(No Model.)

T. T. WOODWARD.

VAPOR BURNER.

No. 272,999. Patented Feb. 27, 1883.

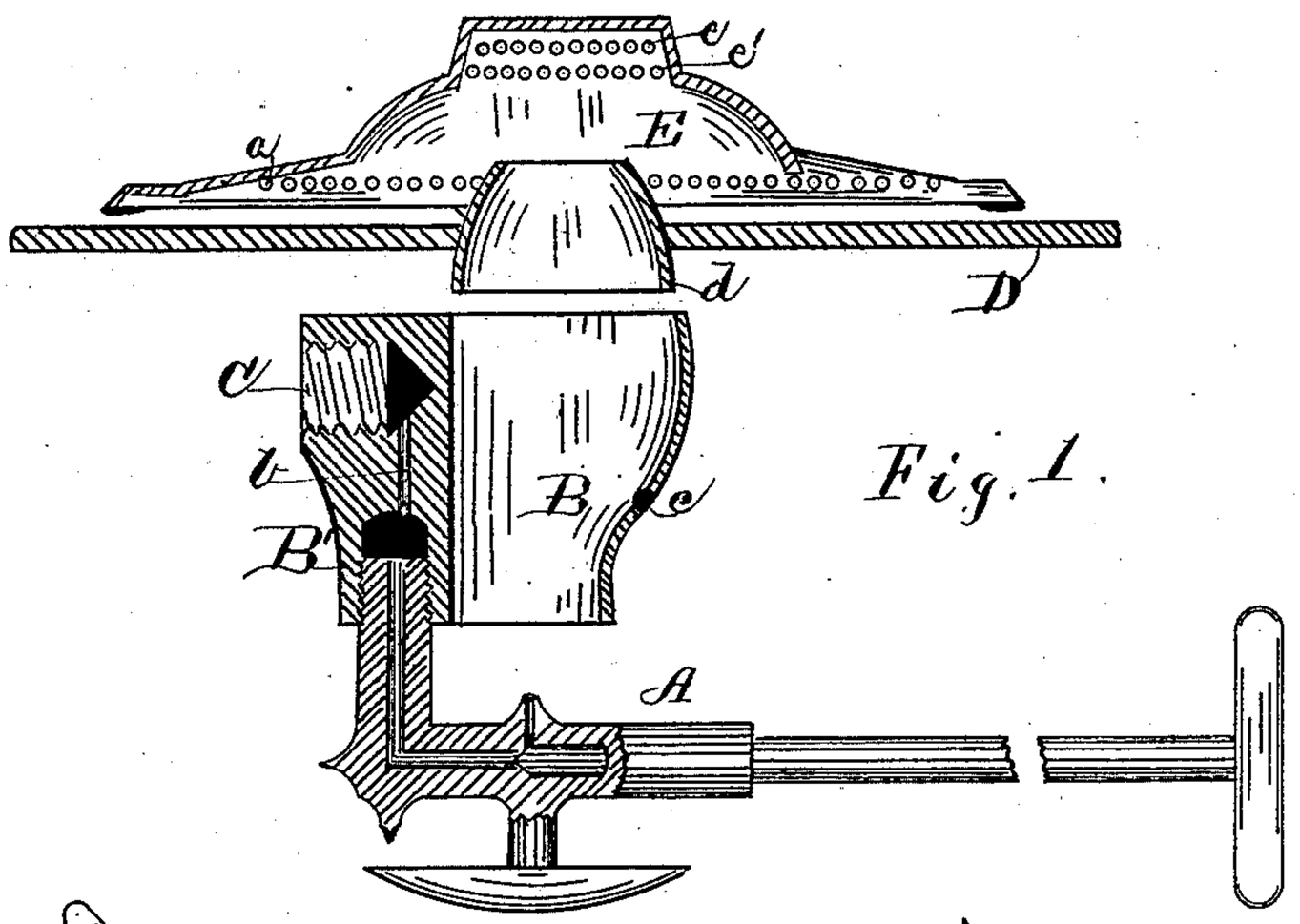

Fig. 1.

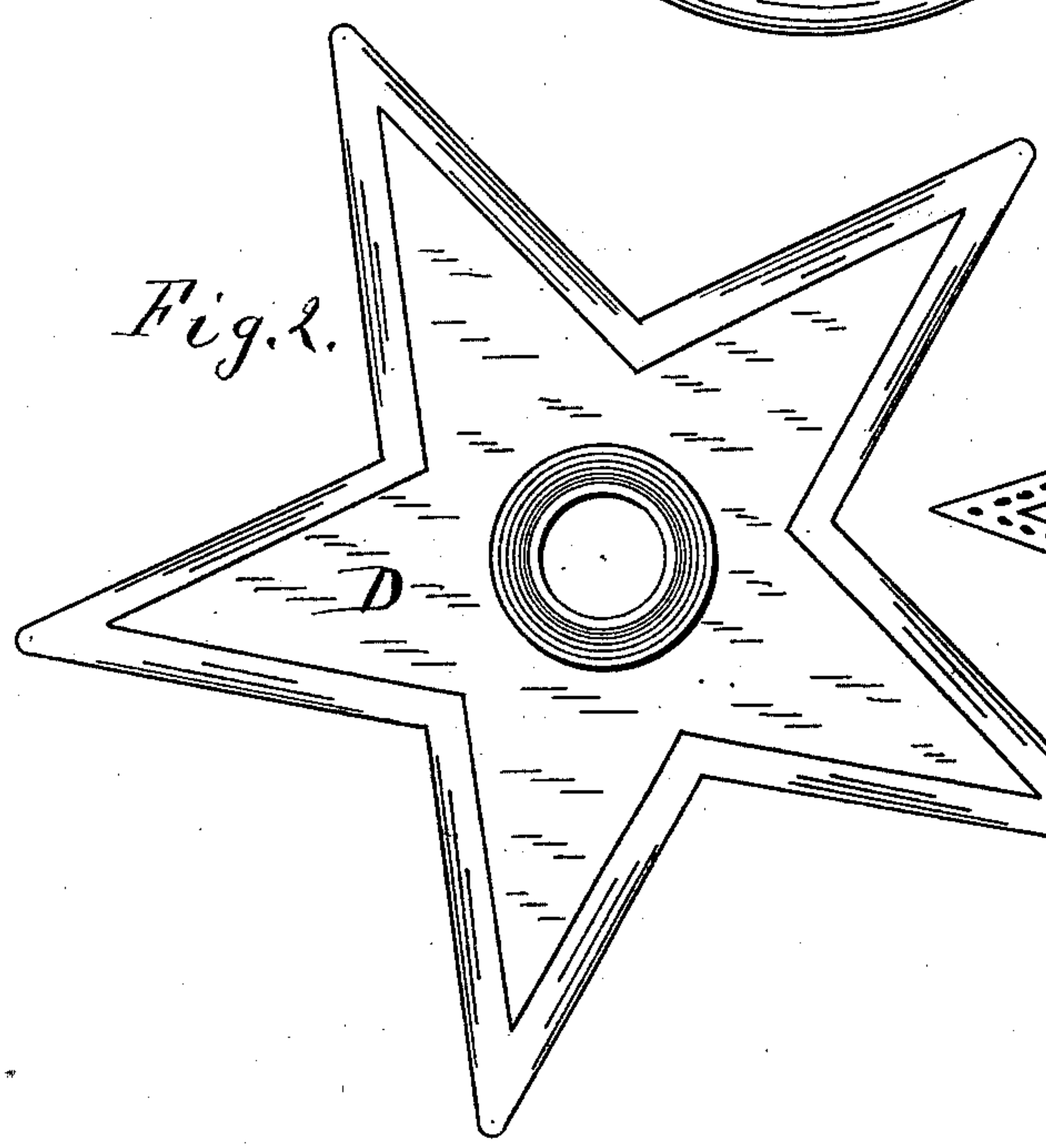

Fig. 2.

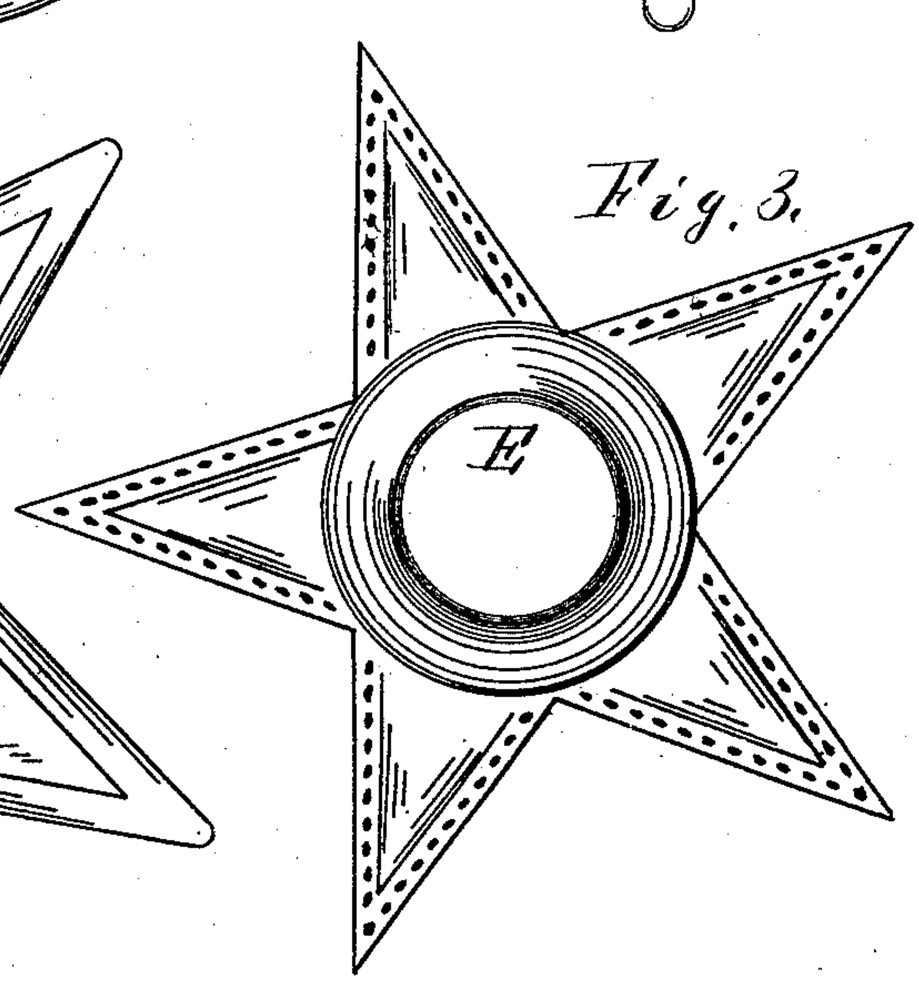

Fig. 3.

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UNITED STATES PATENT OFFICE.

T. TRASK WOODWARD, OF PANA, ASSIGNOR OF ONE-HALF TO THOMAS H. WINGATE, OF DECATUR, ILLINOIS.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 272,999, dated February 27, 1883.

Application filed December 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, T. TRASK WOODWARD, a citizen of the United States, residing at Pana, in the county of Christian and State of Illinois, have invented a new and useful Improvement in Vapor-Burners, of which the following is a specification.

My invention relates to certain new and useful improvements in vapor-burners; and it consists, first, in the general form of the cup and generator and the plate and cap, each of which is in the form of a five-pointed star; second, in the construction of the conducting-tube and generator and its combination with the star-shaped plate which forms the upper contracted end of the conducting-tube, all of which will hereinafter be more fully described, and such parts as are believed to be new and novel pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents the burner in cross-section, the plate being elevated slightly above the generator, and the cap also slightly elevated above the plate, so as to show more clearly the general form of each. Fig. 2 is a plan of the plate as it appears from the top, showing the rib or bead around the edge, within which the cap fits. Fig. 3 is a top plan of the removable cap.

Similar letters refer to similar parts throughout the several views.

A represents an ordinary screw-valve screwed into the lower part of the generator B′, as in other burners. The induction-tube B in its construction is new, as it is in the form of a half-oval, one of its side walls forming the generator, as shown at B′, into which the supply-pipe, which carries the valve, is screwed, a small pin-hole, *b*, uniting the two pipes A and C, through which the fluid passes. The lower end of the induction-tube is contracted by the straight wall of the generator B′, and the lower opening of the induction-tube is half-round, so that the flame passes up along one side of the generator constantly. The upper portion of this generator B′ increases in thickness, and the tube B is increased in diameter, but corresponds in shape to its lower end. The plate D is removable, and is provided with a ring or collar, *d*, located directly in the center and extending above and below the plate. Its upper end, or that part which projects above the plate, is formed with a contracted opening at its upper end, while its lower end extends about one-fourth of an inch below the plate, forming a straight ring or collar, which is adapted to fit within the upper orifice of the induction-tube, the plate resting upon the top of the same, thus forming a contracted continuation of the induction-tube, and at the same time affording a means of securing the plate firmly upon the generator. Upon the top of this plate D is fitted a removable cap, E, having a row of small perforations, *a*, extending from its circular body to the extremity of each point on each of their sides, as shown in Fig. 1. The extreme points of the cap are slightly bent downward, so that when the cap is placed upon the plate D it rests upon these downward-projecting points, leaving a small opening between the cap and plate, through which is emitted a continuous solid flame which does not extend out far enough to mingle with the flame coming from the row of jets *a* just above it, thereby producing a very pretty effect and rendering the burner attractive and ornamental as well as useful. The upper part of this cap E is crowned with a small dome with a flat top provided with two rows of perforations, *e* and *e′*. These holes in each row are alternate with the others, so that the flame does not intermingle.

The special advantages claimed for the half-oval induction-tube are as follows: By having the lower end contracted, the middle swelled or bulged, and the upper end contracted smaller than the lower end, a tendency to create a vacuum is produced within the bulged portion, which serves to steady the flame and prevents whistling or roaring, and acts upon the same principle as a bulb in a common blow-pipe. At the lower part of the swelled portion are one or more small holes (see *c*, Fig. 1) for the purpose of admitting air, which mingles with the gas arising from the valve-jet and makes a more perfect combustion, rendering a perfectly-blue flame. It has been proven by actual experi-

ment and practically demonstrated that admitting air at the point indicated at *c*, Fig. 1, above the lower orifice of the conducting tube or chamber, is a decided advantage in producing a pure combustion of gas and blue flame. The advantages in the star-shape burner over a round or square one are that a large area of flame is produced from an ordinary-sized jet-valve, and it is so placed upon the top of the generator that one of its points lies along the top of the inlet-pipe, keeping it hot, and thereby assisting in a certain degree the generation.

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

1. In a vapor-burner, the generator and induction-tube B′ and B, constructed in the form shown, with one or more holes or air-ducts, *c*, located above its lower orifice, for the purpose described, in combination with a supply-pipe, C, and jet-valve A, substantially as set forth.

2. In a vapor-burner, the star-shaped plate D, in combination with the induction-tube B and generator B′, provided with a ring or thimble, *d*, centrally located and projecting above and below said plate, its lower portion adapted to fit within the upper orifice of the said induction-tube, its upper part extending above the plate and being contracted, forming a continuation of said conductor, as shown, and for the purpose described.

3. In a vapor-burner, the star-shaped removable cap E, in combination with the star-shaped plate D, the generator B′, and induction-tube B, said cap being provided with a row of perforations, *a*, extending from the body to the extremities of the points on each of their sides, as shown, and the depressed points or their equivalents, which rest upon the plate to keep the main body of the cap off said plate, thereby leaving an opening between them which emits a solid sheet of flame separate and apart from the jets *a*, substantially as shown, and for the purpose specified.

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Witnesses:
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