

(No Model.)

H. S. BELDEN.
VAPOR BURNER.

No. 267,657.

Patented Nov. 14, 1882.

Fig. 1

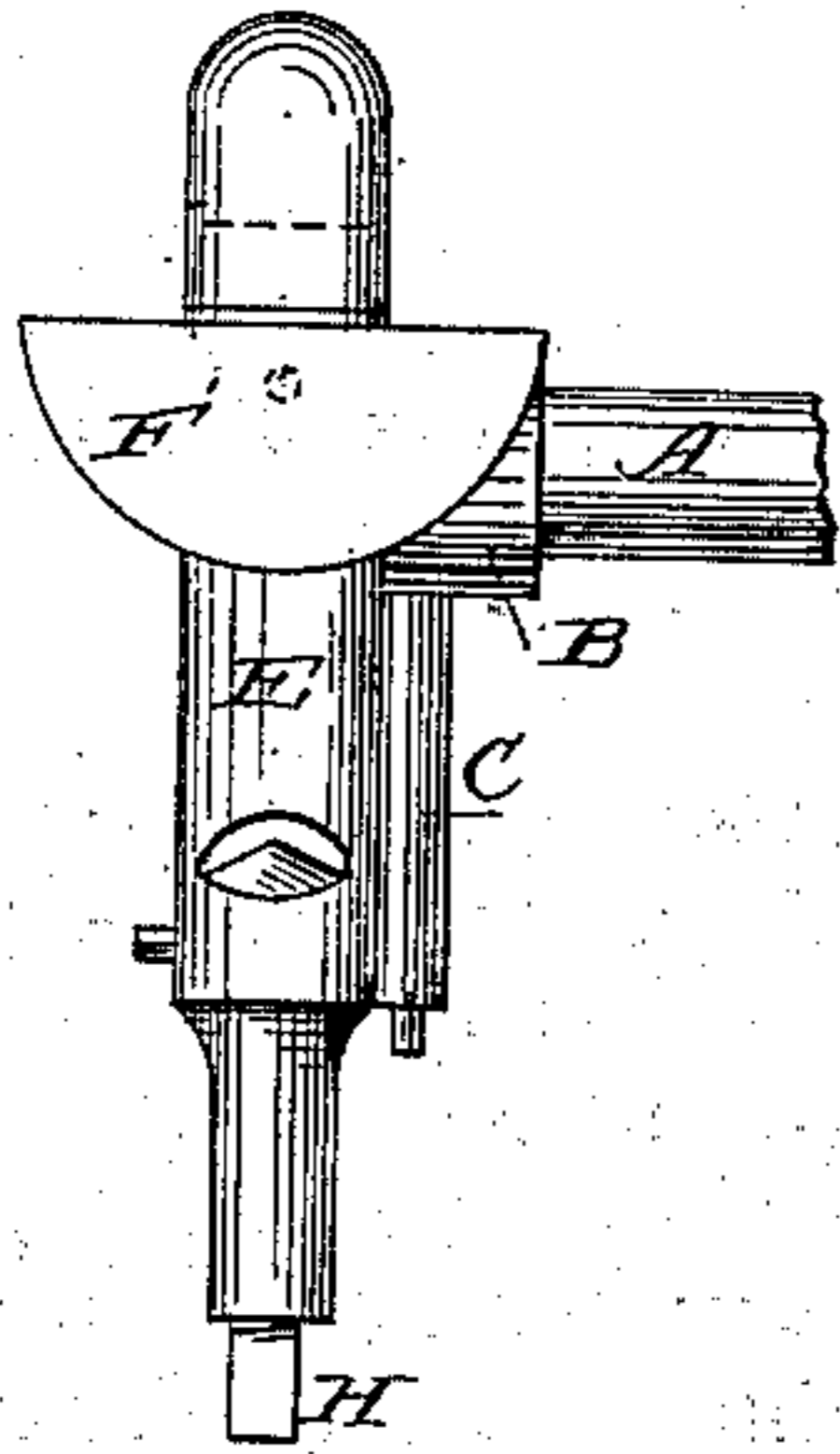


Fig. 3.

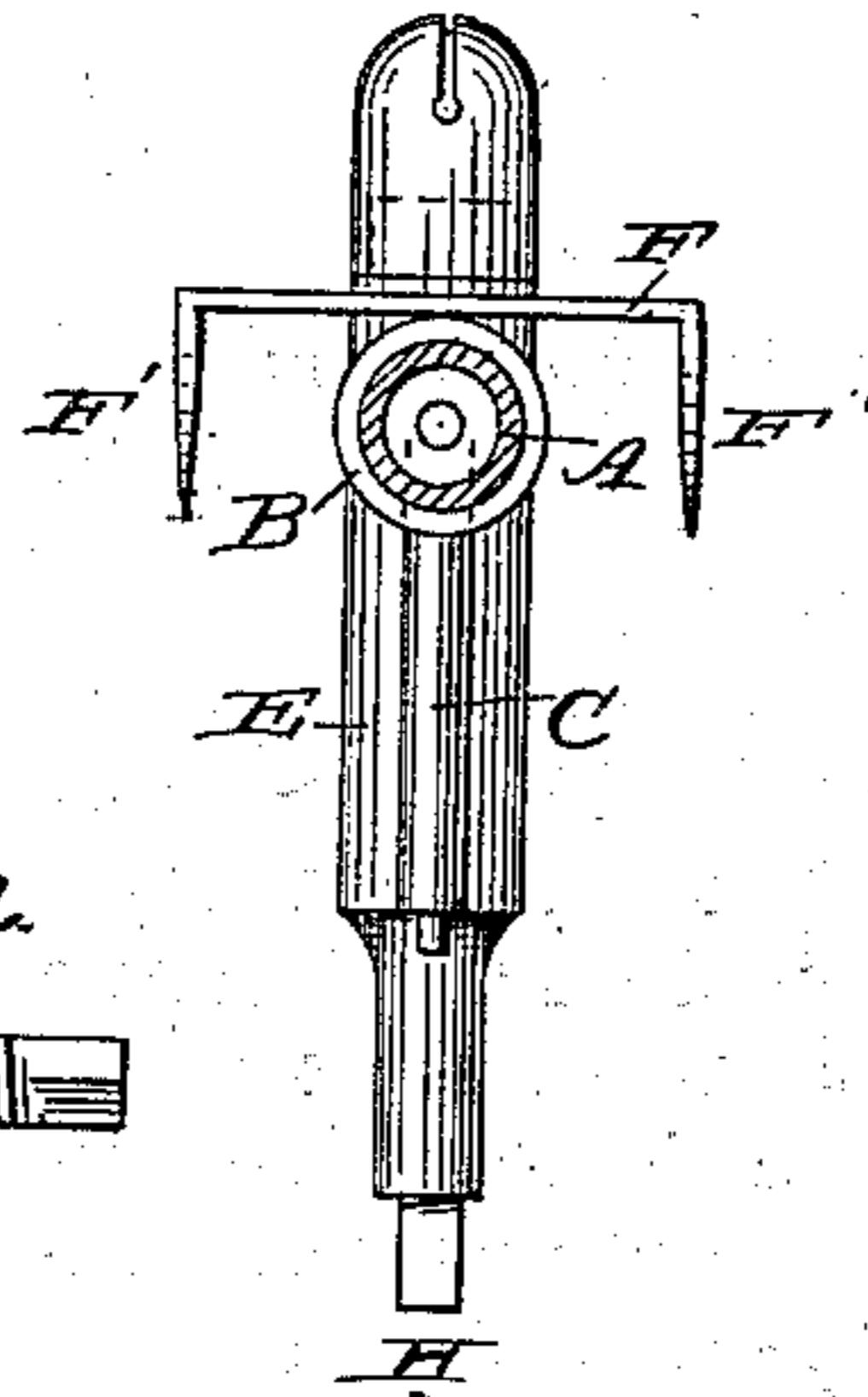


Fig. 12.



Fig. 2.

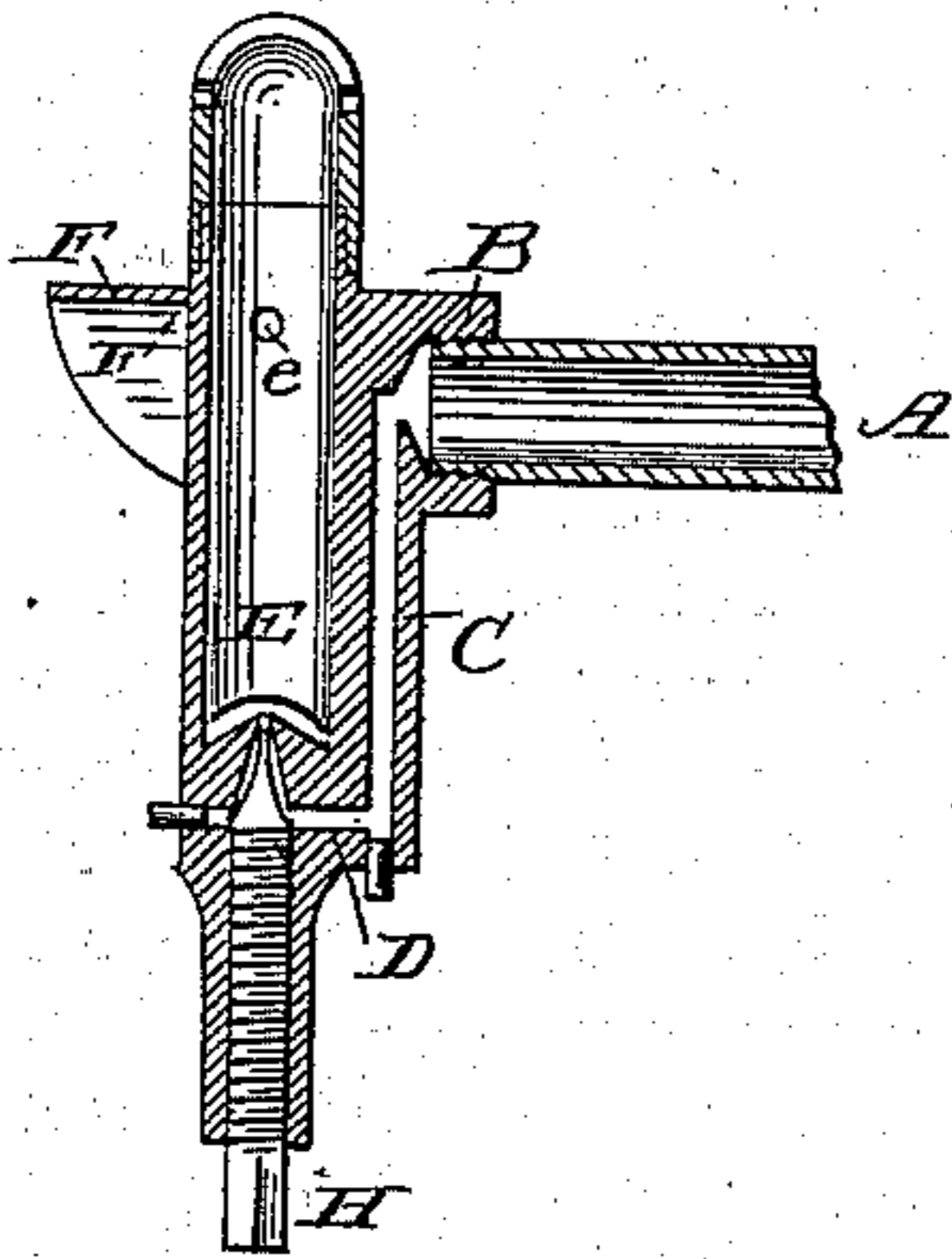


Fig. 5.

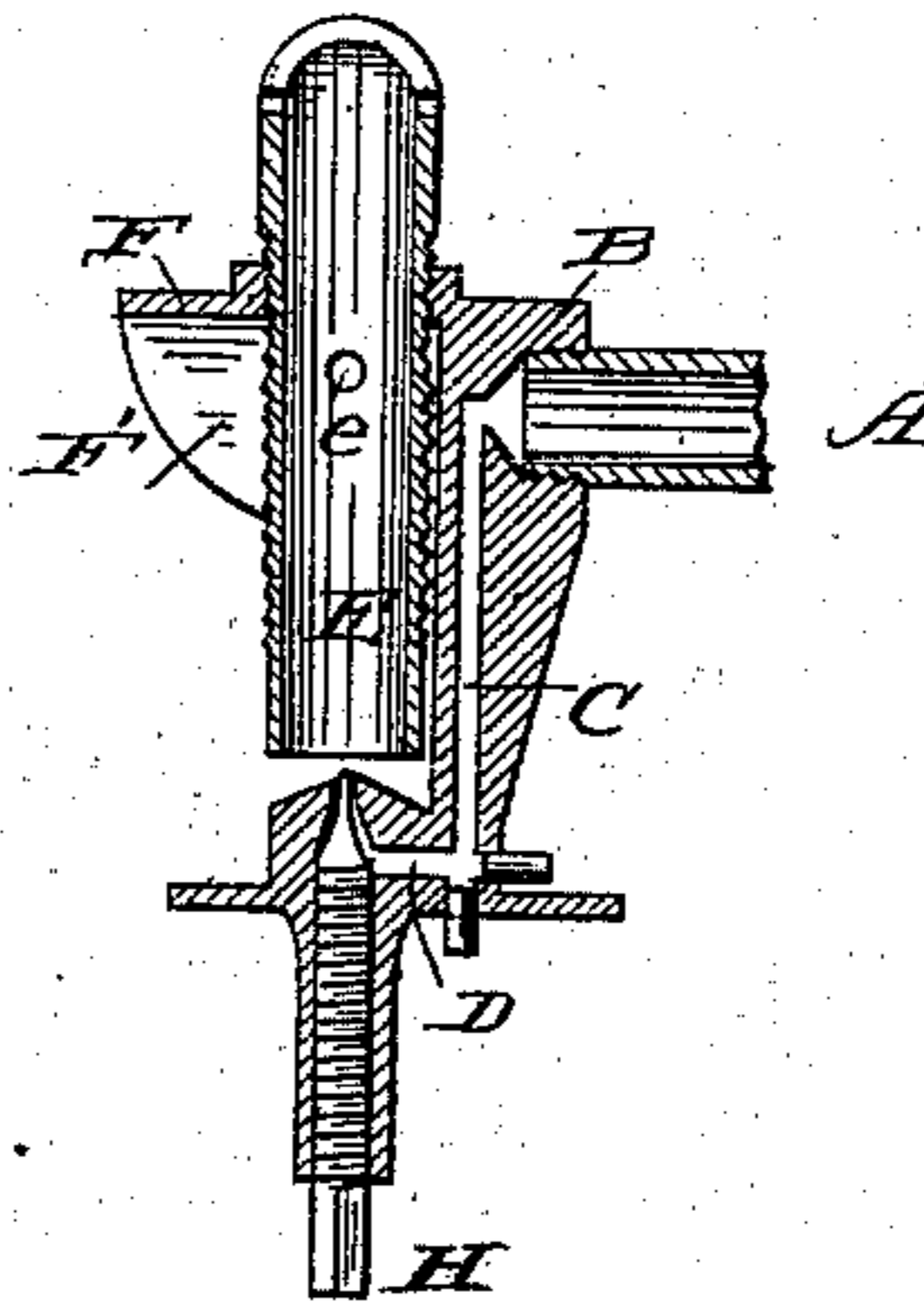


Fig. 6



Fig. 4.

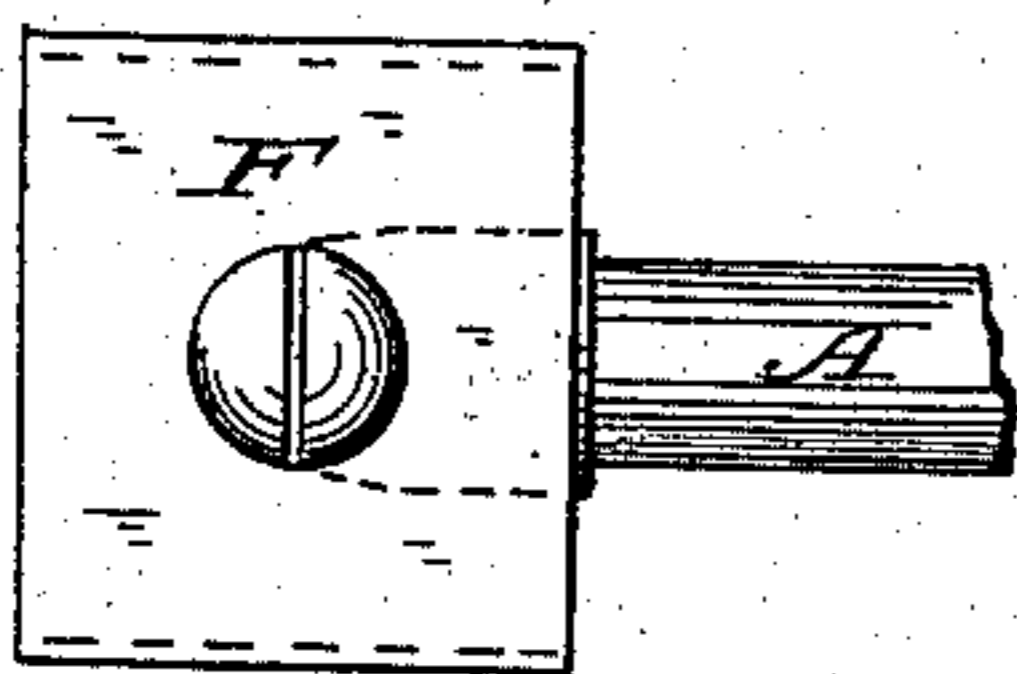


Fig. 7

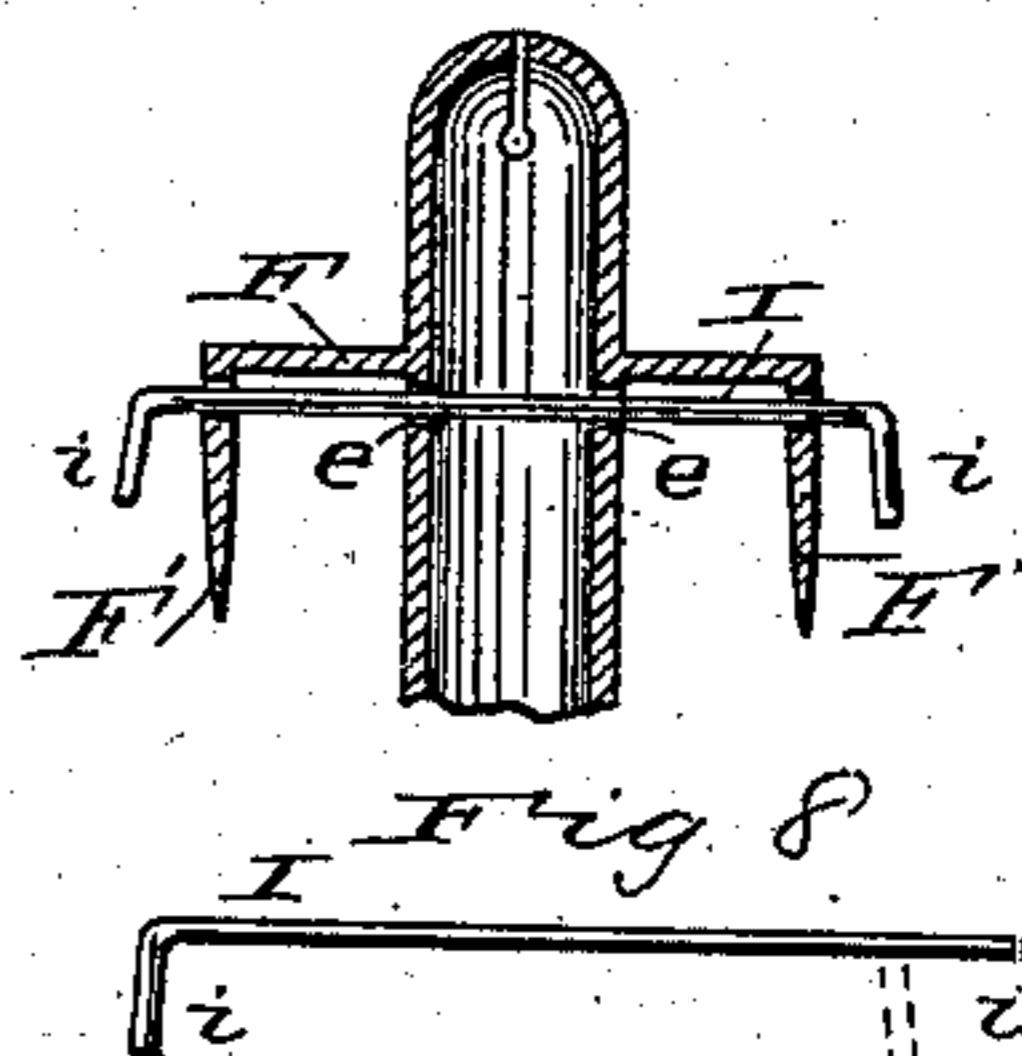


Fig. 11

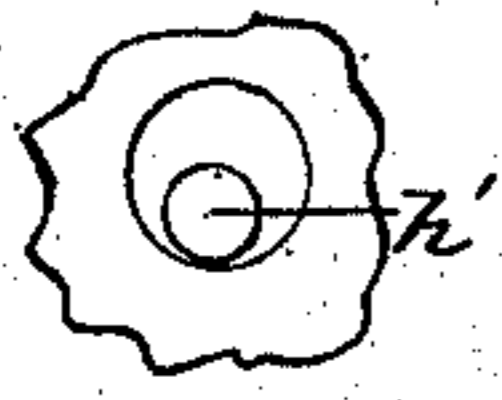
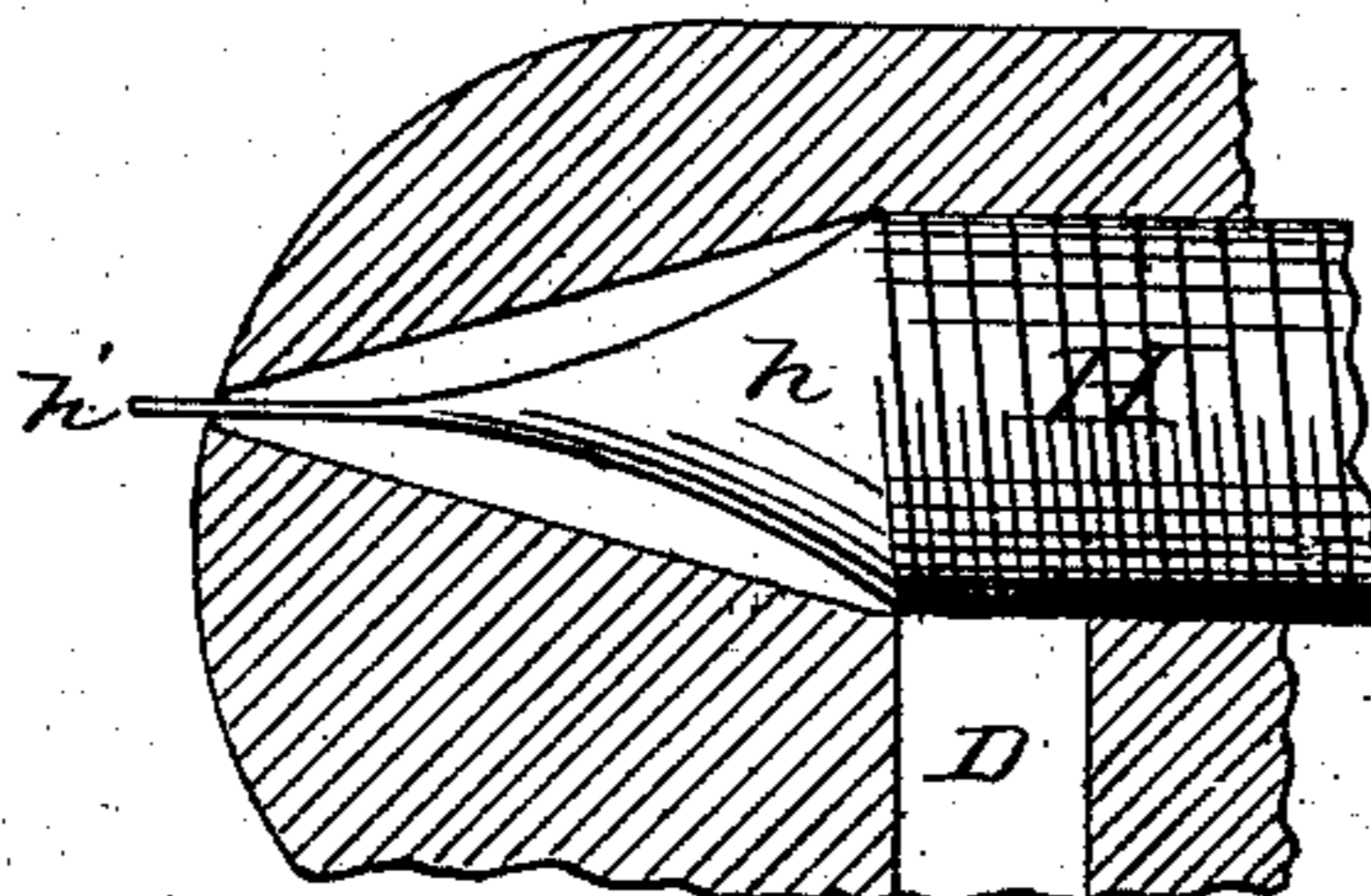


Fig. 10



Fig. 9



Witnesses:

H. N. Low
J. S. Barker

Inventor:

Henry S. Belden

by Doubleday & Bell

attys.

UNITED STATES PATENT OFFICE.

HENRY S. BELDEN, OF CANTON, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 267,657, dated November 14, 1882.

Application filed April 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. BELDEN, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of a burner embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is an elevation from the side on which the supply-pipe is. Fig. 4 is a top plan view. Fig. 5 is a view showing a modified form of some of the parts. Fig. 6 is a view of the burner-tube shown in Fig. 5 detached. Fig. 7 is a sectional view, showing a portion of the burner-tube, the wings, and the wire or pin mounted loosely across the tube. Fig. 8 is a detached view of the wire or pin. Fig. 9 is a view on an enlarged scale of my improved needle-valve. Fig. 10 shows on a large scale the proper position of the valve-point relative to the orifice; and Fig. 11 shows the improper position taken by the now common valves. Fig. 12 shows the needle-valve detached.

A represents the supply-pipe, communicating with a reservoir in any suitable position. It is connected with the vaporizing-chamber or retort portion of the burner by means of a screw-thread, or in any other suitable way.

The burner has an outwardly-projecting socket part, B, a downwardly-projecting tube, C, a lateral passage, D, and a larger vertical tube, E. These may be formed by casting them all in one piece, as shown in Figs. 1 and 2, and drilling the passages; or they may be formed separately and be afterward joined together in any preferred manner. Some of the features also may be embodied in burners which in their general nature are different from that shown. In Figs. 5 and 6 a form is shown having the burner-tube made separately from the other parts, and united thereto in a manner to be hereinafter described.

F represents a plate situated transversely to the burner-tube E, and extended outwardly therefrom on all sides. It is situated on the top of the chamber or socket B. It is provided with downwardly-turned wings or shields F' upon opposite sides of the tube, and preferably curved in outline, as shown in Figs. 1 and 2.

ee are apertures or orifices formed in the burner-tube E immediately below the plate F, and adapted to direct jets of vapor against said plate and against the wings F'. The jets of vapor at this point operate to produce a great heat in the surrounding metallic parts, which heat is immediately conducted to the illuminating material that is passing through the pipes A and C, whereby said material is vaporized. Under some circumstances a single jet will be found sufficient for heating purposes. The passage of the vapor is regulated by a valve-screw at H, which may be of any well-known form, or of the form hereinafter described.

I represents a rod mounted in the apertures *ee* in the burner-tube, it being less in diameter than the said apertures. It projects outwardly through the wings F' F', which are perforated to permit its passage, and is held in place by arms *ii*, formed by bending or otherwise. By means of this device the apertures through which the heating-jets issue can be readily cleaned of soot and other sediment tending to deposit in the orifices and to impede the proper flow of oil and vapor. The rod can be pushed to and fro, and in this way instantly remove any sediment. Moreover, the holes *ee* will be partially filled by the rod, which will permit the making of larger holes than could be otherwise employed, and the larger holes can be made much more quickly and easily than the smaller ones. However, I do not limit the rest of the invention to the use of this rod or pin, as the other features can be used without it.

It will be seen that the wings F' and the plate F, being situated directly opposite to the supply-pipe A and the receiving-chamber B, insure that there shall be applied to the oil much greater heat than can be applied when the shields or hoods are arranged at a considerable distance above the supply-pipe, as has been the custom heretofore.

In the construction shown in Fig. 5 a burner-tube is employed which is made of ordinary metal tubing. The tip is formed by flattening or bending inward the edges of the end of the tubing, which is effected either by a swaging-machine or other forming-machine suitable for the purpose. In this way I can produce a mixing-chamber, burner, and tip at a cost much less than that incident to the ordinary way of

making burner-tubes—that is, by casting and drilling.

The tube shown in said Fig. 5 is, moreover, provided with an external screw-thread adapted to engage with a thread in the plate F, whereby it can be supported not only detachably, but also adjustably, so that it can be put at different heights to regulate the admission of air, the position of the illuminating-jet, and also the position of the heating-jets.

In Fig. 9 I have shown the improved valve-screw which I have devised, said figure showing also its relations to the walls of the orifice around its point *h*'. By examining said figure it will be seen that the conical part *h* of the valve is recessed to form a chamber around it, between it and the surrounding wall, which insures that no part of the point shall come in contact with the walls of the orifice or the walls of the chamber inside of the orifice.

Great trouble has been experienced with valves as heretofore constructed from the fact that more or less contact is permitted between the valve-point and the surrounding wall. The fine steel point is often tightly compressed by the surrounding metal, and therefore, when an attempt is made to withdraw the valve, the point is broken or marred, the compression resulting either from the rusting of the parts or from contraction of the metal surrounding the point caused by cooling. This is obviated by making the point as I have shown it. Moreover, by shaping the valve-point thus I prevent the wedge action invariably experienced with the ordinary valve, which action causes the bursting of many burners, as a cone when pressed forward by the screw tends to force apart the surrounding walls, and there is nothing to insure that the point and conical part shall always have a free space around them. When thus constructed the point can be brought accurately to the center of the orifice, so that there shall be no deflection of the jet caused by the point. With the points as now constructed there is contact on one side or another with the wall. This bends the point accordingly, causing it to lie eccentrically in the orifice, as shown in end view in Fig. 11, and as a result the vapor is thrown away from its proper path, the desired relation of the point and orifice being shown in Fig. 10. A valve-screw of this character is adapted for use in either a burner of the kind shown in Figs. 2 and 5 or in burners of the sort known as "plate-burners."

I am aware that use has been made for a long time of valve-screws having needle-points somewhat cone-shaped, and which in longitudinal section have rectilineal sides. Some of these valves have the base of the point considerably less in diameter than the end of the shank portion. These in practice are found to be infe-

rior, as the points very easily break off at the base. The object of this part of my invention is to avoid this fault, and I provide the point with a base as broad as the shank part of the screw and yet at the same time provide a chamber or free space entirely around the operative part of the point by recessing it in a lathe or otherwise, so that in longitudinal section the sides shall be concave.

I do not in this case claim the method herein described of manufacturing burner tubes and tips from ordinary tubing; nor do I claim anything but what is specifically set forth in the following claims, reserving the right to claim all other patentable matters in another application I am about to file.

What I claim is—

1. The combination with the mixing-chamber and the jet-orifices *e e*, of a heating shield or plate situated away from the mixing-chamber to provide a heating space or chamber between the mixing-chamber and said plate, and furnished with an orifice coinciding with the heating-jet orifice, whereby a cleaning implement can be inserted into the heating-jet orifice after it has been passed through the plate and across the heating-chamber, substantially as set forth.

2. The combination, with the pipe-socket B, of the retort passage C, extending downward therefrom, the mixing-chamber tube communicating with and extending upward from the bottom of the retort passage C, the heating-plate forming substantially an extension of the upper part of the pipe-socket B and surrounding the mixing-chamber tube, the downwardly-extending wings *F' F'* at the edges of the plate, and the orifices *ee*, arranged to throw lateral jets below the plate F and against the shields *F'*, on substantially the plane of the pipe-socket B, as set forth.

3. In a vapor-burner, the combination, with the mixing-chamber having a heating-jet orifice, of a cleaning implement permanently but loosely mounted in said orifice, substantially as and for the purposes set forth.

4. In a vapor-burner, the combination, with the pipe-socket B, the retort-passage C, extending downward therefrom, the upwardly-turned escape-orifice, and the shield or plate F, secured rigidly to the pipe-socket and projecting directly therefrom, of the removable burner-tube supported in said shield or plate independently of the other parts of the burner, substantially as set forth.

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

HENRY S. BELDEN.

Witnesses:

H. H. BLISS,

H. H. DOUBLEDAY.