F. BARTHEL.

CARBURETER.

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1,026,425.

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Fig. 1.

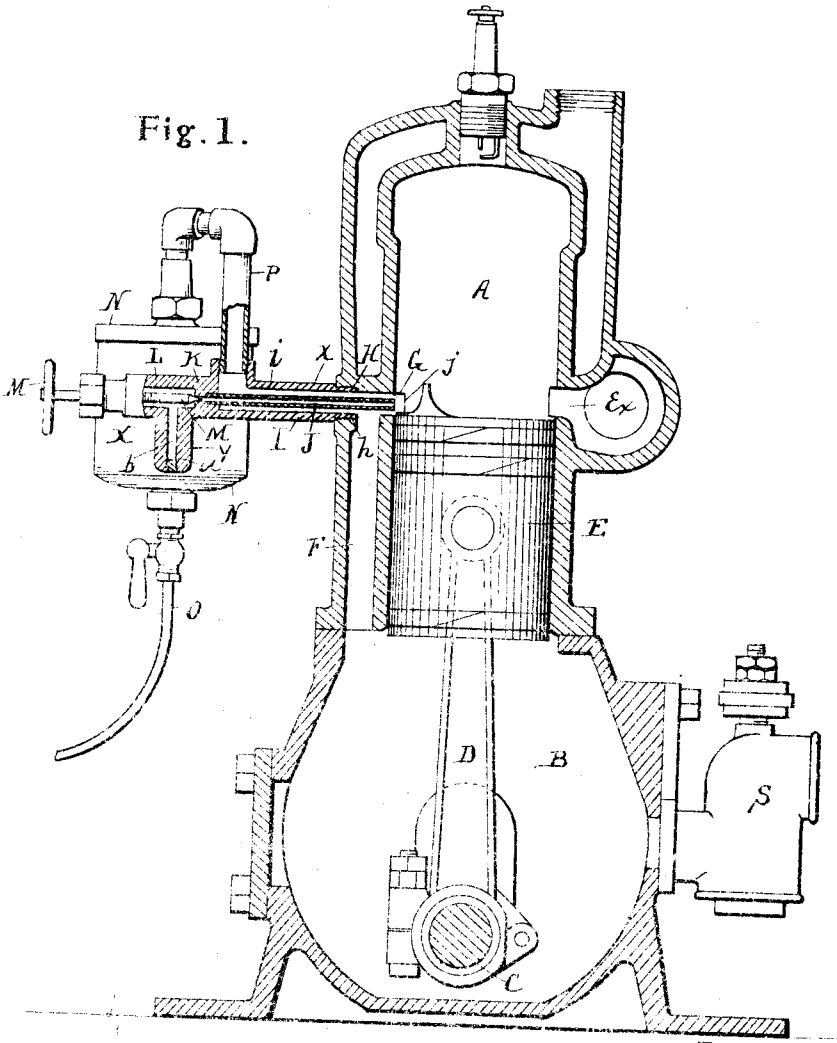


Fig. 2.

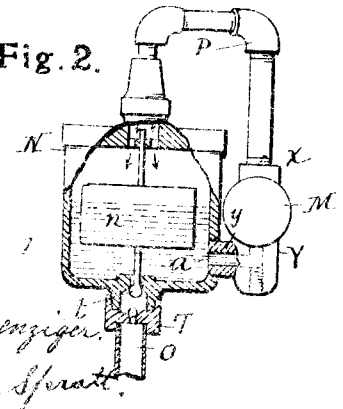
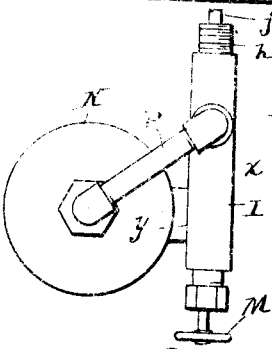


Fig. 3.



Witnesses

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CARBURETER.

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To all whom it may concern:

Be it known that I, FREDERICK BARTHEL, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Carbureters, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to carbureters and an object of my improvement is to provide an improved carbureter, which will carburet the air as it passes into the combustion chamber of a two cycle internal combustion engine.

In the previous state of the art, carbureters have been constructed to deliver the hydrocarbon to the air as it passes from the atmosphere to an internal combustion engine, the spraying action being due to the current of air passing the delivery nozzle. And carbureters have been constructed to deliver the hydrocarbon to the air as it passes to the combustion chamber of a two cycle internal combustion engine. This latter kind has been designed to be actuated by a difference of pressure between the reservoir from which the hydrocarbon is drawn and the delivery nozzle, this difference of pressure being attained by connecting said reservoir with a part of the engine remote from that at which the delivery nozzle is located, so that the reservoir shall be connected with a portion of the delivery apparatus of the engine in which the air is at a greater pressure than it is at the point at which the delivery nozzle is located.

In my device, I arrange that the hydrocarbon shall be delivered to a two cycle engine by the action of the current of air passing the delivery nozzle, as in the first kind of apparatus above described. I therefore place the delivery nozzle at a point where the passing current of air shall spray the hydrocarbon therefrom and I connect the reservoir with a point of the air delivery apparatus of the engine closely adjacent to said delivery nozzle so that the pressure in the reservoir and at the delivery nozzle shall be practically the same, except for the spraying action of the passing current of air. I accomplish this object in the device illustrated in the accompanying drawings, in which,

Figure 1, is a sectional elevation of a two cycle gas engine having an apparatus embodying my invention attached thereto; said apparatus being partly in section on the same plane as the engine. Fig. 2, is a detail view of the apparatus embodying my invention separate from the engine, the reservoir and immediately adjacent parts being broken away to show the internal construction. Fig. 3, is a plan view of said apparatus.

A, is the cylinder, and B the crank case of a two cycle internal combustion engine; the cylinder opens into the crank case and the latter serves as a compression chamber as in the usual construction of such engines.

S, is the intake valve to the crank case B.

F, is the by-pass for the air.

G, is the port through which the air is discharged from the crank case B through the passage, or by-pass, F in the combustion chamber.

E *x*, is the exhaust port, E, the piston, D, the connecting rod, and C, the crank of the engine.

N, is a reservoir for the liquid hydrocarbon.

O, is the supply pipe to the reservoir N.

T, is a check valve controlling the port between the reservoir N and the supply pipe O and automatically opening toward said reservoir.

n, is a float and *t*, is a ball or valve on a stem depending from the center of the float *n*, the same acting to maintain an approximately constant level in the reservoir N, in the usual way.

X, is a casting, consisting of a horizontal cylindrical portion I, and a portion Y extending downward toward one end of the portion I.

h, is a screw threaded nipple formed on the end of the portion I.

y, is a screw threaded nipple extending laterally from the portion Y.

The portion I is bored in from one end to form a comparatively large opening or bore, *i*, therein extending about two-thirds of the way through from end to end. From the rear end of the bore *i* in the portion I an aperture extends upward which is internally screw threaded.

P, indicate a series of pipes. one end be-

ing fitted into the lateral aperture communicating with the bore *i* and the other end of said pipes communicating with the reservoir N above the level of the fluid therein, thus forming an open connection between said reservoir and bore.

Extending in from the opposite end of the cylindrical portion I to that from which the bore *i* extends, is a coaxial cylindrical aperture L. There is a partition K left between the inner ends of the aperture L and bore *i*. A small aperture coaxial with the apertures *i* and L is drilled through the partition K, and into this aperture is tightly fitted a small pipe J which extends through and out of the end of the bore *i* leaving a space between its outer wall and the inner wall of the bore *i*.

M, is a needle valve adapted to control the opening to the pipe J. The nipple *y* is screwed into a screw threaded aperture in the reservoir N below the level of the fluid therein and the nipple *h* is screwed into an aperture H in the engine wall, the end *j* of the pipe J extending into the port G. The pipes are then connected to form a communication between the bore *i* and the interior of the reservoir N, as above described.

There is an aperture *b* formed vertically through the portion Y and communicating with the aperture L and there is an aperture *a* drilled coaxial with the nipple Y from the outer end of said nipple and communicating with the aperture *b*. The lower end of the aperture *b* is closed by a plug, as indicated.

The operation of the above described device is as follows:—The bore *i* communicating with the reservoir N through the pipes P and with the engine at a point adjacent to the nozzle *j* keeps the pressure in said reservoir the same as at the end *j* of the pipe J and the air rushing through the by-pass F and through the port G acts to spray the hydrocarbon from the end *j*, of the pipe J in the usual way.

It will be seen that the device may be easily and cheaply constructed, as there is but one casting X to be made which may be drilled into to form the various chambers and apertures and may be readily connected with the usual cup or reservoir N and screwed into an aperture in the wall of the engine.

When the piston E ascends a partial vacuum is formed in the crank chamber B, by-pass F, bore *i*, pipe P, and the reservoir N above the liquid therein, and a supply of hydrocarbon is drawn through the pipe O to supply any slight deficiency that may be therein. If there is sufficient liquid in the reservoir N, the float *n* will be raised until the valve *l* closes the aperture through the supply pipe and prevents any further inflow of fluid.

The amount of hydrocarbon delivered may be regulated in the usual way by the needle valve M.

What I claim is:—

1. The combination with a two-cycle internal combustion engine having a combustion chamber, a compression chamber and a transfer passage connecting said compression and combustion chambers, means for compressing air in said compression chamber and transferring the same to said combustion chamber through said transfer passage, an inclosed hydrocarbon reservoir, a conduit for liquid leading from said reservoir beneath the level of the hydrocarbon therein and opening to the interior of said transfer passage and an unobstructed passage leading from said reservoir above the liquid therein and opening into said transfer passage adjacent to the opening from said conduit, for the purpose described.

2. In an apparatus of the kind described, the integral casting X having a bore *i* formed therein and terminating in said casting, an aperture formed in the end wall of said bore, a pipe J smaller than the bore *i* extending through said bore and having its inner end fitting into said aperture, said casting being provided with a lateral opening, opening into said bore, a passage for hydrocarbon communicating with said pipe, an engine casing and cylinder, a passage for air in said casing leading to said cylinder and provided with an aperture in its wall, said casting engaging in said opening so that its bore shall communicate with said passage.

3. The combination with a two-cycle internal combustion engine having a combustion chamber, an apparatus for compressing the charge and transferring the same to the combustion chamber having a screw threaded aperture through its wall of a casing X having a hollow portion I screw threaded at its end to engage in said aperture and closed at its outer end, a pipe J extending through the bore of said hollow portion, a hydrocarbon reservoir, means for putting said pipe into communication with said reservoir below the level of the hydrocarbon therein, and means for putting the interior of said hollow portion into communication with said reservoir above the level of the hydrocarbon therein.

4. The combination with a two-cycle internal combustion engine having a combustion chamber, a compression chamber and a transfer passage permanently open to said compression chamber, a port connecting said combustion chamber and said transfer passage, means for compressing air in said compression chamber and means for opening and closing said port so as to transfer said compressed air to said combustion chamber through said transfer passage of

an inclosed hydrocarbon reservoir, a conduit for liquid leading from said reservoir beneath the level of the hydrocarbon therein, said conduit opening into said transfer passage between said port and the opening of said passage into said compression chamber, and a permanently open passage leading from said reservoir above the liquid therein, and opening into said transfer passage adjacent to the opening from said conduit so that the static pressure in said reservoir above the liquid therein shall be the same as the static pressure in said transfer passage adjacent to the opening of said conduit into said transfer passage.

In testimony whereof, I sign this specification in the presence of two witnesses.

FREDERICK BARTHEL.

Witnesses:
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