Nov. 4, 1941. T. E. MAJOR 2,261,502

LINKAGE MECHANISM FOR CARBURETOR VALVES

Original Filed June 1, 1940 4 Sheets-Sheet 1

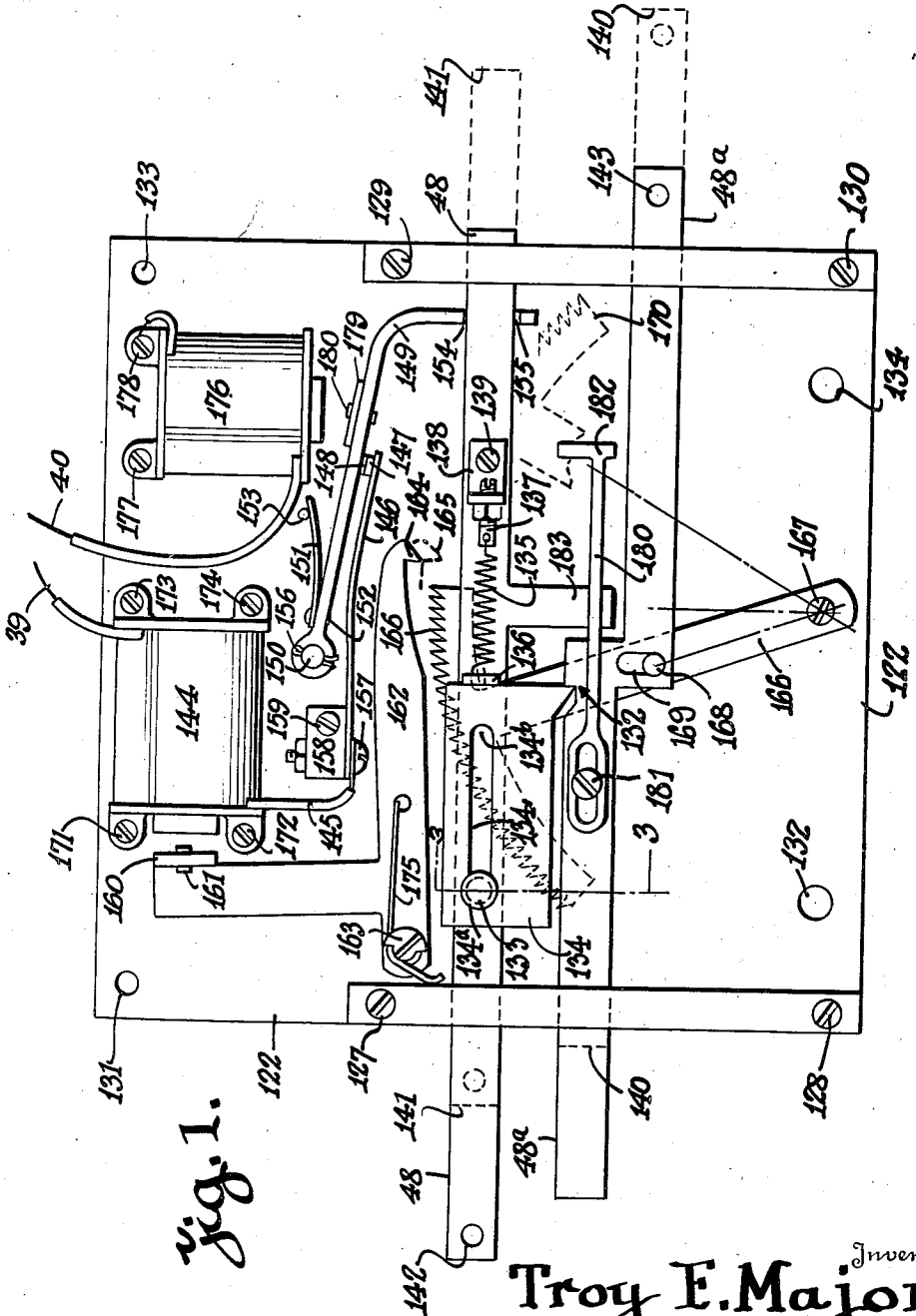


Fig. 1.

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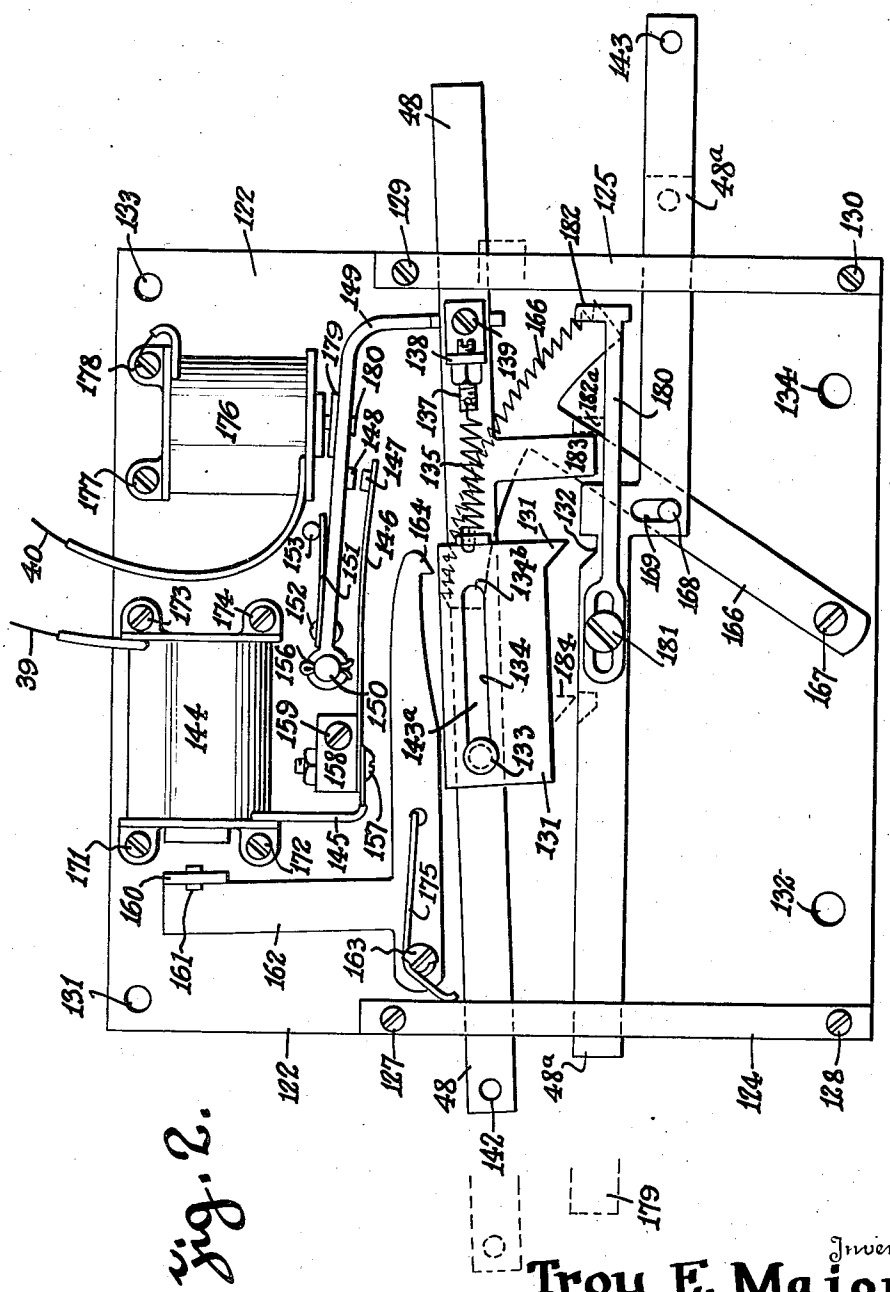


Fig. 2.

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LINKAGE MECHANISM FOR CARBURETOR VALVES

Original Filed June 1, 1940 4 Sheets-Sheet 3

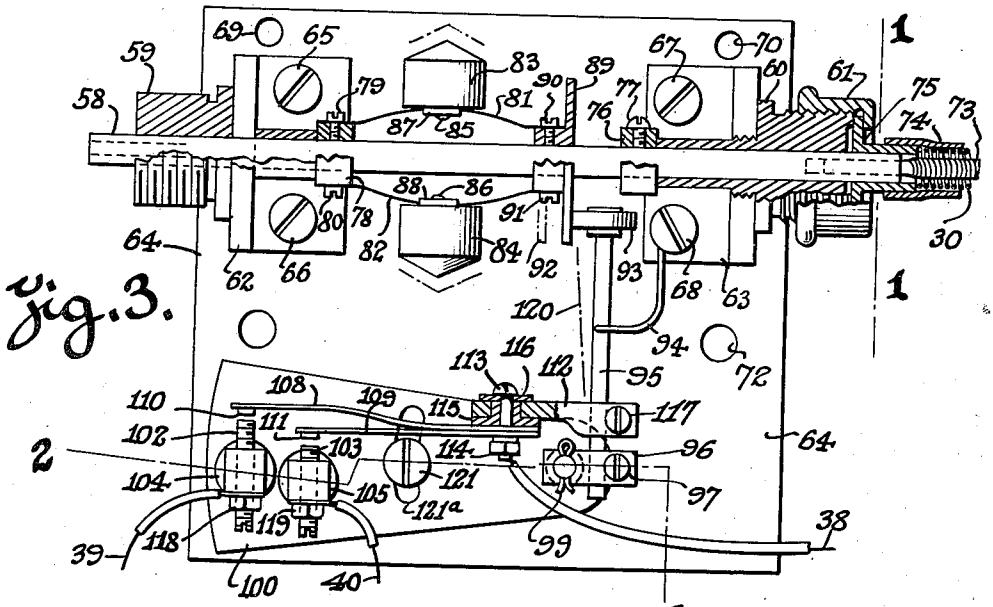


Fig. 3.

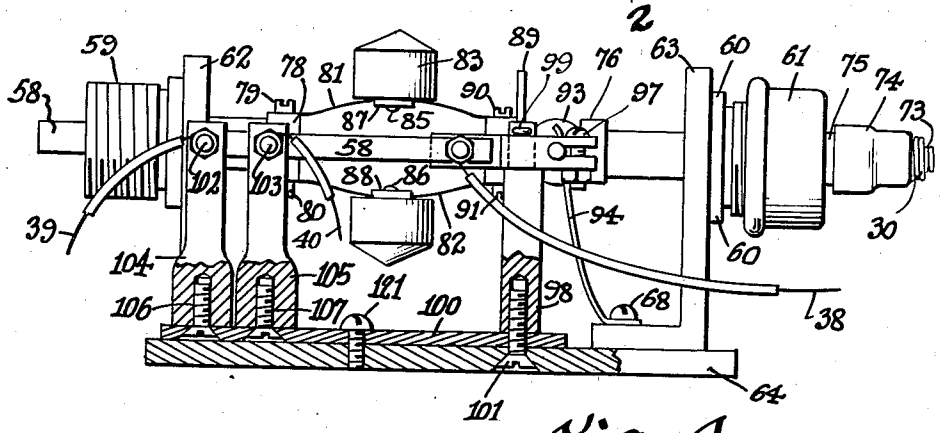


Fig. 4.

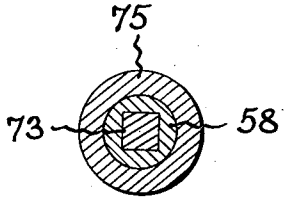


Fig. 5.

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LINKAGE MECHANISM FOR CARBURETOR VALVES

Original Filed June 1, 1940 4 Sheets-Sheet 4

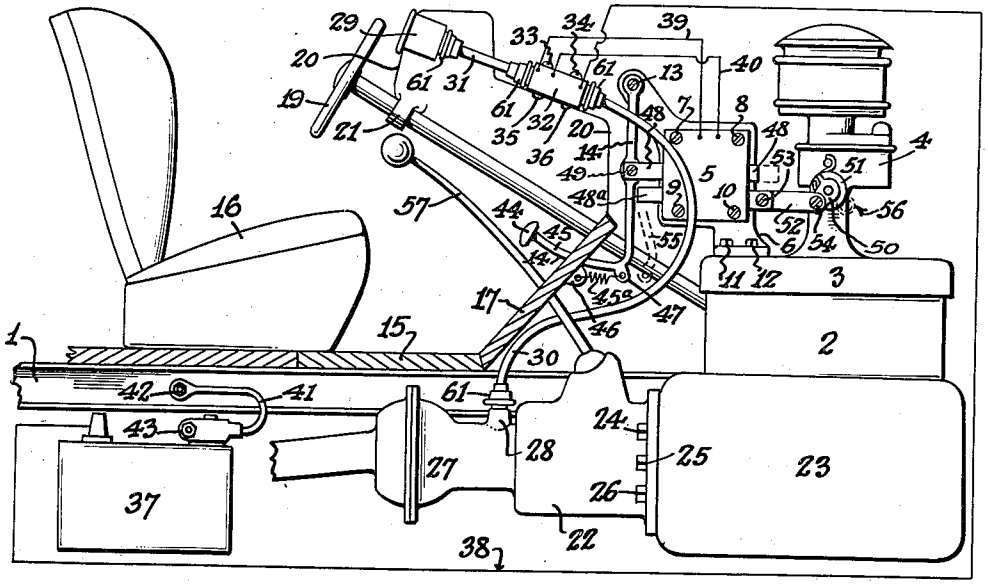


Fig. 6.

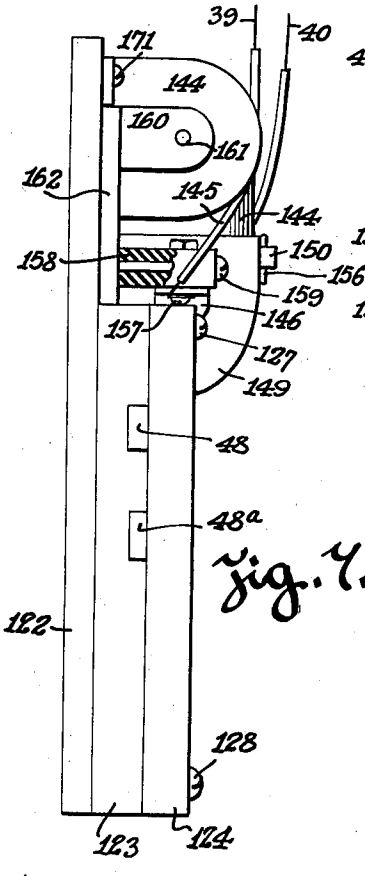


Fig. 7.

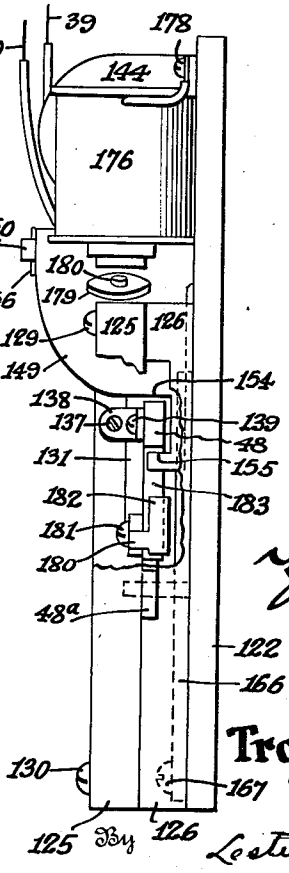


Fig. 8.

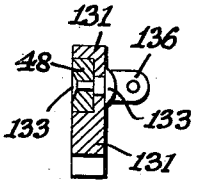


Fig. 9.

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Patented Nov. 4, 1941 2,261,502

UNITED STATES PATENT OFFICE

2,261,502

LINKAGE MECHANISM FOR CARBURETOR VALVES

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Original application June 1, 1940, Serial No. 338,445. Divided and this application March 25, 1941, Serial No. 385,199

3 Claims. (Cl. 74—526)

This application is a division of my pending application, Serial No. 338,445, filed June 1, 1940.

My invention relates to a speed control device for a motor vehicle and this application more particularly to a linkage mechanism for a carburetor valve.

The object of my invention is to provide a novel speed control device which will allow the motor to deliver its maximum power to the driving mechanism of the vehicle until the vehicle attains a desired speed at which the novel speed control device has been adjusted to function.

Another object of my invention is to provide a novel speed control which will partially or completely close the throttle valve of the carburetor or other fuel feeding mechanism whenever the speed of the vehicle exceeds the desired speed by a predetermined number of miles per hour.

Another object of my invention is to govern the speed of the vehicle when the vehicle has attained the desired speed by preventing any increase in the throttle opening as long as the speed of the vehicle remains equal to or greater than the desired speed.

Still another object of my invention is to provide a novel speed control device which is reliable, accurate, compact, economical to manufacture and install, easy to adjust, not likely to get out of order, and which will not prevent the operation of a motor vehicle in the usual manner if the speed control device should become defective.

I attain these and other objects of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the carburetor throttle valve operating mechanism with all parts in the at rest or starting position;

Fig. 2 is a similar elevation of the carburetor throttle valve operating mechanism with all parts in the positions occupied at the point of release;

Fig. 3 is a plan view, partly in section, of the circuit closing and breaking means in partial section;

Fig. 4 is an elevation view of the circuit closing and breaking means, partially in section, on line 2—2 of Fig. 3;

Fig. 5 is a section on line 1—1 of Fig. 3;

Fig. 6 is a side elevation of a motor vehicle, partly in section, with the novel speed control device attached;

Fig. 7 is a rear elevation of Fig. 1, with a portion in section;

Fig. 8 is a front elevation of Fig. 1; and,

Fig. 9 is a section on line 3—3 of Fig. 1.

Referring to Fig. 6, the frame of the motor vehicle is 1 and supports the motor 2. Motor 2 is provided with a cylinder head 3 to which the carburetor 4 is attached. The throttle valve operating mechanism which is shown in detail in Figs. 1, 2, 7, 8, and 9 is enclosed by the cover 5 and attached to the support bracket 6 by the screws 7, 8, 9 and 10. The screws 11 and 12 secure the support bracket to the cylinder head and the screw 13 in the upwardly extending arm of the support bracket provides a pivot for the foot accelerator arm 14.

The vehicle frame 1 also supports the floor 15, the seat 16, the dash board 17, the steering column 18 which is provided with a steering wheel 19, and the formed metal part 20, which serves for part of the dash, for the instrument support panel, and as a support for the upper end of the steering column 18 to which it is attached by the band 21.

The transmission 22 is secured to the crank case 23 by the screws 24, 25, and 26. The transmission is provided with the universal joint 27 and the speedometer drive terminal 28 which is connected to the speedometer 29 by the two flexible shafts 30 and 31 and through the circuit closing and breaking means enclosed by the cover 32. The circuit closing and breaking means is shown in Fig. 3 and will be described in detail later. The cover is held to the circuit closing and breaking means by the screws 33 and 34, and the circuit closing and breaking means is secured to the dash 20 by the screws 35 and 36. Electric current is supplied to the circuit closing and breaking mechanism enclosed by the cover 32 by the battery 37 through the wire 38. At the desired and maximum speeds wire 38 is connected by suitable contacts to wires 39 and 40 respectively which completes an electrical circuit through the carburetor throttle valve operating mechanism under the cover 5, the motor 2, vehicle frame 1, and battery cable 41 to the battery. The battery cable 41 is secured to the frame 1 by the screw 42 and to the battery by the screw 43.

The foot accelerator arm terminates with a pedal 44 and is provided with an arcuate portion 45 which swings through an opening through dash board 17. The foot accelerator arm is normally held in the start position by the extension spring 45a which is provided with end hooks secured in a hole in the dash board cleat 46 and also in a hole in the accelerator arm lug 47. The accelerator slide 48 is attached to the foot

accelerator arm by the screw 49. The carburetor throttle valve lever 50 is normally held in a closed position by the torsion spring 51, one end of which is secured to the carburetor body and the other end terminating in a hook engaging member 54. The carburetor throttle valve lever 50 is connected to the throttle valve slide 48a by the link 52 and the link pivot screws 53 and 54. So long as the speed of the vehicle does not equal or exceed the desired speed in miles per hour, the foot accelerator when depressed opens the carburetor throttle valve a corresponding amount. When the foot accelerator is fully depressed the foot accelerator arm swings to the dotted line position 55, and the carburetor lever 50 swings to the full open position shown by the dotted line position 56.

The vehicle may be operated in the conventional manner and the motor accelerated to deliver full power at any position of the gear shift lever 57 so long as the vehicle does not equal or exceed the desired speed. When the speed equals or exceeds the desired speed, my novel speed control device becomes operative in a very desirable and effective manner.

Referring now to Figs. 3 and 4 which show the circuit closing and breaking means which is connected to the speedometer flexible drive shafts 30 and 31 at opposite ends of the governor shaft 58. The governor shaft is supported by the bearings 59 and 60 near each of its ends. The bearings 59 and 60 are threaded to engage the bearing brackets 62 and 63 and also to engage the hollow shaft nuts 61. The bearing brackets are secured to the base plate 64 by the screws 65, 66, 67 and 68. The base plate 64 is provided with apertures 69 and 70 for the screws 33 and 34 which secure the cover 32, (see Fig. 6), and also with apertures 71 and 72 for the screws 35 and 36 which secure the base plate 64 to the dash 20. The ends of the flexible shaft center shafts 73 are squared to enter and drive or be driven by the ends of the governor shaft 58 which is provided with a square axial hole in each of its ends, (as shown in Fig. 5).

The flexible shafts 30 and 31 terminate with a flange sleeve 75 attached to the flexible shaft 30 by the sleeve 74, and the flange sleeves 75, which are L-shape in cross section through one-half the sleeve, are secured to the respective bearings by like hollow shaft nuts 61 the end portions of nuts 61 engaging the outturned flanges of sleeves 75, as shown in Fig. 3. At the inner ends of the bearing 59 are secured a set collar 76 by means of screw 77 and a set collar 78 secured by screws 79 and 80. Screws 79 and 80 also secure one end of each of the governor springs 81 and 82. Attached to the governor springs at the center of their length are the governor weights 83 and 84 secured by the rivets 85 and 86 and washers 87 and 88. The other ends of the governor springs are secured by screws 90 and 91 to the hub of the governor disc 89. Disc 89 is drawn to the dotted line position 92, (shown in Fig. 3) when the governor weights swing outward to the dotted line positions shown in Fig. 3, as the speed of the governor shaft 58 increases in revolution in proportion to the increase in speed of the motor vehicle. The disc roller 93 is forced to follow the movement of the disc 89 by the spring 94 which is firmly held at its lower end by screw 68 mounted on bracket 63.

The roller shaft 95 is held in a bearing block 96 by screw 97. The bearing block pivots on the end of the standard 98 and is held thereon by the cotter key 99. The lower end of standard 98 is secured to the plate 100 by the screw 101 which passes through the base plate 64. The contact screws 102 and 103 are screwed through the ends of the contact standards 104 and 105 respectively. The contact standards are made of non-conducting material and are secured to the plate 100 by the screws 106 and 107, as shown in Fig. 4.

As shown in Fig. 3, the springs 108 and 109 are fitted with contact points 110 and 111 at their outer ends and secured at their opposite ends to the clamp block 112 by the screw 113 and nut 114. The screw 113 and the springs 108 and 109 are insulated electrically from the clamp block by the insulation parts 115 and 116. The nut 114 connects the wire 38 from the battery to the springs 108 and 109. The clamp block 112 is secured to the roller arm 95 by the screw 117. The wire 39 is connected to contact screw 102 by nut 118, and wire 40 is held to contact screw 103 by nut 119. It will be understood from the construction of the entire contact making and breaking means, as illustrated in Figs. 3 and 4, that as the governor disc 89 moves toward the position shown in dotted lines as 92 and shaft 95 correspondingly moves to the dotted line position 120, the contacts 110 and 111 are correspondingly moved toward the respective contact screws 102 and 103. The proper setting of the contact screws is accomplished by rotating the plate 100 around the pivot screw 101 (as shown in Fig. 4) until the contact between the contact point 110 and contact screw 102 is made at approximately the desired speed, and thereupon clamping the plate 100 to the base plate 64 by means of the screw 121 which passes through the radial slot 121a in the plate and in threaded engagement with base plate 64. The accurate adjustment of the contacts between the point 110 and contact screw 102 at the desired speed and between the point 111 and the contact screw 103 is made by screwing the screws 102 and 103 outward or backward through the contact standards 104 and 105 and locking the contact screws with the nuts 118 and 119. For example, the first contact may close a circuit through wire 39 at 46 miles per hour and the second contact close a circuit through the wire 40 at 50 miles per hour in order for my novel speed control device to properly function at the desired speed of 46 miles and at a maximum speed of 50 miles per hour. The electric circuits through the wires 39 and 40 control the action of carburetor throttle valve control mechanism which is enclosed by cover 5, (shown in Fig. 6) and hereinafter described. The contacts are to remain adjustable for whatever setting is desired to properly govern the speed at any other desired or maximum speeds.

The carburetor throttle valve operating mechanism consists of the accelerator slide 48 and the throttle valve slide 48a and related parts supported by the base plate 122. The slides 48 and 48a are held in proper relation by the guide bars 123, 124, 125, and 126 (see Figs. 7 and 8), which are secured to the base plate 122 by the screws 127, 128, 129, and 130. The base plate 122 is provided with holes 131, 132, 133, and 134 through which the screws 7, 8, 9, and 10 pass to secure the cover 5 and base plate 122 to the support bracket 6, as shown in Figs. 2 and 6.

The accelerator slide 48 is provided with a

latch slide 131 which engages a notch 132 in slide 48a. The latch slide 131 is held to the accelerator slide 48 by the rivet 133 which passes through the slot 134 of the latch slide 131. The tension spring 135, secured at one end into the ear 136 of the latch slide 131 and secured at the other end to the screw 137 which in turn is screwed through the lug 138 that is secured to the accelerator slide 48 by the screw 139, normally draws the latch slide 131 along the accelerator slide 48 until the end 134a of the slot 134 strikes the rivet 133. The spring 135 is of sufficient strength to force the throttle valve slide 48a to the position 140, shown in Fig. 2 in full lines and in Fig. 1 in dotted lines, against the resistance of the torsion spring 51, (shown in Fig. 6) and while so doing keep the slot end 134a against the rivet 133 as the accelerator slide 48 is forced to the position 141 by the foot accelerator arm movement, through screw 49 engaged in the hole 142. The screw 53 (Fig. 6) engaged in the hole 143 of member 48a connects said throttle valve slide 48a with the link 52, which in turn is connected to the carburetor throttle valve lever 50.

When the circuit is closed through wires 38 and 39 at the desired vehicle speed by the circuit closing and breaking means shown in Figs. 3 and 4, the current flows through the solenoid 144, the wire 145, the spring 146, the contact points 147 and 148, the swinging release lever 149, and through the release lever pivot pin 150 secured in the grounded plate 122.

The swinging release lever 149 is provided with a spring 151 secured by rivet 152 to press against the pin 153, which is screwed into plate 122, to move the swinging release lever downward. The swinging release lever is notched at its lower end to loosely embrace the upper and lower edges of the accelerator slide 48, as shown by the shoulders 154 and 155, and is held on the pivot pin 150 by the cotter key 156. The spring 146 is connected to the wire 145 and clamped by screw 157 to the insulating block 158 which is secured by the screw 159 to the plate 122. The circuit through wire 39 energizes the solenoid 144 and its attracts the pole shoe 160 provided with the pole shoe pin 161 which swings the latch bell crank 162 on the pivot screw 163, secured in plate 122, to lower the latch lug 164 to the position 165, as shown in dotted lines in Fig. 1, where it will engage the teeth on the ratchet segment lever 166. The ratchet segment lever pivots on screw 167, secured in plate 122, and is provided with a pin 168 which engages the slot 169 in the throttle valve slide 48a, whereby the ratchet segment lever 166 is swung to the dotted line position 140. The solenoid 144 is secured to the plate 122 by the screws 171, 172, 173, and 174. The latch bell crank is normally held in release position by the torsion spring 175.

If the motor vehicle is being slowly accelerated at the instant the desired speed is reached, the latch lug 164 will engage the ratchet segment and prevent a further movement of the throttle valve slide 48a, and therefore also prevent a further opening of the carburetor throttle valve, although the foot accelerator may be later fully depressed to move the accelerator slide 48 to the position 141, as this results only in the extension of spring 135 and the movement of rivet 133 toward the slot end 143b.

In case the foot accelerator was so far depressed at the instant the desired speed was reached that the vehicle continues to accelerate to the maximum speed, a circuit is closed, as explained, through wire 40 to the solenoid 176, which is secured to the plate 122 by the screws 177 and 178. The solenoid 176 is grounded through screw 178 and attracts the pole shoe 179 on the swinging release lever 149. This operation lifts the swing release lever 149 and the accelerator slide 48 to the position shown in Fig. 2. When the accelerator slide 48 is lifted the latch slide 131 is disengaged from the notch 132 in the throttle valve slide 48a and the latter is returned to the position 185, as shown in Fig. 2.

If desired, the arm 180, which is secured to the throttle valve slide 48a by the screw 181, and provided with a foot 182, may be adjusted so that the foot will strike the lug 183, as shown in dotted lines at 182a. This checks the closing of the throttle valve at some desired opening less than the opening required to accelerate the vehicle to the desired speed, by stopping the throttle valve slide before it reaches the full closed position 185. This last adjustment is made with the foot accelerator fully depressed in order that the throttle will also fully close when the foot accelerator is released.

When the foot accelerator is fully released the latch slide 131 will return to the dotted line position 184 (as shown in Fig. 2) and will reengage the notch 132 in the carburetor slide 48a (as shown in Fig. 1), when the speed of the vehicle drops below the maximum speed and the solenoid 176 is deenergized by the breaking of the circuit through wire 40 in a reverse manner to the closing of the same circuit. The contact between the points 147 and 148 is broken whenever the solenoid 176 lifts the swinging release lever 149 in order to deenergize solenoid 144 and release the latch lug 164 from the ratchet segment lever 166 at the same instant that the latch slide 131 is withdrawn from the notch 132 in the carburetor slide 48a to allow a free return of the latter.

It will be understood from the above that a motor vehicle equipped with my novel speed control device may be operated in the usual manner in all gears and at all speeds below the desired speed, and a further opening of the throttle will be prevented when the vehicle attains the desired speed until the vehicle speed drops below the desired speed. Also the throttle opening may be entirely closed when the maximum speed has been reached or only partially closed to any opening less than the opening required for maintaining the desired speed at the choice of the driver. The full power of the motor is again available as soon as the speed drops below the desired speed simply by releasing and again depressing the accelerator. This last advantage is very desirable as the full motor power may be utilized to maintain the desired speed under heavy load and adverse road grade.

What I claim is:

1. In a motor vehicle speed control device, a carburetor valve controlling mechanism, comprising a base plate, an accelerator slide member slidably mounted on the base plate and having a depending lug, a throttle valve slide member slidably mounted on the base plate, a pivotally mounted ratchet segment lever operatively connected to the throttle valve slide member, a spring-controlled latch positioned to engage the aforesaid ratchet member, a latch slide member carried by the accelerator slide member and positioned to be thrown into and out of engagement

with the throttle valve slide member, a spring resiliently connecting the latch slide member with the accelerator slide member, means carried by the throttle valve slide member adapted to operatively engage the lug of the accelerator slide member for checking the closing of the throttle valve before it reaches full closed position, and electrically controlled mechanism for operating the latch member to cause it to engage the ratchet segment lever.

2. In a motor vehicle speed control device, a carburetor throttle valve controlling mechanism, comprising a base plate, an accelerator slide member slidably mounted on the base plate, and having a depending lug, a throttle valve slide member slidably mounted on the base plate, a pivotally mounted ratchet segment lever operatively connected to the throttle valve slide member, a spring-controlled latch positioned to engage the aforesaid ratchet member, an adjustable latch slide member carried by the accelerator slide member and positioned to be thrown into and out of engagement with the throttle valve slide member, and adjustable spring resiliently connecting the latch slide member with the accelerator slide member, adjustable means carried by the throttle valve slide member adapted to operatively engage the lug of the accelerator slide member for checking the closing of the throttle valve before it reaches full closed position, and electrically controlled mechanism for operating the latch member to cause it to engage the ratchet segment lever.

3. In a motor vehicle speed control device, a carburetor valve controlling mechanism, comprising a base plate, an accelerator slide member slidably mounted on the base plate and having a depending lug, a throttle valve slide member slidably mounted on the base plate, a pivotally mounted ratchet segment lever operatively connected to the throttle valve slide member, a spring-controlled latch positioned to engage the aforesaid ratchet member, a latch slide member carried by the accelerator slide member and positioned to be thrown into and out of engagement with the throttle valve slide member, a spring resiliently connecting the latch slide member with the accelerator slide member, means carried by the throttle valve slide member adapted to operatively engage the lug of the accelerator slide member for checking the closing of the throttle valve before it reaches full closed position, electrically controlled mechanism for operating the latch member to cause it to engage the ratchet segment lever, and electrically-controlled means for automatically disconnecting the accelerator slide member from the throttle valve slide member under the predetermined condition described.

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