

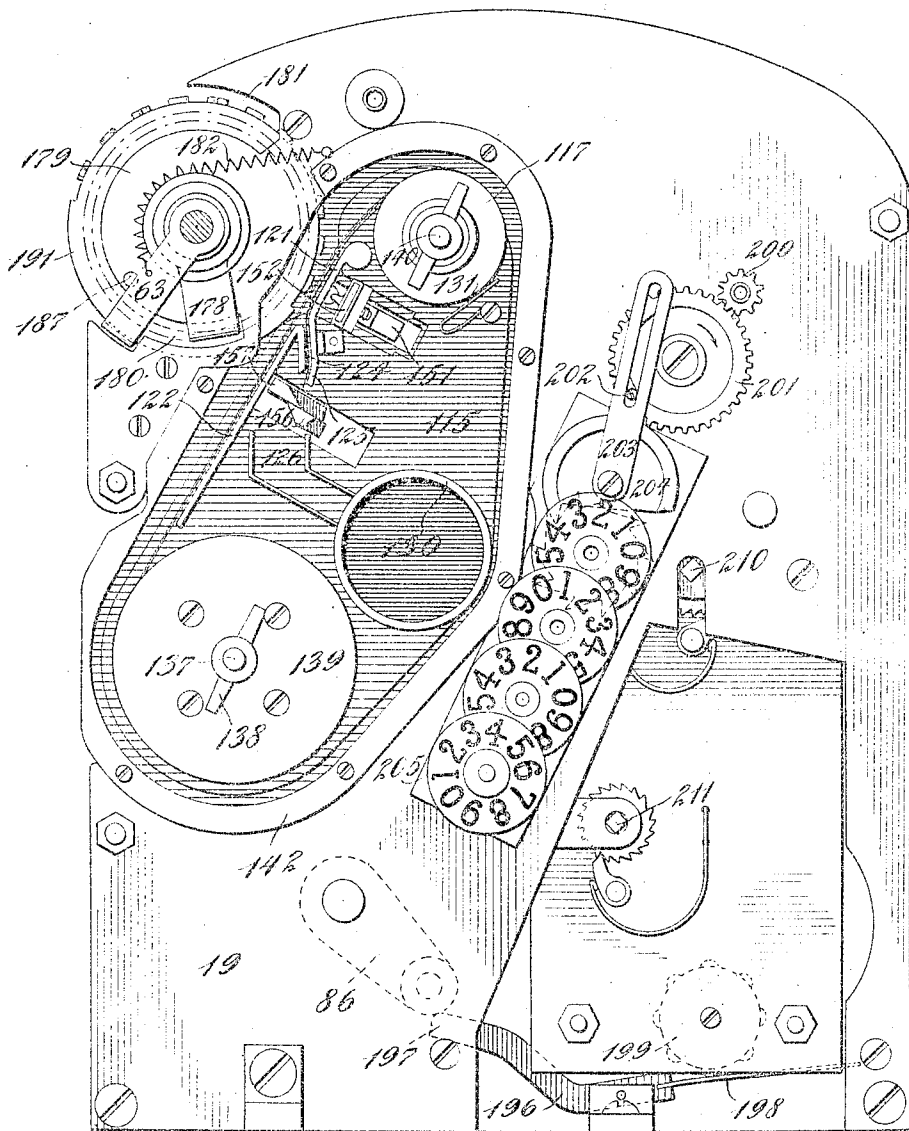
F. R. IMHOF.  
TAXIMETER.  
APPLICATION FILED OCT. 4, 1910.

1,053,513.

Patented Feb. 18, 1913

8 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

*John A. Cheney*  
*Charles H. Hadden*

Inventor

*Frederick R. Imhof*

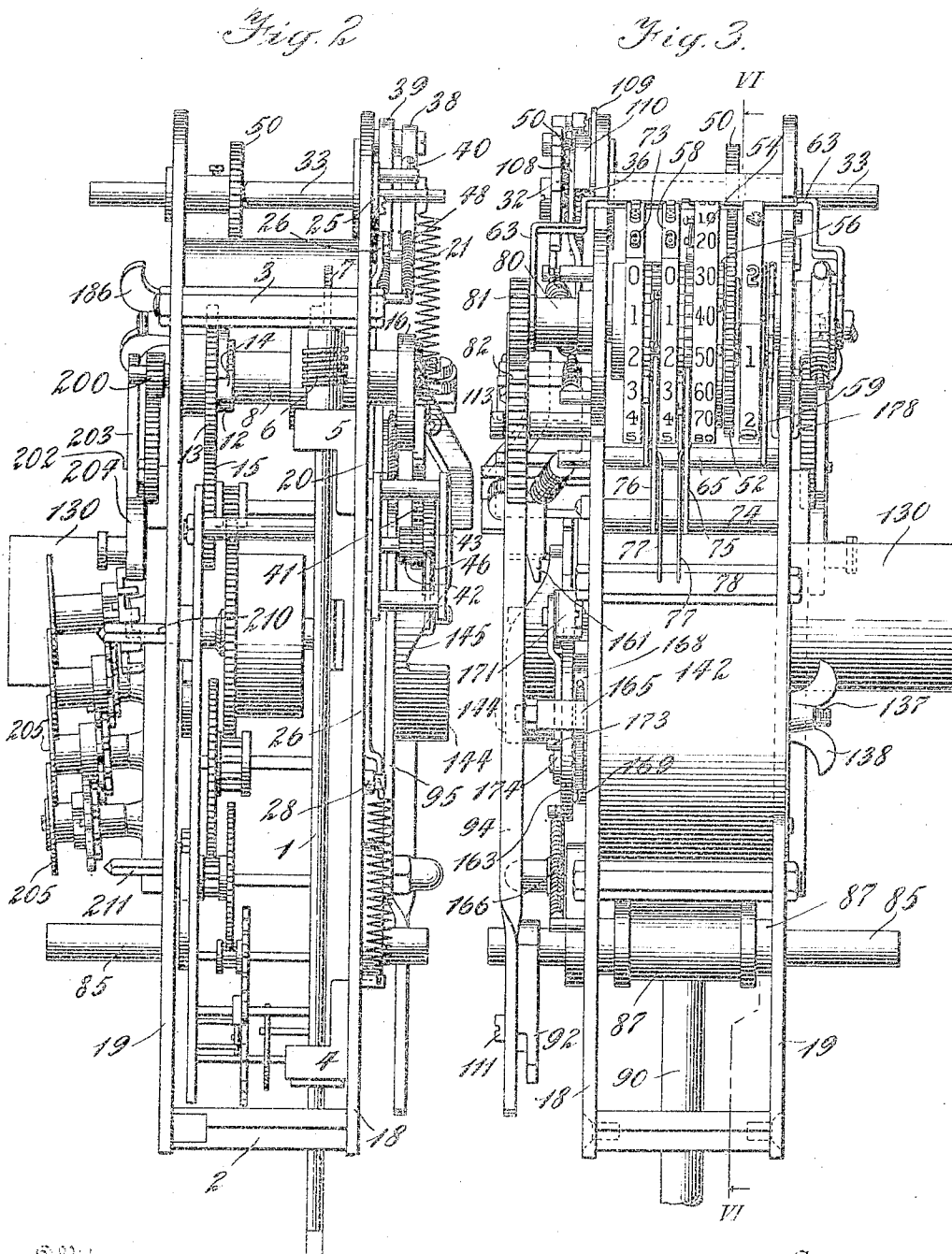
By *his* Attorneys

*Rosenbaum & Stockbridge*

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Patented Feb. 18, 1913

8 SHEETS—SHEET 2.



Witnesses:  
*Geo. C. Schenck*  
*Chas. P. Hadden*

Inventor  
*Frederick R. Imhof*  
By his Attorneys  
*Rosenbaum & Luckenbach*

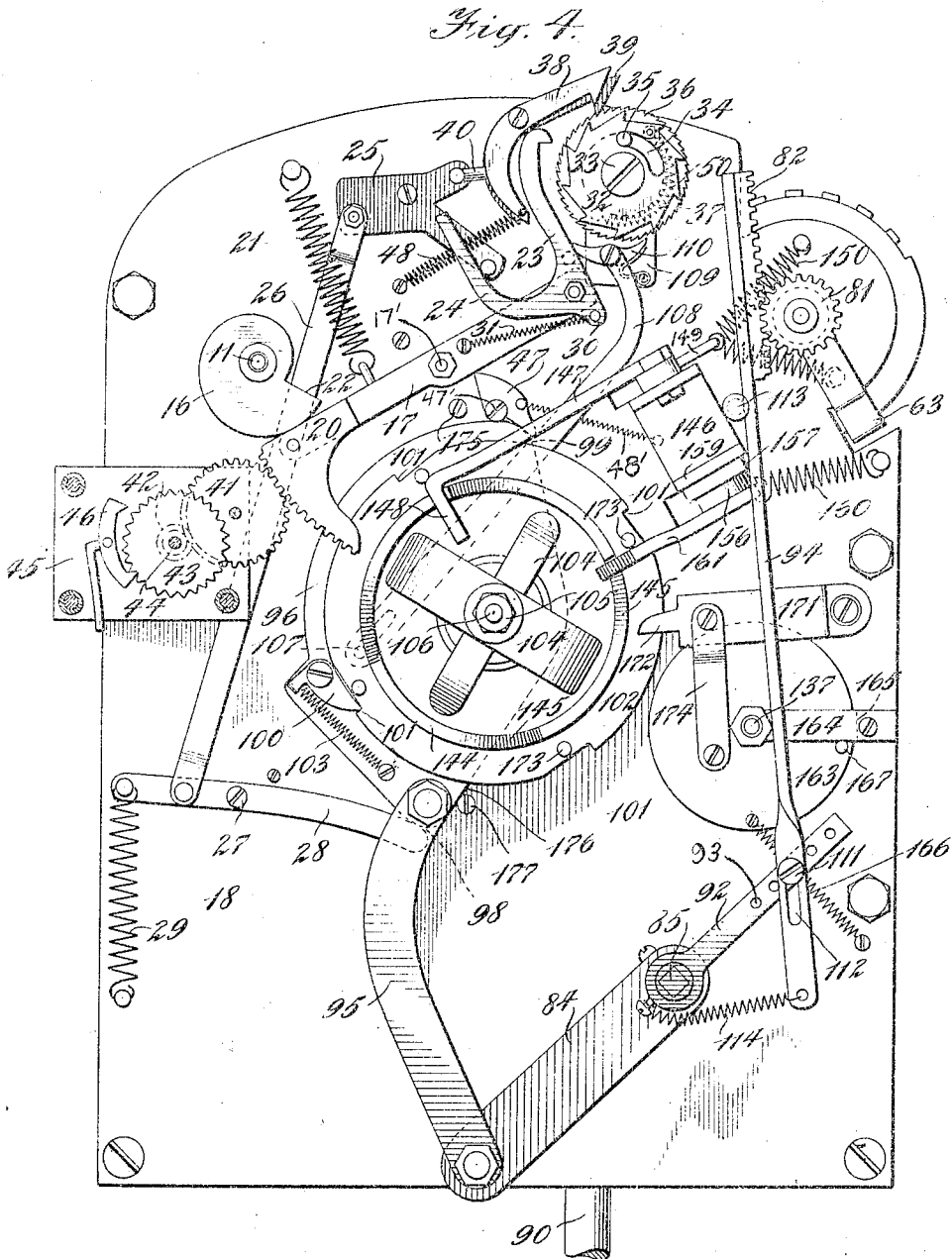
F. R. IMHOF.  
TAXIMETER.

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Patented Feb. 18, 1913.

8 SHEETS-SHEET 3.



Witnesses:  
*W. J. Schuchert*  
*Chas. J. H. H. H.*

Inventor  
*Frederick R. Imhof*  
By his Attorneys  
*Rosenbaum & Lockbridge*

F. R. IMHOF.  
TAXIMETER.

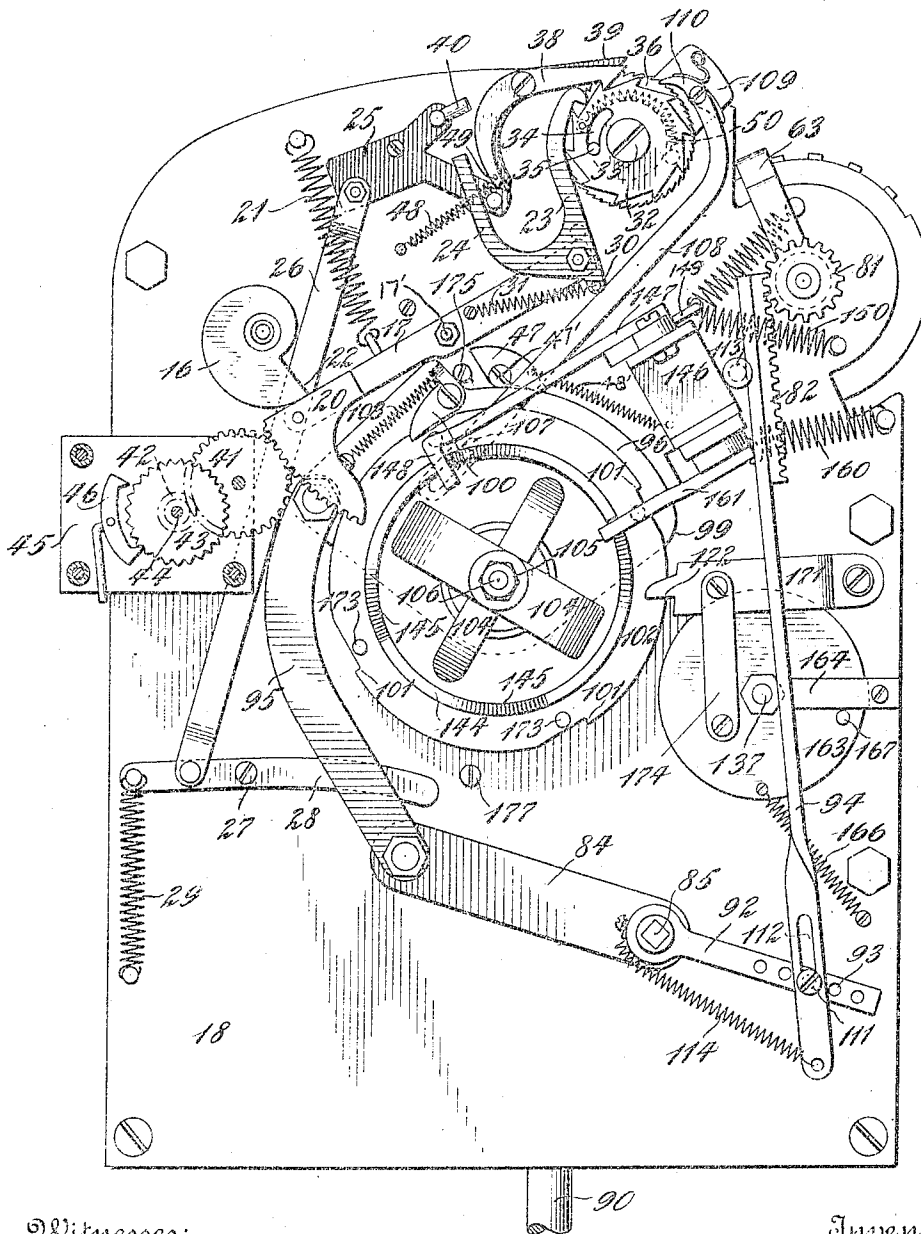
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8 SHEETS—SHEET 4.

Fig. 5.



Witnesses:  
*Spokane, Wash.*  
*Chas. J. Fisher*

Inventor  
*Frederick R. Imhof*  
By his Attorneys  
*Rosenbaum & Co. Chicago*

F. R. IMHOF.

TAXIMETER.

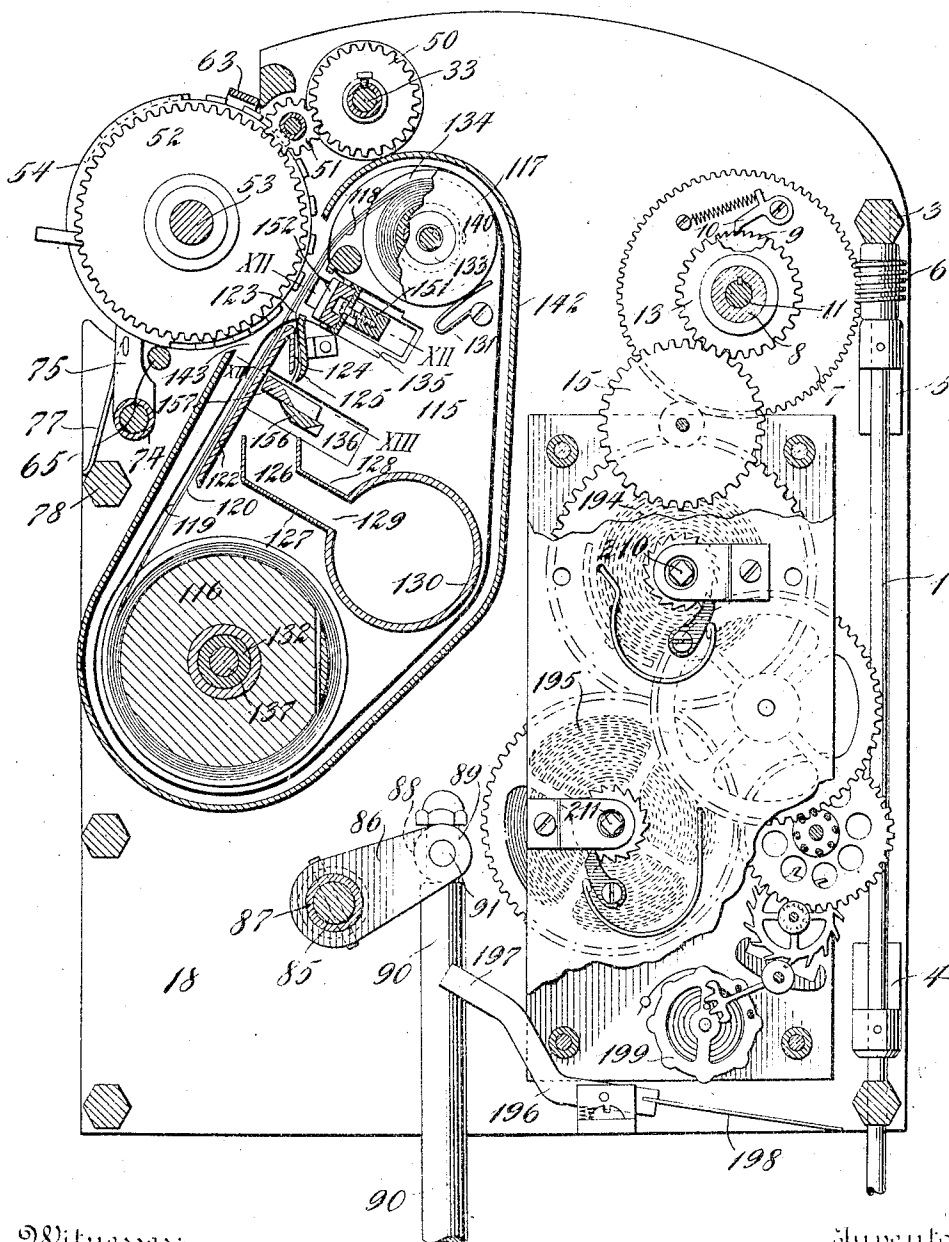
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Patented Feb. 18, 1913.

8 SHEETS-SHEET 5.

Fig. 6.



Witnesses:

*Wm. L. Cheney,*

*Chas. F. Hiron*

Inventor

*Frederick R. Imhof*

By *his* Attorneys

*Rosenbaum & Tucknidge*

F. R. IMHOF.

TAXIMETER.

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8 SHEETS-SHEET 6.

Fig. 7.

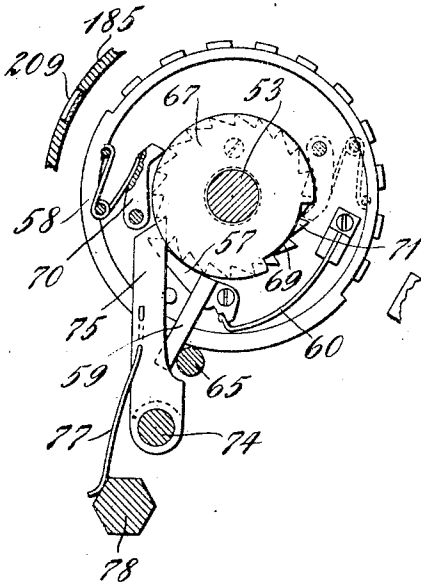


Fig. 8.

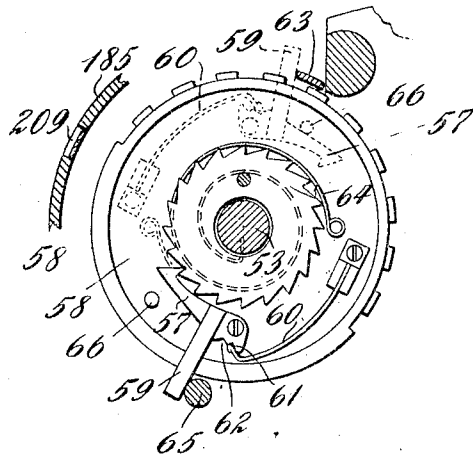


Fig. 9.

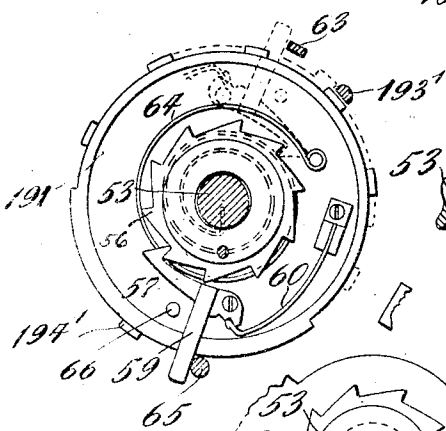


Fig. 10.

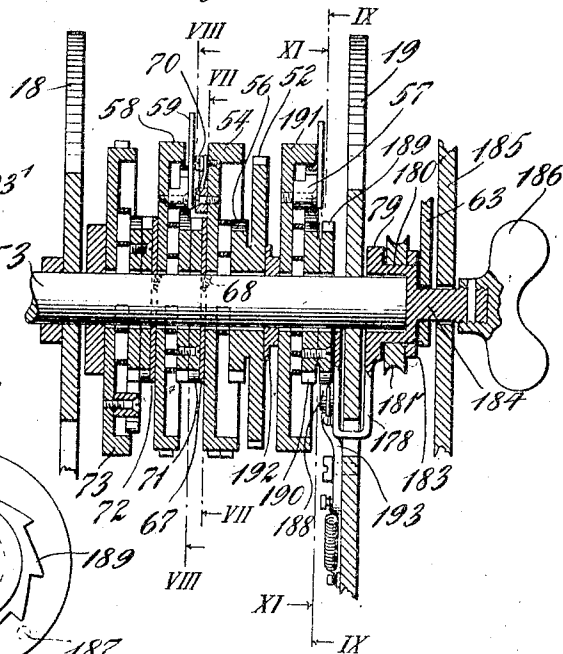
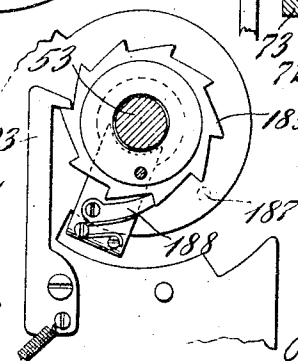


Fig. 11.

Witnesses:  
*John A. Schenck*  
*Chas. P. H. H. H.*

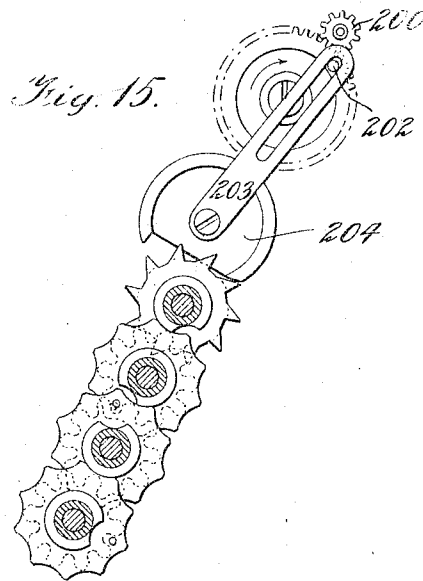
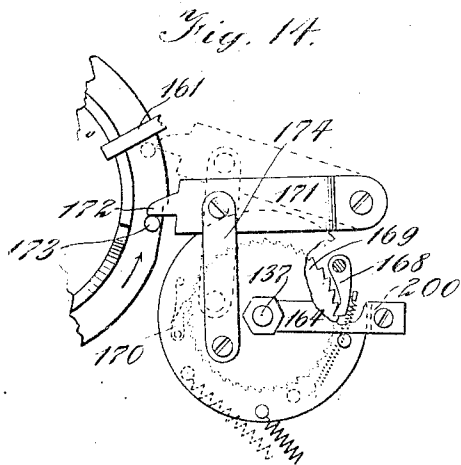
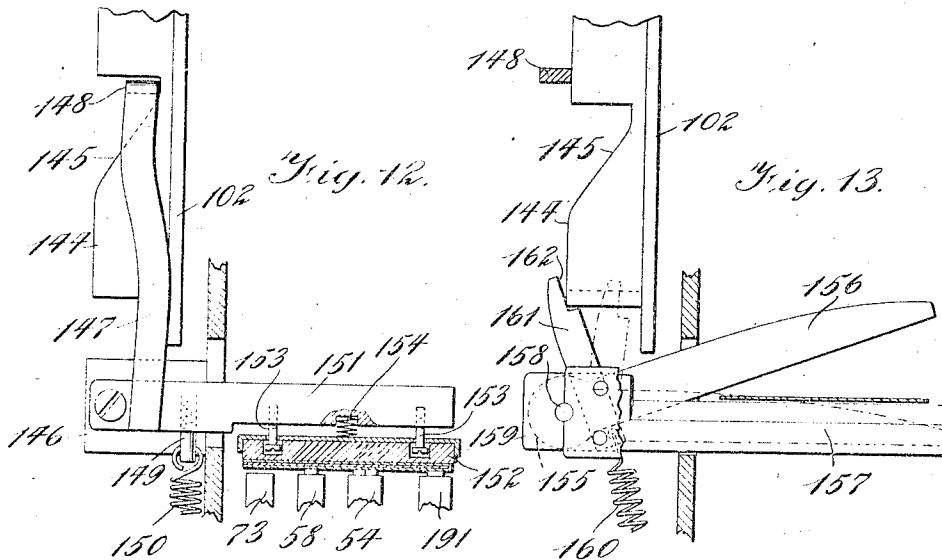


Inventor  
*Frederick R. Imhof*  
 By his Attorneys  
*Rosenbaum & Co. K. K.*

F. R. IMHOF.  
TAXIMETER.  
APPLICATION FILED OCT. 4, 1910.

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Patented Feb. 18, 1913.  
8 SHEETS—SHEET 7.



Witnesses:  
*Joseph H. H. H.*  
*Chas. H. H.*

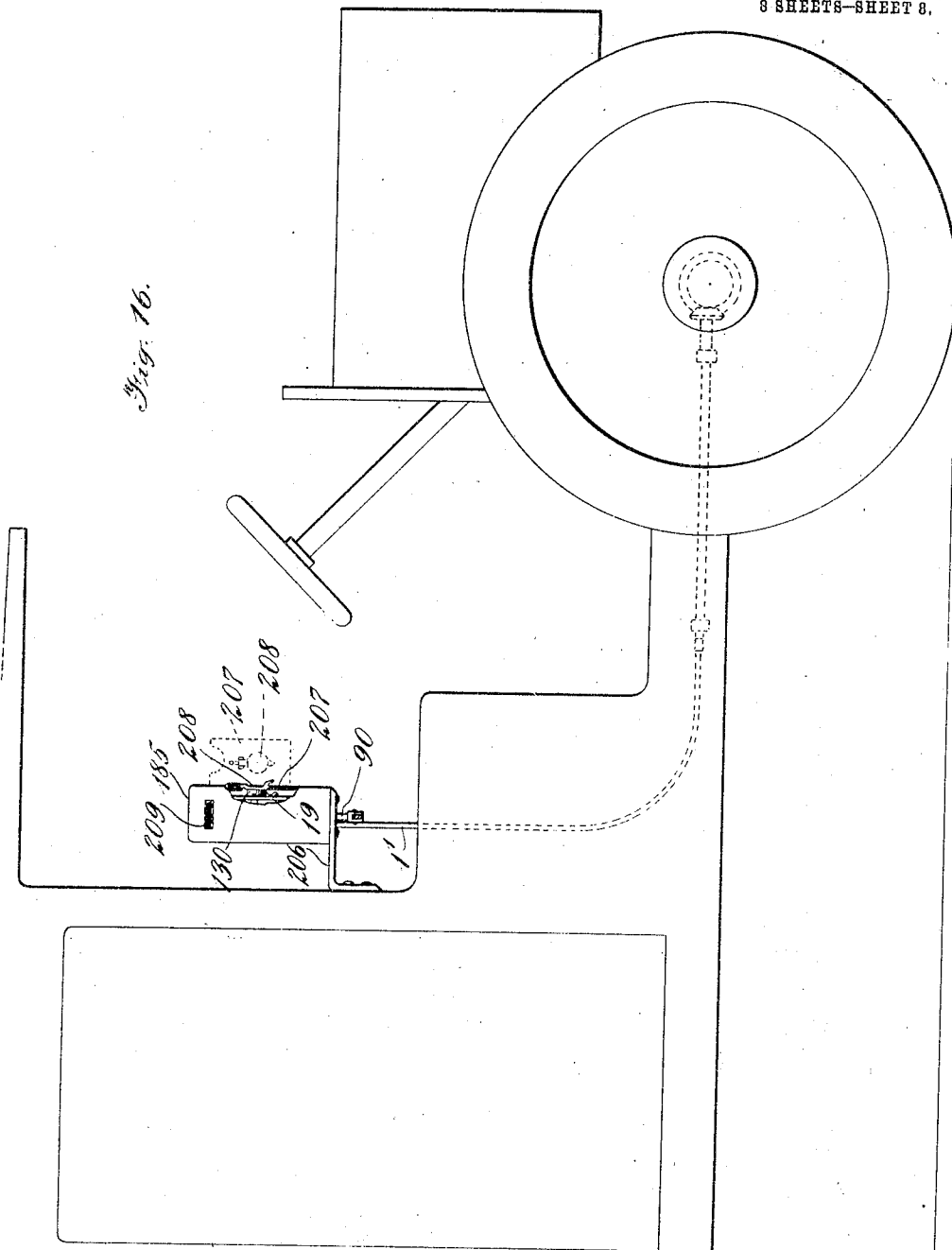
Inventor  
*Frederick R. Imhof*  
By his Attorneys  
*Rosenbaum & Luckin*

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8 SHEETS—SHEET 8.

Fig. 16.



Witnesses:  
*John C. Cheney*  
*Charles F. Hadden*

Inventor  
*Frederick R. Imhof*  
By his Attorneys  
*Rosenbaum & Stockbridge*

# UNITED STATES PATENT OFFICE.

FREDERICK R. IMHOF, OF NEW YORK, N. Y., ASSIGNOR TO POST LOCK REGISTER CO.,  
A CORPORATION OF NEW YORK.

## TAXIMETER.

1,053,513.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed October 4, 1910. Serial No. 535,133.

*To all whom it may concern:*

Be it known that I, FREDERICK R. IMHOF, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Taximeters, of which the following is a full, clear, and exact description.

This invention relates to registering and printing meters and more particularly to meters of the type described in the application of Truman W. Post, Serial No. 545,820, filed February 25, 1910. Meters of this type are adapted to be carried by vehicles, such for example, as taxicabs; and a passenger in a vehicle so equipped is assured that he will not be overcharged for the distance which he may have traveled or the time for which he has maintained such vehicle at his disposition. The apparatus, further prevents imposition upon the taximeter company by its employees. The device is designed to accurately register the distance traversed upon suitable dials. It is also provided with means whereby when a vehicle is held at the disposition of a passenger, a charge will be registered against him which shall be proportional to the time which the vehicle remains motionless, or substantially motionless. Further, the mechanism is provided with means whereby when the passenger leaves the vehicle and arranges with the chauffeur to settle for the same, the mechanism will print and cut a ticket accurately determining the amount of fare and extras due the company; thus not leaving it optional to the chauffeur, who very frequently, especially when the vehicle is in a badly lighted street, is enabled to overcharge a passenger who cannot plainly see the taximeter dials. The mechanism is further arranged to record permanently each individual transaction and to store such record within its casing. By preventing its employees from defrauding passengers, the company assures itself of an increased use of its vehicles and is at all times enabled accurately to check its chauffeurs or drivers.

The present application relates more especially to certain improved arrangements of parts in mechanisms of the type in question whereby reading of the dials is facilitated; the baggage dial being now disposed adjacent the money dials. The arrange-

ment of the parts actuating these dials has been materially improved; reducing friction and simplifying and rendering more positive in action the construction employed. Further, means have been provided whereby said parts now operate smoothly; and freedom from jars, due to the former too sudden and violent action of the spring actuated parts, is secured.

Other objects of the invention will be hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings which form a part hereof: Figure 1 is a front elevation of the apparatus with the casing removed. Fig. 2 is a side view showing the driving spindle and worm. Fig. 3 is a view of the opposite side of the apparatus, showing the type wheels. Fig. 4 is a rear elevation; the actuating parts being shown in their normal or resting position. Fig. 5 is a view showing such parts in operating position. Fig. 6 is a section taken on line VI—VI of Fig. 3. Fig. 7 is a detail section taken on line VII—VII of Fig. 10, hereinafter referred to. Fig. 8 is a similar section taken on line VIII—VIII of said Fig. 10. Fig. 9 is a similar section taken on line IX—IX of Fig. 10. Fig. 10 is a vertical detail section taken on the axis of the dials. Fig. 11 is a detail section taken on line XI—XI of Fig. 10, said line corresponding to line IX—IX aforesaid; the section in Fig. 11, however, being viewed oppositely to that in Fig. 9, as indicated by the arrows. Fig. 12 is a detail of the platen and platen bar; the platen being shown in section: said section being taken on line XII—XII of Fig. 6. Fig. 13 is a detail of the ticket chopping mechanism as viewed in a section taken on line XIII—XIII of Fig. 6. Fig. 14 is a detail of the roll actuating mechanism. Fig. 15 is a detail of the counter mechanism. Fig. 16 is a diagrammatic representation of a vehicle with my device in position thereon.

*Driving mechanism.*—The mechanism is driven from a spindle 1 which is preferably, although not necessarily, driven in turn from a flexible shaft 1' of the type ordinarily employed to drive meters used upon automobiles and like vehicles. The spindle 1 is suitably journaled in cross-bars 2 and 3 and in brackets 4 and 5 carried by the side walls of the frame. Upon the upper end of spindle 1 is a worm 6, which in turn drives

the worm wheel 7, which is carried by a shaft upon which is rotatably mounted a drum 8; the wheel 7 being rotatable upon said shaft. A ratchet 9 is preferably integrally formed upon said drum and is adapted to engage a spring pressed pawl 10 which is pivoted to wheel 7. Drum 8 is keyed to shaft 11; said shaft being designated the "cam shaft" for reasons herein-  
 10 after set forth; and at the other end of this drum is a correspondingly formed ratchet 12, which also is permanently affixed thereto. A wheel 13 is loosely mounted upon cam shaft 11, and carries a spring pressed pawl 14 which is pivoted thereto; said pawl being pressed by a spring into engagement with ratchet 12. It is to be observed that the direction of engagement of the pawls with their respective ratchets is such that  
 20 both wheel 7 and wheel 13 may be held stationary while the cam shaft is rotated clockwise as viewed from the rear of the machine. The teeth of wheel 13 intermesh with those of a wheel 15 which forms an element in a gear train driven by suitable clockwork; the latter being preferably adapted to run for ten or twelve hours.

The arrangement of parts hereinbefore set forth is such that if the spindle 1 be not rotated, as for example when the vehicle is stationary, the clockwork will advance the wheel 13 slowly and thereby effect a corresponding rotation of the shaft 11. Now, however, if the vehicle be started and the speed thereof be anything over a predetermined slow rate, the worm 6 will advance its wheel 7 at a greater rate than that at which wheel 13 is being driven by the clockwork, and hence the drum-carried ratchet 12 will, by rotating faster than said wheel 13, cause the pawl 14 thereof to slip over said ratchet. In general therefore it may be stated, that the shaft 11 will be driven either from the spindle or from the clock  
 40 springs, depending on whether or not the spindle is rotating above a predetermined speed.

The cam shaft 11 carries a cam 16 upon the rear end thereof which is adapted to operate the oscillatory beam 17 once in every revolution of the shaft. Beam 17 is pivoted to the rear wall 18 of the mechanism frame, the front wall of which has been designated 19. The extremity 20 of beam 17 is normally pressed against the surface of the cam by a spring 21, and when the point 22 of the cam has advanced beyond the extremity of the beam, said beam is abruptly displaced and thereby effects the displacement of the pawl 23 which is pivoted to the other extremity of said beam. The pawl 23 has an extension 24, the extremity of which is engageable by a pin carried upon the V-shaped lever 25 which latter is pivoted to plate 18.  
 65 A rod 26 is pivoted to said lever and extends

obliquely downward across the surface of plate 18; being preferably offset in order to pass under cam 16. Rod or link 26 is pivotally connected at 27 to a lever 28, which is in turn pivoted to plate 18. Beyond the pivot 27 is attached a spring 29 which is normally under tension and the further end of which is secured to plate 18.

Returning now to the pawl 23, an extension 30 thereof has secured to its end a spring 31, which is fastened to the body of the beam 17 adjacent the pivotal point thereof. Spring 31 hence normally effects the engagement of pawl 23 with a ratchet 32; and said ratchet is loosely pivoted upon a spindle 33. The body of this ratchet is provided with an arcuate slot 34. Extending into this slot is a pin 35 which is secured to a ratchet wheel 36; the latter being permanently affixed to the spindle 33. A spring 37 is secured to the rear face of the ratchet 32 and the other end of said spring is in like manner secured to the face of wheel 36, and normally tends to hold ratchet 32 with respect to pin 35, in the position shown in Fig. 4. Locking pawls 38 and 39, pivoted to the plate 18, prevent backward movement of the ratchets 32 and 36. A projection 40 on the other arm of lever 25, serves to disengage pawl 38 from its ratchet 32; while pawl 39 preferably always remains in engagement with ratchet 36. When the cam 16 releases the beam 17, the pawl 23, carried at the extremity of the latter, pulls the ratchet 32 around a predetermined distance; and in order to lessen the shock due to the abrupt action of the spring 21, it has been found desirable to provide a time-element mechanism or escapement in connection with said beam. The extremity 20 of said beam is hence extended laterally to form an arcuate rack, which engages with a spur wheel 41; the latter being in mesh with a pinion 42 formed integral with a ratchet wheel 43, pivoted at 44 to the walls of a suitable casing 45. An escapement 46 engages with the ratchet 44 in the usual manner; so that the jerking action of the spring 21 is materially reduced and the movement of the beam operated parts rendered smooth and regular.  
 115

Pivoted at 47' to the plate 18, adjacent the pivotal point 17' of the beam 17 is a somewhat triangularly shaped latch 47, one extremity of which is engageable with the under surface of said beam, to prevent actuation thereof. This latch is normally held in its locking position, by a light spring 48' one end of which is secured to plate 18. In corresponding fashion a pair of superposed springs 48 and 49 normally tend to hold pawls 38 and 39 in engagement with their respective ratchets.  
 125

The shaft or spindle 33 carries thereon a gear wheel 50, which engages a pinion 51, 130

pivoted upon plate 19. This pinion in turn intermeshes with a gear 52 which is loosely mounted upon a fixed shaft 53. Loosely mounted on shaft 53 is a numbered printing or type wheel 54 upon the face of which are numbered consecutively the figures 10, 20, 30, etc., designating cents. These type-numbers ranging from 00 to 90 are spaced around substantially over one-half of the face of wheel 53; while corresponding figures are positioned diametrically opposite those above referred to, around the other half of said wheel; such figures being preferably recessed and blackened to form the readable numerals. The type are of course formed in reverse so as to print properly and the record strip hereinafter referred to is adapted to be pressed against the face of wheel 54 and the others of like character hereafter described. By thus placing the type and visual symbols upon the same member it is absolutely impossible for the mechanism to become so disarranged that it might be printing one numeral and exposing another through the sight hole in the casing.

The type wheel 54 is normally adapted to angularly advance one step at a time; such advance being due to an oscillation of the beam 17. The relatively abrupt movement of said beam, under the influence of its spring 21 urges the ratchet 32 around a predetermined distance, which movement, by reason of the engagement of pin 35 with the end, in the manner shown in Figs. 4 and 5, of slot 34 rotates ratchet 36 and thereby the spindle 33. Gear 52 carries a ratchet 56 which is in engagement with a pawl 57, as indicated in Fig. 3. Step by step counter-clockwise movement (as viewed from the rear of the machine) of gear 52 hence advances wheel 54 step by step, in the manner above stated.

To the left of type wheel 54, as viewed in Fig. 10, is a somewhat similar wheel 58 which is shown in elevation in Fig. 8; and as the pawl and ratchet arrangement just described is substantially the same for both wheels, as also for others hereinafter described, one description will suffice for all. Pawl 57 is pivoted to the side of the type wheel and has an arm 59 outwardly extending therefrom, beyond the face of said wheel. A spring 60 is also carried by said wheel, said spring having at the free end thereof a detent which is adapted to engage either of two notches 61-62 in the outer face of the pawl. Notch 61 is preferably rearwardly disposed with respect to the axis of the pawl, while notch 62 is correspondingly forwardly disposed. By reason of this construction, the pawl will remain in operative engagement with its ratchet when once so disposed; until force is applied to the arm 59 to urge the pawl away from the ratchet; said pawl thereafter

remaining out of engagement until the arm 59 is positively moved in the opposite direction.

Pawl 57, being in engagement with ratchet 56, will advance the type wheel counter-clockwise, until said pawl is disposed in the position indicated in dotted lines in Fig. 9, when the arm 59 engages a cross-bar 63, which raises the pawl and frees wheel 54 from its connection with ratchet 56. A spring 64 then aids in returning the type wheel to its initial position and in so doing causes the arm 59, which is carried around by said wheel, to impinge against a stop bar 65 which extends between plates 18 and 19, as shown in Fig. 3. This re-sets the pawl and the outer side of the wheel will thereafter again upwardly advance step by step as before. A stop pin 66 is provided for limiting the movement of the pawl.

The left hand side of wheel 54, as viewed in Fig. 10, bears against a thin plate or disk 67 which is fast upon the spindle or shaft 53. A small screw 68 may be used as a means for securing disk 67, the screw being somewhat obliquely disposed as shown. The periphery of this disk is notched at 69, as shown in Fig. 7, and this disk is of such diameter that spring pressed pawl 70 which is pivoted to the face of wheel 54, will ride normally around the edge of the disk and thereby be held out of engagement with a ratchet 71, until the notch 69 is encountered. The pawl 70 is then pressed by its spring against its ratchet, and wheel 54 and such ratchet thereafter move together for a short distance. This engagement of pawl 70 and its ratchet only occurs during the last step of wheel 54, namely, in advancing from 90 cents to \$1.00 as indicated by the characters on said wheel. The ratchet 71 is fixedly united to its accompanying ratchets 56 by screws or the like. This ratchet co-acts with wheel 58 in the manner above described and hence said wheel will be advanced step by step and will be automatically returned to 0 every tenth step in the same manner as wheel 54; but will only so advance once for every ten steps of the latter wheel. Type wheel 58 is arranged with both raised and recessed digits ranging from 0 to 9, substantially in correspondence with wheel 54. A second stationary disk 72 is disposed adjacent wheel 58 and a similar pawl and ratchet arrangement enables this wheel to in turn drive the third type wheel 73, which is similar to wheel 58 and records tens of dollars. Pivotaly mounted upon a cross-rod 74 are two relatively long pawls 75 and 76 which coöperate with the ratchets 71 of wheels 54 and 73, to prevent any retrograde movement thereof. These pawls are each provided with a spring 77 which bears against a cross-bar 78 of the frame.

The three type wheels enable the mechanism to register up to \$99.90; and are positive and accurate in action.

Referring again to Fig. 3, the cross-bar 63 is there shown as preferably U-shaped, the right side or leg of the U extending around the plate 19 and being pivoted to cap 79 which is mounted upon the end of the fixed shaft 53. The left leg of the bar 63 is correspondingly secured between a sleeve 80 and a pinion 81 which are revolvably mounted upon the other extremity of shaft 53. When the pinion 81 is rotated by its rack 82 in the manner hereinafter described, the bar 63 is swung around from its bottom position up into engagement with the edges of plates 18 and 19, as shown in Fig. 5.

Referring now to the parts illustrated in Figs. 4, 5 and 6, a master lever 84 is pivoted to a shaft 85, which is journaled in plates 18 and 19. This shaft is operable by means of arms 86 which are pinned or otherwise secured thereto, and are spaced from each other at the inner ends thereof by a sleeve 87 (Fig. 6) and at their outer ends by a cross-rod 88. Rod 88 is transversely apertured for the reception of the reduced end 89 of a rod 90; and its ends are provided with trunnions 91 which are journaled in the respective arms 86. The forward outer extremity of shaft 85 is preferably squared and carries an arm 92, which is provided with a plurality of pin holes 93, so as to permit of some adjustment of the stroke of the slotted rod 94 which carries the rack 82 above referred to. A link 95 unites the other extremity of master lever 84 to a segmental crank plate 96. The lower corner 98 of this crank plate bears against the extended arm of lever 28 when the said plate is in its downmost position; the spring 29 being placed under tension; and through the action of rod 26 and V-lever 25, the pawls 23 and 38 above described, will be forced out of engagement with ratchet 32. The first effect therefore of an inward motion of rod 90 is to release said pawls, allowing them to fall into engagement with said ratchet. The second effect of the advance of the crank plate is the displacing of latch 47, since the forward end 99 of said plate engages the lower arm of the triangularly shaped latch and rotates the same around, and releases the oscillatory beam 17: so that for every revolution of the cam shaft 11, said beam will oscillate once back and forth. Each one of these oscillations effects an advance of ratchet 32 one step, and the said ratchet in turn, by means of the train of gears aforesaid, advances the type wheels. The continued advance of the crank plate to the end of its throw causes a pawl 100, which is pivotally mounted thereon, to engage one of the four ratchet teeth 101 upon the periphery of a cam disk 102. Pawl 100

is normally held in engagement with the edge of said cam disk by means of a spring 103, one end of which is secured to the cam plate. The effect of the rotation of this cam plate will be hereinafter described under another heading. It suffices here to say that the return throw of the crank plate, when actuated by a downward motion of rod 90, causes a ticket to be printed and severed from a ticket strip. The cam disk 102 is frictionally held against inadvertent displacement by bowed springs 104; said springs being held under tension by a nut 105 mounted on the cam-disk pivot-pin 106. Pivotally secured at 107 to the under side of cam plate 102, is a link 108, and the further end of said link is in turn connected to a crank arm 109. This arm is rotatably mounted on spindle 33, and carries a spring pressed pawl 110 which is disposed for engagement with the ratchet 36. When the rod 90 is pressed inwardly and the crank plate rotates through substantially 90°, the ratchet 36 is advanced a distance corresponding to that by which it would ordinarily be advanced by three revolutions of the cam 16, or in other words, through three successive engagements of pawl 23 with ratchet 32. Ordinarily when the oscillatory beam is allowed to move, which is the case when the cab is occupied and the rod 90 is in its innermost position, the rotation of cam 16 will advance ratchet 32 one step at a time. But if the fixed charge for the first half mile of a taxicab is, let us say, thirty cents, the initial movement of rod 90 immediately registers thirty cents against the passenger. Thereafter assuming that the cam 16 will rotate four times while the machine is traversing one mile, and as the slot in ratchet 32 is just sufficiently long to allow the pin 35 to traverse the length of the same while ratchet 32 is advancing two steps; and as each of said steps corresponds to one rotation of the cam wheel which is equivalent to a distance traversed by the vehicle of one-quarter of a mile, it is evident that the mechanism will automatically charge thirty cents for the first half mile and will make no further charge against the user thereof until such half mile has been traversed. It is obvious, of course, that by varying the size of the ratchet 32, and the number of teeth therein, it is possible to make the initial charge anything desired, ranging from, let us say, twenty cents to sixty cents for the first half mile. For each successive quarter of a mile thereafter the mechanism will be advanced one step and an additional charge of ten cents will be recorded against the passenger.

In concluding the description of the driving mechanism, the operation of the parts controlled by the arm or extension 92 may be briefly described. As the shaft 85 rotates

to effect the movements of the various parts above described, it simultaneously raises the arm 92. The rod 94 by reason of its slotted connection with this arm, is not immediately driven upwardly, the pin 11 traversing the slot 112 freely until it encounters the upper end of said slot. Thereafter rod 94, through the instrumentality of its rack 82, rotates the pinion 81 and thereby the cross-bar 63. The cross-bar moves to its uppermost position and hence the upward advance of the pawl arms 59, due to the step by step motion of the type wheels, will not be impeded until this bar is encountered at the ends of their respective upward travels. The slotted connection is provided so that this rotation of the cross-bar in either direction may be relatively quite abrupt. When the shaft 85 is reversely rotated, the cross-bar is urged downwardly and frees all of the pawls 57 from their ratchets, no matter where they may happen to be disposed, provided that they, or any one of them, have started on their upward course. The pawls thereafter reset themselves by the impingement of their arms 59 against the lower stop bar 65.

The rack 82 may be held to its engagement with pinion 91 by any suitable means, such as the roller 113, or spring 114, or both.

*Printing mechanism.*—Let us now consider the printing mechanism, referring to Figs. 1 and 6, wherein is shown a withdrawable or removable reel-plate 115 of somewhat irregular contour and mounted upon which are the reels 116 and 117, respectively designating the receiving or driving reel and the supply or driven reel. The supply reel 117 carries wrapped together thereon two strips of paper 118 and 119 and an inked or carbon ribbon 120. The thin transparent strip of paper 119 is outermost and together with the inked ribbon 120 passes in succession over the guide plates 121 and 122 and is thereafter wound upon reel 116. The paper strip 118 passes along together with the ribbon 120 over the guide plate 121, but parts company with the ribbon and strip 119 at point 123, from whence it travels down through a narrow channel 124 formed by the respective bent ends of the guide plates. The lowermost end 125 of guide plate 121 is up-turned in order to direct the strip of paper leaving the channel 124 toward the mouth of a channel 126 formed by guides 127 and 128, which serve to direct the paper or ticket, as it has become by this time, in the manner hereinafter to be described, through a slot 129 down into the cylindrical finger box 130. The respective guide plates are all secured at their lowermost edges, (as viewed in Fig. 8) to the reel plate 115. A narrow spring 131 normally prevents excessive movement of reel 117 by engaging the lower flange thereof, and both

of the reels are removable from their respective stems 132 and 133. The reels are of any ordinary construction, being provided with flanges 134 whereby to hold the paper strips and ribbon in position thereon. Two apertures are provided in the reel plate, one designated 135 for the reception of a platen bar to be hereinafter described, and the other 136 for the reception of the ticket knife. The respective reel spindles 132 and 133 are tubular and are secured at their lower ends to plate 115. The spindle 132 is adapted to receive a shaft 137, the end of which is threaded for engagement with the thumb nut 138, and the body of reel 116 is axially apertured for the reception of spindle 132 through from the inner end thereof to the inner side of plate 139. The reduced threaded portion 140 extends outwardly through a correspondingly sized aperture in plate 139, thereby affording the means of clamping the reel to the shaft. The remaining reel spindle 117 is adapted to be mounted upon a fixed spindle 140, which is secured in any suitable manner to plate 18, as for example by riveting. The reel plate 115 with the reels thereon is readily removable from the aperture 141 which is provided in plate 19. It is desirable that a casing or box 142 be fitted into the space between the plates 18 and 19 through aperture 141, thereby laterally inclosing all sides of the reel cavity so formed save where the type wheels project through at 143.

Referring now to Figs. 4 and 5, the cam plate is there shown as being provided with a cylindrical projection 144 upon the outer face thereof, and the said cylinder is notched upon its exposed edge to provide four symmetrical cams 145. Pivoted to a bracket 146, which is secured to plate 18 adjacent to cam plate 102, is a platen bell-lever 147, an end 148 of which is bent substantially at right angles to the body of the lever for engagement with cams 145. Bell-lever 147 is further provided with means, such as a pin 149, upon its remaining arm for engagement with springs 150, by means of which the offset end is normally held in engagement with cam cylinder 144. An arm 151 of the bell-lever extends laterally into the pocket formed by casing 142 and forms the platen bar. The platen bar 151 preferably carries a resiliently and somewhat flexibly mounted platen 152; screws 153 holding the platen in position on its bar, while the spring 154 serves to resiliently space it therefrom.

While the master lever 84 is being withdrawn, which is done when the passenger is leaving the vehicle and desires to know the amount of his fare, the cam plate 102 is rotated as hereinabove described, and the initial movement thereof withdraws the particular cam 145 with which extension 148 happens

to be in engagement, out of such engagement, and the platen is abruptly displaced by the action of its spring 150; as the result of which the platen bar snaps sharply up against the paper strip which has been unreeled from reel 117 and thereby presses portions of said strip against the inked ribbon 120 which in turn is pressed against strip 119, and the latter against the particular numerals upon the type wheels which happen to be opposite the platen bar at that moment. This obviously results in printing upon both strips 118 and 119, the exact amount of fare due. The continued rotation of cam plate 102 by the further movement of the master lever, causes the next cam to engage extension 148, angularly displacing the same. This effects a lowering of the platen bar, and releases the printed strip. The extension travels up the incline of the cam until it encounters the flat upper edge of the latter; there its movement ceases and the cam also finally comes to rest with the platen extension adjacent the sharp declivity of the cam, ready for the next printing operation. The return of the master lever to its innermost position, which is designed to be done when the vehicle is next occupied, engages pawl 100 with the next tooth 101. It will thus be seen that a ticket is printed for the passenger and simultaneously an identical record is made upon strip 119, which is, obviously, wound up in turn upon reel 116 to be reviewed by the book keeper of the vehicle company after the reel has been removed from its spindle by the company's agent. The impressions made upon strip 119 are in reverse, but the strip is made thin and translucent and such impressions may hence be easily read through from the other side of the strip.

*Cutting off device.*—The bracket 146 is preferably U-shaped and upon the arm opposite that on which the platen lever is pivoted is a similarly mounted knife lever which is also substantially L-shaped, and is provided with a lug 155 which constitutes an extension of the blade 156, said lug being pivoted to the remaining knife blade 157 at 158. Blade 157 is affixed to the remaining arm 159 of bracket 146. A spring 160 is attached to knife blade 156, and the other extremity of this spring is secured to plate 18; hence the blades will normally tend to be closed. The shorter arm 161, which is firmly affixed to knife 156 and extends substantially at right angles thereto, is recessed at the free extremity 162 thereof for engagement with the surface of cams 145. The action of such cams upon the arm 161 is slightly different from their action upon the platen lever arm 147; in that when the master lever is in withdrawn position, the arm 161 is disposed in its innermost position, as shown in Fig. 3, and the

parts are so proportioned as to effect one complete oscillation of said arm while the master lever is moving from its innermost to its outermost position. As a result of this action the slip, which has had printed thereon the amount of fare as hereinbefore described, and has advanced through channel 124 and out of the mouth thereof directly between knife blades 156 and 157, which at such time are in open position, may now be severed. Just as the master lever reaches the end of its outward throw, and also just as the paper has ceased to advance under the action of the mechanism to be hereinafter described, the blade 156 is actuated by its spring and severs a ticket from the paper strip. This ticket drops down into the finger box 130 from whence it is adapted to be removed by the fingers of the operator.

*Reel controlling mechanism.*—Positioned upon the outer side of plate 18 is a crank disk 163 which is loosely mounted upon the projecting extremity of shaft 137. This shaft is journaled in plate 18 and in the arm 164 of an L-shaped bracket 165. This bracket is secured in any suitable manner adjacent the edge of plate 18, and the crank disk 163 is mounted between said arm 164, and plate 18. A spring 166, one end of which is secured to the crank disk, and the other end of which is secured to plate 18, normally tends to retain said disk in such position that a pin 167 which extends through said crank disk is engaged by the arm 164. Crank disk 163 carries upon its under surface a spring pressed pawl 168, which engages a ratchet 169, the latter being secured to shaft 137. As the crank disk is rotated clockwise, as viewed in Fig. 14, the shaft 137 will be correspondingly rotated, while a second spring pressed pawl 170 which is secured to plate 18, prevents a retrograde motion of ratchet 169 when the crank disk rotates counterclockwise. Pivoted to plate 18, at one side of the crank disk, is an offset lever 171, the free end of which is formed into a tooth 172, which is adapted to engage any one of four pins 173 which project outwardly from cam disk 102; said pins being positioned adjacent the notches 101 in the periphery of said disk. As a pin 173 advances through substantially 90° for each outward stroke of the master lever it will engage the tooth 172 when it has accomplished somewhat over one-half of its travel, and will move the latter outward from the crank disk and thereby impart a rotary motion to crank disk 163 through its connection therewith by a link 174. The continued rotation of cam disk 102 will effect the disengagement of pin 173 and tooth 172 just prior to the termination of the stroke of the master lever and also immediately prior to the release of knife

lever 161. As shaft 137 is in engagement with the outer plate of the reel 116, it is evident that the said reel will be rotated a predetermined amount at each upward stroke of the master lever, and as its movement is discontinued just prior to the operating of the knife, the paper strip will be stationary at the moment when the ticket is severed therefrom.

In concluding the description of the reel mechanism, attention is especially directed to the compact arrangement of parts upon the reel plate and to the convenient positioning of the reels with respect to the platen and knives. No particular adjustment of the reels or strips is necessary, it being sufficient to merely slip the plate with the rolls in place thereon down into the reel pocket and the platen and knife blades are so disposed with respect to the strips as to properly perform their functions.

A stop pin 175 secured in plate 18, limits the outward throw of the master lever by engaging the edge of the crank plate, while the inner throw of said lever is limited by the engagement of a projecting flank 176 of said crank plate with a stop pin 177; so that the reels and other parts of the device may in no case be moved more than the proper amount.

*Mechanism for registering extras.*—Referring to Figs. 1 and 10, the cap 79, previously described as being located upon the end of the fixed shaft 53, is provided with a U-shaped arm or hook 178 which extends around a wing 179 of the plate 19; said plate being arcuately slotted at 180 and 181 to accommodate respectively the arm 179 and cross-bar 63. The arm 178 serves to retain the cap 79 in position upon the projecting extremity of the fixed shaft; the cap being freely revoluble thereupon. Cap 79 is reduced in diameter at 180' to afford a seat for a grooved idler 181'; a flexible helical spring 182 riding in the groove of the idler and serving to balance the upward thrust upon the cross-bar 63 when the latter is actuated by rack 82. A collar 183 spaces the idler from the adjacent leg of bar 63; the cap being further reduced at 184 to engage with said bar and being threaded at its outer extremity, which protrudes through the casting 185, for engagement with a thumb nut 186; the nut being also, preferably, pinned to the threaded extremity.

By turning nut 186, clockwise as viewed in Fig. 1, until the arm 178 encounters the stop pin 187, a spring pressed pawl 188 (shown in Figs. 10 and 11) advances a ratchet 189, one step. This ratchet is loosely or revolubly mounted on shaft 53, and is fixedly secured to a second ratchet 190. The latter is disposed for engagement with one of the pawls 57 which is carried by an extras dial or type wheel 191; said type

wheel being loosely mounted on shaft 53 and being of the same diameter as wheels 54, 58 and 73 above described. Type wheel 191 is preferably spaced from wheel 54 by a washer or collar 192.

The ratchet 189 is prevented from retrograde movement, at any time, by the spring pressed pawl 193, which is pivoted to the wall or plate 19. The type wheel 191 is preferably faceted, as indicated in Fig. 3, and has raised or printing digits ranging from 0 to 5, spaced around on one half of its facets, and corresponding painted or readable digits upon the other half of the wheel face; the wheel hence being adapted to register up to five trunks or bags, which is about all that a vehicle would reasonably be expected to carry. The tariff for each piece of luggage may be 20 cents. If therefore the passenger places two bags or trunks on the vehicle, the driver or chauffeur will turn the handle or nut 186 twice, releasing it before each successive turn, which will advance the extras dial to 2, indicating two pieces of luggage, or an extra charge of 40 cents. A stop 193' limits the movement of wheel 191 by its engagement with a lug 194' carried by said wheel.

By reason of the fact that the extras dial is not in any way connected with the money dials, it is impossible to tamper with the latter through the instrumentality of the extras handle or nut; and yet as all of the dials are in alinement, the slip or ticket may be printed with a record of every charge made against the passenger.

It is obvious, of course, that any characters desired may be placed upon the extras wheel; for example, instead of the numerals 1, 2, etc. which have been chosen for simplicity of illustration, said wheel may be made to print +.20; +.40; etc. The printed ticket would in such case register, let us say, 2.48+.40.

*Clock-work.*—A few words should be devoted to the clock-work which by reason of its special construction is particularly adapted to the mechanism to which this application relates. One of the essential requirements in a taximeter is lightness, since by reason of the fact that the meter is usually carried upon the front wall of the vehicle and since the vehicle is subjected to relatively severe vibration, and said wall might be injured if the weight of the meter were considerable. The meter must also be of minimum size and hence it is imperative that the dimensions of the clock-work must be kept as small as possible, while such mechanism must be quite powerfully actuated or driven. The clock-work shown in Fig. 6, is compact and yet powerful, being driven by a plurality of springs 194—195 which co-act to drive the cam 16 in the manner above described. A further element of

novelty in connection with this apparatus is involved in the clock-arresting device, which comprises the pivotally mounted beam 196 which, as shown in Figs. 1 and 6, is adapted to be oscillated by the arms 86 which are arranged to engage the end 197 of said beam, when in their extreme downmost position. A flat spring 198 projects forwardly from the short end of said beam and when the end 198 is driven downwardly, this spring engages the escapement controlling wheel 199 which is provided with knobs around its periphery. The clock mechanism is hence permitted to run only when the vehicle is occupied; and but a very slight upward movement of the rod 90 suffices to throw it into action.

*Total mileage record.*—The cam shaft 11 extends forwardly through the plate 19 and carries upon this exposed end a pinion 200. This pinion meshes with a gear 201 which carries a pin 202, the latter having a slotted engagement with a lever 203 which rocks a mutilated disk 204. This disk operates a series of registering dials 205, which indicate the total mileage to be charged against the vehicle. The particular mechanism used for driving these dials has been indicated but need not be here described since it forms no part of this invention. By reason of the dual drive of the cam shaft *i. e.*, from either the clockwork of the flexible shaft, depending on the speed of said shaft, the mileage registered is not only that actually traversed by the vehicle, but also covers the time that the vehicle is held at the disposition of a passenger, either idle or running below the predetermined minimum rate aforesaid, expressed in miles.

The total mileage register enables the company to ascertain whether the operator has needlessly driven the vehicle without passengers.

*Résumé.*—The meter mechanism should preferably be substantially entirely inclosed in its casing 185, exposing only the interior of the ticket or finger box 130, so that the meter cannot be tampered with; and further so that it may not be injured by exposure to the weather. The casing is designed to slip down over the mechanism and is secured to a base 206 which may be secured to the front wall of the vehicle, as shown in Fig. 16. The front face of this casing is provided with a door 207 which may be locked in any proper manner. This door permits removal and replacement of the reel plate. At the center of said door is a finger box cover 208, which permits access to said box by the driver. A glass covered aperture 209 in the side of the casing exposes the type wheels on the readable side thereof. The clock mechanism can be wound by means of its respective stems 210—211, small openings being provided in

the casing for this purpose; but the reel plate is removable from its pocket only by the proper official of the company, the driver having no access thereto. It will be seen from the foregoing, therefore, that I have provided a mechanism which is adapted to keep account of the movement of the vehicle whether occupied or unoccupied; to account for the movements of the same when occupied; to indicate visually to the operator and to the passenger the amount of fare to be collected; and the number of pieces of baggage carried; or, if desired, the corresponding charge therefor; to print and cut-off a ticket bearing thereupon the exact amount of fare due from the passenger and the number of pieces of baggage carried; to keep a duplicate of such record, which is stored up for the inspection of the owner of the vehicle, or his accredited agent; to charge the passenger a predetermined rate for a predetermined initial distance; to charge thereafter an additional amount proportional to each fraction of a mile traversed by the vehicle; to charge a predetermined amount for the time for which the vehicle is at the disposition of the passenger, although not actually in motion; and to record the actual amount of money due from the operator to the company upon his return to the garage. The mechanism is very simple when the number of its functions are taken into account, and it is substantially proof against the weather and also proof against being tampered with by the operator without the company's becoming cognizant of such fact upon his return to the garage.

The present invention possesses all of the desirable characteristics afforded by the mechanism described in Serial Number 545,820, hereinbefore referred to, but is much more positive and smooth in its action; not so liable to disarrangement, and eliminates all possibility of tampering with the registering dials by means of the extras operating parts; and the ticket, further shows definitely the number of pieces of luggage carried by the vehicle. It will be noted further that the present arrangement for returning the respective type wheels to their initial position is a positive one, not depending merely upon the springs 64 with which such wheels are provided; since the pawl arms 59 are engaged by the cross-bar 63 and the latter positively thrust any wheels downwardly which may have a tendency to stick, owing to grit or dirt or the like. The springs 64 are provided to aid this action and also to steady the upward advance of the type wheels.

What I claim, is:

1. A fare recording apparatus comprising a master lever, a ratcheted part operable thereby, a tripping member driven by

power, a platen actuable by said ratcheted part, a recording wheel, and means whereby said wheel is actuated by the movement of said member comprising a movable element and a cooperating time element mechanism for retarding the action of such element.

2. A fare recording apparatus comprising a master lever, a ratcheted part operable thereby, a cam driven by power, a platen actuable by said ratcheted part, a recording wheel, means for advancing said wheel comprising an oscillatable element and a cooperating time element mechanism for retarding a movement of said element.

3. A vehicle fare recording apparatus comprising a cam, means for driving said cam proportionate to the speed of the vehicle, a recording wheel, intermediate mechanism including an oscillatable member for driving said wheel from said cam and cooperating time element means for retarding a movement of said oscillatable member.

4. A vehicle fare recording apparatus comprising a cam, means for driving said cam proportionate to the speed of the vehicle, a recording wheel, intermediate mechanism including a movable member for driving said wheel from said cam and cooperating time element means for retarding a movement of said movable member.

5. In a vehicle fare recording apparatus, a plurality of type carrying members disposed in alinement, a platen cooperating therewith for effecting the impression of symbols upon material having a surface adapted to receive such impression, mechanism for automatically advancing one of said members, said mechanism including an oscillatable member, and mechanism for advancing another of said type-carrying members to indicate an extra charge, the material being recorded thereon the advance of all of the said members and the extra charge being separately indicated thereon, and time element means for retarding a movement of one of said members.

6. In a vehicle fare recording apparatus, alined type carrying members, an oscillatably mounted platen cooperating therewith for effecting the impression of symbols upon material having a surface adapted to receive such impression, means for intermittently and automatically advancing one of said members, and means for advancing another of said members an amount proportional to an extra charge, said last mentioned member separately registering said charge upon the said material and the means for advancing the same being distinct from the operating means for the first mentioned member.

7. A fare recording apparatus comprising a plurality of type carrying dials, a platen cooperating therewith for effecting the impression of symbols upon material having a

surface adapted to receive such impression, latching devices carried by some of said dials, means cooperating with said latching devices whereby the advance of one of said dials through a predetermined path advances another of said dials through a portion of its total predetermined path, and means movable in one direction for actuating said platen and movable in the other direction for disengaging said latching devices whereby all of said dials may be returned to an initial position.

8. A vehicle fare recording apparatus comprising recording dials, mechanism for advancing said dials in proportion to the advance of said vehicle, said mechanism including a shaft and a pawl spaced from and mounted for rotation around said shaft, and means for returning said dials to their initial position comprising a member revoluble about said shaft and adapted to engage a part of said pawl.

9. A vehicle fare recording apparatus comprising recording dials, means for advancing said dials in proportion to the advance of said vehicle, and means for returning said dials to their initial position, comprising a revoluble member, and a rack and pinion for rotating said member.

10. A vehicle fare recording apparatus comprising recording dials, means for advancing said dials in proportion to the advance of said vehicle, means for stopping the advance of said dials, and positive means for returning said dials to initial position.

11. In a vehicle fare recording apparatus, a revoluble type carrying member, a platen cooperating therewith for effecting the impression of symbols upon material having a surface adapted to receive such impression, mechanism for advancing said member in proportion to the advance of the vehicle, manually operated means for stopping the advance of said member, and positive means for returning said member to its initial position.

12. In a vehicle fare recording apparatus, a revoluble type carrying member, a platen cooperating therewith for effecting the impression of symbols upon material having a surface adapted to receive such impression, mechanism for advancing said member in proportion to the advance of the vehicle, said mechanism including a shaft, a ratchet and a pawl cooperating with said ratchet, said pawl being mounted for rotation around said shaft, manually controlled means for stopping the advance of said member, and positive means for returning said member to its initial position, said last mentioned means comprising a part adapted to be rotated about said shaft, said part being engageable with said pawl.

13. In a vehicle fare recording apparatus, a revoluble type carrying member, a platen

coöperating therewith for effecting the impression of symbols upon material having a surface adapted to receive such impression, mechanism for advancing said member in proportion to the advance of the vehicle, said mechanism including a shaft, a ratchet and a pawl coöperating with said ratchet, said pawl being mounted for rotation around said shaft, manually controlled means for stopping the advance of said member, positive means for returning said member to its initial position, said last mentioned means comprising a part adapted to be rotated about said shaft, said part being engageable with said pawl, and connections between said rotatable part and an element of said manually operated stopping means.

14. In a vehicle fare recording apparatus, a shaft, a plurality of revoluble type carrying members mounted loosely on said shaft,

means coöperating with said members for effecting the impression of symbols upon material having a surface adapted to receive such impression, mechanism for advancing said members in proportion to the advance of the vehicle, said mechanism including a ratchet concentric with said shaft and a plurality of pawls adapted to engage said ratchets, said pawls being mounted for rotation around said shaft, means for stopping the advance of said type carrying members, said stopping means including a part adapted to be rotated about said shaft; said part being engageable with all of said pawls.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

FREDERICK R. IMHOF.

Witnesses:

WALDO M. CHAPIN,  
WILLIAM C. LARY.