

No. 742,594.

PATENTED OCT. 27, 1903.

W. COLLINS.
GAS BURNER.

APPLICATION FILED NOV. 23, 1901.

NO MODEL

Fig. I.

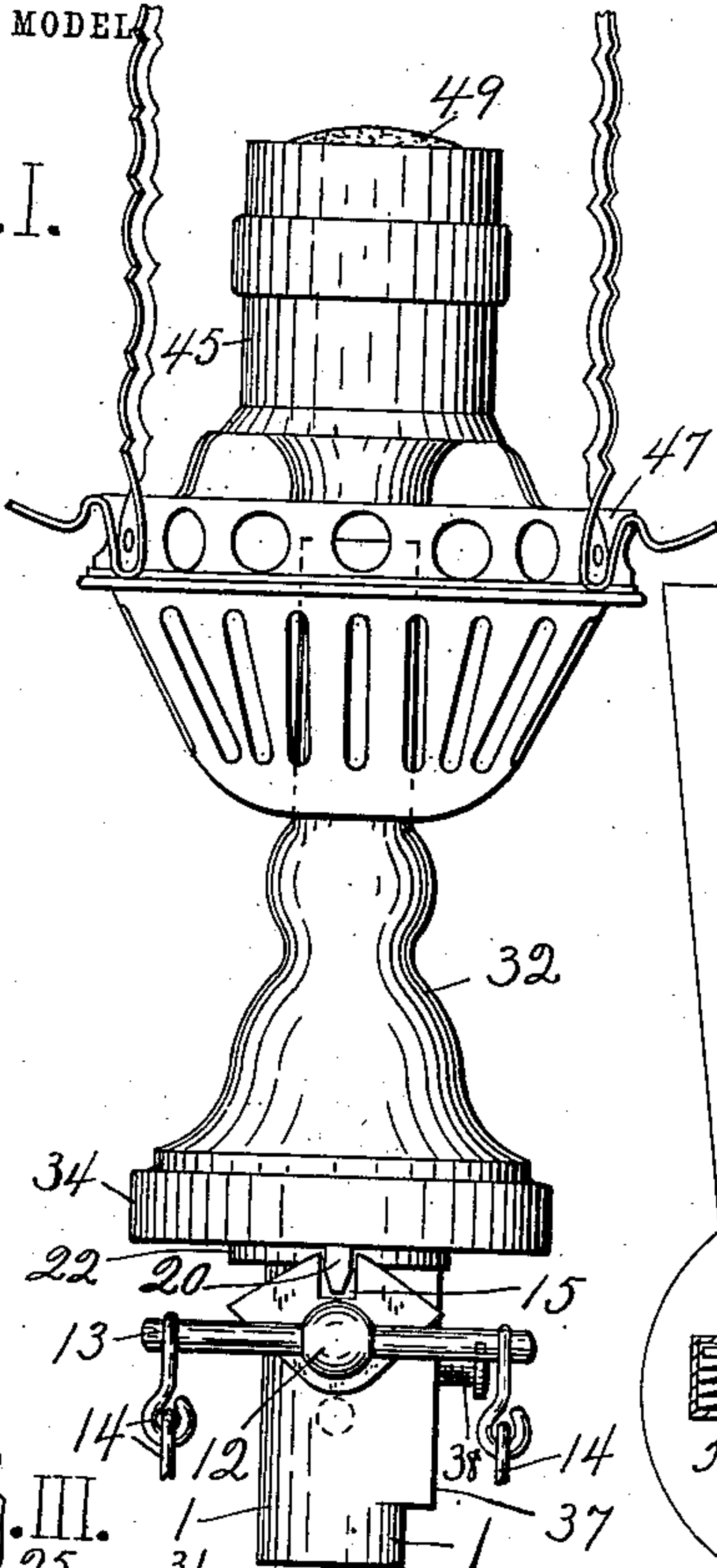


Fig. X.

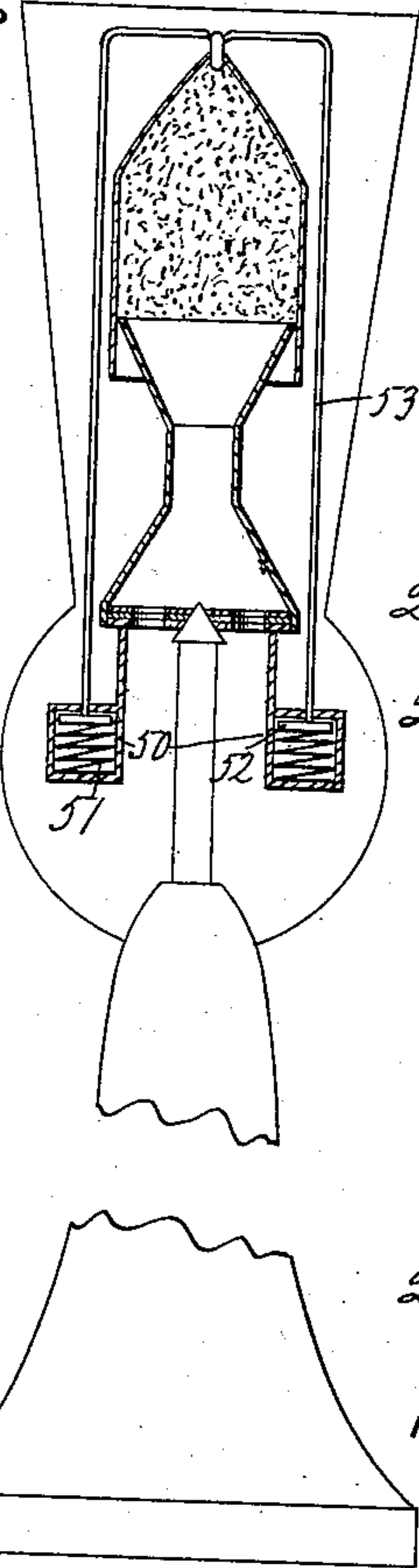


Fig. II.

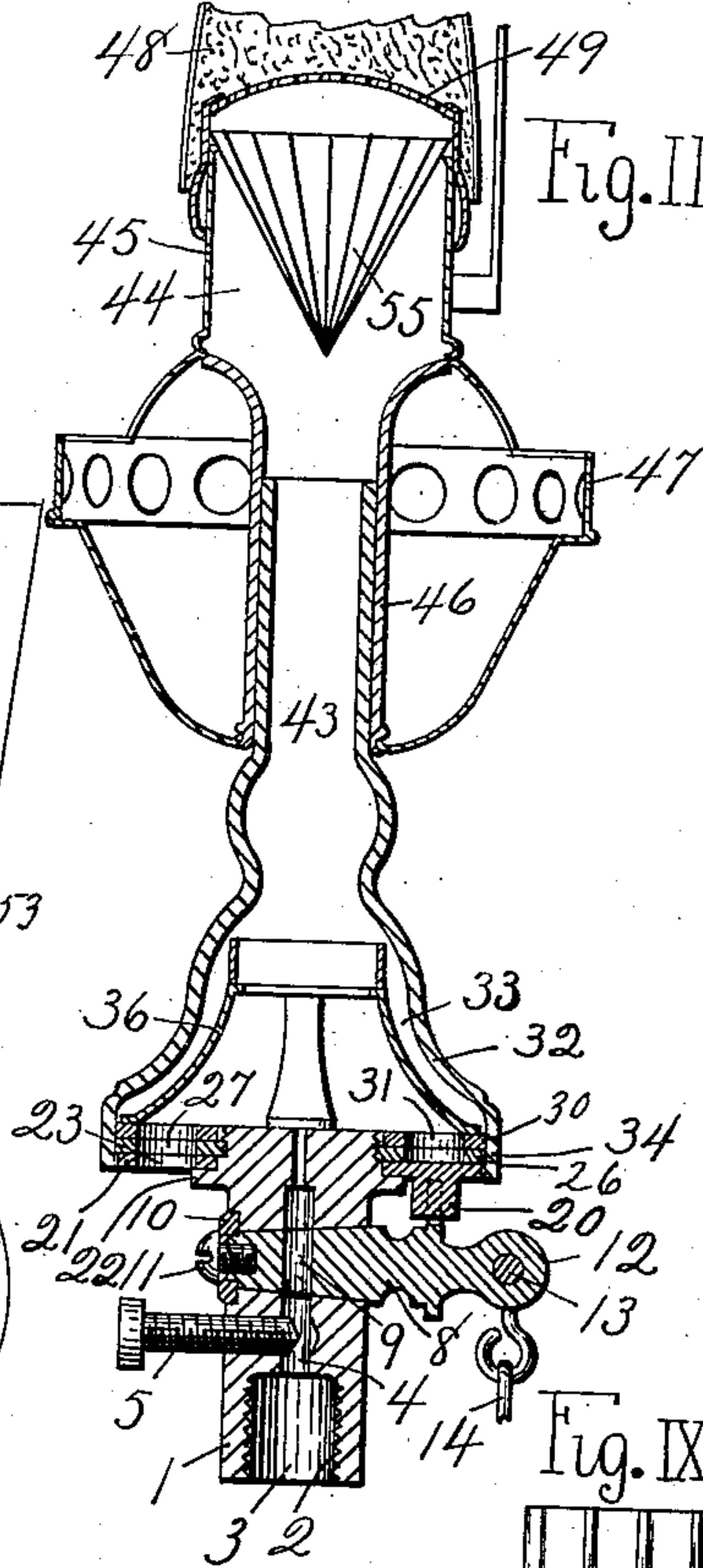


Fig. III.

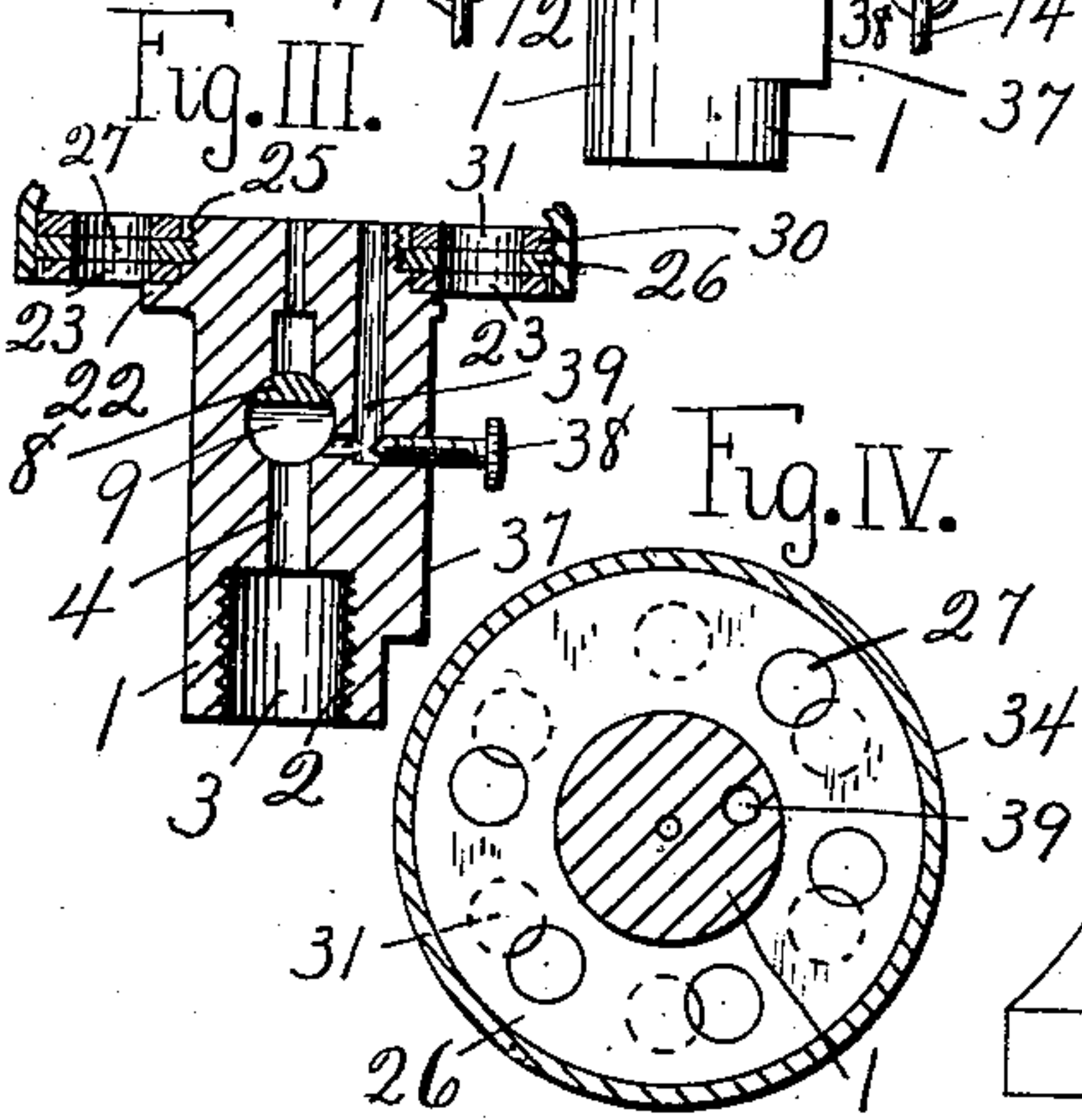


Fig. IV.

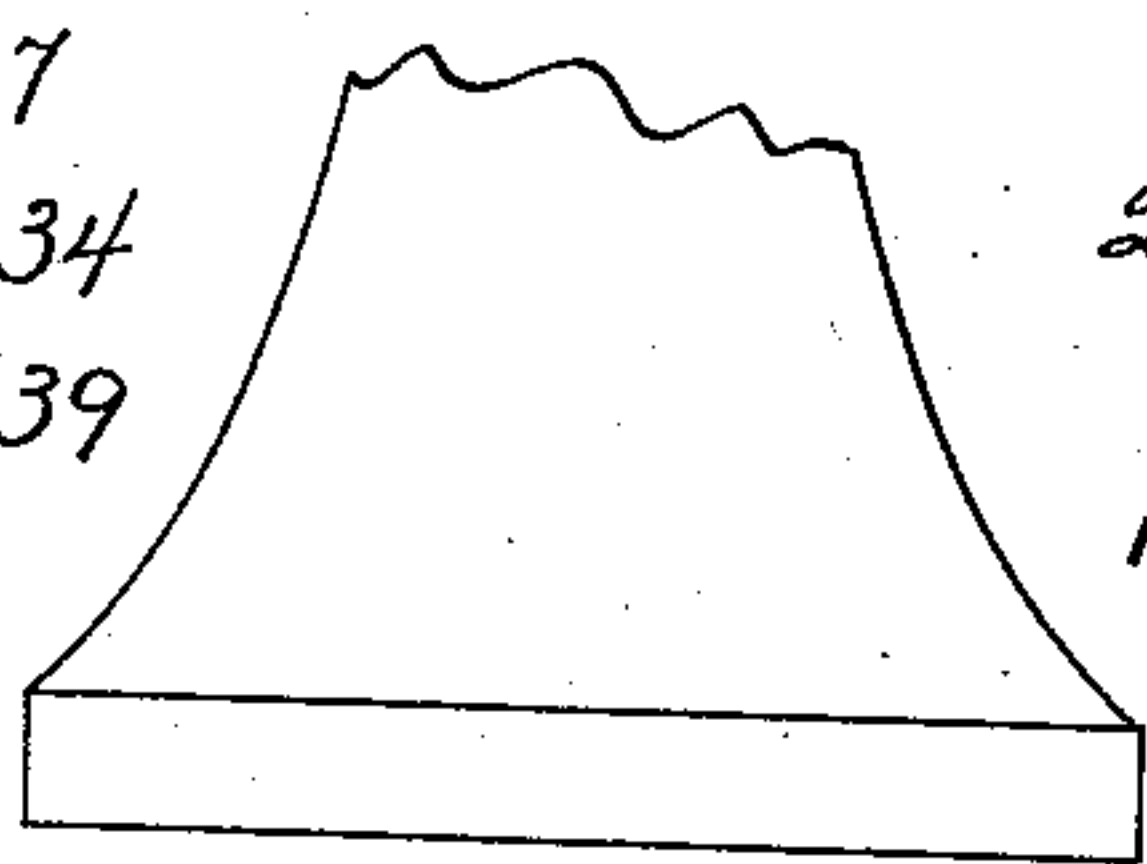


Fig. V.

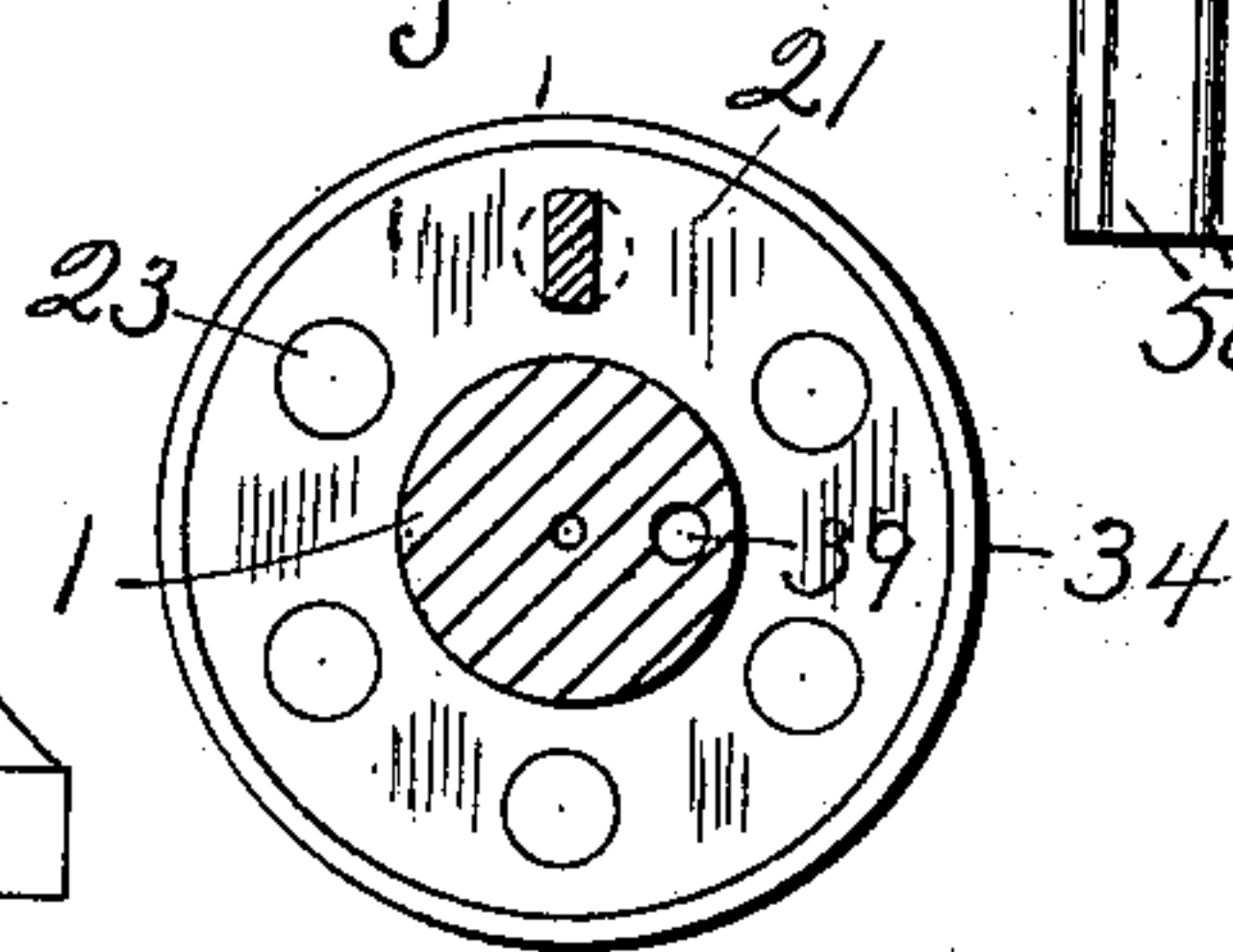


Fig. IX.



Fig. VII.

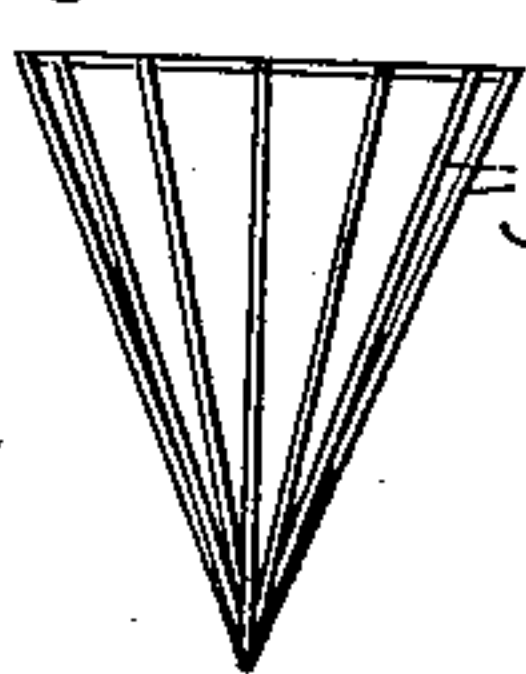


Fig. VI.

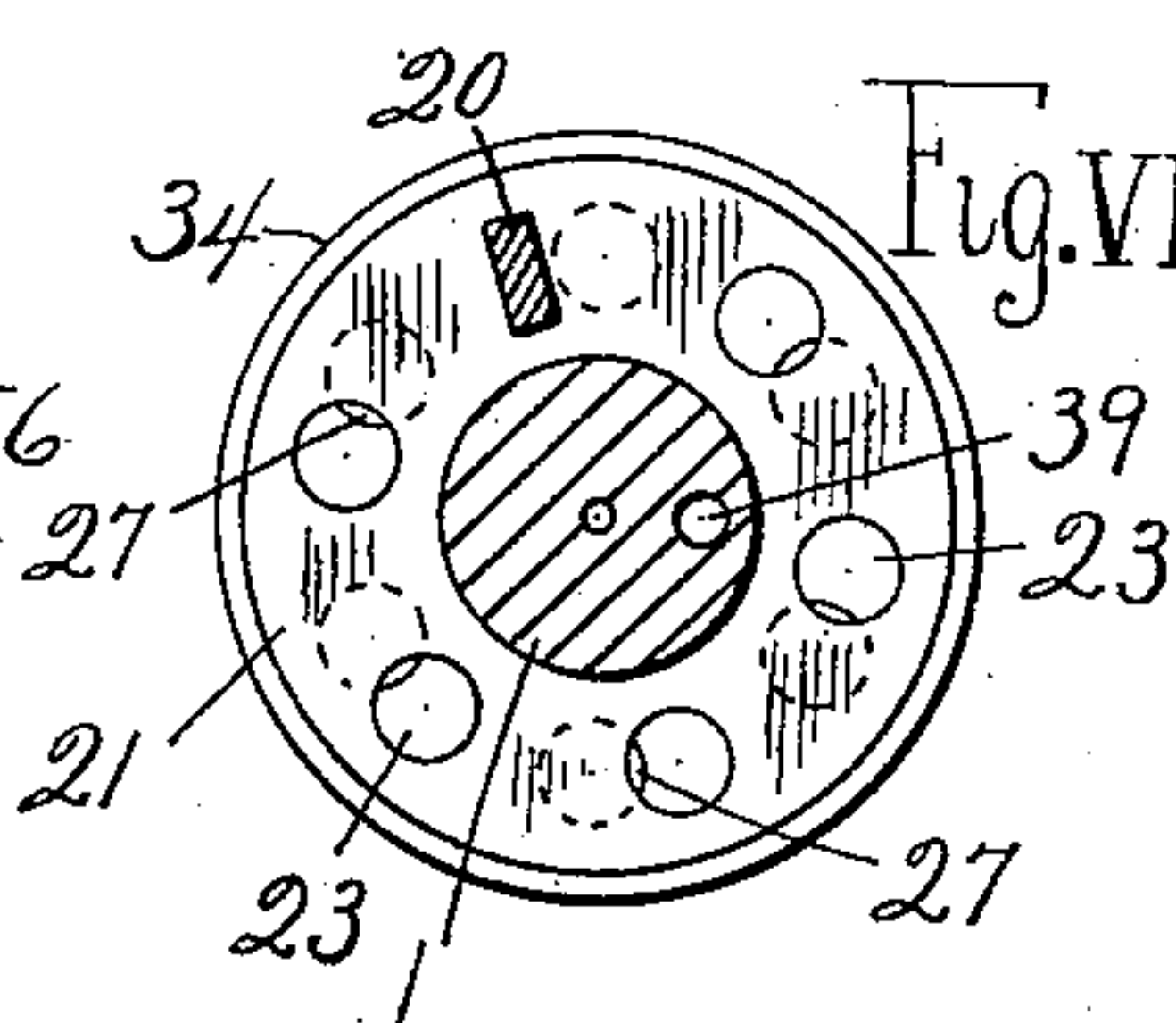
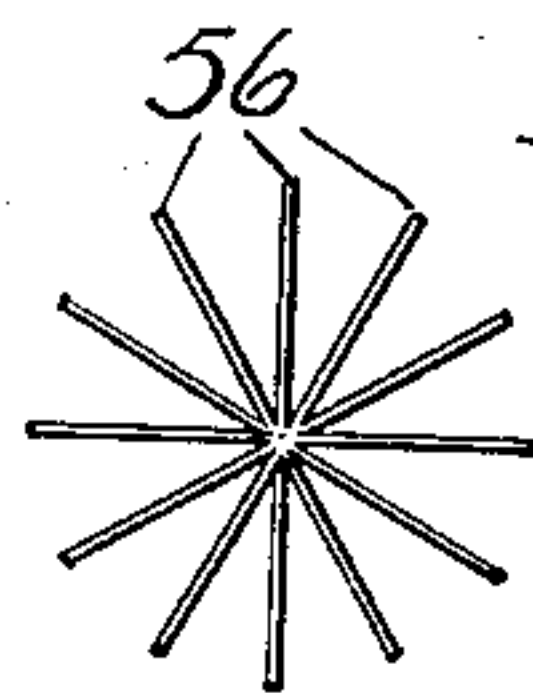


Fig. VIII.



WITNESSES:

C. B. Schoenck
T. B. Friend

INVENTOR

Warren Collins

BY

Alfred Wilkinson
ATTORNEY.

UNITED STATES PATENT OFFICE.

WARREN COLLINS, OF COLLEGEPOINT, NEW YORK, ASSIGNOR TO STAMFORD GAS STOVE COMPANY, OF STAMFORD, CONNECTICUT, A CORPORATION OF NEW YORK.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 742,594, dated October 27, 1903.

Application filed November 23, 1901. Serial No. 83,374. (No model.)

To all whom it may concern:

Be it known that I, WARREN COLLINS, of Collegepoint, Long Island, in the county of Queens, in the State of New York, have invented new and useful Improvements in Gas-Burners, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to a gas-burner of improved construction and operation; and it consists of a base with a small inlet for the gas, a mixing-chamber arranged above the base and formed with a large inlet for the air, and an upper mixing-chamber connected therewith, where the gas and air are further mixed and forced outwardly by passing through a nest of radiating partitions, whereby an intimate mixture of the gas and air is obtained and practically perfect combustion when the mixture is ignited above the gauze top with a hot flame for generating heat and for rendering incandescent the mantle arranged above the flame. In the base are arranged means for regulating the flow of gas and air to be mixed and simultaneously controlling the amount admitted, also means for regulating a supply of gas for a pilot-light when the main supply is cut off. A desirable means for supporting the mantle is shown.

My invention will be understood by reference to the accompanying drawings, in which the reference-numerals of the specification indicate the same parts in all the figures.

Figure I is an elevation of my burner. Fig. II is a vertical section. Fig. III is a section of the base at right angles to Fig. II. Figs. IV, V, and VI are bottom plans and sections illustrating the regulation of the air-supply. Fig. IV is a section through the base and shell, taken above the annular controlling-plate. Figs. V and VI are bottom plans of the shell with base shown in section and controlling-plate in two positions. Figs. VII and IX are elevations of nests of radiating partitions to be arranged in upper mixing-chamber. Fig. VIII is a top plan of Figs. VII and IX. Fig. X is a diagram showing in elevation a desirable means for sustaining the mantle.

In the figures, 1 indicates the base, threaded at 2 to fit the gas-pipe and formed with the gas-inlet 3, diminishing at 4 and provided

with the screw 5 for regulating the supply of gas. This is controlled during burning by a tapering plug or valve 8, provided with a hole or groove 9 registering with the inlet 4, as shown in Fig. II, to permit the gas to pass or turned to cut off the gas, as shown in Fig. III, from the main inlet, permitting it to pass through the pilot-light channel. The plug is held in position by plate 10 and screw 11 and may be provided at its outer end 12 with lever 13 and chains 14 14 for controlling or turning off the gas from the flame. It is also formed at its outer end with notch 15, engaging stud 20 on annular controlling-plate 21, supported on shoulder 22 integral with the base and perforated at 23 for the admission of air in the mixing-chamber. The base is threaded at 25 for the attachment of second annular or base plate 26, correspondingly perforated at 27, on which rests a third annular or shell plate 30, correspondingly perforated at 31 and connected to the shell 32 of the mixing-chamber 33, having downwardly depending margin 34. By turning shell and shell plate 30 on base-plate 26, secured to the base, air-inlet holes 31 and 27 may be arranged to register, admitting a full supply of air, or may be partially closed, admitting only a limited amount, to reduce the amount of gas consumed and expense, the supply during operation being controlled by controlling-plate 21 simultaneously with control of gas by the plug, both controlling-plate and plug being operated together from the lever. This shell and mixing-chamber are of sufficient size for the admission of a sufficient amount of air and a thorough mixture thereof with the gas and are shown of a convenient conical form, in which is arranged the checker 36 for slightly checking and confining the air and gas as they enter and to promote their mixture. The flow must be checked only slightly, otherwise the heat and incandescence would be reduced. In projection 37 in the base, regulated by the screw 38, is the pilot-light channel 39, connected with gas-inlet 3 or 4 below the valve to permit the passage of a limited amount of gas when the main supply is cut off to maintain a so-called "pilot-light" for the relighting of the main supply. This pilot-light may be used or not, as desired. From the mixing-

chamber 33 the mingled air and gas passes through tube 43 to the upper mixing-chamber 44 within cylindrical shell 45, having tube 46 fitted to tube 43 and carrying a gallery 47 for globe or chimney, on which may be supported an incandescent mantle 48 of usual construction. On the top of the shell 45 is arranged a gauze cap to prevent back lighting. In this upper mixing-chamber 44 is preferably inserted a nest 55 or group of radiating partitions 56, called the "mixer," and forming between them channels enlarging outwardly, by which intimate mixture of the air and gas is insured, and without checking the draft the mixture is forced outwardly in the channels toward the mantle, where the heat is desired, to generate a high degree of heat adjacent to the mantle and heat it quickly to incandescence. This mixer also absorbs the heat and raises the temperature of the mixture almost to the ignition-point before it escapes through the gauze.

My peculiar construction of base, with independent regulation and simultaneous control of gas-inflow and air, my enlarged conical mixing-chamber, and my radiating mixer arranged in the upper mixing-chamber may be used independently in various sorts of burners, but are preferably combined to obtain excellent combustion with great efficiency and great economy in the use of the gas, to generate a large amount of heat for heating purposes, or, as here shown, to render incandescent the light-giving mantle.

By my construction of a cone-shaped mixing-chamber with large inlet a considerable amount of air is admitted and immediately mixed with the gas at its inlet, where the gas-pressure is the strongest, which produces a good mixture, substantially complete combustion, and great efficiency.

My construction of base is convenient, by which the air and gas are simultaneously controlled and shut off when desired, while still permitting the flow of a minute amount of gas for the pilot-light within the mantle, thus producing a convenient yellow pilot-light instead of the ordinary small blue flame when the air and gas are shut off almost entirely. My burner is easily assembled and taken apart to be cleaned.

In Fig. X is shown an elastic and yielding support for the mantle to overcome and counteract the injurious shock and vibration to which it is subjected in many situations. On the base or other support are carried boxes 50, in which are arranged springs 51, acting as a yielding support for guide-plates 52, fitting the boxes and carrying the wire arch 53, from which depends the mantle. The springs absorb all ordinary shocks and vibrations, protecting the mantle and prolonging its life.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination with a base formed with a small gas-inlet, means

for regulating and controlling the inflow of the gas, of a shell forming a mixing-chamber arranged above the gas-inlet and having large air-inlets, means for controlling and means for regulating the inflow of air, and a checker having legs extending outwardly beyond said air-inlets adjacent to the sides of the shell, and an integral head supported on said legs directly above the gas-inlet, whereby the gas and air are slightly checked and thoroughly mixed.

2. In a gas-burner, the combination with a base formed with a small gas-inlet, of means for regulating the size of the inlet to regulate the inflow of gas, independent means for controlling the inflow of gas, an enlarged shell forming a mixing-chamber arranged above the base to receive the inflowing gas, said shell having large air-inlets, means to regulate the size of the air-inlets to regulate the inflow of air, and independent means for controlling the inflow of air.

3. In a gas-burner, the combination with a base formed with a small gas-inlet, of means to regulate the size of the inlet to regulate the amount of gas passing through the inlet, an enlarged shell forming a mixing-chamber supported on the base above the gas-inlet to receive the inflowing gas, said shell having large air-inlets, means for regulating the size of the air-inlets to regulate the amount of inflowing air, and independent means for instantaneously and simultaneously diminishing or cutting off the amount of air and gas entering the mixing-chamber during the operation of the burner.

4. In a gas-burner, the combination with a base formed with a small gas-inlet, of means for regulating and means for controlling the inflow of gas through the inlet, a conical shell supported on the base and having a margin extending outwardly around said base and formed with an annular series of large air-inlets, a tube extending upwardly from the apex of said conical shell, and an upper shell supported on said tube forming an upper mixing-chamber.

5. In a gas-burner, the combination with a suitable support, of a shell forming a mixing-chamber supported thereon, a nest of partitions radiating from a central longitudinal axis arranged in the shell, means to admit air and gas to the bottom of the shell, and a mantle, to be rendered incandescent by the burning of the air and gas, arranged immediately above the shell.

6. In a gas-burner, the combination with a base having a gas-inlet, of a shell arranged above the base forming a mixing-chamber, said shell being formed with air-inlets, a tube extending upwardly from said-shell, an upper shell supported on said tube forming an upper mixing-chamber, means to regulate and control the supply of air and gas to the lower mixing-chamber, and a nest of partitions radiating from a central longitudinal axis arranged in the upper mixing-chamber.

7. In a gas-burner, the combination with a suitable supporting-base having inlets for the air and the gas, of a tube conducting air and gas to a shell forming an upper mixing-chamber, a perforated cap arranged to form the top of said upper mixing-chamber, and a nest of partitions radiating from a central longitudinal axis arranged in said upper chamber.

8. In a gas-burner, the combination with a base having a longitudinal, contracted gas-inlet and a shoulder near its upper end, of a plug fitted to said base for controlling said inlet, an annular air-controlling plate formed with air-inlets supported on said shoulder and connected to said plug to be rotated thereby, a corresponding annular base-plate formed with corresponding air-inlet openings connected to the base and arranged above said air-controlling plate, a corresponding annular shell-plate formed with corresponding air-inlet openings arranged above said base-plate, and a shell forming a mixing-chamber connected to said shell-plate.

9. In a gas-burner, the combination with a base having a longitudinal, contracted gas-inlet and a shoulder near its upper end, of a plug fitted to the base for controlling the gas-inlet, an annular controlling-plate formed with air-inlets supported on the shoulder and connected to the plug to be rotated thereby, a corresponding annular base-plate formed with corresponding air-inlet openings connected to the base and arranged above the air-controlling plate, a corresponding annular shell-plate having a downwardly-depending margin and extending upwardly above the base, and a checker arranged within said mixing-chamber for the air and gas inlets.

10. As a new article of manufacture for use in a gas-burner, a mixer composed of a series of partitions radiating from a central longitudinal axis, forming between them channels open from end to end and enlarging gradually from the center outwardly, whereby the vapor is forced outwardly without checking the draft.

11. In a burner, the combination with a suitable support, of a shell on the support forming a mixing-chamber, means to admit gas to the shell, means to admit air to the shell, a mantle to be heated to incandescence arranged immediately above the shell and a mixer arranged in the shell composed of a series of partitions radiating from a central longitudinal axis, forming between them open channels, whereby the mixed air and gas is forced outwardly toward the mantle without checking the draft.

12. In an incandescent gas-burner, a shell, a main tube thereon for conducting the mixed air and gas to the burner, the burner on the

end of the main tube, a mantle arranged immediately above the burner and surrounding its upper end, means to admit gas to the shell, means to admit air thereto, means to shut off the air, and means to shut off the main supply of gas, permitting a small amount to pass directly into the shell and tube to the burner.

13. In an incandescent burner, a base, means for admitting gas therethrough to the burner, a perforated, annular base-plate secured on the base, a shell arranged above the base and having a tube extending upwardly to the burner, a corresponding, perforated, annular, shell-plate secured to the shell and resting on the base-plate, whereby the shell is rotatably supported on the base to regulate the size of the air-admission openings.

14. In an incandescent burner, a base having a gas-inlet, a horizontally-arranged, perforated, annular base-plate secured on the base and extending outwardly from its upper end, a shell forming a mixing-chamber and extending upwardly from the base to the burner, and a corresponding, perforated, annular shell-plate secured to the shell and resting on the base-plate.

15. In an incandescent burner, a base formed with a gas-inlet, a plug arranged in the base to control the gas-inlet, a perforated, annular base-plate secured on the base, a shell arranged above the base and extending upwardly to the burner, a corresponding perforated, annular shell-plate secured to the shell and resting on the base-plate, a corresponding perforated, annular controlling-plate arranged in contact with one of said annular plates, and means to turn said controlling-plate to control the inflow of air while the burner is in operation.

16. In an incandescent burner, a base formed with a gas-inlet, a plug arranged in the base to control the gas-inlet, a perforated, annular base-plate secured on the base, a shell arranged above the base and extending upwardly to the burner, a corresponding, perforated, annular shell-plate secured to the shell and resting on the base-plate, a corresponding perforated, annular controlling-plate arranged in contact with one of said annular plates and a connection between said controlling-plate and the plug, whereby said controlling-plate is rotated as the plug is turned simultaneously to control the inflow of air and gas.

In testimony whereof I have hereunto signed my name.

WARREN COLLINS. [L. S.]

Witnesses:

THOMAS CONYNGTON,
LOUIS B. HASBROUCK.