

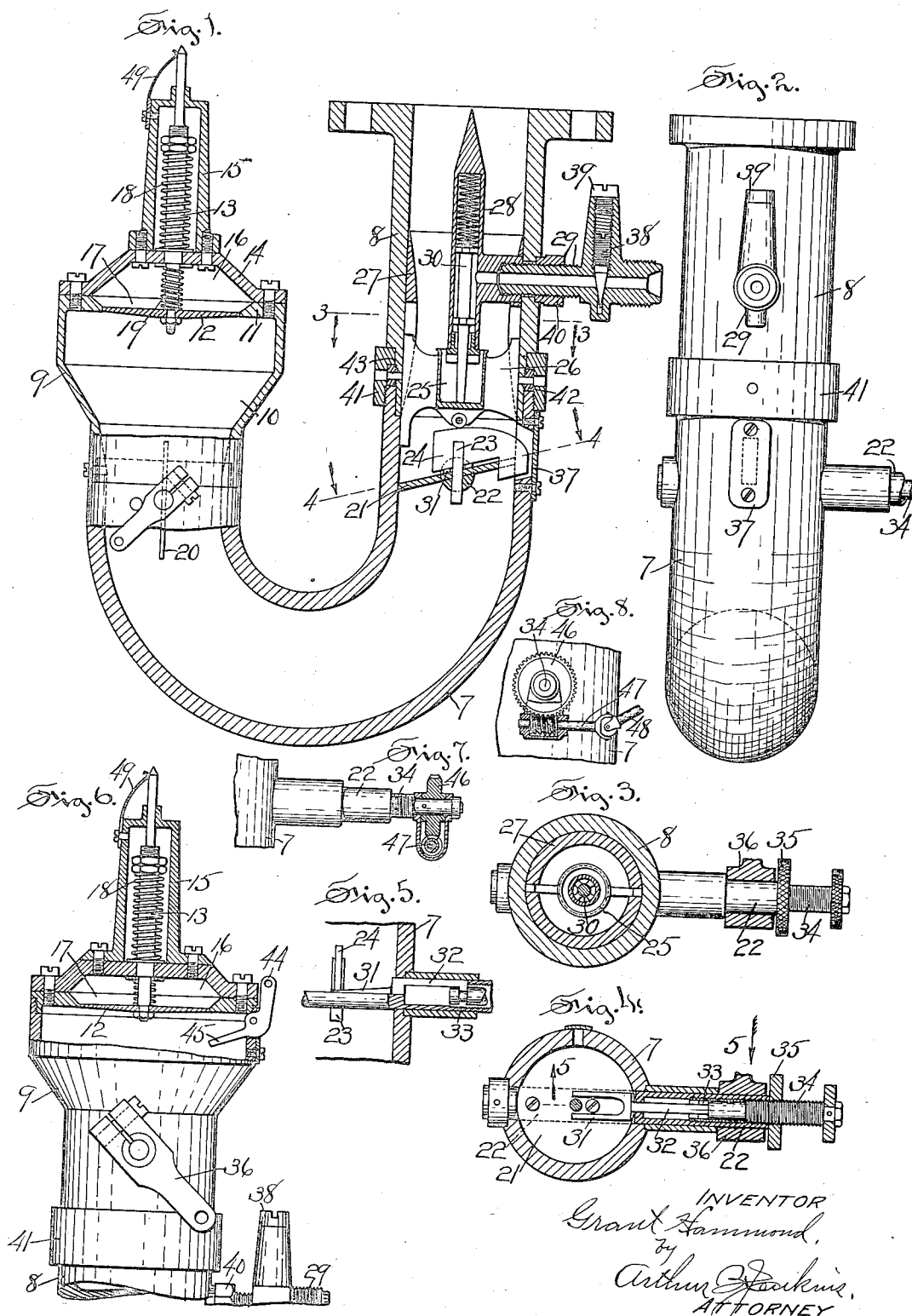
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CARBURETOR

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CARBURETOR

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My invention relates to the class of devices that are employed for mixing fuel and air for combustion purposes, as in internal combustion engines, and an object of my invention, among others, is the production of a device of this type that shall be simple in construction and particularly efficient in operation.

One form of a carburetor embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawing, in which—

Figure 1 is a view in central lengthwise section through the larger part of my improved carburetor.

Figure 2 is an end view of the device.

Figure 3 is a view in section on a plane denoted by the dotted line 3—3 of Figure 1.

Figure 4 is a view in section on a plane denoted by the dotted line 4—4 of Figure 1.

Figure 5 is a view in section on a plane denoted by the dotted line 5—5 of Figure 4.

Figure 6 is a view of the intake end of my improved carburetor broken away to show a slightly modified form of construction.

Figures 7 and 8 are detail side and end views respectively of the parts for adjusting the needle valve cam showing a modification thereof.

In the accompanying drawing the numeral 7 indicates the body of my improved carburetor that is of tubular form and of substantially U-shape, and is adapted to be removably attached to a connector 8 formed for attachment as to the manifold of an internal combustion engine. The outer end of the body is flared, this flared portion 9 constituting an intake having an intake chamber 10 with a flange 11 formed with a central opening somewhat larger in size than the opening through the body 7.

A valve 12 is so fitted within said opening as to provide just sufficient air for the engine while "idling", said valve being attached to the inner end of a valve stem 13 projecting outwardly through a bridge 14 and hollow tip 15. Said bridge is attached to the intake, as by means of screws and the tip is secured to the bridge in a similar manner, and as shown in Figure 1 of the drawing. Inlet openings 16 are formed on opposite sides of the bridge into an inlet chamber 17 thereunder. A valve closing spring 18 is located in a chamber in the tip 15, the lower end of the spring being seated against the end of the bridge 14 and the opposite end being secured by nuts attached to the valve stem as by means of screw threads.

The spring 18 is of sufficient strength to keep the valve 12 closed while the engine is "idling", but to permit said valve to gradually open under conditions created by the engine in the carburetor as the speed of the engine increases and when it is operating under normal conditions. A vent spring 19 is mounted on the stem 13 between the top of the bridge 14 and the valve 12. This spring is for the purpose of holding the valve in place except in cases of "backfire" at which time the spring yields and permits the valve to open to release the pressure. A choke valve 20 is located adjacent to the intake chamber 10, this choke valve being of any ordinary construction and it may be operated in any ordinary manner.

A throttle valve 21 is secured to a valve spindle 22 rotatably mounted in the sides of the body 7, the spindle being of hemicylindrical shape in cross section within the tube and the valve being secured to the flat side of the spindle. A cam retaining pin 23 projects from said spindle into a slot in a needle actuating cam 24 supported by the throttle valve, said cam having a tail projecting into a slot in the valve to retain the cam in place. The edge of said cam engages a roller 25 rotatably mounted in a projection from the under side of a vacuum cup 25 supported by a web 26 extending across the opening in the connector 8, the ends of the web being located in slots in a Venturi tube 27 in said connector.

A valve case 28 is supported on the end of a nipple 29 projecting through the wall of the connector 8, said case containing a spring pressed needle valve 30 for controlling flow of fuel into the carburetor. All of the parts just described may be of ordinary construction and further description is therefore omitted herein.

The position of the cam 24 with respect to the valve 21 may be adjusted as by means of a forked cam adjuster 31 that straddles the pin 23. The forked end of this adjuster is tapered and lies between the cam and the valve, as shown in Figure 1 of the drawing. A stem 32 from the adjuster has a lug 33 at its end located in a groove in the inner end of an adjusting spindle 34 projecting into a hole formed lengthwise in the outer end of the throttle valve spindle 22. The spindle 34 is screw threaded into said hole and is clamped to the spindle 22 as by means of a clamp nut 35, as shown in Figures 4 and 5 of the drawing.

When the nut 35 is tightened the spindles 22 and 34 are rigidly united and the valve 21 is then operated as by means of a valve actuating arm 36 secured on the valve spindle 22 and connected in any ordinary manner with a manually operated

device for controlling the throttle. The cam 24 projects into an opening in the side of the body 7 of the carburetor, said opening being closed by a plate 37, as shown in Figure 1 of the drawing.

5 A regulating valve 38 is located in a projection from the side of the nipple 29, this valve being tapered and projecting across the passage through the nipple into a hole in the opposite side of the passage. This valve may be adjusted as
10 by means of a screw driver inserted into a hole in the projection, said hole being closed as by means of a screw 39. By means of this valve the amount of combustible fluid supplied to the carburetor may be adjusted in accordance with
15 atmospheric conditions. A nut 40 is used to clamp the nipple in place. The mouth of the cup 25 is flared or of trumpet shape whereby a partial vacuum is produced in the mouth of the cup as the air rushes past such mouth, this aiding out-
20 ward flow of fuel from within the cup.

The body 7 is attached to the connector 8 by means of a band 41 that is secured to the end of said body. A ring 42 is screwed on to the re-
25 duced end of the connector 8, this ring forming a shoulder that is engaged by a lip 43 on one edge of the band 41. Registering holes are formed through the ring and band. To attach the parts the ring 42 is placed within the band against the flange thereon and pins are placed
30 in the registering openings. The parts are now slipped over the reduced end of the connector 8 and turning movement of the band causes the ring to engage the threads on the connector.

The parts are turned until the end of the
35 thread is reached, at which time further turning movement of the parts is prevented. In this position there will be looseness enough between the ring and the lip 43 to permit free turning movement of the band after the pins have been moved
40 inwardly out of the holes in the band and into the holes in the ring and reduced end of the connector. The end of the body 7 is now placed within the band, the threads are engaged and a turning movement of the band will draw the body
45 tightly into place. To disconnect the parts the band is turned in the opposite direction, loosening the body and then by inserting a tool into the opening the pins are moved outwardly into the holes in the ring and band, and the band then
50 being turned the ring is disengaged.

In the structure shown in Figure 6 the valve 12 is utilized as a choke valve. In this structure the U-bend in the body 7 is omitted and the flared
55 part 9 of the body is located adjacent the throttle valve. In this structure a choke lever 44 is pivotally mounted at one side of the enlarged end of the body and said lever has a choke finger 45 projecting into the body and underlying the valve, as
60 shown in Figure 6. The lever 44 is connected with any ordinary form of choke device, as a knob, and in starting operations, this knob being pulled, the finger is brought into contact with the valve to prevent the latter from opening and the intake is therefore closed in a manner common
65 to choking operations.

The valve 12 is in fact a vacuum retaining valve and operates to preserve the vacuum within the manifold should the throttle be suddenly opened to a material degree to increase the speed of the
70 engine. This valve will maintain a vacuum according to the tension of the spring when the throttle is thrown wide open.

It frequently happens that extra power is instantly required, and with a carburetor having a
75 wide open air intake, if the throttle be sud-

denly opened, the vacuum within the manifold is instantly destroyed. As it is this vacuum which draws the fuel into the manifold for supply to the engine, the destruction of the vacuum cuts off the supply of fuel and the engine becomes stalled.

With my improved device if the throttle be suddenly opened to obtain increased power, the valve 12 remains closed and thereby preserves the vacuum in the manifold and the fuel in enriched
10 quantities is supplied to the engine which immediately picks up its speed, and as the speed increases the conditions within the carburetor become such as to cause the valve to gradually open, until, with the engine running the full speed, said
15 valve is opened to its full extent. I have found that this effect will be obtained in an automobile traveling at less than five miles an hour on an upgrade and without changing the gears from "high" to a lower speed.

Retention of the valve 12 in its closed position at a time when the throttle is suddenly opened, as above described also supplies a rich mixture at just the time when extra power is
20 required to enable the engine to speed up from a low running condition.

In the structure shown in Figures 7 and 8 operation of the adjuster cam 31 is provided for by means that may be located upon the instrument board of an automobile. To accomplish this a
30 worm gear 46 is secured to the spindle 34 and a worm secured to an adjusting shaft 47 meshes with the worm gear. The shaft 47 is suitably connected with an operating device on the instrument board, a portion of such connection
35 shown herein being in the form of a universal joint and a connecting shaft 48.

When the valve 12 is in its closed position and the spring 18 is under minimum tension unless restrained there is liability of vibration. To
40 avoid this I provide a dampener in the form of a spring 49 which presses with its free end against the stem 13 just under the pointed tip thereof as shown in Figure 1.

In accordance with the provisions of the patent statutes I have described the principles of
45 operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative, and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim:

1. A carburetor including a body, a throttle
55 valve within the body, a valve actuating cam supported by said throttle valve, a wedge interposed between the throttle valve and cam for adjusting the position of the latter, a stem on said adjusting wedge, an adjusting spindle into
60 which said stem projects, and means for securing said stem and spindle together.

2. A carburetor including a body, a throttle valve located within the body, a valve operating spindle secured to said valve, a valve actuating
65 cam supported by said throttle valve, an adjusting wedge located between the throttle valve and cam, a stem projecting from said wedge into an opening in said spindle, an adjusting spindle projecting into said opening and engaged with the
70 stem therein, and means for rigidly securing said adjusting and throttle spindles together.

3. A carburetor including a body, a throttle valve within the body, a valve actuating cam supported by said throttle valve, a member to
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adjust the position of said cam, a stem on said adjusting member, an adjusting spindle and a throttle actuating spindle one of which is attached to said stem and one of which is screw threadedly engaged with the other, and a lock nut for securing said spindles together.

4. A carburetor including a body, a throttle valve within the body, a valve actuating cam supported by said throttle valve, an adjusting member interposed between said valve and cam for adjusting the position of the latter, a stem on said adjusting member, an adjusting spindle and a throttle actuating spindle one of which is attached to said stem and one of which is screw threadedly engaged with the other, a worm gear secured to one of said members, a worm in mesh with said worm gear, and a connection with said worm for operating said adjusting member.

5. A carburetor including a body having an air intake and a connection for supply of fuel, a valve

to control flow of air in said air intake, a spring for maintaining said valve in a closed position under conditions created in said body by opening the throttle when the engine is running at low speed to prevent inflow of air at such time at the air intake, said spring yieldingly resisting movement of the valve to open under conditions created in said body as the engine increases its speed, and spring means automatically coming into operation only when the said valve is closed to prevent its vibration when in its closed position.

6. A carburetor including a body having an air intake, means for supplying fuel within said body, a vacuum cup connected with said supply means to receive fuel therefrom, a Venturi tube in said body, said tube having slots on opposite sides thereof, and webs projecting in opposite directions from said cup into said slots to maintain the cup in position in said body.

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