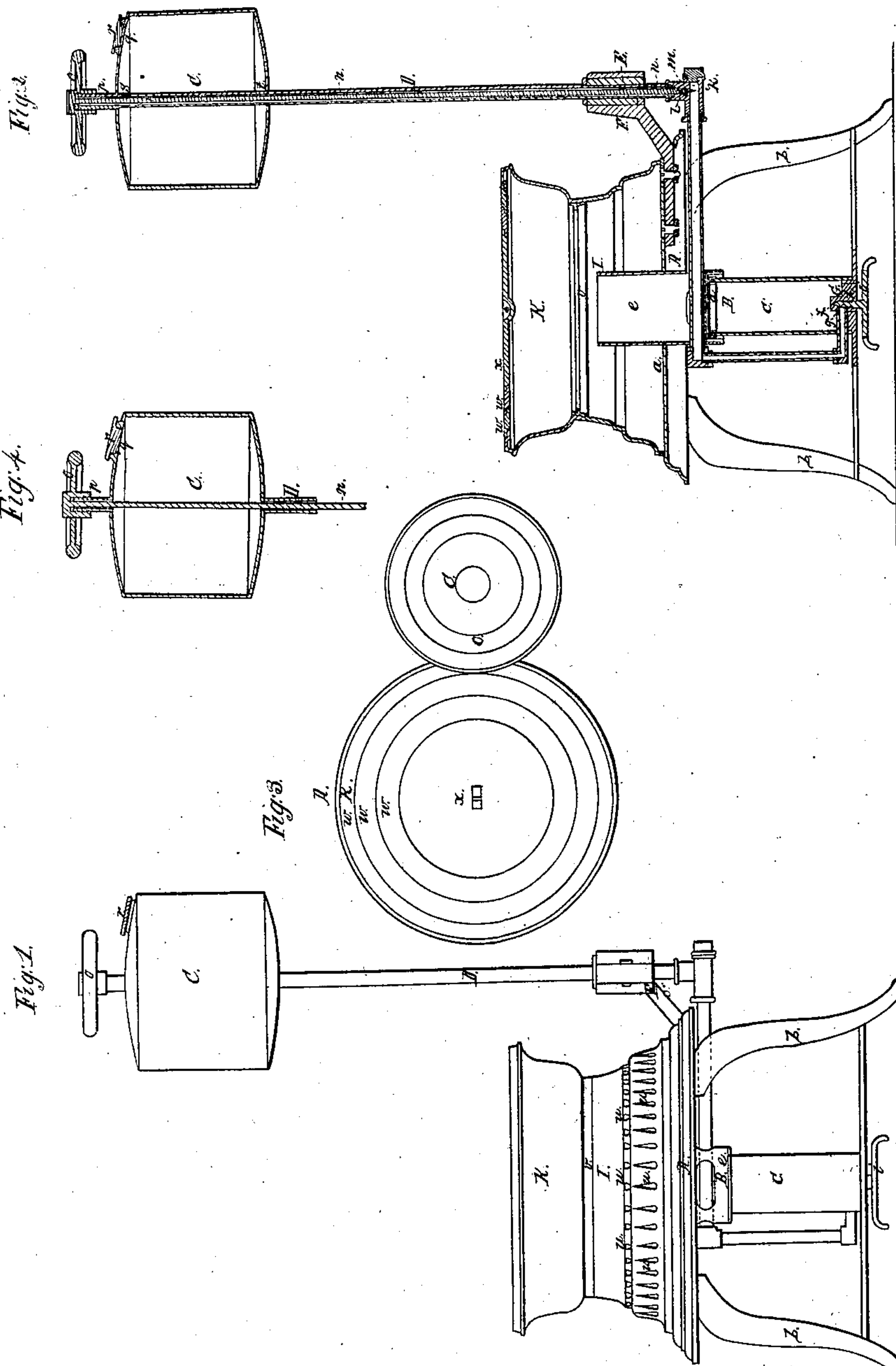


No. 42,103.

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O. F. MORRILL.
VAPOR STOVE.



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IMPROVEMENT IN VAPOR-STOVES.

Specification forming part of Letters Patent No. 42,103, dated March 29, 1864.

To all whom it may concern:

Be it known that I, OSCAR F. MORRILL, a resident of Chelsea, in the county of Suffolk and State of Massachusetts, have made an invention of certain new and useful Improvements in Apparatus for Generating Heat for Culinary or Various other Purposes; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, Fig. 2 a vertical section, and Fig. 3 a top view, of my said heat-generating apparatus.

In the said drawings, A denotes a stand, which consists of a circular disk or tablet, *a*, and a suitable number of legs, *b b*, extending therefrom. Within this stand there is arranged an aerovapor burner, B, which consists of a tube, *c*, which is open at its lower end, and at its upper end is capped by a foraminous plate or wire-gauze diaphragm, *d*, over which there is a perforated chimney, *e*, which extends through the part *a* concentrically and rises above it, as shown in Fig. 2. Raised some distance above this stand there is a reservoir or close chamber or vessel, C, for holding "petroleum naphtha," or "carbon spirits," or any liquid easily-vaporizable and combustible, the said vessel C being supported by a conduit or tube, D, which not only passes entirely through and extends a short distance above the said vessel, but also extends downward from it toward the stand A and through a block of wood, E, (or some other suitable non-conductor of heat,) held in place by means of an arm or projection, F, fastened to and extended from the said stand. The purpose of the block E, which I term the "insulator," is to so insulate the conduit from the stand as to prevent the heat of the latter, when the apparatus may be in use, from being so absorbed by the conduit as to vaporize the liquid which may be flowing down the vertical part of it. From the said insulator the conduit extends horizontally underneath the tablet *a* and over the foraminous diaphragm of the burner, and thence down alongside of the exterior surface of the said burner, and thence is carried horizontally into the lower part of the burner and opens into a vertical jet tube or receiver, G. At its upper end the said receiver has a very small eduction-orifice, *f*,

which is conical, to receive a conical valve, *g*, whose stem is furnished with an elevating-screw, *h*, and a pronged wheel, *i*, arranged as shown in Fig. 2. The said screw is tapped into the receiver G, and when turned in one direction will elevate the valve toward its seat or the opening *f*. The screw, when revolved in the opposite direction, will depress the valve. At the bend *k* of the conduit D there is another such valve and valve-seat, the same being shown at *l* and *m* in Fig. 2, the stem *n* of the valve being extended up through and out of the standard or longer vertical part of the conduit, as shown in the drawings. Such stem, at its upper end, is provided with a hand-wheel, *o*, by which it may be revolved. The hub of the hand-wheel is recessed to fit around and screw upon the upper part of and constitute a cap to the conduit, as shown at *p* in Fig. 2. Furthermore, the reservoir C is furnished with a filling-orifice, *q*, provided with a screw cap, *r*, and there are two holes, *s t*, made through that part of the conduit D which is within the reservoir C, one of these holes, *s*, being near the top, and the other, *t*, being near the bottom, of the reservoir. Surrounding the chimney is a separate casing, I, having numerous holes, *u u u*, made through its sides. It is through these holes that the spent volatile products or gases make their escape after having acted on the vessels or apparatus which may be arranged over the chimney. The casing I has a contracted-neck, *v*, made to receive another casing or boiler-supporter, K, which rests upon it, and is formed as shown in the drawings. The said boiler-supporter K is provided with one or more rings, *w*, and a circular cover or plate, *x*. The second ring laps on the first ring, and in its turn is lapped on by the third ring, which is also lapped on by the cover, the whole being arranged concentrically and formed as shown in the drawings, and particularly in Fig. 3. When the rings and cover are in place, they serve to cover the opening in the top of the boiler-supporter, and may be used for sustaining one or more sad-irons or other articles or vessels to be heated by the flame of the burner. By removing the cover from the inner ring, we shall have an opening either for insertion of a kettle, boiler, or pan into the latter, or for the admission of

heat directly to a pan or vessel when placed on the said ring. So, by removing the second, or second and third, rings from the rest of the apparatus, larger openings may be formed for like purposes.

By means of the two valves arranged and applied to the conduit D as described we are enabled to regulate not only the discharge of liquid into the vaporizer or that part of the conduit which is horizontal and immediately over the burner, but we can also regulate the flowage or escape of vapor that may be formed. With but one valve in the conduit the flame will often suddenly decrease in height, and is subject to much fluctuation; but I have found when a valve is used to regulate the flowage of the liquid into the vaporizer, and another valve is also employed to regulate the discharge of vapor therefrom, the height of the flame may be adjusted and the apparatus will operate to much better advantage than with but one valve. Furthermore, by having the conduit extended into, through, and out of the reservoir in manner as specified, and providing the conduit with the extra hole, *s*, arranged near the top of the reservoir, any fluid within the conduit will not be liable to be expelled from or driven out of the top of the conduit; but when back flowage, occasioned by the pressure of the gas or vapor in the vaporizer, may take place, such fluid will be driven through the hole *s* and back into the reservoir.

The arrangement of the valve rod or stem *n* within the conduit D in manner as shown in Fig. 2 not only imparts strength to the conduit, but enables the hand-wheel to answer the twofold purpose of a cap to the conduit and a means of rotating the valve-stem. By having the reservoir C elevated above the burner or fixed on a conduit rising some distance above the stand, I am enabled to obtain a head or pressure of the fluid in the conduit advantageous to its emission through the main-valve opening and into the vaporizer. I would also remark that, instead of carrying the conduit straight over the burner, it may be curved more or less, so as to increase the heating-surface of it. I would further state that, in consequence of the position of the hand-wheel and its valve-stem *n* there is not the danger of leakage that there would be with a faucet-valve arranged at the head of the conduit.

I would also remark that, instead of extending the conduit up into or through the reservoir, I sometimes arrange the conduit so as not to go through or up into it, but to open out of its bottom, as shown in Fig. 4. This, however, does not present the advantage of the extension of the conduit from top to bottom of the reservoir or through it, for in the latter case the strain of the screw of the valve-rod is thrown on the conduit entirely, and has no tendency to burst up the head of the reservoir, as it would have were there no

extension of the conduit through the reservoir. I would further remark that the manner of combining the hand-wheel *o* of the valve-stem *n* with the conduit B—that is to say, by recessing the hand-wheel and screwing it on the top of the conduit—not only provides a means of regulating the valve independently of the reservoir, but causes the hub of the hand-wheel to serve as a cap to the opening at the top of the reservoir or as a means of closing the same. I would further remark that it is often the case that while the valve may be open the formation and pressure of combustible vapor within the vaporizer or conduit may not be sufficient to carry the effluent stream up through the wire-gauze or foraminous top of the burner. It will therefore be seen that were there no valve at the orifice of discharge, it would sometimes happen that the stream of combustible vapor passing out of the conduit or vaporizer would not press upward with the force required to have it properly rush through the foraminous top of the burner, but with an adjustable valve the size of the opening of discharge may be so regulated or diminished as to cause the vapor to ascend with the force and to the height required. This will be so particularly when there may be but a small portion of the fluid flowing into the vaporizer.

Having thus described my said apparatus, what I claim therein as my invention is as follows, viz:

1. The arrangement of the valve-stem, reservoir, conduit, and hand-wheel when the conduit is extended into and through the reservoir.

2. The extension of the said stem and conduit through and beyond the reservoir, and providing the conduit with the extra hole *s*, the whole being substantially as specified.

3. The combination of the auxiliary valve *g* and its actuating mechanism, (screw *h* and wheel *i*,) or their equivalents, with the aerovapor burner, as described, its conduit D, reservoir C, its main valve *l*, and an actuating mechanism, so made and applied to the valve *l* as to be so separate and distinct from the actuating mechanism of the auxiliary valve *g* as to enable either of such actuating mechanisms, with its valve, to be operated or put in operation without at the same time effecting any movements of the other of the said actuating mechanisms and its valve, the whole being arranged substantially as described.

4. The combination of the hand-wheel *o* of the valve-stem *n* with the conduit D, substantially in manner and so as to serve the purposes as specified, the hand-wheel under such circumstances being recessed and screwed on the conduit, instead of the valve-rod being screwed into the reservoir.

5. In combination and arrangement with an aerovapor burner, substantially as described, and its fluid-vaporizer, or means of converting the hydrocarbon fluid into a vapor, the ad-

justable valve *g* and its seat, the same being for the purpose of enabling the vapor to be ejected out of the vaporizer to a height sufficient to enable it to pass up through the wire-gauze diaphragm of the air and vapor mixer of the burner.

6. The combination of an aerovapor burner substantially as described, a reservoir, a conduit or vaporizer, and two valves, so arranged that one of such valves may be used to control the ingress of fluid into the vaporizer and the other to control the egress of combustible vapor therefrom.

7. The combination of a fluid reservoir and

vaporizer and aerovapor burner with a valve to regulate the escape of vapor, under an arrangement to operate in the manner and for the purposes set forth.

8. The combination of a fluid reservoir and vaporizer, the aerovapor burner, and the requisite valves to regulate the supply of fluid and the escape of vapor, together with a stove or support for vessels or articles to be heated.

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