C. H. WERLIN.

GAS BURNING STOVE.

APPLICATION FILED MAY 5, 1919.

1,378,071. **Patented May 17, 1921.**

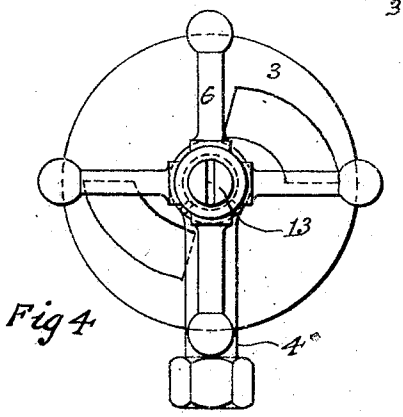


Fig 4

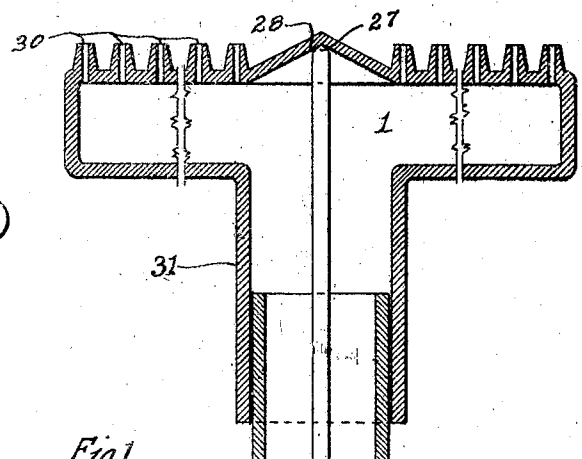
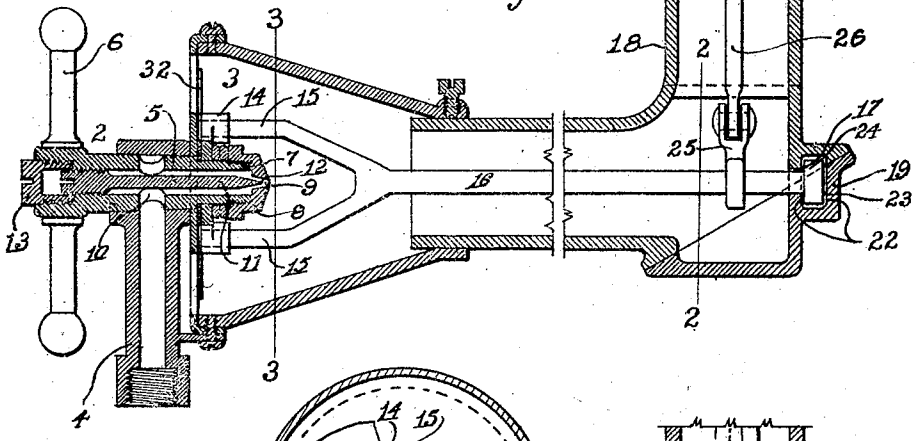


Fig 1



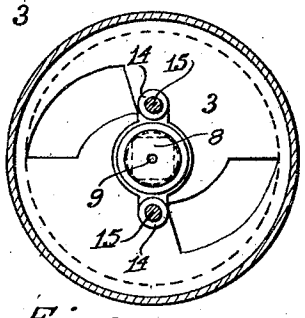


Fig 3

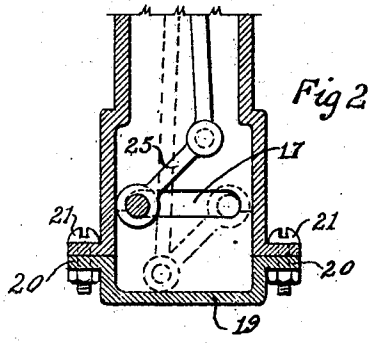


Fig 2

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UNITED STATES PATENT OFFICE.

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GAS-BURNING STOVE.

1,378,071. Specification of Letters Patent. Patented May 17, 1921.

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To all whom it may concern:

Be it known that I, CHARLES H. WERLIN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Gas-Burning Stoves, of which the following is a specification.

This invention relates broadly to improvements in gas burning stoves, and has particular reference to an improved adjustable burner structure which is capable of being automatically adjusted to maintain the flame emitted thereby in such relation to an associated receptacle that the latter will receive the full effect of the flame so that the heat loss will be reduced to a minimum.

The object of the invention resides in the combination of an adjustable gas burner and the valve structure for controlling the admittance of gas thereto, a connection existing between said valve structure and burner so that when the latter is used in connection with gas of relatively high pressures the opening of said valve structure will increase the space existing between the burner and an associated receptacle or vessel, in order that the tip of the flame emitted by said burner will be so directed and concentrated that the maximum efficiency of the volume of gas consumed will be obtained, the construction being such that overlapping of the flames emitted by the burner will be prevented, and in this manner heat loss will be effectively reduced.

Upon practical tests recently conducted by a reputable institute of technology it has been found that for cooking operations it is chiefly the tip of the flame that can be used for effective service. If the flame is short and the vessel is so far away that the hot point of the flame does not come close to the vessel, satisfactory results can not be obtained. On the other hand, if the flame is very long in order to reach the high vessel, the stove will be wasteful in the use of gas. Again, where two flames strike each other, due to the fact that the burner is located too near the receptacle or vessel so that the flames merge, poor combustion will result, as this will produce a luminous flame which will in turn result in a smoking and inefficient burner. It is for these reasons, among others, that at high pressures natural gas stoves are inefficient and therefore wasteful in their use of gas. With the above objections in mind, the present invention provides a burner which may be efficiently and effectively adapted to gas of both high and low pressure, in order that the burner may be positioned in properly spaced relation from the receptacle which it is heating so as to economize from a standpoint of fuel consumption and to effect the heating of the vessel in a proper and scientific manner.

A further object of the invention resides in the adjustable burner structure which when employed in connection with gas of relatively high pressure will have the space between its burner jets and the receptacle increased when the valve structure is turned on to increase the volume of gas flowing to the burner, and conversely, when said burner is employed in connection with gas of low pressure its adjustment is such that the turning on of the valve structure to increase the volume of gas will result in forcing said burner toward the receptacle so that the flame emitted thereby may be used to the greatest advantage.

With these and other objects in view, as will appear as the description proceeds, the invention accordingly consists in the novel features of construction, combination of elements and arrangement of parts hereinafter to be fully described and to have the scope thereof pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a vertical sectional view taken through the gas burner comprising the preferred embodiment of the invention,

Fig. 2 is a transverse vertical sectional view taken along the line 2—2 of Fig. 1,

Fig. 3 is a similar view taken along the line 3—3 of Fig. 1, and

Fig. 4 is a detail front elevation of the controlling valve structure and its associated air shell.

Referring more particularly to the details of the invention, as they are illustrated in the accompanying drawing, the numeral 1 designates the adjustable gas burner, the numeral 2 the gas controlling valve structure thereof and the numeral 3 the mixing shell and the burner supporting structure.

The valve structure 2 in its preferred form consists of an inlet pipe 4, which is threaded at its lower end for the reception of a suitable supply main. The flow of gas from the pipe 4 into the mixing shell 3 is

controlled by means of a rotatable valve plug 5, which latter is of tubular formation and is inwardly tapered to snugly fit within its reception chamber formed in the upper end of the pipe 4. A manipulating handle 6 is formed upon the outer end of the plug 5 in order that its rotation may be conveniently effected. To control the flow of gas through the plug 5, the same, if desired, is provided with a reduced threaded extremity 7 which protrudes into the shell 3 and is adapted to receive a nut 8 having a nozzle opening 9 formed therein, said opening establishing communication between the hollow interior of the plug 5 and the shell 3. It will thus be apparent that when the plug 5 is rotated so that its bores 10 will register with the bore of the pipe 4, fuel in a gaseous state will be permitted to pass to the hollow interior of said plug and thence into the shell 3 by way of the opening 9. If desired, the plug 5 is provided with an internal needle valve 11, which has its outer end threaded to engage with similar threads formed interiorly of said plug, whereby longitudinal adjustments on part of the needle valve may be obtained. The inner end of this valve 11 terminates in a sharpened point 12, which is adapted to coöperate with the opening 9 to control the effective area of the latter. Through the use of said valve 11 excessive gas pressures may be reduced and the action of the burner thereby rendered more efficient and economical. A cap screw 13 is employed to cover the adjusting end of the valve 11 so that the latter will not readily become out of adjustment.

Suitably secured in a rigid manner upon the reduced extremity 7 of the plug 5 is a support 14, which is adapted to rotate in unison with the plug 5. This support is provided, in this instance, with a pair of diametrically opposed openings in which are loosely received the bifurcated end 15 of a burner adjusting rod 16, the latter extending in this instance on a horizontal plane and has its end, opposite to the bifurcated end 15, journaled within an elongated socket 17, said socket being formed in a substantially L-shaped member 18 connecting the shell structure 3 with the burner 1 and serving to define means for conveying the carbureted gas from the shell 3 to said burner. The member 18 is preferably provided with a supplemental cap plate 19, which is secured to said member by providing flanges 20 upon the latter for coöperation with similar flanges formed upon the cap plate, fastening elements 21 being disposed to pass through registering openings formed in said flanges in order to securely unite the cap plate and member together. To define completely the socket 17 said cap plate is formed with a channeled flange 22 which communicates with the interior of the member 18 by means of an elongated slot 23, the latter being adapted to receive the inwardly journaled end of the rod 16; an enlarged head 24 is provided upon said inner end of said rod and is adapted to be received within the socket 17, the same serving to support the rod 16 for rotation.

Carried by the rod 16 is a crank arm 25 which is located substantially in vertical alinement with the upstanding portion of the member 18, and pivotally secured to the outer bifurcated end of the arm 25 is the lower end of a burner supporting element 26, the latter extending substantially in an upwardly directed position and terminates in a pointed extremity 27, which latter being received within a similarly shaped depression 28 formed in the upper spud carrying surface 29 of the burner 1, said element serving, in this instance, as the sole support for the burner 1, in order that the working height of said burner may be controlled by the operation of the valve structure 2. Said burner is of the ordinary type having the usual drilled outlet openings or spuds 30, and terminates in a downwardly directed sleeve 31 which surrounds the upper end of the L-shaped member 18, said member serving to guide the burner in its vertical movements and assists in maintaining the same in a steady and well supported condition.

In the event of the burner 1 being employed in connection with gas of relatively high pressures, it will be seen that by turning the valve 5 so as to permit of the flow of gas to said burner that the latter will be lowered successively and in proportion to the extent of opening on part of the ports of said valve plug. This is accomplished by means of the support 14 and the rod 16, which are rotatable in unison with the plug 5 and through the medium of the element 26 which is linked to the rod 16 by means of the arm 25. Thus the opening of the valve 5 will result in oscillating the arm 25 in a downward direction so that the element 26 will be lowered to an extent governed by the degree of opening on part of the valve ports 10. Thus when the gas is turned on to its fullest extent, the burner 1 will occupy its lowermost position so that the jets of flame issuing from the spuds 30 will have their tips located immediately under or just in engagement with the bottom of a vessel positioned over said burner. This arrangement is particularly desirable when gas of high pressure is being used, as it prevents the tips of the flames from overlapping or merging when contacting with the bottom of the vessel and in this manner producing waste and inefficiency. Again, by the gradual adjustment of the burner, gaged by the extent of opening of the valve 5, the tips of the flames emitted by said burner will at all times just reach the vessel being heated so

that the features of the invention are carried out irrespective of the extent of opening of said valve.

When the burner is employed in connection with gas of relatively low pressure, the rod 16 is rotated so that the element 26 will operate in a manner just the reverse of that described in order to adapt the burner to high pressure gas. By rotating the rod 16 a half turn, the arm 25 will be oppositely positioned and, as shown in Fig. 1, when the valve 5 occupies its fully open position the burner 1 will be located at its closest position of relation to the vessel being heated, so that the relatively reduced flame emitted by said spuds will be brought into efficient heat distributing relation with the bottoms of the vessel. Then, as the gas is gradually turned off the heat of said burner is reduced as it is not essential when the gas is turned down that the burner should operate with its greatest effectiveness.

From the foregoing description taken in connection with the accompanying drawing it will be seen that there is provided a burner peculiarly adapted to efficiently employ to the best advantage gas of both high and low pressures, so that the tips of the flames discharged by said burner will be brought into such relation with the vessel being heated that waste or loss of heat will be reduced to a minimum and to thereby obtain the maximum caloric value of the volume of gas or other similar fuel utilized. Under certain circumstances, the use of the slot 23 may be eliminated, but where the diametrical area of the vertically extending portion of the member 18 is somewhat restricted, the use of said slot is necessary in order to enable the supporting element 26 to be shifted from one position of operation to the other. Again, the plug 5 may be provided with the usual air controlling shutter 32, which operates over the air inlet ports of the shell 3 to control the entrance of air into said shell.

What I claim is:

1. In a gas stove, a valve structure, a vertically adjustable burner member, an element operated by such structure for controlling the working height of said burner member with respect to an associated vessel, and means permitting of the shifting of the working positions of said element to reverse the operation of said burner member.

2. In a gas stove, a valve structure, a vertically adjustable burner member, a conduit leading from said valve structure, mechanism coöperative with said valve structure and burner member situated within said conduit, said mechanism being operable to decrease the working height of said member proportionably to the increase in gas flow through said valve structure under high pressure conditions, and said mechanism being reversible to raise said burner member under low pressure conditions proportionably to the increase in gas flow through the valve structure.

3. In a gas stove, a valve structure, a conduit leading from said valve structure and terminating in an upstanding portion, a burner member telescoping upon said portion, a shaft positioned within said conduit and extending co-axially with said valve structure, means whereby said shaft will be caused to rotate in unison with said valve structure, a stem located in parallelism within said burner member and operating to support the latter, and means connecting said shaft to said stem to raise and lower the burner member in proportion to the extent of gas flow through the valve structure.

In testimony whereof I affix my signature.

CHARLES H. WERLIN.