

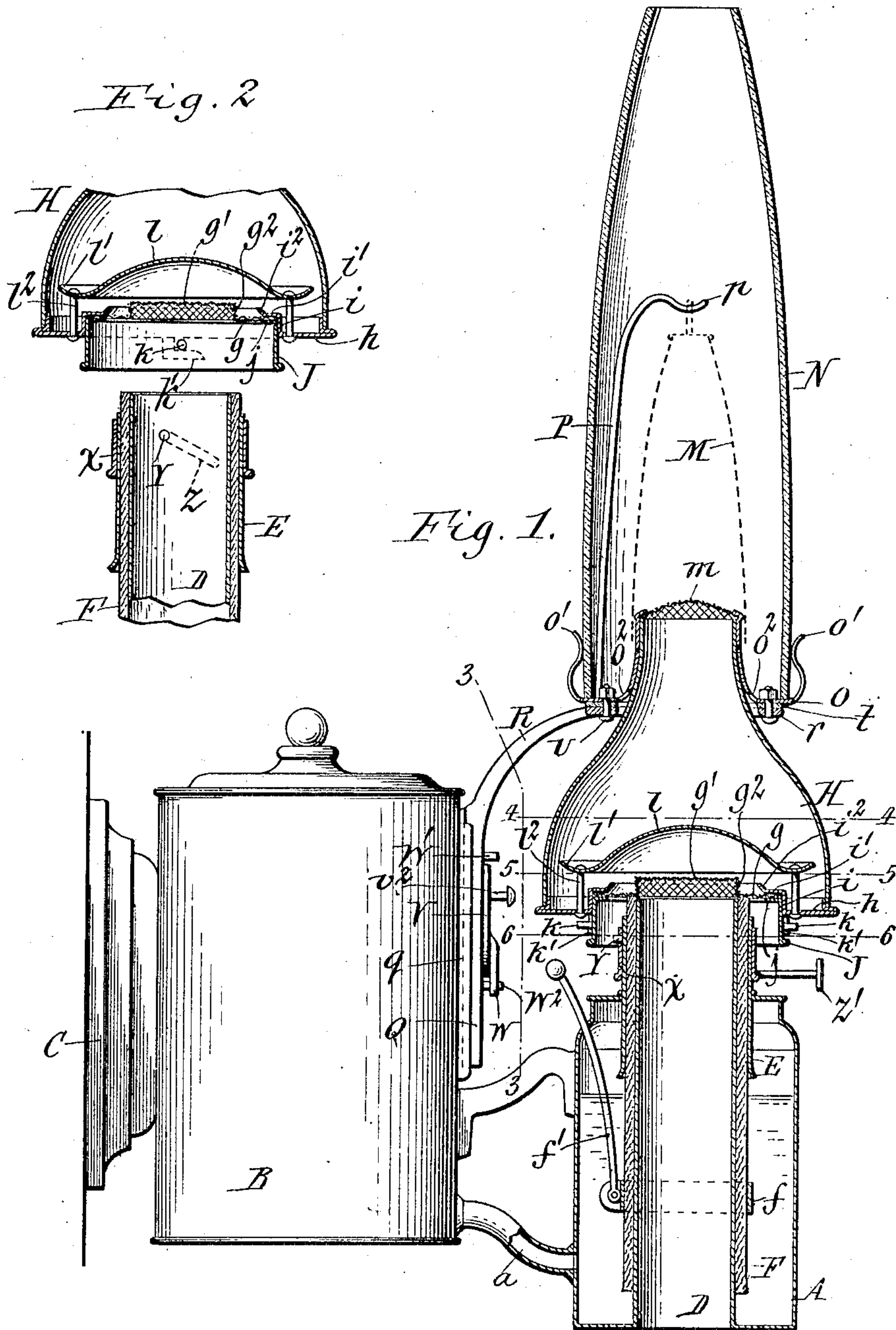
No. 871,100.

PATENTED NOV. 19, 1907.

F. A. BAYNES.
OIL BURNER FOR LAMPS AND STOVES.

APPLICATION FILED MAR. 12, 1906.

2 SHEETS—SHEET 1.



Witnesses:

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Fig. 3.

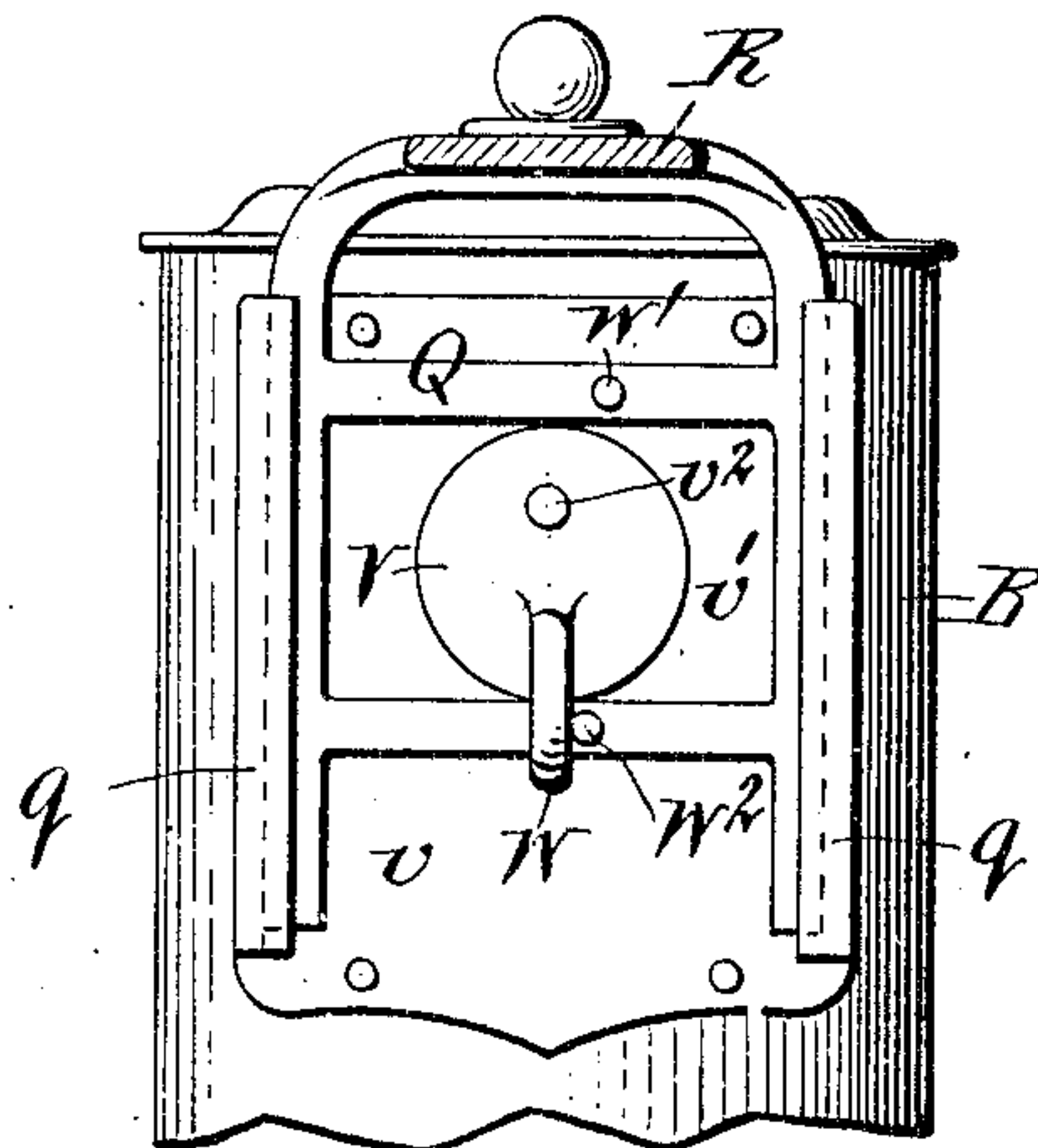


Fig. 4.

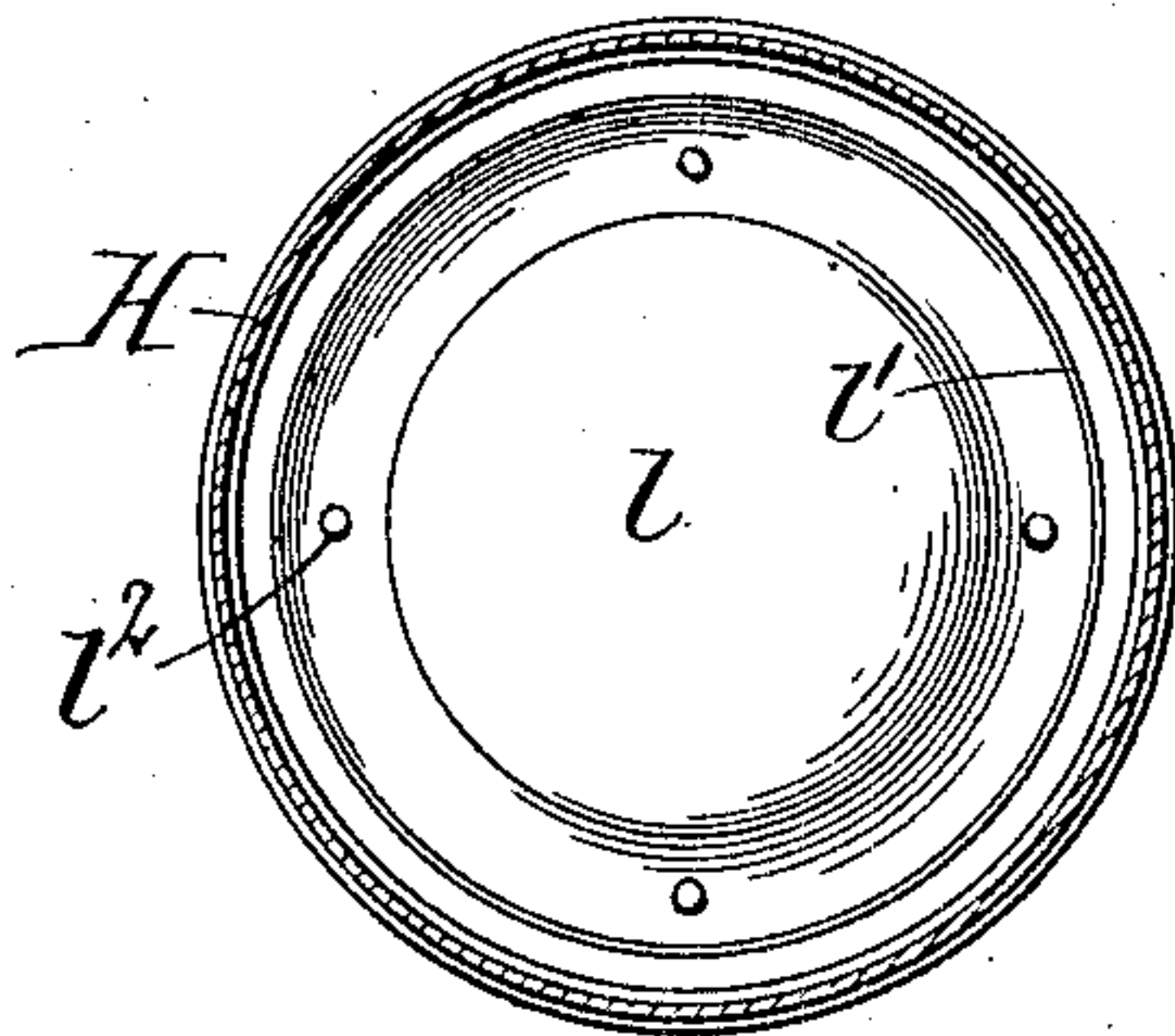


Fig. 5.

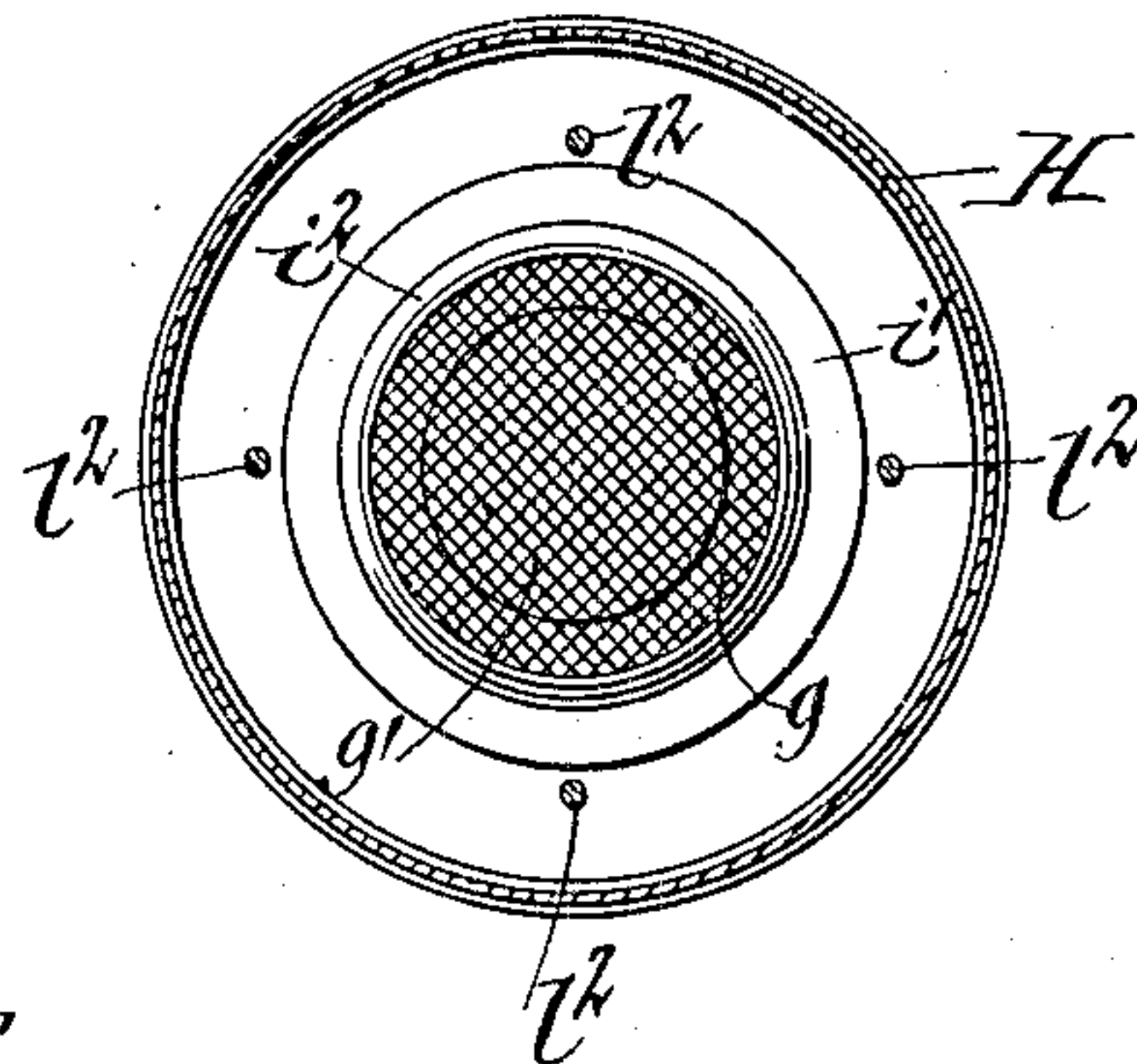
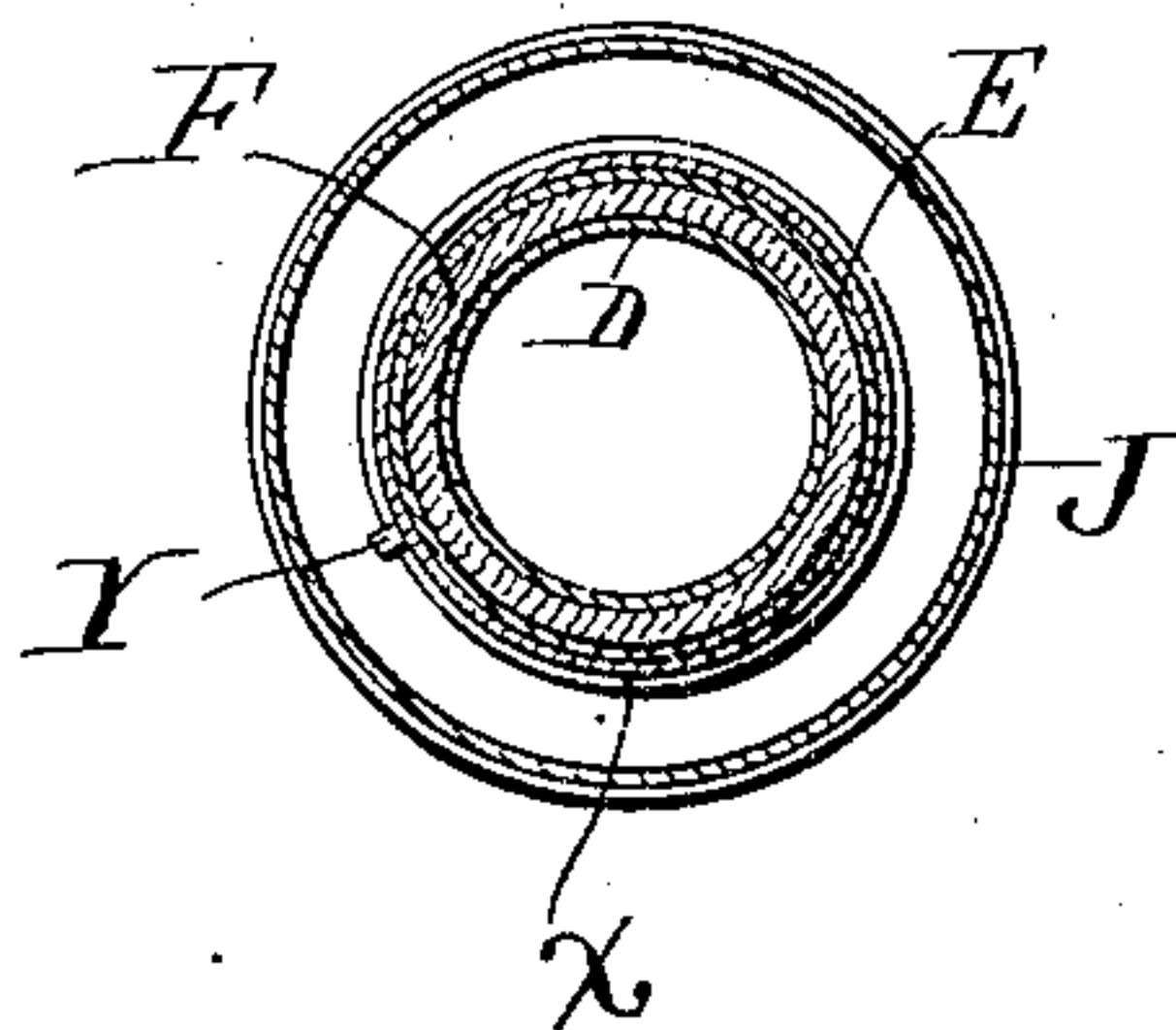


Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK A. BAYNES, OF BUFFALO, NEW YORK.

OIL-BURNER FOR LAMPS AND STOVES.

No. 871,100.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed March 12, 1906. Serial No. 305,501.

To all whom it may concern:

Be it known that I, FREDERICK A. BAYNES, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Oil-Burners for Lamps and Stoves, of which the following is a specification.

This invention relates to a kerosene or other oil burner in which the oil is first converted into vapor and then mixed with air to form the gas which is subsequently burned for producing heat or illumination.

The object of my invention is to provide a burner of this character which is safe and easily handled, which produces a light of increased candle power for the amount of oil consumed and which is so constructed that the parts are free from soot and not liable to become easily disarranged.

In the accompanying drawings consisting of two sheets:—Figure 1 is a vertical section of my improved burner applied to a lamp. Fig. 2 is a fragmentary sectional view of the vapor generator and the mixer raised above the generator. Fig. 3 is a fragmentary vertical section in line 3—3, Fig. 1. Figs. 4, 5 and 6 are horizontal sections in the correspondingly numbered lines in Fig. 1.

Similar letters of reference indicate corresponding parts throughout the several views.

Although the drawings show my improved burner in connection with a lamp for illumination the same is equally applicable to an oil stove for heating purposes.

A represents the oil pot of the lamp or stove which has its lower end connected by a tube *a* with an oil supply reservoir B arranged adjacent thereto. The oil pot and reservoir may be supported in any suitable manner but, as shown in the drawings, the same are supported on a wall by means of a bracket C attached to the oil reservoir.

D represents an upright inner air flue or wick tube which extends from the bottom of the oil pot through an opening in the top thereof and terminates at its upper end some distance above said top.

E is an outer wick tube surrounding the inner tube and extending downwardly part way into the upper part of the oil pot while its upper end terminates some distance short of the upper end of the inner tube.

F represents the tubular wick which is arranged in the annular space between the inner and outer tubes D, E and is

immersed at its lower end in the oil contained in the pot. The upper end of the wick terminates flush with or slightly above the upper end of the inner tube so that little or no part of the inner side or bore of the wick is exposed but a considerable part of its outer side or peripheral area is exposed owing to the termination of the upper end of the outer tube below the corresponding end of the inner tube.

Any suitable means may be provided for adjusting the wick lengthwise between the inner and outer tubes when necessary. The means for this purpose shown in the drawings consists of an adjusting collar *f* embracing the lower part of the wick and a handle or finger piece *f'* extending from one side of the adjusting collar through an opening in the top of the oil pot.

Above the upper end of the wick is arranged a vapor generator screen of woven wire or the like which preferably consists of an outer horizontal annular flange *g* and an upwardly dished central part having a horizontal top *g'* and a cylindrical side wall *g''* which connects the outer edge of the top with the inner edge of the flange. When this screen is in its operative position the inner part or edge of its flange rests upon or is arranged close to the upper edge of the wick and the upwardly dished central part thereof is arranged with its cylindrical wall in line with the bore of the inner wick tube, as shown in Fig. 1.

The outer edge or marginal part of the flange of the screen is mounted on the bottom *h* of an upwardly narrowing or contracting dome H. The connection between the screen and said bottom is preferably so constructed as to form an annular air supply channel or space around the wick at the upper end thereof and also to permit of readily replacing the screen when worn out. The means for this purpose shown in the drawings are constructed as follows:—*i* represents an upwardly projecting cylindrical wall arranged at the edge of a circular opening formed centrally in the bottom of the dome. At its upper edge this cylindrical wall is provided with an inway projecting horizontal flange *i'* which is provided at its inner edge with an upwardly tapering or inclined annular deflecting rim *i''*. The latter terminates at its upper edge slightly below the top of the central dished part of the generator screen. The diameter of the periphery of the

screen flange *g* is the same or nearly so as the internal diameter of the cylindrical wall *i* which receives this screen flange. The screen flange bears with its upper side adjacent to its periphery against the underside of the flange *i'* of the cylindrical wall and is held against the same by means of an inwardly projecting flange *j* arranged at the upper end of a cylindrical hood *J* which fits with its upper portion into the central wall *i* of the dome. The lower part of this hood projects some distance downwardly below the bottom of the dome and the upper edge of the outer wick tube so as to form an annular air space or conduit around the upper part of the wick which conduit is open at its lower end to admit the external air. That portion of the screen flange *g* between the periphery of the wick and the inner edge of the flanges is uncovered or exposed so as to permit the air and gases to pass from the interior of the hood through this portion of the screen into the lower part of the dome. Air also passes from the exterior upwardly through the central tube or flue and through the cylindrical wall and top of the dished part of the screen into the lower part of the dome. The hood is detachably held in place on the lower part of the dome the preferred means for this purpose shown in the drawings consisting of pins *k* projecting outwardly from the lower part of the hood and engaging with hooks *k'* on the underside of the dome bottom. Upon turning the hood its locking pins may be moved into or out of engagement with the hooks *k'* for fastening or releasing the generator screen. The wall *i* and the flange *i'* practically form a socket in which the generator screen is secured by a clamp consisting of the hood *J*, flange *j*, the pins *k* and hooks *k'*. In the lower part of the dome is arranged a spreader or deflector which consists of an upwardly dished central part *l* and an upwardly turned marginal flange *l'*. This deflector is arranged in the dome above the screen and its socket so as to form a gas passage which conducts the vapors from the wick laterally to the sides of the dome at the lower end thereof, and the periphery of the deflector is separated from the wall of the dome so as to form an annular passage or conduit between the edge of the spreader and the wall of the dome through which the gas passes from the lower part of the dome to the upper part thereof. The deflector is supported in its central position relatively to the dome, the wick and adjacent parts by means of a plurality of upright pins or posts *l²* which are connected at their upper ends with the deflector near the margin thereof while their lower ends are secured to the bottom of the dome adjacent to the outer side of the screen socket.

At its upper end the dome is provided with

a burner screen *m* over which hangs an incandescent mantle *M* and around said mantle and the upper part of the dome is a chimney *N* of glass or other transparent material.

The dome, mantle and chimney are movably supported so that the same and the parts connected therewith may be raised for exposing the upper end of the wick and permit of lighting and trimming the same. The means for this purpose may be variously constructed but those shown in the drawings as illustrating one way of accomplishing this result are constructed as follows:—

O represents a gallery secured around the upper part of the dome and supporting the chimney at its lower end, the latter being removably held in place on the gallery spring tongues or fingers *o'* projecting upwardly from the outer edge of the gallery and bearing against the outer side of the chimney. Rising from the bottom of the gallery within the chimney is a rod *P* which is provided at its upper end with an arm *p* upon which the upper end of the incandescent mantle is supported.

Q represents a vertically movable slide which is guided in ways *q, q* on the adjacent part of the oil reservoir and provided at its upper end with a laterally projecting bracket *R* which terminates in a supporting ring *r*. This ring surrounds the dome below the gallery and supports the latter by means of an interposed washer or ring of asbestos *t* whereby the transmission of heat from the gallery to the oil reservoir is minimized and danger of overheating the latter is avoided. The supporting ring and gallery may be connected in any suitable manner, for instance as shown in Fig. 1, by means of bolts *U* extending vertically through the lower part of the gallery, the asbestos insulating ring and the supporting ring.

The raising and lowering of the slide on the guides of the oil reservoir may be effected in various ways, a suitable means for this purpose being shown in the drawings, the same consisting of a rotary cam or eccentric *V* pivoted on a plate *v* which connects the guides and working in a horizontal slot or opening *v'* in the slide. Upon turning this cam so that its salient part is vertically below its pivot, the bracket and upper parts of the burner supported thereon are lowered into their operative position in which the generator screen rests or nearly rests upon the upper end of the wick and the hood *J* surrounds the upper end of the wick and the outer wick tube, as shown in Fig. 1. Upon turning the cam so that its salient part is vertically above the pivot the slide is raised into its highest position, whereby the upper parts of the burner are raised so that a clear space is formed between the generator screen and hood and the upper end of the wick and its inner and outer tubes, which position of

the parts affords sufficiently free access to the wick for lighting the same. The cam is preferably turned by means of a laterally projecting thumb piece, handle or arm W arranged on the front side thereof and its turning movement is arrested when the slide is in its highest and lowest positions by means of stop pins or lugs W', W² arranged on the slide above and below the cam in position to be engaged by its thumb piece or handle.

For the purpose of lighting the wick it is only necessary to expose the same sufficiently to permit of reaching the same easily with a match and the throw of the cam has therefore been so determined that upon rotating the same upwardly the upper parts of the burner will be raised a sufficient distance above the wick to permit of properly lighting the same.

For trimming the wick it is necessary to have a greater amount of clearance space above the same and to permit of obtaining additional clearance, the pivot pin v^2 of the cam is extended forwardly some distance so to permit the cam to slip forwardly upon its pivot and out of its slot in the slide. When this is done the slide can be raised an additional distance until the lower side of the cam slot v' engages with the underside of the pivot pin v^2 which additional distance raises the hood and generator screen sufficiently high above the upper end of the wick to permit of conveniently and properly trimming the same.

After the lighting the wick and lowering the upper part of the burner so that its screen engages with the upper end or is close to the upper end of the wick the latter burns with a blue flame on the outer side of its upper end which is exposed above the upper end of the outer tube. The air for supporting this flame enters at the lower end of the hood. The burning of this flame causes the oil to be drawn upwardly from the oil pot and converted into a vapor which leaves the upper end of the wick, passes upwardly through the flange of the generator screen and into the lower part of the dome below the spreader. The flame striking the underside of the generator screen causes the same to become heated so that the air passing upwardly from the hood through the margin of the screen and from the central flue through the central part of the screen into the lower part of the dome becomes heated. The heated air upon rising through the central part of the screen strikes the central upwardly dished part of the spreader whereby this air is directed downwardly and laterally in all directions toward the side of the lower part of the dome. The central current of air and the side current of air and the current of vapor between them are heated to the highest point immediately above the flame of the

wick at which time the vapor and air have the greatest affinity for each other and produce an intimate mixture of the same which is possible at no other time. The air and the vapor are thus in the best condition for producing a gaseous mixture of the same so that the same contains a maximum number of heat units and has the greatest heating capacity. This intimate mixing of the air and vapor is further aided by the two currents of air constantly impinging against opposite sides of the current of vapor while the latter is drawn out into a continually thinning sheet upon being deflected by the spreader.

The conical rim i serves to prevent the side current of air from passing laterally immediately upon issuing upwardly from the flange of the screen and directs the same inwardly over the flame so as to insure bringing the same together with the vapor and inner air current over the hottest point where the same unite most readily. In the absence of this provision the two currents of air and vapor would be too cold and would not mix uniformly and intimately, resulting in the production of an inferior gas. The mixed air and vapor upon reaching the side of the dome at the lower end thereof pass upwardly through the annular space between the spreader and the dome into the upper part of the latter. Above the spreader the gas comes together and is conducted by the upper part of the dome to the burner screen through which it passes and is burned within the mantle in the usual manner, heating the latter to the point of incandescence and producing illumination in a well known manner.

The upward contraction of the dome is preferably in the form of a double reverse curve or ogee whereby the gases in passing upwardly through the dome do not encounter any abrupt shoulders or obstructions and are not suddenly deflected but are permitted to move smoothly and evenly in this direction, whereby the volume of gas as it passes upwardly through the dome is distributed uniformly over the same, thereby causing a uniform illumination of all parts of the mantle.

The passages in the dome are of such area that they permit an unrestricted flow of the gas to the outlet, thereby permitting a full draft which prevents condensation of gas and formation of odors from drippings. The gaseous mixture burns at the outlet of the dome with a blue flame. When the burner is embodied in a lamp, as shown in the drawings, this blue flame heats the mantle to a high degree of incandescence but when the burner is embodied in a stove or heater the gas issuing from the dome is burned in a radiator or in any other suitable manner.

By dishing the generator screen in the manner described the same furnishes a gas passage of larger area, it permits the central cur-

rent of air to strike the vapor more directly and it also stiffens the screen so that distortion thereof is prevented, causing the screen to be retained in a position in which the same bears evenly on all parts of the wick and producing a uniform generation of vapor around the entire wick. It has been found in practice that an irregular generation of gas is produced when the screen does not bear uniformly on all parts of the wick and causes an irregular supply of gaseous mixture to the mantle so that some part thereof burns more brilliant than another and therefore impairs the illuminating capacity of the same accordingly.

By burning the wick on its outer side only a larger flame is produced which increases the volume of heat for the generation of vapor and causes the air and vapor to be more perfectly combined and in the best proportion to effect complete combustion thereof, whereby the production of soot is avoided and less frequent cleaning of the burner is required.

My improved construction of burner is practically self regulating inasmuch as increase in heat at the mantle causes an increased flow of air through the hood which forces the generator flame nearer to the wick and thus increases the generation of vapor in the same measure as the supply of air increases and vice versa, thereby continually maintaining a balance between the air and vapor and preventing smoking or blackening of the mantle.

The generation of the vapor and the mixture of the air in the burner is so rapid that the mantle may be lighted immediately after the wick by the same match, rendering the burner absolutely odorless.

It will be observed that in my improved burner no metallic contact takes place between the upper or mixing part carrying the mantle and the lower or generating part connected with the oil pot. By this separation of the upper and lower parts of the burner gradual increase in the generation of vapor which otherwise would occur by metallic conduction of heat is avoided, thereby insuring a steady and even light or flame.

Openings ϕ^2 are formed in the bottom of the gallery within the chimney to supply air for supporting combustion at the mantle.

Any suitable means may be provided for extinguishing the burner without raising the upper part of the same. The means for this purpose shown in the drawings consist of a snuffer x , which is constructed in the form of a sleeve surrounding the outer wick tube above the oil pot. When the lamp is burning this snuffing sleeve is moved downwardly so that its upper edge is in line with or below the upper edge of the outer wick tube, as shown in Fig. 1. When it is desired to extinguish the burner the snuffer is moved upwardly on the outer wick tube until its upper

edge bears against or is close to the under side of the generator screen, whereby the outer side of the wick at its upper end is inclosed and air is excluded therefrom, thereby extinguishing the flame and arresting the further generation of gas. After the wick has been thus snuffed out the mantle continues to glow until the gas within the dome has been consumed which is but a comparatively short time. The raising and lowering of the snuffer is preferably effected by means of one or more pins Y arranged on the outer wick tube and projecting into a spiral or inclined slot Z in the snuffing sleeve. Upon turning this sleeve in one direction by means of a thumb piece Z' the wedge action of the slot in said sleeve against the pin Y causes the sleeve to move upwardly while rotary movement of this sleeve in the reverse direction causes the same to be moved downwardly by this means.

I claim as my invention:—

1. A burner comprising a tubular wick, an inner air tube arranged within the wick and extending practically to its upper end so as to cover the inner side of the wick, an outer wick tube surrounding the wick and terminating below the upper end of the wick so as to expose the outer side of the wick, and a generator screen having an upwardly dished foraminous central part which is arranged above the bore of said inner tube and a laterally projecting foraminous flange which is arranged transversely on the upper end of said wick, substantially as set forth.

2. A burner comprising a tubular wick, an inner air tube arranged within the wick and extending practically to its upper end so as to cover the inner side of the wick, an outer wick tube surrounding the wick and terminating below the upper end of the wick so as to expose the outer side of the same, a generator screen arranged transversely on the upper end of the wick and extending over said tubes beyond the outer side of the outer tube, a dome having a central opening in its bottom in which said wick, tubes and screen are arranged, and means for detachably securing said screen at its edge to said bottom, substantially as set forth.

3. A burner comprising a tubular wick, an inner air tube arranged within the wick and extending practically to its upper edge, an outer wick tube surrounding the wick and terminating below the upper edge of the wick, a generator screen arranged above said wick and tubes and extending laterally beyond the outer side of the outer tube, a dome having a central opening in its bottom which receives said wick, tubes and screen, and means for securing said screen at its edge to said bottom, consisting of a socket arranged on said bottom and having a flange against which one side of said screen bears, a circular clamping member having a flange

bearing against the opposite side of said screen and a pin and hook connecting said socket and clamping member, substantially as set forth.

5 4. A burner comprising a tubular wick, an inner air tube arranged within the wick and extending practically to its upper edge, an outer wick tube surrounding the wick and terminating below the upper edge of the
10 wick, a generator screen arranged over said wick and tubes and projecting laterally beyond the outer side of the outer tube, a dome arranged above said wick, tubes and screen, a bottom for said dome having a central
15 opening in which said wick, tubes and screen are arranged, a cylindrical wall projecting upwardly from the edge of said opening and having an internal flange which bears against the upper side of said screen and a cylin-
20 drical hood secured within said wall and having an internal flange which bears against the underside of said screen, substantially as set forth.

5 5. A burner comprising a tubular wick, an inner air tube arranged within the wick and extending practically to its upper end so as to cover the inner side of the wick, an outer
tube surrounding the wick and terminating below the upper end of the wick so as to ex-
30 pose the outer side of the wick, a generator screen arranged on the upper end of the wick, a dome arranged above said wick and tubes, a bottom for said dome having a central opening which receives the upper ends of
35 said wick, screen and tubes, and a circular spreader arranged in the dome above said wick, tubes and screen and extending laterally beyond the screen and separated at its edge from the inner side of the dome by an
40 annular passage which connects the spaces in the lower and upper parts of the dome, substantially as set forth.

6. A burner comprising a tubular wick, an inner air tube arranged within the wick and
45 extending practically to its upper end so as to cover the inner side of the wick, an outer wick tube surrounding the wick and terminating below the upper end of the wick so as to expose the outer side of the wick, a gen-
50 erator screen arranged on the upper end of the wick, a dome arranged above said wick and tubes, a bottom for said dome having a central opening which receives the upper ends of said wick, screen and tubes, a circu-
55 lar spreader arranged in the dome and separated at its edge from the side of the dome by an annular passage which connects the spaces in the lower and upper parts of the

dome, and posts which connect the spreader with the bottom of the dome, substantially 60 as set forth.

7. The combination of an oil reservoir, an oil pot supplied from said reservoir, a wick supplied from said pot, wick tubes arranged on the inner and outer sides of said wick, a 65 generator screen on the upper end of said wick but disengaged from said tubes, a dome arranged over said screen, and means which are disengaged from said wick tubes and which connect said screen with the dome, 70 substantially as set forth.

8. The combination of an oil reservoir, an oil pot, supplied from said reservoir, a wick supplied from said pot, wick tubes arranged on the inner and outer sides of the wick, a 75 generator screen arranged over said wick, a dome arranged over said screen, a supporting device for said screen which connects with said dome but which does not engage with said wick tubes, and a bracket mounted 80 on said reservoir and having a ring for supporting the dome, substantially as set forth.

9. The combination of an oil reservoir, an oil pot supplied from said reservoir, a wick supplied from said pot, wick tubes arranged 85 on the inner and outer sides of said wick, a generator screen arranged over said wick, a dome arranged over said screen, means for supporting said screen from the dome, a bracket supporting said dome, a vertically 90 movable slide supporting the bracket, guides arranged on said reservoir which receive said slide, and a cam for raising and lowering said slide, substantially as set forth.

10. The combination of a reservoir, an oil 95 pot supplied from said reservoir, a wick supplied from said pot, wick tubes arranged on the inner and outer sides of the wick, a generator screen arranged over said wick, a dome arranged over said screen, means for 100 supporting said screen from said dome, a bracket supporting said dome, a vertically movable slide supporting the bracket, guides on said reservoir which receive said slide, a rotary cam pivoted on the reservoir and 105 working in a slot in said slide, an operating handle on said cam, and stops arranged to be engaged by said handle for limiting the rotation of the cam, substantially as set forth.

Witness my hand this 10th day of March, 110 1906.

FREDERICK A. BAYNES.

Witnesses:

THEO. L. POPP,
E. M. GRAHAM.