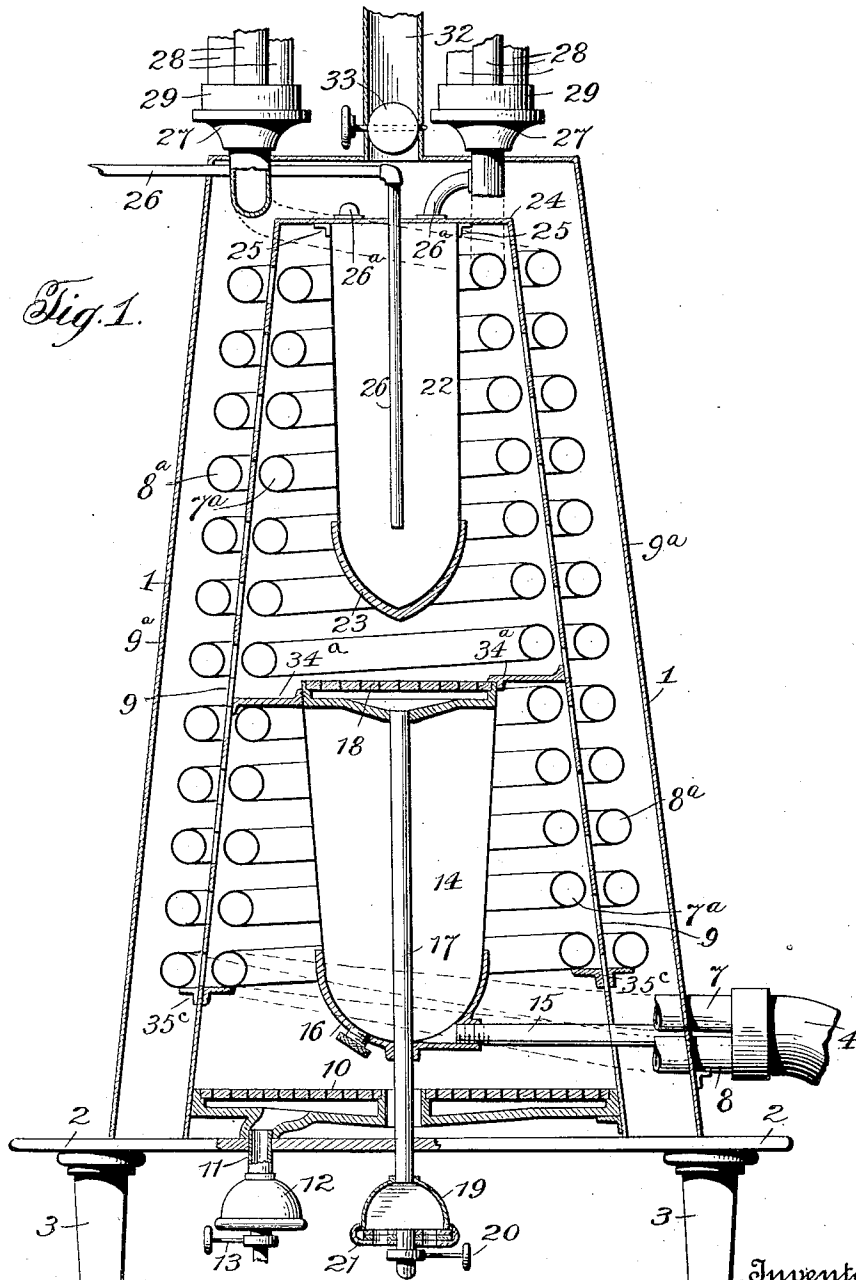


M. DICKSON.
HOT AIR FURNACE.
APPLICATION FILED AUG. 22, 1911.

1,042,654.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.



Witnesses:
James Hutchinson
C. A. Krey

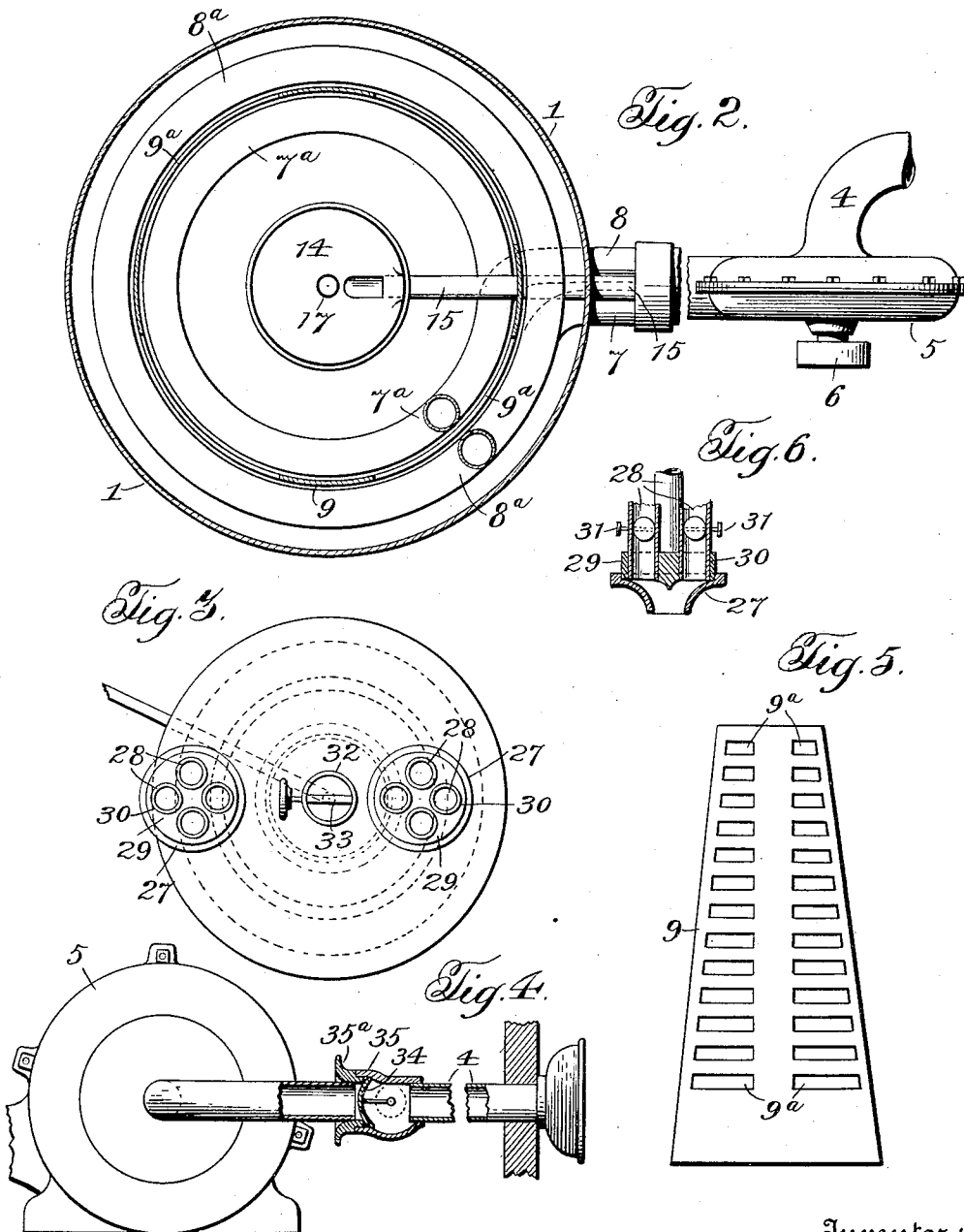
Inventor:
Myron Dickson
By Joseph H. Hunter. Attorney.

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UNITED STATES PATENT OFFICE.

MYRON DICKSON, OF MARTINSVILLE, INDIANA.

HOT-AIR FURNACE.

1,042,654.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed August 22, 1911. Serial No. 645,351.

To all whom it may concern:

Be it known that I, MYRON DICKSON, a citizen of the United States, residing at Martinsville, in the county of Morgan and State of Indiana, 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 relates to hot air furnaces and has among its primary objects the provision of novel instrumentalities for more rapidly and thoroughly heating the incoming cool air, discharging the same into suitable distributing conduits leading from the furnace to various rooms or the like, and means whereby the heated air is moistened.

15 The various improvements will be manifest from the description to follow wherein the novel details in construction and arrangement of parts will be referred to at length.

For a clear understanding of the invention reference is directed to the accompanying drawings which form a part hereof and wherein is disclosed for the purpose of illustration a convenient and satisfactory embodiment of the invention though it is to be borne in mind that minor changes may be made in carrying out the principles of the invention without departing from the spirit thereof.

25 In the drawings: Figure 1 is a vertical sectional view of the apparatus with certain parts in elevation and others cut away for the purpose of clearness. Fig. 2 is a transverse section showing the fan casing in elevation. Fig. 3 is a top plan view. Fig. 4 is a view partly in section of the air inlet pipe and fan casing. Fig. 5 is a detail view in elevation of the drum separating the heating coils. Fig. 6 is a detail view of the distributing conduits in connection with a hooded terminal of one of the heating coils.

40 Referring now more particularly to the drawings 1 is a casing for the furnace the same being conveniently formed of sheet metal or the like and the sides of which preferably taper inwardly and upwardly after the fashion of a cone so as to provide an extended heating surface over which the heating medium may pass. The casing conveniently rests upon a bottom 2 having suitable supporting legs or standards 3 adapted to rest upon the floor or other surface.

55 4 is a cold air inlet pipe or conduit and

interposed in said conduit intermediate its ends is a suitable fan or blower casing 5 in which is positioned a fan or blower of any suitable construction and adapted to be operated through the medium of an electrical belt or other drive connecting with the pulley 6 projecting without the casing 5 and connected to the shaft of the fan. Connected to the inner end of the conduit 4 are pipes 7 and 8 respectively which lead into the casing 1 and connect with coils 7^a and 8^a respectively, the coils running in a horizontal direction and extending substantially throughout the length of the casing thereby forming two series of coils, which series like the casing in outline taper inwardly and upwardly toward the top of the casing. While only two series of coils are shown for the purpose of illustration it is obvious that any number of series may be provided, and each series is preferably separated by a skeleton frame 9 also conical in shape and having openings 9^a at close intervals throughout its circumference and from top to bottom thereof as more clearly illustrated in Fig. 5.

It is within the contemplation of my invention to provide various forms of heating means for the coils 7^a and 8^a and in the illustration the heating medium takes the form of a gas burner or burners 10 adapted to be fed from a supply conduit 11 projecting through the bottom 2 of the casing and connecting with a suitable mixer 12 the main gas supply being regulated by a suitable valve 13.

From the construction so far referred to it will be noted that the conical formation and arrangement of casings and heating coils positioning the same above and substantially overlying the burner 10 thereby provides extended radiating surfaces for the heat from the burner with the result that the air coils are subjected to an increased area of heat and the action of the heat thereon will be more direct.

An additional heating surface for the air coils is provided the same taking the form of a chamber 14 conveniently formed of sheet metal with tapering sides and closed throughout thereby providing a closed air chamber, air being supplied from the main conduit 4 through the medium of a relatively small pipe 15 passing through and opening in the bottom of the receptacle 14. The bottom of the receptacle is conveniently

formed of cast metal 16 thereby protecting the same from the flames of the burner 10. The fact that the chamber 14 is closed throughout results in confining a body of air in the chamber whereby additional heat will be radiated from the chamber 14 to act upon the coils 7^a and 8^a. The chamber 14 is conveniently mounted upon a tubular member or stem 17 conveniently connected to the bottom 2 of the furnace and constituting a gas supply for an auxiliary burner 18 superimposed on the top of the chamber 14. The tubular member 17 connects at its lower end with a mixer 19 and the main gas supply is controlled by a suitable valve 20. The air supply into either of the mixing chambers 12 and 19 may be regulated by a suitable rotatable valve 21.

The gas burner 18 not only supplies an additional heating medium for the coils 7^a and 8^a, at a point removed from the main burner 10 but the same also constitutes means for heating water or the like in a suitable receptacle 22 thereby maintaining the latter at a proper temperature so as not to detract from the heating power of the air within the coils 7^a and 8^a when the moisture provided by the water enters into said coils in a manner about to be described. The receptacle 22 is conveniently formed of sheet metal with the reinforced or protecting bottom of thickened metal 23. Conveniently the top 24 of the apertured casing 9 constitutes the top of the receptacle 22 the latter being connected to the top 24 in any suitable manner as by angle braces 25. A water supply pipe 26 leads from any suitable source without the casing into the chamber 22 having its outlet adjacent the bottom thereof. It is contemplated by the provision of the chamber 22 to not only supply additional heat radiating surfaces for heating the air in the pipes 7^a and 8^a but also to provide sufficient moisture to the air within the coils whereby to moisten the heated air prior to its admission into a room or the like through the usual registers. To this end relatively small conduits 26^a and 26^b connect at one end with the receptacle 22 adjacent the top thereof and at their opposite ends one to the terminal of each series of coils as clearly illustrated in Fig. 1. The coils connect at a point above the connection of the water pipes with a suitable seat 27 constituting a rest for a series of distributing pipes 28 supported in any desired manner on the member 27 conveniently by providing an annular block 29 with a series of circumferentially arranged openings 30 for the various distributing pipes. Preferably each distributing pipe is provided with a suitable damper 31 whereby the passage of air may be regulated. Projecting upwardly from the case 1 is a suitable outlet stack 32 for the products of combustion the same being

controlled by a suitable damper 33 as is obvious. Preferably the incoming air is filtered and to this end I provide in the conduit 4 at one side of the fan casing 5 a filter disk 34 removably held in place conveniently by abutting collars 35 and 35^a respectively mounted upon opposing sections of the conduit 4 as more clearly illustrated in Fig. 4. The casing 14 is supported adjacent its top by brackets 34^a and 34^b projecting from the inner surface of the member 9 and the brackets 34^a serve the additional function of retaining the burner 18 in place. The member 9 is also provided with supporting brackets 35^c for the coils 7^a and 8^a respectively.

The operation is believed to be clear to one skilled in the art. The fan in the inlet conduit being set in operation, air is forced therethrough and divided into what may be said to be three currents two of which lead to the coils 7^a and 8^a respectively and the other into the closed chamber 14. This chamber being highly heated by the burner 10 arranged therebelow and also by the burner 18 thereabove and the chamber being closed throughout will maintain the contained air in a highly heated condition at all times, thereby providing an extended radiating surface to the surrounding coils 7^a and 8^a which latter because of their conical outline are positioned above the burners or in the path of the products of combustion. This arrangement quickly and efficiently heats the air in the coiled pipes and the heat is maintained by the radiating surface provided by the upper chamber 22 adapted to contain water in a heated condition due to the action of the burner 18. The chamber 22 is in communication with the coils as stated thereby delivering to the coils a sufficient quantity of moisture to insure the delivery of moist air into the rooms or the like to be heated.

It is within the contemplation of the invention to convert the apparatus into a ventilating or cool air circulating system as desired by cutting out the burners, supplying the chamber 22 with cool water, and sucking into the inlet conduit cool air.

What I claim as new is:

1. In an apparatus of the character described, the combination of an outer casing, the wall of which tapers inwardly toward its upper end, a water receptacle within said casing spaced from the sides thereof, an air receptacle also in the casing closed throughout and spaced vertically from the first mentioned receptacle, a heating element interposed between the receptacles, an air pipe arranged in a series of coils surrounding both receptacles and extending substantially from top to bottom of the casing, an inlet conduit connecting with said pipe, and a fan in the conduit.

2. In an apparatus of the character described, a casing, an air receptacle therein having closed walls, a heater arranged below said receptacle, coils within the casing surrounding said receptacle, an air inlet for the coils and receptacle, a water receptacle arranged above the air receptacle and having communication with the coils, and a heater positioned between said receptacles.

3. In an apparatus of the character described, a casing, an air receptacle therein having closed walls, a heater arranged below said receptacle, coils within the casing surrounding said receptacle, an air inlet for the coils and receptacle, a water receptacle arranged above the air receptacle, a pipe establishing communication between said water receptacle and the coils, and a burner positioned on the top of the air receptacle and beneath the water receptacle.

4. In an apparatus of the character described, the combination of an outer casing inclined upward and inward, a receptacle within the casing constituting a chamber closed throughout, said receptacle being spaced from the side walls of the casing, a heater arranged below said receptacle, coils within the casing surrounding said receptacle, said coils forming an air conduit, an air inlet for the coils and said receptacle, and an auxiliary casing within the first mentioned casing and extending between said coils, said auxiliary casing being substantially similar in outline to the outer casing and having a plurality of closely associated openings.

5. In an apparatus of the character described, the combination of an outer casing inclined upward and inward, a receptacle within the casing constituting a chamber closed throughout, said receptacle being spaced from the side walls of the casing, a heater arranged below said receptacle, coils within the casing surrounding said receptacle, said coils forming an air conduit, an air inlet for the coils and said receptacle, an auxiliary casing within the first mentioned casing and extending between said coils, said auxiliary casing also inclining inwardly toward its upper end and having a plurality of closely associated openings, and supports on the auxiliary casing for said coils.

6. In an apparatus of the character described, the combination of an inclosing casing, an auxiliary casing positioned in the first mentioned casing, the auxiliary casing having a series of closely associated openings, coiled pipes extending over opposite sides of the auxiliary casing and substantially from top to bottom thereof, a hot air receptacle within the auxiliary casing, a common inlet conduit having means of connection with said coil pipes and with said receptacle, and a heater adjacent the lower end of the auxiliary casing.

7. In an apparatus of the character described, the combination of an inclosing casing, an auxiliary casing positioned in the first mentioned casing, the auxiliary casing having a series of closely associated openings, coiled pipes extending over opposite sides of the auxiliary casing and substantially from top to bottom thereof, a hot air receptacle within the auxiliary casing, a common inlet conduit having means of connection with said coil pipes and with said receptacle, and a heater adjacent the lower end of the auxiliary casing, the said casings and coiled pipes in general outline tapering inwardly from bottom to top of the apparatus.

8. In an apparatus of the character described, the combination of a casing, a receptacle within the casing adjacent the lower end thereof and separated from the side walls of the casing, an auxiliary receptacle also positioned within the casing adjacent the top thereof and spaced from the side walls of the casing, one of said receptacles constituting a water chamber and the other receptacle constituting a hot air chamber closed throughout, a burner positioned adjacent the lower end of the casing and within the same, a hot air conduit interposed between the side walls of the casing and said receptacles, connection between said conduit and the water receptacle, an air inlet conduit, and a plurality of branch pipes leading from the conduit to a point within the casing one of said pipes connecting with the hot air conduit and the other with the hot air chamber.

9. In an apparatus of the character described, the combination of a casing, a receptacle within the casing adjacent the lower end thereof and separated from the side walls of the casing, an auxiliary receptacle also positioned within the casing adjacent the top thereof and spaced from the side walls of the casing, one of said receptacles constituting a water chamber and the other receptacle constituting a hot air chamber closed throughout, a burner positioned adjacent the lower end of the casing and within the same, an auxiliary burner arranged within the casing and at a point intermediate said receptacles, a hot air conduit interposed between the side walls of the casing and said receptacles, connections between said conduit and the water receptacle, an air inlet conduit, a plurality of branch pipes leading from the conduit to a point within the casing, one of said pipes connecting with the hot air conduit and the other with the hot air chamber, and a fan positioned within said conduit.

10. In an apparatus of the character described, the combination of an outer casing, a receptacle within the casing spaced from the side walls thereof and closed through-

out, a hot air conduit positioned between
said receptacle and the side wall of the cas-
ing, an air inlet for said conduit and for
said receptacle, a burner positioned on the
5 top of the receptacle, a valve controlled sup-
ply pipe in communication with the burner
passing through the bottom of the recep-
tacle and through the bottom of the casing,
an auxiliary burner positioned below the re-
10 ceptacle and within the casing, and a valve

controlled supporting pipe passing through
the bottom of the casing in communication
with the burner.

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

MYRON DICKSON.

Witnesses:

T. M. DICKSON,
GEORGE M. ISENHOWER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
