F. J. PARKER.

COMBINATION GAS AND COAL FURNACE.

APPLICATION FILED APR. 9, 1908.

946,266. Patented Jan. 11, 1910.

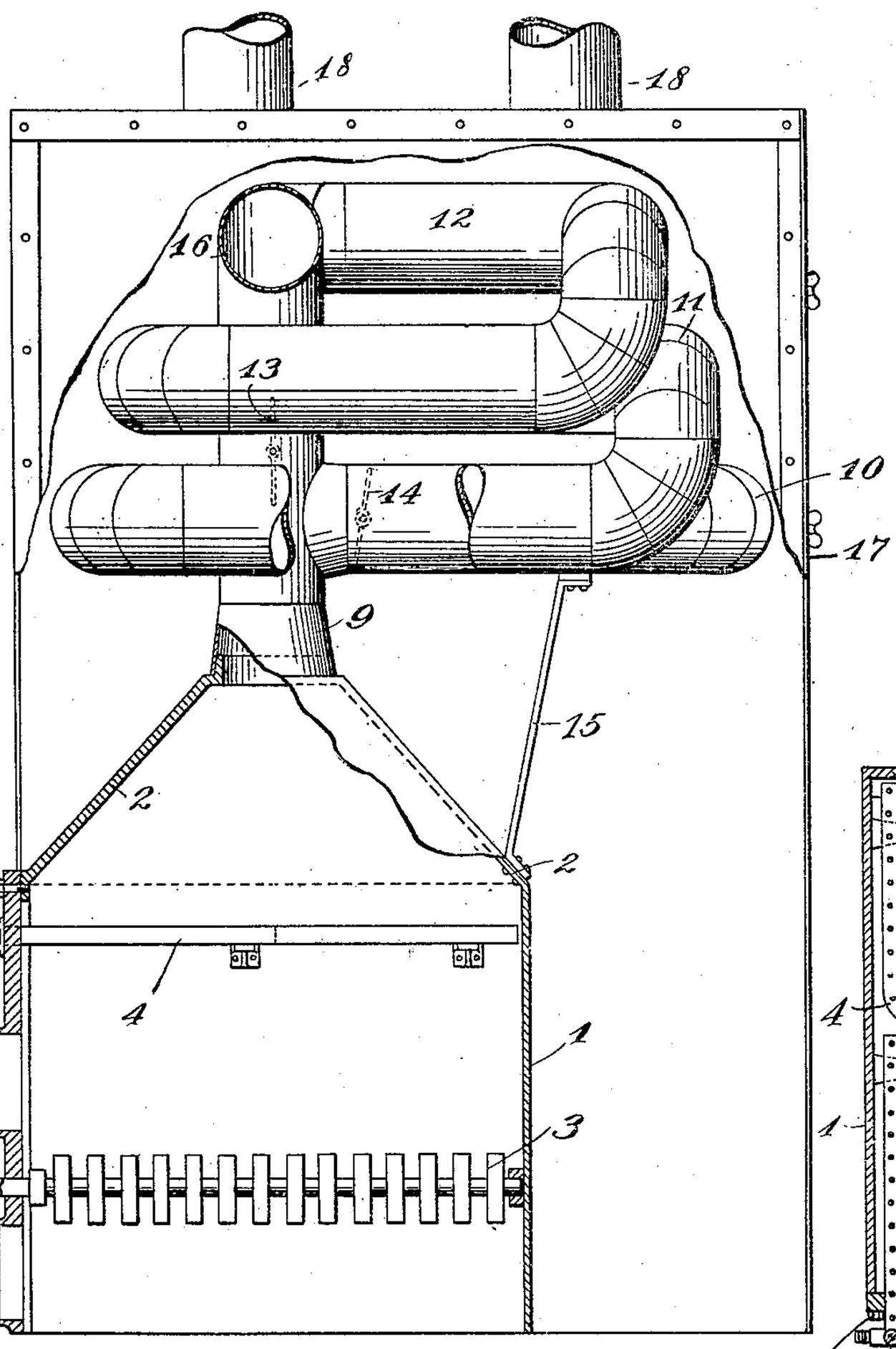

Fig. 1

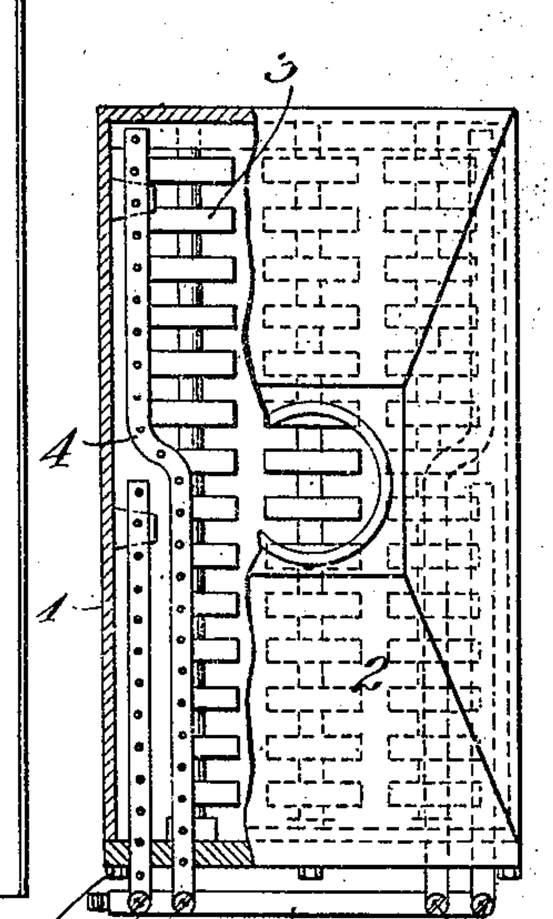

Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

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COMBINATION GAS AND COAL FURNACE.

946,266. Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed April 9, 1908. Serial No. 426,112.

To all whom it may concern:

Be it known that I, FREDERICK J. PARKER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Combination Gas and Coal Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to combined coal and gas, hot air furnaces.

In the commercial type of furnaces now extant wherein it is possible to substitute gas as a fuel in the place of coal in the same furnace, it is always necessary to remove the gas burner or burners from the fire box of the furnace before the coal grate can be used. Again in many types of such furnaces, the entire grate must be covered with fire brick or analogous material and the gas burner placed above this filling material. It is very obvious that the amount of work required to make the change in the furnace from coal to gas or vice versa is not inconsiderable and the annoyance and inconvenience incident to such a change is very great.

Now the object of my invention is to provide a type of combination furnace which permits the gas burners to remain in the furnace at all times even when the coal grate is in operation, and requiring no adjusting or assemblage of parts when it is desired to burn the gas instead of coal other than to turn on the gas and light it.

Another feature of my invention is the provision of a radiator through which the products of combustion may pass when the gas is used as a fuel and a separate flue through which the products of combustion may pass when coal is used as a fuel. The radiator which is to be used when the gas is employed is of such form as to allow the complete radiation of the heat from the products of combustion and so to conserve all the heat units which are developed by the burning of the gas.

Generally speaking, the invention comprises the elements and combinations thereof set out in the claims.

Reference should be had to the accompanying drawings in which—

Figure 1 is an end elevation partly in section of a hot air furnace embodying my invention; and Fig. 2 is a plan view partly in section of the furnace with the casing and radiator removed.

The furnace comprises the fire box 1 and dome 2 which rests upon the fire box. Within the fire box are grate sections 3 and any desired form of grate may be employed. I have shown a grate of three sections and of the type known as the rocking grate. Near the top of the box and at each side thereof are gas burners 4. These gas burners consist of a long burner and a short burner, the long burner being bent outwardly near the front portion so as to allow the insertion of a short gas burner near the wall. These burners are supported at one end in the front wall of the furnace and at their inner ends by means of lugs which are bolted to the side walls of the fire box. The burners are removable through the openings in the front wall of the fire box into which they project. By the provision of a burner such as I have shown, it is possible to regulate the amount of gas which is burned to a nicety so as not to produce an excessive amount of heat.

As is evident from Fig. 2 of the drawings, the gas burners upon each side of the furnace are the same and one of the long burners singly or one of the short burners singly may be used, or any combination of the four burners. These gas burners are connected with a supply pipe 5 which is connected with the gas main and the supply of gas to the furnace is regulated by the valves 6, one of such valves being interposed between the supply pipe 5 and each burner. The front wall of the fire box of the furnace is constructed as in the ordinary furnace having the ash door 7 and the coal feed door 8 and the arrangement of means for supplying and regulating the air to the fire box is as in the usual construction of furnaces.

Mounted upon the fire box 1 is a dome 2 which is given the form of a truncated pyramid, the sides of the pyramid slanting inwardly and a flue pipe 9 forms the outlet from this dome. The shape of this dome is especially designed to direct the products of combustion toward the flue pipe 9, thereby improving the draft in the furnace and directing all the heat, particularly that heat developed when the gas burners are used, toward the flue. The front of the fire box is made so as to be removable from the rest of the structure and is held in its proper position by means of bolts as is indicated at

19 in Fig. 1. This will allow ready access to the interior of the fire box so as to remove the grates when the same need repair.

The flue pipe 9 is in communication with the chimney of the building in which the furnace is used, and is the same in function as is the ordinary flue pipe. Mounted upon this flue pipe 9 is a series of tiers of pipes 10, 11 and 12 which are connected to the flue pipe 9 at two points. The lower part is connected to the flue pipe 9 at a point a short distance above the dome 2 and is connected at the second point at the end of this series of pipe. The pipe 9 has a damper 13 within it which is just above the opening at which the tier of pipe 10 connects and a damper 14 is placed within the tier of pipe 10 at a point just beyond its connection with the flue pipe 9. The dampers are operated by suitable connections from the exterior of the casing. These tiers of pipe form a radiator and comprise straight sections of pipe which are united to each other by means of elbows and the tiers are connected with each other by means of elbows. The radiator is braced and held in place by suitable braces 15.

When coal is employed as a fuel in the furnace, the damper 14 is closed and the damper 13 is open. This will allow the products of combustion to pass directly through the flue 9 and to the chimney. When gas is used as a fuel, the damper 13 is closed, and the damper 14 is open. This forces the products of combustion to pass through the series of pipe composing the radiator, and so afford a large radiating surface, whereby the air which it is desired to heat coming in contact with the pipes will absorb practically all the heat units which have been developed in the combustion of gas so that none will be wasted. The products of combustion will pass out of the flue pipe 9 at the point 16 and so pass to the chimney.

I am aware that certain furnaces have been designed heretofore employing coal as a fuel in which the products of combustion are forced to pass through a coil pipe before passing to the flue pipe and to the chimney, but such furnaces have proved entirely impracticable for the reason that the products of combustion where coal is used are heavily laden with soot. This soot deposits within the coils of pipe through which it passes and soon chokes up the passage. It has heretofore been found necessary to make the connection with the chimney in as direct a line as possible to avoid such soot accumulation. However, when gas is used as a fuel, no such soot is present in the product of combustion, and moreover, it has been found that where the ordinary flue is used, with the direct connection to the chimney, that a large amount of heat is wasted. In the construction which I have shown the direct flue is present and may be used when coal is employed as a fuel but when the gas is burned, the products of combustion being sent through a radiator of large surface will give up its entire amount of heat units, thereby effecting a great saving in the amount of gas which it is necessary to burn to produce the amount of heat desired.

The fire box, dome and radiator are inclosed within a casing 17 as is ordinarily used in hot air furnaces, and air is supplied to the interior thereof through suitable openings in a manner well known in the art. The air passing through the casing contacts with the radiator pipes and thence through the hot air pipes 18 to the rooms or place to which it is desired to supply heat. And moreover, it will be seen from the foregoing description that I have provided a furnace wherein the construction is such that the gas burner may remain in the furnace at all times, and I have further provided means for utilizing and saving all the heat units developed by the combustion of the gas when the same is used as a fuel.

I claim:

1. In a hot air furnace, a fire box having a removable front wall, a gas burner and a grate supported at their forward ends by the said removable wall.

2. In a hot air furnace, a fire box having a removable front wall, a gas burner and a grate supported at their forward ends by the said removable wall, the gas burner being supported above and out of contact with the grate.

3. In a hot air furnace, a fire box having a removable front wall, a gas burner and a grate supported at their forward ends by the said removable wall, a dome having converging sides mounted upon the fire box, and a radiator formed of connected pipes arranged in tiers around the flue pipe, a damper in the flue pipe, and a damper in the radiator pipe, for the purpose described.

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

FREDERICK J. PARKER.

Witnesses:
CARL HEROLD,
A. J. HUDSON.