

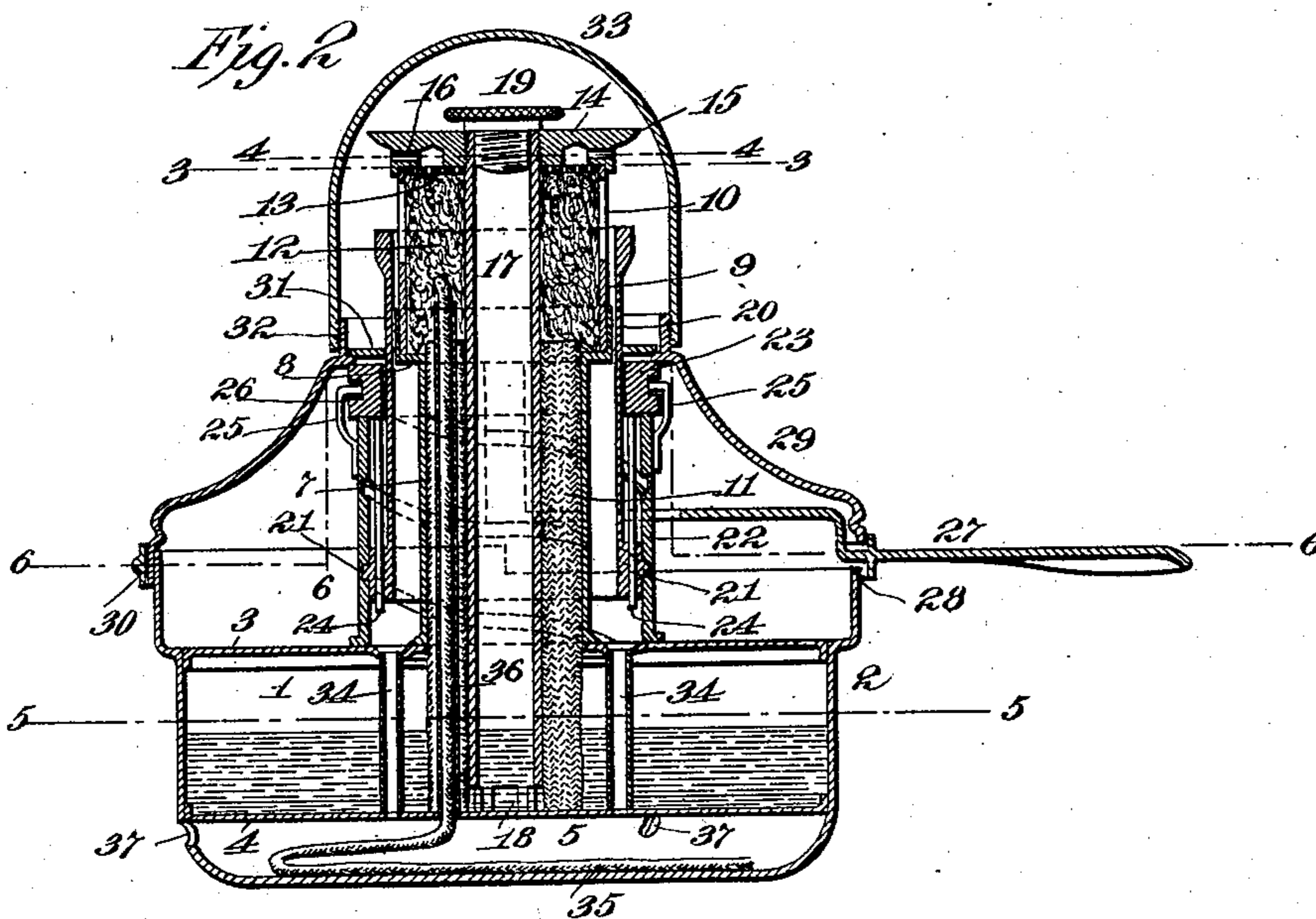
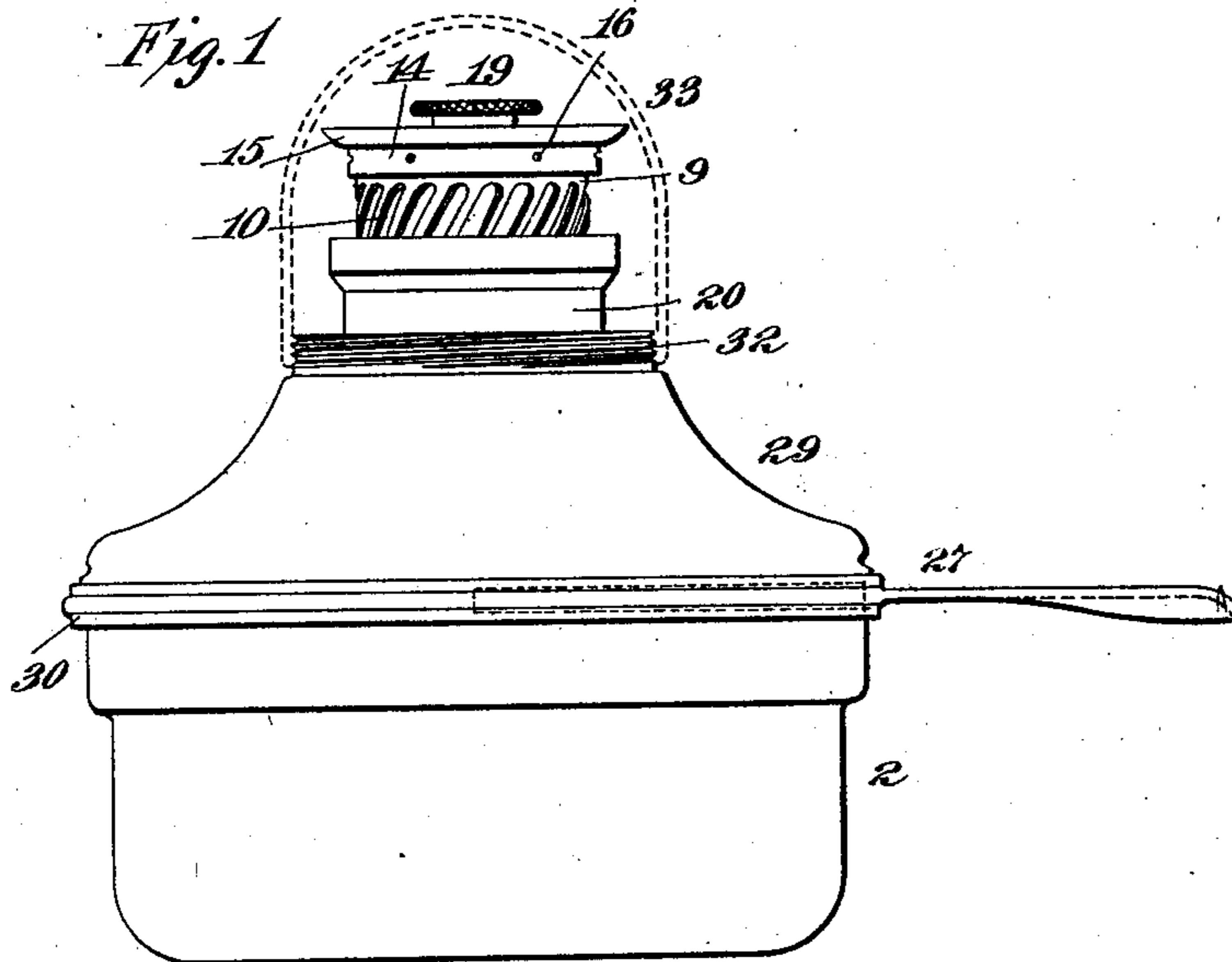
No. 720,634.

PATENTED FEB. 17, 1903.

J. P. STEPPE.  
ALCOHOL BURNER.  
APPLICATION FILED MAR. 14, 1900.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 3

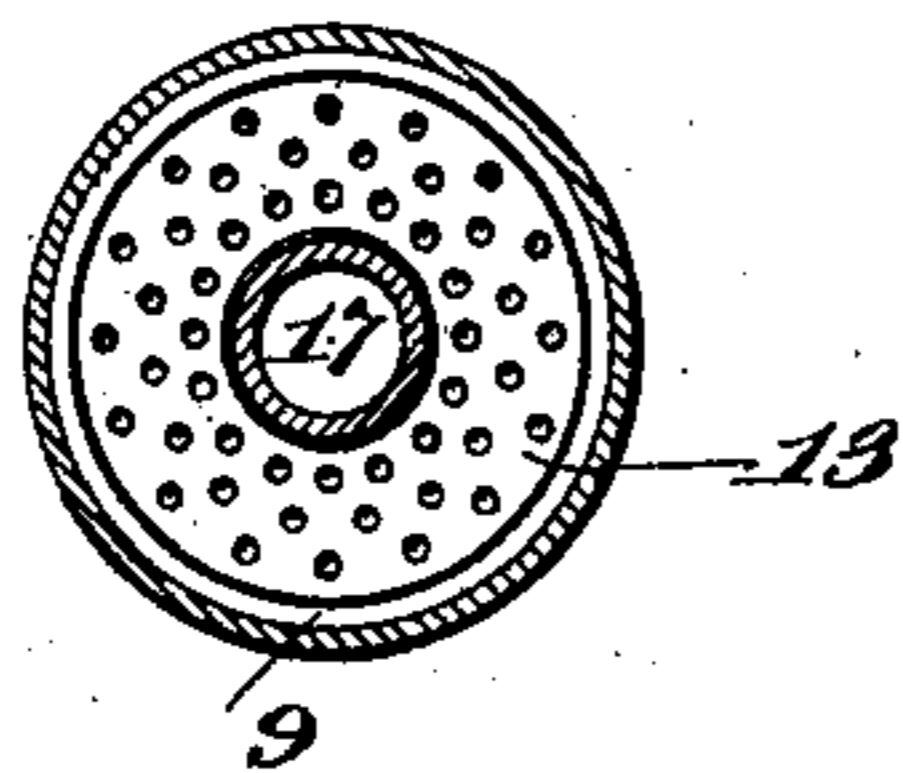


Fig. 4

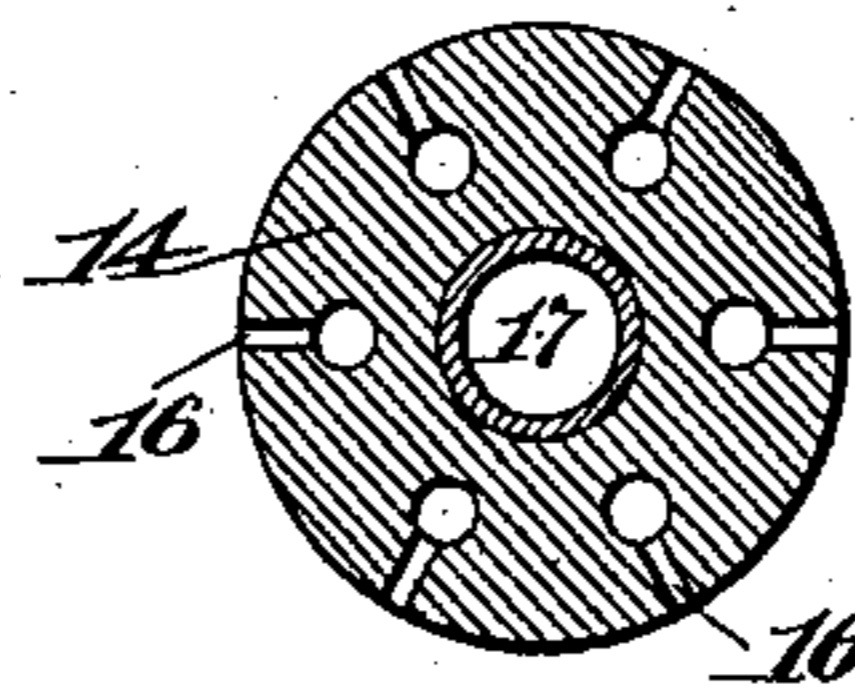


Fig. 5

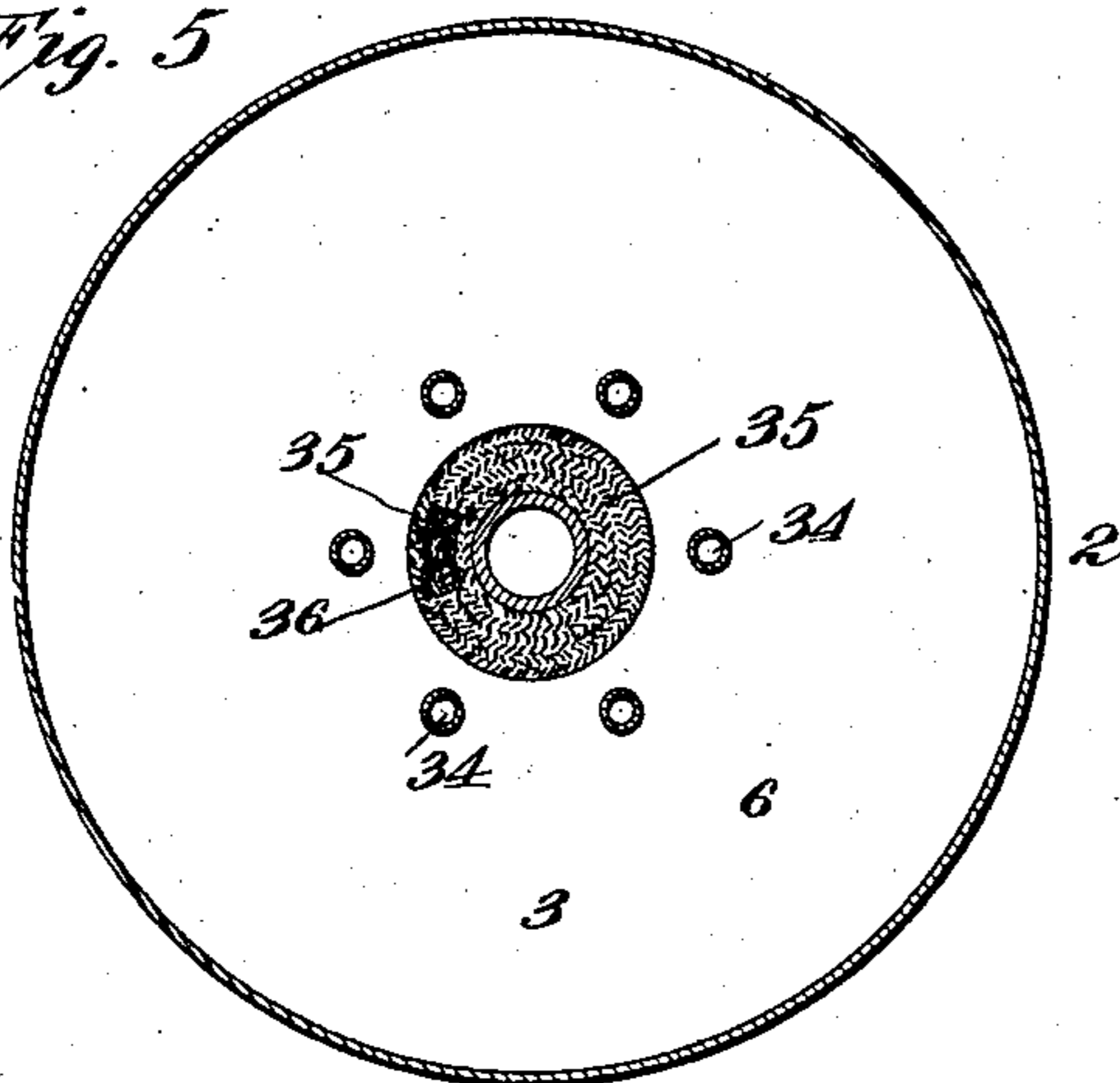
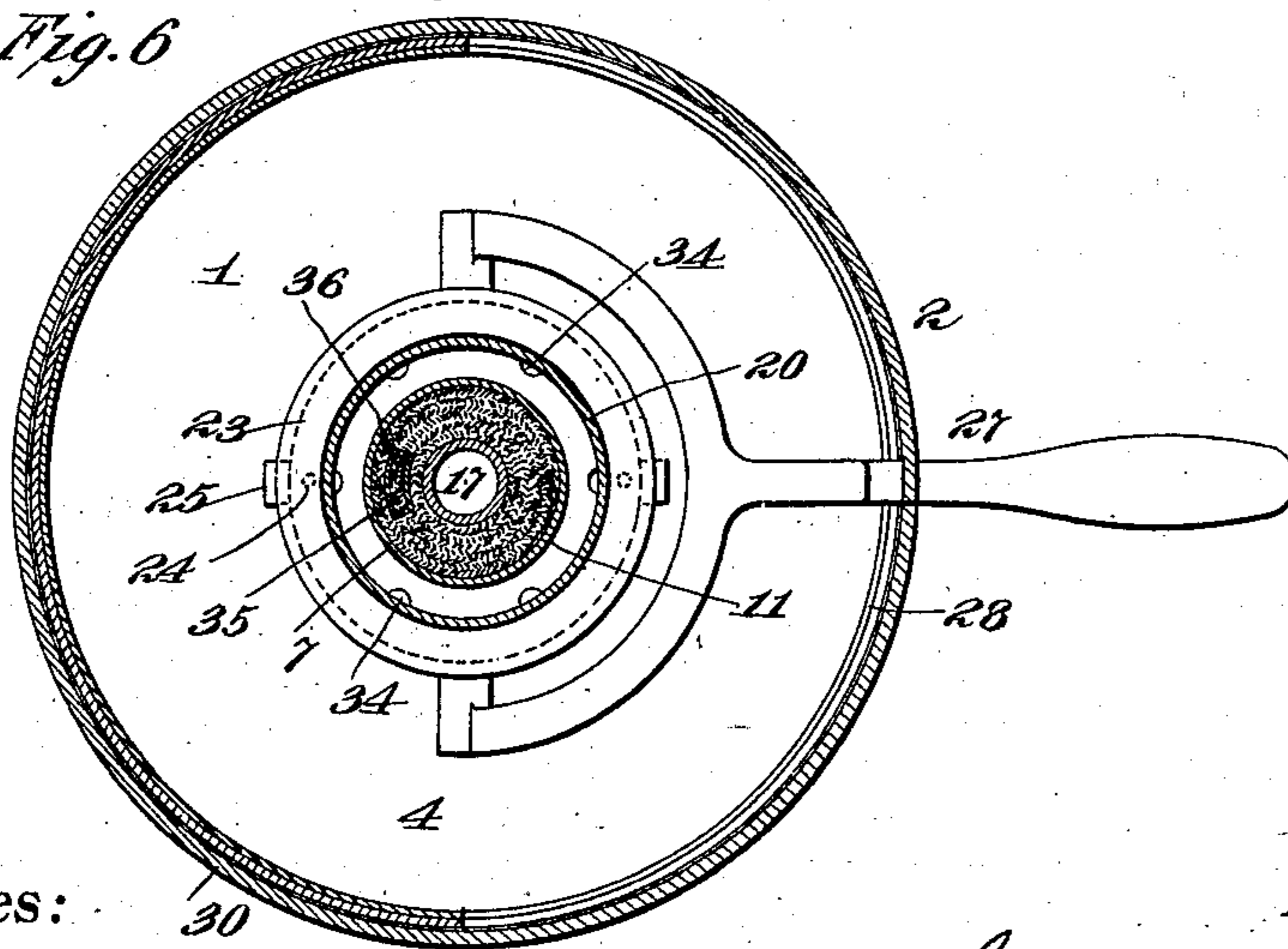


Fig. 6



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# UNITED STATES PATENT OFFICE.

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## ALCOHOL-BURNER.

SPECIFICATION forming part of Letters Patent No. 720,634, dated February 17, 1903.

Application filed March 14, 1900. Serial No. 8,589. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN P. STEPPE, a citizen of the United States, residing in the borough of Brooklyn, city and State of New York, have invented a certain new and useful Improvement in Alcohol-Burners, of which the following is a specification.

My invention relates to various new and useful improvements in alcohol-burners adapted especially for use in connection with chafing-dishes, but capable of any other use wherein the production of a very hot flame with absolute safety is essential.

My objects are to secure an improved construction of alcohol-burners by which a perfect regulation of the flame can be secured, to obtain a lamp of great capacity and wherein all waste is avoided, either of evaporation or from volatilization or ebullition during use, and to produce a lamp wherein the alcohol may be burned to the best advantage to secure a regulable flame and perfect combustion.

In order to effect my first object, I construct an alcohol-lamp with a font from which extends a wick-tube, in which is placed a wick. Above the wick-tube is carried a burner-tube, the surface of which is suitably perforated and which contains, preferably, asbestos kept saturated with the alcohol from the wick. The burner-tube may be perforated with circular or other shaped openings; but it is preferably provided with a series of parallel slots extending obliquely and arranged in a horizontal series. Such a construction includes my invention in its most generic aspect. Regulation of the flame is secured by employing a regulating-tube, which coöperates with the burner-tube and which normally discloses the openings therein to allow the combustion of the alcohol with which the wick or wick-like material within the burner-tube is saturated. Movement of the regulating-tube with respect to the burner-tube is effected either by moving the regulating-tube or the burner-tube, or both, so as to shut off to a greater or less extent the openings or perforations in the burner-tube, and thereby limit the size or capacity of the flame. Preferably an adjustable regulating-tube is

used which is capable of movement vertically with respect to the burner-tube and which results in the gradual shutting off of the perforations or openings in the burner-tube, commencing at the bottom and progressing gradually toward the top. Any suitable mechanism can be employed for effecting the regulation, and I shall describe and illustrate a convenient form of adjusting device which may be used when a vertically-adjustable regulating-tube is employed, as is preferable.

By providing an alcohol-lamp with a font which supplies alcohol to a wick or wick-like material within the burner-tube and by providing a regulating-tube so arranged as to effect or permit the closure and disclosure of more or less of the openings or perforations in the burner-tube I secure an alcohol-lamp wherein the combustion will be perfect at all times, even when the area of the perforations or openings in the burner-tube has been reduced to the minimum.

In order that the flame can be reduced below that which would be secured by contracting the area of the openings or perforations in the burner-tube within practicable limits, I may also employ in connection with my improved lamp one or more vents located above the burner-tube and through which the alcohol in gas form may issue and be consumed after all the openings or perforations in the burner-tube have been closed. These gas-vents may be conveniently formed in a disk which is located immediately above the burner-tube, as I shall describe. When the improved lamp is provided with a regulating-tube which is movable vertically to shut off or disclose the perforations or openings in the burner-tube, the same regulating-tube may be employed to cut off or disclose the vent-openings, and with the preferred construction the disk carrying the vent-openings is provided with a flange, against which the upper edge of the regulating-tube may be brought into contact when it is desired to extinguish the lamp, the regulating-tube in its upward travel gradually cutting off the openings or perforations in the burner-tube, then covering the vent-openings, and finally com-

ing into contact with said flange, so as to effectively extinguish the flame.

In connection with the second object of my invention I have discovered that with the  
5 asbestos alcohol-lamps as heretofore constructed waste of alcohol has been due principally to two causes. In most of the prior alcohol-lamps a very large alcohol-saturated surface is used, which allows rapid evaporation  
10 when the lamp has been extinguished, so that the lamp requires to be supplied with alcohol generally each time it is used, and no way has been suggested by which the waste due to this cause can be overcome. The second  
15 source of waste of alcohol occurs in the burning of the lamp, and particularly after it has been burning for some time and is hot, since the alcohol by its extreme volatility volatilizes and ebulliates off, generally condensing and depositing on the cooler parts of  
20 the lamp and oftentimes accumulating in such quantities as to make the lamp dangerous, since such deposits are likely to be ignited from the flame. With my improved  
25 lamp I use a very small burning-surface, and with the preferred construction the regulating-tube is capable of being moved upward into tight contact with the flange by which the flame is extinguished, so that there is little  
30 opportunity for evaporation, which, if it takes place at all, proceeds very slowly. If desired, the lamp may be provided with a removable cap, which may be screwed in place when the lamp is out of use, so as to cover  
35 the burner and regulating mechanism and absolutely prevent any possibility of evaporation.

In order to prevent loss due to the ebullition of the alcohol from the font or its evaporation  
40 out through the burner-tube and the accumulation of the escaping alcohol around the burner-tube, I use in the preferred construction a false bottom or waste-receiver conveniently located beneath the font and  
45 connected with the space immediately surrounding the burner-tube or wick-tube by one or more ducts. Therefore any alcohol which may escape from the cause indicated around the burner-tube will be immediately  
50 conducted into the waste-receiver by the duct or ducts referred to. From the waste-receiver the escaped alcohol is fed to the burner-tube by a supplementary wick, this return being effected as rapidly as the waste  
55 alcohol accumulates. By thus providing for the reception of any waste alcohol in a receiver, as explained, I not only obviate the waste indicated, but I also prevent the accumulation of the alcohol on the cooler parts of  
60 the lamp and its accidental ignition from the flame.

In most of the alcohol-lamps now on the market the combustion has been imperfect  
65 owing to the limited air-supply furnished to the flame, and as a result the actual heat developed is far below that which should theoretically be produced. With such lamps also

the regulation of the flame has been generally effected by contracting the opening through which the flame is permitted to pass. 70 This is objectionable, not only because practically the maximum amount of alcohol is consumed at all times whether the flame is reduced or not, but also because the actual contraction of the flame by suitable dampening devices results in the lamp becoming very  
75 hot, so as to increase the waste due to volatilization and ebullition. With my improved lamp I utilize a cylindrical or tubular burner which offers a maximum surface for air-supply, and I effect the regulation, as explained,  
80 preferably by actually contracting the surface of combustion instead of by contracting the size of the flame produced from a combustion-surface of constant area, as is now  
85 the case. In this way I not only effect very much better combustion, but produce the regulation always under the most economical conditions.

When my lamp is provided with a false  
90 bottom or waste-receiver, as explained, I prefer to admit an additional air-supply within the latter, so that air may circulate up around the burner-tube and within the regulating-tube to be directed into actual contact with  
95 the flame, thus increasing the combustion.

In the accompanying drawings I show an alcohol-lamp embodying my present improvements, but which may be varied not only in its proportions but in its construction within  
100 the limits of the claims to be hereinafter made.

In the drawings, Figure 1 represents a side elevation of the lamp, showing a cap in dotted lines; Fig. 2, a vertical section; Fig. 3, a  
105 section on the line 3 3; Fig. 4, a section on the line 4 4; Fig. 5, a section on the line 5 5, and Fig. 6 a section on the line 6 6.

In all of the above views corresponding parts are represented by the same numerals  
110 of reference.

The font 1 is of any desired form, and in the present instance it is formed within a body 2 between two diaphragms or partitions 3 and 4, secured in place in any suitable way within the body, as shown. Thus with this  
115 construction a chamber 5 will be formed at the bottom of the body, which constitutes the waste-receiver of the preferred construction, and a chamber 6 will be formed at the upper end of the body for receiving any desired  
120 regulating mechanism.

Extending upward from the partition 4 and communicating with the font 1 is a wick-tube 7, having a shoulder 8 near its top. Seated within the shoulder 8 is a burner-tube 9, provided with suitable openings or perforations  
125 therein, said openings preferably constituting a series of inclined slots 10, arranged in a horizontal line near the upper part of the burner-tube. A wick 11 supplies the burner-tube with alcohol from the font, and said  
130 burner-tube is preferably filled with asbestos 12, suitably packed within the burner-tube and which is supplied with alcohol from the wick

11. The flame, it will be obvious, is produced by the ignition of the alcohol with which the asbestos packing 12 is saturated through the openings 10. Preferably a disk of perforated metal 13 is placed within the upper end of the burner-tube to hold the asbestos packing therein in position. The burner-tube may be provided with a disk 14 above it, having a flange 15 and preferably provided with a series of vents 16, opening beneath the flange and through which alcohol from the burner-tube may issue as a gas.

The font 1 may be supplied with alcohol in any suitable way—as, for instance, through an opening or tube leading into the font and having a suitable cap for closing it. I illustrate a tube 17 for this purpose, which extends down vertically through the burner and wick tubes into the font and which may be secured at its lower end to the bottom of the font and is provided with one or more openings 18, through which the alcohol may flow into the font. When a centrally-located filling-tube 17 is employed, the disk 14 may be screwed thereon, as shown. A plug 19 is used for closing the upper end of the filling-tube when the lamp is in use.

Mounted concentrically to the burner-tube is a regulating-tube 20, arranged in this instance to be moved vertically upward with respect to the burner-tube and at the end of its movement to be brought into tight engagement beneath the flange 15, so as to close from the air the entire area of the openings 10 and to close also the vents 16. As this tube moves upward it will be obvious that the flame will be gradually contracted until the openings 10 are entirely closed, after which alcohol in gas form will issue through the vents 16, providing a flame of minimum intensity. The final movement upward of the regulating-sleeve 20, engaging its upper end with the flange 15, extinguishes the flames which are fed through the vents 16, as will be obvious. The sleeve 20 may be operated in any suitable way and by any suitable mechanism. In the present instance I illustrate this sleeve as being provided with a mutilated thread 21 thereon at its bottom, which engages a thread cut in the bore of a sleeve 22, which is secured to the top of the font. By turning the regulating-sleeve 20 the engagement of these threads will elevate and depress it. This turning of the sleeve may be effected by any suitable mechanism—as, for instance, by a ring 23, having one or more pins 24, which pass through holes in the sleeve 20, as shown, which ring is prevented from vertical movement by one or more clips 25, which engage a slot 26 therein. The ring 23 may, if desired, be turned by a lever 27, working in a slot 28, formed between the body 2 and a suitable cover 29 therefor. If a lever 27 is used for moving the ring 23, it may carry a concealing-ring 30, which extends entirely around the body of the lamp and which moves with the lever, as will be understood. The central

opening in the cover 29 is preferably large enough, as shown, to enable the ring 23 and the regulating-sleeve 20 to be taken out when repairs are necessary, and said opening is preferably concealed, so as to make a close fit with the sleeve 20 by a ring 31, secured in place in any suitable way. The cover 29 may carry a screw-threaded flange 32, with which a cap 33 may engage if it is desired to exclude air entirely from the burner to prevent any possibility of evaporation.

In use there is always danger, especially when the lamp is hot, of the alcohol volatilizing out through the burner or ebulliating out of the font and condensing and accumulating on the cooler portions of the lamp, thus not only resulting in waste, but in danger also, since such accumulations are likely to become ignited from the flame. With a lamp constructed as shown any alcohol which would thus escape from the font would be likely to accumulate in the chamber between the wick-tube 7 and the sleeve 22. I therefore connect this space with the false bottom or waste-receiver 5 by means of one or more ducts 34, which pass directly through the font, as shown. In order to return the alcohol which is thus permitted by the ducts 34 to accumulate in the waste-receiver 5, I utilize an auxiliary wick 35, placed within an auxiliary wick-tube 36, leading up into the burner-tube, as shown. When a waste-receiver is used, as explained, one or more perforations 37 are formed therein to permit air to enter the waste-receiver and pass upward through the duct or ducts 34 into the space around the wick-tube 7, so that an additional air-supply will be directed into immediate proximity to the flame.

The operation of the improved lamp, assuming the specific embodiment of my invention illustrated to be used, is as follows: The cap 33 is removed and alcohol, either of the grain or wood variety, is poured into the font 1 through the filling-tube 17. The plug 19 is screwed in place. The lever 27 is turned to partially rotate the ring 23, causing the threads 21 to depress the regulating-tube 20 and disclose the entire area of the slots 10 in the burner-tube. Alcohol is fed from the font to the saturated material within the burner-tube by the wick 11. A match is applied to the saturated material within the slots 10 and a very hot flame will be secured by the combustion of the alcohol, said flame being of tubular form and extending up and around the disk 14. Of course a part of the alcohol within the burner-tube will be converted into gas, which will pass out through the vents 16 and will be consumed, thus supplementing the flame. Any alcohol which may find its way by volatilization or ebullition within the space around the wick-tube will immediately flow through the ducts 34 into the waste-receiver 5, from which it will be returned by the wick 35 back to the burner-tube, thus effectively preventing any waste

from this cause. When the openings 37 are used in the waste-receiver, an additional air-supply will pass through the waste-receiver up through the duct or ducts 34 around the wick-tube and will impinge directly against the flame, so as to increase the combustion thereof. When it is desired to regulate the lamp or to entirely cut off the flame, the lever 27 is moved to partially rotate the ring 23, causing the sleeve 20 to be partially rotated, and the threads 21 will elevate the regulating-tube with respect to the wick-tube, gradually cutting off the area of the openings 10, and thereby gradually diminishing the flame. This movement of the regulating-tube may continue until the openings 10 have been entirely closed, and no further combustion of alcohol through said openings can therefore take place. At this time alcohol will be volatilized within the burner and will escape as gas through the vents 16 and be consumed by the flame, which will thus be of its minimum intensity. The further movement upward of the regulating-tube 20 cuts off the vents 16, and when the upper end of the regulating-tube engages beneath the flange 15 the lamp will be entirely extinguished. The cap 33, if used, may be then replaced and it will be found that even after a lapse of several days no appreciable evaporation has taken place, so that the lamp will be immediately ready for use without the necessity of re-filling.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. An improved alcohol-burner, comprising in combination a font, an exteriorly-perforated, tubular burner carried by the font and containing a wick-like material supplied with alcohol from the font, a regulating-tube arranged concentrically to the burner, means for moving the regulating-tube and burner with respect to each other to cover or disclose the perforations in the burner, a cap carried by the burner, and a series of gas-vents in said cap communicating with the interior of the burner, substantially as set forth.

2. An improved alcohol-lamp, comprising in combination a font, an exteriorly-perforated, tubular burner carried by the font and containing a wick-like material supplied with alcohol from the font, a regulating-tube arranged concentrically to the burner, means for moving the regulating-tube and burner with respect to each other to cover or disclose the perforations in the burner, a cap carried by the burner, and a series of gas-vents in said cap communicating with the interior of the burner, the relative movement of the regulating-tube and burner with respect to each other being sufficient to cover or disclose said gas-vents, substantially as set forth.

3. An improved alcohol-lamp, comprising in combination a font, an interiorly-perforated, tubular burner carried by the font and containing a wick-like material supplied

with alcohol from the font, a regulating-tube arranged concentrically to the burner, means for moving the regulating-tube and burner with respect to each other, a filling-tube mounted within the regulating-tube and communicating with the interior of the font, and a removable cap for closing the filling-tube, substantially as set forth.

4. An improved alcohol-lamp, comprising in combination a font, a perforated tubular burner carried by the font and containing a wick-like material supplied with alcohol from the font, a stationary disk carried by the burner, a regulating-tube mounted concentrically to the burner and movable toward and away from said disk, and a series of gas-vents in said disk, with respect to which the regulating-tube is also movable, substantially as set forth.

5. An improved alcohol-lamp, comprising in combination a font, a perforated tubular burner carried by the font and containing a wick-like material supplied with alcohol from the font, a stationary disk carried by the burner, a regulating-tube mounted concentrically to the burner and movable toward and away from said disk, and a series of gas-vents in said disk, with respect to which the regulating-tube is also movable, said disk being provided with a flange which is engaged by the regulating-tube in its uppermost position, substantially as set forth.

6. An improved alcohol-lamp, comprising in combination a font, a wick-tube carried by the font, a wick within said tube, a perforated burner-tube carried by the wick-tube, a wick-like material within the burner-tube supplied with alcohol from the wick, a perforated diaphragm within the burner-tube, a stationary disk carried by the burner-tube, a series of vents in said disk, and a regulating-tube movable with respect to the burner-tube, substantially as set forth.

7. An improved alcohol-lamp, comprising in combination a font, a wick-tube, a wick in said tube, a burner-tube carried by the wick-tube, a wick-like material in the burner-tube supplied with alcohol from the wick, a regulating-tube movable concentrically with respect to the burner-tube, and a filling-tube located centrally in the wick and burner tubes and connected at its lower end to the font, substantially as set forth.

8. An improved alcohol-lamp, comprising in combination a font, a wick-tube, a wick in said tube, a burner-tube carried by the wick-tube, a wick-like material in the burner-tube supplied with alcohol from the wick, a regulating-tube movable concentrically with respect to the burner-tube, a filling-tube located centrally in the wick and burner tubes and connected at its lower end to the font, and a disk above the burner-tube carried by the filling-tube, substantially as set forth.

9. In an alcohol-lamp, the combination of a font, a cylindrical burner supplied with alcohol from said font, a regulating-tube mov-

able with respect to said burner, a thread carried by said regulating-tube, a threaded sleeve carried by the font, with which the thread on the regulating-tube engages, and means 5 for turning the regulating-tube so as to provide for its movement with respect to the burner, said means comprising a rotatable ring and connections between said ring and the regulating-tube to permit the regulating-tube to move vertically with respect to the 10 ring, substantially as set forth.

10. In an alcohol-lamp, the combination of a font, a cylindrical burner supplied with alcohol from said font, a regulating-tube 15 movable with respect to said burner, a thread carried by said regulating-tube, a threaded

sleeve carried by the font, with which the thread on the regulating-tube engages, means for turning the regulating-tube so as to provide for its movement with respect to the 20 burner, a handle for turning the regulating-tube, said handle working in a slot in the font-body, and a concealing-ring carried by the handle for concealing said slot, substantially as set forth.

25 This specification signed and witnessed this 12th day of March, 1900.

JOHN P. STEPPE.

Witnesses:

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