Nov. 22, 1955 W. E. ARMSTRONG 2,724,584

CARBURETOR

Filed Dec. 14, 1950 3 Sheets-Sheet 1

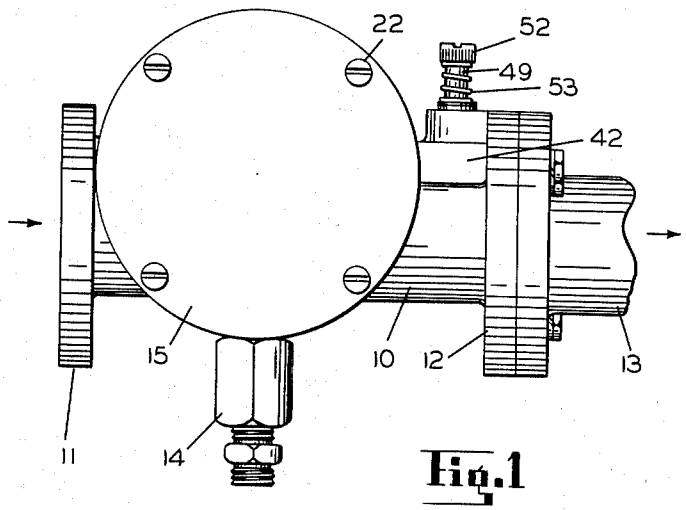

Fig. 1

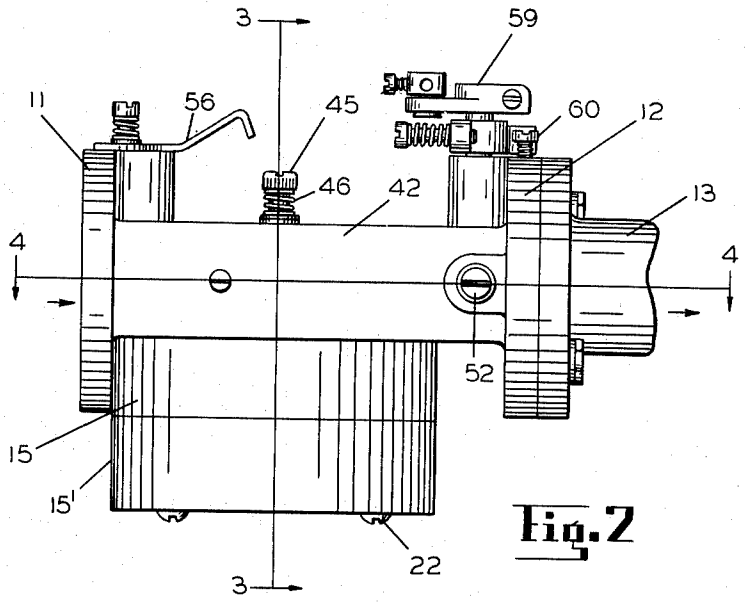

Fig. 2

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Filed Dec. 14, 1950 3 Sheets-Sheet 2

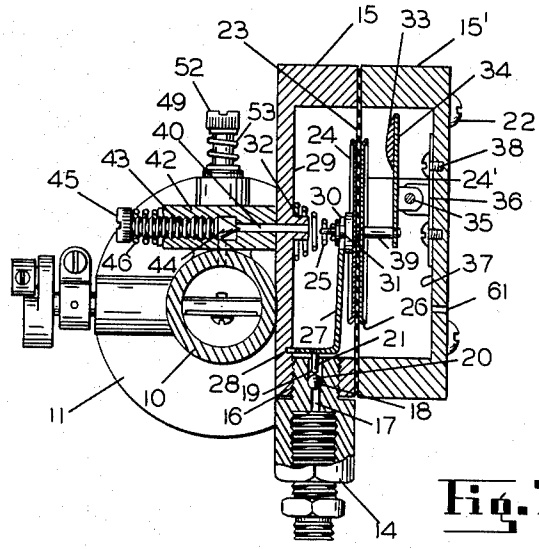

Fig. 3

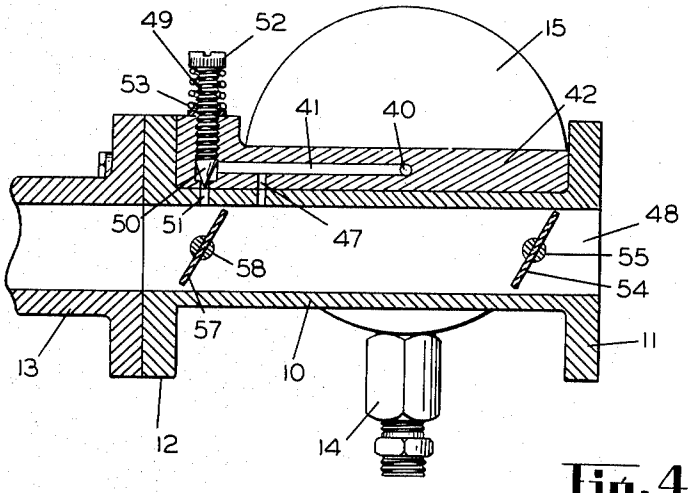

Fig. 4

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CARBURETOR

Filed Dec. 14, 1950 3 Sheets-Sheet 3

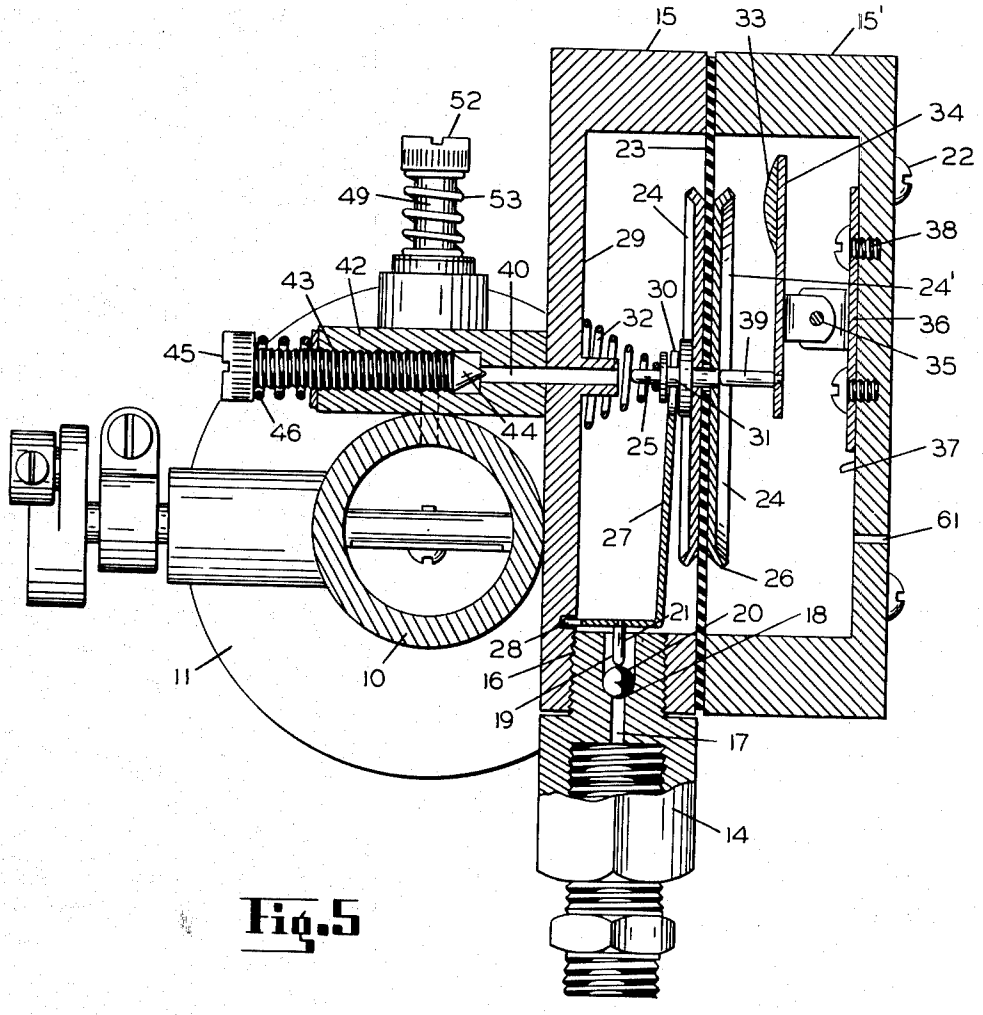

Fig. 5

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2,724,584

CARBURETOR

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Application December 14, 1950, Serial No. 200,827

2 Claims. (Cl. 261—69)

My invention relates to carburetors, and more particularly to a diaphragm type of carburetor to be employed in the fuel supply of an internal combustion engine.

An object of my invention is to provide a carburetor that may be employed on internal combustion engines that are to be used in various positions when mounted on handtools, and need not be held in a horizontal or vertical plane exclusively in the use of the tool.

Still another object of my invention is to provide a carburetor that may be installed into a conventional fuel supply line leading to a conventional manifold of an internal combustion engine.

A further object of my invention is to provide a device of the character described that may be provided with various types of mountings to fit particular installations designed for its adoption on various engines.

It is manifest to anyone familiar with the art that power tools such as hand saws or the like which are operated by an internal combustion engine are quite frequently employed in a manner that necessitates their being inverted or inclined angularly to one or the other side, and it is imperative that the supply of fuel be constant in any position.

With the device as described and claimed herein, the fuel supply will at all times be governed and regulated, yet provide quick response to the throttle adjustment.

The device is exceedingly simple in construction, economical to manufacture, yet highly efficient for the purpose for which it is intended.

Other and further objects of my invention will become more apparent as the description proceeds when taken in conjunction with the drawings in which:

Figure 1 is a side elevation of the assembled carburetor.

Figure 2 is a top view of the assembled carburetor as shown in Figure 1.

Figure 3 is a fragmentally, laterally disposed cross-sectional view of the assembled carburetor, taken at the line 3—3 in Figure 2.

Figure 4 is a longitudinal fragmentary cross-sectional view of the device taken at the line 4—4 in Figure 2, and

Figure 5 is a view as shown in Figure 3 enlarged to provide for clearer detail of the component parts constituting the device.

Similar characters of reference indicate corresponding parts throughout the several views, and referring now to the same, the character **10** shows a longitudinal cylindrical body of the device forming an air passage which is provided at each of its ends with flanges shown as **11** and **12**. The flange **11** acts as a support for an air cleaner (not shown), while the flange **12** acts as a mounting to support the entire device onto the air intake manifold which is shown in fragmentary section and indicated by the character **13**. In Figures 3 and 4, I show a lateral and longitudinal cross-section respectively. The fuel inlet **14** engages the lower portion of a housing or enclosure **15** having a cap **15'**, and the inlet **14** is supported by

means of a threaded portion at **16** as shown in Figure 3 and is provided with a port **17** having a seat **18** and terminating into a larger tubular portion **19**, which guides the ball **20**, which ball contacts the seat **18** and has a pin **21** disposed on its top surface.

The cap **15'** is shown attached to the housing or enclosure **15** by means of a plurality of screws **22**. However, this may be attached in any efficient manner, and a pliable diaphragm **23** is disposed between the body **15** of the enclosure and the cap **15'**. There are a pair of circular rigid discs of sheet material shown as **24** and **24'** adjacent the opposite sides of the diaphragm **23**. The diaphragm **23** is provided with an aperture through its center, and the discs **24** and **24'** are attached to a longitudinal centrally disposed pin **25**, extending through a centrally disposed aperture within the diaphragm.

The discs **24** and **24'** are shown arcuated outwardly at their outer peripheral edges **26**, to prevent the edges of the discs from cutting into the pliable diaphragm during its actuation.

A lever **27** is pivotally inserted at **28** into the inner face **29** of the enclosure **15**. This lever is forked at its upper end **30**, and engages a collar **31** forming a part of the pin **25**, and a conical resilient member or spring **32** is disposed between this collar **31** and the inner face **29** of the enclosure **15**. The lower right angle portion of the lever **27**, rests on the top of the pin **21** which contacts the upper face of the valve ball **20** and keeps the ball **20** in engagement with the seat **18** in the port **17** which acts as a valve for the fuel inlet.

There is a counter-balance weight **33** attached to the top of a pivoted arm **34**, which arm is hingedly mounted at **35** to a bracket **36** attached to the inner face **37**, of the cap **15'**, by means of screws **38** or in any other efficient manner. This arm **34** has a pin **39** attached thereto and extending at right angle therefrom at its lower end, and the outwardly extending end of the pin **39** engages the center of the diaphragm disc **24'**.

Extending outward through the wall of the diaphragm enclosure **15** and in alignment with the pin **25** is an outlet port **40** which enters a fuel passage **41** which extends longitudinally within the member **42** which is attached to the body **10** of the carburetor tube, and a valve stem **43** having a conical point **44** engaging the outer periphery of the port **40**, threadedly engages the member **42** and is shown with a slotted head **45** for adjusting the point **44** on the stem **43**. The stem **43** is held secure and kept from revolving by means of the resilient member **46** disposed between the head **45** and the member **42**, thus forming a main fuel adjusting valve.

The longitudinal tubular fuel passage **41** has a tubular outlet **47** leading to the enclosure **48** formed by the body **10**. There is also an idler adjustment screw **49** entering the fuel passage **41** through the member **42**. This screw **49** is equipped with a conical point **50** engaging an auxiliary port **51** leading from the fuel passage **51** to the enclosure **48**.

The screw **49** is provided with a slotted head **52** for adjustment, and is held in a fixed position after adjustment by means of the resilient member **53** disposed between the head **51** and the member **42**.

There is shown a choke valve **54**, mounted on a shaft **55**, which is journaled within the enclosure **48** and actuated by means of the lever **56**, and a throttle valve **57**, disposed within the enclosure **48**, is mounted on the shaft **58** which is actuated by the lever **59** and the adjustment of the lever is limited by its engagement with the stop screw **60**.

The operation of the device is extremely simple and positive. Obviously, the purpose of the carburetor is to provide a constant and correct fuel supply no matter

what angle the tool actuated by the internal combustion engine is held. The carburetor forming a part of the engine will function equally efficient whether the engine is turned over onto either side, or inverted. The stabilizing counterbalance will at all times perform its function. It is manifest to anyone familiar with the art that the engine during its operation will create a vacuum in the compartment **15** causing the diaphragm **23** to flex inwardly against the pressure of the resilient member **32** and by so doing will permit air to enter the compartment formed by the cap **15'** through the vent **61**, and as the resilient member **32** is compressed, the lever **27** will move toward the outlet port **40** at its upper end causing the pin **21** to rise, thereby permitting the ball **20** to be free on the seat **18** permitting fuel to enter through the inlet **17**. However, when the device is turned to a position as shown in Figure 2, and the cap **15'** is at the bottom, the weight **33** will cause the lever **34** to pivot at **35** forcing the pin **39** upwardly to stabilize the weight of the diaphragm, spring, fuel and all parts resting on upper part of the diaphragm, and will balance the action of the diaphragm against the pressure of the spring **32** permitting the vacuum caused by the engine to draw the fuel in a normal manner. This would not be possible without the stabilized counterbalanced feature provided by the weight **33**. The control of the fuel supply through the port **40** is accomplished by the manual adjustment of the screw **43**, and as the fuel supply enters the port **40**, it will flow through the main fuel supply passage in the member **42** and will pass through the port **47** where it will mix with the air and where it is controlled by means of the throttle vane **57** on the shaft **58** actuated by the throttle lever **59**.

The purpose of the entire construction is to definitely stabilize the movement of the diaphragm **23** between the resilient member **32** and the lever **34** which is weighted with the balance weight. In that way, the control of the amount of fuel entering through the port **17** is governed and the exact amount of fuel can be further governed by means of the valve **44** in the supply line.

In the specific construction shown, there are many features not heretofore anticipated by the art, and although I have shown a particular arrangement of the component parts constituting the device, I am fully cognizant of the fact that many changes in the form and configuration of the component parts may be made without affecting the efficiency or operativeness of the device, and without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent in the United States is:

1. In a carburetor, the combination comprising a throat member having an air passage therethrough, a housing providing a fuel regulating chamber adjacent said throat member, a fuel discharge passage extending from said chamber to a fuel jet opening into said throat, flow restricting metering means disposed in said discharge passage, said regulating chamber having an open side communicating with the atmosphere, a pliable diaphragm movable between inner and outer positions closing said open side of said chamber, spring means cooperatively engaging said diaphragm to urge the same toward its outer position, fuel inlet means on said housing for admission of fuel under pressure to said regulating chamber, said inlet means providing a port passage terminating in a tubular passage opening to said regulating chamber and having a valve seat at the junction of the port and tubular passages, a ball valve movable in said tubular passage and effective in engagement with said valve seat to close said port passage, said ball valve being displaceable from the valve seat responsively to the pressure of fuel in the port passage, to admit fuel through the tubular passage to said chamber, a valve controlling lever having a first part operatively connected to said spring means and diaphragm, and a second part extending at substantially a right-angle to the said first part, said second part of the lever overlying the opening of said tubular passage to the chamber and having its end engaging a wall portion of said housing in pivotal support of the lever thereon, said lever pivoting in response to movements of said diaphragm such that said second part thereof is displaced toward and away from said tubular passage correspondingly to diaphragm movements toward and away from its said outer position, and a pin extending in said tubular passage between said second part of the lever and said ball valve effective in the pivoted position of the lever corresponding to the outer position of the diaphragm, to dispose and retain the ball valve on said valve seat, said lever upon diaphragm movement in the direction of its said inner position, pivoting to raise said pin from the ball valve and thereby release the latter for fuel pressure response to open said port passage and admit fuel to said chamber.

2. In a carburetor, the combination in accordance with claim 1, wherein a pivoted counterweight lever is disposed substantially parallel to said diaphragm, said counterweight lever is disposed substantially parallel to said diaphragm, said counterweight lever having a mid fulcrum, a weighted free end, and an operating end connected to said diaphragm.

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