

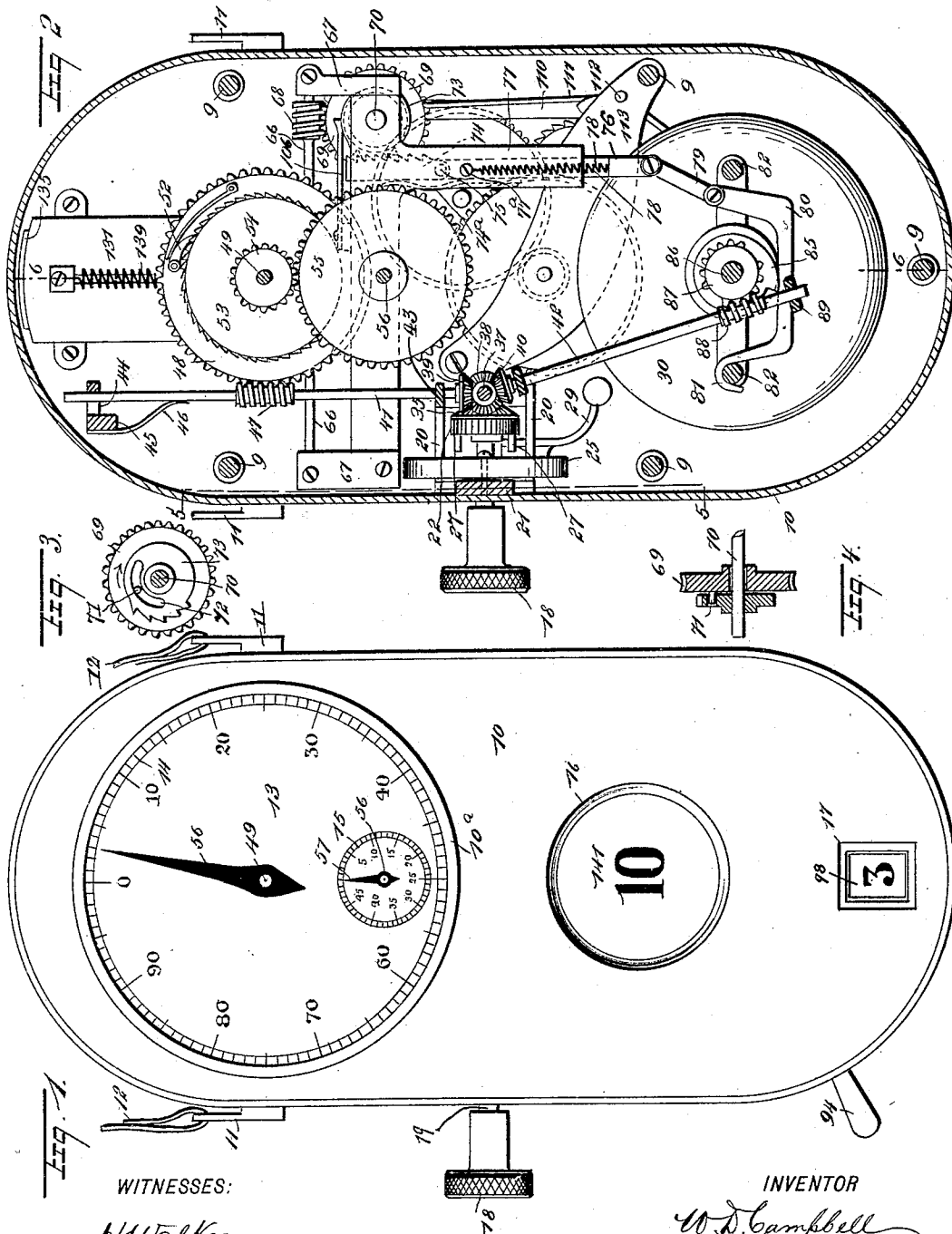
(No Model.)

3 Sheets—Sheet 1.

W. D. CAMPBELL.
FARE REGISTER.

No. 550,158.

Patented Nov. 19, 1895.



WITNESSES:

H. Walker
H. P. Hutchinson

INVENTOR

W. D. Campbell

BY

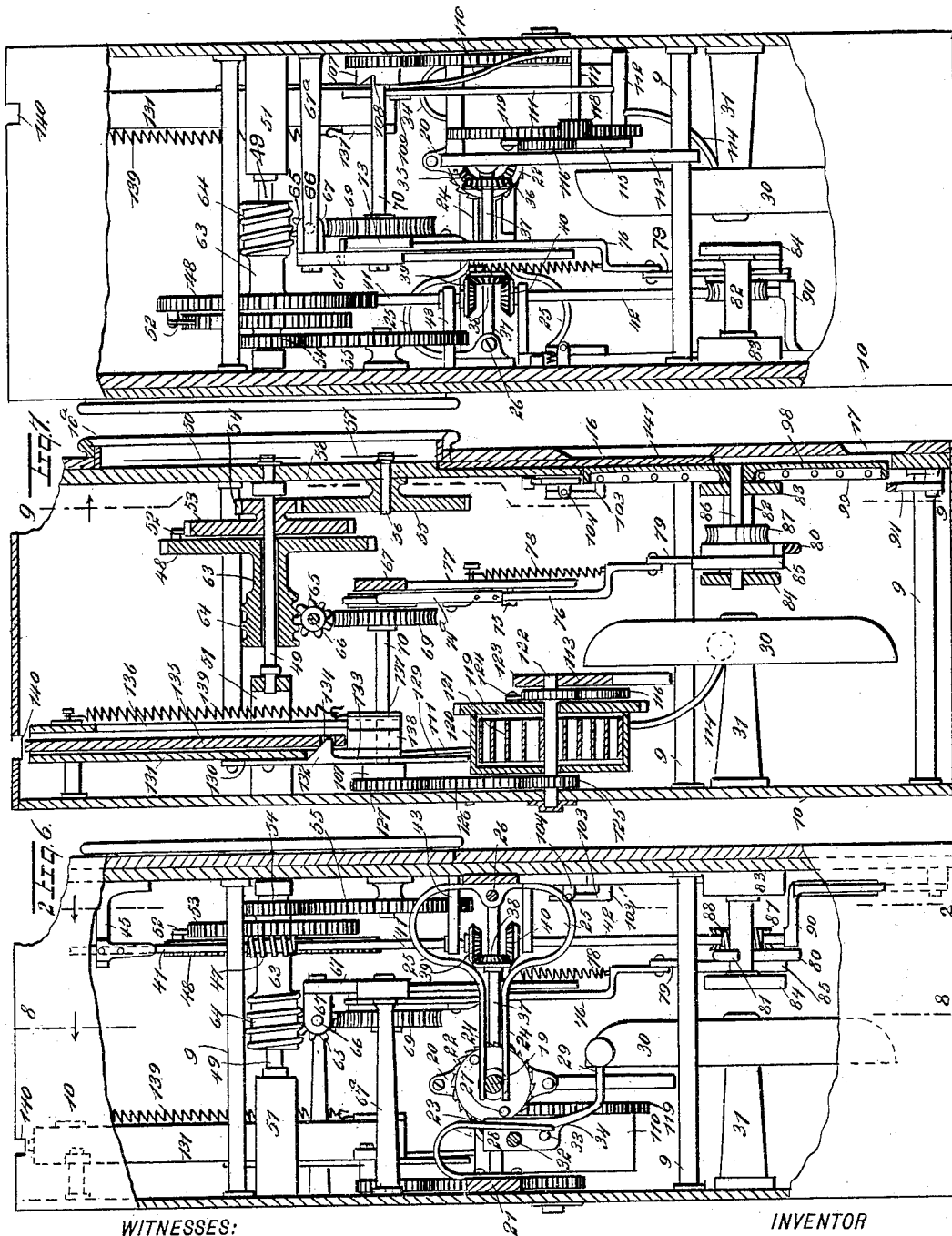
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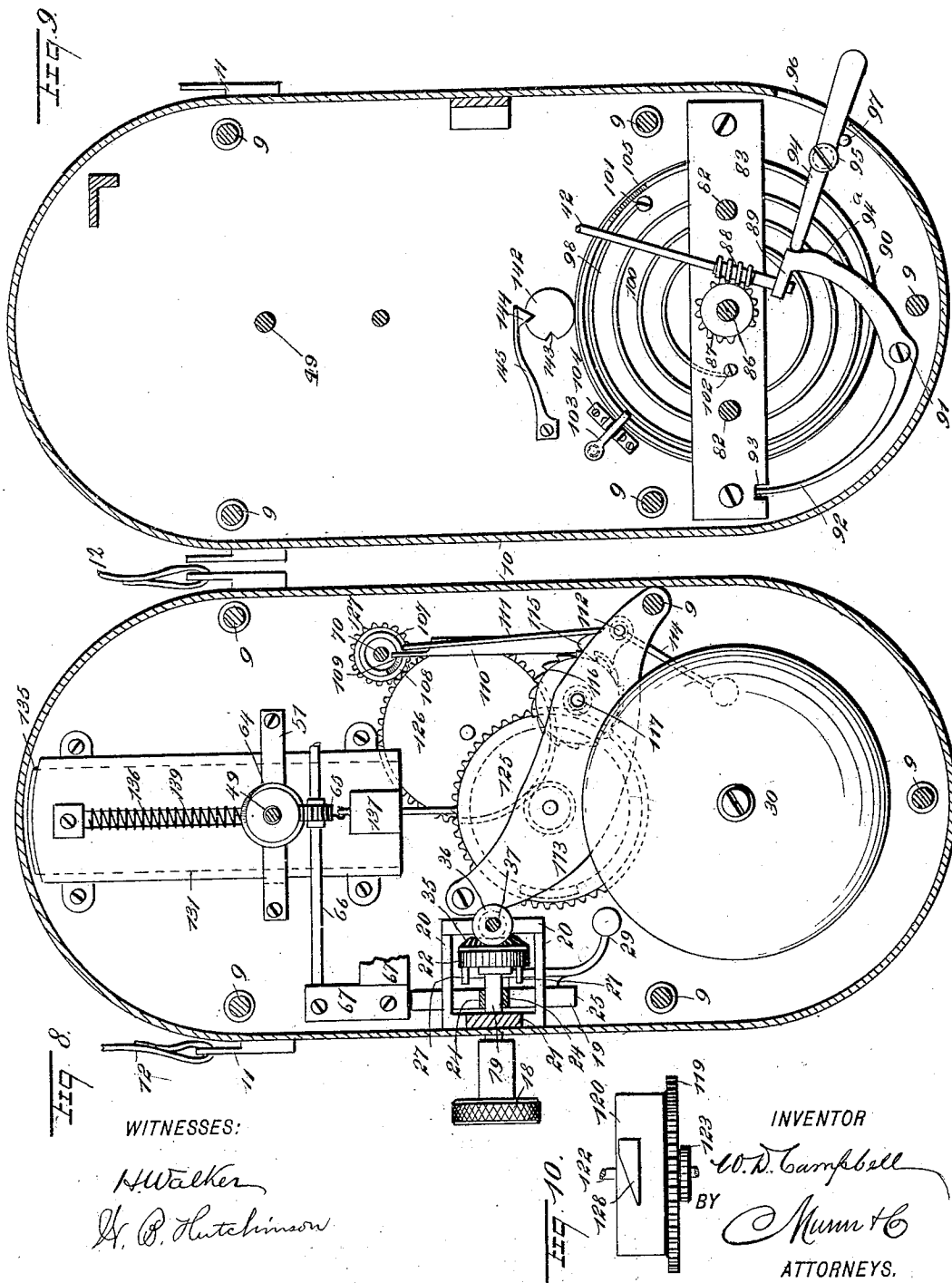
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UNITED STATES PATENT OFFICE.

WALTER DAWSON CAMPBELL, OF BUENOS AYRES, ARGENTINE REPUBLIC,
ASSIGNOR TO HIMSELF, AND JAMES T. BUSTIN, OF ST. JOHN, CANADA.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 550,158, dated November 19, 1895.

Application filed February 15, 1895. Serial No. 538,526. (No model.)

To all whom it may concern:

Be it known that I, WALTER DAWSON CAMPBELL, of Buenos Ayres, Argentine Republic, have invented a new and Improved Fare-Register, of which the following is a full, clear, and exact description.

My invention relates to improvements in fare-registers such as are used by conductors to register the fares which they take; and the object of my invention is to produce a device of this kind which accurately registers the fares and which is constructed and operated in such a way that it is impossible for the conductor using it to cheat the company owning the register, the device to this end being adapted to be used co-operatively by the conductor and passengers, and, therefore, to insure the co-operation of the passengers, it is arranged in such a way that after a certain number of fares have been registered a prize or premium ticket will be thrown out, which will represent a valuable prize—as, for instance, a certain small percentage of all the fares registered—which ticket becomes the property of the passenger paying the last fare, and its face value is paid by the company owning the register.

The device is provided with a register-dial, which is in full view of each passenger and which shows whether or not the register is properly worked, and as the ticket is likely to appear at any time it prompts the passenger to watch carefully in order that he may see that the machine is fairly worked and that he has his chance to win the prize.

It will be seen, then, that if the machine is provided with accurately-registering mechanism and is operated in such a way as to insure the careful inspection of the several passengers the chances of cheating the company or party owning the register are very remote.

To these ends my invention consists of certain features of construction and combination of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the fare-register embodying my invention. Fig. 2 is

a vertical section on the line 2 2 of Fig. 5. Fig. 3 is a detail sectional view of a part of the gear mechanism controlling the ticket-releasing device. Fig. 4 is a cross-section of the connected ratchet and gear wheels shown in Fig. 3. Fig. 5 is a broken sectional elevation on the line 5 5 of Fig. 2. Fig. 6 is a vertical cross-section on the line 6 6 of Fig. 2. Fig. 7 is a broken sectional elevation, looking from the opposite side to the view shown in Fig. 5. Fig. 8 is a vertical section on the line 8 8 of Fig. 5. Fig. 9 is a vertical section on the line 9 9 of Fig. 7, and Fig. 10 is a detail view of the spring-drum.

The machine is preferably inclosed in a case 10, which, in order that it may be conveniently carried by a conductor, has bails 11, to which is attached a strap 12, adapted to be worn around the neck; but the device may be carried in any convenient manner. The front and back plates of the case are independent of its sides and are connected by cross-bolts 9. The case has in front an opening 10^a, in which is a dial 13, having around its edge marks 14 to indicate the number of fares taken up to one hundred fares, while a smaller dial 15 is adapted to indicate the hundreds, the dial being substantially like that used on ordinary registers, gas-meters, &c. The case has also in front an opening 16, in which is displayed the amount of a fare, as hereinafter specified, and another opening 17 is adapted to exhibit the number of fares up to a certain limited number, and the dial 98 is turned back, all as described below.

The device is operated by turning a milled thumb-wheel 18 on one side of the case 10, which is secured to a spindle 19, extending into the case and journaled in a yoke 20 and cross-piece 21 in the case, this spindle gearing with the registering mechanism, as presently described, and carrying also a ratchet-wheel 22, which is engaged by a detent-pawl 23, (shown clearly in Fig. 5,) and thus the spindle is prevented from being turned in the wrong direction. The spindle 19 is pressed by the spring-arms 24, which straddle it, as shown in Figs. 5, 7, and 8, and which form part of the curved spring 25, which is secured, as shown at 26, to a suitable support in the case.

The ratchet-wheel 22 has on one side pins 27, which are adapted to engage the squared end 28 (see Fig. 5) of the hammer 29, which is adapted to strike a gong 30, and this is supported on a suitable post 31 on the back of the case. The squared part 28 of the hammer-shank is fulcrumed, as shown at 32, and is provided near its lower end with a pin 33, which is pressed by the curved spring 34, which is fastened to the cross-piece 21, as shown best in Fig. 5.

In using the machine the thumb-wheel is turned until the bell rings, which is caused by one of the pins 27 pushing outward on the upper part of the squared shank 28 of the hammer, thus pushing the pin 33 against the spring 24, and when the said pin 27 clears the top of the hammer-shank the spring 34 brings the shank quickly back and causes the hammer to strike the gong 30.

The spindle 19 has at its inner end a beveled pinion 35, which is preferably made integral with the ratchet-wheel 22, and the pinion engages with a pinion 36 on a transverse shaft 37, having at its end a pinion 38, which meshes with pinions 39 and 40 on the worm-shafts 41 and 42, the former of which extends upwardly and the latter downwardly from the spindle, and the shaft 41 is at its lower end mounted in the post 43, so that it may have a slight rocking movement, and at its upper end the shaft enters a slot 44 in the bracket 45, which is secured to the front plate of the case, and the shaft 41 is pressed by a spring 46, which is secured to the aforesaid bracket, (see Fig. 2,) so as to normally hold the screw 47 in engagement with the worm-wheel 48, which turns loosely on the shaft 49, which extends transversely through the upper part of the case, being at one end journaled in a bracket 51, (see Fig. 5,) which is secured to the back of the case, and at the front end the spindle 49 carries the indicator or hand 50, which moves over the dial 13. (See Fig. 1.)

The worm-wheel carries a pawl 52, which engages a ratchet-wheel 53, which is fast to the shaft 49, so that when the worm-wheel is turned the ratchet-wheel, shaft, and indicator or hand will also be turned, but the pawl connection just described enables the ratchet-wheel and indicator or hand to be readily turned back to 0, as will presently appear. The ratchet-wheel 53 carries a small gear-wheel or pinion 54, which meshes with a larger wheel 55 on a spindle 56, which is journaled in the front plate and carries a hand 57, moving over the dial 15. The teeth of the gear-wheels 54 and 55 are accurately numbered, so that the hand 57 will move with precision over the marks of the dial 15 and indicate the number of rotations and partial rotations of the hand 50 on the dial 13.

The worm-wheel 48 referred to above has on its back side a sleeve 63, and this carries a worm 64, which engages a small worm-wheel 65 on the nearly horizontal shaft 66,

which is mounted in a bracket 67, which is supported on posts 67^a, and the shaft 66 has a worm 68 (see Fig. 2) thereon meshing with a worm-wheel 69, which is loose on a shaft 70, which shaft extends at right angles to the shaft 66 and is journaled in the bracket 67 and in the back plate of the case 10. The worm-wheel 69 is loose on the shaft 70, (see Fig. 4,) and it has a pin 71, which extends through a curved slot 72 of the mutilated ratchet-wheel 73, which is fastened to the shaft 70, and thus the turning of the worm-wheel 69 will turn the shaft 70 only when the pin 71 is at one end of the slot 72.

The mutilated ratchet-wheel 73 is turned by the lifting of the rack 74, (shown by dotted lines in Fig. 2;) but it will be seen that the rack-bar will engage the ratchet-wheel only during a portion of the rotation of the latter, and hence the operation of both the worm-wheel 69 and rack-bar 74 in turning the shaft is intermittent, and this double arrangement for turning the shaft controls the issuing of the prize-ticket, as will hereinafter appear, and renders it impossible for the conductor to note just when the ticket is to issue and by fraud get possession of the same.

The rack 74 is pivoted at its lower end, as shown at 75, to a slide-bar 76, as plainly shown in Figs. 5, 6, and 7, and is pressed by a spring 74^a into engagement with the ratchet-wheel. The slide-bar 76 slides on a guide-bar 77 and is normally lifted by a spring 78, which is secured to the slide-bar and to a stud or screw 77^a on the guide-bar, and the lower end of the slide-bar connects by a link 79 with a lever 80, which lever is of a general U shape, as shown in Fig. 2, and is at one end formed into a hook 81, resting on one of the posts 82, which connect the bracket-plates 83 and 84, these parts serving as supports for the cam-shaft 86 and its carried parts, to be presently described, and the plate 83 also serves as a shield for the spring 100 of the number-disk 98, which displays the number of fares, as will also be presently described.

It will be seen that when the lever 80 is depressed and then suddenly released it will be raised by the spring 78, which, acting on the slide-plate 77 and rack 74, actuates the mutilated ratchet-wheel 73, as above specified. The lever 80 is depressed by a rotatable cam 85 on the shaft 86, which is journaled in the bracket-plates 83 and 84, (see Fig. 6,) and this shaft is turned by means of a mutilated worm-wheel 87 and screw 88 on the shaft 42, already referred to as being turned by the spindle 19.

The shaft 86 is intended to be turned in one direction only far enough to move the fare-indicating disk 98 sufficiently to display three or four consecutive fares when it is turned back, and the mutilated gear, in conjunction with the mechanism to be presently described, prevents the shaft and disk from being turned too far. The lower end of the shaft 42 is journaled in an arm 89, which extends lat-

erally from one end of a tilting spring-impelled lever 90, (see Fig. 9,) this being fulcrumed near the center, as shown at 91, and having a spring shank or tail 92, which enters a notch 93 in the plate 83, and the spring of the lever is sufficient to normally throw the screw 88 out of contact with the worm-wheel 87. The screw is held in contact with the worm-wheel by a tilting lever 94, which is fulcrumed near the center, as shown at 95, and projects outward through a slot 96 in the case 10, the downward movement of the lever being limited by a pin 97. The inner end of the lever is adapted to move over a cam 94^a on the lever 90, and it will be seen that by lifting the outer end of the lever 94 the inner end will be depressed so as to permit the spring-lever 90 to throw the screw 88 out of engagement with the worm-wheel 87; but when the outer end of the lever 94 is depressed the inner end is raised, and, acting on the cam 94^a, it forces the screw into engagement with the worm-wheel.

The shaft 86 carries at its outer end a disk 98, which has preferably an edge-flange 99, which flange serves to confine the outward expansion of an operating-spring, and the disk near its periphery turns opposite the sight-slot 17 in the front of the case, and the disk has on it at regular intervals numbers arranged consecutively from 1 to 3 or 4, as desired, and every time a fare is rung up the disk will be turned until the highest number is reached, when the outer end of the lever 94 is raised to permit the screw 88 to disengage the worm-wheel 87, and the spring 100 returns the disk 98 to its normal position. The spring 100 is coiled around the shaft 86 and has one end secured to the disk 98, as shown at 101, and the other fastened, as shown at 102, to the bracket-plate 83 or other support, all as shown in Fig. 9. The disk 98 is limited in its movement by a pawl 103, which is pivoted in a suitable support 104 and rides on the flange 99 of the disk, so as to abut with the shoulder 105 on the said flange.

It will be seen from the above description that when the spindle 19 is turned to register a fare the movement will be transmitted by the shaft 41 and connected mechanism above described to the hands 50 and 57 of the registering-dial, also by means of the shaft 42 and connected mechanism to the fare-indicating disk 98, which enables the passenger to see that his fare is registered, and further by the connection described with both shafts 41 and 42 to the shaft 70, which controls the ticket-delivering mechanism, to be hereinafter more particularly described, the shaft 70 is prevented from turning too freely by a spring-pawl 106, (see Fig. 2,) and it carries a cam-wheel 107, with a notch 108 in one side, (see Fig. 7,) which is adapted to receive the wide head 109 of the spring-pawl 110, which is secured to the case 10, and when the head is not in engagement with the notch 108 it is pressed outward by the cam-wheel,

so as to extend into the path of the arm 111 on the hammer-shaft 112, and thus prevent the said shaft from turning or oscillating. The shaft 112 is journaled in a bracket-plate 113, which is suitably supported within the case, and the shaft carries the hammer 114, which is adapted to strike the gong 30, already referred to. The shaft 112 has an anchor escapement-pawl 115, plainly shown in Fig. 8, which is adapted to engage with its two teeth the ratchet or escapement wheel 116, the teeth engaging alternately in the usual manner. This wheel 116 is secured to a shaft 117, which is journaled in the plate 113, and the opposite side of the case 10, and the shaft carries a pinion 118, which meshes with and is driven by the gear-wheel 119 on the spring-barrel 120, which barrel and gear-wheel are connected by the ordinary coil-spring with a shaft 122, which is held in the plate 123 and in a wall of the case 10. The barrel is prevented from turning back by a ratchet-wheel 123 on the shaft 122 and a pawl 124 on the gear-wheel 119, as seen in Figs. 7 and 9.

It will be seen that when the shaft 70 is turned until the notch 108 receives the head 109 of the pawl 110 the arm 111 will be liberated by the cam-wheel 107, and the spring 121, acting on the spring-barrel and gear 119, sets in motion the pinion 118 and shaft 112, the latter being controlled by the escapement comprising the pawl 115 and wheel 116, and the shaft 112 being set in motion causes the hammer 114 to repeatedly strike the gong 30, this acting as a signal to indicate that the ticket is released, which release occurs instantaneously with the sounding of the gong.

The shaft 122 is connected by gears 125, 126, and 127 with the shaft 70, so that as the latter is slowly turned to actuate the cam 107 and release the arm 111 it will also wind up the spring 121, and the spring is therefore ready for use the instant it is liberated.

The releasing of the prize-ticket is effected by the wedge-shaped cam 128 (see Fig. 10) on the spring-barrel 120, which cam engages the lower or free end of the tripping-arm 129, which is secured, as shown at 130, (see Fig. 6,) to the ticket-chute 131, and the tripping-arm has thereon a tooth 132, which projects through a slot 133 in the chute 131 and enters a hole 134 in the ticket 135, which fits nicely in the chute and is preferably of metal. The arm 129 is a spring-arm, so that when the ticket is pushed in the tooth 132 automatically engages the ticket and holds it until the arm is pushed back by the wedge 128, so as to pull out the tooth.

The ticket, as shown in Fig. 6, may be suitably printed or marked to indicate its value and the fact that it will be redeemed by the company or party owning the register, and usually the amount of the ticket will be a small percentage of the total amount of fares registered by the machine. The ticket rests on and is raised by a slide 138, which is mov-

able in the chute 131 and which has a projecting portion 137, slidable in a longitudinal slot 136 of the chute, as indicated in Figs. 7 and 8, and this projecting end is secured to a spring 139, which is also fastened to the chute near the top, and thus when the tooth 132 is pulled out the spring raises the slide and lifts the ticket upward through a slot 140 in the case-top.

In order that the machine may indicate the values of fares a rotatable plate 141 may be used to turn opposite or back of the aperture 16, and this plate is large enough for the amounts of several fares to be placed upon it, which amounts may be turned opposite the opening, as Fig. 1 shows. The journal 142 (see Fig. 9) of the plate 141 is provided with notches 143 to be engaged by a tooth 144 of a spring 145, and this spring and tooth hold the plate 141 from turning accidentally; but the resistance of the spring is light and the plate may be turned around by pressure with the fingers, so as to bring the desired number opposite the aperture 16.

When the register is to be used, the machine is set at "0" and the ticket 135 pushed into the chute 131, where it is engaged by the tooth 132 and held in such a way that it cannot be fraudulently or accidentally released. The plate 141 is set to indicate the amount of a fare, and then as the conductor gathers his tickets or fares he turns the milled wheel 18 and spindle 19 after each fare, and the ringing of the bell by the movement of the hammer 29, which is actuated by the pins 27 on the ratchet-wheel 22 of the spindle, indicates each time when the milled wheel is turned far enough. When the spindle 19 is turned it actuates both shafts 41 and 42, as above specified, the former by means of the gear connection described turning the hands 50 and 57 to register fares, and the latter turning the shaft 86 and disk 98. When three or four fares have been registered, according to the arrangement of the cam 85 and the numbering of the disk 98, the lever 80, which will have been depressed by the cam 85, will be suddenly released and the spring 78 will bring the lever back to position and at the same time lift up the slide-plate 77 and rack 74, which will actuate the mutilated ratchet-wheel 73 and shaft 70; but the shaft will not be moved unless the teeth of the ratchet-wheel are in mesh with those of the rack, and, as previously described, the turning of the shaft 41 will not, by reason of its connected gearing, turn the shaft 70, unless the pin 71 on the gear-wheel 69 is at the end of the slide 72 of the mutilated ratchet-wheel 73, and thus, as this shaft 70 is intermittently turned and operated by both the gear connection with the shaft 41 and the rack and ratchet connection with the shaft 42, the conductor cannot determine when the shaft 70 is to be actuated in a way to release the prize-ticket 135, and hence the machine cannot be tampered with.

When the machine has about reached its capacity of registering, the cam-wheel 107 will have moved far enough to bring the notch 108 nearly opposite the head 109 of the pawl 110, and as the last number is registered the said head springs into the notch, thus releasing the arm 111, which releases the spring 121 and sets the gong to sounding, as already specified, while the wedge-shaped cam 128 strikes the tripping-arm 129, pulls out the tooth 122 from the ticket 125, and the latter is ejected by the spring 139 and handed to the passenger whose fare was last registered.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A fare register, comprising registering mechanism, a ticket chute, a spring-pressed slide to throw out the ticket, a catch or pawl having a direct retaining engagement with the ticket, and a spring barrel carrying a cam for releasing the catch, substantially as described.

2. A fare register, comprising registering mechanism, a ticket chute, a spring-pressed slide in the chute, a punctured ticket, a spring tripping arm having a tooth to engage the ticket, and a cam device for striking the arm and releasing the tooth and ticket, substantially as described.

3. A fare register, comprising registering mechanism, an ejectable ticket, a tripping arm to lock the ticket in the register, a spring barrel, a gong sounded by the turning of the spring barrel, automatic means for releasing the spring barrel, and a device worked by the spring barrel to release the tripping arm and ticket, substantially as described.

4. The combination, with the registering mechanism and the ejectable ticket, of a cam wheel geared to the registering mechanism, a spring barrel, an arm operatively connected with the spring barrel and controlled by the cam, and mechanism controlled by the spring barrel to discharge the ticket, substantially as described.

5. The combination, with the registering mechanism, the ejectable ticket, the ejecting devices for the ticket and the revoluble cam controlling said devices, of a double set of mechanism adapted to intermittently and alternately turn the controlling cam, substantially as described.

6. The combination, with the revoluble spindle, the registering mechanism, the ticket ejecting mechanism and the cam controlling the said ejecting mechanism, of a shaft geared to the spindle and disconnectably geared to the registering mechanism, a ratchet wheel on the controlling cam shaft, the gear wheel having a limited movement in relation to the cam wheel and geared to the registering mechanism, a second shaft geared to the spindle, an indicating device worked from the second shaft, and an operative connection between the second shaft and the ratchet wheel, substantially as described.

7. The combination, with the registering mechanism, the ticket ejecting apparatus and the cam wheel controlling said apparatus, of the slotted ratchet wheel on the cam wheel shaft, and the worm wheel geared to the registering mechanism and provided with a pin which enters the slot of the ratchet wheel, substantially as described,

8. The combination, of the registering mechanism, the notched cam wheel geared thereto, the ticket ejecting apparatus, the spring barrel, the gong mechanism sounded by the spring barrel, the controlling arm of the spring barrel held adjacent to the cam wheel, and a pawl indicating the said controlling arm and riding on the notched face of the cam wheel, substantially as described.

9. A fare register, having a dial, registering mechanism to move a hand on the dial, a revoluble indicating disk operated by the registering mechanism, a spring to return the disk to normal position, a lever to release the disk, and means for limiting its movement, substantially as described.

10. The combination, with the revoluble spindle, the revoluble indicating disk and the

spring to return the disk, of the disk shaft, the worm wheel thereon, the screw shaft engaging the said worm wheel and gearing with the spindle, and a lever controlled device to disengage the screw shaft and worm wheel, substantially as described.

11. The combination, with the revoluble spindle, the movable indicating disk and the spring to return the disk, of the worm wheel on the disk shaft, the spring lever supporting the screw shaft and adapted to throw it out of engagement with the worm wheel, and a second lever to position the spring lever, substantially as described.

12. The combination, of the registering mechanism, the ticket ejecting apparatus, the spring barrel to set in motion the ejecting apparatus, the revoluble cam controlling the spring barrel, and a gear connection between the shafts of the cam and spring barrel, substantially as described.

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