

L. L. BLOCH.
SPEED RECORDING MECHANISM.
APPLICATION FILED MAY 27, 1909.

954,921.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 1.

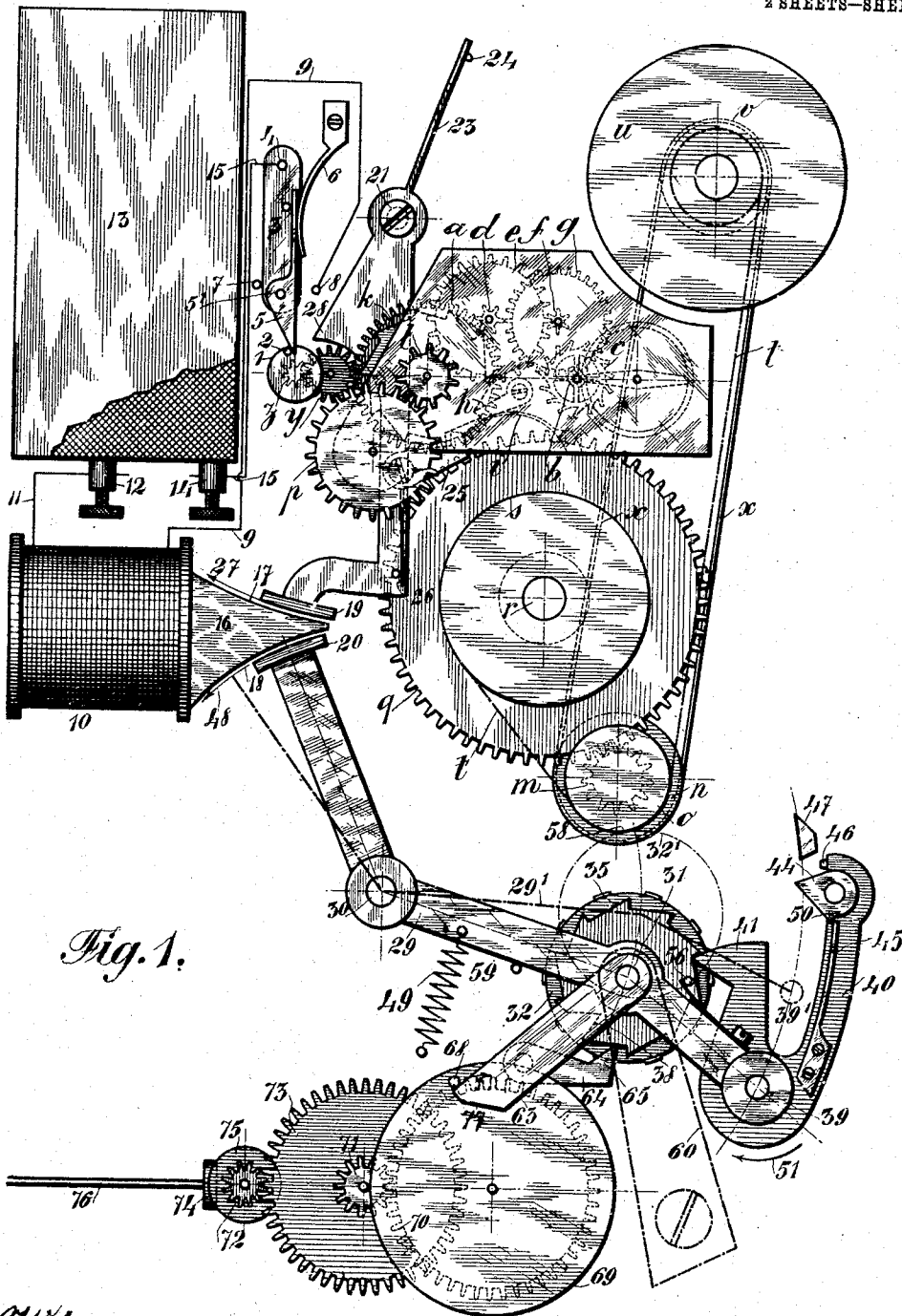


Fig. 1.

Witnesses:
C. L. L. Franch
D. R. Kelly

Inventor:
Leon Louis Bloch
by *Asmussen*
his Attorney

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2 SHEETS—SHEET 2.

Fig. 2.

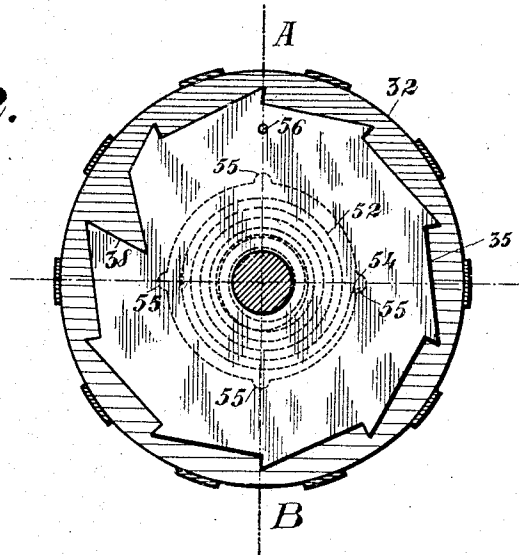
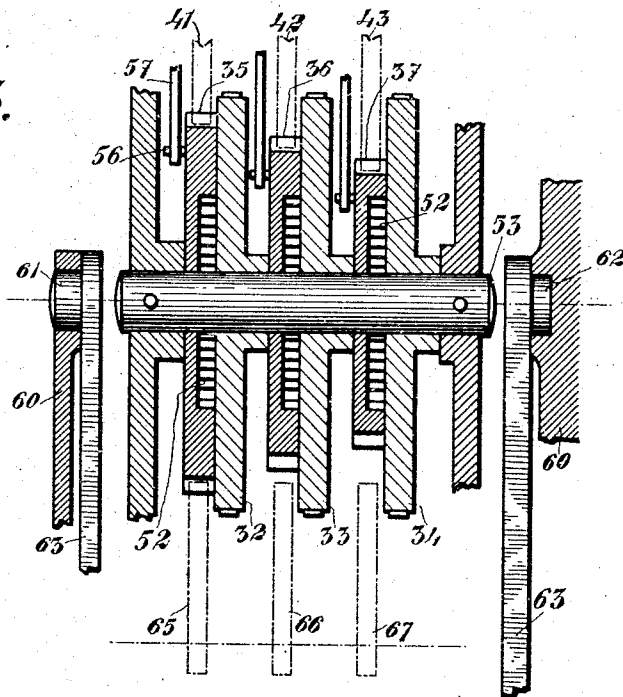


Fig. 3.



Witnesses:
C. C. Frank
D. R. Kelly

Inventor:
Leon Louis Bloch
by *Almon*
his Attorney

UNITED STATES PATENT OFFICE.

LÉON LOUIS BLOCH, OF LA CHAUX-DE-FONDS, SWITZERLAND.

SPEED-RECORDING MECHANISM.

954,921.

Specification of Letters Patent.

Patented Apr. 12, 1910.

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To all whom it may concern:

Be it known that I, LÉON LOUIS BLOCH, watch-manufacturer, citizen of France, residing at La Chaux-de-Fonds, Canton of Neuchâtel, Switzerland, have invented certain new and useful Improvements in Speed-Recording Mechanism, of which the following is a specification.

This invention relates to an automatic apparatus for registering the speed of a vehicle.

In the annexed drawings which illustrate the invention by way of example, Figure 1 is an elevation. Fig. 2 is a detailed view in elevation and to enlarged scale. Fig. 3 is a transverse section on the line A—B of Fig. 2.

The apparatus illustrated comprises a clockwork movement with an automatically winding spring barrel and controlling the unrolling of a ribbon adapted to receive inscriptions from a totalizing meter with disks the periphery of which is provided with types adapted to impress numbers on the said ribbon, this meter being operated by one of the wheels of the vehicle and by a source of current.

The clockwork movement comprises a barrel spring *a* driving the pinion *b* of the escapement wheel *c* through the intermediary of pinions or wheels *d*, *e*, *f* and *g*. The main spring of the barrel is kept stressed by a pawl *h* held under the action of a spring *i*, in the teeth of a ratchet *k*. The shaft of the barrel *a* carries a pinion *l* which drives a pinion *m*, the shaft of which is solid with a pulley *n* and with a spool *o*, through the intermediary of wheels *p* and *q*. The shaft *r* of the wheel *q* carries a drum *s* around which is wound a long band or ribbon of paper *t* which passes around the circumference of the spool *o* and is rolled around a drum *u* which is solid with a pulley *v* connected to the pulley *n* by a flexible member, strap or cord *x* or the like with the object of continuously holding the paper band *t* stretched. The spool *o* is provided with any suitable means (not shown) to insure a regular movement of the band without slip. The barrel *a* drives also, through the intermediary of a wheel *y* and a pinion *z*, a disk 1 carrying, electrically insulated, a pin 2 which, at each turn of this disk, raises a detent 3, pivoted at 4, by means of the movable nose 5 which a spring 6 continuously holds against a fixed foot 7.

An electrically insulated terminal 8

against which abuts the detent 3 at each revolution of the disk 1, is connected by a wire 9 to one end of the winding of an electromagnet 10 whose other end is connected, by a wire 11, to one pole 12 of an electric battery 13. The other pole 14 of this battery is connected by a wire 15 to the pivoted detent 3. The pole piece 16 of the electromagnet 10 has two parts 17 and 18 each curved in the form of an arc traced from a center which is also the pivot of an armature 19 or 20. The armature 19 is pivoted at 21 and terminates in a spring 23 the end of which bears against a fixed foot 24. On this armature 19 is pivoted a pawl 25, having a spring 26, which pawl tends continuously to engage the teeth of the ratchet *k* of the barrel.

The clock movement is such that the disk 1 makes ten revolutions per hour, or one revolution in six minutes. Ten times per hour the pin 2 will lift the detent 3 and establish a contact with the terminal 8, closing the electric circuit in which is included the electromagnet 10. To each of these contacts will correspond one attraction of the armature by the pole piece 16 in the direction of the arrow 27, and the winding by a fraction of a turn of the main-spring of the barrel by the pawl 25 acting on the ratchet *k*. The armature 19 in being lowered under the action of the electromagnet, after having acted by its pawl, on the ratchet *k* will abut with its claw 28 against the nose 5 of the detent 3 pivoted at 5¹ and reopen the electric circuit, permitting the armature to resume its initial position. The clock movement drives the spool *o* in such manner that the paper strip *t* moves at a speed of five millimeters in six minutes.

The armature 20 is connected with a lever 29 pivoted at 30 and carrying, pivoted on it at 31, a meter with three disks 32, 33, 34 each provided on its circumference with the numerals 0 to 9 and each being solid with a ratchet 35, 36 or 37 respectively, each ratchet having a series of ten teeth corresponding to one of the numerals of the disk. In each disk these teeth are of equal depth except that 38 corresponding to the numeral 9, which is deeper than the others. The ratchets 35, 36, 37 are of different diameters, that is to say the diameter measured at the points of the teeth of the second ratchet 36 is less than the diameter measured at the bottom of the teeth of the first ratchet 35 and

the diameter measured at the point of the teeth of the third ratchet 37 is smaller than the diameter measured at the bottom of the teeth of the second ratchet 36. Only the deep tooth 38 is the same depth in all three ratchets.

At the upper end of the lever 29 is pivoted at 39 a lever 40 carrying three pawls 41, 42, 43 each acting on one of the ratchets 35, 36, 37 and to the upper end of which is pivoted a finger 44 which a spring 45 tends to press continuously against a fixed spur 46. A fixed abutment 47 is placed in the path of the finger 44, so that when the lever 29 oscillates in the direction of the arrow 48, under the electro-magnetic action of the pole-piece 16, the finger 44 rotates a fraction of a revolution, the pawls 41, 42, 43 continuing to act on their respective ratchets, but when, under the action of a spring 49, the lever 29 moves back, the finger 44 held by the spur 46 abuts with its inclined face against the abutment 47 and causes the lever 40 to oscillate a fraction of a revolution in the direction of the arrow 51, which oscillation places the three pawls 41, 42, 43 out of the reach of their respective ratchets.

Each of the disks, 32, 33, 34 carries in a circular depression a spiral spring 52 one end of which is attached to the shaft 53 on which are mounted the said disks, while the other end terminates in a hook 54, Fig. 2, entering one of the four notches 55 of the depression in which the spiral spring is housed, so that the said springs remain constantly stressed but without their tension being increased. This arrangement is that which is employed in horology in the barrel-springs of watches known by the name of "Roskopf." The spiral springs 52 are stressed in such a direction that the ratchets tend constantly to act against their respective pawls 41, 42, 43.

Each of the three ratchets carries a foot 56 intended to stop its circular movement under the action of its spiral spring when the pawls 41, 42, 43 cease to act on the said ratchets. The position of each disk, when the foot 56 abuts against the spring 57 secured to the lever 29, is such that the numeral zero of each disk is opposite the part 58 of the paper band *t* on which it will strike when the lever 29 oscillates in the direction of the arrow 48 under the action of the electro-magnet. In the position of rest (Fig. 1) the spring 49 holds the lever 29 pressed against a stop 59.

In a bridge 60 is pivoted at 61 and 62, a strap 63 carrying a pivoted pawl 64 with three noses 65, 66, 67 equidistant from the axis of the shaft 53 and each adapted to engage in one of the ratchets 35, 36 or 37, under the action of a pin 68 fixed to a disk 69 on a wheel 70 which operates, through

the intermediary of pinions 71, 72 and wheel 73, a roller 74 acting by friction on a disk 75 solid with the pinion 72. The roller 74 is connected by a flexible cable 76 to a pinion, wheel, roller or the like, actuated by one of the wheels of the vehicle, in such manner that the disk 69 makes one revolution for each hectometer. Thus, every hundred meters, the pin 68 will act in the direction of the arrow 77 under the strap 63, so as to cause one of the teeth of the ratchets to be advanced by means of their respective pawls 65, 66 or 67.

When the pawl 65 after nine hectometers have been traveled by the vehicle will have rotated the disk 32 through 9/10ths of a revolution, at the tenth hectometer this pawl will fall into the deep tooth 38 of the ratchet 35, which will allow the pawl 66 to approach the ratchet 36 and rotate this ratchet and its disk 33 until the moment when, this latter having effected a complete revolution, the pawl 66 will fall in its turn into the deep tooth of the ratchet 36 thus allowing the pawl 67 to operate the ratchet 37 in its turn.

Every six minutes the winding of the electro-magnet 10 will be traversed by the electric current from the battery 13, the armature 20 will be violently attracted in the direction of the arrow 48 and the number indicated by the numerals of the meter opposite the part 58 of the ribbon or band will be marked on this ribbon by the disks which will occupy the position 32'. During this movement, the finger 44 has passed over the abutment 47 without altering the position of the pawls 41, 42, 43 but as soon as the electric circuit is opened again by the claw 28 of the armature 19 acting on the nose 5 of the detent 3, as has been above explained, the lever 29 moves back to its initial position and as the finger 44 cannot rotate in this direction the lever 40 is raised and the three pawls cease to hold the ratchets 35, 36, 37 which, under the action of their spring 52, reoccupy their initial position so that the zero of each of the three disks is opposite the part 58 of the ribbon, each ratchet solid with the disk being held in this position by its foot 56 abutting against the spring 57.

The movement of the lever 29 under the electro-magnetic action is very rapid so that as soon as the number of the meter is marked on the ribbon this meter returns to its first position opposite the pawl 64 with the three noses which continues, as explained, to advance the meter by one numeral for every hectometer traveled until the moment when, after a new period of six minutes, the ribbon *t* having advanced 5 mm., the meter again marks on it the number of hectometers traveled by the vehicle during the said period, and so on. It will thus be possible, when

the vehicle has been stopped to verify at what speed the vehicle has traveled and the number of hectometers covered, this number being equal to the number of kilometers traveled in one hour.

The casing of the apparatus, not shown in the drawing, may have a shutter or a glass window which permits of ascertaining the speed at which the vehicle is traveling, at any moment.

Instead of an electro-magnet and an electric current other arrangements may be used for operating the oscillating lever carrying the meter and for automatically winding the clockwork barrel; for example there may be used a strong barrel with main spring of which the winding could be operated automatically by the cable 72 or one of the movers of the train of wheels which this cable operates.

The meter may be operated, for totalizing the numerals and for effecting the return of the disks to zero, by a mechanism other than that described and illustrated.

The movement of one wheel of the vehicle to the disk the pin 68 of which operates the support 63 of the pawls operating the meter may be transmitted by means other than those described, for example by means of electricity or compressed air or by belt or chain transmission.

A ribbon or a piece of fabric impregnated with color may be introduced between the meter and the part 58 where the numerals of the meter strike the paper band *t* so that the numbers may be marked after the manner of a typewriter. Instead of a paper band the device may have one or more paper disks on which the imprint of the numbers of the meter may be marked as on a band, this disk or disks being divided and moved circularly by a predetermined amount. The clockwork movement controlling the movement of the strip or disk intended to receive the indications of the meter may also operate hour, minute and second hands indicating the time on a suitable dial.

The unit of time corresponding to one winding of the barrel of the clockwork and to an impression of the meter on the member intended to receive it may be other than that of six minutes given by way of example; also, the unit of distance traveled by vehicle and registered by the totalizing meter may be other than the hectometer also given by way of example. The registering device may be placed on any road or railway vehicle or vessel traveling on water or in the air; it suffices in each case to connect to the totalizing meter by any suitable means one of the moving members of the said vehicle the speed of rotation of which is in a definite relation to the speed of movement of this vehicle.

Having described my invention what I claim and desire to secure by Letters Patent of the United States is:—

1. In speed recording mechanism, the combination with means for actuating a record receiving member, of a record indicating device, and means acting independently of the movement of the object whose speed or distance of travel is to be measured to simultaneously wind the actuating means and to cause the printing device to operate, substantially as described.

2. In speed recording mechanism, the combination with means for constantly moving a record receiving member, of a meter adapted to indicate records upon said member, and means acting independently of the movement of the object whose speed or distance of travel is to be measured to simultaneously wind the actuating means and to cause the meter to indicate records upon the record receiving member, substantially as described.

3. In speed recording mechanism, the combination with means for actuating a record receiving member, of a meter adapted to print records on said member, means for operating the meter to produce records of speed or distance of travel, and means acting independently of the movement of the object whose speed or distance of travel is to be measured to simultaneously wind the actuating means and to cause the meter to indicate records on the record receiving member, substantially as described.

4. In speed recording mechanism, the combination with spring influenced means for actuating a record receiving member, of a record printing device and means acting independently of the movement of the object whose speed or distance of travel is to be measured to simultaneously wind the spring influenced actuating means and to cause the printing device to impress a record on the record receiving member, substantially as described.

5. In speed recording mechanism, the combination with a record printing device normally spaced from a record receiving member, of means for actuating the tape, and means acting to simultaneously wind the actuating means and to move the printing device into operative contact with the member, substantially as described.

6. In speed recording mechanism, the combination with a record printing device normally spaced from a record receiving member, of means for actuating the said member, means for operating the printing device to show records of speed or distance, and means acting to simultaneously wind the actuating means and to move the printing device into operative contact with the said member, substantially as described.

7. In speed recording mechanism, the com-

5 bination with a clockwork movement for actuating a record receiving member, an armature associated with said clockwork movement, a totalizing meter and printing means carried thereby, an armature carried by the meter, and an electromagnet with means to close the circuit thereto to cause the electromagnet to attract both armatures to thereby wind the clockwork movement and to move the printing device into contact with the said member, substantially as described.

10 8. In speed recording mechanism, the combination with means for actuating a record receiving member, of a meter and printing means carried thereby, means for operating the meter to indicate speed or distance, an electromagnet, an extended pole piece carried thereby, an armature carried by the said actuating means, a second armature carried by the meter, a source of electric current, and means for closing a circuit including the electromagnet whereby both said armatures will be attracted to the pole piece to simultaneously wind the tape operating means and to move the printing means into contact with the said member, substantially as described.

15 9. In speed recording mechanism, the combination with means for actuating a record receiving member, a totalizing meter comprising a plurality of disks each having suitable indicating characters on its periphery, means for operating said disks from the object whose speed or distance of travel is to be recorded, and means operating to simul-

taneously wind the said actuating member and to cause the meter to impress records upon the record receiving means, substantially as described.

20 10. In speed recording mechanism, the combination with a clockwork movement for actuating a record receiving member, of a totalizing meter comprising a plurality of disks each having suitable indicating characters on its periphery, means for advancing said disks in consonance with the speed or distance traveled, means for preventing the untimely return of said disks, and means acting to simultaneously wind the clockwork movement and to move the meter into contact with the said member, substantially as described.

25 11. In speed recording mechanism, the combination with means for actuating a record receiving member, of a totalizing meter comprising a plurality of disks each having suitable indicating characters on its periphery, means for advancing said disks, means for moving said disks into contact with the record receiving member, and means for engaging said disks during their advance and printing movement but becoming released from the disks after the latter have printed a record, substantially as described.

30 In testimony whereof I affix my signature in presence of two witnesses.

LÉON LOUIS BLOCH.

Witnesses:

ARNOLD ESCOFFEY,
K. MATHEY-VOULZ.