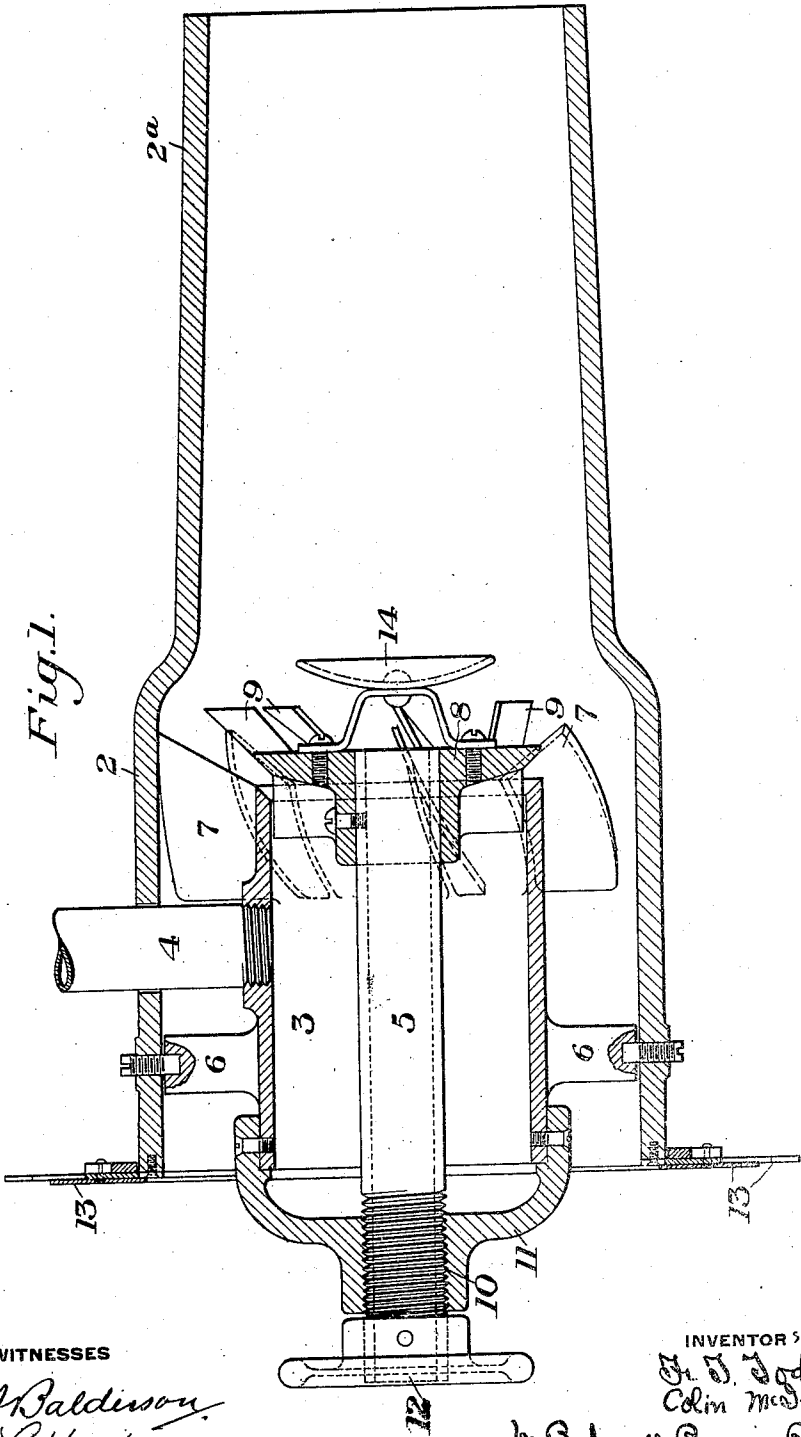


F. T. TODD & C. McINNES.  
GAS BURNER.  
APPLICATION FILED AUG. 11, 1908.

Patented Oct. 26, 1909.  
2 SHEETS—SHEET 1.

938,182.



WITNESSES

*R. A. Baldwin*  
*G. L. Winters*

INVENTOR'S

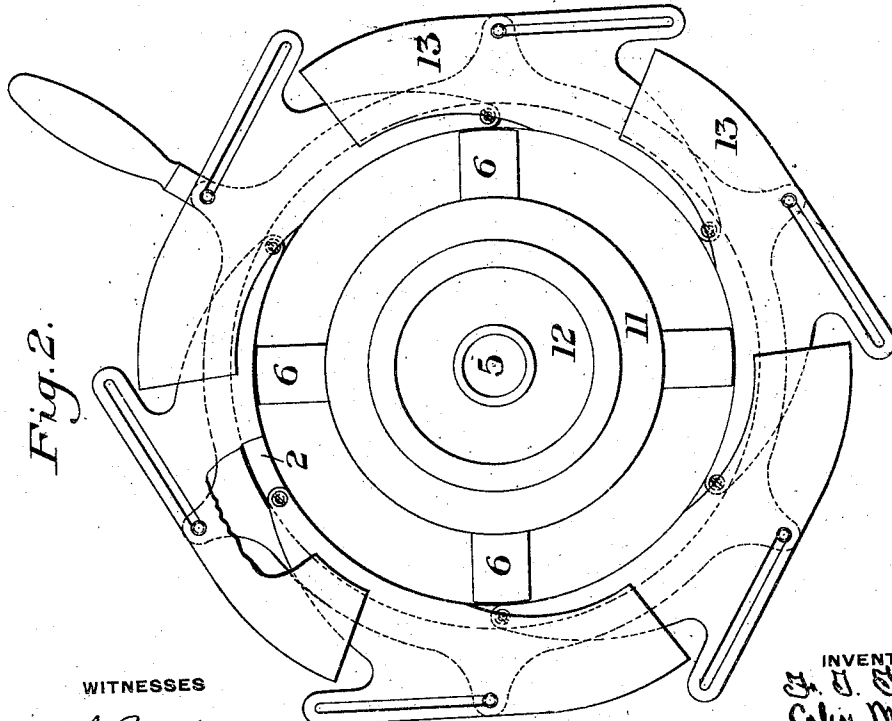
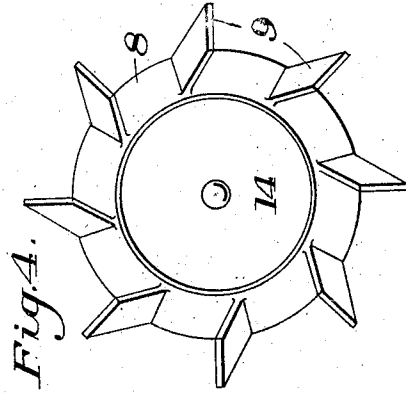
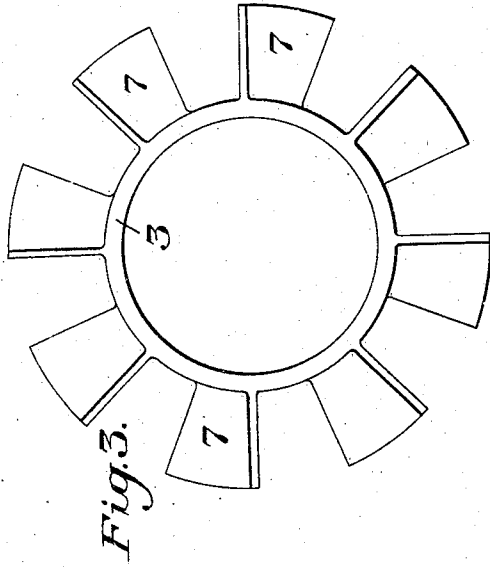
*F. T. Todd*  
*C. M. McInnes*

*by Bakewell, Byrnes & Parmelee*  
*their Attys*

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WITNESSES

R. A. Balderson  
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# UNITED STATES PATENT OFFICE.

FRED T. TODD, OF PITTSBURG, AND COLIN McINNES, OF CARNEGIE, PENNSYLVANIA.

## GAS-BURNER.

938,182.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed August 11, 1908. Serial No. 447,963.

*To all whom it may concern:*

Be it known that we, FRED T. TODD, of Pittsburgh, Allegheny county, Pennsylvania, and COLIN McINNES, of Carnegie, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Gas-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of one form of gas-burner embodying our invention; Fig. 2 is an end view showing the air regulating valve or shutter; and Figs. 3 and 4 are end views showing the deflectors.

Our invention has relation to gas burners and is designed to provide a gas burner of simple construction in which a high degree of combustion may be obtained, due to the provision of means whereby the gas and air are thoroughly commingled.

A further object of the invention is to provide means whereby the supply of air can be readily regulated according to the requirements and to the pressure of the gas.

The precise nature of our invention will be best understood by reference to the accompanying drawings in which we have shown one embodiment thereof and which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement without departing from the spirit and scope of our invention as defined in the appended claims.

In these drawings, the numeral 2 designates the shell of the burner having a nozzle portion 2<sup>a</sup> preferably of reduced diameter at one end. The shell 2 is open at its larger end to provide for the admission of air, and placed centrally within this end portion of the shell is a chamber 3 into one side of which leads a gas admission pipe 4 which extends outwardly through the shell. Extending centrally through the chamber is an air inlet pipe 5 which is open at its ends. The chamber 3 may be formed by a cylindrical hollow member having lugs or projections 6 by means of which it is properly held and centered within the shell 2; its inner end being provided with a series of spirally directed wings or blades 7 which act as deflectors for the incoming air. Secured to the inner end of the central air

tube 5 is a deflecting head 8 also provided with a series of deflecting wings or blades 9 which are designed to effect a whirling motion of the gas as it escapes from the chamber 3, this whirling motion being in the opposite direction to the whirling motion of the air effected by the vanes or wings 7. The vanes or wings 7 are also preferably arranged, as shown, to direct the discharged air inwardly toward the center of the burner, while the wings or blades 9 preferably direct the gas outwardly. In order to provide for the adjustment of the area of the gas escape opening between the head 8 and the end of the chamber 3, the central air tube 5 has a threaded bearing 10 in the outer end wall 11 of the chamber 3, the outer end of the tube 5 having a hand wheel 12 or other suitable operating means. In order to regulate the admission of air at the open end of this shell 2 any suitable valve means may be provided. For this purpose we have shown a shutter valve composed of a plurality of similar segments 13 which form a shutter similar to the well known camera shutter or diaphragm.

The operation is as follows:—The gas which escapes from the chamber 3 is given a whirling motion and is intimately mixed with the air entering through the vanes or wings 7, which, as above described, has a whirling motion due to the said vanes, in the opposite direction from the motion of the gas. At the same time another current of air passes through central pipe or tube 5 and is spread outwardly by means of the deflector 14 secured to the head 8. It will be seen therefore that the gas enters the burner nozzle between an inner and outer current of air, and by means of the whirling movements described, the air and gas become thoroughly admixed so that a high degree of combustion takes place. By adjusting the head 8 relatively to the end of the chamber 3, the amount of gas can be regulated, while by adjusting the shutter 13 the inflow of air can be regulated according to the pressure of gas and to get the proper admixture in all cases.

It will be obvious that various changes can be made in the details of construction and arrangement, and that instead of the wings or blades 7 and 9, any other suitable means may be employed to impart the de-

sired whirling movements to the air and gas. In place of the shutter valve 3, any other suitable regulating means may be employed.

What we claim is:—

- 5 1. A gas burner having a gas inlet and a surrounding air inlet, means for producing an inward whirling movement of the air discharged from said air inlet, and a plurality of outwardly directed or diverging deflectors for producing an outward whirling movement of the gas discharged from the gas inlet; substantially as described.
- 10 2. A gas burner having a centrally arranged gas inlet chamber, a surrounding air inlet chamber, and a second air inlet passage extending through the gas inlet chamber, the gas inlet chamber having deflecting means on its outer surface for producing a whirling movement of the air, and
- 15 20 the second air inlet passage having a deflecting head provided with deflecting means for producing a whirling movement of the gas; substantially as described.
- 25 3. A gas burner comprising a case or shell open at its outer end, a gas inlet chamber within the case of said shell, and an air inlet tube extending through the gas inlet chamber, the gas inlet chamber having deflecting wings or vanes arranged to produce
- 30 a whirling movement of the air, and the air inlet pipe or tube having a deflecting head provided with wings or vanes arranged to effect a whirling movement of the gas, and means for adjusting said deflecting head
- 35 to vary the amount of gas discharged from said chamber; substantially as described.

4. A gas burner having a gas inlet and a surrounding air inlet, means for producing an inward whirling movement of the air discharged from said air inlet, and means for producing an outward whirling movement of the gas discharged from the gas inlet, the said means for imparting movement to the gas being located beyond the point where the gas is discharged to meet the air; substantially as described.

5. A gas burner having a gas inlet chamber, a surrounding air inlet chamber, and a central air inlet pipe or tube extending through the gas chamber, means for producing opposite whirling movements of the gas and air discharged from said chambers, and a deflector for deflecting outwardly the air discharged from the central pipe or tube; substantially as described.

6. A gas burner having a gas inlet and a surrounding air inlet, means for producing an inward whirling movement of the air discharged from said air inlet, and means for producing an outward whirling movement of the gas discharged from the gas inlet, and another air inlet arranged to discharge centrally of the gas discharge; substantially as described.

In testimony whereof, we have hereunto set our hands.

FRED T. TODD.  
COLIN McINNES.

Witnesses:

R. A. BALDERSON,  
H. M. CORWIN