

W. R. JEAVONS.
BURNER.

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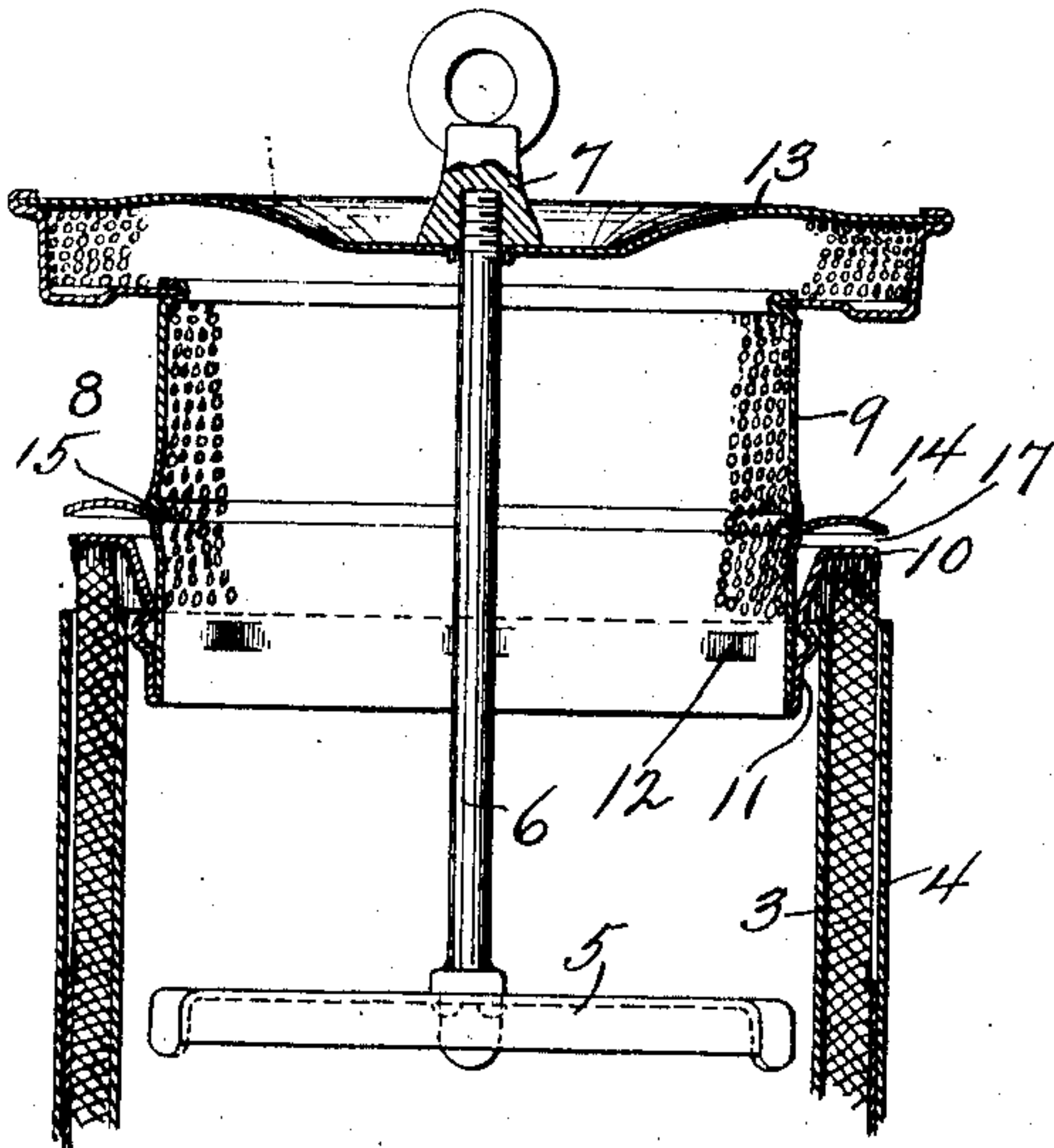


Fig. 2

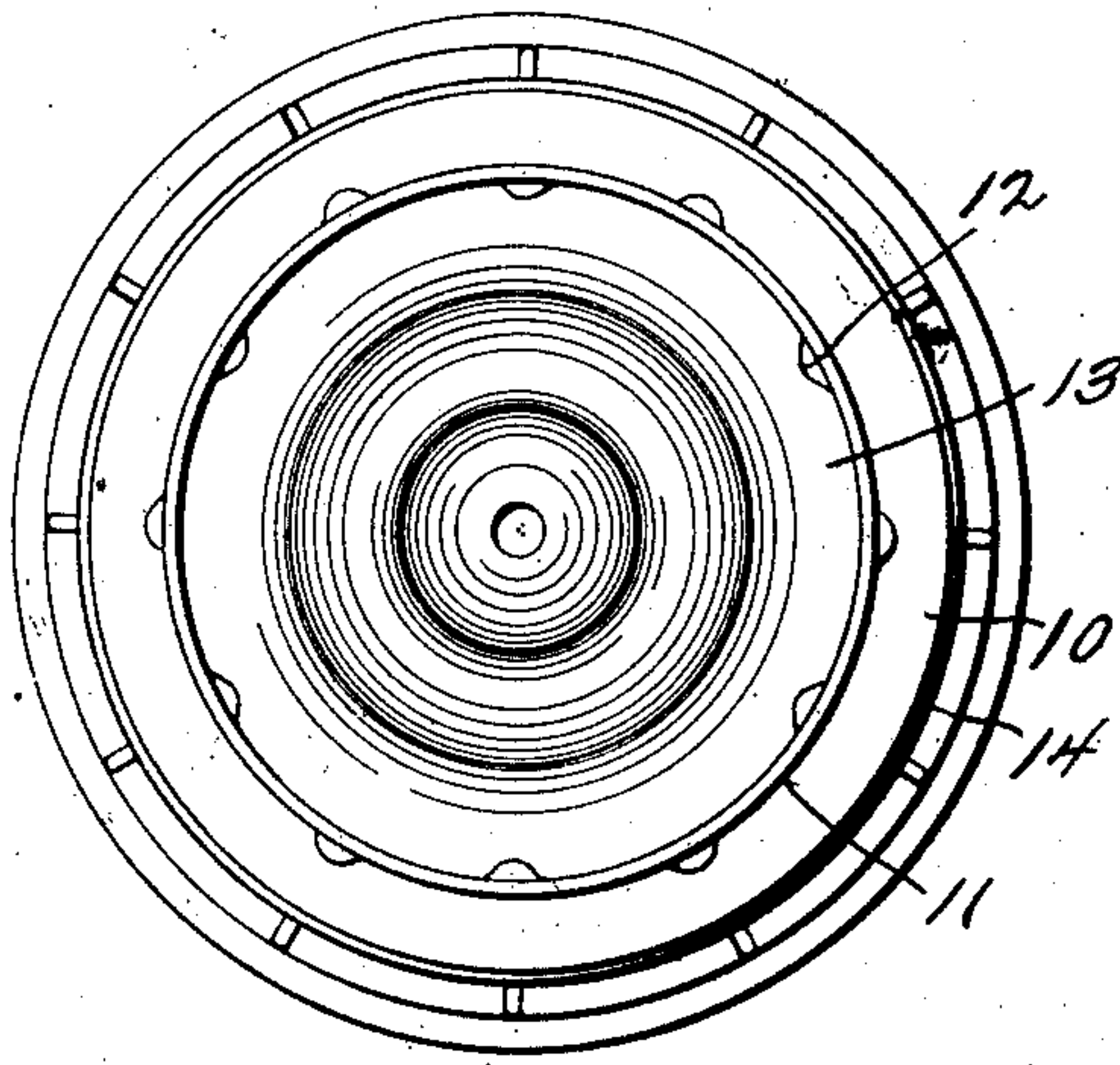


Fig. 3

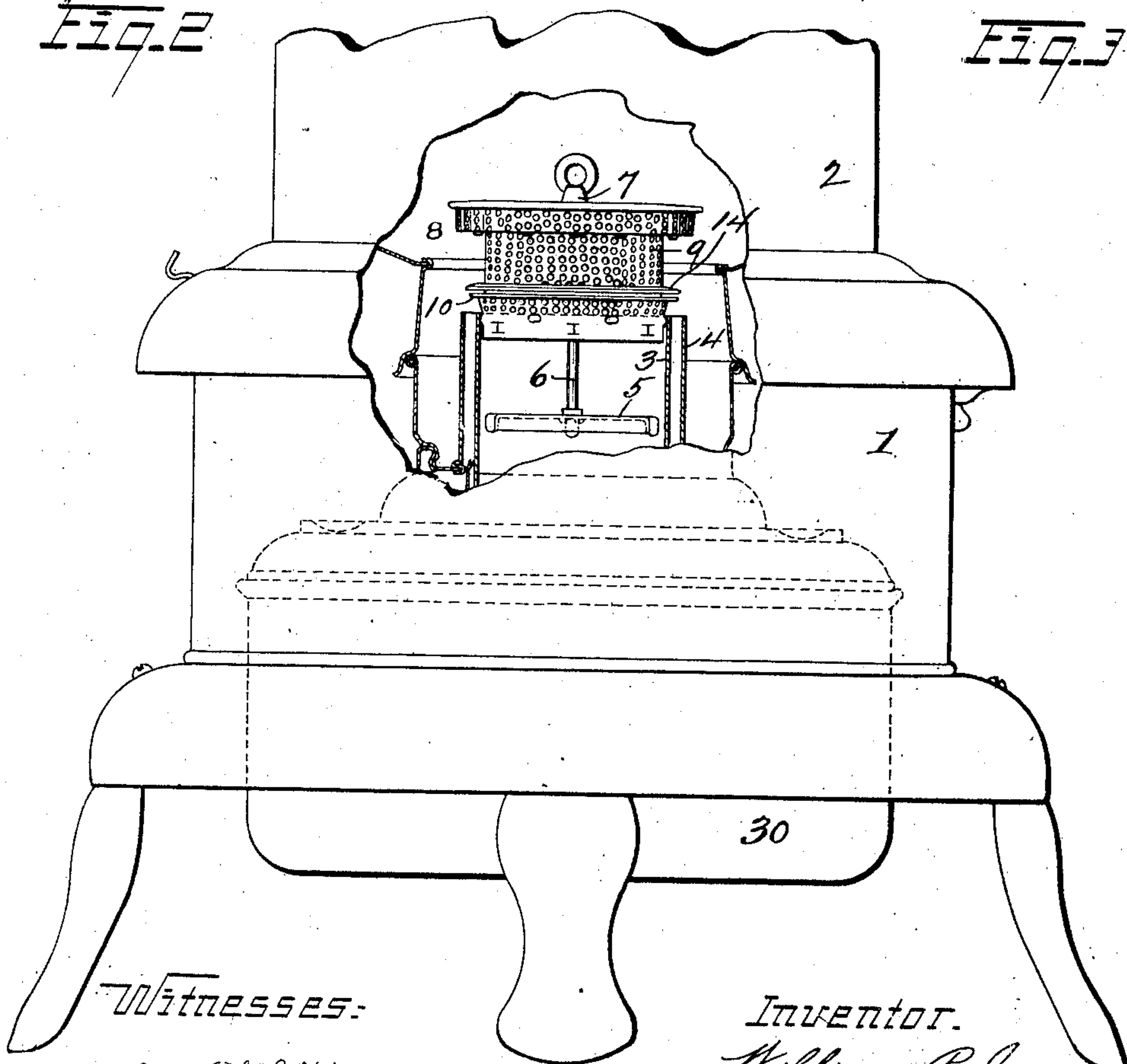


Fig. 1

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UNITED STATES PATENT OFFICE.

WILLIAM R. JEAVONS, OF CLEVELAND, OHIO.

BURNER.

No. 906,887.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM R. JEAVONS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to oil burners and more especially to burners which are employed in heating stoves and lamps, and, in the preferred form, is especially applicable to burners which are used in stoves known to the trade as "smokeless heaters." The burners which have heretofore been used in stoves of this type are provided each with a stop for the wick, the stop being carried by the air distributor and so arranged that the wick cannot be turned up beyond a certain predetermined height. The wick stop is generally constructed as a flange carried by the vertically extending portion of the air distributor and projecting across the top of the wick tubes in position to intercept the wick. As the wick rises, the flange rests on top of the wick and is carried upward thereby, carrying with it the air distributor, and the upward excursion of the wick is limited by a stop nut which prevents the air distributor from being raised beyond a certain predetermined distance. For the heavier oils, the stop is so set that when the wick is raised to the highest point its top is about a quarter inch above the top of the wick tubes, this area of wick being for the maximum flame, and with this height of wick there is provided on its outside a sufficiently large exposed surface to permit the wick to be easily lighted, and in its operation, owing to the relatively large expanse of such exposure, any slight irregularity in the top of the wick is practically negligible compared with the amount of exposure and the flame produced is substantially of uniform height. With the use of heavy oils and the stop arranged to give a quarter inch wick exposure, the amount of vapor produced is sufficient to make a large flame, but not sufficient to make an excessively high flame that would produce smoke; hence the trade name of "smokeless heaters." In some localities, however, there are in use what are known as "light oils" which are more volatile and vaporize with less heat than do the heavier oils above referred to.

In operating the type of burner above de-

scribed, having a quarter inch wick exposure and employed with the lighter oils, the wick exposure is too great, as the vaporizing temperature of such oils is relatively low, and a greater volume of vapor is produced from the same exposed area of wick. The result is that, under these conditions, the flame is excessively high and smoky, and the remedy usually is to decrease the amount of wick exposure and in this way lessen the amount of vapor produced and thereby produce a lower flame. This lessening of the wick exposure, while it makes the flame lower and smokeless in the use of these lighter oils, has the disadvantage that the space between the top of the wick tubes and the wick stopping flange is small—usually from $\frac{3}{8}$ to $\frac{1}{8}$ inch—and with this small wick exposure it is exceedingly difficult to initially light the burner by reason of the proximity of the metal portions of the flange and the wick tubes. Further than this, any irregularities in the wick, with such small wick exposure, will produce much greater irregularities in the flame than when the wick exposure is greater, as such irregularities bear a larger proportion to the area of the exposed wick than in the former case. It is, therefore, exceedingly desirable, for the satisfactory lighting and operation of these burners, to retain a large wick exposure and, at the same time, not have such an excess of vapor produced when operating with light oils that the flame will be entirely beyond limits and undesirable.

The object of this invention is to maintain a large exposed wick surface and, at the same time, lessen the rate of vaporization from such surface where the character of the oils used makes it desirable to do so, and to embody the means for doing this in a safe and reliable construction. Generally stated, the invention may be defined as consisting of the combinations of elements embodied in the claims hereto annexed and illustrated in the drawings, wherein—

Figure 1 represents an elevation of a portion of a stove or heater, the casing being broken away and the air deflector and certain portions of the burner parts being shown in elevation. Fig. 2 represents an enlarged sectional view of the upper portion of a burner having my invention applied thereto, and Fig. 3 represents a bottom plan of the air deflector.

Describing the parts by reference numerals, 1 represents the base of a lamp or heater,

2 the drum thereof and 30 the oil reservoir. Projecting upwardly from the oil reservoir are the inner and outer wick tubes 3 and 4 respectively. Within the inner wick tube 5 there is located a spider or frame 5 from which there projects upwardly a rod 6 having its upper end threaded for the reception of the interiorly threaded nut 7. Nut 7 retains the air distributor 8 in place in the upper end of the inner wick tube and serves as a stop to limit its upward excursion when lifted by the wick. This air distributor 8 comprises a vertically extending sleeve 9 of perforated material extending downwardly 15 within the top of the inner wick tube and having suitably secured thereto the stop or wick flange 10, which projects laterally into the path of the wick and rests on its top surface when the wick is in raised position. This 20 wick flange projects outwardly from the skirt 11, the lower end of which is secured to the end of the sleeve 9 in any suitable manner, as by pressing the metal thereof inwardly at 12. The spreader plate 13 is provided with a central perforation through 25 which the top of rod 6 projects, and the nut 7, when in place on the rod, limits the upward movement of the spreader plate and parts, including the wick flange 10, so that 30 the wick can be raised only to a predetermined height. In practice with heavy oils that take considerable heat for their volatilization, the parts are arranged so that the top of the wick is turned up to about from $\frac{1}{8}$ 35 to $\frac{1}{4}$ inch above the top of the wick tubes for the highest flame obtainable without smoking. With lighter oils, or oils that volatilize at a lower temperature, such wick exposure would be altogether too great and would 40 cause an excessively high and smoky flame.

For the purpose of enabling the burner to operate satisfactorily with such oils and with the same wick exposure, I provide the following construction whereby the top of the 45 wick and the wick flange which is associated therewith are cooled relatively to the temperature which said flange and wick would otherwise attain. Above the wick flange 10 and at a distance of about $\frac{1}{8}$ inch, more or 50 less, there is located a protecting member or flange 14. For the purpose of making this flange stiff and rigid, it may be curved as shown, although the curving of this is not essential, and it may be applied to sleeve 9 of 55 the air distributor by fitting it into a groove 15 formed in such sleeve. In the construction of the air distributor described, it will be seen that with the skirt 11 and its projecting wick flange 10 arranged as described, 60 a space is provided between the inner edge of the wick flange 10 and the sleeve 9, and that from said inner edge the skirt extends downwardly and inwardly to its junction with 65 ally from the sleeve 9, forms with said sleeve

and the skirt of the flange 10 an enlarged chamber having a considerable area of perforated metal through which air may be supplied to the narrow space between the two flanges. While it is desirable to have an ample perforated area for supplying air to this passage between the two flanges, it is not essential that it should be unduly large, and if this area were smaller than shown in the particular construction illustrated herein, it 75 would answer the purpose of allowing a current of air to pass between the two flanges. It will be seen, however, that with this arrangement, not only is the protecting flange 14 in position to intercept the heat radiated 80 from the flame and shield the wick flange from such radiation, but also that there is a current of cool air coming from the interior of the burner, and such protecting flange 14 directs this current of air so that it passes 85 directly over the wick flange 10, thus keeping it considerably cooler than would be the case if the air currents were not so directed by the protecting flange 14.

It will be apparent that the construction 90 of the air distributor may be changed somewhat from that shown, but in any case the wick flange and the protecting flange should be so arranged to leave the slot or passage 17, as this arrangement not only lessens the 95 heat which may be imparted to the wick from the lower flange, by the action of the protecting flange in intercepting and shielding the lower flange and top of the wick from the heat radiated from the body of the flame, 100 but the protecting flange also provides with the wick flange a passageway through which air from the interior of the burner may flow to positively maintain the lower flange at a 105 lower temperature. It has been found in practice that, by making the upper flange wider or narrower, it exerts a greater or less shielding influence on the lower flange, so that with a given wick exposure and a certain grade of oil, the vaporization from the 110 exposed wick will be greater with a narrower flange and less with a wider flange, whereby it is possible, by making a protecting flange of proper width, to provide a large wick exposure, but still, with the use of light oils, 115 have a maximum flame that is safely below the smoking point. With such light oils as are used in the Western States, a protecting flange a trifle larger than the wick flange is preferably used, as this gives the maximum 120 smokeless flame with $\frac{1}{4}$ inch wick exposure, where, on the other hand, without such protecting flange, such Western oils would give an excessively large flame, on the point of smoking, with from $\frac{3}{8}$ to $\frac{1}{2}$ inch wick exposure. 125

Having described my invention, I claim:

1. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper end of 130

the inner wick tube, a ring having a portion projecting outwardly and upwardly from said sleeve to form therewith a space or chamber, the projecting portion having a flange extending into the path of the wick, and a second flange carried by said sleeve above the first mentioned flange and spaced therefrom, said sleeve being perforated to permit the flow of air from the interior of the burner to said space or chamber and through the passageway formed between said flanges, substantially as specified.

2. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper end of the inner wick tube, a flange secured to said sleeve and projecting over the top of the wick and serving as a stop therefor, and a second flange also secured to said sleeve and also extending over the top of the wick in proximity to and above the first-mentioned flange and in position to shield said first-mentioned flange from radiant heat of the flame, the sleeve extending above the second flange and being perforated to supply air from the interior of the burner to the passageway formed between said flanges and to the flame above said flanges, substantially as specified.

3. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper end of the inner wick tube, a flange secured to said sleeve and projecting over the top of the wick and serving as a stop therefor, a second flange also secured to said sleeve and also extending over the top of the wick in proximity to and above the first mentioned flange and in position to shield said first mentioned flange from radiant heat of the flame, the sleeve extending above the uppermost flange and being perforated between said flanges and above the same to supply air from the interior of the burner to the passageway formed between said flanges and to the flame above said flanges, substantially as specified.

4. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper

end of the inner wick tube, a ring having a portion projecting outwardly and upwardly from said sleeve to form therewith a space or chamber, the projecting portion having a flange extending into the path of the wick, said ring being perforated, and a second flange carried by said sleeve above the first mentioned flange and spaced therefrom, said sleeve being perforated to permit the flow of air from the interior of the burner to said space or chamber and through the passageway formed between said flanges, substantially as specified.

5. In an oil burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper end of the inner wick tube, a ring having a portion projecting outwardly and upwardly from said sleeve to form therewith a space or chamber, the projecting portion having a flange extending into the path of the wick, said ring being perforated, and a second flange carried by said sleeve above the first mentioned flange and spaced therefrom, said sleeve extending above the latter flange and being perforated thereabove and between said flanges to permit the flow of air from the interior of the burner to the space between said flanges and to the flame above said flanges, substantially as specified.

6. In a burner, the combination of an inner and an outer wick tube, a wick therebetween, an air deflector comprising a sleeve projecting upwardly from the upper end of the inner wick tube, a flange secured to said sleeve and projecting over the top of the wick and serving as a stop therefor, and a second flange also secured to said sleeve and also extending over the top of the wick in proximity to and above the first mentioned flange and in position to shield said first mentioned flange from radiant heat of the flame, the sleeve extending above the second flange and being perforated thereabove.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

WILLIAM R. JEAVONS.

Witnesses:

J. B. HULL,
G. A. MYERS.