No. 886,545. PATENTED MAY 5, 1908.

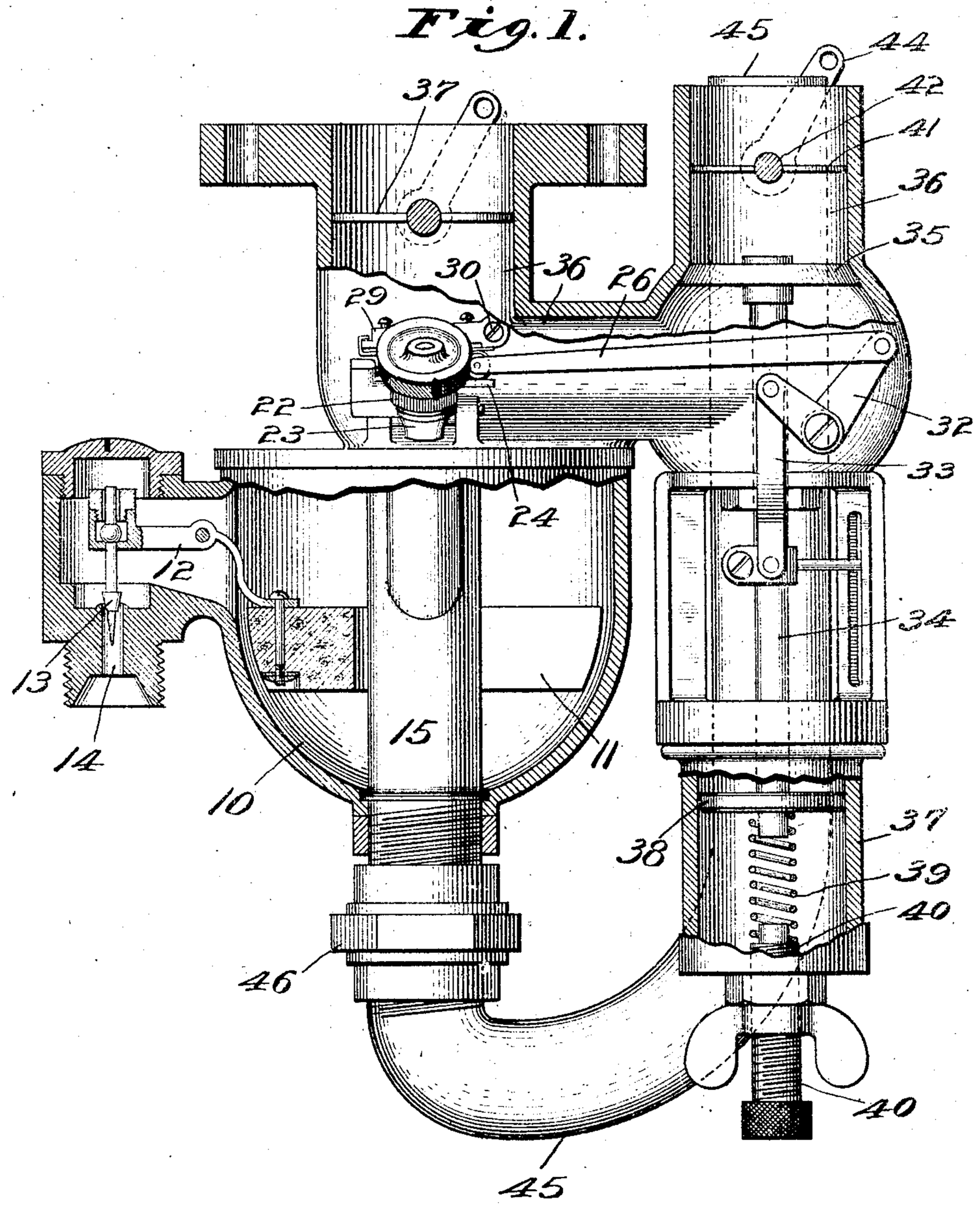
G. M. SCHEBLER.

CARBURETER.

APPLICATION FILED MAY 27, 1907.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

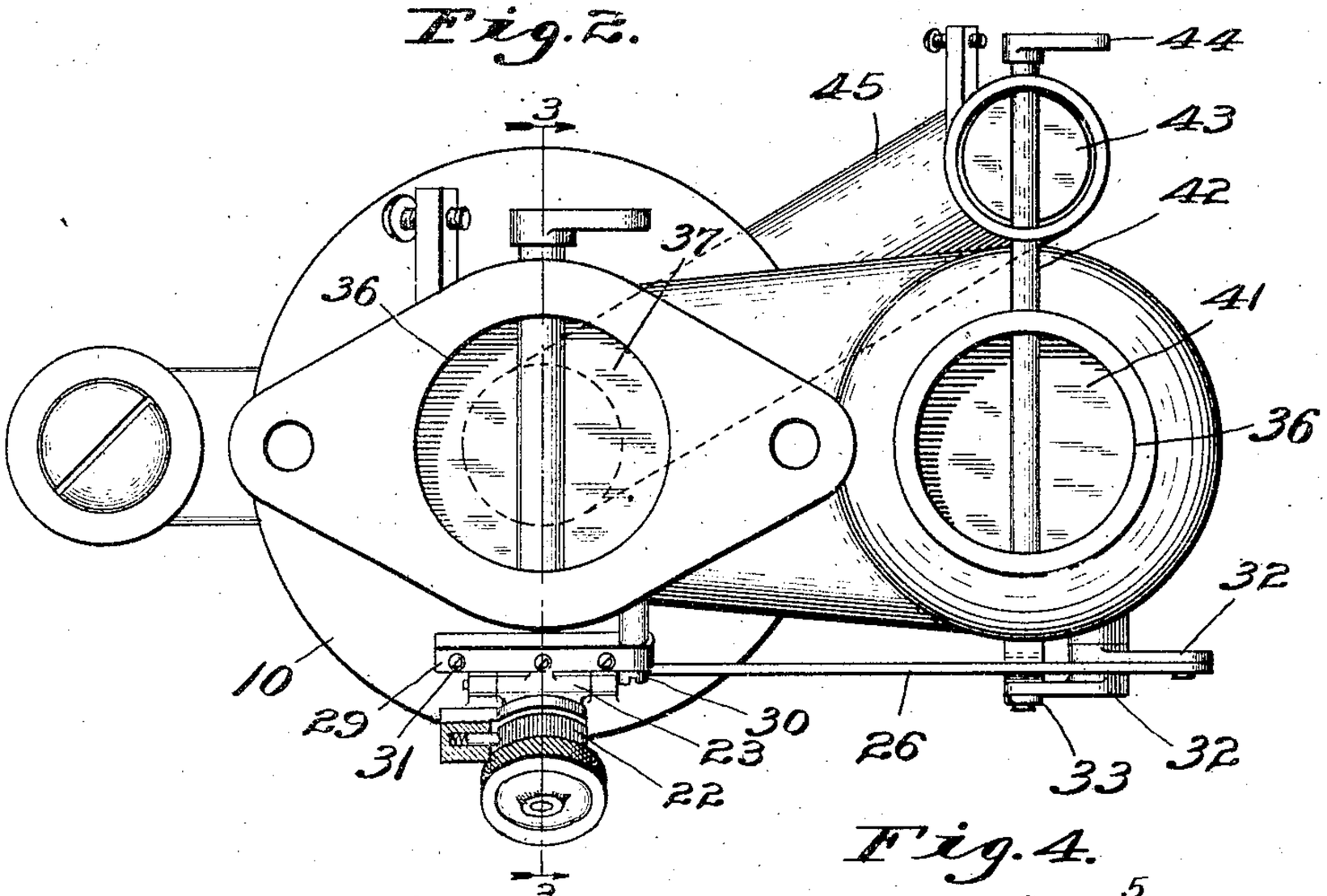


Fig. 3.

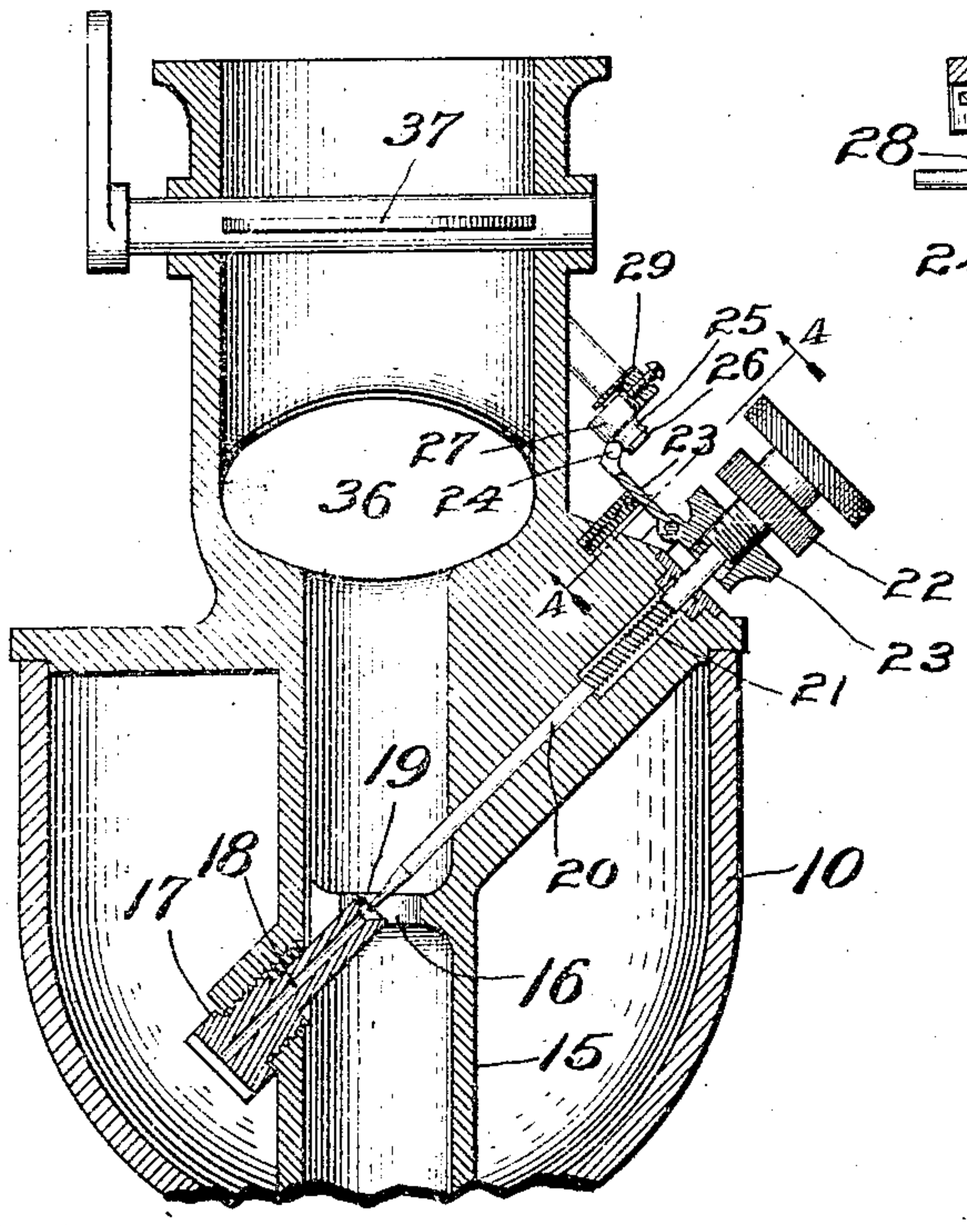


Fig. 4.

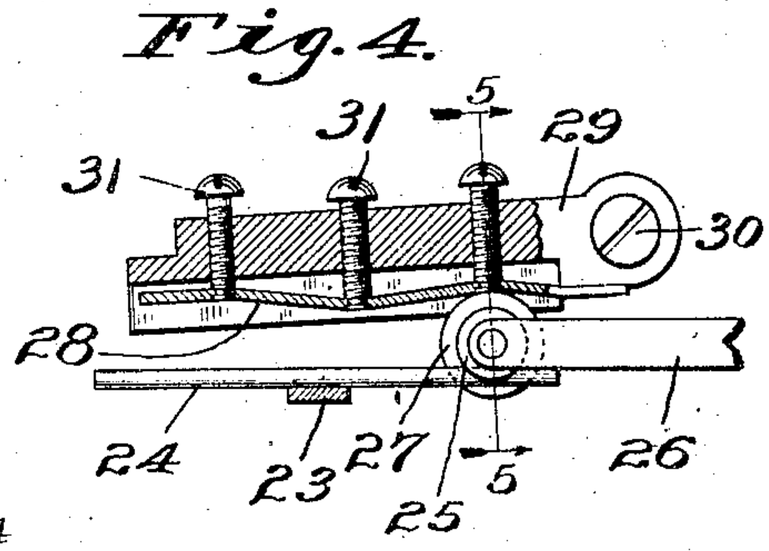
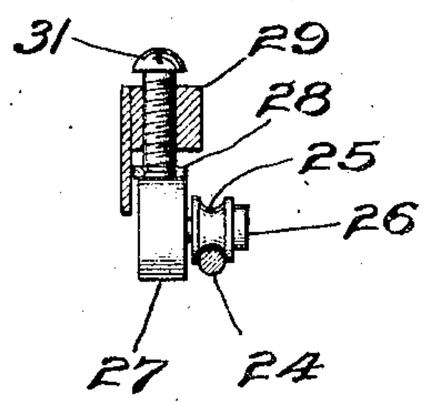


Fig. 5.



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4 SHEETS—SHEET 3.

Fig. 6.

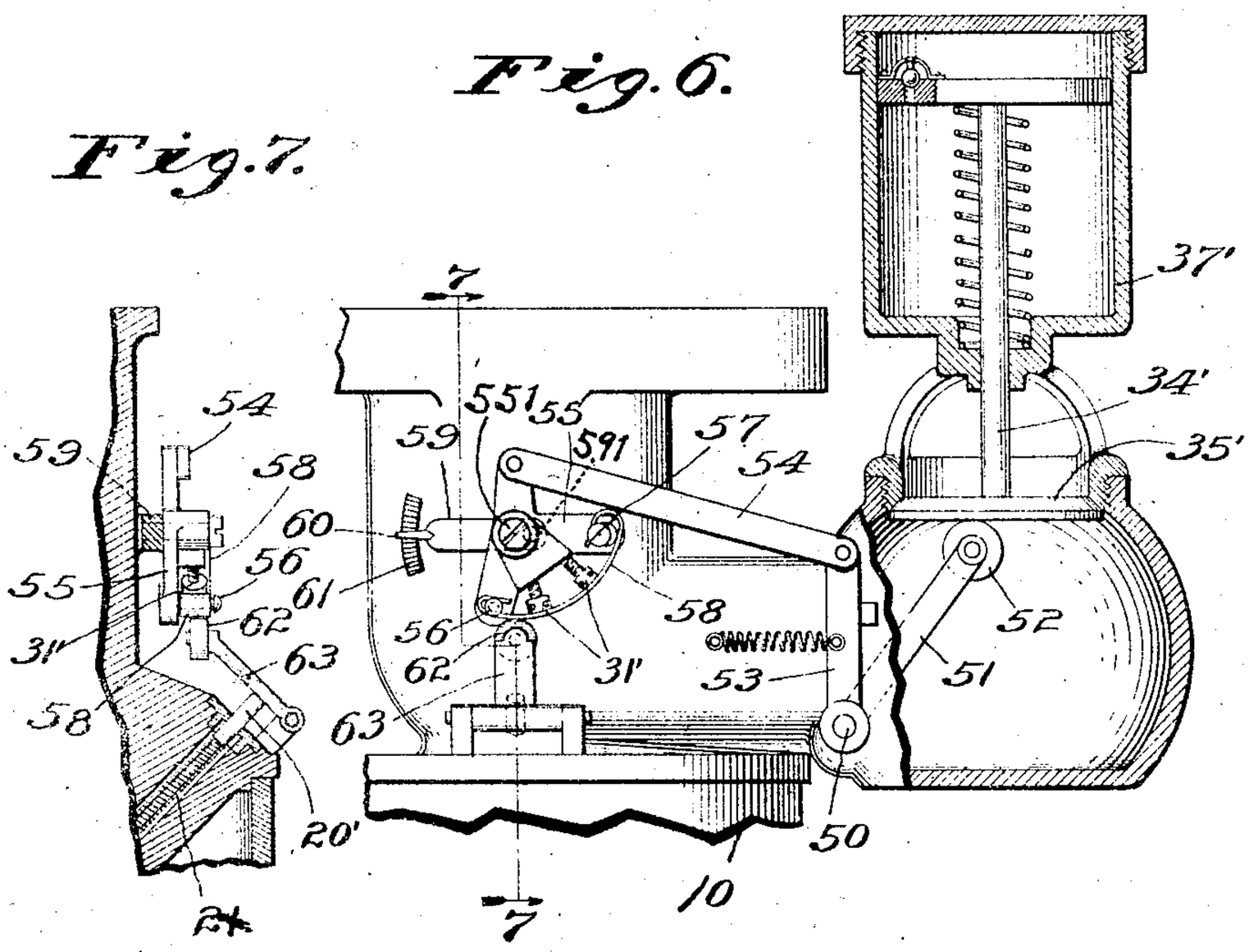
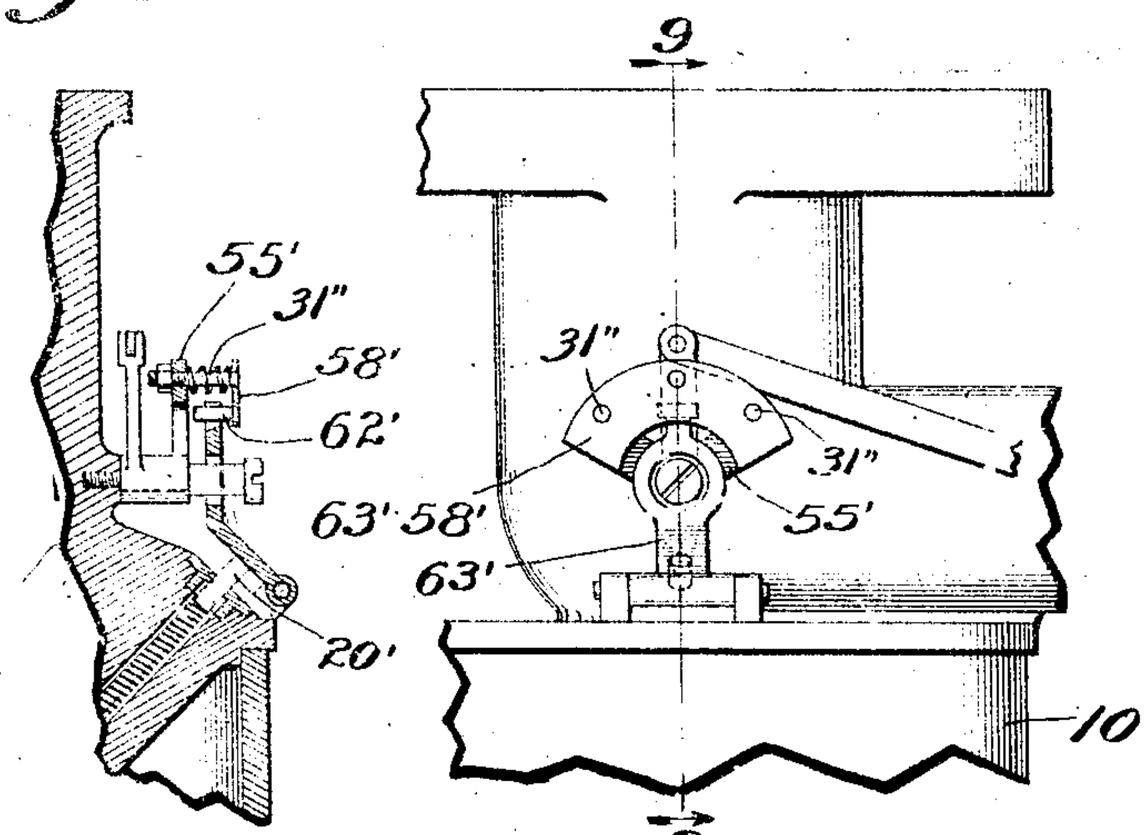


Fig. 7.

Fig. 8.

Fig. 9.



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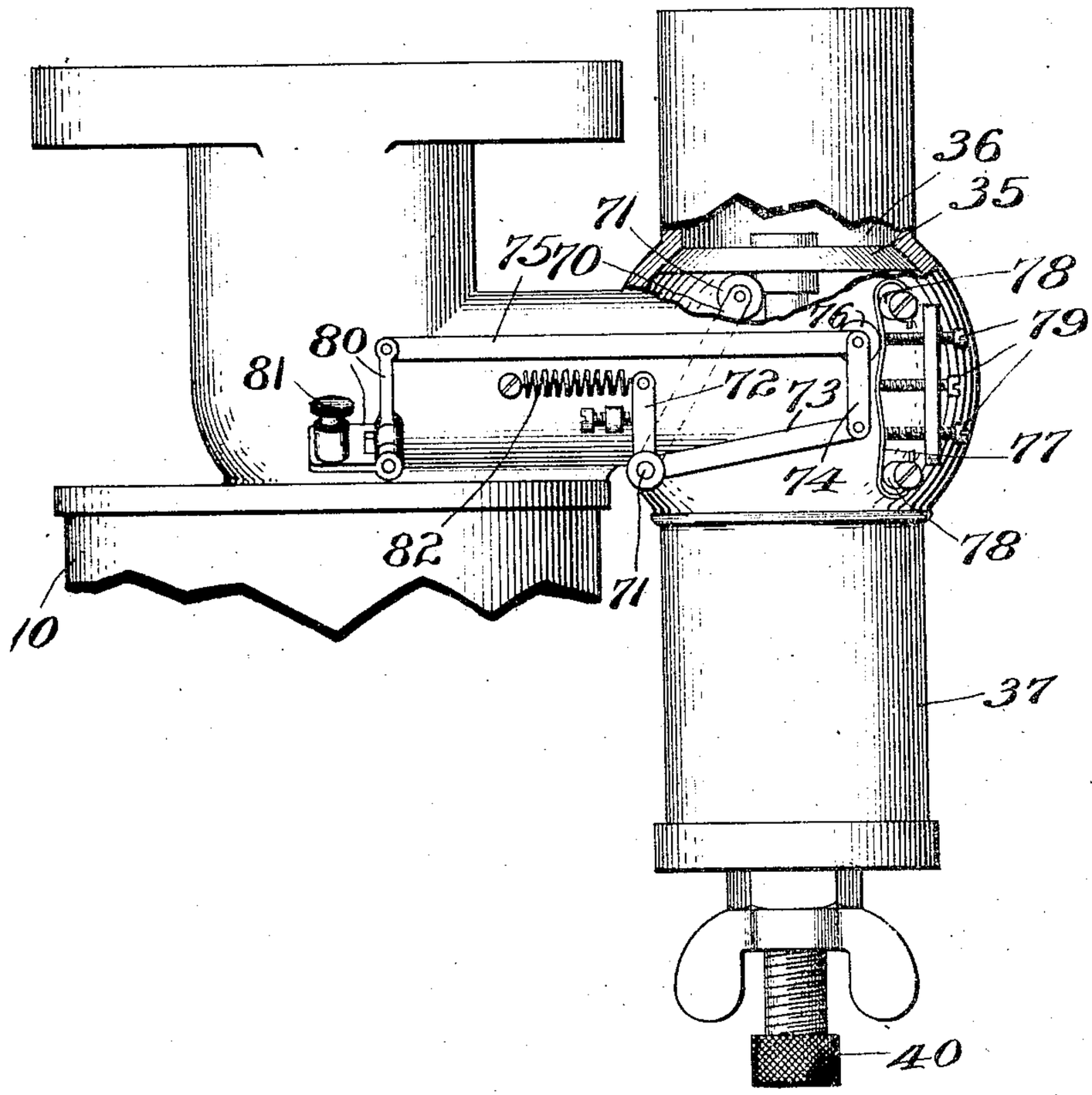
4 SHEETS—SHEET 4.

Fig. 10.



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UNITED STATES PATENT OFFICE.

GEORGE M. SCHEBLER, OF INDIANAPOLIS, INDIANA.

CARBURETER.

No. 886,545. Specification of Letters Patent. Patented May 5, 1908.

Application filed May 27, 1907. Serial No. 375,964.

To all whom it may concern:

Be it known that I, GEORGE M. SCHEBLER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The object of my invention is to produce a carbureter, especially designed for use in connection with internal combustion engines, the construction being such that the fuel admission valve will be automatically shifted in accordance with the exact requirements at any particular time and also such that the extent of such automatic adjustment and the relation thereof to the air supply will be readily adjustable.

A further object of my invention is to provide such improvements in details of construction as will be hereafter pointed out.

The accompanying drawings illustrate my invention.

Figure 1 is an elevation in partial vertical section of a carbureter embodying my improvement; Fig. 2 a plan; Fig. 3 a section on line 3—3 of Fig. 2; Fig. 4 a detail of means for adjusting and regulating the automatic manipulation of the fuel valve; Fig. 5 a detail on line 5—5 of Fig. 4; Fig. 6 an elevation in partial vertical section of a modified form; Fig. 7 a section on line 7—7 of Fig. 6; Fig. 8 a detail elevation of another modification, Fig. 9 a section on line 9—9 of Fig. 8, and Fig. 10 an elevation, in partial section, of another modification.

In the drawings, 10 indicates a suitable reservoir having the usual float 11 therein, said float operating through a lever 12 upon a valve 13 which controls the fuel in that passage 14. Passing through reservoir 10 is an air tube 15 which is restricted at a point 16 at about the normal level of liquid in reservoir 10. Projected through the wall of tube 15 is a nozzle 17 having a passage 18 therethrough, said passage forming a communication between reservoir 10 and tube 15, the inner end of the nozzle being substantially at the point of restriction in tube 15, and provided at its inner end with a valve seat 19 adapted to receive needle valve 20 which is normally held outward by a light spring 21. Threaded upon the outer end of the stem of the needle valve 20 is an adjusting head 22 which is supported in one arm of a lever 23. Lever 23 is provided at one end with a track 24 adapted to receive a roller 25 carried by an arm 26, said arm also carrying a roller 27 adapted to engage a track 28 carried by an arm 29 pivotally supported at 30, the arrangement being such that arm 29 may be adjusted upon its pivot 30 at any suitable angle relative to the track 24 of lever 23. Track 28 is preferably a piece of spring or other suitably flexible strip supported at various points in its lengths by screws 31 which are threaded through the arm 29 and engage the blade 28 so as to adjust the same in both directions so that, by adjusting the screws 31 independently, the track 28 may be given any desired shape so that the passage of rollers 25 and 27 between tracks 24 and 28 will variously affect lever 23 and consequently valve 20 at different points in the movement of arm 26. In order to automatically operate arm 26 I provide a lever 32 one arm of which is connected to arm 26 while the other arm is connected by a link 33 with the stem 34 of the main air inlet valve 35. This air inlet valve 35 lies in the supplementary air passage 36 which communicates with the upper end of the air tube 15 above the inlet nozzle 17 but below the usual throttle valve 37. In order to dampen the action of the valve 35 I deem it advisable to provide a dash-pot dampener which in Fig. 1 is shown as consisting of a cylinder 37 supported beneath valve 35 and having within it a piston 38 attached to the valve stem 34, a light spring 39 being provided to normally close the valve 35 and said spring being provided with an adjustable abutment 40 in the usual manner.

Arranged in passage 36 outside of valve 35, on the air side, I provide a throttle valve 41 which is adapted to practically completely close passage 36. Connecting with the lower end of tube 15 is an air tube 45, being conveniently connected by means of a union 46, and this air tube is extended up alongside the supplemental air tube 36 so that the shaft 42 of valve 41 may be extended through the walls of passage 36 and through the walls of tube 45 so as to support valve 43 within tube 45 said valve, however, being somewhat smaller than tube 45 so that, when valve 41 is in its closed position, valve 43 will still permit a limited flow of air through tube 45 into tube 15. Shaft 42 is provided with a suitable operating lever 44 which may be provided with a link (not shown) extended to a point convenient of access.

In operation valve 20 is so adjusted that, in the position shown in Fig. 1, air sucked

through the apparatus past valve 43 will produce a proper mixture. Valves 41 and 43 are then opened, as is also the throttle valve 37, and, as the engine increases in speed, the suction upon valve 35 will cause it to leave its seat and, when it leaves its seat, it will operate through link 33 and lever 32 upon arm 26 so as to drive rollers 25 and 27 between tracks 24 and 28, thus causing the arm 23 to swing so as to automatically move valve 20 toward and from its seat 19, as the conditions may require, to automatically regulate the flow of fuel to the air stream passing through tube 15. By experiment, the various screws 31 may be adjusted so that track 28 will be given such form as that the valve 20 will be properly manipulated by the movement of valve 35.

In the modification shown in Fig. 6 the dash-pot 37′ is arranged above the main body of the carbureter and, therefore, the valve stem 34′ of valve 35 is reversed. In this form the bell crank 32 is eliminated and instead a shaft 50 is journaled in the casing and provided on its inner end with an arm 51 having a roller 52 adapted to coöperate with valve 35′ while at its outer end the shaft 50 is provided with an arm 53 which is connected by a link 54 with a swinging segment 55. This segment is provided at one end with a pin 56 while at the other end is an eccentric 57 which is rotatably adjustable on arm 55. Hooked over pin 56 is one end of a flexible track 58, the opposite end being hooked over the eccentric 57. At intermediate points track 58 is connected to adjusting screws 31′ similar to the adjusting screws 31 so that the said track may be flexed by said screws so as to be brought into any desired form, the relative adjustment of the eccentric 57 assisting in this adjustment. In order to provide for further adjustment I pivot the segment 55 upon a swinging arm 59 having a finger 60 adapted to engage a roughened segment 61 so as to be held in any desired position of adjustment. As indicated in dotted lines in Fig. 6 the pivot support 591 of arm 59 on the casing is slightly eccentric to the pivot point of segment 55 so that, by swinging arm 59 upon its pivot, the segment 55 may be shifted bodily with relation to a roller 62 carried by a lever 63 adapted to engage the outer end of the needle valve 20′ which is similar to the needle valve 20.

In the modification shown in Figs. 8 and 9 the segment 55′ differs slightly in form from segment 55 and the flexible track 58′, instead of being parallel with the axis of lever 55′, is in a plane substantially at right angles to said axis, said track 58′ being adjustable at various points in its length by adjusting screws 31″ carried by the segment 55′. The flexible track 58′ is adapted to engage a roller 62′ carried by a lever 63′ similar to lever 63.

Difficulty might be experienced in adjusting the flexible track shown in Figs. 6 to 9 inclusive and a construction such as is shown in Fig. 10 may be adopted. In this form I provide, within the main casing, an arm 70 having a roller 71 at its free end, which roller is adapted to be engaged by the air inlet valve 35. Arm 70 is attached to a shaft 71 journaled in the main casing and said shaft is provided at its outer end with a pair of arms 72 and 73. Arm 73 is connected by a link 74 with one end of a link 75 which, at that end, carries a roller 76 adapted to engage the flexible track 77. Track 77 is supported at each end by an angularly adjustable eccentric 78 and at intermediate points is connected to the inner ends of adjusting screws 79. The opposite end of link 75 is connected to one arm of the lever 80, the other arm of said lever being connected to the valve stem 81, said valve stem being similar to the valve stem 20 in Fig. 3 and normally urged outward by a light spring in the same way as spring 21, the arrangement being such that said spring (not shown in Fig. 10) serves to hold roller 76 into engagement with the track 77. A light spring 82, connected to arm 72, serves to hold the roller end of link 75 in its normal upper position, the arrangement being such that, when valve 35 opens by reason of the vacuum established in the casing, it will act upon roller 71 to cause roller 78 to move downward along track 79, said track being adjusted to such shape as to produce the desired positioning of the valve stem 81 for any given position of the valve 35. It is to be understood that the shapes of the flexible track, shown in the drawings, are exaggerated for clearness of illustration.

I claim as my invention:

1. In a carbureter, the combination, with the casing, having an air passage, a fuel nozzle in communication with said passage, and a fuel valve coöperating with said nozzle, of an automatic spring-controlled air valve, a movable member coacting with the said fuel valve for moving the same, intermediate connections between said movable member and the air valve, and means cooperating with said intermediate connections, whereby the effect of the said movable member upon the fuel valve is varied at various points in the stroke of said movable member.

2. In a carbureter, the combination, with the casing, having a mixture passage, a primary air passage communicating with the mixture passage, a fuel nozzle communicating with the primary air passage, a fuel valve coöperating with said nozzle, and a secondary air passage communicating with the mixture passage, of a pair of valves, one mounted in the secondary air passage and adapted to substantially close the same, and

the other mounted in the primary air passage and adapted to only partially close the same, and means for simultaneously actuating the two valves.

3. In a carbureter, the combination, with the casing, having a mixture passage, a primary air passage communicating with the mixture passage, a fuel nozzle communicating with the primary air passage, a fuel valve coöperating with said nozzle, and a secondary air passage communicating with the mixture passage, of a pair of valves, one mounted in the secondary air passage and adapted to substantially close the same, and the other mounted in the primary air passage and adapted to only partially close the same, and means for simultaneously actuating the two valves, a second valve mounted in the secondary air passage and yieldingly held in closing position, and intermediate connections between said last mentioned valve and the fuel valve, for the purpose set forth.

4. In a carbureter, the combination, with the casing, having a mixture passage, a primary air passage communicating with the mixture passage, a fuel nozzle communicating with the primary air passage, a fuel valve coöperating with said nozzle, and a secondary air passage communicating with the mixture passage, of a pair of valves; one mounted in the secondary air passage and adapted to substantially close the same, and the other mounted in the primary air passage and adapted to only partially close the same, and means for simultaneously actuating the two valves, a second valve mounted in the secondary air passage and yieldingly held in closing position, intermediate connections between said last mentioned valve and the fuel valve, for the purpose set forth, and means coöperating with such intermediate connections whereby the effect on the fuel valve is varied at various points in the stroke of the fuel valve.

5. In a carbureter, the combination, with the feeding nozzle and valve thereof, of a flexible track member, means for adjusting said track member transversely at various points in its length, means for bodily adjusting said track member and intermediate connections between said track member and fuel valve for varying the position of the fuel valve relative to its nozzle.

6. In a carbureter, the combination, with the feeding nozzle and valve thereof, of a flexible track member, means for adjusting said track member transversely at various points in its length, means for bodily adjusting said track member independent of the first mentioned adjusting means, and intermediate connections between said track member and fuel valve for varying the position of the fuel valve relative to its nozzle.

7. In a carbureter, the combination, with a main casing having an air passage, an air valve therein, a fuel nozzle communicating with said passage, and a fuel valve coöperating with said nozzle, of a flexible track member, means for adjusting said track member transversely at various points in its length, means for bodily adjusting said track member and intermediate connections between said track member and fuel valve for varying the position of the nozzle valve relative to its nozzle.

8. In a carbureter, the combination, with a main casing having an air passage, an air valve therein, a fuel nozzle communicating with said passage, and a fuel valve coöperating with said nozzle, of a flexible track member, means for adjusting said track member transversely at various points in its length, means for bodily adjusting said track member independent of the first mentioned adjusting means, and intermediate connections between said track member and fuel valve for varying the position of the nozzle valve relative to its nozzle.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this twentieth day of May, A. D. one thousand nine hundred and seven.

GEORGE M. SCHEBLER. [L. S.]

Witnesses:
ARTHUR M. HOOD,
THOMAS W. MCMEANS.