D. E. BANGS.

CARBURETERS.

No. 193,911. Patented Aug. 7, 1877.

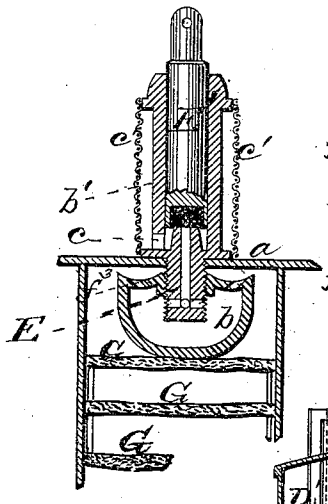


Fig. 2.

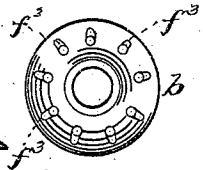


Fig 3

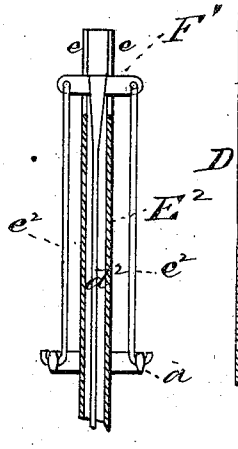


Fig 4

Fig. 1.

WITNESSES

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DAVID E. BANGS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN CARBURETERS.

Specification forming part of Letters Patent No. **193,911**, dated August 7, 1877; application filed May 26, 1877.

To all whom it may concern:

Be it known that I, DAVID E. BANGS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and valuable Improvement in Carbureter; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical central section of my improved carbureter. Fig. 2 is a detached sectional view of valve and fixtures. Fig. 3 is a plan view of the rose for the discharge of naphtha; and Fig. 4 is a detail view of the float-rod, showing its attachment to the lever.

This invention has for its object the improvement of that class of carbureters for which Letters Patent of the United States were granted to me, bearing date of October 31, 1876.

The object of the invention is, first, to devise means for replenishing the carbureting-tank without the loss of gas or the admission of air; secondly, to provide means for determining the quantity of hydrocarbon oils in the carbureter; thirdly, to provide means whereby the delivery of oils to the carbureter may be automatically attained; and, finally, to improve the apparatus generally.

The nature of my invention will be fully described in the following explanation and set forth in the claims.

In the annexed drawings, the letter A designates the oil-reservoir, and B the carbureting-chamber, separated therefrom by a division wall, *a*. The former is provided with a close annular condensing-chamber, C, filled with gravel, soap-stone, or other suitable material, and both the reservoir, and its casing, and the carbureting-tank are surrounded by a third casing, containing asbestus or other suitable non-conducting materials. This latter casing is lettered D in the drawings, and the fire-proof material D′. The carbureting-chamber will be provided with a labyrinthine passage, through which the gas or air will pass on its way from the induct-pipe to a reticulated opening leading into the condensing-chamber. This latter is provided with an educt leading into the main, and the enriched gas, as in the patent aforesaid, is deprived of its excess of carbon in the said condenser, so that the deposit of the products of condensation in the mains and supply-pipes is effectually obviated.

E represents a metallic tube, extending above and below the diaphragm *a*, and open at both ends. The lower end of tube E is provided with a rose, *b*, and its upper end opens above the said diaphragm into a metallic pipe of larger bore, *b′*. This latter is provided with an aperture or apertures, *c*, and is surrounded by a reticulated cylinder, *c′*. When the upper end of the tube E is open the oil in reservoir A passes through it into the carbureter below through the apertures *c*, all foreign matters being excluded by the reticulated cylinder aforesaid.

Tube E is opened or closed as follows: Its upper end is made conical, and a leather-shod plunger, E^1, is passed into the pipe *b′*. This latter is suspended from or pivoted to the weight end of a vibrating lever, *d*, having its fulcrum in an upright post, d^1, and when free accurately closes the said tube E. The power end of this lever is bifurcated, and straddles a metallic tube, E^2, extending through the said diaphragm. This tube is occupied by a rod, d^2, carrying on its lower end, in the carbureting-chamber, a float, F, and upon its upper end a cross-head, F′. This latter projects at each end through longitudinal slots *e*, formed in tube E^2, and its ends are connected with the forked end of the lever *d* by means of rods e^2. When the carbureting-vat is adequately full the float will rise and lower the plunger E^1 upon the conical end of pipe E, effectively closing it, and cutting off the flow of oil from the reservoir into the carbureter. As the oil in the latter is carried off by vaporization the float will fall and the plunger be raised, thus reopening the communicating pipe E, and allowing the oil to flow from the reservoir to the carbureter. The rose *b* aforesaid is hemispherical in its general shape, and its upper plane surface is provided with oblique diverging discharge-openings f^3, through which the oil will be discharged scatteringly against the

under side of the diaphragm *a*. Such of the oil as is not vaporized while thus sprinkled or divided falls upon spaced layers, G, of cloth, lamp-wick, or other similar material, dripping through which it will be vaporized as fast as may be required. These layers of cloth are about one-half inch apart, and are supported on a frame or other like device, in such a manner that the gas or air to be enriched passes uninterruptedly through it on its way to the reticulated opening leading into the condensing-chamber. As the naphtha passes out of the reservoir into the carbureting-chamber a partial vacuum is created in the former, which in time would interrupt the flow of oil therefrom. This vacuum is filled by a fresh supply of oil as follows, without admitting air into the reservoir or allowing gas to escape: The reservoir A is provided with a two-way cock, H, having two discharge-passages $f f^1$, and two induct-nozzles, $g g^1$. These latter are connected, by means of bent pipes of any suitable material, with a second two-way cock, I, in a filling-vessel, J, two separate and independent nozzles, *h h'*, being provided for the purpose. These are extended in distinct passages *i i'* into the said vessel, the former terminating just inside of the same. Passage *i'* is provided inside of the vessel J with a pipe, K, extending nearly to the top of said vessel J. When both the two-way cocks are open oil will flow, through passage *i*, nozzle *h'*, pipe *p'*, and its connecting-ducts in the lower cock, into the reservoir, filling up the vacuum in the same, while the vapors or air in the upper part of the reservoir will flow up the passage *f*, nozzle *g*, through passage *h* and pipe *p*, into its connecting-passages in the upper cock, and will be discharged into the upper part of the filling-vessel aforesaid. By this means an equilibrium is established between the reservoir and the filling-vessel. To determine the quantity of oil in the reservoir A, I employ a metallic pipe, L, extending through the upper wall of the same. In this pipe is placed an endwise-movable rod, *l*, having on its lower end a float, *m*, and upon its upper end a ball, *n*, having its seat in a recess at the upper extremity of the said pipe. If the oil be low the float will fall and lower the ball proportionately; but if it be high, the float will rise and thrust the rod out of the upper end of the pipe. When not in use the upper extremity of the tell-tale pipe will be covered with a screw-cap, *o*. The oil having been fed in sufficient quantity to the reservoir, one or both of the cocks may be turned off. The pipes may be then disconnected, if it be deemed necessary, without loss of gas from the reservoir, or of oil from the filling-vessel. In practice, the lower two-way cock and the tell-tale are inclosed within a chamber, N, when not in use, and the chamber being partly filled with water the said devices will be effectually sealed.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a carbureting-chamber and an oil-reservoir arranged above the same, of the connecting-pipe E, having rose *b* upon its lower end and a valve-seat at its upper end, the exterior perforated guide-pipe *b'*, the reticulated guard *c'*, encircling said pipe, the plunger E^1, working in pipe *b'*, the vibrating lever *d*, a float, F, rod d^2, connecting said lever and float, and a guide-tube, E^2, in which said rod reciprocates, substantially as specified.

2. The combination, with the feed-pipe E, having one end in the reservoir and the other in the carbureter, of the shield-pipe *b'*, having apertures *c*, the encircling reticulated guard *c'*, the rose *b*, and the plunger E^1, substantially as specified.

3. The combination, with an oil-reservoir, a carbureting-chamber, separated by a diaphragm therefrom, and a pipe extending through said diaphragm, of a rose applied upon the lower end of said pipe, and perforated on its upper side, whereby the oil is discharged scatteringly against the said diaphragm, substantially as specified.

4. The combination, with an oil-reservoir, a carbureting-chamber below it, a separating-diaphragm, a pipe extending through the said diaphragm, and an inverted rose upon the lower end of said pipe, of an open-ended removable frame, and the spaced independent horizontal evaporating-layers supported by said frame, substantially as specified.

5. The oil-reservoir A, having a two-way cock and separate induct and exit orifices *g g'* and $f f^1$, of the filling-tank J, having a two-way cock, I, with like orifices, the tube K, extending to the top of said tank, and the connecting-pipes *p p'*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

DAVID E. BANGS.

Witnesses:
WM. F. GRUBB,
HENRY M. DOW.