W. K. ANDERSEN.

CARBURETER.

APPLICATION FILED SEPT. 23, 1910.

1,041,708.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.

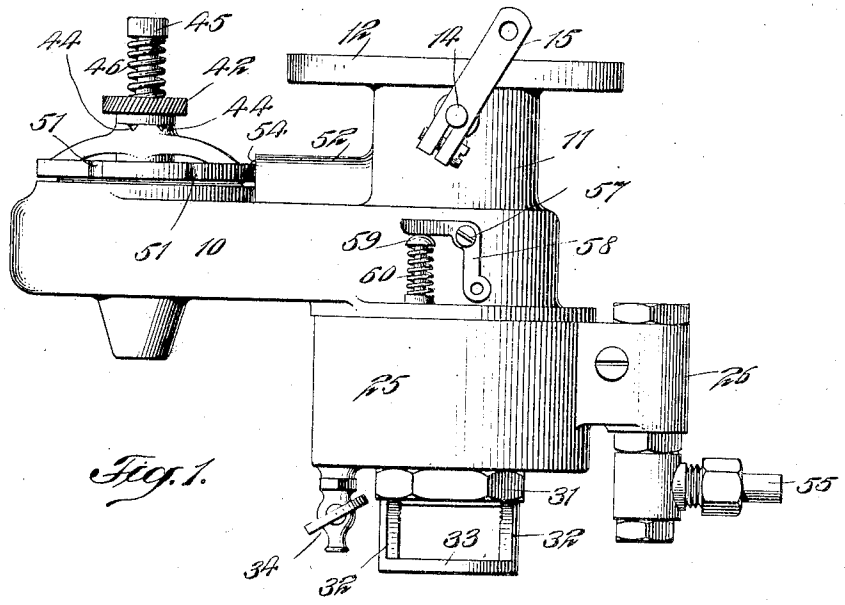

Fig. 1.

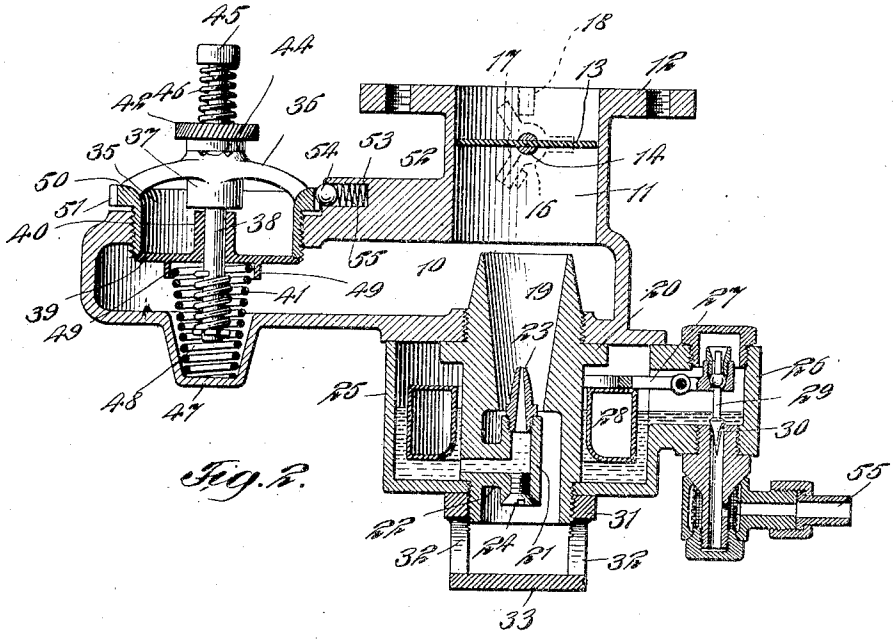

Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

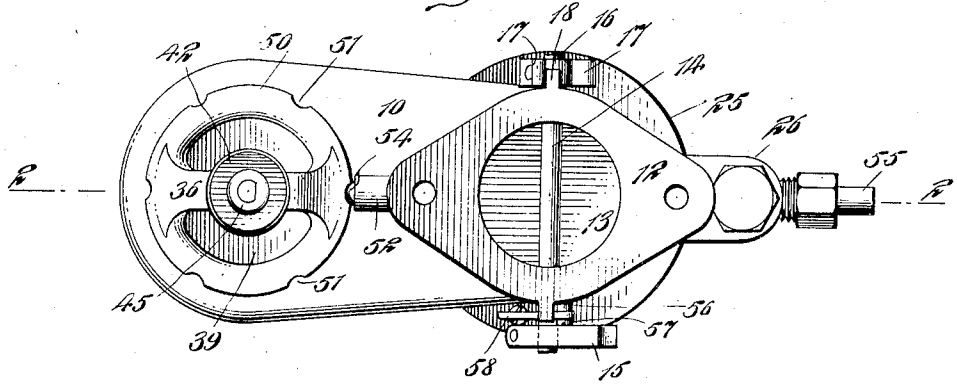


Fig. 4.

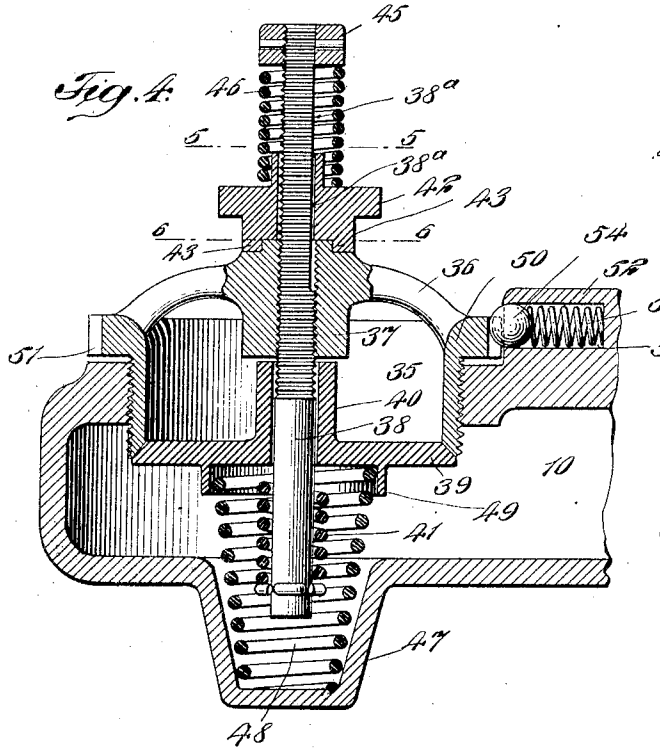


Fig. 5.

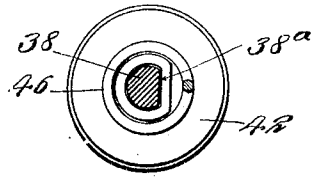
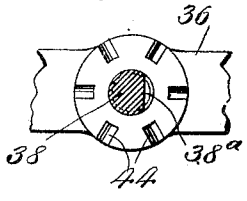


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM K. ANDERSEN, OF NEW YORK, N. Y.

CARBURETER.

1,041,708. Specification of Letters Patent. Patented Oct. 15, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM K. ANDERSEN, a subject of the King of Denmark, residing at Richmond Hill, city of New York, borough of Queens, in the county of Queens and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a full, clear, and exact specification.

My invention relates to means for producing explosive mixtures from hydrocarbons or other liquid fuels adapted for use as a motive power for explosive engines, and the same has for its object more particularly to provide a simple, efficient and reliable apparatus whereby a properly proportioned explosive mixture may be readily produced and maintained.

Further, said invention has for its object to provide a carbureter which may be easily and conveniently adjusted or regulated to produce and maintain said properly proportioned explosive mixture.

Further, said invention has for its object to provide a carbureter in which the air supply may be easily and conveniently adjusted to meet the requirements of the motor under varying conditions of operation.

Further, said invention has for its object to provide a carbureter in which the auxiliary air valve is so constructed and arranged that the same can be easily and conveniently regulated either by adjusting the valve and its support or bushing directly, or by adjusting the valve independently of its support or bushing.

To the attainment of the aforesaid objects and ends, my invention consists in the novel details of construction and in the combination, connection and arrangement of parts hereinafter more fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, wherein like numerals of reference indicate like parts, Figure 1 is a side view showing one form of carbureter constructed according to, and embodying my said invention; Fig. 2 is a longitudinal section taken on the line 2—2 of Fig. 3. Fig. 3 is a plan or top view; Fig. 4 is an enlarged detail central section taken partly on the line 2—2 of Fig. 3, showing a portion of the carbureter casing with the means for controlling or regulating the auxiliary air supply to the carbureter; Fig. 5 is a detail cross-section taken on the line 5—5 of Fig. 4 showing the construction of the valve stem and the means for actuating the same, and Fig. 6 is a detail cross-section taken on the line 6—6 of Fig. 4 showing a portion of the means for securing the valve stem and valve to its adjusted position.

In said drawings, the carbureter is shown comprising a flat, horizontal casing 10 provided upon its upper side adjacent to one end with a tubular outlet 11 having a flange 12 at its upper end for securing the carbureter to the inlet pipe or manifold of a motor.

13 denotes a throttle valve pivotally mounted in the outlet 11 upon a shaft 14, and provided at one end with an operating lever 15, and at its opposite end with a stop 16 having projections 17, 17 thereon adapted to engage with opposite sides of a lug 18 on a flange 12 whereby to limit the movement of said throttle valve 13.

In the bottom of the horizontal casing 10, directly below the outlet 11, is provided a threaded opening within which is secured a tube 19 having its flaring end extending into said casing 10. The said tube 19 is provided upon its outer side with an annular flange 20 adapted to engage the under side of the casing 10 to limit the inward movement of said tube 19 while the same is being secured within said casing.

21 denotes a short tube section arranged vertically within the lower portion of the tube 19 and secured thereto by a short horizontal tube section 22.

23 denotes a conical nozzle secured to the upper end of said vertical tube 21 and extending into the constricted end of the tube 19, and in the lower end of said vertical tube 21 is secured a screw 24 which serves as a closure for the lower end of said tube, and which screw 24 is adapted to be removed therefrom to facilitate the cleaning of the nozzle 23.

25 denotes a circular float casing which is provided in its base with a centrally located threaded aperture adapted to be screwed upon the lower end of the tube 19 whereby to bring the upper edge of said float casing 25 into contact with the under side of the horizontal casing 10 and inclose said tube. The float casing 25 is provided at one side with an offset portion 26 which communicates at its lower end with a source of gasolene supply. Within said offset portion 26

is pivotally secured a lever 27 having its inner end bifurcated and disposed above an annular float 28 arranged within the casing 25 and surrounding the tube 19. At the outer end of said lever 27 is pivotally secured a valve stem 29 having a valve 30 at its lower end adapted to control the supply of gasolene to the float casing 25.

31 denotes a nut adapted to be screwed upon the lower projecting end of the tube 19 and to act as a lock nut to hold the float casing 25 duly secured in position thereon. Said nut 31 is provided with a plurality of depending members 32 to the lower ends of which is secured a flat disk 33. The float casing 25 is provided at its base with a drip-cock 34 to facilitate the cleaning of said float casing.

In the upper side of the casing 10 adjacent to the end opposite to the one from which the outlet 11 extends, is provided a screw-threaded aperture within which is fitted a screw-threaded bushing 35 provided at its lower edge with a valve seat, and at its upper end with a yoke 36, having a vertical bearing 37 in which is adjustably disposed a valve stem 38.

39 denotes a valve having an upwardly extending sleeve portion 40, and disposed upon the valve stem 38, and below the valve 39 is mounted a coil spring 41. The upper portion of the valve stem 38 is screw-threaded and adapted to work within the interiorly-threaded vertical bearing 37. The upper end of the valve stem 38 is also partly cut away at one side to form a flat surface 38ª, and upon the cut-away portion of said valve stem 38 is secured a nut 42 provided upon its under side with oppositely arranged depending teeth 43, 43 adapted to enter into correspondingly shaped notches or recesses 44, 44 provided in the upper surface of the bearing 37. Upon the extreme upper end of the valve stem 38 is rigidly secured a head 45, and intermediate said head and the nut 42, is disposed a coil spring 46 whereby the projections or teeth 43, 43 arranged upon the under side of said nut 42 may be maintained in position within the recesses 44, 44 in the upper end of the bearing 37 in order to hold said valve stem and valve to their adjusted positions.

In the body of the valve casing 10 directly below the center of the valve bushing 35, is provided a depressed portion or recess 47 forming a receptacle to receive the lower end of a spring 48 which has its end in contact with the under side of the valve 39, and maintained in position thereunder by a depending annular flange 49 extending from the under side of the valve 39. The valve bushing 35 is provided at its upper edge with a laterally extending flange 50 having a series of vertical recesses 51, 51 in the periphery thereof, arranged equally distant from each other, and the casing 10 is provided upon its upper surface with a projection 52 having a horizontal opening 53, in one end thereof adjacent to the flange 50 of the bushing 35, in which opening is disposed a ball 54 maintained normally slightly projected by a spring 55 arranged in the portion of said opening behind said ball 54. The ball 54 is maintained in position within said horizontal opening 53 by slightly reducing the diameter of the outer end of said opening; and is adapted to enter into the vertical recesses 51 in the flange 50 of the bushing 35 as the bushing is rotated in the course of the adjustment of the valve 39, and hold said bushing and its valve to their adjusted positions within the casing. Upon the outer side of the casing 10 just above the float casing 25 is provided an outwardly extending bearing 56 upon which is pivotally secured by a screw 57, a bell-crank 58 having the end of its horizontal member bearing upon a priming pin 59 which extends through the casing 10, and into the float casing 25, and has its end bearing upon one of the bifurcated ends of the lever 27 controlled by said float 28.

60 denotes a coil spring disposed upon the priming pin 59 intermediate its upper end and the casing 10. The end of the vertical portion of said bell-crank lever is adapted to be connected with a suitable actuating device whereby said priming pin may be depressed in order to obtain the initial supply of gasolene to start the motor.

The operation of the carbureter is as follows: Gasolene is admitted in the usual manner through the inlet 55, and controlled by the valve 30 through the medium of the lever 29 and float 28 arranged within the float casing 25. As soon as the throttle valve 13 is opened and the motor set in operation, air will be drawn primarily through the open lever end of the tube 19, and mix with a certain amount of gasolene issuing from the conical nozzle extending into the constricted lower end of said tube 19. As the suction increases, owing to the increased speed of the motor, air will be drawn into the casing 10 through the auxiliary inlet formed by the bushing 35, and pass between the lower edge of said bushing 35 and the valve 39 seating thereon. The action of the valve is initially controlled by the larger and weaker spring 48, and as the suction becomes greater and more air must be drawn into the carbureter, the valve 39 will be opened still further, and as it continues to descend it will engage the upper end of the spring 41 disposed upon the lower end of the valve stem 38 and thereupon the downward or opening movement of the valve will be yieldingly resisted for the remainder of its movement by the combined action of the springs 41 and 48. The opening movement

of the valve 39 is primarily controlled by the spring 48, and the tension of this spring may be increased or diminished by rotating the bushing 35 within its threaded opening. As soon as the bushing 35 has been adjusted to the desired position in order to obtain the required tensioning of the valve 39 the ball 54 will automatically spring into the recess 51 nearest thereto in the flange 50, and thus serve to hold the bushing with its valve to the adjusted position. The further action of the valve 39, as it opens wider under the increased suction of the motor, is controlled by the small spring 41 disposed upon the lower end of the valve stem within the larger spring 48. The amount of movement accorded to the valve 39 upon the stem 38 under the lesser resistance of the spring 41 is controlled by rotating the nut 42 and the valve stem 38, which being in threaded engagement with the vertical bearing 37 is caused to rise or descend according to the direction in which the nut 42 is turned. By turning the nut 42 to the left, the distance between the under side of the valve 39 and the upper end of the spring 41 is increased, and by turning the nut 42 to the right the distance is diminished. As soon as the desired adjustment has been obtained, the spring 46 upon the upper nut of the valve stem 38 will cause the projections 43, 43 on the under side of the nut 42 to spring into the recesses 44, 44 provided in the upper side of the bearing 37, and thus serve to hold the parts to their adjusted position.

It will be noted that in my improved carbureter I am enabled to easily and conveniently adjust the auxiliary air supply to suit the conditions of operation under low speed as well as under high speed by merely turning the bushing 35, or by turning the nut 42 arranged upon the valve stem 38, which control the primary resisting spring 48, and the secondary resisting spring 41, respectively.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is as follows:

1. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a support adjustably mounted in said auxiliary air inlet, means for securing said support to its adjusted position, a valve mounted upon said support, means for yieldingly resisting the movement of said valve with one degree of resistance for a part of its movement, and means for resisting the movement of said valve with a greater degree of resistance for the remainder of its movement, means for actuating said adjustable support whereby to regulate the tension of the means for initially resisting the movement of said valve, and means for regulating the tension of the means for subsequently resisting the movement of said valve for the remainder of its movement, substantially as specified.

2. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a support adjustable in said auxiliary air inlet, means for securing said support to its adjusted position, a valve stem adjustably mounted in said support, a valve loosely mounted upon said stem, means for yieldingly resisting the movement of said valve for a portion of its movement, and means arranged upon said stem for yieldingly resisting the movement of said valve stem for the remainder of its movement, substantially as specified.

3. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a support adjustable in said auxiliary air inlet, means for securing said support to its adjusted position, a valve stem adjustably mounted in said support, a valve loosely mounted upon said stem, means for regulating the extent of movement of said valve, means arranged within said casing below said valve for primarily resisting the movement of said valve, and means arranged upon said valve stem below said valve adapted to coöperate with said first-named means for resisting the movement of said valve for the remainder of its movement, substantially as specified.

4. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a screw-threaded bushing adjustably arranged in said auxiliary air inlet, a valve stem adjustably mounted in said bushing, a valve loosely mounted upon said bushing and adapted to seat thereon, means arranged upon said valve stem for regulating the movement of said valve upon said stem, a spring arranged within said casing below said valve for initially resisting the movement of said valve, and a spring disposed upon said valve stem below said valve adapted to coöperate with said first-named spring whereby to subsequently resist the movement of said valve for the remainder of its movement, substantially as specified.

5. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a screw-threaded bushing adjustably arranged in said auxiliary air inlet, means for securing said bushing to its adjusted position, a valve stem adjustably mounted in said bushing, a valve loosely mounted upon said bushing and adapted to seat thereon, means arranged upon said valve stem for regulating the movement of said valve upon said stem, a spring arranged within said casing below said valve for initially resisting the movement of said valve, and a spring disposed upon said valve stem below said valve adapt-

ed to coöperate with said first-named spring whereby to subsequently resist the movement of said valve for the remainder of its movement, substantially as specified.

6. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a screw-threaded bushing adjustably arranged in said auxiliary air inlet, a valve stem having a threaded portion and loosely mounted in said bushing, an adjusting nut arranged upon the threaded portion of said stem whereby to regulate the extent of movement of said valve upon said stem, a spring arranged upon said stem intermediate its upper end and said nut whereby to hold said stem to its adjusted position, a valve loosely mounted upon the lower portion of said stem adapted to seat against the under side of said bushing, a spring disposed within said casing below said valve adapted to moderately resist the movement of said spring for a portion of its movement, a spring disposed upon the lower end of said valve stem below the valve thereon adapted to coöperate with said first-named spring whereby to resist to a greater degree the movement of said valve for the balance of its movement, and a spring actuated device adapted to engage with said bushing whereby to hold the same to its adjusted position, substantially as specified.

7. In an apparatus of the character described, the combination with a casing having an auxiliary air inlet, of a screw-threaded bushing adjustably arranged in said auxiliary inlet, a flange on said bushing having a series of recesses therein, a valve stem having a threaded portion and loosely mounted in said bushing, an adjusting nut arranged upon the threaded portion of said stem whereby to regulate the extent of movement of said valve upon said stem, a spring arranged upon said stem intermediate its upper end and said nut, whereby to hold said stem to its adjusted position, a valve loosely mounted upon the lower portion of said stem adapted to seat against the under side of said bushing, a spring disposed within said casing below said valve adapted to moderately resist the movement of said spring for a portion of its movement, a spring disposed upon the lower end of said valve stem below the valve thereon adapted to coöperate with said first-named spring whereby to resist to a greater degree the movement of said valve for the balance of its movement, and a spring actuated device arranged in said casing adapted to engage with the recesses in said bushing whereby to secure said bushing to its adjusted position, substantially as specified.

Signed at the city of New York, borough of Manhattan, in the county and State of New York, this thirty-first day of August, one thousand nine hundred and ten.

WILLIAM K. ANDERSEN.

Witnesses:
CONRAD A. DIETERICH,
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