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AUTOMATIC IGNITION CUT-OFF CONTROL FOR ENGINE IDLING

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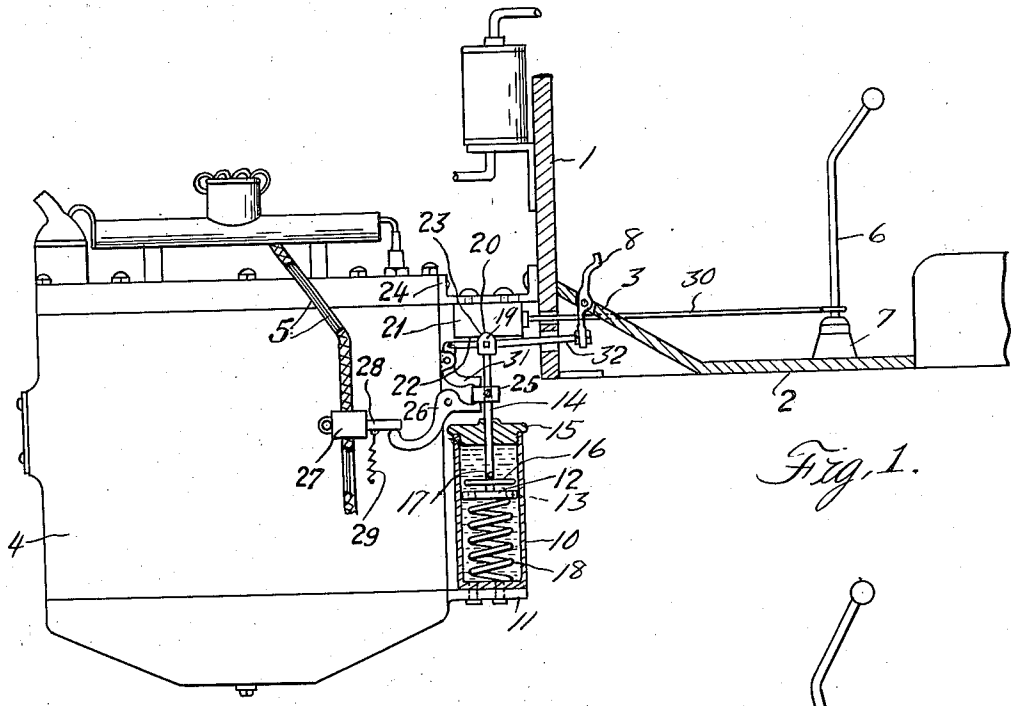


Fig. 1.

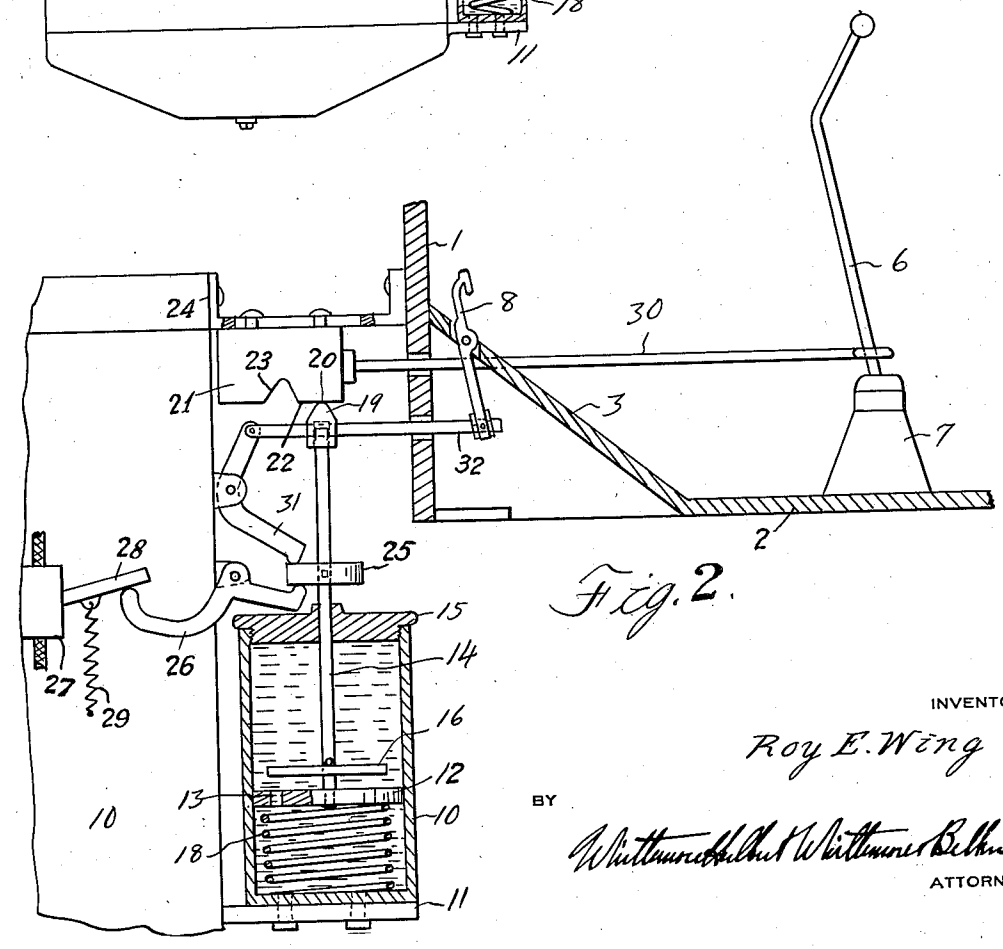


Fig. 2.

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AUTOMATIC IGNITION-CUT-OFF CONTROL FOR ENGINE IDLING

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This invention relates generally to means for controlling the supply of fuel such as gasoline to internal combustion engines of motor vehicles and consists of certain novel features of construction, combinations and arrangements of parts that will be hereinafter more fully described and particularly pointed out in the appended claims.

In the past many fatalities have been caused from persons being overcome by carbon monoxide gas delivered from the exhausts of motor vehicles. A research into the causes of such fatalities has disclosed that many if not all of them have occurred through the occupants of the garage or motor vehicle as the case may be, being overcome and rendered semiunconscious from the escaping gases and thereby unable while in this partially paralyzed condition to cut off the motor that was producing the deadly gas.

Carbon monoxide, being odorless is impossible to detect through the natural senses of the human body and it is also a recognized fact that it may be present in sufficient quantity to partially paralyze the motive functions of the body without necessarily being present in enough volume to cause fatal results. However, if the gas is not allowed to continue to generate for any great length of time these fatalities can be minimized. In fact, fatal accidents have occurred to occupants of motor vehicles who have been overcome while parked with the motor running, examples of these being in the daily newspapers, and in most instances these could have been prevented if the motor had not continued to operate while the gearshift lever was in neutral position until the engine stopped through the depletion of the gas supply from the main gas tank.

Thus it will be seen from the above explanation that there is a dangerous deficiency in the present automobile construction and it is of such a serious nature that steps should be taken to overcome as far as possible these preventable accidents.

My invention therefore is based on the theory that the engines of motor vehicles should not be permitted to operate or idle indefinitely with the gearshift lever in neutral after the vehicle itself has been brought to a standstill. One embodiment of my invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a fragmentary elevation of a motor vehicle with a safety device embodying my invention applied thereto;

Figure 2 is an enlarged fragmentary sectional view of the safety device.

Referring now to the drawings,—1 is the dash, 2 is the flooring, and 3 is the toe-board riser of a vehicle body. 4 is an internal combustion engine in advance of the dash 1 and having suitable conductors 5 that electrically connect the distributor and ignition switch (not shown) of the engine, 6 is the usual transmission or gearshift lever adjustably mounted in a bracket 7 on the flooring 2, and 8 is a starter pedal pivotally mounted on the toe-board riser 3.

In the present instance I have provided a mechanism operable by the transmission lever 6 and starter pedal 8 to control the electrical connection between the distributor and spark plugs of the engine and thereby control the operation of the engine. As shown, 10 is the dash pot secured to a lateral flange 11 of the engine block and containing a suitable fluid such as oil, 12 is a piston reciprocating in the dash pot 10 and having holes or openings 13 therein to permit oil in the dash pot to flow through the piston when it is on the down stroke, 14 is a reciprocating stem or rod rigid with the piston 12 and extending upwardly through a removable cover 15 of the dash pot, and 16 is an imperforate follower slidable on the stem 14 between a lug 17 and the piston 12 and adapted to close the openings 13 in the piston on the up stroke thereof. 18 is a coil spring in the dash pot between the bottom thereof and the piston 12 and normally holds the piston 12 and stem 14 in raised position. 19 is a head rigid with the stem 14 at the upper end thereof and having a pointed upper end 20, 21 is a reciprocating block having a flat lower face 22 and having an inverted substantially V-shaped groove 23 extending transversely of said lower face and adapted to receive the pointed upper

end 20 of the head 19 when the piston 12 is in raised position. 24 is a substantially U-shaped bracket secured to the dash 1 and constituting a support for the reciprocating block 21, 25 is a collar rigidly mounted on the stem 14 intermediate of its ends, and 26 is a lever pivoted intermediate of its ends on the engine block and having its rear end engaging the lower face of the collar 25. 27 is a box rigidly mounted on the engine block and containing an electrical switch of suitable design for controlling the passage of electrical current through the conductors 5 from the ignition switch (not shown) to the primary interrupter of the engine, and 28 is a vertically swinging actuating arm for the switch and projecting laterally from the box 27 and resting on the forward end of the lever 26. 29 is a coil spring anchored on the engine block and normally holding the arm 28 in lowered position and holding the switch in open position so that the circuit to the spark plugs is broken. 30 is a rod terminally connected to the block 21 and gear-shift lever 6 and adapted to be moved by the latter for reciprocating the block, 31 is a lever pivoted intermediate its ends on the engine block and having its lower end engaging the upper face of the collar 25 on the stem 14, and 32 is a link terminally connected to the upper end of the lever 31 and to the lower end of the starter pedal 8 and adapted when the pedal is depressed to cause the lever 31 to depress the stem 14 and piston 12 and thereby cause the lever 26 through engagement with the arm 28 to close the switch and establish an electrical connection between the ignition switch and primary interrupter to enable the engine to operate as usual.

In use, when the lever 6 is in neutral position, the parts just described are in the position shown in Figure 1 and the switch in the box 27 is held in open position so that the supply of electrical current from the ignition switch to the primary interrupter is cut off and the engine is accordingly rendered inoperative. When the lever 6 is moved to any of the positions of second, reverse, or high, etc., the block 21 is reciprocated by the rod 30 so that the pointed upper end 20 of the head 19 is cammed downwardly out of the groove 23. This causes the stem 14 and piston 12 to be depressed in the dash pot 10 and causes the lever 26 to be rocked about its pivot by the collar 25 to raise the rear free end of the arm 28 and thereby cause the switch to be closed to establish an electrical connection from the ignition switch to the primary interrupter of the engine and permit the usual operation of the engine. In this connection it will be noted that on the down stroke of the piston 12 the spring 18 is compressed and the follower 16 will uncover the openings 13 in the piston and will allow the oil in the dash pot to flow freely through these openings. Then when the lever 6 is returned to neutral position the block 21 will be moved longitudinally so that the groove 23 therein will be in vertical alignment with the head 19, thus allowing the stem 14 and piston 12 to move upwardly and enabling the spring 29 to lower the arm 28 and open the switch in the box 27. Accordingly the supply of electrical current from the ignition switch to the primary interrupter is cut off and the engine becomes inoperative. In this connection it will be noted that the up stroke of the piston is much slower than the down stroke since the follower 16 on the up stroke closes the openings 13. Thus, the oil in the dash pot can not flow through the piston but instead resists the upward movement of the piston in the said dash pot. Moreover, the period of time in which the switch can be so cut off may be readily determined and regulated by fixing the tension of the spring 18. This is also true of the down stroke of the piston, however, the area of the openings 13 also is a factor in determining the period of time in which the piston may complete its down stroke. Furthermore, the down stroke of the piston may be effected by any movement of the lever 6 from neutral position, since movement of the rod 30 by the lever 6 will cause the block 21 to slide either forwardly or rearwardly and in doing so will depress or cam downwardly the head 19 from the groove 20 and thereby cause the stem 14 and piston 12 to move downwardly.

It will also be noted that the provision of the lever 31 and link 32 forming an operating connection between the starter pedal 8 and the piston stem 14 enables the switch in the box 27 to be readily closed by the depression of the starter pedal 8 in the event the motor vehicle would of necessity, for example on account of stop lights, traffic and the like, be required to remain motionless for a greater period of time than that in which the safety device would function to cut off the supply of electrical current to the spark plugs. In other words, with my construction, if the engine is rendered inoperative in such an instance it might be made operative quickly by depressing the starter 8 to cause the switch to close the circuit and establish an electrical connection between the distributor and spark plugs and permit the usual operation of the engine. This means prevents confusion on the part of the operator, particularly if he is an inexperienced operator or not familiar with the operation of the safety device and also obviates service cost. It is the natural tendency of the driver when an engine goes dead to press upon the starter, however, I have devised the connection comprising the lever 31 and link 32 between the starter 8

and rod 14 to take care of this. Depression of the starter pedal 8 would reset the dash pot mechanism and the engine would continue to operate until the gearshift lever 6 is again returned to neutral position and the piston 12 had again reached its full up stroke position.

Thus, from the foregoing description it will be apparent that my invention possesses considerable utility and has many advantages. For instance, my device will reduce if not entirely eliminate accidental death from carbon monoxide or other deadly gases generated by internal combustion engines of motor vehicles. It will prevent an operator from leaving the engine of the vehicle running for any great length of time after the operator has left the vehicle, and this aside from the dangers of asphyxiation will tend to reduce accidents with children tampering with parts of the vehicles. It will also reduce gasoline consumption now wasted by many drivers of motor vehicles, particularly delivery trucks, who are inclined to let the engines of their vehicles run from starting time in the morning to quitting time at night. It will also reduce fire risk in automobiles.

While it is believed that from the foregoing description the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What I claim as my invention is:

1. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for conveying electrical currents from an ignition switch to the primary interrupter, a gear-shift lever, and a starter pedal, of an electrical switch for controlling the passage of electrical currents through said conductors, means operable when said lever is in a predetermined position to open said last mentioned switch, and means operable by said starter pedal to close said switch.

2. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for conveying electrical currents from an ignition switch to the primary interrupter, a gearshift lever, and a starter pedal, of an electrical switch controlling the passage of electrical currents through said conductor, means associated with said lever for closing said last mentioned switch when said lever is in an operating position such as high, low, reverse, etc., means for opening said switch when said lever is in neutral position, and means operable by said starter pedal for again closing said switch after it has been opened by the second mentioned means.

3. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for conveying electrical currents from an ignition switch to the primary interrupter, a gearshift lever, and a starter pedal, of an electrical switch controlling the passage of electrical currents through said conductors, means associated with said lever for closing said last mentioned switch when said lever is in an operating position such as high, low, reverse, etc., means for closing said switch including a reciprocating part, means for retarding the movement of said reciprocating part when moved in one direction, and actuating means for said reciprocating part including connections with said lever and pedal respectively.

4. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for conveying electrical currents from an ignition switch to the primary interrupter, a gearshift lever, and a starter pedal, of an electrical switch controlling the passage of electrical currents through said conductors, means associated with said lever for closing said last mentioned switch when said lever is in an operating position such as high, low, reverse, etc., means for closing said switch including a reciprocating part, an operating connection between said part and lever including a second reciprocating part, and an operating connection between the first mentioned reciprocating part and said starter pedal including a pivotally mounted part.

5. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from a primary interrupter to an ignition switch, and a gear shift lever, of an electrical switch connected to and controlling the passage of electrical current through said conductors, and actuating means for said last mentioned switch including adjustable means connected to said lever and operable when said lever is in a neutral position to open the last mentioned switch.

6. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors, and actuating means for said last mentioned switch connected to said lever to be actuated thereby, and including means operable automatically when said lever is in a predetermined position to open the said last mentioned switch.

7. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring elec-

trical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors, and actuating means for said last mentioned switch including means connected to and operable by said lever when the latter is in any position other than neutral for closing said last mentioned switch, and means associated with said last mentioned means for rendering the said last mentioned means inoperative and opening said last mentioned switch when said lever is in neutral position.

8. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors, and means for controlling said last mentioned switch including a pivotally mounted part for actuating said switch, a reciprocating part for actuating said pivotally mounted part, and means connected to and operable by said lever for actuating said reciprocating part.

9. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductor and having an operating arm, and means for controlling said last mentioned switch including a pivotally mounted part egageable with said operating arm to open and close the switch, and actuating means for the pivotally mounted part including means connected to and operable by said lever.

10. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, and means for controlling said last mentioned switch including a pivotally mounted part engageable with said arm, and actuating means for said part including two reciprocating means, one being operable by the other, and the other being connected to said lever to be actuated thereby.

11. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, of a pivotally mounted part engageable with said arm, and actuating means for said pivotally mounted part including a rod mounted to reciprocate adjacent the pivotally mounted part, a collar on the rod engageable with the pivotally mounted part, and means connected to and operable by the lever to reciprocate the rod.

12. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, and two means for actuating said switch arm, one of said actuating means being connected to and operable by said lever when the latter is in any position other than neutral to close said last mentioned switch, and the other means being associated with said first mentioned means and operable automatically when said lever is in neutral position to render said first means inoperative and to open said last mentioned switch.

13. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, a pivotally mounted part engageable with said arm, actuating means for said pivotally mounted part including a rod mounted to reciprocate adjacent the pivotally mounted part, a collar on the rod engageable with the pivotally mounted part, means connected to and operable by the lever for reciprocating the rod, and means operable independently of said last mentioned means for reciprocating said rod.

14. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring electrical currents from a primary interrupter to an ignition switch, and a gear shift lever, of an electrical switch connected to and controlling the passage of electrical current through said conductors, and means connected to and operable by said lever for actuating said last mentioned switch.

15. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring the electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, a pivotally mounted part engageable with said arm, actuating means for said pivotally

mounted part including a rod mounted to reciprocate adjacent the pivotally mounted part, a collar on the rod engageable with the pivotally mounted part and three means for reciprocating said rod, two of said means being operable to move the rod in one direction, and the third means being operable to move the rod in the opposite direction.

16. In a motor vehicle, the combination with an internal combustion engine having electrical conductors for transferring the electrical currents from an ignition switch to a primary interrupter, and a gear shift lever, of an electrical switch controlling the passage of electrical current through said conductors and having an operating arm, a pivotally mounted part engageable with said arm, actuating means for said pivotally mounted part including a rod mounted to reciprocate adjacent the pivotally mounted part, a collar on the rod engageable with the pivotally mounted part and two means for reciprocating said rod, one being engageable with the rod, and one being engageable with the collar.

In testimony whereof I affix my signature.

ROY E. WING.