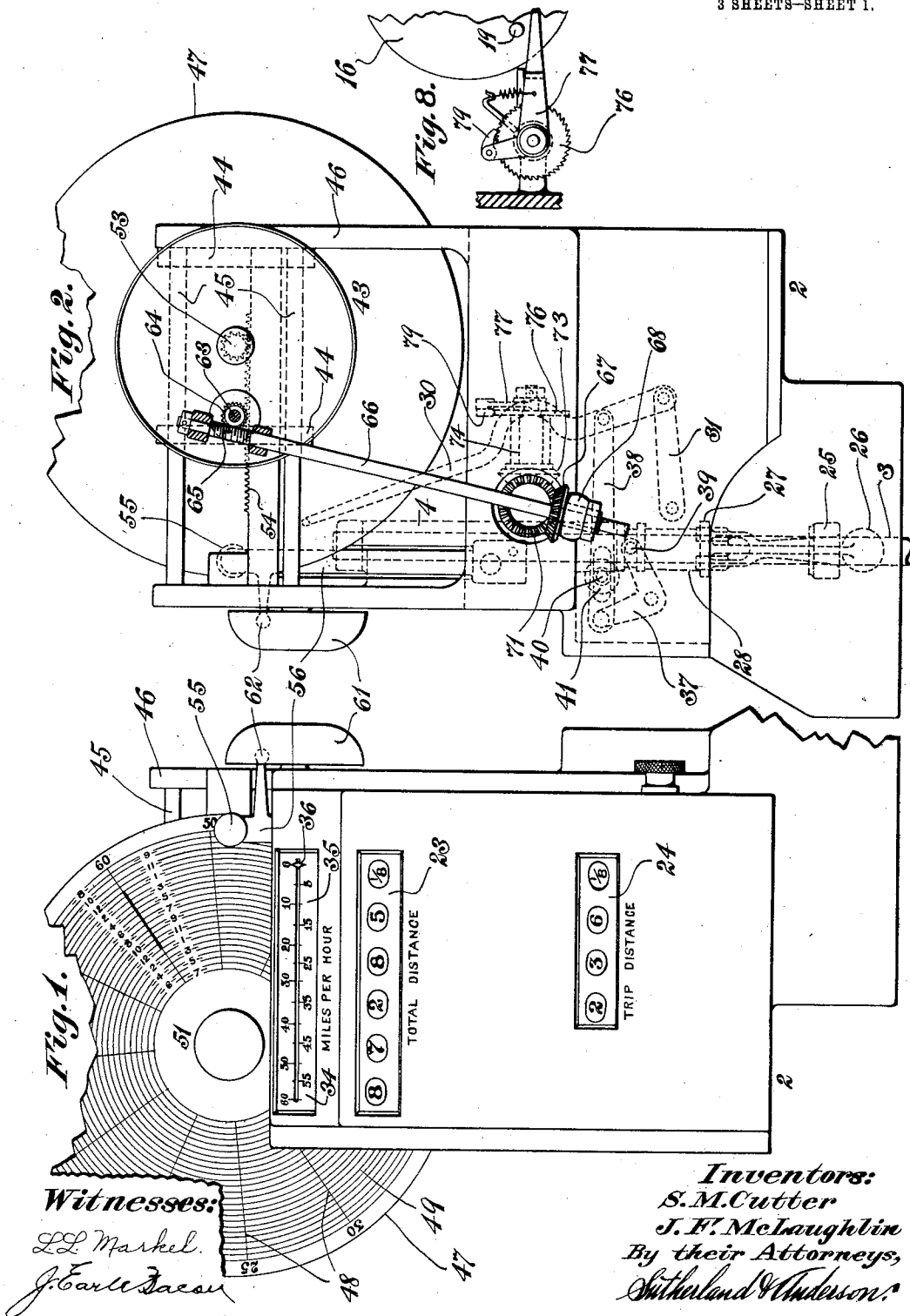


S. M. CUTTER & J. F. McLAUGHLIN.
MILEAGE INDICATING APPARATUS.
APPLICATION FILED JAN. 7, 1911.

1,089,695.

Patented Mar. 10, 1914.

3 SHEETS-SHEET 1.

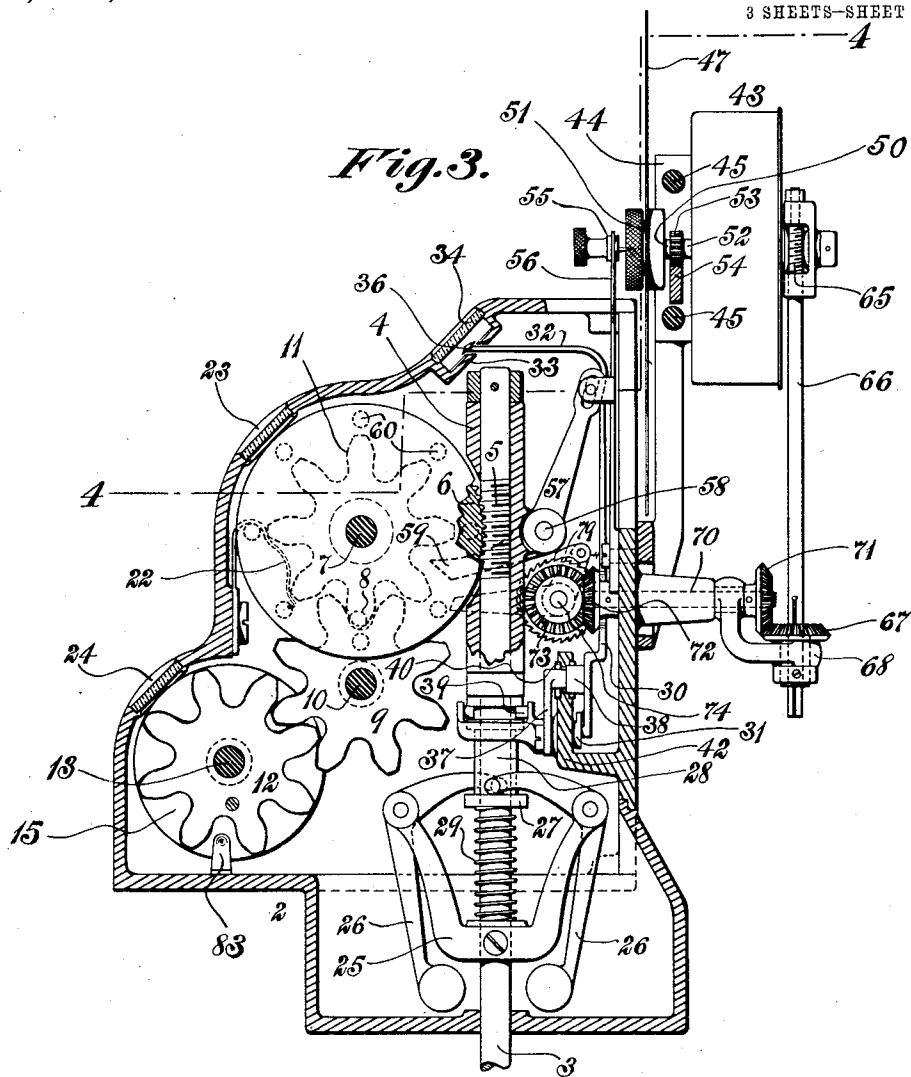


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Witnesses:

L. L. Markel.
J. Ericsson

Inventors:

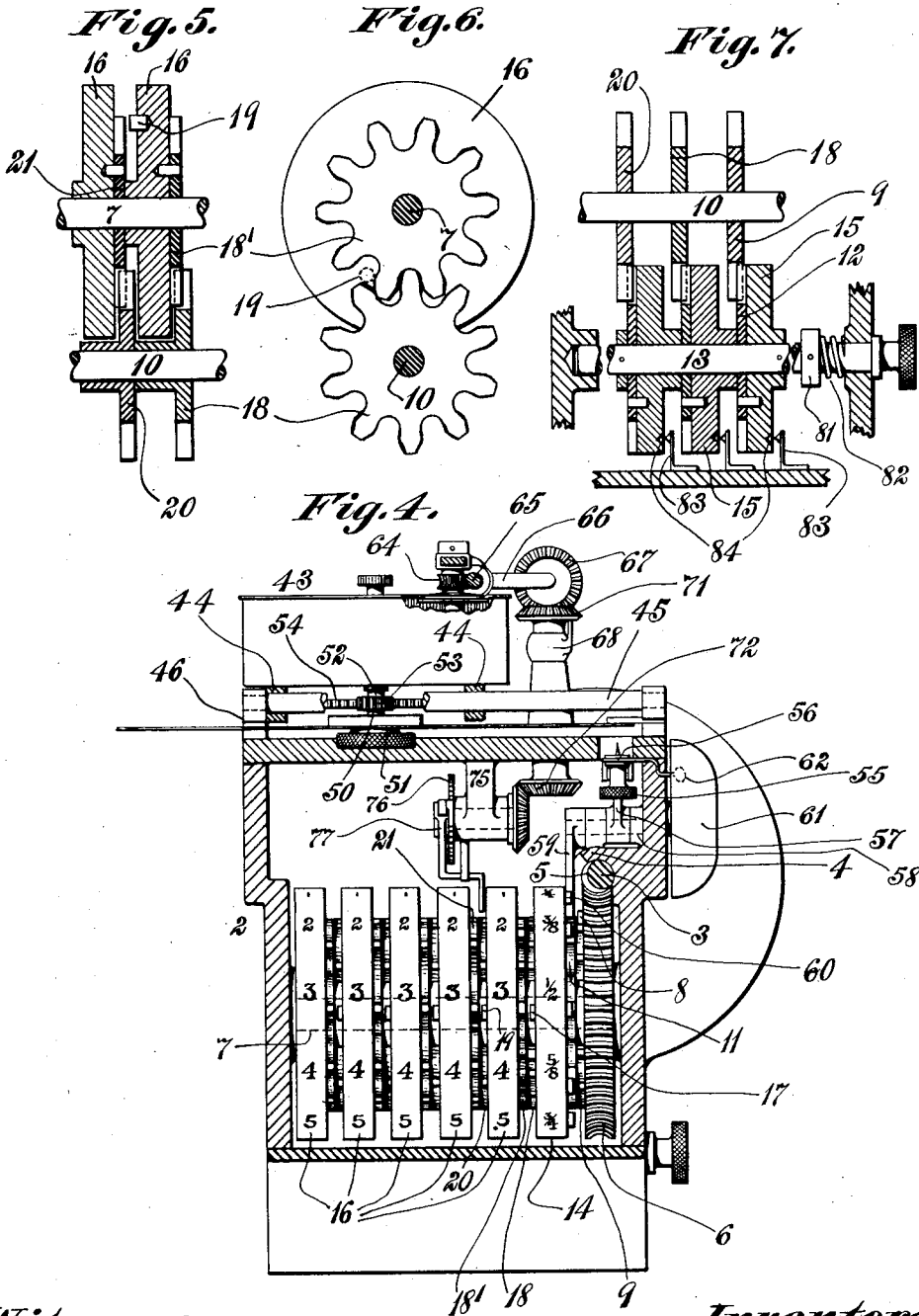
S. M. Cutter
J. F. McLaughlin
By their Attorneys,
Switthard & Anderson

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3 SHEETS-SHEET 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

SOLOMON M. CUTTER AND JOHN F. McLAUGHLIN, OF HARTFORD, CONNECTICUT.

MILEAGE-INDICATING APPARATUS.

1,089,695.

Specification of Letters Patent.

Patented Mar. 10, 1914.

Application filed January 7, 1911. Serial No. 601,415.

To all whom it may concern:

Be it known that we, SOLOMON M. CUTTER and JOHN F. McLAUGHLIN, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Mileage-Indicating Apparatus, of which the following is a specification.

This invention relates to what we shall for convenience term a mileage indicating apparatus, this title having been adopted simply because the apparatus is shown for indicating mileage. It is conceivable, of course, that the same may be put to other uses. When employed, however, for the purpose set forth, it can be utilized with advantage in connection with an automobile, although it will operate with equal utility in conjunction with vehicles or conveyances of other kinds.

In the drawings accompanying and forming part of the present specification, we have shown in detail one convenient form of embodiment of the invention, which to enable those skilled in the art to practise the same, will be set forth fully in the following description, while the novelty of the invention will be included in the claims succeeding said description. From such observations it will be obvious that we do not restrict ourselves to the showing made by said drawings and description; we may depart therefrom in several and radical respects within the scope of our invention as expressed in said claims.

The apparatus as shown has means for registering the mileage or even the fraction of a mile, in making a trip on an automobile, for instance, and also a separate register for showing a total mileage made by the car within a given period. It also has means for indicating the speed and for recording the distance traveled and the amount of time required in traveling such a distance. It is not essential, of course, that all these different mechanisms be employed together, as it is possible that we may use them separately.

Referring to said drawings: Figure 1 is a front elevation of a mileage indicating apparatus involving our invention. Fig. 2 is a rear elevation of said apparatus. Fig. 3 is a vertical sectional view of the same. Fig. 4 is a horizontal section on the line 4—4 of Fig. 3. Fig. 5 is a detail view of a portion

of the total registering mechanism and certain coöperating devices. Fig. 6 is a side elevation of the same. Fig. 7 is a detail view of a portion of the trip indicating register and the resetting means therefor, and Fig. 8 is a detail view of a portion of the winding mechanism hereinafter described.

Like characters refer to like parts throughout the several figures of the drawings.

It is our custom to mount certain of the operative parts in a suitable casing or housing and that denoted in a general way by 2 can be effectively utilized for this purpose and in practice we prefer to support this casing on some relatively fixed part of a conveyance or its equivalent. For example, this casing can be rigidly connected to the dash board or other convenient part of an automobile. It will be evident that when the device is to be used in connection with an automobile it is necessary that some moving part of such vehicle be connected with the apparatus, and while any desirable means may be provided for this purpose, the transmission shaft 3 is shown, said shaft being connected in some suitable manner with one of the front wheels of the automobile, extending upward therefrom and into the casing 2. The connections between said shaft 3 and the wheel from which it receives its motion are not shown, as the invention does not concern these, although it will be evident that when the automobile is in motion, the shaft 3 will be rotated.

As will be understood from what we have already intimated the apparatus has means for registering the distance covered on a trip and also the total amount of travel of the car in a given interval. It is possible that instead of measuring miles, we might register another standard of measure, this being unimportant, although the two registers indicate in the present instance miles and fractional parts thereof, the fractions in the present case being eighths, and both registers are operated in the construction illustrated, from the shaft 3. The shaft 3 is shown supported by a rigid bearing 4 in the casing 2 and as also having a worm 5, in mesh with a worm gear 6, the bearing 4 having an opening to provide for the mesh between the said worm and worm gear. The worm gear 6 is loose on the shaft 7 supported by suitable bearings on the side walls of the casing 2.

While the power for operating the registering mechanism is initially applied to the total or upper register, as will hereinafter appear and is thereby transferred to the trip register, this is not essential, as such relation might be reversed. We prefer to interpose between the two registers means for transferring the effect of one to the other as will now appear. On what is shown as the inner side face of the worm 6 is an actuating part (shown as a projection or pin 8) which is coöperative in the present instance with a pinion as 9 represented as having eight teeth, only for the reason that as organized the machine registers eighths of a mile. If any other fraction of a mile were to be registered, the teeth of the said intermediate pinion would be of a corresponding number. This pinion 9 is loosely carried upon the shaft 10 supported by bearings on the side wall of the casing. The teeth of the pinion 9 are made sufficiently wide to be engaged by the pin 8 and to also engage the primary pinion 11 of the total register, and they also mesh with the teeth of the primary pinion 12 of the trip or lower register, said pinion 12 being loosely carried by the shaft 13 supported by bearings on the side walls of the casing 2. It will be clear that each of said pinions 9, 11 and 12 has eight teeth. The parts are so proportioned that when the car travels one-eighth of a mile, the worm gear 6 is given one full turn, and it follows that owing to the engagement between the pin 8 and the pinion 9, the latter is given one step movement on each full turn of said worm; that is to say, the pinion 9 will be operated a distance equaling that between two teeth thereof on each full rotation of the worm gear 6, and it naturally follows, that the primary pinion 11 of the total mileage or upper register and that the primary pinion 12 of the trip or lower mileage register are each given a one step or one tooth movement, on each full turn of the said worm gear 6 or when the car travels one-eighth of a mile.

The pinion 11 is rigidly connected with the first disk 14 of the total register, while the pinion 12 is rigidly connected with the first disk 15 of the trip register, and these disks have peripheral marks indicating eighths of a mile. Loosely carried by the upper shaft 7 are register disks each for convenience designated by 16, the disk 16 next the disk 14 being the units one of the total register, the adjacent one being the tens and so on after the fashion of registers of the ordinary kind, and each of the said disks 16 will bear on its face the symbols 0 to 9 inclusive. The fraction disk 14 has on its inner side a projection 17 which when said fraction disk 14 has made one full turn is adapted to operate the pinion 18, one step or tooth and when the pinion 18

which is loosely carried by the shaft 10 has made said one step movement, it will, through the gear 18' fastened to the first wheel 16 turn the latter one step to register by said first disk or wheel 16, the fact that the car has traveled one mile. The first wheel 16 is provided with a similar pin 19 and when said disk or wheel 16 has practically made one full turn or virtually registered ten miles, said pin 19 will engage the pinion 20 also loosely supported by said shaft 10 and will turn said pinion one step whereby the latter will operate the gear 21 rigidly fastened to the second disk or wheel 16 of the total register. This same operation will be carried throughout the different disks or wheels of the total register.

It will be understood that there are several of the intermediate or idle pinions such as 18 and 20 carried on the intermediate shaft 10. Although we have for convenience of description given these two last mentioned pinions different characters, they are of similar construction, there being, as will be understood, five of such pinions on the said intermediate shaft 10. We should also explain that the units, tens and hundreds wheels or disks of the lower or trip register receive their motion from the first three of the pinions such as 18 and 20 carried on said shaft 10, it being remembered that the fraction disk or wheel of the trip register receives its motion from the eight tooth pinion 9. It should also be explained that all the pinions on the shaft 10 except the pinion 9 have ten teeth after the fashion of registers of the ordinary kind. To prevent accidental motion of the register parts, springs as 22 may be provided. The casing 2 will have on its front sight openings as 23 and 24 covered with glass or other transparent material through which the numerals on the two sets of registering wheels can be seen.

We have illustrated means for indicating the speed traveled by the car, and although said means may vary, that now to be described is quite satisfactory. To the shaft 3 is fastened the yoke 25 and to the branches of this yoke are fulcrumed centrifugally operated members as the angle levers 26, the outer arms of which may as shown be weighted, while the inner arms bear against a flange 27 on the sleeve 28 slidably connected with said shaft 3, a coiled spring 29 surrounding the shaft 3, being interposed between said slidable sleeve 28 and the body of the yoke 25. It will be clear that as the shaft rotates, the weighted arms of the levers 26 will be thrown outward and the faster the speed of the car, the greater will be the extent said weighted arms are thus operated, and we utilize this particular function for securing the speed indication on a scale or otherwise.

The finger or pointer member of the speed

indicator is denoted by 30, and it is in the nature of a floating lever, being fulcrumed at its lower end to the lever 31 pivoted to the back of the casing 2 within the same.

5 The upper portion of the pointer member or floating lever 30 is bent forward as at 32 and extends through a longitudinal slot in the boxing 33 formed on the interior of the casing 2, said boxing being covered by a
10 sheet of glass or other transparent substance 34. The front face of the bottom of the boxing is provided with a mileage indicating scale 35 which is adapted to be traversed by the finger 36 carried at the extreme for-
15 ward or outer end of the floating lever or pointer 30. Fulcrumed within the casing 2 is a lever 37 one arm of which is pivoted to the floating lever 38 and the other arm of which is forked, the branches of the fork being provided with pins 39 to enter a peripheral channel or groove in the slidable sleeve
20 28. The lever or link 38 is also pivoted to the pointer or floating member 30 between the ends thereof, the fulcrum for said lever or link being a pin 40 carried on a slide 41 supported by a bracket or bearing 42 in the casing. It will be clear, therefore, that as the automobile speeds up the shaft 3 will be rapidly rotated, and therefore, as already
30 set forth, the arms 26 will be swung outward whereby the pointer member or floating lever 30 will be swung to the right in Fig. 2 through the described connections thereby causing the finger 36 to travel toward the left in Fig. 1 and to indicate on the scale 35 the speed of the car. Owing to the described construction the finger 36 is always
35 caused to follow a straight path which is shown as horizontal, although the action in question may be obtained in other ways.

We also provide means for securing a permanent record, and the record may, of course, vary. In the present instance the purpose of the record is to show the distance covered by the car in a given time and to also show what is done with the car throughout the day, and these records are advantageous. For example, should the owner of the car be arrested for speeding,
40 the card on which the record is made will prove whether or not he has, while on the other hand a check can be had on the chauffeur, that is to say, the card will show whether or not the chauffeur has been using the car without the permission of the owner.
55 These are simply two illustrations, as the records on the card may be used for entirely different purposes. They would in case the apparatus is used on a locomotive, be of value in making speed and like tests.

It will be apparent that we use the term "card" in a generic sense to include devices of different kinds whereon a record can be made by a marking device or its equivalent.
65 Said recording means in the present in-

stance, is time controlled or coöperates with a time controlled device, and in this event an ordinary clock can be utilized with advantage. We have shown such a clock and the same is denoted in a general way by 43. The internal construction of the clock is quite well understood, so that it is not necessary for us to show or describe the same. The clock, however, is mounted for shifting movement. The front of the clock casing is shown provided with projections 44 perforated to receive the guide rods or rails 45 which are supported by the upright arms of the bracket 46 fastened suitably to the casing 2. It will be understood that the clock 43 travels on the rods or rails 45 which present a suitable track or way for said clock.

The card on which the record is made as already intimated may vary considerably, although it is shown as a disk 47 provided with two separate scales, one scale being made up of radial lines each denoted by 48 and indicating fractions of an hour such as five minute intervals, and the other gage lines 49 being circular and indicating hours. The minute arbor of the clock 43 is denoted by 50, and the card or disk 49 is clamped to said minute arbor 50 by a clamping device supported thereby, constituting a suitable card carrier and denoted in a general way by 51. From this it will be clear that the card 49 is given one full turn each hour. In addition to the rotary movement of the card, the card has with the clock a shifting movement bodily, and this operation is effected by the movement of the clock itself, and can be effected through the hour arbor 52 which is shown having fastened thereto a pinion 53 in mesh with a stationary rack bar 54 carried by the upright arms of said bracket 46. As the hour arbor 52 turns on the operation of the clock work, the pinion 53 is also turned, and being in mesh with the teeth of the stationary rack bar 54, the clock will be moved thereon, covering a predetermined distance each twenty-four hours, and on this movement the card 47 is correspondingly operated. The card, therefore, has a compound movement.

There is employed in connection with the card 47 a marking device, and this marking device may vary in character. It is shown as a punch 55 which on each operation is adapted to puncture or perforate the card 47. The punch 55 is shown supported at the upper end of the carrier 56 which may, as illustrated, consist of a spring arm fastened at its butt to the casing 2 interiorly thereof, the said casing having an opening through which the upper portion of the spring arm 56 can extend. By virtue of this construction the punch can be given a very rapid or accelerated motion which is important in that there is no possibility of lagging or dragging on the part of the punch. Said

spring arm 56 has a loose connection with the arm 57 fastened to the rock shaft 58 supported by the bearing 4. To said rock shaft 58 is also fastened the arm 59, the toe of which is located in the path of pins 60 fastened to the inner side of the disk 14, there being eight of such pins, and they being equidistantly disposed. Each time the car travels an eighth of a mile, one of said pins 60 will strike the toe of the arm 59 and will pull the same downward, thereby swinging the arm 57, through the rock shaft 58 forward and retracting the spring 56 and when said particular pin passes or rides off the arm 59, the spring arm 56 will be released, so that it can spring instantaneously forward by its resiliency and cause the punch 55 to puncture the card and equally rapidly return, both movements preferably being quicker than the movement of the card. It will, therefore, be apparent that each time the car travels an eighth of a mile an indication of this fact will be made on the card 47. If, therefore, the card 47 shows eight successive punch marks between two of the radial scale lines 48, this will mean that the car has traveled twelve miles an hour. If sixteen of such marks appear, this shows that the car has traveled twenty-four miles an hour. By the aid, therefore, of these radial scale marks, it is easy to determine just how far the car travels in a given time. The circular scale lines will indicate what has been done with the car for each hour of the twenty-four in a day, and we may mark the radial lines or place some other indication on the card, to divide a. m. from p. m.

We provide alarm means, as will now appear, for giving audible notice when certain distances have been traveled, and the bell 61 answers satisfactorily in this connection, the hammer 62 for said bell being connected with the carrier or spring arm 56 which has already been described. Hence it will be clear that on each operative swing of the said carrier or spring arm 56, the hammer 62 will strike said bell.

While the clock 43 can be manually wound we prefer that this result be automatically secured, and several different ways can be provided for attaining this end. By said automatic operation we assure that the main spring of the clock will be kept practically under high tension at all times so as to insure the transverse or bodily movement of the clock without delay. The means now to be described for effecting this automatic winding is satisfactory. On the winding arbor 63 of the clock is frictionally connected a worm gear 64 in mesh with the worm 65 on the swinging shaft 66, the lower end of said shaft having a splined connection with a bevel gear 67. Due to the frictional connection between the winding arbor 63 and the worm gear 67, it will be apparent that

when a full winding of the clock spring is completed, a slip will occur between said arbor and worm gear so that further turning of the latter may take place without effect. Said shaft 66 is supported at its lower end by a bracket 68 which sustains said bevel gear 67, said bracket being sustained for swinging motion by the shaft 70 carried by and extending through the rear wall of the casing 2. The shaft 70 is shown provided at its outer end with a bevel gear 71 in mesh with the bevel gear 67, and it will be apparent that when the shaft 70 is turned the shaft 66 will be also turned and will serve through the gearing already described to rotate the winding arbor 63 and thereby wind the clock 43. It will be understood that as the shaft 66 swings, it has an endwise movement, it swinging with the bracket 68 and moving longitudinally through the gear 67. The shaft 70 has fastened to its inner end a bevel gear 72 in mesh with the bevel gear 73 rigidly fastened to the transverse stub shaft 74 carried by a bracket 75 in the casing 2. The shaft 74 also rigidly carries a ratchet wheel 76 and loosely supports a lever as 77, one arm of which is in the path of the pin 19 extending from the units wheel of the upper or total register already described, so that each time said particular wheel makes a turn, it strikes and pulls down the adjacent arm of said lever 77. The other arm of said lever carries a pivoted pawl 79 whereby when the lever 77 is operated in the manner just described, the ratchet wheel 76 will be turned as will the shaft 74, and gear 73, whereby the latter through the intermediate described parts will serve to operate the winding arbor 63 of the clock. We have simply illustrated a means for intermittently operating the lever 77. This, of course, is not essential as means of a very different type might be employed for automatically winding the clock which is the prime motive in view.

The shaft 13 as will be remembered carries the several disks 15 of the trip register device and these disks 15, although loosely supported by said shaft, are susceptible of being frictionally driven therefrom, and this condition can be obtained by a fit, if necessary, and the purpose thereof is to permit the shaft 13 to reset the several disks 15 to zero, for which reason said shaft is endwise movable, having at its outer end a knob 80 accessible exteriorly of the casing 2. In addition the shaft 13 carries inside the casing a collar 81 which is normally forced inward by a coiled spring 82 bearing against the same and also against the casing, the purpose of the spring being normally to maintain the several disks 15 in operative relation with the transmission mechanism carried by the shaft 9 and already described, which transmission mechanism comprises

pinions as 18 and 20. It will be clear that when the shaft 13 is drawn outwardly, the several disks will be carried out of mesh with the gears of the transmission mechanism, so that by then turning the shaft 13, the disks 15 can be reset, and when their zero marks are opposite the sight opening 24, spring fingers as 83 within the casing will spring into notches 84 in the adjacent faces of the said disks 15. When the said trip register has been reset, the shaft 13 will be released, and the normal relation will be restored by the spring 82.

What we claim is:

1. In an apparatus of the class described adapted for attachment to a movable vehicle, the combination of a card carrier, and a marking device for the card on the card carrier, a clock having means for causing a relative motion of the marking device and the card about an axis and for also causing the movement bodily of the card radially of said axis, and independent means operable by and on the movement of the vehicle for causing a third relative motion of the card and marking device to obtain a mark on the card.

2. In an apparatus of the class described adapted for attachment to a movable vehicle, the combination of a card carrier, and a punch for punching the card on the card carrier, a clock having means for causing a relative motion of the marking device and the card about an axis and for also causing the movement bodily of the card radially of said axis, and independent means operable by and on the movement of the vehicle for causing a third relative motion of the punch and card to effect the punching of said card.

3. In an apparatus of the class described,

the combination of a clock and a card carrier, one of the arbors of the clock having said card carrier connected therewith, means operable by another arbor of the clock for bodily shifting said clock and thereby the card carrier and card, and a marking device for the card.

4. In an apparatus of the class described, the combination of a clock having minute and hour arbors, a card carrier connected with the minute arbor, and mechanism for bodily shifting the clock, operable by said hour arbor.

5. In an apparatus of the class described, the combination of a card carrier, and a clock, the clock having independent members rotative at different speeds, one of said members being connected with the card carrier, and means for shifting the clock, connected with the other of said members.

6. In an apparatus of the class described, the combination of a clock having a minute arbor and an hour arbor, a card carrier rotatably connected with the minute arbor, and rack and pinion mechanism operable by the hour arbor, for bodily shifting the clock.

7. In an apparatus of the class described, the combination of a clock mounted for traveling movement, having minute and hour arbors, a pinion fastened to the hour arbor, a stationary rack in mesh with said pinion, and a card carrier connected with the minute arbor.

In testimony whereof we affix our signatures in presence of two witnesses.

SOLOMON M. CUTTER.

JOHN F. McLAUGHLIN.

Witnesses:

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MILTON E. LOWRY.