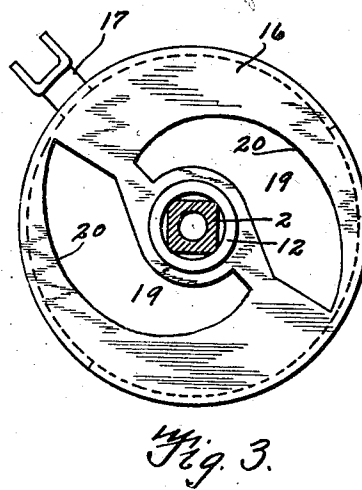
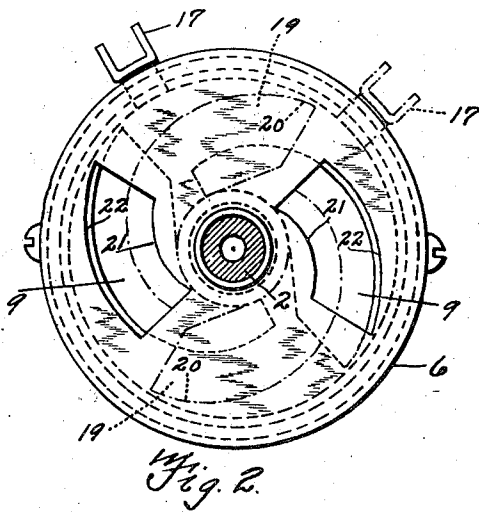
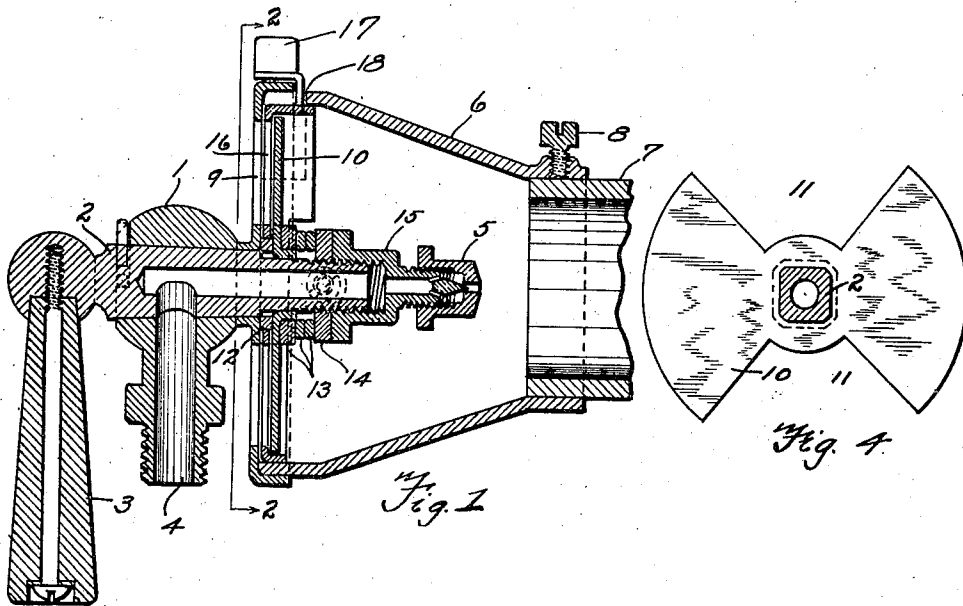


C. H. WERLIN.
 PROPORTIONAL GAS AND AIR MIXER.
 APPLICATION FILED NOV. 11, 1918.

1,320,107.

Patented Oct. 28, 1919.



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PROPORTIONAL GAS AND AIR MIXER.

1,320,107.

Specification of Letters Patent.

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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 Proportional Gas and Air Mixers, of which the following is a specification.

This invention relates to proportional gas and air mixers and is designed particularly to give the proper mixture of air and gas to effect complete combustion and, at the same time, to obtain the highest thermal efficiency.

The main object of my invention resides in a structure which is readily adaptable to varying conditions of gas pressure and draft whereby the mixture and flame may be properly regulated as above described. As a corollary to this, the structure may also be made to adapt itself to varying sizes of burner pipes within a predetermined range. In this structure, I contemplate providing a mixing shell having the usual air openings or their equivalent and a valve mechanism leading into this shell together with means operating automatically with the opening valve for increasing the effective size of the air openings and additional means whereby the maximum size of these air openings regulated by their width measurement may be initially set or may be varied at various times to suit changing conditions of draft and gas pressure.

One embodiment for carrying out the above principles is illustrated in the accompanying sheet of drawings wherein similar characters of reference designate corresponding parts and wherein,

Figure 1 is a vertical longitudinal section taken through one form of admission valve and mixer shell with my improvements applied thereto.

Fig. 2 is a section taken on line 2—2 of Fig. 1,

Fig. 3 is a face view of the manually operated shutter whereby the maximum effective size of the mixer air openings may be adjusted as desired and,

Fig. 4 is a face view of the shutter which operates automatically in conjunction with the valve mechanism to regulate the effective size of the mixer air openings.

In Fig. 1, the regulating valve is designated in its entirety by the reference numeral 1 and comprises a central hollow

plug 2 which may be oscillated by means of the handle 3. A connection 4 is shown as leading into the interior of the plug 2 to supply gas thereto and this gas is then emitted out of the end of the nozzle 5. A mixer shell 6 is suitably mounted in connection with the valve mechanism so that the discharge end of the valve is located within the shell as shown and this shell also is adapted to fit over the burner pipe 7 and held in place thereon by means of a set screw 8. The burner or face of the shell 6 is provided with a pair of air openings 9 whereby air is supplied to the entry gas. A shutter 10 of the form shown in Fig. 4 wherein opposed open spaces 11 are provided is rigidly mounted in connection with the valve mechanism and as shown in Fig. 1 is rigidly mounted in connection with the valve plug 2. This rigid mounting is accomplished by clamping the shutter 10 between the washers 12 and 13, the clamping effect being produced by means of the nut 14 and the lock nut 15, the latter carrying the nozzle 5. By suitably tightening the nuts 14 and 15, the washer 13 clamps the shutter 10 in connection with the washer 12 so that operation of the valve plug 2 also causes movement of the shutter 10. This shutter is located upon the valve plug in such manner that the effective size of the mixer air openings 9 are increased as the valve is opened.

To adapt the structure to varying gas pressures and also to varying sizes of pipes 7, it being understood that these latter may be pushed up or down as desired, there is provided an additional shutter 16 shown detached in Fig. 3. This shutter is mounted rotatably upon the washer 12 and is provided with an operating handle 17 operatively projecting through the slotted portion 18 of the mixer shell 6. This shutter is provided with a pair of openings 19 of a size gradually increasing in width from the small end to the large end. In addition, the outer edges 20 of these openings are formed on a curve of gradually increasing radius so that no matter what may be the position of the shutter 16, the effective openings through the mixer shell will be of segmental circular form although the variation in effective size is obtained by thus varying the effective width. This is rendered possible by making the edges 21 and

22 of the openings 9 in the mixer face of a contour concentric with the edges 20 of the shutter 16.

From the foregoing description, taken in connection with the accompanying sheet of drawings, it will be apparent that the shutter 16 may be initially set to produce any desired effective size of air opening through the mixer shell. The effective sizes of these openings is governed in a great measure by the gas pressure, barometric condition, and also the size of burner or pipe that the valve is adapted to supply. Having determined the proper position of the shutter 16, the shutter 10 is brought into play to operate automatically with the opening of the valve 1 to gradually increase the size of the air openings as previously determined by the location of the shutter 16 during the opening movement of this valve. It will thus be apparent that for a small supply of gas, a small supply of air is also admitted and this balance holds true for any of the various conditions encountered in the combustion of gas.

What I claim is:

1. In a gas valve and mixer structure, a mixer shell having air openings, a valve mechanism leading into said shell, a shutter carried by said mechanism to cooperate with said air openings to increase the effective size of said air openings as the valve mechanism is opened, and an additional shutter arranged to vary the effective width of said air openings but independent of the operation of said valve mechanism.

2. In a gas valve and mixer structure, a mixer shell having air openings, a valve mechanism leading into said shell, a shut-

ter movable with the opening movement of said mechanism and cooperating with said air openings to increase their effective size as the valve mechanism is opened and an additional shutter rotatably mounted with respect to said shell and operable from the exterior of the shell to also vary the effective width of said air openings entirely independent of said first named shutter and the opening movement of said mechanism.

3. In a gas valve and mixer structure, a mixer shell having air openings, a valve mechanism leading into said shell, a shutter movable with the opening movement of said mechanism and cooperating with said air openings to increase their effective size as the valve mechanism is opened, an additional shutter rotatably mounted with respect to said shell and provided with openings gradually increasing in width from one end to the other to cooperate with said shell air openings, and a handle structure located exteriorly of the shell for setting said last named shutter at any desired position irrespective of the operation of said valve mechanism.

4. In a gas valve and mixer structure, a mixer shell having air openings, a valve mechanism leading into said shell, means operating automatically with the opening of said mechanism for increasing the effective size of said openings, and additional means manually operated and entirely independent of said first named means for also varying the effective width of said shell openings.

In testimony whereof I affix my signature.

CHARLES H. WERLIN.