Oct. 12, 1926. 1,602,799

E. A. McGRATH

SPEEDOMETER CONTROLLED SWITCH

Filed Oct. 21, 1924

Fig. 1

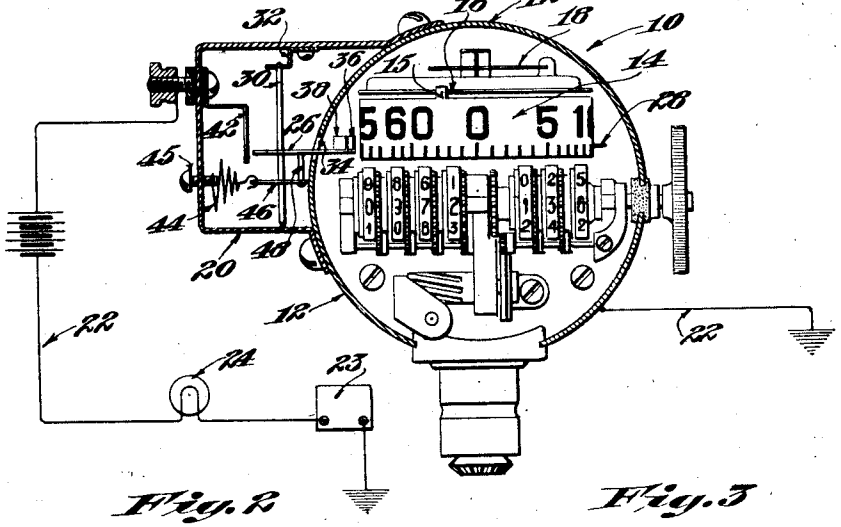



Fig. 2

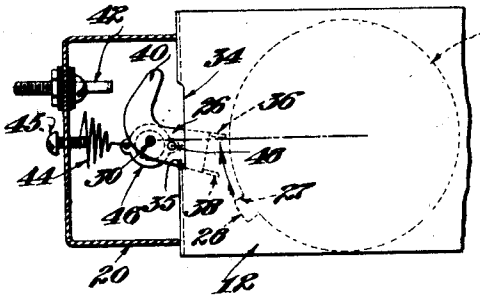


Fig. 3

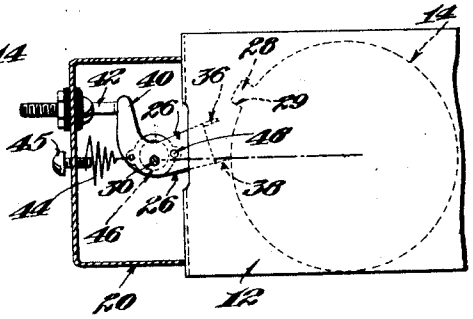


Fig. 4

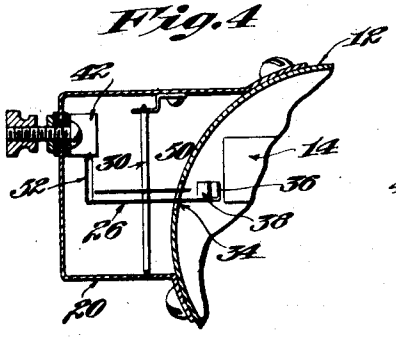
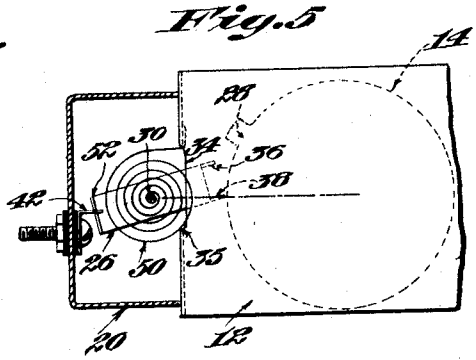


Fig. 5



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Patented Oct. 12, 1926. 1,602,799

# UNITED STATES PATENT OFFICE.

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## SPEEDOMETER-CONTROLLED SWITCH.

Application filed October 21, 1924. Serial No. 744,946.

This invention relates to an improved speed controller, particularly adapted for use in conjunction with the speedometer installed in automobiles, which operates automatically to give a signal when an illegal rate of speed has been attained by the car.

It is a well known fact that drivers of automobiles do not watch the speedometer when driving and that, due to the difficulty of instinctively gaging the rate of speed of a car, the legal speed is frequently exceeded unconsciously. It is an object of this invention to render constant reference to the speedometer reading wholly unnecessary by providing an audible signal to warn the driver whenever the rate of speed equals or exceeds the legal rate. The invention further provides for a visual signal, that is maintained constantly operative while the car is travelling at or above the illegal speed, and is so placed that it is readily seen by drivers of approaching cars or officers of the law.

To the accomplishment of this object and such others as may hereinafter appear, as will readily be understood by those skilled in the art, the invention comprises the features and combination of parts hereinafter described and then particularly pointed out in the appended claims.

The various features of the invention will best be understood from a description of the preferred embodiments thereof illustrated in the accompanying drawing.

In the embodiment of the invention illustrated in the drawing,

Figure 1 is a view, in front elevation, of one form of the invention applied to a speedometer of the Stewart-Warner type, the front casing being removed;

Figs. 2 and 3 are views, in plan, showing the inoperative and operative positions of the trigger which closes the electric circuit shown in Fig. 1;

Fig. 4 is a view, in front elevation, of another form of the invention but also employing a circuit making and breaking trigger, the circuit being open in this view; and

Fig. 5 is a view, in plan, of the form of the invention shown in Fig. 4, the circuit being closed in this view.

In the embodiment of the invention illustrated in Figs. 1, 2 and 3 of the drawing, 10 represents a speedometer of the Stewart-Warner type within the casing 12 of which is mounted the drum dial 14, having the usual lug 15 for engaging a stop 16 under the influence of the return spring 18, thus maintaining "0" on the dial registered with the sight opening in the face (not illustrated) when the car is at rest.

Mounted on the casing 12, conveniently at the left side of the casing, is a shell 20 which supports the device for energizing an electric circuit 22 (Fig. 1) and operating a signal such as the buzzer 23 or lamp 24, or both, whenever a rate of speed is attained that equals or exceeds the legal limit. The circuit making and breaking is determined by an oscillatory trigger 26 the movement of which is controlled by the engagement therewith of a trip lug 28 on the drum dial 14.

The trigger is secured to a rock-shaft 30 having its upper end journaled in a bearing 32 and its lower end stepped in a wall of the shell 20. The speedometer casing is slotted at 34 permitting the inner end of the trigger to project therethrough. This end is forked, providing two trip arms 36 and 38 which lie alternately on center and in the path of the trip lug 28 upon travel of the lug in a direction to respectively accelerate or decelerate the speed of the car in which the speedometer is installed. The outer end 40 of the trigger constitutes means for closing the circuit by engaging an electric contact 42 in one angular position of the trigger.

The trigger 26 is maintained in one or the other of its angular positions, illustrated by Figs. 2 and 3, by a contractile spring 44, continually under tension but weaker than the drum dial return spring 18. One end of this spring 44 is adjustably connected at 45 to a wall of the shell 20 and its other end is connected to one side of a loop 46, surrounding the rock-shaft 30, the other side of which is pivotally mounted on a pin 48 depending from the trigger inside the rock-shaft. It will be observed that the distance from the pin 48 to the rock-shaft is considerably less than from the pin 48 to the pivotal spring connection 45. Consequently the arc of travel of the pin 48, as the trigger swings from one extreme position to the other, causes the spring 44 to be extended as the trigger crosses center and then immediately contract, snapping the trigger quickly into its new angular position.

The trip lug 28 is located at such a point

on the periphery of the drum dial that as the speed of the car increases it will meet the trigger arm 36 and turn the trigger just past center when the illegal speed marking on the dial registers within the sight opening. As illustrated, the setting is for indicating an illegal speed of thirty miles per hour. Fig. 2 illustrates the position of the parts when the trip lug, moving in the direction of the arrow, is nearing the trigger arm 36, there being no current flowing in the circuit 22 at this time. In Fig. 3 the trigger 26 has been pushed across the center by the moving trip lug 28 and the spring 44 has functioned to turn and hold the trigger in the position in which its end 40 engages the contact 42 thus closing the electric circuit and energizing the buzzer 23 to sound a warning to the driver.

If the automobile laws require a visible notice to officers of the law, and other drivers on the road, that the legal speed is being exceeded then the lamp 24 is connected in the circuit and is mounted on some prominent part of the car, preferably on the mud guard above the left front wheel where the driver also cannot fail to see it.

It will be observed from the position of the trip lug 28 in Fig. 3 that current continues to flow through the circuit 22 on continued acceleration of the speed above the legal limit, the warning signals thus being continuously operated until the trigger 26 is turned back to its position shown in Fig. 2. On hearing, or seeing, the warning signal the prudent driver will throttle down his engine thus causing the drum dial 14 to rotate in a direction opposite to that of the arrow on Fig. 2 and at the time the speedometer registers "30" the trip lug will have engaged the trigger arm 38 and moved the trigger to center, thus breaking the circuit 22. At just below 30 miles per hour the spring 44 functions again to snap the trigger to the position of Fig. 2 and hold it there. The forward wall 35 of the slot 34 acts as a stop for the trigger when in this position.

Attention is called to the design of the trip lug 28. This lug should be so proportioned relative to the distance between the trip arms 36 and 38 that on an acceleration of the speed of the car its forward wall 27 (Fig. 2) will have engaged and brought the trigger across center when the speedometer registers "30" so that the spring 44 may immediately function to close the electric circuit, and on a deceleration of the speed of the car its rear wall 29 (Fig. 3) will have engaged and moved the trigger arm 38 sufficiently to break the circuit when the speedometer registers "30". By making the width of the trip lug substantially one-half the distance between the trigger arms this end is attained and extreme accuracy of operation is insured.

In the form of the invention illustrated in Figs. 4 and 5 the parts having the same reference characters are similar to those of the preferred construction. In this form a torsion spring 50 is connected to the rock-shaft 30 and to the speedometer casing in such manner that the trigger 26 continually tends to seat against the slot wall 35. When the trigger 26 is turned to the position of Fig. 5 by the advancing trip lug 28 then an upstanding piece of light spring metal 52 at its outer end is snapped under the lower edge of the vertically arranged contact 42. The upper end of the spring piece 52 may be curved or beveled so as to act as a latch to keep the circuit closed against the tendency of the spring 50 to return the trigger to its initial position. When the trip lug 28 retreats during a deceleration of the speed its pressure on the trigger arm 38 unlatches the piece 52, thus breaking the circuit, and the spring 50 functions to return the trigger to a position with its arm 36 in the path of the trip lug.

In accordance with my invention a circuit maker and breaker is provided that may be operated perfectly by the delicate speedometer control mechanism, and also is so light and easily operated that no drag whatever is placed on the drum dial, permitting the dial to register with the same accuracy as when the speed indicating controller is not present.

That an illegal-speed signal attachment shall operate without materially hindering the movements of the drum-dial is imperative in the type of speedometer now in general use, as the drum-dial must be actuated with such delicacy that the slightest drag will interfere fatally with that high standard of accuracy which is demanded in this class of devices. In my device, I avoid all appreciable drag on the dial not only by keeping the switch off the dial-drum, but also by so constructing the parts that the switch will be thrown by the dial by an exceedingly light touch; and, furthermore, this light engagement of the dial with the switch is but momentary, i. e., just long enough to carry the switch over center through an arc of a small fraction of an inch in length.

In both illustrated forms of the invention the trigger constitutes an electric switch, the position of which is automatically controlled by a predetermined rate of speed of the car as registered by the speedometer, whether the trigger be given its quick movement by a spring or otherwise. It will be understood, however, by those skilled in the art that my automatic speed controller may be operated with equal facility by any moving actuator installed on the car which changes its position in accordance with variations in the rate of speed, above and below a predeter-

mined limit, as does the drum dial of a speedometer.

While it is preferred to employ the specific construction and arrangement of parts shown and described it will be understood that this construction is not essential except so far as specified in the claims, and may be changed or modified without departing from the broader features of the invention.

What is claimed as new, is:—

1. Speed indicating mechanism for automobiles having, in combination, a speedometer having a dial member movable in one direction as the rate of speed increases and in the opposite direction as it decreases, a trigger at a predetermined point in the path of said member and movable to two different positions to make and break a circuit, a device associated with the movable member in position to momentarily engage said trigger to shift it to one position or the other, and means independent of said movable member for maintaining said trigger in the position it assumes after engagement by said movable member.

2. Speed indicating mechanism for automobiles having, in combination, a speedometer having a dial member movable in one direction as the rate of speed increases and in the opposite direction as it decreases, a trigger independent of said movable member and located at a predetermined point in the path of said member and movable to two different positions to make and break a circuit, a device associated with the movable member in position to momentarily engage said trigger to shift it to one position or the other, and means for maintaining said trigger in the position it assumes after engagement by said movable member and after said member has travelled beyond the trigger in one direction or the other.

3. Speed indicating mechanism for automobiles having, in combination, an oscillating dial member movable in a fixed path and controlled by the speed of the car, a pivoted trigger extending in the path of said member to be momentarily engaged by the member during its travel whereby to move the trigger in a direction to close a circuit.

4. In combination with a speedometer embodying a speed-indicating drum-dial and vehicle-driven means for oscillating it axially to indicate changes in the speed of the vehicle, of an illegal-speed indicating means therefor embodying a tappet or lug on the drum-dial, a quick-acting trigger pivotally mounted independently of the drum-dial in position to be thrown in either direction by momentary contact with said tappet or lug at a predetermined position of the drum-dial, and a switch associated with said trigger which will be closed in one position of the trigger and open in its other position.

5. Speed indicating mechanism for automobiles having, in combination, a pivotally mounted switch, a member movable in opposite directions past said switch as the speed of the car is accelerated or decelerated constructed and arranged to have but a momentary contact with the switch and cause it to be thrown to one side or the other to make or to break a circuit whenever the position of said member indicates a predetermined rate of speed, and means to hold the switch in the position to which it is thrown until the member again indicates the predetermined rate of speed regardless of variations from said rate during the intervening interval.

6. The combination with a speedometer having a slot through its casing, of a pivotally mounted quick-acting trigger projecting inward through said slot, a member on the trigger for closing a circuit when the trigger is turned in one direction on its pivot, and a trip lug on the drum dial proper positioned to momentarily engage the trigger and cause it to be turned in said direction when the speedometer registers a predetermined rate of speed.

7. The combination with a speedometer having a slot through its casing, of a pivotally mounted trigger projecting therethrough having a forked end within the casing, a trip lug on the drum dial proper positioned to momentarily engage one leg of the fork, when a predetermined rate of speed is reached while the speed is being accelerated, to swing the trigger to one side and close a circuit and to engage the other leg of the fork, when said rate of speed is reached while the speed is being decelerated, to swing the trigger to the other side, and means for quickly actuating said trigger away from said lug into its final position at one side or the other and maintaining such position until again engaged by said trip lug.

8. The combination with a speedometer having a slot through its casing, of a pivotally mounted trigger projecting therethrough having a forked end within the casing, a trip lug on the drum dial proper positioned to momentarily engage one leg of the fork, when a predetermined rate of speed is reached while the speed is being accelerated, to swing the trigger to one side and close a circuit and to engage the other leg of the fork, when said rate of speed is reached while the speed is being decelerated, to swing the trigger to the other side, said trip lug having a width of substantially one-half the distance between the two legs of said fork, and means for quickly actuating said trigger away from said lug into its final position at one side or the other and maintaining such position until again engaged by said trip lug.

9. The combination with a pivotally mounted switch, of a speedometer provided with a trip lug on its drum dial proper adapted to engage said switch momentarily only, when the speedometer registers a predetermined rate of speed, and move it across center, and a spring for snapping the switch into position for closing a circuit.

10. The combination with a pivotally mounted switch and a spring acting upon said switch in a manner to hold it in an angular position at either side of dead center, in one of which positions a circuit is closed and in the other of which open, of a speedometer provided with a trip lug on its drum dial proper adapted to momentarily engage the switch while in one angular position, upon registration of a predetermined rate of speed through either acceleration or deceleration, and swing it across center whereupon said spring operates to snap the switch away from said lug into its other angular position.

11. Speed indicating mechanism for automobiles having, in combination, an electric circuit including a signal device, a member movable in one direction as the rate of speed increases and in the opposite direction as it decreases, and a device independent of said member in said circuit arranged in the path of said member adapted to be engaged momentarily and moved by said member in one direction or the other according as the rate of speed is increasing or decreasing to respectively close and open the circuit, the movement of said device in either direction carrying it out of said path and out of engagement with said member, whereby continued movement of said member in its direction of travel is unhampered.

12. Speed indicating mechanism for automobiles having, in combination, an electric circuit including a signal device, a member movable to different positions as the speed of the car increases and decreases, a device independent of the movable member in said circuit arranged in the path of said member and at a point in said path indicating a predetermined rate of speed and momentarily cooperating with said moving member when passing said point to close the circuit and energize said signal, and yielding means operating through said device to maintain the circuit closed until said member again passes said point in its course of travel.

EDWARD A. McGRATH.

## Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,602,799, granted October 12, 1926, upon the application of Edward A. McGrath, of Medford, Massachusetts, for an improvement in "Speedometer-Controlled Switches," errors appear in the printed specification requiring correction as follows: Page 4, lines 25 and 26, claim 11, strike out the words and comma "an electric circuit including a signal device,"; line 30, strike out the words "in said circuit", and line 35, for the article "the" read *a;* same page, lines 42 and 43, claim 12, strike out the words and comma "an electric circuit including a signal device,"; lines 46 and 47, strike out the words "in said circuit", and line 51, for the article "the" read *a;* same claim, lines 51 and 52, strike out the words "and energize said signal"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of November, A. D. 1926.

[SEAL.]

M. J. MOORE,
*Acting Commissioner of Patents.*

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