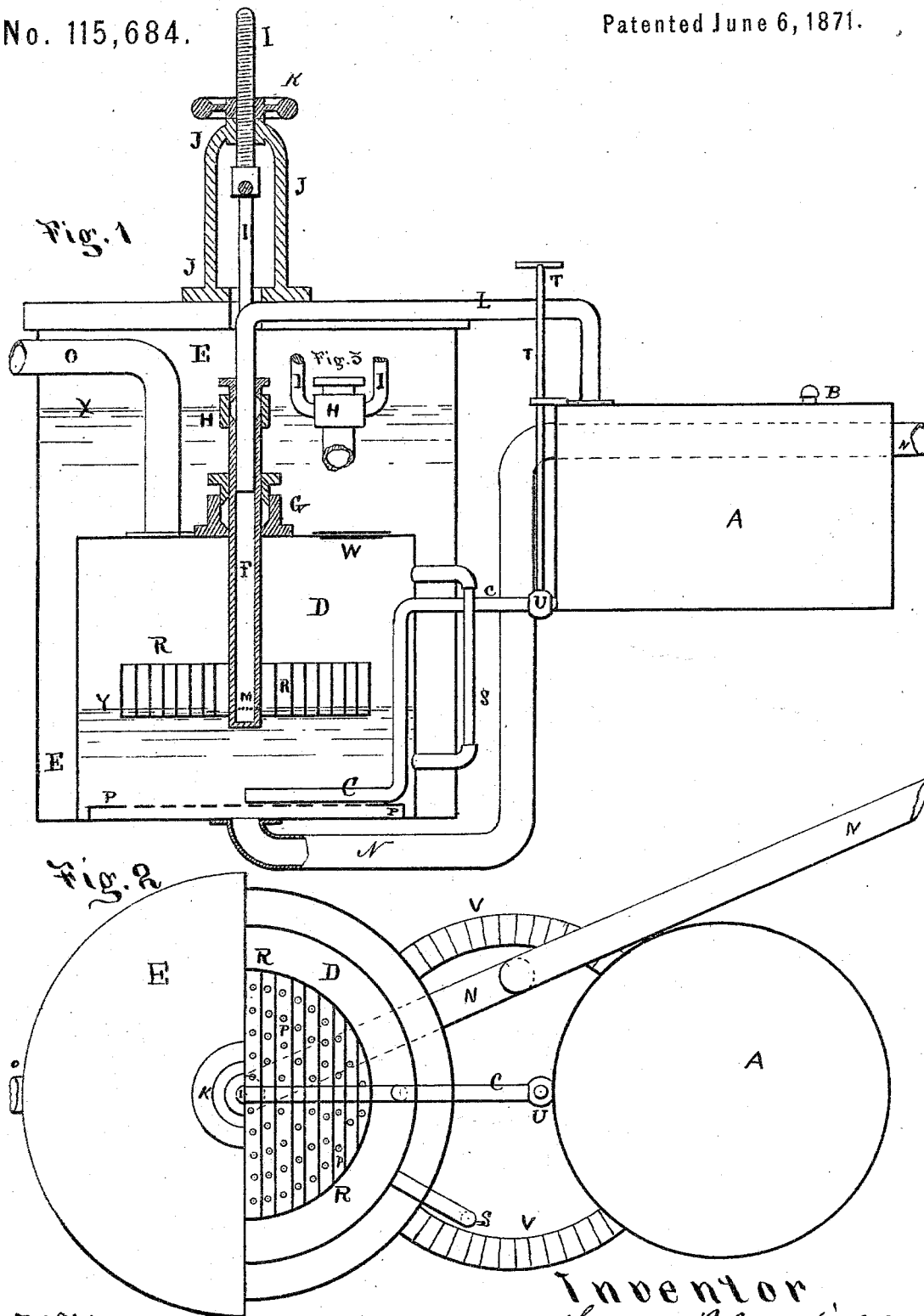


H. BLOOMFIELD.

Improvement in the Manufacture of Pneumatic Gas.

No. 115,684.

Patented June 6, 1871.



Witnesses
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HOMER BLOOMFIELD, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO
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IMPROVEMENT IN THE MANUFACTURE OF PNEUMATIC GAS.

Specification forming part of Letters Patent No. 115,684, dated June 6, 1871.

To all whom it may concern:

Be it known that I, HOMER BLOOMFIELD, of San Francisco, in the county of San Francisco and in the State of California, have invented an Improvement in the Manufacture of Pneumatic Gas, of which the following is a specification:

The first part of my invention consists in a novel construction of the devices employed for feeding the gasoline to the carbureter, whereby the depth of the gasoline in the carbureter may be varied at will, in order that, as the specific gravity of the liquid is reduced by evaporation a fresh supply may be added without drawing off that portion which has been exhausted, or changing the depth of the volatile or working stock; another end sought to be attained by this part of the invention being to permit the depth of the gasoline to be changed, to adapt the machine to be worked at different temperatures, and to carburet the air with uniformity, whether the flow be rapid or slow, by regulating the depth of the gasoline through which the air must pass. The second part of my invention consists in the construction of the vaporizer in such manner that it can be adjusted so as to present a uniform evaporating surface independently of the depth of the gasoline. The third part of my invention consists in supporting the evaporator by means of the pipe through which air or vapor passes from the carbureter to the tank in which the gasoline is stored in order to admit a fresh supply to the carbureter, so that as the depth of the gasoline is varied the position of the vaporizer shall be changed to correspond.

In the drawing, Figure 1 is a vertical section of an air-carbureting or pneumatic gas-generating apparatus embodying my invention. Fig. 2 is part plan and part horizontal section of same. Fig. 3 is a view at right angles to Fig. 1, showing the manner in which the forked rod is attached to the adjustable pipe.

Each part is distinguished by the same letter whenever it appears in the drawing.

A is the reservoir, having a suitable apparatus, B, at the top, through which it may be filled with gasoline or other volatile hydrocarbon liquid from which the vapor is to be generated. C is the feed-pipe, through which the

liquid passes to the carbureter. D is the carbureter or chamber in which the liquid is vaporized and incorporated with atmospheric air, forming pneumatic gas. The carbureter D is placed in the interior and firmly secured to the bottom of a large and strong tank, E, in such a manner that the carbureter may be entirely submerged in and surrounded by water contained in the outer tank E. The interior of the carbureter D also communicates with the interior of the reservoir A through the pipes F and L. The pipe F passes vertically upward through the stuffing-box G in the center of the top of the carbureter, and terminates at its upper extremity into a stuffing-box, H. To the stuffing-box H are attached the lower extremities of the forked rod I. The forked rod I, terminating in a screw at its upper end, passes upward through an opening in the cover of the tank E and up through a stand, J, and hand-wheel K. The pipe L, passing from the top of the reservoir A along the top of the tank E, is turned vertically downward between the forks of the rod I, and terminates in the interior of the pipe F. An air-tight joint is formed by the stuffing-box H, through which the pipe L slips, when the pipe F is moved up or down, by turning the hand-wheel K. The lower end of the pipe F is closed, but just above the end small perforations M are made, through which liquid or vapor may pass to or from the interior of the pipe F. N is the pipe through which air is forced into the carbureter. O is the pipe through which the gas is delivered. P is a perforated plate, under which the air enters the carbureter, and by means of which said air is caused to pass in a greatly-divided state through the liquid contained in the carbureter. To the lower end of the pipe F is attached a vaporizer, R, composed of vertical parallel partitions, formed in whole or in part of Canton flannel or other capillary substance for absorbing the liquid, and exposing an extensive surface for evaporation, and so arranged that the air escaping through the perforations of the plate P and up through the liquid will pass between the partition of the vaporizer and carry up the vapor therein formed. The perforations M of the pipe F are just above the level of the lower edges of the partitions of the vaporizer. S is a glass gage

communicating with the interior of the carbureter, and indicates to the eye the height of the liquid in the carbureter. T is a rod connected with the stop-cock U for the purpose of opening and closing the passage through the feed-pipe C. The whole apparatus may be placed in the ground, so as to have the top of the tanks E about on a level with the surface, in which position the top of the reservoir A would be at some distance below said surface, and be well protected against accident from fire by its covering of earth. For obtaining access to the glass gage S and the stop-cock U, a pit, protected by a wall, V, may be provided. For obtaining access to the interior of the carbureter a man-hole, W, may be made in the top, and carefully closed, so as to be air and water tight, when the machine is in operation.

To understand the operation of my invention, suppose the tank E filled with water to *x*, as represented in Fig. 1, the carbureter D empty, the reservoir A full of gasoline, and the stop-cock U closed. If, now, the stop-cock U be opened, air from the interior of the carbureter will enter the pipe F through the perforations M, pass through the pipes F and L to the reservoir, and displace gasoline; gasoline will, seeking its level, find its way down through the feed-pipe C to the interior of the carbureter, and this flow will continue until the surface of the gasoline in the carbureter rises above the perforations M and stops the entrance of air to the reservoir; the gasoline can then rise no higher in the carbureter, but will enter the pipe F through the perforations M and fill that pipe to the level at which the gasoline stands in the reservoir. If air be now forced in through the pipe N, and in passing through carry off gasoline in the form of vapor, as fast as the gasoline is removed, so as to open the holes M, so fast will the vapor or gas enter the holes M, and, passing up through the gasoline in the pipe F, find its way to the reservoir and displace gasoline to keep up the supply in the carbureter. Now, it being evi-

dent that when the operation of making gas is going on, the level Y of the gasoline will always be very nearly the same as the level of the holes M, it follows that by raising or lowering the pipe F we can regulate the depth of the gasoline in the carbureter, and consequently the quality of vapor incorporated with the air in passing up through the gasoline.

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

1. In combination with the carbureter D, an automatic feeding device, substantially as described, whereby the gasoline or its equivalent may be maintained at different depths, as desired.

2. In combination with the carbureter D, the vaporizer R, or its equivalent, and an automatic feeding device, whereby the uniform depth of immersion of the vaporizer may be maintained.

3. In combination with the carbureter D, an adjustable vaporizer, R, or its equivalent, constructed substantially as described, whereby the vaporizer may be maintained at any desired height within the carbureter, as set forth.

4. In combination with the carbureter D and a feeding device, made adjustable so as to vary the depth of the gasoline, an adjustable vaporizer, operated automatically to rise and fall to maintain a uniform immersion.

5. The combination of forked rod I, hand-wheel K, stand J, pipes F and L with carbureter D, substantially as set forth.

6. The combination of the forked rod I, hand-wheel K, stand J, pipe F, vaporizer R, with the carbureter D for adjusting the height of the vaporizer, substantially as described.

In testimony whereof I have hereunto set my hand this 27th day of February, A. D. 1871.

HOMER BLOOMFIELD.

Witnesses:

F. J. THIBAUT,
B. L. BURLING.