C. F. JOHNSON.

CARBURETER.

APPLICATION FILED SEPT. 29, 1913.

1,095,212.

Patented May 5, 1914.

2 SHEETS—SHEET 1.

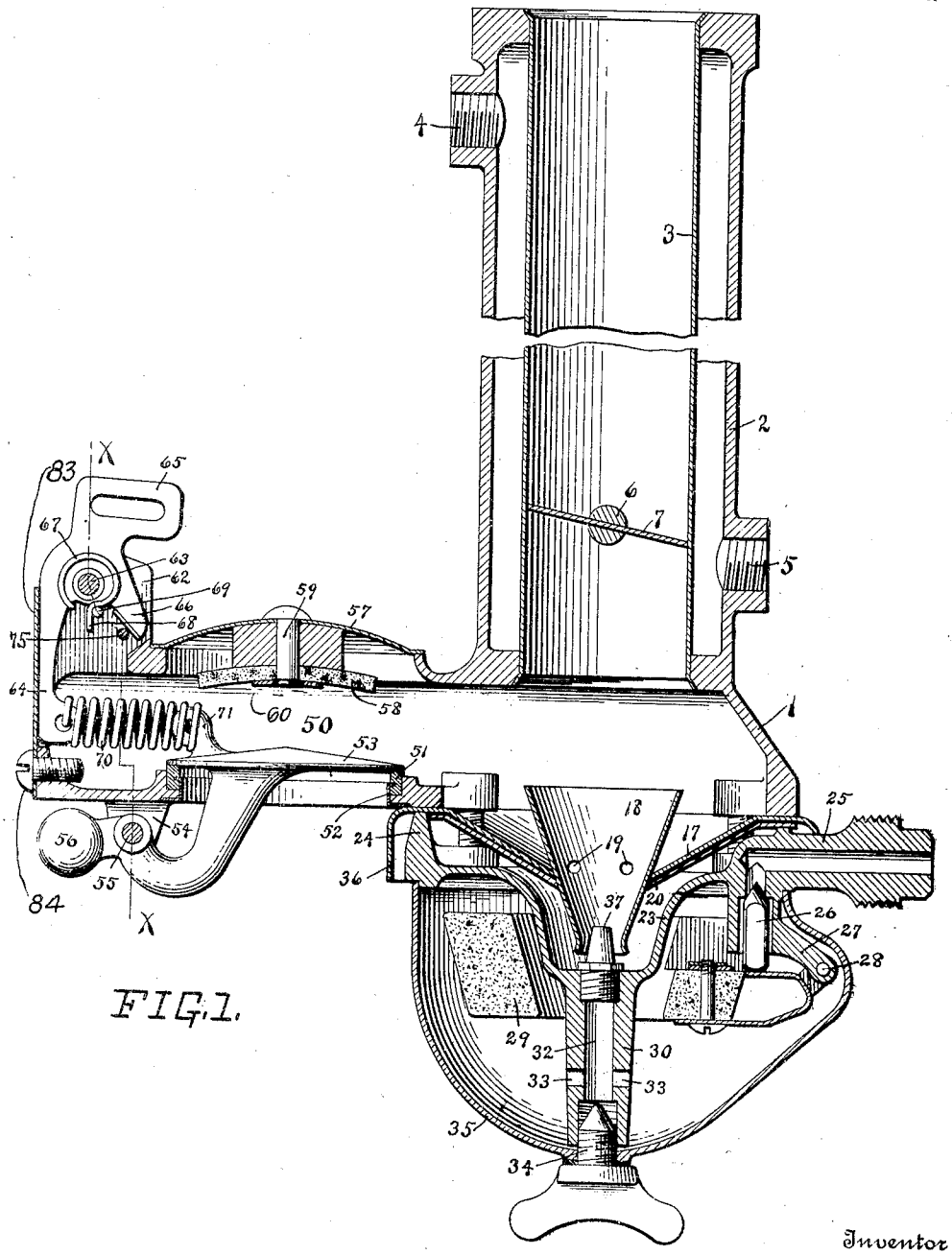


FIG. 1.

Witnesses

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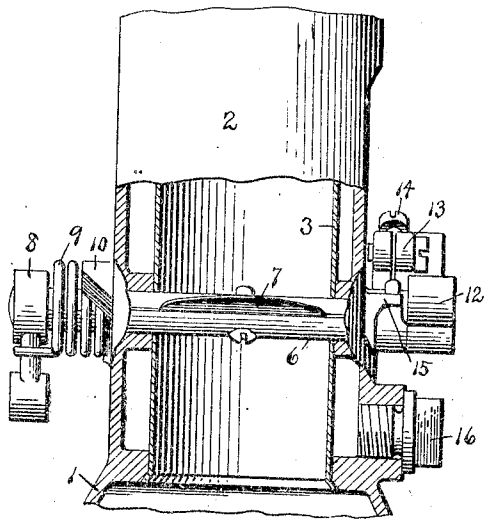


FIG. 2.

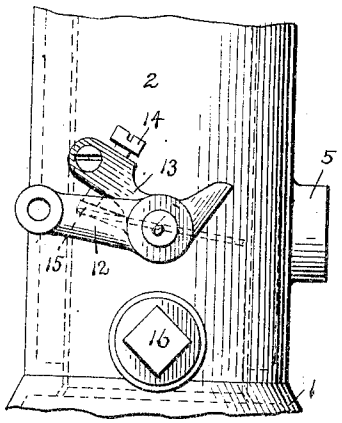


FIG. 3.

FIG. 4.

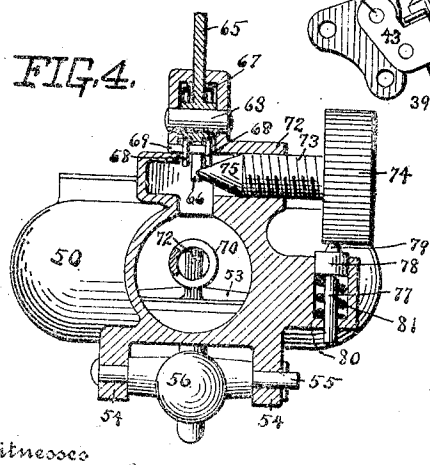
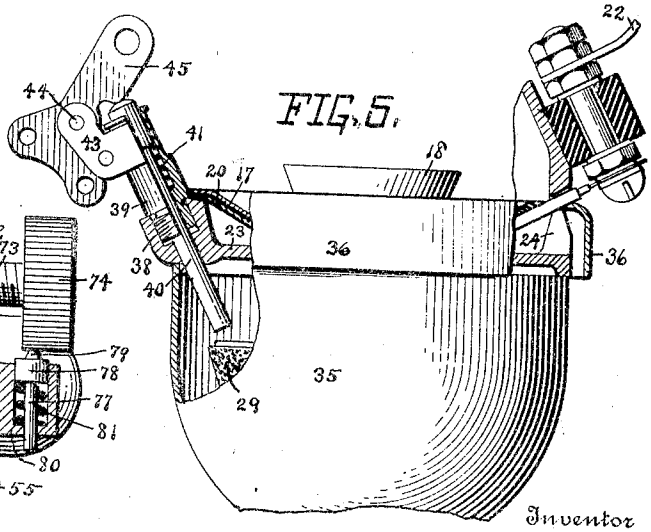


FIG. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,095,212. Specification of Letters Patent. Patented May 5, 1914.

Application filed September 29, 1913. Serial No. 792,251.

To all whom it may concern:

Be it known that I, CHESTER F. JOHNSON, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Carbureter, of which the following is a specification.

This invention relates to means for controlling the current of air passing through the carbureters of internal combustion engines, and its object is to provide a novel valve to control this current of air, and a simple and readily adjusted abutment for the spring which normally holds the air valve on its seat.

This invention consists, in combination with the body of the carbureter, of a valve chamber adjacent thereto, a novel disk valve pivotally mounted in said valve chamber, an adjustable abutment, and a compression spring engaging said abutment and the valve and positioned substantially parallel to the plane of the valve.

In the accompanying drawings, Figure 1 is a central section of the carbureter. Fig. 2 is a transverse section through the throttle valve. Fig. 3 is an elevation of the adjusting device for the throttle valve. Fig. 4 is a section on the line *x*—*x* of Fig. 1. Fig. 5 is an elevation of the float chamber, portions being broken away to show details of construction.

Similar reference characters refer to like parts throughout the several views.

This carbureter comprises a body constituting a carbureting chamber, a float chamber secured thereto, a valve chamber connecting to the body, and a discharge passage extending from the body and in which the throttle valve is mounted.

The body 1 has connected to it an upwardly extending cylindrical shell 2 provided with a tubular lining 3, between which and the shell 2 the circulating water of the engine may pass through the openings 4 and 5 to heat the explosive mixture. A shaft 6 extends through the shell 2 and the lining 3, and carries the throttle valve 7. An arm 8 on one end of the shaft is engaged by the spring 9, the other end of the spring engaging the lug 10 on the shell 2. This spring normally holds the throttle valve in the position shown in Fig. 1. A second arm 12 may be secured to the other end of the shaft 6 so that the throttle may be opened by connecting means extending from a plurality of stations. A third arm 13, carrying an adjustable screw 14, is shown secured to this shaft, the screw engaging a lug 15 on the shell to determine the size of the passage around the throttle valve when the valve is at the limit of its closing movement. A plug 16 permits drainage of the space between the shell 2 and lining 3.

Across an opening in the bottom of the body 1 is a downwardly inclined diaphragm 17, having a downwardly-tapering strangle-tube 18 mounted in its center. The tube 18 has perforations 19 to permit draining off of the fuel which may condense in the body and accumulate on the diaphragm. A heating element 20, grounded at one end on the tube 18, may be secured to the lower side of the diaphragm and be energized by current over the wire 22.

The float-chamber consists of a central casting, comprising the head 23, having upwardly extending lugs 24 contacting with the diaphragm, the feed connection 25 having a seat for the valve 26, the arm 27 carrying a pivot 28 for the float 29, and the stem 30 having the passages 32 and 33. A plug 34 screws into the bottom of the passage 32 and holds the cup 35 in position. The diaphragm has a downwardly extending flange 36 over the openings between the lugs 24. A nozzle 37 may have a predetermined bore to deliver the proper amount of fuel oil.

An extension 38 on the head 23 carries a sleeve 39 in which a stem 40 is slidably mounted, being normally held up by the spring 41. A bracket 43 on the sleeve supports a pivot 44 on which is mounted a lever 45 which may be swung to depress the stem 40 to hold down the float and thus permit the level of the fuel oil to rise higher than the upper end of the nozzle 37 and fill the depression in the head 23, thus insuring a very rich mixture.

A valve chamber 50 extends from the body 1 and has a lower opening or air inlet surrounded by a ring 51, preferably of leather, held in position by a ring 52 of metal. The ring 51 is the seat of the valve 53, which is preferably of aluminum so that it may be very light. Lugs 54, extending down from the chamber 50, support the pivot 55 for this valve, which valve may be counterbalanced by the weight 56. The upper opening in the valve chamber may be closed by a

cap 57. A disk 58, preferably of leather, may be secured to this cap by means of a rivet 59 and washer 60 and furnish a noiseless abutment for the valve 53 and limit its upward movement.

Two plates 62 on the upper side of the valve chamber carry the pivot 63 for the controlling lever which has a downwardly extending arm 64, a slotted arm 65 and an inclined arm 66. This lever is normally in the position shown in Fig. 1, being thus held by means of a double spring 67 that has a circular portion on each side of this lever, concentric with the pivot 63, the two circular portions connected at the right of the arm 64, and the ends 68 of the spring engaging the pin 69. As the circular portions of the spring tend to open, the arm 64 of the lever will be held toward the left, as in Fig. 1.

A compression spring 70 connects to the lower end of the arm 64 and to the lug 71 on the valve 53 and normally holds the valve on its seat. The relation of the parts is such that the spring 70 will be substantially parallel to the seat of the valve 53. When the engine is turned over and begins to draw air up through the carbureter, the valve 53 will be lifted, and, because of the spring 70 being mounted above the plane of the valve and on the opposite side of the valve from its pivot, it will swing up on its outer end as a pivot, so that the rate of compression of the spring will be less than the rate of movement of the valve. If the point of connection of the spring with the arm 64 were moved near to the pivot 55, the compression of the spring would decrease still slower, until the point of support and the pivot 55 coincided when there would be no effective action of the spring.

Moving the point of support from the pivot 55 results in the compression of the spring increasing much faster, the maximum being reached when the line of the spring is at right angles to the line connecting the pivot of the valve and the point of attachment of the spring to the valve. I have found that the most effective action is obtained by so proportioning the parts that the pivot 55 is below substantially the middle of the length of the spring and the spring is substantially parallel to the face of the valve.

To increase the initial tension of the spring, a threaded projection 72 on the valve chamber may be formed to receive the screw 73, provided with a ribbed knob 74 and a pointed end 75 adapted to engage the inclined arm 66, as shown in Fig. 1. By screwing in this point, the arms 66 and 64 will be swung toward the right, (in Fig. 1) and thus initially compress the spring 70. A small pin 77, having a collar 78 and pointed end 79, may be mounted on a proper bore in an extension 80, being held upward by the spring 81 so that the point 79 will engage the knob 74 and prevent the screw from turning after it has been adjusted.

A flat plate 83 may be secured over the space between the plates 63, as shown in Fig. 1, by means of the screw 84, and prevent the entrance of dust and dirt.

By means of a connector attached to the arm 65, increased tension can be put on the spring 70 and the flow of the air through the main inlet may be thereby retarded, thus reducing the air pressure in the body of the carbureter and causing an increased flow of fuel from the nozzle 37. The normal tension on the spring can be regulated by turning the screw 73, in or out, and thereby increasing or decreasing the tension of the spring 70.

I claim.

1. In a carbureter, the combination of a carbureting chamber, a valve chamber connected thereto and having an air inlet in its lower side, a flat valve normally closing said opening and having a downwardly and outwardly extending arm, a pivot for said arm and valve mounted on the valve chamber below the plane of the valve, a lug on the upper side of the valve, and a compression spring mounted above the plane of the valve and substantially parallel thereto and in engagement with said lug to normally hold down the valve.

2. In a carbureter, the combination of a carbureting chamber, a valve chamber connected thereto and having an air inlet in its lower side and a valve-seat encircling the opening, a pivot support extending down from the body and a pivot mounted therein, a valve normally closing the air inlet and having a downwardly extending arm mounted on the pivot, a lug on the upper side of the valve, a compression spring mounted above the plane of the valve with one end in engagement with said lug, and adjustable means for supporting the opposite end of the spring.

3. In a carbureter, the combination of a body having an air inlet and a valve-seat encircling the opening, a pivot support extending down from the body at one side of the opening, a valve normally closing the air inlet and having an arm extending through the opening and pivoted on said support, a compression spring extending above and parallel to the valve seat, a lug on the valve engaging one end of the spring, and an adjustable lever engaging the opposite end of the spring.

4. In a carbureter, the combination of a body having an air inlet, a pivot support extending downwardly at one side of the opening, a valve normally closing said opening and having an arm extending down through the opening, a pivot for the arm mounted on said support, a counterbalance

on the arm beyond the pivot, a lever pivotally mounted adjacent the valve, a spring having one end in engagement with the lever and the other in engagement with the valve, and a screw in engagement with the lever for determining the initial stress of the spring.

5. In a carbureter, the combination of a chamber having an air inlet, a pivot support extending downwardly at one side of the opening, a valve normally closing said opening and having an arm extending down through the opening, a pivot for the arm mounted on the support, a lever pivotally mounted adjacent the valve, a spring having one end in engagement with the lever and the other in engagement with the valve, a pointed screw in engagement with the lever for determining the initial tension of the spring, and means for locking the screw in a given position of adjustment.

6. In a carbureter, the combination of a chamber having an air inlet, a pivotally mounted valve normally closing the inlet, a pivotally mounted lever adjacent the valve, a spring having one end in engagement with the lever and the other end in engagement with the valve, means tending to move the lever in a direction such that, if unrestricted, it would tend to tension the spring, and adjustable means for limiting the amount of said movement.

7. In a carbureter, the combination of a chamber having an air inlet, a pivotally mounted valve normally closing the inlet, a pivotally mounted lever adjacent the valve, a spring having one end in engagement with the lever and the other end in engagement with the valve, a second spring tending to swing the lever in a direction such that, if unrestricted, it would tend to tension the first spring, and adjustable means for limiting the amount of said movement.

8. In a carbureter, the combination of a chambered body having an air inlet, a pivotally mounted valve normally closing the inlet, pivot supporting plates integral with the body, a lever pivoted between said plates, means connecting the lever with the valve, and a plate for closing the space between the pivot supporting plates.

9. In a carbureter, the combination of a body having an air inlet, a valve normally closing the air inlet, a pivot for said valve adjacent the inlet and below the plane of the valve, a compression spring extending above and parallel to the valve seat and substantially equal distances on each side of said pivot, a lug of the valve engaged by one end of the spring, and adjustable means engaging the opposite end of the spring.

10. In a carbureter, the combination of a chamber having an air inlet, a pivotally mounted valve normally closing the inlet, a pivotally mounted lever adjacent the valve, a spring having one end in engagement with the lever and the other end in engagement with the valve and tending to move the lever in one direction, a second spring engaging with the lever and tending to move it in the same direction, and adjustable means for limiting the amount of movement that may be given to the lever.

11. In a carbureter, the combination of a chamber having an air inlet, a pivotally mounted valve normally closing the inlet, a pivotally mounted lever adjacent the valve, a spring having one end in engagement with the lever and the other end in engagement with the valve, and tending to move the lever in one direction, a second spring engaging with the lever and tending to move it in the same direction, and a screw for limiting the amount of movement that may be given to the lever.

12. In a carbureter, the combination of a carbureter chamber, a valve chamber connected thereto and having an air inlet, a substantially flat valve normally closing said inlet, said valve having attached thereto an outwardly and laterally extending arm, a pivot for said arm and valve mounted on the valve chamber, a projection on one side of the valve, and a spring mounted at the same side of the valve as the projection, said spring being arranged substantially parallel to the plane of the valve and having one of its ends in engagement with said projection to normally hold down the valve.

13. In a carbureter, the combination of a carbureter chamber, a valve chamber connected thereto and having an air inlet, a valve-seat around said inlet, a substantially flat inwardly opening valve normally closing said inlet, said valve having attached to the outer side thereof an outwardly and laterally extending arm and to the inner side thereof an inwardly extending projection, a pivot for said arm, and a spring mounted on the same side of the valve as the projection, said spring being arranged substantially parallel to the plane of the valve and having one of its ends in engagement with said projection to normally hold the valve upon the seat.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHESTER F. JOHNSON

Witnesses:
HUGO W. KREINBRING,
L. M. SPENCER