C. M. CONKLIN.

CARBURETER.

APPLICATION FILED OCT. 25, 1911.

1,069,389.

Patented Aug. 5, 1913.

3 SHEETS—SHEET 1.

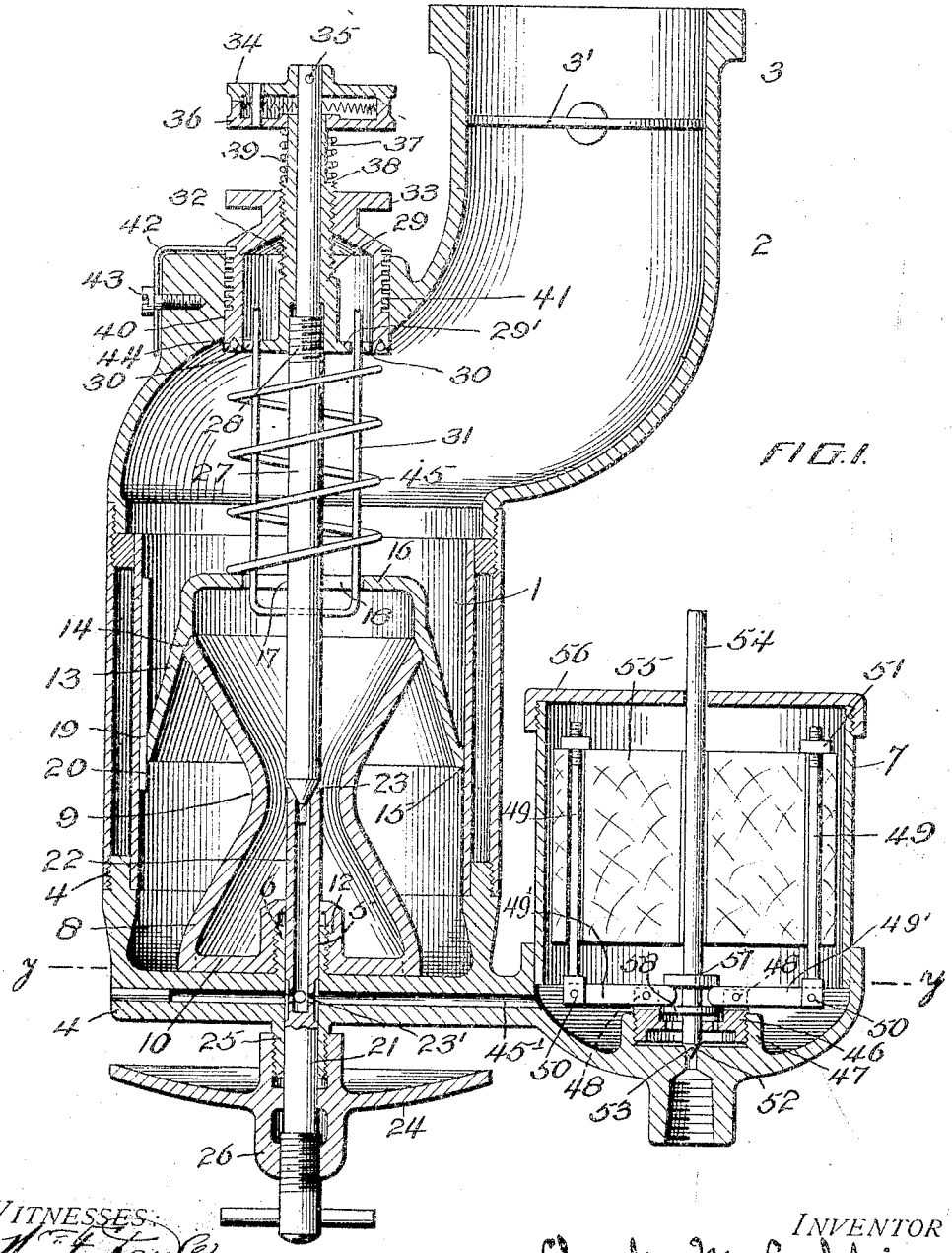

FIG. 1.

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3 SHEETS—SHEET 2.

FIG. 3.

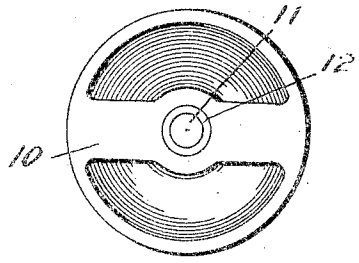


FIG. 2.

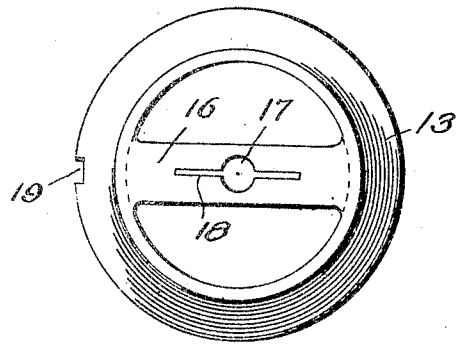


FIG. 6.

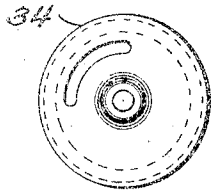


FIG. 5.

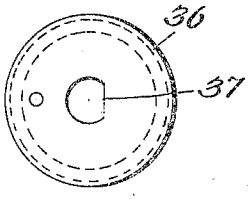


FIG. 4.

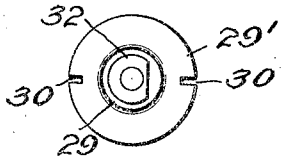
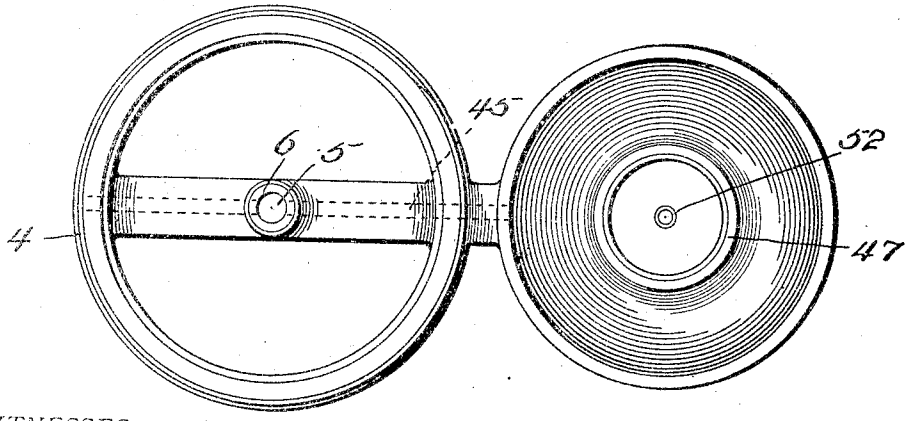


FIG. 7.



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3 SHEETS—SHEET 3.

FIG. 8.

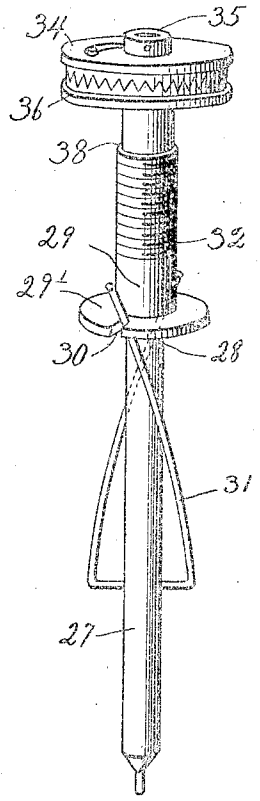
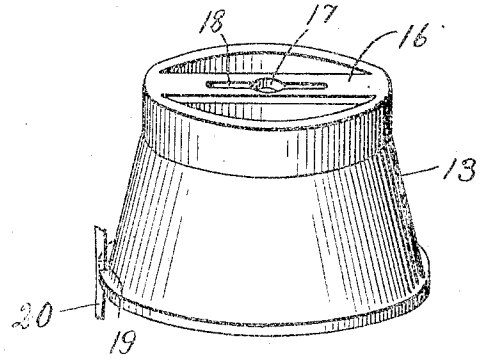


FIG. 9.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,069,389. Specification of Letters Patent. Patented Aug. 5, 1913.

Application filed October 25, 1911. Serial No. 656,648.

To all whom it may concern:

Be it known that I, CHARLES M. CONKLIN, citizen of the United States, residing at Middletown, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Carbureters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in certain new and useful improvements in carbureters designed for use more especially in explosion engines, and involves certain mechanism and parts whereby speed adjustments may be readily effected and a proper amount of fuel provided for the engine.

In order that my invention may be clearly understood, I have illustrated it in the accompanying drawings and described it in the following specification, the special features being more particularly pointed out in the claims.

In the drawings, Figure 1 represents a sectional view of my invention. Fig. 2 is a plan view of my auxiliary valve. Fig. 3 is a similar view of the bottom of the inner shell. Fig. 4 is a top view of the sleeve flange. Fig. 5 is a bottom view of a hand wheel mounted on the sleeve. Fig. 6 is a top view of a hand wheel mounted on the valve stem. Fig. 7 is a plan view taken on *y—y* of Fig. 1. Fig. 8 represents the valve stem, sleeve and disks after adjustment for high speed. Fig. 9 is a perspective view of the auxiliary air valve and spline which prevents its rotation.

Similar numerals indicate identical parts throughout.

1 represents the main body of the carbureter, provided with the extension 2 in which is located the throttle 3. The main body is open at the bottom and is provided with a bridge 4, which extends beyond the said main body and serves as a support for the fuel chamber 7. The bridge 4 is provided with a central opening 5, and hollow screw threaded boss 6. The main body is preferably provided with double walls to form a water jacket.

Located within the main body 1 is a Venturi tube 8, the sides of which approach each other at their central portions forming a throat 9. The top and bottom of the tube 8 are open, and a bridge piece 10 is provided across the latter, having a central opening 11, and screw threaded boss 12 adapted to be screwed to the boss 6. The upper edge of the tube 8 is machined to form a bearing for an auxiliary valve 13, as at 14. The auxiliary valve 13 is substantially in the shape of a hollow frustum and its lower edge is made to form a sliding bearing against the main body as at 15. A central opening is provided in the top of the valve, having a bridge 16 provided with an opening 17 and slot 18. The lower edge of the valve is also provided with a notch 19 adapted to engage a spline 20 secured to the main body, to prevent the valve from rotating, but to allow for longitudinal movement.

21 is a rod hollowed out at a portion of its length to form a tube 22 provided with a valve seat 23 and with openings 23′ at its lower end. The rod 21 passes through the bosses 6 and 12 by which it is centered, and is adjustably secured in place by means of the combined cap and drip pan 24 secured to the downwardly extending boss 25 of the bridge 4. The lower end of the rod is screw threaded and mounted in a screw threaded aperture 26, in the cap 24. It is obvious that by this construction the tube 22 may be raised or lowered.

27 represents the stem of a needle valve adapted to operate in the valve seat 23 of the tube 22. This stem is screw threaded at a portion of its length as at 28, the said stem being slightly reduced in diameter from that point to its upper extremity. Surrounding the stem 27, at a portion of its length is a sleeve 29 threaded at its lower end to engage the screw threaded portion 28 of the stem 27, and provided with an outwardly extending flange 29′ having slots 30 on opposite sides to receive the upper ends of the yoke or guide 31. The sleeve is exteriorly screw threaded at a portion of its length as at 32, and is adapted to be engaged by a similarly threaded portion of an adjusting plug 33, the pitch of the threads on the sleeve 29 and stem 27 being the same.

34 represents a wheel secured to the stem 27, by a pin 35 and having its lower face corrugated. Mounted on the sleeve 29 is a similar wheel 36, having its upper face corrugated, the corrugations of the two wheels

being adapted to fit into each other, the said wheel 36 being kept from rotating on the sleeve, by means of a flat face 37, which at the same time permits of longitudinal movement. Between the wheel 36, and a shoulder 38, provided on the sleeve, is interposed a coil spring 39 which presses the wheel 36 upward into engagement with the wheel 34, thus locking the two wheels together and maintaining the torsion on the yoke or guide 31.

The adjusting plug 33 is machined to a sliding fit in a thickened portion of the main body 40 and the periphery of the plug is provided with a series of grooves 41, adapted to be engaged by a locking dog 42. The locking dog 42 is located conveniently on the upper portion of the main body, and is held in position by a screw 43, and is for the purpose of engaging the grooves 41, and preventing longitudinal movement of the plug, but at the same time permitting circular adjustment, for the purpose of effecting longitudinal adjustment of the valve stem 27.

On the lower face of the plug 33 is a circular groove 44 to receive the upper end of a compression spring 45, the lower end of which rests against the auxiliary valve 13, and tends to force it to its seat.

31 is a yoke or guide approximately U-shaped and consists preferably of steel wire or other material which will yield to torsional strain, and is adapted to engage the stem 27 by means of an opening therethrough. The free ends of the yoke pass upward through slots 30 in the flange of the sleeve, the yoke being adapted to act as an adjustable guide or cam as will appear hereafter.

7 represents my preferred form of fuel chamber, from which the fuel feeds through a tubular opening 45′ in the bridge 4 to the short tube 22 into which it enters through the openings 23′. The chamber is provided with a float valve by which the fuel is maintained at a proper level.

46 is a screw plug secured in a screw threaded boss 47 formed in the bottom of the chamber. A space is provided between the under face of the plug and the bottom of the opening which receives it, to allow for wear on the needle valve, it being obvious that by this construction the needle valve may, if it becomes necessary, be filed to properly engage its seat and the plug screwed down into the opening a sufficient distance to maintain the proper relation of the parts.

Mounted on the plug 46 in suitable bearings on pivots 48, are levers 49′ pivotally connected at 50 with rods 49 which pass freely through the float 55 to which they are adjustably secured by nuts 51. The adjustment here referred to is for the purpose of regulating the level of the liquid fuel in the chamber 7. This can be accomplished by removing the top 56 of the chamber and turning the nuts 51 to effect such change in position of the float as will secure the result desired. A valve seat 52 is provided in the bottom of the chamber in which the needle valve 53 is adapted to operate, said valve having a stem 54 which passes freely through the float member 55 and the top 56. Secured to the valve stem 54 are two collars 57 and 58 into the space between which project the ends of the levers 49′. It is obvious that when the level of the fuel in the chamber falls, the float will fall, thereby raising the ends of the horizontal arms of the levers 49′, and opening the valve 53, permitting an inflow of fuel to the chamber until the float rises sufficiently to close the valve.

The operation of the device is as follows: Partially opening the throttle valve 3′ in the portion 3 of the main body and starting the engine creates a partial vacuum, in the body 1 of the carbureter, causing air to be drawn into the inner shell and upward through the contracted or neck portion 9 and past the valve where the fuel is sprayed, causing a mixture of fuel and air which finally passes through the openings around the bridge 16 to the engine. Slow speed adjustment is obtained by turning the plug 33 thus raising or lowering the valve stem 27 by means of the screw 32 which increases or decreases the opening at the valve seat for the flow of fuel to afford the proper mixture for slow speed of the engine. It is desirable, however, to arrange for an automatic adjustment of the air and fuel supply for different speeds of the engine, and in order to provide such adjustment, I twist the yoke or guide 31 into what may be termed a helical guide or cam. To effect this adjustment the corrugated wheel 36 is depressed against the tension of the spring 39 which disengages the said wheel from the corrugations of the wheel 34, after which the wheel 36, secured to the sleeve 39, is turned to such an extent as will insure, when the valve 13 is raised, a sufficient opening of the valve 23, to afford the proper supply of fuel for higher speed of the engine, for example, as shown in Fig. 8. In turning the wheel 36, it will be noted that the yoke 31 has been twisted into the form of a helix, which acts as a guide or cam, as will be seen hereafter, the two wheels 34 and 36 being again locked together after the above adjustment has been made.

Assuming that the parts are as above described, with the valve 13 at its lowest position for slow speed, to effect a high speed adjustment the throttle is opened wide, and this causes the engine to increase in speed, creating a greater vacuum in the body 1

and a greater inflow of air through the Venturi tube, at the same time lifting the valve 13 against the pressure of the compression spring 45 causing the valve 13 to leave its seat and permitting air to enter the upper part of the body 1 around the outside of the Venturi tube. It is obvious that as the valve 13, which is held from rotation by the spline 20, rises, the slot 18 in said valve, through which the yoke or guide 31 passes, will twist said guide or cam, and thereby cause the stem 27 by means of the sleeve 29 to rise and increase the opening of the valve 23 to provide a greater fuel supply. When the throttle is turned to reduce the opening in the part 2, the valve 13 is forced to its seat by the compression spring 45 and the valve opening 23 will assume its original slow speed condition.

If preferred the yoke or guide or cam 31 may be given its desired form after the valve 13 has been raised for high speed.

What I claim and desire to secure by Letters Patent is:—.

1. In a carbureter of the class described, the combination with the main casing, of a liquid fuel jet, a constantly open air passage around said jet, said passage having an outwardly expanding discharge end, an additional air passage between the said open air passage and the main casing, and a conoidal valve engaging against the interior of the casing and seating upon the discharge end of the open passage, said valve receiving the entire air and fuel supply and forming a mixing chamber.

2. In a carbureter of the class described, the combination with the main casing, of a liquid fuel jet, a Venturi tube surrounding said jet and forming a constantly open air passage, an additional air passage between the Venturi tube and the casing, a valve having a screw threaded stem for regulating the liquid fuel jet, a sliding valve operable by suction for controlling the additional air passage and receiving within the same the air from said passage, and connections between said sliding valve and the fuel jet valve whereby the opening of the additional air supply will also additionally open the liquid fuel jet.

3. In a carbureter of the class described, the combination with the main casing, of a liquid fuel jet, a Venturi tube surrounding the same, forming a constantly open air passage, an additional air passage between the Venturi tube and the main casing, an automatically operable valve for controlling said additional air passage, a manually operable valve for controlling said liquid jet discharge, and connections whereby the opening of the air valve will additionally open the valve controlling the liquid fuel supply, the said automatically operable valve being of conoidal form and receiving the discharge from both the constantly open air and the additional air passages.

4. In a carbureter of the class described, the combination with a liquid fuel jet, of a constantly open air supply passage around said jet, an additional air passage, a valve for controlling the liquid fuel jet, a sliding valve held from rotation for said additional air passage, a helix connected with the liquid fuel valve and having a sliding engagement with the additional air supply valve, whereby the opening of the additional air valve will additionally open the fuel supply valve.

5. In a carbureter of the class described, the combination with the main casing, of a liquid fuel jet, a sliding air valve adapted to be actuated by suction but held from rotation, a manually operable valve for controlling said fuel jet, guides rigidly connected at one end with said jet valve stem and having a freely sliding engagement with said sliding air valve for causing the said jet valve to be positioned by the form of said guides.

6. In a carbureter of the class described, the combination with the main casing, of the liquid fuel jet, a valve for controlling the same, of guides rigidly connected at one end with said valve stem and extending longitudinally of the same, a sliding air valve adapted to be operated by suction but held from rotation, having a sliding engagement with said guides, and manually operable means for changing the relation of said guide to the valve stem.

7. In a carbureter of the class described, the combination with the casing, of a liquid fuel jet, a valve for controlling the liquid supply, guides having a rigid connection with the stem of said valve at one end and extending lengthwise of said stem, a sliding air valve held from rotating movement adapted to be operated by suction, and having a free sliding engagement with the said guides, a sleeve upon said valve stem movable around the same, said sleeve being provided with an outwardly extending flange having openings therein engaging the free ends of said guides and means for locking said sleeve in a desired relation to said valve stem.

8. In a carbureter of the class described, the combination with a liquid fuel jet, a valve for controlling the same, a means for varying the position of said valve, consisting of a horizontally revoluble plug, means for retaining said plug in different horizontal planes, and connections between the same and the valve stem for moving said valve stem longitudinally by turning the plug.

9. In a carbureter of the class described, the combination with a liquid fuel jet, a valve for controlling the same, a means for

varying the position of said valve, consisting of a revoluble plug, means for retaining said plug in different horizontal planes and a screw threaded connection with the valve stem.

10. In a carbureter of the class described, the combination with a liquid fuel jet, a valve for controlling the same, a means for varying the position of said valve, consisting of a revoluble plug, means for retaining said plug in different horizontal planes, a screw threaded connection with the valve stem and means for varying the position of the valve seat.

In testimony whereof I affix my signature, in the presence of two witnesses.

CHARLES M. CONKLIN.

Witnesses:

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CLINTON NASH.