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C. A. VATTER
ELECTRICAL SPEED CONTROLLER

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2,350,431

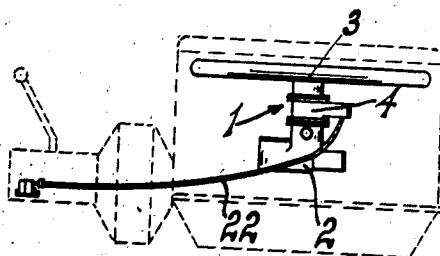


Fig. 1.

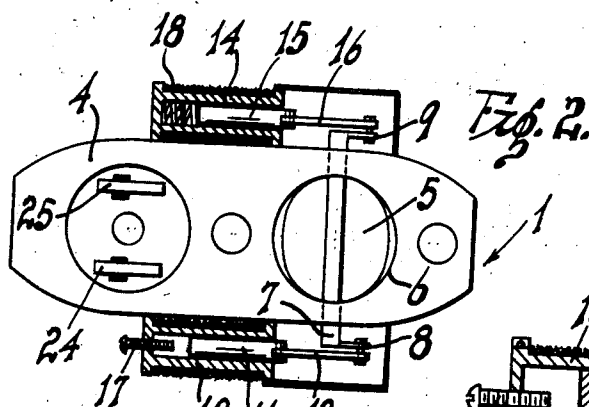


Fig. 2.

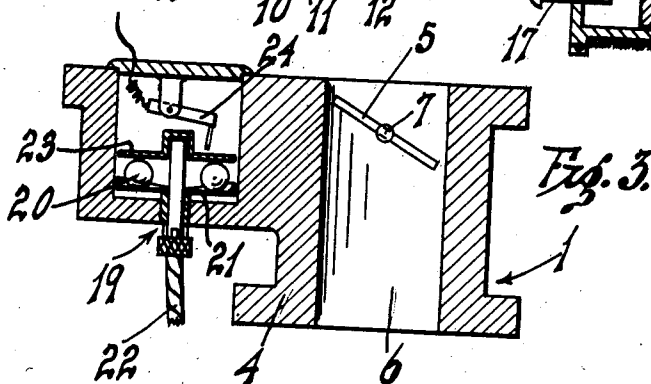


Fig. 3.

Fig. 5.

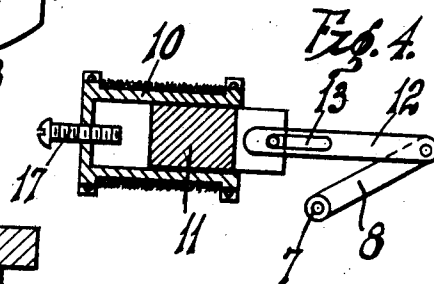
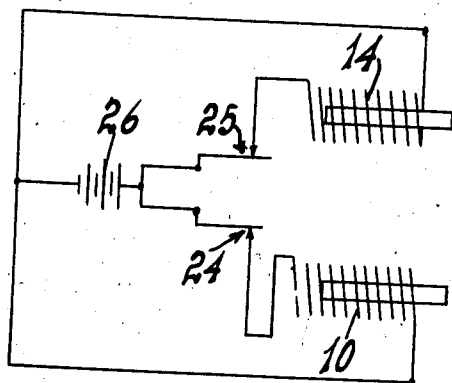


Fig. 4.

INVENTOR.
CLAUDE A. VATTER.
BY.

H. M. Duckman
ATTORNEY.

UNITED STATES PATENT OFFICE

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ELECTRICAL SPEED CONTROLLER

Claude A. Vatter, Long Beach, Calif.

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5 Claims. (Cl. 180—82.1)

This invention relates to an electrical vehicle speed controller and brake wherein the fuel supply to the engine is governed by the speed of the vehicle and overspeeding of the vehicle will cause the controller to first partially shut off the fuel supply to the engine, and then on further increasing the speed of the vehicle, a throttle valve in the intake manifold is entirely closed to provide a braking action on the engine.

An object of my invention is to provide a novel electrical speed controller and brake in which a separate control valve in the manifold is opened and closed by electrical means, such as a solenoid. The electrical means in turn is controlled by a speed sensitive device, the speed sensitive device controlling a switch means.

A further object is to provide a novel electrical speed controller and brake in which one solenoid operates a control valve in the intake manifold, this solenoid being controlled by a speed sensitive device operating through a switch; and a second solenoid operating to completely close the throat of the intake manifold through this same valve, the second solenoid also being controlled from the same speed sensitive device, and through another switch.

Other objects, advantages, and features of invention may appear from the accompanying drawing, the subjoined detailed description, and the appended claims.

In the drawing:

Figure 1 is a diagrammatic side elevation of a motor with my electrical speed controller mounted thereon.

Figure 2 is a top plan view of my controller with parts broken away to show the solenoids, and also a cover removed to show the switches.

Figure 3 is a transverse sectional view of my electrical speed controller.

Figure 4 is a longitudinal sectional view of one of the solenoids.

Figure 5 is a wiring diagram of the electrical portion of my invention.

Referring more particularly to the drawing, my vehicle speed controller and brake effectively controls the maximum speed of a vehicle within close limits by reason of a two-fold action of the speed sensitive device. The speed sensitive device first operates through a switch and thence to one solenoid to partially close the intake manifold to the engine by permitting a slight by-pass of fuel similar to the idling speed requirements of an engine, that is, the control valve is partially closed. If the speed of the vehicle further increases, as for example, going down a long

hill, the speed sensitive device further operates to actuate through another switch and a second solenoid to completely close the control valve in the intake manifold, thus effectively braking the engine and, therefore, the vehicle.

The speed controller 1 is mounted between the carburetor 2 and the intake manifold 3, of an engine. The speed controller is also mounted above the usual manually controlled throttle valve which is present in all gasoline engines. The speed sensitive device of my controller is driven from the drive shaft, transmission, or wheels of the vehicle, as will be further described. My device comprises a fitting 4 which is mounted in the manifold above the usual manual throttle valve and is suitably flanged so that it may be bolted to the usual flanges found on the manifold of a vehicle engine, substantially as shown. A control valve 5 is mounted in the passage 6 of the fitting on a shaft 7. This shaft is journaled in the fitting and extends horizontally and projects out of the fitting at each end. Arms 8 and 9 are fixedly formed or mounted one on each end of the shaft 7 for the purpose of rotating the shaft as will be further described.

A solenoid 10 is mounted on one side of the fitting 4, and this solenoid includes a plunger 11 which is movable horizontally when the solenoid 10 is energized in a manner which is well known. A link 12 connects the plunger 11 and the arm 8, and is pivoted to the plunger and the arm for the purpose of rotating the shaft 7 when the plunger 11 is actuated. An elongated slot 13 in the link 12 enables the shaft 7 to be further rotated in a direction to further close the control valve 5 when the second solenoid 14 is actuated. This second solenoid is also mounted on the fitting 4 and preferably on the side opposite the solenoid 10. This second solenoid is also provided with a plunger 15 which in turn is connected by means of a link 16 to the arm 9. The throw of the plunger 11 is controlled by means of a setscrew 17 which extends into one end of the solenoid 10. A spring 18 engages the plunger 15 urging this plunger outwardly and thus tending to return the valve 5 to its open position. The speed sensitive device 19 consists of a plurality of balls 20 which move outwardly on a rotating plate 21 under the urge of centrifugal force. The balls move outwardly on an inclined track, thus causing the balls to move upwardly as they are thrown outwardly by centrifugal force. The plate 21 is rotated by a flexible shaft 22, the shaft being driven from the transmission of the ve-

hicle, or the drive shaft, or the wheels, or a wheel, as may be desired.

A disc 23 is mounted above the balls 20 and is engageable by these balls as they move vertically, thus causing this disc to rise. A pair of switches 24-25 are mounted immediately above the disc 23, and these switches are actuated by the disc as said disc moves vertically. The switches 24-25 may be of the mercury-tumble type, or may be of the direct contact type, if desired. One terminal from each of the switches is connected to a battery 26, and this battery in turn is connected to one end of the coils of the solenoids 10 and 14, substantially as shown in Figure 5. The second terminal of the switch 24 is connected to the other end of the solenoid 10, and the second contact of the switch 25 is connected to the other end of the solenoid 14, thus it will be seen that the switch 24 controls the solenoid 10, while the switch 25 controls the solenoid 14. Now, if the disc 23 is moved vertically under the urge of the balls 20, the switch 24 will first be contacted and actuated. If the switch 24 is closed the solenoid 10 is actuated and thereupon the plunger 11 of this solenoid moves inwardly into its coil, and the shaft 7 is rotated to move the control valve 5 into partially closed position. If the speed of the vehicle continues to increase, the balls 20 will be moved further outwardly and upwardly, thus further raising the disc 23 and thereupon the second switch 25 is contacted and actuated. The solenoid 14 is now energized. This causes the plunger 15 to move inwardly thereupon further rotating the shaft 7 and completely closing the control valve 5. This further rotation of the shaft 7 is permitted without disturbing the plunger 11 because of the slot 13. When the speed of the vehicle decreases, the balls 20 will roll inwardly, thus opening first the switch 25 (because of its tumble action), thereafter the coil spring 18 pushes the plunger 15 outwardly and the valve 5 is partly opened. If the speed of the vehicle further decreases, the switch 24 is opened in the same manner as the switch 25. The solenoid 10 is thus de-energized, and the coil spring 18 can function to completely open the valve 5.

Having described my invention, I claim:

1. An electrical speed controller for a motor vehicle comprising a valve, adapted to be connected with the fuel intake of the engine of the vehicle, a speed sensitive device of the centrifugal type, drive means for said speed sensitive device extending from a rotary element of the vehicle thereto and rotating said speed sensitive device at speed variations corresponding to those at which the vehicle operates, a tumble switch mounted adjacent to and opened and closed by action of the speed sensitive device, a solenoid, said solenoid being operatively connected to the valve and adapted to partly close the same, a second tumble switch mounted adjacent the speed sensitive device, said second switch being engageable and operable by the speed sensitive device after the first switch has been actuated, a second solenoid, the second switch being electrically connected to the second solenoid, said second solenoid being operably connected to the valve and adapted to completely close said valve.
2. An electrical speed controller for a motor vehicle comprising a valve, adapted for connection with the fuel intake of the engine of the vehicle, a speed sensitive device of the centrifugal type, drive means for said speed sensitive

device extending from a rotary element of the vehicle thereto, said speed sensitive device being driven at speed variations corresponding to those at which the vehicle operates, a tumble switch mounted adjacent the speed sensitive device and actuated thereby, a solenoid, said solenoid being operatively connected to the valve and adapted to partly close the same, a second tumble switch mounted adjacent the speed sensitive device, said second switch being engageable and operable by the speed sensitive device after the first switch has been actuated, a second solenoid, the second switch being electrically connected to the second solenoid, said second solenoid being operably connected to the valve and adapted to completely close said valve, the first solenoid being connected to said valve with a lost-motion connection.

3. In a speed controller for a motor vehicle, a valve body adapted to be mounted between a fuel source and the fuel intake of the engine of the vehicle and formed with a fuel passage, a valve member for closing said passage having a shaft rotatably mounted across the passage and having crank arms at its ends, solenoids at opposite sides of said body each having a slidable core operatively connected with the companion crank arm by a link pivoted to the core and the crank arm, means for limiting sliding of the core of one solenoid and thereby limiting closing of the valve member when said solenoid is energized the link for the core of the said solenoid being slidable longitudinally of the core thereof to permit complete closing of the valve member when the other solenoid is energized, and switch means carried by said body and actuated from a rotary element of the vehicle for energizing the first solenoid and partially closing the fuel passage when the vehicle is moving at predetermined speed and afterwards energizing the second solenoid to completely close the fuel passage when the speed of the vehicle has increased to a predetermined rate.

4. In a speed controller for a motor vehicle, a valve body adapted to be mounted between a fuel source and the fuel intake of the engine of the vehicle and formed with a fuel passage, a valve member for closing said passage having a shaft rotatably mounted across the passage and having crank arms at its ends, solenoids at opposite sides of said body each having a slidable core operatively connected with the companion crank arm by a link pivoted to the core and the crank arm, means for limiting closing of the valve member when the solenoid is energized, the link for the core of the said solenoid being slidable longitudinally of the core thereof to permit complete closing of the valve member when the other solenoid is energized, said body being formed with a chamber spaced from the fuel passage, a speed sensitive device of the centrifugal type in said chamber having a drive shaft rotated from a rotary element of the vehicle at speed variations corresponding to the speed of the vehicle, and switch means actuated by said speed sensitive device for first energizing the first mentioned solenoid when the vehicle attains a predetermined speed and partially closing the fuel passage and afterward energizing the second solenoid to completely close the fuel passage when the speed of the vehicle advances to a predetermined higher rate of speed.

5. In a speed controller for a motor vehicle,

a valve body adapted to be mounted between a fuel source and the fuel intake of the engine of the vehicle and formed with a fuel passage, a valve member for closing said passage having a shaft rotatably mounted across the passage and having crank arms at its ends, solenoids at opposite sides of said body each having a slidable core operatively connected with the companion crank arm by a link pivoted to the core and the crank arm, means for limiting sliding of the core of one solenoid and thereby limiting closing of the valve member when the solenoid is energized, the link for the core of the said solenoid being slidable longitudinally of the core thereof to permit complete closing of the valve chamber when the other solenoid is energized, said body being formed with a chamber spaced from the fuel passage, a speed sen-

sitive device of the centrifugal type in said chamber having a drive shaft rotated from a rotary element of the vehicle at speed variations corresponding to the speed of the vehicle, a cover for said chamber, and switches carried by said cover and suspended therefrom within the chamber over the speed sensitive device, one switch being in position for initial actuation by the speed sensitive device to energize the first solenoid and partially close the fuel passage when the vehicle attains a predetermined speed and the other switch being in position to be afterward actuated and energize the second solenoid to completely close the fuel passage when the speed of the vehicle advances to a predetermined higher rate of speed.

CLAUDE A. VATTER.