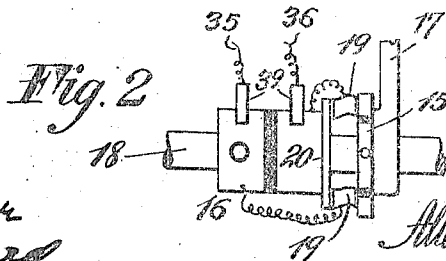
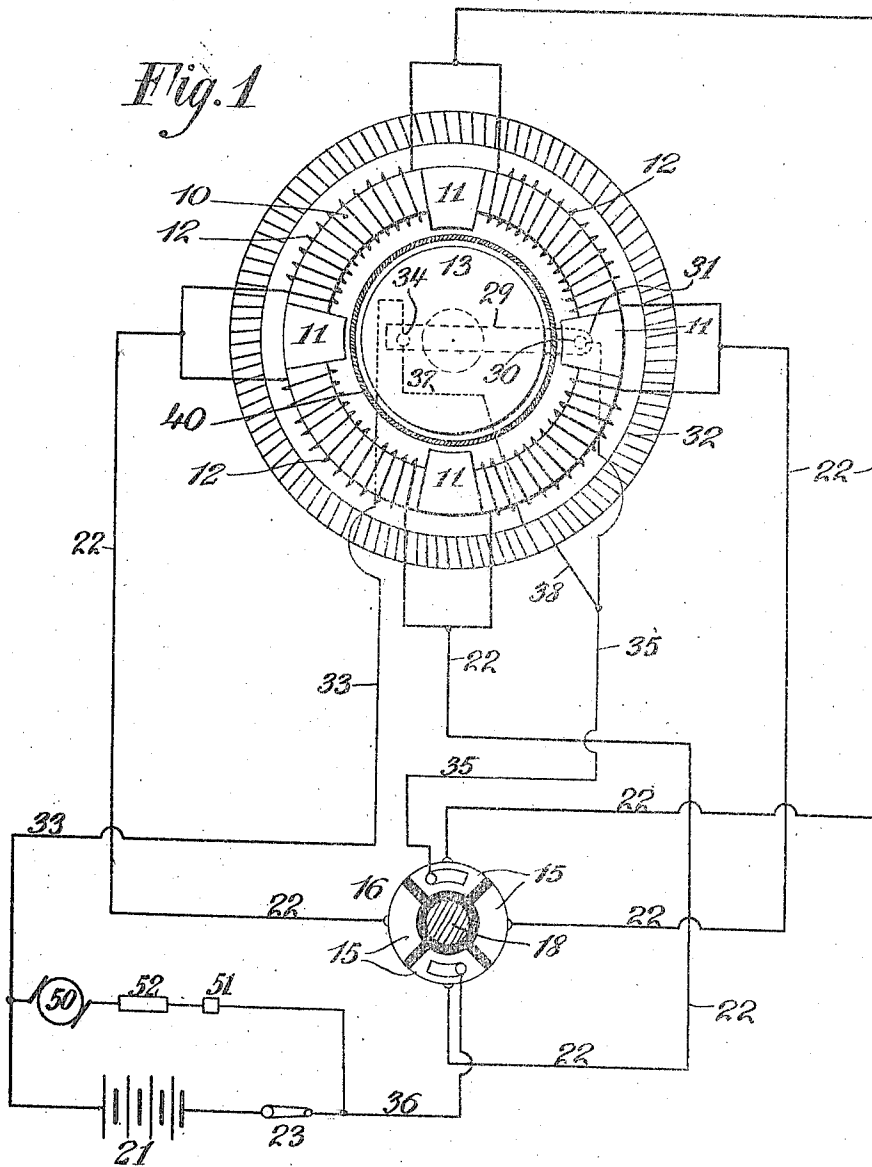


A. A. CANTON.
SPEEDOMETER.
APPLICATION FILED OCT. 29, 1914.

1,196,516.

Patented Aug. 29, '916.
2 SHEETS—SHEET 1.



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Fig. 3

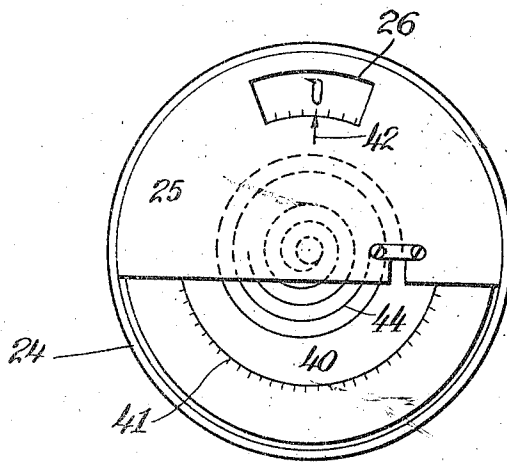
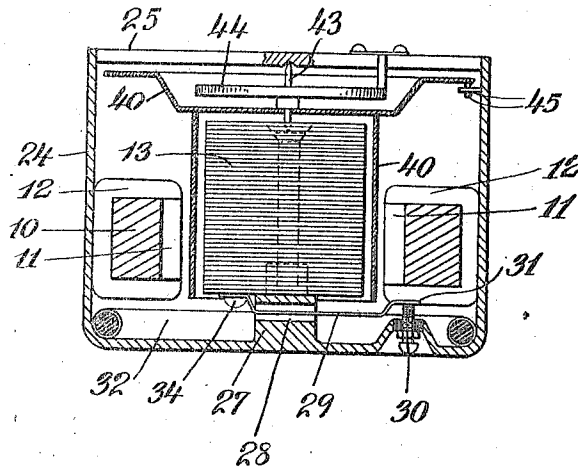


Fig. 4

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UNITED STATES PATENT OFFICE.

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SPEEDOMETER.

1,196,516.

Specification of Letters Patent.

Patented Aug. 29, 1916.

Application filed October 29, 1914. Serial No. 869,181.

To all whom it may concern:

Be it known that I, ALLEN A. CANTON, a citizen of the United States of America, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Speedometers, of which the following is a specification.

This invention relates to improvements in electrically operated speedometers and the object of the invention is to provide certain improvements or novel features in combination with the speedometer or other similar apparatus whereby to simplify the operation thereof and with a view of rendering its operation more certain and dependable.

With these and other objects in view, all of which will appear as this specification proceeds, the invention comprises the elements and parts arranged and combined with a speedometer as hereinafter set forth and as shown in the accompanying drawings in which—

Figure 1 is a wiring diagram illustrating the invention. Fig. 2 is a detail view of the commutator. Fig. 3 is a substantially central sectional view of the speedometer, and Fig. 4 is a plan view.

Referring to the drawing the numeral 10 indicates the core of an electromagnet, preferably circular in form and having the poles 11 between which are wound the coils 12.

13 represents the armature for the electromagnet and which is preferably composed of soft iron laminae as shown.

The coils of the electromagnet are connected serially to the segments 15 of a commutator 16 which is suitably secured to a bracket 17 which may form a bearing for the shaft 18, the speed of which is to be measured.

19, 19 are brushes mounted on a brush-holder 20 which is secured so as to rotate with the shaft 18. The brushes 19 are connected across the battery or other source of electrical energy 21 as will appear presently. The coils 12 of the electromagnet 10—11 are connected to the commutator segments 15 by wires 22, 22.

23 is a controlling switch.

The apparatus is contained within a casing 24 of suitable non-conducting material, see Fig. 3, which is provided with a cover 25 having a window 26. The casing is provided with a central boss 27 for the sup-

port of the armature 13. The boss is apertured at 28. Secured to the armature and passing through the aperture 28 there is mounted a leaf spring or vibrating contact lever 29 normally in contact with the adjustable contact point 30 suitably mounted in the bottom of the casing. The contact lever 29 is arranged diametrically as appears from Fig. 1 with its free end 31 projecting in under one of the aforesaid poles 11.

32 is a suitable resistance mounted in inductive relation to the electromagnet 10—11—12.

The circuit between the battery 21 and the brushes 19 referred to above may now be traced by way of the wire 33 to the binding post 34 of the contact lever 29, through the latter to contact point 30 and back to the commutator and battery by way of wires 35 and 36. The resistance 32 is connected in shunt between the wires 33 and 35 by means of the wires 37 and 38.

39 are sliding contacts for supplying the brushes 19 with current in the usual manner.

A speed indicator 40 of aluminum or similar material is mounted to rotate between the armature 13 and the electromagnet 10—12 so as to cut the magnetic lines of force between these two elements, for which purpose the indicator is provided with a skirt or cylinder as shown. The indicator is further provided with a scale 41 which is read through the window 26 with reference to a fixed mark 42 on the cover of the casing. The pivot 43 of the indicator has its bearings in the cover and the armature as shown.

44 is a hair spring which tends to keep the indicator in zero position and 45 represents stops for limiting the movement of the indicator.

The operation is as follows: The rotation of the shaft 18 produces a rotating magnetic field between the electromagnet and the armature and which in turn imparts a rotative tendency to the indicator in the direction of rotation of said field and in direct proportion to the rotative speed of the shaft 18, such tendency, however, being opposed by the spring 44 in such a proportion with respect to the magnetic effect created by the electromagnet as to cause the indicator to revolve to an extent in direct proportion to the speed of the shaft 18, so that,

when the indicator scale is properly calibrated, the exact speed of the rotation of the shaft will be indicated with reference to the fixed mark 42. The stops 45 prevent the indicator from making more than one revolution as is obvious. Hence, the speed of the shaft 18 may be read directly by means of the scale 41 on the indicator because the movement of the latter is in direct proportion to said speed. This condition, however, exists only while the strength of the rotating magnetic field remains practically constant. Variations therein, due to variations in the voltage of the current from the source 21, influences the movement of the indicator as is obvious and the latter does not then correctly indicate the speed of the operating shaft 18. An increase in voltage beyond that for which the apparatus is designed strengthens the magnetic field and will cause a too fast movement of the indicator and vice versa. It will be noted, therefore, that the construction illustrated and described provides a regulating mechanism to eliminate from the operation of the speedometer such inaccuracies or irregularities as are caused by variations in the strength of the rotating magnetic field due to an increase or decrease in voltage in the circuit from that for which the apparatus is designed.

The regulating means or mechanism referred to and which constitutes one of the features of this invention comprises the resistance 32 and the controlling lever 29. During the normal operation of the apparatus the resistance is short circuited by way of the lever 29 and contact point 30. When, however, the voltage increases, the magnetic strength of the poles 11 is increased and the free end 31 of the lever 29 is attracted by the pole immediately above it. This breaks the contact at 30 and cuts the resistance into the circuit to decrease the voltage for the speedometer, the current passing from the battery, through wire 33, wire 37 to the resistance 32, through the latter and by wire 38 to wire 35, through the commutator, the coils 12 and back to the battery by wires 22 and 36. The resistance is further wound in the opposite direction to that of the coils 12 and thus also acts to dampen or cut down the magnetic strength of the electromagnet when the resistance is in the circuit. When the voltage decreases to normal, the contact lever itself acts as a spring and again makes contact at 30 so as to cut the resistance out. Thus the variations in voltage and in the strength of the rotating magnetic field automatically operates the lever 29 and causes a vibration of the latter to make and break contact with the contact point 30 to govern the relation of the resist-

ance to the circuit and maintain the voltage practically constant for the speedometer. 65

When the battery is the sole source of current supply it is generally overcharged so that it will discharge current with a higher voltage than desired for operating the speedometer, in which case the resistance will be cut into the circuit at the start of the operation, but will be cut out automatically as the voltage drops. Frequently, however, a generator 50 is connected serially with the battery to charge the latter in which case the resistance will be cut into or out of the circuit in response to variations in voltage. 70 75

51 represents diagrammatically a speed controlled switch and 52 a reverse relay such as are usual and well known in the art. 80

From the foregoing it is clear that means have been provided within the speedometer mechanism itself for eliminating the disturbing influence in the operation of the speedometer due to variations in the voltage. 85

I do not wish to be understood as limiting my invention to the embodiment illustrated and described, but that I claim all such modifications and variations as properly come within the principle of the invention and the scope of the appended claims. 90

I claim:—

1. The combination of an electrically operated speedometer mechanism, means for supplying current to the same and including a circuit, a resistance for the latter and means in said speedometer mechanism and responsive to the voltage in said circuit for governing the relation of the said resistance to the circuit. 95 100

2. The combination of an electromagnet, an armature, an indicator member between the latter and said electromagnet, a circuit for supplying current to the said electromagnet, a resistance for said circuit and a contact lever mounted on said armature and responsive to the voltage in said circuit for governing the relation of the resistance to the circuit. 105

3. The combination of a casing, a speed indicator mounted to rotate therein, a shaft, electric means within said casing for operating said indicator and controlled by the speed of the said shaft, a circuit for supplying current to said electric means, a resistance for said circuit mounted within said casing and mechanism supported within the latter and responsive to the voltage in said circuit for governing the relation of the said resistance to the circuit. 110 115 120

Signed at New York, N. Y., this 23rd day of October, 1914.

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