

(No Model.)

W. H. SMITH.
Vapor Burner.

No. 230,584.

Patented July 27, 1880.

Fig. 1.

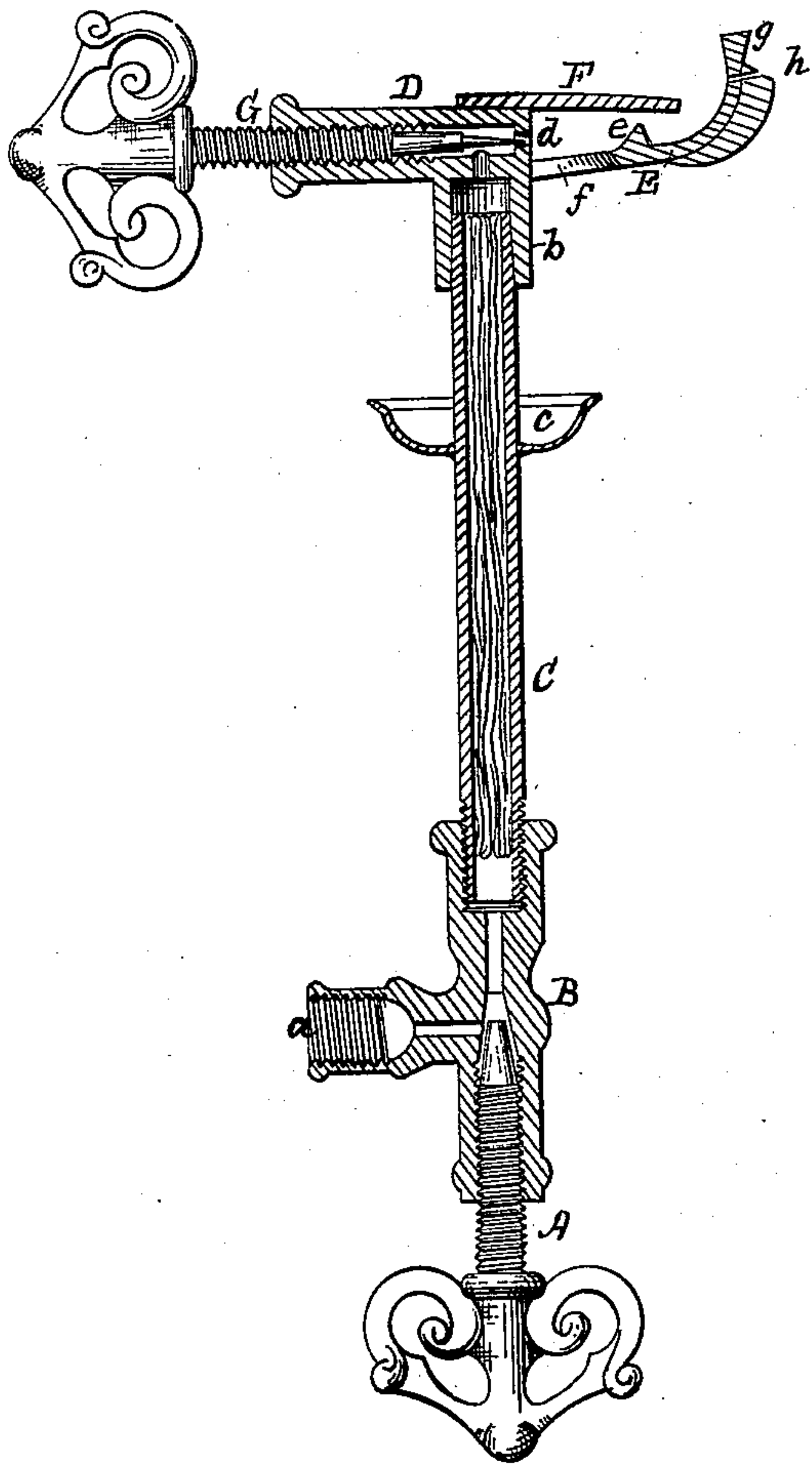


Fig. 2.

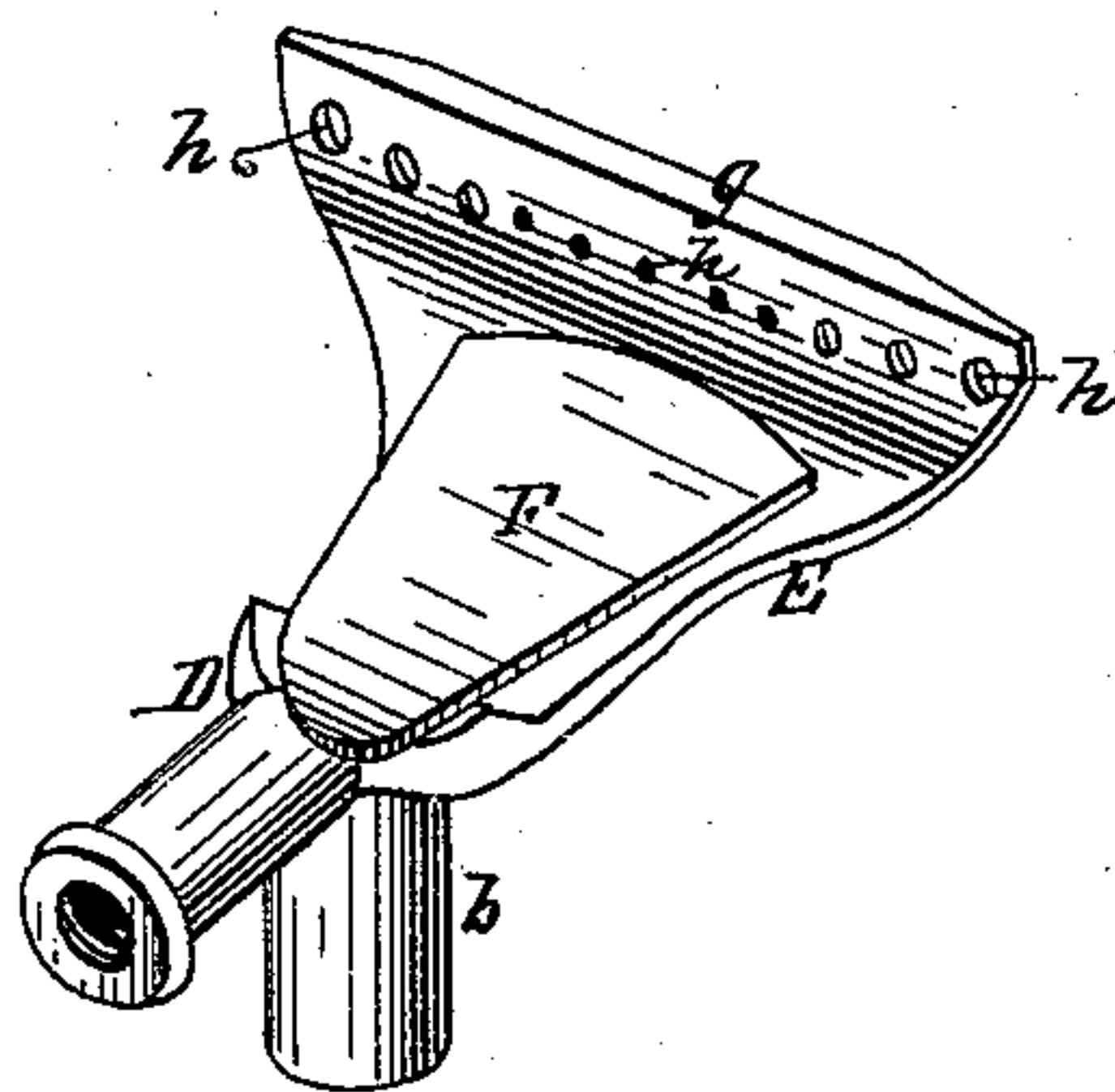
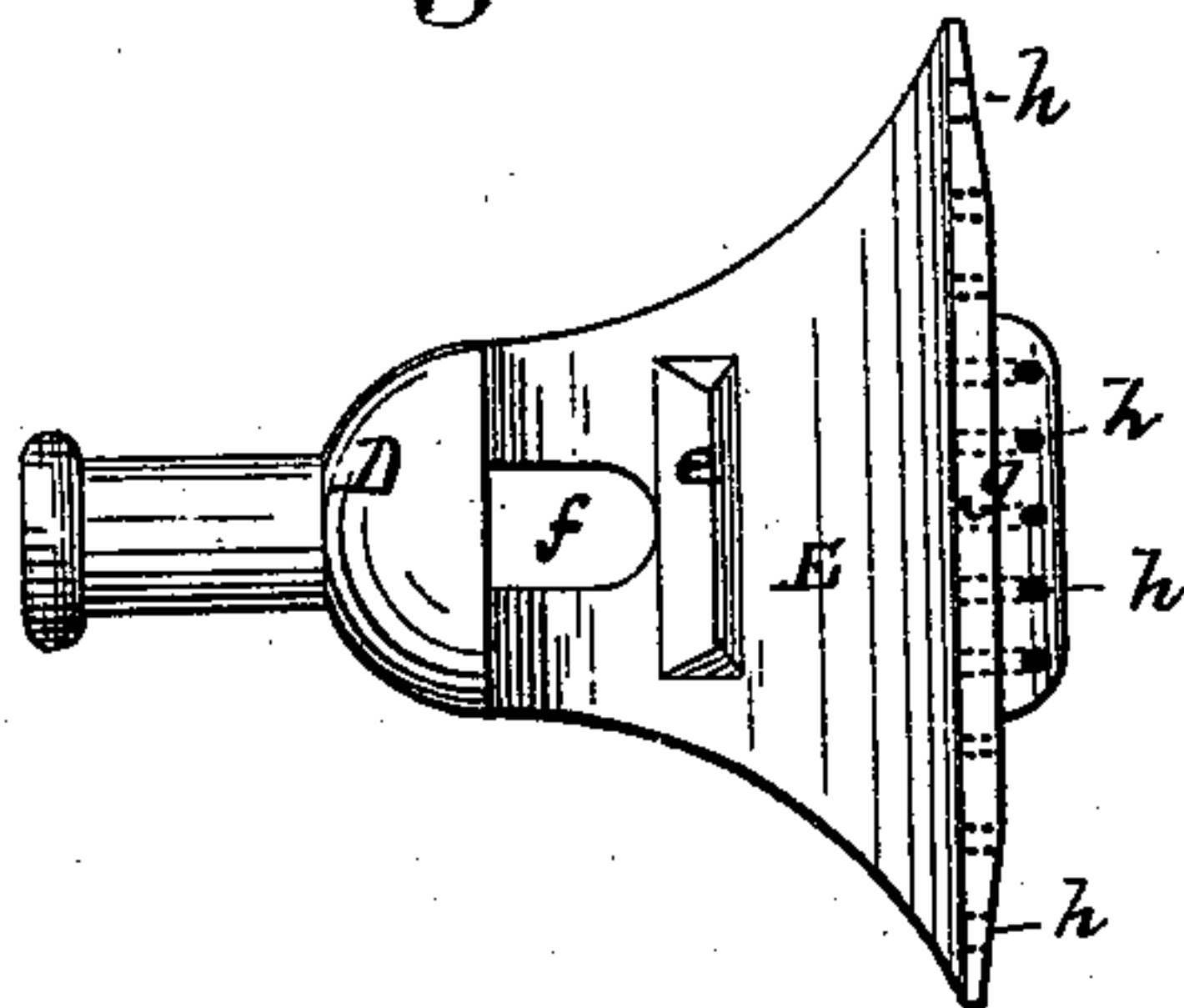


Fig. 3.



WITNESSES

E. A. Dick
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INVENTOR

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UNITED STATES PATENT OFFICE.

WILLARD H. SMITH, OF BROOKLYN, NEW YORK.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 230,584, dated July 27, 1880.

Application filed April 5, 1880. (No model.)

To all whom it may concern :

Be it known that I, WILLARD H. SMITH, of Brooklyn, in the county of Kings, State of New York, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a specification.

My invention relates to that kind of vapor-burners known as "plate" burners—that is to say, burners in which there is combined with the nipple or tip from which the flame is projected a "plate," so-called, which extends from a point below the nipple horizontally, or nearly so, for some distance, and is then curved upward, so as to deflect the flame upwardly, and is directed to means for procuring more complete combustion and a better illuminating-flame.

My invention can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of a plate-burner containing my improvements in their preferred form. Fig. 2 is a perspective view of the burner without its needle-valve, and detached from the pipes which support it and connect it with the oil-supply. Fig. 3 is a plan of the same with the top plate removed.

A is the usual valve or plug in the coupling B, for regulating the supply of oil which flows to the burner through a pipe screwed into the seat *a* and communicating with the fluid-reservoir. Screwed on the upper end of the coupling B is the packing-tube C, containing wicking or packing, and surmounted, in the usual way, by the burner D, which has a tubular socket or neck, *b*, fitting tightly upon and around the upper end of the tube C. At a point on the packing-tube below the burner is placed the usual cup *e*.

The burner has, in common with other plate-burners, the usual plate E, top plate, F, and needle-valve G, for regulating the flow through the nipple or jet-orifice *d*.

My improvements reside in the several details of construction of the plate E, which will now be more particularly pointed out.

Upon the upper face of the plate I form or attach a transverse bar or rib or projection, *e*, so placed with relation to the orifice or nipple *d* that the flame-jet will strike against the

said part *e*. The effect of this is to break up and spread the jet, thereby causing more air to be taken in by or intermingled with the flame than is the case in the ordinary plate-burner, and to this extent obtaining better combustion, and consequently a brighter and larger flame.

The rib or projection *e* is formed at a point between the nipple and the point at which the jet issuing therefrom would otherwise strike the plate. It not only spreads and breaks up the jet, but also deflects it upward, so as to leave an air-space behind the rib relatively to the direction of movement of the jet, and causing, when the burner is in use, air to enter and pass up between the plate and the flame, which produces more complete combustion, and consequently a more brilliant flame.

In the plate E, just in front of the jet orifice or nipple, between the latter and the bar or raised part *e*, I form an opening, *f*, through which air enters, the air for the flame being thus taken through the under side of the burner below the flame-jet. This I find is productive of decidedly good results, the air being supplied at a point where it acts with the best effect, especially when the opening is used in conjunction with the bar or raised part *e*.

The top plate, F, serves as a deflector for the under-draft, and also as a cover to prevent wind from blowing down through the air-hole *f*. The latter serves also as an opening through which the oil from the orifice *d* can flow down directly into the cup *e*.

To obtain greater heat I thicken the top edge of the outer upwardly-curved part of the plate E, as shown at *g*, so that the flame will have room to cover or hug the top edge of the plate against the draft passing up on the back side of the plate. This feature I find of advantage.

Through the upwardly-curved part of the plate I form a number of holes, *h*, extending through from front to rear of the plate. These holes may be used, whether the plate be thickened at its upper part or not, and may be formed in the thickened part, or a little lower down. Their preferred arrangement is shown in the drawings. By this means I greatly increase the heat, inasmuch as the flame will pass through these holes and burn on the other side, thereby surrounding the top of the metal plate

with flame. I have, in effect, two flames, one on each side of the plate, which draw together over the top of the plate and form a single flame, the current of air admitted behind the rib *e* passing above the top of the plate and continuing up between the two parts of the flame until the two merge in one. The result is that I obtain a larger and more brilliant flame than can be obtained in the ordinary plate-burner. The upper part of the flame of the latter is of reddish color, and continuously throws off carbon. In my improved burner the flame is bright throughout its extent, and carbon, if given off at all, is in such minute quantity and so seldom as to indicate very complete combustion.

It is manifest that the form and number of the holes *h* can be varied, all that is required being an orifice or orifices, whether in the form of a slit or a hole or holes of other shape, through which the flame may pass to the other side of the plate.

I am aware that it has been proposed to use a grooved or corrugated plate for plate-burners.

I am also aware that in a vapor-burner it has been proposed to form on each side of the flame-slot in the burner holes for small auxiliary heating-flames, and also to combine with the jet of a vapor-burner a plate curved at its top to form a pocket overhanging the jet, with perforations in its top for the passage of the flame. I claim none of these things.

Having described my invention, what I claim and desire to secure by Letters Patent, is as follows:

1. In plate-burners, the combination, with the nipple, of the plate formed or provided on its upper face, in advance of the said nipple, with a transverse rib or bar or raised part projecting above the surface of the plate into and

across the path of the flame-jet, substantially as hereinbefore set forth.

2. In plate-burners, the combination, with the nipple, of the plate formed or provided both with a transverse rib or bar or raised part projecting above the surface of the plate into and across the path of the flame-jet, and with an air-admission opening intermediate between said rib and the nipple, substantially as hereinbefore set forth.

3. In plate-burners, an upwardly-curved deflector-plate formed with a transverse rib, bar, or raised part projecting above the face of the plate into and across the path of the flame-jet issuing from the nipple, and also provided at its upper end with a flame-passage extending through the plate from front to rear, substantially as hereinbefore set forth.

4. In plate-burners, the combination of the nipple, the upwardly-curved plate formed or provided with a transverse rib or bar projecting across the path of the jet from said nipple, and the top plate or shield, substantially as hereinbefore set forth.

5. In plate-burners, the combination of the nipple, the top plate or shield, and the upwardly-curved plate provided with a transverse bar or rib projecting across the path of the jet from said nipple, and with an air-admission opening at a point between said rib and the nipple, substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 31st day of March, 1880.

WILLARD H. SMITH.

Witnesses:

JOSIAH T. LOVEJOY,
JAMES P. FOSTER.