Jan. 5, 1932. P. W. McCOY 1,839,796

GAS BURNER TIP

Filed June 19, 1930

Fig. 1

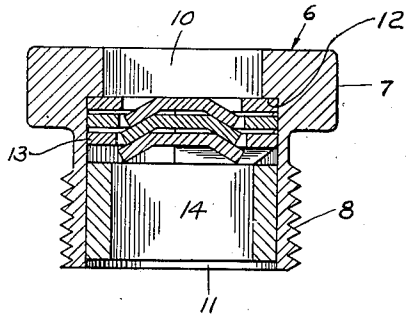


Fig. 2

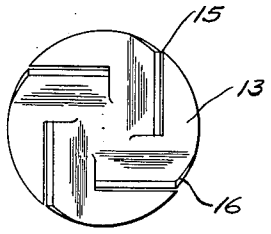


Fig. 4

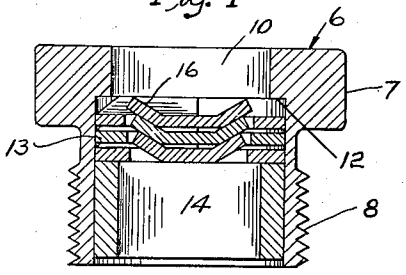


Fig. 3

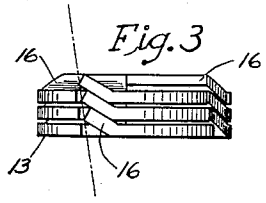
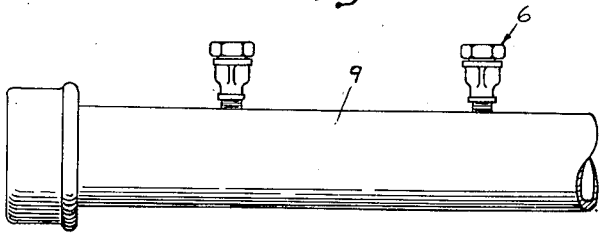


Fig. 5



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UNITED STATES PATENT OFFICE

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GAS BURNER TIP

Application filed June 19, 1930. Serial No. 462,233.

This invention relates to improvements in gas burners and more particularly to burners of the cup type for burning preformed or explosive mixtures of air and gas.

An explosive mixture of natural gas and air will not burn satisfactorily in a burner designed for burning an explosive mixture of artificial gas and air nor will an explosive mixture of artificial gas and air burn satisfactorily in a burner designed for burning an explosive mixture of natural gas and air.

With the above facts in mind, it is the object of the present invention to provide a burner of such type that depending on how the parts are assembled the burner shall be adapted for burning explosive mixtures of natural gas and air or of artificial gas and air as the case may be.

Referring to the drawings:

Fig. 1 is an enlarged axial section through the improved burner showing how the parts are arranged for burning a mixture of artificial gas and air.

Fig. 2 is a plan view of one of the burner elements shown in Figs. 1 and 4.

Fig. 3 is a side elevation showing how the disks may be nested;

Fig. 4 is a view similar to Fig. 1 showing how the disks are reversed to form a burner adapted to properly burn a mixture of natural gas and air.

Fig. 5 is a side elevation of a mixture-supply manifold with the burners mounted thereon.

The main body of the burner is indicated at 6 and comprises a tubular member made from hexagonal bar stock to provide a wrench head 7, the major portion of the body being turned down and provided with screw threads 8 to permit the body to be screwed into a suitable supply pipe 9.

The body has alined bores 10 and 11 of relatively different diameters whereby there is formed a shoulder 12 intermediate the ends of said body. This shoulder forms a seat for a disk 13 of which a plurality is positioned in the bore 11 and held in place by a ring 14 pressed into the bore.

Each disk is made of relatively thin heat-resisting alloy and is provided with a plurality of slits 15 formed by severing the metal on chord lines. The slits are preferably at right angles to each other and of a length approximately equal to one half the length of the chord on which they are formed. In forming the slits, the metal is pressed away from the plane of the disk to form an angularly projecting lip 16 it being noted that all of the lips are on the same side of the disk.

The disks are so assembled in the bore 11 that the slits of adjacent disks are in substantial alinement. When so assembled the lips of adjacent disks are in actual contact but those portions of one disk between the lips do not contact with the similar portions of the adjacent disk but on the contrary are in slightly spaced relation. Such spacing is advantageous in that the mixture from the bore 11 is free to flow between the disks in passing into the bore 10 with the result that the disks are kept relatively cool.

While generally speaking the slits 15 of one disk are in substantial alinement with the slits of an adjacent disk nevertheless the disks tend to assume a position in slight angular advance with respect to each other with the result that a plane passed through a group of alined slits will be at an incline with respect to the axis of the bores 10 and

From the foregoing description it will be a group of alined slits is an important feature of the invention since depending on whether the disks are assembled with the lips of the disks facing away from the bore 10 as in Fig. 1 or facing the bore 10 as in Fig. 4, the mixture flowing into the bore 10 will be directed towards the axis of the bore or towards the side walls of the bore.

When the mixture to be burned consists of natural gas and air the disks will be assembled with the lips 16 facing the bore 90 as shown in Fig. 4 whereas when the mixture consists of artificial gas and air the lips 16 will be directed away from the bore 10 as shown in Fig. 1. It will, of course, be understood that the mixture issues from the alined slits in the form of a thin sheet. The mixture entering the cup or bore 10 burns within

the confines of the cup and is practically immune from blow-off.

The burners find special utility in closed chambers such as bake ovens but are not limited to such use. It may be well to note that the burners are considerably smaller than shown in the drawings. Thus in actual practice the bore 10 will be approximately three eighths to one half inch in diameter. The disks 13 will have a thickness of approximately one thirty second of an inch and the lips 16 will be bent up just enough to provide a relatively restricted passage through the slit or line of severance of the metal.

From the foregoing description it will be readily seen that the present invention provides a burner which can be cheaply manufactured and which by merely assembling the disks with the lips in the proper direction can be used with either natural or artificial gas as the case may be.

What is claimed is:

1. In a burner tip for burning preformed mixture of air and gas, the combination of a tubular body having at one end a relatively short bore adapted to form the walls of a combustion cup, apertured means forming the bottom of said cup, said means comprising a stack of abutting disks, each disk being provided with a plurality of similar slits, said slits being formed by shearing the metal of the disk in a manner to form lips projecting from the surface of the disk.

2. In a burner tip for burning preformed mixture of air and gas, the combination of a tubular body having at one end a relatively short bore adapted to form the walls of a combustion cup, apertured means forming the bottom of said cup, said means comprising a stack of abutting disks, each disk being provided with a plurality of similar slits, said slits being formed by shearing the metal of the disk in a manner to form lips projecting from the surface shorter than the diameter, said slits being located in chord lines of the disk.

3. In a burner tip for burning preformed mixture of air and gas, the combination of a tubular body having at one end a relatively short bore adapted to form the walls of a combustion cup, apertured means forming the bottom of said cup, said means comprising a plurality of relatively thin disks, each disk being provided with a plurality of similar slits, said slits being formed by shearing the metal of the disk in a manner to form lips projecting from the surface of the disk, the disks being nested in such manner that substantially unobstructed passages from one side to the other of said means may be formed through said slits, the disks being in slight angular advance of each other.

4. In a burner tip for burning preformed mixture of air and gas, the combination of a tubular body having at one end a relatively short bore adapted to form the walls of a combustion cup, apertured means forming the bottom of said cup, said means comprising a plurality of disks each provided with slits formed by shearing the metal in a manner to form laterally projecting lips on chord lines through the disk, the disks being nested with the slits of one disk in substantial alinement with the slits of an adjacent disk, the lips of adjacent disks being in abutting relation and serving to maintain the non-lipped portions of said disks in relatively spaced relation.

5. In a burner tip for burning preformed mixture of air and gas, the combination of a tubular body having at one end a relatively short bore forming the walls of a combustion cup, apertured means forming the bottom of the cup, said means comprising at least one relatively thin disk provided with slits on chord lines shorter than the diameter, said slits being formed by severing the metal of the disk in a manner to cause the metal at one side of the slit to assume an angle with respect to the plane of the disk.

In testimony whereof I affix my signature.

PHILIP WM. McCOY.