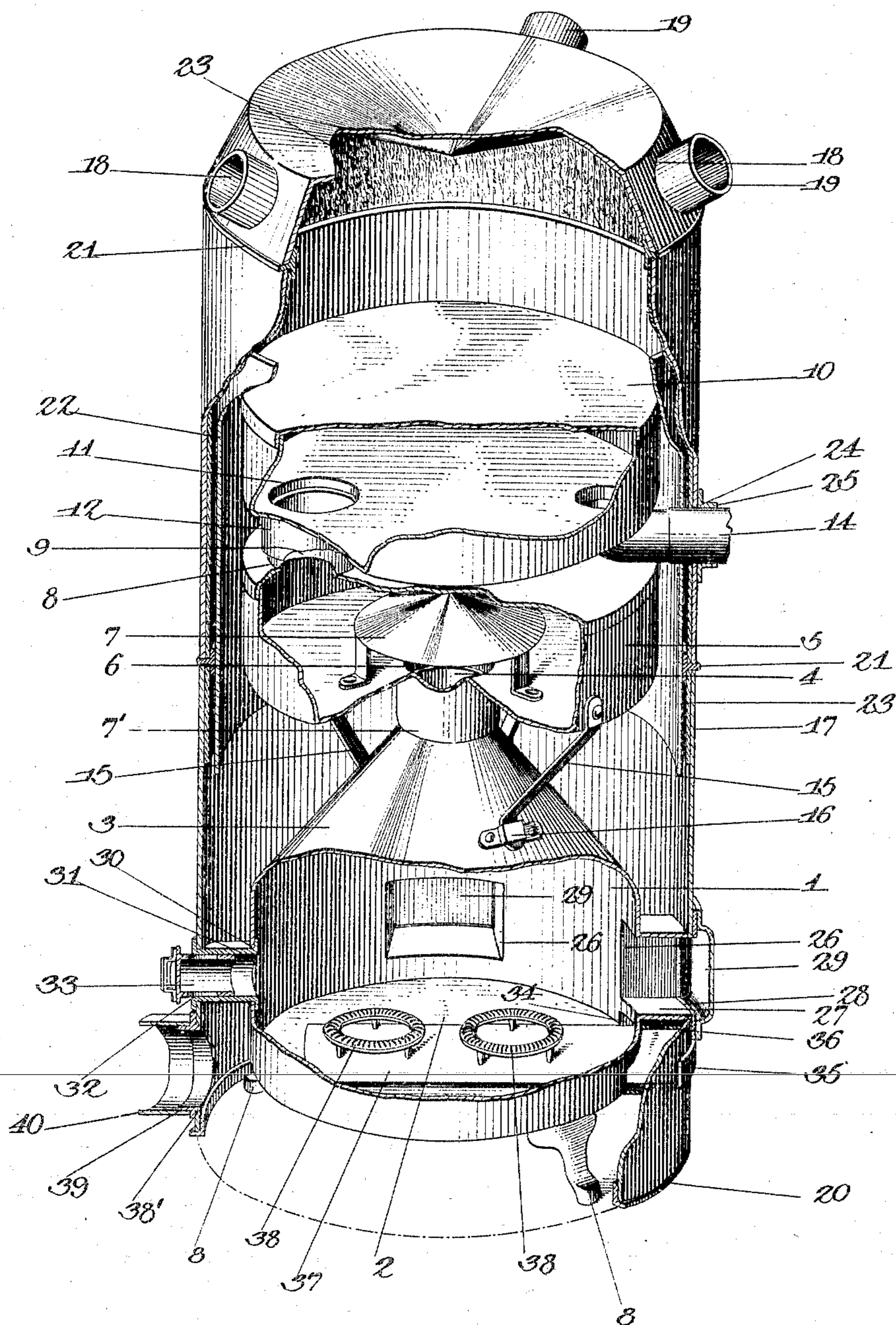


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D. D. HUGHES.
FURNACE.

APPLICATION FILED DEC. 20, 1904.



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UNITED STATES PATENT OFFICE.

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 784,048, dated March 7, 1905.

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To all whom it may concern:

Be it known that I, DENIS D. HUGHES, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Furnace, of which the following is a specification.

This invention relates to hot-air furnaces; and it has for its object to present a device of this class of simple inexpensive construction and which shall be especially adapted for the consumption of gas as a fuel.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawing has been illustrated a simple and preferred form of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

The single figure of the drawing represents a perspective view of a furnace constructed in accordance with the principles of the invention, parts having been broken away for the purpose of exposing the interior construction.

The furnace-box of this device consists of a sheet-metal cylinder 1, having a flat bottom 2 and a conical top 3, the latter terminating at the apex thereof in a cylindrical flange or collar 4. Above the furnace-box is arranged a radiating drum or cylinder 5, the bottom of which has a central opening 6, surrounded by a depending annular flange or collar 7', which exteriorly engages the collar 4 at the apex of the furnace-box. The latter is preferably supported at a suitable elevation from the floor by means of legs 8. Within the drum 5 and supported above the central opening 6 is a conical deflector 7, and in the top of said

drum, near one edge thereof, is an opening 8, surrounded by a flange or collar 9.

10 is a superimposed radiating-drum the bottom of which is provided near one edge with an opening 11, surrounded by a flange or collar 12, which exteriorly engages the flange or collar 9 of the drum 5. The bottom of the drum 10 is provided at the side diametrically opposite from the opening 11 with an opening 13, with which is connected a flue or pipe 14, through which the products of combustion are conveyed to the chimney or to a point of final exit.

Suitably connected with the lower drum 5 are a plurality of braces 15, the lower ends of which have been shown as engaging sockets 16 upon the conical top of the furnace-box. By this construction the weight of the radiating-drums will be supported in such a manner that the parts may be readily disconnected when desired for the purpose of cleaning or repairing the same.

The furnace-box and the drums or radiators are surrounded by an exterior cylindrical casing 17, which rests upon the floor and which is provided at its upper end with openings 18, surrounded by collars 19, with which may be connected pipes for conducting the air which is heated by radiation from the furnace-box and the radiating-drums to the apartments to be heated. The casing 17 is preferably built up of a plurality of sections, the lowermost of which is reinforced at its lower edge by a flange-iron 20, which is L-shaped in cross-section. The adjacent edges of the sections are separated by flange-irons 21, which are approximately T-shaped in cross-section. By this construction the parts of the furnace-casing may be conveniently assembled or disassembled, and a simple and efficient construction is obtained. The upper portion of the furnace-casing has an interior lining 22, of bright tinued iron or steel, and between the latter and the furnace-casing proper is interposed a lining 23, of asbestos or equivalent non-conductive material. Loss of heat by radiation from the furnace-casing is thereby avoided. The asbestos lining may be made to abut upon one of the flange-irons 21, which will prevent it from being readily displaced.

The furnace-casing has an opening 24, surrounded by a flange 25, for the passage of the flue 14.

The furnace-box 1 is provided with one or
5 more door-openings 26, which are connected
by flanges or collars 27 with registering open-
ings 28 in the casing 17, the latter openings
being provided with doors 29, through which
access may be had to the interior of the fur-
10 nace-box. The latter also has an opening 30,
connected by a pipe 31 with an opening 32 in
the furnace-casing, which is for the admission
of air to support combustion. A slotted tu-
bular stop 33 is arranged in the pipe 32 for
15 the purpose of regulating the air-supply. The
furnace-box and the casing are also provided
below one of the furnace-doors with openings
34 and 35, connected by a flange or collar 36,
said openings being for the passage of a slide
20 or drawer 37, upon which the burner or burn-
ers 38 are supported, this construction being
resorted to for the purpose of enabling said
burners to be conveniently removed for the
purpose of inspection or repairs. These burn-
25 ers, which may be of any suitable well-known
construction, are to be connected with the
source of gas-supply in any convenient man-
ner, which is no part of the present invention.

Cold air is admitted from without to the in-
30 terior of the casing 17 through an opening 38'
near the lower end of said casing, said open-
ing being surrounded by a flange 39, with
which is connected an air-inlet pipe 40, which
may be extended to a source of supply of pure
35 air.

The operation and advantages of this inven-
tion will be readily understood from the fore-
going description, taken in connection with
the drawing hereto annexed.

40 The improved furnace is particularly in-
tended to be used in districts where there is a
supply of natural gas and where, consequently,
this gas is largely utilized for heating pur-
poses. By this invention a device is provided
45 in which the gas will be economically con-
sumed and at the same time very effectively,
so far as the production of heat is concerned.

The device is preferably constructed
throughout of sheet metal.

50 It is obvious that the burner may be regu-
lated to consume more or less gas, according
to the degree of heat that it may be desired
to produce. It is likewise obvious that the
supply of air required for admixture with gas
55 to support combustion may also be very easily
regulated by means of the very simple device
provided for the purpose. The products of
combustion in an intensely-heated state will
rise from the furnace-box into the radiating-
60 drums, which thus become intensely heated,

the radiated heat being absorbed by the air
within the casing, which being thus charged
with heat is conveyed through the pipes pro-
vided for the purpose to the apartments that
are to be heated. The products of combus- 65
tion are compelled to pass from the upper
radiating-drum 10 in a downward direction
and through the pipe 14 to the point of exit.
Pure cold air is constantly and liberally sup-
plied through the pipe 40 and inlet 38 to sup- 70
plant that which is carried off in a heated
state through the pipes connected with the
collars 19. The interior of the furnace-box
is readily accessible for the purpose of ignit- 75
ing the gas when the latter has been turned on.

This improved gas-furnace is highly effi-
cient in practice, and a furnace of moderate
size will be found efficient to heat a compara-
tively large dwelling. The device requires
practically no attention beyond merely ignit- 80
ing and extinguishing the flames and regulat-
ing the air-supply, which latter is accom-
plished by simply moving the stop 25 outward
or inward in the tube 23, as may be required.

It will be seen that by the radiating-drums 85
constructed as herein described the products
of combustion will be compelled to pass in a
circuitous course to the point of final exit, so
that the greatest possible percentage of heat
90 units will be utilized. It is desired to be un-
derstood, however, that the radiating means
for conducting the products of combustion to
the point of exit may be changed within the
scope of the invention.

Having thus described the invention, what 95
is claimed is—

In a gas-furnace, a furnace-casing having
hot-air exits and a cold-air inlet, a furnace-
box within the casing, said box having a con- 100
ical top provided at its apex with an annular
flange, a plurality of radiating-drums suitably
connected with each other, one of said drums
having an opening surrounded by a depend-
ing flange engaging the flange at the apex of
the furnace-top and braces connected with 105
sockets upon said furnace-top, an exit-pipe
depending from one of the radiating-drums
and extending through the wall of the casing
to a point of final exit, communicating open-
ings in the casing and the furnace-box, means 110
for regulating the admission of air into the
latter, and a gas-burner within the furnace-
box.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in 115
the presence of two witnesses.

DENIS D. HUGHES.

Witnesses:

O. W. JONES,
W. A. CURRY.