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HYDRAULIC SPEED CONTROL FOR MOTOR VEHICLES

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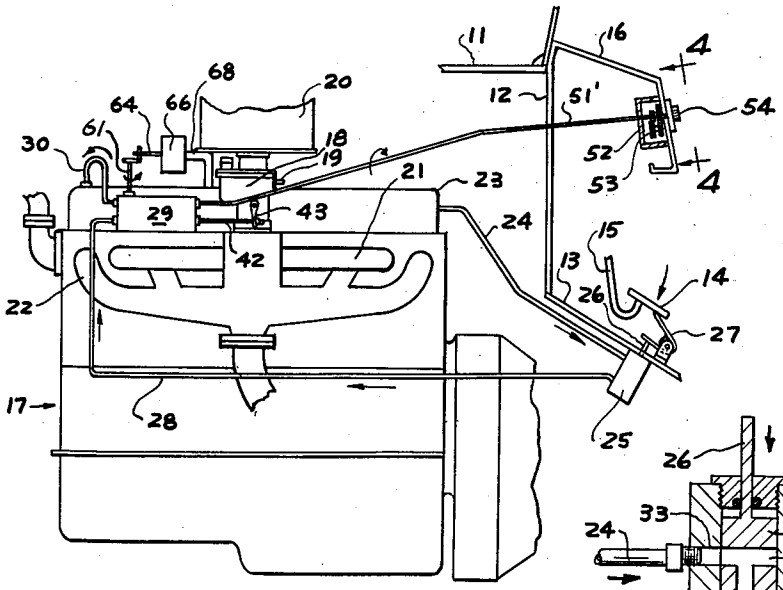


Fig. 1

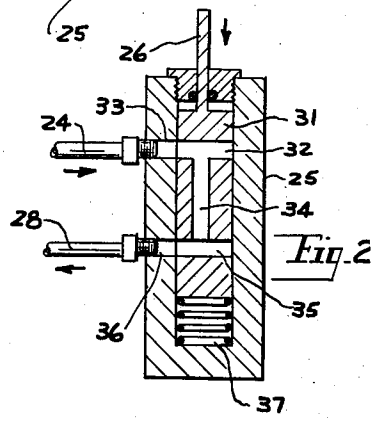


Fig. 2

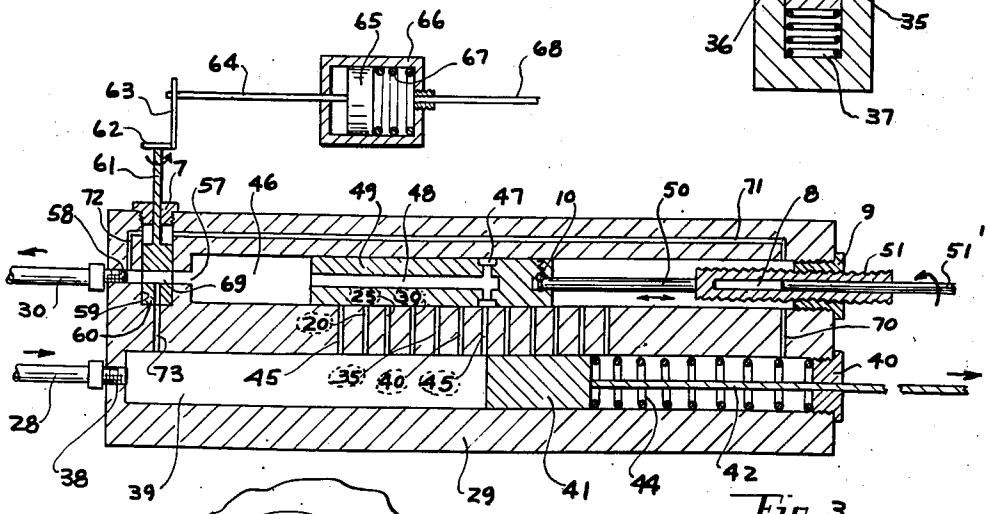


Fig. 3

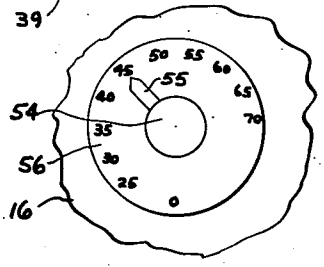


Fig. 4

INVENTOR.
JESSE M. SEAY
BY
Robert A. Sloman
ATTORNEY

United States Patent Office

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HYDRAULIC SPEED CONTROL FOR MOTOR VEHICLES

Jesse M. Seay, Detroit, Mich.

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5 Claims. (Cl. 192—3)

This invention relates to a speed control for a vehicle, and more particularly to a hydraulically operated mechanism for regulating the carburetor control valve.

One of the inconveniences encountered with the conventional accelerator pedal used in motor vehicles is the requirement that the driver's foot must be in constant engagement with the pedal, which, on long trips becomes tiring.

The present invention provides a novel means for operating the carburetor valve control lever which eliminates the use of the accelerator pedal.

It is the object of the present invention to provide a hydraulic mechanism for operating the carburetor control lever, together with a remote manual speed control upon the vehicle dashboard for regulating said hydraulic mechanism.

It is another object of this invention to utilize the conventional lubricating oil pressure means of the vehicle engine for delivering fluid under pressure to said hydraulic mechanism.

It is the further object of the present invention to provide on the vehicle dashboard a dial indicator control pointer for setting the control mechanism to the desired speed.

It is the further object of this invention to provide a bypass valve structure in the fluid system for the carburetor control whereby the fluid supply is temporarily interrupted on application of the vehicle's brakes.

It is still the further object herein to provide for increased control movement of the hydraulic control mechanism upon the temporary falling off of the engine vacuum as where the engine encounters an increased load which might be due to an incline in the roadway or a desire for acceleration.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawing in which:

Fig. 1 is a fragmentary side elevational view of a vehicle engine and portions of the associated vehicle chassis.

Fig. 2 is an elevational section on an enlarged scale of the brake pedal operated bypass valve.

Fig. 3 is an elevational section on an enlarged scale of the fluid control mechanism shown in Fig. 1.

Fig. 4 is a section taken on line 4—4 of Fig. 1, but on an enlarged scale.

Referring to the drawing, a portion of the vehicle chassis is shown at 11, Fig. 1 terminating in the conventional fire wall 12, floorboard 13 and dashboard 16, and the associated fragmentary brake pedal 14 with its supporting arm 15, all being of conventional construction.

The vehicle engine 17 has a carburetor 18 with fuel supply conduit 19 fragmentarily shown, and above the carburetor a conventional air intake 20. There is also shown the fuel intake manifold 21 associated with said carburetor, and also the exhaust manifold 22 and adjacent thereto the cylinder head 23 from which engine oil is delivered under pressure through conduit 24.

This oil is delivered to the emergency cutoff valve 25 hereafter referred to as a bypass valve which has a piston

31 therein and rod 26 arranged with respect to the said brake pedal and the associated leaf spring 27 whereby application of the vehicle brake will move the bypass valve piston 31 from the normal position of operation shown in Fig. 2, against the action of coiled spring 37, cutting off the flow of pressure fluid.

Normally circulating pressure fluid leaves bypass valve 25 through conduit 28 for direction to housing 29 for the hydraulic control mechanism which regulates the longitudinal adjustment of rod 42 connected at its outer end to the carburetor valve control lever 43.

Exhaust fluid from control mechanism 29 returns to the fluid pressure source within cylinder head 23 by means of conduit 30.

Said bypass valve has a pair of radial passages 32 and 35 interconnected by the axial passage 34. Pressure fluid from conduit 24 passes from intake port 33 into passage 32, through passage 34, out passage 35, and through outlet port 36 connecting conduit 28.

Referring now to Fig. 3 there is shown on an enlarged scale the heart of the present hydraulic control mechanism generally indicated at 29, and which includes inlet 38 connected by conduit 28, and which provides pressure fluid to the inlet bore 39 and the movable piston 41 therein.

Piston rod 42 extends through sealing cap 40 and is connected, as shown in Fig. 1, with the carburetor valve control lever 43. Accordingly longitudinal adjustment of piston 41 against the action of coiled spring 44 will determine the adjustment of the conventional butterfly valve in the carburetor, and the resulting speed of operation of the vehicle engine.

Within housing 29 there is an outlet bore 46 parallel to bore 39, and interconnecting said bores are a series of parallel spaced transverse bleed passages generally indicated at 45. Additional circled numerals identify the successive bleed passages corresponding to the desired vehicle speed i. e., 25, 30, 35, 40, 45, etc., miles per hour.

Longitudinally adjustable piston 49 is manually set from the remote control 54 on the vehicle dashboard hereafter described, and includes the axial passage 48 which extends to one end of the piston 49, the other end of said passage terminating in the radial bore 47.

In operation, the piston 49 has been manually set so that bore 47 registers with the bleed passage corresponding to 45 miles per hour. This means that upon application of pressure fluid to bore 39, piston 41 will be moved longitudinally controlling the vehicle carburetor until the bleed passage corresponding to the circled 45 numeral is uncovered. At that point piston 41 will stop and pressure fluid passes through said bleed passage and through passages 47 and 48 into bore 46 and through the outlet 57 and the outlet fitting 58 to the exhaust conduit 30 for return to the pressure fluid source.

Piston rod 50 has a swivel connection with piston 49 by means of a suitable spring biased ball detent 10 which engages within an annular recess formed adjacent the end of rod 50. Said rod terminates in the elongated screw 51 which threadedly engages a suitable sealing plug 9 at the end of bore 46, said screw being adapted for longitudinal adjustment on rotation thereof.

For this purpose, there is provided an elongated flexible shaft 51′ of polygonal shape in cross section whose outer free end is slidably keyed within a correspondingly shaped slot 8 formed throughout a greater portion of the length of screw 51.

The opposite end of shaft 51′ extends through fire wall 12 and into gear box 52 and is connected to a small pinion which is intermeshed with a series of speed up gears connected with the shaft of the manually rotatable pointer 54. As shown in Fig. 4 said pointer includes a manually rotatable knob and indicator 55 mov-

able with respect to calibrated disc **56** which has marked thereon a series of numerals corresponding to the speeds 25, 30, 35, 40, etc., miles per hour.

As the distance of movement of pointer arm **55** for a 5-mile per hour change is somewhat limited, in order to provide for a corresponding longitudinal adjustment of piston **49**, it is necessary to employ the gear box **52** which thereby multiplies the rotary movement of shaft **51'**. This shaft in turn rotates screw **51** for obtaining the desired adjustment of piston **49**.

Interposed within housing **29** adjacent exhaust outlet **57** there is provided an upright bore **59** for the arcuately adjustable plug valve **60** which has a transverse passage **69** normally in registry with outlet **57**.

Slight rotation of valve **60** will thus constrict the flow of exhaust fluid with the result that there will be a fluid pressure build-up in bore **39** and additional adjustment of piston **41** without further adjustment of piston **49**. This is desirable where the vehicle engine is placed under increased load as in driving on an incline such as a hill.

Rotatable piston rod **61** extends through a suitable closure seal **7** and carries a disc **62** at its upper end eccentrically connected by the elongated arm **63** to piston rod **64** for the piston **65** within housing **66**. Coiled spring **67** normally urges piston **65** to the left. Vacuum conduit **68** is connected to cylinder **66** and is also connected to the engine vacuum such as at the engine intake manifold whereby changes in the vacum condition of the engine, such as a falling off thereof will permit the spring **67** to become more effective causing movement to the left of piston **65**. This in turn rotates disc **62** and causes a slight constriction of passage **69** with respect to exhaust outlet **57**.

As the supply of pressure fluid to bore **39** is unchanged, there is a partial pressure build-up in bore **39** with the result that piston **41** will move to the right of the position shown in Fig. 3. This causes a further opening of the control valve within the carburetor **18** and increased power.

As vacuum in the engine again builds up to normal, it will operate against spring **67** returning piston **65** to the neutral position shown in Fig. 3 relieving the constriction in exhaust passage **57**, so that pressure in bore **39** returns to normal, and piston **41** returns to the position shown in Fig. 3.

Bleed passage **70** interconnects the outer ends of bores **39** and **46** so that pressure fluid which has escaped past piston **41** may pass into the exhaust bore **46** and travel through passage **71** and join exhaust outlet **57** through passage **72**. This prevents a build up of pressure fluid upon the right end of bore **39**. An additional exhaust passage **73** connects the left end of bore **39** with said exhaust passage to furthermore prevent too great a build up of fluid pressure within bore **39**.

The maximum increase in power whenever there is a vacuum fall off, is limited to the movement of piston **41** past the end of piston **49**. After that, additional pressure will bleed fluid through a second bleed passage adjacent the end of piston **49**, and will exhaust through conduits **71** and **72**.

Having described my invention, reference should now be had to the claims which follow:

I claim:

1. A speed control for a vehicle having a dashboard and a carburetor valve control lever; an elongated housing having spaced inlet and outlet bores closed at their ends with a series of parallel spaced transverse bleed passages interconnecting said bores, a first piston movable within said inlet bore and having a piston rod projecting from said housing and operatively joined to said lever, spring means in said bore urging said piston in one direction, said housing having an inlet joining said inlet bore, a source of fluid under pressure connected with said inlet for moving said piston in the opposite direction, a longitudinally adjustable second piston in said outlet bore having an axial conduit extending to one end of said second piston and intermediate the ends of said piston a connecting radial passage adapted for selective registry for one of said bleed passages, said housing having an outlet joining said outlet bore for returning pressure fluid to said source, a longitudinally adjustable rod connected with said second piston and projecting from said housing, and a manually operable remote control on said dashboard connected with said latter rod, whereby longitudinal adjustments of said second piston control the longitudinal pressure fluid operated adjustment of said first piston.

2. The speed control of claim 1, said longitudinally adjustable rod for said second piston having a threaded means engaging said housing, said remote control including a flexible shaft of polygonal cross section slidably engaging said rod in driving relation.

3. The speed control of claim 1, said longitudinally adjustable rod for said second piston having a threaded means engaging said housing, said remote control including a flexible shaft of polygonal cross section slidably engaging said rod in driving relation, a speed designating dial on said dashboard, a manually rotatable pointer on said dial, and intermeshing gear means interconnecting said pointer and said flexible shaft.

4. The speed control of claim 1, a plug valve in said housing having a transverse passage normally interposed in said fluid outlet and rotatable for partially constricting said outlet, a cylinder containing a movable piston and rod eccentrically joined to said plug valve, spring means urging said piston in one direction, a conduit connecting said cylinder to the vehicle engine vacuum for moving said piston in the opposite direction whereby upon a falling off of said vacuum said outlet will be partially constricted providing additional longitudinal movement of said first piston.

5. The speed control of claim 1, said vehicle having a brake pedal, a fluid bypass valve interposed between said pressure fluid source and said inlet, a spring biased piston having a series of connecting passages for conducting pressure fluid through said bypass valve, and a rod on said piston engageable by said brake pedal for cutting off flow of pressure fluid on brake application.

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