A. D. SUTTON.

FURNACE.

APPLICATION FILED JULY 20, 1917.

1,388,075.

Patented Aug. 16, 1921.

2 SHEETS—SHEET 1.

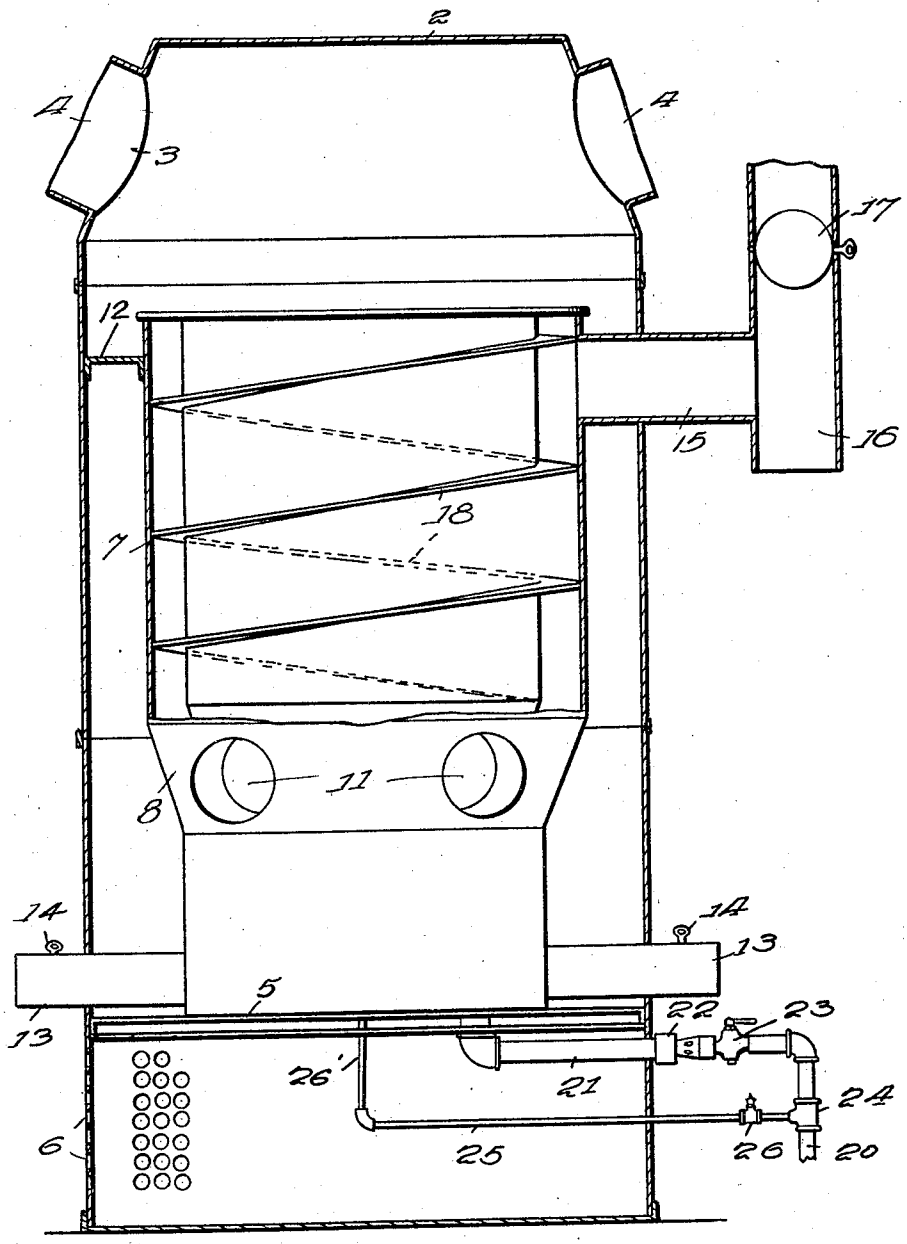


FIG. 1.

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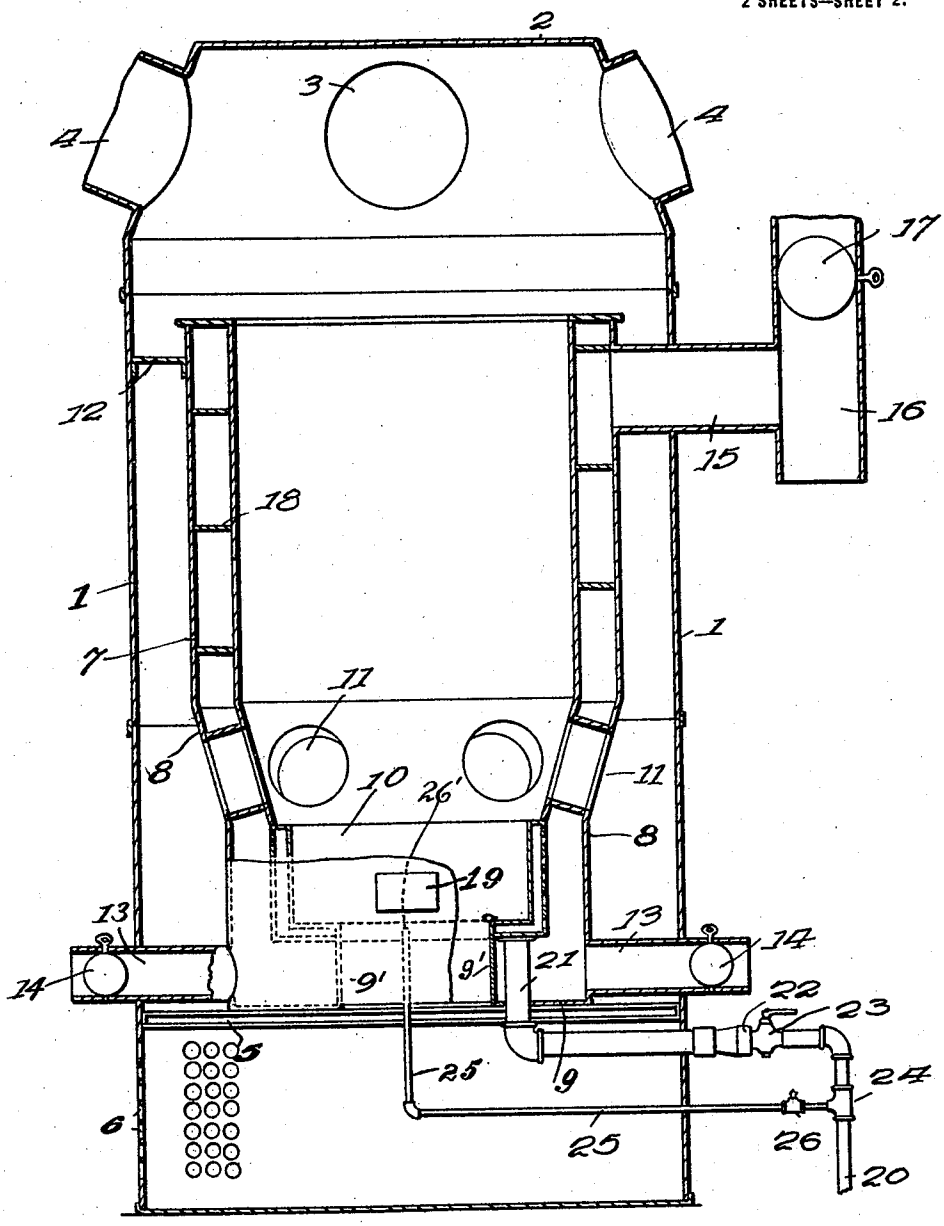


Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR D. SUTTON, OF PITTSBURGH, PENNSYLVANIA.

FURNACE.

1,388,075. Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed July 20, 1917. Serial No. 181,759.

To all whom it may concern:

Be it known that I, ARTHUR D. SUTTON, a citizen of the United States, and resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to improvements in furnaces and it is the dominant object of the invention to provide a gas burning furnace capable of heating air introduced thereinto and distributing the same by way of pipes to the rooms of a house or building for heating purposes, the fuel consumption of the furnace being reduced to minimum.

Another and equally important object of the invention is to provide a furnace with an air heating chamber for receiving fresh air therein and heating the same for distribution; means being included in the air heating chamber for utilizing all heat from the products of combustion exhausted thereby. A further object of the invention is the provision of a furnace of this character, wherein its structure is an improvement over the subject matter of Letters Patent Number 679,684, issued on or about the 30th day of July, 1901.

Other independent objects are to provide features of construction of portions of the furnace which tend toward the attainment of the above aims irrespective of the relation in which they are used.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of my invention:

Figure 1 is a vertical section through the furnace casing showing the arrangement of the air heating chamber a portion of which is broken away and shown in section; and

Fig. 2 is a vertical section through the furnace and heating chamber.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Having more particular reference to the drawings, 1 represents the casing or housing of the furnace, the upper portion of which is formed substantially frusto-conical as at 2 and provided with a plurality of hot air outlet openings 3 having conduits or pipes 4 extending therefrom, it of course being understood that the said pipes 4 communicate with the various rooms of a house or building in order that the air heated by the furnace may be equally distributed therein. Supporting bars 5 are arranged transversely of the lower portion of the furnace casing 1 and secured to the opposite side thereof by rivets or other suitable fastening devices. To permit ingress of fresh air, the lower portion of the furnace casing is provided with a plurality of perforations generally designated by the numeral 6. However, in this connection, it will be readily understood that the lower portion may be formed solid or if desired, the perforations provided with a rotatable sleeve having similar perforations formed therein whereby the same may be opened or closed to regulate the ingress of air to the furnace interior.

Arranged within the furnace casing 1 upon the supporting bars 5 is an air heating chamber indicated in its entirety by the numeral 7, the said chamber comprising a double walled casing having the lower portion thereof constricted as at 8 with the inner wall terminating short of the outer wall, the latter being formed with an inwardly directed relatively wide flange 9 bearing upon the supporting bars 5.

Disposed within the lower or restricted portion of the casing and bearing beneath the shorter inner wall of the casing is a fuel burner indicated as a whole at 10 and circular in shape and having double walls with the outer wall perforated. The burner 10 is formed with a large central opening, and extending between the opening and the inner edge of the flange 9 is a tubular member 9′, which thus provides a passage for the air from the casing below the casing 7—8 through the burner and thence to the interior of the chamber 7 and out through the flues 4. Air inlet openings 11 are formed

in the constricted portion 8 of the chamber, and, obviously, serve as means for permitting the introduction of fresh air from the furnace casing thereinto in order that the same may be heated and delivered by way of the pipes 4 to the rooms of a house or building. Stay pieces 12 are arranged between the outer wall of the air heating chamber and the wall of the furnace casing and serve as means for rigidly maintaining the former in spaced relation thereto. Communicating with the lower extremity of the air heating chamber are air inlet ducts 13 having dampers 14 arranged therein in order that the passage of air through the same into the double walled structure of the chamber may be controlled at will by the user. An air outlet duct 15 communicates with the upper extremity of the air heating chamber 7 and discharges into a flue 16 having a damper 17 arranged therein. Spiral baffles 18 are arranged in the space occurring between the inner and outer walls of the air heating chamber 7 and afford means for delaying the discharge of the spent products of combustion into the flue 16 by deflecting their passage therethrough, thus fully utilizing such heat as may be given out thereby.

To permit access to the burner 10, a door is arranged in the furnace casing 1, not shown, and another is arranged in the lower portion of the air heating chamber 7, indicated at 19.

A gas supply conduit 20 is extended into proximity of the base of the furnace casing and is engaged by a short conduit 21 which extends through an opening formed in the furnace casing into engagement with the lower portion of the burner 10, an air mixing valve, of conventional construction and designated by the numeral 22 being interposed therein, while a second valve 23 is arranged adjacent the same and offers means whereby the flow of gas through the conduit 21 to the burner may be regulated by the user. A T connection 24 is also interposed in the conduit 20 and is engaged by a branch conduit 25 having a valve 26 interposed therein, the said branch conduit communicating with a pilot burner 26′ which terminates within the burner 10 in position for lighting through the door 19. Thus, it will be readily understood that the burner 10 may have the gas flowing therefrom ignited quite readily.

From the foregoing, it will be understood by those skilled in the art that with my improved gas burning furnace I provide an efficient medium for heating air and distributing the same to the various rooms of a house or building. The novel construction of the air heating chamber is such as to prevent any possibility of the wasting of heat which might be caused by the direct discharge of the spent products of combustion. Further, due to the air heating space afforded by the chamber 7, such air as is introduced thereinto will be evenly heated previous to its discharge into the pipes 4 for distribution. Obviously, the draft through the space occurring between the inner and outer walls of the air heating chamber may be regulated by the user of the furnace through the dampers 14 arranged in the air inlet ducts 13. Thus, the flow of the spent products of combustion may be retarded or quickened, such as conditions or preference may dictate.

Manifestly, the construction shown is capable of considerable modification and such modification as is within the scope of my claims, I consider within the spirit of my invention.

I claim:

1. In a furnace of the class described, an outer casing having cold air inlet openings at their lower part and hot air flues leading from the upper part. a heating drum within the outer casing and spaced from the sides and bottom thereof and open at the top and bottom and formed with outer and inner walls in spaced relation and with air passages providing communication between the casing and the interior of the drum, the outer wall of the drum being directed inwardly at its lower end to form an annular flange, a tubular member extending from the bottom flange of the drum, a burner supported on the tubular member and comprising an outer perforated wall and an inner imperforate wall, air inlet elements communicating with the drum at its lower part, and an outlet element leading from the upper part of the drum.

2. In a furnace of the class described, an outer casing having cold air inlets in the lower part and hot air flues leading from the upper part, a heating drum within the casing open at the top and bottom and formed with outer and inner walls in spaced relation and of unequal length, and with air passages providing communication between the casing and the interior of the drum, a tubular member extending from the bottom of the drum and providing communication between the interior of the drum and the outer casing, a burner supported upon the tubular member and comprising an inner imperforate wall and an outer perforated wall, said burner engaging the shorter inner wall of the drum at its upper part, and with air inlet elements leading from the upper part of the drum.

3. In a furnace of the class described, an outer casing having cold air inlets in its lower part and hot air flues leading from its upper part, a heating drum within the casing and formed with outer and inner walls in spaced relation and of unequal length, an

annular flange extending inwardly from the lower end of the outer longer wall of the drum, a tubular member extending upwardly from the opening in the flange, a burner supported upon the tubular member and comprising an inner imperforate wall and an outer perforated wall, said burner engaging the shorter inner wall of the drum at the upper part of the drum, and an outlet leading from the upper part of the outer wall of the drum.

In testimony whereof, I affix my signature hereto.

ARTHUR D. SUTTON.