

(No Model.)

G. BARTHEL.
LAMP FOR BURNING HYDROCARBONS.

No. 478,733.

Patented July 12, 1892.

Fig. 1.

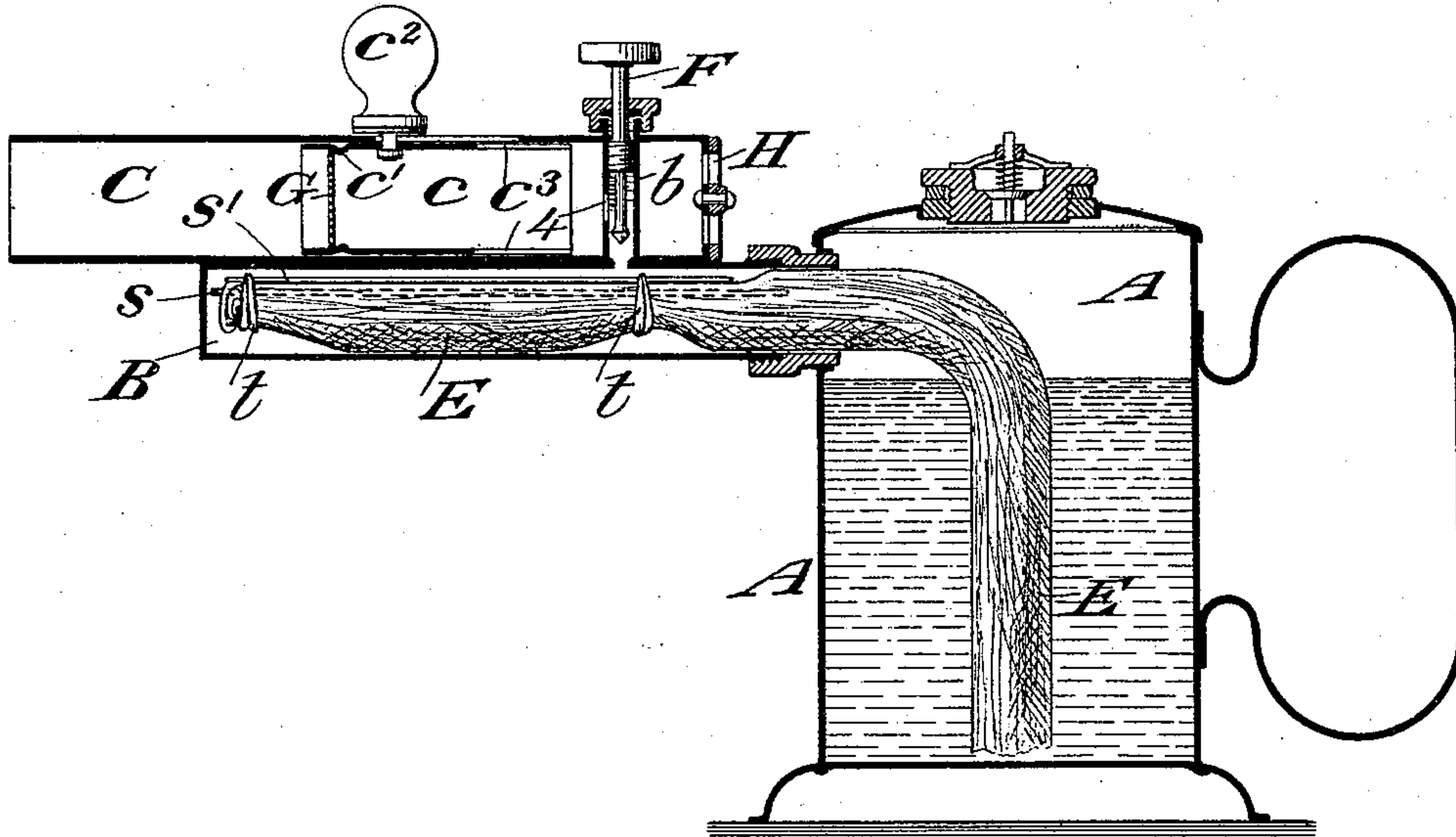
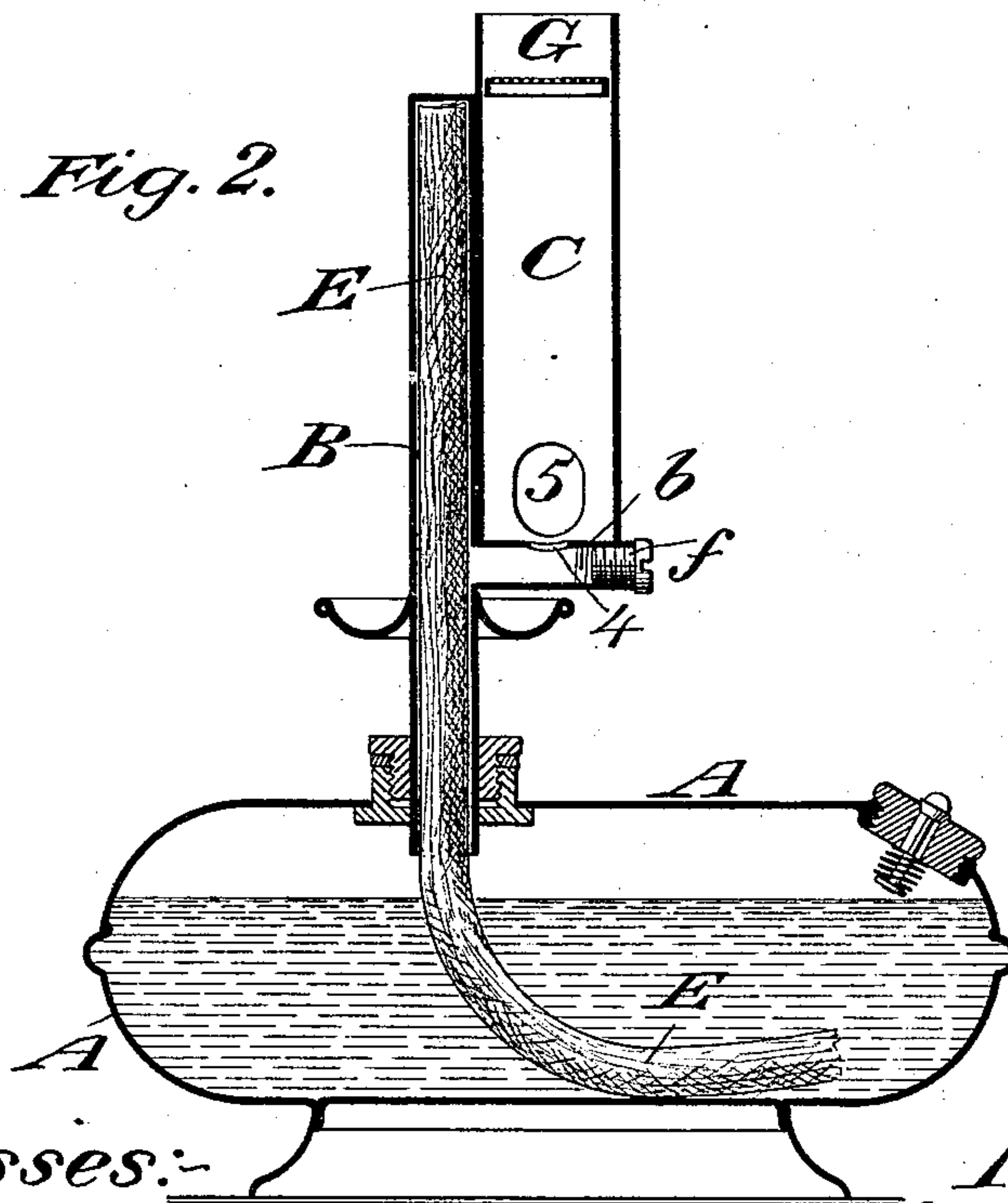


Fig. 2.



Witnesses:-

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UNITED STATES PATENT OFFICE.

GUSTAV BARTHEL, OF DRESDEN, GERMANY.

LAMP FOR BURNING HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 478,733, dated July 12, 1892.

Application filed October 27, 1891. Serial No. 409,965. (No model.) Patented in Switzerland May 15, 1891, No. 3,541; in France June 15, 1891, No. 214,145; in Italy June 30, 1891, LVIII, 294, and in Austria-Hungary December 3, 1891, No. 3,700 and No. 3,517.

To all whom it may concern:

Be it known that I, GUSTAV BARTHEL, of Dresden, in the Kingdom of Saxony, German Empire, have invented a new and useful Improvement in Lamps for Burning Hydrocarbons, (which has been patented in Italy by patent of June 30, 1891, Vol. 58, No. 294; in Switzerland by Patent No. 3,541, dated May 15, 1891; in France by Brevet No. 214,145, dated June 15, 1891, and in Austria-Hungary by Privilegium Vol. 41, Fol. 3,700, and Vol. 25, Fol. 3,517, dated December 3, 1891,) of which the following is a specification.

The lamp which is the subject of the present invention is particularly adapted for burning spirit or alcohol, although it may be used with all the other well-known hydrocarbons employed for feeding lamps, and it is intended to burn with a blue flame to serve for scientific, industrial, and other purposes in which heat is required.

The main feature of this lamp and in which it differs from others is the arrangement of two simple pipes or tubes side by side and in close proximity to each other, one of said tubes communicating with the reservoir, containing a wick and constituting an evaporating-chamber, the other being open at both ends and constituting a burner-tube, and a nozzle which projects laterally from the first tube across the second one for the introduction into the latter of the vapor generated in the first tube by the heat imparted to it from the second one through the adjacent walls of the two. As the vapors of spirits have the tendency to condense and fall at the colder faces of the apparatus, the latter must be arranged in such a manner as to prevent the vapors from escaping into the reservoir. This is effected by making the evaporating-vessel tight against the reservoir by means of the full wick, while not preventing the latter from sucking or conducting the spirit into the evaporating-vessel, and by creating direct communication from the evaporating-vessel into the burner-tube, thereby preventing too much heating of the reservoir. In order to create a sufficient space in the evaporating-tube for the vapors to collect and to issue into the burner-tube, I bind down the wick in the evaporating-tube for a

certain distance, within which the direct communication to the burner-tube takes place, leaving a full end of the wick toward the reservoir for the purpose above stated. In some cases I prefer to supply the burner-tube with a foraminous diaphragm for the vapors to pass through and to burn from this diaphragm to the open end of the burner-tube. Now in order to regulate the flame and by this regulation to regulate at the same time the influence of such flame upon the space in the evaporating tube or vessel, I arrange the diaphragm to be made adjustable lengthwise of the said tube.

Figs. 1 and 2 of the accompanying drawings represent central vertical sections of two forms of lamp illustrating my invention, the example represented in Fig. 1 having a horizontal arrangement of the burner-tubes and being suitable for soldering and other industrial purposes, and the example represented in Fig. 2 having a vertical arrangement of the tubes and being suitable for use instead of the well-known Bunsen burner in laboratories where there is no gas.

Similar letters and numerals of reference designate corresponding parts in the two figures.

I will first describe the example represented in Fig. 1, in which all the features of my invention are embodied.

A is the reservoir.

B is the wick or evaporating tube, which is closed at its outer end and is connected with the reservoir by a suitable screw device. The tube is supplied with a full wick E, extending to or nearly to the bottom of the reservoir A.

C is the burner-tube, arranged side by side with the wick-tube B in the closest proximity thereto, so that they form practically one body. From the wick-tube B a nozzle *b* projects laterally into and across the burner-tube. The said nozzle *b* has a small hole 4, facing in the direction of the length of the tube C. The said nozzle is represented as fitted with a regulating-valve F to regulate the flow of vapor through it. The burner-tube C is open at its rear end and has an air-admitting regulating-disk H, and is represented as fitted with a foraminous dia-

phragm G, the object of which is to confine the flame to the forward part of the tube.

The wick E is represented as extending the whole length of the tube B. It is of such size and texture that in the normal condition in which that part of it near the reservoir is left it so fits the said tube that, while it will permit the passage through it of the liquid from the reservoir into the evaporating-space in the forward part of the said tube, it will prevent the vapors from escaping back into the reservoir. The binding of the wick for the purpose of creating an evaporating-space in the greater part of the length of the said tube is represented as effected by binders *t* of thread or wire which surround it and wires or strips of metal *s s'*, one of which runs lengthwise through the wick and the other of which runs along the outside of it within the binders *t*. Either or both of the wires or strips may be used. In the space thus formed the vapors generated in the said tube by the heat in the burner-tube C are caused to accumulate, so as to be delivered in a constant stream through the nozzle *b* into the latter tube.

The foraminous diaphragm G in the burner-tube C is represented as held within the said tube by inserting therein a tube *c* of less diameter and by providing the smaller tube *c* with an internal rim *c'*, against which the diaphragm G rests. For enabling the smaller tube *c* to be shifted longitudinally with the diaphragm G within the burner-tube C, I provide the latter with two slots *c³*, one at the top for the fastening of the knob *c²* to tube *c* and one at the bottom, the latter for allowing the tube *c* to pass beyond the nozzle *b*. By this arrangement the diaphragm G is made capable of being shifted either way. In shifting it to the front or open end of the tube C the flame will have less effect upon the evaporating-chamber in the tube B, and thereby the intensity and size of the flame will be reduced, whereas if the diaphragm G is shifted toward the nozzle *b* the effect of the flame on the tube B will be increased, the evaporation in B will be more enlivened, and consequently the issue of vapors will be increased.

The example of my invention shown in Fig. 2 differs from that shown in Fig. 1 in the following particulars: The wick-tube and burner-tube are arranged upright instead of horizontally. The diaphragm G, instead of being movable, is fixed. The burner-tube, instead of having an opening at the back for the ad-

mission of air, has no such opening, but has side openings 5 for such admission. The nozzle *b*, instead of projecting into the burner-tube, projects across its back or bottom, with its opening 4 in communication with the said tube, substantially like the nozzle *b* in the first-described example, and said nozzle has no regulating-valve F, but is simply furnished with a removable screw-stopper for cleaning. Moreover, in the example shown in Fig. 2, the wick E is represented as unbound within the tube B.

In some cases the diaphragm may be dispensed with, especially in a lamp for soldering purposes, in which case a very sharp flame is required.

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

1. In a lamp for burning alcohol, hydrocarbons, and their derivatives, the combination, with a reservoir, of a wick-tube constituting an evaporator and a burner-tube open to the atmosphere at both ends, the said tubes being arranged side by side in close proximity to each other, and a nozzle projecting laterally from the said wick-tube directly across and in communication with the burner-tube, substantially as and for the purpose herein set forth.

2. In a lamp having a wick-tube B and a burner-tube C, both tubes being arranged parallel and in close proximity to each other outside the fuel-reservoir A, and a wick arranged in the tube B and extending into the reservoir A, the wick within the tube B being partly bound to form an evaporating-chamber in the tube B and partly forming a packing to prevent the vapors created in the tube B from escaping into the reservoir A, substantially as herein set forth.

3. The combination, with the lamp-burner tube open at its outer end and having at its inner end inlet-openings for air and vapor, of a foraminous diaphragm G, adjustable longitudinally within said tube to vary its distance from said inlet-openings and from said open outer end, respectively, substantially as and for the purpose herein set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GUSTAV BARTHEL.

Witnesses:

WILHELM WIESENHÜTTER,
GEORG RICHTER.