

L. EHRLICH, G. REIN & E. CATLIN.

FARE REGISTER.

No. 536,273.

Patented Mar. 26, 1895.

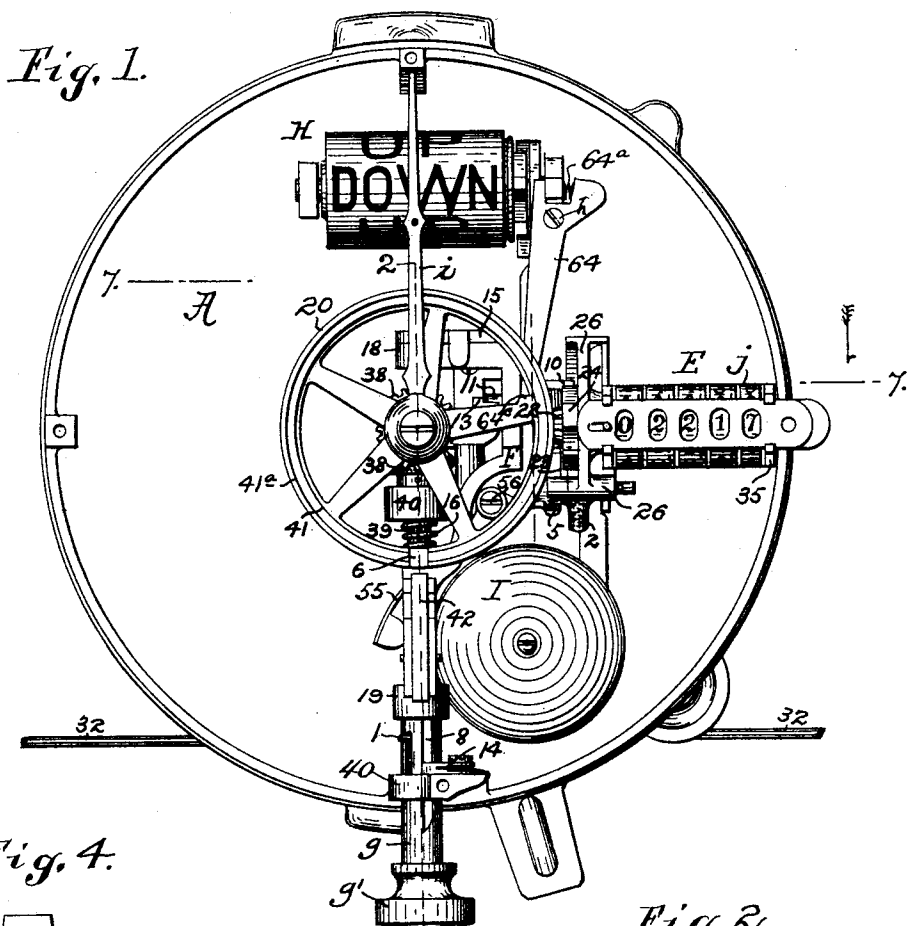


Fig. 4.

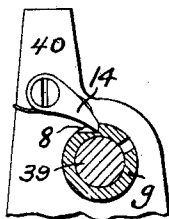


Fig. 2.

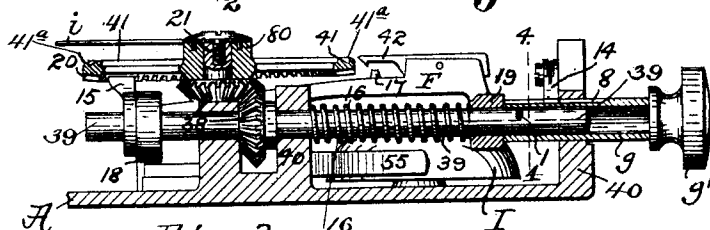
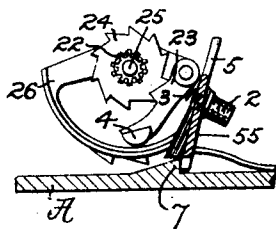


Fig. 3.



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(No Model.)

2 Sheets—Sheet 2.

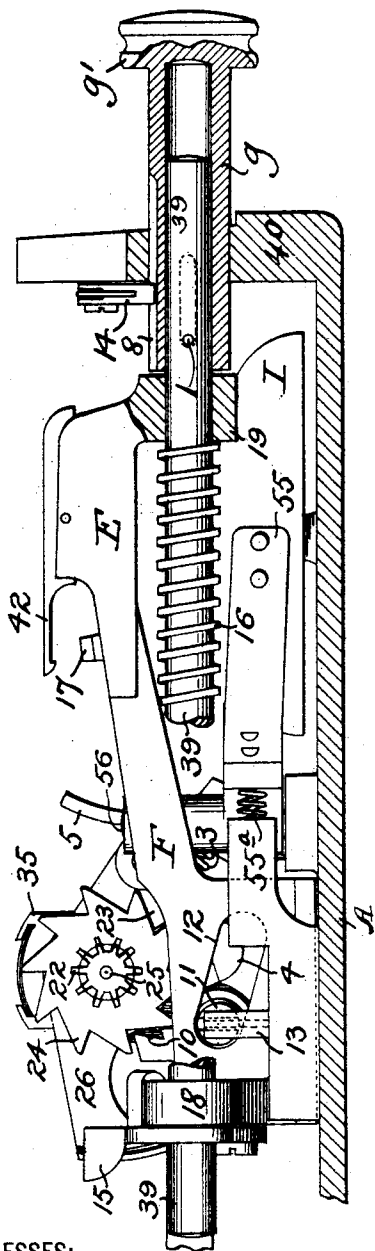
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Fig. 5.



WITNESSES:
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Fig. 7.

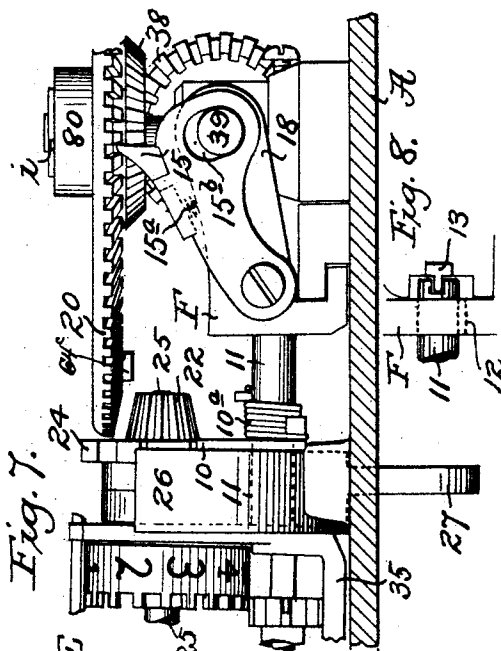


Fig. 6.

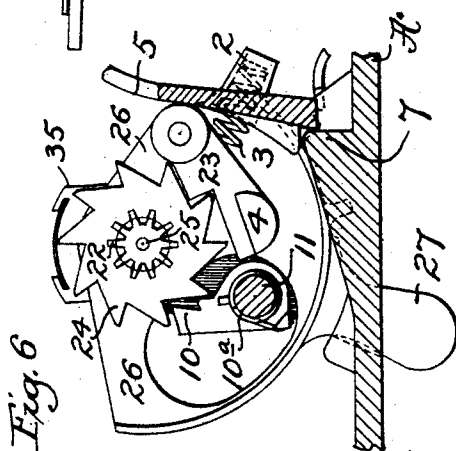
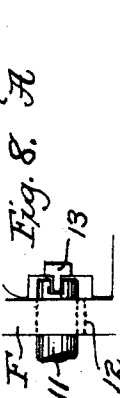


Fig. 8.



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UNITED STATES PATENT OFFICE.

LEO EHRLICH, GUSTAVUS REIN, AND EPHRON CATLIN, OF ST. LOUIS, MISSOURI,
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FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 536,273, dated March 26, 1895.

Application filed November 5, 1892. Serial No. 451,109. (No model.)

To all whom it may concern:

Be it known that we, LEO EHRLICH, GUSTAVUS REIN, and EPHRON CATLIN, of St. Louis, in the 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 registers and indicators commonly called street-car or fare registers wherein is employed a step by step revoluble index moving over a fixed indicator-dial in connection with a permanent register or set of adding wheels that 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 is an improvement on the structure and operation of the devices set forth in Letters Patent of Leo Ehrlich, No. 490,342, dated January 24, 1893, whereby simplification is obtained and more effective operation secured; and consists, chiefly, in a certain novel construction of the resetting device for returning the trip-register to the zero or starting position whereby the required coupling mechanism heretofore employed in similar registers is wholly dispensed with.

It also consists in the novel construction hereinafter fully set forth.

In the drawings which illustrate a practical embodiment of the invention Figure 1 is an elevation of the register with the inclosing case, the glass front, and the dial removed to disclose the operative mechanism. Fig. 2 is a vertical central sectional elevation on the line 2—2 of Fig. 1. Fig. 3 is an end elevation of the actuating pawl-carrier, pawl, and ratchet, and bevel pinion for connection with the bevel wheel of the trip-register. Fig. 4 is an enlarged cross section on the line 4—4 of Fig. 2, showing the hold back pawl of the resetting device for the trip-register. Fig. 5 is an enlarged central section similar to Fig. 2 with the exception that certain gearing is omitted to expose other parts. Fig. 6 is an enlarged sectional and end elevation of the parts shown in Fig. 3, with other adjacent devices. Fig. 7 is a sectional elevation taken on the line 7—7 of Fig. 1, looking in the direction of the arrow, and looking from the

left of Figs. 2, 5, and 6. Fig. 8 is a detail plan of a guide for steadying the end of the stud 11.

It is to be understood that only so much of the register is shown herein as is necessary to an understanding of the present invention; parts not herein particularly specified and illustrated being the same as in said patent.

The mechanism of the register is supported by a base plate A surrounded as usual by an inclosing case. The register consists of a trip-register represented by the revoluble index hand *i* in connection with the usual dial, not shown; and of a permanent register E represented by a number of adding wheels adapted to preserve the sum of the operations of the trip-register.

The index *i* is fixedly secured to the hub 80 of a bevel gear 20 that is supported to rotate loosely on a central bearing stud 21 projecting from the base plate. The step-by-step indicating movements of the index are imparted by the oscillations of an actuating device consisting of a pawl 23 that engages with a ratchet 24 fast to a bevel pinion 22 which meshes with the gear 20. The ratchet 24 and bevel pinion 22 are both fast to the shaft 25 of the adding device or permanent register E, the units wheel *j* of which is also fast to said shaft; and any backward movement is prevented by a hold-back pawl 10 in this instance engaging with the ratchet 24, which pawl 10 is held to duty by a spring 10^a. The pawl 23 is carried by a pawl carrier 26, see Figs. 1, 3, and 6, that is hung loosely on the shaft 25 and is moved through its finger 27 in any suitable manner as in said application by an operating cord 32 that extends within reach of the operator. The arrangement is such that each time the operating cord 32 is pulled upon, the pawl carrier 26 is oscillated so that in moving in one direction backward the pawl 23 passes over the ratchet and engages with a tooth thereof, and in the opposite direction moves such ratchet forward a step, thus moving the permanent register a step and through the pinion 22 and gear 20 the index *i* also one step.

The pawl 23 is held to duty in engagement with the ratchet 24 by a small coiled spring 3, held in a socket 2 carried by the pawl-car-

rier 26 and bearing against the back of the pawl.

An alarm is sounded each time the pawl-carrier 26 is oscillated by providing the end 5 of the pawl 23 with a boss 4 which as the pawl is pressed outward in passing backward over a tooth of the ratchet 24 bears against a widened end 5 of a bell-hammer 55 mounted on a pivot 56 on the base-plate A. The dropping and engagement of the pawl with the succeeding tooth suddenly releases the bell-hammer and allows it to spring forward under the tension of its spring 55^a and forcibly strike the bell I; such forward movement of the bell-hammer being limited by an abutment 7 projecting from the base-plate A, as seen in Figs. 3 and 6. After the bell has thus been struck the widened, or as it may be stated, lengthened end 5 of the bell-hammer returns in position in time to meet the heel of the pawl 23 which then bears against it and slides along its face with sufficient friction to prevent any over-movement of the trip and permanent registers by any sudden return of the pawl on this its feeding movement, which as is common is caused by the force of a spring, not herein shown.

The permanent register E, as before stated consists of the usual series of adding wheels representing units, tens, hundreds, thousands, &c., carried by the shaft 25 in the frame 35 and having the usual carrying pinions. This permanent-register carrying-frame 35 is hinged upon a pin 36 at its outer side to the back plate A, see Fig. 7 so that the frame, adding wheels, actuating pawl-carrier 26, and bevel pinion 22 may be rocked bodily toward the back plate A, to disconnect said pinion 22 from the gear 20 whereby the permanent register is temporarily disconnected from the trip-register and thus render the trip-register capable of being returned to zero independent of the permanent register. So far as some of the features of the present invention are concerned other means of disconnection may be employed.

The re-setting device or mechanism by which the trip-register is returned to the zero position or initial starting point without disturbing the permanent register, consists in the main of a revoluble shaft 39, in gear with the trip-register and a means for disconnecting a hold-back or lock from the trip-register whereby it is rendered free to move by means of said shaft.

In the present practical embodiment of this invention, the revoluble resetting shaft 39, is mounted in suitable bearings 40, projecting from the base-plate A of the register and is in gear with the index *i* of the trip-register by a pair of miter-gears 38 (see Figs. 1, 2, and 7) one fast to the end of said shaft and the other fast to the bevel gear 20, so that, as the index *i* is moved step by step in registering the fares collected, the shaft 39 will be correspondingly moved.

The backward movement of the trip-regis-

ter is in the present case prevented by the action of the hold-back pawl 10, engaging with the ratchet 24, through the geared connection between the trip and the permanent registers. In order, therefore, to relieve the trip-register from the influence of such a pawl or other pawl having a similar function but different location, it is requisite to temporarily disconnect such pawl or lock from the trip-register. This is effected in the present instance by rocking the permanent register frame 35 so as to temporarily disconnect the pinion 22, from the gear 20, whereby the gear 20, and index *i* of the trip-register are wholly disconnected and freed both from the permanent register E and from the hold-back pawl 10. The particular means for accomplishing this disconnection, as herein shown, consists of the slide F, Figs. 2, 5, and 7, which is provided with means adapted to rock the permanent register frame 35 by an inward movement and to restore said frame by a reverse movement of said slide. This slide F is provided at opposite ends with hubs 18, 19, which embrace and slide on the shaft 39. Said slide F is moved in one direction by the inward movement of a sleeve *g*, having a thumb wheel *g'* at its outer end and mounted on the shaft 39 and to move longitudinally with respect thereto but adapted to rotate the latter through a pin 1, fitting a slot in the sleeve as in Fig. 1. The reverse or return movement of the slide F is had by a spring 16 coiled about the shaft 39 between the hub 19, of said slide and one of the bearings 40, Figs. 2, 5, and 7.

The slide F is provided with an inclined slot 12, see Fig. 5, that is engaged by the end of a stud 11, projecting rigidly from the frame 35, see Fig. 7, in such manner that when the slide F is pushed inwardly as just described, the slot will force the stud toward the back plate A, and hence carry the frame 35 with it and so disengage the gear 20 and pinion 22. The end of the stud 11 is grooved to receive a vertical guide 13, see Figs. 5 and 8, projecting from the back plate A, and is thereby steadied in being moved by the inclined slot 12 of the slide F.

In operating the re-setting device, as thus far described, the thumb-wheel sleeve *g*, is pushed inwardly thereby also pushing the slide F inwardly against the power of the spring 16. As soon as the slide has been moved sufficiently to have disconnected the permanent register from the trip-register, the shaft 39, through the thumb-wheel *g'*, may be rotated backward to return the index *i* to zero.

To obviate the necessity of holding the slide F, forcibly inward during the rotation of the resetting shaft, 39, and to provide a guard compelling the complete return of the trip-register to zero and preventing the premature return of the slide F before such return is effected the slide F, carries one part of a retaining device consisting of a pawl 42 pivoted thereto and adapted to engage with the

other part of the retaining device consisting of a circular flange 41 on the outer surface of the gear 20. In whatever position the trip-register may have been moved during the usual operations of the register, when the slide F is pushed inward through the thumb-wheel sleeve *g*, the pawl 42, will be moved to engage with the flange 41 of the gear 20, and the slide be thereby retained in such inward position, whereupon the thumb-wheel *g'* and shaft 39 may be readily rotated and through the miter-gears 38 revolve the index *i* backward to zero position. When the zero-position is reached, means are provided for freeing the pawl 42 from the circular retaining flange 41 so that the spring 16 may be free to return the slide 39 outward to its normal position. Thus the retaining flange 41 is not continuous but has a recess 6 formed in it at a point and of sufficient width to permit the pawl 42 to pass outward from alignment with the flange 41, when the index *i* arrives at the zero position as in Fig. 1. The same surface of the gear 20 is also provided with another flange 41^a arranged to catch the pawl 42 should the slide F be moved only partially inward, in which case, the parts are so arranged as hereinafter described that the shaft 39 cannot be rotated, and thus compels a full inward movement of said slide.

To prevent the premature rotation of the shaft 39 and consequently that of the gear 20, should the slide F be not moved fully inward, said slide F may carry a fixed detent 17 Fig. 2, arranged in such position with respect to the complete movement of the slide that it will take into the teeth of the gear 20 and remain therein should said slide be only partially moved inwardly, but if it be moved to its limit of inward movement the detent 17 will pass to the inner side of the teeth of said gear and have no effect to prevent its rotation and that of the shaft 39.

At the same time the slide F is moved inward preliminary to the rotation of the shaft 39 to reset the trip-register to zero another detent represented by a yielding pawl 15 carried by the inner end of said slide F, see Figs. 1, and 7, is moved longitudinally into engagement with the teeth of the gear 20 and remains in engagement so long as the slide is in said position, which pawl 15 in the normal position of the parts and during the step by step movements of the trip register lies out of engagement with the gear 20, as in Fig. 2. This pawl 15 is arranged, when engaged with the gear 20, to yield, by its spring 15^a and slot 15^b that embraces the end of the shaft 39, to permit the free backward rotation of the gear 20 but will firmly lock it against movement should it be attempted to move it in the reverse direction. The return of the index *i* to the zero position is determined and fixed by a pawl 14, see Figs. 1, 2, 4, and 5, carried by the frame of the register and engaging with a tooth or notch 8 in the thumb-wheel sleeve *g*, such notch being elongated

to suit the longitudinal change positions of the sleeve without disengaging the pawl. The stopping of the trip-register at the zero position may also be additionally insured by an arm 64 (see Fig. 1) adapted to meet a projection 64^a, see Fig. 7, on the under side of the gear 20. This arm 64 is pivoted to a post *h* and is mounted to yield in one direction by a spring 64^a so that should the trip-register be moved to register one hundred fares and over or in other words be moved to have made a complete rotation or over the projection 64^a may pass the end of the arm 64.

From the foregoing, it will be understood that, in order to return the trip-register to zero position, it is simply necessary to move the slide inwardly to the proper position to relieve the trip-register of the hold-back pawl 10 and sufficiently to free the fixed detent 17 from the gear 20, and then rotate the shaft 39 until its further rotation is stopped by the pawl 14. The retaining device (represented by the pawl 42 and flange 41) simply serves to hold the slide in position and to prevent its return until and only when the complete resetting of the trip-register has occurred. It will also be noticed that the resetting shaft 39 is constantly coupled to the trip-register so that no coupling for connecting and disconnecting the two are necessary. Any attempt at moving the trip-register through the shaft 39 without first moving the slide F inwardly is prevented by the hold back pawl 10 through the geared connection with its ratchet 24 which securely locks said shaft 39 against such movement.

The register herein shown is also provided with a direction indicator H adapted to be changed in position when the slide F is moved inwardly the same as in said patent, but as this forms no part of the present invention and does not modify the novel features thereof no further description is necessary.

What is claimed is—

1. The combination of the trip-register, the permanent-register normally in gear with the trip-register, a hold-back pawl for the trip and permanent registers, a slide for releasing the permanent register with its hold-back pawl from engagement with the trip-register, another pawl moved into engagement with the trip-register by the slide, and means for returning the trip-register to zero, substantially as described.

2. The combination of the trip and permanent registers normally geared together, a hold-back pawl preventing backward movement of the trip-register, a slide for disengaging the trip and permanent registers and removing said hold-back pawl from its action on the trip-register, another pawl moved into engagement with the trip-register by said slide for preventing forward movement of the trip-register, and means for returning the trip-register to zero, substantially as described.

3. The combination with the trip register

gear 20, the miter-gear carried therewith, and the index hand secured to the gear 20, of a resetting shaft, a miter-gear secured thereto in engagement with the other miter-gear, a longitudinally movable slide having hubs embracing said shaft, a pawl carried by one of the hubs for temporary engagement with the gear 20, and a thumb piece for moving the slide and rotating said shaft, substantially as described.

4. The combination of the trip-register, a hold back pawl therefor, a slide for releasing said pawl, another pawl moved into engagement with the trip-register by the slide, and a resetting shaft for the trip-register, substantially as described.

5. The combination of the trip-register, a hold back pawl therefor, a slide for releasing said pawl, a fixed detent moved into and out of engagement with the trip-register, and another pawl moved into engagement with the trip register by said slide, and a resetting shaft for the trip register, substantially as described.

6. The combination of the trip-register, two hold back pawls, one normally preventing movement of the register in one direction, and the other out of engagement but adapted to prevent movement of the register in the reverse direction, and a releasing device for moving the one pawl out of engagement and the other into engagement with the trip-register, substantially as described.

7. In a fare register, the combination of the trip-register gear 20, and the longitudinally movable pawl 15, for temporary engagement with said gear, substantially as described.

8. The combination of an index and its carrying wheel, the permanent register geared with said wheel, a disengaging device for disconnecting said register from said wheel, a spring constantly tending to hold said device in its inactive position, a circular flange on the wheel, a non-rotating engaging latch carried by the device, and hand moved gearing for rotating the wheel to zero, as set forth.

9. In a fare register, the combination of the wheel 20 having a circular flange with a recess, a slide having a non-rotating latch for engaging said flange, hand moved gearing for rotating said wheel until the recess in the flange coincides with the latch, and a spring free to move the latch from the recess, as set forth.

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

LEO EHRLICH.

GUSTAVUS REIN.

EPHRON CATLIN.

Witnesses as to signatures of Leo Ehrlich and Gustavus Rein:

W. PALMER CLARKSON,

J. C. BOWMAN.

Witnesses as to signature of Ephron Catlin:

E. C. LACKLAND,

E. M. LACKLAND.