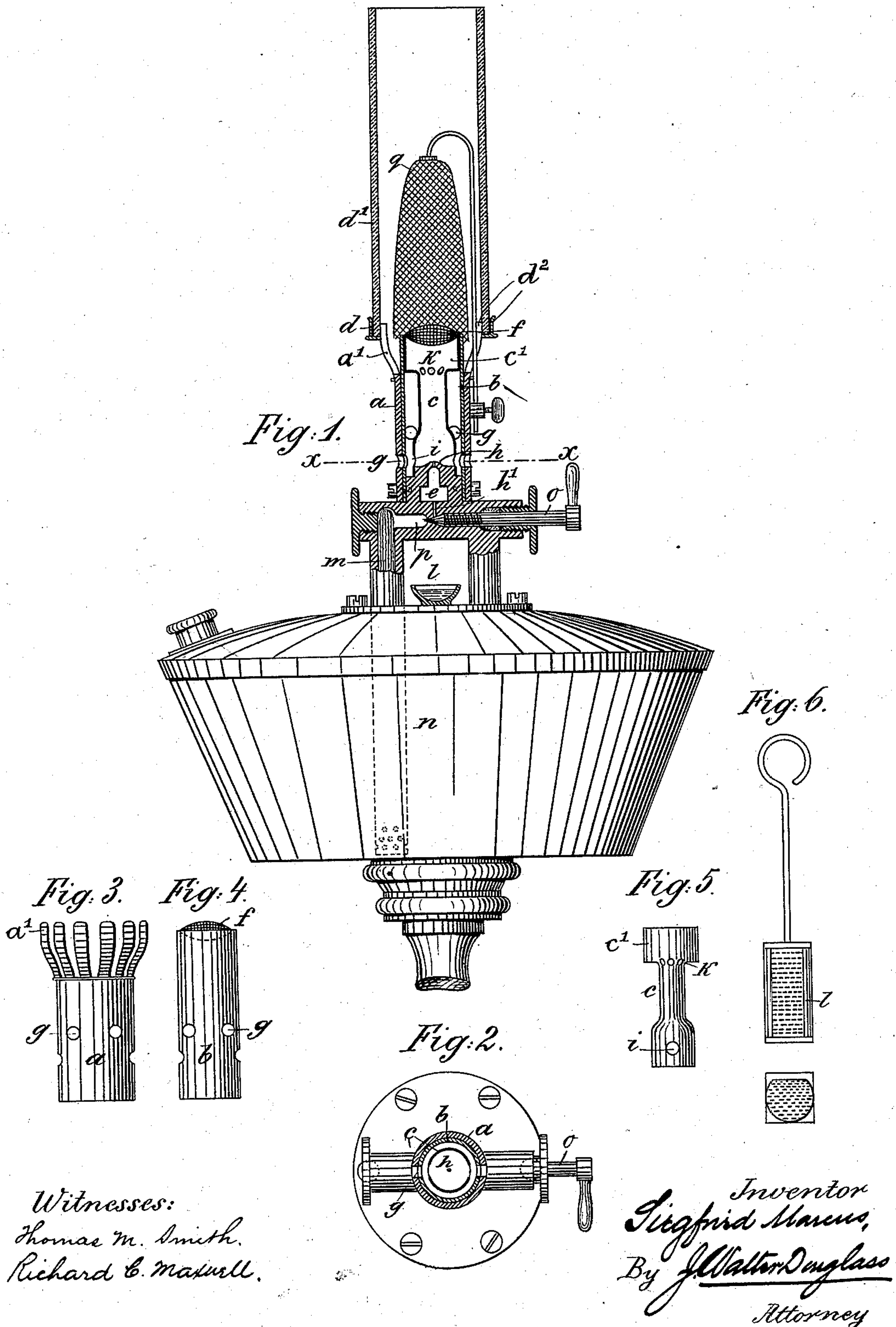


(No Model.)

S. MARCUS.  
INCANDESCENT HYDROCARBON LAMP.

No. 558,589.

Patented Apr. 21, 1896.





# UNITED STATES PATENT OFFICE.

SIEGFRIED MARCUS, OF VIENNA, AUSTRIA-HUNGARY.

## INCANDESCENT HYDROCARBON-LAMP.

SPECIFICATION forming part of Letters Patent No. 558,589, dated April 21, 1896.

Application filed October 7, 1895. Serial No. 564,849. (No model.) Patented in France March 14, 1895, No. 245,815; in Belgium March 14, 1895, No. 114,559; in England March 15, 1895, No. 5,510, and in Austria May 25, 1895, No. 45/1,844.

*To all whom it may concern:*

Be it known that I, SIEGFRIED MARCUS, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Incandescent Hydrocarbon-Lamps, (for which I have obtained Letters Patent in Austria, No. 45/1,844, dated May 25, 1895; in France, No. 245,815, dated March 14, 1895; in Belgium, No. 114,559, dated March 14, 1895, and in Great Britain, No. 5,510, dated March 15, 1895,) of which the following is a specification.

My invention has relation to incandescent hydrocarbon-lamps, and in such connection it relates particularly to the construction and arrangement of the burner of such a lamp, whereby a mixture of heated air and vaporized hydrocarbon is utilized for heating or incandescent-lighting purposes.

The principal objects of my invention are, first, to provide a simple, durable, and efficient lamp, wherein liquid hydrocarbons after vaporization and admixture with heated air may be burned either for incandescent-lighting or heating purposes, and, second, to provide in such a lamp a burner adapted to vaporize liquid hydrocarbons, mix the same with air heated by the flame of said burner, and utilize said admixture for the purpose of heating to incandescence a mantle of suitable material or for heating purposes.

My invention consists of a hydrocarbon-lamp for incandescent or heating purposes, constructed and arranged in substantially the manner hereinafter described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 represents, partly in side elevation and partly in vertical section, a lamp and burner embodying features of my invention. Fig. 2 is a top or plan view of the lamp when sectioned on the line  $x x$  of Fig. 1. Figs. 3, 4, and 5 respectively represent in side elevation the different portions of the burner of the lamp, and Fig. 6 represents in top or plan view and end elevation a spirit-burner adapt-

ed to permit of the heating of the lamp-burner in the initial stage of ignition of the burner.

Referring to the drawings,  $a$  represents the outside tube of the lamp-burner, terminating at its top in a basket-like or open-pronged portion  $a'$ . Within the tube  $a$ , below its top  $a'$ , and either integral with the tube  $a$  or fitted snugly therein, is arranged a concentric tube  $b$ , the upper end  $f$  of which terminates in a gauze or other suitably-covered opening. Within the tube  $b$  is located a concentric tube  $c$ , the body of which is of considerably less diameter than the inner diameter of the tube  $b$ , the head  $c'$  of the tube  $c$  fitting snugly in the upper end of the tube  $b$ , below the burner-opening  $f$ .

The tubes  $a$  and  $b$  are perforated near their lower ends, as at  $g$ , and the tube  $c$  is perforated at both its upper and lower ends, as indicated at  $i$  and  $k$  in Figs. 1 and 4. To the prongs  $a'$  of the tube  $a$  is secured a frame or ring  $d$ , between the upwardly-extending flanges  $d^2$ , in connection with which is mounted a chimney  $d'$ , and resting against both the inside and outside thereof.

Below the lower ends of the tubes  $a$ ,  $b$ , and  $c$ , and supporting the same, is a heating or vaporizing chamber  $e$ , communicating by means of a needle-like opening  $h$  with the interior of the tube  $c$ , as indicated in Fig. 1. The entrance  $h'$  to this chamber  $e$  is larger than the exit-opening  $h$ , and is controlled by a needle-valve  $o$ .

In the receptacle  $n$ , designed to hold the easily-vaporized liquid hydrocarbon—such as gasoline, naphtha, or similar light oils—extends the wick  $m$ , which leads from said receptacle  $n$  to the canal  $p$ . The entrance from the canal  $p$  to the heating-chamber  $e$  is controlled by the needle-valve  $o$ .

Above the burner  $f$  of the tube  $b$  is suspended a cone or mantle  $q$ , of suitable incombustible material, adapted, when highly heated, to become incandescent.

In operation it is necessary first to heat the liquid hydrocarbon let into the chamber  $e$  by extraneous means to vaporize the same. For this purpose is provided a receptacle or pan  $l$ , filled with absorbent incombustible material, such as asbestos, saturated with alcohol,



and after the ignition of the same it is placed directly under the canal *p*, so as to heat the hydrocarbon led into the canal *p* by the wick *m* to a temperature necessary to vaporize the same, as illustrated in Figs. 1 and 6. In practice a minute or so is all the time that is necessary to produce such a result, after which the vaporized oil, passing from the canal *p* through the chamber *e* and tube *c* to the burner *f*, is ignited, and then the heating or vaporizing of the hydrocarbon is automatic, and the receptacle or pan *l* may be removed. The flame produced at *f* by the burning of the vapor is directed in an upward direction against the mantle or cone *q* and side-wise against the chimney *d'*, the ring *d*, and the tube *a*. The tubes *a* and *b* are thus rapidly heated and in turn rapidly heat up the chamber *e*, which then serves as the heating or vaporizing chamber. At the same time the air which enters through the perforations *g* and *i* is also heated, as well as the air between the tubes *b* and *c*, which enters the tube *e* through the perforations *k* in the tube *c*. The vaporized hydrocarbon is therefore mixed in the tube *c* with heated air, the air combining with the vapor before it reaches the burner *f* in such quantities that a sootless and very hot flame is produced at *f*, which flame readily heats the mantle or cone *q* to incandescence.

In practice it has been found desirable to fill the chamber *e* with small shot or bunches of wire, so that the hydrocarbon is divided up into small streams, which may be more readily vaporized by the heat of the chamber *e*. The basket-like or pronged head *a'* of the tube *a* permits the entrance of air to the chimney *d'*.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hydrocarbon-lamp, a burner consisting of concentric tubes, whereof the outer forms a support for the lamp-chimney and the inner a burner and mixing-chamber, the inner tube being perforated at its upper and lower ends and the outer tube perforated at its lower end, a vaporizing-chamber located in the lower end of the outer tube and adapted to be heated thereby, said inner tube being supported on and in direct communication with the vaporizing-chamber and in contact at its upper end only with the outer tube, substantially as described.

2. In a hydrocarbon-lamp, a burner consisting of three concentric tubes, whereof the outer and middle tubes are fitted snugly together at their perforated lower ends, the upper end of the outer tube forming an open support for the lamp-chimney, the upper end of the middle tube constituting the burner, the body of the internal tube perforated at its lower and upper ends and being of less diameter than the internal diameter of the middle tube, the said internal tube being enlarged at its upper end to fit snugly in said middle tube, in combination with a vaporizing-chamber in the lower portions of said three tubes and in open communication with the internal tube, substantially as described.

In witness whereof I hereunto set my hand in presence of two witnesses.

SIEGFRIED MARCUS.

Witnesses:

VICTOR TISCHLER,  
FERDINAND SATTLER.