

1,053,143.

Patented Feb. 18, 1913.

Fig. 1.

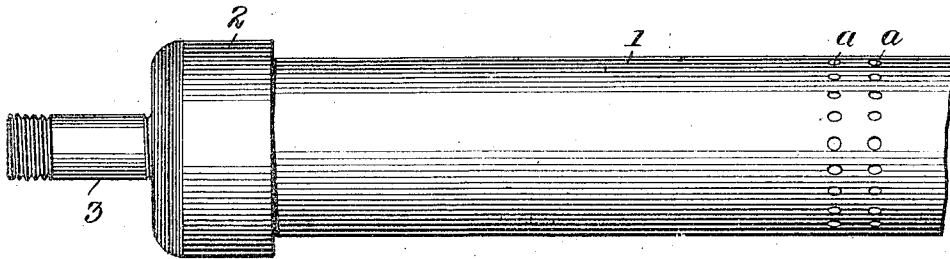


Fig. 2.

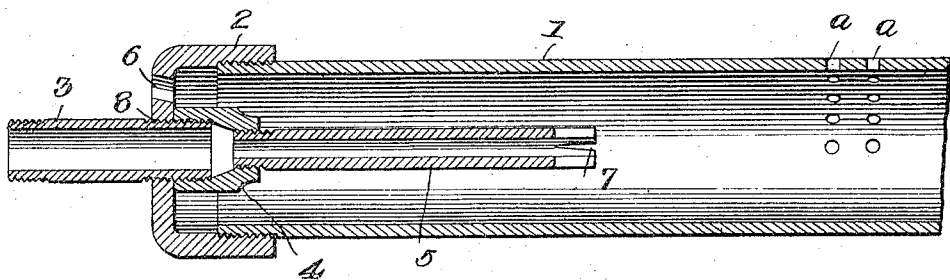


Fig. 3.

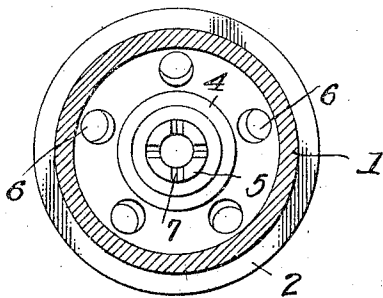
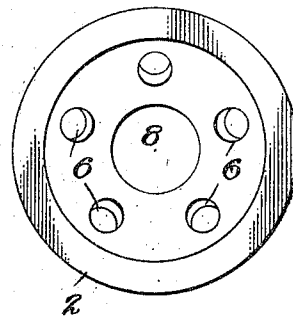


Fig. 4.



Inventor

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Witnesses

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By

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UNITED STATES PATENT OFFICE.

WILLIAM O. ALTMAN, OF KANE, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO JOHN A. JOHNSON, OF KANE, PENNSYLVANIA.

FUEL-GAS MIXER.

1,053,143.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed July 5, 1911. Serial No. 637,003.

To all whom it may concern:

Be it known that I, WILLIAM O. ALTMAN, a citizen of the United States, residing at Kane, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Gas Mixers, of which the following is a specification.

This invention relates to an improved apparatus for commingling atmospheric air in proper proportions with hydro-carbon gases naturally or artificially generated, before the fluid reaches the combustion chamber of the furnace or boiler.

One of the principal objects of this invention is to provide a manner of mixing the air and gas so that the complete combustion as well as the maximum amount of heat is produced.

One of the difficulties experienced with the mixers now in common use is to acquire and maintain the right amount of air for proper combustion, and to introduce it into the mixing chamber in such manner that correct intermingling may be had of the gas and air before it reaches the point of ignition.

Another object of this invention is to improve and simplify the production and operation of devices of this character, so as to be comparatively simple and inexpensive to manufacture as well as reliable and efficient in use, and readily attached and employed with any standard burners now in common use.

With these objects in view the various novel features of construction and arrangement of parts will be hereinafter more fully described, reference being had to the accompanying drawings forming a part of this specification in which:

Figure 1, is a top plan view of the device embodying the invention. Fig. 2, is a longitudinal section of the same device. Fig. 3, is a view of the mixer from the combustion end. Fig. 4, is an end view of the reducer showing the air ports.

Referring to the drawings, 1 is a burner tube having a series of perforations *a-a* spaced apart thereon, which tube extends into the combustion chamber of a stove or furnace, 2 is a cap or reducer which is screw threaded to receive the end of the burner tube. In the center of the cap or reducer 2, is an aperture 8, screw threaded to receive the feed tube 3, which tube projects through

the reducer sufficiently to engage the interior reducer 4, whose opposite or reduced end is screw threaded to receive the distributing tube 5.

Located around the central aperture in the cap or reducer 2, are air ports 6—6 designed to introduce a proportionate amount of air to the amount of gas introduced. The method of commingling the same will be more fully described.

The distributing tube 5, extends well into the interior of the burner tube 1, and has in its internal end, an opening of novel construction which constitutes an important feature of this invention, comprising as it does longitudinal V shaped slots 7, shown in Fig. 2, said slots having properties which produce novel results in their functions of intermingling the gas emitted therethrough, with atmospheric air introduced into the burner tube through the air ports 6—6.

By the adoption of the novel form of aperture in the discharge end of the distributing tube, comprising as it does lateral V shaped slits cut into the sides of the tube, I am able to produce a commingling of the gas with the air which is most effective in producing a mixture capable of the highest state of combustion. Furthermore as the mixture of gas and air is consumed, there is produced a siphonetic action which draws in the air through the air ports, and in its kinetic action past the V shaped slits in the distributing tube it has the effect of drawing out the gas from the novel aperture of the discharge end of the distributing tube, causing a discharge therefrom independent of the pressure maintained in the gas mains.

In the developments of my improved form of air mixer, I have evolved a means of bringing the air and gas into proper assimilation to create a mixture of highest combustion, due to the proportion at which I introduce the element of gas and air separately, and the novel form of the aperture of the tube from which the gas is omitted. I have found that in combining atmospheric air with hydro-carbon gases, and more particularly with natural gas, that the proportion of air should be eleven and one half parts to one part of hydro-carbon gas. That to acquire these results I provide air ports 6—6 of such size that their combined area will be eleven times the area of the distributing tube 5. This proportion with my

novel form of slots leading from the aperture in the distributing tube, tends to maintain, under varying degrees of pressure at which illuminating and heating gas is usually delivered, the proper proportion of air and gas, to secure the highest possible combustions.

In the construction of my apparatus it will be observed that the distributing tube is of generous proportions, which eliminates the variations of gas flow due to high or low pressure of gas when a small aperture for distributing the gas is used, and my improved form of mixer will operate equally well on high or low pressure there being no undue draft of air through the air ports due to the effect of a blast of gas coming from a small aperture.

While I have found that the proper ratio of air to natural gas to make perfect combustion is eleven to one, this can be increased to twelve to one, without affecting materially the combustion, but to exceed that ratio, will be detrimental to the combustion and materially lessen the heat of the flame produced thereby. On the other hand with a diminished amount of air below the proportion of eleven and one half to one there is a production of carbon and a state of improper combustion.

I do not wish to limit myself to the spe-

cific form of apparatus herein described, as my apparatus may be made in other forms and designs without departing from the spirit of my invention.

Having thus described my invention what I claim is:

1. A gas mixer having a cylindrical mixing chamber, a plurality of air inlets there-to, and a gas inlet comprising a tube extending into the mixing chamber having V shaped slots placed in the outlet end providing means for introducing the gas in said mixing chamber between the air inlets and points of ignition.

2. A gas mixer comprising a cylindrical mixing chamber, a gas tube extending into said mixing chamber, forming an annular flue between said tube and the walls of the mixing chamber, means for introducing air into said flue, and means comprising V shaped slots placed in the inner end of the gas tube for commingling gas with the air as it passes from said annular flue into the mixing chamber.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM O. ALTMAN.

Witnesses:

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G. W. BERRY.