

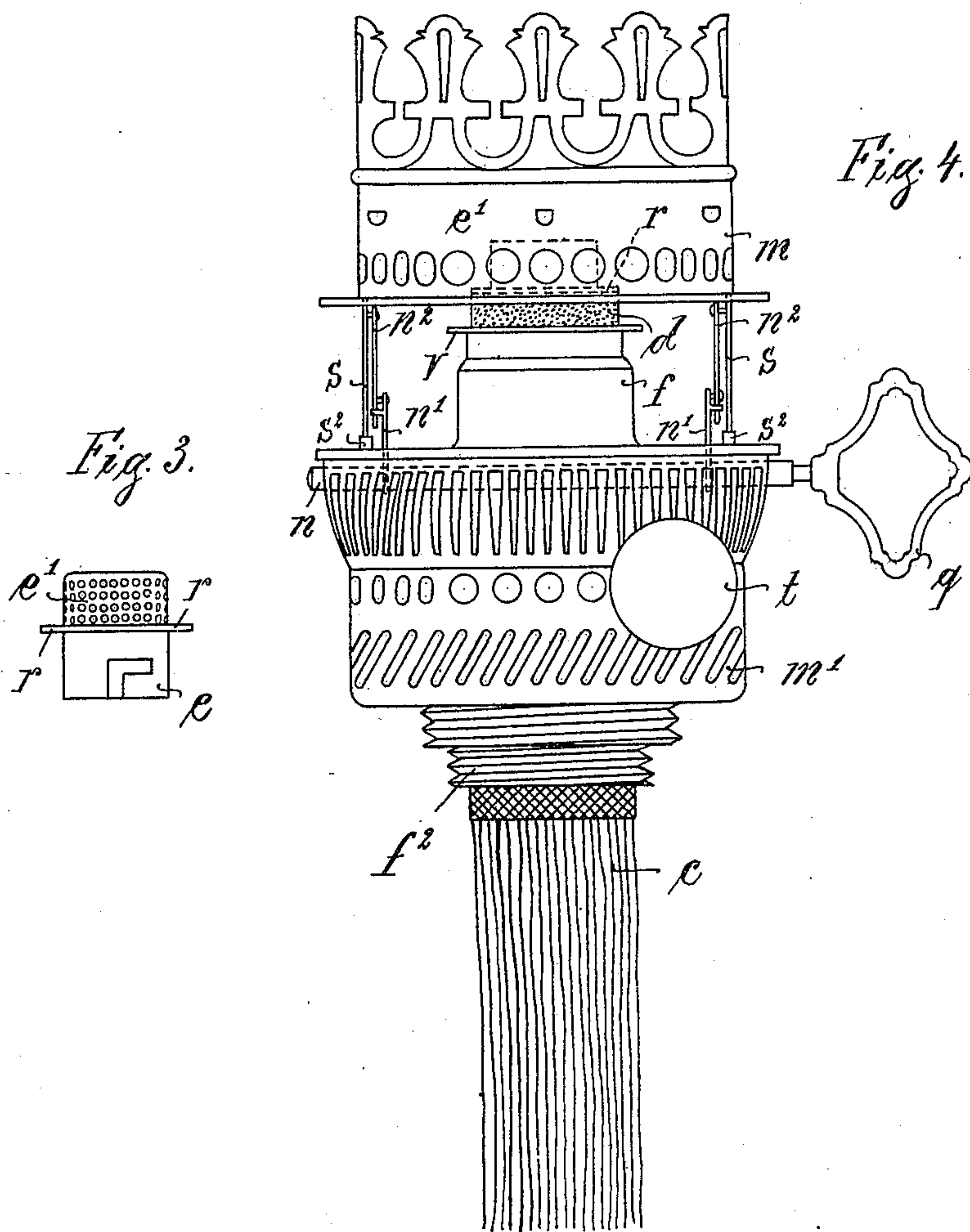


H. HURWITZ & R. LEHMING.  
 BLUE FLAME BURNER.  
 APPLICATION FILED MAR. 2, 1907.

917,302.

Patented Apr. 6, 1909.

2 SHEETS—SHEET 2.



Witnesses:  
 Arthur Scholz  
 Paul Wallenberg

Inventors:  
 Hermann Hurwitz  
 and Richard Lehming  
 by Robert Seifert  
 Attorney



# UNITED STATES PATENT OFFICE.

HERMANN HURWITZ AND RICHARD LEHMING, OF BERLIN, GERMANY; SAID LEHMING  
ASSIGNOR TO SAID HURWITZ.

## BLUE-FLAME BURNER.

No. 917,302.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed March 2, 1907. Serial No. 360,261.

*To all whom it may concern:*

Be it known that we, HERMANN HURWITZ and RICHARD LEHMING, both subjects of the King of Prussia, German Emperor, and residents of 56 Stralauerstrasse, Berlin, Kingdom of Prussia, German Empire, have jointly invented Improvements in Blue-Flame Burners, of which the following is an exact specification.

Our invention relates to a blue flame burner arrangement for lamps, burning oil or the like hydro-carbons and in particular refers to a burner where the flame issues from the lateral surface of the wick only.

The object of the present invention is to provide for a regulating organ, by means of which the blue flame formed on the sides of the wick is regulated as well as extinguished. Said object is obtained by means of a special constructed tube adapted to slide up and down on the outer wick tube of the stationary wick in combination with an air baffling cap for the conducting and baffling of incoming air to and near the burning surface of the lamp.

The regulating organ principally consists of a hollow tube fitted over the outer wick tube, which at its upper end slides on the outer surface of the wick. This upper end of the regulating tube is provided with an outward projecting flange, that is to serve as a protection for the burning flame, in as much as it catches part of the upward directed air stream and prevents a direct striking of the latter against the burning wick surface which would cause partial or complete extinguishing of the flame. The lower part of said regulating tube is also provided with outward projecting circular plates which serve the purpose of baffling the full stream of the incoming outer air current. By means of this regulating tube and the means to slide said tube up and down an easy and practical regulation and extinguishing of the flame is accomplished. In combination with said regulating tube a special air-cap is provided. Said cap is attached to the inner wick tube by suitable means and has an outward projecting flange that rests upon the top surface of the wick tip, covering same entirely which is of considerable importance when the wick tip is arranged quite separate from the part which projects into the oil holder and which is herein referred to as the feeder wick. This arrangement firstly prevents a

burning of the wick tip at the top, secondly by pressing upon the wick tip it insures a close contact between the separate feeder wick and the wick tip at their joint, thus causing an uninterrupted flow of the oil between the two wicks, and thirdly it effects a safe and sure extinguishing of the flame by moving the regulating tube upward, until the projecting flange on the top end of same comes in line with said flange of the air cap resting on top of the wick tip.

In order to make our invention better understood we accompany same by drawings in which:

Figure 1 is a vertical section of the complete burner. Fig. 2 is a side elevation of the burner with the outer parts and the regulating tube removed. Fig. 3 is a side view of the air cap and Fig. 4 is a side view of the complete burner arrangement with the upper part, the so-called gallery, shown in an up-lifted position.

On these drawings *a* designates the inner and *b* the outer wick tube.

*c* is the stationary feeder wick arranged between the two wick tubes.

*c'* are slots cut into the two lower parts of the two wick tubes and the wick and positioned diametrically opposite one another.

The wick tip placed on top of the feeder wick consists of two parts, an inner layer *d'* and an outer mantle *d*, the latter being of harder material than the inner layer. On the upper part of the outer lateral surface of this wick tip mantle *d* the blue flame is formed.

On top of the wick tip an air cap *e* is placed. This cap is provided with an outwardly projecting flange *r* somewhere near the central portion thereof, which flange rests upon the top surface of the wick tip. The upper part of the cap *e* above said flange is provided with several rows of perforations *e'*, whereas the lower part is attached to the inner wick tube by means of a bayonet-slide or by similar means. In attaching the air cap to the inner wick tube the flange *r* presses upon the wick tip, which in turn forces the lower end of the wick tip against the top of the feeder wick and in this way accomplishes a close contact between the two wicks at their joint, so that the ascending oil can freely flow from the one wick part to the other. The regulating tube *f* is arranged around the outer wick tube *b* and is suitably



guided thereon, which may for instance be done by means of a tongued joint affixed to the regulating tube, said tongue projecting into a groove cut into the outer wick tube.

5 A rack  $f'$  is attached to the lower part of the regulating tube  $f$ . Said rack engages with the pinion  $t'$  mounted on a rod  $t$ .

On or near the top of the regulating tube  $f$  an outwardly projecting flange  $v$  is attached.  
10 This flange serves the purpose of protecting the burning flame against the direct draft of the upwardly streaming fresh air current and prevents an extinguishing of the flame. Furthermore there are circular plates  $p, p'$  attached to the lower part of the regulating tube  $f$ , that principally serve the purpose of baffling the incoming fresh air current. The exact location of said plates depends on the construction of the burner employed.

20 In order to avoid a vacuum between the regulating tube  $f$  and the outer wick tube  $b$  and thereby prevent an easy relative motion between said tubes, a small hole  $o$  is made in the tube  $f$ . Outside of the tube  $f$  and around the wick tip an outer burner cap  $k$  is arranged, which cap  $k$  in combination with the flange  $v$  on regulating tube  $f$  forms an air conducting and baffling device to and near the burning flame. In order to limit the  
30 lowest position of said flange  $v$  and thereby the lateral burning of the lamp, the rack  $f'$  is extended to butt against the bottom of the threaded ring  $f^2$  attached to the lowest part of the burner, whenever the lowest position of the flange  $v$  is reached.

The plates  $p, p'$ , in preventing the outer air current from becoming too strong, at the same time allow for a sufficient quantity of air to enter through the slots  $c'$  cut into the  
40 lower part of the outer and inner tube  $a$  and  $b$  and the feeder wick  $c$  at different places. This current of air follows the central hollow formed by the inner air tube  $a$  and escapes at the top through the small perforations  $e'$  of the air cap  $e$ , whence it streams into the blue flame.

Between the outer mantle  $d$  of the wick tip and the outer wick tube  $b$  there is at their place of joining a small air space  $i$  left between which serves the purpose of preventing  
50 a creeping of the surplus oil beyond that place and between the tubes.

The outer casing of the lamp consists of two parts, an upper movable portion,  $m$ , the so-called gallery, and a lower stationary part  $m'$ . The gallery holds the lamp cylinder and is adapted to be raised and lowered by means of a shaft  $n$  eccentrically journaled into the stationary casing  $m'$ . This shaft is  
55 provided with a handle  $q$  and levers  $n'$  affixed thereto. The latter hinge into links  $n^2$  whose upper ends are pivoted to rails  $s$  guided in sockets  $s^2$ . These sockets are firmly attached to the stationary lower  
65 casing  $m'$ .

In the following the operating of the lamp is explained: If the burner is to be lighted the gallery  $m$  is uplifted by means of turning the handle  $q$  clockwise. Meanwhile the regulating tube  $f$  is placed at its lower position, *i. e.* with the rack-end  $f'$  abutting against the bottom of ring  $f^2$ . Now the wick tip is lighted at its free outer surface at the sides and, after a little warming up of the burner has taken place, the gallery  $m$  is lowered and a blue burning flame appears at once. The full force of the instreaming current of fresh air is baffled by the circular plates  $p$  and  $p'$  and the reduced current passing said plates is conducted between the  
70 outer cap  $k$  and the regulating tube  $f$  toward the flame, but a direct striking against the lateral burning surface of the wick tip is prevented by the projecting flange  $v$ . At the same time a sufficient air current enters  
75 the slot  $c$  on the lower portion of the wick tubes and rushes through the central passage to the inside of the flame, entering into same through the perforations  $e'$  of the air cap  $e$ . If the flame is to be extinguished the knob  
80 attached to the outside of the rod  $t$  is turned counter-clockwise, which raises the regulating tube  $f$ . The flange  $v$  at the end of said tube slides up on the sides of the burning wick part and in this way extinguishes the  
85 flame, which object is thoroughly accomplished as soon as said flange  $v$  is in line with the flange  $r$  of the air cap  $e$ .

Having thus fully described the nature of our said invention, what we desire to secure  
90 by Letters Patent of the United States, is:—

1. A blue flame burner for burning oils and other hydrocarbons having in combination a wick with an outside lateral burning surface, outer and inner wick holding tubes, an inner  
95 perforated cap arranged on the inner wick tube, a slidable regulating tube adapted to slide over said lateral burning surface of the wick, a baffle flange at the upper end of said regulating tube and an outer burner cap extending as a hood over the end and exposed part of said wick and surrounding said slidable regulating tube.

2. In a blue burner for burning oils and the like hydrocarbons having an outside  
100 lateral burning surface the combination of a burner cap  $k$  arranged around the wick tip with a flame regulating tube  $f$  fitted on the outer wick tube and adapted to slide up and down thereon, said regulating tube being  
105 provided with an outwardly projecting flange  $v$  at its upper end and with circular air baffling plates  $p, p'$  near its bottom, substantially as described and for the purpose set forth.

3. In a blue burner for burning oils and the like hydrocarbons having an outside  
110 lateral burning surface the combination comprising a burner cap  $k$  arranged around the wick tip, a flame regulating tube  $f$  fitted on  
115  
120  
125  
130



the outer wick tube and adapted to slide up and down thereon, an outwardly projecting flange *v* attached to the upper end of the regulating tube, circular air baffling plates *p*, *p'* connected to the lower part of the regulating tube and a perforated air cap *e* having an outwardly projecting flange *r* attached near the central portion thereof said flange resting upon the top surface of the wick tip and covering same, substantially as described and for the purpose set forth.

4. In a blue burner for burning oils and the like hydrocarbons having an outside lateral burning surface, the combination providing for conducting of air to the inner and outer part of the flame, comprising an outer and inner wick tube with a stationary feeder wick between, the hollow of said inner wick tube forming a central air passage, said wick tubes and inclosed wick being provided with longitudinal openings at the lower portion thereof to allow for an entering of outside air to the said central air passage, a perforated air cap *e* disposed on the top end of said central air passage and having an outwardly projecting flange *r* attached near the central portion thereof, said flange resting upon the top surface of the wick tip, means for detachably fastening said cap to the inner wick tube, a flame regulating tube *f* fitted on the outer wick tube and adapted to slide up and down thereon, said regulating tube having circular air baffling plates *p*, *p'* disposed near its lower part and a flange *v* attached to its upper end, and a burner cap *k* arranged around the wick tip substantially as described and for the purpose set forth.

5. In a blue burner for burning oils and the like hydrocarbons the combination comprising a stationary feeder wick, an outer and inner wick tube holding the upper portion of said feeder wick said tubes and inclosed wick having slots formed therein for the passage of air to the central wick tube a separate wick tip disposed on top of the feeder wick and consisting of an outer and inner layer, the outer layer having the lateral burning surfaces on the outside, a burner cap *k* arranged around the wick tip, a flame regulating tube *f* fitted on the outer wick tube and adapted to slide up and down thereon, an outwardly projecting flange *v* attached to the upper end of the regulating tube, circular air baffling plates *p*, *p'* connected to the lower part of the regulating tube, means for moving said regulating tube and means for

limiting the lowest position thereof, a perforated air cap *e* having an outwardly projecting flange *r* attached near the center portion thereof, said flange resting upon the top surface of the wick tip and covering same, and means for attaching said burner cap to the inner wick tube.

6. In a blue burner for burning oils and the like hydrocarbons the combination comprising a stationary feeder wick, an outer and inner wick tube holding the upper portion of said feeder wick said tubes and inclosed wick having slots formed therein for the passage of air to the central wick tube, a separate wick tip disposed on top of the feeder wick and consisting of an outer and inner layer, the outer layer having the lateral burning surfaces on the outside, a burner cap *k* arranged around the wick tip, a flame regulating tube *f* fitted on the outer wick tube and adapted to slide up and down thereon, an outwardly projecting flange *v* attached to the upper end of the regulating tube, circular air baffling plates *p*, *p'* connected to the lower part of the regulating tube, means for moving said regulating tube and means for limiting the lowest position thereof, a perforated air cap *e* having an outwardly projecting flange resting upon the top surface of the wick tip and covering same, means for attaching said air cap to the inner wick tube, a gallery *m* adapted to be raised and lowered and means to accomplish the moving of said gallery, substantially as described and for the purpose set forth.

7. A blue flame burner for burning oil and other hydrocarbons having in combination an outer and inner wick tube, a suction wick between said tubes, a separate wick tip at the upper end of said suction wick and between said tubes, an inner perforated cap at the upper end of said inner wick tube, a flange on said cap resting on the upper edge of said wick tip, a slidable regulating tube fitted over the outer wick tube, a baffling flange on said regulating tube at its upper end, for the purpose set forth.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

HERMANN HURWITZ.  
RICHARD LEHMING.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.