(No Model.)

W. H. SILVER.

VAPORIZING OIL STOVE.

No. 604,703. Patented May 24, 1898.

Fig. 1.

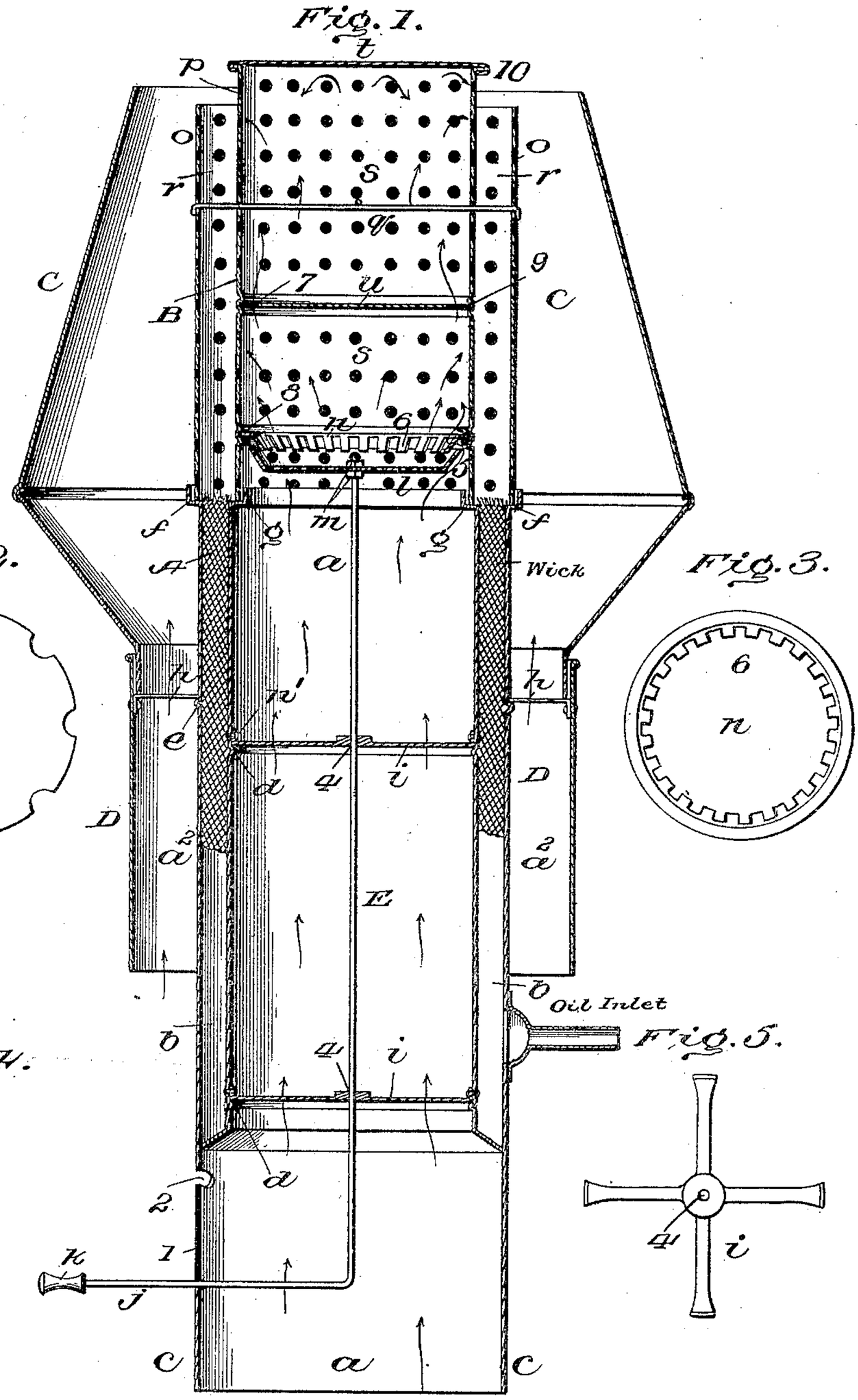

Fig. 2.

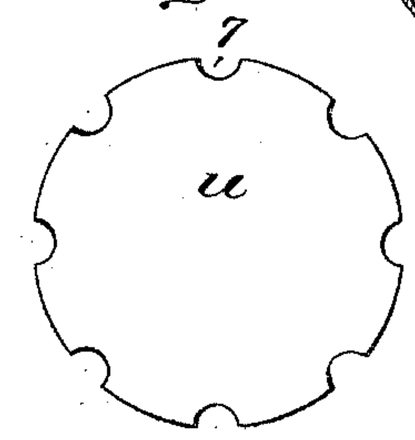

Fig. 3.

Fig. 4.

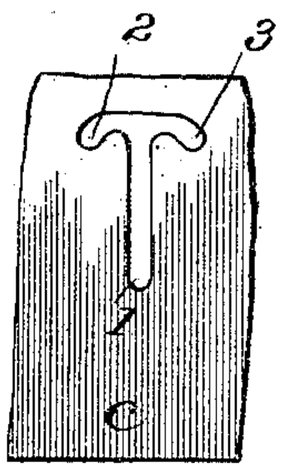

Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

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VAPORIZING OIL-STOVE.

SPECIFICATION forming part of Letters Patent No. 604,703, dated May 24, 1898.

Application filed May 24, 1897. Serial No. 637,870. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SILVER, a citizen of the United States of America, and a resident of the city of Brooklyn, in the State of New York, have invented a new and useful Improvement in Vaporizing Oil-Stoves, of which the following is a specification.

This invention relates to what are known as "blue-flame" oil-stoves, in which vaporized hydrocarbons are burned with annular flames of intense heat produced by the aid of "combustion-tubes," and it relates, primarily, to those in which the oil is fed to the burning-point by means of wick-tubes and wicks.

The invention consists in certain novel features of construction and combinations of parts hereinafter set forth and claimed; and its objects are, first, to mingle the right proportion of air with the vapor to support perfect combustion, and thus to render the flames free from odor; secondly, to prevent overheating the wick-tube by avoiding the radiation or deflection of heat downward into its air-space, as well as the transmission of heat thereto from the combustion-tube through metallic connections, and by its exposure both internally and externally to the air, and, thirdly, to render the improved stove simple and easily cleaned and repaired.

A sheet of drawings accompanies this specification as part thereof.

Figure 1 of the drawings is a sectional elevation of the burner of a vaporizing oil-stove and its appurtenances constructed according to this invention. Fig. 2 is a face view of an air-distributing disk forming part thereof. Fig. 3 is a like view of its lifter-abutment. Fig. 4 is a fragmentary elevation projected from Fig. 1, and Fig. 5 is a plan view of one of the pair of guide-spiders shown within the wick-tube in Fig. 1.

Like letters and numbers refer to like parts in all the figures.

An annular wick-tube A is constructed for the purposes of this invention with inner and outer surfaces exposed to cooling air-contact and with a practically unobstructed central air-space *a* open at bottom and top for the admission and flow of the cooling and flame-feeding air. Its outer wall projects below the wick-space *b* in the form of a peculiarly-slotted downward extension *c*, and the wick-tube is provided with inwardly-projecting beads *d* and outwardly-projecting beads *e*, in addition to the customary flanged shoulders *f* and *g* at its upper end, and other necessary details. The combustion-tube B rests loosely upon said shoulders *f* and *g* of the wick-tube within an outer drum or metallic chimney C, and the latter is supported by a gallery D, surrounding the wick-tube A below its upper end, separated therefrom by the customary annular air-inlet a^2 and fixedly attached to the wick-tube by brackets *h*, supported beneath by said beads *e*.

The only attachments within the wick-tube are a pair of guide-spiders *i*, Figs. 1 and 5, located by said beads *d* and preferably riveted fast. These form axial guides 4 for a vertical lifter-rod E within the wick-tube. A horizontal arm *j* at the lower end of said rod projects outward through the slot of said wick-tube extension *c* and terminates in a lifter-knob *k*. The respective parts of said slot, which is preferably T-shaped, are marked 1, 2, and 3 in Figs. 1 and 4. The arm *j* normally rests in the bottom of the vertical portion I and when lifted to elevate the combustion-tube B may be turned either to the right or left, where it is securely held in one of the downwardly-curved detents 2 or 3.

The lifter-rod E carries at its upper end a perforated lifter-disk *l*, Fig. 1, preferably dish-shaped, with its rim 5 upturned and attached between a pair of screw-nuts *m*, so as to be detachable, and a lifter-abutment *n*, Figs. 1 and 3, is secured within the lower end of the combustion-tube B, preferably in the form of a ring having downwardly and inwardly inclined fingers 6 to coact with the rim 5 of the lifter-disk *l* when the latter is elevated to raise the combustion-tube for lighting the stove, said lifter-disk and lifter-abutment being normally out of contact with each other, as in Fig. 1, so that the air may pass freely around the former, while said lifter-disk serves by its perforations to regulate the admission of air to the air-chamber of the combustion-tube, and thus to regulate its supply to the interior of the flame and

also to prevent the radiation or deflection of heat downward from the highly-heated combustion-tube into the wick-tube.

The combustion-tube B comprises the customary concentric outer and inner walls *o* and *p*, connected with each other, but not with the outer drum C, by crossed wires *q*, in one or more pairs, said walls inclosing an annular flame-space *r* and a central air-chamber or mixing-chamber *s*, the latter closed at top by an imperforate cap *t* and provided at about mid-height with an imperforate air-directing disk *u*, Figs. 1 and 2, having notches 7 in its perimeter, which allow the air to pass freely to the space above said disk, directing it at the same time outward and through the perforated inner wall for immediate admixture with the free vapors with reference to their combustion.

The notches 7 serve to equalize the supply of air to the flame on all sides of the combustion-tube, and thus to assist in maintaining a blue flame of uniform height and intensity at all points, and the projections between the notches bring the disk into contact with the inner wall of the tube on all sides for mutual support.

The lifter-abutment *n* and air-directing disk *u* are preferably and conveniently held between pairs of beads 8 and 9, formed in the inner wall of the combustion-tube. The closed cap *t* is preferably secured to the upper edge of the inner wall *p*, as shown at 10, Fig. 1, and the lifter-disk *l* and outer and inner walls *o* and *p* may be cut and formed from one and the same sheet of perforated iron or brass.

The combustion-tube B is freely removable from the wick-tube A, and its open lower end affords access to its interior when thus removed for cleaning out its air-chamber *s*, which is important owing to the scaling of the inner walls *p* when made of iron and the furring or "frosting" of the same if of brass. Access can only be had to the air-space above the disk *u* by making the cap *t* removable; but without resorting to this scale may be detached by tapping the sides of the tube and it will escape through the notches 7, while that portion of the tube below said disk may be thoroughly cleaned out at will. Access may also be had to the interior of the air-space *a* of the wick-tube, should it require cleaning, by removing the lifter-disk *l*. Said imperforate cap *t* prevents any escape of vapor or air from the inner chamber *s* of the combustion-tube B except through the perforations at its sides. It is my experience that when there is an escape of air at the top of the inner wall *p* it draws off a very considerable quantity of unconsumed gases which create an offensive odor. By forcing the air and vapor to escape through the perforations of the highly-heated metal into the flame-space *r* the combustion is rendered more perfect, and by my arrangement as a whole I avoid any perceptible odor or offensive smell.

The notched air-directing disk *u* is held in place inside the inner wall *p* of the combustion-tube without any other means of support than that afforded by said inner wall itself, and it has the advantage over other diaphragms of not only regulating the admission of air into the chamber above the diaphragm, but at the same time of strengthening the inner wall at its weakest part and of keeping the same cool by directing against said inner wall the draft of air through the notches of the disk just where the flame has a tendency to and very frequently does burn out said inner wall.

The wick-raiser (not shown) may be of any known or improved construction appropriate thereto, and the same is true of other parts of the improved stove omitted from the drawings.

The outer drum or chimney C may be provided with a door to obviate lifting it for lighting the stove, and other like modifications will suggest themselves to those skilled in the art.

Having thus described the said improvement, I claim as my invention and desire to patent under this specification—

1. A vaporizing oil-stove comprising an annular wick-tube having a practically unobstructed central air-chamber open at bottom and top, a superposed combustion-tube having concentric perforated walls and loosely seated at the top of said wick-tube, a fixedly-attached gallery surrounding said wick-tube, an outer drum supported on said gallery, and means for elevating said combustion-tube including a vertical lifter-rod within the wick-tube, a perforated lifter-disk carried by the upper end of said rod and serving by its perforations to regulate the supply of air to the interior of the flame, and a lifter-abutment within said combustion-tube to coact with said lifter-disk, substantially as hereinbefore specified.

2. In a vaporizing oil-stove, the combination of an annular wick-tube having a practically unobstructed air-chamber open at bottom and top, a superposed combustion-tube loosely seated at the top of said wick-tube, and means for elevating said combustion-tube comprising a vertical lifter-rod within said wick-tube, a disk-shaped perforated disk carried by the upper end of said rod, and a lifter-abutment within said combustion-tube in the form of a fixed ring having downwardly and inwardly inclined fingers to coact with the upturned rim of said disk.

3. In a vaporizing oil-stove, a combustion-tube constructed with concentric outer and inner walls inclosing an annular flame-space and a central air-chamber and provided within the latter with an imperforate air-directing disk having notches in its perimeter forming the air-passages, the projections between said notches bringing the disk into contact with the inner wall of the tube on all sides, for mutual support.

4. In a vaporizing oil-stove, a combustion-tube constructed with concentric outer and inner walls inclosing an annular flame-space and a central air-chamber, the latter closed at top by an imperforate cap and open at bottom, and provided at mid-height within said air-chamber with an imperforate air-directing disk having notches in its perimeter forming the air-passages, the projections between said notches bringing the disk into contact with the inner wall of the tube on all sides, for mutual support, substantially as hereinbefore specified.

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