

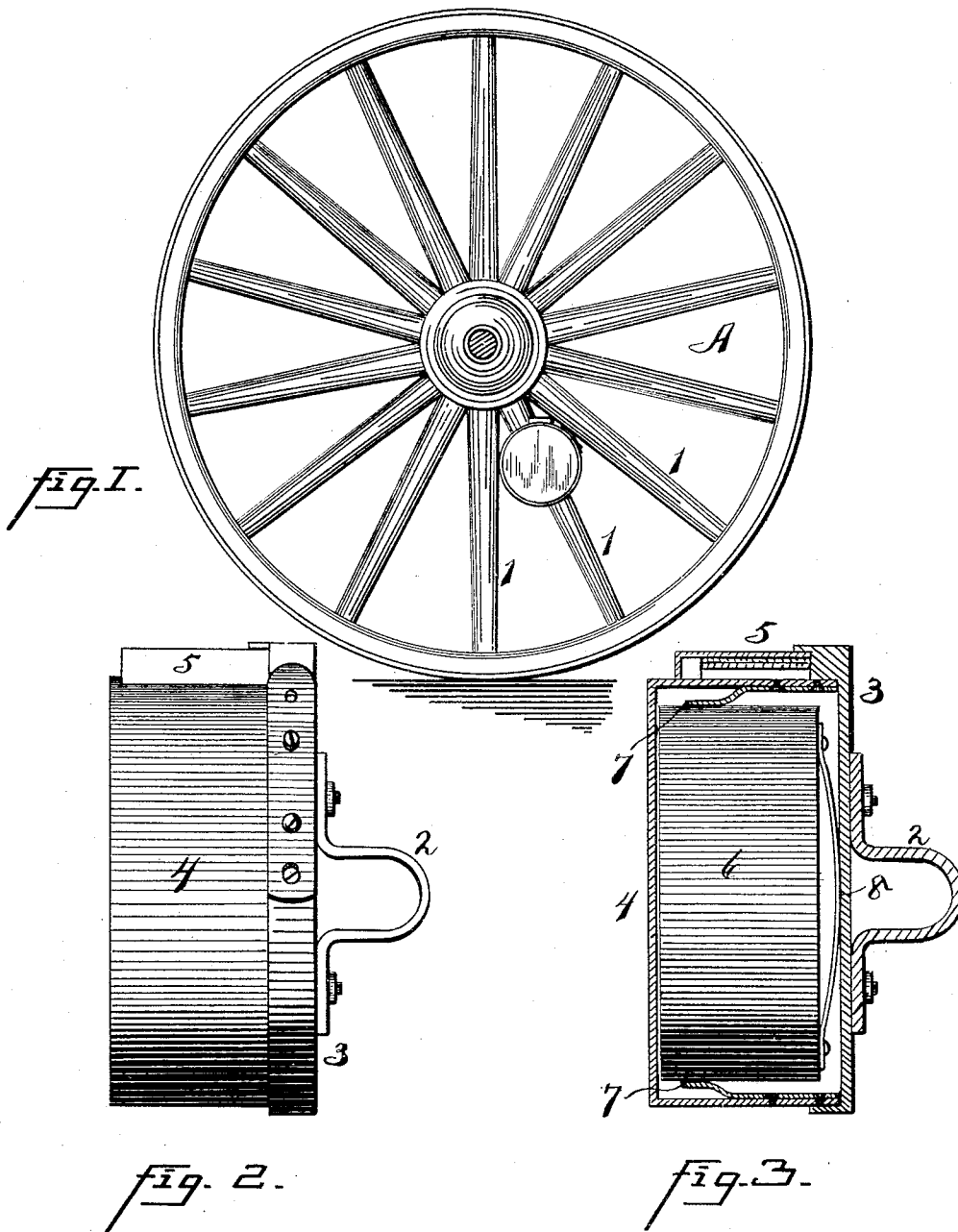
(No Model.)

3 Sheets—Sheet 1.

W. L. BUNDY.
RECORDING APPARATUS.

No. 578,283.

Patented Mar. 2, 1897.



WITNESSES:
Charles W. Marvin.
H. A. Carhart

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BY
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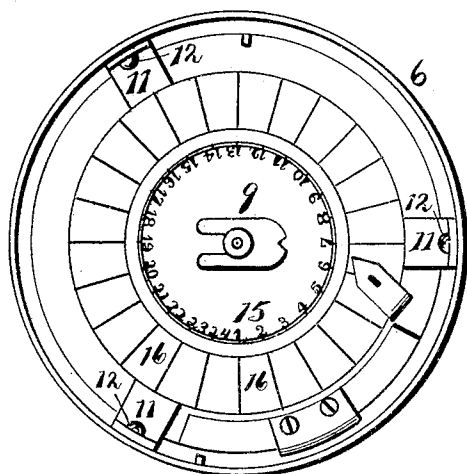


fig. 4.

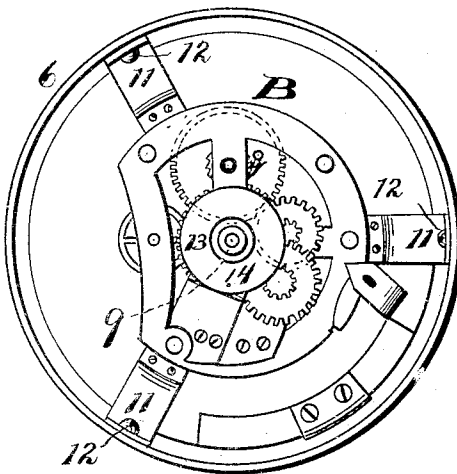


fig. 5.

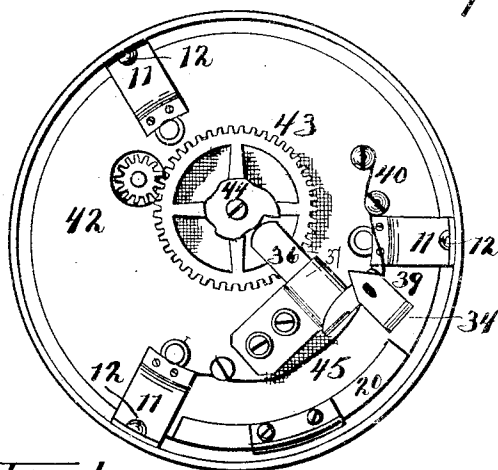


fig. 6.

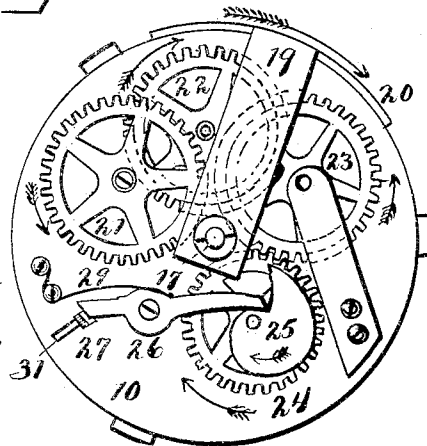


fig. 7.

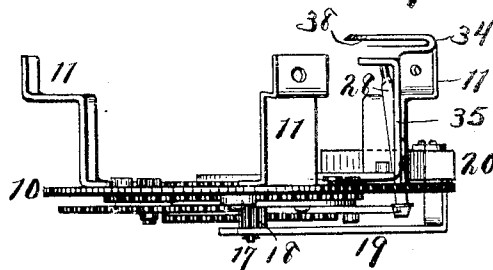


fig. 8.

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(No Model.)

3 Sheets—Sheet 3.

W. L. BUNDY.
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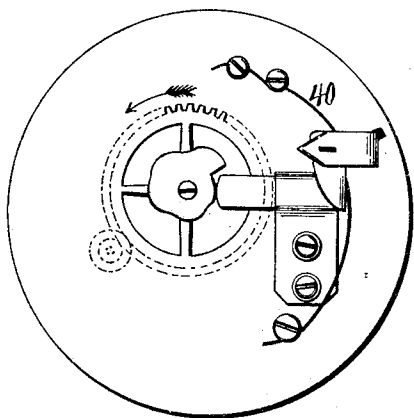


Fig. 9.

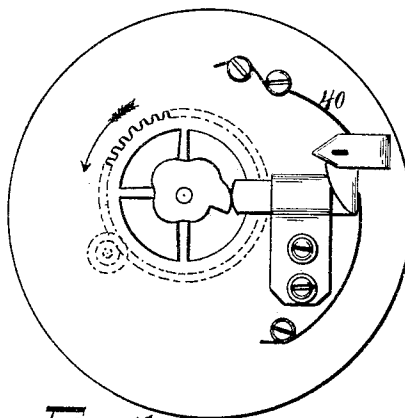


Fig. 11.

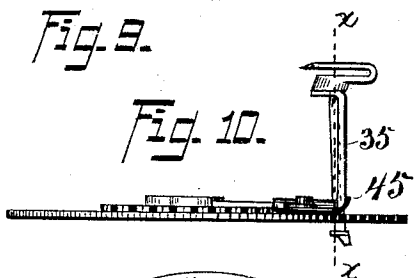


Fig. 10.

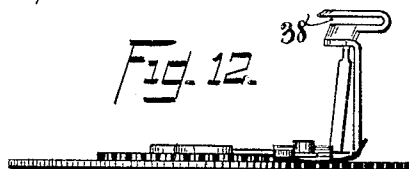


Fig. 12.

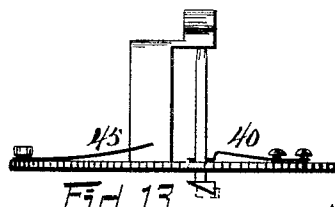
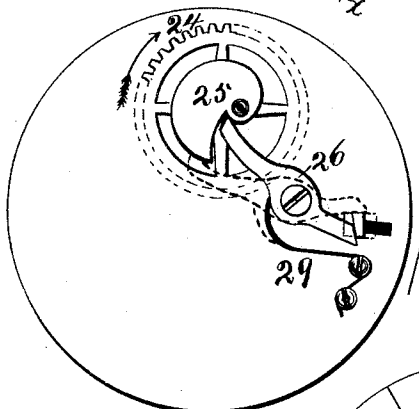


Fig. 13.

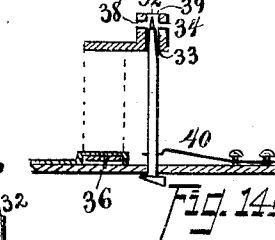


Fig. 14.

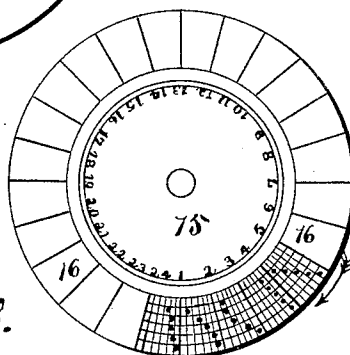
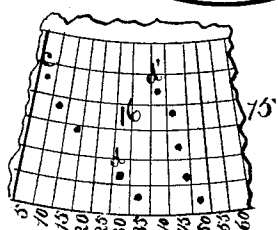


Fig. 15.

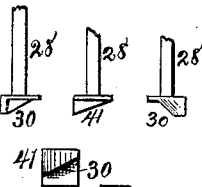


Fig. 16.

Fig. 17.

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UNITED STATES PATENT OFFICE.

WILLARD L. BUNDY, OF BINGHAMTON, NEW YORK.

RECORDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 578,283, dated March 2, 1897.

Application filed February 8, 1896. Serial No. 578,490. (No model.)

To all whom it may concern:

Be it known that I, WILLARD L. BUNDY, of Binghamton, in the county of Broome, in the State of New York, have invented new and useful Improvements in Recording Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to apparatus for recording distances, speed of travel, and the time consumed, all simultaneously and in a single machine, and adapted to be attached to a rotating object, as to the spoke of a vehicle-wheel, so that the rotation of the wheel actuates the distance-recording mechanism. The time mechanism simultaneously operates to rotate a recording-dial spaced or divided by subdivisions on radial lines, so that the time consumed between the making of any two punch-marks can be readily ascertained, the punching or recording mechanism being gaged, as by a cam and actuating-gearing, so that said cam will rotate once for a given distance traveled, regulated by a fixed number of revolutions of the wheel and the circumference thereof, and actuate the recording mechanism, as a punch, to mark the dial, and also, when the wheel is not rotating, the time mechanism will not actuate the punching device to record the time that the wheel is standing still, but the dial will indicate it, all of which is very valuable as a detector in the business of hacks or cabs to indicate the working time for which the driver must make returns, and also determines the number of miles a vehicle has traveled and the rates of speed at which it has been driven, whether fast or slow, each dial being adapted to be used for twenty-four hours, and the graduations thereon each indicate a given number of minutes, the punching mechanism being adapted to evenly space the marks made, and in case the dial shows a greater space between two of the marks than the regulation space such space will indicate that the wheel or vehicle was still during the time measured or indicated by that space, or substantially so, because when each space represents ten minutes the vehicle may have traveled for a part of that time and stood still for the remainder.

My object is to produce a combined speed,

distance, and time recorder of this class and embodying the features above outlined; and my invention consists in the several novel features of construction and operation hereinafter described and which are specifically set forth in the claims hereunto annexed.

It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of a wheel with my apparatus mounted upon one of the spokes. Fig. 2 is a side elevation of the recorder detached. Fig. 3 is a sectional elevation showing the elastic springy mounting of the case for the recording mechanism within the outer casing and the lock by which the body of said casing is detachably secured to the base. Fig. 4 is a front elevation of the case removed from the casing. Fig. 5 is a like view of the same, the recording-dial having been removed. Fig. 6 is a like view of the same with the clockwork removed and showing a plan of the stepped cam mechanism for shifting the needle-point on a line substantially radial to the case or the dial. Fig. 7 is a rear elevation of the recording mechanism removed from the case and showing a plan of the train of gearing actuating the cam to operate the lever which engages with the punch to operate it to prick or mark the dial at certain fixed and predetermined intervals. Fig. 8 is a side elevation of Fig. 6. Fig. 9 is a plan of the stepped cam, the slide with which it engages, and the needle-guide carried by the slide and by which the needle-point is shifted upon a line substantially radial to the dial and showing the first step of the cam in engagement with said slide. Fig. 10 is a side elevation of the same. Fig. 11 is a plan of the stepped cam, slide, and needle-guide and showing the last step of the cam in engagement with the slide. Fig. 12 is a side elevation of the same. Fig. 13 is a front elevation of either Figs. 9 or 11. Fig. 14 is a vertical sectional elevation of Fig. 9 on line *xx*. Fig. 15 is a plan view of the plain cam, the needle-operating lever, and the cam-head upon the end of the needle with which the lever engages. Fig. 16 shows five different views of the needle and the cam-head thereon. Fig. 17 is a plan of the recording-dial, showing its hour-graduations and dotted in some of the

spaces to indicate punch-marks. Fig. 18 is an enlarged plan of a segment of the dial embracing an hour-space thereon.

A is a wheel provided with spokes 1, upon one of which the recorder is secured by means of a loop 2 around it, which is detachably connected to the casing-cover 3, the casing itself being like unto a cylindrical box 4. A lock 5 of any suitable construction secures said cover to said casing. A case 6 is inserted into said casing and laterally engages with the springs 7, and 8 is a spring upon said case which engages with the casing-cover, all to yieldingly support the case and protect it as much as possible from concussion and damage to the clock mechanism within it.

B is a clockwork or time-keeping mechanism, in which the shaft 9 corresponds to the hour-hand shaft of a clock, and is driven by the wound-up spring to be rotated once in each hour, and as this clock is of ordinary construction it needs no further description, the frame of said clock being mounted upon a back plate 10 and somewhat detached therefrom, and said back plate (and clock also) is suspended in the case by means of the angular arms 11, secured to said back plate and having their outer ends detachably secured to the case by screws 12. A disk 13 is secured upon said hour-shaft and provided with a sharpened spur 14, and 15 is the recording-dial, removably mounted upon said shaft and disk and prevented from slipping by means of said spur engaging with said dial. This dial is of paper and is provided with radial lines dividing it up into compartments 16, each of which represents an hour, and these may be subdivided by additional lines into spaces each of which indicates five or ten minutes, and this dial is rotated by the hour-hand shaft. In Fig. 17 several of the compartments are shown as subdivided by radial lines into ten-minute radial subdivisions, and by the concentric circles these subdivisions are transversely subdivided, creating spaces between said circles which represent distances, as, for instance, one mile, and the punch-actuating mechanism is so adjusted as to make its mark in these spaces, or substantially so, so that by figuring the time and the number of miles the speed of travel is ascertained, the time and distance of a job is learned, the time a vehicle stands still is also determined, and the apparatus is a preventive of dishonesty upon the part of the driver.

In Figs. 4 to 8 the mechanism for actuating the marking-punch is shown. In the center of the back plate 10 an arbor 17 is secured, upon which a pinion 18 is loosely mounted. 19 is a bar secured to said pinion, and 20 is a weight secured upon said bar. A gear 21 is driven by said pinion, and this drives a pinion (not shown) secured to the face of said gear, and this drives the gear 22, and this through a pinion (not shown) drives the gear 23, and this engages and drives the gear 24, which rotates the cam 25, this whole train of

gearing being driven by the swinging of said weighted arm in a direction opposite to that of the rotation of the back plate, case, and casing and wheel, and all being so arranged and proportioned as to require a fixed number of rotations of the wheel, making a fixed distance traveled, as a mile, in order to rotate the cam one revolution. A lever 26 is pivoted upon the back plate and has one end in engagement with this cam, and the other in engagement with the beveled head 27 of the needle 28, and 29 is a spring engaging with said lever and brought under tension by the movement of said lever when the cam is rotated and causing it to snap down onto the body when the lever passes the point or apex of the cam, as shown in Fig. 7, said lever being then engaged with the bevel 30. This needle is mounted in a slotway 31 in the back plate and is adapted to be reciprocated therein both laterally in the line of the length thereof and in the line of the length of the needle. It is provided with a point 32 and passes freely through an opening 33 in the arm 34 upon the upright 35, which is erected upon a slide 36, which passes loosely under a guide 37 upon the outer face of the back plate. The arm 34 is elongated and doubled substantially as shown, creating a notch 38, into which the edge of the dial is inserted, and a recess 39 is provided to receive the needle-point when it is shifted, as shown in Fig. 14, to mark or punch the dial. When by the rotation of the cam 25 the lever is swung clear of the head of the needle, the spring 40 throws it inwardly behind the lever into position, so that when the lever passes the cam its end will engage with the bevel 41 upon the needle-head and be forced over it, forcing said needle lengthwise into the position shown in Fig. 14 to punch the paper, and then the spring 40 will retract said needle to the position shown in Fig. 13.

In Fig. 7 the weight is swung to one side, in order to better show the cam and lever, its normal position being substantially as shown in Figs. 4, 5, and 6. The lateral movement of the needle-head produces a tension upon the spring 40 in that direction, and this tension is removed when the head is shifted as aforesaid, and then the longitudinal movement of the needle produces another tension upon it to retract the needle. The shaft upon which the gear 23 is secured passes through the back plate and carries a pinion 42, which engages with the gear 43, upon which the stepped cam 44 is, with which the slide 36 engages, so that the rotation of said cam forces said slide and the arms 34 outward step by step and carries with it the point of the needle from the position shown in Fig. 10 to that in Fig. 12, inclined outwardly, in order to step by step shift the needle-point to make its successive punch-marks in the dial, said cam gradually shifting said slide from the position shown in Fig. 9 to that shown in Fig. 11, when the needle makes the outermost

mark upon the dial. Then when the slide passes the last step of the cam the spring 45 retracts it and the needle into the position shown in Figs. 9 and 10.

5 In Fig. 18 an hour-division of the dial is shown enlarged and graduated to five-minute spaces, and assuming that each dot indicates one hundred revolutions of the wheel then the
10 row of dots *c* indicates that during the first fifteen minutes of the hour the vehicle traveled three hundred revolutions of the wheel, the distance being obtained by multiplying the circumference by the number of revolutions. Looking at the row of compartments num-
15 bered "20" and "25" we find that there are no marks within, which indicates that the vehicle either stood still for that time from "15" to "30," or was fifteen minutes in rotating the wheel one hundred times. Then looking at
20 the broken row (marked *d d'*) we see that from "30" to "50" the wheel made seven hundred revolutions, the fast speed being indicated by the short time of travel. From "50" to "60" the vehicle either stood still or did not travel
25 far enough to rotate the wheel one hundred times in the ten minutes.

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

30 1. The combination with a wheel and a casing mounted upon and rotated by the revolution of the wheel, of a train of gearing and a cam upon the terminal gear stepped to indi-

cate a fixed distance of travel by said wheel for each revolution of said cam, and a weight 35 pivoted upon an arbor concentric to said casing and adapted to swing thereon to maintain a vertical position and thereby drive said gearing.

2. The combination with a time-indicating 40 dial, its inclosing casing, and a wheel upon which the casing is mounted, a slide a needle mounted therein, a stepped cam engaging with said slide and means to actuate said needle to mark said dial at each successive step of said 45 cam, and means to rotate said cam.

3. The combination with a wheel, a casing mounted thereon, a time-indicating dial with- 50 in it and means to rotate it, in combination with a train of gearing within said casing, a cam upon the terminal gear thereof, a needle actuated by said cam to mark said dial at each revolution of said cam, a stepped cam 55 actuated by said gearing, a slide engaging with the latter cam and guiding said needle to shift the marking upon said dial at each step of this cam, and a weight pivoted con- 60 centric with said casing and driving said gearing by maintaining its vertical equilibrium when the wheel revolves.

In witness whereof I have hereunto set my hand on this 4th day of January, 1895.

WILLARD L. BUNDY.

In presence of—

C. W. SMITH,
HOWARD P. DENISON.