

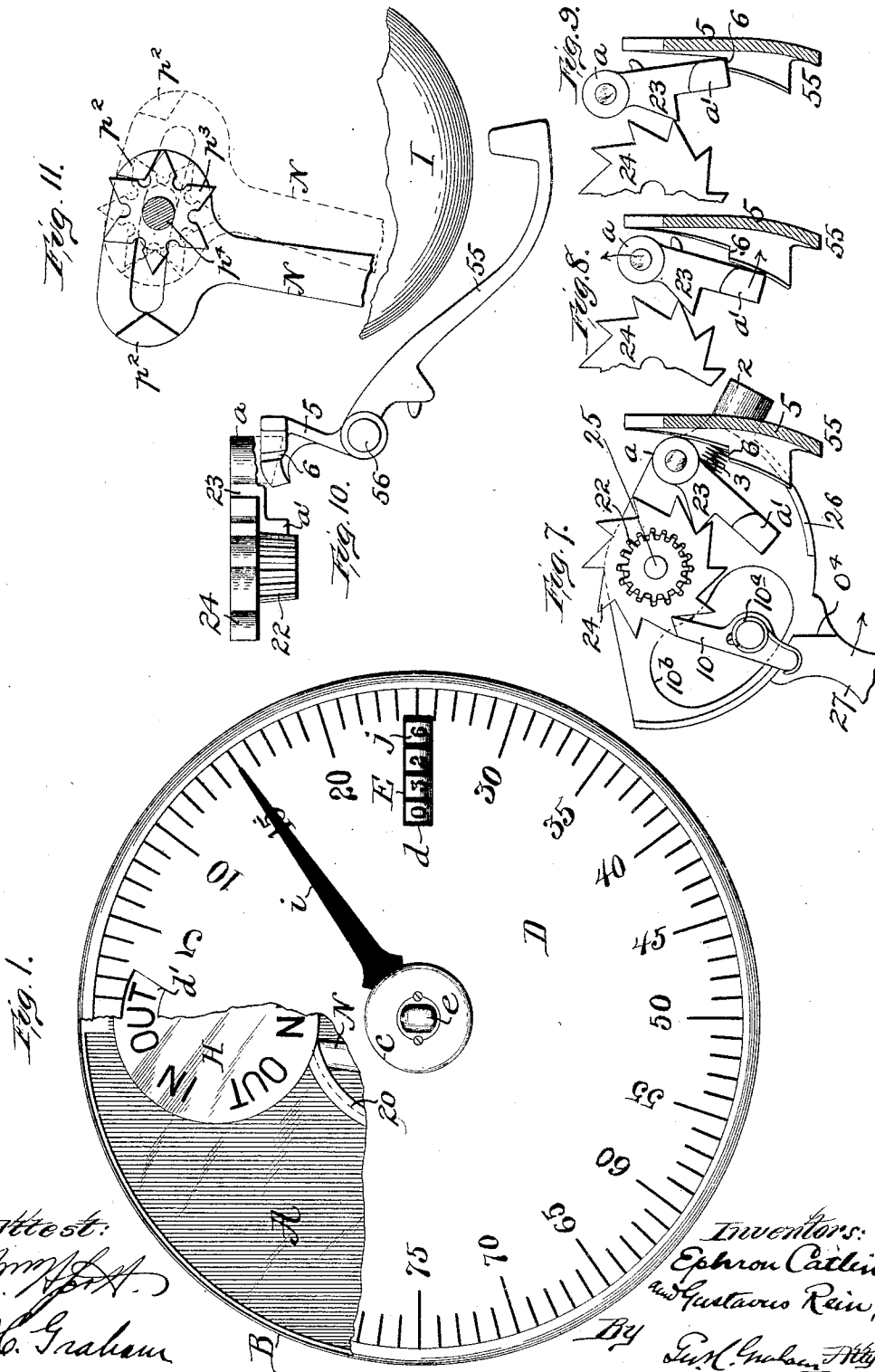
(No Model.)

3 Sheets—Sheet 1.

E. CATLIN & G. REIN.
FARE REGISTER.

No. 531,020.

Patented Dec. 18, 1894.



Attest:
[Signature]
H. Graham

Inventors:
Ephron Catlin
and Gustavus Rein,
By *[Signature]* H. Graham, Atty.

(No Model.)

3 Sheets—Sheet 2.

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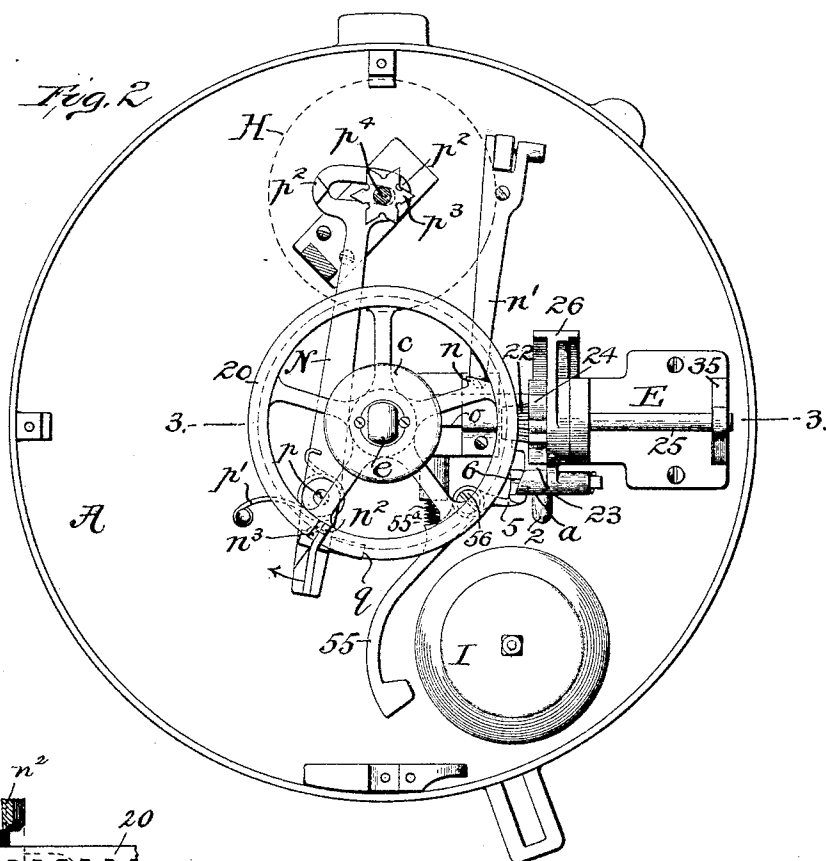


Fig. 14.

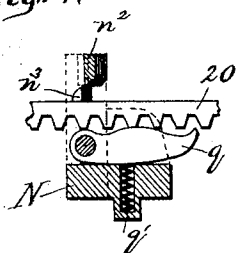


Fig. 15.

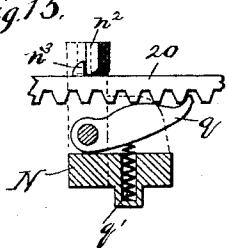


Fig. 4

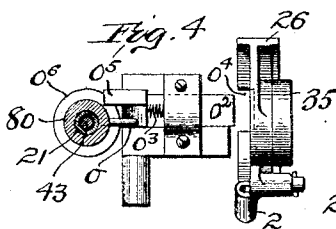


Fig. 6.

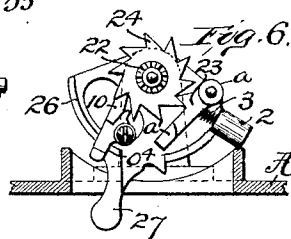
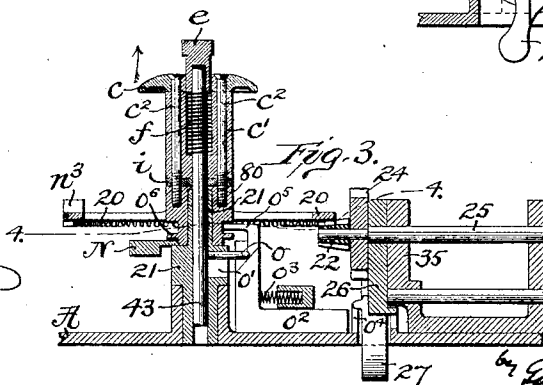


Fig. 3.



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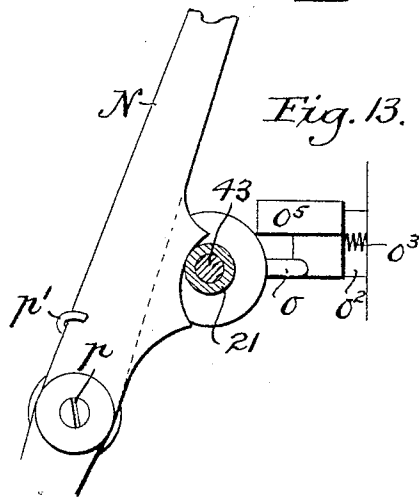
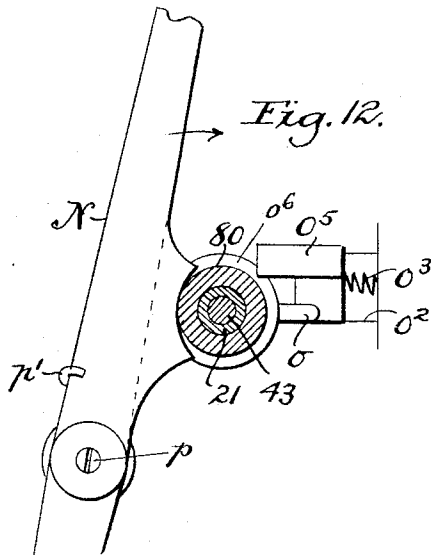
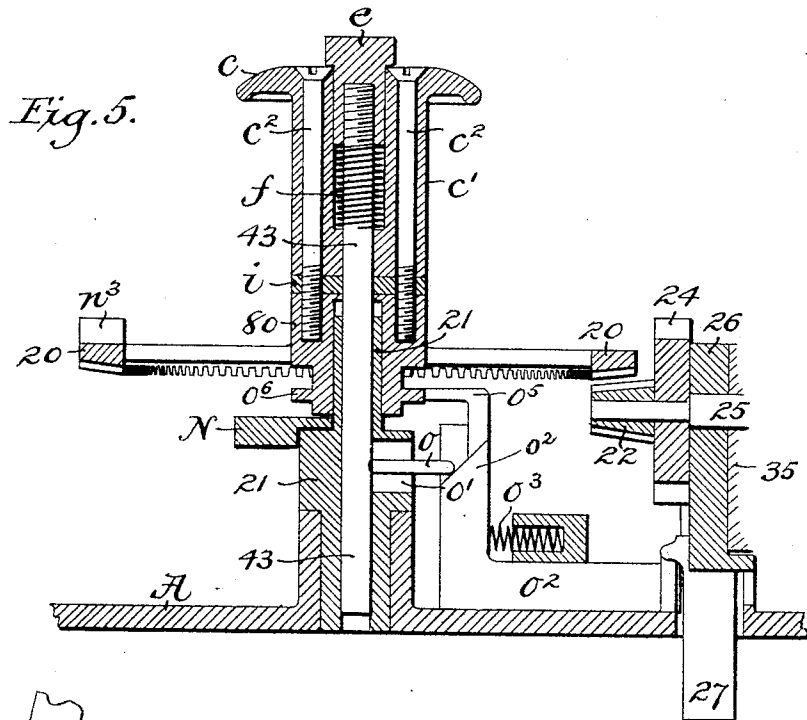
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WITNESSES:

H. Graham
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INVENTORS

Ephron Catlin & Gustavus Rein,

BY

E. M. Graham
ATTORNEY

UNITED STATES PATENT OFFICE.

EPHRON CATLIN AND GUSTAVUS REIN, OF ST. LOUIS, MISSOURI, ASSIGNORS
TO THE ST. LOUIS REGISTER COMPANY, OF SAME PLACE.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 531,020, dated December 18, 1894.

Application filed October 24, 1893. Serial No. 489,061. (No model.)

To all whom it may concern:

Be it known that we, EPHRON CATLIN, a citizen of the United States, and GUSTAVUS REIN, a subject of the German Emperor, both residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Fare-Registers, of which the following is a specification.

This invention relates to that class of street car registers in which is employed a step by step revoluble index moving over a fixed register-dial forming the trip register, together with a permanent register or set of adding wheels that is or are moved in unison with the index of the trip register to preserve the sum of the operations of the register while the index may be returned to zero.

The present invention embraces certain improvements upon such registers, which more particularly reside in the means for returning the trip register to zero; in the means for locking and releasing the permanent register during and upon the completion of the return of the trip register to zero; in the means for changing the position of the direction-indicator; and also in certain details of construction and combination of parts fully herein-after set forth.

In the accompanying drawings which illustrate a practical embodiment of the invention: Figure 1 is a face view of a fare register embodying the improvements, a part of the register-dial being broken away to disclose a portion of the underlying parts. Fig. 2 is an elevation of the mechanism of the register underlying the register-dial which has been removed, the wheels of the permanent register being omitted. Fig. 3 is a vertical cross section on the line 3—3, of Fig. 2, showing only a portion of the base or back-plate, with the parts in normal operative position. Fig. 4 is a horizontal section on the line 4—4, of Fig. 3, showing particularly the locking device for the permanent register. Fig. 5 is a section similar to Fig. 3, with the parts in a changed position at the time the trip register gear has been disconnected from the permanent register, and the latter register locked against movement. Fig. 6 is an end elevation of the devices for actuating the register, showing the pawl, pawl-carrier, ratchet, and

bevel pinion. Figs. 7, 8, and 9 are enlarged detail elevations partly in section of the parts and portion of the parts shown in Fig. 6, with the addition of a portion of the bell hammer illustrating the action of the pawl upon the bell hammer. Fig. 10 is a plan view of some of the parts shown in Fig. 7 with the bell hammer and portion of the bell showing how the head of the bell hammer is held a short distance from the bell after each striking movement. Fig. 11 is an enlarged sectional detail of the toothed wheel and anchor-lever for operating the direction-indicator. Figs. 12 and 13 are views of the means for locking and releasing the anchor-lever. Figs. 14 and 15 are sectional elevations of a hold-back pawl in inactive and active positions.

Referring to said drawings, it will be understood that the mechanism of the fare register, considered as a whole, is supported by a base plate A, surrounded as usual by an inclosing case B. The mechanism embraces a trip-register represented by the rotatable step by step movable index hand *i* overlying the register dial D, and a permanent register E represented by a number of adding wheels (shown in Fig. 1), adapted to preserve the sum of the operations of the trip register.

The dial D is permanently mounted on suitable posts projecting from the base plate A and is provided with a central perforation for the hub 80 of a bevel gear 20, and with openings *d*, *d'*, one for exposing the numerals on the wheels of the permanent register E, and the other for one or the other of the indications of a direction indicator H. The bevel gear 20 is mounted to rotate loosely on a journal formed by a central post or stud 21 projecting from the base plate A, the inner end of the hub 80 resting normally on a shoulder formed integral with the post 21. As shown in Figs. 3 and 5 the post 21 is a separate piece firmly and rigidly seated in a boss on the base plate A. To the outer side of the hub 80 of this gear 20 is fixedly secured the index *i*, it being in this instance interposed between said hub and the shank *c'* of a projecting grasping piece *c*, screws *c*² being tapped into the hub 80 to secure said grasping-piece, index, and hub together. The shank or hub *c'* of the grasping piece *c*, the

bevel gear 20, and the post 21 having a central perforation in which is supported a longitudinally movable rod or stem 43 having at its outer end projecting from the center of the

5 grasping piece *c* a thumb piece or knob *e*.

Between the inner end of the thumb-piece *e* and an inner shoulder in the hub *c'* is interposed a helical spring *f* surrounding the rod or stem 43, by which spring the rod 43 is
10 held outward and the grasping-piece *c* and connected bevel gear 20 inward and thus permits, as will presently appear, an inward movement of the rod 43, and an outward movement of the grasping-piece *c* against the
15 pressure of said spring *f*.

The bevel gear 20 when in its normal position as in Fig. 3, meshes with a bevel pinion 22 that is fixed to a horizontal shaft 25 of the adding wheels of the permanent register E
20 so that the trip register and the permanent register shall move in unison. The shaft 25 is mounted in bearings in a frame 35 that is rigidly fixed to the base plate A at one side of the axis of the bevel gear 20. The shaft
25 25 has also secured to it a ratchet 24 with which engages a pawl 23 of the actuating device. The pawl 23 is connected to a pawl-carrier 26 that is hung loosely on the shaft 25 and has an operating finger 27 projecting
30 through a slot in the base-plate A which is intended to be engaged by an actuating slide (not shown) that is in turn connected to one or more operating cords extending through the car to be pulled by the conductor to rock the
35 pawl carrier 26 and its pawl 23 in one direction against the force of a spring connected to the slide, which spring as soon as the operating cord is freed by the conductor returns the slide to its normal position and also rocks
40 the pawl-carrier and pawl back to their starting positions, completing one registering movement of the connected parts. This slide and the spring is not herein shown, as its construction and operation are now well known,
45 an example and description thereof being found in Letters Patent No. 490,342, granted January 24, 1893, to Leo Ehrlich.

The pawl 23 is formed with a projecting hub *a* at its pivotal connection with the pawl-carrier 26, and at its free end with a nose *a'*
50 for coaction with the bell hammer 55 in a manner to be explained, and said pawl is held to duty in engagement with the ratchet 24 by a compression spring 3 that is held in a socket
55 2 formed in said pawl-carrier.

Each time the pawl carrier is oscillated or rocked once forward and back, a single step movement is imparted to the ratchet 24 and by it to the shaft 25 moving the units wheel
60 *j* (see Fig. 1), of the permanent register one step and through the bevel pinion 22 and gear 20, the index *i*, one step, thereby registering one fare. A repetition of the oscillation of the pawl-carrier moves the index *i* and units wheel
65 *j* another step and so on. The units wheel *j* is fixed to the shaft 25 as in said patent. Any backward movement of the ratchet 24 is pre-

vented by a hold-back pawl 10 pivoted on a stud projecting from the frame 35 and projecting through an opening 10^b in the pawl
70 carrier 26, as seen in Fig. 7, said pawl 10 being held to duty by a spring 10^a coiled about its pivot stud.

The bell hammer 55 is mounted on a pivot 56 projecting from the base-plate A, see Figs. 75 2 and 10, and is arranged to strike the bell I upon the forward movement of the pawl-carrier 26, indicated by the arrow in Fig. 7, through the instrumentality of the pawl 23. To this end the bell hammer 55 is formed
80 beyond its pivot with a heel 5 (as seen in Fig. 2) having a flange that provides a notch or step 6, (see Figs. 7, 8, 9, and 10) which flange is arranged to be borne upon at different times by the nose *a'* of the pawl 23
85 and by the hub *a* of said pawl. When the pawl carrier 26 is rocked forward as indicated by the arrow in Fig. 7, the end of the pawl 23 in moving past a tooth of the ratchet 24 is rocked or forced outward as indicated in Fig. 90 8, so that its nose *a'* strikes against the flanged heel 5 of the bell hammer 55 thereby rocking said hammer and carrying its head away from the bell I. As the pawl-carrier 26 and pawl 23 continue to move in the direction of the
95 arrow, Fig. 7, the pawl 23 under the force of its spring 3 suddenly vibrates into engagement with the tooth of the ratchet 24 so that its nose *a'* leaves the heel 5 of the bell hammer 55 and allows said hammer to likewise
100 suddenly strike the bell. On the return oscillation of the pawl-carrier 26 and pawl 23 in moving the ratchet 24 one step, the hub *a* of said pawl bears against the flanged heel 5 of the bell hammer, and said flange being
105 slightly cam shaped or not concentric with the arc of movement of the pivot of the pawl 23, said bell hammer 55 is rocked slightly on its pivot to carry its head away from contact with the bell which it has just struck,
110 as is shown in Figs. 2, 7, and 10. The movement of the head of the bell-hammer away from the bell takes place immediately after the bell has been sounded and hence the continued bearing of the hammer upon the
115 bell does not tend to lessen its vibrations. As the pawl-carrier 26 nearly reaches the limit of its forward oscillation, the pawl 23 or its nose *a'* is arranged to engage or enter the step or notch 6 in the heel 5 of the bell
120 hammer 55 and thus prevents a premature backward movement of the pawl-carrier at such time, as is seen in Fig. 9. In this position of the parts the pawl 23 has not quite engaged with the tooth of the ratchet 24, and
125 is thus obliged to make a slight further movement to drop into the depression of such tooth. As soon as this occurs the nose *a'* of the pawl 23 has been freed from the notch 6 of the bell hammer and hence said pawl is enabled to
130 move back to its original position moving the ratchet 24 and its connected parts one step forward. By this construction of the bell hammer and its coaction with the operating

pawl 23, the very important function of preventing a return movement of the pawl before reaching the limit of its stroke is prevented. Heretofore this guard against the premature return of the pawl has been effected by a toothed edge and detent on the inner side of the false back plate with which these registers are usually provided as in said former Letters Patent No. 490,342, but the perfection of its working depended upon the accuracy with which two independent castings were interlocked, and much trouble was found in practice to obtain this accuracy in view of the different degrees of shrinkage of the metal. In the present construction, as the pawl and bell hammer are fitted to and carried by the same back plate the former difficulty is entirely overcome.

In the course of the use of the register as thus far described the trip-register wheel 20 is rotated step by step with the index i carrying said index away from the zero mark on the dial and also carrying an abutment n rigid with said wheel 20 away from the free end of the zero stop n' which stop is mounted yielding in one direction only, so as to permit said abutment n in the forward movement of said wheel 20 when having registered one hundred fares or made a complete rotation to pass said stop without interference, but said zero stop is fixed in the other direction so that when the wheel 20 is rotated back to the zero position its abutment n will strike the end of the zero-stop n' and the wheel be held against further movement in that direction. To effect this backward rotation of the wheel 20 and index i , the teeth of the wheel 20 are first removed from mesh with the pinion 22 and for this purpose the operator grasps the hand wheel or grasping piece c and pulls it outwardly against the tension of the spring f . In order, however, to first lock the permanent register E against movement while this disconnection of the wheel 20 and pinion 22 occurs and to prevent this disconnection until the lock is moved into locking position, the rod 43 is pressed inwardly also against the tension of said spring f , by a pressure of the finger upon its thumb-piece e . This inward movement of the rod 43 forces a pin o (which it carries projecting through a slot o' in the central post 21) against the inclined upper end of an L-shaped slide o^2 forming the lock so that said slide is moved outwardly in its guideway on the base plate against a compression spring o^3 so that its outer end is moved in front of a projection or engaged with a recess o^4 in the pawl-carrier 26, see Fig. 4, and thereby securely locking said carrier and its pawl against movement. This locking slide o^2 carries a finger or guard o^5 that normally overlies a flange or shoulder o^6 on the hub 80 of the wheel 20 and hence resists any tendency to move the wheel 20 outward to disconnect it from the pinion 22; but when the locking slide o^2 is moved into locking position this finger o^5 is simultaneously removed from over the flange o^6 , see Fig. 5,

and hence releases the wheel 20. In this moved position of the guard o^5 its end bears against the circumference of the flange o^6 and thus prevents the return of the locking slide o^2 until said flange is removed by the return of the wheel 20 to normal position. As soon as this wheel 20 is disconnected from the pinion 22 said wheel is then free to be rotated backwardly until stopped by a secondary zero stop n^2 mounted on the lever n meeting a projection n^3 on the upper side of the wheel 20; this secondary stop being provided mainly for another purpose as will be presently explained.

The direction indicator H is moved to change its indication each time the trip register wheel 20 is disconnected from the pinion 22, it not being dependent for its movement upon the backward rotation of the trip register to zero position because in some instances no fares may have been collected and hence no movement of the register has taken place during a trip of the car. The secondary stop n^2 is carried at the end of the short arm of a lever N that is pivoted on a stud p projecting from the base plate, a coiled spring p' tending to rock the lever in the direction of the arrow in Figs. 2 and 12. The other or longer arm of the lever N is shaped in the form of an anchor lever having pallets p^2 (see Figs. 2 and 11) in position alternately to engage the teeth of star wheel p^3 that is secured to a shaft p^4 carrying at its outer end a disk on which are delineated the direction indications. The tendency of the coiled spring p' is such that as soon as the wheel 20 is disconnected from the pinion 22 and its projection n^3 raised into alignment with the stop n^2 , said wheel 20, assuming said wheel has not been moved during a trip of the vehicle is rotated forward slightly by the force exerted by said secondary stop n^2 upon the projection n^3 and thus permits said coiled spring to rock the lever N in the direction of the arrow Fig. 2, to throw the opposite or anchor portion of the lever into the position shown by dotted lines, Fig. 11. This movement of the lever N has forced one of its pallets p^2 into contact with the star wheel p^3 and moved it a partial step in the act of imparting a full step movement to the direction indicator disk H to change the indication. The slight forward movement of the wheel 20 under the action of the spring p' only occurs when the projection n^3 is against the stop n^2 , the register not having been operated during a trip; but, should the register have been operated and the projection n^3 consequently removed, a more or less distance from the stop n^2 , said slight forward movement does not occur. The remaining portion of the step movement of the direction indicator is effected by the return vibration of the lever N brought about by the forcing backward pressure of the projection n^3 against the stop n^2 to rock said lever in bringing the wheel 20 exactly to the zero position.

While the wheel 20 is in operative position

in mesh with the pinion 22 the lever N is held against premature movement by the extreme end of the hub 80 of the wheel 20 being interposed in its path of vibration as in Figs. 3 and 12, preventing any movement of said lever, but when the wheel 20 is moved outwardly out of mesh with the pinion 22 in the act of returning it to zero position the hub is moved from its position restraining the lever N, whereupon under the force of its spring p' it rocks below the end of the hub against the central post 21 as in Figs. 5 and 13. When the lever N is rocked back to its original position on the return of the wheel 20 to zero, the hub 80 of the wheel 20 is again interposed to hold the lever against movement.

Any forward movement of the wheel 20 when in its disconnected position is prevented by a pawl q , that is pivoted to the outer short arm end of the lever N, see Figs. 2, 14, and 15, and borne upon by a compression spring q' . When the wheel 20 is down in its normal position the pawl q is forced and held downward against the slight tension of its spring q' as in Fig. 14, and the teeth of the wheel 20 ride over its body portion its free end thus not offering any obstruction to the forward rotation of the wheel; but when the wheel is raised as in Fig. 15, into disconnected position as before explained, the end of the pawl q moves to its active position in engagement with the teeth of said wheel 20 to prevent forward rotations.

What is claimed is—

1. The combination of the permanent register mounted in a fixed position, a trip register normally connected to move in unison with the permanent register, and means for moving the trip register outwardly on its axis of rotation to disconnect the two registers and rotate the trip register to zero, substantially as described.

2. The combination of the permanent register, a trip register normally connected to move in unison with the permanent register, a bearing for the trip register permitting the outward movement of the trip register and on which said register rotates, and a grasping piece connected with the trip register for moving said trip register, and returning it to zero substantially as described.

3. The combination of the permanent register, mounted in a fixed position, a trip register connected therewith, a grasping piece for disconnecting the trip register, and a lock acting to lock the permanent register against movement while disconnected, substantially as described.

4. The combination of the permanent register, a trip register connected therewith, a grasping piece for disconnecting the trip register, a guard preventing such disconnection, and means for removing said guard, substantially as described.

5. The combination of the permanent register mounted in a fixed position, an outwardly movable trip register, a grasping piece therefor, a lock acting to lock the permanent register, a push piece mounted within said grasping piece to move the lock into operative position, substantially as described.

6. In a register, the combination of the actuating pawl, and a stepped or notched piece mounted adjacent said pawl to be free thereof in the forward actuating movement of the pawl and to be engaged thereby and prevent a premature return movement thereof, substantially as described.

7. In a register, the combination of the actuating pawl, and a bell hammer rocked by said pawl and having a stepped or notched portion in position to be engaged by the pawl to prevent its premature return movement, substantially as described.

8. The combination of the direction indicator anchor lever, carrying a stop, the trip register wheel having a projection for contact with said stop, and means for rotating said wheel to move the lever, substantially as described.

9. The combination of the outwardly movable trip register wheel and the pawl q adapted to occupy inactive and active positions with respect to said wheel to prevent operative forward movement of said wheel in one of its moved positions, substantially as described.

10. The combination with the direction indicator, of an anchor-lever, for moving said indicator, a spring for rocking the lever in one direction, a removable stop restraining the action of the spring, and means for rocking the lever in the opposite direction, substantially as described.

11. The combination with the trip and permanent registers, of means for disconnecting said registers, a guard normally preventing the disconnection, and a lock acting to lock one of the registers against movement, and means for removing the guard and moving the lock, substantially as described.

12. The combination with the trip and permanent registers and means for moving the trip register into disconnected position, of a guard normally engaging the trip register and preventing its disconnection movement and a lock acting to lock the permanent register against movement while the trip register is disconnected, substantially as described.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

EPHRON CATLIN.
GUSTAVUS REIN.

Witnesses as to Ephron Catlin:

WM. F. CASWELL,
F. A. FLANDERS.

Witnesses as to Gustavus Rein:

E. F. WICKHAM,
E. A. TRACY.