J. G. WILLIAMS.

CARBURETER.

APPLICATION FILED JUNE 3, 1907.

973,602. Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

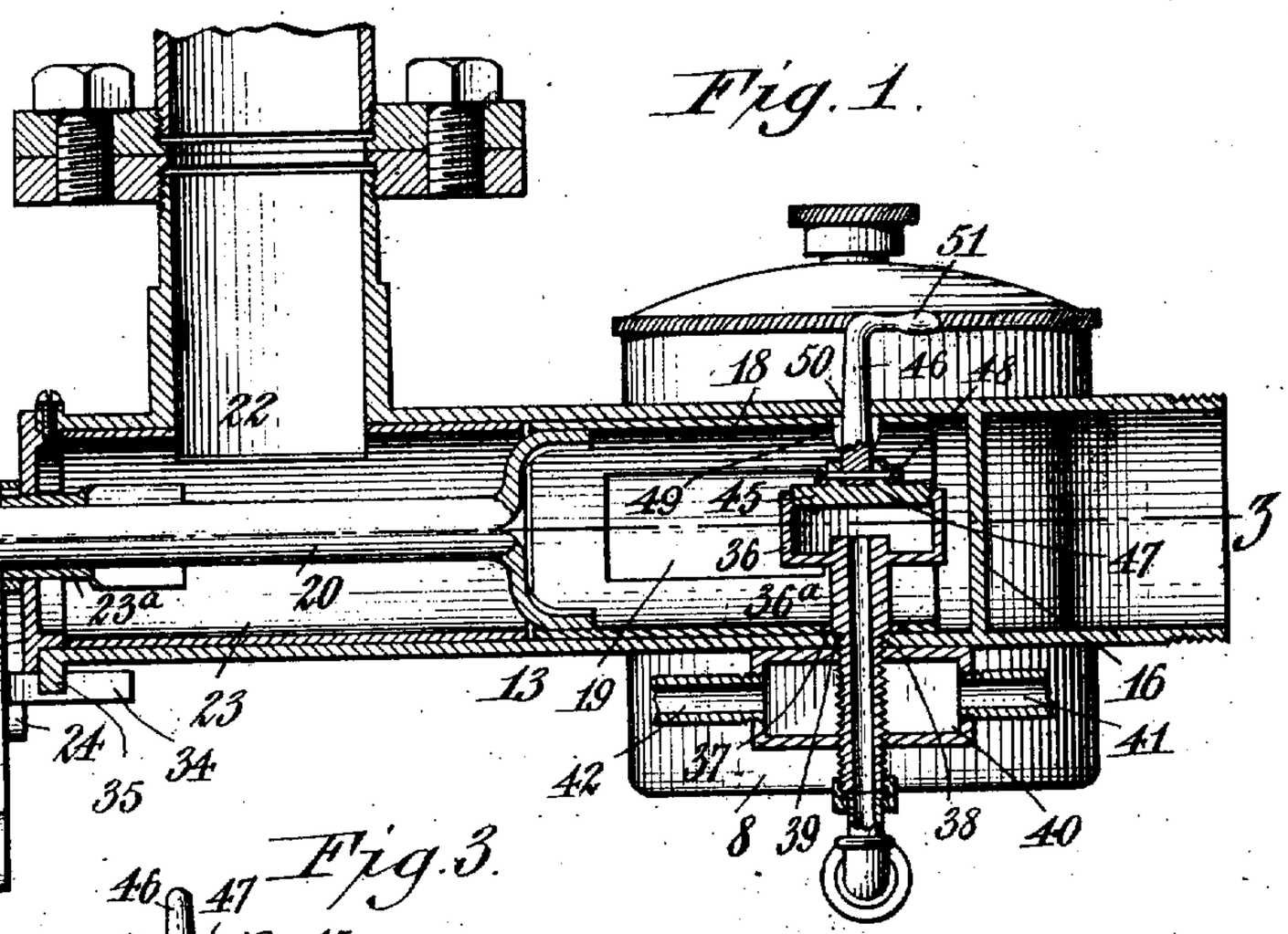

Fig. 3.

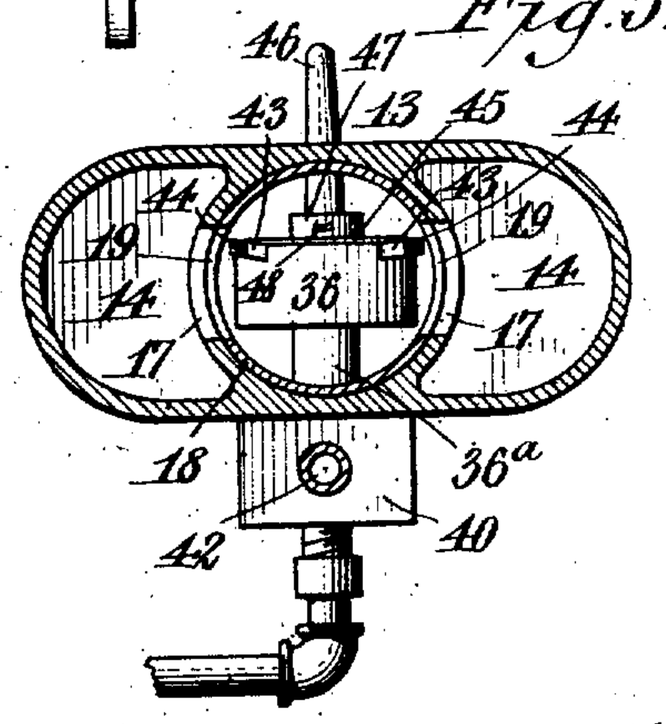

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 4.

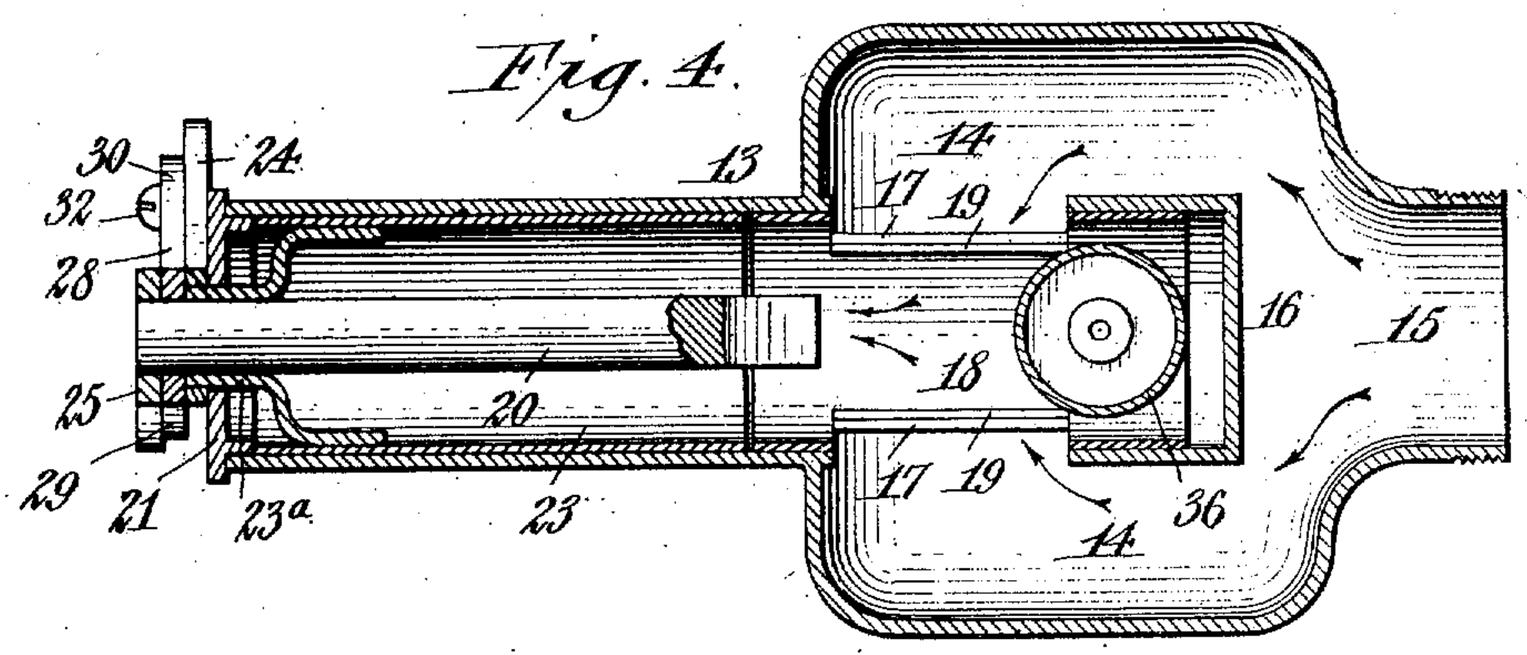


Fig. 5.

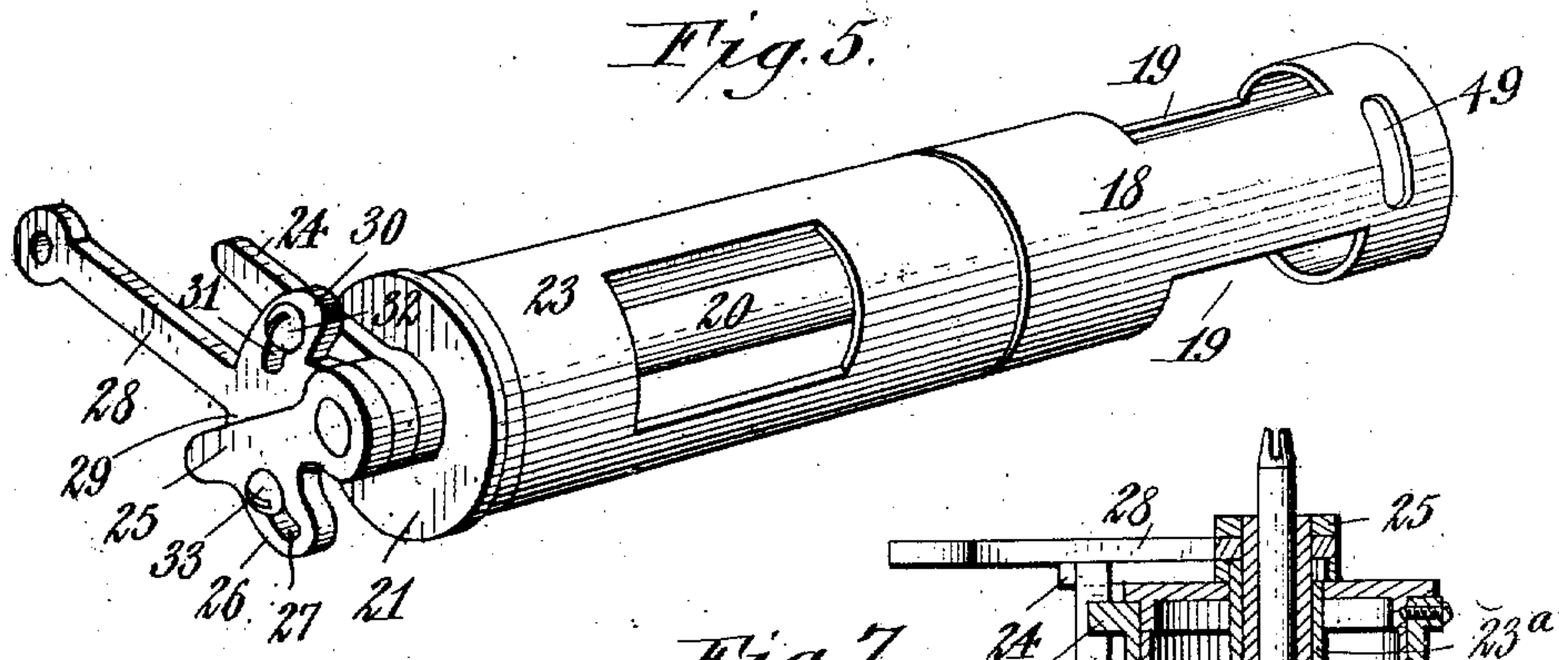


Fig. 7.

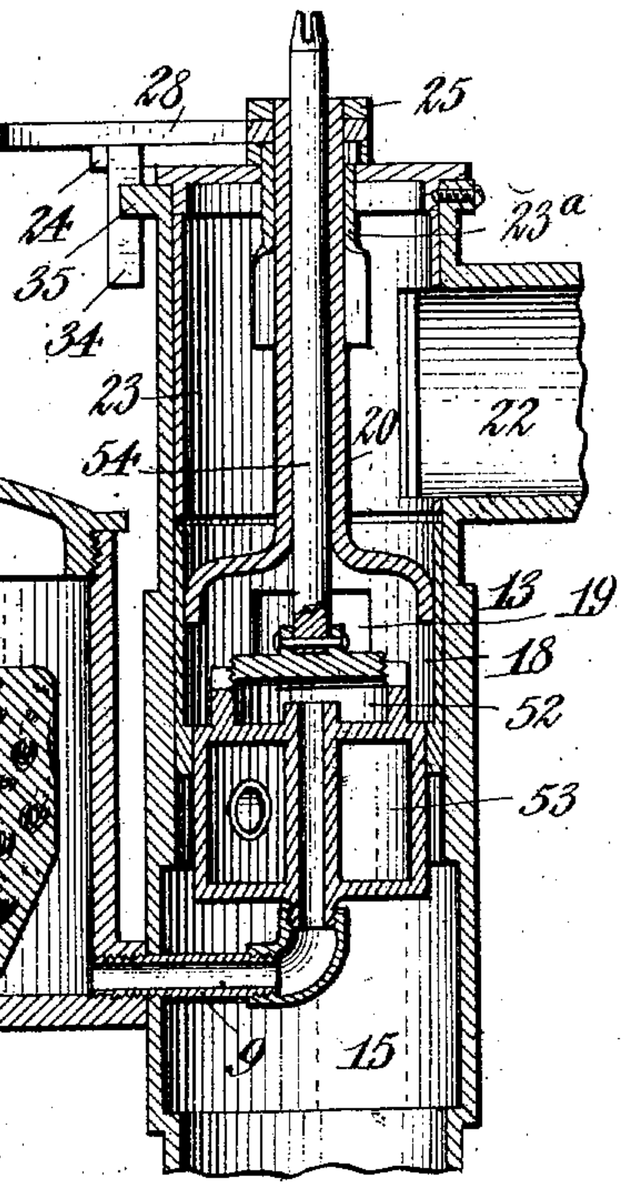
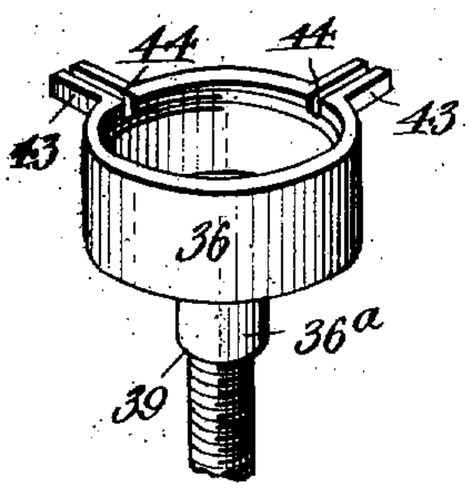


Fig. 6.



Witnesses:
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UNITED STATES PATENT OFFICE.

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CARBURETER.

973,602. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed June 3, 1907. Serial No. 376,943.

To all whom it may concern:

Be it known that I, JOSEPH G. WILLIAMS, a citizen of the United States, and resident of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to carbureters of that general class used in connection with explosive engines.

The object of my invention is the production of a carbureter wherein the gasolene or other liquid-hydro-carbon is heated at the point of vaporizing whereby a much richer gas is obtained; to provide a simple, effective, and inexpensive carbureter whereby the proper mixture of air and gasolene can be acquired and maintained under all conditions of usage, so that the engine may be run at high, intermediate, or low speed without subjecting it to strain or sudden shocks.

The invention consists in the construction arrangement, and combination of parts to be hereinafter described and particularly pointed out in the appended claims.

Referring to the drawings, similar numerals of reference refer to similar parts in the several figures.

Figure 1 is a central longitudinal section through the carbureter proper. Fig. 2 is a plan view of the same and of the gasolene feed-chamber connected therewith. Fig. 3 is a transverse section taken on line *y—y*, Fig. 2. Fig. 4 is a horizontal section taken on line *x—x*, Fig. 1. Fig. 5 is a detached perspective view of the air-inlet valve and the throttle-valve, together with the mechanism for actuating the same. Fig. 6 is a detached perspective view of the gasolene-well with the regulating-cover removed. Fig. 7 is a central vertical section of a carbureter showing my invention embodied therein in modified form.

The numeral 8 designates a gasolene or other fluid hydro-carbon feed-chamber connected with the carbureter proper by a feed-pipe 9. This chamber may be of any common or approved pattern whereby the gasolene is maintained at a constant level in the carbureter-chamber; such for instance as shown in section in Fig. 7, in which the gasolene is supplied to the feed-chamber by a pipe 10 leading to the gasolene supply tank and in which a float 11 is attached to the stem of an inlet-valve 12 to supply the gasolene to the chamber in proportion to its consumption.

13 designates the carbureter casing which, in the main, is cylindrical in cross-section, and at one end is laterally extended on opposite sides to provide air-passages 14 which merge into a single passage 15 through which the air enters to be vaporized. The cylindrical portion of the casing I shall term the "mixing" or "carbureting" chamber, which is closed at one end, as at 16, to compel the air to pass to opposite sides thereof. Said carbureting-chamber has two ports or openings 17 through which the air is drawn, and these ports are adapted to be closed to the extent required for highest efficiency under varying conditions, by a cylindrical air inlet-valve 18 fitting snugly within the chamber and having openings 19 corresponding preferably in size with the ports 17. Said valve has a stem 20 secured thereto which extends axially through the carbureting-chamber and through a cover 21 closing the opposite end of the chamber. Said carbureting-chamber has a mixture-outlet 22 which is adapted for connection with the ignition-chamber of the engine. Said outlet is opened or closed by a cylindrical valve which fits snugly within the chamber, it being equipped with a hollow stem 23^a arranged axially thereon and extending through the cover 21 and having the stem of the inlet-valve passing therethrough and extending beyond the end thereof.

Secured to the hollow stem of the throttle-valve is an adjusting-lever 24 and on the end of the stem of the inlet-valve is an adjusting-lever 25 having a lateral extension 26 provided with a curved slot 27 whose axis is coincident with that of the stem to which it is secured. An operating-lever 28 common to both valves is held loosely on the stem of the inlet-valve between adjusting-levers 24 and 25 and it has opposite lateral extensions 29 and 30, the latter having a curved slot 31 whose axis is coincident with that of the stem of the throttle-valve, and passing through said last-mentioned slot is a screw 32 which takes into a tapped opening in lever 24. Similarly, a screw 33 passes through slot 27 in lever 25 and takes into a tapped opening in the extension 29 of lever 28. Lever 24 serves to actuate and adjust the throttle-valve independent of the inlet-valve, while lever 25 serves to actuate and adjust the inlet-valve independent of

the throttle-valve, and the intermediate or loosely-mounted lever 28 termed the "operating-lever", serves to actuate them in unison when the screws 32 and 33 are tightened to connect the three levers. The operating-lever has an arm 34 projecting therefrom which strikes a stop 35 on the casing of the carbureter and limits the rotary movement of the valves.

Near the closed end of the carbureting-chamber and surrounded by the air-inlet valve is a gasolene well or chamber 36 which is preferably cylindrical and has a depending integral sleeve 36ª which passes through a transverse slot 37 in said inlet-valve and through an opening 38 in the wall of the carbureting-chamber; said sleeve being exteriorly threaded from its outer end to a shoulder 39 formed by reducing the diameter of the sleeve where threaded and said shoulder bears against the inner side of the wall of said carbureting-chamber. Surrounding said sleeve is a heating-chamber 40 having alined holes in opposite walls which are tapped to fit onto the threaded portion of said sleeve, serving at the same time as a means to securely hold the gasolene well in place; it acting similar to a nut to draw the shoulder on said sleeve firmly against the inner face of the carbureting-chamber. Threaded into said heating-chamber is an inlet-pipe 41 through which hot air or hot water is introduced into said chamber from any suitable source, and an outlet-pipe 42 is threaded into said chamber at a point directly opposite said inlet-pipe. The sleeve of the gasolene-well has the gasolene feed-pipe 9 connected therewith, through which the gasolene is fed from the gasolene feed-chamber to the gasolene-well.

The wall of the gasolene-well is provided with diverging lugs 43 extending into the path of the air passing through the inlet-valve, and the upper edge of the gasolene-well is slitted, as at 44, in line with said lugs, said slits being extended through said lugs so that the air is carbureted as it passes over them. The confining well is threaded internally at its upper end to receive the threaded edge of a combined regulator and cover 45 which is adapted to be screwed into the gasolene well to close the inner ends of the slits to the desired extent; thus governing the size of the openings through which the gasolene flows from its retaining well. The gasolene feed-chamber has its float so adjusted that the gasolene well is filled at all times. The air entering through the openings of the inlet-valve passes over the slitted lugs or extensions of the gasolene-well, through the carbureting-chamber, and out the mixture-outlet leading to the ignition-chamber of the engine. In passing over the slitted lugs or extensions of the gasolene-well, the air has an aspirating effect thereon, and as said extensions are so disposed that they lie in close proximity to the ports or openings in the inlet-valve, all the air drawn into the carbureting-chamber is thoroughly vaporized.

The heated air passing through the heating-chamber heats the sleeve of the gasolene-well and the latter, which is made of metal, as is the sleeve thereof, becomes heated to its top edge, thereby heating the gasolene at the point of vaporization. The two currents of air drawn into the carbureting-chamber at opposite sides thereof, meet after having passed over the slitted lugs or extensions of the gasolene-well and are intimately mixed, thus assuring a proper mixture.

The regulator or cover of the gasolene-well is adjusted by a handle 46 having its inner end entering a socket 47 in said cover, in which it is secured by a pin 48, said handle extending through a transverse slot 49 in the inlet-valve and through an opening 50 in the wall of the carbureting-chamber and having a finger-piece 51 at its outer end for conveniently manipulating the same. The slots 37 and 49 in the inlet-valve allow the latter to be rotated and the handle 46 to be manipulated irrespective of the position the inlet-valve may be in.

In the embodiment of my invention above described, the carbureter proper is horizontally disposed, while in Fig. 7, I have embodied my invention in a carbureter which is vertically disposed. In the latter embodiment, the gasolene-well 52 is formed integrally with the heating-chamber 53 and both are situated within the carbureting-chamber. The stem of the inlet-valve is made hollow, and passing through the same is the handle 54 of the gasolene-well cover or regulator; said handle projecting from the casing at the top for conveniently manipulating the same.

When adjusting the carbureter for use, the air-inlet-valve and the throttle-valve are opened wide, the cover or regulator of the gasolene-well is then adjusted for vaporizing of the proper quantity of gasolene to run the engine effectively at high speed; the operating-lever 28 is then moved to bring the arm 34 thereof against the stop 35 on the casing, by which action both valves are rotated so as to almost entirely close the ports 17 and the mixture-outlet: the screws 32 and 33 are next loosened t permit the adjusting-lever 24 to be moved independent of the levers 25 and 28 which permits independent adjustment of the throttle-valve for the desired low speed; the adjusting-lever 25 is next moved to permit independent adjustment of the air inlet-valve for proper mixture at low speed. After these adjustments are effected, the screws 32 and 33 of the levers 24, 25, and 28

are tightened, and the carbureter controlled by actuation of the operating-lever. The carbureter is thus adjusted for use, and when in use, it is controlled for all speeds by simple actuation of the operating-lever.

Having thus described my invention, what I claim is,—

1. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber having an air-inlet, a mixture-outlet, and connection with said feed-chamber, a cylindrical inlet-valve having an axial stem and an opening and serving to govern the size of said air-inlet, a cylindrical throttle-valve having an opening and a hollow stem through which the stem of the inlet-valve passes and being adapted to govern the size of the mixture-outlet, a lever affixed to the stem of the throttle-valve, a lever affixed to the stem of the inlet-valve, a lever loosely held on said last-mentioned stem, means for connecting said levers so that all may be actuated together, and means for carbureting the air passing through the carbureting-chamber.

2. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber having an air-inlet, a mixture-outlet, and connection with said feed-chamber, an inlet-valve for said air-inlet provided with a stem, a throttle-valve for said mixture-outlet provided with a hollow stem through which the stem of the inlet-valve passes, a lever secured to the stem of the throttle-valve, a lever loosely mounted on the stem of the inlet-valve and having a slot therein, a screw passing through said slot and threaded into the lever on the stem of the throttle-valve, a lever secured to the stem of the inlet-valve and having a slot, a screw passing through the latter and threaded into said loosely-mounted lever, and means for carbureting the air passing through the carbureting-chamber.

3. In a carbureter, the combination with a gasolene feed-chamber, of a carbureting-chamber having a valve-controlled air-inlet and a valve-controlled mixture-outlet, a gasolene well within the carbureting-chamber having gasolene escape-openings and a depending sleeve provided with a reduced threaded portion extending through the wall of the carbureting-chamber, and a heating-chamber having alined threaded openings to receive the reduced threaded portion of said sleeve, said heating-chamber serving to heat the gasolene passing through said sleeve and to securely hold the gasolene-well in proper position.

4. In a carbureter, the combination with a gasolene feed-chamber having a valve-controlled air-inlet and a valve-controlled mixture-outlet, a cylindrical gasolene-well within said carbureting-chamber having outstanding lugs and slits formed in the upper edge of the cylindrical wall of said gasolene well and extending to the outer ends of said lugs, and means for closing the inner ends of said slits to the extent desired.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

JOSEPH G. WILLIAMS.

Witnesses:
EMIL NEUHART,
ELLA C. PLUECKHAHN.