G. S. ANDREWS.

GAS BURNER.

APPLICATION FILED AUG. 4, 1908.

912,054. Patented Feb. 9, 1909.

Fig. 1

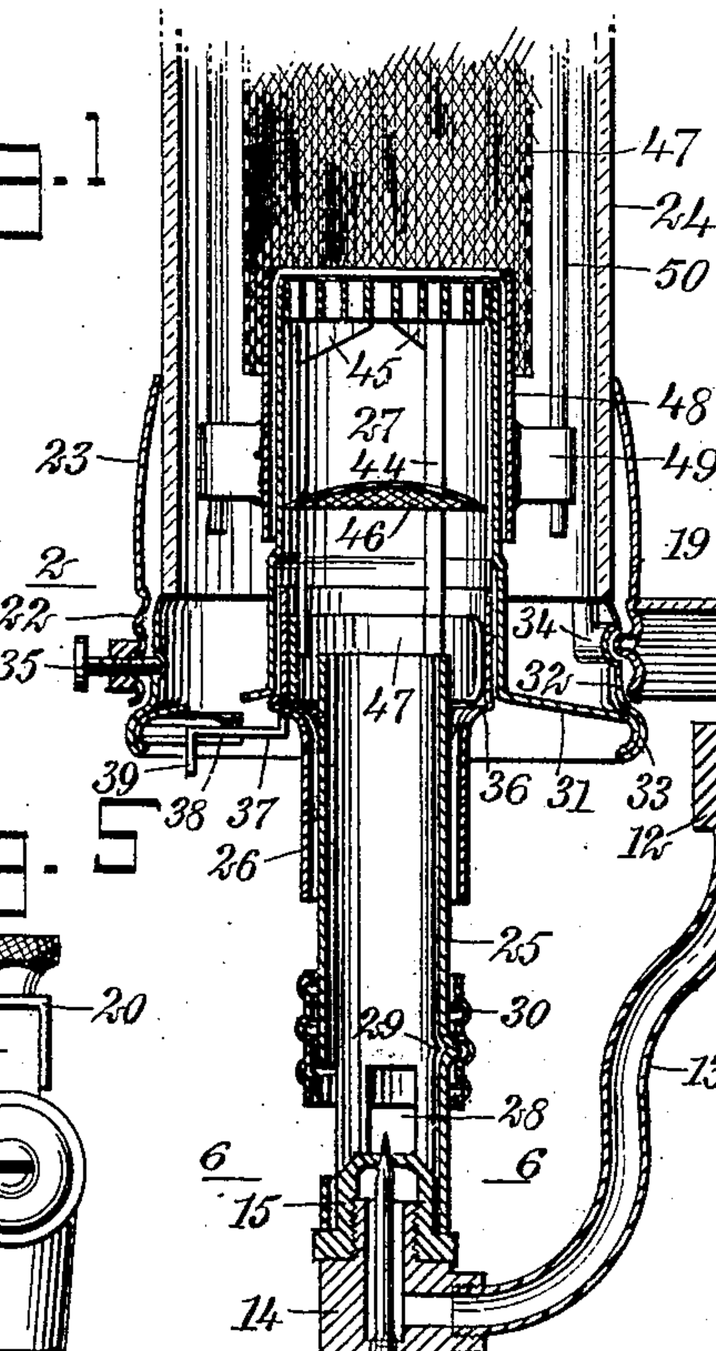


Fig. 3

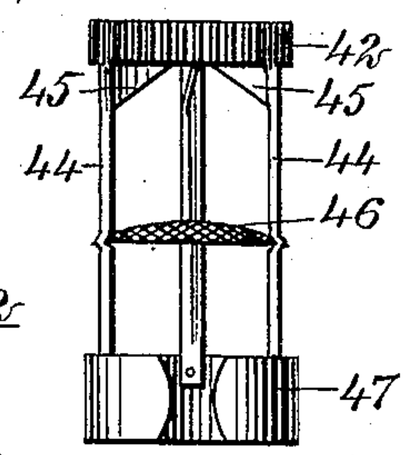


Fig. 5

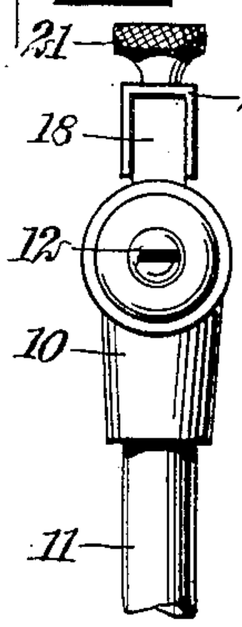


Fig. 6

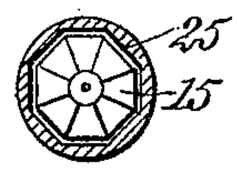


Fig. 7

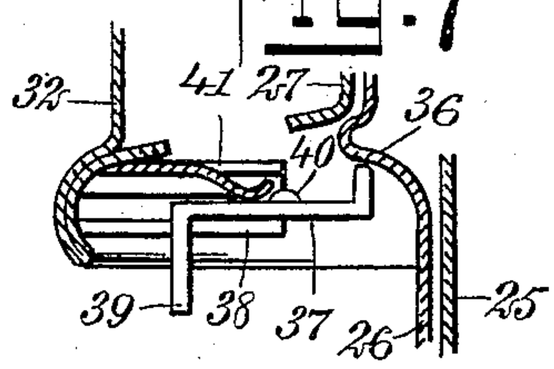


Fig. 2

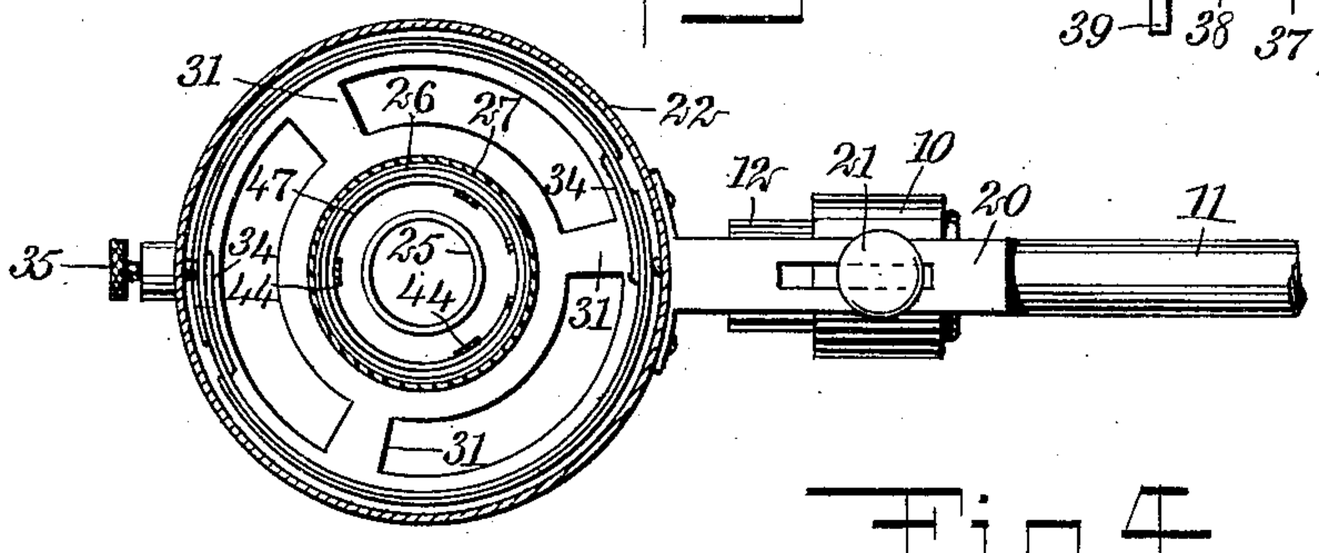
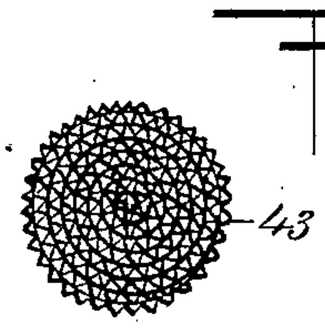


Fig. 4



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE S. ANDREWS, OF BUTLER, PENNSYLVANIA.

GAS-BURNER.

No. 912,054. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed August 4, 1908. Serial No. 446,917.

To all whom it may concern:

Be it known that I, GEORGE S. ANDREWS, a citizen of the United States, and a resident of Butler, in the county of Butler and State of Pennsylvania, have invented a new and Improved Gas-Burner, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in gas burners, and more particularly to that type of burner disclosed in my previous Letters Patent No. 864,593, issued August 27, 1907.

The main objects of my present invention are to facilitate the movement of the gas-delivery nipple in a lateral direction and about a turning plug having a horizontal axis; to provide closer connections between the mixing tube and the gas-delivery nipple; to utilize the mixing tube as the means for normally preventing the lateral movement of the gas-delivery nipple; to provide improved means for regulating the inflow of air to the mixing tube; to provide an improved form of tube; to provide for the lateral adjustment of the chimney and mantle-carrying part, and to provide an improved regulating plate at which the burning takes place.

Other objects and advantages of my invention will be hereinafter more clearly set forth in connection with the detail description.

It is to be understood that the various features of my invention may be employed either alone or in combination with the other features of the burner disclosed in my previous patent, or in a burner of the same general type.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a central vertical section through a burner constructed in accordance with my invention; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is a side elevation of the delivery plate at the upper end of the mixing tube and the means for supporting the same; Fig. 4 is a face view of said plate; Fig. 5 is an end view of the stationary burner-supporting head; Fig. 6 is a transverse section on the line 6—6 of Fig. 1; and Fig. 7 is a sectional detail showing the mixing-tube retaining means.

In the specific form illustrated in the accompanying drawings, I provide a head 10 supported upon a stationary gas-delivery conduit or bracket 11, and constituting a valve casing. Said head also constitutes a support for the lower part, which includes the gas-delivery nozzle, and a support for the upper part which includes the mixing tube, the mantle support, and the chimney support. Within the head is mounted the turning plug 12, which turning plug has its axis disposed in a horizontal plane and in a vertical plane common to the axis of the mixing tube. In other words, the axis of the turning plug if projected, would pass diametrically through the mixing tube. A short conduit 13 is supported by the turning plug at its outer end and serves to support a gas-delivery head 14. The head 14 carries a delivery nipple 15, and a needle valve 17 extends up through the head to the aperture in the nozzle to control the escape of gas through the latter. The turning plug 12 is provided with a passage therethrough, so that when the plug is in such a position that the head 14 comes in alinement with the mixing tube, gas may flow from the conduit 11 through the turning plug 12 and the conduit 13 to the gas-delivery nozzle, but when the plug 12 is turned to bring the gas-delivery nozzle out of alinement with the mixing tube, the supply of gas is shut off at said plug. The gas-delivery nozzle may be of any suitable form, but it is preferably non-circular in cross section, so as to prevent rotation of the mixing tube when the latter is in engagement therewith, as will be more fully described hereinafter. The upper portion of the head above the turning plug 12 is so formed as to constitute a support for the upper part of the burner, and to permit of the adjustment of the latter. As shown, this upper part is in the form of a flange or cleat 18, and the shell 19 of the upper part of the burner is provided with a laterally-extending inverted channel-shaped arm 20, which incloses said cleat or flange and engages with opposite sides thereof. This channel-shaped arm is provided with a slot extending longitudinally thereof, and through this slot a set screw 21 extends into the cleat or flange 18 of the head. By tight-

ening the set screw, the arm 20 may be rigidly secured to the head, while by loosening the set screw, the arm may be moved longitudinally to bring the upper part of the burner at a greater or less distance from the turning plug and head 10. As a mixing tube is carried by the upper part and concentric therewith, it is evident that this adjustment of the position of said upper part permits the mixing tube to be brought directly over the gas-delivery nozzle 15, even though the conduit 13 should be accidentally bent or the turning plug 12 should become so worn as to necessitate its longitudinal adjustment within its conical seat. By removing the set screw, the upper part may be entirely removed from the head without necessitating the employment of any special tools.

The shell 19 may be of any suitable character, but is so constructed as to support the mixing tube and the chimney, if a chimney be employed. As shown, the shell includes a ring or band 22, rigidly secured to the arm 20 and having upwardly extending flange or resilient members 23 for receiving the lower end of the chimney 24. The mixing tube, in the present instance, is formed of three separate telescoping sections 25, 26 and 27. The lowest and smallest of these sections, 25, is adapted to rest upon a flange of the gas-delivery nozzle 15 and its lower end is adapted to fit the non-circular portion of the nozzle, so as to be held from rotation when said mixing tube section is in its lowered position. Adjacent the lower end of the tube section 25, and adjacent the upper end of the nozzle 15, there are provided a plurality of air-inlet openings 28, through which air may enter to become mixed with the gas escaping past the needle valve 17. For regulating the size of these openings, the tube section 25 is provided with an outwardly-extending bead, flange or projection 29, and a sleeve 30 encircling the lower end of the tube and having threaded engagement with said projection. By rotating the sleeve 30, it may be raised or lowered to uncover more or less of the openings 28, so as to admit more or less of air. While rotating the sleeve 30 to adjust the same, the tube section 25 is held against rotation by its engagement with the nozzle 15.

The upper tube section 27 is supported by the annular portion 22 of the shell, and is connected thereto by a bayonet joint. The tube section is of considerably smaller diameter than the shell, and at its lower end is provided with arms or spokes 31, connected to a collar 32 adapted to fit up into the lower end of the shell. This collar is provided with an annular bead 33 at its lower end to limit the upward movement, and at its outer surface it is provided with one or more bayonet slots 34 to receive inwardly-extending lugs carried by the shell. By extending the collar up into the lower end of the shell and rotating it a short distance, the bayonet slots serve to support it in position, and to prevent its accidental rotation a set screw 35 may be employed. As shown, the set screw extends through the shell into a recess in the collar 32. As illustrated, the upper end of the collar 32 serves to support the chimney, so that the chimney may be withdrawn through the lower end of the shell and without disturbing any shade which may be employed. It is evident that the chimney may be supported by the shell and independently of the collar, if desired.

The intermediate section 26 extends up into the lower end of the upper section 27 and incloses the upper end of the lower section 25. This section is supported by the upper section and serves to support the reticulated metal plate at which the burning takes place. The upper end of the section 26 is somewhat larger than the lower end, so as to present a shoulder 36, adjacent the lower end of the upper section, and at the outer edge of the shoulder is a small bead for limiting the upward movement of the tube section 26, as is clearly indicated in Fig. 7. For holding the intermediate tube section 26 in position, the collar 32, adjacent its lower end, carries a slide 37 supported within radially-disposed guides 38. The inner end of the slide is adapted for engagement beneath the shoulder 36 of the tube section 26, and the outer end is provided with a downwardly-extending flange 39, by means of which the slide may be moved longitudinally. For preventing accidental movement of the slide, the latter is preferably provided with a slight projection 40 upon its upper surface, and between the two guides is mounted a downwardly-extending spring 41 for engagement with the slide at one side of the projection.

Within the upper tube section 27 and supported by the intermediate tube section, is a member 42, which takes the place of the ordinary wire gauze disk commonly employed at the outlet end of the mixing tube. This member serves to more thoroughly mix the air and gas and to present a surface at which the flame is formed and through which the flame cannot readily pass into the mixing tube. This member 42 is preferably formed of a thin strip of sheet metal 43, a portion of which is corrugated and a portion of which is uncorrugated. The two portions are bent adjacent the end of the corrugated portion and are coiled in the form of a spiral, so that the uncorrugated portion lies intermediate adjacent coils of the corrugated portion, to space them apart, as indicated in Fig. 4. The outer coil of the strip is provided with branches, arms or projections 44, which constitute legs for supporting the coiled portion, which latter will

be hereinafter referred to as the " reticulated plate ". These supports or legs may be formed integral with the metal of the outer coil and may be provided with triangular flanges 45 integral therewith and extending inwardly beneath the center coils. Intermediate the ends of the legs or supports they may be provided with recesses to receive and support a wire gauze plate 46, and the lower ends of the legs are preferably connected to a split ring or collar 47, which latter is normally disposed within the upper end of the mixing tube section 26 and rests upon the shoulder 36 of the latter. The reticulated plate when in position, comes adjacent the upper end of the upper mixing tube section, but is removable through the lower end thereof upon the removal of the intermediate tube section 26. In connection with the mixing tube, there is preferably employed a mantle 47, which may be supported in any suitable manner from its upper end and inclosing the upper end of the mixing tube section 27. As shown, a collar 48 is slidably mounted upon the upper mixing tube section and carries arms 49 which extend outwardly and connect with upwardly-extending rods 50, leading to the upper end of the mantle for supporting the latter.

In my improved burner above described, each of the three sections of the mixing tube may be removed in series upon the lateral movement of the delivery nozzle 15 out of alinement with the mixing tube. The reticulated plate may be removed from the upper tube section without necessitating the removal of said tube section. The parts are all adjustable in respect to each other, and any part may be readily removed for cleaning, repairing or replacement.

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

1. A gas burner, comprising a head, a vertically-disposed mixing tube carried thereby, a turning plug carried by said head, a conduit connected to said turning plug, and a gas-delivery nozzle carried by said conduit and normally disposed in alinement with said mixing tube, said turning plug being rotatable upon a horizontal axis, which axis intersects the vertical axis of the mixing tube, whereby the gas-delivery nozzle may be moved laterally and upwardly upon either side of the mixing tube.

2. A laterally-movable gas burner, including a gas-delivery nozzle, and a mixing tube, including a plurality of telescoping sections, one of said sections being movable into or out of engagement with said nozzle and movable from the burner upon the lateral movement of the nozzle.

3. A gas burner, including a gas-delivery nozzle, and a mixing tube, including a plurality of telescoping sections, one of said sections being movable into or out of engagement with said nozzle, and held from rotation in respect to said nozzle by its engagement therewith.

4. A gas burner, including a gas-delivery nozzle, a mixing tube, including a plurality of telescoping sections, one of said sections being movable into or out of engagement with said nozzle, and a rotatable sleeve carried by one of said sections and constituting an air regulator.

5. A gas burner, comprising a gas-delivery nozzle, a mixing tube formed of a plurality of telescoping sections, one of said sections being movable into or out of engagement with said nozzle and held from rotation when in engagement with said nozzle, said last mentioned section having a plurality of air inlet openings, and a sleeve having threaded engagement with said section and adapted to regulate the size of said openings.

6. A gas burner, including a gas-delivery nozzle, a mixing tube longitudinally movable into engagement therewith, and an air regulator carried by said mixing tube.

7. A gas burner, including a laterally-movable gas-delivery nozzle, and a vertically-movable mixing tube adapted to engage therewith and normally prevent the lateral movement of said nozzle.

8. A gas burner, including a gas-delivery nozzle, a mixing tube including a plurality of telescoping sections, means for supporting one of said sections independently of said nozzle, and means for supporting one of said sections from said nozzle.

9. A gas burner, including an annular ring or shell, means for supporting the same, a tube concentric with said ring and of smaller diameter, a collar carried by said tube and concentric with the lower end thereof, and means for detachably securing said collar to said ring, said collar being removable from the under side of the ring.

10. A gas burner, comprising a ring or shell, a tube concentric therewith, a mixing tube section concentric with said first-mentioned tube and detachably secured thereto and removable from the lower end thereof and a gas delivery nozzle below said tube.

11. A gas burner, comprising an annular ring or shell a tube concentric therewith and supported thereby and removable from the under side thereof, a second tube concentric therewith and longitudinally movable in respect thereto, and means for supporting said second tube from said first-mentioned tube.

12. A gas burner, including an annular ring or shell, a tube concentric therewith and detachably secured thereto, a second tube extending into said first-mentioned tube from the lower end thereof and removable therefrom and having an outwardly-ex-

tending shoulder, and a slide carried by the first-mentioned tube for engagement beneath said shoulder for normally holding the second-mentioned tube against displacement.

13. A gas burner, including a mixing tube, a safety plate adjacent the delivery end of said tube and formed of a spiral coil of sheet metal, a split ring within said tube intermediate its ends, and means for supporting said plate from said split ring, said means including a plurality of bars integral with the sheet metal forming said coil.

14. A gas burner, including a mixing tube, a reticulated safety plate adjacent the delivery end thereof and formed of a spiral coil of corrugated sheet metal, legs integral with said sheet metal and extending longitudinally thereof for supporting the plate, and lugs or shoulders carried by said legs and extending beneath said coil for supporting the central portion of the latter.

15. A gas burner, comprising an upper part including a mixing tube, a lower part including a gas delivery nozzle movable out of alinement with said mixing tube, and means for adjusting said mixing tube laterally in respect to said nozzle.

16. A gas burner, a gas delivery nozzle, including a substantially stationary head, a shell, an arm carried thereby, and in engagement with said head, a mixing tube carried by said shell, and means for adjusting the arm longitudinally in respect to said head to vary the relationship of the tube and nozzle.

17. A gas burner, comprising a head having an upwardly-extending flange, a ring, an arm carried thereby and having a groove in its under surface to receive said flange, means for securing said arm to said flange in an adjusted position, and a mixing tube carried by said ring.

18. A gas burner, comprising a head having an upwardly-extending flange, a ring, an arm carried thereby and having a groove in its under surface to receive said flange, means for securing said arm to said flange in an adjusted position, and a mixing tube carried by said ring and removable from beneath the same.

19. A gas burner, comprising a head having an upwardly-extending flange, a ring, an arm carried thereby and having a groove in its under surface to receive said flange, means for securing said arm to said flange in an adjusted position, a mixing tube carried by said ring, a gas-delivery nozzle, a conduit connected thereto, and a turning plug within said head and supporting said conduit and rotatable about an axis substantially parallel to said arm.

20. A gas burner, including a head, a shell, an arm carried thereby and detachably secured to said head and adjustable longitudinally in respect thereto, a mixing tube carried by said shell, a turning plug carried by said head and rotatable about an axis substantially parallel to said arm, and a gas-delivery nozzle in alinement with said mixing tube and carried by said turning plug.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE S. ANDREWS.

Witnesses:

L. P. WALKER,

BLAIR M. LURE.