H. W. DOPP.

HYDROCARBON BURNER FOR COOKING AND HEATING.

No. 48,379. Patented June 27, 1865.

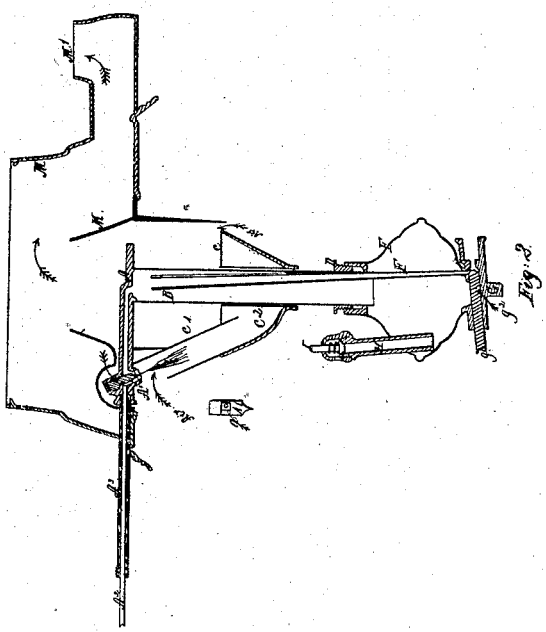

Fig. 2.

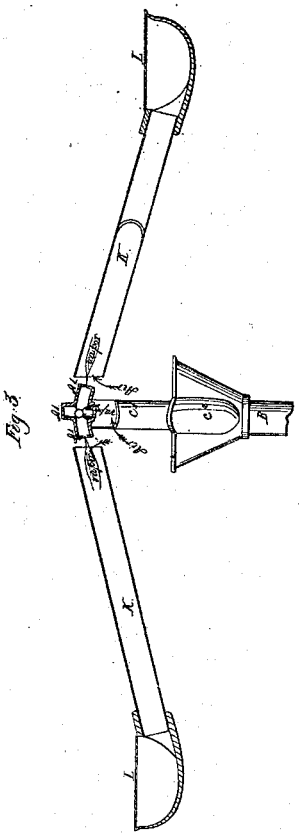

Fig. 3.

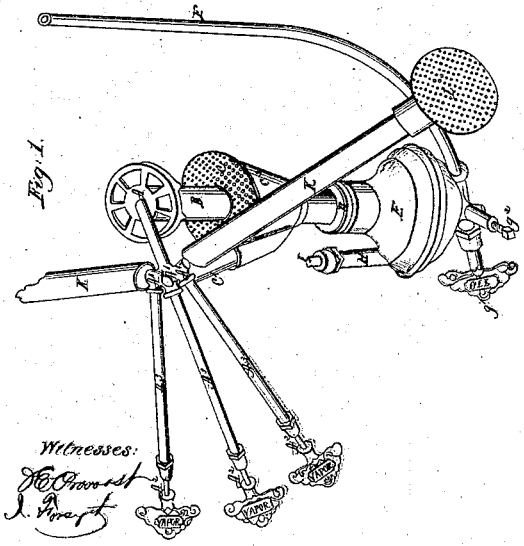

Fig. 1.

Witnesses:

Inventor:

H. W. Dopp.

UNITED STATES PATENT OFFICE.

H. W. DOPP, OF BUFFALO, NEW YORK.

HYDROCARBON-BURNER FOR COOKING AND HEATING.

Specification forming part of Letters Patent No. **48,379**, dated June 27, 1865.

To all whom it may concern:

Be it known that I, H. W. DOPP, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and improved mode of burning vapor from hydrocarbon liquids for heating and cooking purposes; and I do hereby declare that the following is an exact and true description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure I is a perspective view of the model, showing the mode of supplying three burners with vapor obtained from one generator. Fig. II is a center section of the generating apparatus, showing the same in connection with a frame for supporting cooking utensils. Fig. III is a sectional cut of the two branch burners, also the vapor-controlling part of the generating apparatus, and a partial front view of the main burner which sustains the continuous vaporization.

A is the generator and top of retort.

A′ in Fig. II is a little stem with a needle-point on one end and a slot on one side at right angles, which point passes in and through a small orifice, out of which the vapor from the retort makes its exit. This needle-point graduates the quantity of vapor.

a is a square block with a hole in its center, in which is secured a crank-pin. This block, being fitted into the slot of stem A′ so as to admit of a forward and backward sliding motion when the crank-pin is turned, furnishes a firm and durable bearing for said crank-pin, and keeps the stem A′ in position, so as to produce a right lineal motion.

A′ A′ A′ in Figs. I and III show the multiplication of what is said of A′ in Fig. II.

A^2 in Fig. II is a spindle or shaft running through a tube which is screwed into generator A. This spindle is provided on one end with a crank-pin, which works and turns in the sliding block *a*, which block is secured to little stem A′ by means of a slot running on one side of it at right angles. By turning said spindle a backward and forward sliding motion is given to block *a* and needle-point at A′, so as to pass out of and into the vapor-orifice.

A^2 A^2 A^2 in Fig. I show the multiplication of what is said of A^2 in Fig. II.

A^3 in Fig. II is a tube, having one end secured into generator A, through which the spindle A^2 runs.

B is the retort.

C is the perforated plate of the main burner.

C′ is the commingling-tube.

C^2 is a shell, to which is attached the perforated plate C and tube C′, the whole constituting the main burner.

D is a stopping-box, intended to secure a tight joint and connect the retort to the lower part of the generating apparatus, thus giving a chance of disconnecting readily and substituting another retort when the one in use should give out, and making the invention entirely practicable for general use.

E is a small reservoir, intended to contain water. The office of this water is to collect and absorb the residue of the oil not vaporizable and to secure the oil-controlling faucet from leakage.

F is a feed-tube conducting the oil from oil-reservoir to retort. The same is extended to the top of the retort, so that the oil will be lit up to the point where effectual vaporization is accomplished, thus securing a more perfect way of vaporizing all hydrocarbon liquids composed of unequal specific gravities—such as crude petroleum—which this apparatus is designed to burn.

G is the base of the water-reservoir, constructed with two faucet-screws.

g′ is a faucet-screw, to let on or cut off the supply of oil. The same is secured into G in such a manner as to be always surrounded with water, thus effectually guarding against leakage of oil, as oil or other hydrocarbon liquid cannot remain under water or any other liquid whose specific gravity is greater than that of the hydrocarbon liquid.

g^2 is a faucet-screw, also secured to G. This is to draw off the water from reservoir E when desirable so to do from an excess of residuum.

H is a tube secured into reservoir E, through which the water is supplied.

I is a conical valve, having its seat in tube H, and being secured to the same by means of a screw-box and a small spiral spring surrounding the valve. The object of this valve is to act as a safety-valve when at any time through a mistake of the operator excessive pressure

might be produced—as, for instance, in kindling or lighting up the apparatus when the retort is full of oil and the oil-faucet shut off—so as to exclude communication with the oil-reservoir, and when, at the same time the vapor-faucet is not opened to allow the escape of vapor under such circumstances, there would be without this safety-valve great danger of the retort bursting; but this safety-valve, being in communication with and subject to the pressure of the vapor thus generated, yields and permits the water to escape, which lowers the oil in the retort below the point of vaporization, and then is pressed back to its seat by means of the spiral spring. By this arrangement under no circumstances can any accident take place.

K K are commingling and conducting tubes for branch burners.

L L are the two branch burners, which are provided with perforated plates, through which the vapor escapes before it is ignited like the main burner.

M M represent the mode of applying the heat for cooking purposes.

M′ shows the mode of carrying off the gases which are the products of combustion. A general objection obtains against the use of the ordinary gas-stove on account of the absence of any mode of removing the gases obtained from the combustion, these gases being exhausted in the room where the said gas-stove is operating. To overcome this objection in this apparatus a connection can be made with M′ and a chimney or other aperture by means of a pipe or tube. This connection with chimney is not needed to create a draft, there being no need for such application in gas or vapor stoves, but is especially desirable for the purpose described.

To operate this apparatus, a reservoir of coal-oil or other hydrocarbon liquid at an altitude of two or more feet is attached by connection at G. Water is to be supplied to reservoir E by means of tube H. Then primary heat is to be applied to the generator A and retort B by the use of about a table-spoonful of alcohol, naphtha, or other suitable material placed in a cup surrounding the retort and sitting on the perforated plate C. This is to be ignited. Oil is then to be let into the retort by turning the faucet screw handle marked "Oil." When the alcohol is about two-thirds consumed vaporization will be effected. Now a supply of vapor can be given to the main burner by partially turning the middle faucet-handle marked "Vapor." The vapor now escapes with a current down into the commingling-tube C′, thereby mingling with the required atmosphere necessary to produce perfect combustion. Then, after thorough mingling, the vapor passes up through the perforated plate C, and, coming in contact with the flame of the kindling material, is ignited. When the kindling-liquid is consumed the cup is to be removed and a larger supply of vapor admitted by increased turning of the said faucet-handle marked "Vapor." Continuous vaporization and combustion will now be sustained.

The branch burners may be operated at any time that the main burner is burning by turning the right and left hand vapor-faucets, which permits the vapor to pass along through the commingling and conducting tubes K K, which becomes in its passage sufficiently mingled with the atmosphere and may be ignited above the perforated plates of the burners L L with a lighted match.

To stop the operation of the burners the flame may be extinguished by turning off the supply of vapor by turning the vapor-faucet-handle marked "Vapor" and then shutting off the supply of oil by turning the faucet-handle marked "Oil."

I claim—

1. Needle-point A′, in combination with spindle A^2, perforated plate C, crank-pin, sliding block, and slot, substantially as shown and described.

2. The commingling-tube C′, in combination with perforated plate C, arranged and operating substantially in the manner described.

3. The mode of connecting the rotort B with reservoir E, for the purpose described.

4. The application of reservoir E for the collection of the residue of hydrocarbon liquids.

5. The use of water or other liquid of suitable specific gravity for the purpose described, but only in connection with hydrocarbon-vapor stoves for cooking and heating purposes.

6. The safety-valve I, for the purpose set forth.

7. The draw-off faucet g^2, in combination with reservoir E, for the purpose herein set forth.

8. Supplying vapor to two or more areo-vapor burners by one generating apparatus.

9. The retort B and feed-tube F, when constructed as and for the purposes set forth.

10. The use of a pipe or tube, in connection with a chimney or other aperture, for the removal of noxious gases obtained from hydrocarbon liquid, the product of combustion, as described and set forth.

H. W. DOPP.

Witnesses:
I. E. PROVOOST,
I. FORSYTH.