No. 788,067. PATENTED APR. 25, 1905.

L. RHODES.

VAPOR BURNER.

APPLICATION FILED MAR. 1, 1904.

2 SHEETS—SHEET 1.

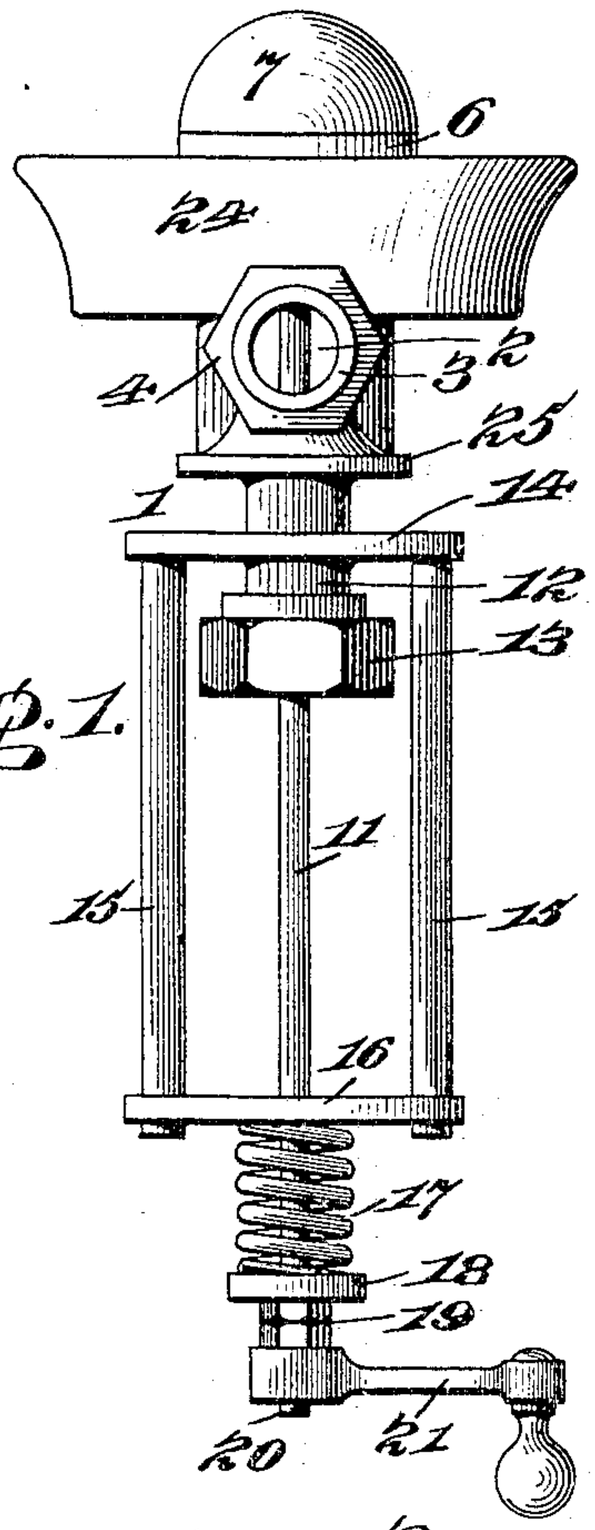


Fig. 1.

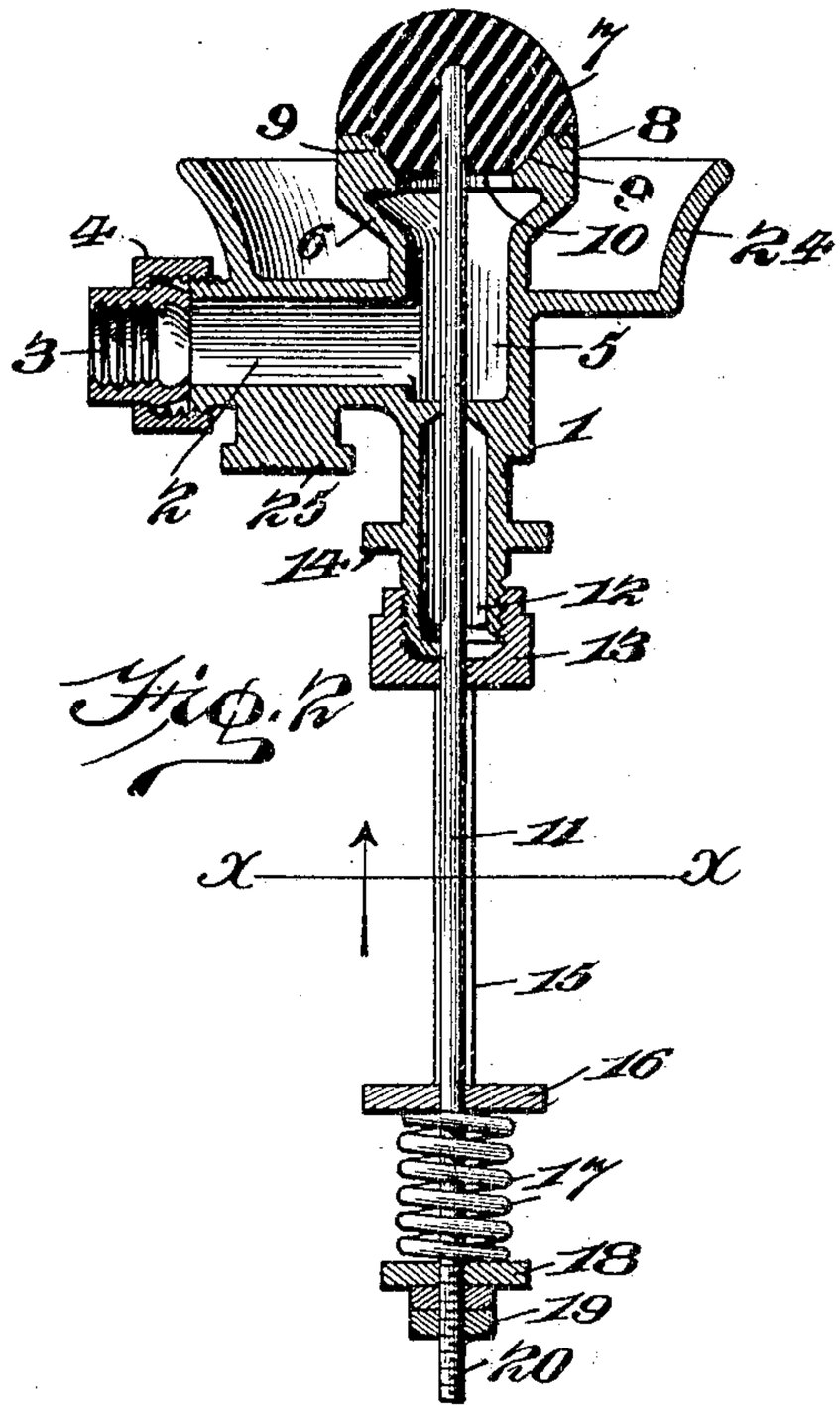
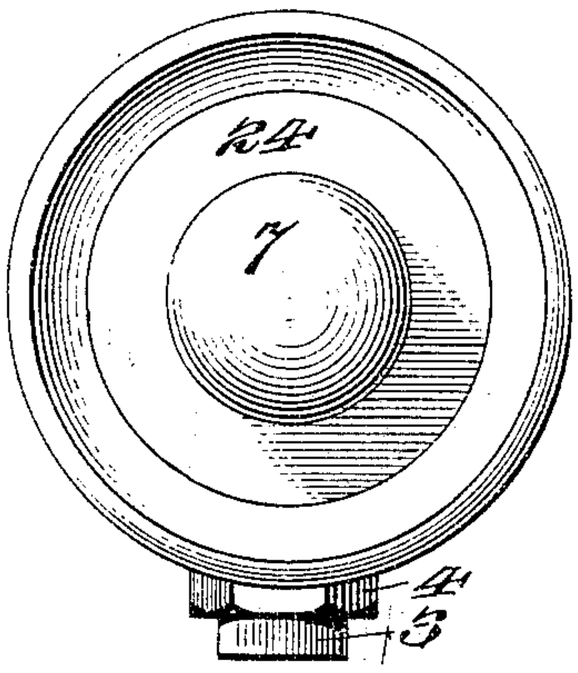
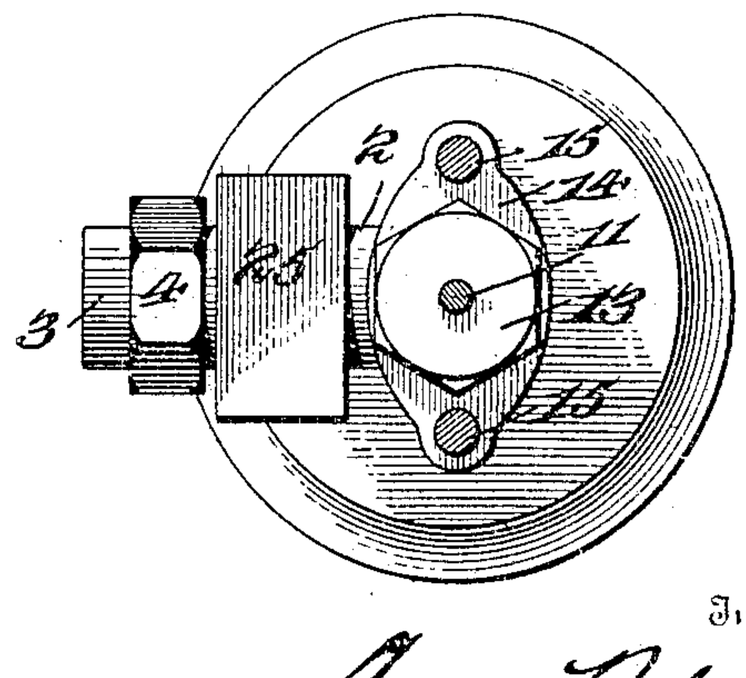


Fig. 2.

Fig. 3.

Fig. 4.





Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

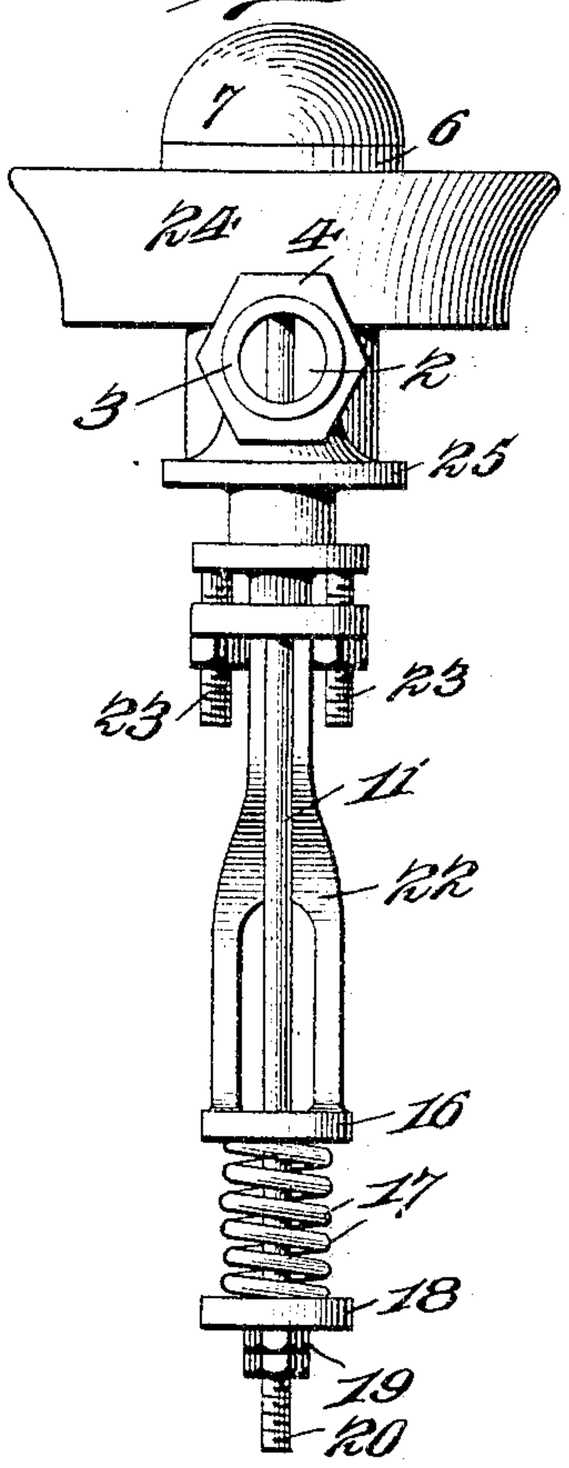


Fig. 6.

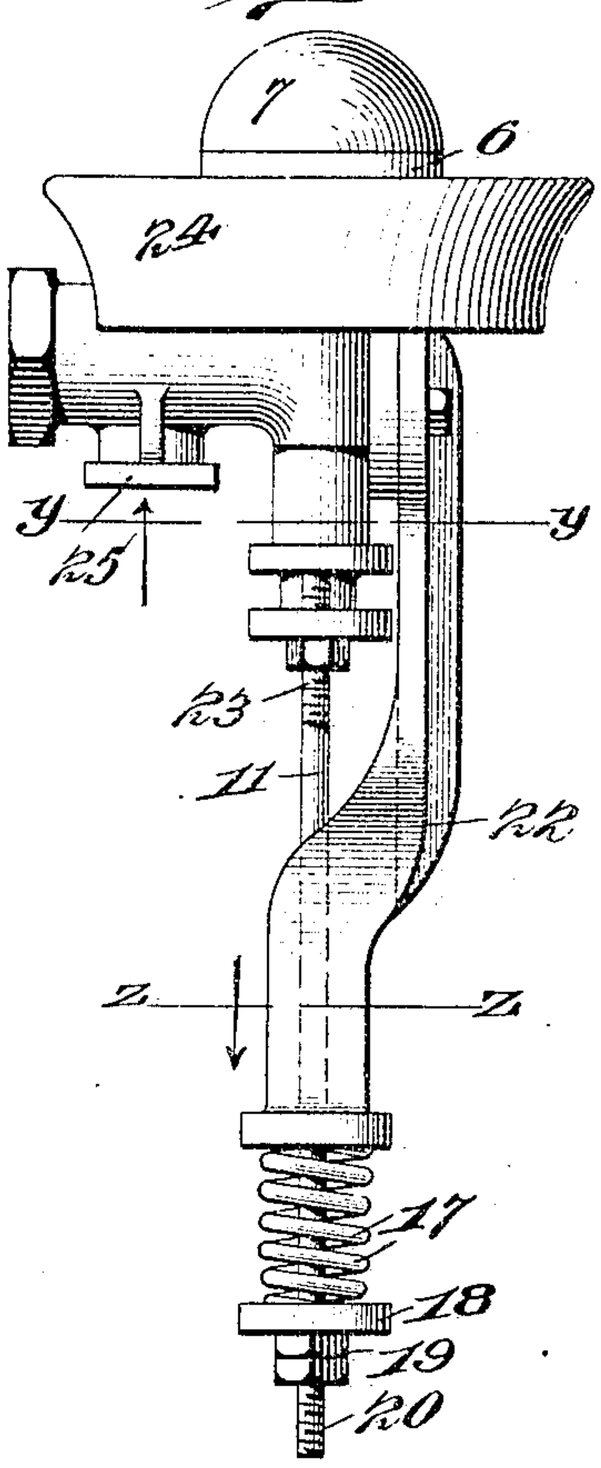


Fig. 7.

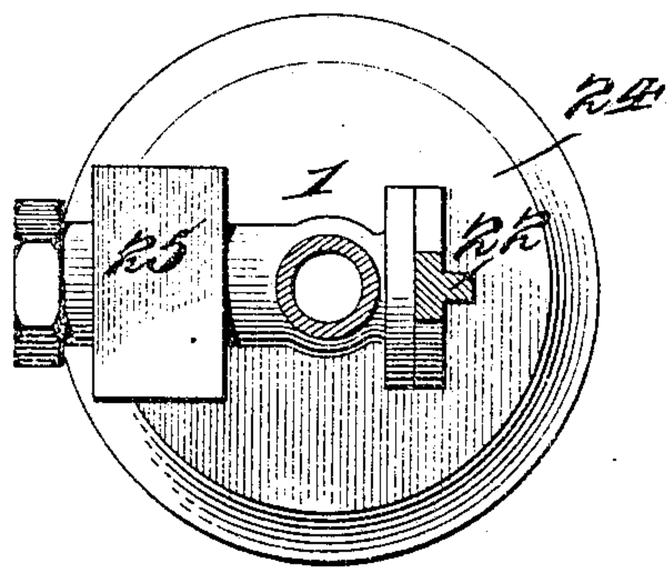
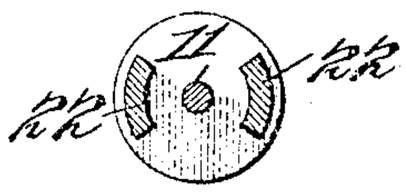


Fig. 8.



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UNITED STATES PATENT OFFICE.

LEVI RHODES, OF SPOKANE, WASHINGTON, ASSIGNOR TO MOTOR TRACTION COMPANY, OF SPOKANE, WASHINGTON, A CORPORATION.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 788,067, dated April 25, 1905.

Application filed March 1, 1904. Serial No. 195,990.

To all whom it may concern:

Be it known that I, LEVI RHODES, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a specification.

This invention relates especially to that class of vapor-burners in which provision is made for automatically controlling the vapor-outlet so as to accommodate the escape of a varying volume of vapor and by reason of such control maintain the requisite velocity of escape therefrom in the interest of perfect combustion.

The object of the invention is the production of a vapor-burner of the above character by which crude petroleum, kerosene, or alcohol can be utilized direct to produce the same heating results as obtained by more volatile products and also to provide against the obstruction of the burner from the residue of the oil or other liquid fuel consumed, so that it will be practicable to use the crude and less expensive liquid fuels for propulsion and other purposes.

To these ends the invention primarily consists in a vapor-chamber provided with a closure adapted to seat against the pressure of the vapor within said chamber and be operated thereby, said closure being carried by a stem extending through said chamber to the exterior thereof, which stem is provided with means for rotating the same, and thereby rotate the closure upon its seat, and also provided with a spring tension device, whereby the closure is normally placed under pressure to resist the vapor-pressure and seat the same.

The invention further consists in certain other novel features in the arrangement and construction of parts, all as hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view of the burner in end elevation; Fig. 2, a view in side elevation, in which the burner proper is shown by a transverse vertical section; Fig. 3, a top or plan view; Fig. 4, a view showing the under side of the burner proper by a section taken on the line *x x* of Fig. 2; Fig. 5, a view in side elevation of a modified form of the invention, and Fig. 6 a section view taken on the line *y y* of Fig. 5.

In practicing the invention the burner is operated in conjunction with a vaporizing retort arranged to receive its heating from the burner and into which the liquid fuel is fed, and this being a well-known part of vapor-burners no illustration thereof is necessary in the present instance.

Referring to the drawings, 1 indicates the vapor-chamber of the burner, which receives its vapor from a retort such as referred to and through a conduit (not shown) connecting with the burner at the inlet 2, which inlet is shown as provided with a coupling-section 3 and nut 4 for this purpose. The outlet 5 of the vapor-chamber is formed in the top of the central upstanding and outwardly-flared part 6 of the casting and is closed by the hemispherical element 7, which forms the valve-closure of the burner, as well as the device for spreading the vapor and directing its course, so as to secure the thorough admixture of air necessary to the complete combustion of the vapor.

The top of the part 6 presents an outer annular flat face 8 and an inner inwardly-inclining beveled face 9, which faces together form a seat for the valve-closure 7, the under side of which is provided with a central tapering portion 10, adapted to fit the said beveled seat. Not only does this construction provide for the proper seating of the closure, but the vapor is directed outward from under the closure in a horizontal direction and in a comparatively large circle on account of the width of the closure and the seat. The spherical form of the upper surface of the closure 7 has the effect of giving the proper upward course to the flames without keeping the air therefrom.

The closure 7 is mounted upon a stem 11, which extends through the vertical portion of the vapor-chamber and out through a stuffing-box 12, forming a part of the casting and provided with the usual closing-nut 13. That portion of the casting forming the stuffing-

box is provided with an elliptical flange 14, which forms a support for two or more depending rods 15, which flange and rods form, together with a centrally-perforated bar 16, connecting the rods at their lower ends, a guide-frame for firmly supporting the stem 11 and guiding it during its reciprocatory movement.

The stem is provided with a coil-spring 17, which bears at its upper end against the bar 16 and at its lower end on a support 18, mounted to move loosely on said stem. The spring is confined under tension between the bar 16 and the support 18 by means of the adjusting-nut 19, working on the screw-threaded portion 20 of the stem and furnishing a support to support 19, and by this nut 19 the tension of the spring is regulated whenever necessary.

The operation of the spring 17 is to normally seat the closure 7 and permit the raising of the same under the pressure of the vapor and insure the escape of the vapor with the proper degree of force notwithstanding any fluctuation in the volume thereof.

The stem 11 is designed to be rotated by means of the crank-handle 21 for the purpose of imparting rotation to the closure 7 in order to free its seating-surfaces and that of its seat from any accumulation that forms thereon, especially in burning crude petroleum. This operation of cleaning is assisted by the pressure of the spring 17, and it may be performed at any time without interfering with the operation of the valve-stem during the burning operation or requiring any change of parts, and by this provision for constantly cleaning the burner it is possible to use the crude products mentioned as fuel for vehicle propulsion.

In Fig. 5 a modification is shown in the means for furnishing a guide to the valve-stem and a seat for the spring 17. This consists of an arm or bracket 22 secured to one side of the burner by a set-screw 23 and having its base portion 16, which forms the guide for the stem and seat for the spring, connected by bifurcated portions of the arm or bracket; but it will be obvious that various changes and modifications can be made in the details of construction of this and other parts of the burner and still be within the spirit and scope of the invention. It will also be observed that with the burner and surrounding the part 6 is cast a pan 24 for receiving a quantity of oil to be initially lighted for starting the burner after the usual manner and that a depending lug 25 is also cast with the burner to form a rest by which the burner may be mounted on a suitable support.

Having fully described the invention, what I claim, and desire to secure by Letters Patent, is—

1. A vapor-burner comprising a vapor-chamber having an outlet, a closure arranged to seat thereon and to be operated by the vapor-pressure, a stem secured to said closure extending through and below said chamber, a spring connected to said stem to seat said closure against the vapor-pressure, and means for rotating said stem and closure, substantially as and for the purpose set forth.

2. A vapor-burner comprising a vapor-chamber, a closure for the outlet of said chamber adapted to be operated by the vapor-pressure within said chamber, a stem for said closure, extending through said chamber to the exterior thereof, a guide for said stem projected from the burner, and a spring carried by said stem and having one end seating on said guide, as and for the purpose set forth.

3. A vapor-burner comprising, a vapor-chamber, a closure for the outlet of said chamber adapted to be operated by vapor-pressure within said chamber, a stem for said closure, extending through said chamber to the exterior thereof, a projected guide for said stem, a spring connected to said stem to seat said closure against the vapor-pressure, and means for rotating said stem and closure, substantially as and for the purpose set forth.

4. A vapor-burner comprising, a vapor-chamber, a closure for the outlet of said chamber adapted to be operated by the vapor-pressure within said chamber, a stem for said closure, extending through said chamber to the exterior thereof, a projected guide for said stem, a spring carried by said stem and adapted to seat at one end against said guide, a seat for the other end of said spring, movable upon the stem, and means for adjusting said seat, as and for the purpose set forth.

5. A vapor-burner comprising a vapor-chamber, a closure for the outlet of said chamber, adapted to be operated by the vapor-pressure within said chamber, a stem for said closure, extending through said chamber to the exterior thereof, a spring carried by said stem for placing said closure under a seating pressure, and a crank-handle carried by said stem for rotating the same, as and for the purpose set forth.

6. A vapor-burner comprising a vapor-chamber having an outwardly-flared outlet and a horizontally-arranged seat surrounding the outlet, a closure for the outlet, adapted to be supported on said seat, and having a central tapering portion to fit said outlet, a stem carrying said closure, and a spring connected to said stem to seat said closure against the vapor-pressure, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in presence of two witnesses.

LEVI RHODES.

Witnesses:
H. S. HERKELRATH,
B. W. WOOLVERTON.