

May 24, 1938.

R. J. KALBREIER

2,118,730

SPEED CONTROL

Filed April 7, 1937

3 Sheets-Sheet 1

Fig. 1.

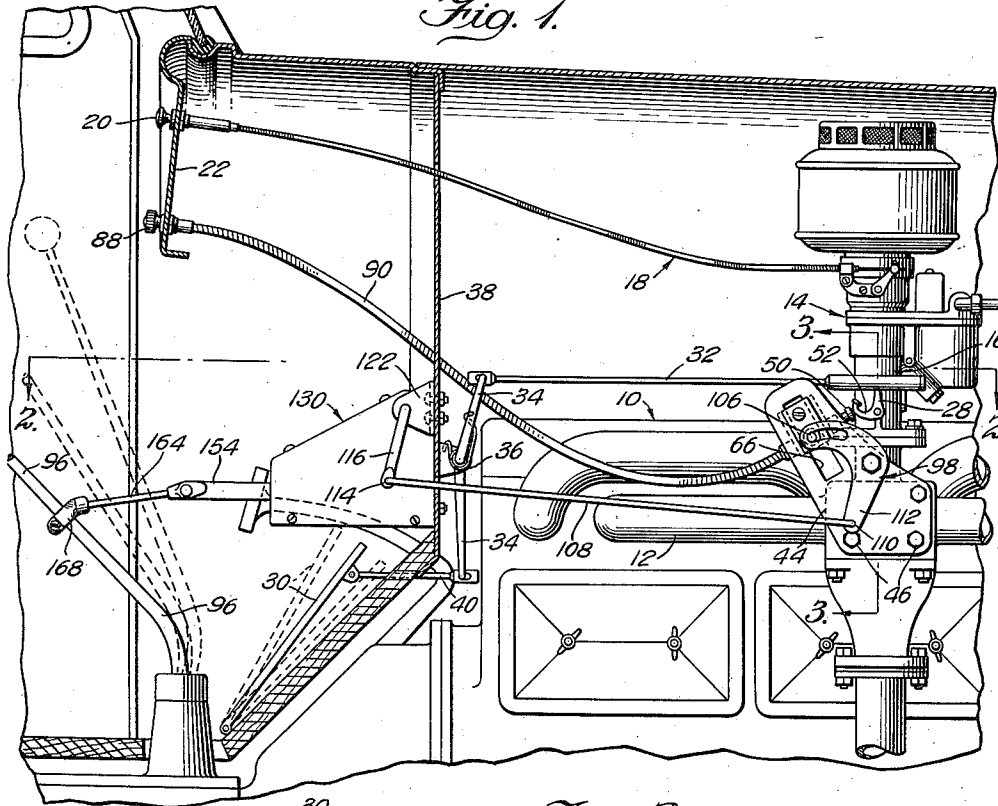
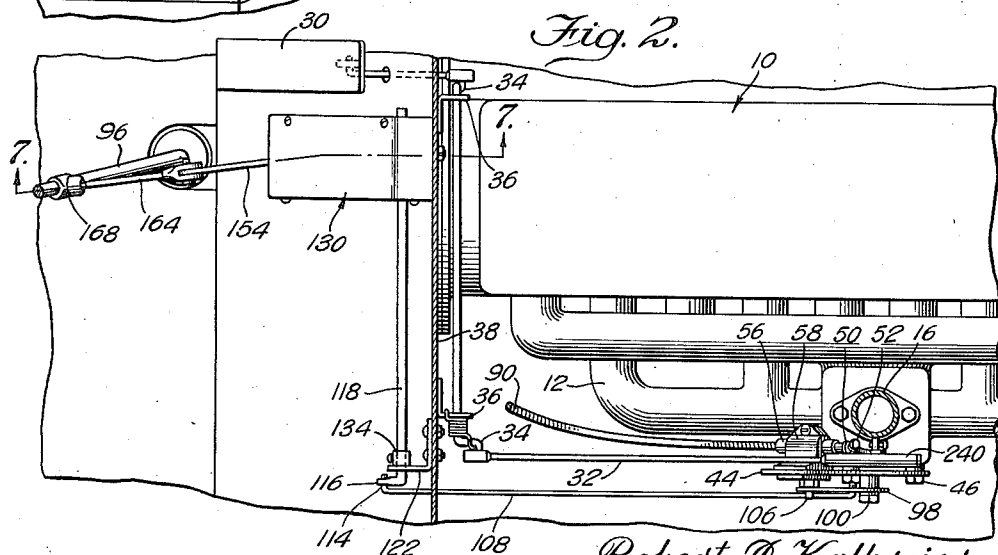


Fig. 2.



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Fig. 3.

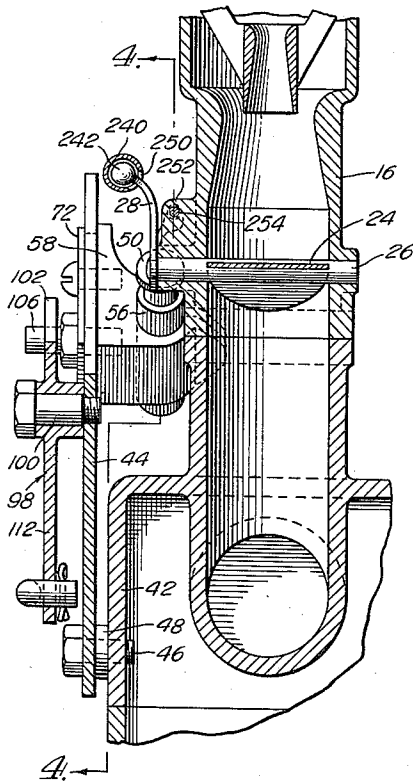


Fig. 4.

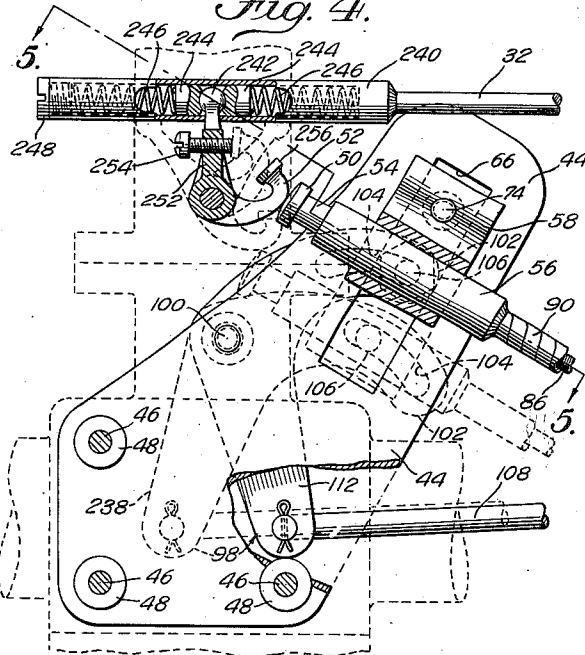
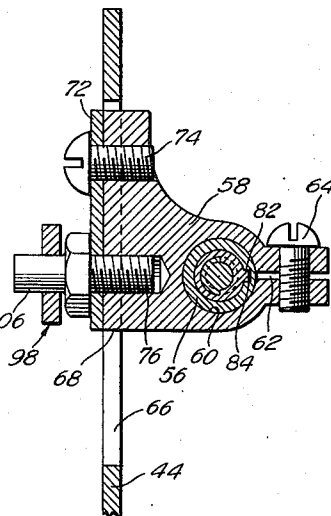
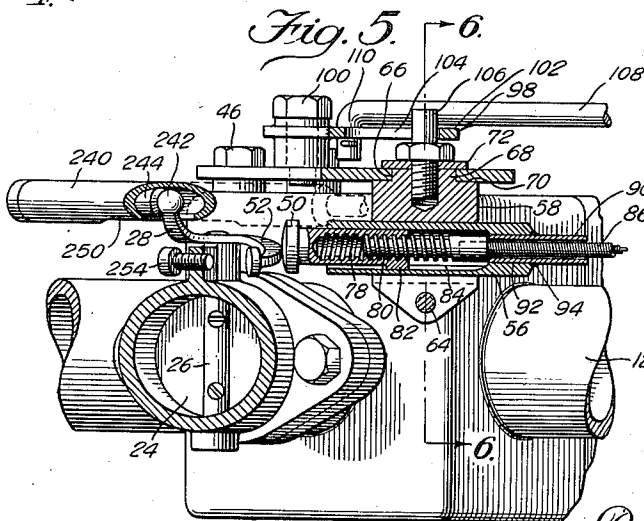


Fig. 6.



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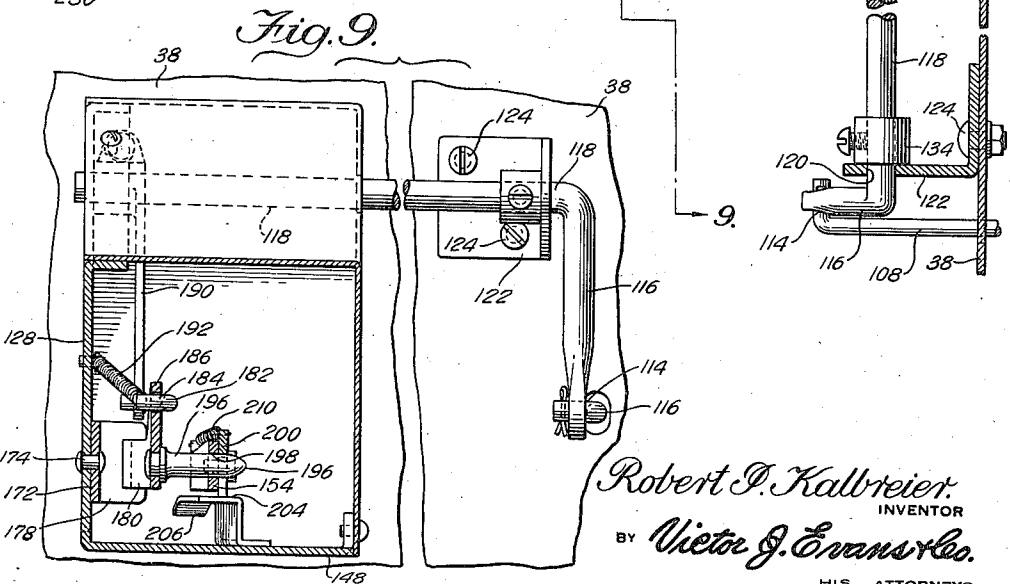
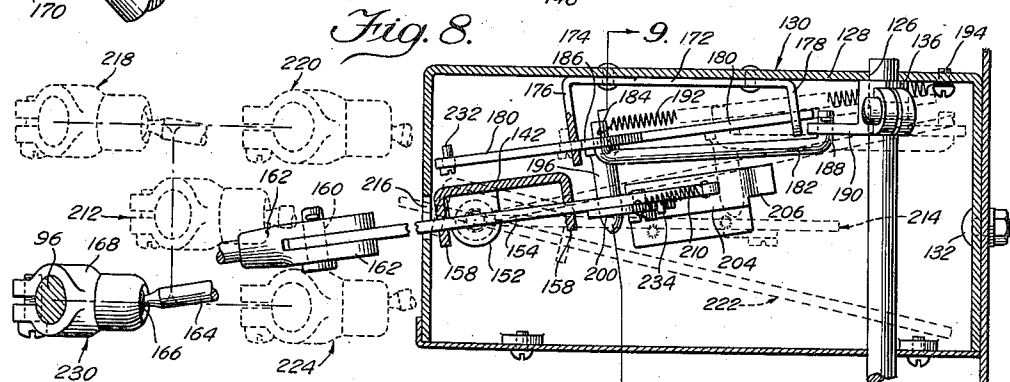
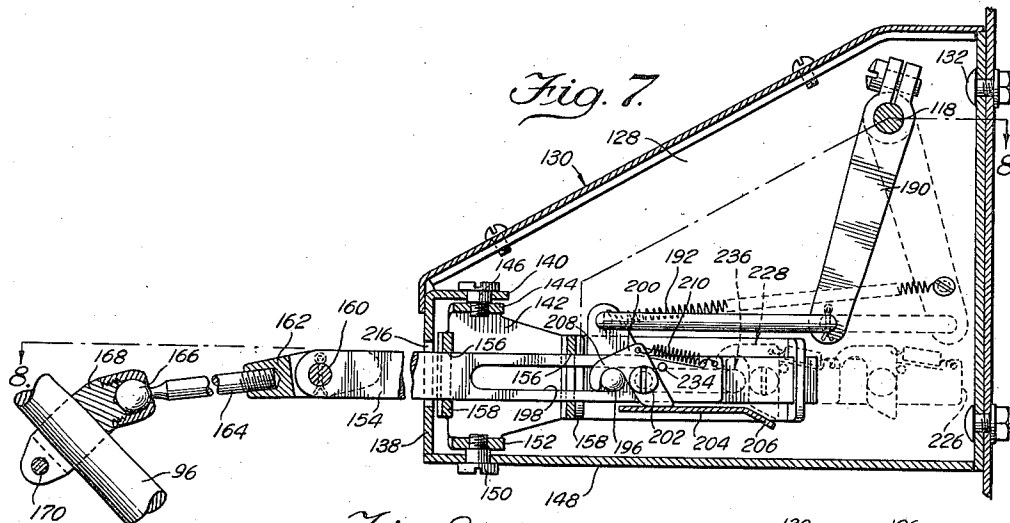
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UNITED STATES PATENT OFFICE

2,118,730

SPEED CONTROL

Robert J. Kalbreier, Chicago, Ill.

Application April 7, 1937, Serial No. 135,551

8 Claims. (Cl. 74-472)

My invention relates to internal combustion engines, and includes among its objects and advantages the provision of an improved speed control associated with the gear shift lever in such a manner as to be rendered operable only when the gears are shifted to high speed.

This application comprises in part a continuation of my co-pending application on Speed controls, filed August 6, 1936, Serial No. 94,664.

In the accompanying drawings:

Fig. 1 is an elevational view of an engine showing my invention applied thereto and connected with the gear shift lever;

Fig. 2 is a view taken along the line 2-2 of Fig. 1;

Fig. 3 is a sectional view along the line 3-3 of Fig. 1;

Fig. 4 is a sectional view along the line 4-4 of Fig. 3;

Fig. 5 is a sectional view along the line 5-5 of Fig. 4;

Fig. 6 is a sectional view along the line 6-6 of Fig. 5;

Fig. 7 is an enlarged sectional view taken along the line 7-7 of Fig. 2;

Fig. 8 is a sectional view along the line 8-8 of Fig. 7; and

Fig. 9 is a sectional view along the line 9-9 of Fig. 8.

In the embodiment selected to illustrate my invention I make use of an automotive vehicle engine 10 including the usual intake manifold 12 and carburetor 14. A conventional conduit 16 establishes communication between the carburetor 14 and the intake manifold 12. The usual choke valve control 18 is associated with the carburetor 14 and may be operated through the medium of a knob 20 mounted on the instrument panel 22 in the usual way.

Referring to Figs. 3 and 5, the throttle valve 24 is fixedly connected with a shaft 26 journaled in the conduit 16. To one end of the shaft 26 I fixedly connect an arm 28 which is operatively connected with the accelerator pedal 30 through the medium of a link 32 having one end loosely connected to a lever 34 pivotally mounted on a bracket 36 attached to the wall 38. The lower end of the lever 34 is movably connected with a link 40 which in turn is pivotally connected with the accelerator pedal 30. Upon the wall 42 of the intake manifold I mount a plate 44 through the medium of bolts 46. Spacers 48 are positioned between the plate and the wall 42. Plate 44 carries an abutment 50 which may be positioned in the path of an arm 52 fixedly con-

nected with the arm 28. Abutment 50 may be adjusted to vary the full open position of the throttle valve 24 for limiting the speed of the engine.

The abutment 50 includes a shaft 54 slidably mounted in a sleeve 56 carried by a support 58. In Fig. 6, the support 58 includes a bore 60 having frictional contact with the sleeve 56 and the member 58 is slotted at 62 and provided with a screw 64 which may be tightened for firmly clamping the sleeve 56 in the desired position. I slot the plate 44 at 66 and shape the member 58 to provide a rib 68 which is slidably mounted in the slot 66 (see Fig. 5). The shoulders 70 on the support 58 bear against one side of the plate 44, while a retaining plate 72 bears against the opposite face of the plate. Screws 74 and 76 clamp the retaining plate 72 against the rib 68 but the rib is of sufficient depth to permit the support 58 to slide freely relatively to the plate 44.

Referring to Figs. 5 and 6, the shaft 54 is internally threaded at 78 for the reception of a screw 80, rotation of which moves the shaft 54 longitudinally of the sleeve 56 for changing the abutting relation between the abutment 50 and the arm 52 for speed varying purposes.

Shaft 54 carries a key 82 slidably mounted in a key way 84 in the inner face of the sleeve 56, which key restrains the shaft 54 from rotary movement relatively to the sleeve, but permits free longitudinal shifting of the shaft. To one end of the screw 80 I connect a flexible control 86 which extends to the instrument panel 22 and is provided with a knob 88 through the medium of which the control 86 may be rotated for turning the screw 80.

The control 86 may be enclosed within a coiled and flexible tubular member 90 having one end fixedly secured within the bore 92 in the sleeve 56 by welding 94. The opposite end of the member 90 may be secured to the instrument panel 22 in any suitable manner. Such devices are well known in the art and need not be described in further detail.

My speed limiting feature is designed to be rendered operable only when the gear shift lever 96 has been shifted to high speed. In all other speeds the abutment 50 occupies the dotted line position of Fig. 4, at which time the arm 52 may be moved its full distance without interference from the abutment. In this way, I attain a speed control which is effective at high speed only and in which the efficiency of the

engine is not impaired at the low speeds or when the gear shift lever 96 is shifted to reverse.

On the outer face of the plate 44 I mount a bell crank 98. The bell crank is pivotally mounted upon a screw 100 threaded into the plate 44, while the upper reach 102 of the bell crank is provided with a curved slot 104 within which the extension 106 of the bolt 76 slides freely. A link 108 has one end pivotally connected at 110 with the lower reach 112 of the bell crank and its opposite end pivotally connected at 114 with a lever 116 fixedly carried by a rotatable shaft 118.

Referring to Figs. 7, 8 and 9 the shaft 118 is journaled at 120 in a bracket 122 bolted at 124 to the wall 38. The shaft is also journaled at 126 in the wall 128 of a box 130 secured to the wall 38 by bolts 132. Collars 134 and 136 prevent endwise movement of the shaft 118 but it is so journaled as to be freely rotatable. The wall 128 includes a right-angular flange 138 which defines the front end of the box 130. An ear 140 is carried by the flange 138 for supporting a bearing bracket 142.

This bracket includes an ear 144 arranged in parallel relation with the ear 140 and rotatably related thereto by a screw 146. The screw is threaded to the ear 144 and includes a smooth reach which rotates freely within an opening within the ear 140. The bottom 148 of the box is provided with an opening for loosely receiving a screw 150 having its end threaded into an ear 152 corresponding to the ear 144. Screws 146 and 150 are positioned in axial alignment so that the bearing bracket 142 may be rotated about the axis of the screws. A bar 154 is slidably mounted within slots 156 in flanges 158 comprising integral parts of the bearing bracket 142. One end of the bar 154 is pivotally connected at 160 with a bifurcated coupling 162 fixedly connected with a rod 164 having a universal connection 166 with a collar 168 clamped upon the gear shift lever 96 by a bolt 170.

A plate 172 is riveted at 174 to the wall 128 and is bent to provide parallel reaches 176 and 178 having openings for loosely and slidably supporting a bar 180. A link 182 has one end bent to provide a shaft 184 which passes loosely through an opening in a lateral extension 186 carried by the plate 180. The opposite end of the link 182 is bent to provide a shaft 188 which is pivotally connected with the lower end of an arm 190 formed integrally with the collar 136.

A tension spring 192 has one end connected with the shaft 184 and its upper end connected with the wall 128 by a screw 194. Normally the spring 192 yieldingly holds the arm 190 into dotted line position of Fig. 7, at which time the bell crank 98 is positioned in the dotted line position of Fig. 4 with the abutment 50 out of obstructing relation with the arm 52.

A pin 196 is fixedly connected with the bar 180 and is arranged to extend through a slot 198 in the bar 154 (see Fig. 7). Upon one face of the bar 154 I pivotally connect a dog 200 by means of a screw 202. The lower end of the dog 200 is arranged in operative relation with a cam plate 204 having an end 206. With the bar 154 positioned according to Figs. 7 and 8, the pin 196 is latched to the dog 200 through the medium of the hook 208.

In the neutral position of the gear shift lever 96 the lower end of the dog 200 is positioned directly above the incline 206 as indicated in dotted lines in Fig. 7. At this time the hook 208

is positioned out of latching relation with the pin 196. A tension spring 210 has one end connected with the dot 200 and its opposite end connected with the inner end of the bar 154 for urging the dog 200 to the vertical positions indicated in dotted lines in Fig. 7.

Pressure relation between the dog 200 and the cam plate 204 with the bar 154 positioned according to Fig. 7 holds the hook 208 in connected relation with the pin 196 which in turn is fixedly connected with the bar 180, which in turn is connected with the arm 190 through the medium of the link 182. It will thus be seen that a pull on the bar 154 with the hook 208 connected with the pin 196 will exert a pull on the arm 190 which in turn rotates the shaft 118. Such rotation of the shaft 118 exerts a pull on the reach 112 of the bell crank for sliding the support 58 upwardly to position the abutment 50 in the path of the arm 52. The slot 104 is so inclined as to raise and lower the support 58 for shifting the abutment 50 through pivotal action of the bell crank 98.

With the gear shift lever 96 positioned according to the full line illustration of Figs. 7 and 8, which represents high speed, the pin 196 is positioned at the right hand end of the slot 198 when viewing Fig. 7. With the lever 96 in neutral position represented generally at 212 in Fig. 8 the bar 154 occupies the position 214. The bar 154 together with the bearing bracket 142 is rotatable about a vertical axis represented by the screws 146 and 150. The wall 138 is provided with an opening 216 of sufficient proportions to permit lateral shifting of the bar while the universal connection 156 and the pivotal connection 160 flexibly connect the gear shift lever 96 with the bar 154 so as to permit free shifting of the lever.

As the lever 96 is shifted from neutral to first speed or reverse, indicated at 218 and 220, respectively, in Fig. 8, the bar 154 is swung in the direction of the dotted line position 222, at which time the slot 198 has moved away from the pin 196 so that forward or backward movement of the gear shift lever 96 will impart no movement to the pin 196. When shifting from first to second speed, indicated at 224, the bar 154 is shifted laterally and the pin 196 will again be positioned in the slot 198. As the gear shift lever 96 is pushed forwardly the inner end of the bar 154 will be shifted to the dotted line position 226, which shifting is independent of the pin 196. As the bar 154 moves toward the dotted line position 226, the dog 200 assumes the dotted line position 228 which frees the dog from the pin. At the same time the slot 198 is of such length as to permit continued movement of the bar 154 independently of the pin 196. As the lever 96 is shifted to high speed, indicated at 230, outward movement of the lever 154 causes the incline 206 to pivot the dog 200 over the pin 196 as the dog moves inwardly of the cam plate 204 for operatively connecting the pin 196 with the bar 154. Continued movement of the bar 154 raises the abutment 50 into the path of the arm 52. Bar 180 carries a pin 232 which engages the reach 176 for limiting the movement of the bar because of the spring 192. Bar 154 carries a pin 234 which resists the tension of the spring 210 when the dog has reached the position 228. Pin 232 engages the reach 176 when the lever 96 is in neutral position. Such engagement determines the dotted line position of the arm 190. When the lever 96 is shifted to positions 220 or

224 the slot 198 permits free movement of the bar 154 relatively to the pin 196, which in the neutral position of the lever 96 takes the position indicated at 236.

5 Spring 192 and the weight of the support 58 and the load carried thereby co-operate to support the bell crank 98 in the position 238 of Fig. 4. In operation, the abutment 59 is located out of the path of the arm 52 in the 212, 218, 220 and 10 224 positions of the shift lever 96. Under such conditions the throttle valve 24 may be operated in the usual manner and shifted to any position between its two limits of movement without interference from the abutment 59. Simultaneously 15 with adjustment of the gear shift lever 96 to the position 230, the abutment 59 will be lifted into operating relation with the arm 52 and the opening movement of the throttle valve 24 will be limited depending upon the adjustment of the 20 abutment 59.

In Fig. 4, I illustrate the link 32 as being connected with a tube 240 within which the ball 242 on the arm 28 is positioned. Recessed blocks 244 are urged against the head 242 by reason of compression springs 246 located inside the sleeve 240. One end of the sleeve may be closed by a plug 248. The sleeve 240 includes a slot 250 through which the arm 28 extends. It will thus be seen that I 30 have provided a resilient connection between the arm 28 and the pedal 30. The resilient connection provides a protective feature which prevents injury to the arm 52 after it has engaged the abutment 59 in the event that excessive pressure is applied to the pedal 30. After engagement has 35 been established between the ear 52 and the abutment 59 excessive pressure on the pedal 30 is dissipated through the medium of the springs 246. Conduit 16 includes a flange 252 which carries a screw 254 arranged to abut the head 256 on the arm 52 for limiting rotation of the shaft 26 when the throttle valve 24 reaches its closed position.

Without further elaboration, the foregoing will 40 so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. The combination of a throttle valve having 50 stop means, manually actuated means connected with the throttle valve for operating the same, a support, companion stop means movably related to said support for co-operation with said first stop means, to limit the open position of 55 the throttle valve, gear shifting means movable to different positions, an operating connection between said gear shifting means and said companion stop means so constructed and arranged as to move the companion stop means into operative relation with said first stop means in one 60 position only of the gear shifting means, and manually actuated means connected with the companion stop means for adjusting the same, to vary the open position of the throttle valve.

2. The combination of a throttle valve having 65 stop means, manually actuated means connected with the throttle valve for operating the same, a support, companion stop means movably related to said support for co-operation with said first stop means, to limit the open position of the 70 throttle valve, gear shifting means movable to different positions, an operating connection between said gear shifting means and said companion stop means so constructed and arranged 75 as to move the companion stop means into oper-

ative relation with said first stop means in one position only of the gear shifting means, manually actuated means connected with the companion stop means for adjusting the same, 5 to vary the open position of the throttle valve, foot actuated means for operating the throttle valve, and a resilient connection between the throttle valve and said foot actuated means.

3. The combination of a throttle valve having 10 stop means, manually actuated means connected with the throttle valve for operating the same, a support, companion stop means movably related to said support for co-operation with said first stop means, to limit the open position of the 15 throttle valve, gear shifting means movable to different positions, an operating connection between said gear shifting means and said companion stop means so constructed and arranged as to move the companion stop means into operative relation with said first stop means in one position 20 only of the gear shifting means, manually actuated means connected with the companion stop means for adjusting the same, to vary the open position of the throttle valve, and yielding means for normally holding the companion stop means 25 in an inoperative position.

4. The combination of a throttle valve having 30 stop means, manually actuated means connected with the throttle valve for operating the same, a support, companion stop means movably related to the support and co-operating with said first stop means, to limit the open position of the throttle valve, a gear shift lever movable to different positions, and an operating connection 35 between the gear shift lever and said companion stop means so constructed and arranged as to move the companion stop means into operating relation with the first stop means in one position only of the gear shift lever, said operating connection comprising in part a pivotally mounted 40 bell crank for moving the companion stop means into and out of operating relation with the first stop means.

5. The combination of a throttle valve having 45 stop means, manually actuated means connected with the throttle valve for operating the same, a support, companion stop means movably related to the support and co-operating with said first stop means, to limit the open position of the throttle valve, a gear shift lever movable to different positions, an operating connection 50 between the gear shift lever and said companion stop means so constructed and arranged as to move the companion stop means into operating relation with the first stop means in one position only of the gear shift lever, and manually actuated means connected with said companion stop means for adjusting the latter, to vary the open position of the throttle valve. 60

6. The combination with a throttle valve and a gear shift lever, of an abutting element fixedly connected with the throttle valve, manually actuated means connected with the throttle valve for actuating the same, a fixed guide member, an 65 abutment slidably related to said fixed guide member and arranged to be positioned in the path of said abutting element, to limit the opening position of the throttle valve, manually actuated means for shifting the abutment, a screw connection between the abutment and said last 70 named manually actuated means, and an operating connection between the gear shift lever and said abutment so constructed and arranged as to move the abutment into the path of said 75

abutting element in one position only of the gear shift lever.

7. The combination of a throttle valve having stop means, means for actuating the throttle valve, a support, a supporting member slidably connected with the support, an abutment having threaded relation with said member, to be adjusted longitudinally in directions at an angle to the sliding movement of said member, said abutment co-operating with the stop means, to limit the open position of the throttle valve, gear shifting means movable to different positions, an operating connection between said gear shifting means and said member so constructed and arranged as to move the abutment into abutting relation with said stop means in one position only of the gear shifting means, and means connected with said abutment for adjusting the same, to vary the open position of the throttle valve.

8. The combination of a throttle valve having

stop means, means for actuating the throttle valve, a support, a supporting member slidably connected with the support, an abutment having threaded relation with said member, to be adjusted longitudinally in directions at an angle to the sliding movement of said member, said abutment co-operating with the stop means, to limit the open position of the throttle valve, gear shifting means movable to different positions, an operating connection between said gear shifting means and said member so constructed and arranged as to move the abutment into abutting relation with said stop means in one position only of the gear shifting means, and means connected with said abutment for adjusting the same, to vary the open position of the throttle valve, said manually actuated means including in part a bell crank having camming relation with said member.

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