C. V. WITT.

GAS BURNER.

APPLICATION FILED AUG. 5, 1918. RENEWED OCT. 27, 1920.

1,360,981. **Patented Nov. 30, 1920.**

Fig. 1.

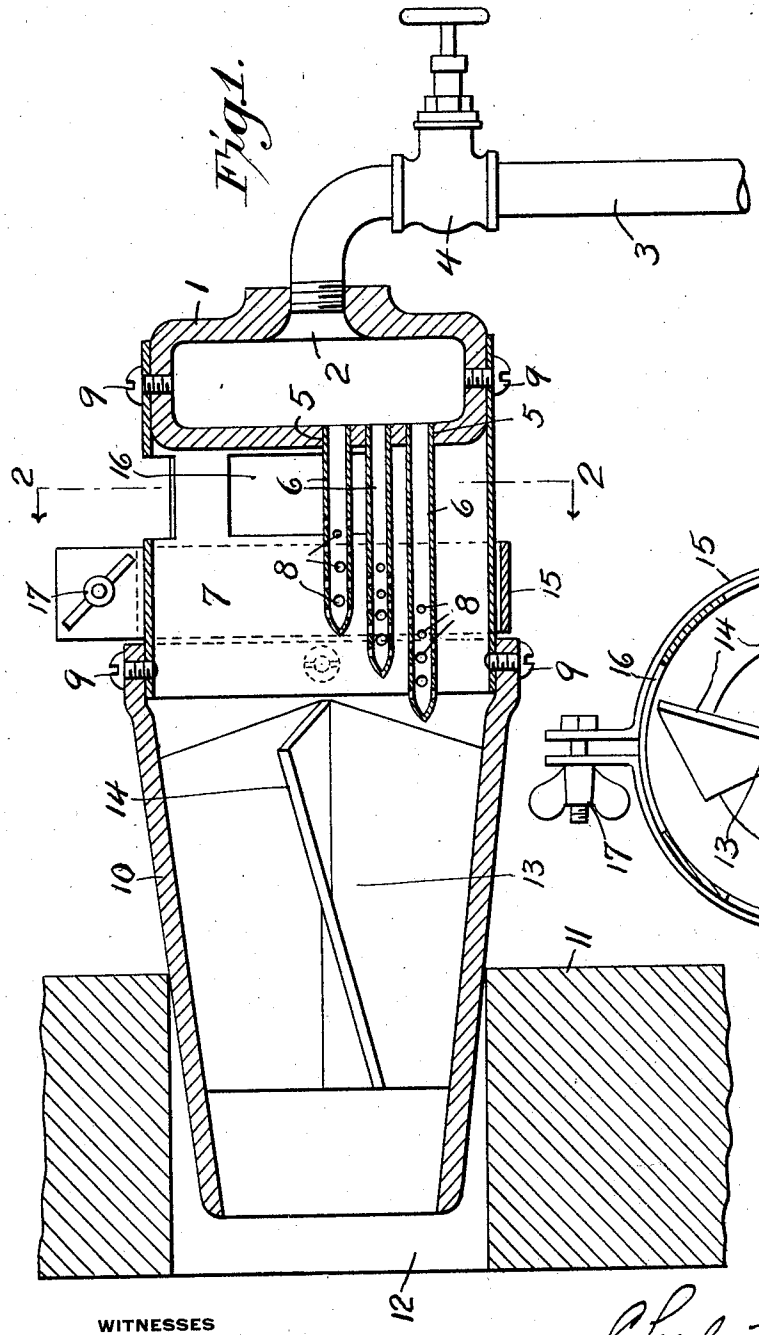
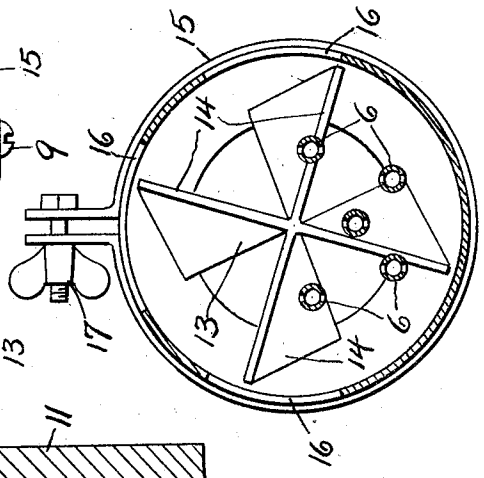


Fig. 2.



WITNESSES

J. Hebert Bradley.

INVENTOR

Charles V. Witt

by John H. Poney

his atty

UNITED STATES PATENT OFFICE.

CHARLES V. WITT, OF PITTSBURGH, PENNSYLVANIA.

GAS-BURNER.

1,360,981. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed August 5, 1918, Serial No. 248,304. Renewed October 27, 1920. Serial No. 419,994.

To all whom it may concern:

Be it known that I, CHARLES V. WITT, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Burners, of which improvement the following is a specification.

My invention relates to improvements in gas burners.

The object of my invention is to produce a complete combustion gas burner. This object I attain by means of the device hereinafter more specifically described, reference being had to the accompanying drawings, forming part hereof, in which:

Figure 1 is a central longitudinal section of my improved burner, showing also a section of the front wall of the furnace.

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

Referring to said drawings, 1 is a gas chamber, which comprises a circular hollow casting, in the front or outer wall of which an orifice, 2, is formed, in which one end of the gas supply pipe, 3, is secured. The said gas supply pipe is provided with a valve, 4, which is adapted to control and regulate the admission of gas to said gas chamber. The inner wall of said gas chamber is provided with a number of orifices, 5, in which the outer ends of tubes, 6, are inserted and secured. The said tubes are all inserted in said wall in the lower portion thereof, that is, below a horizontal line through the center of said gas chamber, and project into a mixing chamber, 7. The said tubes are of different lengths and are closed at their inner ends, the walls thereof having therethrough perforations, 8, for the emission of gas, the area or size of which perforations increases toward the inner closed ends of said tubes, whereby a uniform current or quantity of gas is emitted or discharged through all of said perforations. The outer end of said mixing chamber, 7, is secured to the gas chamber in any suitable way, but shown in the drawings to be secured thereto by screws, 9. The inner end of said mixing chamber, 7, is secured in a similar manner to the nozzle, 10, which is preferably tapered toward the front wall, 11, of the furnace projecting in an opening, 12, formed in said front wall. 13 is a spider, snugly fitted within said nozzle and provided with spirally disposed blades, 14, which extend longitudinally almost the entire length of said nozzle, for the purpose of giving the gases drawn therethrough a swirling motion on their admission to the furnace. A band, 15, is adapted to be adjusted over the outer end of the mixing chamber, 7, for the purpose of increasing or decreasing the area of the openings, 16, all of which are formed in said chamber above the horizontal center line thereof and above the burner tubes, 6, whereby the air, which is heavier than the gas, is admitted above the gas, and the gas, being lighter, in its ascent through the incoming air produces complete mixture of the two gases, *i. e.*: of the atmospheric air and the gas, forming a combustible mixture which is given, as heretofore stated, a swirling projection through the nozzle by means of the spider. The separable ends of said band, 15, are connected by means of a bolt or thumbscrew, 17, whereby the said band may be tightened and loosened for the purposes of adjustment. The burners are inserted into the front end of the boiler furnace and the space under the boiler is otherwise tightly closed, so that no air is admitted thereto, except that which passes through the air ports, 16, in the mixing chamber. The air drawn through said ports, owing to its specific gravity, has a tendency to fall toward the bottom of the mixing chamber, and the gas emitted from the openings in the tubes, 6, being lighter than the air, has a tendency to rise; thus the dropping air and the rising gas are brought into intimate admixture, the tubes being of different lengths; that is to say, the lower tube being longer than the upper tube, which insures that no air settles near the bottom of the burner without being saturated with gas. The tapering nozzle gives the gas and air mixture a greater velocity when leaving the burner and the spirally disposed spider inside of the nozzle gives the escaping mixture a whirling motion, thus perfecting and producing a complete mixture and insuring complete combustion of the combustible gases.

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

1. A gas burner taking into consideration the different specific weights of the gases to be mixed, comprising a gas chamber, a mixing chamber adjacent thereto, and a tapering discharge nozzle, the mixing chamber

having air admission openings all of which are located at a point above a horizontal line drawn through the center thereof and having projecting therein gas emission tubes communicating with the gas chamber, the said gas emission tubes all of which being below the horizontal line, whereby the lighter element, gas, in its ascent thoroughly commingles with the heavier element, air, in its descent, thereby producing a complete combustible mixture.

2. In a gas burner comprising a gas chamber, a mixing chamber adjacent thereto and a discharge nozzle, the combination of said gas chamber having series of tubes all of which project into the mixing chamber below a line drawn through the horizontal plane thereof, the said mixing chamber having air admission openings all of which are formed at a point above a horizontal line drawn through the center thereof, the said gas tubes being of different lengths, closed at the inner end and having series of openings at right angles to the axis thereof, the openings in the outer end being of greater area than those nearer the gas chamber.

3. A gas burner comprising a gas chamber and a gas mixing chamber adjacent thereto and a gas discharge nozzle, the said mixing chamber having air inlets, all of which are located at a point above a line drawn through the horizontal center thereof and having means for regulating the size of said openings and having projecting therein gas emission tubes communicating with the gas chamber, all of the said gas emission tubes being below the horizontal line, whereby the lighter element, gas, in its ascent thoroughly commingles with the heavier element, air, in its descent and whereby the admission of the air may be regulated.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES V. WITT.

In presence of—
CLARENCE A. WILLIAMS,
JOHN H. RONEY.