(No Model.)

J. E. LEE.

THERMOCAUTER.

No. 541,441. Patented June 18, 1895.

FIG. 1.

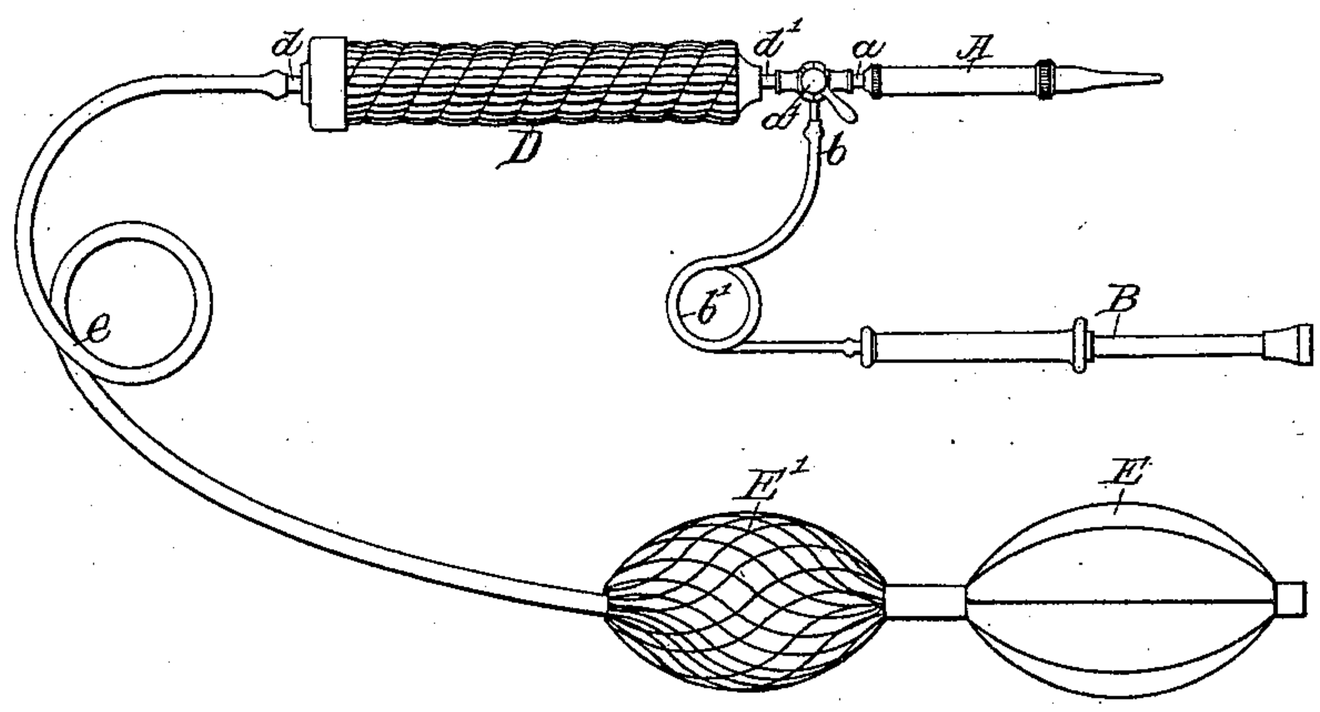


FIG. 2.

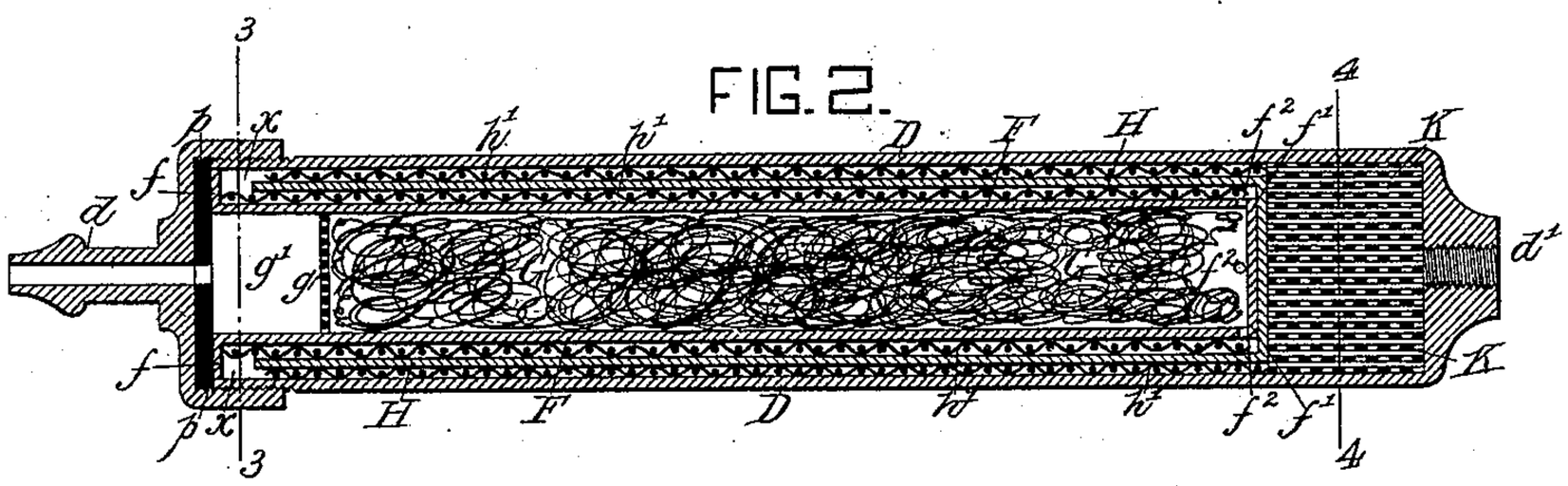


FIG. 3.

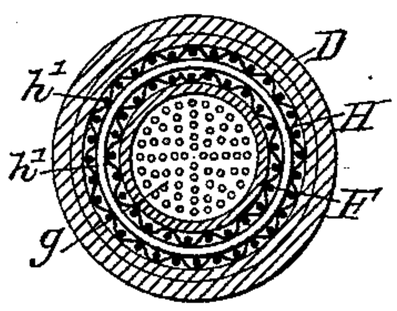


FIG. 4.

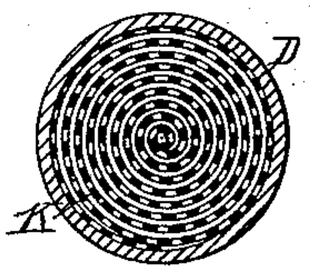
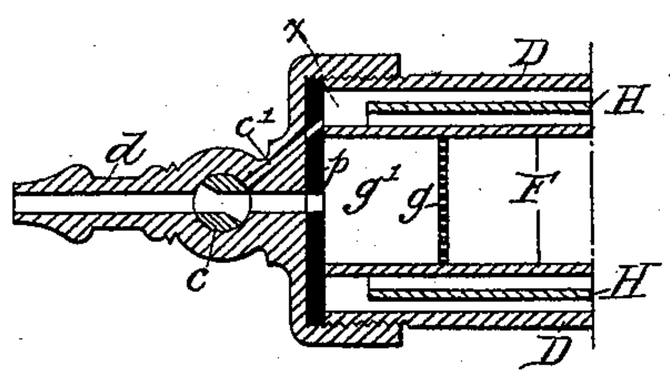


FIG. 5.



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THERMOCAUTER.

SPECIFICATION forming part of Letters Patent No. 541,441, dated June 18, 1895.

Application filed February 7, 1895. Serial No. 537,643. (No model.)

To all whom it may concern:

Be it known that I, JOHN ELLWOOD LEE, a citizen of the United States, and a resident of Conshohocken, Montgomery county, Pennsylvania, have invented Improvements in Cauterizing Apparatus, of which the following is a specification.

My invention consists of improvements in the construction of thermo-cauterizing apparatus, and has more particular reference to that portion of the appliance which is commonly termed the carburetor.

The object of my invention is to so construct the device that the carbureted air or gas will burn in the cauterizer with an intense heat to quickly bring, and easily keep the point at the desired red or white heat, and this without the formation of soot, which would quickly choke up the passages, and also without danger of causing explosions or extinguishing the flame within the point.

In the accompanying drawings, Figure 1 is a view illustrating the thermocauterizing apparatus. Fig. 2 is a sectional view of my carburetor, drawn to an enlarged scale. Figs. 3 and 4 are sectional views on the lines 3 3 and 4 4, respectively, in Fig. 2; and Fig. 5 is a view of a modification.

Referring to Fig. 1, A is a cauterizing instrument of any suitable or well-known construction, connected by a short pipe *a* with the discharge outlet *d'* of the carburetor D. The inlet *d* of the carbureting vessel D is connected by a flexible tube *e* with the usual air supply compressed bulb or pump E, and regulating or expansion bulb E'.

In the pipe *a* there may be provided a three-way cock *a'* with a side outlet *b* to which may be connected a flexible tube *b'* leading to a second cauterizing instrument B with a different form or point from that at A, for in many instances it may be desirable to have two different cauterizing points workable from the same carburetor and air bulb, avoiding the delay which would be taken up during an operation in taking off one point and putting on another.

The carbureting vessel D is preferably a metal cylinder of a form adapted to constitute a convenient handle for any of the cauterizing points desired to be used—as A or B for instance.

In the thermo-cauterizing apparatus as usually constructed, one of two difficulties has usually been found to exist, namely: either that the air forced through the carburetor is apt to become so heavily impregnated with the hydrocarbon that soot will form within the cauterizing point and soon choke it up, or the force of the current of air through the carburetor will carry through, to the cauterizing point, some of the volatile liquid in small drops which explode and put the flame out, and otherwise give trouble. I have found that both these difficulties can be avoided by constructing the thermo-cauterizing carburetor in the manner which I will now describe, referring more particularly to Figs. 2, 3 and 4.

The inlet end *d* of the carbureting cylinder D may conveniently be in the form of a detachable screw cap, as illustrated in Fig. 2, while the outlet end *d'* may be formed in one with or attached to the cylinder. Within the outer cylinder, there is a central tube F, which is preferably provided at the inlet end of the carburetor, with an outwardly projecting flange *f*, fitting snugly within the inner diameter of the cylinder D, while the opposite end of this tube F is closed, as at *f'*, except that small passages f^2 are provided near the end of the tube. The main body of this tube may be filled with fibrous or any other suitable material G of a more or less absorbent capacity to hold the hydro-carbon or other volatile liquid more or less suspended. Near the inlet end is a wire gauze or other perforate diaphragm *g* leaving a cup-like space *g'*. A packing washer *p* is provided between the inlet cap *d* and the tube F and the outer cylinder D to make the joints tight.

Between the inner tube F and the outer cylinder D there is provided an intermediate tube or annular diaphragm H closed toward the outlet end of the carburetor, but a little shorter in length than the tube F, in order to leave a space at *x* for the passage of the air from the inside to the outside of the tube H. Around the outside of the tube F, or in other words, between the tube F and the tube H, there is provided some fibrous or reticulated material, such as a layer of wire gauze *h*, and preferably also there is a layer of similar material *h'* between the tube H and the cylinder D. Although it is not essential, I prefer also

to leave a space between the ends of the tubes F and H and the outlet d' to introduce what I may term a filtering diaphragm K which may be conveniently formed of a coil of perforated sheet metal or wire gauze or other such suitable material.

In using this carburetor the hydro-carbon or other volatile liquid is poured into the cup-like space g', while the carbureting cylinder D is held in an upright position and the cap has been removed. By preference I make this space g' of a size to receive just sufficient of the volatile liquid for charging the carburetor properly to its full capacity. The cylinder is held in an upright position sufficiently long to let the liquid be absorbed by the material G in the central tube. Then when the parts are connected up, as illustrated in Fig. 1, and the bulb E is operated, the air will be driven from the inlet passage d through the fibrous material in the central tube F, out through the openings f^2, back again through the reticulated space between the tubes F and H toward the inlet end of the carburetor and thence in the opposite direction through the reticulated space between the tube H and the outer cylinder D, and thence to the outlet passage d' through the filtering diaphragm K, if that be used. By passing the air through the suspended liquid in this circuitous course, and through the reticulated or filtering material therein, I am enabled to insure proper saturation of the air with hydrocarbon, or other volatile liquid to give the gas which will produce the needed intensely hot flame without danger of producing soot and without liability of the carrying over to the cauterizing point, of drops of the liquid put into the carburetor.

In some cases, I may lead the air into the carburetor at different points, by providing a communication between the air inlet and the reticulated chambers around the tube F of the carburetor, and I prefer to make this communication controllable to vary the mixture of air and gas. This may be accomplished by providing in the inlet cap d a cock c, controlling a small air passage c' to the point x in the chambers, this cock being in this case shown as controlling also the entire air inlet to the carburetor. The flange f on the tube F is in this case omitted.

I claim as my invention—

1. A thermo-cauterizing apparatus, having a carburetor with inlet and outlet passages at opposite ends, an inner tube with a second tube outside the first, and forming an annular diaphragm between the inner tube and the outer cylinder of the carburetor, the passage at one end of the carburetor opening into the inner tube which at its opposite end opens into the space between the inner tube and the diaphragm, while the latter opens into the space between the diaphragm and the outer cylinder, this last space connecting with the passage at the other end of the carburetor.

2. A carburetor with inlet and outlet passages, a central tube, into which the inlet opens, and which contains material to hold the volatile liquid in suspension, circuitous passages around said tube and communicating therewith at the end opposite from the inlet and leading to the discharge outlet of the carburetor, substantially as described.

3. A carburetor with inlet and outlet passages, a central tube, into which the inlet opens and which contains material to hold the volatile liquid in suspension, a perforated diaphragm in said tube to leave a cup-like space at the inlet end, and circuitous passages leading from said central tube to the outlet of the carburetor.

4. A carburetor having inlet and outlet passages at opposite ends with a central tube and annular chambers about the tube, the chambers and tube communicating with each other alternately at opposite ends with reticulated material in such chambers, with a filtering diaphragm at the outlet end, substantially as described.

5. A carburetor having an outer cylinder and a central tube, which contains material to hold the volatile liquid in suspension, circuitous passages around said tube, a removable cap with an inlet opening into said central tube, a packing in the cap to make the joints tight, and an outlet at the opposite end of the cylinder, substantially as described.

6. A cauterizing appliance, having a carburetor provided with circuitous passages and an inlet having passages leading into said carburetor at different points, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN ELLWOOD LEE.

Witnesses:
C. L. MATHIAS,
G. R. KLINE.