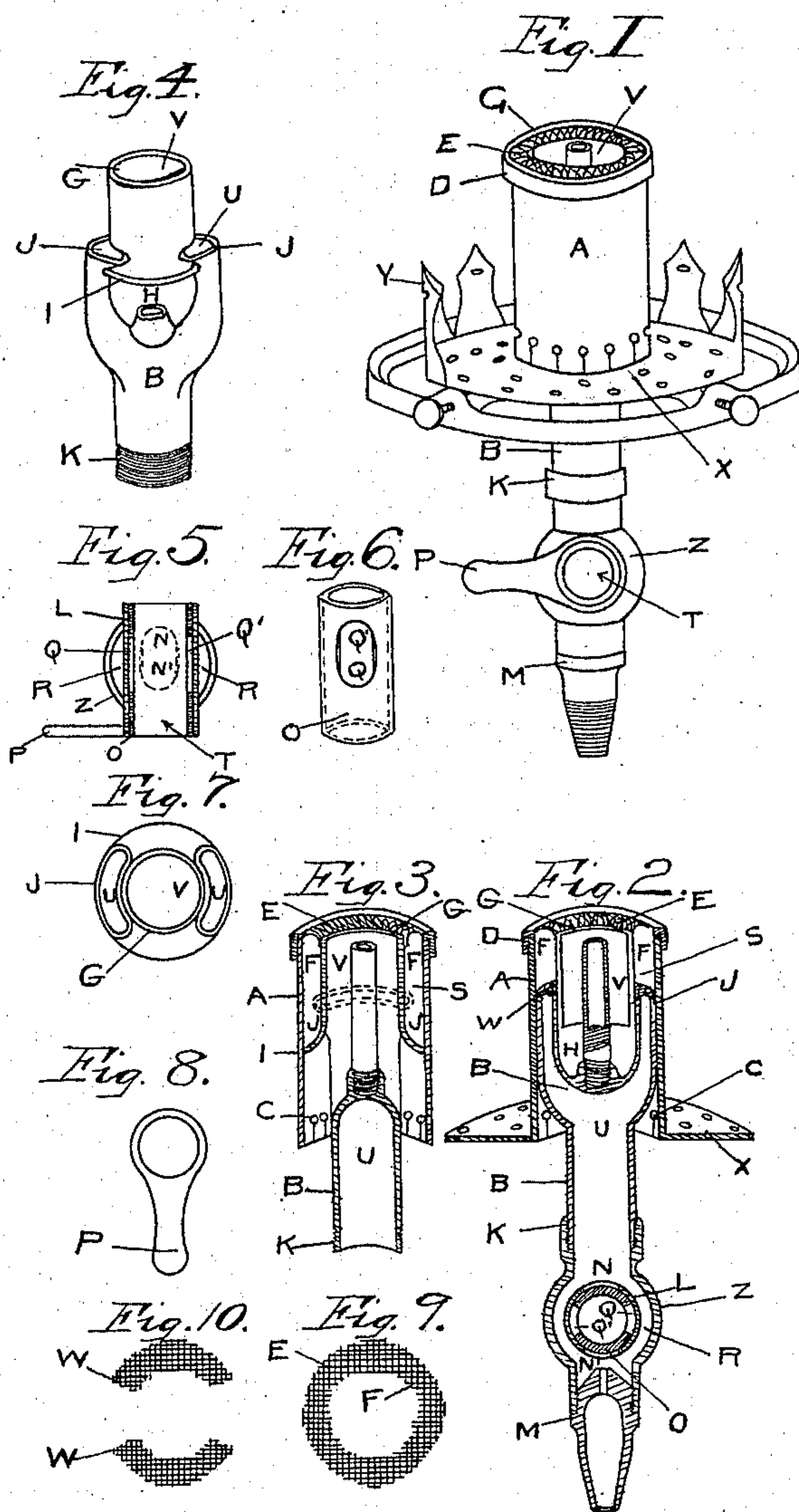


(No Model.)

J. F. BURGESS.
GAS BURNER.

No. 574,018.

Patented Dec. 29, 1896.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN FOYSTER BURGESS, OF LONDON, ENGLAND.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 574,018, dated December 29, 1896.

Application filed July 1, 1896. Serial No. 597,690. (No model.) Patented in England December 3, 1895, No. 23,150.

To all whom it may concern:

Be it known that I, JOHN FOYSTER BURGESS, a subject of the Queen of Great Britain, and a resident of 85 Reighton Road, Upper Clapton, London, in the county of Middlesex, England, have invented certain new and useful Improvements in Gas-Burners, (patented in England December 3, 1895, No. 23,150,) of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to what are known as "convertible" gas-burners, or to that class of burners which can be used as ordinary Argand burners for burning pure gas, or which by simply applying an air-valve can be used as atmospheric burners to heat any suitable substance to incandescence.

The invention embodies the conversion or application of these methods or functions applied to other burners of similar types, which would improve the operation thereof, so as to enhance their luminous powers and their economical virtues if adopted or applied.

The invention also relates to special means or devices for converting an ordinary Argand gas-burner into a burner for burning gas and air, so as to render an incandescing medium incandescent, by simply operating a valve with which the burner is provided, and by means of this valve the burner may be converted from an ordinary Argand burner into a burner for heating to incandescence any suitable medium.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a perspective side view of my improved burner; Fig. 2, a central vertical section thereof, partly in perspective; Fig. 3, a similar view of a part of said burner at right angles to Fig. 2; Fig. 4, a perspective side elevation of a Y-pipe or gas-conveyer which forms a part thereof, showing also a center stop or air pipe; Fig. 5, a central vertical section of a tubular air-cock, showing the valve of the air-inlet closed; Fig. 6, a side view, partly in perspective, of the tubular air-valve, showing the air holes, perforations, or ports. Fig. 7 is an end view of the

Y-tube or gas-pipe employed and showing how the stop-pipe closes the remaining space left in the tubular Y-pipe; Fig. 8, a plan view of the air-cock; Fig. 9, a plan view of a wire-gauze partition which is used in the burner for distributing the gas; and Fig. 10 is a similar view of another wire-gauze partition, composed of one or more pieces, which is used for a similar purpose in the Y-pipe.

The burner consists of an arrangement of tubes through which pure gas or a mixture of gas and air is conducted either for a luminous flame or a non-luminous atmospheric flame, and a special feature of the burner is its adaptability to burn or heat to incandescence a substance in the shape of a pear, or any desired shape, in the middle space within the annular flame, said substance being herein called and termed a "center piece" or "core." It can also be used to heat to incandescence at one and the same time a core in the middle space within the annular flame and a mantle on the exterior of said flame, thus producing an enormous amount of light, and for this said purpose the core and mantle can be fitted separately, or they can be made or used in one piece.

Another feature of the burner is its adaptability to be converted into an ordinary Argand burner by means of the tubular air-cock shown in Fig. 5 or a valve of similar functions hereinafter described, thus giving a highly luminous flame without the use of incandescent material.

The burner consists of an exterior tube A, which slides over a Y-shaped tube or pipe B, thus forming a gas-chamber S, as shown in Figs. 2 and 3, and the bottom of the tube A is perforated and slotted, as shown at C, for the purpose of fitting easily and firmly into a hole in the center of a draft-regulator plate X, and also for supplying air in conjunction with the regulating-plate X to either atmospheric or luminous flames.

The tube A is fitted with a cap D to hold or fasten in place the top platform or gauze cap E on the outer side or edge thereof, the inner edge being turned down, as shown at F in Figs. 2 and 3, thus leaving a hole to fit the center stop or air tube G.

In Fig. 4 I have shown the center pipe B, which terminates at the top in the Y-piece

or two-way pipe, and this pipe has a central boss for holding a core or other suspender II, as shown in Figs. 2, 3, and 4, and the said two-way pipe is fitted at the top with the center stop or air pipe, which is somewhat smaller than the tube A at its top, as shown at G, and in such manner that the bottom flange I thereof and the sides of the Y-piece B fit exactly inside of the tube A and form a complete circle, as shown in Fig. 7, and over the top or outlets of the Y-piece B, inside chambers S, and at J is fitted the under platform of wire-gauze W, which is shown in Fig. 10 and which is made in one or more pieces, as convenient. The lower end of the center pipe or continuation of the Y-piece B is screwed to fit into the tubular air-cock, as shown at K, and this cock or valve consists of a spherical or other shaped piece convenient for conveying gas around the seating, as shown at R, and the ends of the cock are provided with sockets for attaching the Y-piece and pin-burner, as shown at M and K, respectively. The tubular seating consists of a piece of tube, (shown in Fig. 5,) through which holes or ports are cut at each side, as shown at N and N', and this seating is secured to the body of the cock Z and is made tubular for convenience of construction.

The tubular conical or parallel valve consists of a tube O, which fits the tube-seating L and allows said valve-tube O to rotate and move around by means of the handle P, which is secured to end of tube O, and formed in the tube O are holes at each side, as shown at Q and Q', to correspond, match, or coincide with the holes N and N' in the tubular seating L, so that when in that position air is freely supplied to the Y-piece through the valve O in the direction of the arrow T and through the holes N and Q, above described, and it can be stopped at will by turning the handle P so that the ports or perforations do not coincide, thus stopping the air-supply and preventing the mixture thereof with the gas.

The cock or other valve is adapted for special use to prevent the gas from igniting at the pin-burner M when used for burning with air, and thus for lighting the burner the valve is shut and the gas is lighted at the top, and then the valve is opened, and air is admitted or allowed to pass into the tube and mix with the gas to any extent. If the gas is ignited down at the pin-burner when the valve is open, by simply closing and opening the valve the gas will be extinguished at the pin-burner, and the main burner will adopt its ordinary functions.

The valve of these burners can be made in various forms other than the one shown in the drawings; but this one is selected to simply show one type of valve applicable for convertible gas-burners and to illustrate the functions claimed.

The plate X, Figs. 1 and 2, I term a "draft-regulator" plate. Its special features are as

follows: When the chimney is inserted and held in position by the forks or springs Y, its base rests upon the top of said plate, thus reducing to a minimum the flow of air through the chimney outside of the flame, which in ordinary burners is indefinite, but with this draft-regulator plate is made definite, and only a correct amount is supplied by the holes in said plate and that supplied through the holes C in the tube A, and thus by virtue of the heat of the flame the natural draft for luminous lighting herein described and also for burning with air is nearly all passed up through the space V, forming an annular flame for complete combustion at the top of the gauze E. This constitutes the special feature of my burner for incandescent lighting, because the burner herein described produces an annular flame of intense heat and that is of such a nature that it will heat to incandescence any suitable material in the center space within said annular flame.

When the valve O is closed, no air can enter the base of tube B, and the gas is supplied by a pin-burner M, as will be readily understood. The pure gas then passes up through the Y-tube B into the gas-chamber S and is spread and diffused by the wire-gauze distribution-plate W and passes on to the wire-gauze platform E, from which the gas issues, forming, when ignited, an Argand type or annular flame, the outer tube A being open at its base, and the center supply or air tube G being opened at both ends it leaves a space right through the outer tube A by virtue of the center supply or air tube G being open at both ends.

Through the space V the air ascends into the middle space within the Argand flame, and this air, as well as that which is supplied from the outside, serves for the complete combustion of the gas, thus practically destroying the non-luminous portion of the flame by the great amount of oxygen which is passed through the center of the flame by virtue of the regulating-plate X, thus producing a brilliant Argand or annular flame suitable for all lighting purposes, at the same time consuming considerably less gas than other burners giving the same degree of light.

When the valve O is open—that is, when the ports N and N' coincide with the ports Q and Q'—the gas is supplied by the pin-burner M, heretofore mentioned, and the air passes in through the air-inlet holes and mixes with the gas as both ascend together through the Y piece or tube B to chamber S, where it is thoroughly mixed and equally distributed by the gauze W to the wire-gauze platform E, from which the gas and air mixture issues, and forming, when ignited, an annular flame, there being the space V, hereinbefore mentioned, through the outer tube and the center supply or air tube, and the air ascends through this space V into the middle space within the annular flange, and this air, as well as that which is supplied from the outside,

serves for the complete combustion of the gas by the great amount of oxygen that is passed up through the space V into the middle of the flame by virtue of the regulating-plate X, thus producing a non-luminous flame of good shape and high degree of heat.

My improved burner may be applied with advantage for many heating purposes, but is especially applicable, as above stated, for the purpose of rendering a suitable body incandescent, and the particular functional principles of this burner can also be applied to other burners of the Argand or Bunsen type, as will be readily understood.

It will be apparent that this device may be used as an ordinary Argand gas-burner whenever desired and that by means of the air-valve it may be converted into a Bunsen burner, so as to be used as an incandescent gas-burner whenever preferred, and it will thus be seen that I accomplish the object of my invention by means of a device which is simple in construction and operation and which is comparatively inexpensive.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described burner for gas and air, which comprises a Y-tube in which is placed a revoluble air-valve, for admitting air thereto, and below which is placed a pin-valve through which the gas passes, said Y-tube being provided at its upper end with a central tube and an outer tube, whereby an annular chamber is formed into which the gas and air are discharged, and said annular chamber being provided at its upper end with a wire-gauze or other distributing cap, and means for admitting air through said central tube, substantially as shown and described.

2. The herein-described burner for gas and air, which comprises a Y-tube in which is placed a revoluble air-valve, for admitting air thereto, and below which is placed a pin-valve through which the gas passes, said Y-tube being provided at its upper end with a central tube and an outer tube, whereby an annular chamber is formed into which the gas and air are discharged, and said annular chamber being provided at its upper end with a wire-gauze or other distributing cap, and means for admitting air through said central tube, said burner being also provided at the bottom of the outer tube with an air-distributing plate which is adapted to support a chimney and by which air is admitted to the outer side of the flame, substantially as shown and described.

3. The herein-described burner for gas and air, which comprises a Y-tube in which is placed a revoluble air-valve, for admitting air thereto, and below which is placed a pin-valve through which the gas passes, said Y-tube being provided at its upper end with a cen-

tral tube and an outer tube, whereby an annular chamber is formed into which the gas and air are discharged, and said annular chamber being provided at its upper end with a wire-gauze or other distributing cap, and means for admitting air through said central tube, said burner being also provided at the bottom of the outer tube with an air-distributing plate which is adapted to support a chimney and by which air is admitted to the outer side of the flame, and said Y-tube being also provided at its upper end with a gauze cap or cover, substantially as shown and described.

4. The herein-described burner for burning gas and air, which comprises a Y-tube the lower end of which is provided with a casing through which passes a tube provided with side ports or openings, and in which is mounted a tubular valve provided with corresponding side ports or openings whereby air is admitted into said tube, said tube being also provided below said air-valves with a pin-valve for admitting gas, and said Y-tube being provided at its upper end with an inner central tube, and an outer tube by which an annular chamber is formed, and said annular chamber being provided at its upper end with a gauze cap or cover, and the upper ends of the separate parts of the Y-tube being also provided with gauze caps or covers, substantially as shown and described.

5. The herein-described burner for burning gas and air, which comprises a Y-tube the lower end of which is provided with a casing through which passes a tube provided with side ports or openings, and in which is mounted a tubular valve provided with corresponding side ports or openings, whereby air is admitted into said tube, said tube being also provided below said air-valve with a pin-valve for admitting gas, and said Y-tube being provided at its upper end with an inner central tube, and an outer tube by which an annular chamber is formed, and said annular chamber being provided at its upper end with a gauze cap or cover, and the upper ends of the separate parts of the Y-tube being also provided with gauze caps or covers, and the lower end of the central tube at the upper end of the Y-tube being provided with an outwardly-directed flange, and said outer tube being provided at its lower end with an air-distributing plate which is adapted to serve as a chimney-holder, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 30th day of May, 1896.

JOHN FOYSTER BURGESS.

Witnesses:

ARTHUR CODLING,
RICHARD GEORGE DYER.