H. N. MOTSINGER.

CARBURETER.

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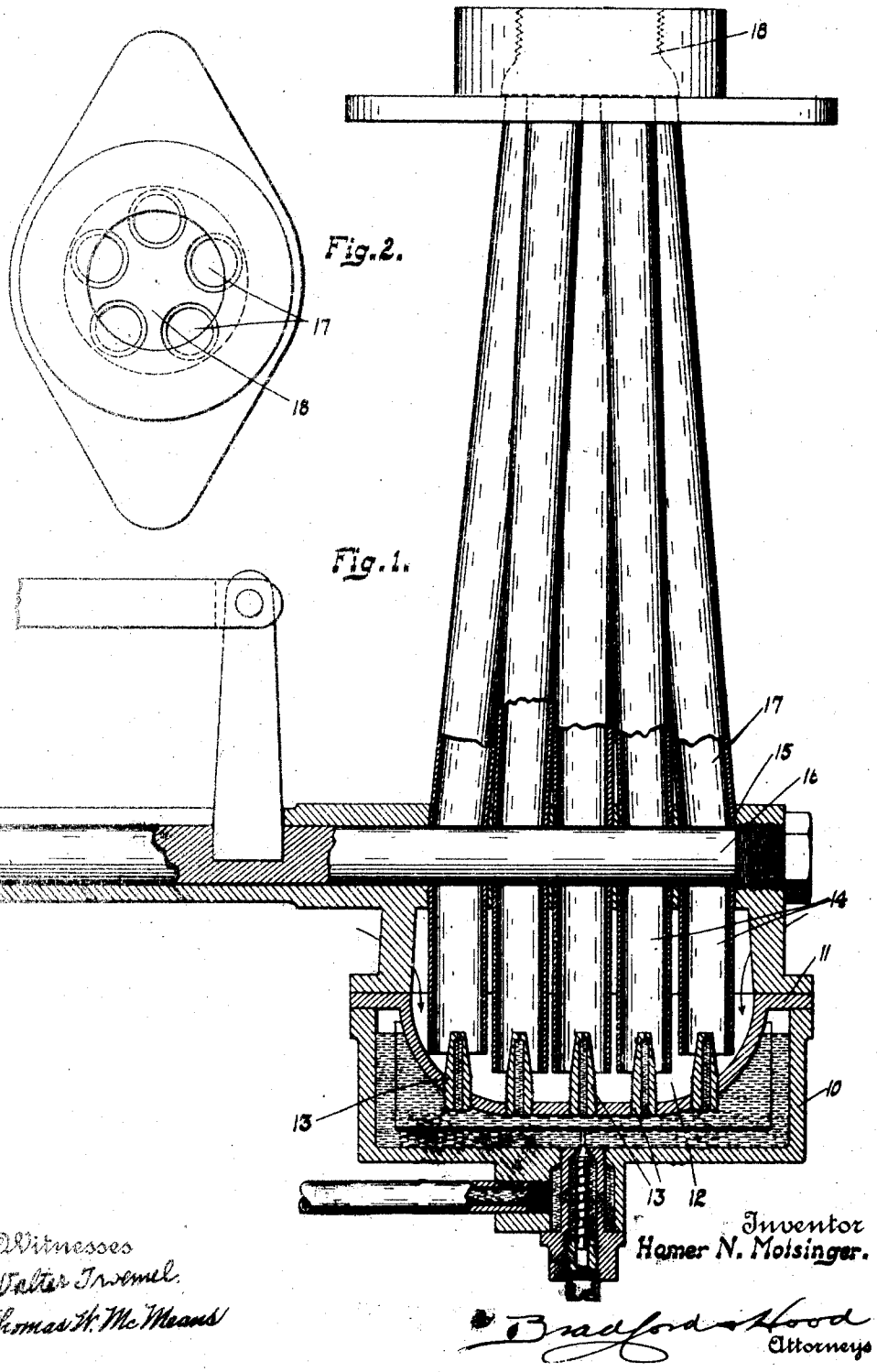

Fig. 2.

Fig. 1.

Witnesses
Walter Trowmel.
Thomas H. McMeans

Inventor
Homer N. Motsinger.

Bradford & Hood
Attorneys

UNITED STATES PATENT OFFICE.

HOMER N. MOTSINGER, OF PENDLETON, INDIANA, ASSIGNOR TO MOTSINGER DEVICE MANUFACTURING COMPANY, OF LA FAYETTE, INDIANA, A CORPORATION OF INDIANA.

CARBURETER.

1,021,547. Specification of Letters Patent. Patented Mar. 26, 1912.

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To all whom it may concern:

Be it known that I, HOMER N. MOTSINGER, a citizen of the United States, residing at Pendleton, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

In carbureters as heretofore commonly constructed a fuel nozzle of comparatively small area is arranged with its discharge outlet within an air passage, the area of which is sufficient to supply the maximum demand of the motor, and a regulating member is then arranged in conjunction with the air passage by means of which the effective vacuum on the gasolene nozzle, proportional to the quantity of air entering, is maintained at the right amount, or approximately so. This device is generally automatically shifted in accordance with the speed of the motor and consequent fuel demand of the motor. It has generally been recognized that such a construction is only an approximation to an ideal carbureting condition because, at the slowest speed or lowest suction of the motor, the area of the pipe being such as to be sufficient for the maximum demand of the motor, the air speed is so low that the gasolene discharged from the nozzle falls down and does not properly vaporize, while at the maximum demand the size of the nozzle having to be small for the minimum demand, the vacuum necessary to induce the proper amount of gasolene to flow from the nozzle is exceedingly great, thus causing a reduction in the horse power of the motor, due to the throttling effect of the automatic air valve through which the major air supply must be drawn. The unreliability of moving parts and their liability to become clogged with dirt is also very objectionable.

I have discovered that a satisfactory carbureting velocity of an air current attainable with the vacuum producible by the movement of an ordinary motor by hand, cannot be obtained in a passage having an area materially exceeding the area of a passage three-eighths to one-half of an inch in diameter, and that in such a passage, while the air velocity therethrough will be increased by an increase of speed of the engine, yet such increase of air velocity only affects the fuel in such way as to supply an adequate and proper additional amount of fuel to the increased volume of air. Such a tube however, is not of sufficient capacity to supply an adequate volume of carbureted air to a motor of any commercial size. I have therefore found that, in order to produce perfect carburation at all speeds of the motor, and at the same time to supply an adequate volume of carbureted air to the motor at all speeds, it is necessary to provide a plurality of carbureting units, the carbureting working adjustment of each of which is fixed during operation, but which may be connected with or disconnected from the motor in succession.

The object of my present invention is therefore to produce a carbureter structure having the qualities described.

The accompanying drawings illustrate my invention.

Figure 1 is a full sized elevation in partial vertical section of a carbureter which I have constructed in accordance with my invention and Fig. 2 a plan of the upper end thereof.

In the drawings, 10 indicates a fuel reservoir the upper end of which is closed by a plate 11 having a central cup-like depression 12 through which are projected as many fuel nozzles 13 as may be desired. Projecting downwardly into the cup-like depression 12, one over each nozzle 13, are the tubes 14, the lower ends of which are open and lie below the upper ends of the nozzles 13. These tubes 14 are so adjusted in size, relative to the fuel nozzles 13, that air velocities attainable therethrough by the vacuum producible by the motor with which the carbureter is to work, will produce that amount of lifting on the fuel which will produce proper carburation of the air. In practice, I have found that the tubes 14 should be approximately three-eighths to one-half of an inch in diameter. The upper ends of all of the tubes 14 deliver into a valve chamber 15 within which is fitted a longitudinally movable plug valve 16. Chamber 15 may deliver directly to a distributing chamber from which pipes (not shown) may be led to the several motor cylinders to be supplied, but I have found experimentally that it is desirable to continue the tubes to a point as near as possible to the cylinders to be supplied, and

for that reason, in the form shown in the drawings, I have shown a plurality of tubes 17, of the size and number corresponding to tubes 14, leading from the upper end or side of chamber 15 and delivering to a distributing head 18. Valve 16 may be longitudinally moved so as to successively open tubes 14 into the valve chamber, and inversely successively close the said tubes, by any suitable means. It will be noticed that the valve chamber, in which valve 16 is mounted, is, when the valve is in closed position, completely filled and that, as the valve 16 is moved in the opening direction the volume of the valve chamber is increased in direct relation with the increased number of carbureter units brought into play by such movement and therefore the velocity of the carbureted air is not decreased as it passes through the valve chamber. This is an important feature of my invention. It is well known that when air at a given velocity is caused to take up a fuel vapor, such as gasolene, at a velocity which produces maximum efficiency, there will be a precipitation of the fuel vapor if the velocity of the air is permitted to materially drop and it is therefore important to maintain the velocity of the carbureted air at its maximum efficiency to a point as close as possible to the combustion chamber of the engine.

Any suitable controlling means, for maintaining a proper level of fuel within the cup 10, may be provided, the particular construction of this portion of the mechanism forming no part of my present invention.

While I have shown the relation between the fuel nozzle and the mixing tube as being non-adjustable it is to be understood that, in practice, so far as my invention is concerned, there may be an adjustability between these parts by means of which the effective carbureting relation may be varied for different atmospheric and fuel conditions, but such adjustment will be a non-automatic one so far as the operation of the motor, with which the carbureter is to work, is concerned, these parts of the carburcter, during operation, remaining in a fixed carbureting relation throughout the variations of velocity of the motor.

The slight difference in height of the tubes 14 relative to the nozzles 13 is merely a matter of convenience in manufacture and does not materially affect the operation of the structure so long as the relation is a fixed one.

I claim as my invention:

1. A carbureter comprising a plurality of carbureting units each having a fixed carbureting relation, and all delivering into a valve chamber, a valve normally filling said valve chamber and movable to successively and cumulatively bring the carbureting units into communication with said valve chamber and to increase the mixture-receiving volume of such valve chamber, said valve chamber bearing such relation to the carbureting units delivering thereto that the velocity of delivery from the carbureting unit through said valve chamber will not be materially decreased as it passes through the valve chamber.

2. A carbureter comprising a plurality of carbureting units each having a fixed carbureting relation, and all delivering into a valve chamber, a valve normally filling said valve chamber and movable to successively and cumulatively bring the carbureting units into communication with said valve chamber, and a plurality of tubes leading from said valve chamber and corresponding in size and number with the carbureting units delivering to said valve chamber, said valve chamber bearing such relation to the carbureting units delivering thereto that the velocity of delivery from a carbureting unit through said valve chamber to the corresponding tube will not be materially decreased as it passes through the valve chamber.

3. A carbureter comprising a valve chamber having a plurality of passages delivering thereto and a corresponding plurality of passages leading therefrom, a plurality of fuel nozzles one mounted in each of the aforesaid leading-in passages and having a normally fixed carbureting relation thereto a fuel reservoir communicating with said fuel nozzles, and a valve mounted in and filling said valve chamber and movable to successively and cumulatively open communication from the leading-in passages into the valve chamber.

4. A carbureter for internal combustion engines, comprising a fuel reservoir, a plurality of fuel nozzles leading therefrom, a plurality of air tubes, one associated with each of said nozzles and having a fixed carbureting relation thereto, said tubes delivering into a valve chamber, a corresponding series of tubes leading from said valve chamber to a point close to the inlet valve of the engine, and a valve arranged within the valve chamber and movable to successively open and close the connection between the two sets of tubes.

5. A carbureter for internal combustion engines, comprising a fuel reservoir, a plurality of fuel nozzles leading therefrom, a plurality of air tubes, one associated with each of said nozzles and having a fixed carbureting relation thereto, and having a cross section not materially exceeding that within which the vacuum, producible by the motor with which the apparatus is to work, will produce, at minimum velocity, a fuel delivery from the nozzle, said tubes delivering in a valve chamber, a corresponding series

of tubes leading from said valve chamber to a point close to the inlet valve of the engine, and a valve arranged within the valve chamber and movable to successively open and close the connection between the two sets of tubes.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this twenty-second day of September, A. D. one thousand nine hundred and nine.

HOMER N. MOTSINGER. [L. S.].

Witnesses:

ARTHUR M. HOOD,

THOMAS W. MCMEANS.