No. 646,090. Patented Mar. 27, 1900.

J. P. FARMER.

GAS BURNER.

(Application filed May 23, 1899.)

(No Model.)

3 Sheets—Sheet 1

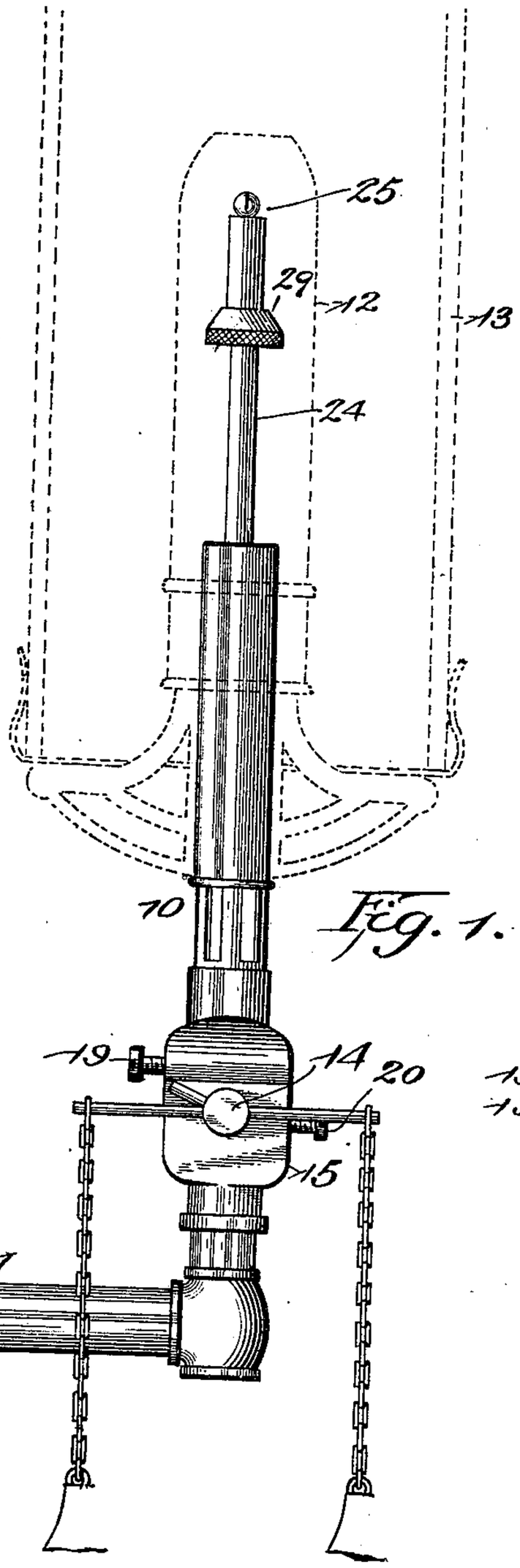

Fig. 1.

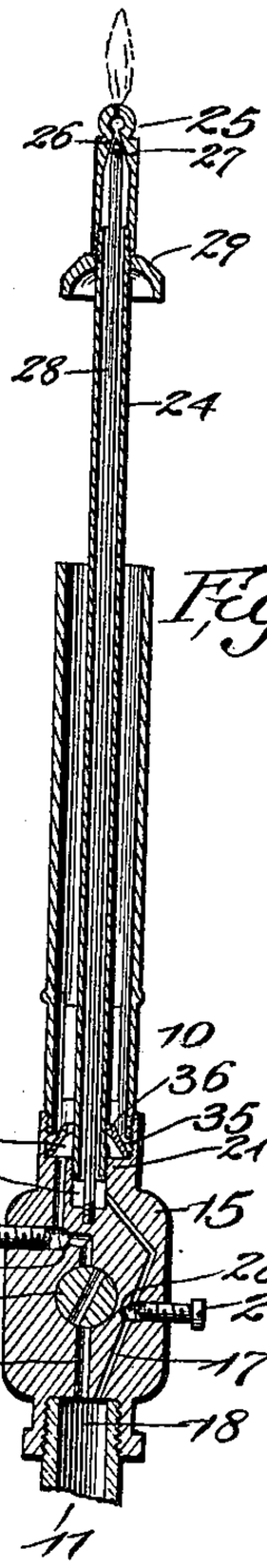

Fig. 2.

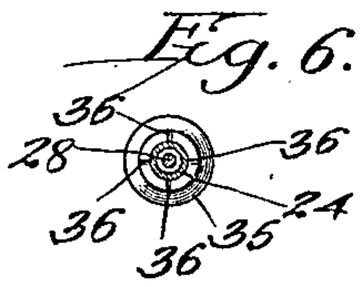

Fig. 6.

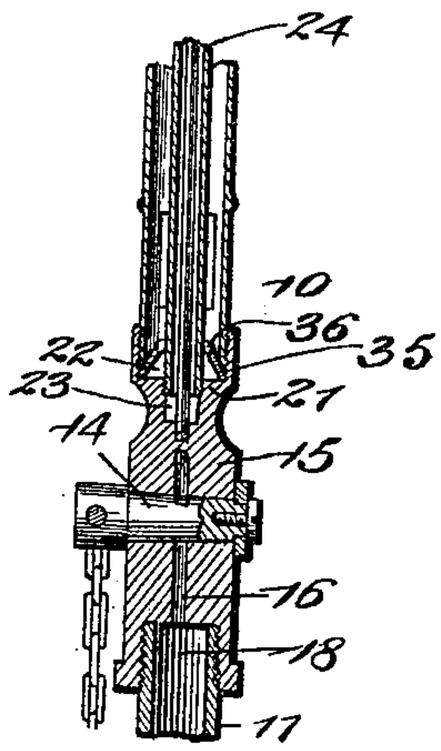

Fig. 3.

Witnesses
A. Roy Appenzeller Jr.
[illegible]

By his Attorneys.

John P. Farmer, Inventor.

Church & Co.

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3 Sheets—Sheet 2.

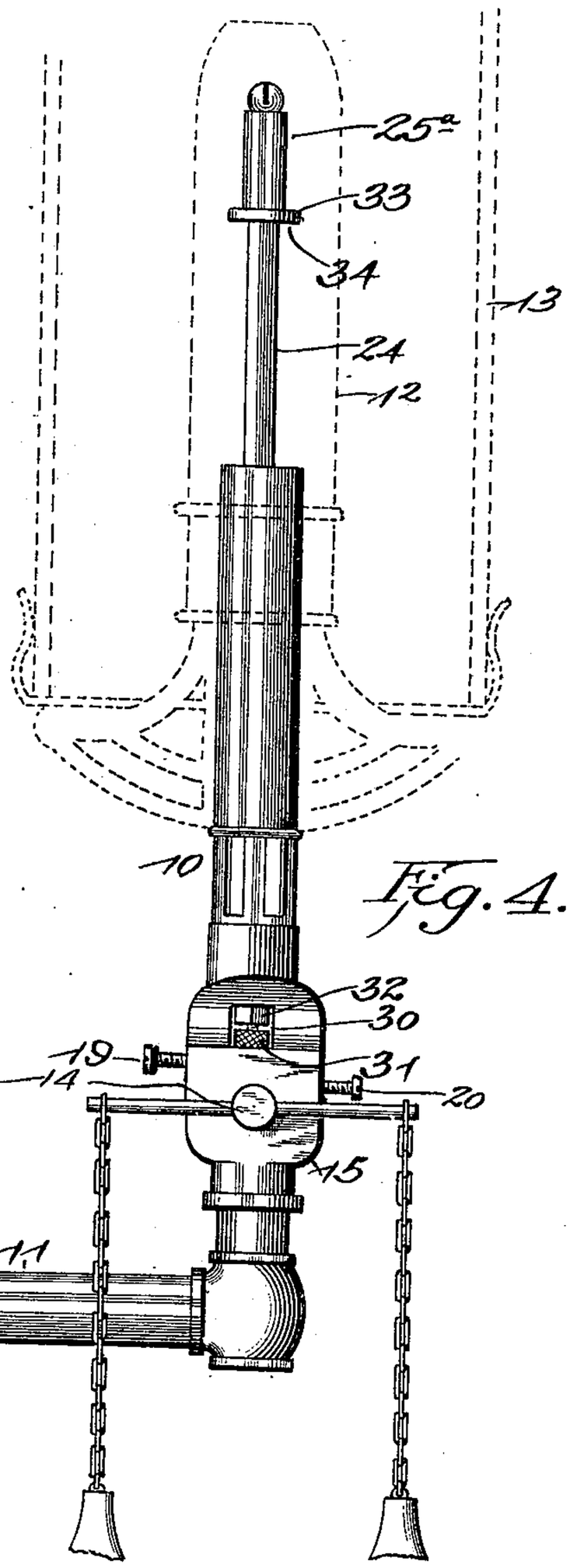

Fig. 4.

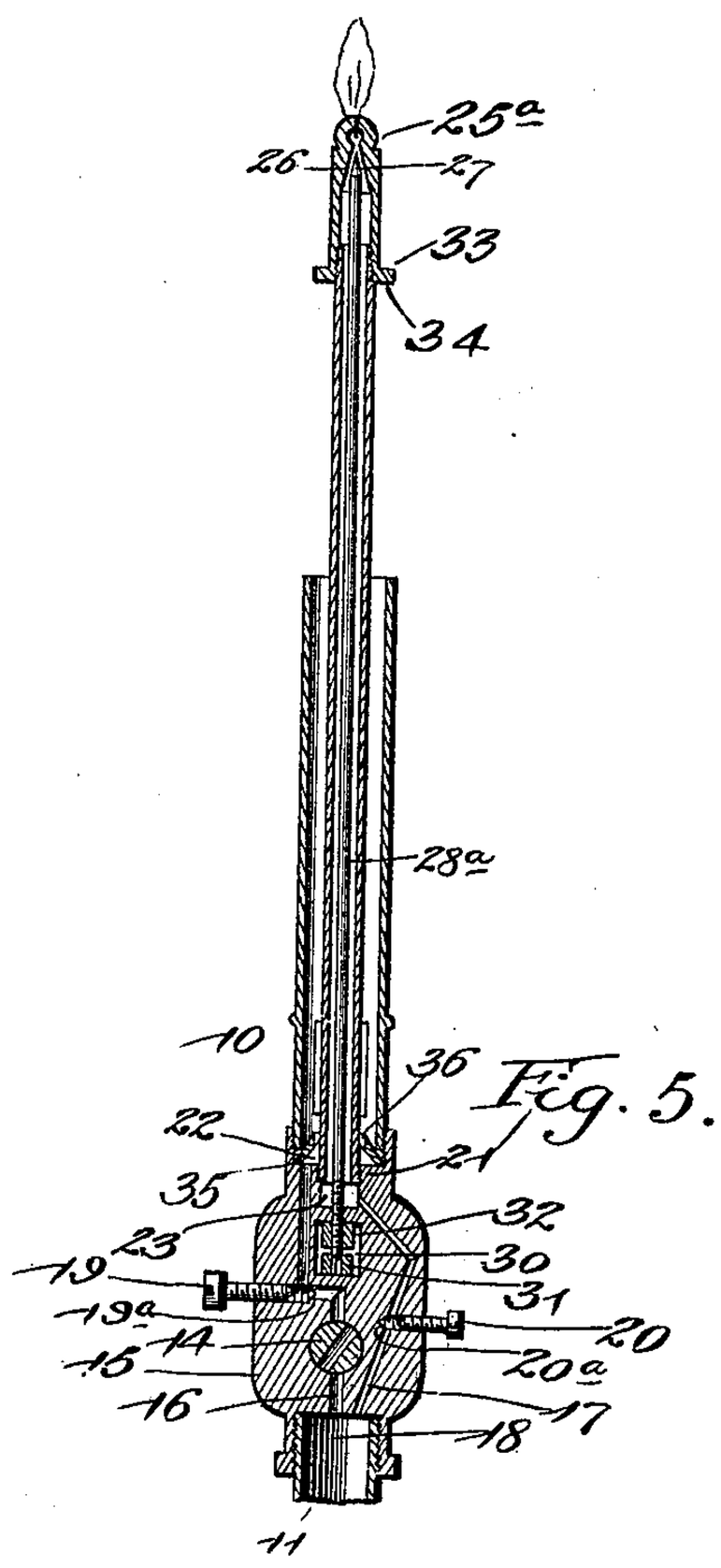

Fig. 5.

Witnesses
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(Application filed May 23, 1899.)

(No Model.) 3 Sheets—Sheet 3

Fig. 7.

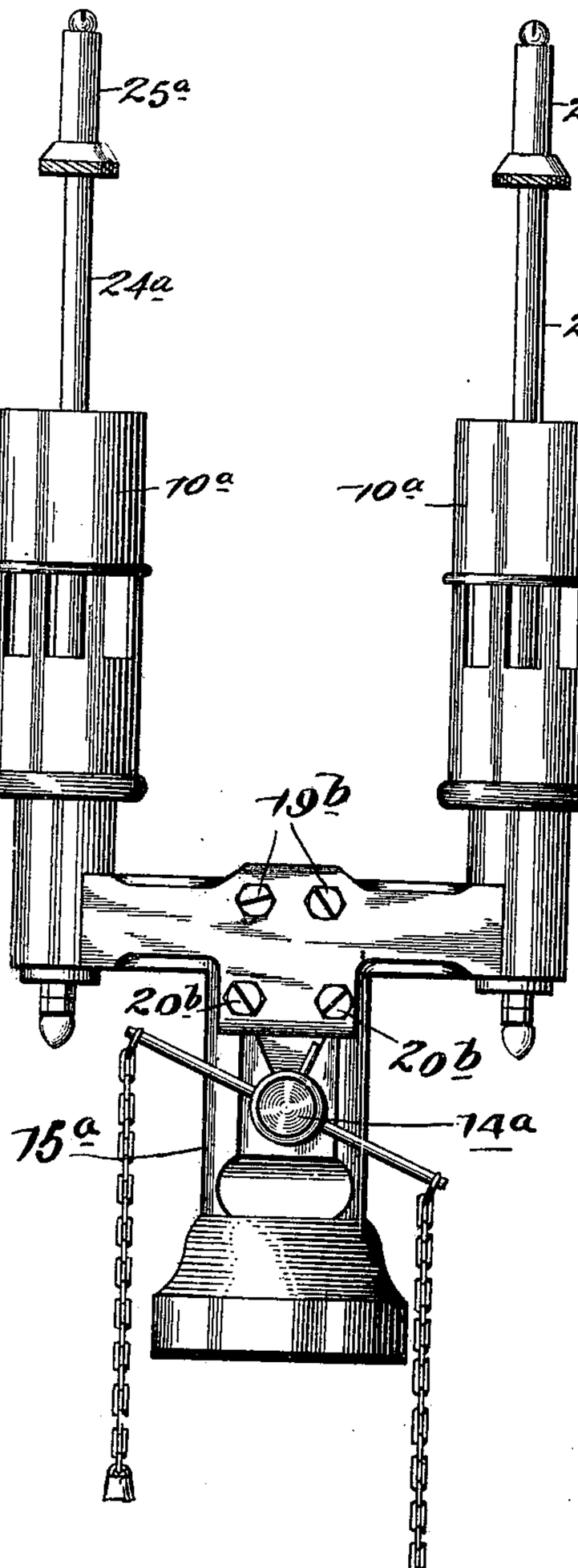
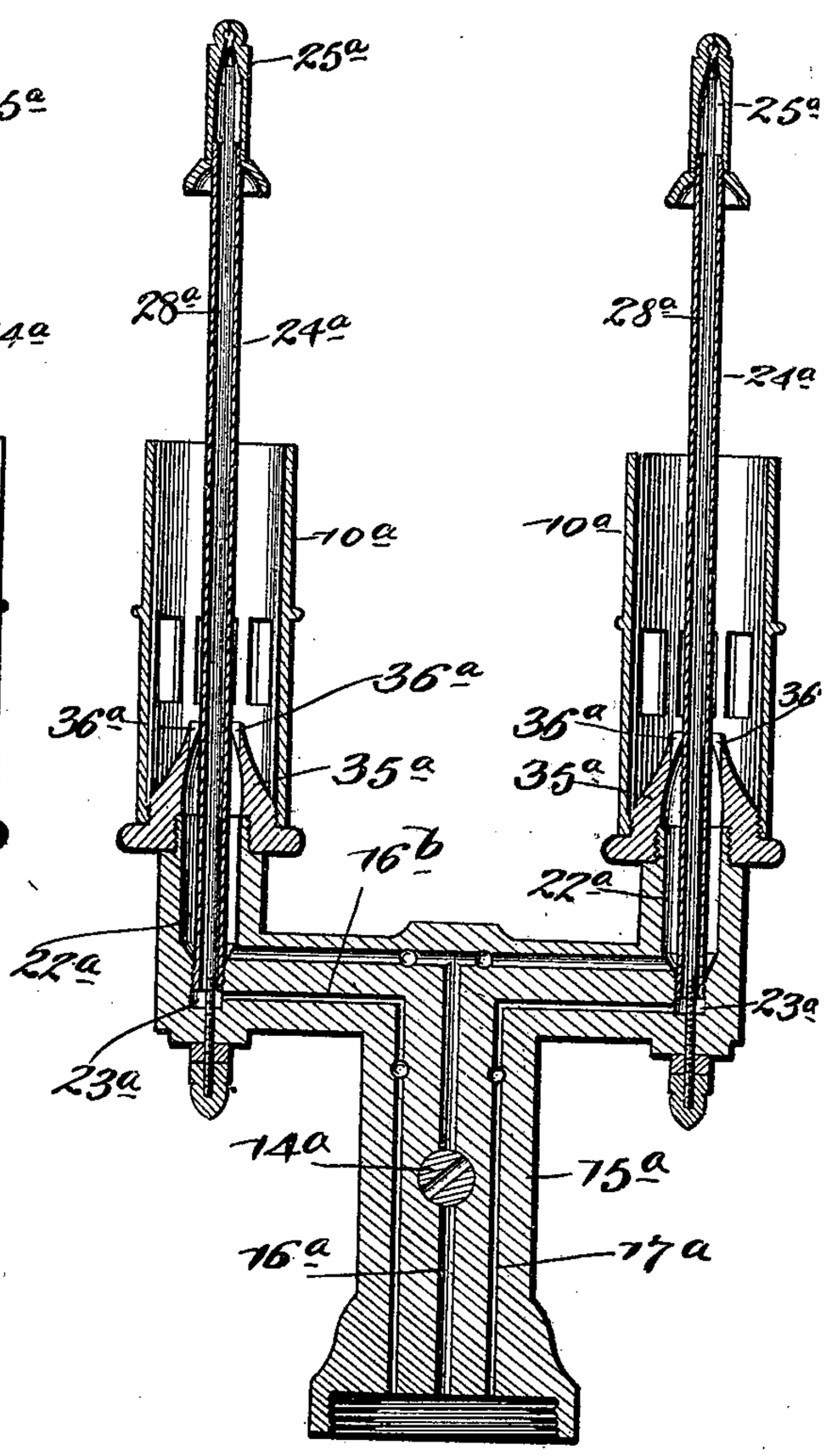


Fig. 8.



Witnesses
A. Roy Appleman
D. C. Hazle

John P. Farmer, Inventor.
By his Attorneys,
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN P. FARMER, OF PORTLAND, OREGON.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 646,090, dated March 27, 1900.

Application filed May 23, 1899. Serial No. 717,936. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. FARMER, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Gas-Burner, of which the following is a specification.

My invention relates to gas-burners of that type used for illuminating purposes and wherein refractory incandescent mantles are employed, and particularly to a construction of burner embodying a by-pass and pilot-burner, whereby under certain conditions a continuous flame is maintained at the pilot-burner to cause the lighting of the gas at the main burner when the main supply is opened; and the object in view is to provide a simple, compact, and efficient construction and arrangement of parts wherein the by-pass is located wholly within the casing of the main valve or key, and the pilot-burner, with the means whereby the passage through the orifice thereof is controlled, are located within the space inclosed by the incandescent mantle.

Further objects and advantages of this invention will appear in the following description and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view of a burner constructed in accordance with my invention, the same being shown in connection with a mantle and chimney of the ordinary construction and arrangement. Fig. 2 is a sectional view of the same, taken in a plane transverse to the axis of the main gas-controlling valve or key. Fig. 3 is a sectional view taken in a plane perpendicular to that of Fig. 2. Fig. 4 is a front view of a modified construction of burner embodying the essential features of my invention. Fig. 5 is a vertical sectional view of the burner shown in Fig. 4 upon a plane similar to that of Fig. 2. Fig. 6 is a detail plan view of the main-burner plate, shown in operative relation with the pilot-burner tube. Fig. 7 is a front view of an adaptation of my improved burner for use in connection with street-lamps and analogous devices. Fig. 8 is a sectional view of the same.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

The main burner 10, which is carried by the supply-pipe or bracket-arm 11, may be of any ordinary or preferred construction, that which is indicated in the drawings being of a type adapted to be employed in connection with an incandescent mantle 12 and chimney 13, (indicated in dotted lines,) said main burner, however, having a main valve or key 14, also of the ordinary construction, but arranged in a casing 15, which in addition to the main supply channel or passage 16 (controlled by said main valve or key) is provided with a by-pass or auxiliary supply-passage 17. This by-pass or auxiliary passage is in communication at one end with the main supply-chamber 18, formed in the lower end of the casing, but is wholly out of communication with the main gas-passage. Said main and auxiliary gas-passages, furthermore, are provided with regulating devices, consisting of valves 19 and 20, preferably having threaded stems and consisting in the construction illustrated of screws threaded in suitable openings in the casing in communication, respectively, with the said gas-passages. These regulating-valves are adapted to fit adjacent seats 19^a and 20^a and are designed to vary the extent of opening of the passages, and hence to regulate the flow of gas therethrough.

The upper portion of the interior of the valve-casing is divided by a transverse partition 21 to form an upper or superjacent main-burner feed-chamber 22 and a lower or subjacent pilot-burner feed-chamber 23, with the former of which communicates the main gas passage or channel 16 and with the latter of which communicates the auxiliary gas passage or channel 17; also, this partition wall or web by which the main and pilot burner feed-chambers are separated is provided with a central opening, in which is removably fitted the lower end of a thermostatic pilot-burner tube 24, corresponding in general construction and form with a similar part illustrated in my copending application, Serial No. 696,268, filed November 12, 1898, said thermostatic tube being in communication solely with the subjacent pilot-burner feed-chamber 23. Said pilot-burner tube is provided at its upper end with the pilot-burner tip or jet 25, having an orifice consisting of an elongated slot in contradistinction to the round

orifice illustrated in my said former application. At the point of communication of said burner-orifice with the bore of the thermostatic tube is formed a valve-seat 26, and in cooperative relation therewith is a pilot-burner-controlling valve 27, carried by a stem 28, which extends axially through the thermostatic tube to and beyond the lower end thereof and is fixed at its extremity to the valve-casing, preferably at the floor of the pilot-burner feed-chamber. The thermostatic tube is constructed of a material adapted to expand appreciably when heated, whereby it may elongate, while the pilot valve and stem, which may be integral, as illustrated, are constructed of neutral steel or other material which is practically unaffected by heat or of which the ratio of expansion when subjected to heat is less than that of the tube, whereby when the pilot-burner is exposed to heat, due to a flame at its orifice or to a flame at the main burner, the tube will be expanded longitudinally to a sufficient extent to remove the seat 26 from the valve, and thus allow the escape of gas through the pilot-burner orifice. Thus the pilot-burner tube, which is in communication with the pilot-burner feed-chamber, extends vertically upward from the valve-casing through the center of the main-burner tube 10 and also extends into and terminates near the upper end of the incandescent mantle 12, with the orifice of the pilot-burner located at such a point that if the main gas-supply has been shut off and is turned on (a flame being present at the pilot-burner orifice) the gas within the mantle will be ignited only when it has reached an elevation sufficient to entirely fill a mantle and the lower portion of the chimney. In other words, the orifice of the pilot-burner is located at a point adjacent to the top of the mantle, whereby in lighting the gas supplied by the main burner the shock which is ordinarily due to the admixture of air with the gas in the chimney is avoided. It will be understood that should the flame at the pilot-burner orifice become extinguished by reason of a draft or through intention upon the part of the operator the contraction of the thermostatic tube will seat the valve and close said orifice.

Various means of adjustment may be provided for varying the relative positions of the valve and seat whereby the pilot-burner orifice is controlled; but in Figs. 1 to 3, inclusive, I have illustrated a preferred form, wherein the pilot-burner tip or jet is constructed separately from the body portion of the thermostatic tube and is threaded thereon or therein for axial adjustment. Preferably the body portion of the tube is provided with an exterior thread, while the pilot-burner tip or jet is fitted exteriorly thereon, and the advantage of this construction resides in the fact that I am enabled, in connection with said tip or jet, to employ a peripherally-milled lock-nut 29, also threaded upon the body portion of the thermostatic tube and adapted to be turned up against the lower end of the tip or jet to secure the latter at the desired adjustment. It is obvious that by axially adjusting the tip or jet upon the body portion of the tube the distance between the valve-seat carried by the tip and the valve carried by the neutral stem may be varied. Furthermore, this construction and relative arrangement of parts enables me to utilize the lock-nut as a deflector or spreader for the gas discharged by the main burner, said nut being directly in the path of upward movement of such gas. Thus in Figs. 1 to 3 I have shown said lock-nut recessed at its under side to form a bell, which constitutes an efficient deflector or spreader. Thus in the construction shown in Figs. 1 to 3 the adjustment of the parts to vary the relative positions of the valve and valve-seat, which control the pilot-burner orifice, is accomplished by the axial adjustment of the burner tip or jet; but in the construction illustrated in Figs. 4 and 5 I have provided for the axial adjustment of the stem of the valve, which is indicated at 28^a and is extended entirely through the floor of the pilot-valve feed-chamber into a recess 30, which is open at opposite sides of the burner-casing, said stem being threaded in the casing and having its lower end squared or flattened to form a seat, upon which is fitted a milled feed-nut 31, adapted to be turned by inserting into the recess a thin instrument from either side of the bearing. Also threaded upon the valve-stem within the recess is a lock-nut 32, which may be tightened to secure the stem at the desired adjustment.

Arranged within the main-burner feed-chamber, above the point of communication of the main gas-supply passage, is a burner-disk 35, which is split radially to form slits 36, which constitute main-burner gas-orifices, the object in using radially-elongated slits being to prevent the gas in escaping from the main-burner feed-chamber from following the pilot-burner tube, which extends through said main-burner disk. Furthermore, I utilize this radial splitting of the burner-disk to secure it snugly and frictionally upon the pilot-burner tube, as there is sufficient radial yielding of the walls of the central opening in said disk to provide for constructing said opening of a diameter slightly less than the exterior diameter of the pilot-burner tube, whereby the disk may be held by contractive force at any desired adjustment upon the pilot-burner tube. I have found in practice that the radial disposition or elongation of the main-burner orifices, together with the snug fitting of the burner-disk upon said tube, causes the spreading of the gas within the burner-tube 10, and hence the efficient supply of gas at the point of ignition.

In Figs. 7 and 8 I have shown an adaptation

of my improved burner for use in connection with street-lamps, and referring thereto it will be seen that 10^a represents the main burners. 14^a is a main valve or key arranged in the casing 15^a, provided with the main supply channel or passage 16^a and with by-passes or auxiliary supply-passages 17^a, said main supply-channel being branched for communication with main-burner feed-chambers 22^a and the auxiliary supply-passages being in communication by channels 16^b with auxiliary pilot-burner feed-chambers 23^a. Communicating with said auxiliary feed-chambers are thermostatic pilot-burner tubes 24^a, through which extend the stems 28^a of pilot-burner-controlling valves. Each of the branches of the main-burner supply-channel is fitted with a regulating-valve 19^b, and each of the auxiliary feed-channels is supplied with a regulating-valve 20^b, said valves corresponding in construction with those described in connection with the other forms of my invention. Also fitted upon the upper end of the pilot-burner tube is a pilot-burner tip or jet 25^a.

The branches of the main-burner feed-channel and the passages 16^b are formed in lateral arms of the main-burner casing 15^a, and threaded upon the upturned extremities of said arms to cover the main-burner feed-chambers are burner-disks 35^a, consisting of caps having radial outlet-slits 36^a, through which the gas passes to the burner-tubes 10^a.

It will be seen that the device may be provided with any desired number of arms or branches to support a plurality of burner-tubes, and therefore that my invention is adapted for use in connection with street and other lamps requiring burners of great illuminating power.

In practice various changes in the form, proportion, size, and minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. A burner having a valve-casing provided with separate main-burner and pilot-burner feed-chambers, respectively in communication with a gas-supply chamber, concentric main and pilot burner tubes respectively in communication with said feed-chambers, and a main-burner disk centrally perforated and provided with elongated radial gas-orifices opening into the central perforation and resulting in the formation of fingers in frictional engagement with the pilot-burner tube, substantially as specified.

2. A burner having a valve-casing provided with separate main-burner and pilot-burner feed-chambers, respectively in communication with a gas-supply chamber, concentric main and pilot burner tubes respectively in communication with said feed-chambers, and a contractile burner-disk fitted upon the pilot-burner tube and provided with radial slits forming main-burner gas-orifices and resultant fingers engaged with the pilot-burner tube, substantially as specified.

3. A burner having outer and inner main and pilot burner tubes in communication with a common gas-supply chamber, the pilot-burner tube being of thermostatic material and extending into the zone of heat of the main burner to be energized thereby to initially open the pilot-burner when the main burner is ignited, and having a burner tip or jet threaded upon the body portion of the tube for axial adjustment and provided with a burner-orifice, a valve-seat upon the tip, a lock-nut threaded upon the body portion of the pilot-burner tube for securing said burner tip or jet in its adjusted positions, and a valve arranged within the pilot-burner tube in operative relation with said valve-seat to engage and disengage the seat as the pilot-burner tube contracts and expands and regulate the flow of gas through the pilot-tube.

4. A burner having outer and inner main and pilot burner tubes in communication with a common gas-supply chamber, the pilot-burner tube being of thermostatic material and having a burner tip or jet threaded upon the body portion of the tube for axial adjustment and provided with a burner-orifice and a valve-seat upon the tip, a combined lock-nut and deflector threaded upon the body portion of the pilot-burner tube to secure said burner tip or jet in its adjusted position, and a valve arranged within the pilot-burner tube in operative relation with said valve-seat to engage and disengage the seat as the pilot-burner tube contracts and expands and regulate the flow of gas through the pilot-tube.

5. A burner having outer and inner main and pilot burner tubes in communication with a common gas-supply chamber, the pilot-burner tube being of thermostatic material and having a burner tip or jet threaded upon the body portion of the tube for axial adjustment and provided with a burner-orifice, a valve-seat upon the tip, a deflector or shield fitted upon the body portion of the pilot-burner tube for axial adjustment parallel with said burner tip or jet, and a valve arranged within the pilot-burner in operative relation with said valve-seat to engage and disengage the seat as the pilot-burner tube contracts and expands and regulate the flow of gas through the pilot-tube.

6. A burner having outer and inner main and pilot burner tubes in communication with a common gas-supply chamber, the pilot-burner tube being of thermostatic material and having a burner tip or jet threaded upon the body portion of the tube for axial adjustment and provided with a burner-orifice, a valve-seat upon the tip, a lock-nut threaded upon the body portion of the pilot-burner tube in operative relation with said adjustable tip or jet, and having a recessed under

side to constitute a deflector or shield and a valve arranged within the pilot-burner in operative relation with said valve-seat to engage and disengage the seat as the pilot-burner tube contracts and expands and regulate the flow of gas through the pilot-tube, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN P. FARMER.

Witnesses:

LAUREN PEASE,

GEO. E. STREETER.