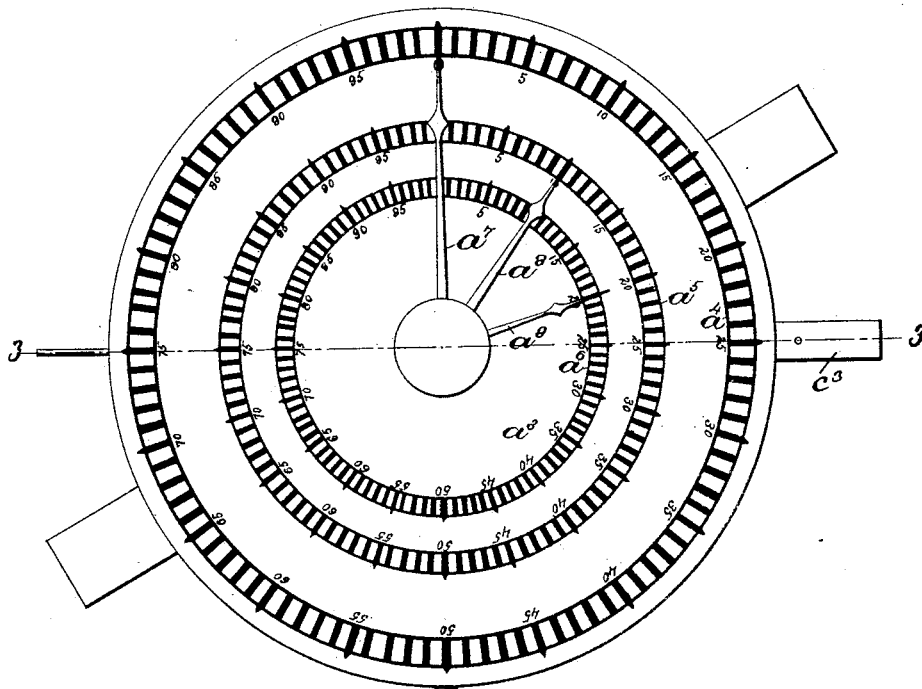


2 Sheets—Sheet 1.

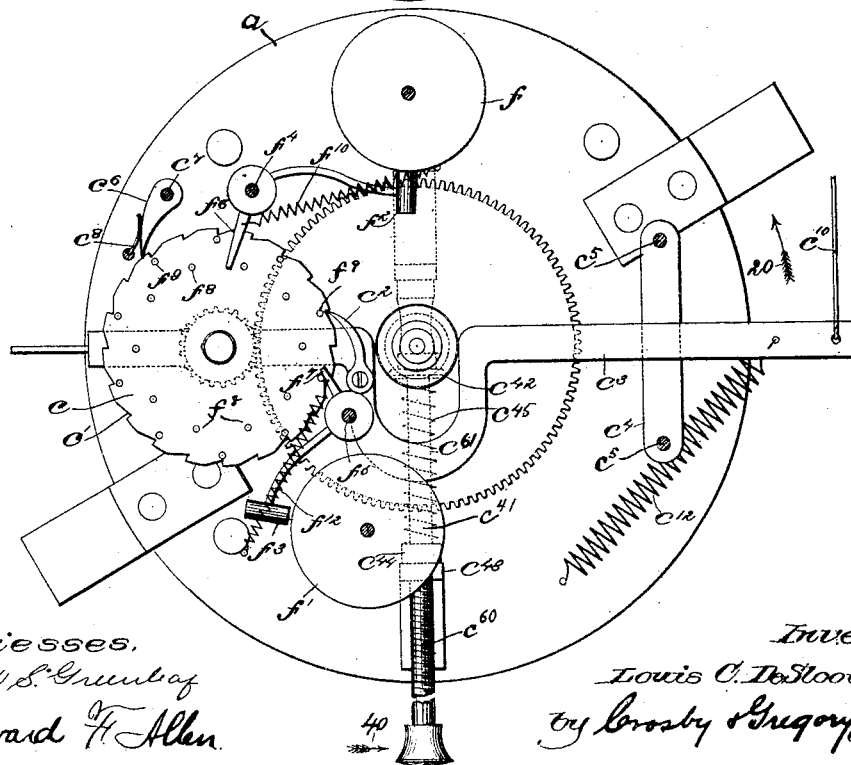
No. 454,902.

Patented June 30, 1891.

*Fig:1.*



*Fig: h.*



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FARE REGISTER.

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Fig. 3.

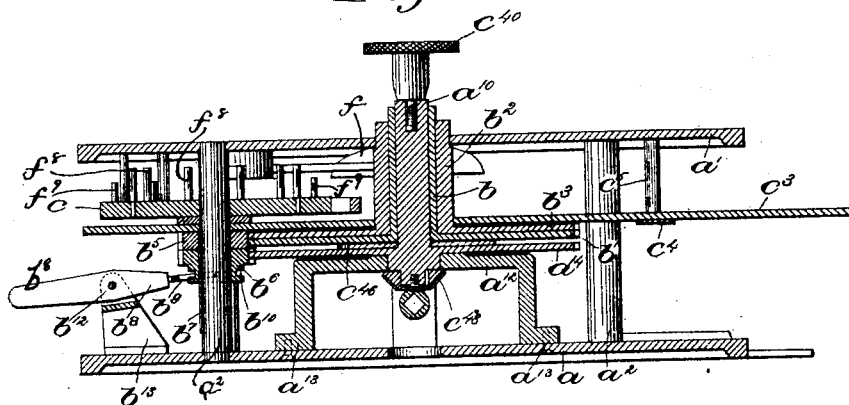


Fig. 6.

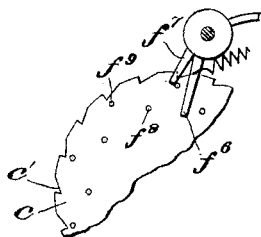


Fig. 4.

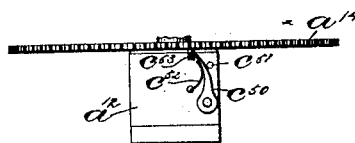


Fig. 5.

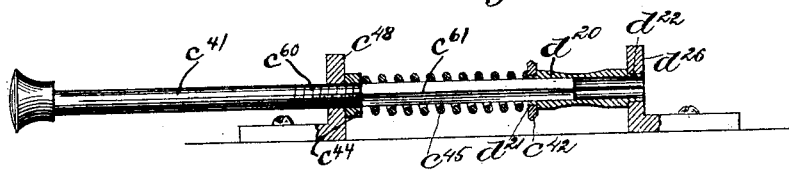


Fig. 8.

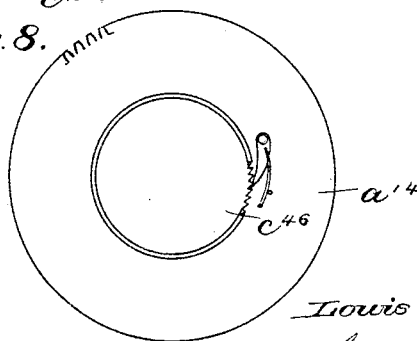
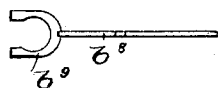


Fig. 7.



Witnesses.

Fred S. Greenleaf.

Edward F. Allen

Inventor.

Louis C. De Sloovere

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# UNITED STATES PATENT OFFICE.

LOUIS C. DE SLOOVERE, OF SALEM, MASSACHUSETTS.

## FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 454,902, dated June 30, 1891.

Application filed February 3, 1891. Serial No. 380,054. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS C. DE SLOOVERE, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Fare-Registers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to fare-registers especially adapted to be used on street-railway cars, and has for its object to provide a simple and efficient register.

In accordance with my invention preferably three pointers or hands are employed which co-operate with graduations on a dial, there being, preferably, a ring or circle of graduations for each pointer or hand. The graduations on one of the circles or rings, preferably the innermost one, indicate hundreds and the graduations on the two remaining circles indicate units. The pointer co-operating with the hundreds circle or ring is moved an additional graduation or space at each complete revolution of the units-indicating pointer, as will be described, and one of the units-indicating pointers may be moved back to zero, when desired, while the other units-indicating pointer is prevented from being moved backward.

My improved register is preferably provided with two audible signals or bells, preferably of different intonation, so that the registering of successive fares may be indicated by the ringing of different-sounding bells.

The apparatus is constructed, as will be described, so that a fare must be registered before a signal or bell will be sounded.

The particular features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a face view of a register embodying my invention; Fig. 2, a top or plan view of the register in the position shown in Fig. 3, with the indicating-dial and the front plate of the register removed; Fig. 3, a central transverse section of the register on the line 3 3, Fig. 1; Figs. 4 and 5, details to be referred to; Fig. 6, a modification to be referred to; and Figs. 7 and 8 other details of the register shown in Fig. 1, to be referred to.

The frame-work of my improved apparatus, which may be of metal or other suitable ma-

terial, consists, as herein shown, of two plates or disks  $a$   $a'$  and post  $a^2$ , to which the said disks are secured. The disk or plate  $a'$  has secured to or forming part of it a dial  $a^3$ , (see Fig. 1,) preferably provided with three concentric rings or circles  $a^4$   $a^5$   $a^6$ , each subdivided or graduated to indicate from 0 to 99. The graduated rings or circles  $a^4$   $a^5$   $a^6$  have co-operating with them pointers or hands  $a^7$   $a^8$   $a^9$ . The hand  $a^7$  is made fast on a shaft or arbor  $a^{10}$ , (see Fig. 3,) extended through the plate or disk  $a'$  and having bearings, as herein shown, in a bar or angle-iron  $a^{12}$ , secured to the plate  $a$ , as by screws  $a^{13}$ , or in other suitable manner. The shaft  $a^{10}$  has secured to or forming part of it a toothed disk or gear  $a^{14}$ , provided in the present instance with one hundred teeth. The shaft  $a^{10}$  has loosely mounted upon it a sleeve  $b$ , having secured to or forming part of it a gear or toothed disk  $b'$ , provided with the same number of teeth as on the gear  $a^{14}$ —that is, one hundred. The sleeve  $b$  has loose on it a sleeve  $b^2$ , having secured to or forming a part of it a gear  $b^3$ , having one less tooth than the disk  $b'$ —that is, ninety-nine teeth. The hand or pointer  $a^7$  is made fast on the shaft  $a^{10}$ , and the hand or pointer  $a^8$  is fast on the sleeve  $b$ , while the hand or pointer  $a^9$  is made fast on the sleeve  $b^2$ . The gears  $a^{14}$  and  $b'$  constitute the units gears and the gear  $b^3$  the hundreds gear. These gears are rotated in unison, one tooth at a time, by means of pinions  $b^5$   $b^6$  on a shaft  $b^7$ , the pinion  $b^5$  being made fast on the said shaft and the pinion  $b^6$  being keyed thereon, so as to revolve therewith, but is yet free to be moved longitudinally thereon by means of a clutch-lever  $b^8$ , which may be of any usual or well-known construction, it being herein represented as provided with forked arms  $b^9$ , having studs to enter an annular groove  $b^{10}$  in a collar secured to or forming part of the pinion  $b^6$ . The clutch-lever  $b^8$  (see Figs. 3 and 7) is pivoted, as at  $b^{12}$ , to a standard or lug  $b^{13}$ , secured to the plate  $a$ . The shaft  $b^7$  is rotated, as herein shown, by means of a ratchet disk or wheel  $c$ , having peripheral notches or teeth  $c'$ , (see Fig. 2,) which are engaged by a push or actuating pawl  $c^2$ , pivoted on a main actuating device or pull-bar  $c^3$ , pivotally mounted on the shaft  $b^7$  and extended, as herein shown, across the apparatus, being curved or bent to

avoid the main or center shaft, and being supported at its outer end, as herein shown, by a bar  $c^4$ , secured to the plate  $a'$ , as by screws or posts  $c^5$ . The ratchet-disk  $c$  is also engaged by a retaining or stop pawl  $c^6$ , pivoted, as at  $c^7$ , to the plate  $a'$  and normally kept pressed against the periphery of the said disk by a spring  $c^8$ . The ratchet disk or wheel  $c$  is rotated the distance of one tooth by pulling the bar forward or in the direction indicated by arrow 20 in Fig. 2. This may be effected in practice by means of the usual cord or strap  $c^{10}$  now commonly employed, and only a portion of which is shown in Fig. 2. The pull-bar  $c^3$  is returned to its normal or starting position, preferably, by means of a spring  $c^{12}$ , one end of which is fastened to the said bar and the other end of which is secured to the frame-work of the apparatus, it being shown as secured to the plate  $a$ . The pinion  $b^6$  is normally in the position shown in Fig. 3 in engagement with the gear  $a^{14}$ ; but to permit the gear  $a^{14}$  to be moved back to zero on the dial the said pinion is moved longitudinally on its shaft  $b^7$  out of engagement with the gear  $a^{14}$ , and the latter may then be turned backward by means of a thumb-screw  $c^{40}$  on the upper end of the shaft  $a^{10}$ , or by means of a rod  $c^{41}$ , adapted to rotate a bevel-pinion  $c^{42}$ , (see dotted lines, Fig. 2, and full lines, Fig. 5,) which meshes with a bevel-pinion  $c^{43}$ , fast on the lower end of the shaft  $a^{10}$ . The rod  $c^{41}$  has a screw-threaded portion  $c^{60}$ , which turns in an upright  $c^{48}$ , and said rod has also a square or other than round end portion  $c^{61}$ , which enters a hole of corresponding shape in a bushing or sleeve  $d^{20}$ , having a journal  $d^{22}$  bearing in a stand or support  $d^{26}$ . The beveled pinion  $c^{42}$  is mounted loosely on said bushing or sleeve  $d^{20}$  at  $d^{21}$ , and a spiral spring  $c^{45}$  encircles a portion of the rod at  $c^{61}$ , one end of which bears against said pinion and the other end against a nut  $c^{44}$ , secured to the rod  $c^{41}$ . By rotating the rod  $c^{41}$  in the direction of the arrow 40 (see Fig. 2) when it is in its outermost position, the spring  $c^{45}$  not being compressed at such time, the bushing or sleeve  $d^{20}$  will be revolved; but the beveled pinion  $c^{42}$  will remain at rest. As the rod or shaft  $c^{41}$  is further rotated in the direction of the arrow 40, (see Fig. 2,) the spring  $c^{45}$  will be compressed and will act to force the loose pinion  $c^{42}$  firmly against the shoulder on the sleeve or bushing  $d^{20}$ , and said pinion, being thereby held frictionally, will turn with the rod or shaft.

The gear  $b^7$  has secured to or forming part of it on its under side a substantially small ratchet-wheel  $c^{46}$ , provided with a hundred teeth, which are successively engaged by a pawl (see Fig. 8) which is pivoted to the gear  $a^{14}$ , the said ratchet-wheel and pawl constituting a locking device by which the gear  $a^{14}$  is prevented from being moved or rotated in a forward direction when the pinion  $b^6$  is disengaged from said gear. The gear  $a^{14}$ , when rotated backward to place the pointer  $a^7$  at

zero, is arrested in its backward rotation at the proper position by a stop, herein shown as a pawl  $c^{50}$ , pivoted to the side of the bar  $a^{12}$  and normally pressed, against a pin  $c^{51}$  by a spring  $c^{52}$ , (see Fig. 4,) the said pawl being engaged by a pin or stud  $c^{53}$  on the under side of the gear  $a^{14}$ .

The apparatus is provided with preferably two audible signals or bells  $f f'$ , secured, as herein shown, to the plate  $a'$ , the said bells being struck by hammers  $f^2 f^3$  on levers pivoted, as at  $f^4 f^5$ , and provided, as shown in Fig. 2, with arms  $f^6 f^7$ , extended into the path of movement of actuating devices, herein shown as studs or pins  $f^8 f^9$ , arranged in circular rows upon one face of the ratchet disk or wheel  $c$ . The pins or studs  $f^9$  co-operate with and act upon the arm  $f^7$  of the hammer for the bell  $f'$ , and the studs or pins  $f^8$  are longer than the studs  $f^9$  and co-operate with and act upon the arm  $f^6$  of the hammer for the bell  $f$ . The arm  $f^6$  extends over the outer row of pins or studs  $f^9$ , and is cut away or made narrow enough to clear the studs or pins  $f^9$ . The strikers  $f^2 f^3$  are normally held up against their respective bells  $f f'$  by springs  $f^{10} f^{12}$ , having one end secured to the arms  $f^6 f^7$  and their other end to the frame-work of the machine. The pins or studs  $f^8 f^9$  are arranged on the ratchet disk or wheel so that the said pins are alternately brought into engagement with the arms  $f^6 f^7$  during the revolution of the ratchet wheel or disk—that is, the said pins are arranged opposite the teeth of the ratchet-wheel. For instance, one of the pins  $f^8$  is opposite or in line with one tooth  $c'$ , and one of the pins  $f^9$  is in line with or opposite the next adjacent tooth  $c'$ , so that, as herein shown, the disk or wheel  $c$  is rotated the distance of two teeth before either arm  $f^6 f^7$  is successively acted upon. The pins or studs  $f^8 f^9$  are arranged so that the locking-pawl  $c^6$  is engaged with a tooth of the wheel before either bell is sounded. For instance, the lever  $c^3$  is represented in Fig. 2 as being moved in the direction of arrow 20, and a stud  $f^9$  is in engagement with the arm  $f^7$  and is turning the bell-hammer on its pivot against the action of its spring  $f^{12}$ . The locking or retaining pawl  $c^6$  is at such time in close proximity to a tooth  $c'$  of the ratchet-wheel. The locking-pawl  $c^6$  is located with respect to the ratchet-wheel so that it will engage a tooth of the said wheel just before the pin  $f^9$  has passed by or been disengaged from the arm  $f^7$ , so that a fare is registered before the bell rings.

I have herein shown two bells, and while I may prefer to employ this construction I do not desire to limit my invention in this respect, as but a single bell might be used, the hammer of the said bell being provided with two arms  $f^6 f^7$ , as shown in Fig. 6, the said arms being arranged so that they will engage the pins  $f^8 f^9$  in succession, as described.

The operation of the registering part of the apparatus may be described as follows, viz: Let it be supposed that all three of the pointers

are at zero and that the car is to make its first trip. On this trip the conductor operates the lever  $c^3$  to register each fare collected, and at each operation of the said lever the wheels or gears  $a^{14}$ ,  $b^7$ , and  $b^3$  are rotated the distance of one tooth, and the pointers  $a^7$   $a^8$   $a^9$  are moved in unison step by step over the dial; and let it be supposed that the conductor has collected ten fares. All the pointers will register with the tenth graduation of the dial. If a new conductor takes the car on the next trip, he turns one of the units-pointers back to zero—namely, the pointer  $a^7$ , while the other units-pointer remains at the tenth graduation to show the number of fares collected by the first conductor. The pointers  $a^8$  and  $a^9$  will move step by step in unison until they have completed one revolution, and when the pointer  $a^8$  arrives at zero the pointer  $a^9$  will have been moved around to the first graduation beyond zero, because its actuating-gear  $b^3$  has one less tooth than the gears  $a^{14}$   $b^7$ . The pointer  $a^9$  will indicate that one hundred fares have been collected.

It will be seen that for each complete revolution of the units-pointers the pointer  $a^9$  will be moved forward one additional space, and the number of hundreds fares collected will be indicated on the dial by the number of graduations between the pointer  $a^9$  and the pointer  $a^8$ , which in the present instance is shown as ten hundred.

The number of units-fares collected will be indicated by the number of graduations between the pointer  $a^8$  and the zero on the circle  $a^5$ .

I claim—

1. In a fare-register, the combination of the following instrumentalities: a main shaft having fixed to it a gear and a pointer or index, a sleeve on said shaft having fixed to it a gear and a pointer or index, a second sleeve on said shaft having fixed to it a gear and a pointer or index, a shaft provided with driving-pinions, a ratchet-wheel on said shaft, and an actuating device or pull-bar, to operate substantially as described.

2. In a fare-register, the combination of the following instrumentalities: a main shaft having fixed to it a gear and a pointer or index, a sleeve on said shaft having fixed to it a gear and a pointer or index, a second sleeve on said shaft having fixed to it a gear and a pointer or index, a shaft provided with driving-pinions, a ratchet-wheel on said shaft, an actuating device or pull-bar, and an audible signal operated by the ratchet-wheel, substantially as described.

3. In a registering apparatus, the combination, with a main shaft provided with a gear and having a pointer or index secured to it, of a sleeve fitted upon said shaft and provided with a gear and having a pointer secured to it, a shaft having a movable pinion and a stationary pinion, means to move said movable pinion, a ratchet disk or wheel on said pinion-shaft, an audible signal, a striker

for said signal, studs borne by said ratchet-wheel for actuating the said striker, and an actuating device or pull-bar for said ratchet-wheel, to operate substantially as described.

4. In a registering apparatus, the combination, with a main shaft provided with a gear and having a pointer or index secured to it, of a sleeve fitted upon said shaft and provided with a gear and having a pointer secured to it, a second sleeve mounted upon the first sleeve and provided with a gear, the number of teeth of which is one less than the number of teeth on the gears on the first sleeve and the shaft, a shaft  $b^7$ , provided with pinions  $b^5$   $b^6$ , a ratchet-wheel on said pinion-shaft, studs or pins  $f^8$   $f^9$  on the said ratchet-wheel, a bell, a striker therefor actuated by the pins on the ratchet-wheel, a locking-pawl, a push-pawl, and a pull-bar to actuate said push-pawl, substantially as described.

5. In a fare-register, the combination, with a shaft  $a^{10}$ , provided with a gear  $a^{14}$  and having a pointer  $a^7$ , a sleeve  $b$ , loosely mounted on said shaft, of a gear  $b^7$  on said sleeve, a pointer or index  $a^8$  on said sleeve, a second sleeve  $b^2$ , a gear  $b^3$  thereon, the number of teeth of which is one less than the number of teeth on the gears  $a^{14}$   $b^7$ , a pointer  $a^9$ , fast on the sleeve  $b^2$ , a ratchet-wheel  $c^{16}$  and a pawl to engage it, a shaft  $b^7$ , a pinion  $b^5$ , fast on said shaft, in mesh with the gears  $b^3$   $b^7$ , a pinion  $b^6$ , keyed on the shaft  $b^7$ , in mesh with the gear  $a^{14}$ , means to disengage the pinion  $b^6$  from the gear  $a^{14}$ , a disk  $c$ , provided with ratchet-teeth  $c'$  on its periphery and having studs or pins  $f^8$   $f^9$  opposite said teeth, a push-pawl to rotate said disk, a pull-bar to actuate the push-pawl, a locking-pawl  $c^6$ , and audible signals having strikers operated by the said studs or pins, substantially as described.

6. In a fare-register, the combination, with a shaft  $a^{10}$ , provided with a gear  $a^{14}$  and having a pointer  $a^7$ , of a sleeve  $b$ , loosely mounted on said shaft, a gear  $b^7$  on said sleeve, a pointer or index  $a^8$  on said sleeve, a second sleeve  $b^2$ , a gear  $b^3$  thereon, a pointer  $a^9$ , fast on the sleeve  $b^2$ , a ratchet-wheel  $c^{16}$  and a pawl to engage it, a shaft  $b^7$ , a pinion  $b^5$ , fast on said shaft, in mesh with the gears  $b^3$   $b^7$ , a pinion  $b^6$ , keyed on the shaft  $b^7$ , in mesh with the gear  $a^{14}$ , means to disengage the pinion  $b^6$  from the gear  $a^{14}$ , and means to rotate the shaft  $a^{10}$  in a backward direction, substantially as described.

7. In a fare-register, the combination, with a shaft  $a^{10}$ , provided with a gear  $a^{14}$  and having a pointer  $a^7$ , of a sleeve  $b$ , loosely mounted on said shaft, a gear  $b^7$  on said sleeve, a pointer or index  $a^8$  on said sleeve, a second sleeve  $b^2$ , a gear  $b^3$  thereon, and a pointer  $a^9$ , fast on the sleeve  $b^2$ , a ratchet-wheel  $c^{16}$  and a pawl to engage it, a shaft  $b^7$ , a pinion  $b^5$ , fast on said shaft, in mesh with the gears  $b^3$   $b^7$ , a pinion  $b^6$ , keyed on the shaft  $b^7$ , in mesh with the gear  $a^{14}$ , means to disengage the pinion  $b^6$  from the gear  $a^{14}$ , means to rotate

the shaft  $a^{10}$  in a backward direction, and a stop to limit the backward rotation of the said shaft, substantially as described.

8. In a registering apparatus, the combination, with a main shaft provided with a gear and a pinion  $c^{13}$  and means to rotate said shaft, of a longitudinally-movable rotatable shaft or rod  $c^{11}$ , having a bushing or sleeve rotatable therewith, bearings for said rod and bushing, a pinion  $c^{12}$ , in mesh with the pinion  $c^{13}$  and loose on said bushing, and a spring inclosing said rod between the pinion  $c^{12}$  and one of the bearings, compression of the spring by longitudinal movement of the rod holding the said pinion frictionally to rotate with it to thereby restore the main shaft to its normal position, substantially as described.

9. In a fare-register, the combination of the following instrumentalities: a main shaft, a gear and pointer fixed to it, a sleeve on said shaft having a gear and pointer fixed to it, another sleeve on said shaft having a gear and pointer fixed to it, an operating-shaft and two driving-pinions thereon, one of which is movable out of and into engagement

with one of the gears, whereby the other gear may be moved forward or set back, and a ratchet-wheel and actuating device for said shaft, substantially as described.

10. In a fare-register, the combination of the following instrumentalities: a main shaft, a gear and pointer fixed to it, a sleeve on said shaft having a gear and pointer fixed to it, another sleeve on said shaft having a gear and pointer fixed to it, an operating-shaft and two driving-pinions thereon and means for rendering one of said driving-pinions inoperative, so that the gear which it drives may be set back to its normal position or starting-point, and a ratchet-wheel and actuating device for said shaft, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS C. DE SLOOVERE.

Witnesses:

JAS. H. CHURCHILL,  
A. S. WIEGAND.