Aug. 28, 1934. L. W. YONGE 1,972,037

SINGLE PEDAL STARTER AND ACCELERATOR CONTROL

Filed June 19, 1933 2 Sheets-Sheet 1

Fig. 1.

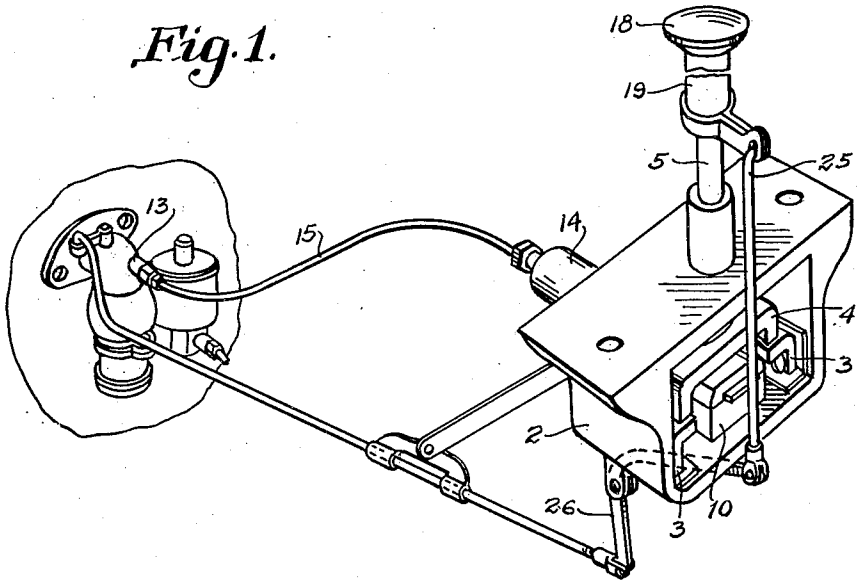


Fig. 2.

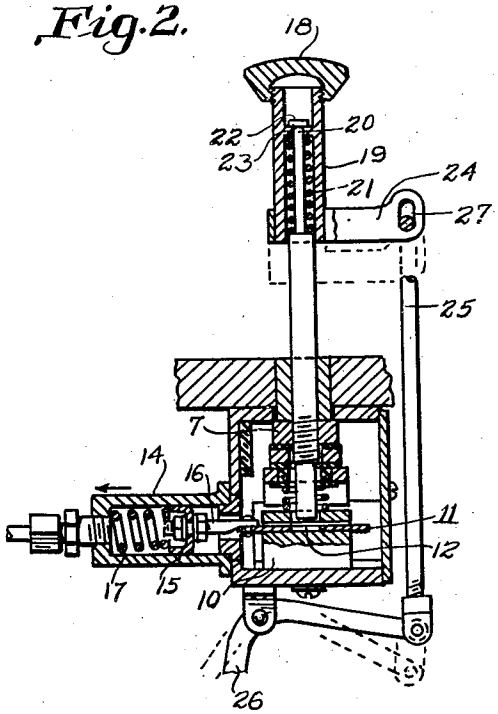
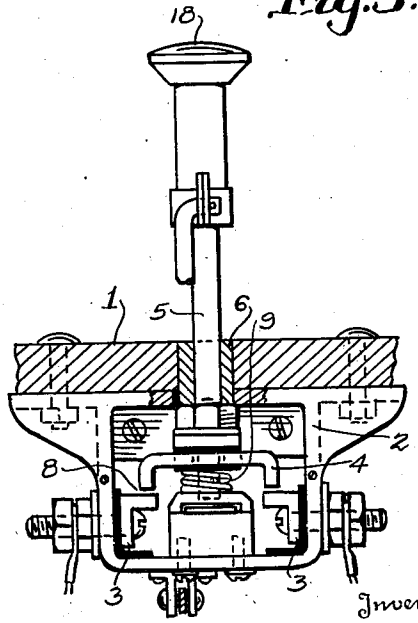


Fig. 3.



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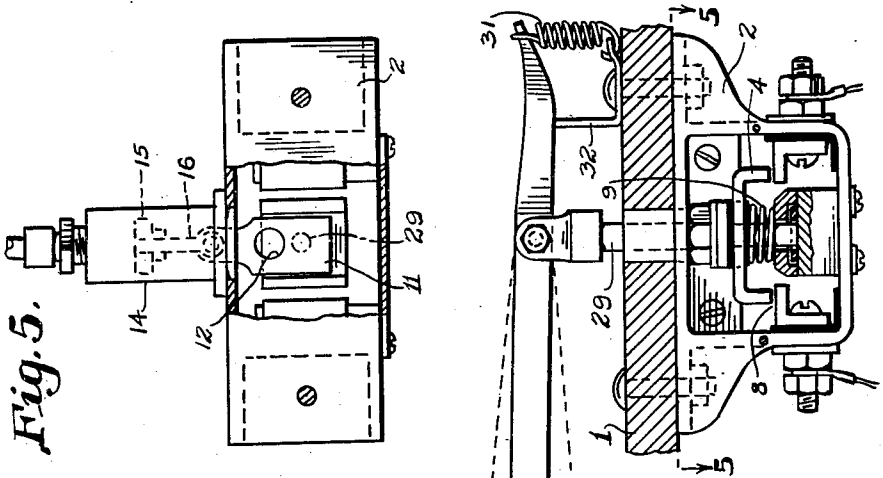


Fig. 5.

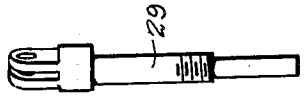


Fig. 6.

Fig. 4.

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Patented Aug. 28, 1934

1,972,037

UNITED STATES PATENT OFFICE

1,972,037

SINGLE PEDAL STARTER AND ACCELERATOR CONTROL

Laurie W. Yonge, Jacksonville, Fla.

Application June 19, 1933, Serial No. 676,573

4 Claims. (Cl. 123—179)

This invention relates to means for operating the starter of an auto-vehicle, and the accelerator by means of a single pedal, thus eliminating one of the pedals with which the motorist now has to contend and simplifying the art of driving.

One of the objects of the invention is to provide operating connections leading from the single pedal to the starter switch and accelerator respectively, simultaneously actuable through said pedal when the engine is not running for closing the starter switch, and including an element interposable into the path of movement of one of said connections responsive to a function of the engine while running, for inhibiting the starter switch closing movement, while at the same time permitting the actuation of the accelerator connection by the pedal.

Another object of the invention is the provision of the operating connections from the single pedal to the starter switch and accelerator, respectively, the connections for the starter switch being limited to a minor movement whereby it is not essential that the accelerator be operated in the act of starting the engine, and there being a resiliently compensated lost motion between said starter switch and accelerator connections so that when the movement of the starter switch connection is inhibited by the interposition of the locking element, the accelerator connection is free to move independently thereof responsive to operation of the pedal.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawings which accompany and form a part of the following specification and throughout the several figures of which the same characters of reference have been used to indicate identical parts:

Figure 1 is a perspective view of the common pedal and the connections to the starter switch and engine throttle valve;

Figure 2 is a longitudinal section through the device of the invention, the connections to the engine being broken away;

Figure 3 is a section taken in a plane perpendicularly to that of Figure 2;

Figure 4 is a slightly modified form of the invention;

Figure 5 is a section taken along the line 5—5 of Figure 4; and

Figure 6 is a perspective view of the starter switch rod.

Before adverting to the description of the present invention, it may be stated that the latch or lock interposable in the operating connection to the starter switch, and the means for actuating the same through a fluid pressure function of the engine while running, is per se, described and claimed in my Patent No. 1,455,697, granted May 15, 1923. The present invention is a combination of the device disclosed in my aforesaid application with other mechanism through which the above described results are realized.

Referring now in detail to that form of the invention disclosed in Figures 1, 2 and 3, the numeral 1 represents the floor of an automobile having a frame or casing 2 bolted or otherwise secured to the underside thereof and which contains the starting switch mechanism. Said mechanism comprises the fixed switch contacts 3 and the movable contact 4, the latter being carried by a rod 5 which reciprocates through a suitable aperture in the floor of the automobile. In the present exemplary embodiment of the invention, a bushing 6 is provided as a guide for the rod 5. The rod 5 is threaded adjacent its lower end, receiving a nut 7 which may be adjusted to limit the upward movement of the rod 5 and to determine the normal gap 8 between the fixed and movable switch contacts. A spring 9 surrounds the lower end of the rod 5 beneath the movable contact and abuts against a block 10 secured in the lower part of the casing. The spring normally biases the rod 5 in an upward direction in which the movable and fixed switch contacts are maintained apart. When the rod 5 is depressed by pressure on the pedal 18, the movable contact 4 comes into engagement with the fixed contacts 3 against the tension of the spring 9.

The block 10 is formed with a recess in its upper surface into which the lower end of the rod 5 extends and into which it descends when the pedal is pressed to close the starter switch. The block 10 is formed with a transverse slot and a keeper 11 is slidably mounted in said slot. Said keeper has a perforation 12 registrable with the depression in the block 10 and when the switch contacts are closed the end of the rod 5 extends through said perforation. The keeper 11 is adapted to be moved laterally so as to bring an imperforate portion thereof beneath the end of the rod 5. When the keeper is in this position the pedal will bring the rod 5 against the keeper, but no further so that the switch contacts are maintained in open position.

Means are provided operated through a function of the engine while running for moving the keeper into a position in which it will interpose

the imperforate portion thereof in the path of the rod 5. This means comprises a tube 13 connecting into the intake manifold of the engine at one end and at the other end communicating with the outer part of a cylinder 14 made fast to the casing 2. Said cylinder has a piston 15 and a piston rod 16, the latter being pivotally connected to the keeper 11. A spring 17 in the cylinder, presses against the piston and normally biases it to a position in which the aperture 12 in the keeper is in registry with the lower end of the rod 5. Just as soon as the engine starts running, the vacuum created in the intake manifold is communicated through the tube 13 and withdraws the piston against the pressure of the spring 17, pulling the keeper to a position in which the imperforate portion thereof is beneath the rod 5. The keeper will be maintained in this position just so long as the engine is running and consequently, it will be impossible to operate the starter while the engine is in operation. Just as soon as the engine stops and the vacuum is relieved the spring 17 forces the piston and the keeper back to the position shown in Figure 2 in which the parts are so related that upon pressure being applied to the pedal 18, the starter switch can again be closed.

The pedal 18 is telescopically connected with respect to the rod 5 by means of a hollow stem 19 in which the upper end of the rod 5 is adapted to reciprocate. Said rod is preferably of reduced diameter in that portion which is normally enclosed within the stem 19 forming a pin 20 surrounded by a spring 21. The pen 20 has a head 22 behind a partition 23 which functions to hold the stem and the rod 5 inseparable. The spring 21 is stiffer than the spring 9 so that the rod 5 and the sleeve 19 move together in the act of compressing the spring 9 when the keeper is in position to permit the free descent of the rod 5 in the starter switch actuating operation. When however the keeper is in position to inhibit the downward movement of the rod 5, the spring 21 is compressed permitting the sleeve 19 to slide telescopically over the rod 5. An arm 24 is attached to the sleeve 19 and partakes of the movements thereof. Accelerator connections 25 and 26 are operatively connected to the arm 24. The gap 8 between the fixed and movable switch contacts is wider than the clearance between the rod 5 when in its uppermost position and the plane of the upper surface of the keeper 11 so that when the keeper is in position to inhibit the downward movement of the rod 5, the gaps beween the movable parts of the starter switch cannot be closed. The arm 24 is provided with a slot 27 receiving the end of the accelerator connection 25 and providing sufficient lost motion so that the starter may be closed without operating the accelerator. It is conceivable however that the driver of the car might wish to operate the accelerator at the time of starting, and it is obvious that after the fixed and movable contacts have come into engagement, further pressure of the foot upon the pedal 18 will take up the lost motion between the arm 24 and the accelerator connection 25, permiting the accelerator to be operated.

In the normal operation of the device, the driver removes the pressure of his foot momentarily from the pedal 18 after the engine has started, so as to permit the automatic withdrawal of the rod 5 from the path of the keeper 11 under the expansion of the spring 9. The keeper 11 which was biased by the vacuum of the running engine to a position in which it presses against the sides of the rod 5, then flies into its inhibiting position as soon as the rod 5 has been withdrawn.

In that form of the invention shown in Figures 4, 5 and 6, the pedal is remotely situated with respect to the starter switch actuating mechanism, being connected thereto by a lever 28, the latter being connected at an intermediate point to a rod 29 corresponding to the rod 5 shown in the first form of the invention, insofar as its relation to the movable element of the starter switch is concerned. The pedal 18 is provided with a rod 30 which rests upon or is otherwise connected to one end of the lever 28, and on the opposite side of the rod 29 said lever is pulled down by a spring 31 anchored at one end to the floor board. An upstanding lug 32 engages the lever 28 at a point between the connection of the rod 29 and the spring 31 and serves as a fulcrum for said lever. The rod 30 is connected at its bottom end to the accelerator. The structure aside from such differentiations as have been pointed out may be similar to that form of the invention disclosed in Figures 1, 2 and 3.

When it is desired to start the engine, the pedal 18 is depressed, this rocks the lever 28 about its fulcrum 32, depressing the rod 29 against the pressure of the spring 9, closing the switch. The moment the engine starts, the keeper will be thrown to a position against the rod, and by momentarily raising the foot from the pedal 18, the spring 31 rocks the lever in the opposite direction, elevating the rod 29 and permitting the keeper to fly to a position in which it inhibits the further downward movement of the rod 29. Further pressure upon the pedal 18 will have no effect upon the starter since the rod 29 can move down no farther. Further deflection of the lever 28 is permitted by the spring 31, and enables the pedal 18 and rod 30 to be reciprocated through a range of larger amplitude, operating the accelerator which is secured to the lower end of the rod 30 as indicated at 33.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of my invention, it is to be understood that numerous changes, alterations or substitutions may be resorted to without transcending the scope of tthe invention as claimed.

What I claim is:

1. Single pedal control for internal combustion engine with automatic selection of starter and accelerator operation, comprising in combination a starter switch having fixed and movable elements, a throttle valve operating element, switch closing means, a pedal operatively connected both to said switch closing means and valve operating element, said pedal telescoping with respect to said switch closing means, a spring affording a yielding factor in the telescoping movement of said pedal, a spring normally maintaining the movable element of said switch in open position, the power of said first named spring predominating, and means operating responsively to a function of the engine while running, interposable in the line of force transmission between said pedal and the movable element of said switch for maintaining the latter open, the yielding telescopic movement of said pedal permitting actuation of the valve operating element independently of the switch

closing means, when the movement of the latter is inhibited.

2. Single pedal control as claimed in claim 1, there being lost motion between said valve operating element and said switch closing means of less amplitude than the range of movement of said valve operating element.

3. Single pedal control for internal combustion engines with automatic selection of starter and accelerator operation, comprising in combination a starter switch having fixed and movable elements, and a throttle valve operating element, switch closing means, a pedal operatively connected to said valve operating element, a lever connecting said pedal to said switch closing means, means forming a fulcrum for said lever, a spring on the opposite side of said fulcrum from the connection of said lever with said switch closing means, means operating responsively to the operation of the engine while running, interposable in the line of force transmission between said pedal and the movable element of said switch for maintaining said switch open, said spring affording a range of movement for said lever independently of and greater than the range of movement of said switch closing means for permitting operation of the valve operating element when the movement of said switch closing means is inhibited.

4. Single pedal control for internal combustion engines with automatic selection of starter and accelerator operation, comprising in combination a starter switch having fixed and movable elements, and a throttle valve-operating element, switch closing means, a pedal, means forming a variable connection between said pedal and switch closing means, said throttle valve-operating element being connected to said pedal on the pedal side of said variable connection, the latter permitting said pedal and switch closing means to operate unitarily when the engine is not running, and inhibiting means operating responsive to the vacuum of said engine when it runs, interposable by virtue of said vacuum in the path of movement of said switch closing element for maintaining said switch open and permitting movement of said pedal and throttle valve-operating element independently of said switch closing means.

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