F. RANSOM.

CARBURETING APPARATUS.

No. 67,216. Patented July 30, 1867.

Fig: 1.

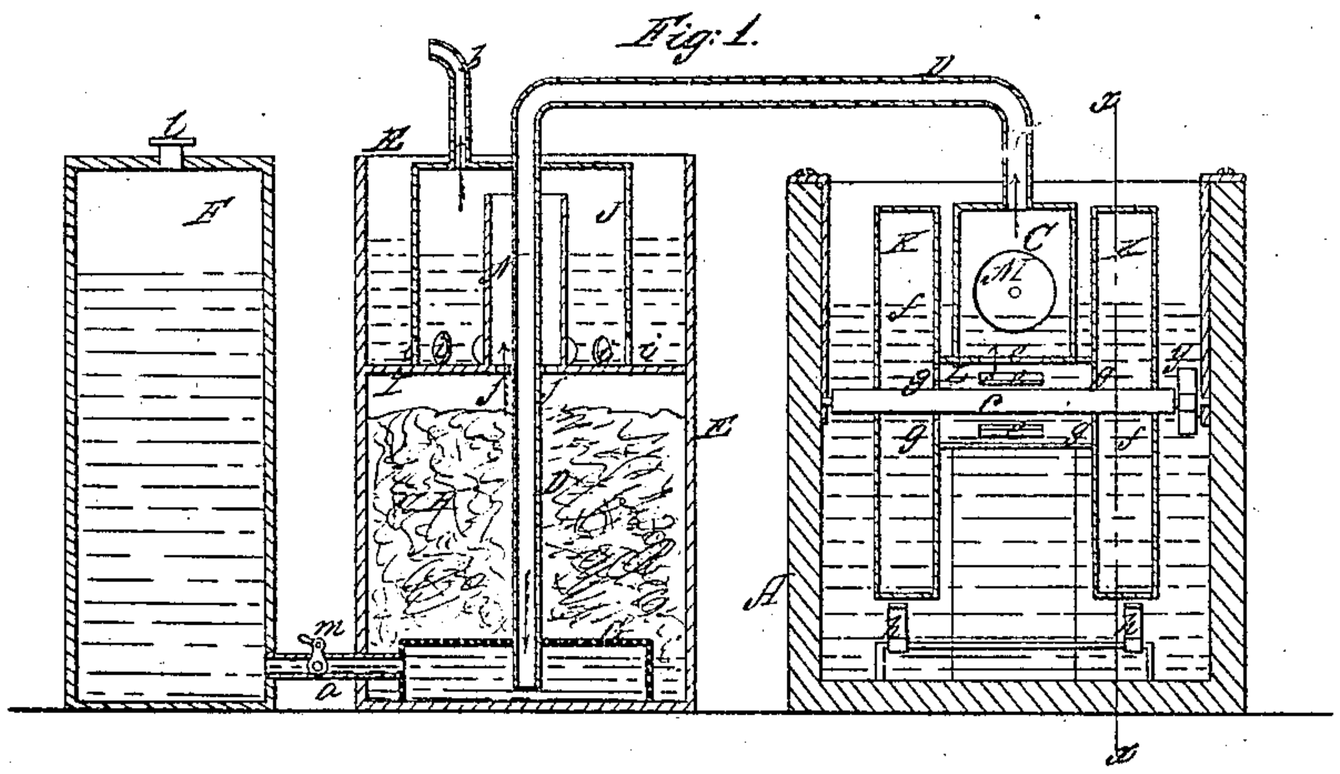



Fig: 2.

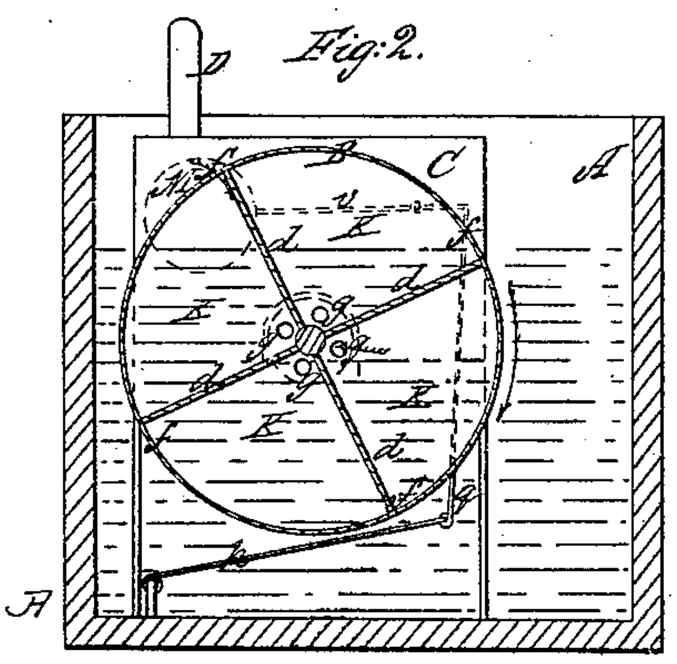
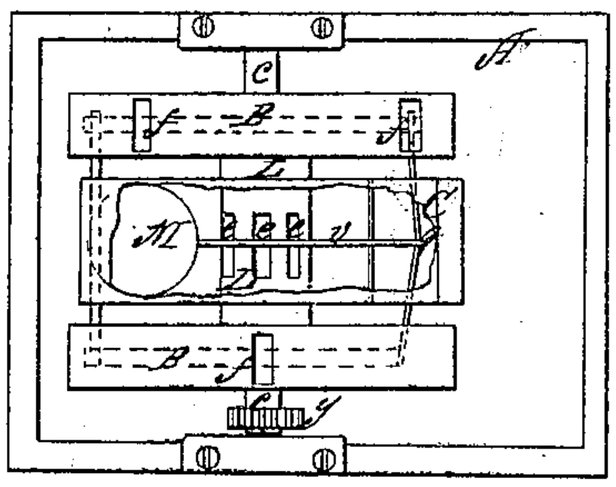



Fig: 3.

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FRANKLIN RANSOM, OF BUFFALO, NEW YORK, ASSIGNOR TO T. F. FRANK, OF SAME PLACE.

*Letters Patent No.* 67,216, *dated July* 30, 1867.

## IMPROVED CARBURETTING APPARATUS

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, FRANKLIN RANSOM, of the city of Buffalo, in the county of Erie, and State of New York, have invented certain new and useful improvements in Apparatus for Carburetting Air; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved apparatus.

Figure 2 is a section through one of the air-wheels in the plane of *x x*, fig. 1.

Figure 3 is a plan of the air-pumping apparatus.

Like letters designate corresponding parts in all the figures.

The object of my invention is to charge common air with the volatile elements of hydrocarbon liquids, by forcing it through and in intimate contact with the particles of the same, by means of the improved apparatus hereinafter described, so as to render the mixture suitable for the purposes of illumination.

The invention consists in the special combination and arrangement of parts for pumping or forcing the air, and for supplying the gasoline or other hydrocarbon liquid; in the special arrangement of the shield for protecting the ends of the air and gasoline pipes; and in the peculiar manner of counteracting the effects of the pulsations, and producing a uniform flow of the gaseous mixture to the burners.

In the drawings, A represents a box or tub for holding the air-pumping wheels B B, of which there may be two or more arranged on the same shaft *c*, as hereafter more fully explained. C is a receiver of the air forced therein by the wheels B. D is the air pipe leading therefrom to, and terminating near, the bottom of the carburetting vessel E. F is the reservoir or vessel for holding the gasoline, made air-tight, with a pipe, *a*, near its bottom, which connects with the carburetting vessel. G is the perforated shield for protecting the ends of the pipes D and *a* from the porous or fibrous material H, which is filled in above. I is a partition or diaphragm dividing the vessel L, and J is the regulator, from which the gas is conducted by a pipe, *b*, to the burners.

The wheels are constructed, as shown in figs. 1 and 2, of two disks, connected at their peripheries by a strip of metal, so as to form a short hollow cylinder. I prefer to employ two, (although more may be employed if desired,) which are mounted in any suitable way on the same axis or shaft *c*, having its bearings in the sides of the box A. One end of the shaft, on the outside or inside of the box, may be provided with gear, *y*, or other suitable mechanism, for operating it, by means of a spring, weight, or other power. These wheels or cylinders are divided into several compartments, K K, (preferably four,) by radial partitions *d d*, at right angles to each other, as clearly shown in fig. 2. In the periphery of each wheel are apertures *f*, one of which opens into each division K, at the junction of the partitions *d* with the former, for the admission of the air and water, at the centre of the wheel. Around the axis are holes *g g*, for the escape of the air into the concentric tube or pipe L, which surrounds the shaft *c* and connects the two wheels, being provided with openings *e e*, near its centre, for the escape of the air into the receiver C, placed over them. The wheels B B are both arranged on the same shaft in such a manner that the openings *f* in the two wheels will be intermediate of each other, so as to render their action alternate, and, consequently, more uniform.

The receiver C is a vessel of any suitable construction, open at the bottom, with slots in its sides, so as to fit over the pipe L, the lower edge being immersed in the water in the tub A, so as to form an air-tight compartment for receiving the air as it is discharged through the openings *e*. *h h* are light brake-bars arranged under each wheel, as shown, and hinged at one end to the bottom of the tub A, while the other ends are connected together, and are provided with a cord or small rod, *q*, which connects with the short arm of a lever, *v*, in the upper portion of the receiver C, a float, M, which may be made of a bag inflated with hydrogen gas, or it may be of any other suitable construction, being attached to the end of the long arm by which the brakes are operated, as will presently be explained.

The operation of this part of my apparatus is as follows: The tub A being filled with water up to about the point represented in the drawings, the shaft *c* is set in motion in the direction indicated by the arrow in fig. 2. The portion of the wheels above the water line is filled with air, which enters through the apertures *f*, that

become submerged and closed by the water as the wheels revolve, thereby confining the air therein till the compartment which contains it is lowered beneath the water, when the pressure of the liquid above, together with the difference in the densities of the two, will force the air through the central holes *g* into the pipe L, and thence through openings *e*, whence it escapes into the receiver above. The use of the two wheels prevents that partially intermittent or irregular action of the pumping apparatus, and in a measure, the consequent pulsations of the air, as it is being pumped or forced to the carburetting vessel, which would otherwise ensue. From the receiver the air is conducted through pipe D to near the bottom of the carburetting vessel, when it is discharged into the gasoline, with which the lower portion of the vessel is filled, as clearly shown in fig. 1. In the bottom of E I provide a perforated box, G, of any desired form, with the holes for the introduction of the ends of the tubes D *a*, for the purpose of protecting the orifices of the latter from being obstructed by the fibrous material E, of any suitable kind, as wool, flax, &c., which is filled in the space beneath the partition I. This porous or fibrous material, becoming saturated with the hydrocarbon liquid, presents a greatly-multiplied surface for the particles of air to come in contact with, as it is forced up through the interstices, fully charging it with the volatile and inflammable elements. Above and resting inverted upon the floor I is the cylindrical vessel J, made air-tight at the top, where the pipe D passes through, but provided with apertures *i i* at the bottom for the free passage of the water, which partially fills the upper portion of L. Within this regulating vessel J, and surrounding the pipe D, is the enlarged pipe N, extending nearly to the top of the vessel J, with its upper end left open, while the joint at its lower end is made water-tight, so as to retain the water which surrounds it. The carburetted air, as it rises to the top of the fibrous material H, passes through openings *j* in the floor I at the centre, and thence up the pipe N into the regulator J. The gas enters this vessel with a kind of pulsating action. To neutralize this effect various devices have been employed. Some have used an elastic bag, the sides of which would yield to the pulsations. In my improvement I employ the mobility of water to accomplish the same result. There being a free passage for the water back and forth through the openings *i* at the bottom of the regulator, the surface of the water within the latter readily yields as the gas pulsates, completely neutralizing its effects, so that the gaseous mixture passes off through pipe *b* to the burners in a continuous and uniform flow. To maintain the proper supply of gasoline or other liquid in the carburetting vessel, I fill the reservoir F through the opening *l*, at the top, which is then closed air-tight, and the stop-cock *m*, in the connecting pipe *a*, opened, when the liquid will flow into the vessel E till it reaches the height of the top of the orifice of *a*, when the pressure of the air in the carburetting vessel will stop its further flow. As the liquid in the latter vessel becomes volatilized, so as to reduce the surface a little below the top of the orifice, the air begins to enter the pipe and ascend in bubbles to the top of the reservoir, which, by partially counterbalancing the pressure, permits the flow of the liquid again till the orifice is again closed, when it ceases, and so on till the reservoir becomes empty. The wheels B may be easily operated by any suitable mechanism, and both being mounted on the same shaft, less gearing is required to operate them than would be the case if mounted on separate shafts, and consequently less power is required to operate them, owing to the diminished friction, which is a matter of great importance in the use of apparatus for carburetting purposes. This arrangement is also more simple, and can be constructed at a less expense than any other with which I am acquainted. The brakes *h h* operate to regulate the action of the apparatus to the amount of gas required in the following manner: When only a small quantity is required for illumination, which is less than the amount being manufactured, the pressure of the air within the receiver C increases, which depresses the water within the same, causing the float to fall, which brings the brake-bars *h* in contact with the peripheries of the wheels, the resistance of which either retards or entirely overcomes the motive power of the apparatus, (which is preferably a weight or spring,) causing the wheels to stop pumping. Again, when the gas is consumed so as to diminish the pressure of the air within the receiver, the water rises in the same, elevating the float therein and releasing the brakes, when the wheels are again set in motion, thus automatically, and in a perfect manner, regulating the manufacture of the gaseous mixture to the varying amount that may be required. The construction and arrangement of the reservoir with the carburetting vessel supplies the requisite amount of the gasoline or other liquid, from time to time, as may be required, in an equally perfect and automatic manner. The shield G protects the ends of the air and gasoline pipes from the fibrous material above, and permits the free escape of the air into the liquid within the shield, from whence its particles come in the most intimate contact with those of the liquid, as it is forced upward through the saturated material and into the regulator, which, by counteracting the pulsations of the fluid, causes it to pass from thence, in an even and uniform flow, to the burners.

I do not claim broadly the combination of the wheels B B, but what I claim as my invention is—

1. Two or more air-wheels, B, mounted on the same shaft, and connected by the concentric cylinder L, in combination with the receiver C and tub A, arranged substantially as and for the purpose set forth.

2. I also claim, in combination with the wheels B B, the brakes *h h*, actuated by the float M and lever *v*, for regulating the operation of the apparatus, substantially in the manner specified.

3. I also claim the regulating vessel J and tube N, arranged within the carburetting vessel E, and operating substantially as described.

4. I also claim the shield G, in combination with the fibrous material H and vessels J E, as and for the purpose specified.

5. I also claim, in combination with the carburetting vessel E, the reservoir F, for supplying the hydrocarbon liquid to the former, operating in the manner set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANKLIN RANSOM.

Witnesses:

JAY HYATT,

ALBERT HAIGHT.