

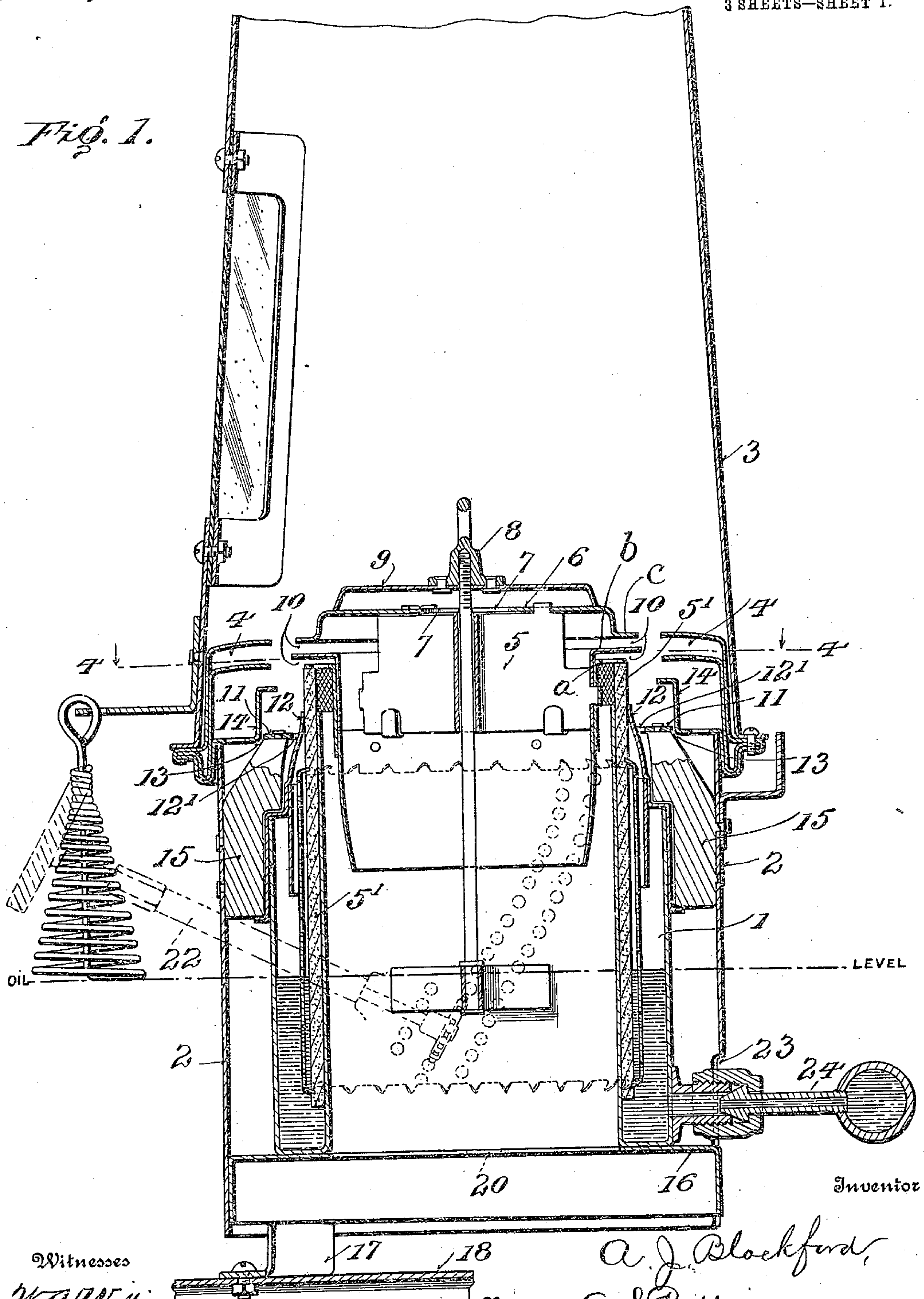
APPLICATION FILED APR. 20, 1908.

Patented Mar. 22, 1910.

3 SHEETS—SHEET 1.

952,870.

Fig. 1.



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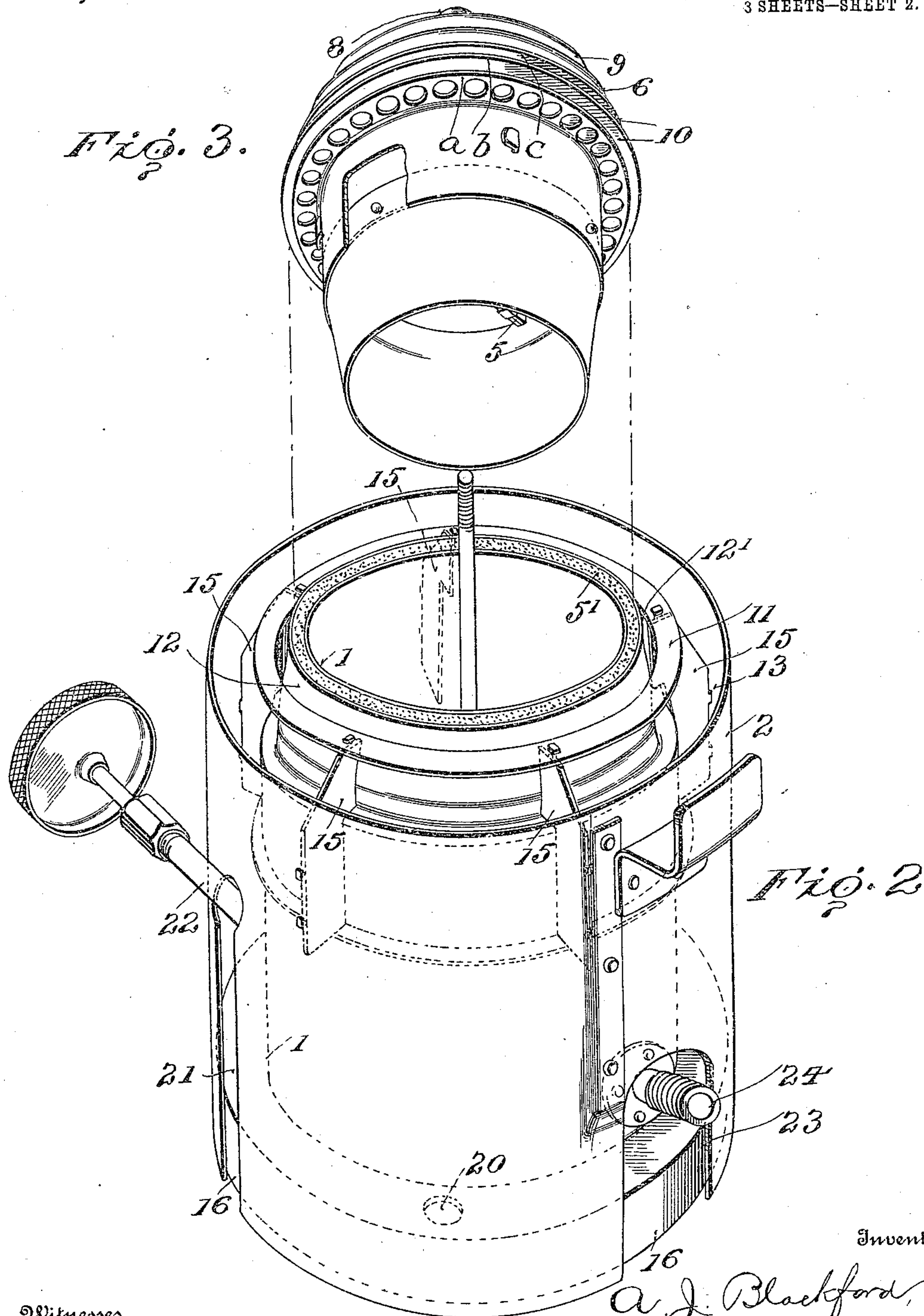
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3 SHEETS—SHEET 2.



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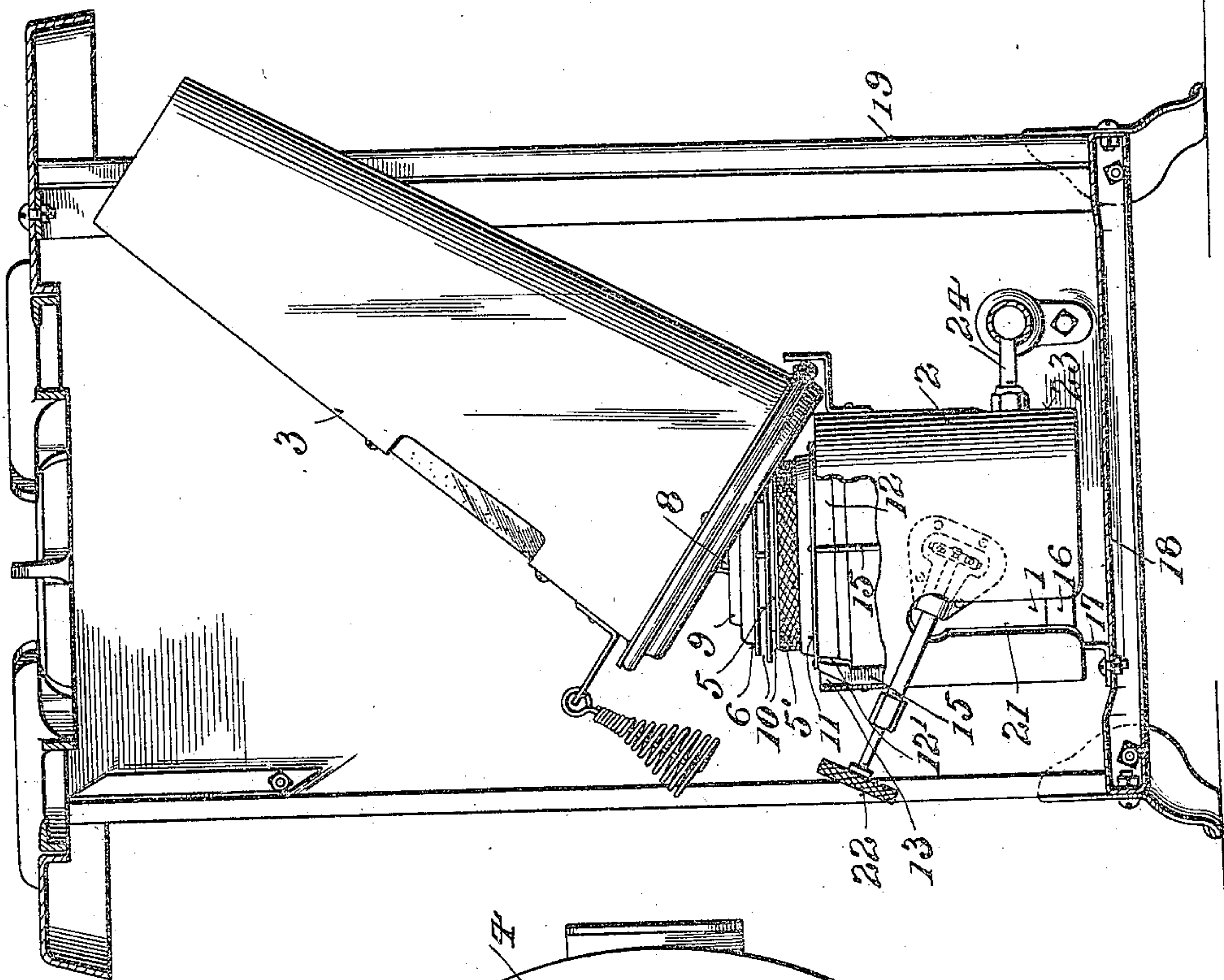


Fig. 5.

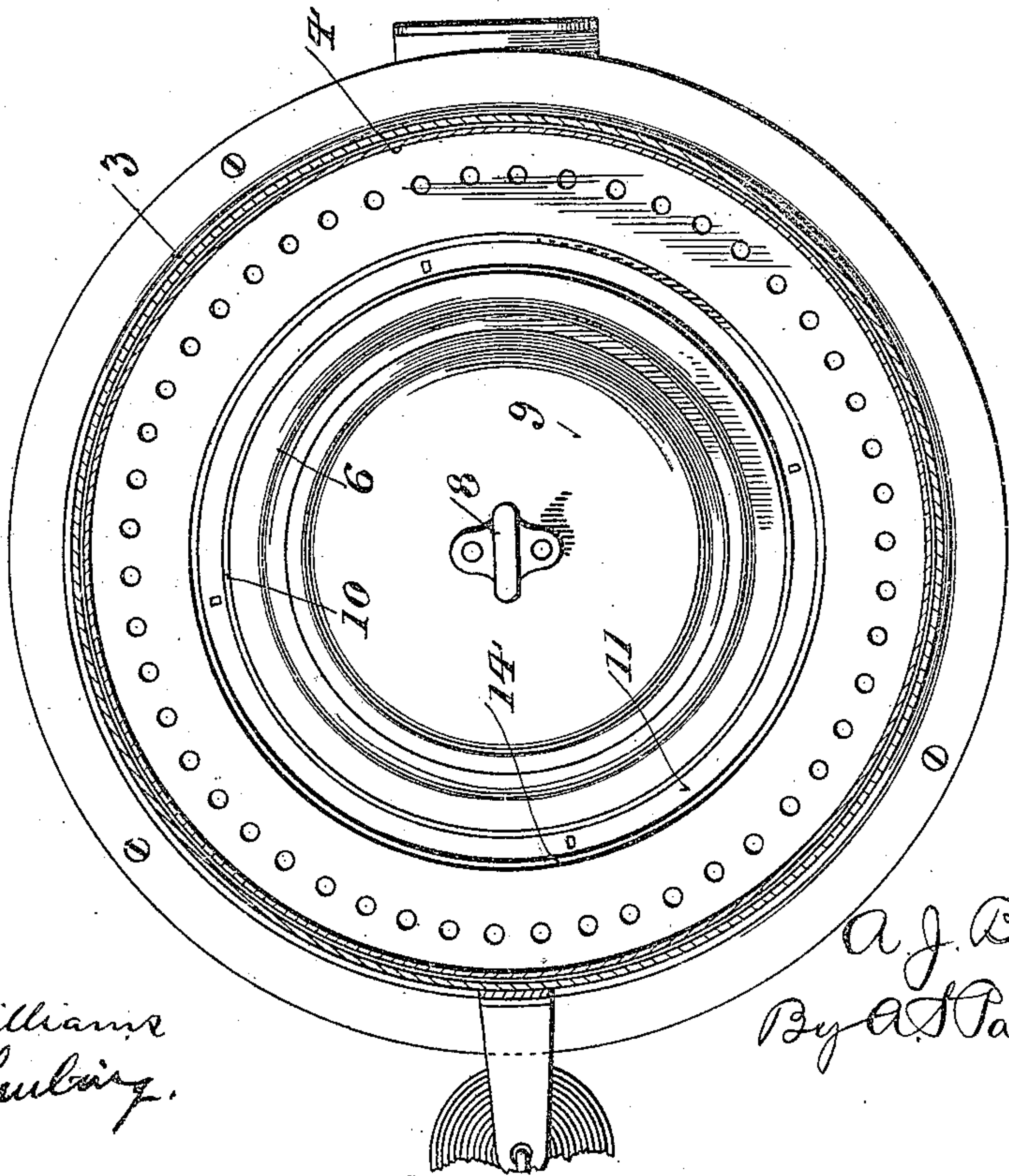


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## WICK BLUE-FLAME BURNER.

952,870.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed April 20, 1908. Serial No. 428,107.

*To all whom it may concern:*

Be it known that I, ATWELL J. BLACKFORD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Wick Blue-Flame Burners, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in wick blue flame burners, and pertains to that class of blue flame burners in which a blue flame is produced by restricting the air passages adjacent the wick, and without the use of the well known concentric combustion tubes.

In carrying out the present improvement, I provide a vertically-movable flame converter or deflector which rests upon and moves up and down with the wick, and is of the general character shown and described in my co-pending application No. 377,057.

One object of my present invention is to hold the flame at its adjusted height at any point from maximum to minimum adjustment, and thus prevent the creeping upward of the flame when it is adjusted, by adjustably increasing the flow of air through the burner, thereby cooling the burner, and holding the flame at its adjusted height.

Another object of the present invention is to prevent the flashing upward of the flame when the wick and the converter are lowered, by providing an outlet for the air at the upper end of the burner, and preventing the sudden lateral forcing of the air against the base of the flame when the flame converter is lowered with the wick.

There are other constructions having specific objects which will be described hereinafter.

In the accompanying drawings, Figure 1, is a vertical central sectional view of a burner embodying my present improvements. Fig. 2, is a top perspective view of my improved burner with the flame converter removed therefrom. Fig. 3, is an under detached perspective view of the flame converter. Fig. 4, is a horizontal sectional view on the line 4—4 of Fig. 1. Fig. 5, is a side elevation of the burner showing it in position on a frame, and the chimney tilted backward for initial lighting.

The present improvement pertains to a

wick blue flame oil stove, in which 1 is the wick tube, 2 a surrounding drum, 3, a chimney, which carries a gallery 4 surrounding the upper end of the wick, and 5 a flame converter, which is provided with the projecting flanges *a*, *b* and *c*. The flange *a* projects in the path of the wick 5', and the converter 5 travels up and down with the wick, by reason of the engagement of the wick with the said flange *a*, as more fully described hereinafter.

One of my present improvements consists in providing the cap 6 of the flame converter with an air passage 7, and in providing the stop member 8 with a projecting flange 9 adapted to close the opening 7 against outside communication when the wick is at the limit of its adjustment, as shown in Fig. 1. As here shown, this stop diaphragm 9 is of an inverted cup-shape, but I desire it to be understood that its shape may be varied without materially departing from the present improvement, so long as it performs the function of the closing and opening of the air passage-way 7.

In operation, when the flame is at maximum height by turning the wick 5' to the position shown in Fig. 1, the wick is stopped in its upward movement by the engagement of the stop diaphragm 9 against the cap 6 of the flame converter shown in Fig. 1, and the proper amount of air passes through the passages 10 and around the outside of the flame to maintain it at its maximum adjustment. When the wick is lowered, however, the flame converter moves downward and an air passage will be formed between the lower edge of the stop diaphragm 9 and the cap 6 of the converter, thus permitting air to flow through the passage 7 below the diaphragm and to the flame. This serves to cause an increased passage of air through the burner and tends to cool it, and also feeds an additional current of air to the flame and serves to cool it. The amount of air passing through the interior of the burner, and between the diaphragm 9 and the cap 6, gradually increases as the wick and converter are lowered, thus increasing the flow of the air through the burner and to the flame as the flame is lowered. In this way the amount of air fed to the flame and the volume passing through the interior of the burner is automatically regulated and automatically provides the



regulated necessary amount to suit the varied conditions of adjustment for maintaining the flame at its adjusted height.

In practice it is found that it is necessary to furnish more air for cooling the burner to maintain the flame at a very low point, than it is to maintain it at an intermediate or maximum point, and this automatic manner of gradually increasing the volume of air as just stated, is found to meet the required necessities of the burner to maintain the flame at its adjusted height. Furthermore, in burners of this type, it is found that when the wick is lowered, thus lowering the converter, there is a sudden impulse of air currents through the passages 10 to the base of the flame, and this causes the flame to flash upward. This flashing of the flame is very noticeable in the ordinary operation of the burner, because usually the wick is lowered suddenly.

The construction just described for furnishing increased volumes of air to cool the flame and the burner, also serves to almost, if not wholly eliminate the flashing of the flame when the wick is lowered by reason of the fact that the opening of the passage 7 furnishes an escape for the air, and to such an extent as to prevent the sudden forcing of air currents through the passages 10 sufficiently to cause the flashing of the flame. By flashing of the flame is meant the creating of a yellow or illuminating flame which appears to flash upward, and is objectionable.

An annular ring 11 is located in the upper end or portion of the space between the outer wick tube 12, and the surrounding drum 2. This ring is arranged to form an air passage 12' between it and the outer wick-tube, and an air passage 13 between the outer edge of the ring and the flange 14 of the gallery 4. Preferably, the ring is located just below the upper end of the outer wick tube 12, and when the chimney 3 is tilted backward, as shown in Fig. 5, it leaves the wick 5' exposed for easy ignition, while at the same time the ring limits the volume of air which passes upward between the outer wick-tube and the lower flange 14 of the chimney gallery. Suitable supports 15 have their lower ends connected to the drum 2, and their upper ends carry the ring 11. By admitting the passage of a limited amount of air at the inner and outer edges of the ring 11, the proper amount of air is fed to the points above, and the rush of a large volume of air is prevented. The surrounding drum 2 is removable, and it is desirable that its lower end should be properly centered, and that it be parallel with the outer wick-tube. It is also desirable that the volume of air admitted between the drum and the outer wick-tube should be limited. For these purposes an inverted cup-shaped flange 16

is suitably connected with supports 17 which rest on the base 18 of the frame 19 in which the burner is supported. This flange serves to position the lower end of the drum 2, and it is provided with the openings 20 for admitting air between the drum and the outer wick tube, and these openings are located at points between the slot 21 for the wick adjuster 22 and the slot 23 for the oil supply 24. The slots 21 and 23, together with the openings 20, allow the proper amount of air to pass between the drum and the other wick-tube.

I desire it understood that I do not make any claim herein for those features of the burner which are shown and described in my aforesaid co-pending application, as those features are made the subject-matter of the claims in that application.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In a burner of the character described, the combination with an adjustable wick, of a flame converter adjustable with the wick and having a cap, the said converter having air passages for producing a blue flame, and in addition an air passage in its cap, and means for shutting off the flow of air through the additional air passage when the wick is raised and for permitting the flow of air through it as the wick is lowered.

2. In a burner of the character described, the combination with a vertically-adjustable wick, of a flame converter adjustable therewith and provided with a cap, the converter having air passages, and means for increasing the flow of the air through the burner when the wick is lowered.

3. In an oil burner, the combination with a vertically adjustable wick, of a flame converter vertically adjustable therewith, the converter having normally open flame supplying air passages, an additional air passage, and means for shutting off the flow of air through said additional air passage when the wick is raised but permitting air to flow through it when the wick is lowered for the purpose described.

4. In an oil burner, the combination with a vapor generator, and means for increasing and diminishing the volume of vapor generated by the generator, of a flame converter upwardly movable as the volume of vapor generated is increased, the converter having an air passage supplying air for the maximum flame, the converter also having an additional air passage, and means for shutting off the flow of air through the additional air passage during the maximum flame and permitting air to flow through it when the flame is reduced.

5. In an oil burner, the combination with a vertically adjustable wick, of a flame converter vertically-adjustable with the wick,



the flame converter provided with air passages, and means for providing an additional air current to the flame when the flame converter is lowered.

5 6. In an oil burner, the combination with a vertically-adjustable wick, of a flame converter movable vertically with the wick, said converter having air passages, and means for shutting off the flow of air through one  
10 of the air passages when the converter is raised and for permitting the flow of air through the said air passage when the converter is lowered.

15 7. In an oil burner, the combination with a vertically adjustable wick, of a flame converter movable vertically with the wick, said converter having air passages, and means for shutting off the flow of air through one of the air passages when the converter is  
20 raised and for permitting a gradually increased flow of air through the said air passage when the wick is lowered.

25 8. In an oil burner the combination with a vertically-adjustable wick, of a vertically-movable flame converter supported and carried by the wick, the converter having lat-

eral air passages for the flame, and an additional air passage in its upper end, a stop above and for the converter, the stop constructed to shut off the flow of air through  
30 the opening in the top of the converter when it is raised and to permit the flow of air through the opening when the converter is lowered.

9. In an oil burner the combination with  
35 a vertically-adjustable wick, of a flame converter carried by the wick, the converter having laterally-extending air passages and an air passage at its top, a stop for the converter, the stop having a laterally-extending  
40 diaphragm adapted to shut off the flow of air through the top passage when the converter is raised and to permit air to flow through it when it is lowered and to form  
45 an additional air passage between the diaphragm and the converter top.

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

ATWELL J. BLACKFORD.

Witnesses:

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