H. J. HYAMS. 2 Sheets—Sheet 1.

Apparatus for Carbureting Air.

No. 204,974. Patented June 18, 1878.

Fig. 1.

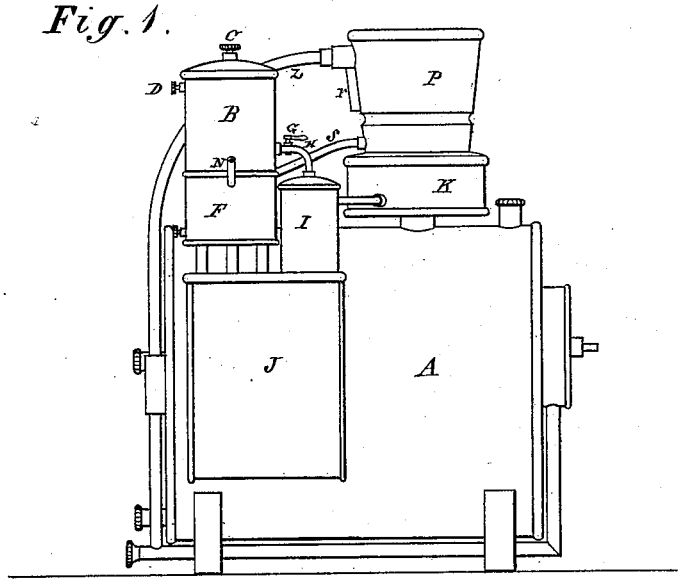
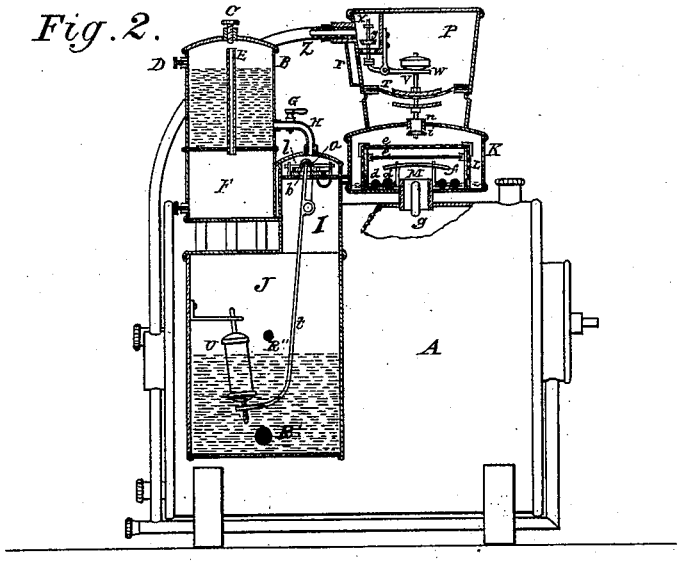


Fig. 2.



Witnesses.

Jonathan Ord.

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2 Sheets—Sheet 2.

H. J. HYAMS.

Apparatus for Carbureting Air.

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Fig. 3.

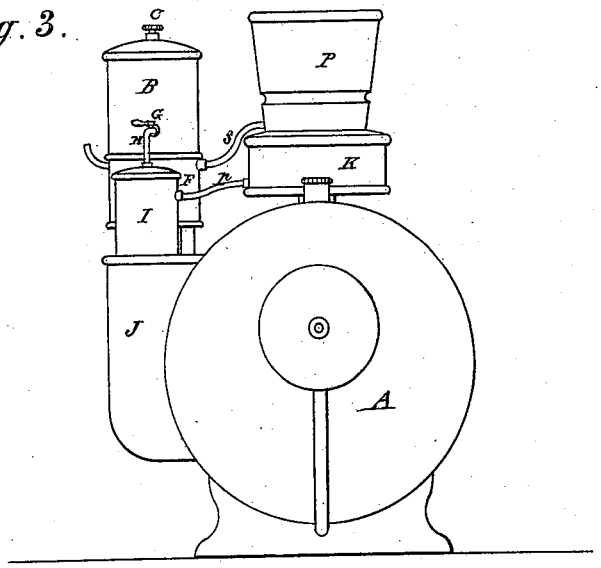
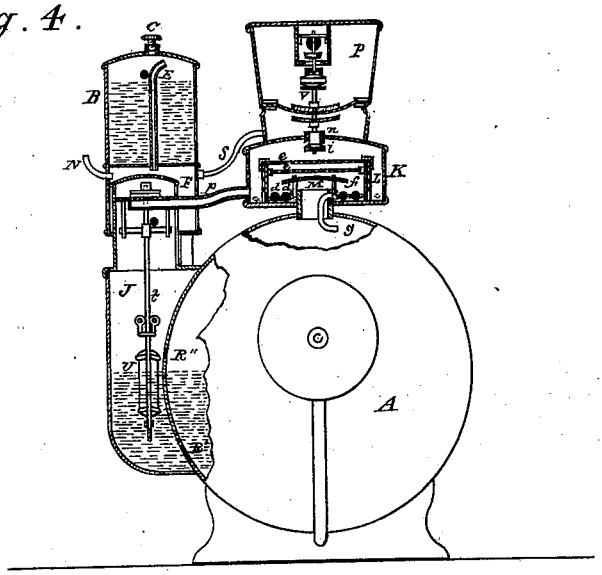


Fig. 4.



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UNITED STATES PATENT OFFICE.

HYAM J. HYAMS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **204,974**, dated June 18, 1878; application filed April 19, 1877.

To all whom it may concern:

Be it known that I, HYAM JACOB HYAMS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Carbureting Air; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon.

My invention relates to an improvement in apparatus for carbureting air; and consists, first, in a perforated circular frame, covered with cotton cloth or other porous material, arranged inside of the recarbureting-chamber, in combination with a hood-covered carbureted-air pipe and curved inlet or gasoline-feed pipe; secondly, in a movable diaphragm, provided with a vertical rod, to the upper end of which is attached a lever, connecting it with a valve, in combination with the air-supplying pipe, for automatically regulating the supply of atmosphere to the main cylinder and preventing the escape of carbureted air therefrom in that direction, in the manner shown and set forth.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by reference to the accompanying drawings, wherein—

Figure 1 represents a front elevation of my improved apparatus for carbureting air; Fig. 2, a similar view, having so much in section as is necessary to exhibit those parts comprising my invention. Fig. 3 represents an end elevation of the apparatus; Fig. 4, a similar view, partly in section.

The carbureting-chamber A and its inside operative mechanism are intended to be like that for which Letters Patent were granted to me on the 26th day of October, 1875, and of which no description is herein deemed necessary; but in order to accomplish the objects of my present invention, I have placed outside of, and which may be at a proper elevation and at any convenient distance from, the carbureter A a cylindrical gasoline receptacle or reservoir, B, into which the gasoline is to be charged through an opening, C, in its top until it reaches the level of a similar opening, D, in its side, a short distance below, when both openings are to be tightly closed, each by its appropriate screw-plug or stopper.

Arranged vertically within this reservoir is a small open pipe, E, that extends upward above the proposed fluid-line, and through this pipe such vapors that may arise from such gasoline contained therein will have an opportunity to escape in a downward direction into a condensing-chamber, F, beneath, thus acting as a vent.

From near the bottom of the reservoir B, and provided with a suitable stop-cock, G, is a pipe, H, that leads to and communicates with a valve-chest, I, arranged on top of the float-chamber J, outside of the carbureting-cylinder A.

In the bottom of this chest is arranged a sliding valve, *a*, which rests closely upon its seat, through which is cut an inlet-port, *b*, leading directly into a branch pipe, *p*, extending to a recarbureting-chamber, K, which chamber is of a low cylindrical form, and in which is placed a circular frame, L, punctured or provided with numerous small holes, *d d*, near its bottom edge. Over this circular frame, and reaching down the outside thereof, are stretched, at a little distance apart, two layers, *e e*, of cotton cloth or other absorbent porous material that, through capillary attraction, will keep constantly moist.

Located centrally within this circular frame and under the several plies of cotton cloth is a short pipe, M, of large diameter, that opens directly into the top of the main carbureting-cylinder A. The upper end of this pipe is made to extend vertically a short distance into the space surrounded by the circular frame, and is surmounted by a hood or deflecting-shield, *f*, the object of which I will presently state.

Through the side of the large pipe M, just mentioned, is placed a very small pipe, *g*, with its mouth on a level with the fluid-line kept and maintained in the recarbureting-chamber K. This little pipe extends inside of and down through the larger pipe and into the main cylinder, where it is bent and led some distance to one side of the large pipe, for purposes hereinafter referred to.

Immediately above, and connected by means

of a valveway, *n*, to the before-mentioned recarbureting-chamber K, is a conically-shaped gas and air regulator, P, the lower portion of which connects by means of a suitable pipe, *s*, with the condensing-chamber F, previously alluded to.

Horizontally across the middle of the regulator, and tightly secured thereto at its edge, is an impervious flexible diaphragm, T. Vertically through the center of this diaphragm T extends a long rod, V, on the bottom end of which is a valve, *i*, for closing at the proper time, and by an upward movement, the opening or way leading to the chamber beneath. Near the upper end of this rod is placed an equalizing-weight, and also is attached one end of a centrally-pivoted lever, *w*, on the opposite end of which is secured another vertical rod, *x*, supporting a valve, *y*, for closing, by a downward movement, the air-passages *r* leading to the outside pipe *z*, through which atmosphere is supplied to the interior of the main cylinder or carbureting-vessel A.

Operation: The gasoline, as I before remarked, is to be poured into the receiver B through the opening C in its top until it reaches or comes up to a level with the upper opening D at its side, when both of these openings are to be closed, each by means of its appropriate screw-plug or stopper. If the feed-cock G is then turned the gasoline will flow through the pipe H into the valve-chest I, and from thence down through the inlet-port of the valve *a*, and continue onward through another pipe, *p*, communicating with the recarbureting-chamber K, in which it will rise sufficiently high to pass through the numerous small holes around and near the bottom of the circular frame within, and when at a certain level any increase will flow through the small feed-pipe *g* into the main carbureting-cylinder A, and, rising therein, will soon reach the large opening R′, communicating with the float-chamber J, and by flowing therein will eventually and gradually raise the float U until the proper level is attained, which level is on a line drawn horizontally through the small opening R″, just above the axis of the main cylinder A. As the float is buoyed upward by the increase of fluid it will draw on the long lever *t*, and cause it, by means of its pivoted connections, to move the slide-valve *a* on its seat until it covers the inlet-port, and thus prevent for the time any further inflow, keeping it closed until the fluid in the cylinder is partially exhausted or falls below the intended level, when the float will descend, so as to open the valve and admit a fresh supply while any fluid material or gasoline remains in the reservoir B.

As the atmospheric air is drawn or forced through the body of gasoline contained in the main cylinder after the manner commonly in use for such purposes, it rises therein surcharged with hydrocarbon vapor, which vapor, by its extreme levity, tends upward, and, if allowed, will ascend through the pipe M until it impinges against the cap or hood *f*, by which it is deflected downward onto the surface of the fresh ingoing fluid contained in the recarbureting-chamber, and from thence pass upward through the several plies of saturated cotton cloth, by which operation it is caused to take up additional atoms of illuminating matter, and by that means is much improved in quality, and consequently produces a better light. As the pressure increases, the so recharged atmospheric air will pass onward and upward through the valveway *n* into the regulating-chamber P, and from thence by a pipe, *s*, to the condenser F, and from thence through another pipe, N, eventually to the burners.

Should the burners be suddenly closed or the escape of carbureted air otherwise cut off, its expansion will so act upon the diaphragm as to cause it to rise and close the carbureted-air valve *i*, thus preventing further travel in that direction. At the same time that the gas-valve *i* closes, the action of the diaphragm is such, through its connection with the air-valve Y, as to close it also, by which operation the vapors are prevented from reacting and escaping through and by means of the air-pipes, and thus the vapors that would otherwise escape and deteriorate the quality of the gasoline are held in abeyance until their use is required.

The object of curving the lower end of the little feed-pipe *g* to one side of the carbureted-air pipe M is for the purpose of preventing the inward flow of gasoline from in any manner interfering with the outward flow of carbureted air, and thereby avoid any aberration or flickering of the light, which would certainly occur if the liquid were allowed to fall directly through the path of the ascending carbureted air.

Having described so much of this device as constitutes my present invention, I claim—

1. The perforated circular frame L, covered with cotton cloth or other porous material, arranged inside of the recarbureting-chamber K, in combination with the hood-covered carbureted-air pipe M and curved inlet or gasoline-feed pipe *g*, substantially as shown and set forth.

2. The movable diaphragm T, provided with a vertical rod, V, to the upper end of which is attached a lever, W, connecting it with a valve, Y, in combination with the air-supplying pipe *r*, for automatically regulating the supply of atmosphere to the main cylinder A and preventing the escape of carbureted air therefrom in that direction, in the manner shown and set forth.

H. J. HYAMS.

Witnesses:
JOSIAH W. ELLS,
ROBERT S. SILL.