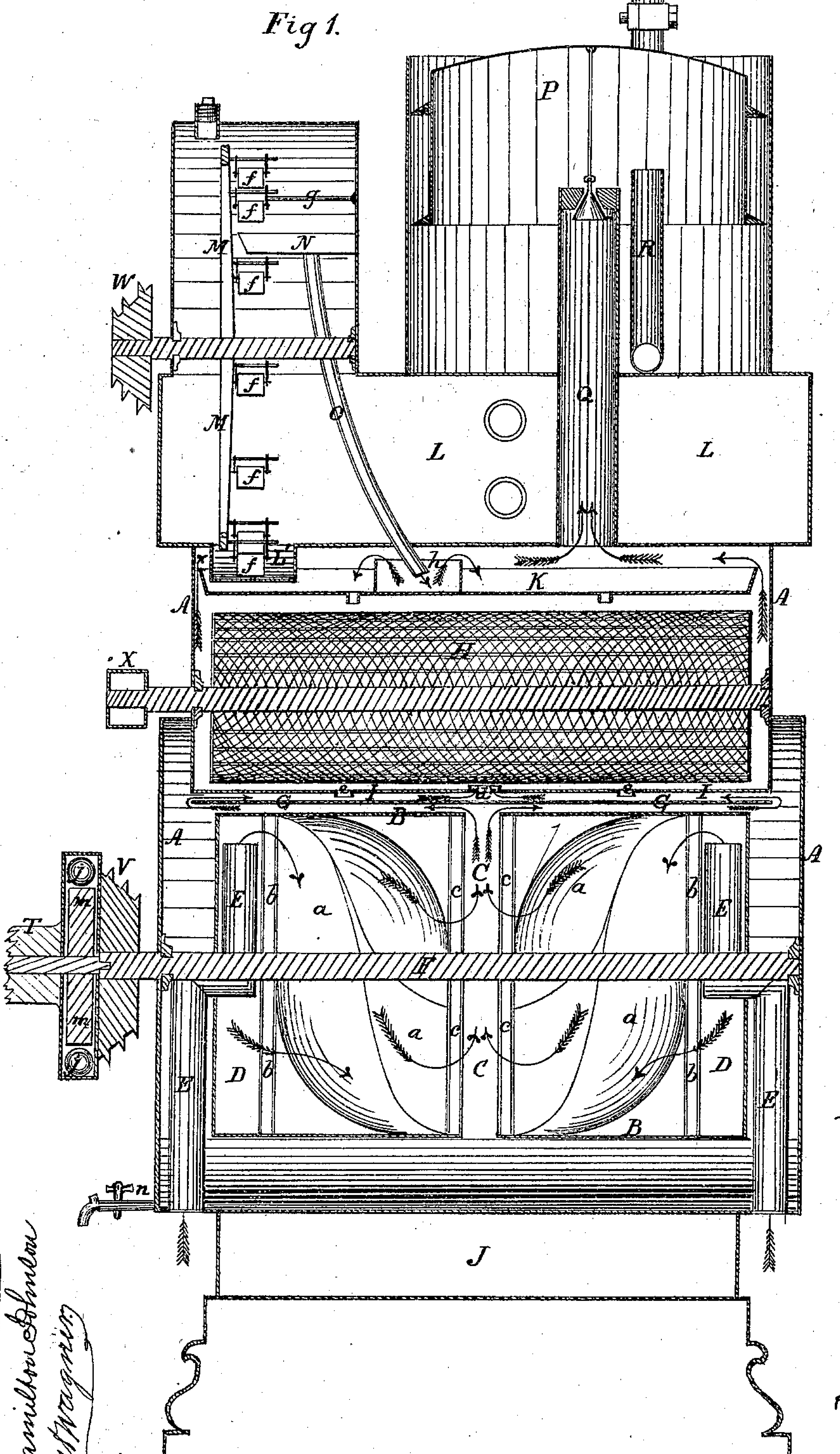
T. JUDD & E. DOTY.

Apparatus for Carburetting Air.

No. 138,409.　　　　Patented April 29, 1873.

Fig 1.



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By their Attorneys

2 Sheets--Sheet 2.

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Fig. 2.

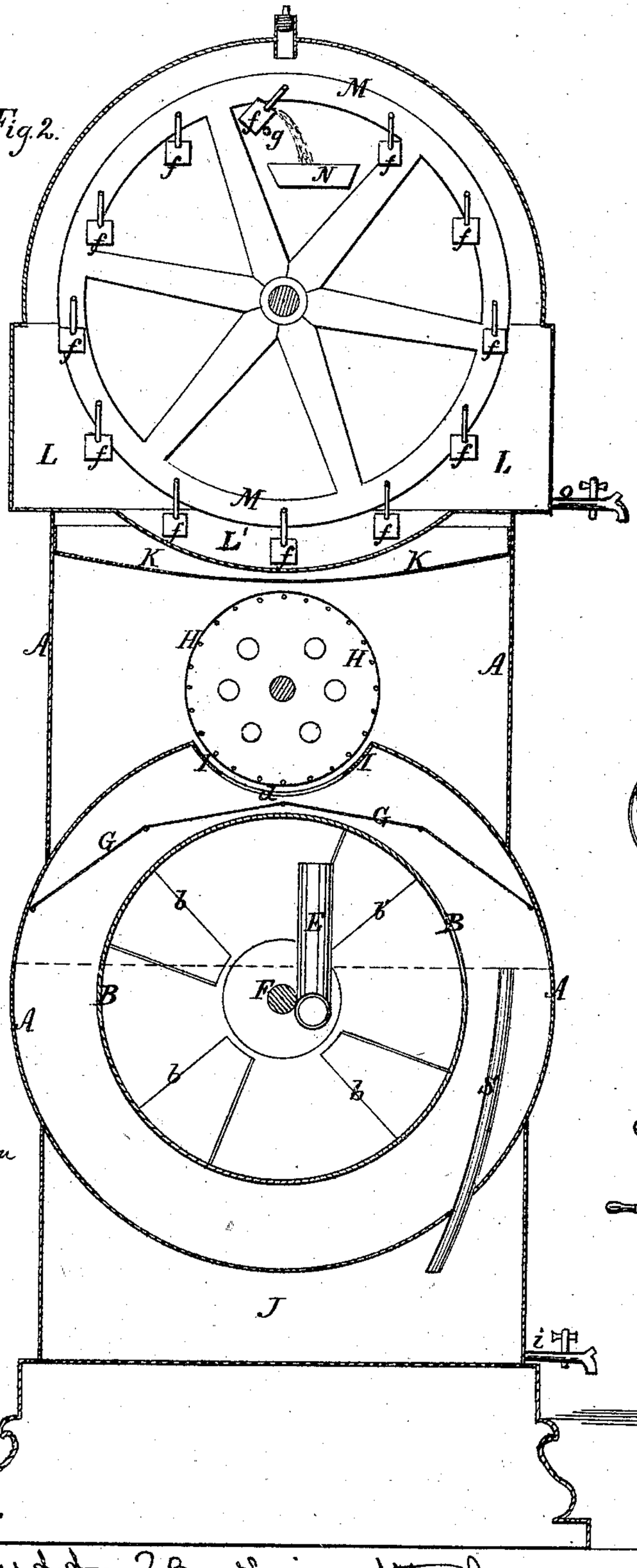


Fig. 3.

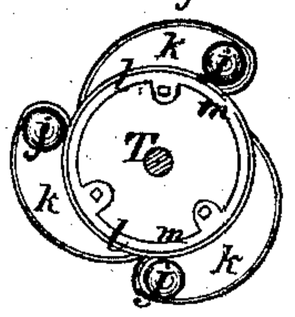
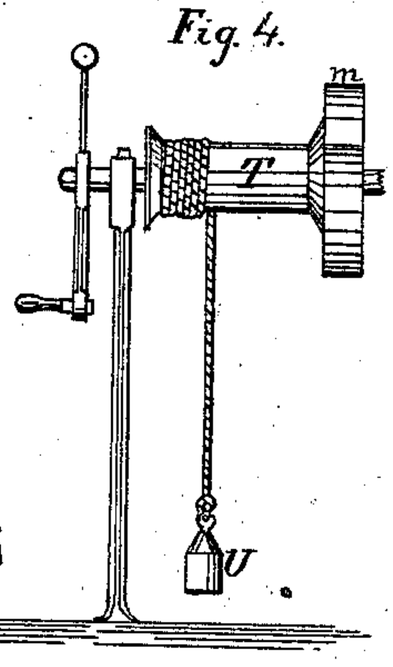


Fig. 4.



Witnesses.

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J. West Wagner.

Inventors.

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UNITED STATES PATENT OFFICE.

THORWALDSEN JUDD AND ELLIS DOTY, OF JANESVILLE, WISCONSIN, ASSIGNORS TO THE PHILADELPHIA GAS-MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **138,409**, dated April 29, 1873; application filed January 14, 1871.

To all whom it may concern:

Be it known that we, THORWALDSEN JUDD and ELLIS DOTY, of Janesville, in the county of Rock and State of Wisconsin, have jointly invented certain new and useful Improvements in Carbureting Apparatus, of which the following is a description:

Our invention relates to apparatus for carbureting atmospheric air for producing illuminating gas. There are only certain features, however, in the apparatus which constitute our improvements. These consist, first, in the arrangement of the evaporating surface with respect to the central-exit air-chamber so as to receive the air therefrom and cause it to impinge upon and pass in contact with said surface toward both ends, and thereby bring the air in contact with a large surface of gasoline, which could not be effected to the same extent by causing the air to pass from one end of the evaporating surface to the other in the same direction; but by forcing the air directly against the middle of the generating surface from a single exit-chamber it is divided and deflected in opposite directions over the gasoline surface. We have also improved the gasoline-feeding device by providing the revolving supply-wheel with hinged buckets arranged to pass over a concave bottom and fill, and then come in contact with a fixed arm, so as to empty their contents by a movement independent of that of the wheel, whereby we obtain the advantage of a regular supply and obviate the necessity of having to fill the gasoline-tank to supply the feed-buckets, as heretofore; and as gasoline deteriorates very rapidly it is of the last importance in carbureting apparatus to use a small and constant fresh supply, which advantage we gain by hinging the feed-buckets, which, in passing over the concave depression, dip up the smallest quantity until all is used, and emptying it by a positive independent movement of each bucket, and in this way keep the gasoline fresh and the supply in the tank small, instead of at a level of half the diameter of the feed-wheel, as heretofore.

Another improvement which we have made in the feeding apparatus consists in connecting a tray, which receives the gasoline from the tilting buckets within the gasoline-chamber, with a sealing basin or cup arranged outside of and beneath said chamber by an intermediate tube, which connects the tray inside of the gasoline-tank with the sealing-cup outside of said tank, whereby a constant supply of gasoline is produced outside of the tank, while the entrance of the carbureted air within the tank is sealed by the overflowing cup beneath said tank. This arrangement has the advantage of great simplicity, perfect feed of gasoline from the wheel, and a perfect seal between the generator and the feeding-buckets, and in this respect is an improvement in the manner of feeding the gasoline to an evaporating surface.

A further improvement which we have made consists in connecting the water-chamber of the air-wheel with a waste-chamber outside for the purpose of carrying off and saving the waste gasoline from the surface of the water, and thereby automatically regulate the height of the fluid within which the air-wheel revolves, by which a very great advantage is obtained in saving all the dripping gasoline from the evaporating surface, and thus effect a greater saving in the material used than hitherto obtained.

In the accompanying drawing, Figure 1 represents a vertical longitudinal section of a carbureting apparatus embracing our improvements. Fig. 2 represents a vertical cross-section of the same, and Figs. 3 and 4 represent the winding device.

The air-wheel is arranged at the bottom, and the gasoline feed-wheel and the gasometer at the top of the case A, as shown in the drawing. The air-wheel B is divided transversely, so as to form a central exit, C, for the air; and the buckets *a* thereof are con-

structed of spiral vanes and receive air at both outer ends *b* of said wheel, and discharge at both inner ends *c* into the central space C, as shown in Fig. 1. The wheel, therefore, has a double capacity, both to gather and discharge the air, and produces a more continuous and uniform supply than can be obtained from a single wheel. The wheel B has two end air-chambers, D, instead of one, into which separate air-supply pipes E lead, so as to allow the wheel to revolve. The shaft F of the wheel is supported in the case, and one end extends outside to receive the driving-parts. A fixed gas-generating surface or canopy, G, is arranged above the air-wheel to receive the action of the impinging blasts of air from the central chamber C of the wheel. A cylindrical revolving gas-generating surface, H, is arranged above the fixed one, G, and between these the case is divided by a partition or tray, I, having a central cross-opening, *d*, through which air passes from the wheel to the revolving surface H at the inside of its length, as shown by the arrows, so that the air passes over the entire surface of both generators, as the air passes around both ends of the fixed generators to the middle of the other through the central opening *d*. The tray I is provided with openings *e*, through which the gasoline passes from the revolving evaporator to the fixed one, G, the waste from which drips down upon the water in which the wheel revolves. To keep the fluid in the wheel-chamber always at the same level we arrange a pipe, S, within the wheel-chamber to carry off and preserve for use the waste gasoline above the height at which it is desired the fluid shall maintain, so that any increase in this height will be automatically carried off and conducted into a waste-chamber, J, below, whence it is drawn off by a stop-cock, *i*, and returned to the gasoline-chamber for use. A receiving and distributing tray, K, is arranged above the evaporator H to receive the gasoline from the feed-wheel and distribute it upon the evaporator H. This tray K is beneath the bottom of the gasoline-chamber L, and only communicates with the latter by a feed sealed pipe, O, so that the gas cannot escape into the chamber L. The feed-wheel M is arranged, at one end of this chamber L, upon a short shaft, by which it is revolved. To its rim a series of buckets, *f*, are hinged so as to hang downward, as shown in Fig. 2. The buckets *f* are revolved within a depression, L′, in the bottom of the chamber L; and a small supply of gasoline can be used by being dipped up by the hinged buckets, which pass into the depression L′. The buckets *f* fill in passing through the space L′, and as they pass to the uppermost elevation they are tilted in the direction of the motion of the wheel by striking a fixed rod, *g*, and discharge their contents into a tray, N, from whence the gasoline passes through the sealing-pipe O to the distributing-tray K, as shown in Fig. 1. The tilting of the buckets allows them to empty at once their contents at a certain point, which a fixed bucket could not do. The pipe O connects the two trays N and K, and its discharging end is sealed in a cup, *h*, kept filled by the feed-wheel, and, running over, supplies the distributing-tray K. In this way the gasoline is fed from a perfectly-sealed chamber onto the gas-generator, which is a very economical and advantageous arrangement. The gasometer P is arranged upon the gasoline-chamber L, and communicates, by means of a pipe, Q, with the gas-chamber of the generators; and a pipe, R, supplies the burners from the gasometer.

The air-wheel B, cylinder H, and feed-wheel M may be operated in any suitable way.

The waste-gas chamber J, water-chamber A, and the gasoline-chamber L are provided with stop-cocks *i*, *n*, and *o*, by which to draw off the contents when desired.

The clutch for the driving-shaft of the air-wheel is rendered noiseless by means of rubber balls *j* fitted into eccentric grooves *k* in an annular rim, *l*, on the end of the clutch-shaft T, so as to come in contact with and bear upon a similar rim, *m*, on the end of the winding-hub, the rubber balls *j* allowing the weight to be wound up, but preventing the unwinding of the weight without turning the air-wheel by the eccentric grooved rim, Fig. 3, and also allow the weight to be unwound without reversing the motion of the air-wheel.

We do not claim regulating the supply of gasoline to the generating-surface according to the speed of the air-wheel, nor the arrangement or use of the cone-pulleys or fusee for that purpose, as that is patented to Foster & Ganster, March 9, 1869; nor do we claim supplying the gasoline in measured quantities to the generating-surfaces, but only such new devices as form the subject-matter of our claims.

Having described our invention, we claim—

1. The air-wheel B, divided to form a central exit-chamber, C, in combination with the two end receiving air-chambers D and the open inner discharging ends *c* of the wheel, as and to produce the advantages described.

2. The arrangement of the central air-exit chamber C with respect to the fixed generating-surface G, to cause the air from the wheel to impinge against the middle of the generator and forced over both ends thereof to obtain a more uniform contact of the air with the generating-surface, as described.

3. The hinged tilting buckets *f* of the gasoline-supply wheel M, in combination with the tilting-arm *g*, the receiving-tray N, and the conducting sealing-tube O, arranged to operate as described.

4. The sealing-pipe O, arranged to conduct the gasoline from the feed-wheel to a sealing-

cup, *h*, beneath the gasoline-chamber L, and thereby effect an open feed-communication between the gas and the gasoline-chambers, and prevent the escape of the gas into the latter, as shown and described.

5. The pipe S, arranged to connect the water-chamber A with a waste-chamber, J, for the purpose of carrying off the waste gasoline from the surface of the water and automatically regulate the height of the fluid within which the air-wheel revolves, as described.

6. The winding and driving clutch of the air-wheel, having eccentric grooves *k* and rubber balls *j* to render the parts noiseless in winding, and to allow the weight to be unwound without reversing the motion of the air-wheel, as described.

In testimony whereof we have hereunto set our names.

THOR. JUDD.
ELLIS DOTY.

Witnesses to the signature of THOR. JUDD:
WM. V. ARCHER,
WM. H. CLARKSON.
Witnesses to the signature of ELLIS DOTY:
G. S. E. DIXON,
J. B. CASSODAY.