

Nov. 7, 1933.

F. G. CRONE

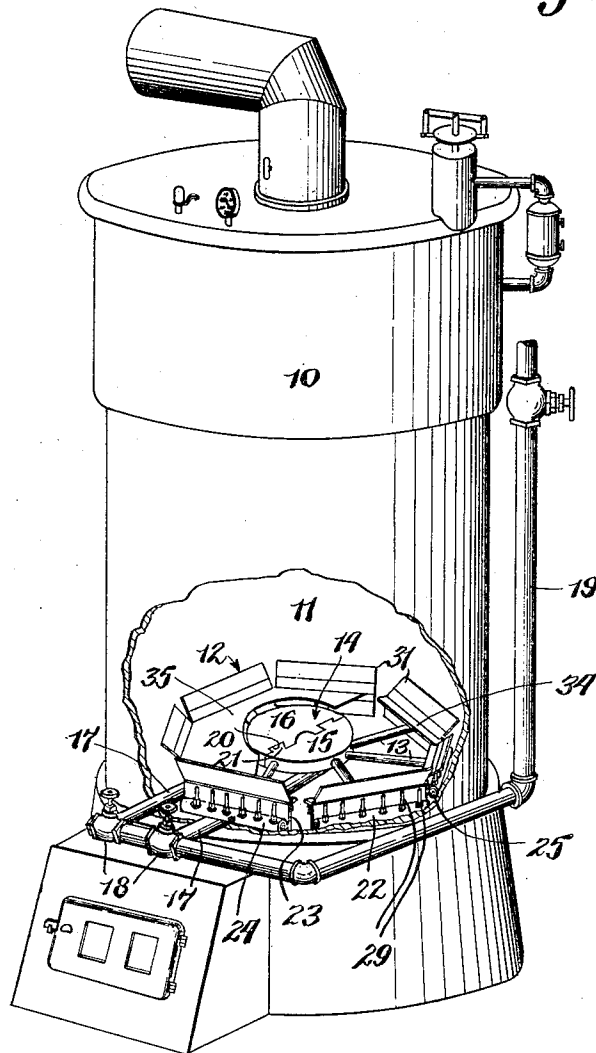
1,933,790

GAS BURNER

Filed Oct. 16, 1931

3 Sheets-Sheet 1

Fig. 1.



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3 Sheets-Sheet 2

Fig. 2.

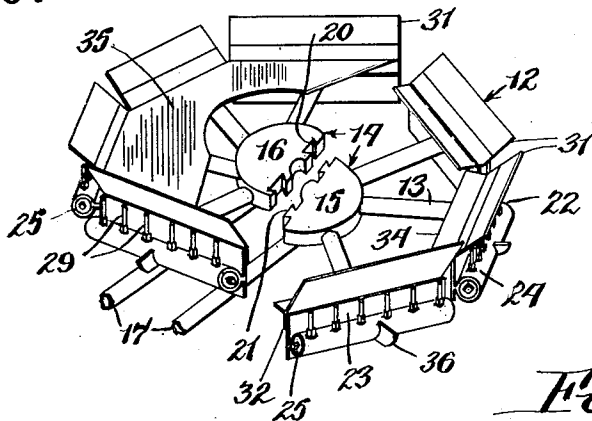


Fig. 3.

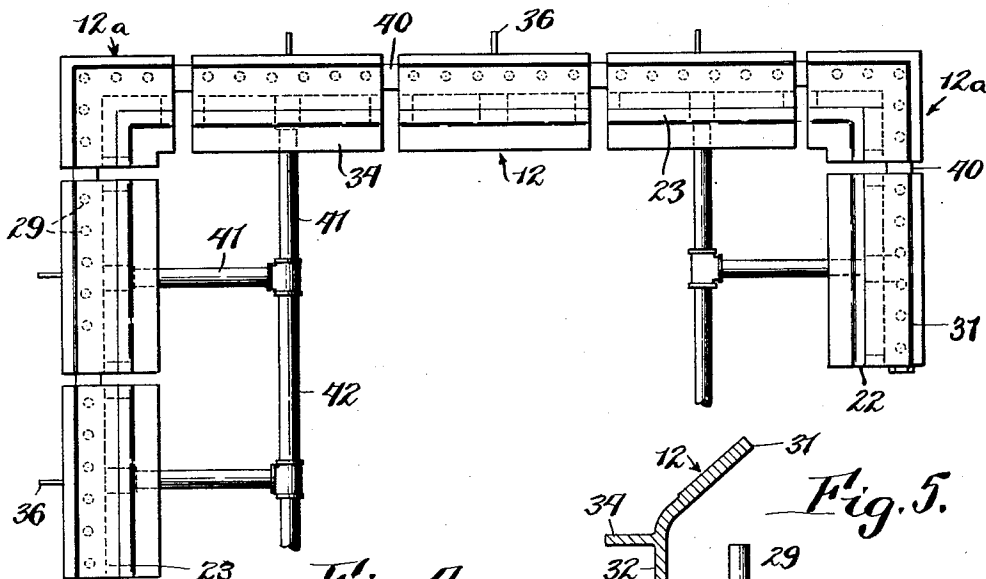
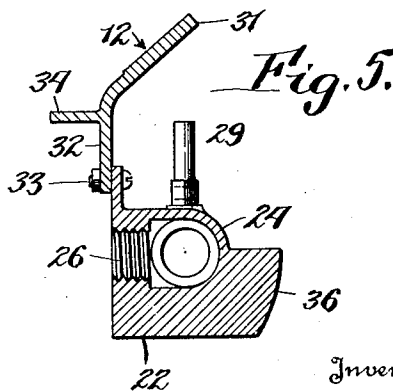
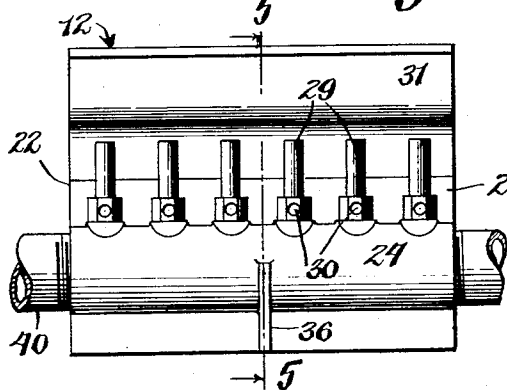


Fig. 4.



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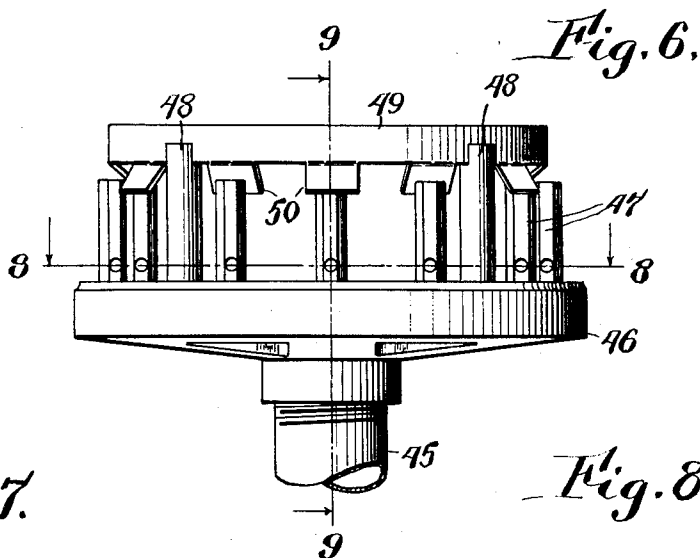


Fig. 7.

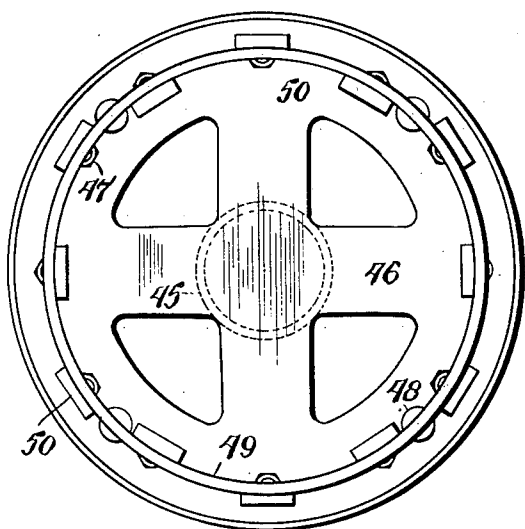


Fig. 8.

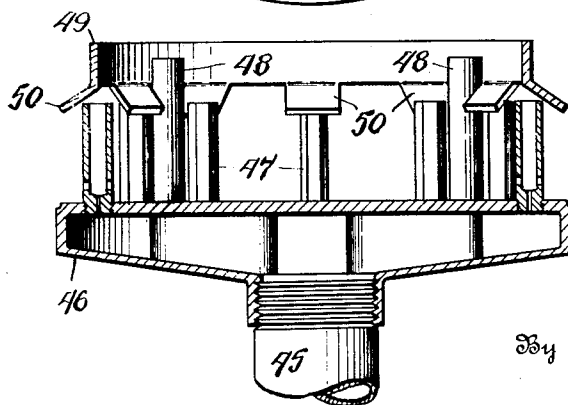
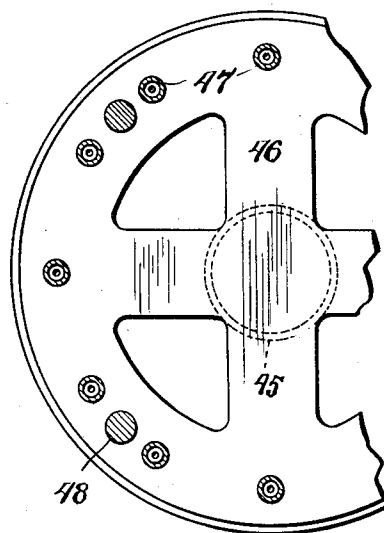


Fig. 9.

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UNITED STATES PATENT OFFICE

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GAS BURNER

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Application October 16, 1931. Serial No. 569,165

2 Claims. (Cl. 158—104)

This invention relates to a gas burner and more particularly to a gas burner adapted to be put into a furnace or other central heating plant for the purpose of heating homes or buildings although the invention can also be embodied in burners designed for use for other purposes.

In the installation of gas burners the size of the burner depends upon the amount of heating which is required. Thus for a very large home or office building a much larger capacity burner must be provided than would be required to heat a small home or building. To avoid the necessity of manufacturing and keeping on hand a large number of styles and sizes of gas burners, one of the principal objects of this invention is to provide a burner which is made up in sections so that where a larger burner is required, all that is necessary is to add more sections to the burner as compared with a smaller installation where a smaller amount of heat is required.

Another object is to provide such a sectional gas burner in which each individual section is so designed that it can be adapted to any type or kind of installation, that is, in installations of round or square fire boxes or in fire boxes which are very large and require several gas pipes to supply the necessary amount of gas for maintaining the desired temperature in the building.

Another object is to provide a baffle for the flames issuing from the burner jet which deflects the flames laterally to secure better combustion, and to insure their igniting one from the other and also reduce the danger of the flames going out.

Other objects are to provide a gas burner which is extremely simple in its construction and can be provided at low cost, which is efficient in operation and effects the maximum amount of heat with a minimum consumption of fuel and in which the burner will remain in good working condition for a long period of time without requiring attention or repairs.

Another object is to provide a lug on each of the burner sections so that each burner section is held spaced from the fire box wall and at the proper distance to secure a proper play of the flame from each jet against the side of the fire box wall.

In the accompanying drawings:

Figure 1 is a perspective view of a domestic furnace showing the same broken away to disclose one form of my invention in which the gas burner is made up of a plurality of units or sections which are disposed in an annular arrangement around the sides of the fire box.

Figure 2 is a perspective view of the form of the invention shown in Fig. 1 showing the two edges of the burner separated and illustrating how each half of the burner can be removed from the fire box without requiring dismantling of the entire burner.

Figure 3 shows a different arrangement of the burner units shown in Figs. 1 and 2 and shows the manner in which they can be used in a very large square or rectangular fire box.

Figure 4 is an enlarged side elevation of the burner units shown in Figs. 1-3.

Figure 5 is a vertical, transverse section taken on line 5-5, Fig. 4.

Figure 6 is a side elevation of a modified form of burner embodying my invention.

Figure 7 is a top plan view of the form of the invention shown in Fig. 6.

Figures 8 and 9 are sections taken on the correspondingly numbered lines in Fig. 6.

Referring more particularly to the form of the invention shown in Figs. 1-5 the numeral 10 represents a furnace such as are commonly used in domestic heating and having a fire box 11 in which the gas burner is arranged. This furnace 10 is shown as being round and consequently has a round fire box 11.

Where such a round fire box is encountered the burner units 12 are arranged in an annular row around the sides of the fire box 11 and are supplied with gas by means of radial pipes 13 which connect with a central two-part manifold 14, the halves 15 and 16 of which are locked and each half is connected to a gas supply pipe 17. The pipes 13 are right hand threaded at one end and left hand threaded at the other, and the parts 15, 16 and 12 correspondingly threaded so that upon turning the radial pipe 13, these parts are drawn together the proper distance. The flow of gas through each of these gas supply pipes 17 is controlled by a valve 18 each of which valves 18 connects the gas supply pipes with a gas main 19. It will be understood that the gas supply pipes 17 extend out through the usual clean-out door or opening (not shown) provided in such furnaces for the cleaning out of ashes and clinkers when the same is being used as a coal furnace and that the burner as a whole can rest upon the usual grates provided for the operation of the furnace with coal.

The two halves 15 and 16 of the central manifold 14 are hollow and are preferably made of cast metal in semi-circular form so as to provide a chamber which receives the gas from the gas supply pipe 17 and distributes it through

the radial branch pipes 13 which lead to the burner units 12. By making the central manifold 14 in two parts it is obvious that the burner can be very easily removed from the furnace since all that need be done to take out the burner is to separate the two halves 15 and 16 of the central manifold and break the connections between the manifold sections 15 and 16 and the gas pipe 17 whereupon each manifold section 15 and 16 can be removed through the furnace door together with the radiating pipes and burner units 12 connected with it. In order to hold the two halves 15 and 16 of the central manifold in proper position with reference to one another the two halves are preferably interlocked. For this purpose the straight side of the manifold section 16 is formed to provide a pair of vertical dovetail slots 20 which receive dovetail projections 21 on the other manifold section 15. It is apparent that when the dovetail projections on the manifold section 15 are interlocked with the dovetail grooves in the manifold section 16 the two part manifold is in the form of a circular body and the burner units are held in exact circular arrangement so that each of those burner units 12 is held at the same distance from the sides of the fire box or water leg of the furnace.

Each of the burner units 12 is preferably constructed as follows:

Each burner unit is made of a cast metal body 22 which includes a longitudinal inner wall 23 and a cylindrical hollow part 24 integrally formed with the wall 23. The ends of the tubular part 24 of each burner unit are open and are threaded, the threads at both ends being right hand threads. When the burner units are assembled in the manner shown in Figs. 1 and 2 both of these ends are closed by plugs 25 so that they are completely sealed. The radial pipes 13 screw into threaded opening 26 at the inner side and in the center of each burner unit 12, these openings 26 communicating with the interior of the cylindrical part 24 of the burner section.

Screwed into the upper side of each of the cylindrical parts 24 of each burner unit are a plurality of burner jets 29. These burner jets can be provided in any desired number and as shown six jets are provided for each of the burner units 12. Each of these jets is hollow and has a central orifice which permits the gas to pass from the cylindrical part 24 and discharge from the tip of each jet and air holes 30 are provided in each jet which mix the desired quantity of air with the gas stream flowing through each of the jets.

As the burning gas issues from each jet it is baffled by an inclined baffle 31 which extends over each of the jets 29 of each burner unit 12. This baffle 31 is preferably made of cast metal and has a depending flange 32 which is adapted to be secured to the upper side of the wall 23 of each burner unit by means of bolts 33 or in any other suitable manner. The baffle 31 is also formed to provide an inwardly extending flange or shelf 34. The shelves of the several burner units 12 serve to support a sheet 35 of asbestos or the like which sheet or plate prevents an undue upward draft of air through the space between the burners, as best shown in Figs. 1 and 2.

In order to prevent the burner units 12 from being spaced too closely to the sides of the fire box wall, and thereby reducing their heating efficiency, lugs 36 are formed integrally with each of the burner units 12, these lugs extending radially outward from the center of each of the burner

units. It is apparent that by this means the burner units can be spaced no more closely to the fire box than the lugs 36 will permit. It is also apparent that the baffles 31 not only prevent the gas from blowing out but also serve to more intimately mix the gas and air as it issues from the several jets, serve to deflect the burning stream of gas toward the fire box wall and also serve to insure the ignition of one jet of gas from the other so that only one jet need be lighted to insure the ignition of the entire burner.

In larger burner installations or in installations in a square or rectangular fire box the circular arrangement of the burner units 12 shown in Figs. 1 and 2 cannot, of course, be employed. When the units are to be installed in a square or rectangular fire box the units 12 are supplied without the end plugs 25 and the units 12 are connected by short coupling pipes 40 which screw into the open ends of the cylindrical portions 24 of the several burner units 12 so that the burner units are arranged end to end as indicated in Fig. 3.

The units 12 are rectangularly arranged around the sides of the fire box (not shown) and at the corners of the fire box special units 12a are provided which are similar in all respects to the units 12 except that instead of being straight, the ends of each of these units 12a are at right angles to one another. The majority of the burner units 12 are independently supplied with gas through branch lines 41 which connect with a manifold or main line 42. The corner units 12a are, however, supplied with gas through their connections 40 with the adjacent units 12 and where it is inconvenient to supply gas directly to any one of the units 12, such as is the case with the center unit 12 in Fig. 3, these units 12 can also be supplied with gas through their connections 40 with the adjacent units 12. It will also be understood that the gas can be fed into the end one of a series of the units 12 thereby eliminating the piping 41 and 42.

It is apparent from the foregoing that the burner unit shown in Figs. 1-5 is adapted for either round or rectangular fire boxes and also that they can be made up into burners having any desired capacity.

In the form of the invention shown in Figs. 6-9 the burner is supported on the gas supply pipe 45 which connects with the bottom of a hollow cast metal body 46 which forms the manifold in which the jets 47 are screwed. Any number of these jets may be provided and any number of rows may also be provided, these jets being shown in circular arrangement and one row being provided. These jets are similar to the jets shown in Figs. 1-5. In order to baffle the burning gas issuing from these jets 47 a plurality of posts 48 are mounted on the top of the burner head or manifold 46 and these posts 48 are slotted at their upper ends to receive a baffle ring 49. This baffle ring is formed to provide a plurality of laterally deflected depending baffles 50 which are staggered with reference to one another, one-half of the baffles 50 being deflected inwardly or toward the center of the ring 49 while the alternate baffles are deflected outwardly or away from the center of the ring 49. These baffles 50 are arranged so that they are disposed over each of the jets 47 and in close proximity thereto so that the burning gas issuing from the jets 47 is deflected laterally. These baffles, as in the preferred embodiment shown in Figs. 1-5, serve to more intimately mix the gas and air as

they issue from the jets 47 and also serve to prevent the flame from each jet from blowing out. As in the preferred construction these baffles are removably connected to the body of the burner and are supported exclusively there-
5 by, so that they are always held in the exact proper relation to the burner jets.

From the foregoing it is apparent that the present invention provides a jet burner in which
10 the gas and air issuing from the jets is intimately mixed by a baffle which the flame strikes and that this baffle reduces the liability of this flame to blow out; this baffle is also removably attached to the burner body so that it can be
15 easily removed in cleaning the jets or other parts of the burner and at the same time is so mounted that the baffles are always held in proper relation to the jets; in the form of the invention shown in Figs. 1-5 a burner unit is provided which
20 is built up of a plurality of similar units which are adapted to be arranged either in a circular or a rectangular fire box and in either arrangement are adapted to play against the sides of the fire box to secure the maximum heat transfer;
25 and all forms of the invention are inexpensive to manufacture, can be easily installed and will operate with maximum efficiency for a long time without getting out of order or requiring repairs.

I claim as my invention:

1. A gas burner comprising an elongated hollow body, means for admitting gas to said body, a plurality of burner jets arranged in a longitudinal row along said body and extending upwardly therefrom, means for mixing air with the gas passing through said jets, a wall formed integrally with said hollow body and extending upwardly therefrom at one side of said row of jets, a baffle removably arranged at the upper end
80 of said wall and extending at an oblique angle over the open upper ends of and in line with said jets whereby the removal of said baffle permits of drilling and tapping the openings in said body for said jets and screw means securing said baffle to said wall, said baffle being arranged close
90 to the upper ends of said jets to deflect the burning streams of gas issuing from said jets laterally and upwardly.

2. A gas burner comprising a central hollow manifold composed of two sections, one of said sections being formed to provide a vertical dovetail groove and the other being formed to provide an integral cooperating dovetail projection fitting said groove, a gas supply pipe for each of said
95 sections, a plurality of outlet pipes radiating from said manifold and a plurality of burner units secured to the outer ends of said outlet pipes.

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