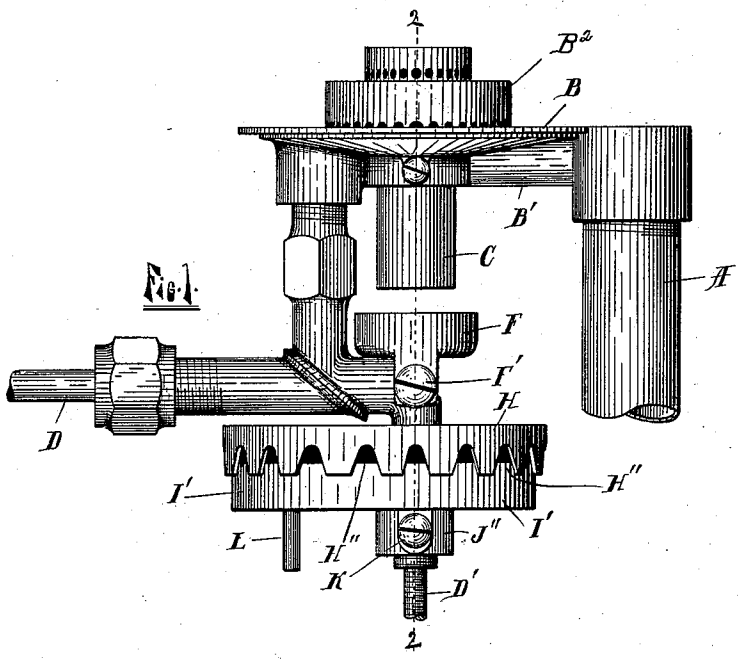
(No Model.)

G. W. BILLINGS.

VAPOR BURNER ATTACHMENT.

No. 568,228. Patented Sept. 22, 1896.

Fig. 1.



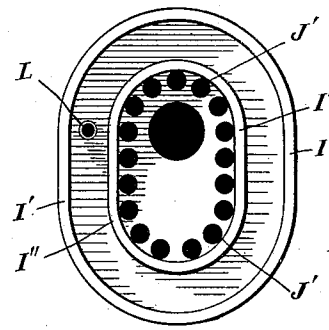


Fig. 3.

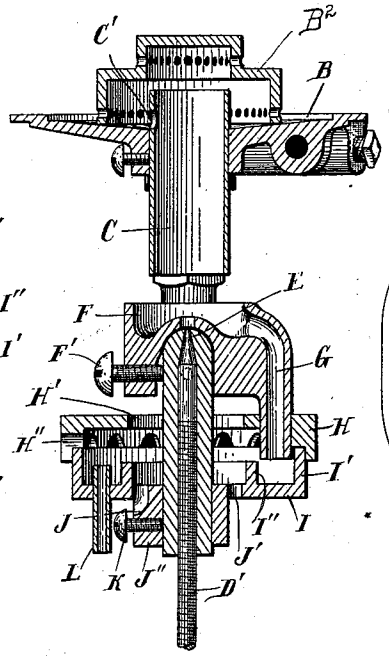


Fig. 2.

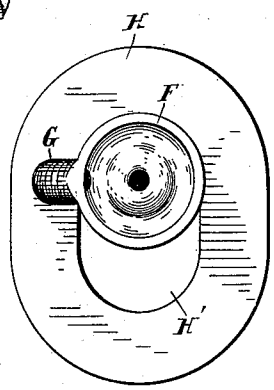


Fig. 4.

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UNITED STATES PATENT OFFICE.

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VAPOR-BURNER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 568,228, dated September 22, 1896.

Application filed April 6, 1896. Serial No. 586,439. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BILLINGS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Vapor-Burner Attachments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an attachment for vapor-burners, and its object is to provide means whereby the preliminary heating may be done with a portion of the same liquid that is used to afterward supply the burner without producing smoke or condensing carbon upon the burner, to prevent fire from following the overflow of liquid from the cup, and to provide the same with certain new and useful features, hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of an ordinary gasolene-stove burner having my improved device attached; Fig. 2, a vertical section of the same on the line 2 2 of Fig. 1; Fig. 3, a plan view of the lower cup, and Fig. 4 a plan view of the cap and conduit.

Like letters refer to like parts in all of the figures.

A represents the stand-pipe, B the burner-plate, having the vaporizing-passages B′, C the mixing-tube, having the lateral opening C′, D the needle-valve, D′ the cleaning-valve, and E the jet-orifice, of an ordinary gasolene-stove burner.

B^2 designates the burner-cap. It will be seen that oil jetted through the aperture E will strike said cap and flow through the apertures C′ in the mixing-tube.

My invention consists generically of a cup surrounding the jet-orifice to collect the liquid, and a lower cup having communication with the former cup and serving to receive and hold the liquid, a cap for the latter cup, and air-passages arranged to secure complete combustion; and the invention also consists in certain details of construction, substantially as hereinafter described, and particularly pointed out in the subjoined claims.

In the drawings, F represents the annular cup surrounding the jet-orifice and secured to the valve-casing by a screw F′. The conduit G extends downward from said cup and its open lower end passes through the cap H and terminates above an annular cup I, said cup having its outer wall I′ engaging and supporting said cap H and having a narrow space between its inner wall I″ and the said cap for the escape of vapor and air. Said cap has a central opening H′ for the upward escape of the flame and lateral openings for the ingress of air. The annular cup I is provided with a bottom plate J, closing the space surrounded by said cup and provided with openings J′ for the ingress of air and a boss J″ and set-screw K to attach it to the casing of the cleaning-valve D′. A vertically-adjustable tube L extends through the bottom of the cup I, through which tube the liquid in said cup overflows when in excess. It will be observed that the annular cup F also surrounds and protects the needle-valve point when it projects from the jet-orifice.

The device is constructed so that it may readily be attached to the usual form of burner by removing the usual cup therefrom and attaching my device by the set-screws F′ K.

The operation of my device is as follows: A portion of the liquid in the stand-pipe A is allowed to escape by opening the valves D and D′ into the annular cup F in the usual manner and flows through the conduit G into the annular cup I without getting upon any of the other parts. Any excess flows through the tube L, from whence it may be conveyed away by a pipe or allowed to drop into a suitable receptacle. Upon lighting this liquid in the cup I, should it boil it will not overflow upon the outside of the cup and carry the fire with it to the liquid below, but will pass through the said tube, the lower end of which is beyond igniting distance from the flame. The inrush of air through the opening H and across the surface of the liquid and also vertically through the vertical openings J into the interior of the flame escaping at the opening H′ effectually mingles a sufficient amount of air with the vapor to effect complete com-

bustion of all the carbon, forming a hot blue flame at once before the device becomes heated. The space between the cap and inner wall I″ is made of such width as to permit the flow of the air and vapor, while at the same time preventing the flame from forming beneath the cap and over the liquid in the cup. This gives opportunity for the mixing of the air and vapor before combustion occurs. After the burner has become heated sufficiently to vaporize the liquid flowing through the passages B′ it operates as usual.

What I claim, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a heater for vapor-burners, consisting of an upper and a lower cup connected by a conduit, a cap on the lower cup, having lateral openings, and means for attaching said cups to a vapor-burner, substantially as described.

2. As an article of manufacture, the combination of an annular cup having a lateral and downwardly-extended conduit, a second annular cup, having an overflow-tube, and air-openings within its inner wall, and a cap, having a central opening, and lateral openings, and means for attaching said article to a vapor-burner, substantially as described.

3. As an article of manufacture, the combination of an annular cup, adapted to surround the jet-orifice of a vapor-burner and having a set-screw to attach the same to the casing of the valve and a downwardly-extending conduit, a second annular cup, to receive the liquid and having a bottom plate, having vertical openings and a boss and screw, and a cap having a central opening and lateral openings, substantially as described.

4. In combination with a vapor-burner, substantially as described, an annular cup surrounding the jet-orifice of said burner, a conduit extending downward from said cup, an annular cup surrounding the valve-casing of said burner, and a cap on said cup, having a central opening and lateral openings, substantially as described.

5. In combination with a vapor-burner, substantially as described, an annular cup surrounding the jet-orifice of said burner and having a set-screw engaging the valve-casing, and a laterally and downwardly projecting conduit an annular cup beneath said conduit and surrounding the valve-casing, a plate closing the interior of said cup, and having vertical openings and a boss and set-screw engaging the valve-casing of said burner and a cap engaging the outer wall of said cup and at a distance above the inner wall of the same and provided with a central opening and lateral openings, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. BILLINGS.

Witnesses:
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