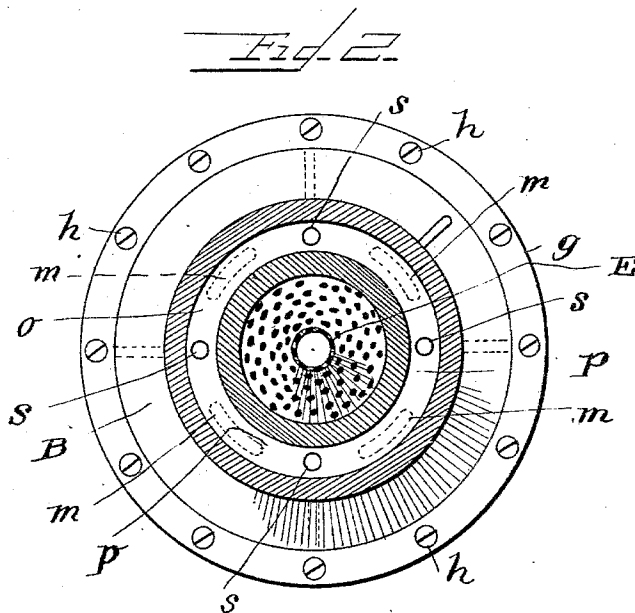
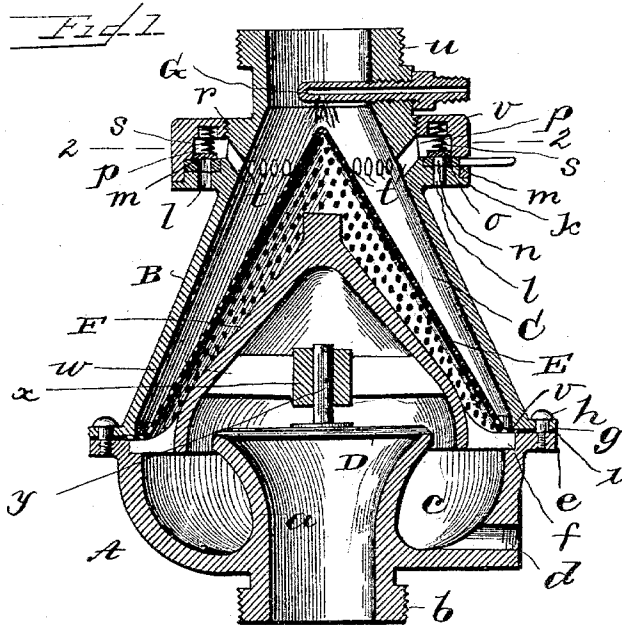


(No Model.)

B. W. GRIST.
VAPORIZER FOR GAS MOTORS.

No. 545,125.

Patented Aug. 27, 1895.



Witnesses
O. A. Farkenschmidt,
D. W. Reinold.

Inventor
Benj. W. Grist
By D. E. Reinold
Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN W. GRIST, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
PENNSYLVANIA IRON WORKS COMPANY, OF SAME PLACE.

VAPORIZER FOR GAS-MOTORS.

SPECIFICATION forming part of Letters Patent No. 545,125, dated August 27, 1895.

Application filed June 17, 1895. Serial No. 553,063. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN W. GRIST, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Vaporizers for Gas-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to gas-motors, and has especial reference to means for vaporizing hydrocarbons or other volatile liquids for use as an explosive agent in such motors; and it consists in certain improvements in construction whereby the liquid is spread into a thin sheet and air in comminuted streams passed through the liquid and thoroughly saturated therewith and the excess of liquid returned to the source of supply, as will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a vertical transverse section, and Fig. 2 a top plan view on the line 2 2, Fig. 1.

Reference being had to the drawings and the letters thereon, A indicates the lower section of the two-part outer casing, which is provided with a concentric tubular nozzle *a*, which extends above and below the bottom thereof, the outer end of which is provided with a screw-thread *b*, by which it may be connected to a suitable air-supply tube, and the inner end is flaring to direct the air outward toward the deflector, and around the upper extension of the nozzle is an annular chamber *c* to receive the excess of liquid supplied to the vaporizer and which is not taken up by the air supplied thereto, and said excess of liquid is discharged from the chamber *c* through passage *d* and returned to the pump which supplies the liquid or to a suitable reservoir. The section A is also provided with an external annular flange *e* and an internal concentric seat *f*.

The upper section B of the casing is provided with an annular flange *g*, by which it is secured to the flange *e* of the section A by suitable bolts *h*, with a packing-gasket *i* in-

terposed between the flanges, and near the upper end is an annular projection *k*, in which are ports or passages *l*, and upon said projection rests an annular cut-off valve *m*, which is provided with ports or passages *n*, which register with the ports *l*. The valve *m* is axially movable upon its seat on the projection *k* to regulate the quantity of air admitted to the vaporizer.

Above, and resting upon the upper surface of the valve *m*, is an annular check-valve *o*, which is inclosed in a chamber *p*, formed by the annular cover *q*, which engages a screw-thread *r* on the outside of the section B, and the valve *o* is held to its seat by springs *s* to prevent the escape of carbureted air, and from the annular chamber *p* air is admitted to the vaporizing-chamber C through ports or passages *t* to mingle with the air supplied through nozzle *a* and its valve D. The upper end of the section B is provided with a screw-thread *u* to connect the vaporizer to the induction-pipe of a gas-motor.

Within the casing is a foraminous cone E, secured in concentric position by a flange *v*, secured between the flanges *e* and *g* to spread the liquid into a thin sheet or film and comminute the air in its passage through the fine perforations in the cone, so as to present fine or thin streams of air to the liquid to produce rapid carbureting of the air, and within the cone E is a conical deflector F, which extends down below the upper or terminal end of the nozzle *a* and prevents liquid entering the nozzle after passing through the perforations in the cone E and directs the liquid into the chamber *c*. The deflector is provided with a transverse bar *w*, with the boss *x* of which the stem *y* of the valve D engages and limits the upward movement of the valve.

Liquid is supplied to the vaporizer by a suitable pump, (not shown,) or by any suitable means used for the purpose, through tube G, which terminates above and adjacent to the cone and directs the liquid upon the apex of the cone.

The main air-valve D and the supplemental air-valve *o* are opened by the induction-stroke of the piston of the gas-motor and closed automatically, the former by gravity and the latter by the spring *s*.

Having thus fully described my invention, what I claim is—

1. A device for vaporizing volatile liquids, comprising an outer casing, a foraminous cone within the casing and a liquid supply above said cone, in combination with an air supply below the cone.

2. A device for vaporizing volatile liquids, comprising an outer casing, a foraminous cone within the casing, a deflector within the cone and a liquid supply above the cone, in combination with an air supply below the cone and concentric thereto.

3. A device for vaporizing volatile liquids, comprising an outer casing foraminous cone within the casing and a liquid supply above the cone, in combination with an air supply below the cone and provided with a check valve.

4. A device for vaporizing volatile liquids, comprising an outer casing constructed to be connected at its upper end with the induction pipe of a gas motor and having a passage through the bottom of the casing to supply air, and a valve controlling said passage, in combination with a foraminous cone within the casing and above the air supply and an oil supply above and adjacent to the apex of said cone.

5. A device for vaporizing volatile liquids, comprising an outer casing provided with means for connecting it with the induction pipe of a gas motor, an air supply in the bottom of the casing and having a flaring discharge end, a valve for controlling said supply, an annular liquid chamber and a passage leading therefrom, in combination with a liquid supply, means for spreading the liquid into a thin sheet and diffusing the air through the liquid.

6. A device for vaporizing volatile liquids, comprising an outer casing, a foraminous cone within the casing, an air supply below the

cone and provided with a check valve and a deflector, a guide and guard for the check valve, in combination with a liquid supply above the cone.

7. A device for vaporizing volatile liquids, comprising an outer casing, means for supplying liquid and means for spreading the liquid into a thin sheet and comminuting air, in combination with a main air supply at the lower end of the casing and a supplemental air supply near the upper end thereof.

8. A device for vaporizing volatile liquids, comprising an outer casing, means for supplying liquid and a foraminous cone to spread the liquid into a thin sheet and comminute air, in combination with a main air supply below the cone and a supplemental air supply near the apex of the cone.

9. A device for vaporizing volatile liquids, comprising an outer casing provided with a concentric air supply in its bottom, an annular supplemental air supply in the wall of the casing and provided with a cut off valve and a check valve and a foraminous cone, in combination with a liquid supply above the cone.

10. A device for vaporizing volatile liquids, comprising a two part conical casing, the lower section of which casing is provided with a concentric air supply nozzle extending above and below the bottom thereof, an annular liquid chamber around said nozzle a discharge communicating with said chamber and a valve seated upon the inner end of the nozzle, in combination with a deflector above and surrounding the valve, a foraminous cone above the deflector and a liquid supply above the cone.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN W. GRIST.

Witnesses:

EDMUND CELLISON,
HOWLAND CIRT.