

No. 621,430.

Patented Mar. 21, 1899.

E. J. SCHAUER.
VAPOR BURNER.

(Application filed Jan. 29, 1898.)

(No Model.)

Fig. 1.

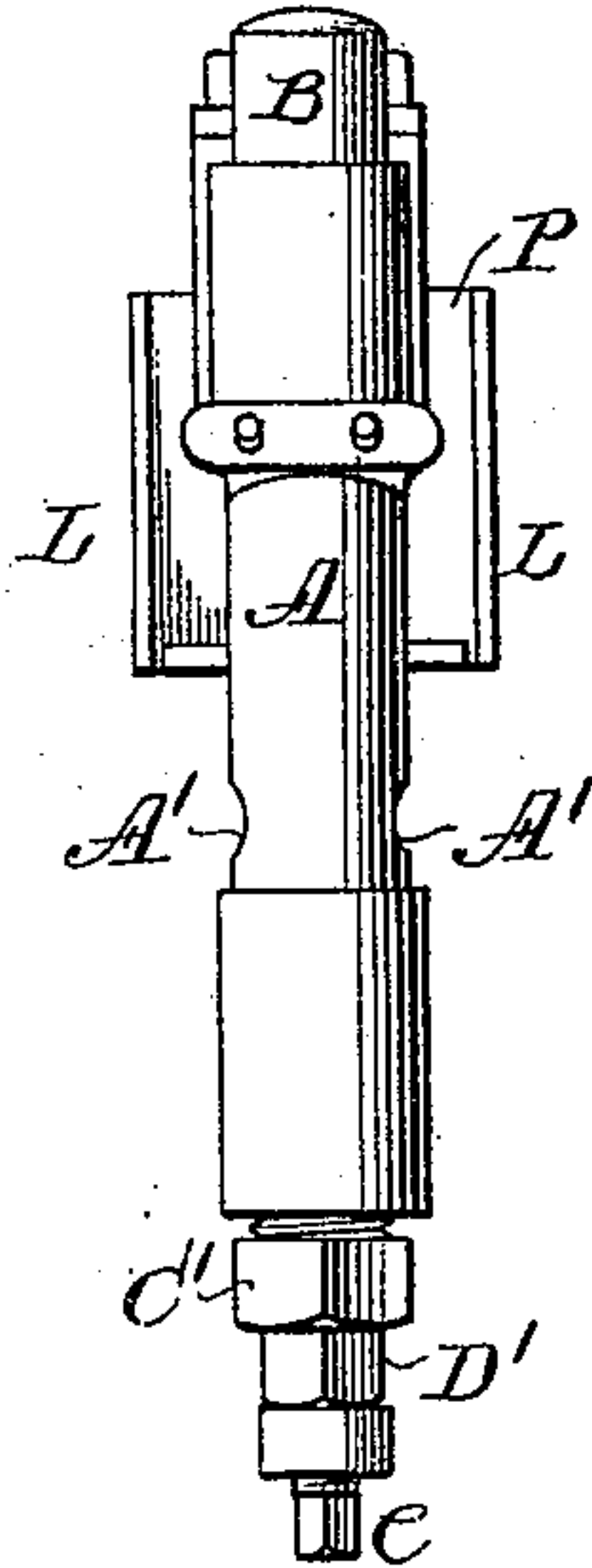


Fig. 2.

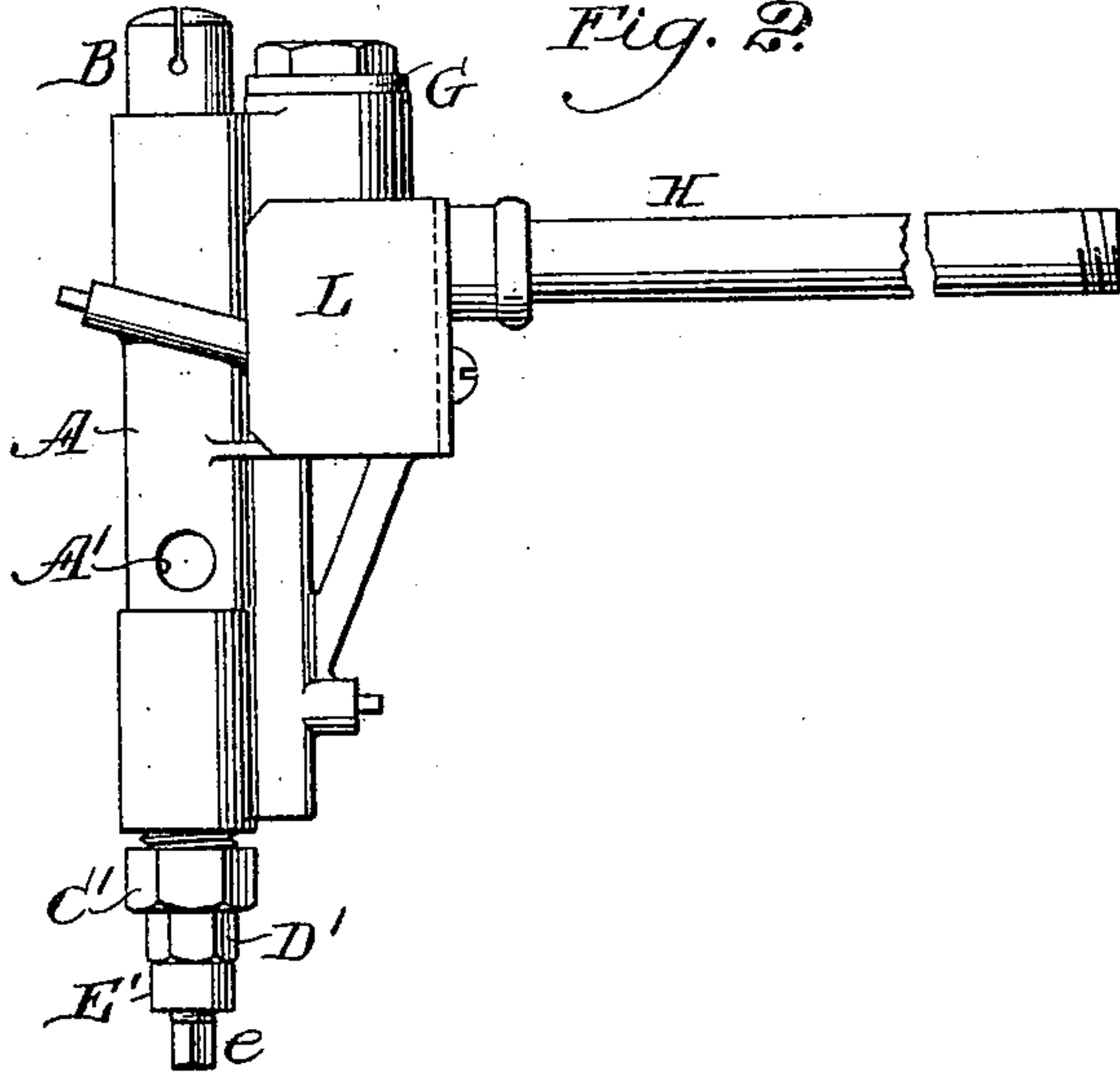


Fig. 4.

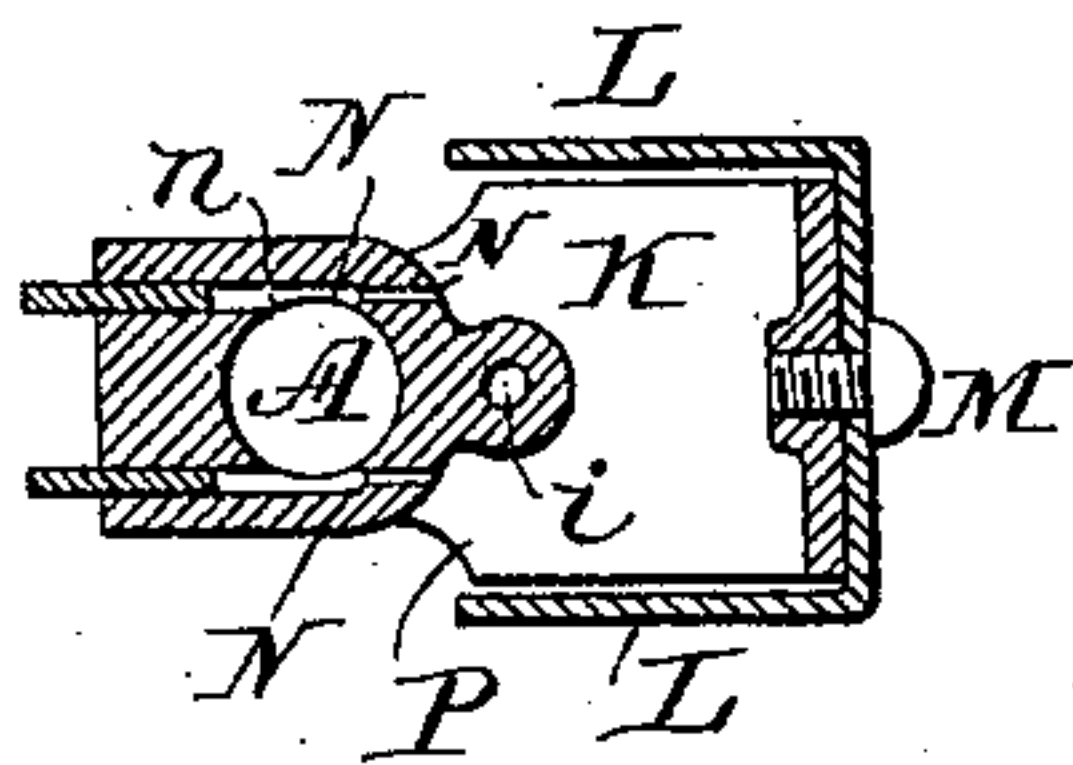
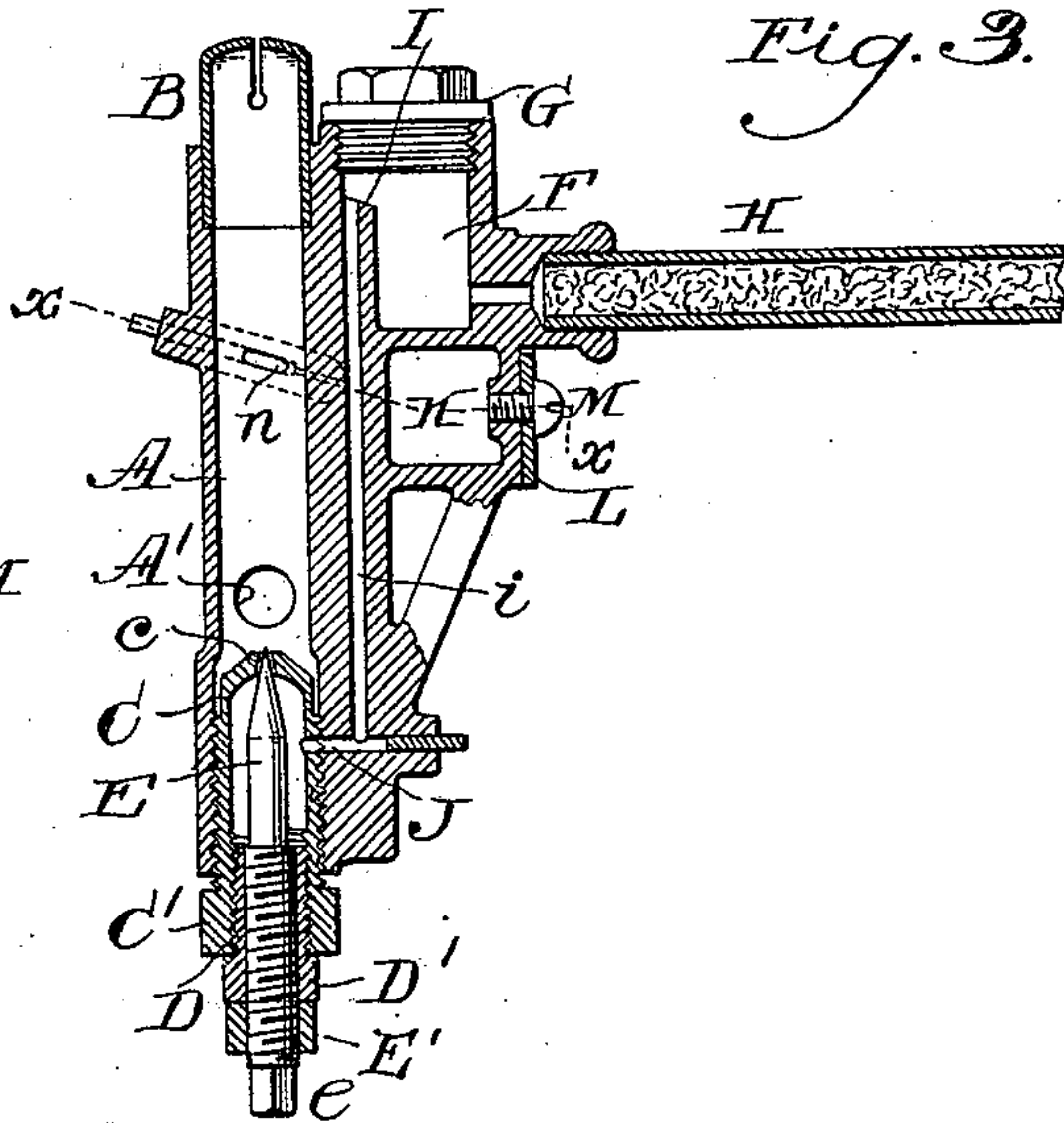


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD J. SCHAUER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE PENNSYLVANIA GLOBE GAS LIGHT COMPANY, OF PENNSYLVANIA.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 621,430, dated March 21, 1899.

Application filed January 29, 1898. Serial No. 668,427. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. SCHAUER, of Chicago, Cook county, State of Illinois, have invented an Improvement in Vapor-Burners, of which the following is a specification.

My invention has reference to vapor-burners; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a simple and inexpensive construction of vapor-burner which shall secure the most advantageous results in operation.

In carrying out my invention I provide the mixing-chamber at the top with a vapor-burner tip and at the bottom with a screw-plug containing a needle-valve and a reservoir, the former to control the vapor passing into the mixing-tube and the latter to receive and hold particles of material or oil which might find their way into the plug and avoid their being driven into or through the needle-valve orifice, which might clog the same. The upper part of the mixing-tube is provided with a naphtha-reservoir adapted to be heated by a jet or jets leading from the mixing-tube, and the outlet from the said reservoir extends from the upper portion thereof and down to the hollow plug closing the needle-valve.

My improvements will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a vapor-burner embodying my improvements. Fig. 2 is a side elevation of same. Fig. 3 is a sectional side elevation of same, and Fig. 4 is a cross-section of same on line $x x$.

A is the mixing-tube and is provided at the top with a burner-tip B, preferably removable. The lower part of the mixing-tube is provided with a hollow plug C, having its top or crown perforated, as at c , to receive the point of a needle-valve E. The plug C is screw-threaded and screws into the bottom of the mixing-tube and may be turned by means of a hexagonal or other head C'. Screwed into the bottom of the hollow plug C is a bushing D, which carries the needle-valve E, which latter is pointed at the top to fit into

the aperture c in the plug and screw-threaded at its lower portion to tightly fit the bushing D. The lower part of the bushing is formed with a head for the purpose of screwing the bushing into or out of the plug. The screw-threaded part of the needle-valve at the lower portion is provided with a nut E', which limits the adjustment of the needle-valve and acts as a lock-nut to prevent its accidental displacement after having been once adjusted to its seat c . The lower end of the needle-valve is made square, as at e , for the purpose of turning it when necessary. The body of the mixing-chamber at a point slightly above the orifice of the needle-valve is formed with air-apertures A' to permit the ready entrance of air to be mixed with the vapor before the same is burned.

F is a reservoir arranged outside of the body and near its upper portion and is closed at the top by a cap G. The inlet to the reservoir F is preferably above its lower portion and communicates with the horizontal pipe H, filled with cotton or asbestos or other fibrous material to limit the free access of the naphtha to the reservoir F in use.

I is the outlet from the reservoir and opens therefrom near its upper portion, so that the said reservoir might contain a considerable quantity of naphtha without allowing the same to run down into the needle-valve, and will therefore compensate for any slight irregularity in the flow of the naphtha to the burner or the vaporization thereof. The outlet I connects with a downwardly-extending tubular orifice i , in turn communicating with a horizontal orifice J, leading into the plug C at a short distance from its upper end. The bushing D of the plug only extends into the bottom thereof a short distance, so as to leave a considerable clearance-space between the top of the bushing and the inlet-orifice J to receive any liquid naphtha or impurities which might pass out of the reservoir into the plug. The bottom of the reservoir F is made flat, so as to present a large surface for heating, and the lower portion is surrounded by a wall L of a compartment K, consisting of a bent U-shaped piece of sheet metal, secured to the main casting by a screw M. The floor of the compartment K is formed of a part of the

casting making up the burner as a whole. The forward and upper portion of the compartment is open, as at P, so as to allow the escape of the products of combustion, which
 5 are projected into the said compartment through the nozzles N N, arranged to project flames into said compartment and opening from the mixing-tube A at point *n*. I prefer to employ two of the nozzles N and arrange
 10 them slightly obliquely downward, so as to cause the flame to strike the rear wall and floor of the compartment K, so as to be spread or diffused for the purpose of more fully enveloping the reservoir F. By the construction
 15 herein shown the reservoir F provides a source of naphtha which insures the proper supply of vapor to the nozzle at the bottom of the mixing-tube and at the same time prevents flooding thereof. Furthermore, the arrangement of the outlet I from the upper portion of the reservoir F avoids any tendency of the same becoming clogged and insures under ordinary operation nothing but vapor passing into the tube *i*, and thereby avoiding
 20 spluttering at the nozzle. By employing the plug C of the construction shown I am enabled to readily clean the valve and valve-seat and to remove any deleterious particles which may from time to time collect and at the same time am enabled to vary and adjust the vapor-nozzle at the bottom of the mixing-tube so as to secure the best possible results.

It is evident that the vapor-jets N might be dispensed with if the main flame from the
 35 burner-tip B is sufficiently hot; but I prefer to employ a chamber K and one or more jets N. Furthermore, it will be observed that these jets are formed by holes tangential to the vertical hole in the burner-tube, thus
 40 simplifying the formation of the vapor-passages and at the same time making them accurate as to size.

While I prefer the construction shown, I do not limit myself to the minor details thereof,
 45 as they may be modified without departing from the spirit of the invention.

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

50 1. In a vapor-burner, the combination of a mixing-tube having a burner-tip at its upper end, with a detachable cylindrical hollow plug forming a reservoir and secured in the lower part of the mixing-tube said plug being provided at its upper portion with a vapor-aperture, a needle-valve carried by and extending below the hollow plug and adapted to the vapor-aperture in the upper portion thereof the diameter of said needle-valve being
 60 greatly less in size than the interior of the hollow plug so as to leave an interior chamber or reservoir surrounding the needle-valve at all times, and means for supplying a hydrocarbon vapor into the interior of the hollow
 65 plug.

2. In a vapor-burner, the combination of a mixing-tube having a burner-tip at its upper

end, with a detachable hollow plug secured in its lower end by a joint permitting rotation and provided at its upper portion with a vapor-aperture occupying only a small portion of
 70 its internal area, a needle-valve greatly less in diameter than the hollow space in the plug adjustable from below the hollow plug and adapted to the orifice in the upper portion
 75 thereof, a removable bushing at the bottom of the hollow plug to hold the needle-valve therein, means to supply a hydrocarbon vapor to the interior of the hollow plug consisting of a reservoir attached to the upper part
 80 of the mixing-tube and communicating with an oil-supply pipe, an outlet tubular passage integral with the mixing-tube and reservoir and connecting with the interior of the hollow plug, and one or more vapor-nozzles opening from the mixing-tube for supplying heat
 85 to the reservoir, the construction being such that the hollow plug is removable without disconnecting the tubular passage and mixing-tube and its supply-orifice is never closed
 90 by the needle-valve.

3. In a vapor-burner, the combination of a mixing-tube having a burner-tip at its upper end with a detachable hollow plug secured in its lower end and provided at its upper portion with a vapor-aperture, a needle-valve adjustable from the bottom of the hollow plug and adapted to the orifice in the upper portion thereof and of greatly less diameter than
 95 the space in the plug, means to supply a hydrocarbon vapor to the interior of the hollow plug, and a detachable bushing carrying the adjustable needle-valve for securing it in place within and closing the bottom of the hollow plug.
 100

4. In a vapor-burner, the combination of a mixing-tube having a burner-tip at its upper end, with a detachable hollow plug secured in its lower end and provided at its upper portion with a vapor-aperture and having a
 105 large internal space, a screw-threaded needle-valve adjustable from the bottom of the hollow plug and adapted to the orifice in the upper portion thereof and so as to occupy only a moderate portion of the internal space,
 110 means to supply a hydrocarbon vapor to the interior of the hollow plug, a detachable bushing carrying the adjustable needle-valve for securing it in place within and closing the bottom of the hollow plug, and a lock-nut
 115 upon the screw-threaded portion of the needle-valve to lock it in adjusted position within the hollow plug.
 120

5. In a vapor-burner, a mixing-tube provided at the top with a burner-tip, in combination with a hollow chambered plug screwed in the bottom of the mixing-tube and having an aperture in its upper portion and removable from the mixing-tube, an adjustable needle-valve of greatly less diameter than the interior of the plug extending through the bottom of the hollow plug and received in the aperture at the top thereof and leaving a large or roomy annular space or reservoir at all
 125
 130

times within the plug, a naphtha-reservoir arranged above the hollow plug and secured to the upper portion and to one side of the mixing-tube and communicating with a source of oil,
5 and a directly-heated communicating passage formed on the side of the mixing-tube between the upper part of the oil-reservoir and the upper part of the reservoir in the hollow plug at a lower level but independent of said
10 hollow plug and at a distance from the nee-

dle-valve, whereby said plug may be removed without disconnecting the remaining parts of the burner.

In testimony of which invention I hereunto set my hand.

EDWARD J. SCHAUER.

Witnesses:

C. B. ROCKHILL,
W. S. GREAR.