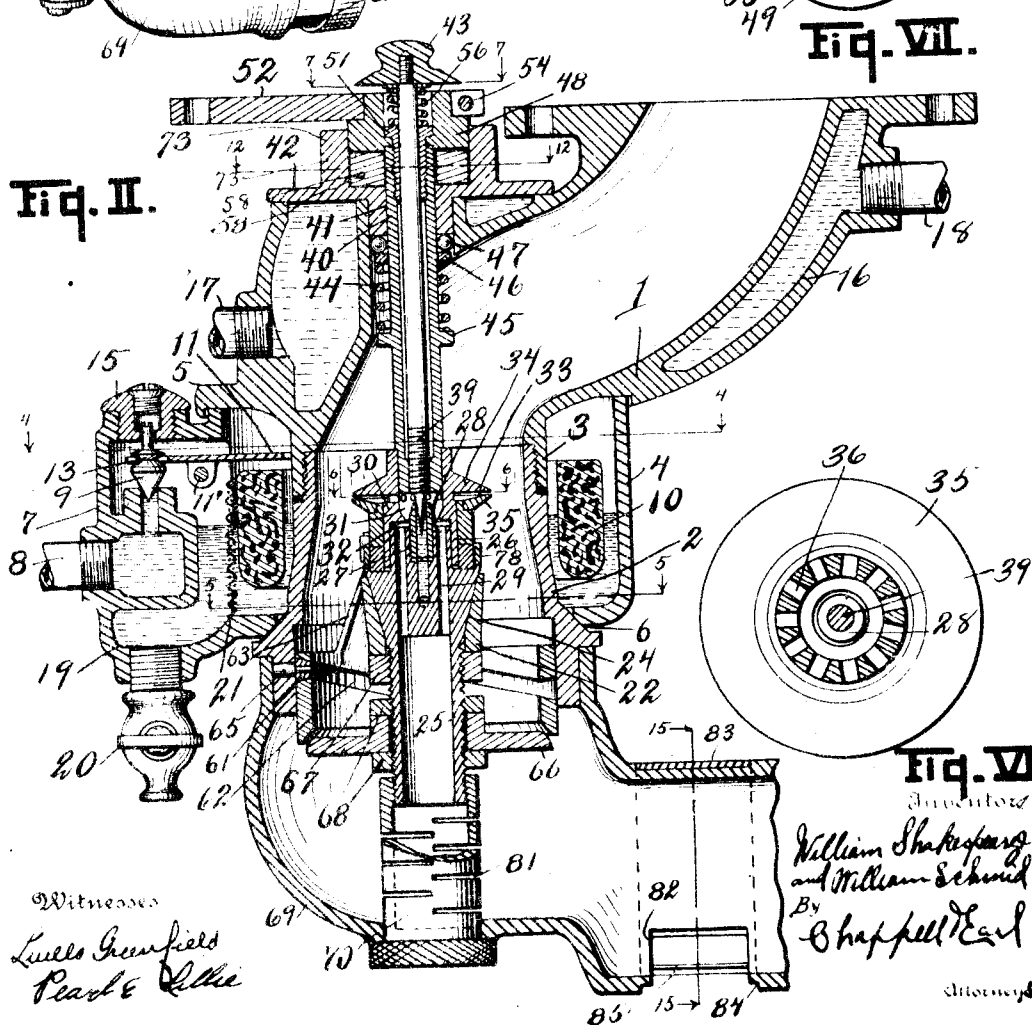
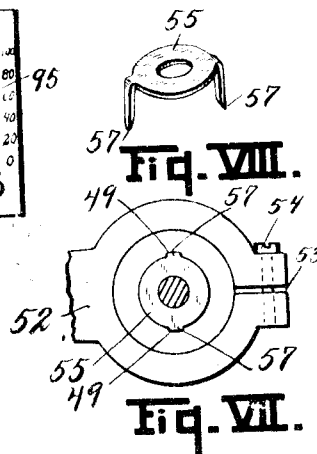
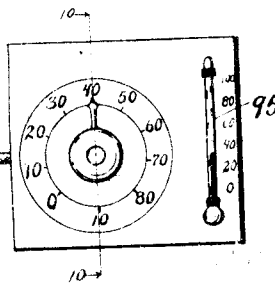


APPLICATION FILED MAR. 26, 1912.

3 SHEETS- SHEET 1.

11



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Patented Aug. 18, 1914.

3 SHEETS SHEET 2.

1,107,713.

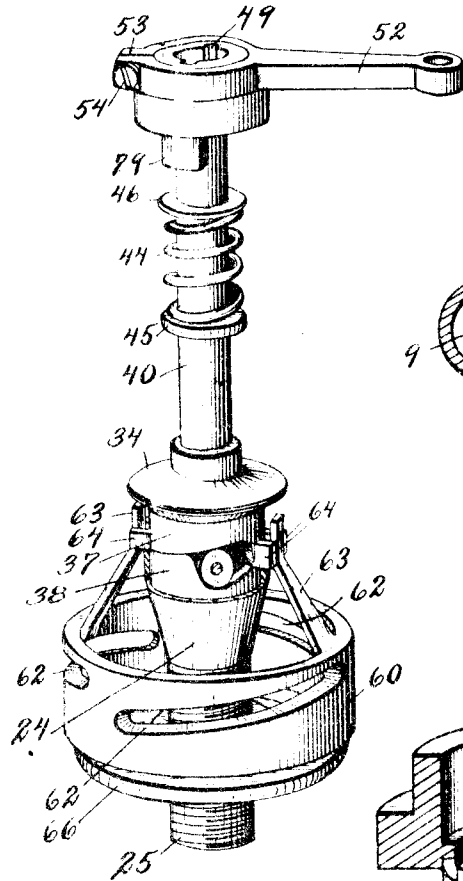


Fig. III.

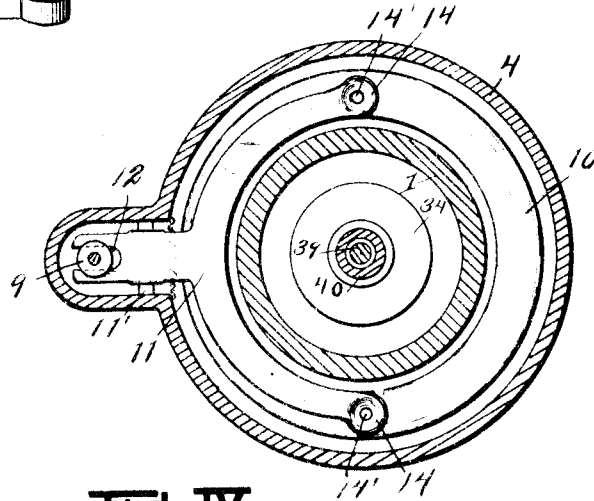


Fig. IV.

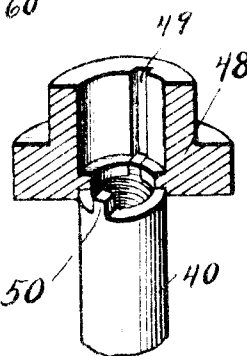


Fig. V.

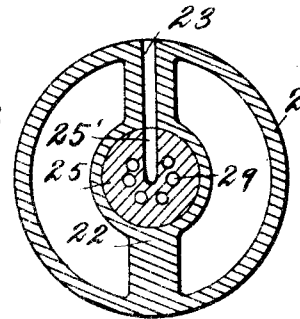


Fig. VI.

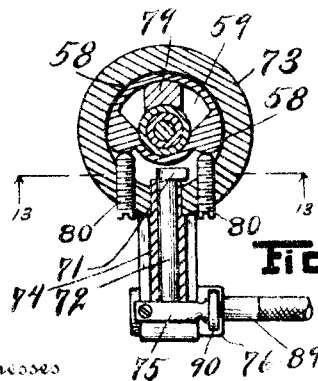


Fig. VII.

Fig. VIII.

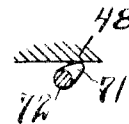


Fig. IX.

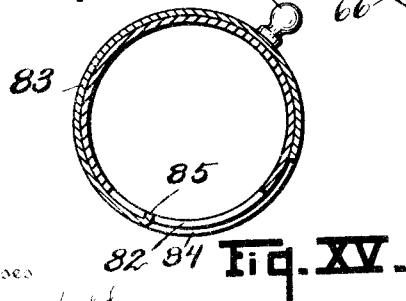
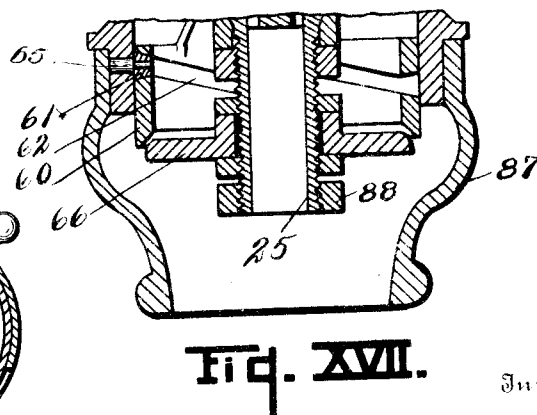
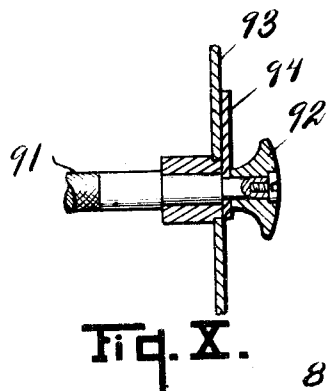
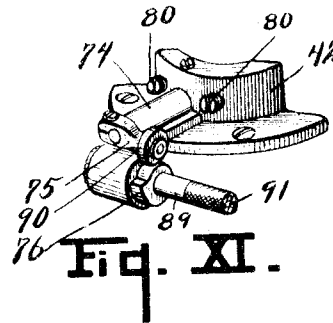
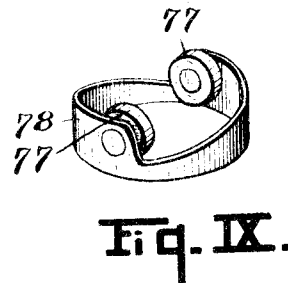
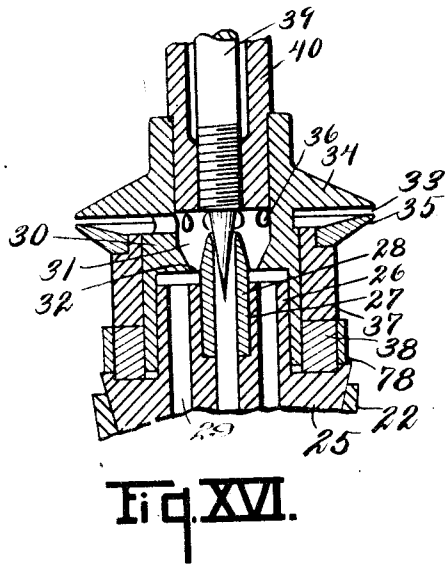
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W. SHAKESPEARE, JR. & W. SCHMID.
CARBURETER.
APPLICATION FILED MAR. 28, 1912.

Patented Aug. 18, 1914.
3 SHEETS SHEET 3.

1,107,713.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,107,713.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed March 28, 1912. Serial No. 686,834.

To all whom it may concern:

Be it known that we, WILLIAM SHAKESPEARE, JR., and WILLIAM SCHMID, citizens of the United States, residing at the city of Kalamazoo, county of Kalamazoo, and State of Michigan, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters.

The main objects of this invention are.—
First, to provide an improved carbureter in which the proper relative proportions of fuel and air are maintained throughout the varying running conditions of the engine.
Second, to provide an improved carbureter in which a dry mixture is secured at low speeds. Third, to provide an improved carbureter in which the air and fuel valves are simultaneously operated. Fourth, to provide an improved carbureter which is capable of very accurate adjustment for proportioning the air and fuel and one in which the proportion is maintained throughout the scope of adjustment of the throttle. Fifth, to provide in a carbureter an improved structure which is not likely to get out of adjustment or repair in use.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a perspective view of our improved carbureter. Fig. II is an enlarged vertical central section thereof. Fig. III is a perspective view of the interior parts of the carbureter removed from the body in order to better show their structure and relation. Fig. IV is a detail horizontal section taken on a line corresponding to line 4—4 of Fig. II, showing the arrangement of the fuel reservoir and the float therein. Fig. V is a horizontal section taken on a line corresponding to line 5—5 of Fig. II, showing the fuel passage from the reservoir. Fig. VI is an enlarged detail section through the primary mixing chamber taken on a line corre-

sponding to line 6—6 of Fig. II. Fig. VII is an enlarged detail section taken on a line corresponding to line 7—7 of Fig. II, showing details of the valve actuating means. Fig. VIII is a detail perspective view of the friction washer 55. Fig. IX is a perspective view of the cam rollers 77 and their supporting ring 78. Fig. X is an enlarged detail section on a line corresponding to line 10—10 of Fig. I showing the index, shaft and finger piece for actuating the fuel and the primary inlet valves without actuating the throttle or secondary inlet valve 60. Fig. XI is a detail perspective view of the actuating connections for the cam 71. Fig. XII is a horizontal section taken on a line corresponding to line 12—12 of Fig. II, showing further details of the actuating connections for the cam 71 and also the adjustable stop for the valve actuating means. Fig. XIII is a detail section taken on a line corresponding to line 13—13 of Fig. XII. Fig. XIV is a detail perspective of the member 40 and its head 48. Fig. XV is a vertical section taken on a line corresponding to line 15—15 of Fig. II through the valve 83 for the air inlet pipe 69. Fig. XVI is an enlarged detail vertical section through the primary mixing chamber and its nozzle, the fuel inlet valve 39 being shown in full lines. Fig. XVII is an enlarged detail vertical section of a modified construction, the modification being in the provision of a skirt 87 in lieu of the inlet pipe 69.

In the drawing, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, the body of our improved carbureter for convenience in manufacturing and assembling is preferably formed of the members 1 and 2 having a passage therethrough constituting the secondary mixing chamber and delivery passage of the carbureter. The member 1 is provided with an internally threaded nipple 3 for the member 2. The fuel reservoir is formed by the cup-like member 4, open at the top and bottom. The body member 2 is arranged through the opening in the bottom of the member 4 to clamp it against the annular flange 5 on the body member 1. The body member 2 is provided with an inclined shoulder 6 which engages the bot-

tom of the member 4 so that when the member 2 is screwed into the nipple 3 the member 4 is clamped in place and coacting with the body of the carbureter forms an annular fuel chamber or reservoir surrounding the body. At one side, the reservoir member 4 is provided with an offset inlet chamber 7 to which the supply pipe 8 is connected. The inlet valve 9 is controlled by the annular float 10 which acts on the lever 11, the lever being pivoted at 11' and slotted at 12 to engage the neck 13 on the valve. The lever 11 is forked to embrace the body of the carbureter. The arms of the lever 15 are cupped downwardly at 14 to provide spherical bearings for the float. The lever is secured to the float by the pins 14' vertically disposed through the bearings 14. The pins loosely engage the bearing to permit free tilting or rocking movement. This connection for the float and the lever holds the float out of contact with the walls of the reservoir and permits the rocking or tilting of the float with the changing fuel level 25 caused by rocking or tilting of the carbureter. The closure plug 15 serves as a guide for the stem of the valve 9. The member 1 of the body in the structure illustrated, is provided with a water jacket 16 having connections 17 and 18, the object being to supply heated water to the jacket when desired. The inlet chamber 7 of the carbureter is provided with a well-like depression 19 and with a drain cock 20, the screen 21 being arranged between the inlet chamber and the reservoir so that the sediment is collected in the well or trap 19 and may be drawn off through the cock 20.

The body member 2 is provided with a cross bar 22 having a fuel inlet passage 23 opening into the fuel reservoir. The cross bar is provided with a conical seat 24 for the primary air and fuel inlet member 25. The member 25 is provided with a conical head fitted into this seat and having a fuel passage 25' registering with the passage 23 in the bar. The member 25 has a nipple 26 at its upper end provided with a central seat 27 for the fuel nozzle 28. The air delivery passages 29 are grouped about the nozzle as clearly shown in Figs. II, V and XVI. The nozzle 28 projects above the nipple 26 and is tapered upwardly. A carbureting chamber member 30 having a carbureting chamber 31 therein is mounted upon the nipple of the member 25 for rotative adjustment thereon. The fuel nozzle 28 projects into the carbureting chamber 31 through the bottom 32 thereof. The bottom 32 of the carbureting chamber serves as an air regulating valve coacting with the nozzle 28. The primary carbureting chamber 31 is provided with a discharge nozzle having an annular slot-like discharge opening 33 which delivers into the main chamber of

the carbureter which constitutes a mixing chamber,—that is, the mixture of air and fuel or carbureted air delivered from the carbureting chamber 31, is when the valve 60 is open, mixed with the air passing that valve. The nozzle is formed by flange-like parts 34 and 35 which are suitably spaced to form the annular slot-like delivery opening for the nozzle. The carbureting chamber 31 communicates with the nozzle 75 through a plurality of ports or openings 36. See Figs. II and XVI. The member 30 is provided with a cam member 37 which coacts with a cam member 38 on the member 25 so that when the member 30 is rotated 80 it is raised and lowered, thus admitting and cutting off the air. To reduce friction we interpose rollers 77 between the cams. The rollers are carried by the ring 78 which is sleeved upon the cam member 38. This also 85 controls the fuel valve 39 which coacts with the fuel nozzle 28. The member 30 is secured to the inner end of the tubular actuating member 40 which is rotatably mounted in a bearing 41 in the cap plate 42 for the 90 water jacket 16. The stem of the valve 39 is threaded into the lower end of the member 40 so that the fuel valve is not materially affected by the contracting and expansion due to heating or cooling of the parts. The 95 stem of the valve 39 projects from the member 40 and is provided with an adjusting or finger piece 43.

The actuating member 40 is held yieldingly downward by means of the coiled 100 spring 44 which rests upon the collar 45 on the member 40, the upper end of the spring engaging the washer-like bearing member 46 for the thrust bearing balls 47. The inner end of the bearing 41 constitutes the 105 other thrust bearing member. On the upper end of the member 40 is a head 48 grooved at 49 to receive the lugs 50 on the member 40 as shown in Fig. XIV. The clamping nut 51 is threaded into the upper end of the member 40 and clamps the member 48 thereto. See Fig. II. The actuating 110 lever 52 is split at 52 and provided with a clamping screw 54 so that the lever may be adjusted to any position desired. 115

The valve 39 is retained in its adjusted positions by the friction washer 55 which bears against the under side of the finger piece 43 and is held in frictional contact therewith by the spring 56, which is seated 120 in the head 48. To prevent the friction washer 55 from turning, it is provided with depending fingers 57 which engage the grooves 49 in the head 48. The head 48 is 125 chambered to receive the stop member 58 which has a segmental slot 59 for the stop lug 79 on the actuating member 40. The stop member 58 pivots on the member 40 and is adjusted by means of the adjusting screws 80. See Fig. XII. With the parts 130

thus arranged, by means of the lever 52, the fuel valve is controlled and also the air supply to the primary mixing chamber. The throttle valve 60 which controls the secondary air supply is also controlled or operated through this same means. The throttle valve 60 is rotatably supported in the lower end of the body member 2 by means of the rollers 61 which engage helically disposed slots 62 in the valve. The valve has upwardly projecting arms 63 which are engaged by lugs 64 projecting from the cam member 37. The rollers 61 are preferably tapered and mounted on pins 65. The slots 62 being wedge-shaped in cross section to correspond to the taper of the rollers, retain the rollers on the pins. The valve 60 coacts with the disk-like plate 66 which is mounted on the member 25. The member 25 is clamped to the cross bar 22 by means of a nut 67. The plate 66 is secured on the member 25 by means of the nuts 68, one arranged above and the other below the plate.

In the structure illustrated, we provide an air supply or inlet pipe 69 adapted to be connected to a heating coil or the like, not illustrated, for supplying heated air to the carbureter. This inlet pipe has an elbow sleeved upon the lower end of the body member 2 and secured by means of the coupling member 70 arranged through the bottom of the elbow and threaded upon the lower end of the inlet member 25. The coupling member 70 has kerf-like air inlets 81 therein. One of the advantages of this form of coupling member 70 is that it serves as a muffler for the air passing into the inlet member 25. The supply 69 is provided with a slot-like port 82 formed transversely therein. This port is controlled by the band-like valve 83 which embraces the pipe 69, the pipe being provided with an annular groove 84 to receive the valve, the valve being in effect, a ring of spring material open at one side to register with the port 82 and turned inwardly at 85 to provide a stop, the stop coacting with the ends of the port. A finger piece 86 is provided for the valve 83. This simple arrangement provides an effective valve in which the valve itself is its retaining means, that is, the valve is sprung over the pipe to engage the annular groove therein and is retained by its own spring tension and the groove. When it is desired to admit cool air, this valve 83 is adjusted to admit the desired amount or if it is desired not to provide any heated air, the valve is fully opened.

In the modified construction shown in Fig. XVII, the pipe 69 is omitted and a skirt 87 substituted therefor. This skirt serves to protect the parts projecting below the lower end of the body member 2. The skirt is provided with a cross bar 88 threaded to engage the lower end of the member 25.

For opening the fuel valve and the primary air inlet and feed valves without opening the valve 60, as is sometimes desirable in starting the engine, the cam 71 is operated. This cam 71 is mounted on the shaft 72 arranged below the lever head 48. The shaft 72 projects through the flange 73 on the bearing plate 42 and is provided with a sleeve-like bearing 74. On the outer end of the shaft 72 is an arm 75. This arm is actuated by the cam 76 on the shaft 89, the arm being provided with a roller 90 resting on the cam. For convenience in operation, the shaft 89 is provided with a flexible extension 91 having a finger button 92. In practice, this finger button is arranged to be manipulated from the seat of the operator. We preferably provide in this connection an index 93 having figures or other indicia thereon indicating degrees of temperature, see Fig. I, in which the index has numerals indicating temperatures from 80 above to 10 below zero. The finger piece 92 is provided with an index finger 94. For convenience, we preferably provide a thermometer which is indicated in conventional form at 95, the thermometer being mounted on the index plate. With these features, the operator has before him means for determining the point to which the fuel valve 39 and the primary inlet valves should be opened in starting the engine in different temperatures.

The operation of the device is as follows.—The fuel valve 39 and the primary inlet valve are normally slightly open, that is, when the throttle valve 60 is closed, these fuel and primary inlet valves are adjusted so that they are slightly open. In starting the engine, the fuel and the primary valves are opened independently of the throttle by means of the finger piece 92 and the operating connections described in connection therewith, the index finger being turned to indicate approximately the temperature. With the engine started and "warmed up," the control or regulation is through the operating lever 52 which controls, as has been described, both the fuel and primary inlet valves and the secondary or throttle valve 60. The air passing through the primary inlet supply to the carbureting chamber 31 is mixed with the fuel and passes with the fuel in a substantially dry mixture into the mixing chamber, where, if the valve 60 is open, it is mixed with more air and passes on to the engine. The engine may be started and in fact run through the carbureting chamber only, but this is not the purpose, and to secure the most satisfactory results, the carbureter should be operated for starting and continued operation through both valve controlling means particularly when the temperature is low. In high temperatures, the engine can be started without manipulation other than through the lever 52.

We have found in practice, that a substantially dry mixture issues from the nozzle of the primary carbureter. This mixture is delivered laterally through the annular nozzle into the mixing chamber and in such a manner that it is evenly mixed with the air passing to the engine so that a very even and effective mixture is secured.

The needle valve arranged as illustrated, opens uniformly and increases the supply of the fuel as the supply of air is increased, thus maintaining the proper proportion.

We have illustrated and described our improved carbureter in the form in which we have embodied the same in practice.

We are aware that considerable modification in structural details is possible but believing that the disclosures made will enable others to embody the same as conditions or taste or design may dictate, we have not attempted to illustrate or describe the various modifications herein.

Having thus described our invention, what we claim is new and desire to secure by Letters Patent is:

1. In a carbureter, the combination with the body, of a carbureting chamber member; a mixing chamber in said body into which said carbureting chamber delivers; an inlet member having an air inlet passage and a fuel inlet passage therein and provided with a nipple at its upper end having a tapered fuel nozzle projecting into said carbureting chamber and a plurality of air discharge passages grouped about said fuel nozzle, the bottom of the carbureting chamber member coacting with the fuel nozzle and constituting an air valve, said carbureting chamber member being provided with a sleeve rotatably engaging said nipple; a rotatably mounted tubular actuating member for said carbureting chamber member; a needle valve arranged longitudinally through said actuating member and threaded for adjustment therein to coact with said fuel nozzle; a cam on said inlet member; a coacting cam on said carbureting chamber member whereby rotative movement of said actuating member moves the carbureting chamber member longitudinally; a cylindrical throttle valve having upwardly projecting arms thereon and helically disposed slots therein; supporting members engaging said slots; and pairs of lugs carried by said carbureting chamber member slidably engaging said arms.

2. In a carbureter, the combination with the body, of a carbureting chamber member; a mixing chamber in said body into which said carbureting chamber delivers; an inlet member having an air inlet passage and a fuel inlet passage therein and provided with a nipple at its upper end having a tapered fuel nozzle projecting into said carbureting chamber and a plurality of air dis-

charge passages grouped about said fuel nozzle, the bottom of the carbureting chamber coacting with the fuel nozzle and constituting an air valve, said carbureting chamber member being provided with a sleeve rotatably engaging said nipple; a rotatably mounted tubular actuating member for said carbureting chamber member; a needle valve arranged longitudinally through said actuating member and threaded for adjustment therein to coact with said fuel nozzle; a cam on said inlet member; and a coacting cam on said carbureting chamber member whereby rotative movement of said actuating member moves the carbureting chamber member longitudinally.

3. In a carbureter, the combination with the body, of a carbureting chamber member; a mixing chamber in said body into which said carbureting chamber delivers; an inlet member having an air inlet passage and a fuel inlet passage therein having a tapered fuel nozzle projecting into said carbureting chamber, the bottom of the carbureting chamber member coacting with the fuel nozzle and constituting an air valve, said carbureting chamber member being mounted on said inlet member; a rotatably mounted actuating member for said carbureting chamber member; a needle valve carried by said carbureting chamber member and threaded for adjustment therein to coact with said fuel nozzle; a cam on said inlet member; a coacting cam on said carbureting chamber member; a cylindrical throttle valve having upwardly projecting arms thereon and helically disposed slots therein; supporting members engaging said slots; and pairs of lugs carried by said carbureting chamber member slidably engaging said arms.

4. In a carbureter, the combination with the body, of a carbureting chamber member; a mixing chamber in said body into which said carbureting chamber delivers; an inlet member having an air inlet passage and a fuel inlet passage therein having a tapered fuel nozzle projecting into said carbureting chamber, the bottom of the carbureting chamber member coacting with the fuel nozzle and constituting an air valve, said carbureting chamber member being rotatably mounted on said inlet member; a rotatably mounted actuating member for said carbureting chamber member; a needle valve carried by said carbureting chamber member and threaded for adjustment therein to coact with said fuel nozzle; a cam on said inlet member; and a coacting cam on said carbureting chamber member whereby rotative movement of said actuating member moves the carbureting chamber member longitudinally.

5. In a carbureter, the combination with the body, of a carbureting chamber member;

an inlet member having an air inlet passage and a fuel inlet passage delivering to the carbureting chamber; fuel and air inlet valves carried by said carbureting chamber member and actuated by the longitudinal movement of said carbureting chamber member; a rotatively mounted actuating member for said carbureting chamber member; a cam on said inlet member; a coacting cam on said carbureting chamber member; a cylindrical throttle valve having helical slots therein; supporting members engaging said slots; upwardly projecting arms on said throttle; and lugs on said carbureting chamber member engaging said arms.

6. In a carbureter, the combination with the body, of a primary carbureting member; an inlet member having an air inlet passage and a fuel inlet passage delivering to the carbureting chamber; fuel and air inlet valves carried by said carbureting chamber member and actuated by the longitudinal movement of said carbureting chamber member; a rotatively mounted actuating member for said carbureting chamber member; a cam on said inlet member; and a coacting cam on said carbureting chamber member whereby rotative movement of said actuating member moves the carbureting chamber member longitudinally.

7. In a carbureter, the combination of an inlet member having an air inlet passage and a fuel inlet passage; a carbureting chamber member rotatably mounted on said inlet member and having a mixing chamber into which said fuel and air passages deliver; air and fuel valves carried by said carbureting chamber member; a cam on said inlet member; and a coacting cam on said carbureting chamber member whereby rotative movement of said actuating member moves the carbureting chamber member longitudinally.

8. In a carbureter, the combination of an inlet member having an air inlet passage and a fuel inlet passage therein and provided with a nipple at its upper end having a tapered fuel nozzle and a plurality of air discharge passages grouped about said fuel nozzle; a carbureting chamber member having a sleeve engaging said nipple and a mixing chamber into which said fuel nozzle projects, the bottom of the mixing chamber coacting with the fuel nozzle constituting an air valve; and means for adjusting said carbureting chamber member.

9. In a carbureter, the combination of an inlet member having an air inlet passage and a fuel inlet passage therein and provided with a tapered fuel nozzle; a carbureting chamber member having a mixing chamber into which said fuel nozzle projects, the bottom of the mixing chamber coacting with the fuel nozzle constituting an air valve; and means for adjusting said car-

bureting chamber member longitudinally to simultaneously operate said fuel and air inlet valves.

10. In a carbureter, the combination of an inlet member having an air inlet passage and a fuel inlet passage; a carbureting chamber member rotatably mounted on said inlet member and having a mixing chamber into which said fuel and air passages deliver; air and fuel valves carried by said carbureting chamber member; a cam on said inlet member; a coacting cam on said carbureting chamber member; a cylindrical throttle valve having upwardly projecting arms thereon and helically disposed slots therein; and supporting members engaging said slots, said carbureting chamber member being provided with lugs engaging said arms.

11. In a carbureter, the combination with the carbureting chamber; fuel and air inlet valves therefor; a mixing chamber into which said carbureting chamber delivers; a throttle for said mixing chamber valve disposed in advance of the discharge of said carbureting chamber; and operating connections for said primary air inlet and fuel valves and said throttle arranged to permit the opening of said primary chamber air inlet and fuel valves independently of said throttle valve, said fuel valve being adjustably associated with said primary air inlet valve.

12. In a carbureter, the combination with the carbureting chamber; of simultaneously operated fuel and air inlet valves therefor; a mixing chamber into which said carbureting chamber delivers; a throttle for said mixing chamber disposed in advance of the discharge of said carbureting chamber; and operating connections for said throttle valve to said carbureting chamber fuel and air inlet valves whereby it is simultaneously operated therewith.

13. In a carbureter, the combination with the carbureting chamber; fuel and air inlet valves therefor; a discharge nozzle for said carbureting chamber; a mixing chamber into which said nozzle delivers; a throttle valve disposed in advance of said nozzle; and operating connections for said primary air inlet and fuel valves and said throttle arranged to permit the opening of said primary air inlet and fuel valves independently of said throttle valve, said fuel valve being adjustably associated with said primary air inlet valve.

14. In a carbureter, the combination with the carbureting chamber; of simultaneously operated fuel and air inlet valves therefor; a discharge nozzle for said carbureting chamber; a mixing chamber into which said nozzle delivers; a throttle valve disposed in advance of said nozzle; and operating connections for said throttle valve to said carbureting chamber fuel and air inlet valves

whereby it is simultaneously operated therewith.

15. In a carbureter, the combination of a carbureting chamber; fuel and air inlet
5 valves therefor; a mixing chamber into which said carbureting chamber delivers; a throttle valve for said mixing chamber; and operating connections for said fuel, carbureting chamber and throttle valves.

10 16. In a carbureter, the combination of a carbureting chamber; of simultaneously operated fuel and air inlet valves therefor; a mixing chamber into which said carbureting chamber delivers; a throttle valve for said
15 mixing chamber; and operating connections for said throttle valve to said carbureting chamber fuel and air inlet valves whereby it is simultaneously operated therewith.

17. In a carbureter, the combination with
20 the carbureting chamber, of simultaneously operated fuel and air inlet valves therefor; an annular discharge nozzle for said carbureting chamber communicating therewith through a plurality of openings; a mixing
25 chamber into which said nozzle delivers; and a throttle valve disposed in advance of said nozzle.

18. In a carbureter, the combination with the carbureting chamber, of simultaneously
30 operated fuel and air inlet valves therefor; an annular discharge nozzle for said carbureting chamber; a mixing chamber into which said nozzle delivers; a throttle valve disposed in advance of said nozzle; and oper-
35 ating connections for said throttle valve to said carbureting chamber fuel and air inlet valves whereby it is simultaneously operated therewith.

19. The combination with the fuel valve,
40 of a primary air inlet valve and a cylindrical throttle valve; an actuating member mounted for rotative and longitudinal movement, the fuel valve being adjustably associated with said actuating member for adjustment
45 relative to the primary air inlet valve; a spring arranged on said actuating member; a cam for actuating said actuating member longitudinally against said spring when the member is rotated; arms on said throttle
50 valve having sliding engagement with said actuating member; and means for moving said actuating member longitudinally independently of its rotative movement.

20. The combination with the fuel valve,
55 of a primary air inlet valve and a cylindrical throttle valve; an actuating member mounted for rotative and longitudinal movement, the fuel valve being adjustably associated with said actuating member for adjustment
60 relative to the primary air inlet valve; a cam for actuating said actuating member longitudinally when the member is rotated; arms on said throttle valve having sliding engagement with said actuating member;
65 and means for moving said actuating mem-

ber longitudinally independently of its rotative movement.

21. The combination with the fuel valve, of an air inlet valve; an actuating member mounted for rotative and longitudinal move-
70 ment, the fuel valve being adjustably associated with said actuating member for adjustment relative to the air inlet valve; a spring arranged on said actuating member; and a cam for actuating said actuating member
75 longitudinally against said spring when the member is rotated.

22. The combination with a fuel valve, of a primary air inlet valve and throttle
80 valves; an actuating member mounted for rotative and longitudinal movement, said fuel and primary inlet valves being opened and closed by the longitudinal movement of said member; operating connections for said
85 actuating member to said throttle valve, said throttle valve being opened by the rotative movement of said actuating member; and means for rotating and for moving said actuating member longitudinally without
90 rotating the same to open said fuel and primary air inlet valves without opening the throttle valve.

23. In a carbureter, the combination of the primary air, fuel inlet and throttle valves; an actuating member therefor mounted for
95 rotative and longitudinal movement, said fuel and primary air inlet valves being actuated by the longitudinal movement of said actuating member, all of said valves being actuated by its rotative movement; means
100 for shifting said actuating member longitudinally comprising finger piece; and an index, said finger piece being provided with an index finger coacting with said index.

24. In a carbureter, the combination of
105 the primary air, fuel inlet and throttle valves; and an actuating member therefor mounted for rotative and longitudinal movement, said fuel and primary air inlet valves being actuated by the longitudinal move-
110 ment of said actuating member, all of said valves being actuated by its rotative movement.

25. In a carbureter, the combination of a valve actuating member mounted for rota-
115 tive movement, and having a stop thereon; a stop member having stops coacting with the stop of said actuating member, said stop member being supported for rotative adjustment; and actuating screws for said stop
120 member.

26. In a carbureter, the combination with the chambered body having a cross bar therein provided with a fuel inlet passage and an upwardly expanding seat; a fuel and
125 air inlet member having a downwardly tapered head fitted in said seat and a fuel passage registering with said passage in said arm; a nut for clamping said tapered head in said arm, said inlet member being thread-
130

ed to receive said nut; and air and fuel valves for controlling said air and fuel passages.

27. In a carbureter, the combination with
5 the chambered body having a cross bar therein, provided with the fuel passage; a member having fuel and air inlets therein arranged through said arm, the fuel passage registering with the fuel passage in
10 said arm; a closure plate for said body; nuts on said body for supporting said plate; a cylindrical valve arranged within said body to coact with said plate, said valve having spiral slots therein; supporting
15 members on said body engaging said slots; and means for rotating said valve whereby it is adjusted longitudinally in said body to and from said plate.

28. In a carbureter, the combination with
20 a chambered body open at its outer end, of a centrally disposed air inlet member having a fuel passage therein; a plate mounted on said air inlet member in a spaced relation to the open end of said body, said inlet
25 member opening on the outside of said plate; and a cylindrical valve supported within said body to be adjusted to and from said plate to admit air between the plate and the edge of the valve.

29. In a carbureter, the combination with
30 the body, of a carbureting chamber member; a mixing chamber in said body into which said carbureting chamber delivers; an inlet member having an air inlet pas-
35 sage and a fuel inlet passage therein, said carbureting chamber member being rotatably mounted on said inlet member; a rotatably mounted actuating member for said

carbureting chamber member; a needle valve carried by said carbureting chamber
40 member threaded for adjustment therein; a cam on said inlet member; a coacting cam on said carbureting chamber member; rollers arranged between said cams; and a supporting ring for said rollers loosely embrac-
45 ing said cam on said inlet member.

30. In a carbureter, the combination of a carbureting chamber; fuel and air inlet valves therefor; a mixing chamber into which said carbureting chamber delivers;
50 a throttle valve for said mixing chamber; operating means for said fuel; valve carbureting and throttle valves adapted to permit the operation of all of said valves simultaneously or the operation of the fuel
55 and air inlet valves simultaneously and independently of the throttle valve.

31. In a carbureter, the combination of a carbureting chamber; simultaneously operated fuel and air inlet valves therefor, the
60 said fuel inlet valve being adjustably associated with the air inlet valve; a mixing chamber into which said carbureting chamber delivers; and a throttle valve for said mixing chamber having operative connection
65 with said carbureting chamber air inlet valve whereby they are simultaneously operated.

In witness whereof, we have hereunto set our hands and seals in the presence of two
70 witnesses.

WILLIAM SHAKESPEARE, JR. [L. s.]

WILLIAM SCHMID. [L. s.]

Witnesses:

LUELLA GREENFIELD,

PRINA WOODRUFF.