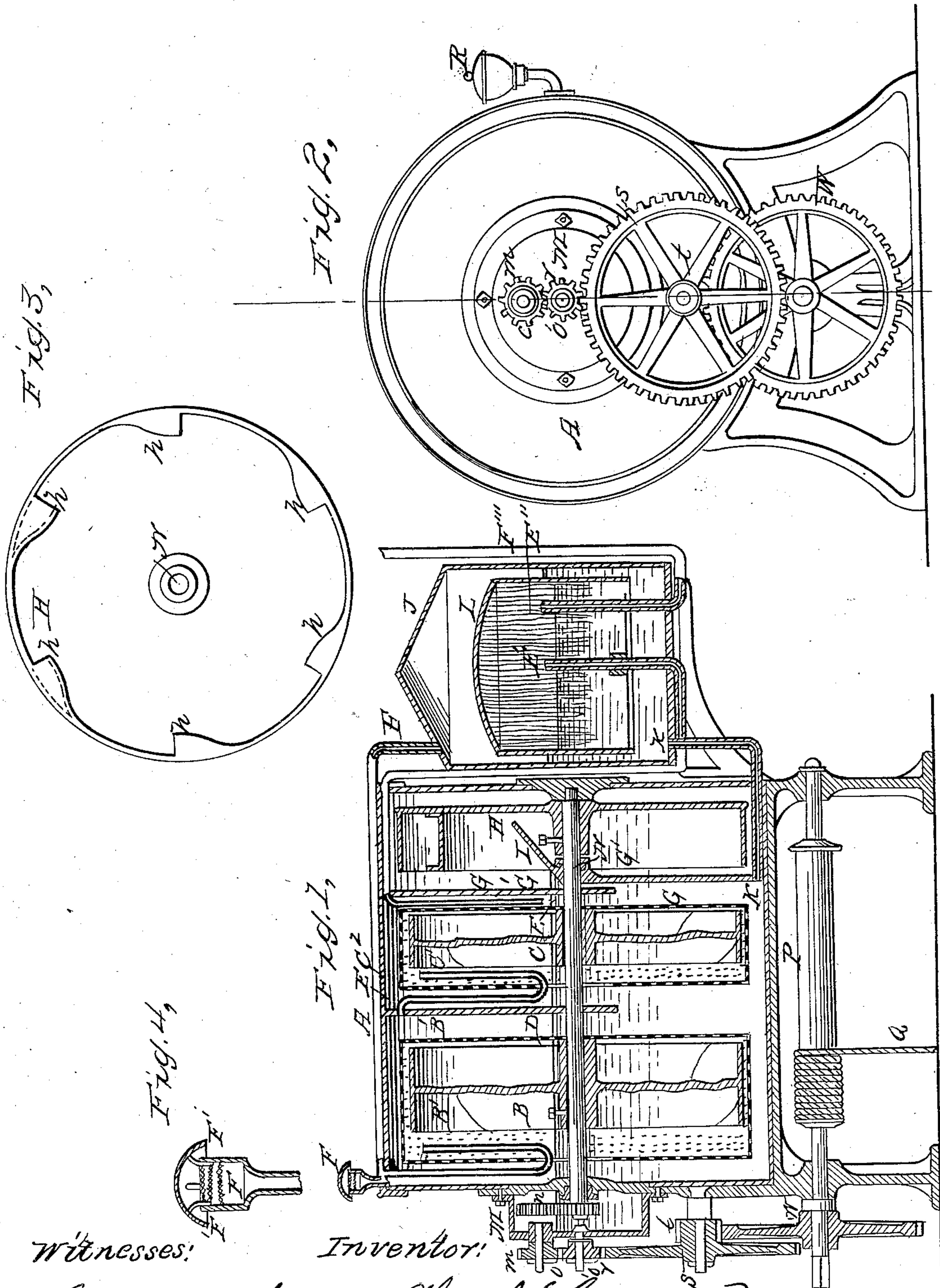


H. L. McAVOY.
Apparatus for Carbureting Air.

No. 57,940.

Patented Sept. 11, 1866.



Witnesses:

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UNITED STATES PATENT OFFICE.

H. L. McAVOY, OF BALTIMORE, MARYLAND.

IMPROVED APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. 57,940, dated September 11, 1866.

To all whom it may concern:

Be it known that I, HUGH L. McAVOY, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and Improved Machine for Carbureting Air; and I do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable one skilled in the art to which the invention appertains to make use of it, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a longitudinal central vertical section on the line *xx*, Fig. 2. Fig. 2 is a front elevation. Fig. 3 is a front elevation of the wheel for elevating the fluid. Fig. 4 is a detached view of the arrangement at the inlet air-aperture of the machine.

The invention consists of a machine through which a body of air is forced by a motor, (or weight, for instance,) and is caused to circulate against surfaces charged with hydrocarbon fluid, by which the said air is carbureted.

The peculiar features of this machine consist of, first, an air-forcing cylinder or chamber, around which is attached a reticulated or permeable covering of perforated metal or wire-gauze, or a frame covered with porous or fibrous material; second, one or more meter-wheels running loosely on the shaft of the forcing-wheel, being driven by the passage through them of the air, and, if need be, having wicking or other fibrous substance hanging therein; third, a partition separating the chambers of the air-forcing and meter wheels, respectively, so as to divide their upper portions; fourth, a pipe connecting the air-forcing-wheel chamber with the interior of the cylinder around the meter-wheel; fifth, a partition separating the meter-wheel chamber from the feeding-wheel chamber; sixth, a feeding-wheel attached to the shaft of the air-forcing wheel and revolving therewith, carrying buckets, cups, gutters, or analogous devices, to elevate the fluid from the lower portion of the chamber in which it revolves, and empty it into the chambers in which the carbureting-wheels revolve; seventh, the apron or gutter connected with the partition between the meter-wheel chamber and the feeding-wheel chamber, and leading the water dropped by the feeding-wheel to the carbureting-chamber, a given level being maintained in the latter at the expense of the fluid in

the chamber in which the feeding-wheel revolves; eighth, the upper portions of the chambers of the air-forcing and meter wheels, respectively, are divided by a partition which extends below the fluid level; but the lower portion is common to both, and both of these wheels, by virtue of the constant exposure of their perforated surfaces to the fluid and to the passing air, become carbureting-wheels as the passing air becomes saturated with hydrocarbon vapor; ninth, a chamber attached to the machine in which a regulator operates, and in which the fluid is maintained on a level with that in the carbureting-chamber by means of a pipe which forms a free communication between them; tenth, an inverted chamber, having fibrous material attached thereto, to which may be attached any ordinary device for regulating the flow of gas or air through the proper pipes; eleventh, a casing by which the upper portion of the train of gearing is attached to the machine, and which covers in the stuffing-box and the wheel to which the shaft of the air-forcing wheel is attached, the said shaft being below the level of the fluid, the shaft of the pinion which passes through the said casing being above the fluid, and the arrangement giving facility for the examination and repairs of said gearing; twelfth, the arrangement of reticulated surfaces or perforated diaphragms in the air-inlet aperture, to prevent the access of flame into the interior of the chamber by accident or carelessness.

In the drawings, A is the outside case, made of suitable size, shape, and material, and perfectly air-tight. B is the air-forcing wheel, attached to the shaft N, and being surrounded, as in a cage, by the attached reticulated or perforated metal cylinder B', which revolves in the chamber B'', and forms the first portion of the carbureting arrangement to which the air is exposed.

C is the carbureting meter-wheel, which runs loosely upon the shaft N, and carries with it the porous or perforated cylinder C'. The inside of the meter-wheel may be hung with wicks or other fibrous or porous material, and the wheel C and cylinder C' revolve in the chamber C'', which is separated from the chamber B'' to a point below the level of the water-line by the partition D.

E is a pipe conducting the gas or air from

the chamber B'' to the interior of the cylinder C'. The pipes E' E' conduct the air thence into the regulating-chamber L, from whence it passes by the pipe E'' for consumption.

F is the pipe admitting air into the air-forcing wheel, and also connecting by a branch with the top of the regulator-chamber J, so as to permit the regulator to rise with freedom. The chamber at the upper end of the air-pipe F (shown at Fig. 4) has several perforated partitions, F', through which the air is at liberty to pass downward, but which prevent the conduction of flame into the interior by the accidental dropping of a match thereinto.

G G are partitions separating the chamber G' from the chamber C''. In the former revolves the dipping or feeding wheel H, which is attached to the shaft N, and is shown in elevation in Fig. 3. It consists of arms carrying buckets h, which dip the hydrocarbon fluid from the lower portion of chamber G' and spill it upon the shelf or apron I, which leads it into the chamber occupied by the carbureting-wheels. This dipping is continuous, and the surplus fluid runs back again into the chamber G' at the ends of the shelf, the point of lowest depression of the latter, the level of the fluid being maintained equable in the carbureting-chamber, while it gradually sinks in chamber G' as it is vaporized and passes off to be consumed.

K K is a pipe connecting the lower portion of the carbureting-chamber with the lower portion of the regulating-chamber J, so that the fluid in each is at the same level.

L is an inverted chamber, hung inside with fibrous material, and rising and falling in the fluid, according to its contents and the pressure within it.

M is a box or casing, containing and supporting the gearing connecting the shaft N of the air-forcing wheel B with the proper motive power.

Heretofore in some cases this gearing has been placed inside, and can be arrived at only with the greatest difficulty. By the arrangement herein proposed it may be readily reached for examination and repairs, if necessary, or for the removal of a foreign body which may have intruded itself between the gearing.

On the shaft N is a pinion, *n*, and this gears into another pinion, *p*, which is on a short shaft, *o*, which is above the level of the fluid, and passes through the side of the casing M, on the outside of which it carries a spur-wheel, *m*, which engages a loose pinion, *r*, on the short shaft *o'*, which is attached to the casing M.

The pinion *o* is rotated by means of the gearings *s t w* and a weighted cord, Q, wound on the drum P in a manner familiar to experts, and giving motion to the machine.

The hydrocarbon fluid is introduced at the opening R, from whence it flows into the chamber G, and overflows into the carbureting-chamber, from whence, by the pipe K, it flows into the chamber J, an even height being attained in every place into which it flows.

The operation of the machine has been incidentally traced in the description of the parts, but it may be briefly described as follows: The gasoline or other sufficiently light hydrocarbon fluid is poured into the machine through the cup R, filling the chambers to the requisite height. The cap being tightly closed, the machine is wound up by turning the shaft P, and it is ready for operation. Upon opening any of the burners, permitting the escape of gas, the weight revolves the gearing, the air-forcing wheel takes in and forces the air through itself and through E into the meter-wheel, which revolves by the passage through it of the air, being loose upon the shaft. This wheel is of smaller capacity than the air-forcing wheel. From chamber C'' the carbureted air passes by pipe E' in the regulator, and thence, by pipes E'' E''', to the place of consumption, the inverted vessel L operating according to the pressure within it, and arranged to open or close a valve (not shown) regulating the flow of gas according to the number of burners in use.

The operation of the feeding apparatus H keeps the chambers in which the air-forcing and meter wheels operate, as well as the regulator-chamber, at the same level until all the fluid in chamber G is exhausted, when all that is necessary to fill every part is to pour in fluid through cup R.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The air-forcing wheel B, and the attached cylindrical casing of perforated metal or frame covered with fibrous or porous material, arranged and operating substantially as described.
2. One or more meter-wheels, C, covered by permeable casing C', revolving independently by the pressure of the gas from the forcing-wheel, being separated from the chamber B'' by the partition D, and connected therewith by pipe E, substantially as described.
3. The feeding apparatus H, operating as described, and connected to any part of the machine, in combination with the partitions G G and shelf or gutter I, substantially as described.
4. The regulator-chamber J and its inverted vessel L, as described, in combination with the connecting-pipes K K, F F, and E' E''.
5. The casing or box M, arranged on the outside of the machine, for containing the gearing, substantially as described.
6. The perforated metal or wire-gauze diaphragms in the air-inlet, for the purpose described.

To the above specification of my improvement in carbureting apparatus I have signed my hand this 21st day of August, 1866.

H. L. McAVOY.

Witnesses:

OCTAVIUS KNIGHT,
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