

No. 764,860.

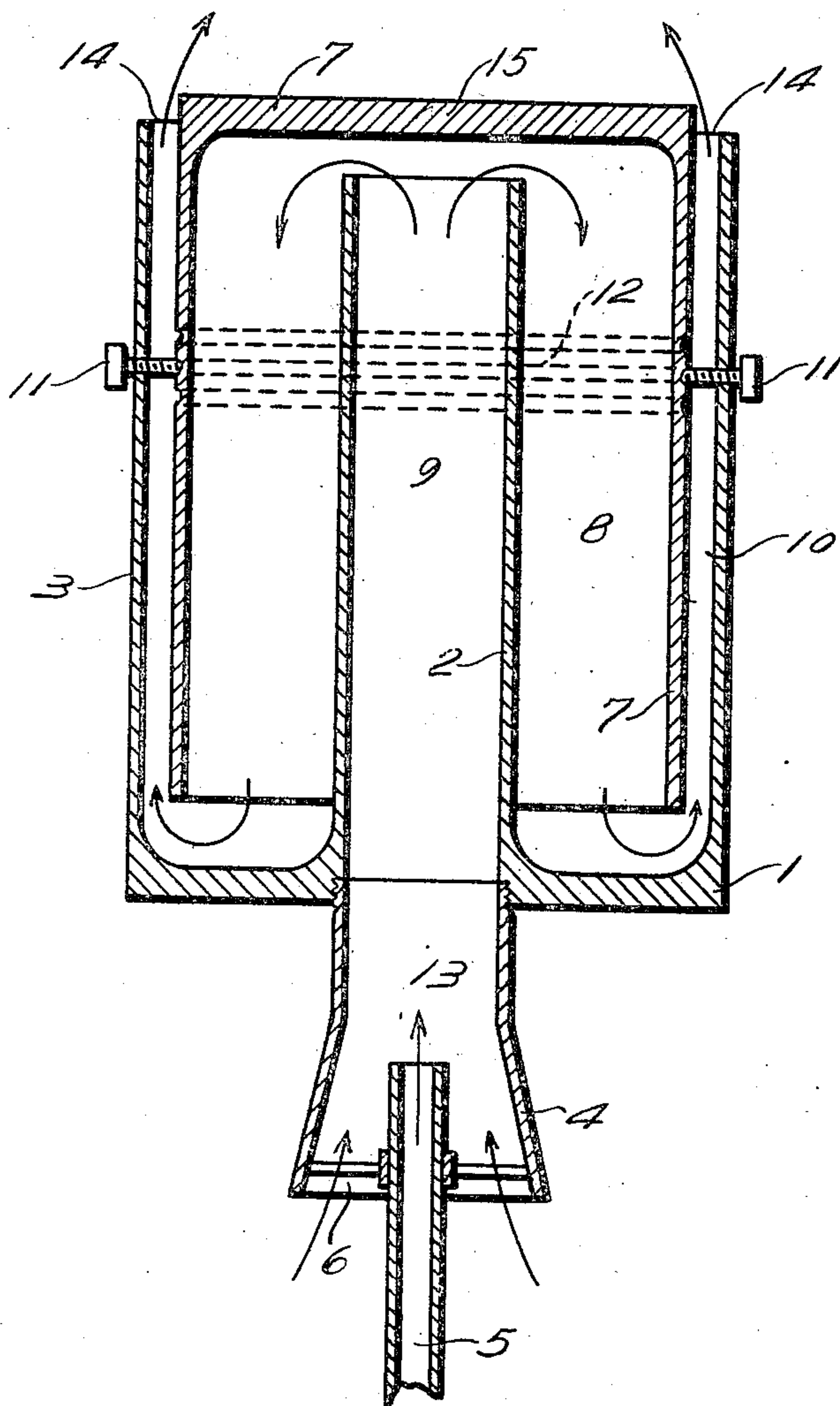
PATENTED JULY 12, 1904.

G. MOORK.

BURNER FOR FLUID FUEL.

APPLICATION FILED FEB. 26, 1904.

NO MODEL.



Witnesses:

Rudolf Rummeler,  
Glen C. Stephens

Inventor,

George Moork

by Rummeler & Rummeler  
Attorneys.

# UNITED STATES PATENT OFFICE.

GEORGE MOORK, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO  
WILLIAM R. RUMMLER, OF CHICAGO, ILLINOIS.

## BURNER FOR FLUID FUEL.

SPECIFICATION forming part of Letters Patent No. 764,860, dated July 12, 1904.

Application filed February 26, 1904. Serial No. 195,455. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE MOORK, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Burners for Fluid Fuel, of which the following is a specification.

My invention relates to burners for fluid (gaseous and liquid) fuel.

In the common forms of burners either the gas or the air, or both, are of such low temperature at the time of mixture and at the time of ignition that much of the gas passes through the flame without perfect combustion.

The main objects of my invention are to provide an improved structure for burners for fluid fuel and to provide means for increasing the efficiency of such burners by thoroughly mixing the fuel with air and rapidly and highly heating such mixture during its passage through the burner, so as to cause a complete combustion of the fuel at its delivery from said burner.

I accomplish these objects by the device shown in the accompanying drawing, which represents a vertical section of a gas-burner constructed according to my invention.

In the construction shown the burner consists of a cylindrical shell or casing 1 open at its upper end and having an inner wall or tubular part 2 extending upwardly through its bottom concentrically with its side walls 3. The part 2 is open both at the top and the bottom and is provided at its lower end with a bell-shaped mixer 4, having a gas-pipe 5 arranged concentrically of its air-inlet 6. A cylindrical hood or inverted shell 7 extends across the upper end of the tubular part 2 and downwardly around the side walls of the part 2 and within the walls 3 of the casing. The space 8 within the hood 7 and surrounding the mixing-chamber 9 is considerably greater in transverse area than the space 10 between the walls of said hood and casing, so that gases entering the space 8 from the mixing-chamber will tend to form eddies and be delayed in their passage from the interior of the casing. The hood 7 is supported within the casing 1 by means of a plurality of set-screws 11, which extend through the side walls 3 of the casing

and are seated in one of the grooves 12 in the side walls of the hood. A plurality of such grooves are provided, so as to permit the vertical adjustment of the hood or shell 7 within the casing.

The operation of the device shown is as follows: Gas is delivered, from the service-pipe, at the fuel-inlet 13 of the mixer by means of the pipe 5 and is there mixed with air entering the mixer at the sides of said fuel-inlet. The mixed air and gases pass upwardly through the mixing-chamber against the inside of the heating-surface 15 and then downwardly through the space 8 within the hood, where the expanded gas and air are more thoroughly mixed. The mixture is finally discharged at 14 at the upper end of the casing. The direction of flow of gas is indicated by the arrows in the drawing. When the gas escaping at 14 is ignited, additional air is taken up from the surrounding atmosphere. The rushing in of such additional air causes the flame to assume a conical form above the top of the hood 7 and causes such flame to play against the upper part of the walls of said hood. The hood 7 being formed of a good conductor of heat, such as iron or brass, rapidly becomes heated through the action of such flame, and the mixed gas and air, playing against the inner face of the heating-surface 15 and then passing downwardly and upwardly through the passages 8 and 10 and along the hot side walls of the hood 7, becomes rapidly and thoroughly heated, so that when it reaches the flame at 14 all of its constituents are in condition to burst into flame and be entirely consumed.

When a liquid fuel is burned, the fuel-inlet 13 will be much smaller, so that the fuel will enter the mixer in the form of a fine spray and be atomized by the air entering the inlets 6. In other respects the operation and structure of the device will be substantially the same as shown.

It will be seen that some of the details of the construction shown may be altered without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A burner comprising an outer shell closed



at the bottom and open at the top; a second shell of less diameter closed at the top and open at the bottom and secured within the outer shell; a third shell, of less diameter than the second, extending from the bottom of the outer shell upwardly within the second shell, opening into said second shell near the top, and having an inlet for receiving fluid fuel from the service-pipe and a separate inlet for air; said shells being adapted to convey the mixture of air and fluid fuel between the walls and discharge the same near the top of and against the outside of the second shell, and adapted, when the mixture is ignited at the discharge end, to cause the flame to play directly upon said second shell for rapidly and highly heating the mixture in the second shell, substantially as described.

2. A burner comprising an outer shell closed at the bottom and open at the top; a second shell of less diameter closed at the top and open at the bottom and secured within the outer shell; a third shell, of less diameter than the second, extending from the bottom of the outer shell upwardly within the second shell, opening into said second shell near the top, and having an inlet for receiving fluid fuel from the service-pipe and a separate inlet for air; the space between the side walls of the second and third shells being of greater area than the space between the side walls of the second and outer shells, and said shells being adapted to convey the mixture of air and fluid fuel between the walls and discharge the same near the top of and against the outside of the second shell, and adapted, when the mixture is ignited at the discharge end, to cause the flame to play directly upon said second shell for rapidly and highly heating the mixture in the second shell, substantially as described.

3. A burner comprising an outer shell closed at the bottom and open at the top; a second shell of less diameter closed at the top and open at the bottom and secured within the outer shell; a third shell, of less diameter than the second, extending from the bottom of the outer shell upwardly within the second shell, opening into said second shell near the top, and having at its lower end an inlet for fluid fuel and an air-inlet; said shells being adapted to convey the mixture of air and fluid fuel between the walls and discharge the same near the top of and against the outside of the second

shell, and adapted, when the mixture is ignited at the discharge end, to cause the flame to play directly upon said second shell for rapidly and highly heating the mixture in the second shell, substantially as described.

4. A burner comprising an outer shell having a double wall with the space therein closed at the bottom and open at the top, an inverted shell open at the bottom and closed at the top by a single heat-conducting wall and having its side walls extending down into the space in said double wall, the outer shell having at its lower end, inward of the double wall, an inlet for fluid fuel and an air-inlet; said shells being adapted to convey the mixture of air and fuel against the inside of the top of the inverted shell, thence downwardly in the double wall and back to the outside of the upper part of the inverted shell, whereby, when the gas is ignited at the outer upper part of the inverted shell, the flame will play directly against said heat-conducting wall and the mixture within said upper part will become rapidly heated, substantially as described.

5. A burner comprising an outer shell closed at the bottom and open at the top; a second shell of less diameter closed at the top and open at the bottom and secured within the outer shell; a third shell, of less diameter than the second, extending from the bottom of the outer shell upwardly within the second shell, opening into said second shell near the top, and having at its lower end an inlet for fluid fuel and an air-inlet; the space between the side walls of the second and third shells being of greater area than the space between the side walls of the second and outer shells, and said shells being adapted to convey the mixture of air and fluid fuel between the walls and discharge the same near the top of and against the outside of the second shell, and adapted, when the mixture is ignited at the discharge end, to cause the flame to play directly upon said second shell for rapidly and highly heating the mixture in the second shell, substantially as described.

Signed at Chicago this 18th day of January, 1904.

GEORGE MOORK.

Witnesses:

WM. R. RUMMLER,  
GLEN C. STEPHENS.