nearly to the top thereof. The drum 13 may be supported upon the combustion-tubes, as
65 shown in the drawing, and a series of conduits 14 extend from near the bottom of the drum 13, through the top thereof and through the bottom of a similar but smaller drum 15 to near the top of the last-named drum, and a
70 series of similar but smaller conduits 16 extend from near the bottom of the drum 15, through the top thereof and through the bottom of a still smaller drum 17 and to near the top of the last-named drum, which latter carries a centrally-arranged smoke-pipe 18, extending from near the bottom of the drum 17 through the top of the casing 1. The casing
75 1 has a number of holes 19 in its top and these holes constitute entrances to the hot-air flues 20, of which any desired number are provided. A number of burners 21 are mounted upon vertical pipes 22, carried by the gas-conduit 6, and one of these is located in each of the combustion-tubes 11. 85

The furnace being constructed as described and shown operates as follows: Gas being supplied to the conduit 6 by opening the gas-valve 9 will flow to the burners 21 and being ignited
90 burn in the combustion-tubes 11, and the products of combustion will flow into the drum 13, thence to drum 15, thence to drum 17, and out of the furnace through the smoke-pipe 18, passing, as indicated by the arrows, successively through the conduits 14 and 16. Air
95 is admitted to the casing 1 through the openings 2, a part of the air going to supply oxygen to the gas in the combustion-tubes and the rest of the air flowing through the opening 4 in the partition 3 and impinging against
100

and passing around the combustion-tubes 11, and the bottom of the drum 13 will be heated and will flow upwardly through the casing and will contact with the conduits 14 and 16 and the drums 15 and 17 and finally emerge in a highly-heated condition through the hot-air pipes 20 20.

It will be noted, and this is an important feature of my invention, that the drums decrease in size from the lowermost to the uppermost drum, and that therefore the casing being of equal diameter throughout that portion in which the drums are located the air-space in the casing gradually increases in size from near the bottom to toward the top of the casing, and therefore the air as it becomes heated by its successive contact with those portions of the furnace through which the products of combustion pass will have an opportunity to expand, and there will therefore be less tendency for this expansion of the air to force it into the hot-air pipes than if the capacity of the casing was the same throughout.

While I have shown and described my improved furnace as being provided with but three of the heating-drums, I wish it to be understood that a greater or less number of the same may be employed without departing from the spirit and scope of the invention.

Another feature of particular importance in my improvement is that the combustion-tubes are cone-shaped and that the conduits 16 are smaller than the conduits 14 and that the latter are somewhat smaller than the upper portions 12 of the combustion-tubes. This construction retards the passage of the products of combustion through the furnace with the resultant effect that the maximum amount of heat is imparted to the air flowing through the furnace, thus effecting a great economy in the consumption of fuel.

What I claim, and desire to secure by Letters Patent, is—

1. In a hot-air furnace, the combination of a casing having inlet-openings, hot-air pipes connected to said casing, a horizontal partition mounted in the casing, a gas-conduit arranged below said partition, a gas-pipe connected to said conduit, a plurality of cone-shaped tubes mounted on said partition, gas-burners carried by said conduit and arranged within said cone-shaped tubes, a plurality of communicating drums arranged in said casing, said drums being of different sizes and one of said drums communicating with said cone-shaped tubes, the smallest drum being arranged at the upper end of the casing, and a smoke-pipe connected to said smallest drum.

2. In a hot-air furnace, the combination with a casing, a horizontal partition in said casing, cone-shaped combustion-tubes mounted on said partition, gas-burners arranged at the lower ends of the combustion-tubes, and a plurality of drums arranged in the casing and communicating with said combustion-tubes and with one another.

3. In a hot-air furnace, the combination with a casing, a plurality of communicating drums of varying sizes and cylindrical form arranged in the casing one over the other, the smallest drum being at the top of the casing and the largest drum near the bottom of the same, combustion-tubes extending downwardly from the lowest drum and gas-burners arranged at the lower ends of said combustion-tubes.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN LEPLA.

Witnesses:

K. H. BUTLEN,
E. E. POTTER.