

Nov. 16, 1943.

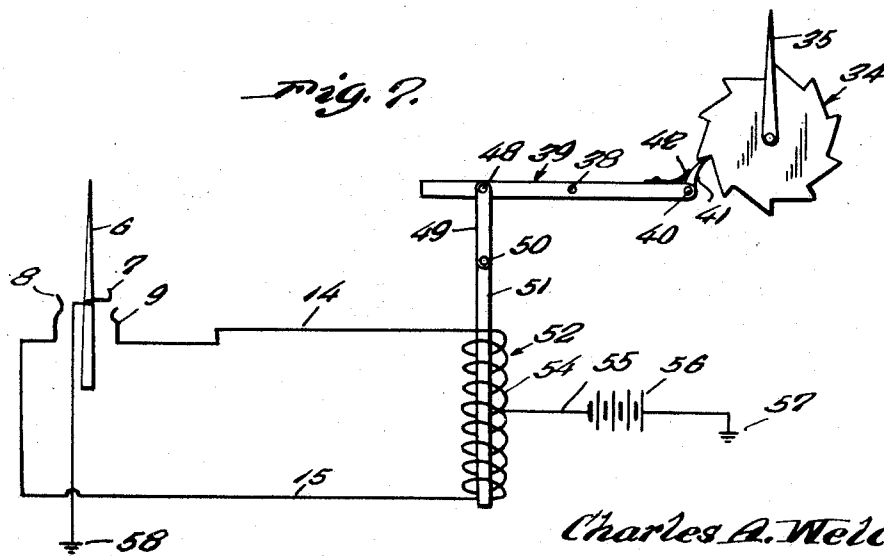
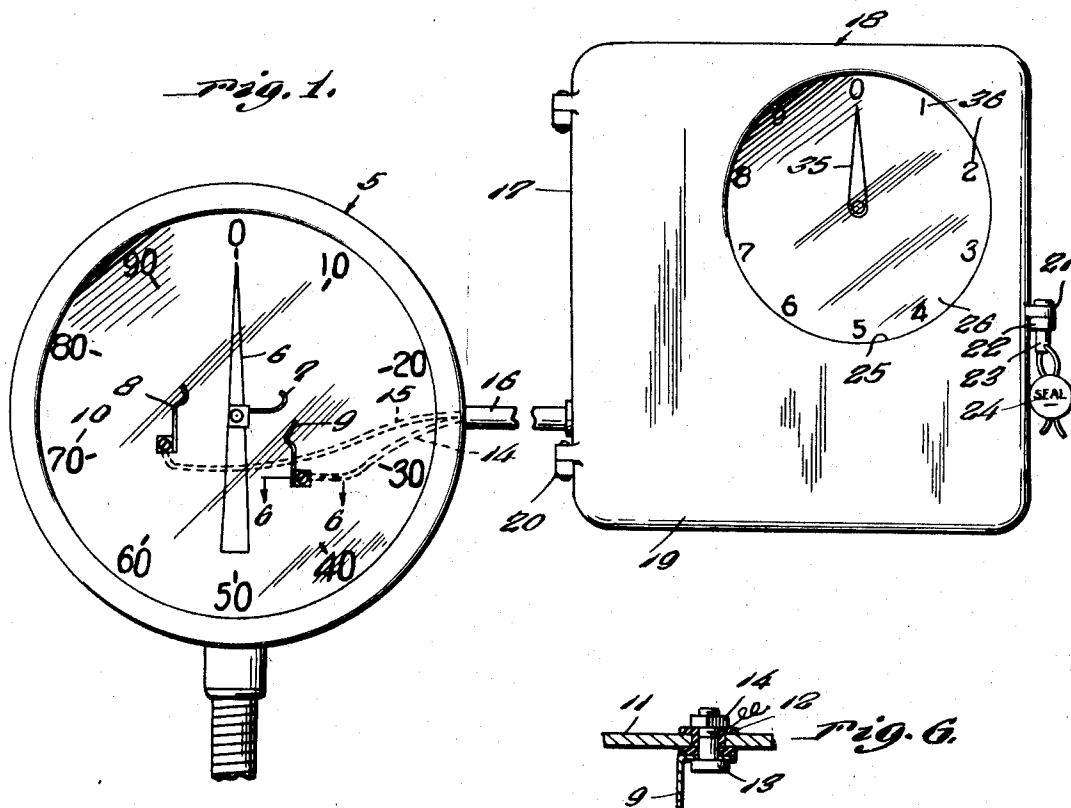
C. A. WELCH

2,334,523

SPEED VIOLATION COUNTER

Filed Oct. 6, 1941

2 Sheets-Sheet 1



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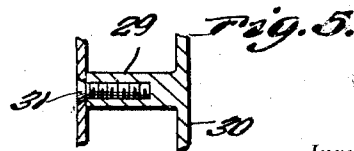
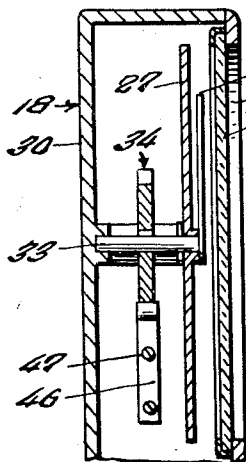
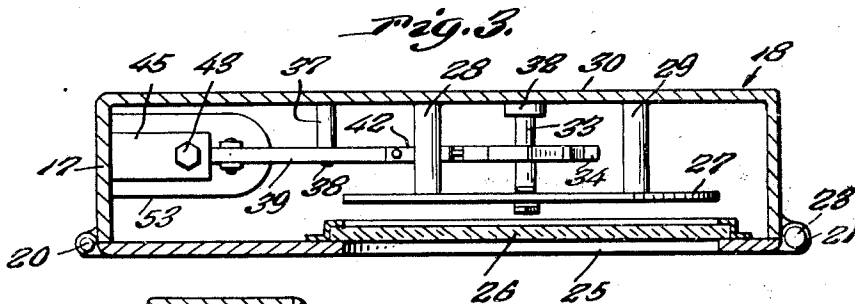
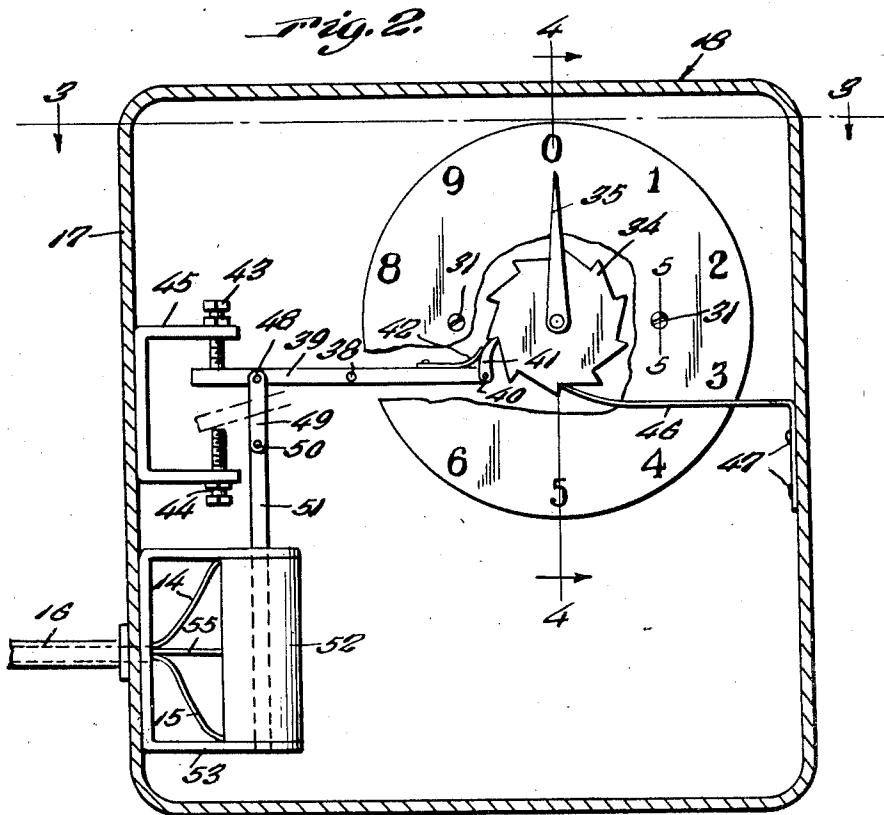
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SPEED VIOLATION COUNTER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,334,523

SPEED VIOLATION COUNTER

Charles A. Welch, Salisbury, Mass.

Application October 6, 1941, Serial No. 413,893

2 Claims. (Cl. 235-95)

My invention relates to improvements in speed violation counters applicable to rotary elements, and particularly to electrically operated counting means for use on automobiles having speedometers, and the primary object of my invention is to provide an arrangement of this character in which the counting mechanism is completely inaccessible except by a key held by the police, and wherein the speedometer operated switch mechanism is relatively inaccessible, whereby means is provided to furnish the highway police with proof of the fact that the motorist has exceeded the speed limit and the fact that the motorist has exceeded a high speed limit a certain definite number of times.

Other important objects and advantages of my invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings:

Figure 1 is a contracted front elevational view of the device as a whole.

Figure 2 is an enlarged longitudinal vertical sectional view taken through the counting mechanism casing to show the internal parts.

Figure 3 is a horizontal sectional view taken through Figure 2 along the line 3-3 and looking downwardly in the direction of the arrows.

Figure 4 is a fragmentary transverse vertical sectional view taken through Figure 2 along the line 4-4 and looking toward the right in the direction of the arrows.

Figure 5 is a fragmentary enlarged vertical transverse sectional view taken through Figure 2 along the line 5-5.

Figure 6 is an enlarged fragmentary horizontal sectional view taken through Figure 1 along the line 6-6 and looking downwardly in the direction of the arrows.

Figure 7 is a schematic view showing the operative arrangement of the active parts and their electrical connections with the automobile battery or other source of current.

Referring in detail to the drawings, the numeral 1 generally designates a conventional type of automobile speedometer modified in accordance with the present invention by the presence on the speedometer hand 2 of a curved flexible spring contact 3 which is adapted to have wiping engagement with stationary spring contacts 4 and 5 which are arbitrarily positioned relative to the speed indicating numerals 6 on the speedometer dial and with reference to the hand con-

tact 7 while in zero position as shown in Figure 1 of the drawings, whereby the contact 4 will be engaged by the hand contact 7 when the automobile reaches and passes the legal high speed limit, and will similarly electrically engage with the contact 5 when the speed of the automobile reaches a certain arbitrary point, such as below ten miles per hour, the hand contact 7 being at all other positions out of engagement with either of the contacts 4 and 5.

As indicated in Figure 6 of the drawings the speedometer dial 11 has a hole bushed by an insulating grommet 12 passing the binding post bolt 13 to which the wire 14 is connected at the back of the dial 11, while the head of the bolt fastens on the front end of the grommet 12 the L-shaped spring contact 9. The contact 8 is constructed similarly to the contact 9, the terminals of the contacts being angularly deflected as shown in Figure 1 to make a proper camming and wiping engagement with the curved terminal of the hand contact 7. The wire 15 from the contact 8 as well as the wire 14 pass through a suitably armored conduit 16 which enters the casing 17 of the counting mechanism which is generally designated 18 and which may be located at a point remote from the speedometer 5, such as at a different place on the instrument panel or thereunder where the same may be readily inspected by the highway police.

The casing 17 may suitably be generally rectangular in form as indicated in the drawings and be of relatively shallow depth so as to avoid taking up much space within the automobile. The same may be conveniently provided with a cover or door 19 hinged as indicated by numeral 20 on a vertical axis and provided with an ear 21 at the free edge thereof to overlap an ear 22 on the casing to receive the headed pin 23 which is adapted to be locked in place by a seal which can be lawfully destroyed only by the police to permit access to the interior of the casing 17. The door 19 has in the upper right hand corner thereof a substantially circular opening 24 closed by a suitable window 25 which exposes the dial 27 which is supported on horizontally spaced posts 28 and 29, respectively, which are secured to the back wall 30 of the casing 17 as indicated in Figure 3 of the drawings, screws 31 traversing the disk and being threaded into the post as indicated in Figure 5. A third post 32 projects from the back wall 30 of the casing 17 to act as a bearing for the tubular shaft 33 which has affixed thereto a ratchet wheel 34. A portion of the shaft 33 projects through an opening at the center of the disk 27

and has affixed thereto the hand 35 which is in indicating position relative to the circumferentially spaced numerals 36 formed on the front of the disk 27 and exposed by the opening 28. The numerals 36 indicate the number of occasions on which the motorist has exceeded the legal speed limit.

A fourth post 37 also secured to the back wall 30 of the casing 17 is located below and to the left of the post 28 and it carries a headed pin 38 which provides a horizontal fulcrum for the ratchet lever 39. The right hand end portion of the lever 39 has horizontally pivoted at 40 on one end thereof a curved dog 41 behind which is operatively positioned a leaf spring 42 to keep the dog normally swung in the right hand direction and engaged with the teeth of the ratchet wheel 34, as shown in Figure 2 of the drawings. The opposite heel end of the lever 39 is positioned between vertically adjustable stop screws 43 and 44, respectively, which are mounted on a U-shaped bracket 45 secured to the left hand end wall of the casing 17, the stops being adjustable to limit the upward and downward swing of the lever 39. A horizontal leaf spring dog 46 is secured on the right hand wall of the casing 17 as indicated by the numeral 47 and it has its upturned free end engaged with the periphery of the ratchet wheel 34 to positively eliminate reverse rotation of the ratchet wheel.

Horizontally pivoted to the lever 39 intermediate the stop screws and the fulcrum 38 is a pair of links 48 between whose lower ends is pivoted as indicated by the numeral 50 the upper end of a solenoid armature 51 which depends into a solenoid magnet 52 which is mounted by a U-shaped bracket 53 secured to the left hand wall of the casing 17 below the bracket 45, as shown in Figure 2 of the drawings. For convenience and efficiency the conduit 16 enters the side wall of the casing 17 adjacent the bracket 53 so that the wires 15 and 14 may be connected to the upper and lower ends of the coil 54 of the solenoid 52, and a center tap 55 from said coil may be led out through the conduit 16 to connect with one side of the car battery 56 whose remaining side is grounded conventionally as indicated by the numeral 57. The speedometer hand contact 7 is similarly grounded in a suitable manner as indicated by the numeral 58.

The presence of the center tap 55 on the coil 54 of the solenoid 52 provides a split winding on the solenoid, one half of which is effective at a time.

As the automobile is accelerated from a speed below that at which the contact 9 is engaged, the speedometer hand 6 advances and at the chosen relatively low speed the speedometer hand contact 7 engages the contact 8 and thereby completes an electrical circuit beginning at ground 58, with the current flowing through the speedometer needle or hand and its contact 7 to the contact 8, thence through the wire 14 to the upper end of the coil 54 of the solenoid 52, thereby energizing the upper winding of the solenoid and passing to the tap 55 to the battery 56 and its ground. The completion of this circuit energizes the upper section of the solenoid winding so as to draw the armature or core 51 upwardly. This operates the lever 39 in one direction to engage its heel and set the dog 41 behind the shoulder of a tooth of the ratchet wheel 34 ready to rotate said wheel when the lever 39 is operated in the opposite direction.

As the automobile is accelerated beyond the

low speed contact position the hand on the speedometer advances and at the predetermined position of the high speed registering contact 8 the speedometer hand contact 7 engages the contact 8, thereby closing an electrical circuit beginning at the speedometer needle ground 58, with the current flowing through the contact 7, through the contact 8, through the wire 15 to the lower end of the winding 54 of the solenoid 52, thereby energizing the lower section of the solenoid winding, through the center tap 55 to the ungrounded side of the battery 56 and through the battery ground to the needle ground 58. The closing of this circuit causes the armature or core 51 to be drawn downwardly toward the lower section of the solenoid winding, whereby the lever 39 is operated in the opposite direction causing the heel end of the lever 39 to engage the lower stop screw 44 and the dog 41 to engage a ratchet tooth 20 and turn the ratchet wheel a distance of one ratchet tooth or one notch, thereby causing the hand 35 on the register 18 to move opposite the numeral 1 thereon and at similar successive actuations to move to indicate a corresponding numeral on the register up to nine the number of violations of the high speed limit which have taken place since the device was first installed. It will be apparent that such violations involve exceeding a predetermined high speed limit preceded by attainment of a lower limit.

After the last described action following the closing of the second circuit described, and the automobile being decelerated so that the hand contact 7 engages again the stationary contact 8, following the breaking of the last described circuit, the lever 39 is retracted to starting position for the next speed violation by the utilization of the upper winding of the solenoid in the manner already described.

It will be evident from the foregoing that I have provided not only an arrangement for actuating counting mechanism, but also means for retracting the actuating agencies by the use of the solenoid with the split winding, the sections of which are energizable during different phases of operative condition of the device.

It is obvious also from the foregoing that the device of the present invention is simple, compact, and unobtrusive in size and appearance, and involves no extensive mutilation of the speedometer or other fittings or equipment of the automobile, being thereby correspondingly less expensive than other similar devices, while being more capable of being applied to automobiles of all makes and types.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not wish to limit the application of the invention thereto except as may be required by the scope of the subjoined claims.

Having described the invention, what is claimed as new is:

1. In a device for counting the number of times a rotary element exceeds a designated high speed limit and attains a designated low speed limit, an actuating member arranged to be moved in one direction to actuate the counting device and in the opposite direction for conditioning for the next actuation, a solenoid comprising a split winding having a center tap defining a pair of longitudinally arranged coil sections, a speed responsive member operatively connected to said rotary element, said speed responsive member having a movable contactor and a pair of spaced

stationary contacts, one of said contacts being positioned to be engaged by said movable contactor only when said contactor reaches a position corresponding to said designated high speed limit, the other contact being positioned to be engaged by said contactor only in a position corresponding to the lower speed limit, said contacts being connected to the outer ends of the corresponding coil sections and said contactor and said center tap being arranged for connection in circuit with a source of current.

2. A counter for use with the movable hand of an automobile speedometer to indicate successive violations of a speed limit comprising a counting dial bearing thereon symbols including numerals of successively higher denomination, a pointer member movable around said dial, means to move said pointer member comprising a

5 ratchet and pawl, the pawl being operative in opposite directions for advance and retraction relative to said ratchet, pawl operating means including a solenoid core movable in opposite directions to advance and retract the pawl, a split solenoid coil including longitudinally consecutive coil sections through which said core extends, said sections being energizable alternately to move said core in opposite directions, respectively, and means to energize said coil sections including a contact carried by said hand, a pair of low and high speed contacts for said sections, respectively, arranged in the path of movement of said first contact to be energized successively thereby under movement of said hand from selected low to selected high speed indicating positions.

CHARLES A. WELCH.