May 7, 1940. E. F. GORMAN 2,199,951

GAS BURNER

Filed Oct. 18, 1938

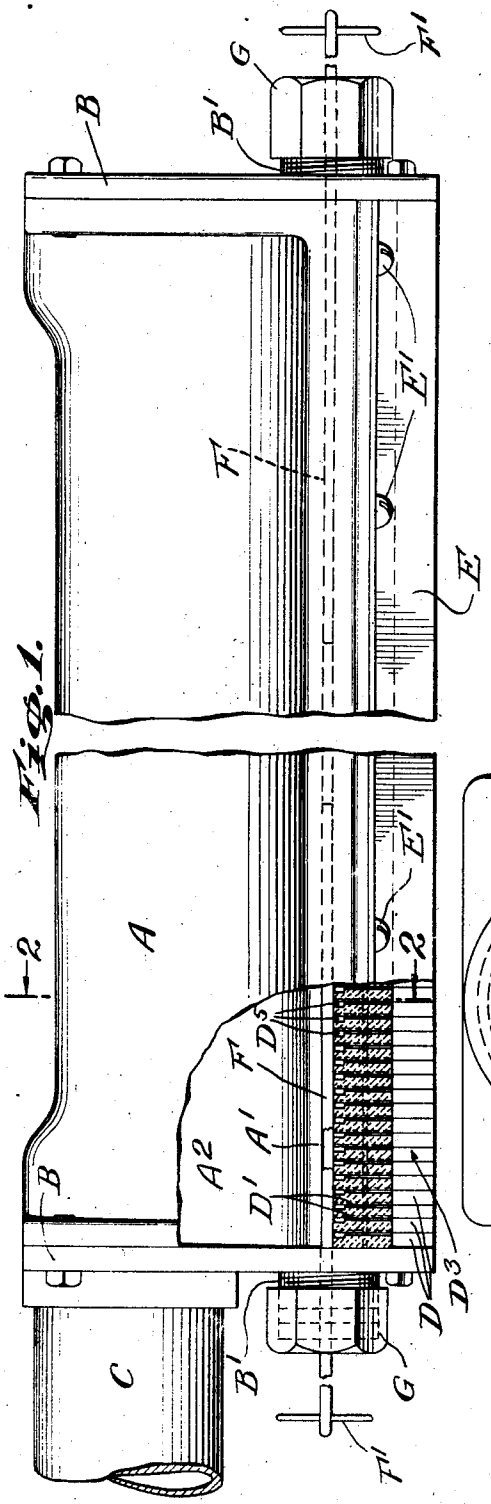


Fig. 1.

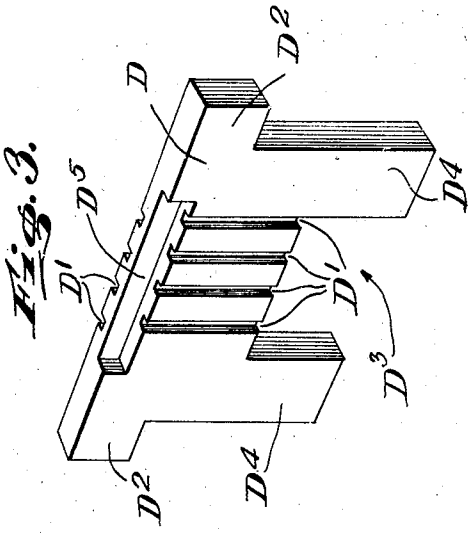


Fig. 3.

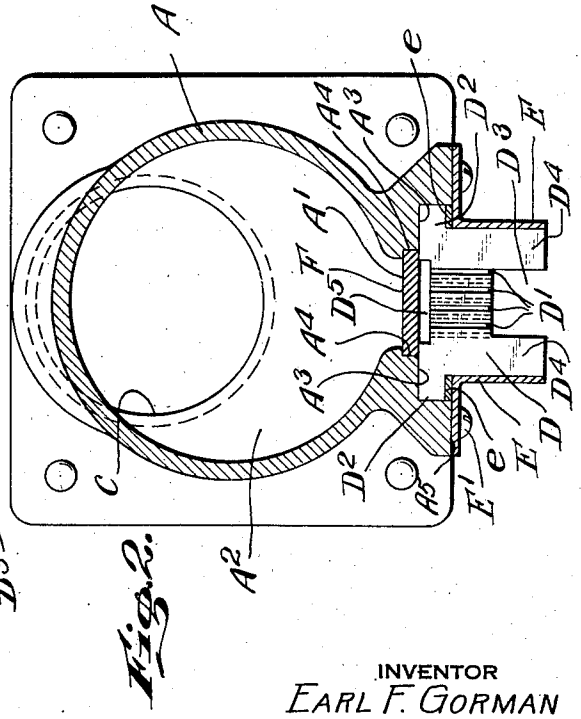


Fig. 2.

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GAS BURNER

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4 Claims. (Cl. 158—116)

The general object of the present invention is to provide an elongated gas burner with improved means for varying the effective length of the burner. More specifically, the object of the present invention is to provide improved means for varying the effective burner length in a ribbon burner of the known type disclosed in the applications of Frederic Hess, Serial No. 713,433, filed March 1, 1934, and Serial No. 195,950 filed March 15, 1938, in which thin ceramic plates with grooves in their sides are arranged side by side to form an elongated orifice wall at one side of the burner fuel chamber, having its orifices formed by said grooves.

In its preferred form, my improved burner comprises a flat metal bar extending into the burner through the corresponding end wall of the fuel chamber and having one side bearing against the burner orifice wall and longitudinally adjustable to cover the burner wall orifices for a greater or lesser portion of the length of the burner. In its preferred form, also, the burner orifice wall comprises ceramic plates which not only have orifice grooves in their sides, as in said prior applications, but are also recessed at their inner ends, to form dirt receiving grooves in the inner side of the orifice wall, into which the orifice grooves open, and which are of greater extent than the orifice grooves in the direction of the burner length. Dust and other burner dirt accumulating on the inner side of the orifice wall, may then be forced into the dirt receiving grooves, when said member is moved to close some of the orifices, without forcing dirt into and thereby choking the orifices so closed.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects attained with its use, reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawing:

Fig. 1 is an elevation partly broken away and in section of a burner constructed in accordance with the present invention;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1; and

Fig. 3 is a perspective view of one of the ceramic plates employed in the burners shown in Figs. 1 and 2.

The burner shown in the drawing comprises a metallic tubular burner body, or manifold, A, having removable end heads B, and formed at one side with a longitudinally extending slot like outlet A′ from the fuel space A^2 within the burner body. The fluid fuel, ordinarily a combustible mixture of air and gas, is supplied to the space A^2 through a supply pipe C connected to one of the end heads B. As shown, the portions of the burner body adjacent the sides of the slot A′ are thickened and shaped to provide a seat or corner recess A^3 at each side of the slot, to receive a corresponding corner portion of each of the multiplicity of relatively thin ceramic plates D which extend across the slot A′, and collectively form a wall closing said slot, except for the burner orifices D′ formed by grooves in the sides of the plates D.

As shown, the plates D are all similar in form, each comprising a portion adjacent the slot A′ of a width to fit in, and extend between the opposing parallel surfaces of, the recesses A^3. The portion of the plate more remote from the slot A′ is of smaller width, so that each plate is thus provided at each side of the slot A′ with a projection D^2 received in the corresponding recess A^3, and adapted to be secured in said recess by a corresponding clamping member E. As shown, each member E is a metal angle bar having one flange held against a bearing surface A^5 on the burner body by clamping bolts E, and having its other flange in reinforcing contact with the corresponding edges of the reduced width portions of the plates D. As shown, a gasket *e* is interposed between each clamping plate E and the corresponding portions D^2 of the plates D.

As shown, the end of each plate D remote from the slot A′ is formed with a notch, and the notches of the different plates collectively form a trough-shaped combustion space D^3 in, and extending longitudinally of, the burner wall formed by plates D. The side walls of the space D^3 are formed by integral portions D^4 of the plates D. As shown, each plate D is formed with a plurality of orifice grooves D′ at each side and the grooves at each side of the plate are in staggered relation with those at the other, so that in the burner wall formed by the assembled similar plates D, the open side of each burner orifice groove D′ formed in one plate, is closed by an ungrooved portion of the surface of the adjacent plate D.

In so far as above described, the burner disclosed herein comprises nothing novel with me,

but is of the type disclosed in said prior applications.

In accordance with the present invention, the portion of the burner body at each side of the slot A' and at the inner side of the adjacent corner recess A^3, is formed with a corner recess A^4. The walls of the two recesses A^4 and the adjacent edges of the plates D form a guideway for one or more flame stops or sliding valves F. As shown, the burner is provided with two valves F, one extending through each burner head end B, and each in the form of a flat bar of metal, ordinarily brass and rectangular in cross section. As shown each valve F is provided at its outer end with a handle F' adapted for engagement by the hand of an operator to adjust the valve longitudinally of the burner. Such valve adjustment varies the effective length of the burner, since each end portion of the orifice wall having its orifice grooves D' overlapped by the corresponding valve F, is rendered inoperative. The effective length of the burner is therefore equal to the distance between the adjacent ends of the two valves F. As shown, each end member B is formed with a chambered boss B', which in conjunction with the gland G provides a leakage preventing stuffing box, through which the corresponding valve F extends.

While the burner orifice grooves D' may vary in cross section in accordance with the burner capacity and burner operating conditions, the grooves are always relatively minute, being ordinarily about one thirty-second ($\frac{1}{32}$) of an inch deep and are usually square. To avoid risk of having the inner ends of the small orifice grooves D' closed by furnace dirt or dust accumulating on the inner edges of the plates D, and scraped off by each valve F when the latter is moved in the direction to shorten the effective length of the burner, I form dirt receiving grooves D^5 in the inner side of the burner wall formed by the ceramic plates D. As shown, each dirt receiving groove D^5 is formed by cutting away an inner edge portion of a corresponding plate D, to form a corner recess extending into the plate from the inner end and from one side of the latter. Each such recess extends into the plate from its side for a distance substantially greater than the corresponding dimension or depth of each of the orifice forming grooves D'. Each groove D^5 is of sufficient length, to communicate with each of the orifice grooves D' formed in the same side of the same plate D, and with the orifices D' in the adjacent side of the immediately adjacent plate D.

With the described construction, when each valve member F is moved in the direction to shorten the effective length of the burner, accumulated dirt scraped off the inner side of the orifice wall by the advancing end of the valve member is pushed into the corresponding grooves D^5 and may accumulate in the latter in relatively substantial amounts without closing or choking the corresponding orifice grooves as those grooves would be closed or choked by the dirt if the grooves D^5 were not provided. In consequence when the valve member is given a reverse adjustment, the effective length of the burner is increased as it could not be if its first mentioned adjustment had choked the grooves D' over which the valve was then moved.

The improved burner construction is characterized not only by the means just described for preventing the burner orifices from being choked by dirt forced into them in decreasing the effective length of the burner, but also by the simplicity and effectiveness of the valve means provided to adjust the valve length.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A gas burner comprising an elongated fuel chamber with burner orifices formed in a portion of its wall extending longitudinally of the chamber, and with an opening in an end wall of said chamber, a member extending into said chamber through said opening and comprising a flat bar portion within said chamber and bearing at one side against the inner side of said wall portion and adjustable longitudinally of the burner to open and close more or less of said orifices and thereby vary the effective length of said burner.

2. A gas burner comprising a burner body formed with a fuel chamber open at one end and comprising an elongated burner orifice wall at one side of said chamber, with burner orifices distributed along the length of said wall, an end head closing the open end of said fuel chamber and formed with an opening, a flat metal bar extending into the fuel chamber through said opening and having one side in engagement with the inner side of said orifice wall and adjustable longitudinally of the latter, whereby more or less of said orifices are closed by said bar, depending on the longitudinal adjustment thereof, and stuffing box means carried by said end head and surrounding said member and preventing leakage along the latter through said opening.

3. A gas burner comprising an elongated fuel chamber with burner orifices formed in a portion of its wall extending longitudinally of the chamber, and a member extending into said chamber at one end of the latter and comprising a barlike portion within said chamber bearing at one side against the inner side of said wall portion and adjustable longitudinally of the burner to open and close more or less of said orifices and thereby vary the effective length of said burner, said wall portion being formed with grooves at its inner side into each of which the corresponding orifices open and each of greater extent in the direction of the length of the burner than the orifices opening thereto, whereby dirt scraped off of said wall by said member may accumulate in the different grooves without choking the orifices opening therefrom.

4. In a gas burner, the combination with a burner body formed with a fuel chamber and with a slot in the wall thereof, of a multiplicity of thin ceramic plates formed with grooves in their sides seated on said body and extending across said slot with said grooves open at one end to and extending away from said chamber and forming burner orifices in a burner wall collectively formed by said plates, a sliding member engaging the inner side of said wall and movable along the latter in a direction transverse to the sides of said plates to extend across

more or less of said orifices and thereby vary the effective length of said burner, said plates being recessed at their ends adjacent said chamber to provide dirt receiving grooves at the inner side of said wall into each of which the inner ends of adjacent orifices open and each of which is of greater extent in the direction of movement of said member than the orifice grooves opening thereto, whereby dirt scraped off of said wall by the advancing end of said member in the adjacent of the latter may collect in said dirt receiving grooves without choking said orifices.

EARL F. GORMAN.