E. J. PROEHL.

CARBURETER.

APPLICATION FILED SEPT. 28, 1910.

979,700. Patented Dec. 27, 1910.

2 SHEETS—SHEET 1.

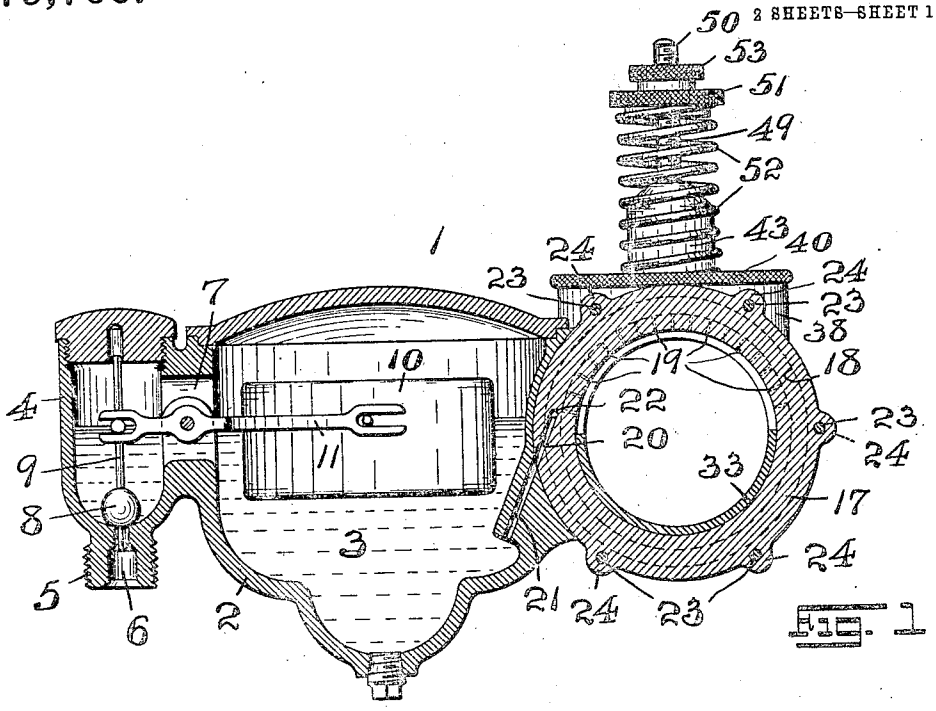
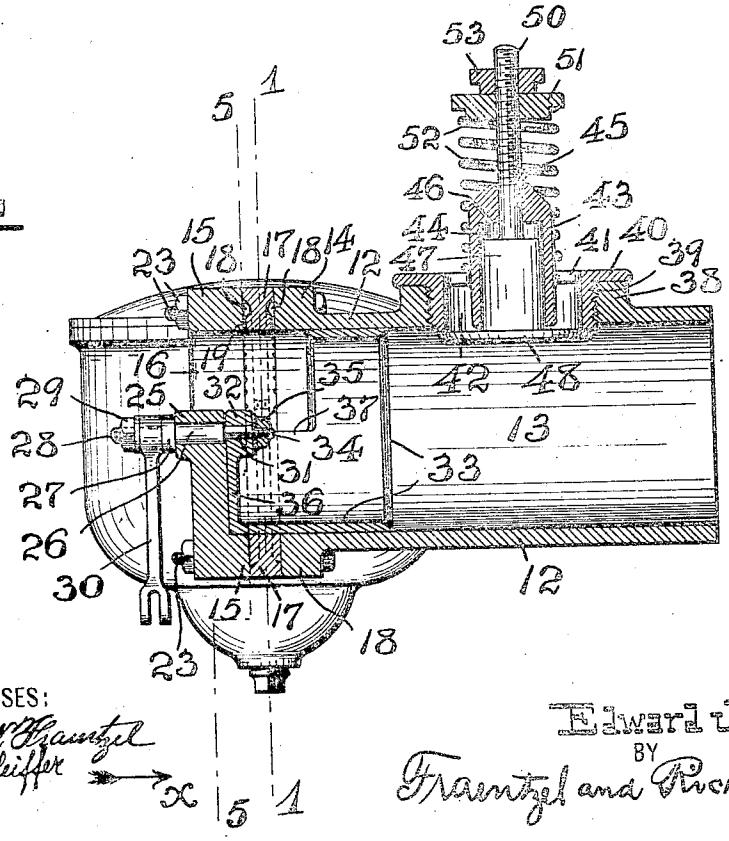


Fig. 1

Fig. 2



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2 SHEETS—SHEET 2.

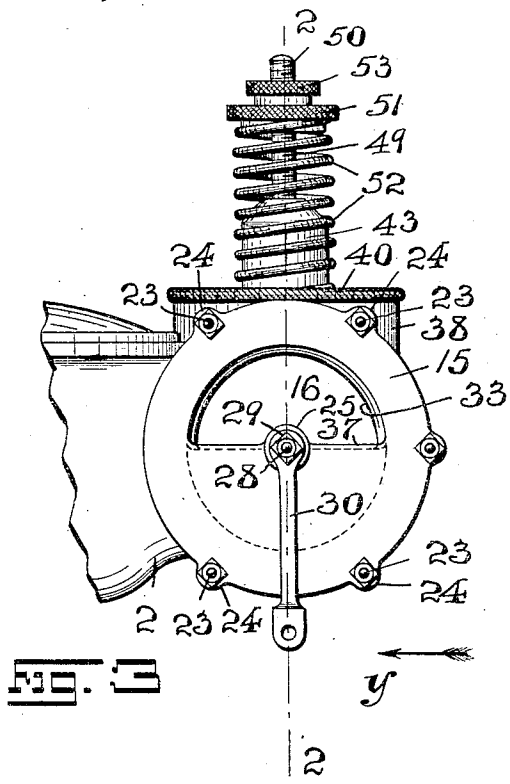

Fig. 3

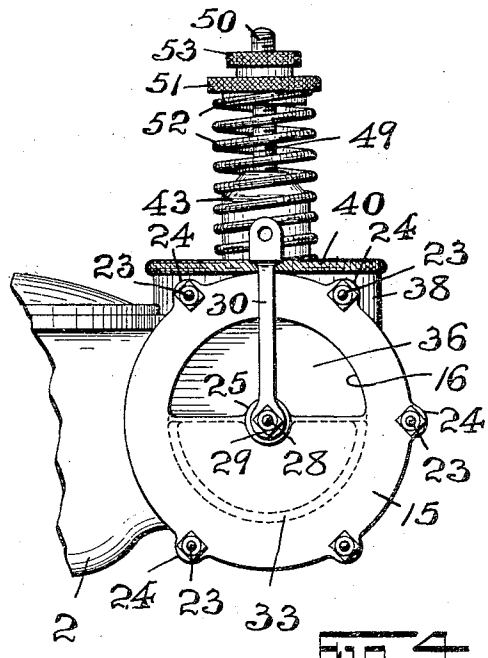

Fig. 4

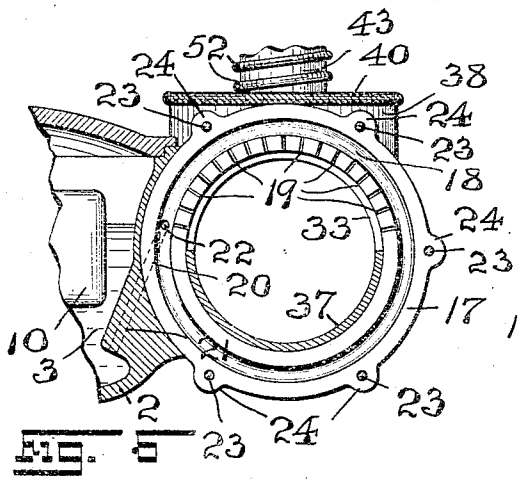

Fig. 5

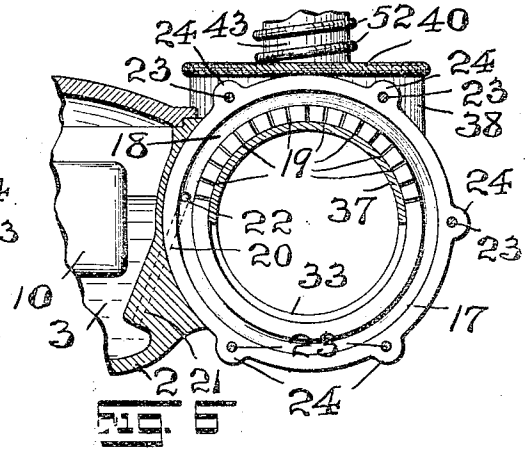

Fig. 6

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CARBURETER.

979,700. Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed September 28, 1910. Serial No. 584,182.

To all whom it may concern:

Be it known that I, EDWARD J. PROEHL, a citizen of the United States, residing at New York, in the county of New York and State of New York, 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, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in carbureters for internal combustion engines; and, the present invention has for its principal object to provide a novel and simply constructed apparatus or device in which a perfect admixture of the gasolene with air is obtained to produce the explosive gas which is to be passed into the cylinders of the internal combustion engine.

The invention has for its further object to provide a means for efficiently atomizing the gasolene so that the same may be quickly and thoroughly mixed with the inrushing air taken into the mixing chamber of the carbureter.

A further object of the present invention is to provide a novel throttle means, whereby the air and gasolene may be simultaneously controlled as they flow into the mixing chamber of the carbureter, so that the supply of air and gasolene to be mixed together may be increased or decreased, at will, by a single movement of a throttle-lever.

A further purpose of the invention is to eliminate in carbureter constructions complicated gasolene feed-mechanism, the parts of which usually are numerous and complicated, so that they are apt to get out of order; and, to substitute therefor an efficient means for feeding the gasolene into the mixing chamber of the carbureter, the parts of which are reduced to the greatest simplicity in construction, to produce not only an efficient gasolene feed, but also a gasolene feed of much higher efficiency than that of the old styles of gasolene feed-mechanism.

Other objects of this invention not at this time more particularly enumerated, will be clearly evident from the following detailed description of the same.

With the various objects of the present invention in view, the said invention consists, primarily, in the novel carbureter for internal combustion engines hereinafter set forth; and, furthermore, this invention consists in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, all of which will be presently more fully described, and then finally embodied in the clauses of the claim which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse vertical section of a carbureter, embodying the principles of the present invention, said section being taken on line 1—1 in Fig. 2, looking in the direction of the arrow *x;* Fig. 2 is a vertical section taken on line 2—2 in said Fig. 3, looking in the direction of the arrow *y;* Fig. 3 is a detail view of the air-inlet end of the mixing chamber of said carbureter, the same being shown with the throttle-lever so adjusted that the throttle opens the passage or inlet for the entrance of air into said mixing chamber; Fig. 4 is a view similar to that shown in Fig. 3, except that here the throttle is adjusted so as to close the air-inlet leading to the mixing chamber; Fig. 5 is a detail vertical section taken on line 5—5 in said Fig. 2, looking in the direction of the arrow *x*, with certain parts of the mechanism omitted, the same illustrating the throttle-member in its opened position, which permits an influx of gasolene into the mixing chamber as the air passes thereinto; and, Fig. 6 is a view similar to that shown in Fig. 5, with the exception that the throttle-member is shown in its closed relation, thus closing the gasolene feed-mechanism simultaneously with the closing of the air-inlet of said mixing chamber.

Similar characters of reference are employed in all of the herein-above described views to indicate corresponding parts.

Referring now to the said drawings, the reference-character 1 indicates the complete form of carbureter made according to and embodying the principles of the present invention, the same comprising a shell-like body 2 providing a gasolene receiving chamber or reservoir 3. Said shell-like body is formed with a suitable casing, as 4, adapted

to contain an inlet-valve, said casing having an inlet end 5 provided with the gasolene-passage 6. A port or passage 7 in the wall of said shell-like body 2 connects the interior of said casing 4 with the interior of said reservoir 3. Arranged within said casing 4 is a valve-member, comprising a ball or other suitably shaped valve 8 mounted upon a valve-stem 9, which serves, when operated, to open and close the gasolene-passage 6 of said valve-casing. The said valve-member 8 is automatically operated by the rise and fall of a float 10, which is arranged within said reservoir 3, said float 10 communicating its movement by means of a suitable lever-connection 11 to said valve-stem 9, in the manner to be clearly understood from an inspection of Fig. 1 of the drawings. Connected with said shell-like body 2, and preferably integrally formed therewith, is a cylindrical body or member 12, the same providing a suitable mixing chamber 13. The forward end of the said cylindrical body or member 12 is provided with an annular flange 14.

The reference-character 15 indicates a face-plate which is provided in its upper half with a semi-circular opening 16, which forms an air-inlet leading to said mixing-chamber 13. Arranged between the said flange 14 of said cylindrical body or member 12 and said face-plate 15 are one or more atomizer-rings 17, the same being provided upon their side-faces with circular grooves or channels 18, suitably disposed in the upper portion or half of the said atomizer ring or rings. Extending from said circular grooves 18 to the inner edges of the said atomizer-ring are a plurality of radially disposed grooves or ducts 19 which are of very small cross-sectional area, and thereby tend to thoroughly break up into small particles the gasolene fed from said semi-circular groove 18 when the same flows through said grooves or ducts 19, and is delivered all around the interior edges of said atomizer ring 17, so that the said gasolene may be quickly and easily taken up and intermixed with the air as it rushes through said inlet 16 into the mixing chamber 13. Said atomizer ring 17 is further provided with a gasolene passage 20 which registers with similar gasolene passage 21 extending through the wall of said shell-like body 2, whereby the gasolene contained in the reservoir 3 may be delivered to said semi-circular grooves 18, through the said passages 20 and 21, and the said transverse passage 22. The said face-plate 15 and atomizer ring 17 are joined or connected with said annular flange 14 by means of suitably disposed bolts and nuts 23, passing through the ears or lugs 24 which are connected with said respective members. The said face-plate 15 is further provided with a centrally disposed perforated hub-portion 25 in which is mounted, rotatably, a spindle 26, said spindle being formed with a shoulder 27. The outer end of said spindle is formed with a screw-threaded shank 28, upon which is secured, by means of the nut and washer 29, a lever or arm 30 adapted to rotate said spindle. The inner end of said spindle 26 is provided with a squared shank 31 upon which is mounted the hub 32 of a throttle-member 33, so that said throttle-member will rotate upon the turning of said spindle 26. Connected with said squared shank 31 is a smaller screw-threaded shank 34 adapted to receive the nut and washer 35 which retains the throttle-member 33 in its operative connection with said spindle 26. Said throttle-member 33 is cylindrical in form and fits snugly within the opening of said cylindrical body or portion 12, so as to turn therein. Said throttle-member 33 is further provided at one end with a semi-circular wall 36, which, when the throttle-member 33 is properly manipulated, tends to close the air-inlet 16 against the passage of air into the mixing chamber 13. Said throttle-member 33 is further provided in coincident position and relation to said wall-member 36 with a semi-cylindrical portion 37, which operating simultaneously with said wall-member 36, upon a proper manipulation of said throttle-member 33, tends to close against the passage of gasolene the said grooves or ducts 19, when the said air-inlet 16 is closed. It will also be apparent that any partial closing of the air-inlet 16 by said throttle-member 33 and its part just described, tends to simultaneously close an equal portion of the gasolene feeding grooves or ducts 19 of said atomizer ring 17. Said cylindrical body-portion 12 is further provided with a boss 38, in turn provided with a screw-threaded opening 39, and arranged in said screw-threaded opening 39 is an auxiliary air-supply valve, said valve comprising a housing 40 provided with air-ports 41 leading into an air-passage 42, and a centrally disposed dash-pot 43. Said dash-pot 43 is provided with a cylindrical chamber 44 and a smaller valve-stem opening 45, and in its wall is an air-vent 46. Arranged in the cylindrical chamber 44 of said dash-pot 42 is a piston 47 provided at its lower end-portion with a valve-disk 48 adapted to normally close the air-passage 42 of said housing 40. The upper end of said piston 47 is provided with a valve-stem 49 which passes through the opening 45 in said dash-pot 43, said stem being formed upon its upper end with screw-threads 50. Arranged upon the screw-threaded portion of said valve-stem is an adjusting nut 51 for adjusting the tension of a coiled spring 52 arranged between the same and the housing 40. A lock-nut 53 is also arranged upon said screw-threaded

valve-stem so as to lock said adjusting nut in its adjusted position.

The operation of the various devices hereinabove described when the said carbureter is carrying out its function of causing the proper admixture of air and gasolene to provide an explosive gas is as follows:—The gasolene from the reservoir 3, being always maintained at a proper level by the operation of said float 10 and said inlet-valve controlled thereby, passes or rises through the passage 21 and passages 20 and 22 into the circular grooves 18 of said atomizer ring 17. The suction caused by the pistons of the internal combustion engine operating in the mixing chamber 13 sucks the gasolene into said grooves 18, and through the small radially disposed grooves or ducts 19, so that the same is carried into and intermixes with the air passing through the inlet 16. To decrease the amount of gas formed by the admixture of gasolene with air, the throttle-member 33 may be operated to close, to the desired degree, the air-inlet 16 and simultaneously shut off the communication with the mixing chamber 13 of a proportionate number of the said radially disposed grooves or ducts 19. In this manner, the strength and quantity of the mixture of air and gasolene may be readily controlled by the single operation of said throttle-member 33, as will be clearly understood. It will thus be seen, that not only is the mechanism I have devised very simple in its construction, but it does in fact eliminate the need or use of a larger number of movable parts which tend to get out of order; and, furthermore, the operation of the device is reduced to the greatest degree of simplicity, and the control of the gas, as it is delivered to the cylinders of the internal combustion engine, is consequently obtained with ease.

Referring now more particularly to the auxiliary air-valve, the operation of the same, briefly, is as follows: At high speed the suction created by the operation of the pistons in the cylinders of the internal combustion engine pulls open the valve-disk 48 so as to allow the air to pass through the ports 41 and through the air-passage 42 into the mixing chamber 13. In order to prevent the too rapid action of the opening and closing means of said valve-disk 48, the piston 47 creates a suction in the dash-pot 43, upon the opening of said valve-disk 48, which retards the movement of said valve-disk 48 long enough to permit the sucking in of air through the vent 46 into the cylindrical chamber 44 of the dash-pot. When the engine slows down however, the spring 52 tends to close the valve-disk 48; but this closing action cannot be rapid because it is checked by the pressure of the piston 47 in driving or expelling the air from said cylindrical chamber 44 through the vent 46 of the dash-pot 43. Thus we have an auxiliary valve which operates smoothly and uniformly to increase or decrease the supply of auxiliary air into the mixing chamber 13, thereby insuring a more perfect admixture of gasolene and air, adapted to and required for the needs of the internal combustion engine.

I am aware that some changes may be made in the general arrangements and combinations of the various devices and parts, as well as in the details of the construction of the same, without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the claims which are appended to the said specification. Hence, I do not limit my invention to the exact arrangements and combinations of the devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

I claim:

1. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves leading to the interior edges of said atomizer ring substantially as and for the purposes set forth.

2. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a throttle-member mounted to rotate within said cylindrical body, a semi-cylindrical portion connected with said throttle-member adapted to be brought into whole or partial closing relation with the outlets of said radially disposed grooves or ducts of said atomizer ring upon the rotation of said throttle-member, substantially as and for the purposes set forth.

3. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a throttle-member mounted to rotate within said cylindrical body, a semi-cylindrical portion connected with said throttle-member adapted to be brought into whole or partial closing relation with the outlets of said radially disposed grooves or ducts of said atomizer ring upon the rotation of said throttle-member, and means for supplying or feeding gasolene to said gasolene-receiving grooves of said atomizer ring

substantially as and for the purposes set forth.

4. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body and adapted to be manipulated to simultaneously close in whole or in part both said air-inlet and said radially disposed grooves or ducts of said atomizer ring, substantially as and for the purposes set forth.

5. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body, and adapted to be manipulated to simultaneously close in whole or in part both said air-inlet and said radially disposed grooves or ducts of said atomizer ring, and means for supplying or feeding gasolene to said gasolene-receiving grooves of said atomizer ring, substantially as and for the purposes set forth.

6. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body, a semi-cylindrical portion connected with said throttle-member adapted to be brought into whole or partial closing relation with the outlets of said radially disposed grooves or ducts of said atomizer ring upon the rotation of said throttle-member, and a semi-circular wall-portion connected with one end of said throttle-member adapted to be brought into registration with said air-inlet of the face-plate so as to close in whole or in part said air-inlet simultaneously with the closing of said radially disposed grooves or ducts of said atomizer ring, substantially as and for the purposes set forth.

7. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body and adapted to simultaneously close in whole or in part both said air-inlet and said radially disposed grooves or ducts of said atomizer ring, and an auxiliary air supply-valve connected with said cylindrical body, substantially as and for the purposes set forth.

8. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body and adapted to simultaneously close in whole or in part both said air-inlet and said radially disposed grooves or ducts of said atomizer ring, an auxiliary air supply-valve connected with said cylindrical body, comprising a housing provided with air-ports and an air-passage, a dash-pot connected therewith provided with an air vent, a valve-disk normally closing said air-passage, a piston connected with said valve-disk and slidably arranged within said dash-pot, a valve-stem extending from said piston, an adjusting nut arranged upon said valve-stem and a spring arranged between said adjusting nut and said housing, substantially as and for the purposes set forth.

9. In a carbureter, the combination with a cylindrical body providing a mixing chamber, of an atomizer ring provided on its faces with gasolene-receiving grooves and a plurality of radially disposed grooves or ducts leading from said gasolene-receiving grooves to the interior edges of said atomizer ring, a face-plate provided with a semi-circular air-inlet adapted to be arranged in connection with said atomizer ring and said cylindrical body, a throttle-member mounted so as to rotate within said cylindrical body and adapted to simultaneously close in whole or in part both said air-inlet and said radially disposed grooves or ducts of said atomizer ring, an auxiliary air supply-valve connected with said cylindrical body, comprising a housing provided with air-ports and an air-passage, a dash-pot con-

nected therewith provided with an air vent, a valve-disk normally closing said air-passage, a piston connected with said valve-disk and slidably arranged within said dash-pot, a valve-stem extending from said piston, an adjusting nut arranged upon said valve-stem and a spring arranged between said adjusting nut and said housing, and means for supplying or feeding gasolene to said gasolene-receiving grooves of said atomizer ring, substantially as and for the purposes set forth.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 26th day of September 1910.

EDWARD J. PROEHL.

Witnesses:
GEORGE D. RICHARDS,
ADOLPH HANSEN.