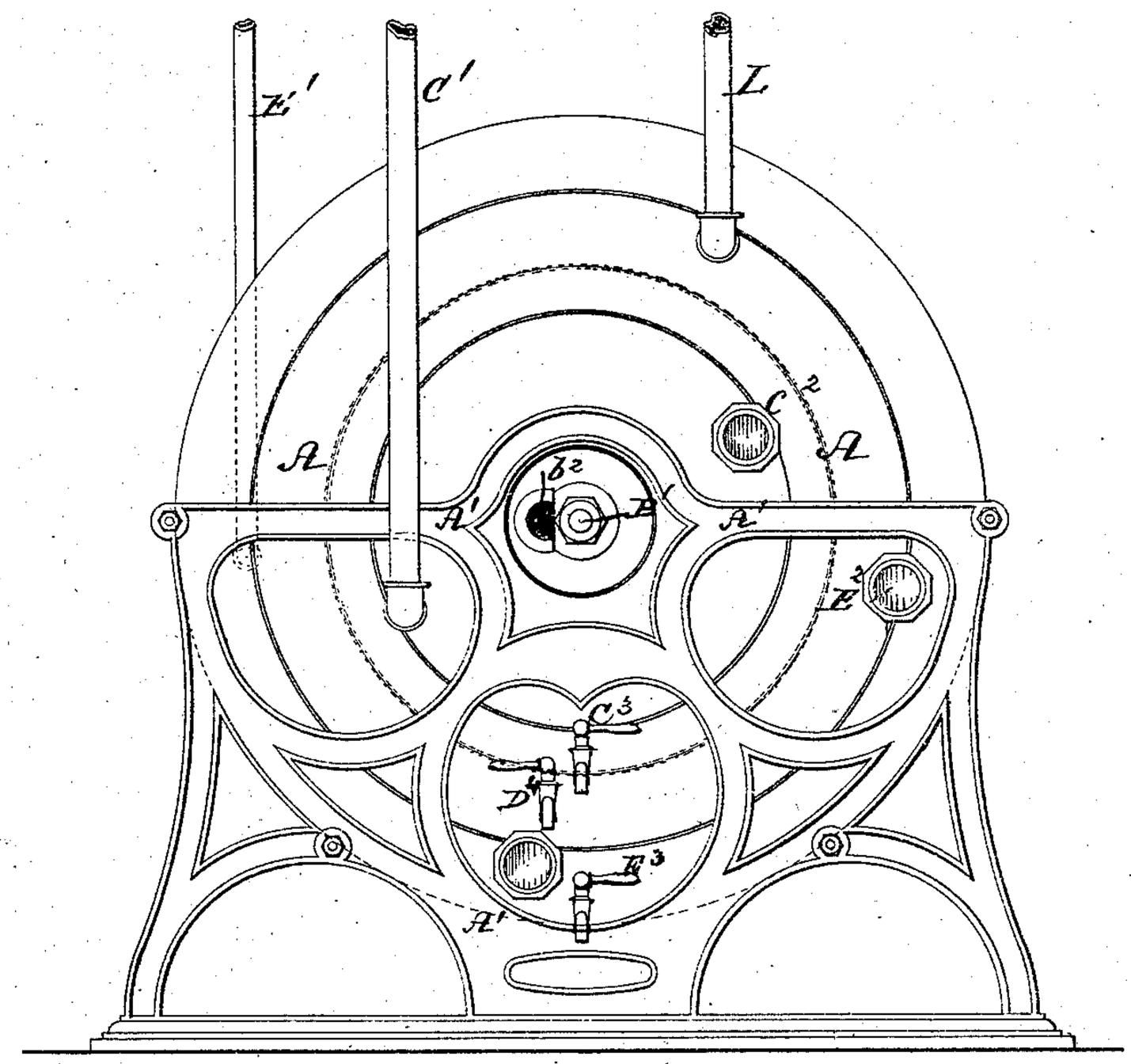
2 Sheets--Sheet 1.

J. B. WILSON, S. HUFTY, Jr., T. JUDD & S. WILLIAMS.

Carbureting Apparatus.

No. 153,876. Patented Aug. 4, 1874.

Fig. 1.



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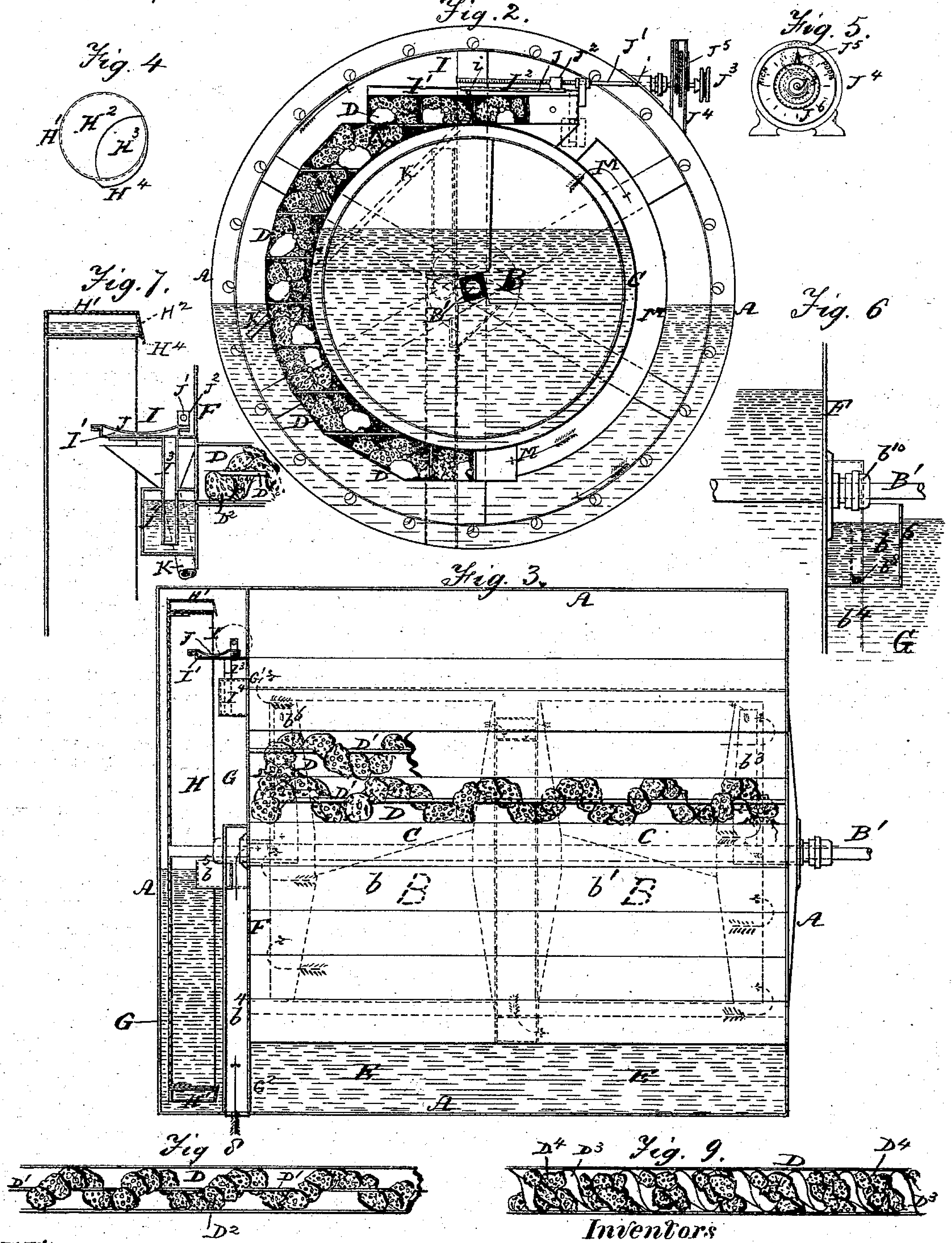

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CARBURETING APPARATUS.

Specification forming part of Letters Patent No. **153,876**, dated August 4, 1874; application filed June 23, 1874.

To all whom it may concern:

Be it known that we, JOSEPH B. WILSON, SAMUEL HUFTY, Jr., THORWALDSEN JUDD, and STANLEY WILLIAMS, all of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Carbureting Apparatus; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in apparatus employed in carbureting atmospheric air for illuminating purposes, whereby greater regularity is obtained in the supply of gasoline to the carbureting-chambers, the quantity of gasoline supplied is capable of being regulated at will, and indicated on a dial affixed on the exterior of the apparatus. The invention also relates to improvements in the arrangement and construction of the carbureting-chambers, and to the combination, with one of the air-supply pipes, of a sealed cup for water, and an overflow-pipe, the nature of which will be fully explained by the following description.

Figure 1 represents a front view, and Figs. 2 and 3 vertical sections, of apparatus constructed according to our invention. Fig. 4 represents an end view of one of the buckets separately. Fig. 5 is a detached view of the index apparatus. Fig. 6 represents an air-supply pipe with sealed cup and overflow-pipe applied thereto. Fig. 7 is a sectional view of the receiving and regulating tray I and parts connected therewith. Fig. 8 is a sectional view of one of the carbureting-chambers. Fig. 9 represents a slight modification of Fig. 8.

In each of the views similar letters of reference are employed to indicate corresponding parts wherever they occur.

A represents the main case of the apparatus, which is formed cylindrical, and supported at each end by means of a framing, A′. Within the case A a blower, B, is arranged, which is mounted on a shaft or axis, B′, projecting through the front casing of the apparatus in position to be driven by a weight power, or by other suitable driving mechanism. The blower B is arranged within a cylindrical casing, C, and around its upper portion, and on one side of it, a series of carbureting-chambers, D, are constructed, one above the other, while on the opposite side an air-passage is formed, which leads from the upper part of the blower-case to the lowest of the series of carbureting-chambers D, a space being left between the blower-case C and the outer case A, which forms a reservoir, E, for the gasoline. F is a partition extending across the cylinder A, which, while it closes one end of the blower, carbureting, and gasoline chambers, also forms a chamber, G, for the reception of the feed-wheel H. G^1 G^2 are passages formed in the partition F, the passage G^1 serving to equalize the pressure in the chambers, while the passage G^2 forms a channel for the passage of the gasoline from the reservoir E to the chamber G. The feed-wheel H is mounted upon, and revolves with, the axis B^1 of the blower B, and on its periphery is provided with a series of buckets, H^1, hereinafter more fully explained, which, on the revolution of the wheel H, continuously take up a given quantity of gasoline from the lower part of the chamber G, and discharge the same into a receiving and regulating tray, I, by means of which the gasoline is conducted to one end of the uppermost of the carbureting-chambers D, and thence, in a zig-zag direction, from one to another, to the lowest of the series, from which it may be drawn off, if desired, by a stop-cock, D^1, as shown. The tray I is divided transversely, by means of a partition, *i*, into two parts, I^1 I^2, the part I^1 being provided with an outlet-pipe, I^3, leading to a seal-cup, I, by means of which the gasoline is conducted to the uppermost chamber D. K is a pipe connected to the part I^2, which serves to conduct any gasoline discharged by the buckets H^1 into the part I^2 back to the lower part of the chamber G. Above the tray I is mounted a sliding trough,

J, which slides on bearings formed by the edges of the tray I. This trough J is moved backward and forward over the surface of the tray I by means of an endless screw, J^1, which at one end works in a bearing, J^2, formed on the trough J, while its opposite end passes through a stuffing-box, *j*, to the exterior of the casing A, and has mounted on it a knob or handle, J^3, for operating the same, and also a pinion for operating a series of gear-wheels mounted within a frame, J^4, for the purpose of actuating an index-hand, J^5, so as to indicate on the dial J^6 the position of the sliding trough J.

The object of the sliding trough J is to regulate, by its position, the quantity of gasoline supplied to the carbureters D by the buckets H^1, and, consequently, the quality or richness of the gas produced by the apparatus.

When it is desired to admit but a small quantity of gasoline to the carbureters D, the trough J is drawn forward so as to expose the part I^2 of the tray I, the effect of which is that a portion of the gasoline brought up and discharged by the buckets H^1 will be received into the part I^2, and conducted back, by the pipe K, to the lower part of the chamber G; but when the richness of the gas is required to be increased the trough J is drawn backward so as to cover up the part I^2, when the whole of the gasoline brought up by the buckets H^1 will be discharged, through the pipe I^3 and seal-cup I^4, to the carbureting-chamber D, the trough J being drawn backward and forward, and covering up a greater or less proportion of the part I^2 from time to time, according to the quality of gas required.

The buckets H^1 are formed cylindrical, and are arranged at equal distances apart around the periphery of the wheel H, and with the line of their axes parallel, one to the other, but at an angle to the axis of the shaft B^1. One end of the buckets H^1 is closed entirely, while the opposite end is provided with a cover, H^2, extending partially across, and leaving an oval-shaped opening or mouth, H^3, through which the gasoline is discharged into the tray I, the object of this peculiarly-shaped cover H^2 being to regulate the quantity of gasoline taken up by the buckets H^1 and discharged into the tray I, irrespective of the quantity of gasoline contained in the chamber G.

The buckets H^1, being arranged upon the periphery of the carrying-wheel, and at an angle to the axis thereof, would, in their ascent, spill out the gasoline picked up from the reservoir, but the hoods H^2, partially covering the mouth of the buckets, serve to keep in a given quantity until the bucket has reached such a position over the tray I that the opening H^3 will permit the discharge of the contents of the buckets.

H^4 is a lip formed on the periphery of the buckets H^1, in position to prevent the gasoline, when being discharged from the buckets H^1, from running backward along the side of the buckets. Within the carbureting-chambers D a rod, D^1, Fig. 8, is supported, around which is arranged a continuous coil of sponge or other suitable substance, D^2, in the form of a screw, the object of thus arranging the sponge or other substance being that a greater amount of surface is presented to impregnate the air with the gasoline, and the air is prevented from passing directly through the chambers in a continuous straight current.

In place of arranging the sponge in the form of a screw, as shown in Fig. 8, the chambers D may be formed with a continuous spiral partition, D^3, as shown by Fig. 9, leaving a spiral channel, D^4, from end to end of the chambers D, in which a series of sponges or other suitable material is arranged, adapted to hold the gasoline and impregnate the air passing through the chambers.

The blower B is formed double, and air is supplied to the half b^1 by means of an air-inlet, b^2, in the front of the apparatus, from which a pipe, b^3, passes upward to within a short distance of the periphery of the blower B. Air is supplied to the half *b* by means of an air-tube, b^4, passing up from the under side of the apparatus, on the rear of the partition F. From the upper part of the tube b^4 a pipe, b^6, passes through the partition F to the interior of the half *b* of the blower B, when it rises to within a short distance of the periphery of the blower, in a similar manner to the tube b^3. On the side of the air-inlet pipe b^4 a seal-cup, b^5, is formed, in position to catch any water passing through the stuffing-box b^{10}. From the lower part of the seal-cup b^5 a small overflow-pipe, b^8, is conducted up inside the pipe b^4 to within a short distance of the level of the cup b^5, the object of this pipe b^8 being to conduct away and discharge into the air-pipe b^4 any surplus water from the cup b^5, and prevent the same dropping into the gasoline in the chamber G, while at the same time the water contained in the pipe b^8 and cup b^5 will prevent the air entering through the inlet-pipe b^4 from passing into the chamber G. The pipe b^4 thus serves the double purpose of forming a conduit for the ingress of air and at the same time a conduit for the egress of the water overflowing from the seal-cup b^5, the air being excluded from penetrating into the gasoline chamber or reservoir.

It will be seen that by this arrangement of apparatus the carbureting-chambers D are partially submerged in the gasoline on the one side, while on the opposite side they are partially covered by the water contained in the blower-chamber C, whereby a more uniform temperature is obtained to the carbureting-chambers D, and a more even evaporation of the gasoline is obtained.

The operation of the apparatus is as follows: Before starting the apparatus, we supply a sufficient quantity of water to the blower-chamber C, by means of the pipe C^1, to bring the level of the water in the blower-chamber C to a level with the center of the gage-glass

C². After this has been done, we supply the gasoline to the reservoir E and chamber G by means of the pipe E¹, until the gasoline rises to a level with the center of the gage-glass E². We then fill the seal-cup b^5 with water, after which we apply the weight or other motive power to the axle B′, which causes the blower B to revolve as soon as a vacuum is caused in the supply-pipe L, by turning on a burner or burners. Air will then be drawn into the apparatus (by the movement of the blower B) through the air-passages b^2 b^4, and after passing through the halves b b^1 of the wheel B will be forced out through the passage M into the lowermost of the carbureting-chambers, and after being forced to and fro through the whole series of carbureters, it is discharged from the last or uppermost carbureter by means of the outlet or supply pipe L, which is connected with the pipes leading to the burners of the building to be lighted. While the air is being forced upward through the carbureting-chambers D the gasoline is being supplied in regulated quantities to the tray I, from which it passes in a downward direction through the series of carbureters D, fitted, as described, in an opposite direction to the air, and in so doing greatly facilitates the impregnation of the air with the vapor of the gasoline.

C³ is a tap or valve for drawing off the water from the blower-chamber C, when desired, while the gasoline can be drawn from the reservoir E and chamber G by the cock E³, and from the carbureters D by the valve D⁴.

We lay no claim to the tubular buckets, irrespective of the special features of construction herein described, or a drip-seal, broadly, as they are shown in a prior application, filed by T. Judd on the 11th day of March, 1874, and now in interference with an application filed by Pierson and Denny.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a carbureting apparatus, the buckets H¹, constructed with covers H², having openings H³ and a lip, H⁴, substantially as and for the purposes described.

2. The combination, with a feed-wheel, H, of a series of buckets, H¹, constructed with covers H² and lips H⁴, substantially as herein set forth.

3. The combination, with the air-supply pipe b^4, of a seal-cup, b^5, for water, and an overflow-pipe, b^8, substantially as and for the purpose described.

4. A series of carbureting-chambers, in combination with the blower and gasoline chambers, the carbureting-chambers arranged between and in contact with the exterior wall of the blower-chamber, which is partially filled with water, and the interior wall of the gasoline-chamber, whereby the carbureters are maintained in a temperature about mean of the gasoline and blower chambers, with which they are in contact, substantially as and for the purpose set forth.

5. A divided receiving-tray for regulating the supply of gasoline to the carbureting-chambers, provided with a sliding trough, substantially as specified.

6. The combination, with a divided receiving-tray provided with a sliding trough, of a pipe and seal-cup, substantially as and for the purposes set forth.

7. In combination with a divided tray, I, provided with a sliding trough, J, pipe I³, and seal-cup I⁴, the return-pipe K, substantially as and for the purposes specified.

8. The combination, with a receiving and regulating tray of a gas-machine, of an index apparatus for indicating the quantity of gasoline being delivered to the sliding trough, substantially as set forth.

9. The combination, with a receiving and regulating tray, I, provided with a sliding trough, J, of a feed-wheel, provided with a series of buckets, substantially as set forth.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

JOSEPH B. WILSON.
SAMUEL HUFTY, JR.
THORWALDSEN JUDD.
STANLEY WILLIAMS.

Witnesses:
J. MACDONALD,
THOMAS D. BROWN.