Dec. 20, 1927. 1,653,568

C. W. HICKS

ACCELERATOR FOR AUTOMOBILE ENGINES

Filed Dec. 29, 1926

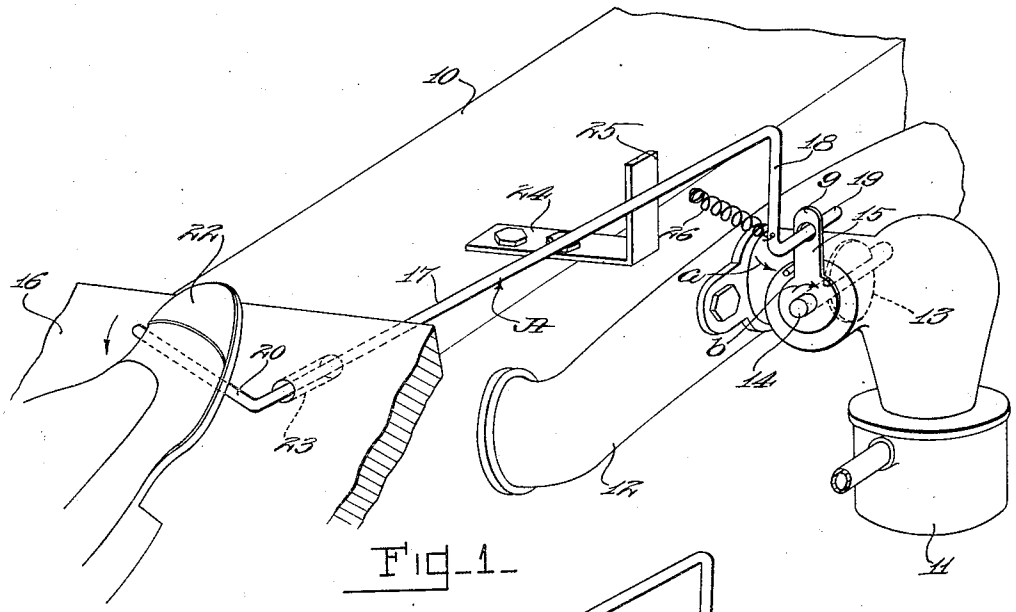


Fig-1-

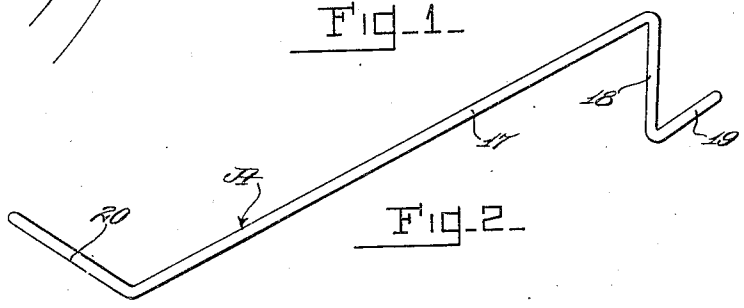


Fig-2-

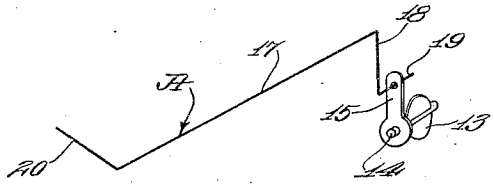


Fig-3-

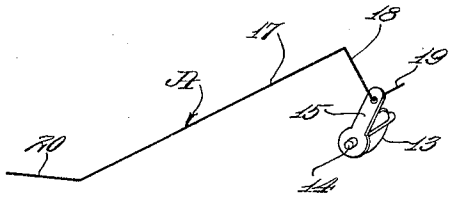


Fig-4-

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UNITED STATES PATENT OFFICE.

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ACCELERATOR FOR AUTOMOBILE ENGINES.

Application filed December 29, 1926. Serial No. 157,692.

The invention relates to a new and useful improvement in accelerator control mechanism for internal combustion engines for automobiles. In the usual construction, the actuating mechanism for the valve which controls the supply of fuel to the carburetor comprises several elements including a foot member, a member connected with the valve spindle and an intermediate link generally spoken of as the accelerator rod and this link or rod has to be pushed or pulled in an axial direction to operate the valve. One objection to such construction is that after a short time of use the several parts tighten at the joints and therefore the action becomes stiffer. This condition makes it necessary for the operator to exert a heavier initial pressure than usual with the result that the foot follows through with a sudden quick movement and instead of causing a gradual opening of the valve it opens the valve abruptly, thereby causing a jerky or uneven movement of the vehicle. Furthermore, when the action is stiff it requires considerable pressure by the foot all of the time and this causes cramping in the leg. The compound construction above mentioned also makes for lost motion at the joints and this lost motion has to be taken up before the valve will move, thus preventing the instantaneous response which is important.

One object of the present invention is to provide accelerator mechanism of simplified construction which eliminates lost motion and makes easier action.

One feature consists in making the accelerator rod integral throughout. Another feature consists in a construction whereby the accelerator rod is rotated on its axis instead of moving in an axial direction. This requires less foot power than when the movement is in an axial direction as in the ordinary construction.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings, and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings:

Fig. 1 is a perspective view of an accelerator mechanism embodying the invention applied to an automobile engine, there being shown only such parts of the automobile and engine as are necessary to illustrate the invention.

Fig. 2 is a perspective view of the accelerator rod detached.

Figs. 3 and 4 are diagrams illustrating different positions of the accelerator mechanism.

Referring now to the drawings, 10 is the motor, 11 the carburetor, 12 the intake manifold, 13 the butterfly valve, 14 the valve spindle and 15 the usual lever or arm connected with the valve spindle 14 and adapted to be connected with the accelerator mechanism. At 16 is shown the foot board.

The accelerator rod is designated as a whole at A and comprises an intermediate body portion 17, preferably straight, said body portion merging at one end in a portion 18 which extends substantially at right angles to the said body portion 17 and which terminates in an end portion 19 extending substantially at right angles to the portion 18 and substantially parallel with the intermediate body portion 17. The other end of said main portion 17 terminates in a pedal member 20 which extends at substantially a right angle to said portion 17 but on the opposite side of the axis of the portion 17 from the portion 18 so that a plane passing through the parts 17, 18 and 19 will be at an angle to a plane passing through 17 and 20.

The end portion 19 is adapted to be engaged with a hole 9 in the valve arm 15 and the end portion 20 serves as a pedal adapted to be engaged by the foot 22 of the operator.

In assembling the accelerator rod the pedal end will be first passed through a hole 23 in the foot board 16 and then the end member 19 can be inserted through the hole 9 in the arm 15 of the valve. It will thus be seen that the parts are very easily assembled.

The hole 23 in the foot board serves as a bearing for one end of the accelerator rod, said hole as shown being somewhat larger

than the diameter of the rod, to permit the rod to assume different angular positions longitudinally thereof as the valve is opened. A bracket 24 is secured to the motor and has an upright arm 25 in position to be engaged by the intermediate portion 17 of the accelerator rod and serves as a side bearing therefor, as well as a guide during the operation of the rod. A spring 26 secured at one end to the lower end of the portion 18 of the rod and at its other end to the motor or other fixed support normally holds the accelerator rod in the position shown in Fig. 1 in which the butterfly valve is closed.

To open the valve the operator presses his foot down upon the pedal portion 20 of the accelerator rod, thereby causing the intermediate portion 17 to partially rotate on its axis and swing the portion 18 and the valve connected portion 19 in the direction of the arrow indicated at *a* in Fig. 1, thereby causing the valve arm 15 to rotate in the direction of the arrow indicated at *b* in said figure and open the valve 13. It is obvious that the extent of opening of the valve will depend upon the extent of depression of the pedal portion 20. When the pedal portion 20 is depressed as just above described, the upright guide member 25 against which the intermediate portion 17 bears will prevent the portion 18 and said portion 17 from swinging over toward the left with the portion 19 as a fulcrum as might take place if it were not for said guide member 25, but as the portion 18 cannot swing to the left with the portion 19 as a fulcrum and as the arm 15 is free to swing to the right, i. e., in the direction of the arrow indicated at *b* in Fig. 1, said arm 15 is compelled to move to the right and open the valve. When the foot pressure is released the spring 26 will rock the accelerator rod back to normal position and close the valve.

It will thus be seen that a simple and light downward pressure of the foot will operate the accelerator rod in a rotary movement without any push or pull in an axial direction and make for much easier action by the operator, and for smoother running of the vehicle. It will also be obvious that the accelerator rod being integral, there is no lost motion, no joints to tighten up or to become stiff nor is there any cramping of the foot of the operator.

What I claim is:

1. In combination with a valve which controls the fuel supply of an internal combustion engine and has a member adapted to be operatively connected with an accelerator rod, an accelerator rod having an intermediate body portion, an arm at one end thereof extending substantially at right angles thereto and having pivotal engagement with said valve member, the other end of said rod having an arm forming a pedal projecting at an angle thereto, said pedal and said valve operating arm being so disposed with relation to each other that a plane passing through said pedal and said body portion will be at an angle to a plane passing through said valve operating arm and said body portion, said pedal portion being adapted to be operated by downward pressure to rotate said body portion on its axis, a bearing for said body portion adjacent the pedal member, a vertically elongated bearing located on the opposite side of the axis of said body portion from said valve so constructed and arranged as to resist lateral movement of the said body portion in the opposite direction from the valve, but permitting vertical movement thereof whereby the body portion while rotating is permitted to also move vertically on its vertical bearing and the valve operating arm is permitted to move in a curved path.

2. In combination with a valve which controls the fuel supply of an internal combustion engine and has a member adapted to be operatively connected with an accelerator rod, an accelerator rod having an intermediate body portion, an arm at one end thereof extending substantially at right angles thereto and having pivotal engagement with said valve member, the other end of said rod having an arm forming a pedal extending at an angle thereto, said pedal and said valve operating arm being so disposed with relation to each other that a plane passing through said pedal and said body portion will be at an angle of substantially 90° to a plane passing through said valve operating arm and said body portion, said pedal portion being adapted to be depressed to rotate said body portion on its axis, a bearing for said body portion adjacent the pedal member, a vertically elongated bearing located on the opposite side of the axis of said body portion from said valve so constructed and arranged as to resist lateral movement of the said body portion in the opposite direction from the valve, but permitting vertical movement thereof whereby the body portion while rotating is permitted to also move vertically on its vertical bearing.

3. In combination with a valve which controls the fuel supply of an internal combustion engine and has a member adapted to be operatively connected with an accelerator rod, an accelerator rod comprising a straight body portion terminating at one end in an arm extending at substantially right angles thereto and then continuing parallel with the axis of said body portion to form an offset portion parallel with said body portion and having operative connection with said valve, the other end of said body portion terminating in an arm extending at an angle thereto and adapted to serve as a pedal, the pedal portion and the said body portion be-

ing in a plane which is substantially at right angles to a plane which passes through the offset portion at the other end and said body portion, a bearing for said intermediate body portion adjacent the pedal portion, a vertical bearing surface for said body portion on the opposite side of the axis thereof from the said valve operating member so constructed and arranged as to form a side stop for the rod when it is rotated and which permits vertical movement of the intermediate portion of the rod.

In testimony whereof I affix my signature.

CYRUS W. HICKS.