June 28, 1932. B. F. POWELL 1,865,045

CONVERTIBLE GAS FURNACE CONSTRUCTION

Filed April 7, 1931 2 Sheets-Sheet 1

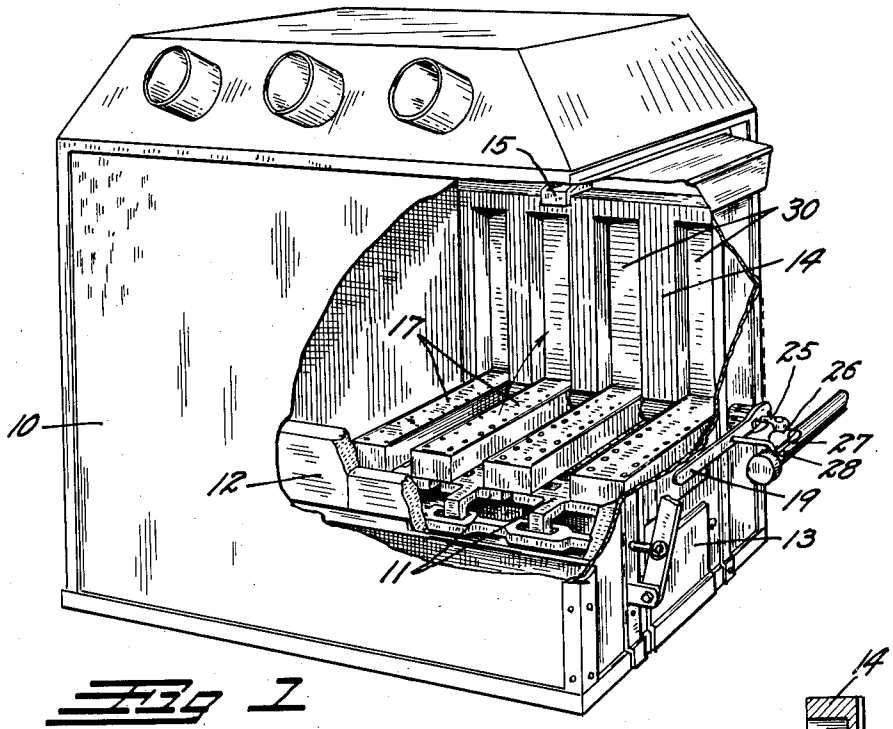


Fig 1

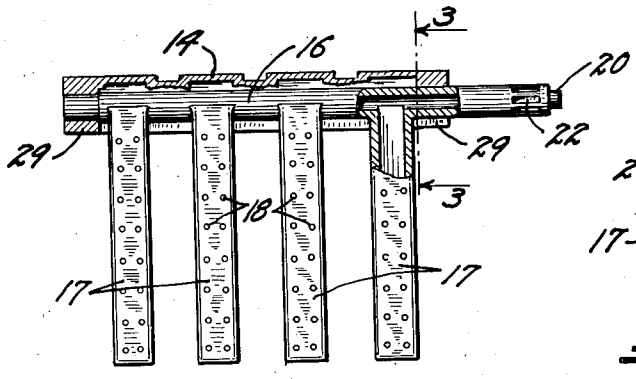


Fig 2

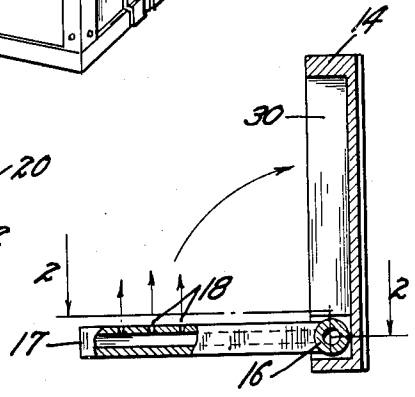


Fig 3

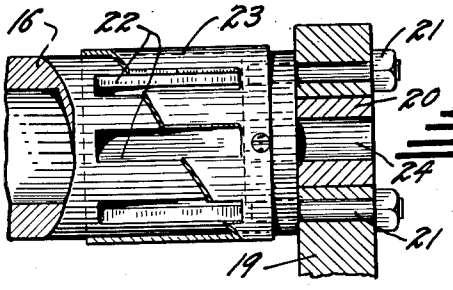


Fig 4

Inventor

BENJAMIN F. POWELL

By

Attorney

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CONVERTIBLE GAS FURNACE CONSTRUCTION

Filed April 7, 1931 2 Sheets-Sheet 2

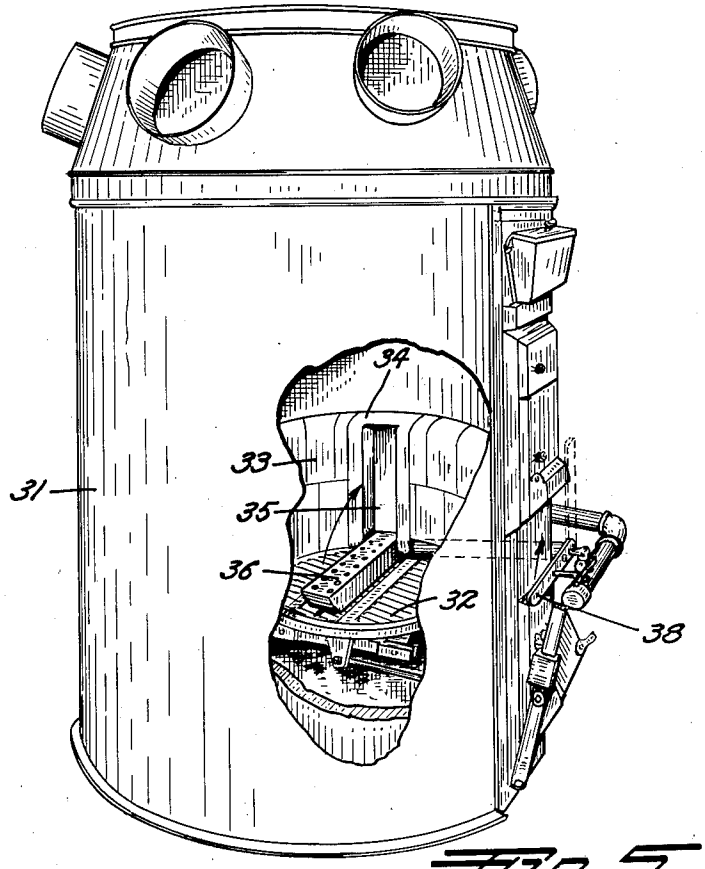


Fig 5

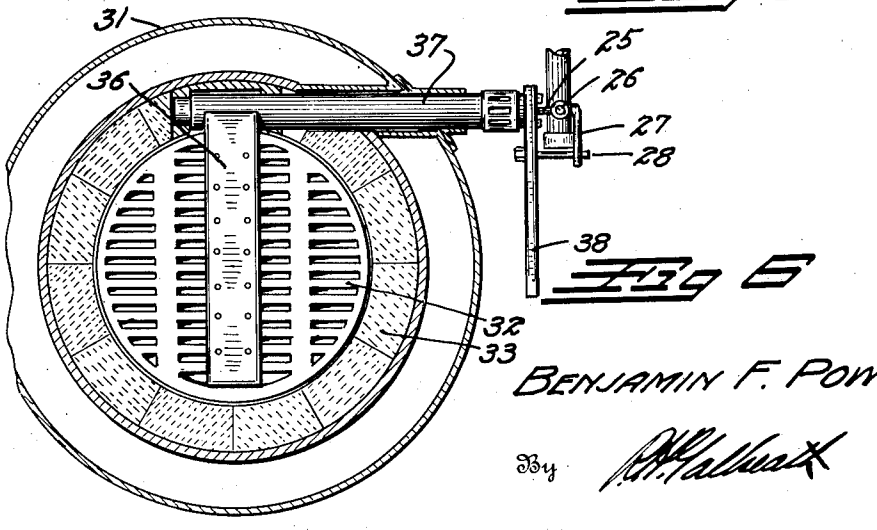


Fig 6

Inventor

BENJAMIN F. POWELL

By

Attorney

Patented June 28, 1932 1,865,045

UNITED STATES PATENT OFFICE

BENJAMIN F. POWELL, OF DENVER, COLORADO, ASSIGNOR TO THOMPSON MFG. COMPANY, OF DENVER, COLORADO

CONVERTIBLE GAS FURNACE CONSTRUCTION

Application filed April 7, 1931. Serial No. 528,272.

This invention relates to a combined gas and coal burning construction for furnaces and heating plants and has for its principal object the provision of a gas burner which can be swung completely out of the way when it is desired to use coal and which can be swung across the firebox when it is desired to use gas and in which both operations can be easily and quickly accomplished from the exterior of the heating plant.

Another object of the invention is to so construct the device that when burning coal the gas burner will be completely protected from coal, ashes, soot, etc., and in which the gas burner, when not in use, will not in any way interfere with the full use of the firebox and grates.

A further object of the invention is to so construct the device that it will be impossible to turn the gas into the gas burner portion when the furnace is being used for coal burning.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which forms a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:

Fig. 1 is a perspective view illustrating the improved burner applied to a furnace of the type having a square firebox.

Fig. 2 is a plan view of the gas burner taken on the line 2—2, Fig. 3.

Fig. 3 is a detail vertical section taken on the line 3—3, Fig. 2.

Fig. 4 is an enlarged detail view of the outer extremity of the burner manifold.

Fig. 5 is a perspective view illustrating the invention installed in a furnace of the type having a circular firebox.

Fig. 6 is a horizontal cross section through the furnace of Fig. 5 looking down upon the burner.

The invention is applicable to any type of firebox. Two types are illustrated in the accompanying drawings.

In Fig. 1 a typical square furnace is illustrated at 10 with its grate bars at 11, firebox lining 12 and ash or draft door at 13. The invention may be installed in this type of furnace by removing the lining 12 at one side of the firebox and positioning in its place a burner wall plate 14 which can be held in place by means of the usual lining clamps 15. The wall plate is provided with burner recesses 30 corresponding in number to the number of burners 17.

The burner proper comprises a manifold 16 carrying one or more burners 17 extending at right angles thereto. The burners 17 are provided with a plurality of flame orifices 18. The manifold 16 is mounted across the bottom of the wall plate 14 in suitable loose bearings 29, and extends outwardly through the front face of the furnace terminating in an operating handle 19. The handle 19 can be secured to the manifold 16 in any desired manner such as by forming a nipple 20 on the extremity of the manifold over which the handle 19 is clamped in place by means of suitable clamp bolts 21.

Adjacent the outer extremity of the manifold 16, primary air openings 22 are formed, the opening of which can be adjusted by means of an air sleeve 23. The outer extremity of the manifold is provided with an axial opening 24 into which a nozzle 25 of a gas valve 26 projects. The valve 26 may be provided with an operating stem or handle 27 which is arranged to be engaged by a projecting pin 28 on the operating handle 19.

It will be seen that when the burners are in the position of Fig. 1 the furnace is perfectly adapted to the burning of gas. In this position the valve stem or handle 27 can be manually opened to admit the gas. The primary combustion air is taken in through the openings 22 and the necessary secondary combustion air can be admitted through the draft door 13 or the usual draft inlets of the furnace.

When it is desired to use the furnace for coal burning the operating handle 19 is swung upwardly to the vertical position. This

causes the burners 17 to swing into their coacting recesses 30 in the wall plate 14 so that an absolutely smooth interior wall is formed in the firebox. When in this position the flame orifices 18 will be completely protected from ashes, coal, dust, etc.

It will be noted that as the operating handle 19 is swung upwardly the pin 28 will swing the valve stem 27 upwardly to the closed position and prevent the valve from being again opened until the burners 17 are again lowered. When it is desired to return to gas burning it is only necessary for the operator to shake his grates to clean the ashes therefrom and then swing the operating lever 19 downwardly to the horizontal position when the furnace will be again in the gas burner position.

In Fig. 5, the invention has been adapted to a furnace 31 having a circular grate 32 and a circular firebox lining 33. In this form, a portion of the lining 33 is removed and a wall recess casting 34 is positioned in place thereof. The casting 34 is provided with a recess 35 for receiving the gas burner illustrated at 36. Otherwise this form is similar to the previously described form, that is, a manifold 37 extends from the burner 36 to the exterior of the furnace terminating in an operating handle 38 similar to the operating handle 19 and a similar gas valve construction is provided.

The operation of this form is also similar to the previously described form and movement of the operating handle 38 will cause the burner 36 to either swing into its recess 35 or lie upon the grate 32.

While the invention has been particularly illustrated as applied to a hot air furnace, it is of course, not limited to this particular use but can be used anywhere it is desired to burn gas interchangeably with other fuels.

The burners are, of course, not limited to the burning of gas but could be adapted to the burning of oil or other fuels without destroying the utility of the convertible features.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. A gas burner for furnace fireboxes comprising: a gas manifold arranged to extend to the exterior of said firebox; a series of burners extending substantially at right angles from said manifold and in parallel relation with each other; a wall member provided with a series of recesses opposite said burners; and means for rotating said manifold so as to swing said burners into said recesses.

2. A convertible gas furnace construction for application to the firebox of a furnace comprising: a wall plate provided with a vertical recess arranged to form the side wall of said firebox; bearings adjacent the bottom of said wall plate; a manifold extending along the bottom of said wall plate and arranged to rotate in said bearing; a burner member extending outward from and at right angles to said manifold and secured to and communicating with the latter; and means for rotating said manifold so as to swing said burner member in to said vertical recess so as to close the latter when said burner is not in use.

3. A convertible gas furnace construction for application to the firebox of a furnace comprising: a wall plate provided with a vertical recess arranged to form the side wall of said firebox; bearings adjacent the bottom of said wall plate; a manifold extending along the bottom of said wall plate and arranged to rotate in said bearings; a burner member extending outward into said firebox at right angles to said manifold, and secured to and communicating with the latter; means for rotating said manifold so as to swing said burner member in said vertical recess to close the latter when said burner is not in use; a gas valve arranged to control the supply of gas to said manifold; a handle for rotating said manifold; and an operative connection between said handle and said gas valve so that they will operate simultaneously.

4. In a furnace having a rectangular firebox: a vertical side wall in said firebox provided with a series of vertical recesses; a rotatable manifold extending across the bottom of each of said recesses; a series of burners formed on and extending from said manifold at each of said recesses, said burners extending at right angles from said manifold in parallel relation across said firebox when in a horizontal position and acting to close said recesses so as to form a continuous face on said wall plate when in a vertical position.

In testimony whereof, I affix my signature.

BENJAMIN F. POWELL.