(No Model.) 2 Sheets—Sheet 1.

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VAPOR BURNER.

No. 525,038. Patented Aug. 28, 1894.

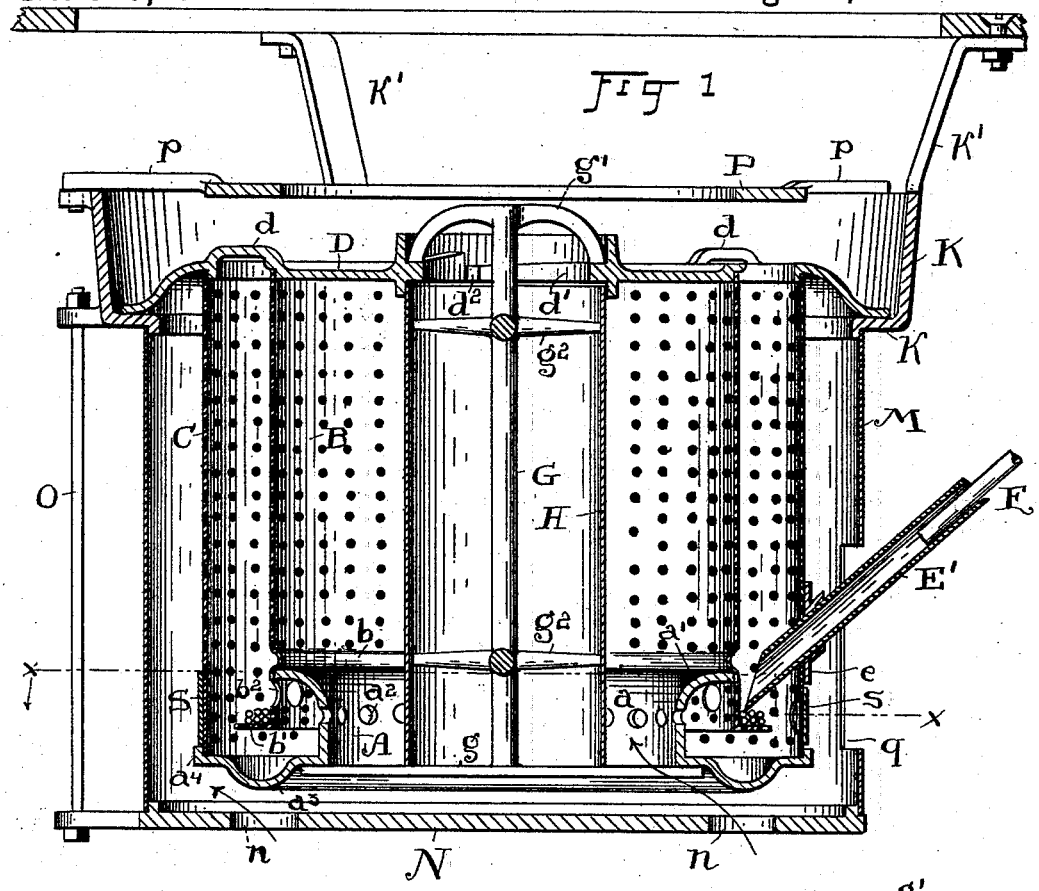

Fig 1

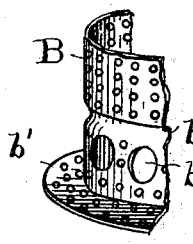

Fig 4

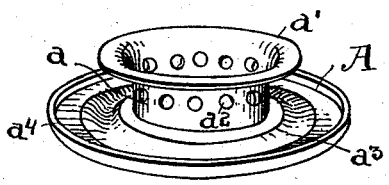

Fig 3

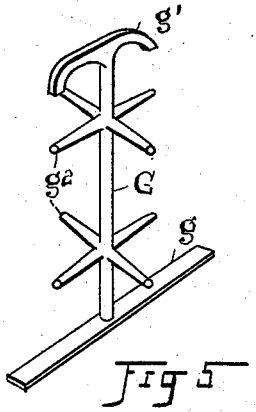

Fig 5

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(No Model.) 2 Sheets—Sheet 2.

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VAPOR BURNER.

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Fig 2

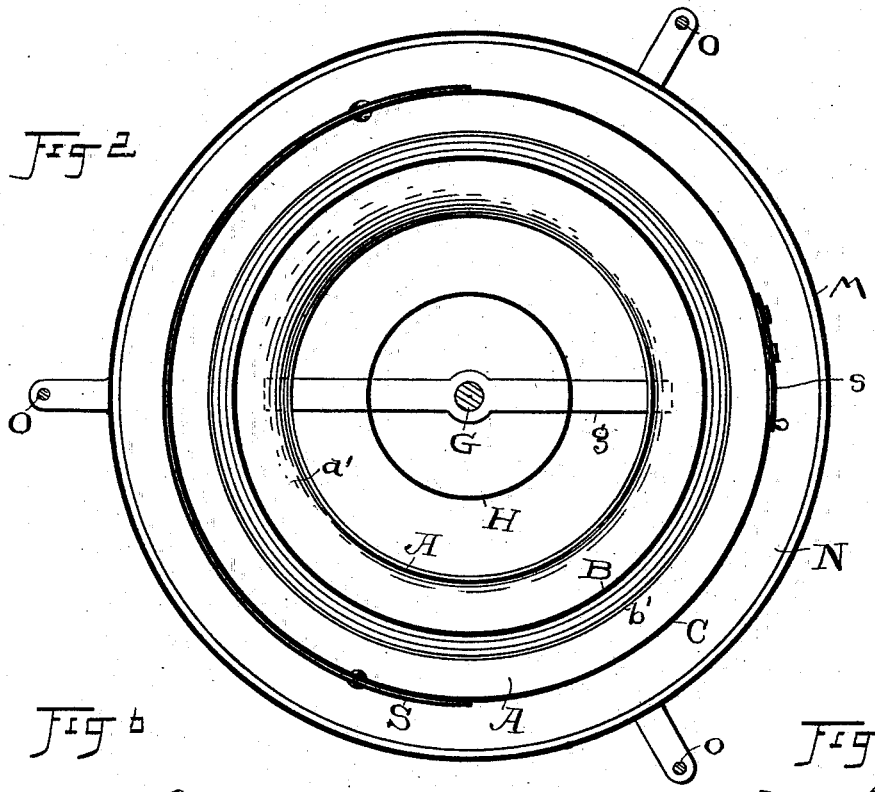


Fig 6

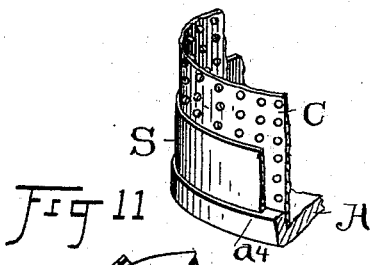


Fig 11

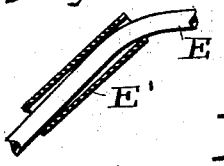


Fig 7

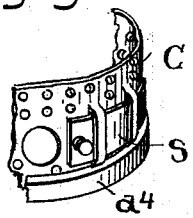


Fig 8

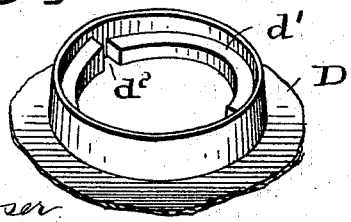


Fig 9

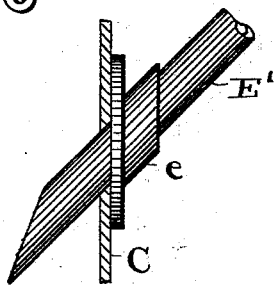
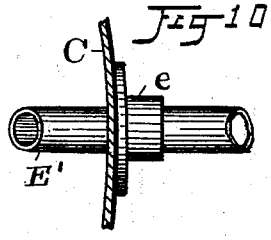


Fig 10



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UNITED STATES PATENT OFFICE.

WILLIAM H. WILDER AND EARL A. THISSELL, OF NORTHAMPTON, MASSACHUSETTS, AND JOHN A. LANNERT AND WILLIAM R. JEAVONS, OF CLEVELAND, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 525,038, dated August 28, 1894.

Application filed March 13, 1893. Serial No. 465,709. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. WILDER and EARL A. THISSELL, residing at Northampton, in the county of Hampshire and State of Massachusetts, and JOHN A. LANNERT and WILLIAM R. JEAVONS, residing at Cleveland, in the county of Cuyahoga and State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Vapor-Burners; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to the type or style of burners shown and described in a patent to W. R. Jeavons, No. 475,401, dated May 24, 1892, and the object of the invention is to provide easy means for separating or dismembering the burner for cleaning and for replacing any of the parts. These and other objects of the invention are secured by and through the construction and combination of parts substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical central section of our improved burner, and Fig. 2, Sheet 2, is a horizontal section of the burner taken on a line corresponding to line x, x, Fig. 1, and looking downward. Fig. 3 is a perspective view, reduced, of the base or bowl of the burner shown in cross section in Fig. 1 in connection with the other parts. Fig. 4 is an elevation of a section of the inner combustion tube and designed to show the construction of the lower portion of the said tube. Fig. 5 is a perspective view of the rack for uniting the upper and lower parts of the burner as hereinafter more fully described. Fig. 6 is an elevation of a sectional portion of the base or bowl and the outer combustion tube, and the band which encircles said tube in part, said band having its ends shown in Fig. 2. Fig. 7 is a perspective view of a section of the base in the outer combustion tube, and designed to develop the bearing or opening through which the burner is initially lighted. Fig. 8 is a perspective view looking downward on the central portion of the upper casting or plate, with its inclined ledges for supporting and locking the rack, substantially as herein described. Figs. 9 and 10 are side and plan views, respectively, showing the supply pipe and sections of the outer combustion tube and the collar around about said pipe to prevent creeping of the oil. Fig. 11 shows the way of holding sliding section of supply pipe.

Referring to Fig. 1, A is the base or bowl of the burner having the construction clearly outlined in Fig. 3. This construction comprises the central vertical tubular portion a, having an outwardly flaring upper edge a', and perforations a^2 about its neck a.

The flange or outward projecting portion a' extends to about a central point over the depression or channel a^3 in the bottom of the said burner, as clearly seen in Fig. 1. By this construction of burner base an open air supply passage is formed up through the center thereof, and the two combustion tubes B and C, respectively, are secured or fixed upon this base substantially as shown. That is, the tube B is formed with an annular bead b which rests upon the outer edge of the flange a', so that said tube is held firmly upon said flange in this way. The said tube, however extends down below said flange about half the distance between the flange and the bottom of the said bowl, and has its lower ends bent outwardly at right angles, as seen at b', forming the ledge or shelf, as clearly disclosed in Fig. 1.

The outer combustion tube C rests within the upturned edge or lip a^4 of the base A, and thus both the combustion tubes are held in place upon the base A. At the top of this structure there is a casting D having an opening corresponding to the open top of the combustion chamber, but bridged across at intervals by webs d. The said plate D rests upon the upper edge of the combustion tubes B and C, thus providing a lateral support for the said tubes at their upper ends. The plate D covers the space upon both sides of the said combustion chamber substantially as herein shown.

As hereinbefore described, the tubes C and B rest upon the burner bowl while the casting D rests upon said tubes. Now, it is desirable for further purposes that these parts thus supported should be locked together in such way that when desired, they may be bodily lifted out of the casing or shell in or by which they are inclosed. To accomplish this locking together we employ the locking rack G, shown clearly in Fig. 5. This rack has cross arms *g* at its bottom adapted to engage under the bowl A, and curved arms *g'* at the top adapted to engage upon the inclined ledges *d'*, within the neck of the top plate D. At the point where one of these inclined ledges terminates and the other begins on opposite sides are recesses or notches d^2 through which the arms *g'* are raised to a position above and upon said inclines or cams. Then as the said rack is turned and as it bears against the bottom of the burner bowl, the said bowl and the top plate and the tubes held by said parts are all firmly locked together and bodily removable from the inclosing casing.

The lower arms *g* are designed to be somewhat flexible so as to accommodate the structure to the expansion and contraction of the parts incident on the heating and cooling, and the said rack G also has a series of arms g^2 in sets between its ends extending outward from different directions and calculated to brace and support laterally the inner air conducting tube H. This tube rests upon the arms *g*, and at its upper end is held within a flange upon the plate D, and the said rack forms the exclusive support for the said tube. This combination of parts, however, practically depends upon and is suspended from the casting D, the outer portion of which curves downwardly somewhat and laterally and rests upon the inward base flange *k* of the ring K. This ring K is suspended from above by means of the brackets *k'* or their equivalent, arranged at intervals about its outer edge.

An outer projecting or shielding drum M is held in position by means of a bottom plate N and the tie rods O pass through ears upon the ring K and the lower plate N, respectively, and locking the said drum or shield M in place between said parts, said parts having flanges where the said drum engages them.

Air passages *n* are formed in the bottom plate N so that there will be a sufficient air supply to the combustion chamber of the burner, and the drum M is at a sufficient distance from the outer combustion tube C to afford an ample air space between them. This outer shielding and supporting framework is considered a permanent part of the stove, while the inner part connected by the rack G, as hereinbefore described, and comprising the burner proper is bodily removable when occasion requires, by simply taking hold of the arm *g'* of the said rack and lifting the burner out. Before this occurs, however, it is necessary to remove the deflector ring P, which is above the combustion chamber, and is supported upon the ring K by projections or arms *p*.

The deflecting or spreading ring is designed to divide the flame so as to make it cover a wider space than would otherwise occur, and when said ring is used along with the ring K, a vacuum seems to form in the space between said outer ring K and the direct draft line of the combustion chamber, and the flame dips in that direction more or less, which is deemed to be an advantage because the flame is thus spread to cover a wider surface without losing any of its heat.

The spreader P may move to one side from immediately over the combustion chamber when a low flame is used so as to get a more direct flow of the heat.

The supply pipe E is supplemented by a short pipe or tube E', which extends into the combustion chamber at an angle of nearly forty-five degrees or thereabout, with its point just over the coils of wire upon the ledge *b'*, and it is found that by having the point of the pipe touch either the wires or their support the oil feeds steadier than if the point be separate, as in the latter case it drops and sometimes bounces off the wires, but when in contact the flow is continuous and unbroken, the same as it would be over an unbroken surface. The said short tube E' is adapted to slide back upon pipe E sufficient to allow the burner to be lifted out of its casing. The said pipe E is bent or angled a short distance above the supplemental or sliding pipe E', so that when the pipe E' is raised to permit the removal of the burner, it wedges and tightens on the angle or bend and is held in a raised position, as shown in Fig. 11. The said short tube E is supported in the outer combustion tube, and the washer *e* fits tightly on the tube E' on the outside of the combustion tube C. When the burner parts are removed the pipe E' can be slipped off and cleaned and then restored to place.

For some reason there is a strong tendency of the oil to creep back upon the outer surface of the supply tube, and this becomes objectionable for many reasons, but when the washer *e* is fixed tightly upon the said supply tube, as in this case, the oil will not pass the washer, and this objection is thereby effectually overcome.

Initial starting is accomplished by introducing a match or other means of lighting through the hole *q* in the outer combustion tube, and through a suitable hand hole in the outer casing, and the sliding door *s* supported in loops, as shown in Fig. 7, or by equivalent means of support, is adapted to cover this hole when not in use.

In this class of burners it has been observed that there is more or less tendency for the

flame to be lower at a point about the supply pipe than at a point opposite, which is in a great measure probably due to currents of heavy vapor traveling from the supply pipe both ways around to the back of the burner, the impulse of these currents inducing greater draft and combustion at the back section and, inversely, the vapor currents being adverse to the draft of the chamber about the supply pipe, cause a deficiency or decreased draft at this section or point. One way of remedying this defect is by means of the band S, which extends about half way around the burner on the side where the flame is too high, the extent of the band being shown in Fig. 2 and the height in Fig. 6. The band covers a number of the lowest air inlets and so reduces draft and combustion at this section of the chamber. Instead of this separate band it is obvious that the tube itself may be imperforate at this point, or made with perforated walls having air inlets of a smaller size or less in number; or, inversely, the opposite section of the chamber may have larger or more numerous air inlets and serve the same purpose, and thus in any case the draft and combustion in the portion of the chamber about the vapor supply are relatively increased and equalization of combustion effected.

Having thus described our invention, what we claim is—

1. A vapor burner having a vapor and combustion chamber, a stationary supply pipe and a removable burner feed pipe, substantially as set forth.

2. A vapor burner having a vapor and combustion chamber, a stationary oil supply pipe and a movable burner feed pipe sleeved on the outside of said supply pipe and entering said chamber, substantially as set forth.

3. In a vapor burner, the combination with a vapor and combustion chamber of a stationary oil supply pipe and a detachable burner feed pipe loosely sleeved on the outside of said supply pipe, substantially as set forth.

4. A vapor burner, a stationary supply pipe and a movable sleeve over said supply pipe extending into said burner and said pipe and sleeve constructed to hold said sleeve in raised position on said stationary pipe, substantially as set forth.

5. In a vapor burner having a vapor and combustion chamber, a stationary supply pipe having a bent or angled portion, a burner feed pipe sleeved on said supply pipe and adapted to engage with said bent or angled portion to hold it in a raised position, substantially as set forth.

6. A vapor burner and burner feed pipe and a washer on said pipe near its discharge opening to prevent creeping of the oil along the exterior of the pipe, substantially as set forth.

7. A vapor burner and a movable burner feed pipe and a washer on the exterior of said pipe in position to be maintained at a vaporizing temperature by said burner, substantially as set forth.

8. In a vapor burner, walls forming a vapor and combustion chamber, one of said walls having an opening through which the burner feed pipe enters the said chamber and the burner feed pipe having a washer or flange thereon, substantially as set forth.

9. In a vapor burner having a vapor and combustion chamber, a removable supply pipe having a portion of its inner end cut away back from its delivery point, substantially as set forth.

10. In a vapor burner, a combustion chamber constructed with walls and having air inlet openings at successive elevations, and the air inlet openings at a portion in plan section of one of said walls obstructed to the inflow of air, substantially as set forth.

11. In a vapor burner, a combustion chamber constructed with walls having air inlet openings arranged to induce a relatively greater draft in one vertical section of the chamber than in other vertical sections thereof, substantially as set forth.

12. In a vapor burner, a combustion chamber formed by tubes and having air inlets at successive elevations in its sides, a vapor supply at one side of said chamber and an obstruction to the inflow of air about the air inlets at the lower portion of the said chamber at a point opposite the vapor supply, substantially as set forth.

13. The perforated tubes, the bowl, the casting having inclined planes, and the holder adapted to engage with the bowl, and the said inclined planes and lock the parts together, substantially as set forth.

14. In a vapor burner, a central air tube and a holder constructed to support the said tube and to lock the top and bottom of the burner together, substantially as set forth.

15. In a vapor burner, a shield and support for the burner consisting of the top ring constructed about its inside to support the burner, the bottom plate, the drum between said parts and means to secure said parts together, substantially as set forth.

16. A vapor burner having a laterally extending top plate from which the burner parts are supported, and a top ring with which said plate engages and is held, substantially as set forth.

17. In a vapor burner, the outer ring above the combustion tubes, and a flame spreader over the combustion chamber supported on said ring and adapted to be moved laterally to uncover the combustion chamber, substantially as set forth.

18. In a vapor stove, the construction of the supporting and shielding casing adapted to be rigidly attached to the stove frame or grate, and the removable burner within said casing, substantially as set forth.

19. A vapor stove frame having a stationary casing or drum fixed thereto, a removable burner supported in said casing or drum and an oil supply pipe for said burner, substantially as set forth.

20. In vapor burners, a casing for the burner a grate and arms connecting the casing and grate, in combination with a removable burner supported in said casing, the said grate being constructed with an opening to pass the burner through, whereby the burner may be removed for cleaning, substantially as set forth.

Witness our hands to the foregoing specification this 16th day of February, 1893.

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EARL A. THISSELL.
JOHN A. LANNERT.
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Witnesses for Lannert and Jeavons:
H. T. FISHER,
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