Nov. 14, 1933. D. L. SUITER 1,934,953

COMBINED AIR AND GAS CONTROL WITH FOOT REST

Filed Aug. 17, 1926 2 Sheets-Sheet 1

Fig. 1.

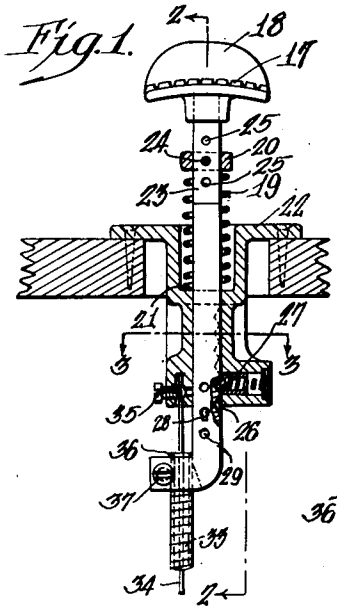


Fig. 2.

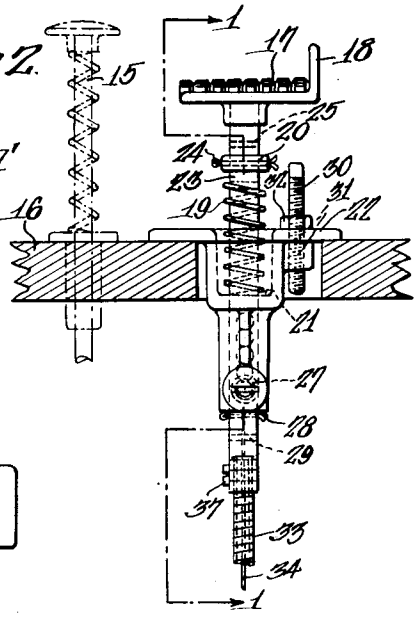


Fig. 7a

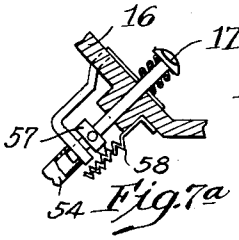


Fig. 3.

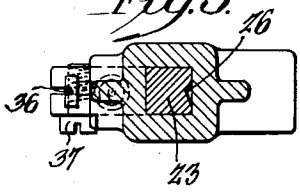


Fig. 4.

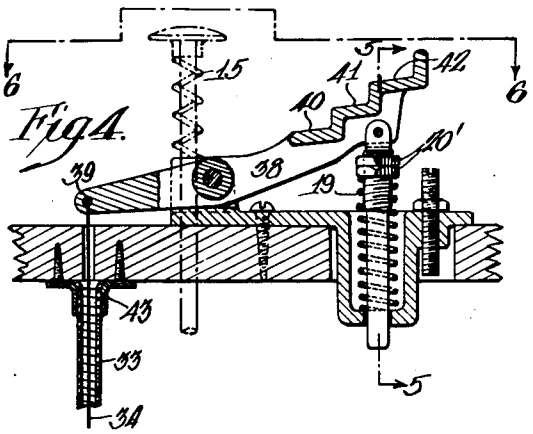


Fig. 5.

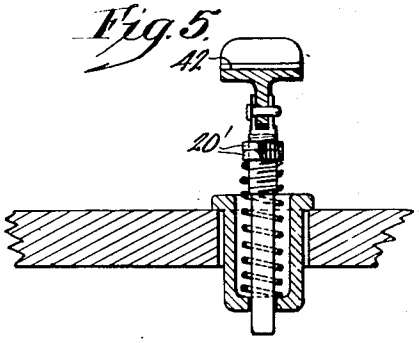


Fig. 6.

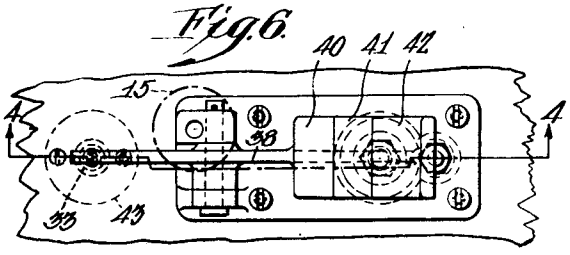
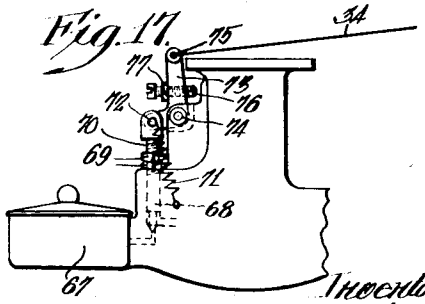


Fig. 17.



Inventor.
David L. Suiter
by
Attorney

Witness:
Walter Thum.

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Fig. 7.

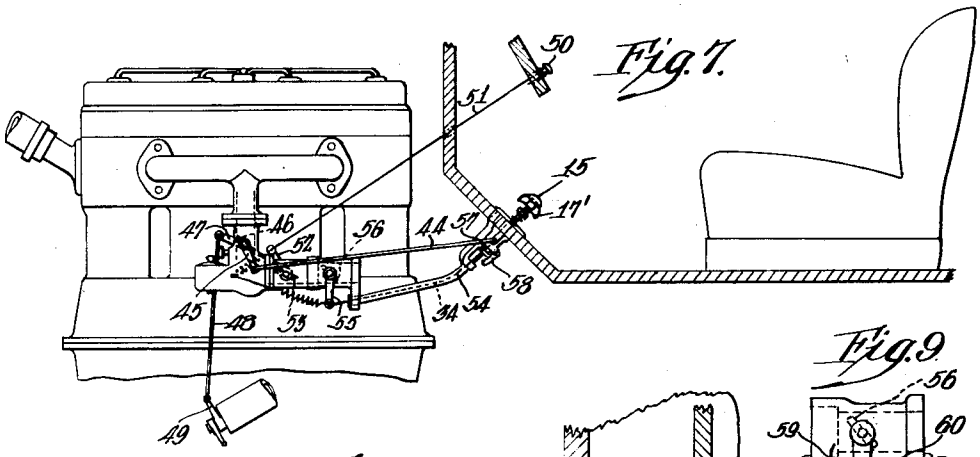


Fig. 9

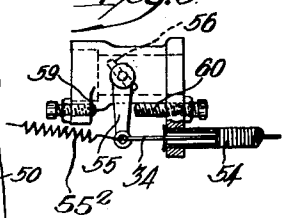


Fig. 8.

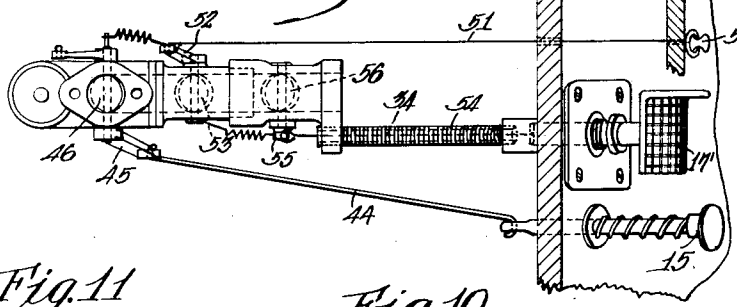


Fig. 11

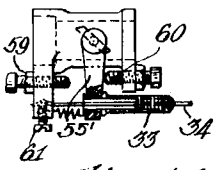


Fig. 10.

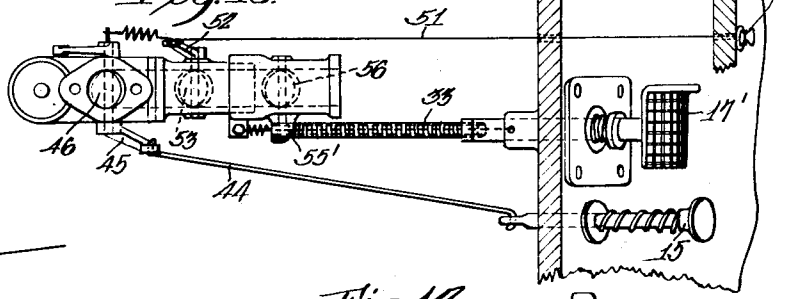


Fig. 14.

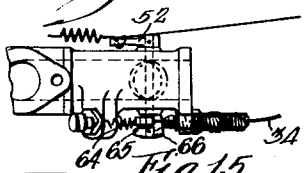


Fig. 12.

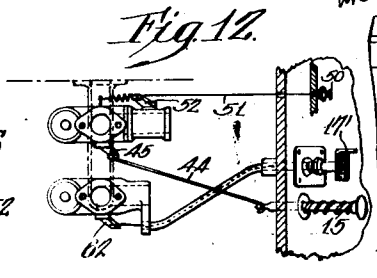


Fig. 13

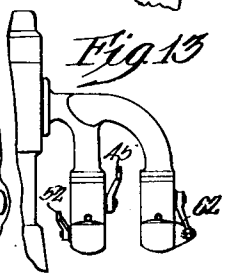


Fig. 15.

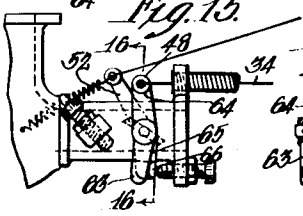
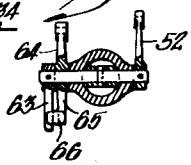


Fig. 16



Witness:
Walter Chase

Inventor
David L. Suiter
by Steele Parker
Attorney

Patented Nov. 14, 1933 1,934,953

UNITED STATES PATENT OFFICE

1,934,953

COMBINED AIR AND GAS CONTROL WITH FOOT REST

David L. Suiter, Philadelphia, Pa.,

Application August 17, 1926. Serial No. 129,706

8 Claims. (Cl. 137—144)

My invention relates to foot-operated devices for controlling the gas mixture supply of an automobile, or other hydrocarbon engine.

One purpose of my invention is to provide foot control of the relative richness of an automobile carburetor mixture.

A further purpose is to provide a depressible step adjacent to the foot accelerator which may be operated to give additional gas mixture or otherwise affect the carburetor supply.

A further purpose is to provide a step adjacent to the normal accelerator button which will serve as a guard to limit the accelerator depression, or may itself be depressed to affect the gas mixture supply, preferably by enriching the gas mixture, or supplying gas mixture from a richer source.

A further purpose is to provide a step adjacent to the accelerator button which shall at the same time be capable of depression to control a carburetor butterfly valve or other valve.

A further purpose is to provide a foot rest adjacent to an accelerator button said foot rest having steps or positions permitting selective graded depression of the button.

A further purpose is to provide a foot rest adjacent to an accelerator button with an adjustable spring foot rest support whereby the extent of the depression of the rest and the resistance to depression can be controlled.

Further purposes will appear in the specification and in the claims.

I prefer to illustrate my invention by a few forms only, from among the many in which it may appear, selecting forms which are practical and efficient, but primarily because they well illustrate the principles involved.

The figures are all largely diagrammatic and the associated carburetor structure is conventional.

Figure 1 is a fragmentary longitudinal section through the floor of a car, and on the line 1—1 of Figure 2 showing one form of my invention.

Figure 2 is a section of Figure 1, taken upon line 2—2 thereof.

Figure 3 is a section of Figure 1 taken upon line 3—3 thereof.

Figure 4 is a fragmentary section, corresponding to Figure 1, showing a second form of the invention and taken upon line 4—4 of Figure 6.

Figure 5 is a section of Figure 4 taken upon line 5—5.

Figure 6 is a top plan view of Figure 4 in the position shown by the line 6—6.

Figure 7 is a fragmentary longitudinal section, largely in side elevation showing the application of an additional form of operating mechanism.

Figure 7*a* is an enlarged fragment of Figure 7.

Figure 8 is an enlarged sectional top plan view of the structure seen in Figure 7.

Figure 9 is an enlarged detail fragmentary view corresponding generally with Figure 8, but showing additional subject matter.

Figures 10 and 12 are fragmentary sectional plan views of additional forms of the invention.

Figure 11 is a detail fragmentary side elevation showing the structure of Figure 10.

Figure 13 is a fragmentary elevation of Figure 12.

Figure 14 is a plan view corresponding generally to Figure 11 but slightly modified.

Figure 15 is a fragmentary side elevation, and Figure 16 is a section upon line 16—16 thereof, of a device showing a further application of the invention.

Figure 17 is a fragmentary side elevation of another form of the invention.

In the drawings similar numerals indicate like parts.

Because of the tremendous use of automobiles, greatly exceeding all other engines used for transportation such as in airplanes, motorcycles and tractors and the convenience of treating one type only in the specification, I have described the invention in connection with automobiles only but of course intend it to apply to these other uses.

Nearly every car is provided with two types of control, for the mixture of gas supplied to the engine. The "choke" controls the proportion of gas to air in the mixture by closing to varying degrees the valve by which air is admitted to the carburetor, restriction of the air inlet causing the suction from the cylinders to draw in a larger proportion of gas. The accelerator, on the other hand, and the usual gas lever at the wheel, control the quantity of mixed gas and air, which is admitted to the cylinder and hence the speed of the engine. In my invention I correlate the accelerator and choke, or accelerator and some other control of the richness or quality of the mixture.

Various other types of control are permissible, as by further opening of the gas valve (usually a needle valve) or by the use of an additional carburetor or carburetor compartment by which at the desired time a richer gas may be supplied to the carburetor.

My invention makes it possible to apply control or perform another function with the same

foot that is pressing the accelerator button, or separately to supply a foot choke adjacent to, and preferably in connection with the accelerator. Moreover, my invention provides for an accelerator button arranged for reliable determination of different depths of depression, or which may be so ratcheted so as to allow the operator to feel different pauses or dwells in its path of depression.

I provide also a desirable, depressible step, which offers sufficient resistance to depression to be serviceable as a foot-rest and yet may be depressed to perform any additional function such as described or which may otherwise be desired.

Taking up first the form shown in Figures 1–3, the spring-retracted accelerator button 15 is shown in its usual position, mounted upon the forward floor section 16 of the car and capable of depression for the usual purpose of increasing the flow of mixed gasoline and air from the mixing chamber of the carburetor to the manifold. Closely adjacent to it so that the foot may be used to engage both, is located a foot rest 17 protected against slipping of the foot by flange 18. The rest is normally held in raised position by any spring 19, pressing upwardly against a stop 20 and downwardly against the bottom of the fitting 22 within which the shank 23 passes and is guided.

The height of the stop 20 may be made adjustable and is so shown in this form where a split pin 24 passes through the stop and fits into any of the openings 25 in the shank.

When the user desires to keep track of the extent of depression of the combined step and operating button this can be done very easily and I show one way of doing it in these figures. I provide partial rests or dwells for the shank as it moves downwardly by notches at a number of places 26 in line for engagement by a spring-pressed pawl 27 which latches into the successive notches so as to tend to hold the shank in any of these several positions. The spring 19 is strong enough to overcome the notching retardation of the spring-pressed pawl. The engagements by the pawl can be felt as the button is depressed.

The upward limit of upward movement of the shank is determined by a pin 28 fitting into any one of the holes 29 and engaging the lower end of the fitting. The lower limit is set by a threaded stud 30 adjustable in height at 31 and locked by nut 32.

In this form the depressible pedal is intended to press upon the flexible outer casing or armor 33 within which passes a guide 34 properly secured at the lower end. This guide member 34 is secured in place by a screw 35 and the casing 33 is fastened to the lower end of the shank by splitting the turned end 36 of the shank, grooving it vertically to fit the shield or cover and tightening the split end upon the casing or cover by screw 37.

In the structure shown there is sufficient resistance to downward movement of the pedal so that the pedal may be used as a rest for the foot for steadier operation of the accelerator. However, the pedal itself can be depressed coincidentally with depression of the accelerator button or subsequently to perform any other foot-controlled function, and the operator can keep track of the extent of the depression by feeling engagement of the spring-pressed pawl with the notches 26 where desired.

In the forms shown in Figures 4, 5, 6, a different form of pedal is used and the transfer of movement is effected by a pull upon the central member 34 as distinguished from pushing of the outer casing 33. The lever 38 takes the place of the shank. The member 34 is secured to the end of the lever at 39 and the effective pedal surface is split up into rests 40, 41 and 42.

Any of these can be selected by the foot, determining the extent of the depression of the accelerator button before any movement of the pedal takes place. The spring 19 here engages with an abutment 20'. The casing 33 is held to the floorboard by a fitting 43.

In Figures 7, 8 and 9 the accelerator button 15 is shown as connected by rod 44 with the arm 45 controlling butterfly throttle valve 46. Connected to the same butterfly valve is a lever 47 controlled from the steering wheel by rod 48 and lever 49. The choke button 50 connects by rod 51 with a lever 52 upon butterfly valve 53, whose partial closure by pulling out the choke reduces the air supply and accordingly increases the proportion of gasoline in the mixture. The choke rod is retracted by a spring.

A depressible pedal 17', which may be desirably formed as that shown by me in Figure 1 pushes downwardly the interior flexible member 34 within a cover 54 and thus operates a lever 55 by which a butterfly valve 56 is turned for the same effect; namely, so that pressure upon the pedal reduces the air supply correspondingly to the reduction of air supply by pulling out the choke. The pedal is spring-retracted upwardly and retardation is provided with the same effect as given by the notches and pin of Figure 1. This is secured by means of a collar 57 engaging with a plate 58, one of them permitting lateral yielding, for example as in Figure 7*a* where corrugations of the spring plate 58 during depressing movement of the pedal snap successively over a projecting edge presented by the collar 57, an operator determining and controlling the extent to which he depresses the foot rest by counting the snap engagements between the members 57 and 58.

As seen in Figure 9, the valve 56 is pulled by the spring 55^2 toward closure and normally held open by the interior connection 34 to the pedal 17'. When the pedal is depressed the valve is partially closed, throttling the air and thereby securing a richer mixture, since the proportion of air in the fuel mixture is decreased I provide screw stops 59 and 60, controlling the range and position of range of movement of the lever arm 55, making both adjustable as desired.

Figures 10 and 11 correspond with Figures 8 and 9 respectively except that the casing 33 engages with and pushes lever 55' in these figures instead of the wire 34 within the casing performing this function. Along with this change, of course, goes the necessity for holding the wire so that it will act as a guide. This is shown in Figure 11, where the screw 61 holds the end of the wire.

In Figures 12 and 13 I connect the combined pedal and button 17' by a wire with an arm 62 of the throttle valve of a separate carburetor connected with the same intake manifold but carrying a special fuel of some character. This operates to give high-powered gas mixture without in the least interfering with the continued operation of the choke or accelerator upon the main carburetor.

Figure 14 corresponds nearly to Figures 8 and

10, and Figure 15 corresponds nearly to Figures 9 and 11, with the difference, however, that the two butterfly valves of Figures 8 and 10 are combined into one such valve in Figures 14 and 15, and both the choke and the foot rest are connected with the valve, so that it can be operated by either. The arm 52 is connected with the butterfly valve and an arm 63. The arm 64 however, is not connected with the butterfly valve directly, but is swung about the axis of the butterfly and is provided with an extension 65 carrying a lug 66 which engages the arm 63 to operate it. Adjustment of the stroke and position of the stroke of the butterfly valve is made by set screws as in Figures 9 and 11. The choke is spring-retracted and controls the butterfly without moving arm 64. When the latter is foot-operated through wire 34, the lug 66 causes the lever arm extension 63 to turn, turning the butterfly valve.

The foot rest for use in the form of Figures 14 and 15 should preferably be of the type shown in Figure 4.

In Figure 17 I show a carburetor float chamber 67 with connections to needle valve 68 whose normal height is adjusted by nuts 69 upon the threaded stem 70. This needle valve is held by spring 71 so as to lie normally in the position of adjustment by the lock nuts. At its upper end I pivot it at 72 to a bell crank 73 pivoted at 74 and whose opposite end 75 is connected by a member 34 so that it can be pulled from any foot-operated mechanism, for example that shown in Figure 4. The maximum opening is regulated by the screw 76 passing through the bell crank and locked by nut 77.

Where I speak of a foot rest and show terminals which though depressible are well suited initially to perform the foot rest function, I intend, of course, in the broader aspects to include any foot-pressed supplemental valve-operating or control mechanism closely enough adjacent to the accelerator button to be pressed at the same time. I also recognize that an additional or supplemental accelerator could be provided, performing the function of the normal accelerator, but supplying a richer or different mixture to be used alternatively with the regular accelerator to obtain part of the benefit of my invention.

In the selection of the word "button" used in conjunction with both operating mechanisms, it is not my intention to confine my invention to accelerator operating means of the recognized "button" type, as I know that there are various other foot-operated means by which the accelerator may be controlled. I have used the word "button" because the device illustrated is of that particular type and because the English language seems to lack a short term suitable for including all of the foot-operated control devices which are used and which could so evidently be used instead of the button illustrated.

It will be obvious that I have provided an accessory foot-operated control most desirably used in connection with gas control but capable of application to other features of car operation.

It will be further evident that my supplemental control though used to the best advantage in connection with the depressible foot rest, can be applied independently and without interference with separate control of the element or function which is to be moved by it.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain part or all of the benefits of my invention without copying the structure shown, and I, therefore, claim all such in so far as they fall within the reasonable spirit and scope of my invention.

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

1. In an automobile, an accelerator button for use with a carburetor, a valve for the carburetor, connections between the accelerator button and valve, a depressible foot rest close to the button adapted to be engaged by the same foot of the automobile operator at the same time, a second carburetor valve controlling the air inlet to the carburetor, connections between the foot rest and the second valve, and choke connections whereby the air inlet to the carburetor is independently operated by choke connections.

2. A plurality of control valves for a carburetor in combination with foot-operated means for controlling the individual valves, one being operable more easily than the other and the other affording a foot rest for operation of the first.

3. In an automobile, a foot operated carburetor accelerator and connections for carburetor control and a foot rest having a shank, in combination with a socket through which the shank is adapted to pass, a spring surrounding the shank and an adjustable upper stop for the spring upon the shank resting upon the spring.

4. In an automobile, a valve in the combustible mixture outlet of a carburetor, a second valve controlling the proportion of air and fuel in the mixture, a first depressible foot member controlling the outlet valve, a second depressible foot member controlling the second valve and near the first foot member at a position adapting it to be depressed selectively, simultaneously or alternatively with the first foot member by the foot operating the said first member.

5. In an automobile, a valve in the combustible mixture outlet of a carburetor, a second valve controlling the proportion of air and fuel in the mixture, an upwardly urged depressible foot member controlling the second valve and means for effecting step variations in the extent of depression of the foot member along the range of movement thereof.

6. In an automobile, a valve in the combustible mixture outlet of a carburetor, a second valve controlling the proportion of air and fuel in the mixture, a first depressible foot member controlling the outlet valve, an upwardly urged depressible second foot member controlling the second valve and near the first foot member at a position adapting it to be depressed selectively, simultaneously or alternatively with the first foot member by the foot operating the said first member in combination with means for effecting step variations in the extent of depression of the second foot member along the range of movement thereof.

7. In an automobile, a valve in the combustible mixture outlet of the carburetor, a second valve controlling the proportion of air and fuel in the mixture, a first depressible pedal controlling the outlet valve, a second depressible pedal controlling the second valve and near the first pedal at a position adapting it to be depressed selectively simultaneously or alternatively with the first pedal by the foot operating the said first pedal, in combination with two members pressing together having respectively a series of ser-

rations and a projection into one of the serrations and connections between the second pedal and one of the members to move the one member with respect to the other so that they engage at the projection at successive serrations during the movement of the second pedal.

8. In an automobile, a valve in the combustible mixture outlet of a carburetor, a second valve controlling the proportion of air and fuel in the mixture, a first depressible foot member controlling the outlet valve, a second depressible foot member controlling the second valve and near the first foot member at a position adapting it to be depressed selectively simultaneously or alternatively with the first foot member by the foot operating the said first member, in combination with connections from the second foot member to give a succession of click movements along the range of movement of the second foot member and individually sensible to the depressing foot thereby permitting an operator to gauge and control the extent of depression by the number of click movements.

DAVID L. SUITER.