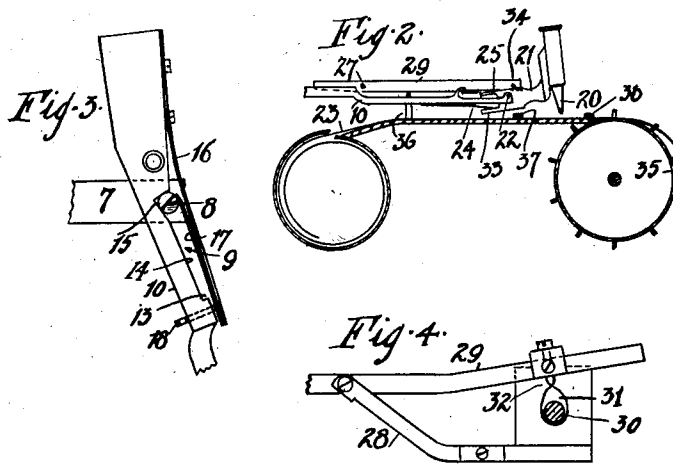
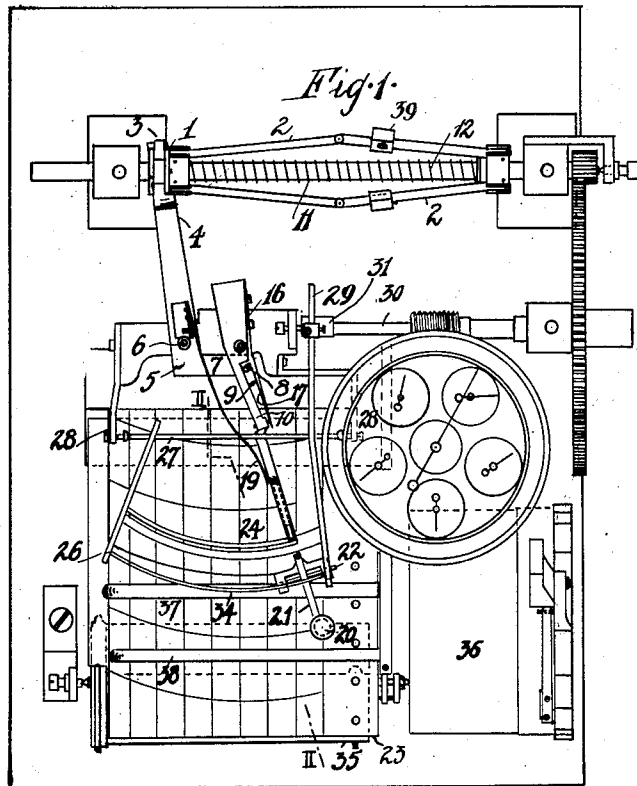


H. GALOPIN.
TACHOMETER.

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1,057,140.

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UNITED STATES PATENT OFFICE.

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TACHOMETER.

1,057,140.

Specification of Letters Patent.

Patented Mar. 25, 1913.

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To all whom it may concern:

Be it known that I, HENRI GALOPIN, a citizen of the Republic of France, residing at Temple Court Place, Melbourne, in the State of Victoria, Australia, scientific-instrument maker, have invented Improvements in Tachometers, of which the following is a specification.

This invention relates to tachometers used on vehicles to both indicate the speed and record same on a diagram paper strip and the improvements are devised for the purpose of insuring accurate results with such instruments.

The improvements are particularly applicable to tachometers wherein the indicating and recording mechanism is controlled by a spring loaded governor, the arms of which fly out with the centrifugal force and cause a sleeve to slide along the governor spindle to which the motion from the vehicle wheel is imparted.

The drawings illustrating the invention comprise—Figure 1 being a plan of the mechanism, Fig. 2 being a vertical section on line II—II of Fig. 1, Figs. 3 and 4 being enlarged details of construction.

According to this invention the slidable sleeve 1 of the governor arms 2 is formed with a recess with which engages a stud 3 fixed on one arm 4 of an angle-lever 5 fulcrumed on a pivot 6. The angle-lever is provided on the other arm 7 with an adjustable pin 8 adapted to engage with a double inclined recess 9 in the indicating lever 10, said recess being shaped so as to compensate for the difference between the centrifugal force of the governor and the resistance of the balancing spiral spring 11 which surrounds the spindle 12 thereof and bears against the slidable sleeve 1. This recess 9 in the lever is closed on the outside by an adjustable double acting spring fastened to said lever while the inside inclined bearing face of the recess has at the outer end a comparatively long inclined face 14 and at the inner end a comparatively short face 15 of greater inclination. The main portion 16 of the spring has a shorter spring 17 of less tension joined to its forward end which doubles back and bears against the pin 8 and the spring is adjusted by a screw 18. By this means the pin during low speeds engages the short greater inclined

bearing face 15, and the weaker portion 17 of the spring thus insuring the indicating lever responding correctly while during greater speeds the pin engages the longer inclined bearing face 14 and the tension is transferred to the stronger portion 16 of the spring by reason of the weaker portion closing against it. By this means the indicating lever 10 is rendered sensitive and so responds quickly at low speeds thus overcoming the difficulty usually arising in tachometers and insuring accurate recording. The indicating lever 10 is normally pressed backward by a light adjustable spring 19 mounted on the angle lever 5 while the double acting spring insures the return of said lever to zero.

The recording pen 20 is mounted on a short spring controlled lever 21 fulcrumed on a pivot 22 on the lever 10 and is thereby yieldingly mounted or capable of vertical reciprocation. If it is desired that the pen shall be maintained in constant contact with the traveling diagram paper strip 23 the spring 24 which controls the pen lever would be mounted on the top of the indicator lever and bear against the underside of the leg 25 of the bifurcated rear end of said pen lever. By preference however the latter is constantly reciprocated vertically so as to intermittently press the recording pen on the diagram paper strip in order to mark a succession of dots forming a practically continuous line, the advantages of which operation are that the tapping motion prevents the ink from clogging at the point of the pen and there is less frictional resistance between the pen and the record strip. The reciprocating motion is effected by means of a framed rocking lever 26 which has a pivotal shaft 27 journaled in brackets 28 while one bar 29 of said rocking lever is in engagement with one or more contacts on a revoluble shaft 30 of the mechanism. By preference the contact consists of a cam 31 upon which rests a pin provided on the underside of the bar 29 of said rocking lever as illustrated in Figs. 1 and 4 while in this construction the spring 24 bears against the leg 33 of the pen lever and so normally holds the pen off the paper strip. The forward transverse rod 34 of the framed rocking lever rests on the pen lever 21 and so intermittently presses the

pen, against the pressure of the spring 24, down upon the paper strip 23 and marks a succession of dots.

The diagram paper strip travels by means of a rotating drum 35 actuated by clock work 36 and is held flat by means of a stud 36 on the underside of the indicator lever 10 and flat springs 37 and 38.

In order to provide against any irregularities which may happen in manufacturing the instruments the governor arms 2 are provided with adjustable sliding weights 39 by means of which the range of said arms may be increased or decreased as required.

I claim:—

1. In tachometers a centrifugal governor, a balancing spiral spring controlling the same, an angle-lever operated by said governor, an indicating lever formed with a recess adapted to be engaged by a pin on said angle-lever, said recess being shaped so as to compensate for the difference between the centrifugal force of the governor and the resistance of the said balancing spring of the governor.

2. In tachometers a spring controlled centrifugal governor, an angle-lever operated thereby, an indicating lever formed with a double inclined recess adapted to be en-

gaged by a pin provided on said angle-lever substantially as and for the purpose specified.

3. In tachometers a spring controlled centrifugal governor, an angle-lever operated thereby, an indicating lever formed with a double inclined recess adapted to be engaged by a pin provided on said angle-lever, the bearing face of said recess being formed with two different inclinations substantially as and for the purpose specified.

4. In tachometers a spring controlled centrifugal governor, an angle-lever operated thereby, an indicating lever formed with a double inclined recess adapted to be engaged by a pin provided on said angle-lever, said recess having a double inclined bearing face inclosed by a double acting spring substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRI GALOPIN.

Witnesses:

EDWARD N. WATERS,

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