3 Sheets—Sheet 1.

I. A. HYAMS.

Carbureter.

No. 225,931 **Patented Mar. 30, 1880.**

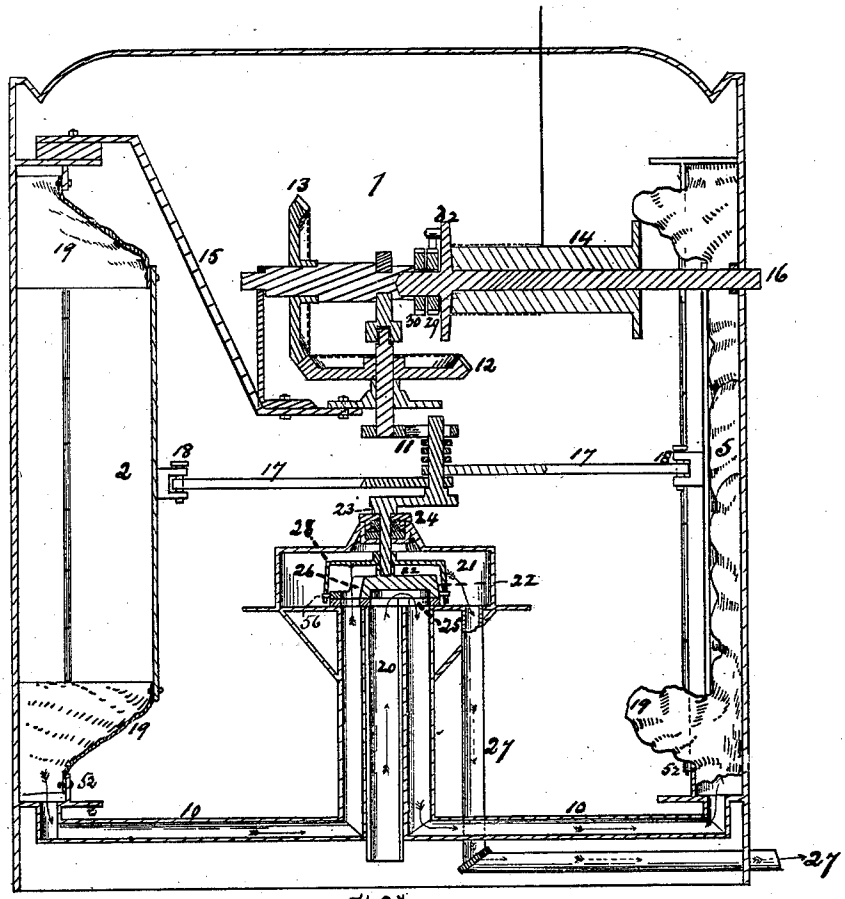


Fig. 1.

Witnesses.
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3 Sheets—Sheet 2.

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Carbureter.

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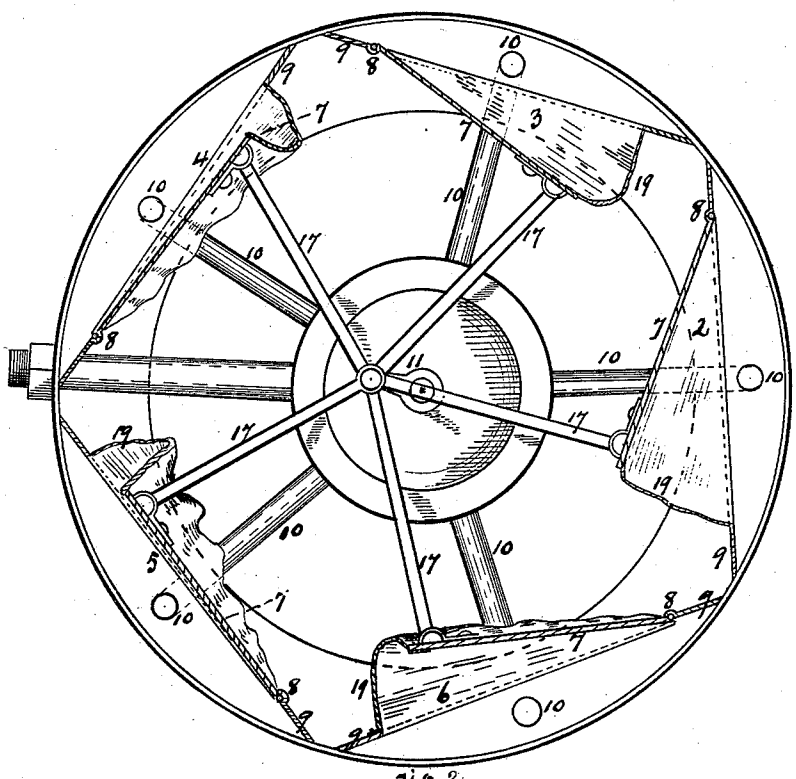


Fig. 2.

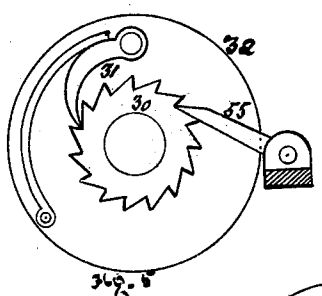


Fig. 5.

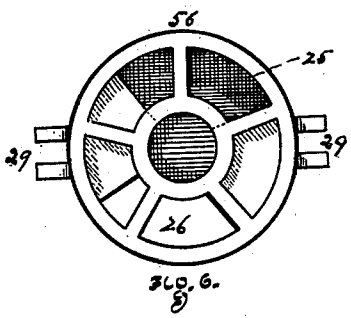


Fig. 6.

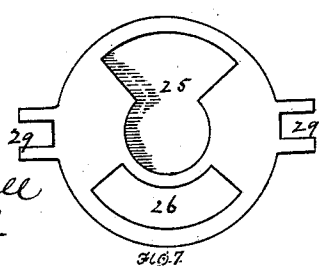


Fig. 7.

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3 Sheets—Sheet 3.

I. A. HYAMS.

Carbureter.

No. 225,931 **Patented Mar. 30, 1880.**

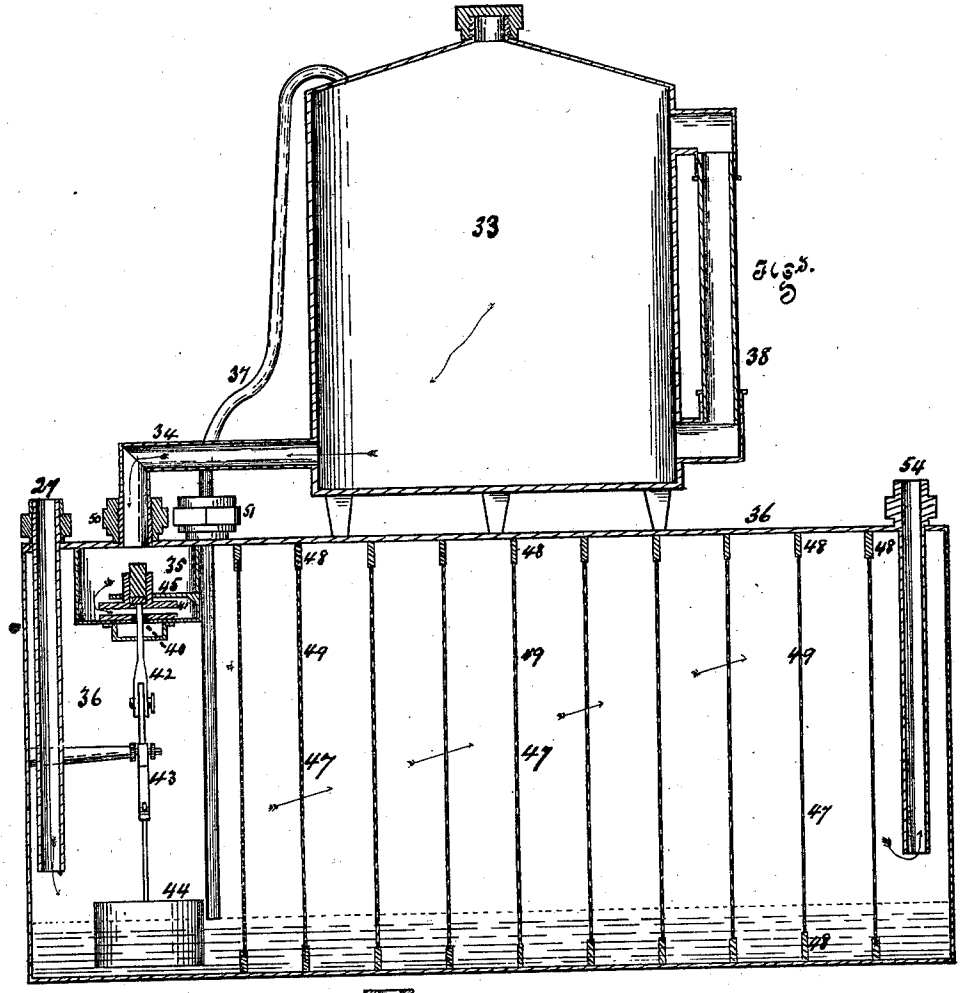


Fig. 3.

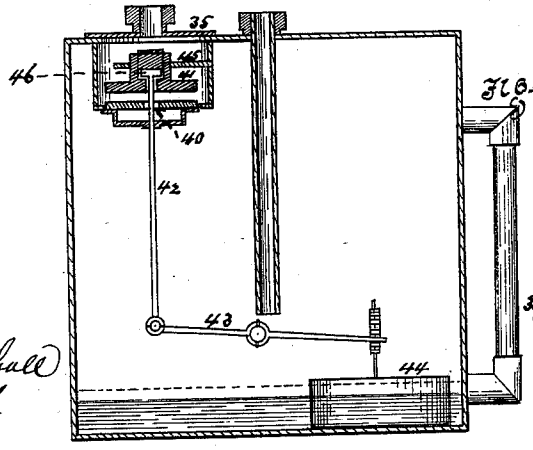


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

ISAAC A. HYAMS, OF PITTSBURG, PENNSYLVANIA.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 225,931, dated March 30, 1880.

Application filed July 28, 1879.

To all whom it may concern:

Be it known that I, ISAAC A. HYAMS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Carbureters; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, (in three sheets,) forming part of this invention, in which—

Figure 1 is a vertical sectional view of my improved blower, the far side being omitted for sake of clearness of illustration. Fig. 2 is a cross-section of the same. Fig. 3 is a vertical section of the tank and carbureting-chamber. Fig. 4 is a sectional view of the carbureting-chamber, showing the valve and float. Figs. 5, 6, and 7 are details of Fig. 1.

Like letters of reference indicate like parts in each.

My invention relates to a dry-blower carbureter. Heretofore, in the construction of dry-blowers for carbureters, where a series were arranged around and operated from a crank-shaft, so far as I am aware, the leaf or flap of the bellows has been connected to the frame by the flexible diaphragm only, so as to permit of a somewhat uncontrolled motion of the leaf when operated by its crank-arm. This results in an unsteady action of the bellows, so that the air-current from the bellows is frequently delivered in irregular jet-like puffs, which renders the action of the carbureter faulty. Such construction also increases the wear and tear on the bellows fabric or flexible diaphragm, where leakage is most likely to occur. The object, therefore, of the first part of my invention is to overcome these objections; and it consists in hinging one edge of the bellows leaf or flap to, or stepping the pintles thereof in, the main frame, which latter has its bearings or connection with the blower-chamber, thus obtaining a firm and steady support for the movable leaf, and one not affected by the action of the crank-arm.

A second cause of irregular and faulty action in dry-blowers of this class has arisen from applying the power from the crank-arm to the movable leaf of the bellows at or near the center thereof, as thereby the leaf was carried forward and back by the crank-arm until the tightening of the flexible diaphragm arrested its forward or backward motion and caused it either to sink or rise, at which time, in either case, more or less strain was put on the flexible diaphragm of the bellows, thus hastening its destruction. The object, therefore, of the second part of my invention is to relieve the flexible diaphragm of destructive strain, &c., and to overcome the objections specified; to which end it consists in hinging the leaf or flap of the bellows to the frame thereof, so that it shall rise and fall in the line of motion of the crank-arm which actuates it, and in pivoting the actuating crank-arm to the leaf off the center and away from the hinged edge of the leaf, so as to obtain the full and uniform movement of the leaf, and at the same time relieve the flexible diaphragm of all strain.

The blower 1 is of tubular form, and has five bellows, 2, 3, 4, 5, and 6, arranged around its sides. Each of these bellows is constructed of a stiff or rigid side or leaf, 7, hinged at 8 to the frame 9, and a flexible air-tight diaphragm, 19, fastened to the leaf or flap 7 and to the frame 9. The frame 9, if unbroken, would form the chord of an arc of the circumference of the blower. Opening into the bottom of each bellows is a pipe, 10, which serves alternately as an induction and a discharge pipe.

In the center of the blower is a crank, 11, which is operated by the bevel-gear wheels 12 and 13 and the drum 14. All of these devices are sustained centrally by the rods 15, of which there are three, while the outer end of the drum-shaft 16 is journaled in the side of the blower between two of the bellows.

The bellows are connected directly with the crank 11 by the arms 17, which are fastened by a pivot-connection, 18, at the outer edge of each flap or leaf 7.

The pipes 10 extend radially to the center, where they meet the induction-pipe 20, and then they turn up at right angles and run up alongside of the pipe 20 and terminate with it in an air-tight dome, 21. In this dome, and covering the mouths of the five pipes 10 and the pipe 20, is a rotating valve, 22, having a seat, 56, operated by the lower stem, 23, of the crank 11, said stem running down through the stuffing-box 24.

The valve 22 has a return-port, 25, which

connects the pipes 20 and 10 and lets air into the bellows, and also a port, 26, which opens directly through it into the dome 21 and permits the air which is being expelled from the bellows to escape into the dome, whence it passes by the discharge-pipe 27 into the carbureting-chamber. The valve is turned by means of the spanner 28, fitting between the lugs 29.

It will be noticed that the bellows draw air during the recession of the crank-pin from them, and that they expel it during the approach of the crank-pin toward them. The open port 26 of the valve is arranged in opposition to the crank-pin, so that when the crank begins to expel air from a bellows—say 2, Fig. 1, for instance—the port 26 affords free escape of the air into the dome 21, and this port is long enough to permit the complete expulsion of air from the bellows. In like manner the port 25 establishes communication between the pipes 20 and 10 when the bellows begin to open, so that they obtain their full supply of air.

The ports of the valve are long enough to extend over one pipe, 10, and partially over the two adjacent ones, so that there is at no time a cessation of either inflowing or outflowing current, and thus the blast is maintained at a steady flow.

The drum 14 is provided with the ordinary cord and weight, also with the usual winding-ratchet 29. When the weight has run down it is wound up by turning the drum backward.

The ratchet-wheels 29 and 30 are both mounted on the shaft 16.

When the machine is running the pawl 31 on the disk 32, catching in the ratchet 29, acts as a clutch and causes the shaft to revolve with the drum; but when the operation of the drum is reversed the pawl 55 prevents the shaft from turning by falling into ratchet 30, while pawl 31, slipping over ratchet 29, permits the weight to be wound up again.

The gasoline is supplied from the tank 33 by the pipe 34 to the valve-chamber 35, which is situated in the upper part of one end of the carbureting-chamber 36. A pipe, 37, runs from the top of the tank 33 nearly to the bottom of the carbureting-chamber 36. The object of this pipe is to equalize the atmospheric pressure in the two vessels by permitting the air in the carbureting-chamber, which is displaced by the entrance of the gasoline from the tank 33, to flow upward through the pipe 37 into the tank.

The pipes 34 37 may be provided with cocks, if desired.

At the side of the tank 33 is an indicator-tube, 38, of glass, or with glass sides, which shows the height of the fluid therein. A similar tube, 39, is attached to the carbureting-chamber 36.

The valve-chamber 35 has a hole, 40, in its bottom, which is controlled by valve 41. The valve 41 is fitted loosely on a stem, 42, which is attached to a lever, 43, and a float, 44, in the carbureter-chamber, whereby the valve is raised or opened as the float 44 sinks with the falling of the liquid in the carbureter-chamber, and closes as the float rises when the quantity of the liquid therein is increased. The valve 41 is loosely mounted on the stem, as clearly shown in Fig. 4, so that it shall not be unseated by agitation or disturbance of the liquid in the carbureting-chamber 36, or by any movement of the lever and float except a positive vertical movement.

The valve is held in place by the guide 45, in which it has a vertical movement, and is secured on the stem 42 by a nut, 46.

The carbureting-chamber is provided with a series of vertical partitions, 47, which are formed of suitable frames 48, in which is stretched a suitable capillary cloth or material, 49. These frames may stand in an inclined position. It is only requisite that their lower ends be immersed in the gasoline, so that the latter will be led up by the capillary action into the path of the current of air from the blower. I prefer that they should stand across the path of the current of air, because the latter becomes more highly charged with the hydrocarbon or carbureted when compelled to pass through the meshes of the material than when it passes over it.

The frames 48 are slid into the chamber 36 any desired distance apart, being held by cleats, lugs, or other spacing devices.

The valve 41 controls the admission of the gasoline into the chamber 36, being opened and closed by the falling and rising of the float on the surface of the liquid in the chamber. Thus the liquid is kept automatically at the required height. But little liquid, comparatively with other machines, is required to be present, as it is only necessary to immerse the lower ends of the capillary material 49 in it, while the economical arrangement of the frame and the immense surface of saturated material exposed to the blast of air causes a very rapid production of thoroughly-carbureted air.

The blast of air enters the carbureting-chamber 36 by the pipe 27 and leaves it by the pipe 54. The pipes 37 and 34 are fastened into the chamber 36 by loose screw-couplings 50 51, and are easily removed.

By this construction I obtain a perfectly practicable dry-blower, and consequently all of its advantages over wet-blowers in obviating all obstructions due to the freezing of the water in the blower, the condensation of the watery vapor taken up by the air in the gas-pipes, and the necessity of watching and keeping the water in the blower at a fixed height.

The doors of the bellows are provided with long pintles, which are stepped in the hinges at 5, so that their weight does not come upon and sag or strain the diaphragms 19.

The shape of the bellows may be varied without departing from my invention.

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

1. A carbureter-blower consisting of a cylindrical shell divided into bellows-sections by a series of frames connected to the shell, each frame having its movable leaf or flap hinged by one edge to its frame, and connected to a crank common to all the bellows of the series by an intermediate crank-arm, substantially as and for the purpose specified.

2. In a carbureter-blower, the leaf or flap of the bellows, hinged at one edge to the frame of the bellows, in combination with a crank-arm pivoted to the leaf or flap at a point off the center and opposite the hinge-connection of the leaf, substantially as and for the purpose specified.

In testimony whereof I, the said ISAAC A. HYAMS, have hereunto set my hand.

ISAAC A. HYAMS.

Witnesses:
W. S. MONTGOMERY,
A. J. HEATON.