

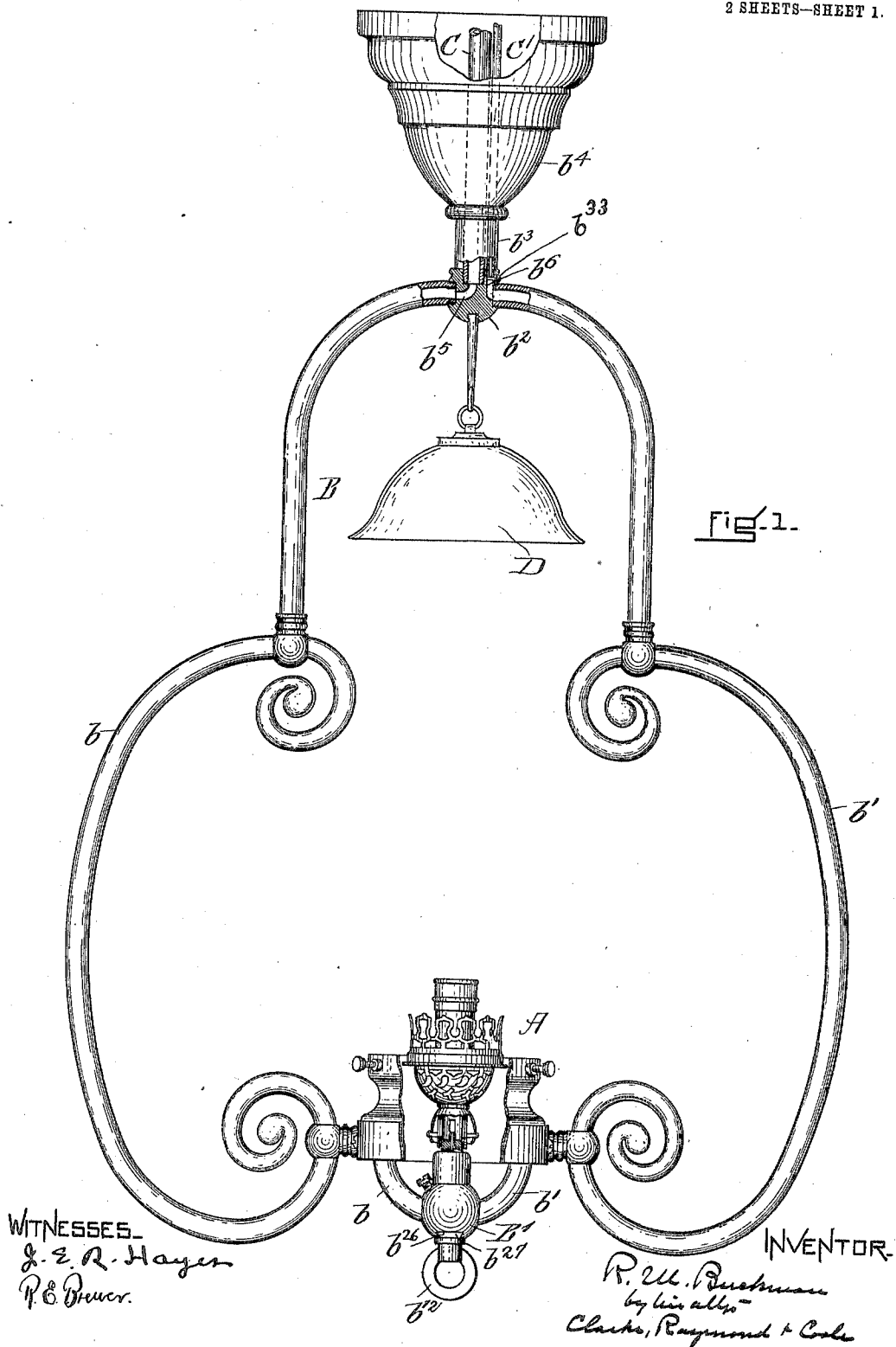
No. 811,529.

PATENTED JAN. 30, 1906.

R. M. BUCKNAM.
GAS BURNER AND FIXTURE THEREFOR.

APPLICATION FILED APR. 13, 1905.

2 SHEETS—SHEET 1.



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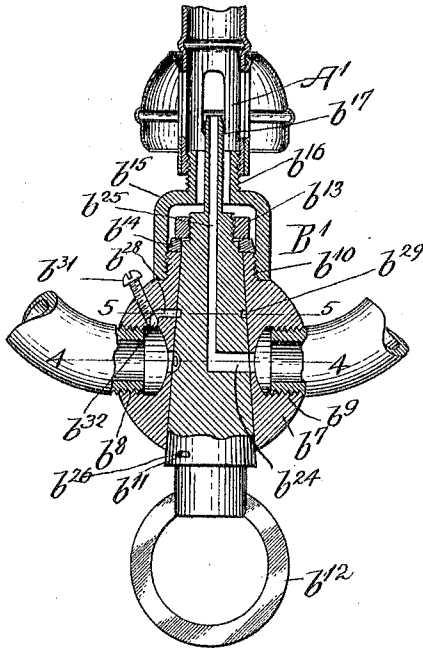


Fig. 2.

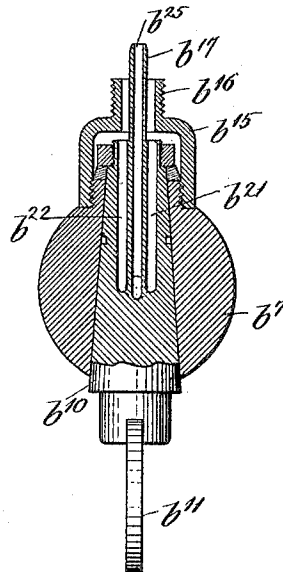


Fig. 3.

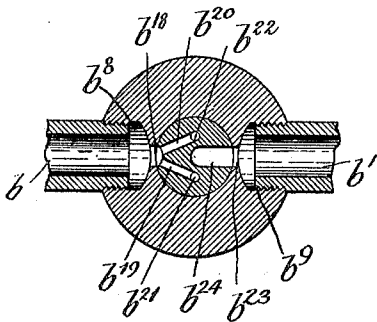


Fig. 4.

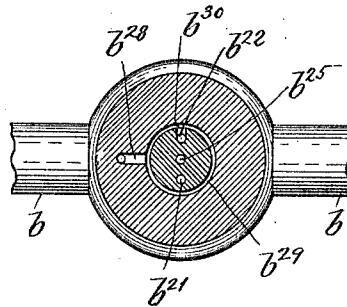


Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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GAS-BURNER AND FIXTURE THEREFOR.

No. 811,529.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed April 13, 1905. Serial No. 255,421.

To all whom it may concern:

Be it known that I, ROBERT M. BUCKNAM, a citizen of the United States, and a resident of Medford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Gas-Burners and Fixtures Therefor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to that type of gas-burner in which air under pressure is fed with the gas into the gas-mixing chamber of the burner. In such kind of a burner it is necessary for the gas and compressed air to be fed to the mixing-chamber of the burner through separate supply-pipes. The burner also is generally hung from a fixture or support.

It is accordingly the object of my invention to so adapt the fixture to the burner that it may furnish these separate gas and air supply pipes.

It is the further object of my invention to provide such fixture with an improved cock or controller for cutting off or regulating the supply of gas and air to the burner and which cock also provides other means of regulation and control, all of which can best be seen and understood by reference to the drawings, in which—

Figure 1 shows a burner fitted with the improved fixture, mainly in elevation. Fig. 2 shows in vertical section the cock forming a portion of the fixture. Fig. 3 shows the same, but in vertical section at right angle to that shown in Fig. 2. Fig. 4 shows a cross-section of the cock, taken on the line 4 4 of Fig. 2. Fig. 5 shows a cross-section of the cock, taken on the line 5 5 of Fig. 2.

In the drawings, A represents the burner, and B the fixture. I have shown an ordinary type of burner having on the inside a mixing-chamber A', which chamber is formed in a tubular case or shell threaded at its end to screw onto the cock B', forming a portion of the fixture and which acts to support the burner in an upright position. The fixture B comprises also the pipes or rods *b b'*, curving up around and over the burner to where they meet in a common joint *b²*, into which screws a gas-inlet pipe C, let down from the ceiling and from which pipe the fixture and burner are ordinarily supported to hang. There also screws into the joint *b²* of the fixture an inlet-pipe C' for the compressed air.

Both these pipes C and C' are inclosed in a tubular casing or shell *b³*, on which rests a shield or canopy *b⁴*, adapted to bear up against the ceiling when the fixture is in place. These members conceal the gas and inlet pipes, besides furnishing a means of ornamentation. The pipes or rods *b b'* of the fixture act as separate gas and air conducting pipes. They connect, respectively, with the gas and air inlet pipes C and C' through the separate passages *b⁵ b⁶*, formed in the joint *b²* of the fixture, the passage *b⁵* connecting the gas-inlet pipe with the gas-conducting pipe or rod *b* of the fixture and the passage *b⁶* connecting the inlet-pipe for the compressed air with the air-conducting pipe *b'* of the fixture. These respective gas and air conducting pipes *b b'* have threaded ends to screw onto the cock or controller B', through which the products pass into the mixing-chamber of the burner, as will hereinafter be explained. By thus arranging the gas and air conducting pipes to extend in part over the burner they are directly exposed to the heat rising from the burner, so that the gas and air become heated before its passage to the burner. This is of decided advantage, especially in heating the air, for it is well known in the art that much better effects are obtained from a heated than from a cold air. In order to direct or concentrate the heat rising from the burner upon these pipes, there may be employed to advantage a bell D, attached to the fixture to hang over the burner. The pipes *b b'* make connection with the cock B' at opposite sides thereof, its outer casing *b⁷* being formed with threaded holes *b⁸ b⁹*, respectively, into which the ends of said pipes of the fixture are adapted to screw.

In order to follow the passage of the air and gas through the cock B' and to understand also the method of its control, it is necessary to understand that the cock comprises an outer preferably spherical casing *b⁷*, into the opposite sides of which the pipes or rods *b b'* are fitted, as before explained, and which casing is also provided with a threaded neck or extension *b¹⁰*. Through this casing, extending vertically, is formed a conical hole or valve-chamber into which fits a conical valvular plug *b¹¹*. The plug *b¹¹* has on its lower end a thumb-piece *b¹²*, by which it may be turned. Upon its upper end the plug is made threaded. The plug is combined with the casing so as to turn therein by means of a locking-nut *b¹³* on its threaded end, and between which

and the threaded head of the casing is inserted a washer b^{14} . Over this nut and washer there fits a cap b^{15} , which screws onto said threaded head of the casing, concealing the means for retaining said plug and making a finished joint. This cap is provided with an upper threaded section b^{16} , onto which screws the burner-tube. It is also to be noted that from the end of the valvular plug there extends up into the mixing-chamber of the burner the nozzle b^{17} .

Referring now to the ports or passages within the cock B' , there extends from the hole b^8 in the side of its casing and into which screws the gas-conducting pipe b a passage or port b^{18} , which extends through the casing into its central hole or valve-chamber. At the point where this port or passage comes out inside the casing there are formed in the valvular plug b^{11} in line with said passage or port, so as to register therewith, the gas-conducting passages b^{19} b^{20} , which extend into and rather toward the sides of the plug or to where they join the respective passages b^{21} b^{22} , extending up through the plug and opening into the mixing-chamber of the burner. Thus when the plug is turned to a certain relative position within its casing the gas may pass through the cock to the burner. On the other side of the cock there is drilled through the wall of its casing in from the hole b^9 into which screws the air-conducting pipe b' a port or passage b^{23} . At the point where this port or passage comes out inside the casing or within its valve-chamber there is formed in the valvular plug in line or so as to register with said port or passage b^{22} a passage b^{24} , which extends into the plug to about its center or to where it meets the contracted passage b^{25} , running up through the plug and its nozzle b^{17} , opening into the mixing-chamber of the burner. Thus through these ports and passages when the valvular plug is turned to a certain position relatively to the casing the air will pass through the same up to the mixing-chamber of the burner. Moreover, it is to be observed that these gas and air passages are so related that when the cock is open both gas and air may pass to the burner at the same time. Upon closing the cock, however, by turning its plug both the gas and air are simultaneously cut off. In this cutting off of the gas and air it is to be noted that the plug is given or limited to a quarter-turn, this by means of the common expedient of a lug b^{26} , working in a slot b^{27} in the bottom of the casing. Thus a relatively long space will separate the passages in the plug and casing when the cock is closed, so insuring an absolute shut-off. In connection with these gas and air passages another point is also to be observed and on which I desire to lay especial stress. The air-passage up through the plug is made much smaller or more contracted than in the casing. I have shown this

contraction in the passage b^{25} , which, as may be seen by reference to Fig. 3, is made much smaller than the passage b^{23} in the casing, as also the passage b^{24} in the plug registering therewith when the cock is open. The effect of this contraction is that only a certain normal amount of air can pass up through the plug into the mixing-chamber of the burner and which amount, moreover, remains substantially constant even if the plug be slightly turned. The same is not true of the gas entering on the other side of the cock, for the relation of the gas-passages in the casing and plug is such that when the plug is slightly turned the gas is correspondingly shut off or diminished in quantity. I have therefore provided the fixture with a cock or controller by which the gas and air may be entirely cut off or the amount of gas slightly cut off or diminished without changing the supply of air. In other words, a proper amount of gas may be fed to the burner to combine with a certain constant quantity of air for insuring the best results in their combustion. I have also furnished the improved cock or controller with means for supporting a pilot-light. In this connection note the by-passage b^{28} , leading out of the hole b^8 in the casing. This passage extends up independently and through the wall of the casing to its hollow interior or valve-chamber. At the point where this passage comes out the valvular plug b^{11} is provided with an annular groove b^{29} , from which there extends into the plug a passage b^{30} , connecting with the passage b^{21} , which opens into the mixing-chamber of the burner. Thus a sufficient quantity of gas not controlled or influenced by the turning of the valve or plug may constantly flow for feeding and supporting a pilot-light.

If it is desired to dispense with or regulate the flow of gas to the pilot-light, there is provided a screw stop-plug b^{31} , crossing the passage b^{28} and screwing into a socket b^{32} . The head of this screw is accessible from without the valvular casing, so that by turning the same the supply of gas to the pilot-light may be regulated or entirely cut off. Attention is also called to the valve or plug b^{33} , located at about the point where the air-inlet pipe joins with the fixture. This valve or plug is for the purpose of regulating the supply of air as occasion demands.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A fixture for a burner of the character specified, the same having separate gas and air conducting pipes, a cock comprising an outer casing having means with which the burner may make connection and to the opposite sides of which casing the said pipes of the fixture are adapted to be connected, a vertical plug contained within the valve-chamber inside said casing, passages leading

from said pipes through the wall of said casing, and passages within said plug opening into the mixing-chamber of the burner, which passages are adapted to register with the passages in the casing, when said plug is turned in one direction or position, or to break connection therewith when turned in another direction or position.

2. A fixture for a burner of the character specified, the same having separate gas and air conducting pipes, a cock having an outer casing with which said gas and air conducting pipes of the fixture are adapted to make connection, a plug contained within the valve-chamber of said casing inside the same, passages leading from said pipes through the wall of the casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner and which gas and air passages in said plug are located to simultaneously register, respectively, with said gas and air passages in the casing, when said plug is in a certain position relatively to said casing, or to become disconnected therefrom and the gas and air entirely cut off upon turning said plug to a changed position, and which gas and air passages within said plug and casing are so related that upon slightly turning said plug within the casing, when said plug is in a certain position, the quantity of air admitted to the mixing-chamber of the burner will not be changed, but the quantity of gas admitted to said chamber will be changed.

3. A fixture for a burner of the character specified, the same having separate gas and air conducting pipes, a cock having an outer casing with which said gas and air conducting pipes of the fixture are adapted to make connection, a plug contained within the valve-chamber of said casing inside the same, passages leading from said pipes through the wall of the casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner, and which gas and air passages are so related in relative size and location that upon slightly turning said plug, when the same is in a certain position, the quantity of air admitted through said plug and casing to the mixing-chamber of the burner will not be changed, but the quantity of gas admitted thereto will be changed.

4. A fixture for a burner of the character specified, the same having separate gas and air conducting pipes, a cock having an outer casing with which said gas and air conducting pipes of the fixture are adapted to make connection, a plug contained within the valve-chamber of said casing, passages communicating with said pipes and leading through said casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner, which gas and air passages in said plug and casing are

located to register simultaneously with one another, when said plug is in a certain position, whereby both gas and air may together simultaneously pass to the mixing-chamber of the burner, or said gas and air be together cut off on turning said plug to a changed position, and the size of which air-passage in the said plug is so related or graduated by the contraction thereof relatively to the size of the air-passage in said casing and said gas-passages that upon slightly turning said plug within the casing the quantity of air admitted to the mixing-chamber of the burner will not be changed, but the quantity of gas admitted to said chamber will be changed or lessened.

5. A fixture for a burner, the same having a cock comprising an outer casing and an inside vertical plug, means for retaining said plug within said casing, and a cap forming a portion of said cock for concealing said means of retention, and which cap is adapted also to receive the burner-tube.

6. In a fixture for a burner, a cock comprising an outer casing and an inside vertical plug, a threaded head on said casing, means for retaining said plug within said casing, a cap ^{b¹⁵} forming a portion of said cock adapted to screw onto said threaded head of the casing, for concealing said means of retention, which cap is open to the end of said plug and which cap, also, is threaded in part to receive the burner-tube.

7. A fixture for a burner of the character specified, the same having separate gas and air conducting pipes, a cock having an outer casing with which said gas and air conducting pipes of the fixture are adapted to make connection, a plug contained within the valve-chamber of said casing inside the same, a passage communicating with the gas-conducting pipe and extending through said casing, one or more gas-passages within said plug, located to register with said gas-passage in the casing when the plug is turned to a certain position and to extend through said plug to open into the mixing-chamber of the burner, and which gas-passages in said casing and plug are so relatively disposed that the gas will become gradually cut off upon turning said plug, and in combination with said gas-passages, an air-passage in communication with the air-conducting pipe and extending through the wall of the casing, a passage ^{b²⁴} within the plug, registering therewith, and a contracted air-passage ^{b²⁵} extending through the plug to open into the mixing-chamber of the burner, which gas and air passages are so related that the gas and air may be simultaneously cut off upon turning said plug to a closed position, or the amount of gas partially cut off without changing the supply of air upon slightly turning the said plug.

8. A cock for a burner of the character specified, the said cock having an outer cas-

ing adapted to receive gas and air conducting pipes, a plug contained within the valve-chamber of said casing inside the same, passages leading from said pipes through the wall of the casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner and which gas and air passages in said plug are located to simultaneously register, respectively, with said gas and air passages in the casing, when said plug is in a certain position relatively to said casing, or to become disconnected therefrom and the gas and air entirely cut off upon turning said plug to a changed position; and which gas and air passages within said plug and casing are so related that, when said plug is in a certain position, upon slightly turning the same within the casing the quantity of air admitted to the mixing-chamber of the burner will not be changed, but the quantity of gas admitted to said chamber will be changed.

9. A cock for a burner of the character specified, the said cock having an outer casing adapted to receive gas and air conducting pipes, a plug contained within the valve-chamber of said casing, passages leading from pipes through the wall of the casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner, and which gas and air passages are so related in relative size and location that, when said plug is in a certain position, upon slightly turning the same within the casing the quantity of air admitted to the mixing-chamber of the burner will not be changed, but the quantity of gas admitted to said chamber will be changed.

10. A cock for a burner of the character specified, the said cock having an outer casing adapted to receive gas and air conducting pipes, a plug contained within the valve-chamber of said casing, passages communicating with said pipes and leading through said casing, gas and air passages within said plug and extending through the same to open into the mixing-chamber of the burner, which gas and air passages in said plug and casing are located to register simultaneously with one another, when said plug is in a certain position, whereby both gas and air may together pass to the mixing-chamber of the burner or said gas and air be together cut off on turning said plug to a changed position, and which air-passage also in said plug is so related or graduated by the contraction thereof relatively to the air-passage in the casing and said gas-passages that upon slightly turning said plug the quantity of air admitted to the mixing-chamber of the burner will not be changed, but the quantity of gas

admitted to the mixing-chamber will be changed.

11. A cock for a burner of the character specified, the said cock having an outer casing adapted to receive gas and air conducting pipes, a plug contained within the valve-chamber of said casing inside the same, a passage communicating with the gas-conducting pipe and extending through said casing, one or more gas-passages within said plug, located to register with said gas-passage in the casing when the plug is turned to a certain position and to extend through said plug to open into the mixing-chamber of the burner, and which gas-passages in said casing and plug are so relatively disposed that the gas will become gradually cut off upon turning said plug, and in combination with said gas-passages, an air-passage in communication with the air-conducting pipe and extending through the wall of the casing, a passage ^{b²⁴} within the plug, registering therewith, and a contracted air-passage ^{b²⁵} extending through the plug to open into the mixing-chamber of the burner, which gas and air passages are so related that the gas and air may be simultaneously cut off upon turning said plug to a closed position, or the amount of gas partially cut off without changing the supply of air upon slightly turning the said plug.

12. A cock for a burner of the character specified, said cock having an outer casing adapted to receive gas and air conducting pipes, a plug contained within the valve-chamber inside said casing, passages leading from said pipes through the wall of said casing, gas and air passages within said plug opening into the mixing-chamber of the burner, which passages are adapted to register with the passages in the casing when said plug is turned in one direction or position, or to break connection therewith when said plug is turned in another direction or position, and in combination with said passages, a gas by-passage in communication with the gas-conducting pipe and extending independently through the wall of said casing to the valve-casing on the interior thereof, an annular groove formed in said plug and located at a point to register with the end of said passage, and a passage extending from said annular groove through said plug to connect with the said gas-passage extending through the same and connecting with the mixing-chamber of the burner, substantially as and for the purposes set forth.

ROBERT M. BUCKNAM.

Witnesses:

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