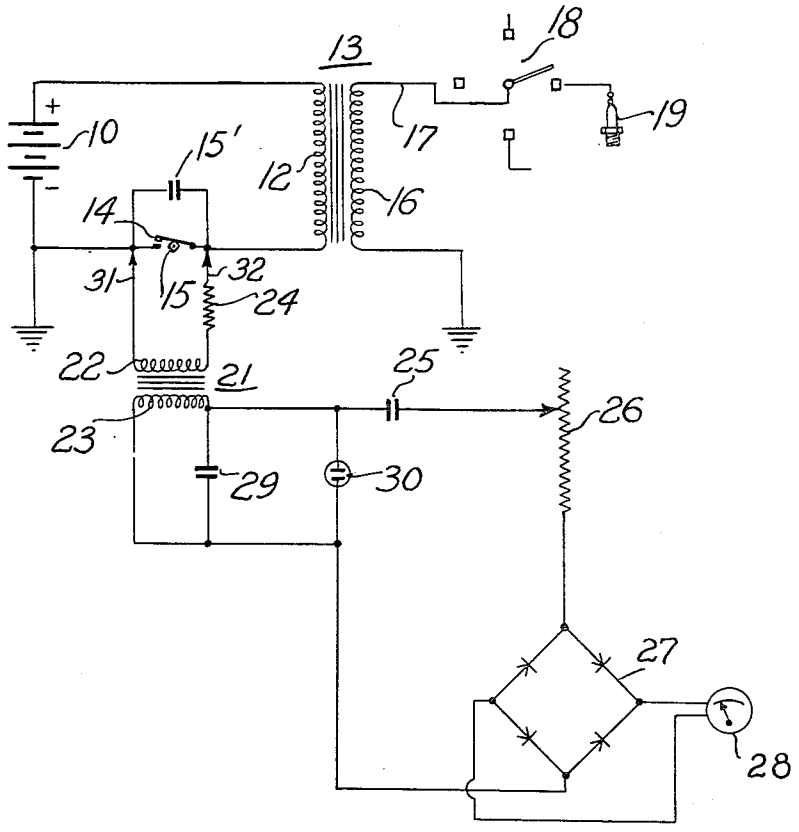
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ELECTRIC TACHOMETER

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ELECTRICAL TACHOMETER

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This invention relates to an electrical tachometer.

An object of this invention is to provide a simple and inexpensive electrical tachometer which can be connected to the ignition system of an internal combustion engine and which does not interfere with the normal operation of the ignition system.

A further object of this invention is to provide an instrument which indicates whether the ignition system is operating properly or not, and which also detects improper operation of the breaker points of the engine ignition system or "point bounce."

From the following detailed description, and the accompanying drawing, the above and other objects and features of the invention will be apparent to those having ordinary skill in the art to which it pertains.

The single view of the drawing is a diagrammatic illustration of an electrical tachometer constructed in accordance with an embodiment of this invention as applied to the ignition system of an internal combustion engine.

In the following detailed description, and the drawing, like reference characters indicate like parts.

In the drawing, the battery of an ignition system for an internal combustion engine is indicated at **10**. The battery **10** is connected in series with a primary winding **12** of an induction coil **13** and with breaker points **14** which are opened and closed by a cam **15** in the customary manner. A condenser **15'** is connected across the breaker points as shown. The secondary or high voltage winding **16** of the induction coil is connected by a conductor **17** to a distributor **18**. The points of the distributor **18** are connected to the various spark plugs **19**, only one of which is shown.

The tachometer includes a transformer **21** having windings **22** and **23**. Winding **22** is connected in series with a resistor **24** across points **14**. Winding **23** is connected through a condenser **25** and an adjustable resistor **26** to a rectifier **27**. The output of the rectifier is impressed on a meter or galvanometer **28**, the reading of which is proportional to the speed of the engine. A condenser **29** and a gaseous discharge tube **30** are connected in parallel across the terminals of transformer winding **23**.

The transformer **21** is a stepup transformer, that is, the output voltage of winding **23** is higher than the input voltage to winding **22**. I have found that if transformer **21** has a ratio of turns in winding **22** to turns in winding **23**, of about 1:15, a satisfactory operative tachometer meter circuit is provided.

The gaseous discharge tube **30** may be a neon bulb of the type known as NE–51 and the condenser **29** may have a capacity of 0.02 microfarad. The condenser **29** serves to smooth out the pulsations produced in the primary circuit of transformer **21** while the tube **30** acts to stabilize the circuit.

In operation, tube **30** flashes once for each break of points **14**. At low speeds the flashes are quite apparent but at higher speeds the flashes become a steady glow to the naked eye.

Meter **28** records the current output of rectifier **27**. The value of that current at any instant is proportional to the engine speed: therefore the meter **28** can be calibrated to indicate directly the engine speed. The adjustable resistor is adjusted so that the meter **28** has a full scale reading at the highest possible engine speed.

In the drawing, leads **31** and **32**, by means of which the tachometer is attached to the engine ignition system are shown connected across points **14**. However, if desired, the leads may be connected directly across ignition coil primary **12**.

The pointer of the meter will advance smoothly as the engine is smoothly accelerated to high speed if the breaker points are operating properly. However, should the pointer be seen to jump ahead suddenly rather than advancing smoothly and in step with the increase in engine speed, it is an indication that the points are bouncing and need attention.

The device illustrated in the drawing and disclosed above is subject to structural modification without departing from the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An electrical tachometer for an internal combustion engine having an ignition system, there being breaker points in said ignition system, which comprises a transformer having primary and secondary windings, means for connecting the primary winding of said transformer across one of the components of the ignition system, a metering circuit comprising a condenser, a resistor connected in series with the secondary winding of the transformer, a second condenser and a gaseous discharge bulb connected in parallel across said secondary transformer winding, whereby an electric current passes through the metering circuit whose magnitude is proportional to the rate of breaking of the breaker points, and means for measuring the current passing through the metering circuit.

2. An electrical tachometer for an internal combustion engine having an ignition system, there being breaker points in said ignition system, which comprises a transformer having primary and secondary windings, means for connecting the primary winding of said transformer across one of the components of the ignition system, a metering circuit comprising a condenser, a resistor connected in series with the secondary winding of the transformer, a second condenser and a neon tube connected in parallel across said secondary transformer winding, whereby an electric currrent passes through the metering circuit whose magnitude is proportional to the rate of breaking of the breaker points, and means for measuring the current passing through the metering circuit.

3. An electrical tachometer for an internal combustion engine having an ignition system, there being breaker points in said ignition system, which comprises a transformer having primary and secondary windings, means for connecting the primary winding of said transformer across one of the components of the ignition system, a metering circuit comprising a condenser, a resistor connected in series with the secondary winding of the transformer, a second condenser and a gaseous discharge bulb connected in parallel across said secondary transformer winding, whereby an electric current passes through the metering circuit whose magnitude is proportional to the rate of breaking of the breaker points, and current measuring means for measuring the current passing through the metering circuit, said current measuring means comprising a rectifier connected in series with the first mentioned condenser, the resistor, and the secondary winding of the transformer, and a galvanometer connected to the rectifier to measure the current passing through the metering circuit.

References Cited in the file of this patent

UNITED STATES PATENTS

2,108,014	Jones	Feb. 8, 1938
2,221,591	Lansdale	Nov. 12, 1940
2,228,367	Sanders	Jan. 14, 1941
2,335,247	Janson	Nov. 30, 1948

FOREIGN PATENTS

865,830	Germany	Feb. 5, 1953