

1,033,443.

A technical drawing of a mechanical assembly. It shows a cross-section of a housing (35) with a central vertical shaft (36). A horizontal shaft (34) passes through the housing, secured by a nut (37) on the right. A hatched rectangular block (33) is positioned below the horizontal shaft. The number 5 is located on the far left, possibly indicating a reference or a specific part.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,033,443.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES A. MORRIS and WALTER H. MERRITT, both citizens of the United States, and residents of and whose post-office addresses are, respectively, 5 Tilton avenue and No. 28 Spring street, in the city of Red Bank, county of Monmouth, State of New Jersey, have invented certain new and useful Improvements in Carbureters, of which the following, taken in connection with the accompanying sheets of drawing, is a complete and concise description.

Our invention relates to improvements in 15 carbureters, and particularly to carbureters employing a wick or similar means for absorbing and exposing the hydrocarbon to vaporization.

Among the objects of our invention are 20 economy, efficiency and simplicity in construction and operation, easy adjustment, the prevention of back firing, the avoidance of trouble from presence of water and other imperurities, the accessibility of parts, and the 25 adaptability of the same carbureter for different powered engines.

In many carbureters the hydrocarbon is admitted through a fine orifice adjusted by a 30 needle valve. A slight obstruction of this orifice affects the admission and even breaking up of the hydrocarbon, and oftentimes produces much disturbance and difficulty in the operation of the device. Further, the 35 vaporization is frequently imperfect and is not easily and automatically regulated, constant adjustments of air valves and other important parts is necessary to meet the 40 varying requirements of load, speed, temperature, humidity, etc. Moreover, in many existing carbureters the vibration of the car 45 constantly affects the flow and frequently permits flooding through the admission of an excess of hydrocarbon over what can be vaporized and taken to the engine. In our device, however, these objections are obviated and we attain the objects set forth 50 above by the means illustrated in the accompanying drawings and described and claimed hereinafter.

In the drawings like figures of reference 55 refer to like parts throughout the respective views.

Figure 1 is a sectional elevation of the device. Fig. 2 is a section of a portion of the 55 device with a part in elevation. Fig. 2 is a

perspective view of a portion of the apparatus.

Referring to the figures, and first specifically to Fig. 1, --1-- is the float chamber, which we may form of glass (although we do not limit ourselves to this material); --2-- and --2^a-- are the top and bottom of 80 said float chamber; --3-- gaskets or washers interposed between the top and bottom portions --2-- and --2^a--; --4-- a vent to the float chamber; --5-- the tubular body of the vaporization chamber, which we may form integral with --2--, or, preferably, as 65 we have illustrated it, screwed into the upper portion or cover of the float chamber --2--; --6-- a flange, which may be screwed down upon --5-- and by which the whole is secured to the manifold or inlet to the engine; --7-- the air inlet; --8-- the air inlet 70 valve; --9-- the spring to the air inlet valve; --10-- adjusting nut for the air inlet valve; --11-- air holes in the tube --5--; --12-- the butterfly valve; --13-- the adjustably butterfly valve stop; --14-- a wick tube provided with the shoulder --16-- 80 abutting against the cap --2-- of the float chamber; --17-- the threaded lower portion of said tube; --18-- a nut adapted to screw over the threaded portion and abutting against the washer --18^a-- to hold the tube 85 --14-- in position and at the same time assemble and hold the float chamber together; --15-- is a wick, which may be of any suitable form or material.

--18^a-- is a cap adapted to screw over the 90 bottom part of the tube --14-- abutting against the nut --18-- or the interposed washer --18^a--; --19-- is a tube adapted to screw into the interior of the pipe --14-- at the bottom, and provided at its top with a 95 mesh or netting --20-- upon which the wicking --15-- may rest; --21-- is a ring or short tube adapted to slip into the top of the tube --14-- and rest upon the top of the wick, and is also provided with a mesh or 100 screen or other guard --22--; --23-- is a float of the usual kind linked to the lever --25-- at --26-- and fulcrumed at the point --24-- the other end of the lever being connected to a valve --27-- in the hydrocarbon 105 supply --29--.

The operation of this float valve mechanism is well known. --28-- are series of holes in the tube 110 --14-- near the bottom of the float chamber to permit the ingress of the hydrocarbon

and its contact with the bottom of the wick; —30— is a coiled spring bearing upon the shoulder —16— of the tube —14— at its lower end, and at its upper end bearing against the lower portion of the skeleton valve —32—, this valve being adapted to move vertically over the top of the tube —14—. The upper portion of the tube —14— is provided with a valve seat —31— into which the valve face —33— is adapted to fit.

—34— is a projection or shoulder upon the top of the valve; —35— the shaft of an adjusting cam; —36— the cam; —37— a lock nut upon the shaft —35— for securing the cam in proper position; —38— a drain or drip cock in the cap —18^b.

The construction and operation of the device are as follows:—

20 The hydrocarbon entering through —29— and past the valve —27— flows into the float chamber —1—, dependent upon the position of the float —23—, in the well known manner. It thereupon passes through the 25 holes —28— and is absorbed and carried up by capillary action through the wick —15— which rests as has already been stated; upon the mesh —20— of the tube —19—. The mesh is adjusted at a point about opposite 30 the center of the holes —28—, so that if water should enter the float chamber it will drop to the bottom of the tube —14— and may then be withdrawn through the drip cock —38— with any other impurities that 35 may have collected. The hydrocarbon, however, passes up, as has already been described, through the wick —15—. The valve —32—33— being normally raised off its seat by the spring —30—, the normal 40 supply of air coming in through the holes —11— is free to pass over the top of the tube and wick, where it picks up the vapor from the hydrocarbon at the top of the wick. In the same way auxiliary air may 45 enter through the valve —8— as the demand requires.

In adjusting the carbureter to any particular engine or to meet particular conditions, the play of the valve —33— is regulated by turning the shaft —35— so that 50 the cam —36— limits the vertical motion of the valve —33— to the degree necessary to give the best results. In the case of a small engine the adjustment of the valve 55 would allow a comparatively small air passage over the tube and wick, whereas in a larger engine the same carbureter, by the adjustment of the cam —36—, would permit a larger opening of the valve to give the 60 necessary increased supply of mixed vapor.

Should for any reason a back firing occur, the explosion will at once close the valve —33— upon its seat —31— thus shutting off the supply of vapor and sealing the tube 65 from the entry of flame.

It is evident that the wick —15— may be very readily removed for renewal or cleaning, and after the carbureter is once adjusted for the particular car, it will be unnecessary to make material changes, since 70 there is no fine orifice which is easily clogged, or needle valve which requires delicate manipulation. Any change that may be necessary can be readily accomplished by the rotation of the cam —36— and adjustment of air valve —8—. Irrespective 75 of the amount of hydrocarbon in the float chamber, the wick carries off a constant quantity by capillary action for vaporization under the valve, so that if for any 80 reason an excess of hydrocarbon is taken into the receptacle, this can do no harm and cannot possibly flood the cylinder. When the receptacle becomes filled, if it should, the float necessarily closes off the supply 85 valve until the level is reduced by the absorption through the wick, when the function is repeated. Further advantages are that the hydrocarbon is finely divided and readily mixes with the air, and water is not 90 carried up through the wick, thus preventing the efficient operation of the device, but accumulates on the bottom of the receptacle and may be drawn out with other impurities. 95

It will be understood that we do not limit ourselves to any particular form, proportion or construction of parts, or the material therefor, nor do we limit ourselves to the exact arrangement set out in the specification and drawings, since in many ways these 10 may be somewhat departed from without departing from the spirit of our invention.

It will further be understood that where we have used the word "wick" we do not 10 mean by that any particular substance or shape, but we include any absorbent means or device having capillary action or by which hydrocarbon may be transferred from one point to another by molecular action or 11 attraction; but where we have spoken of the wick being wholly exposed in the tube, we mean that it is not covered up or inclosed from the air, it being understood that we do not regard the wires or ring —21— as being 1 a cover or inclosure of the wick.

What we do claim as new herein and desire to protect by Letters Patent, is:

1. In a carbureter, the combination of a hydrocarbon reservoir having transparent 1 walls; a reservoir cap and bottom; a central tube wholly open at its top and provided with a flange adapted to bear upon the cap of the reservoir and provided at its lower end with a thread and with an aperture communicating with the interior of the reservoir; a nut adapted to screw upon said thread and force the cap and bottom against the top and bottom of the reservoir walls; a tubular air chamber superimposed upon and 1

screwed into said cap; an auxiliary air valve in said air chamber; a wick in the central tube wholly exposed at the upper end and the lower part of which extends to a point
 5 below the normal hydrocarbon level in the reservoir; a valve adapted to cover the end of the tube situated in the air chamber; means for keeping the valve normally off from its seat; and means for adjusting the
 10 valve.

2. A carbureter comprising a hydro-carbon reservoir; means for controlling admission of hydro-carbon thereto; an air chamber having air inlets, superimposed upon the
 15 reservoir; a tube wholly open at its top; intermediate the hydro-carbon reservoir and air chamber; a wick therein, the lower end of which is adapted to be immersed in the hydro-carbon in the reservoir, and the upper
 20 end being exposed to the air in said air chamber; and a valve for regulating the passage of air over the top of said wick, substantially as herein described.

3. A carbureter comprising a hydrocarbon reservoir; means for controlling the admission of hydrocarbon thereto; an air chamber having air inlets superimposed upon the reservoir; a central tube wholly open at its top communicating at its lower end with the
 25 reservoir and at the other end with the air chamber; a wick therein, the lower end of which is adapted to be immersed in the hydrocarbon in the reservoir, and the upper end being exposed to the air in said air
 30 chamber; a valve adapted to cover the upper end of said tube; means for keeping the valve off its seat; and means for adjusting the valve, substantially as described.

4. A carbureter comprising a hydro-carbon reservoir; an air chamber superimposed upon the reservoir; a tube wholly open at its top, intermediate the reservoir and the air
 40 chamber; air inlets in the air chamber substantially opposite the top of said tube; a wick in said tube, the lower end of which is adapted to be immersed in the hydro-carbon in the reservoir, and the upper end being exposed to the air in said air chamber; a valve
 45 adapted to close the upper end of said tube; and means for adjusting the valve.

5. A carbureter comprising a hydro-carbon reservoir; an air chamber superimposed on the reservoir and provided with air inlets; a tube wholly open at the top connecting the reservoir and air chamber; a wick
 55 in said tube adapted to contact with the hydro-carbon in the reservoir, its upper end being wholly exposed in the tube; and a valve seating on the top of the tube and adapted to regulate the passage of air over
 60 the top of the wick, substantially as herein described.

6. In a carbureter, the combination of a tube wholly open at its top; a wick therein, adapted to contact with and transfer hydro-
 65 carbon; a valve adapted to cover the upper end of the tube; and means for adjusting the same.

7. A carbureter comprising a hydrocarbon reservoir and supply inlet; a float controlled
 70 valve for regulating the supply; an air chamber superimposed on the reservoir and provided with air inlets; a regulatable auxiliary air inlet; a tube wholly open at the top connecting the reservoir and air chamber;
 75 a wick in said tube adapted to contact with the hydrocarbon in the reservoir and its upper end being wholly exposed in the tube; and a valve in the air chamber adapted to regulate the passage of air over the top of
 80 the wick.

8. In a carbureter, the combination of a hydrocarbon reservoir; a removable cap and bottom for said reservoir; a tube wholly open at its top and having an aperture communicating with the interior of the reservoir;
 85 an air chamber superimposed upon the reservoir cap; a wick in the tube wholly exposed at the upper end, and its lower end being adapted to contact with the hydro-carbon in the reservoir; a valve adapted to cover the end of the tube in the air chamber;
 90 means for keeping the valve normally off from its seat on the tube, and means for adjusting the position of the valve relative to its seat, substantially as herein described.

9. In a carbureter, the combination of a hydrocarbon reservoir; an air chamber superimposed thereon; a tube wholly open at its top, connecting the reservoir and the air
 100 chamber; capillary means in said tube; a valve adapted to cover the top of the tube, and provided with passages through which air can pass over the top of the wick, and means for adjusting the position of the valve
 105 relative to its seat, substantially as herein described.

10. In a carbureter, the combination of a hydrocarbon supply; an air chamber; a tube wholly open at its top connecting with and intermediate the hydrocarbon supply and the air chamber; capillary means in said tube adapted to transfer the hydrocarbon,
 110 one end of said capillary means being exposed to the hydrocarbon and the other end being exposed to the air in the air chamber; and a valve adapted to regulate the passage of air over the end of said capillary means, substantially as described.

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Witnesses:

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