H. G. FRANKLIN.

GAS HEATING APPARATUS.

APPLICATION FILED JULY 17, 1918.

1,285,665.

Patented Nov. 26, 1918.

2 SHEETS—SHEET 1.

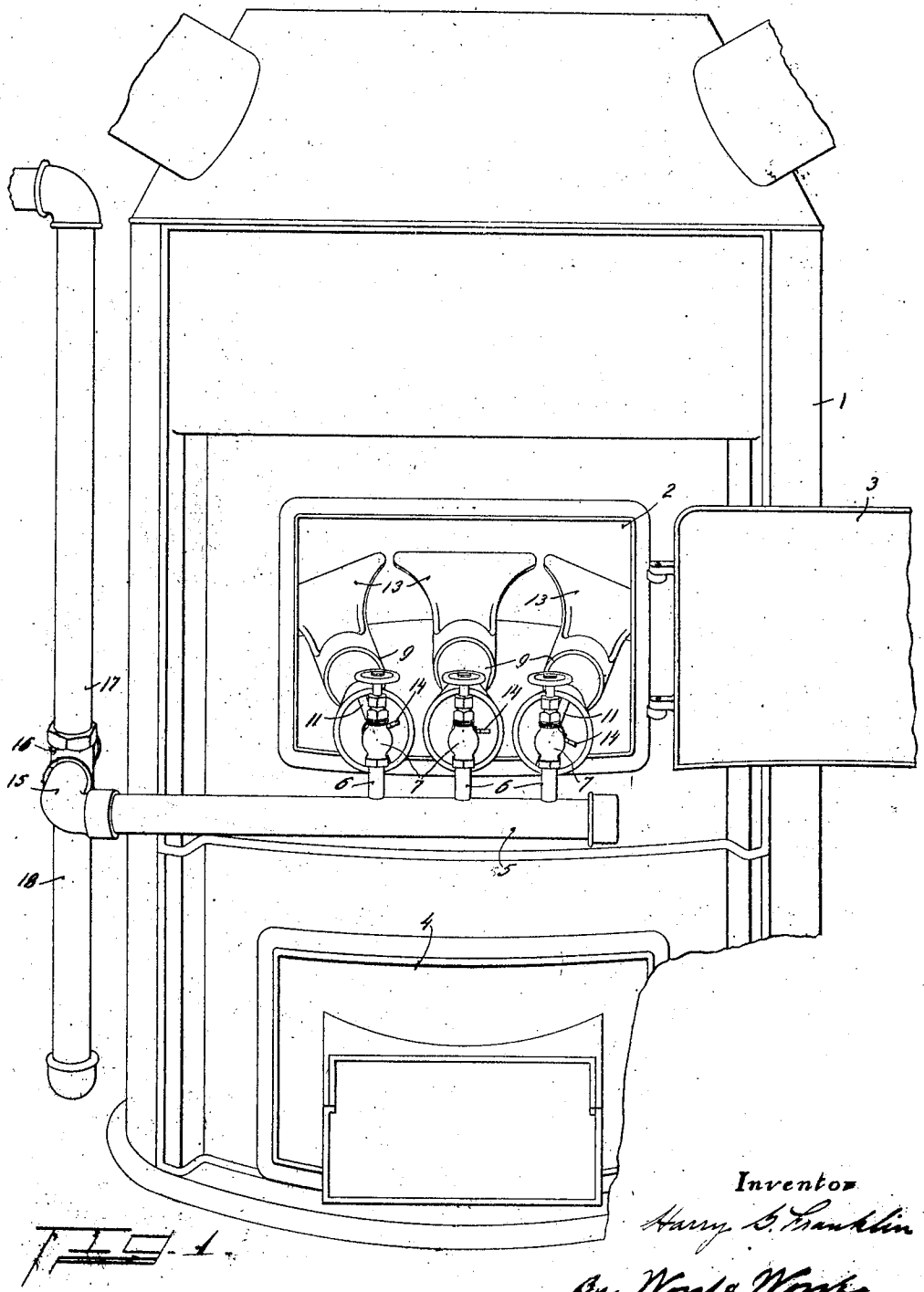


FIG. 1.

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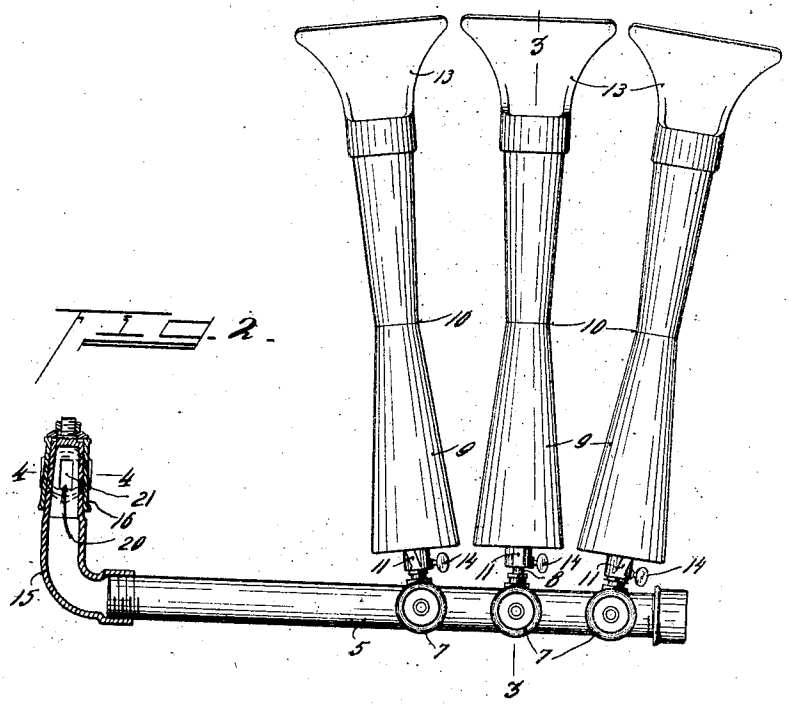


FIG. 2.

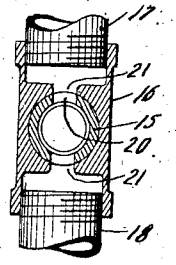


FIG. 4.

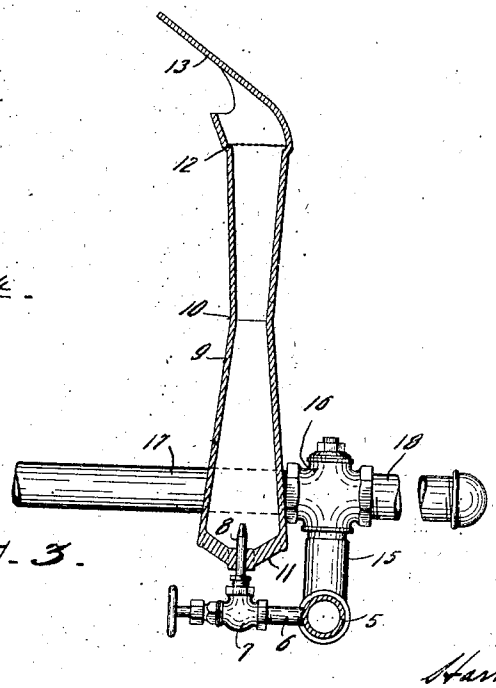


FIG. 3.

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UNITED STATES PATENT OFFICE.

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GAS HEATING APPARATUS.

1,285,665. Specification of Letters Patent. Patented Nov. 26, 1918.

Application filed July 17, 1918. Serial No. 245,413.

To all whom it may concern:

Be it known that I, HARRY G. FRANKLIN, a citizen of the United States, and residing at Hartwell, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Gas Heating Apparatus, of which the following specification is a full disclosure.

My invention relates to a gas heating apparatus particularly adapted for use in combination with a domestic hot-air furnace or other household furnaces for either hot-water or steam.

An object of the invention is to provide a gas heating apparatus which can be easily and quickly swung and removed from its working position, so that the fire chamber of the furnace is accessible for introducing a solid fuel, and the gas supply to the burners automatically cut off or controlled simultaneously with the motion for throwing the apparatus from its working position, and vice versa.

Another object of the invention is to provide a burner tube detachably and adjustably connected over a gas supply nozzle, and of a Venturi tube design, furnishing a central contracted portion from which the tube tapers in opposite directions outwardly toward its ends, for increasing the efficiency of the burner, and an inclined laterally flaring baffle projecting from the end of the tube and over the discharge opening for deflecting the flame and heat against the object to be heated to secure the best results.

Other objects of the invention relate to details of construction and arrangement of parts more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which like reference characters denote corresponding parts throughout the several views, of which:—

Figure 1 is a front elevation of a domestic hot-air furnace for bituminous or solid fuel with my improved gas burners projected into the fire chamber of the furnace through the fuel feed opening, above the grate and ash-pit, with the feed door of the furnace shown in its open position.

Fig. 2 is a top plan view of a series of burners connected to a common feed pipe as a manifold. The feed pipe at one end connects with a plug valve shown in section.

Fig. 3 is a section on line 3, 3, Fig. 2.

Fig. 4 is an enlarged section through the valve on line 4, 4, Fig. 2.

The gas burners and supply connections, as illustrated, are arranged for installation with a coal burning domestic hot-air furnace which permits the furnace to be readily converted from gas to coal burning, as emergencies may arise. The description, therefore, will be principally directed to such particular use, although it is apparent that the burners are adapted for other uses.

Referring to the drawings, 1 indicates an ordinary and commercial hot-air furnace of a coal burning type consisting of a heater or stove, surrounded by a sheet metal casing, to provide an intermediate air space or passage as a conductor for directing the heated air to hot-air conductor piping connecting with the top of the furnace and leading to the various rooms or apartments to be heated.

The furnace may also represent a type commercially known as a "pipeless" furnace in immediate connection with a room directly above the furnace. The furnace at its front side is provided with a feed opening 2, consisting of a furnace snout projection from the fire-box of the heater and connecting with the front face plate of the furnace, to which a feed door 3 is hinged. The furnace has a second passage below the feed passage leading into the ash-pit of the heater, closed by a door 4 mounted upon the front face plate.

No removal of parts or alterations to the furnace are required for making a gas burner installation, so that the furnace can be readily converted for either gas or coal without any tools or the service of a skilled mechanic, and the conversion can be made by anyone in a few minutes.

It has been customary to install gas burners into a hot-air furnace by extending the gas supply pipe into the ash-pit and projecting the burners upwardly from the ash-pit through the grate or discharge through the grate. This places the gas burners at the lowermost point in the heater, resulting in a considerable amount of heat being lost and taken up by the heavy cast iron walls of the heater instead of being radiated into the hot-air space between the heater and its surrounding sheet metal casing.

It has been experienced that more efficient results are obtained by directing the flame

of the burner against the walls of the combustion chamber above the fire-pot of the heater. The upper portion of the heater, forming the combustion chamber, in a coal furnace heater, usually has its wall of spherical form, which exposes a larger peripheral area to the hot-air space between the heater and outer sheet metal casing. By throwing the flame directly against such convex or spherical surface, a larger volume of heat is radiated in said space than is possible with the burners disposed below or at the grate to discharge the gas flame into the fire-pot or against the walls of the fire-pot.

Another material advantage is obtained in that the burners can be extended into the heater through the feed opening, bringing them to a more accessible elevation for regulating the gas to the burners and for withdrawing the burners from the heater.

In the drawing, three burners are comprised in the series, the number being optional and as may be required for a given capacity. They are all the duplicate of one another, with the gas supply independently regulated and controlled, and with their gas nozzles projecting from a manifold or pipe 5, extending in a horizontal plane in front of the furnace face plate when in commission.

In the preferred form of construction, as illustrated, the pipe 5, as a manifold, has a plurality of nipples 6 projecting therefrom, depending upon the number of burners employed. Each nipple has a valve 7 connected thereto for regulating or controlling the gas supply to the burner. A nozzle 8 is connected to the valve and projects laterally therefrom, over which the inlet end of the burner tube 9 is engaged and removably fixed.

The gas burner comprises a tube of Venturi type providing a mixing chamber and having enlarged inlet and outlet open ends tapering from each end inwardly to the central contracted portion 10. The rear end of the tube has a spider or web 11 provided with a central apertured hub axial with the tube into and through which a nozzle 8 is engaged. This rear portion of the tube is open to the atmosphere, furnishing an air inlet around the nozzle for the purpose of providing a combustible mixture. The opposite or discharge end of the burner tube is abruptly enlarged to provide an annular shoulder 12 against which a wire gauze disk rests. This disk is inserted in the tube discharge end to prevent any back flash. A hood or baffle flange 13 projects from the discharge end of the tube, inclined forwardly over the discharge opening of the tube and flares outwardly or laterally for deflecting or spreading the flame against the object or wall to be heated. The burner tube is fixed to the feed nozzle by a thumb screw 14, engaged through the hub portion of the spider. The burner tubes can be readily inserted upon or slipped off of the nozzles and also turned thereon for adjusting the tube, so that the baffle is properly positioned for directing the flame against the wall of the combustion chamber of the heater. The baffles in the drawings are shown inclining in an upward direction, deflecting the flame upwardly against the wall of the combustion chamber, but if desired they may be directed downwardly or at any angle as may be deemed best for the particular installation.

The supply pipe or manifold 5 has its free end capped and its opposite end connects with the angle bend of a tubular plug valve 15. The plug valve engages into the valve casing 16, the valve casing has one end connecting with the vertical supply pipe 17 and its opposite end with a section of pipe 18, extending downward to the base of the furnace, to rest upon the floor or otherwise rigidly fixed to provide a support for the parts connected thereto. The plug valve is of tubular construction to provide a conduit therethrough, adapted to communicate with the supply pipe 17, through the port 20 in the plug valve, and the port 21 in the casing 16, when the ports are in registry with the manifold in its horizontal position. The valve therefore functions as a pivot for the manifold for swinging the manifold from either horizontal to vertical position, as well as controlling the gas supply to the manifold. Thus the manifold, when the burner tubes are detached, can be readily swung upward out of the way when it is desired to fire the furnace with coal. and at the same time cut off the gas supply thereto as a safety feature.

Thus the gas intallation can be quickly and easily removed from its working position so that the fire chamber may be accessible for the purpose of introducing a solid fuel.

Having described my invention, I claim:—

1. In a gas heating apparatus, a fuel feed pipe having a discharge nozzle, a gas burner tube tapering longitudinally from each end inwardly to provide a central contracted portion and opposite enlarged ends, one end engaged over and secured to said nozzle providing an air inlet into the tube around the nozzle, the opposite end of the tube abruptly enlarged, providing an interior annular shoulder, a wire gauze disk within said tube engaged against said shoulder, and an inclined laterally flaring baffle integral with the discharge end of the tube and extending over the opening thereof.

2. In a gas heating apparatus, a fuel feed pipe having a discharge nozzle, a Venturi gas burner tube having enlarged open ends one end engaged over said nozzle and pro-

viding an air inlet around the nozzle, the opposing end having a baffle extending over the discharge opening.

3. In a gas heating apparatus, a fuel feed pipe having a discharge nozzle, a Venturi gas burner tube having enlarged open opposite ends one end engaged over said nozzle and providing an air inlet around the nozzle, the opposite end abruptly enlarged, providing an interior annular shoulder, and a wire gauze disk engaged against said shoulder within the tube.

4. In a gas heating apparatus, a fuel feed pipe having a discharge nozzle, an open end Venturi gas burner tube having one end engaged over said nozzle and providing an air inlet around the nozzle, the opposite end abruptly enlarged, providing an interior annular shoulder, and a wire gauze disk engaged against said shoulder within the tube, and a baffle integral with the discharge end of the tube inclined over the opening thereof.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

HARRY G. FRANKLIN.

Witnesses:
W. WOOCHENBERG,
L. O. BECK.