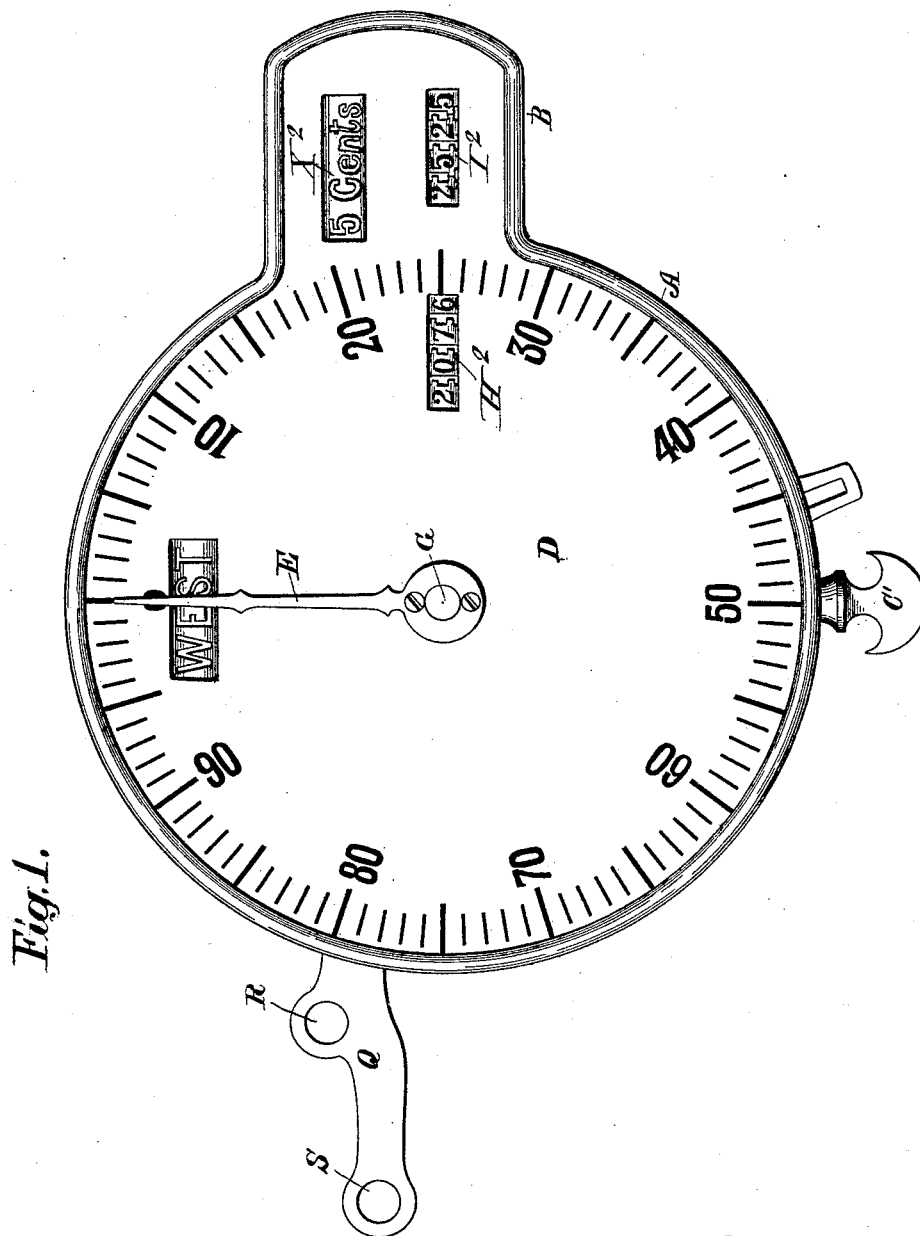


No. 523,930.

Patented July 31, 1894.



Witnesses.  
 S. H. Brainard.  
 R. B. Caffray

Inventor:  
Leo Ehrlich  
by Edward Rector  
his atty

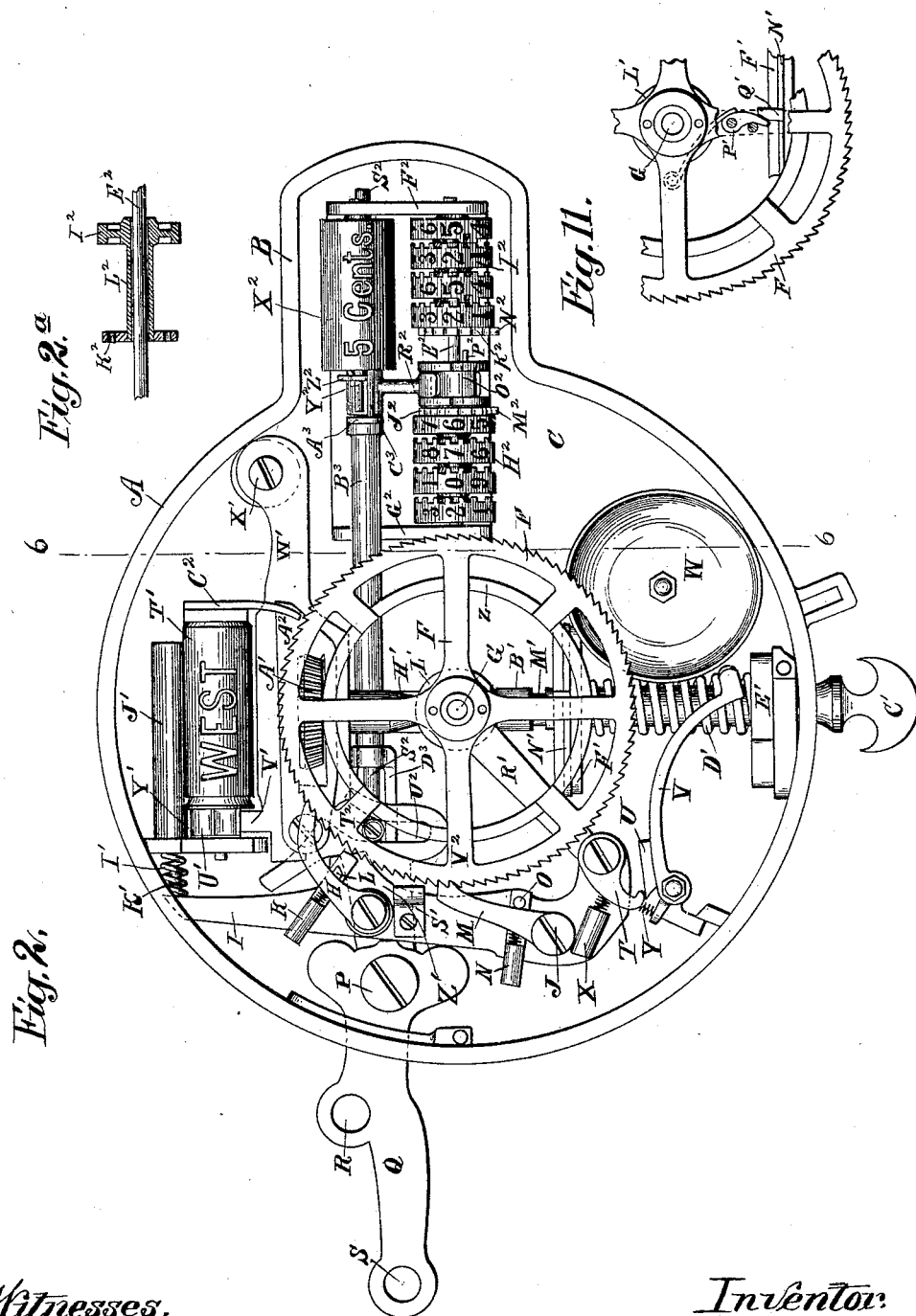
(No Model.)

5 Sheets—Sheet 2.

L. EHRLICH.  
FARE REGISTER.

No. 523,930.

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R. B. Caffray

*Inventor:*

Srs Charles  
by Edward Rector  
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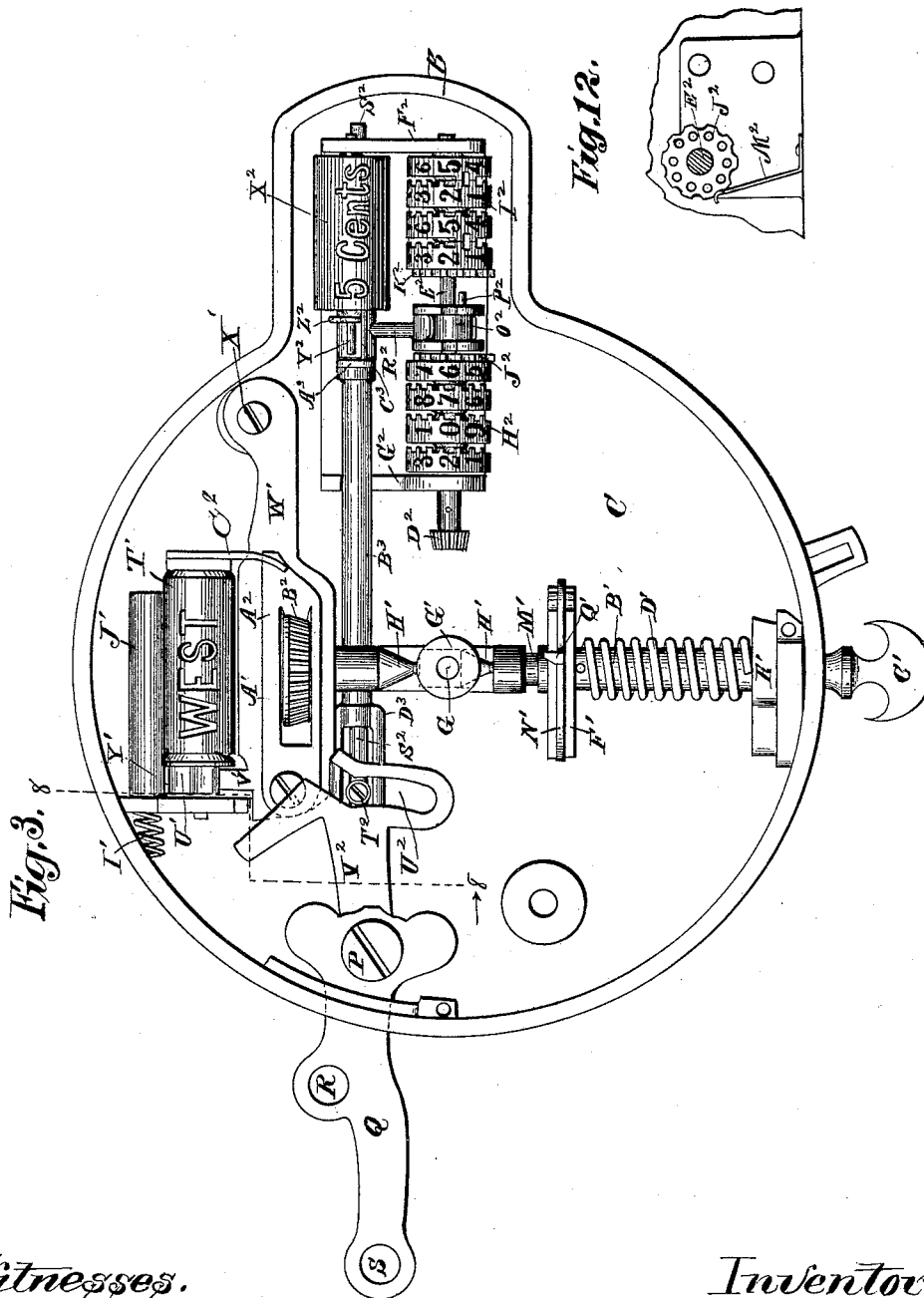
(No Model.)

5 Sheets—Sheet 3.

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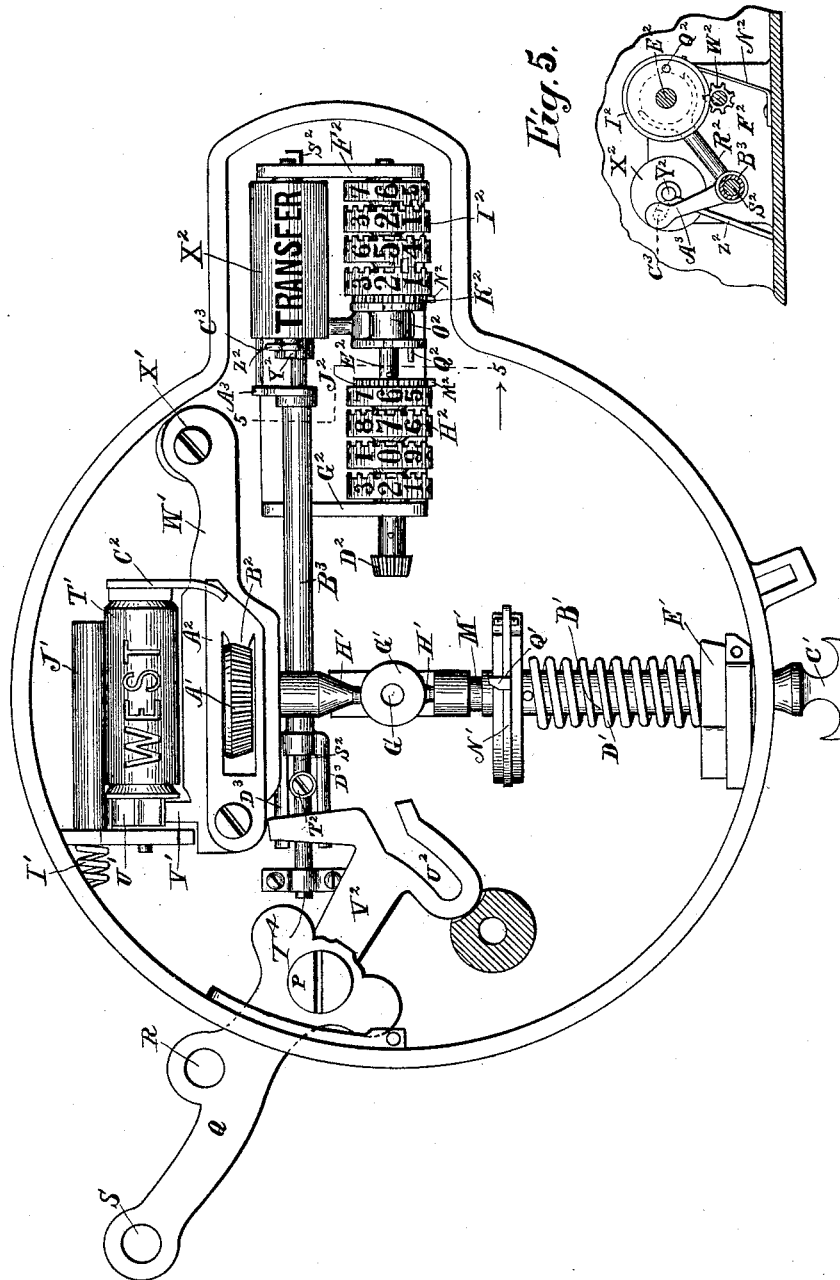
(No Model.)

5 Sheets—Sheet 4.

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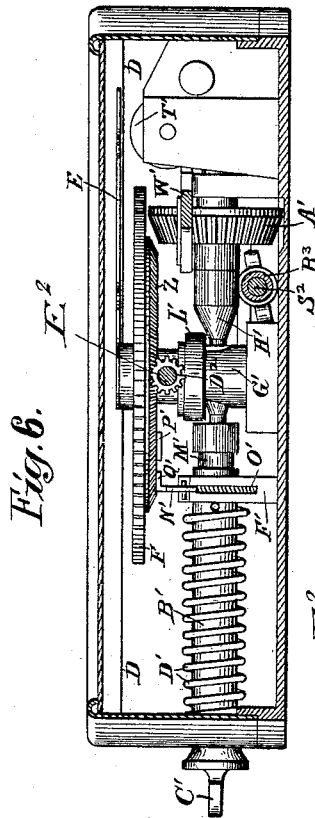


Fig. 6.

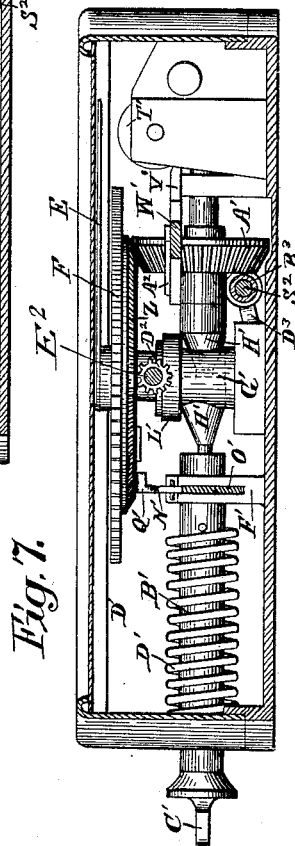


Fig. 7.

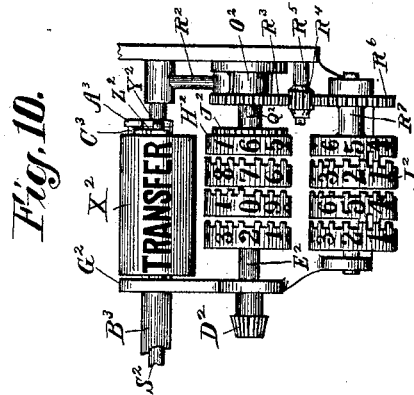


Fig. 10.

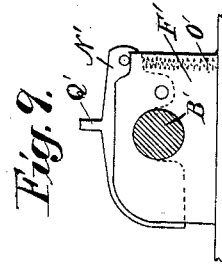


Fig. 9.

Fig. 8.

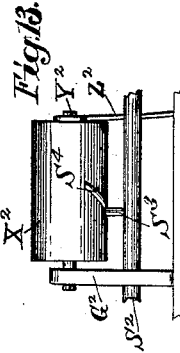
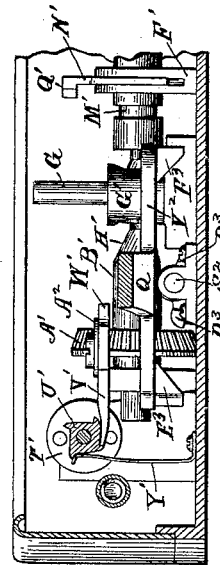


Fig. 13.

Witnesses.  
S. M. Brainard,  
R. B. Caffray.

Inventor.  
Leo Ehrlich  
by Edward Rector  
his atty.

# UNITED STATES PATENT OFFICE.

LEO EHRLICH, OF ST. LOUIS, MISSOURI.

## FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 523,930, dated July 31, 1894.

Application filed September 20, 1893. Serial No. 485,994. (No model.)

*To all whom it may concern:*

Be it known that I, LEO EHRLICH, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Fare-Registers, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to fare registers for use upon street cars and similar vehicles.

It has for its object the production of a fare register which shall perform all of the duties and accomplish all of the results of the registers now generally in use, and which shall at the same time be of cheap and simple construction and absolutely reliable in operation.

It has for its further object the provision of novel means in this class of registers for indicating and preserving separate registrations of different classes of fares, such as cash fares, tickets, transfers, and the like.

The novelty of the invention consists in the novel constructions and arrangements of parts, by which the increased simplicity and improved construction of the register are brought about, and in the new combinations and modes of operation of its various elements, all as will be hereinafter set forth and particularly pointed out in the claims.

In the accompanying drawings Figure 1 is a face view of the register; Fig. 2 a corresponding view with the dial plate and front of the casing removed, exposing the mechanism within; Fig. 2<sup>a</sup> a vertical section through one of the permanent registers; Fig. 3 a view corresponding to Fig. 2, with the trip register wheel, the pawl-carrier, and pawl, and the alarm mechanism removed, and with the operating lever in its normal position of rest, after the registration of a cash fare; Fig. 4 a view corresponding to Fig. 3, with the operating lever in the position it occupies when moved to indicate and register a transfer or ticket fare; Fig. 5 a sectional detail approximately on the line 5—5 of Fig. 4; Fig. 6 a vertical section approximately on the line 6—6 of Fig. 2; Fig. 7 a view corresponding to Fig. 6 with the resetting shaft moved to resetting position; Fig. 8 a sectional detail approxi-

mately on the line 8—8 of Fig. 3; Fig. 9 a detail view showing the latch for holding the resetting shaft in its outer position; Fig. 10 a detail plan view showing the modified arrangement of the permanent registers and fare indicator; Fig. 11 a detail view of part of the trip register wheel showing the trip upon its under side which co-operates with the latch for the resetting shaft; Fig. 12 a detail view of one of the perforated disks of the permanent registers; Fig. 13 a detail view of the fare indicator, showing a different means for operating it.

The same letters of reference are used to indicate identical parts in all the figures.

In common with most registers of this class my improved register embodies a "trip" register, by which the total number of fares collected at any given trip are indicated; a trip indicator, by which the direction of the trip, as north or south, east or west, up or down, is indicated; and a permanent or totalizing register on which the total of all of the fares collected during any given period of time, as a day, is indicated. As is usual in registers of this class it is provided with means for intermittently actuating the trip register, with means for resetting the trip register to zero or initial position at the end of each trip, without affecting the permanent register, with means for automatically setting the trip indicator by the act of resetting the trip register, and with means for locking the trip register or its actuating device from movement during the time such register is disconnected from the permanent register and being reset to zero. It is also provided with an alarm device which is sounded at each actuation of the trip register. My improved register contains elements of novelty in each of these general features which are common in registers of this class, and in addition it contains what is believed to be the broadly new feature of two permanent or totalizing registers, for indicating different classes of fares, independently actuated by a single operating device, as a handle or lever, in combination with an indicator which indicates the different classes of fares adapted to be registered by the two registers and which is automatically shifted by the act of operating either one of the reg-

isters, to expose to view the sign or indication representing the class of fares which is being registered.

In my improved register the trip register is normally in gear with an actuating device for the permanent registers, in this instance a rotary shaft. This shaft can be connected at will with either one of the two permanent registers, and the means for connecting it with said registers is controlled by what may be termed a combined setting and operating handle or lever. This lever actuates the trip register when given a full stroke in either direction, but the direction of its stroke determines which one of the permanent registers shall be actuated by the trip register, so that when the lever is moved in one direction the trip register and one of the permanent registers will be actuated, and when it is moved in the other direction the trip register and the other one of the permanent registers will be actuated. This lever is also connected to the fare indicator, in such manner that upon one stroke of the lever the indicator will be set to indicate the class of fare which is to be registered upon the permanent register actuated by such stroke, and upon the stroke of the lever in the opposite direction it will be shifted to indicate the class of fare to be registered upon the other one of the permanent registers. It will therefore be seen that by attaching to this lever two cords extending along the roof of the car in the usual manner and so connected to the lever that upon pulling one cord the lever will be moved in one direction and upon pulling the other it will be moved in the opposite direction the conductor can, by simply pulling one cord or the other, indicate and register either class of fares which he may receive, the trip register also preserving until the end of the trip a total of both classes of fares and consequently a total of the number of passengers carried.

A detailed description of the construction and operation of the register will now be given by reference to the accompanying drawings.

The casing A of the register may be of substantially circular shape, but in the present instance is shown provided with a lateral extension B at one side to accommodate one of the permanent registers and the fare indicator. The principal working parts are supported upon the back plate C of the casing, Fig. 2, while the front plate D consists of the usual dial, having in this instance a lateral extension to cover the part B of the casing. This front plate is provided with suitable openings for the exposure of the sign upon the trip and fare indicators and the numbers upon the permanent registers. The pointer E which co-operates with the dial upon the front plate is secured to and carried by the hub of a toothed wheel F, Fig. 2, which is loosely mounted upon a fixed central spindle G, the outer end of the hub projecting through a circular central opening in the dial plate to

permit the pointer to be secured to it and travel over the face of the dial. The periphery of the wheel F is provided with one hundred teeth, and the wheel is advanced the space of one tooth at each operation of the register, and the pointer E carried with it over one space upon the dial, the pointer and dial and wheel F constituting the "trip" register of the machine. The actuating pawl H for the wheel F is pivoted to and carried by a lever I pivotally mounted at J upon a suitable stud or support projecting upward from the back-plate C. The pawl H is yieldingly pressed into engagement with the wheel F by a coiled spring confined in a housing K upon the lever I and its movement is limited by a stop-lug L upon the lever I, Fig. 2, as well as by its engagement with the wheel F, for a purpose hereinafter explained. A detaining pawl M mounted upon the pivotal support of the lever I and spring-pressed into engagement with the wheel F by a spring confined in a housing N prevents backward movement of the wheel F so long as it is engaged by said pawl. A stud O limits the movement of the pawl M under the pressure of its spring when the wheel F is disengaged from the pawl in the manner hereinafter described. The lever I is yieldingly held in normal position and returned to such position after being displaced therefrom, by a coiled spring I' confined in a housing J' and encircling a stud K' upon the end of the lever I.

Pivoted at P upon a suitable support projecting from the back-plate C is the operating handle or lever Q, which, as before stated, performs the triple duty of actuating the trip register and shifting the fare indicator and controlling the connection of the permanent registers with the trip register. So far as its co-operation with the trip register (the wheel F) is concerned it might consist of the simple three-armed or approximately T-shaped lever shown in Fig. 2, or, indeed, of a simple bent or bell-crank lever which would operate when moved in one direction to vibrate the pawl-carrying lever I and cause the pawl H to advance the wheel F. In the present instance it is desired that the lever shall actuate the trip register when vibrated in either direction from its normal middle position, and to that end it is provided with two opposite arms adapted to engage the pawl-carrying lever I. The lever is provided with two holes R S for the attachment of the two operating cords, of which the one connected at R will be led upward over a pulley and thence along the car, and the one connected at S downward under a pulley and thence along the car, so that when the one cord is pulled the lever will be vibrated upward, and when the other is pulled it will be vibrated downward. Both movements of the lever will have the same effect upon the pawl-carrier I, each operating simply to advance the wheel F the space of one tooth and cause the pointer to indicate the addition of one unit upon the

wheel. For the purpose of locking the wheel F at the end of the actuating stroke of the pawl-carrier and pawl, and preventing over-throw by reason of its own momentum, the lug L upon the lever I, Fig. 2, heretofore described, is shaped to fit the notches between the teeth upon the wheel F, and at the end of the stroke of the pawl-carrier I to the right the lug takes between two teeth of the wheel and locks it from movement in either direction until the pawl-carrier is retracted. The lower bent end of the pawl-carrying lever I has pivoted to it a hooked dog T adapted to co-operate with a catch-plate U secured upon the striker V of a gong W. A coiled spring confined in a housing X upon the lever I presses the nose of the dog T against the plate U, while the coiled spring Y bearing against the left hand end of the striker V yieldingly holds the striker in the normal position shown with its hammer adjacent the gong and quickly throws it into such position when it is moved therefrom and released. When the upper end of the lever I is moved to the right by the operation of the lever Q the dog T is thrown downward and its spring yields and permits its hook to slip over and catch under the edge of the plate U, and then when the lever I is returned to normal position and the dog T carried upward it will rock the striker V and compress the spring Y until the nose of the dog clears the plate U and releases the striker, whereupon the spring Y will throw it quickly back to normal position and sound the gong. It will thus be seen that the gong is sounded upon the return or negative stroke of the pawl-carrier and pawl, so that the gong cannot be sounded until the register has been actuated and a unit added upon it.

The means for resetting the trip register to zero may be next described, as follows: The wheel F has secured upon its under side a gear-toothed ring Z, which when the wheel F is in its normal position is in constant mesh with a pinion fast upon the driving or actuating shaft of the permanent registers, as will be hereinafter described. This gear-toothed ring Z is adapted to be engaged by a beveled gear A' fast upon one end of a shaft B' mounted in suitable guide-ways to be rotated and to be slid diametrically of the machine, and projecting at its opposite end through the casing where it has secured upon it a suitable thumb-piece C' by which it may be slid and turned. A strong spring D' coiled around this shaft and confined between its outer guide-way E' and a pin passed through the shaft near its inner guide-way F' yieldingly holds the shaft in its normal position, with the gear A' disengaged from the ring Z.

At the center of the machine the shaft B' passes through a cylindrical guide-piece G', Figs. 3, 4, 6, 7, and 8. Upon opposite sides of this guide-piece the shaft is cut away to form two cones or beveled surfaces H' H'. As before stated the wheel F is loosely mounted upon the spindle G. It is provided upon its under

side with an extended hub which terminates at its lower end in a flanged collar or cap L' which fits over the upper end of the cylindrical guide-piece G' and projects into the path of the cones or beveled surfaces H' H' on the shaft B'. The result is that whenever the shaft B' is pulled outward by its thumb-piece C', to engage the gear A' with the ring Z upon the wheel F, preparatory to resetting the trip register to zero, the wheel F will be lifted upon the spindle G and its toothed periphery carried above the plane of the actuating pawl H and holding pawl M, (and the ring Z disengaged from the driving shaft of the permanent registers, hereinafter described,) so that the wheel F will be free to be turned backward to initial position.

The operation of resetting the trip register, therefore, consists in pulling the shaft B' outward to its limit of movement, and thereby lifting the wheel F and engaging the gear A' with the ring Z, and then turning the shaft B' to the left until the wheel is brought to initial position and the pointer E stands opposite zero upon the dial.

For the purpose of temporarily maintaining the shaft B' in its outer resetting position it is provided at M' with a circumferential groove which is adapted to co-operate with a spring-pressed pivoted catch-plate N' fitted in a vertical slot in the guide-piece F'. A spring O' confined in a housing in the guide-piece F', Figs. 6, 7, and 9, presses the right hand end of the catch-plate N' upward and causes its middle portion to bear upon the upper surface of the shaft B' ready to catch into the groove M' when the shaft is slid outward until the groove is brought beneath the plate. When the shaft is slid outward to such position the plate N' catches into the groove M' and maintains the shaft in such outer position, against the stress of its spring D', with the wheel F elevated and the gear A' engaged with the ring Z. The shaft B' may then be freely rotated to reset the register. For the purpose of disengaging the catch-plate N' from the groove M' and releasing the shaft B' as soon as the register has been reset to zero one of the spoke-arms of the wheel F has pivoted to its under side a trip P', Figs. 6, 8 and 11, free to turn upon its pivot in one direction but held from movement thereon in the other. This trip P' is adapted to co-operate with a beveled lug or bearing surface Q' upon the upper edge of the plate N', Fig. 3. When the wheel F is turned backward by means of the resetting shaft B' until it approximately reaches initial position the trip P' engages the beveled lug Q' and rocks the plate N' upon its pivot and just as the wheel F is brought fully to initial position and the pointer E to zero upon the dial the trip P' moves the plate N' entirely out of engagement with the groove M', whereupon the spring D' throws the shaft B' back to normal position and disengages the gear A' from the ring Z. This backward movement of the shaft



also carries the cones H' H' from beneath the cap L' upon the hub of the wheel F and permits the latter to be thrown downward upon the spindle G to normal position by the flat spring R' secured at one end to the back-plate C and bent upward and forked at its opposite end to embrace the hub of the wheel F and bear upon the upper side of the cap L', Figs. 3 and 6.

It will thus be seen that in order to reset the trip register to zero it is simply necessary to pull the shaft B' outward until its groove M' is engaged by the plate N', and to then turn the shaft until said plate is disengaged from the groove and the shaft released and thrown back to normal position by its spring. It will also be seen that the trip P' is free to yield and pass the lug Q' upon the catch-plate N' during the registering movement of the wheel F, so that if the number of fares collected upon a single trip should exceed one hundred the wheel F will be free to continue its rotation beyond initial position.

For the purpose of preventing any accidental vertical displacement of the wheel F at violent manipulations of the operating lever Q there is provided a bent plate S', secured upon the pawl-carrier I, Fig. 2, whose bent upper end is adapted to move over the edge of the wheel F as soon as the pawl-carrier is thrown to the right to turn said wheel, and this plate prevents any upward movement of the wheel during the actuating movement of the pawl-carrier and pawl.

The trip indicator consists of a rotary drum T' mounted in suitable brackets upon the back-plate of the machine and bearing in this instance four indicating signs upon its four diametrically opposite sides. The register illustrated in the drawings may be assumed to be adapted for use upon a road running east and west, and the indicator-drum bears upon two diametrically opposite sides the word West and upon its other two opposite sides the word East, so that a quarter turn of the drum will change the indication from east to west and vice versa. The drum has secured upon its left hand end a ratchet U' having four teeth, Figs. 2, 3, and 8. This ratchet is engaged by an actuating arm or pawl V' in this instance forming part of a lever W' pivoted to a support upon the back-plate of the casing at X'. This lever W' is provided with a longitudinal slot through which passes the upper half of the gear A' upon the shaft B', so that the lever W' is vibrated each time the shaft B' is slid outward and inward, with the result that at each outward movement of the shaft the pawl-arm V' takes over a fresh tooth of the ratchet U' and upon the inward movement of the shaft turns the ratchet and indicating drum a quarter of a rotation and thereby sets the trip indicator for the next trip. A flat spring Y' bearing against the ratchet U', Fig. 8, operates, when the resetting shaft B' is pulled outward, to turn the ratchet and indicator drum slightly

forward to bring the tooth of the ratchet succeeding the one last engaged by the arm V' into position to be engaged by such arm when the resetting shaft is restored to normal position. The provision of this spring co-operating with the ratchet in the manner described permits the employment of a rigid pawl-arm reciprocating with the resetting shaft, and when said shaft is in its normal position the engagement of the end of the pawl-arm with the flat under side of the ratchet securely locks the indicator drum from movement in either direction. The lever W' also serves as a means for locking the pawl-carrier I from operative movement during the time the shaft B' is in its outer position and the trip register disengaged from the permanent register. To this end the extreme left hand end of the lever W' is shaped to co-operate with an extension Z' of the right hand edge of the lever I, Fig. 2, the left hand end of the lever W' moving downward immediately adjacent said extension when the shaft B' is pulled to its outer position, and thereby locking the lever I from any movement to the right until the shaft B' is released and the parts returned to normal position.

The lever W' has pivoted to it near its left hand end a thin spring-metal plate A<sup>2</sup> which is provided with a longitudinal slot embracing the beveled gear A'. At the right hand end of this slot the plate A<sup>2</sup> is so cut as to form a lip B<sup>2</sup>, Figs. 3 and 4, which engages the beveled gear A' and fits between the teeth thereof. The right hand end of the plate A<sup>2</sup> is confined beneath a plate C<sup>2</sup> secured to one of the supporting brackets of the indicating drum T' and projecting over the end of the plate A<sup>2</sup>. The right hand end of the plate A<sup>2</sup> is free to move with the lever W' but the plate C<sup>2</sup> prevents it moving upward. The plate A<sup>2</sup> has sufficient spring to it to permit the lip B<sup>2</sup> to yield and slip over the teeth of the gear A' when the latter is turned toward the left to reset the trip register in the manner heretofore described, but the plate A<sup>2</sup> and lip B<sup>2</sup> will not yield in the opposite direction, so that the engagement of the lip with the gear prevents any movement of the gear toward the right. Consequently when the gear A' is moved into engagement with the toothed ring Z of the wheel F and the latter simultaneously lifted out of engagement with its actuating and detaining pawls and disconnected from the permanent register, the only thing that can be done is to turn the shaft B' and gear A' to the left and reset the trip register to zero. The pivotal arrangement of the plate A<sup>2</sup> permits its lip B<sup>2</sup> to conform itself to the two different positions of the gear A' and to snugly fit between two of its teeth in whichever position it may be. This plate A<sup>2</sup> and its lip B<sup>2</sup> engaging the gear A' not only serve to prevent the gear A' being turned backward to the right, but also serve to hold said gear at all times in exact position for its teeth to mesh with the teeth of the ring Z

when the shaft B' is pulled outward and the gear A' carried under the ring Z.

It will be understood that so long as the trip register remains at zero the latch-plate N' will be held out of engagement with the shaft B' by the trip P' upon the under side of the wheel F, so that the shaft B' can be moved out and in as often as desired and the trip indicator T' set as occasion may require.

Having now described the trip register and the means for actuating and resetting the same, and the trip indicator, I will next describe the permanent registers and the fare indicator.

The gear ring Z upon the wheel F, when the latter is in its normal position, meshes constantly with a beveled pinion D<sup>2</sup>, Figs. 3, 4, 6, and 7, fast upon the left hand end of a rotary shaft E<sup>2</sup> journaled at its opposite ends in bracket-plates F<sup>2</sup> G<sup>2</sup> projecting upward from the back-plate of the casing. The two permanent registers H<sup>2</sup> I<sup>2</sup> are loosely mounted upon this shaft and separated some distance from each other. Fast upon the right hand side of the right hand or units wheel of the register H<sup>2</sup> is a notched disk J<sup>2</sup> which is provided with ten holes arranged in circular order concentric to its axis and adjacent its periphery, Fig. 12. Immediately at the left of the left hand wheel of the register I<sup>2</sup> is a similar notched and perforated disk K<sup>2</sup> which is fast upon the left hand end of a sleeve L<sup>2</sup> loosely mounted upon the shaft E<sup>2</sup> and having fast upon its right hand end the right hand or units wheel of the register I<sup>2</sup>, the three wheels to the left of said units wheel being loosely mounted upon said sleeve, Fig. 2<sup>a</sup>. The result of this is that the units wheel of the register H<sup>2</sup> turns with the disk J<sup>2</sup>, while the units wheel of the register I<sup>2</sup> turns with the disk K<sup>2</sup>.

Spring-pawls M<sup>2</sup> N<sup>2</sup> (see Figs. 5 and 12) engaging the notched peripheries of the respective disks yieldingly hold the disks and the units wheels in the exact positions to which they are moved by the operations of the register.

Feathered upon the shaft E<sup>2</sup> between the two registers H<sup>2</sup> I<sup>2</sup> is a sliding clutch-piece O<sup>2</sup> which is provided upon its opposite sides with laterally projecting pins P<sup>2</sup> Q<sup>2</sup>, the former adapted to enter some one of the holes in the disk K<sup>2</sup> when the clutch-piece O<sup>2</sup> is slid to the right, and the latter adapted to enter some one of the holes in the disk J<sup>2</sup> when it is slid to the left. The result of this is that either one or the other of the registers may be connected to the shaft E<sup>2</sup> by sliding the clutch-piece into engagement with the perforated disk of such register, and when so connected with the shaft E<sup>2</sup> the movements of the trip register, which is in constant gear with the shaft E<sup>2</sup>, will be imparted to such permanent register. Now, the clutch-piece O<sup>2</sup> is automatically shifted into engagement with one or the other of the two registers by the stroke of the operating lever Q in one direc-

tion or the other from its normal middle position. When the outer end of the lever Q is pulled upward the clutch-piece is engaged with the register I<sup>2</sup>, and when it is pulled downward it is engaged with the register H<sup>2</sup>. The means for shifting the clutch-piece O<sup>2</sup> consists of a shifter-yoke R<sup>2</sup> whose opposite forks or arms fit between the flanges or end disks of the clutch-piece. This shifter-yoke is fast upon a longitudinally sliding shaft S<sup>2</sup> mounted at its right hand end in the bracket-plate F<sup>2</sup> and at its left hand end in a guide-piece T<sup>4</sup> secured upon the back-plate of the casing some distance to the left of the middle line occupied by the shaft B', Fig. 4. When this shaft S<sup>2</sup> is slid in one direction or the other the clutch-piece O<sup>2</sup> is of course carried with it and engaged with one or the other of the registers. Near its left hand end the shaft S<sup>2</sup> has fast upon it a vertically projecting stud or screw T<sup>3</sup>, (preferably surrounded by an anti-friction sleeve) which fits in a cam slot U<sup>2</sup> in the right hand end or extension V<sup>2</sup> of the lever Q, Figs. 2 and 3.

As before stated, for the purpose of actuating the trip register the lever Q might consist simply of the three-armed plate fully shown in Fig. 2, or of simply a bent or bell-crank lever, but for the purposes of its co-operation with the permanent registers and fare indicator it is provided with the arm or extension V<sup>2</sup> projecting to the right of its pivotal point P. Now, the shape of the slot U<sup>2</sup> in this arm V<sup>2</sup> of the lever is such that when the left hand end of the lever is pulled downward and its right hand end thrown upward the shaft S<sup>2</sup> will be slid to the left and the clutch-piece O<sup>2</sup> engaged with the disk J<sup>2</sup> of the register H<sup>2</sup>, and when the outer end of the lever Q<sup>2</sup> is pulled upward from its middle position and its right hand end thereby thrown downward the shaft S<sup>2</sup> will be slid to the right and the clutch-piece O<sup>2</sup> engaged with the disk K<sup>2</sup> of the register I<sup>2</sup>.

In the present instance the register H<sup>2</sup> may be taken to be that upon which ordinary cash fares are to be registered, and in Figs. 2 and 3 of the drawings the parts are shown in the position they occupy at the end of a registration of a cash fare, the clutch remaining in engagement with the disk J<sup>2</sup> and the cash fare register consequently connected with the trip register. The operating lever I has sufficient play independently of the pawl-carrier I to permit it to shift the clutch into engagement with one register or the other before actuating the pawl-carrier and turning the trip register, so that at the end of each operation the operating lever may come to rest without disconnecting the clutch from the register which has just been actuated. Consequently at the end of each operation the trip register will remain connected with the register last actuated, so that if the same class of fare is to be registered at the next operation the clutch will simply remain in engagement with such register. Thus, at the end of the registration

of a cash fare the clutch will remain engaged with the disk  $J^2$  of the register  $H^2$ , as in Figs. 2 and 3 of the drawings, while at the end of the registration of a transfer it will remain engaged with the disk  $K^2$  of the transfer register  $I^2$ . Between operations, therefore, while the machine is at rest, the clutch is in engagement with one register or the other, so that the trip register may be said to be normally connected with one register and disconnected from the other. My invention is not limited to this particular arrangement and operation of the parts, however, since the essential thing is that the trip register be capable of connection at will with either the one or the other of the permanent registers. It may therefore be normally connected with one or with the other, or with neither. The construction and arrangement of the parts may be such that the clutch will normally stand midway between the two registers, so that both will be disconnected from the trip register; or means may be employed for restoring the operating lever to a certain position at the end of each operation and thereby always leaving the same register connected with the trip register, no matter which one has been operated; or the construction and arrangement illustrated in the drawings and above described may be employed.

From the foregoing description it will be understood that upon simply pulling the outer end of the lever  $Q$  downward a unit will be added upon the trip register and upon the permanent register  $H^2$ , and that upon pulling the lever upward a unit will be added upon the trip register and upon the permanent register  $I^2$ . If one of the permanent registers be employed to register the cash fares and the other to register the transfer tickets received, then by pulling upon the cash fare rope or cord the conductor will register such fare upon both the trip register and the permanent register  $H^2$ , while by pulling the ticket rope or cord he will register one fare upon the trip register and one upon the transfer ticket register.

The transfers from the units wheel to the tens, from the tens to the hundreds, and from the hundreds to the thousands in each of the permanent registers, are effected by the usual transfer pinions  $W^2$ , Fig. 5, co-operating with gears and teeth upon the register wheels.

As seen in Fig. 2 the two arms of the lever  $Q$  upon opposite sides of its pivotal point  $P$  do not abut against the pawl-carrier  $I$  at the same time, so that the lever is capable of slight idle movement in each direction from its middle position before one or the other of its arms begins to move the pawl-carrier. This first movement of the lever serves to shift the clutch-piece  $O^2$  into engagement with one or the other of the disks  $J^2 K^2$ , after which the further movement of the lever will actuate the pawl-carrier and cause it to turn the wheel  $F$  and the units wheel of the register  $H^2$  or  $J^2$  with which the clutch-piece  $O^2$  may be connected.

Inasmuch as the wheel  $F$  will remain at the point to which it is moved by the pawl-carrier, no matter whether it is given a full unit of movement or not, it follows that the clutch-piece  $O^2$  will likewise remain in any position to which it may be turned by a partial stroke of the operating lever. The pins  $P^2 Q^2$  upon the ends of the clutch-piece, however, register with the openings in the disks  $K^2 J^2$  only when the clutch-piece has been turned a full tenth of a rotation by a full stroke of the operating lever, so that if the clutch-piece be engaged with one of the disks  $J^2 K^2$ , as with the disk  $J^2$  in Fig. 2, and the operating lever  $Q$  be then given a partial stroke and the clutch-piece and units wheel of the register  $H^2$  turned something less than a tenth of a rotation the pin  $P^2$  upon the right hand end of the clutch-piece will be carried out of register with any of the holes in the disk  $K^2$ . If it then be attempted to give the operating lever a stroke in the opposite direction from its normal position the pin  $P^2$  will abut against the disk  $K^2$  and arrest the movement of the parts. It results, therefore, that when the operating lever is given a stroke in either direction sufficient to engage the clutch-piece with either one of the disks  $J^2 K^2$  and to turn such disk slightly from its position of rest, the operating handle can not be given a stroke in the opposite direction and the clutch-piece engaged with the disk of the other register, but on the contrary the only thing that can be done is to complete the full stroke of the lever in the direction in which it was originally moved and to thereby turn the clutch-piece and units registering wheel a full tenth of a rotation and add a unit upon the register. The pins  $P^2 Q^2$  upon the clutch-piece therefore not only co-operate with the holes in the disks  $J^2 K^2$ , to turn the units registering wheels, but they co-operate with the surfaces of such disks to compel a full stroke of the operating lever in the direction in which it may be started before it can be given a stroke in the opposite direction.

The fare indicator consists of a drum  $X^2$  mounted to oscillate back and forth upon a shaft  $Y^2$  fixed at its right hand in the bracket-plate  $F^2$ , Fig. 2. This drum bears upon its surface two signs to indicate the classes of fares which are to be registered upon the two permanent registers. In the present instance one of these signs consists of the number and word "5 cents," to indicate cash fares, and the other consists of the word "Transfer," to indicate transfer ticket fares. A piece of spring wire  $Z^2$  secured at its lower end to the back-plate of the machine, or to the base-plate of the brackets  $F^2 G^2$ , is provided at its upper end with an eye fitting over the end of the shaft  $Y^2$  and bearing against the end of the drum  $X^2$ . The friction between this wire and the end of the drum serves to hold the latter in its different adjusted positions when moved from one to the other. The means for oscillating the drum  $X^2$  consists of an arm  $A^3$

fast upon the right hand end of a sleeve B<sup>3</sup> loose upon the shaft S<sup>2</sup>. This arm A<sup>3</sup> has fast upon it a laterally projecting rod or pin C<sup>3</sup> which passes through a hole in the left hand end or head of the drum X<sup>2</sup>, so that when the sleeve B<sup>3</sup> is oscillated the drum is moved with it. At its left hand end the sleeve B<sup>3</sup> has secured to or formed integral with it two arms D<sup>3</sup> extending to the left parallel with and upon diametrically opposite sides of the shaft S<sup>2</sup>. The right hand arm or extension V<sup>2</sup> of the operating lever Q is provided upon its under side with two beveled lugs or cams E<sup>3</sup> F<sup>3</sup>, Fig. 8, adapted to co-operate with the opposite arms D<sup>3</sup>. When the outer end of the lever Q is pulled downward and its inner end thrown upward the cam F<sup>3</sup> will engage the lower arm D<sup>3</sup> in Figs. 2 and 3, and oscillate the sleeve B<sup>3</sup> forward and bring into view the sign indicating cash fares, while upon pulling the outer end of the lever Q upward and throwing its inner end downward the cam E<sup>3</sup> will engage the other arm D<sup>3</sup> and oscillate the sleeve B<sup>3</sup> in the opposite direction and move the indicating drum to expose the sign which indicates the transfer tickets. After the indicating drum is moved into position to indicate one class of fares it will remain in that position so long as the register is operated to register only that class of fares, but at the first operation to register the other class of fares the indicating drum will be shifted to expose the sign representing such other class of fares. Thus, as shown in the drawings Figs. 1, 2, and 12 the indicating drum is set to indicate cash sales, so that if the operating lever Q be pulled downward, to register a cash fare, the indicating drum will not be moved, but if the lever be pulled upward, to register a transfer ticket, the sleeve B<sup>3</sup> will be oscillated and the drum shifted to indicate transfer tickets.

From the foregoing description it will be understood that upon pulling the operating lever in one direction not only will the trip register be actuated to register one fare and the proper permanent register be actuated to register the particular class of fare which it may be, but the fare indicator will also indicate the class of fare; while upon pulling the operating lever in the opposite direction another fare will be added upon the trip register and upon the second permanent register, and the fare indicator will be shifted to indicate this second class of fare.

It is desirable that the construction of the register and the adjustment of the parts shall be such that it will not be possible to oscillate the fare indicator from one of its indicating positions to the other without giving the operating lever a full stroke and adding a unit upon the trip register and one of the permanent registers and sounding the alarm. The adjustment of the parts in my machine is therefore such that the fare indicator is not moved, (at any operation of the machine at which it is necessary to change the indica-

tion,) until the operating lever has nearly completed its stroke, and to this end the cams E<sup>3</sup> F<sup>3</sup> are placed in such position upon the operating lever, as seen in Fig. 8, that when the lever is at rest they stand at some distance from the respective arms D<sup>3</sup> with which they co-operate, and therefore do not engage said arms and oscillate the sleeve B<sup>3</sup> until the very end of the stroke of the lever. But for the desirability of this mode of operation, to-wit, the shifting of the indicator after the operating lever has performed its registering duty, the indicator X<sup>2</sup> might be actuated directly by the reciprocating movements of the shaft S<sup>2</sup> which shift the clutch-piece O<sup>2</sup>, and the sleeve B<sup>3</sup> with its arms D<sup>3</sup>, the cams E<sup>3</sup> F<sup>3</sup>, and the arms A<sup>3</sup> and rod C<sup>3</sup>, all be dispensed with.

Inasmuch as the mode of operation above mentioned may not be necessary or desirable in some instances, I have illustrated in Fig. 13 the simplification of construction just referred to. As there shown the shaft S<sup>2</sup> is provided with a radially projecting pin S<sup>3</sup> which fits in a diagonal slot S<sup>4</sup> in the indicating drum X<sup>2</sup>. When the shaft S<sup>2</sup> is slid in one direction to engage the clutch-piece O<sup>2</sup> with one of the registers the pin S<sup>3</sup> will travel through the slot S<sup>4</sup> in the indicator-drum and turn the latter to expose one of its indicating signs to view, and when the shaft S<sup>2</sup> is slid in the opposite direction, to engage the clutch-piece O<sup>2</sup> with the other register, the pin S<sup>3</sup> will travel through the slot S<sup>4</sup> to its opposite end and turn the drum to expose the other indicating sign to view. Under this arrangement the setting of the drum and clutch-piece will be simultaneous and will precede the movement of the registers. While it is desirable, for the purposes for which my register is intended, that it shall have the mode of operation first above referred to, nevertheless the combination of the indicator with the permanent registers in the manner just described is a novel and useful one and comes within the scope of my invention.

In event it should be desired to preserve separate registrations of more than two classes of fares a second set of registers corresponding to the registers H<sup>2</sup> I<sup>2</sup> might be provided, in which case such registers would be mounted upon a second shaft corresponding to the shaft E<sup>2</sup> and said second shaft be geared to the trip register wheel F just as the shaft E<sup>2</sup> is. In such event a second operating lever and sliding shaft corresponding to the lever Q and shaft S<sup>2</sup>, and a second clutch-piece operated by such shaft and corresponding to the clutch-piece O<sup>2</sup>, would be employed. In such case the adjustment of the parts would be made such that the two clutch-pieces would be normally disconnected from their co-operating registers, and when either one of the operating levers was given a stroke in one direction its co-operating clutch-piece would be shifted into engagement with the proper register and such register be actuated by the

movement of the trip register wheel; and when it was given a stroke in the opposite direction the other one of its co-operating registers would be actuated. Under such an arrangement four different classes of fares could be registered and independent registrations thereof preserved by the operations of the two levers.

Again, under the construction and arrangement of parts which I have shown the trip register wheel is disconnected from the registering shaft of the permanent registers and geared to the resetting shaft by being lifted upon its axis or central spindle, but it would require only the exercise of mechanical skill in re-arranging the parts to permit the trip register wheel to be depressed for this purpose instead of lifted, the general mode of operation remaining the same.

I have stated in the early part of the specification that the register might be inclosed in a circular casing and the lateral extension inclosing the fare indicator and one of the permanent registers be dispensed with. In Fig. 10 I have shown such re-arrangement of the fare indicator and two permanent registers as would permit the employment of a circular casing. In that arrangement the fare indicator is shifted to the left and placed immediately above the register  $II^2$ , while the shaft  $E^2$  is cut off a short distance to the right of the register  $II^2$  and the register  $I^2$  placed upon an independent shaft below the register  $II^2$ . The oscillating sleeve  $B^3$  is extended to the right to a point adjacent the fare indicator and the arm  $A^3$  is secured upon its right hand end and the pin  $C^3$  arranged to enter an opening in the right hand end or head of the indicator drum. The shaft which supports the indicator drum is fixed at its left hand end in the bracket-plate  $G^2$  and the spring-wire  $Z^2$  fits over its right hand end and bears against the right hand end of the drum. The yoke-arm  $R^2$  which shifts the clutch-piece is secured upon the extreme right hand end of the shaft  $S^2$ . The clutch-piece  $O^2$  is provided upon its left hand end with the pin  $Q^2$  co-operating with the disk  $J^2$  of the register  $II^2$ , but has no pin upon its opposite end. Its left hand flange is formed into a gear  $R^3$  which is adapted to be shifted into and out of mesh with an idle pinion  $R^4$  mounted upon a stud  $R^5$  and meshing constantly with a gear  $R^6$  fast upon the laterally extended hub  $R^7$  of the units wheel of the register  $I^2$ .

When the clutch-piece  $O^2$  is shifted to the left to engage its pin  $Q^2$  with the disk  $J^2$ , preparatory to actuating the register  $II^2$ , it is carried out of engagement with the pinion  $R^4$ , so that when the shaft  $E^2$  is turned by the trip register wheel it will carry the units wheel of the register  $II^2$  with it and not affect the register  $I^2$ . When the clutch-piece is slid to the right and its pin  $Q^2$  disengaged from the disk  $J^2$  the gear  $R^3$  will be thrown into mesh with the pinion  $R^4$ , so that upon the turning of the shaft  $E^2$  by the trip register wheel the

units wheel of the register  $I^2$  will be turned with it.

From the foregoing description it will be seen that it is not essential that the two permanent registers be mounted upon the same shaft, though it is more convenient to so mount them and to provide the register casing with the lateral extension to accommodate them. Even where four registers are employed, as heretofore suggested, it would be possible, by still further extending the portion B of the casing, to mount them all upon a single shaft.

From the description of my invention which has been given it will be understood that in its broader scope it is not restricted to the construction and arrangement of parts shown, but contemplates the broad combinations and modes of operation described. So far as I am aware I am the first in the art to combine a trip register and two or more permanent registers with a single operating handle and connections of any character by which upon one stroke of the handle the trip register and one of the permanent registers will be actuated, and upon a different stroke of the handle the trip register and the other permanent registers will be actuated, and this whether the permanent registers are actuated by the trip register or directly by connections with the operating handle; also the first to combine two permanent registers adapted to register different classes of fares, with a fare indicator adapted to indicate the different classes of fare, and an operating handle and connections of any sort by which upon one stroke of the handle one of the registers will be actuated and the indicator moved to indicate the corresponding class of fare, and upon a different stroke of the handle the other register be actuated and the indicator moved to indicate the other class of fare; also the first to combine these elements with a trip register actuated at each operation of the handle to preserve a registration of the total number of fares registered upon the two permanent registers; as well as the first to produce, under any form and arrangement of parts, the various other combinations and modes of operation set forth in my respective claims.

Again, while my invention is shown and described in this application as embodied in a register actuated by a single handle or operating device, yet it is not so restricted in its broader scope, for I contemplate utilizing it in a register employing two or more handles or operating devices, one for indicating and registering one class of fares, and another for another class. In such a machine, as will be readily understood, the actuating devices may be connected either with the permanent registers, and actuate the trip register through such permanent registers, or they may be connected with the trip register, and actuate the permanent registers through the trip register, as in the present instance.

I am aware that it is not broadly new in

fare registers to so arrange the trip register in relation to the permanent register that it may be moved outwardly upon its axis to disconnect it from the permanent register and permit it to be independently rotated to zero, and I therefore disclaim as my invention the broad combination of a permanent register mounted in a fixed position, a trip register normally connected to move in unison with the permanent register, and means (not substantially the same as mine) for moving the trip register outwardly on its axis of rotation to disconnect the two registers and rotate the trip register to zero.

15 Having thus fully described my invention, I claim—

1. In a fare register, the combination of a trip register, two or more permanent registers, means for connecting the trip register at will with either one of the permanent registers, and a single handle or operating device for actuating the trip register and controlling its connection with the permanent registers, whereby said device may be operated to actuate the trip register and either one of the permanent registers at will, substantially as described.

2. In a fare register, the combination of a trip register, two permanent registers, means for connecting the trip register at will with either one of the permanent registers, and a single operating handle for actuating the trip register and controlling its connection with the permanent registers, said handle being movable in opposite directions from its normal position and operating upon its stroke in one direction to actuate the trip register and connect it with one of the permanent registers, and upon its stroke in the opposite direction to actuate the trip register and the other permanent register, substantially as described.

3. In a fare register, the combination of a trip register, two permanent registers, a driving device for the permanent register normally in gear with the trip register, means for connecting such device at will with either one of the permanent registers, and a single operating handle for actuating the trip register and controlling such connecting means, whereby the said handle may be operated to actuate the trip register and connect the driving device at will with either one of the permanent registers, substantially as described.

4. In a fare register, the combination of a trip register, a rotary shaft geared thereto, two permanent registers, a connecting device mounted to slide upon and turn with the shaft, for intermittently connecting it with either one of the permanent registers, and a single operating handle and connections for actuating the trip register and shifting said connecting device at will into co-operative relation with either one of the permanent registers, substantially as described.

5. In a fare register, the combination of a

trip register, a rotary shaft geared thereto, two permanent registers loosely mounted upon said shaft, a sliding clutch-piece mounted upon and turning with said shaft between the two registers for connecting the shaft at will with either one of the registers, and a single operating handle and connections for actuating the trip register and shifting the clutch to connect the shaft with either one or the other of the permanent registers, substantially as described.

6. In a fare register, the combination of a trip register, a rotary shaft geared thereto, two permanent registers loosely mounted upon said shaft, two perforated disks loose upon said shaft, one turning with the units wheel of each of the permanent registers, a sliding clutch-piece mounted upon and turning with the shaft between the two registers and provided upon its opposite ends with pins co-operating with the perforations in the disks, to connect the clutch-piece and shaft at will with the units wheel of either one or the other of the permanent registers, and a single operating handle and connections for actuating the trip register and shifting the clutch-piece, substantially as described.

7. In a fare register, the combination of a trip register, two permanent registers, one normally in and the other normally out of driving connection with the trip register, and a single operating device and connections for actuating the trip register and throwing the one permanent register out of and the other into driving connection with it at will, substantially as and for the purpose described.

8. In a fare register, the combination of a trip register, a rotary shaft geared thereto, two permanent registers, a connecting device mounted to slide upon and turn with the shaft and normally connecting the shaft with one of the permanent registers, and a single operating handle for actuating the trip register and shifting said connecting device, to connect either one or the other of the permanent registers with the rotary shaft, substantially as described.

9. In a fare register, the combination of a trip register, a rotary shaft geared thereto, two permanent registers loosely mounted upon said shaft, two perforated disks turning with the units wheels of the respective registers, a sliding clutch-piece mounted to slide upon and turn with the shaft between the two registers and provided upon its opposite ends with pins co-operating with the perforated disks, the pin upon one end of the clutch-piece being normally engaged with a perforation in one of the disks, to normally connect the shaft with one of the permanent registers, and a single operating handle and connections for actuating the trip register and shifting the clutch-piece, substantially as described.

10. In a fare register, the combination of a rotary wheel, a pawl-carrier and pawl for turning the same, two registers, means for connect-



ing either one of the registers at will with the rotary wheel, and an operating handle and connections for actuating the pawl-carrier and pawl and controlling the connection of the registers with the rotary wheel, said handle being movable in opposite directions from its normal position and operating upon its stroke in one direction to connect one register with the rotary wheel and actuate the same, and upon its stroke in the opposite direction to connect the other register with the rotary wheel and actuate it, substantially as described.

11. In a fare register, the combination of a rotary wheel, a pawl-carrier and pawl for turning the same, a rotary shaft geared to the wheel, two registers, a connecting member mounted to slide upon and turn with the shaft, for connecting it at will with either register, an operating handle movable in opposite directions from its normal position and co-operating with the pawl-carrier when moved in either direction, to turn the rotary wheel, and means intermediate said handle and the connecting member between the rotary shaft and registers for connecting said shaft with one register or the other according to the direction of stroke of the handle, substantially as described.

12. In a fare register, the combination of a rotary wheel, a pawl-carrier and pawl for turning the same, a rotary shaft geared to the wheel, two registers loosely mounted upon said shaft, a connecting member mounted to slide upon and turn with the shaft between the two registers, for connecting the shaft to either of them at will, a single operating handle movable in opposite directions from normal position and co-operating with the pawl-carrier when moved in either direction, to turn the rotary wheel, and means intermediate said handle and the connecting member for shifting the latter to connect the rotary shaft with one or the other register according to the direction of movement of the handle, substantially as described.

13. In a fare register, the combination of an indicator adapted to indicate different classes of fares, a trip register, two permanent registers for registering the different classes of fares, and an operating handle and connections for actuating the trip register and one of the permanent registers and indicating the corresponding class of fare by a single operation, substantially as described.

14. In a fare register, the combination of an oscillatory indicating drum bearing indicating signs representing different classes of fares, a trip register, two permanent registers for registering the different classes of fares, and means for actuating the trip register and either one of the permanent registers and shifting the indicating drum to indicate the corresponding class of fare by a single operation, substantially as described.

15. In a fare register, the combination of an indicator adapted to indicate different classes

of fares, two or more registers adapted to register the respective classes of fares, and a single operating handle and connections for moving the indicator to indicate either class of fares desired and for actuating the proper register to register such fares by a single operation, substantially as described.

16. In a fare register, the combination of an indicator adapted to indicate different classes of fares, a rotary shaft, two registers, a connecting member mounted to slide upon and turn with the shaft for connecting it at will with one or the other of the registers, and a single operating handle and connections for turning the shaft and shifting the connecting member and moving the indicator, to indicate and register either class of fare desired, substantially as described.

17. In a fare register, the combination of an indicator adapted to indicate different classes of fares, a rotary shaft, two registers loosely mounted thereon and adapted to register the respective classes of fares, a connecting member mounted to slide upon and turn with the shaft between the two registers, for connecting it at will with either one or the other of the registers, and a single operating handle and connections for turning the shaft and shifting the connecting member and moving the indicator, substantially as described.

18. In a fare register, the combination of a rotary wheel, a pawl-carrier and a pawl for turning said wheel, two registers, means for connecting one or the other at will with said wheel, an indicator for indicating different classes of fares adapted to be registered by the respective registers, a single operating handle movable in opposite directions from its normal position and co-operating with the pawl-carrier when moved in either direction, to cause the pawl to turn the rotary wheel, and connections between said operating handle and the indicator and between the operating handle and the means for connecting the registers with the rotary wheel, whereby upon giving the operating handle a stroke in one direction the indicator will be moved to indicate one class of fares and the corresponding register be actuated, and upon giving it a stroke in the opposite direction the indicator will be moved to indicate a different class of fares and the other register be actuated, substantially as described.

19. In a fare register, the combination of a rotary wheel, a pawl-carrier and pawl for turning the same, a rotary shaft in gear with said wheel, two registers, a connecting member mounted to slide upon and turn with the shaft, for connecting it at will with either one of the registers, an indicator adapted to indicate the different classes of fares to be registered by the respective registers, an operating handle moving in opposite directions from normal position, and co-operating with the pawl-carrier when moved in either direction, to turn the rotary wheel and shaft geared thereto, and connections between the operating

handle and the indicator and the connecting member upon the rotary shaft for moving the indicator and shifting the connecting member into engagement with one or the other register at will, substantially as described.

20. In a fare register, the combination of a trip register, two permanent registers either one or the other of which may be connected with the trip register at will, an indicator adapted to indicate different classes of fares to be registered by the respective permanent registers, and an operating handle and connections for actuating the trip register and connecting either one or the other of the permanent registers with it, and for moving the indicator to indicate the class of fares corresponding to the permanent register connected with the trip register, substantially as described.

21. In a fare register, the combination of a trip register wheel movable longitudinally of its axis, a register normally in gear with said wheel, and a rotary and longitudinally movable resetting shaft mounted transversely to the axis of the wheel and adapted when slid in one direction to become geared to the wheel and to move the latter longitudinally of its axis to disconnect it from the register, substantially as described.

22. In a fare register, the combination of a trip register wheel movable longitudinally of its axis and provided with a gear ring, a registering shaft carrying a pinion normally meshing with said ring, and a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid in one direction to engage its gear with the gear ring upon the rotary wheel and to move the latter longitudinally of its axis to disengage said ring from the pinion upon the registering shaft, substantially as described.

23. In a fare register, the combination of a trip register having a gear ring, a registering shaft carrying a pinion normally in mesh with said ring, a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the ring upon the wheel and to disengage said ring from the pinion on the registering shaft, a latch for holding the shaft in resetting position, and a trip upon the wheel for tripping the latch and releasing the shaft when the wheel has been reset to initial position, substantially as described.

24. In a fare register, the combination of a trip register wheel movable longitudinally of its axis, a register normally in gear with said wheel, and a rotary and longitudinally movable resetting shaft intersecting the axis of the wheel and provided with a cone bearing adapted to engage the wheel and move it longitudinally of its axis when the shaft is slid to resetting position, substantially as described.

25. In a fare register, the combination of a

trip register wheel movable longitudinally of its axis and provided with a gear ring, a registering shaft having a pinion normally in mesh with the gear ring, and a rotary and longitudinally movable resetting shaft having fast upon it a gear adapted when the shaft is slid to resetting position to engage the gear ring, and provided also with a cone bearing adapted when the shaft is slid to such position to move the wheel longitudinally of its axis and disengage the gear ring from the pinion on the registering shaft, substantially as described.

26. In a fare register, the combination of a trip register wheel movable longitudinally of its axis and provided with a gear ring, a registering shaft having a pinion normally in mesh with the gear ring, a rotary and longitudinally movable resetting shaft having fast upon it a gear adapted when the shaft is slid to resetting position to engage the gear ring, and provided also with a cone bearing adapted when the shaft is slid to such position to move the wheel longitudinally of its axis and disengage the gear ring from the pinion on the registering shaft, a latch-plate co-operating with the groove in the shaft to hold it in resetting position, a trip upon the wheel for releasing the shaft when the wheel has been reset to initial position, and a spring for restoring the shaft to normal position when released, substantially as described.

27. In a fare register, the combination, with the trip register, its actuating pawl and pawl-carrier, and its rotary and longitudinally movable resetting shaft, of a locking stop reciprocating with the resetting shaft and adapted when the latter is slid to resetting position to move into the path of the pawl-carrier and lock it from movement, substantially as described.

28. In a fare register, the combination of the trip registering wheel F having the gear ring Z, the resetting shaft B' having the gear A' fast upon it, the lever W' having the slot embracing the gear A', and the spring-metal plate A<sup>2</sup> pivoted upon the lever W' and having the slot embracing the gear A' and the lip engaging the teeth thereof, substantially as described.

29. In a fare register, the combination of the trip registering wheel F having the gear ring Z, the resetting shaft B' having the gear A' fast upon it, the rotary indicator T' having the ratchet U', and the lever W' having the slot embracing the gear A' and provided with the pawl arm V' co-operating with the ratchet U', substantially as described.

30. In a fare register, the combination of the trip register wheel F movable longitudinally of its axis, a pawl-carrier I and pawl H, and the guard-plate S' secured to the pawl-carrier and co-operating with the wheel F, substantially as described.

31. In a fare register, the combination of the trip register wheel F mounted to turn upon and move longitudinally of the central



spindle G and provided with the gear ring Z, the shaft E<sup>2</sup> having the pinion D<sup>2</sup> normally in mesh with the ring Z, the pawl-carrier I and pawl H for turning the wheel F, the re-  
 5 setting shaft B' having the gear A' co-operating with the ring Z and the cone bearing H' co-operating with the wheel F, the spring D' for the shaft B', the latch-plate N' co-operating with the groove M' in the shaft,  
 10 and the trip P' carried by the wheel F and co-operating with the plate N', substantially as described.

32. In a fare register, the combination of the trip register wheel F having the gear ring  
 15 Z, the pawl-carrier I and pawl H for turning the wheel, the shaft E<sup>2</sup> having the pinion D<sup>2</sup> meshing with the ring Z, the registers H<sup>2</sup> I<sup>2</sup> loose upon the shaft E<sup>2</sup>, the perforated disks J<sup>2</sup> K<sup>2</sup> loose upon said shaft, one turning with  
 20 the units wheel of each register, the clutch-piece O<sup>2</sup> provided with the pins P<sup>2</sup> Q<sup>2</sup> co-operating with the disks J<sup>2</sup> K<sup>2</sup>, the reciprocating shaft S<sup>2</sup> carrying the yoke-arm R<sup>2</sup> engaging the clutch-piece O<sup>2</sup>, and the lever Q having  
 25 the opposite arms co-operating with the pawl-carrier and the arm V<sup>2</sup> provided with the cam-slot U<sup>2</sup> co-operating with the stud T<sup>2</sup> upon the shaft S<sup>2</sup>, substantially as described.

33. In a fare register, the combination of  
 30 the oscillatory indicating drum X<sup>2</sup>, the rocking sleeve B<sup>3</sup> connected thereto and provided with the arms D<sup>3</sup>, and the lever Q having the cams E<sup>3</sup> F<sup>3</sup> co-operating with the arms D<sup>3</sup>, substantially as described.

34. In a fare register, the combination of  
 35 the trip register wheel, the pawl-carrier and pawl for turning the same, the rotary and longitudinally movable resetting shaft, and the lever W' reciprocating with the resetting  
 40 shaft and movable into the path of the pawl-carrier, to lock the same, when the shaft is moved to resetting position, substantially as described.

35. In a fare register, the combination of  
 45 the trip indicator provided with the ratchet U', the pawl-arm V' reciprocating with the resetting shaft, and the spring Y' bearing against the ratchet U' and operating to turn the latter slightly at each withdrawal of the  
 50 pawl-arm V', substantially as and for the purpose described.

36. In a fare register, the combination of a trip register wheel provided with a gear, and a rotary and longitudinally movable resetting  
 55 shaft having a gear fast upon it, said gear being normally out of mesh with the gear upon the wheel and adapted to be moved into mesh with it when the shaft is slid to resetting position, to gear the shaft to the wheel and cause  
 60 the latter to be reset by rotation of the shaft, substantially as described.

37. In a fare register, the combination of a trip register wheel provided with a gear, a pointer fast upon said wheel, a dial over which  
 65 the pointer moves, and a rotary and longitudinally movable resetting shaft having a

gear fast upon it, said gear being normally out of mesh with the gear upon the wheel and adapted to be moved into mesh with it when the shaft is slid to resetting position, to cause  
 70 the wheel to be reset by rotation of the shaft, substantially as described.

38. In a fare register, the combination of a trip register wheel provided with a gear, a rotary and longitudinally movable resetting  
 75 shaft having a gear fast upon it, said gear being normally out of mesh with the gear upon the wheel and adapted to be moved into mesh with it when the shaft is slid to resetting position, a latch for holding the shaft in resetting  
 80 position, and a trip co-operating with the latch to release the shaft when the wheel has been reset to initial position, substantially as described.

39. In a fare register, the combination of a  
 85 trip register wheel provided with a ratchet and a gear, an actuating pawl co-operating with the ratchet to turn the wheel, a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being  
 90 adapted to move said gear into mesh with the gear upon the wheel and to disengage the wheel and actuating pawl when the shaft is slid to resetting position, to permit the wheel to be reset by rotation of the shaft, substan-  
 95 tially as described.

40. In a fare register, the combination of a trip register wheel having a gear, a permanent register normally in driving connection with  
 100 said wheel, and a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the gear upon the wheel and to disconnect  
 105 said wheel and the permanent register, to permit the trip register wheel to be reset by rotation of the shaft without affecting the permanent register, substantially as described.

41. In a fare register, the combination of a trip register wheel having a gear, a rotary  
 110 shaft having fast upon it a pinion normally meshing with said gear, a permanent register actuated by such shaft, and a rotary and longitudinally movable resetting shaft having a  
 115 gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the gear upon the wheel and to disengage the gear upon the wheel and the pinion upon the rotary shaft, to disconnect the  
 120 permanent and trip registers and permit the latter to be reset without affecting the former, substantially as described.

42. In a fare register, the combination of a trip register wheel provided with a gear, a permanent register normally geared to said  
 125 wheel, a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the gear upon the wheel and to disconnect said wheel  
 130 from the permanent register, a latch for holding the shaft in resetting position, and a trip

co-operating with the latch to release the shaft when the wheel is reset to initial position, substantially as described.

43. In a fare register, the combination of a trip register wheel provided with a ratchet and a gear, an actuating pawl co-operating with the ratchet to turn the wheel, a rotary shaft provided with a pinion normally meshing with the gear upon the wheel, a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the gear upon the wheel and to disconnect the actuating pawl and ratchet and the gear and pinion, a spring yieldingly holding the resetting shaft in normal position, a latch for holding it in resetting position against the stress of such spring, and a trip upon the wheel co-operating with the latch to release the shaft when the wheel is reset to initial position, substantially as described.

44. In a fare register, the combination of a trip register wheel provided with a gear, a pointer fast upon said wheel, a dial over which the pointer moves, a permanent register normally geared to said wheel, a rotary and longitudinally movable resetting shaft having a gear fast upon it, said shaft being adapted when slid to resetting position to engage its gear with the gear upon the wheel and to disconnect the wheel and permanent register, a spring yieldingly holding the shaft in normal position, a latch for holding it in resetting position against the stress of such spring, and a trip co-operating with the latch to release the shaft when the wheel is reset to initial position, substantially as described.

45. In a fare register, the combination of a trip register for registering the total number of fares of all classes during a trip, two permanent registers for registering different classes of fares, adapted to be independently connected with and actuated by the trip register, and means for actuating the trip register and automatically connecting either permanent register with it at will by a single operation.

46. In a fare register, the combination of a trip register for registering the total number of fares of all classes during a trip and adapted to be reset at the end of each trip, a trip indicator automatically operated by the resettings of the trip register, two permanent registers adapted to register different classes of fares, and means for actuating either one of said permanent registers and the trip register at will.

47. In a fare register, the combination of a trip register adapted to be re-set to zero at

the end of each trip, a trip indicator automatically operated by the re-settings of the trip register, two permanent registers adapted to be independently connected with the trip register, and means for actuating the same and connecting either of them at will with the trip register.

48. In a fare register, the combination of a trip register for registering the total number of fares for all classes during a trip, two permanent registers for registering different classes of fares, fare-indicating devices for indicating the different classes of fares, and means for actuating the trip register and either one of the permanent registers at will, and automatically exposing the corresponding fare indicator by a single operation.

49. In a fare register, the combination of a trip register, two permanent registers for registering different classes of fares and adapted to be independently connected with and actuated by the trip register, fare-indicating devices for indicating the different classes of fares, and means for actuating the trip register and automatically connecting either register with it at will and exposing the corresponding fare indicator.

50. In a fare register, the combination of a trip register, two permanent registers for registering different classes of fares adapted to be independently connected with and actuated by the trip register, a fare indicator for indicating different classes of fares, and means for actuating the trip register and automatically connecting either permanent register with it and shifting the fare indicator to indicate the corresponding class of fare.

51. In a fare register, the combination of a trip register, a rotary shaft in gear therewith, two permanent registers for registering different classes of fares, a clutch between the shaft and registers, and means for turning the shaft and shifting the clutch to independently connect said registers with the shaft at will.

52. In a fare register, the combination of a trip register, a rotary shaft in gear therewith, two permanent registers for registering different classes of fares, a clutch for independently connecting said registers with the shaft, a fare indicator for indicating the different classes of fares, and means for actuating the trip register and shifting the clutch and fare indicator.

LEO EHRLICH.

Witnesses:

R. B. CAFFRAY,  
S. W. BRAINARD.