

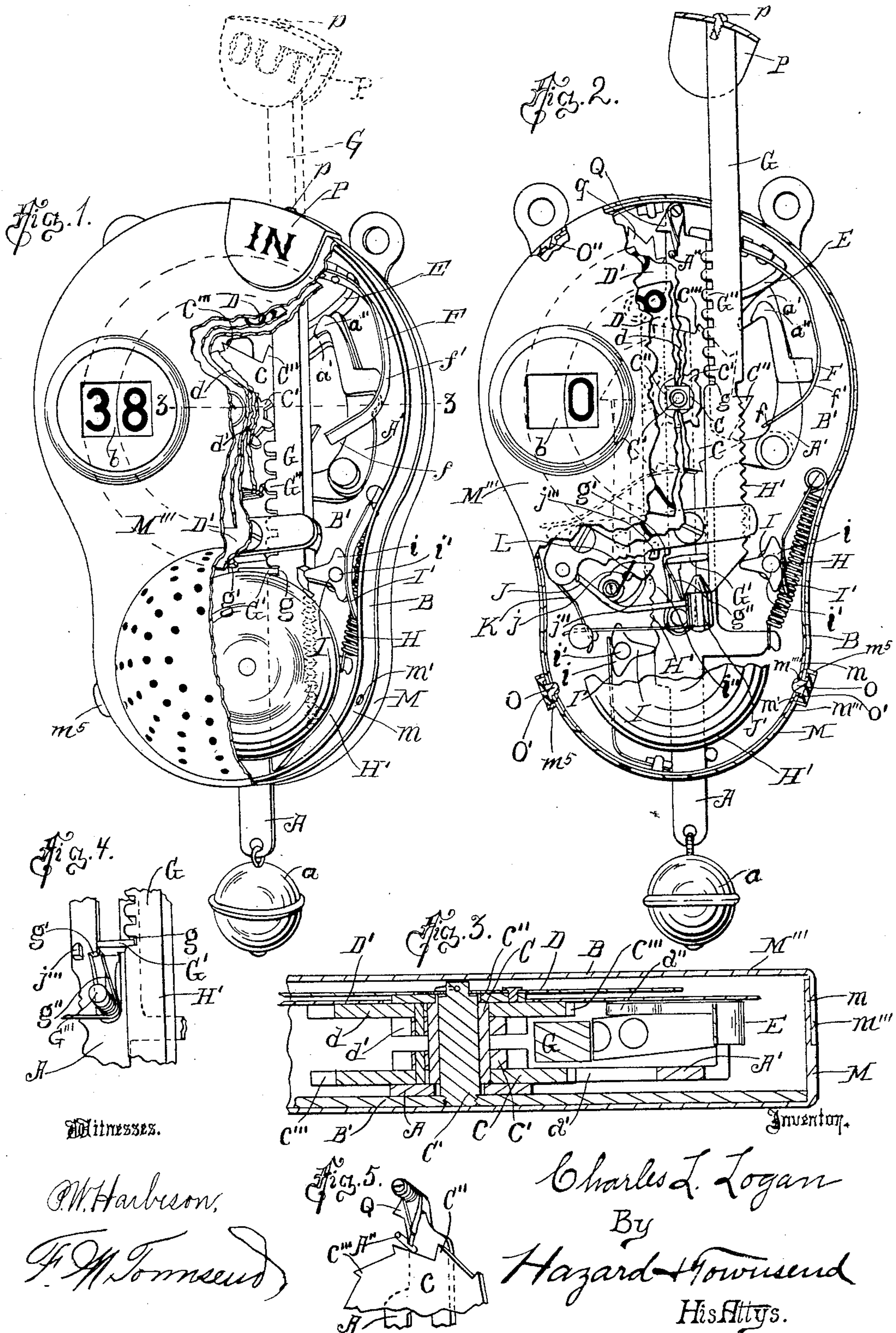
(No Model.)

2 Sheets—Sheet 1.

C. L. LOGAN.  
FARE REGISTER.

No. 563,289.

Patented July 7, 1896.



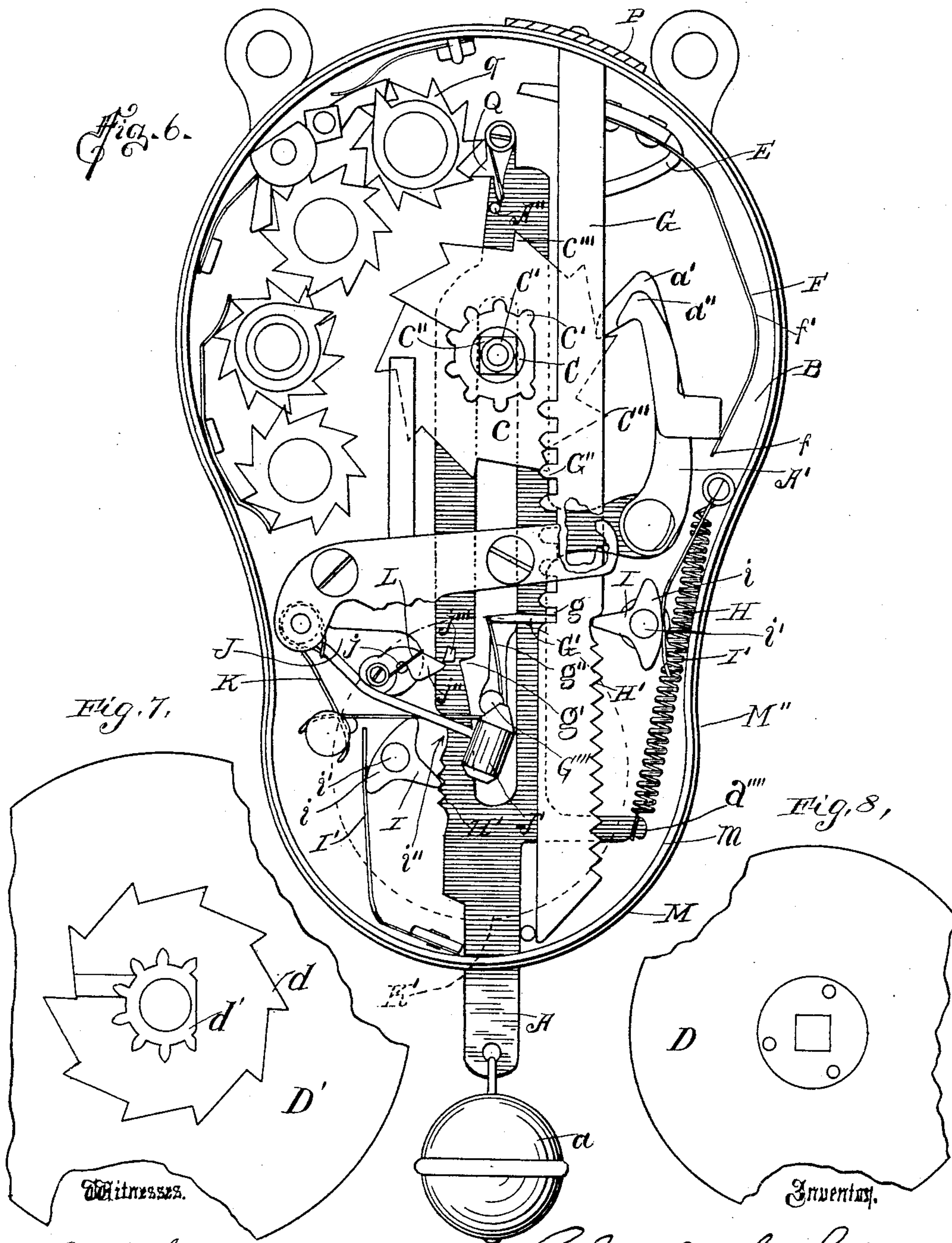
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# UNITED STATES PATENT OFFICE.

CHARLES L. LOGAN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE SAN FRANCISCO REGISTER COMPANY, OF SAN FRANCISCO, CALIFORNIA.

## FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 563,289, dated July 7, 1896.

Application filed May 23, 1894. Serial No. 512,168. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES L. LOGAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Fare-Registers, of which the following is a specification.

My invention relates to improvements upon a certain fare-register invented by me, described and claimed in Letters Patent of the United States No. 499,746, dated June 20, 1893.

The object of my invention is to reduce the size, to simplify the construction, to increase the effectiveness and convenience of operation, and to decrease the liability of dishonest employees tampering with the register without detection.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective side elevation of my invention, a portion of the case and of the registering-dials being broken away to expose the construction. Fig. 2 is a plan view of the register with a fragment of the upper member of the case in place. In this view the resetting-slide is shown drawn out from the case of the register. Fig. 3 is an enlarged cross-section on line 3 3, Fig. 1, looking up, showing the arrangement of the dials and their ratchet-wheels and the dogs which operate the dials. Fig. 4 is an enlarged fragmental perspective view showing the notched actuating-stem and resetting-slide and the reciprocating block arranged to alternately lock such stem and slide. Fig. 5 is a fragmental perspective view of the ratchet-wheel *c*, the upper portion of the stem *A*, and the stop *A''*. In this view the stem is shown in its lowest position. Fig. 6 is an enlarged fragmental view showing the works of my improved register. The front of the casing is removed therefrom and a portion of the frame is also removed to expose the works. The actuating-stem is partially drawn to register a fare. Fig. 7 is an enlarged fragmental rear view of the dial *D'*. Fig. 8 is a like view of the dial *D*.

In the drawings, *A* represents the actuating-stem, which is arranged to reciprocate in the case *M''* of the register and is provided at its bottom with a pull-button *a*.

*C* is a hollow journal-stem, which is provided with a ratchet-wheel *c* and a mutilated cog-wheel *c'*, fixed thereto, and is journaled upon a journal-post *C'*, which is fixed to the frame *B'* of the register. The outer end of the journal-stem *C* is provided with a square shoulder *c''*, upon which the smaller registering-dial *D* is fitted, so that such dial will be rotated by the journal-stem when the stem is rotated. An indicating or registering dial *D'*, of larger diameter than the dial *D*, is journaled upon the journal-stem *C* and is provided on its inner face with the ratchet-wheel *d* and the mutilated cog-wheel *d'*, which are both fixed to the dial and correspond, respectively, to the ratchet-wheel *c* and the cog-wheel *c'*. The ratchet-wheel *c* is provided with a series of ratchet-teeth *c'''*, and one tooth *C''* is notched deeper than the other teeth. A hooked dog *A'* is attached to the actuating-stem *A* and is provided with two hooks *a'* and *a''*, respectively, adapted to engage with the teeth of the ratchet-wheels *c* and *d*. The hook *a''* is shorter than the hook *a'*, and when the hook *a'* engages with the ratchet-teeth of the ratchet-wheel *c* the hook *a''* is held out of engagement with the teeth of the ratchet-wheel *d'* until the hook *a'* enters the deep notch of the tooth *C''*, and thus allows the hook *a''* to engage with the teeth of the ratchet-wheel *d* to rotate such wheel.

The two ratchet-wheels are each provided with ten teeth, so that at each operation of the actuating-stem *A* the ratchet-wheel *c* and dial *D* are moved one-tenth of a rotation, and at each complete rotation of the ratchet-wheel *c* the ratchet-wheel *d* and dial *D'* are moved one-tenth of a rotation.

The dial *D* is provided with the numerals "0" to "9," arranged around its circumference, and the dial *D'* is provided with one blank space and with numerals from "1" to "9;" and thus for each operation of the actuating-stem the different numerals are consecutively exposed by the dial *D*, and at each complete rotation of the dial *D* different numerals are consecutively exposed by the dial *D'*.

From the nature of the views the dials *D* and *D'* are not shown in full, but the arrangement of the numerals upon the dials is one commonly employed in fare-registers, and



those versed in the art will fully comprehend my invention without detailed illustration of the numerals.

The case M'' is provided with a sight-opening *b*, arranged to expose at the same time one numeral on each dial.

A resetting-slide G is provided, similar to the one shown in my former patent, with the exception that one side only of the slide is provided with a cog-rack G'', which is arranged to engage with both the mutilated cog-wheels *c'* and *d'*. The operation of resetting is performed in substantially the same manner as that described in my former patent, and detailed description thereof herein is unnecessary.

In resetting the dials to "0" they are turned in a direction reverse from that in which they are turned while registering, in the manner fully described in my former patent. For this reason it becomes necessary when resetting the dials to hold the dog *a'*, when in its normal position, out of the path of the teeth of the ratchet-wheel *c*, in order to allow such wheel to be rotated in the reverse direction. For this purpose I provide a dog-releasing incline E, which is adapted to receive the dog near its limit of upward movement, and to carry the dog out of the path of the ratchet-teeth. A spring F is attached to the frame of the register and has its lower end *f* curved toward the ratchet-wheel *c*, and its upper part *f'* curved away from the ratchet-wheel, so that when the dog is drawn downward by the actuating-stem A it is held firmly against the ratchet-wheel by the operation of the spring F, but when the stem A is returned to its normal position (shown in Fig. 1) the dog slides upward along the outwardly-curved portion of the spring and engages with the incline E, which retracts the dog from the path of the ratchet-teeth without compressing the spring F.

As a preventive against jumping of the register, I arrange a stop A'' (see Fig. 5) to project into the path of the teeth of the ratchet-wheels *c* and *d* to lock such wheels against rotation after the dog has operated to actuate the ratchet-wheels at each downward movement of the stem, so that both ratchet-wheels are thereby prevented from being thrown forward more than one notch at a time by the dog. As shown in the drawings, this stop is fixed upon the actuating-stem A; but it may be otherwise arranged without departing from the spirit of my invention. It is so arranged that near the limit of downward movement of the stem it is carried into the path of the teeth of the ratchet-wheels *c* and *d*.

The ratchet-wheels are both of the same size and shape, and in Fig. 5 the ratchet-wheel *d* is not shown, but it will be readily understood that the stop A'' engages the wheel *d* in the same manner and at the same time that it engages the wheel *c*. This stop also serves to retain the dog Q in position to engage the ratchet-wheel *g* of the continuous counter.

I provide means for locking the actuating-stem when the resetting-slide is drawn out from the case to reset the dials, and to lock the resetting-slide when the actuating-stem is drawn out from the case to register a fare. Such means is illustrated in Fig. 4 and consists of the resetting-slide G, provided with the notch or recess *g*, which, as shown, is the last notch between the ratchet-teeth on the slide. It is arranged to receive the reciprocating block G'. The actuating-stem A has a notch or recess *g'*, also adapted to receive the block G', which is pivoted to the frame of the register by a pivot G'''; and I provide the block G' with a spring *g''*, arranged to normally hold the block in the recess *g* in the resetting-slide. When the resetting-slide is operated to draw it out from the case, the block G' is forced out of the notch *g*, and is thereby forced in the recess *g'* of the actuating-stem A, whereby the stem is locked against movement until the slide G is again returned to its normal position and allows the block to again enter the recess *g*, and thus release the block from its engagement with the stem A. As soon as the stem A is operated to draw it from the case, the recess *g'* is brought below the block G' and the stem prevents the block from being shifted upon its pivot to carry it out of the recess *g*, thus locking the slide against withdrawal from the case until the stem A is drawn back into its normal position in the case by the operation of the helical spring H, which is operatively connected with an arm *a'''*, which projects from the stem A.

I provide an improved dog for locking the resetting-slide G and the actuating-stem A against being returned to or drawn from the case before reaching the full limit of outward or inward movement, respectively. Such means consist of the combination of the stem G and A, provided with the ratchet-teeth H', with the dog I arranged to engage with such ratchet-teeth, such dog having an elongated head *i* and pivoted to the frame of the register by a pivot *i'*, arranged substantially near the mid-length of such elongated head, and the flat spring I' arranged to bear against the elongated head. By these means the head of the dog engages the spring and the dog is firmly held in contact with the ratchet-teeth, no matter in which direction the dog is pointed.

I also provide improved means for operating the hammer-lever J. Such means consist of the lever provided with the hammer J', the dog-stop *j*, arranged to limit the movement of the dog, the dog *j''*, pivoted to the hammer-lever and arranged to be engaged by a lug *j'''*, which is secured upon the actuating-stem A, so that the downward movement of the stem A will force the dog against the dog-stop and thus carry the hammer-lever downward until the dog slips off of the lug, when the spring K forces the hammer to strike the bell K' and carries the hammer, hammer-lever, and the dog-stop back into their normal position, as



shown in Fig. 2. A suitable spring L is arranged to yieldingly hold the dog against the stop and to allow the lug to press the dog outward away from the stop to allow such 5 lug to pass the dog upon the upward movement of the actuating-stem.

Difficulty has heretofore been experienced in sealing the case of the register so that it may be easily opened, but will give unmistakable evidence of having been tampered 10 with if opened by those unauthorized to do so. The means which I employ for this purpose consists of the back or base member M of the case M', which is provided with a forwardly-projecting flange m, and the casing or cap member M'' of the case, which is provided with the rearwardly-projecting flange m'', arranged to fit upon and embrace the 15 flange m. These two flanges are provided with suitable corresponding pin-receiving perforations m' and m'', respectively, and the perforations m'' are surrounded by an outwardly-projecting flange m<sup>5</sup>, adapted to seat the head of a locking-pin O and to chamber such head, and to receive and chamber a 20 seal O' of wax or other suitable material, which in practice is stamped with the seal of the company owning the register. Thus if this seal is broken it is impossible for it to be replaced by any one not in possession of the stamp of the company. The locking-pins O hold the two members of the case rigidly in position and absolutely prevent opening of the case without breaking the seal.

As shown in the drawings, an inwardly-projecting pin O'' is secured to the flange m'' at the top of the register-case and is arranged to enter a suitable perforation in the flange m, so that the upper part of the case is thus 40 held in place and but two seals are required at the bottom of the case, as shown in the drawings.

In order to avoid any liability of the pull for the resetting-slide G being accidentally engaged to thereby pull the slide out of the case, I provide the resetting-slide with a U-shaped locking direction-indicator member P, which is pivoted to the outer end of the slide by a pivot p and is arranged to seat upon and embrace the case of the register when the slide is in its normal position, as shown in Fig. 1. 50 When it is desired to draw the resetting-slide from the case, the member P is grasped by the thumb and forefinger and the slide is easily drawn outward thereby. The front shape of the U-shaped member shown in Fig. 1 is provided with the word "In" and the rear side (shown in dotted lines in Fig. 1) is provided with the word "Out," and by reason 60 of the U-shaped member embracing the case it is impossible to reverse the member until the slide has been drawn a sufficient distance from the case to bring the bottom of the member above the top of the case, and as soon as the slide is drawn outward a short distance the dog I engages with the ratchet-teeth H' upon the slide and prevents the return of the

slide into the case until the slide is fully drawn out, as shown in Fig. 2. By this arrangement I provide for operating the slide 70 convenient means not projecting from the case and not liable to catch upon the clothing or any other object, to thereby accidentally displace the slide.

The operation is as follows: To register a 75 fare the pull-button a is grasped by the conductor and the stem A is pulled downward, causing the dog a' to engage with the teeth of the ratchet-wheel c and to rotate such ratchet-wheel and the dial D one-tenth of a 80 rotation at each operation of the stem. We will suppose that the cipher has been exposed at the sight-opening in the case, and by the operation of the dog the dial is rotated to expose the numeral "1" through the sight- 85 opening. As the stem A is drawn downward the lug j''' is carried against the dog j'' and forces the hammer-lever J downward until the dog slips off of the lug, when the spring K forces the hammer back and causes it to 90 strike the bell K'. The dog a' and the ratchet-wheel c, the lug j''', and the dog j'' are arranged in such relation to each other that the dial will be rotated and the bell rung practically at the same instant. At the tenth 95 operation the dog a' enters the deep notch of the tooth C'' and thus the dog a'' is brought into engagement with the ratchet-wheel d' and rotates the dial D' one-tenth or a rotation simultaneous with the rotation of the dial D. 100 The dial D' is provided with numerals from "1" to "9," and in place of exposing a cipher through the sight-opening, when the register is reset, a blank space is left, as shown in Fig. 2.

When the end of the trip has been reached 105 and it is desired to reset the register, the operator grasps the U-shaped pull P and pulls the slide G outward. The cog-rack G'' engages with the teeth of the mutilated cog-wheels c' and d' and rotates such cog-wheels back- 110 ward, thus carrying the dials D and D' in a reverse direction from that in which they turn when registering, until the inactive or mutilated faces of such cog-wheels are brought in line with the resetting-slide G, 115 when the dials will be reset to "0." A suitable continuous counter is provided, similar in construction to the one shown in my former patent, but operated by a dog Q, which is secured to the upper end of the stem A and 120 engages with the ratchet-wheel q of the first dial of the continuous counter. The succeeding dials of the continuous counter are operated by a single tooth on each dial of lower order operating on the ten-tooth wheel 125 on the succeeding dial of higher order in the same manner as shown in my former patent, wherefore detailed description and illustration thereof herein is not necessary.

When the stem A is partially drawn from 130 the case of the register, its respective dog I engages with the ratchet-teeth H' upon the stem and prevents the stem from being returned to the case before the stem has been



fully drawn from the case, so that the dog will swing into the recess  $i''$  in such stem. After such stem has been partially returned into the case, the dog engages with such ratchet-teeth to prevent the stem from being drawn outward until it has been fully returned into its normal position, as shown in Fig. 2. As soon as the stem A is drawn outward sufficiently to bring the notch  $g'$  below the block  $G'$ , the block is thereby locked in the recess  $g$  and prevents the slide G from being drawn out from the case until the stem A has been fully returned to its normal position, so that the block  $G'$  can swing into the recess or notch  $g'$  when the slide is drawn out.

When the slide G is drawn out from the case, as shown in Fig. 2, the block is forced out of the notch  $g$  and into the notch  $g'$ , thus locking the stem A against being drawn out until the slide G has been fully returned to the case, as shown in Fig. 1, thus to allow the block  $G'$  to again enter the notch  $g$ .

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fare-register, the combination of the actuating-stem provided with a notch and arranged to reciprocate in the case; the resetting-slide provided with a notch and arranged to reciprocate in the case; the block secured to the frame of the register and arranged to be operated by the stem to enter the notch in the slide to lock the slide against movement when the stem is withdrawn from the case, and to be operated by the slide to enter the notch in the stem to lock the stem against movement when the slide is drawn out from the case.

2. In a fare-register, the combination of the dial provided with the ratchet-wheel; the actuating-stem provided with the hooked dog arranged to engage the ratchet-wheel to rotate it in one direction; the incline arranged to throw the hook out of the path of the ratchet-wheel at the limit of upward movement of the actuating-stem, and means for rotating the dial and ratchet-wheel in the other direction.

3. In a fare-register, the combination of the actuating-stem provided with the lug; the hammer-lever provided with the hammer; the dog-stop arranged to limit the movement of the dog; the dog pivoted to the hammer-lever and arranged to be engaged by the lug on the actuating-stem during the downward movement of such stem and to rest against the dog-stop, and the spring adapted to yieldingly hold the dog against the dog-stop, and to allow the lug to pass the dog upon the upward movement of the actuating-stem.

4. In a fare-register, the combination of the hollow journal-stem provided with the ten-toothed ratchet-wheel, one tooth being notched deeper than the others, the large reg-

istering-dial journaled upon the upper end of such journal-stem and provided with a ten-toothed ratchet-wheel; the small registering-dial secured to the upper end of the journal-stem; the two mutilated cog-wheels secured respectively to the journal-stem and to the large dial; the resetting-slide provided upon one side with the cog-teeth arranged to engage both mutilated cog-wheels; the actuating-stem provided with the two hooks, one arranged to engage the ratchet-wheel upon the journal-post at each operation of the actuating-stem, and the other hook arranged to engage the ratchet-wheel upon the large dial only when the first hook rests in the deep notch in its respective ratchet-wheel.

5. In a fare-register having a resetting-slide provided with ratchet-teeth and the dog arranged to engage such teeth between the outward and inward limit of movement of such slide, the combination therewith of the U-shaped direction-signal pivoted to the outer end of such slide and arranged to seat upon and embrace the case when the slide is in its normal position.

6. In a fare-register, the combination of the two dials, each having the mutilated cog-wheel; and the ratchet-wheel; suitable means arranged to intermittently engage the ratchet-wheels to rotate the dials in one direction; the resetting-slide provided with the cog-rack arranged to engage such cog-wheels to rotate them in the other direction, and having a notch arranged to receive the locking-block when the slide is in its normal position; the actuating-stem provided with a notch adapted to receive the locking-block therein when the stem is in its normal position, and a vibrating block adapted to be operated by the stem to enter the notch and lock the slide when the stem is withdrawn from its normal position, and to be operated by the slide to enter the notch and lock the stem when the slide is withdrawn from its normal position.

7. In a fare-register, the combination of the journal-post fixed to the frame; the hollow journal-stem journaled upon the post; the ratchet-wheel fixed to the journal-stem; the large register-dial provided with the numerals, the ratchet-wheel and the mutilated cog-wheel and journaled upon the journal-stem; the small register-dial provided with the numerals and fixed upon the journal-stem and superimposed upon the large dial; the hooked dogs arranged to engage the ratchet-wheels to intermittently turn the dials in one direction, and the toothed rack arranged to engage the mutilated cog-wheels to turn the dials in the other direction.

CHARLES L. LOGAN.

Witnesses:

ALFRED I. TOWNSEND,  
F. M. TOWNSEND.