J. Sangster.

Carburetting Air.

3 Sheets

No. 75468

Patented Mar. 10, 1868.

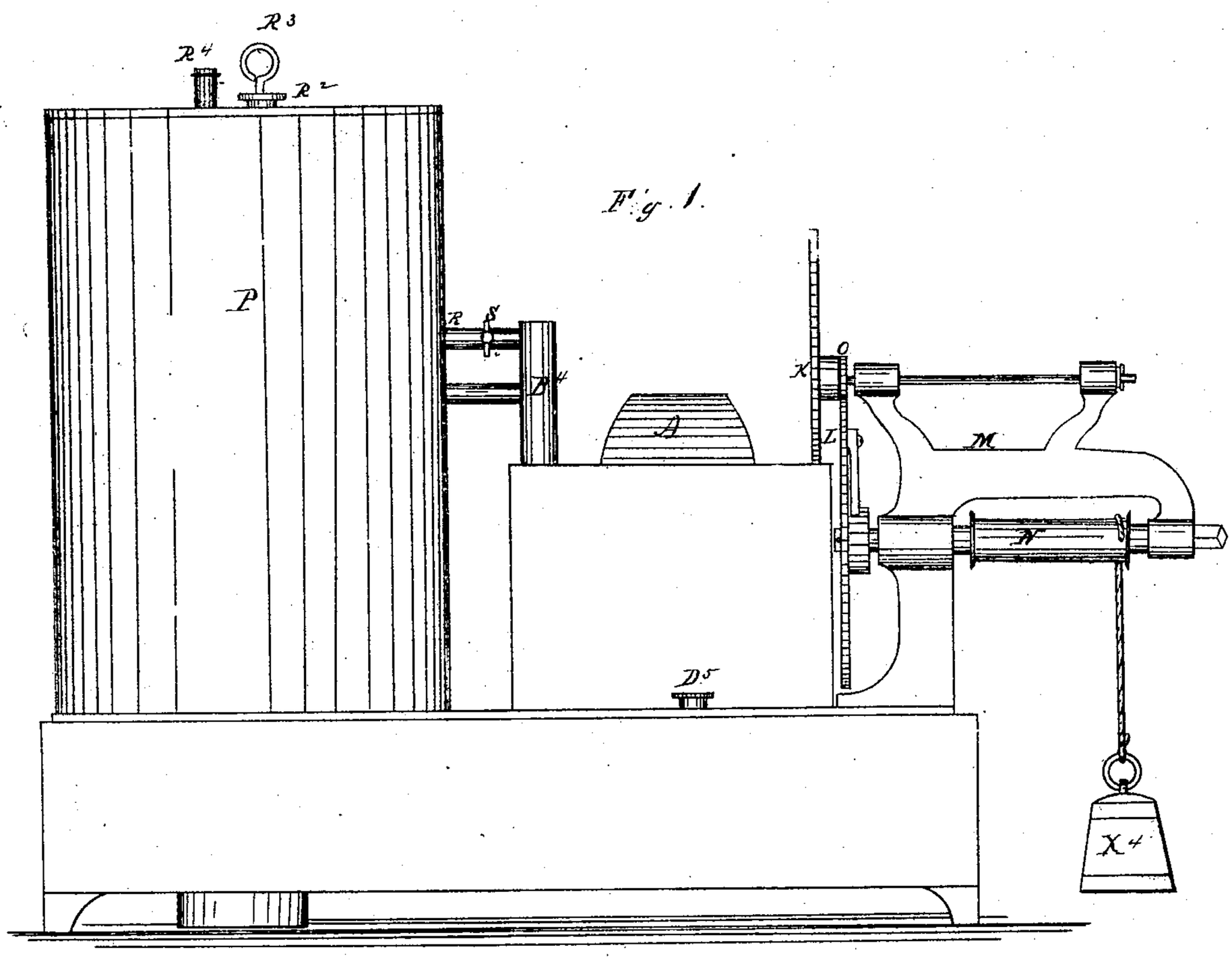

Fig. 1.

Witnesses.
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Drawing. 2.

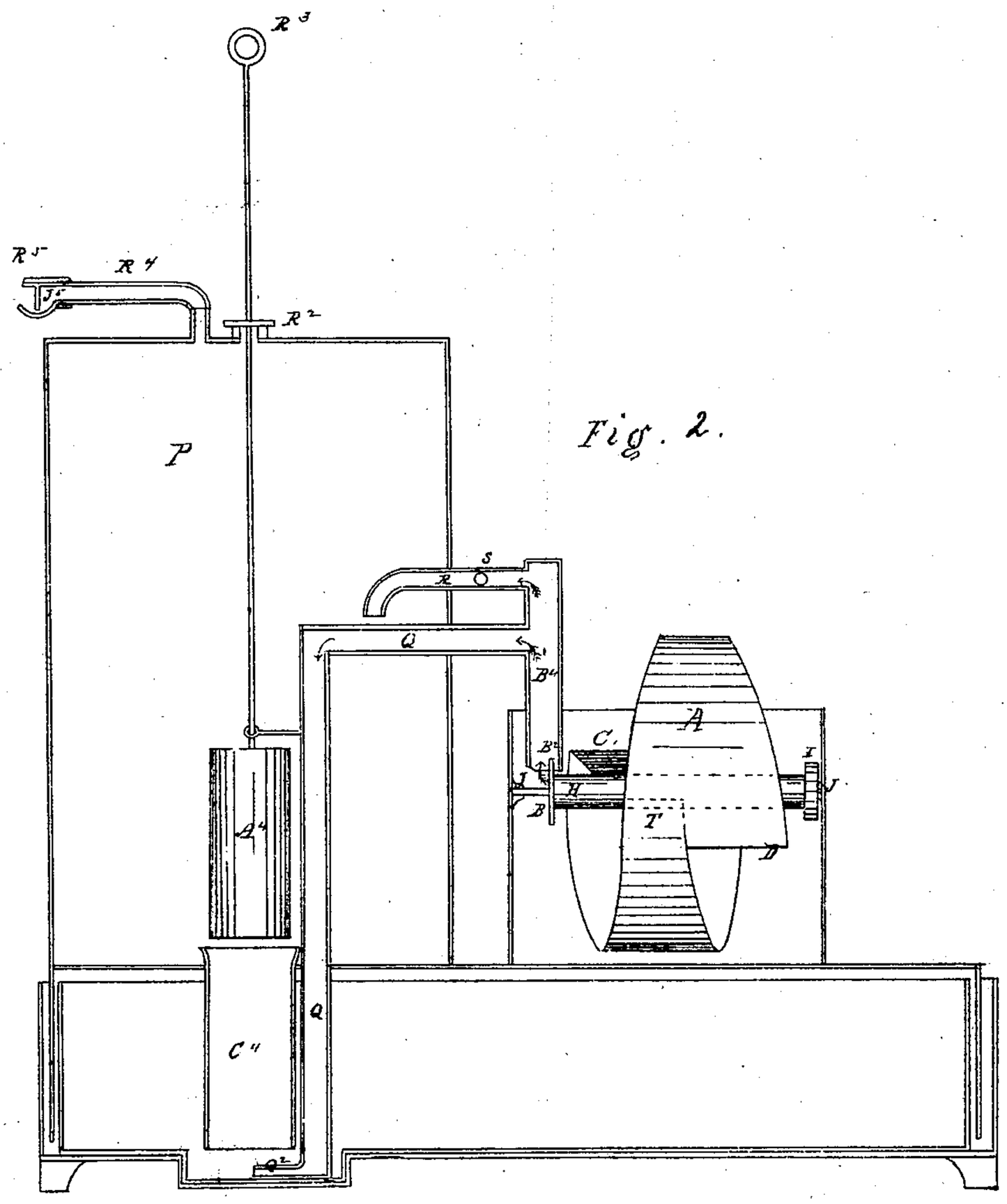

Fig. 2.

Witnesses.

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Patented Mar. 10, 1868

Drawing No. 3.

Fig. 3.

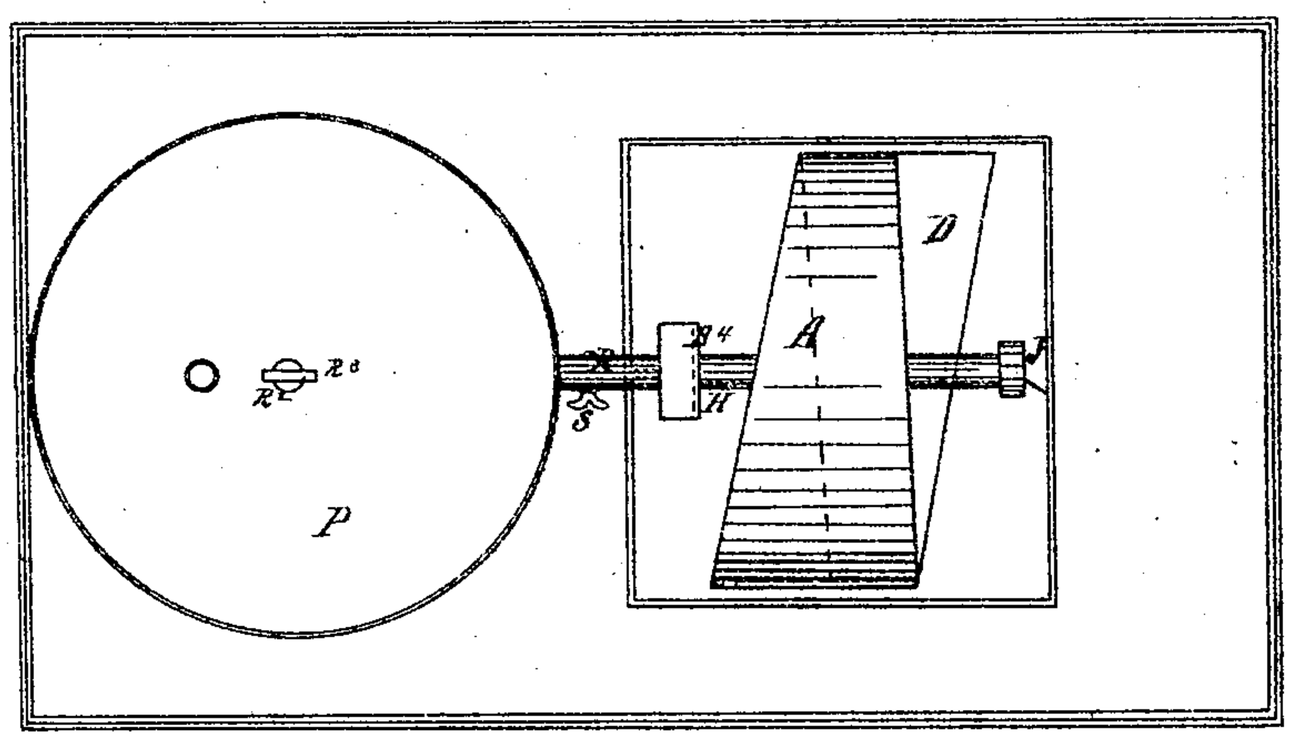


Fig. 4.

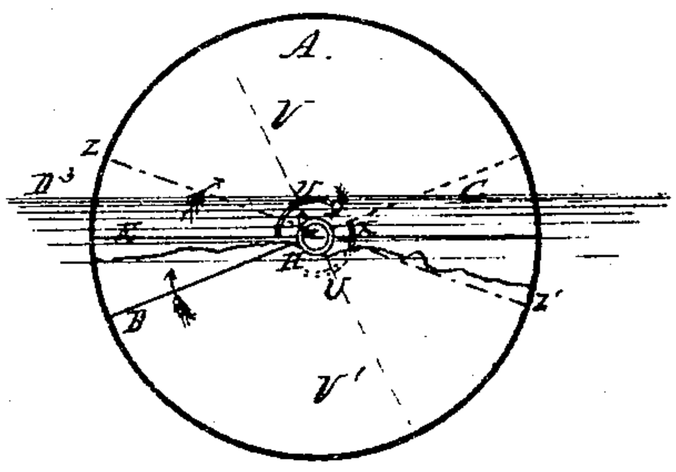
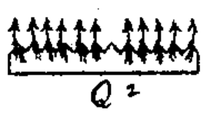


Fig. 5.



Witnesses.

Dan'l H Burtis

Chas W Sangster

Inventor.

James Sangster

United States Patent Office.

JAMES SANGSTER, OF BUFFALO, NEW YORK, ASSIGNOR TO HIMSELF AND DANIEL H. BURTIS, OF SAME PLACE.

Letters Patent No. 75,468, *dated March* 10, 1868.

IMPROVEMENT IN MACHINES FOR CARBURETTING AIR.

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, JAMES SANGSTER, of Buffalo, in the county of Erie, in the State of New York, have invented certain new and useful Improvements in and on Machines for Carburetting Air or Gas; and I do hereby declare that the following specification or description is sufficiently clear and exact to enable others skilled in the art to which it appertains, or with which it is most nearly connected, to make, construct, and use the same, reference being had to the accompanying drawings, making a part of this specification or description.

The nature of my invention consists in—

First, the construction and arrangement of the air or gas-wheel or vessel, so that it may be more easily made and put together, and so that the air or gas may be forced in a continuous and uniform stream, or nearly so, through the carburetting-liquid or substance, and so that no air may be allowed to escape while being forced from the water into the tube through which it is forced through the carburetting-liquid.

Second, in combining, with mechanism for forcing air or gas through carburetting-liquid or liquids, of a device for regulating or adjusting the quantity of air that shall be mingled or combined with said carburetting-liquid or liquids, or with the gas from said carburetting-liquid or liquids.

Third, in constructing and arranging the framework for holding the driving-mechanism, so that it may be cast in one piece, thereby affording an easier and better means of arranging and putting together the gear and pinion-wheels, &c., than the usual means heretofore employed for the same purpose.

Fourth, in a device for dividing the air-bubbles as they rise up through the carburetting-liquid or liquids, the same consisting in a corrugated or fluted tube through which the air is forced, said corrugations being confined to that part or end of the tube from which the air passes in rising up through the said carburetting-liquid or liquids; the object being to divide the air as much as possible, as the bubbles of air, when they are large, as when coming from a common tube, influence the light to a considerable extent, producing the flickering motion of the same which has always been so objectionable in gas made by passing air through carburetting-liquids. By my method the air, which always seeks the highest point of egress, follows, as it is forced through the said carburetted liquid, the upper parts of each corrugation or groove in the said corrugated tube, thus dividing it, so that as many bubbles of air, or nearly so, will rise up through the said liquid as there are divisions or grooves in the tube, thereby affording the means for giving a more steady light by avoiding the flickering of said light, as before mentioned.

Fifth, in the construction of the vessel for holding the carburetting-liquid, so that the distance through which the air passes in passing through said carburetting-liquid will be the same or nearly the same while all or any part of it remains in said vessel.

Sixth, in constructing or arranging the said vessel for holding the carburetting-liquid, so that it may be put together and the joints sealed by water; also in combining with the pipes leading from the machine, a device or devices for taking up any liquid that might condense within them.

In said drawings, in which like parts are represented by like letters—

Figure 1 represents a side elevation of the machine complete.

Figure 2, a vertical longitudinal section, showing the interior arrangement of the several parts.

Figure 3 is a plan view of the machine and air-forcing wheel.

Figure 4 represents a side elevation of the air-forcing wheel, with a part of the side broken out, so as to show the interior construction or arrangement of the same.

Figure 5 is an end view of the tube from which the air is forced into the carburetting-liquid, the arrows showing the manner of dividing the air as it passes up through the carburetting-liquid.

A, in said drawing, represents the air-wheel; it is a hollow drum, with a single partition through the centre, thus dividing it in two halves, each of which halves is so constructed that the space within it becomes smaller from the mouths or openings towards the closed ends of the same, substantially as shown by the dotted lines T, and the openings C D also represent a similar opening on the opposite side, in fig. 2, and also by the view of the wheel shown in fig. 3. H represents a tube from which the air is forced into the vessel or tube

leading to the carburetting-liquid; is fastened to the side of the wheel, so that the partition, which passes through the centre of the said wheel, will pass the end of it at or near the centre. J J represents a small rod or shaft which passes through the centre of the wheel, and is supported in boxes, or the equivalent thereof, substantially as shown near the said letters J in fig. 2. B represents a flange at the end of the tube H, which prevents the air from passing under the partition B^2, thus compelling all of said air to pass up into the tube or chamber Q. E, in fig. 4, which is in partial section, shows the partition through the wheel A. The openings D and C are placed on the sides of the wheel, and a little in advance of the partition E, so that it will enter the water before the air is entirely forced out of the chamber on the opposite side of the wheel, and commence forcing the air just before the said opposite chamber has ceased to force it, by which means a continuous and uniform stream of air is made to flow as the wheel revolves.

It will be readily seen that, when the partition E is in the position shown by the dotted lines Z and Z′ in fig. 4, the opening or chamber V would enlarge instead of being contracted, which enlarging would continue until the end, Z, of said partition was under the surface of the water, which operation would cause a partial vacuum, and draw part of the air from the opposite chamber and prevent a continuous flow of the air. To obviate this objection I make the openings D and C sufficiently large to compensate for the loss of space occupied by the partition E, when in the position as shown in fig. 4 by the letters Z and Z′, and also arrange the said chambers V and V^1, so that the opening or space will gradually contract in width from the beginning to the end.

The letters U represent two guards, one of which is placed in each chamber, and are soldered firmly to the partition E, one on each side, the object being to prevent the air from leaving one chamber and passing into the other, instead of being forced through the tube H, as it would be liable to do when the partition E is in a vertical position; air always taking the easiest points of egress, and hence would be apt to pass across the said partition to the other side, were it not for the guards U, which compel it to pass in the direction of the arrows, which are the only openings left, the other parts of the guards being air-tight.

S represents a stop-cock, and R a tube leading from the chamber B^4. The object of this tube R and stop-cock S, or its equivalent, is to add air to the gas in the chamber P, or its equivalent, when necessary. It very often happens (depending upon the quality of the carburetting-liquid,) that the air takes up too much of said liquid, and makes a gas too rich in carbon, and which is liable to smoke while burning. It is the object and office of the stop-cock S and tube R, or its equivalent, to regulate and adjust the gas in this respect, as by it the machine may be made to mix or mingle with the gas the air in any proportion or quantity desired.

The tube Q communicates with the chamber B^4, and passes into the gas-chamber P, and downward into the carburetting-liquid, terminating in the corrugated tube Q^2, a front view of which is shown in fig. 5, which is grooved or corrugated for purposes hereinbefore described in clause fourth of this specification or description. The carburetting-liquid is kept at its proper level just above the end of the tube at Q^2 by means of the tube C^4, which projects downward from the top of the carburetting-liquid vessel to the point where it is desired to maintain the level of said liquid, at which point, as will be readily seen, it is kept by atmospheric pressure. A^4 represents a weight, which is let down into the tube C^4 when it is desired to fill the vessel with carburetting-liquid; it is operated by the handle R^3, and is kept air-tight by means of the stuffing-box R^2.

The object of the weight A^4 is to fill up the space in the tube C^4, which would otherwise fill up with the carburetting-liquid when the stopper D^5, as shown in fig. 1, was taken off, so that the vessel could be refilled with said liquid, after which the stopper D^5 is screwed down air-tight and the weight A^4 is withdrawn. R^4 represents the outlet-tube for the gas; it is connected to the pipe leading from it by means of the coupling R^5, which is so formed, as shown in fig. 2, that any condensed liquid which might form in the tubes might be taken up by the air, which, as will be seen, has to pass under the partition J^5 in said coupling, as many couplings similar or equivalent to R^5 being used as there are joints of pipe connected to the machine. N represents the shaft upon which the cord holding the weight is wound. M is the framework for holding the driving-machinery. The air-wheel A receives its motion from the weight X^4, as shown in fig. 1, which transmits its motion to the wheel L, pinion O, wheel K, and pinion I, which moves the wheel A.

The operation of the machine is as follows: By causing the wheel A to revolve in the direction of the arrows V^5 in fig. 2, the openings C and D alternately pass into the water and compress the air, forcing it through the tube H, as before mentioned, into the chamber B^4, and from that down through the tube Q and Q^2, from which it rises up through the carburetting-liquid into the gas-chamber P, and from this gas-chamber through the tube R^4 to the burner which may be connected with it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The construction and arrangement of the air-wheel A, in combination with the guard B, substantially as and for the purposes herein described and set forth.

2. The arrangement and form of the frame M, as and for the purposes described in clause third of this specification or description.

3. The combination of the weight A^4 and tube C^4, as and for the purposes described.

4. I claim the coupling R^5, as and for the purposes herein set forth and described.

JAMES SANGSTER.

Witnesses:

DANIEL H. BURTIS,

AMOS W. SANGSTER.