

(No Model.)

5 Sheets—Sheet 1.

E. DOMON, Jr.
SPEED INDICATOR.

No. 592,003.

Patented Oct. 19, 1897.

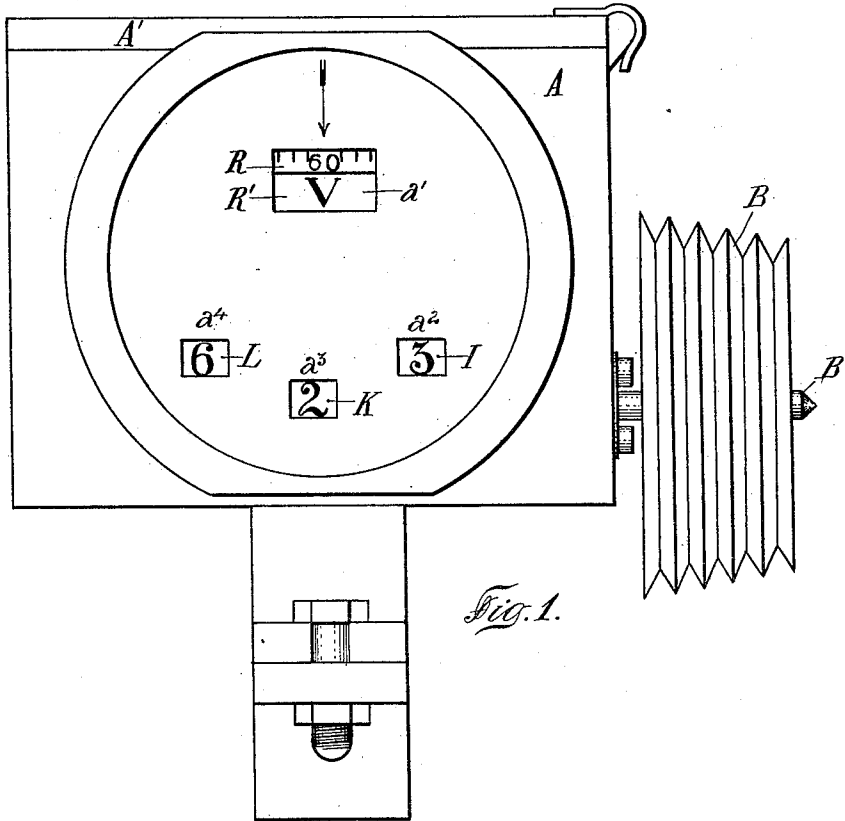


Fig. 1.

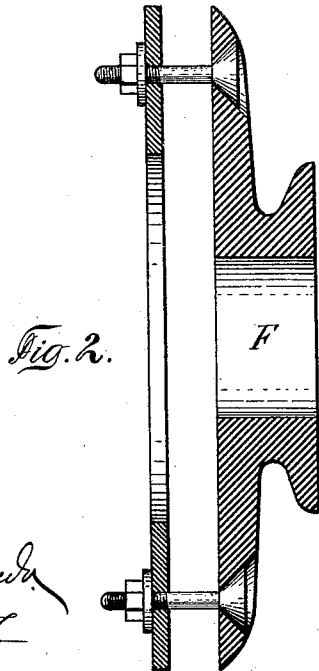


Fig. 2.

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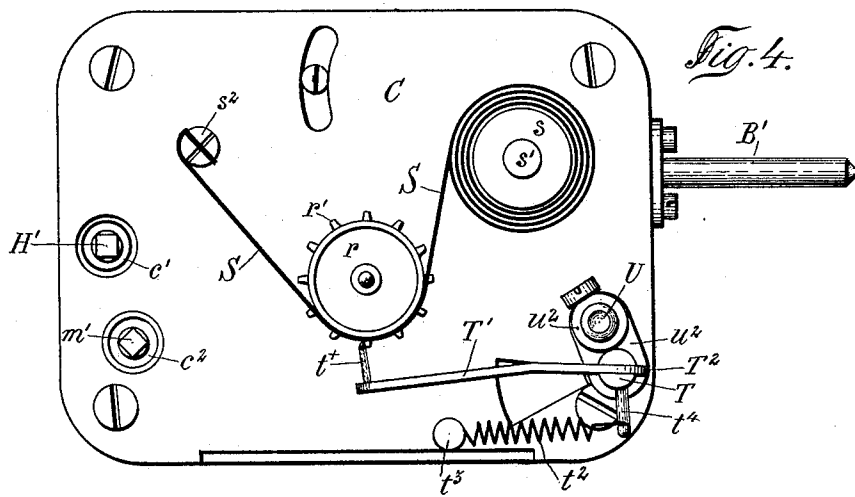
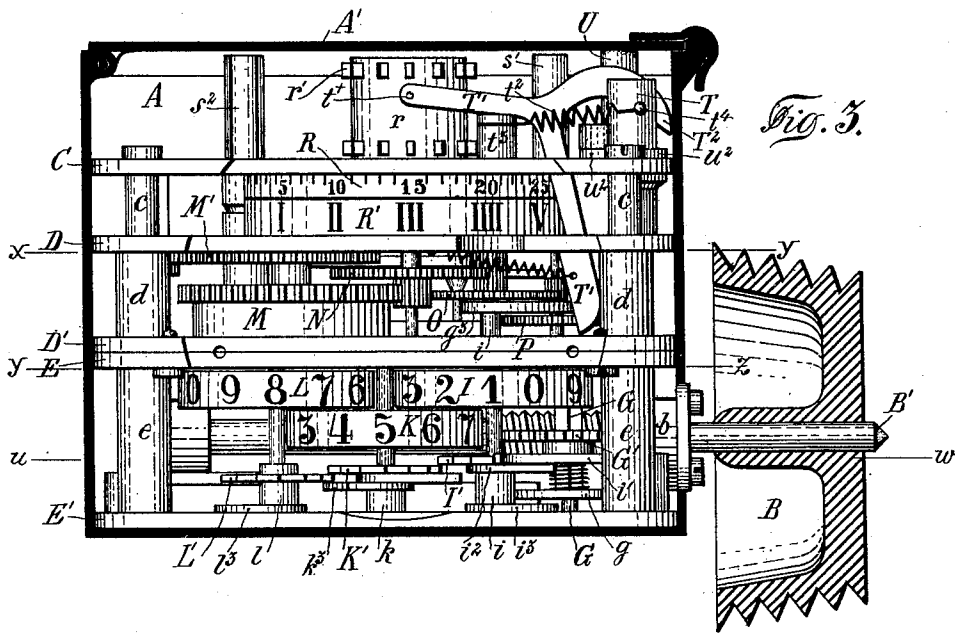
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5 Sheets—Sheet 2.

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5 Sheets—Sheet 3.

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SPEED INDICATOR.

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Patented Oct. 19, 1897.

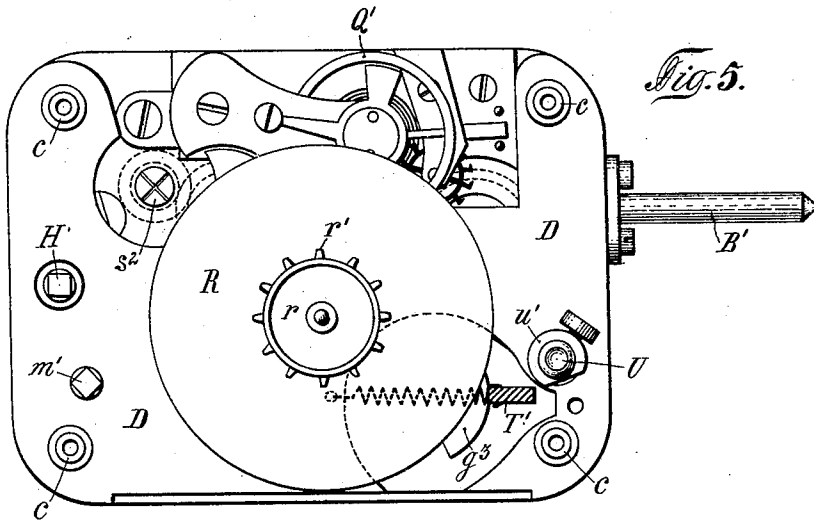


Fig. 5.

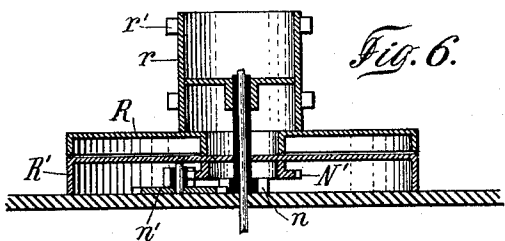


Fig. 6.

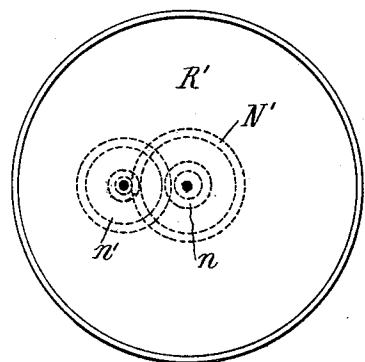


Fig. 7.

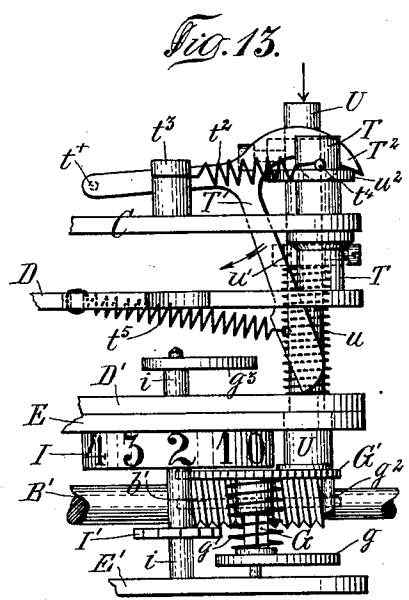


Fig. 13.

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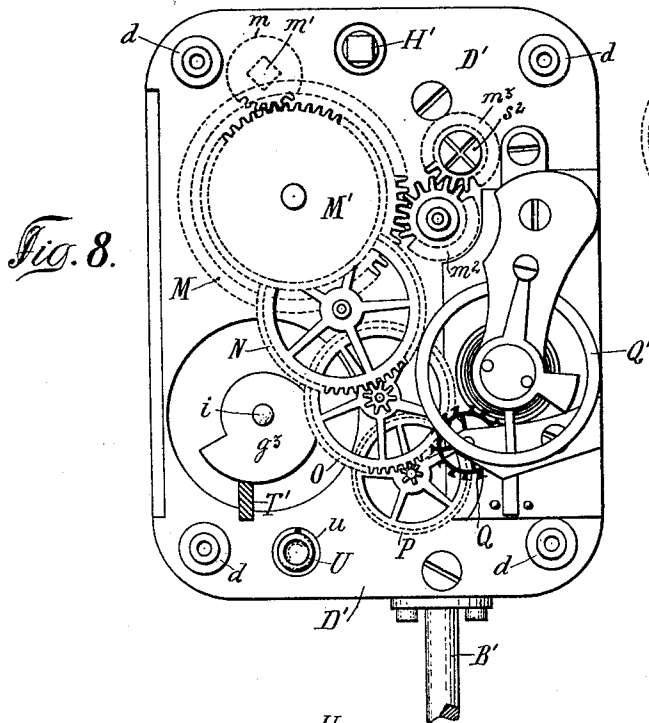


Fig. 8.

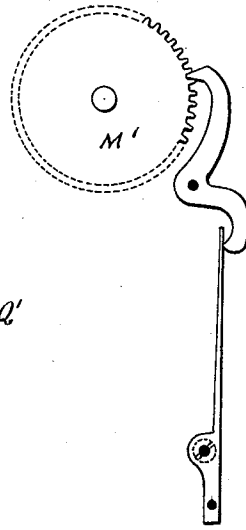


Fig. 9.

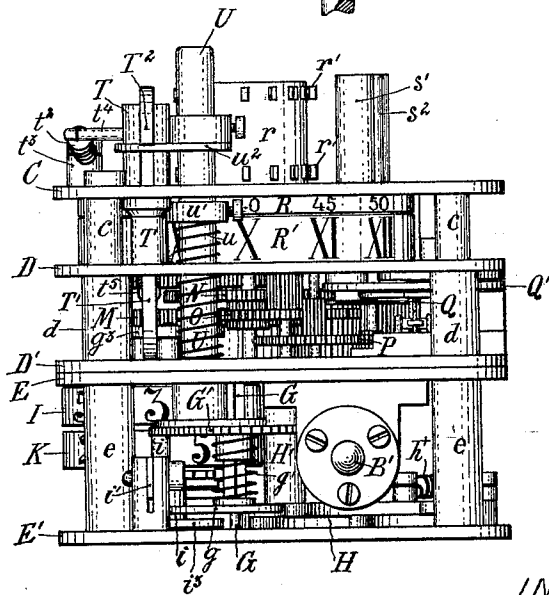


Fig. 12.

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(No Model.)

5 Sheets—Sheet 5.

E. DOMON, Jr.
SPEED INDICATOR.

No. 592,003.

Patented Oct. 19, 1897.

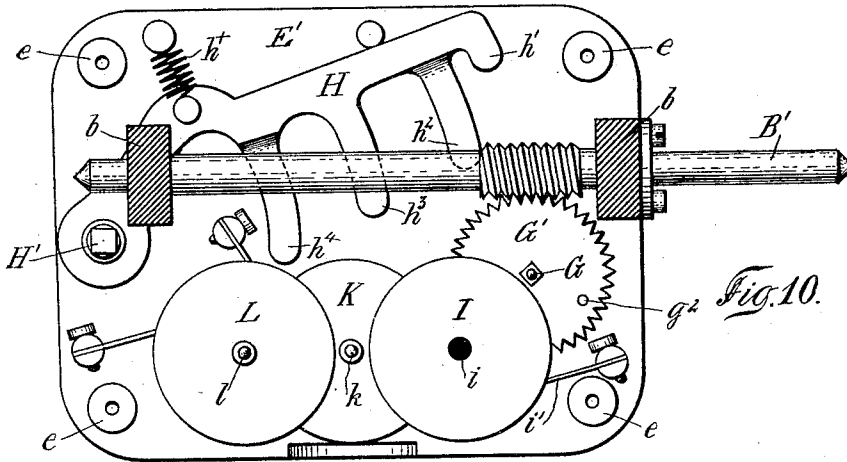


Fig. 10.

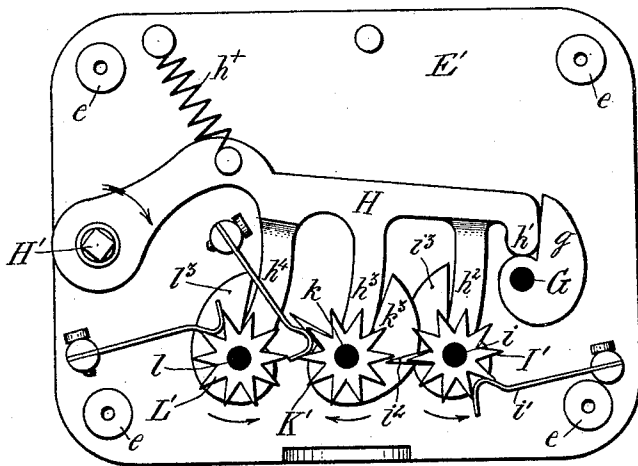


Fig. 11.

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UNITED STATES PATENT OFFICE.

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DINICHERT SON, OF MONTILIER, SWITZERLAND.

SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 592,003, dated October 19, 1897.

Application filed March 11, 1896. Serial No. 582,794. (No model.) Patented in France July 26, 1895, No. 249,196.

To all whom it may concern:

Be it known that I, EDOUARD DOMON, JR., engineer, of 54 Rue de Chambrol, Paris, France, have invented certain new and useful Improvements in Speed-Indicators, (for which I have obtained Letters Patent in France, No. 249,196, dated July 26, 1895,) of which the following is a specification.

The invention consists of an apparatus intended to be combined with any vehicle whatever, but more especially with velocipedes of every kind, for the purpose of simultaneously measuring and recording the speed and the distances which the said vehicle has performed and also the time during which the same has been running and stopped. My said apparatus shows the speed, distances, and time by means of figures on the circumference of suitable barrels or cylinders mounted in front of suitable openings of the box containing the mechanism of the apparatus, and the said barrels, bearing the figures disposed for successively appearing in suitable openings of the casing, may of course be replaced by suitable disks or hands, but I prefer, for the purpose of reducing the bulk of the apparatus to a minimum, to use such rotative barrels or cylinders bearing the said figures which are visible through suitable openings of the box.

The invention further consists in providing the said apparatus with a disk, intended to move along, with a constant speed, controlled by the timepiece belonging to the said apparatus, a ribbon of paper, and to inscribe or mark thereon, in any suitable manner whatever, the units, tens, or hundreds of meters or miles recorded by the mechanism acting upon the above-mentioned barrels, disks, or hands, so as to furnish a permanent record of the distance traveled.

The apparatus is further provided with a device acting upon a stylus or pencil, marking the recorded distances upon the said paper ribbon, and also for recording upon the latter the time when the box of the apparatus has been opened and shut again, so as to avoid any possibility of trickery.

In the accompanying drawings, forming a part of the specification, Figure 1 is an external face view of the complete apparatus. Fig. 2 shows the pulley intended to be fixed

to the wheel of the vehicle—for instance, of a bicycle—for acting upon the apparatus shown in Fig. 1 by means of a suitable cord or string. Fig. 3 is a face view of the apparatus shown in Fig. 1, the casing of the same and also the pulley B being shown in section. Fig. 4 is a top view of the mechanism shown in Fig. 3. Fig. 5 is a top view of Fig. 3 after the withdrawal of the plate C and of those parts of the mechanism placed above said plate C. Fig. 6 shows separately in section, and Fig. 7 seen from beneath, the barrels R, R', and r. Fig. 8 is a sectional top view on line *xy*, Fig. 3, after the withdrawal of the plate D and of those parts of the mechanism placed above said plate D. Fig. 9 is a side view of the toothed wheel acting on the wheel M and its spring-pawl. Fig. 10 is a sectional top view on line *yz* of Fig. 3 after the withdrawal of the plates D' and E and of those parts of the mechanism placed above the plates D'. Fig. 11 is a sectional top view on line *ww* of Fig. 3 similar to Fig. 7, but without the axis B', the worm-wheel G', and the barrels I, K, and L. Fig. 12 is a side view of Fig. 6 seen from right to left. Fig. 13 shows, on a larger scale, part of the mechanism as shown in Fig. 3.

In all the figures the same letters refer to the same parts.

The mechanism of the apparatus comprises two distinct portions, which might be used separately, but which I prefer to combine in a whole, as will be hereinafter described. One of those portions is located in a framing formed of the two plates E and E', connected with one another by means of the pillars *e*, and the other portion of the mechanism is located partly between the plates D and D', connected to one another by means of the pillars *d*, and partly upon the plate C, connected to the plate D by means of the pillars *c*.

The first-mentioned portion of the mechanism is the counter or meter of the distances and the second one is the timepiece provided with means for permanently recording, by means of a geometrical curve, the time and speed for the distance traveled and also the time during which the vehicle has been stopped.

Between the two plates E and E' and par-

allel to the same there is a shaft B' , located in suitable bearings b and provided with a worm b' , as shown in Fig. 10. The shaft B' bears a pulley B with several grooves of different diameter, which are intended to be used in connection with the pulley F, Fig. 2, intended to be fixed to the spokes of the wheel of the vehicle which is to be controlled. According to the dimensions of the diameter of said wheel the one or the other of those grooves of the pulley B will be used.

The shaft G of the worm-wheel G' , which is intended to engage the worm b' of the shaft B' , is perpendicular to the plates E and E' and has its pivots engaged in suitable holes of the same. The said shaft G bears a cam g , intended to be acted upon by the projection h' of the setting-lever II, Figs. 10 and 11. Said shaft G is square in section and the worm-wheel G' has a square hole, thus permitting it to slide along said shaft G. There is provided a spiral spring g' , bearing on the one hand on the face of the cam g and on the other hand beneath the worm-wheel G' , so as to normally lift the latter into the position shown in Fig. 13, in which the said worm-wheel is not in gear with the worm b' . The worm-wheel G' is provided with an eccentric-pin g^2 , projecting downward and intended to act upon the teeth of a star-wheel I' , fixed upon the shaft i of the first barrel I of the counter or meter. In the position of the worm-wheel G' shown in Fig. 13, in which the said worm-wheel does not engage with the worm b' , the pin g^2 is out of reach of said star-wheel I' , but as soon as said worm-wheel G' is put into gear with the worm b' by means of the device which will be hereinafter described the pin g^2 will act upon one of the teeth of the star-wheel I' at every complete rotation of the worm-wheel G' .

It will be observed that according to the described construction the setting of the worm-wheel G' —that is to say, of its pin g^2 —in its starting position is only possible when the said worm-wheel is disengaged from the worm b' , and it will be shown below that this disengaging is only possible by means of opening the cover of the box and that said opening will automatically be recorded on the paper ribbon. Therefore the setting of the barrels, the figures of which record the distances which have been traveled over, cannot be made without a permanent record being indicated on the paper ribbon. The star-wheel I' is further acted upon by a suitable spring i' , which prevents its moving more than one tooth at a time when acted upon by the pin g^2 , as described above.

The barrel I is fixed to the shaft i of the star-wheel I' and bears the figures "0" to "9" or any other suitable figures intended to record the units of the distances traveled over by the vehicle to which the apparatus is affixed, the said figures corresponding to the number of teeth of the star-wheel I' , the driving mechanism being so proportioned that

the said barrel moves one space for every mile traveled. The shaft i is further provided with a finger i^2 , intended to act upon, at each rotation of the star-wheel I' , one tooth of the star-wheel K' , fixed to the shaft k of the barrel K, bearing the figures indicating the ten miles, meters, or other distance, and the said shaft i is further provided with a cam i^3 , intended to be acted upon by the tooth h^2 of the setting-lever II when the barrel I is to be set into its starting position.

The shaft k of the barrel K, marking the tens of miles, meters, or other distances, is provided with a finger k^2 , intended to act upon, at every rotation of the star-wheel K' , one tooth of the star-wheel L' , fixed on the shaft l of the barrel L, bearing the figures intended to mark the hundreds of miles, meters, &c.

The shafts k and l are provided with cams k^3 and l^3 , respectively, intended to be acted upon by the respective projections h^3 and h^4 of the setting-lever II. The said setting-lever is fixed to a shaft II' , pivoted to the plate E' and traversing the plates E, D' , and D and projecting its square-shaped end up to the face of the plate C, which is provided with a suitable hole c' , Fig. 4, allowing a suitable key to be engaged on said shaft II' and to act upon the said setting-lever II, so as to press the same against the cams g , i^3 , k^3 , and l^3 , as shown in Fig. 8. The setting-lever II is provided with a spiral spring h^4 , intended to normally draw the said lever out of reach of the said cams, as shown in Fig. 10. The end of the shaft i of the first barrel I projects through a suitable opening of the plates E and D' and bears a cam g^3 , the purpose of which will be described below.

Between the plates D and D' there is located a time-movement of any suitable kind whatever, preferably provided with an anchor-escapement, so as to be liable to work in spite of the shakes impelled to the vehicle to which the apparatus is fixed. In the drawings, Fig. 8, the said time-movement is composed of a mainspring-barrel M, center wheel N, second wheel O, third wheel P, escapement-wheel Q, and balance-wheel Q' . The arbor of the mainspring-barrel M is provided with a click-wheel M' , combined with any suitable click of usual form and purpose, and with a winding-pinion m , fixed to a winding-arbor m' , pivoted to the plate D and projecting its square end up to the face of the plate C, which is provided with a suitable hole c^2 for the passage of a key intended to wind up the mainspring of the time-movement.

The arbor of the center wheel N bears the usual minutes-wheel n , Fig. 6, the sleeve of which bears the barrel R, bearing the figures intended to indicate the minutes, and the said minutes-wheel acts upon, by means of the usual intermediate wheel n' , the hour-wheel N' , the sleeve of which is fixed to the barrel R' , bearing the figures intended to indicate the hours. The minutes-barrel R is further

provided with a concentric barrel r of smaller diameter projecting through a suitable opening of the plate C and provided with suitable teeth or projections r' , intended to cause the paper-ribbon S, which has corresponding holes, to be moved along with proportional speed according to the minutes recorded by the barrel R. The said corresponding holes of the paper ribbon, moreover, have the purpose of marking the time—for instance, the seconds lapsed—during which the paper ribbon has run along in receiving the geometrical curve drawn upon it by the stylus. The said paper ribbon S is placed on a suitable spool s , rotating on a pin s' , fixed to the plate C. One end of said paper ribbon S engages a slot of a rotative pin s^2 , acted upon by the mainspring-barrel M by means of suitable intermediate gear-wheels m^2 and m^3 , Fig. 8. The sleeve of the wheel m^3 is connected with smooth friction to the pin s^2 and is constantly rotated by the mainspring of the time-piece. The paper ribbon moved along by the projections r' of the barrel will be rolled around the pin s^2 in proportion as it is rolled from the spool s , and the wheel m^3 is rotated with such speed as to always produce a suitable strain on the paper ribbon, the pin s^2 sliding with slight friction in the sleeve of said wheel m^3 when the speed of the latter is too great proportionately to the actual diameter of the paper-roll on the pin s^2 . Thus the linear speed of the paper is maintained, notwithstanding that the diameter of the roll on the pin s^2 increases, the said wheel m^3 only rotating with greater speed than the pin s^2 , which is not firmly connected to it.

The plate C bears a stud T, provided with a transverse slot in which is engaged a three-armed lever T', pivoted at t^4 to the said stud T. One arm of the lever T' projects within reach of the barrel r and carries a pin or stylus t^+ , which bears against the paper ribbon S under the action of a spiral spring t^5 , which connects a pin t^6 on the plate C to the free end of a laterally-projecting arm t^4 of the stud T, the said stud being capable of rotation in the plate C. The other arm of the lever T' projects through a suitable opening of the plate D and bears normally against the cam g^3 mentioned above, under the action of a spiral spring t^5 , the end of which is fixed to the plate D, as shown in Fig. 3.

Parallel to the stud T there is provided a stem U, crossing the plates C, D, D', and E. A spiral spring u is wound around said stem U and bears with its one end upon the plate D' and with its other end against a stop u' , fixed to the said stem U, tending to raise the latter into its position shown in Fig. 13. The lower end of the stem U bears upon the worm-wheel G', and its upper end bears an arm u^2 , which embraces the stud T and is adapted to slide along the same when the stem U is depressed from the position shown in Fig. 13 into that one shown in Fig. 3. In the first of those two positions the arm u^2 of the stem

U bears against the heel T² of the lever T', and the spiral spring u being stronger than the spiral spring t^5 the said lever T' is then maintained in the position shown in Fig. 13, in which its lower arm is out of reach of the cam g^3 , which is then free to be rotated for the setting of the barrel I. The pin or stylus t^+ of the lever T' bears in the position shown in Fig. 13 against one edge of the paper ribbon S and in the position shown in Fig. 3 on the other edge of the same, and when it is thrown from one of these positions into the other one a transverse line is traced across the movable paper ribbon, recording thus the time at which such displacing took place. Now the depression of the stem U from the position shown in Fig. 13 into the position shown in Fig. 3 takes place by means of shutting the cover A' of the casing A of the apparatus, so that if the latter is reopened at any time whatever the time of this reopening will be recorded on the paper ribbon S by a cross-line.

When the cover A' of the box A is shut, as shown in Fig. 3, the worm-wheel G' is pressed into its operative position. The lower arm of the lever T' bears against the cam g^3 and the latter raises the same once at every rotation of the barrel I and records thereby, by tracing a transverse line across the paper ribbon S, the number of units recorded by said barrel I.

The described apparatus works as follows: Having wound up the time-movement by means of a suitable key applied to the arbor m' and set the barrels I, K, and L and also the worm-wheel G' into their starting position by means of a suitable key applied to the arbor H' of the setting-lever H, the cover A' is shut and the lever T' is placed into the position shown in Fig. 3, the pin or stylus t^+ tracing a longitudinal line upon the paper ribbon S, moving constantly along. The shutting of the cover A' causes the worm-wheel G' to be put into gear with the worm b' and the pin g' to be placed in reach of the star-wheel I'. The barrels R and R', being rotated by the described time-movement, will constantly indicate the hours and minutes in the opening a' of the casing A. If after this the pulley B is rotated by the pulley F, fixed to the wheel of the vehicle, the respective barrels I, K, and L will successively present in the openings a^2 , a^3 , and a^4 of the casing A, Fig. 1, the figures corresponding to the units, tens, and hundreds of miles or meters traveled over by the vehicle and at every rotation of the barrel I the pin or stylus t^+ will draw a cross-line on the constantly-moving paper ribbon S, thus exactly recording the speed and also the stopping of the pulley B.

Having thus fully described my invention, I claim—

1. In a cyclometer, the combination of a counting mechanism having star-wheels, a worm-wheel sliding on a squared shaft and having a pin which can act on the first star-

wheel of the counting mechanism, a spiral spring tending to disengage the worm-wheel from its worm and the pin from the first star-wheel of the counting mechanism, a stem U, 5 a spring *u*, acting on the stem U, the three-armed lever T, a stylus on the same, a cam acting on the three-armed lever and also upon the worm-wheel, said stem U being capable of being depressed for the purpose of reën- 10 gaging the worm-wheel with its worm and the three-armed lever with the cam, substantially as herein and for the purpose set forth.

2. In a cyclometer, the combination with a gear-wheel, for engaging the equidistant holes 15 in a paper band, for the purpose of shifting

the band, a stylus for marking upon the paper band, a lever for carrying the stylus, a counting mechanism, a casing containing the counting mechanism, a cover on said casing and means for actuating the lever carrying 20 the stylus, by opening and closing the said cover, substantially as herein shown and described.

In testimony whereof I have signed my name to this specification in the presence of 25 two subscribing witnesses.

EDOUARD DOMON, JR.

Witnesses:

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DAVID T. S. FULLER.