

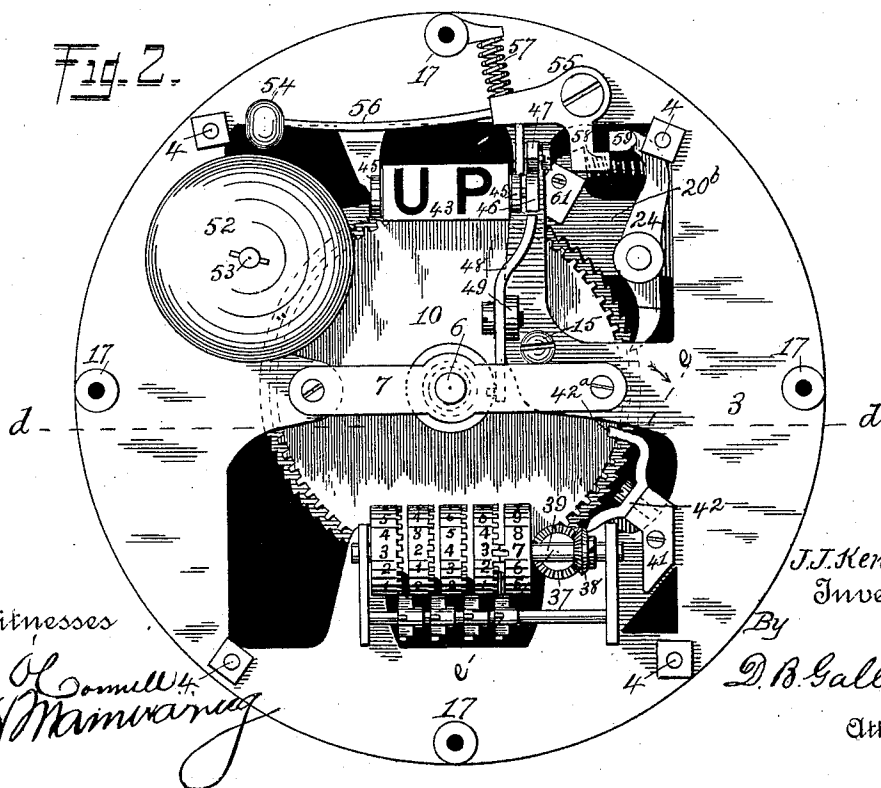
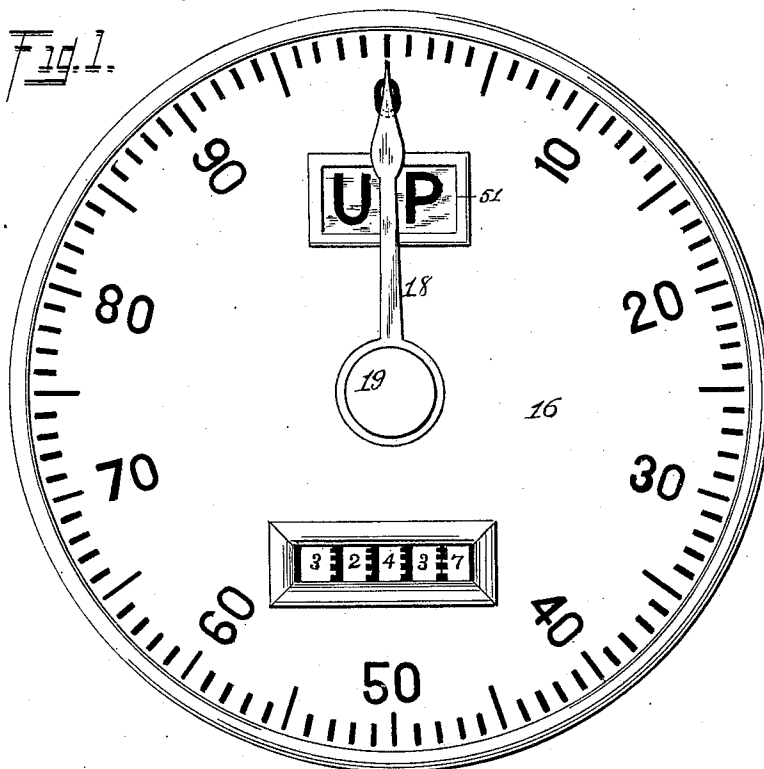
(No Model.)

4 Sheets—Sheet 1.

J. J. KENNELLY.
FARE REGISTER.

No. 576,786.

Patented Feb. 9, 1897.



(No Model.)

4 Sheets—Sheet 2.

J. J. KENNELLY.
FARE REGISTER.

No. 576,786.

Patented Feb. 9, 1897.

Fig. 3.

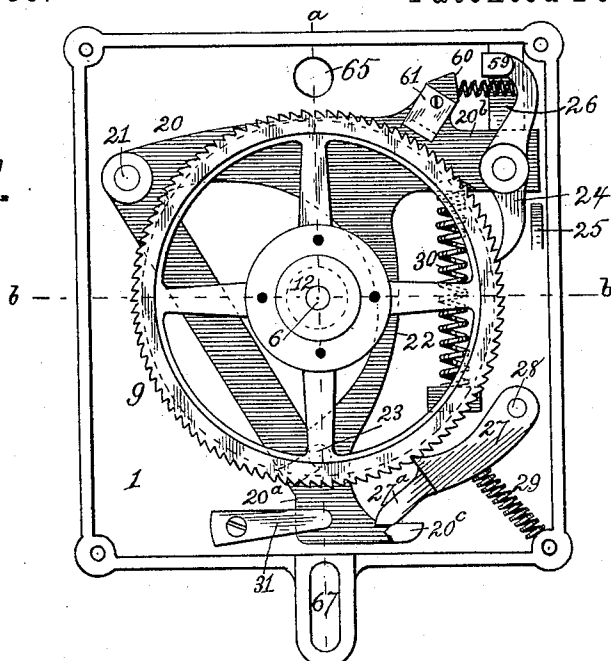


Fig. 4.

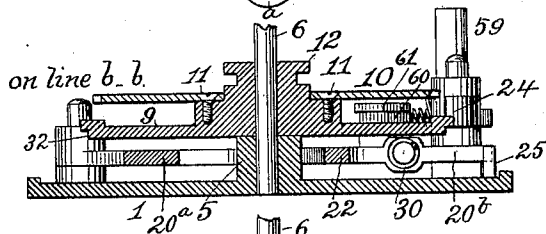


Fig. 5.

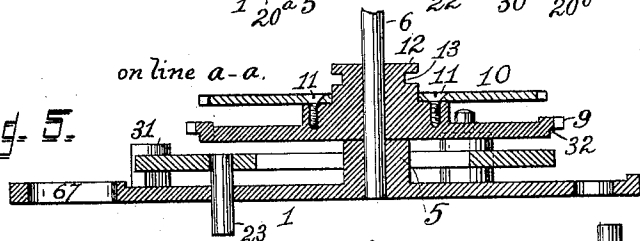
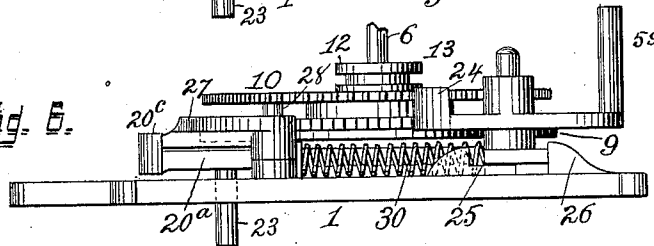


Fig. 6.



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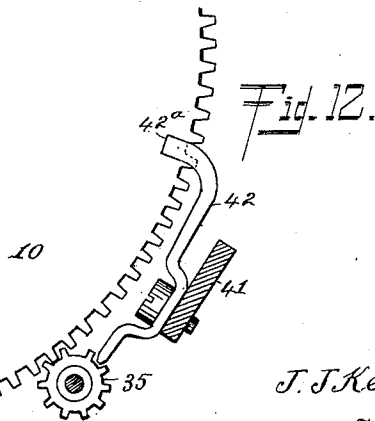
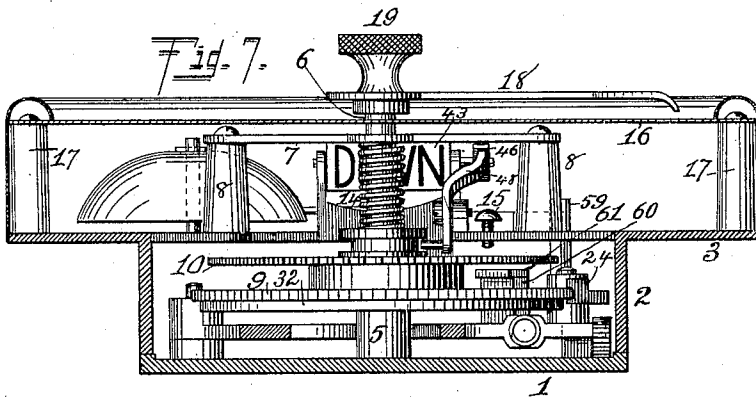
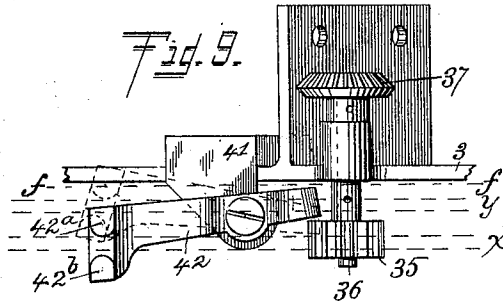
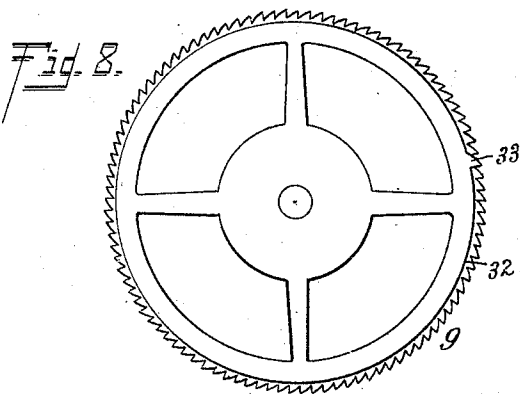
(No Model.)

4 Sheets—Sheet 3.

J. J. KENNELLY.
FARE REGISTER.

No. 576,786.

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4 Sheets—Sheet 4.

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FARE REGISTER.

No. 576,786.

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Fig. 10.

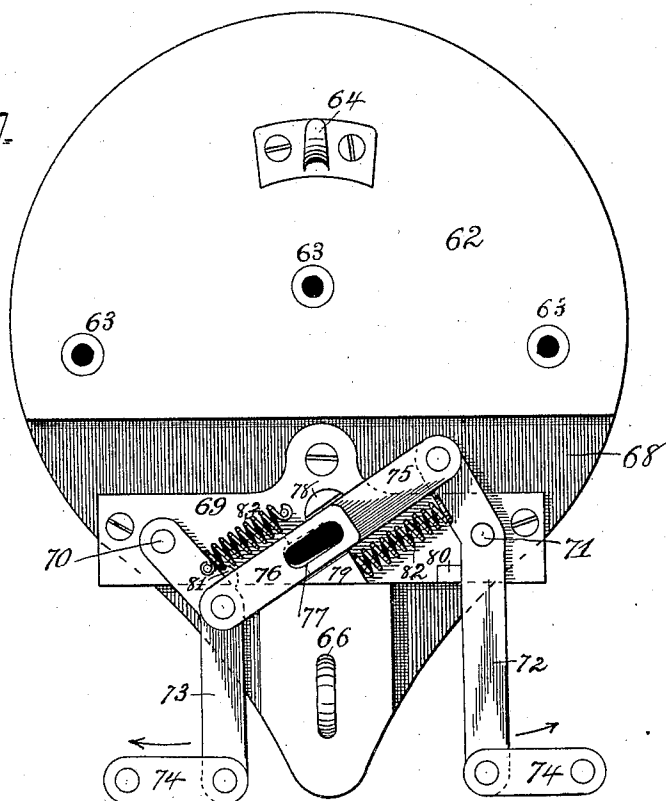
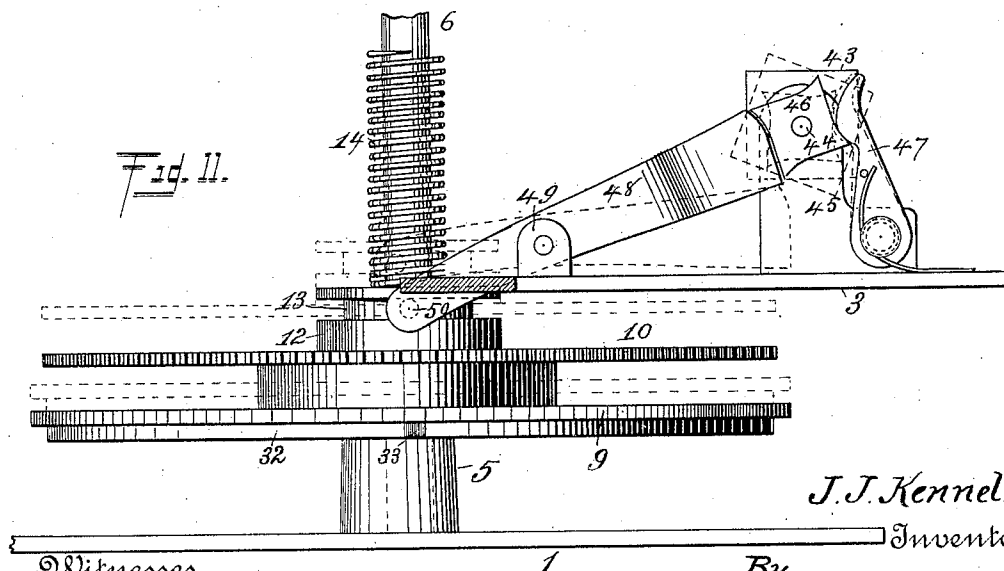


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHN J. KENNELLY, OF NEW YORK, N. Y.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 576,786, dated February 9, 1897.

Application filed May 25, 1896. Serial No. 592,951. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. KENNELLY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Fare-Registers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to that class or style of registers commonly known as "dial-registers," in which a hand moving over a numbered dial or face indicates the number of fares taken during a trip; and the objects are to improve and simplify the construction, to reduce the number of parts, and to provide a register which shall be reliable in operation and not liable to get out of order.

To these ends the invention comprehends the construction, arrangement, and combinations of parts hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate my invention and form a part of this specification, Figure 1 represents a front or face view of the register; Fig. 2, a front elevation with the dial and the hand or pointer removed; Fig. 3, a front view of the base-plate with a portion of the operating mechanism; Fig. 4, a transverse section on the line *b b* of Fig. 3; Fig. 5, a vertical section on the line *a a* of Fig. 3; Fig. 6, a side view of the base-plate and the operating mechanism mounted thereon. Figs. 4, 5, and 6 show the gear-wheel for driving the permanent register, which wheel is omitted from Fig. 3. Fig. 7 represents a transverse section on the line *d d* of Fig. 2, the main gear-wheel and the ratchet-wheel being, however, shown in elevation. Fig. 8 is a rear or under side view of the ratchet-wheel; Fig. 9, a view of the devices for locking the permanent register while the trip-register is being reset to zero, the view being taken on the line *e e* of Fig. 2, looking in the direction of the arrow. Fig. 10 is a face view of the base or block which supports the register in operative position, show-

ing the means for actuating the register; and Fig. 11 shows the direction-indicator in end view with means and connections for turning the same in the operation of resetting the trip-register to zero. Figs. 10 and 11 are on an enlarged scale. Fig. 12 is a horizontal section on the line *f f*, Fig. 9, showing a broken view of the means for locking the permanent register when the trip-register is disconnected.

Referring to the drawings, 1 designates the base-plate, which forms the back of the register case or frame; 2, a rectangular box or case, and 3 a front plate, circular in figure and overhanging the box or case 2. Preferably the box 2 and the front plate 3 are cast integral, but they may be made separate. The parts are bolted together by bolts 4. At the center of the base-plate is a hollow boss 5, which forms a bearing for the rear end of the shaft 6, the front end of said shaft having a bearing in a bridge-piece 7, which is mounted on the ends of two arms or studs 8 8, projecting forward from the front plate 3. Fast on the shaft 6 is a large ratchet-wheel 9 and a gear-wheel 10, these two wheels being preferably, but not necessarily, made separate and fastened together by screws 11. A hub 12, having a circumferential groove 13, for a purpose to be hereinafter explained, projects forward from the wheel 10, and on the shaft between this hub and the bridge-piece 7 is located a spring 14, which constantly presses the shaft and its connected wheels back. The shaft is, however, capable of being drawn longitudinally forward against the force of said spring, the extent of such movement being regulated by a set-screw 15, which projects through the front plate 3.

16 designates the dial or face mounted on studs or arms 17, projecting forward from the plate 3, and 18 is the hand or pointer mounted on the front end of shaft 6 and provided with a knob or finger-piece 19, whereby the shaft is adapted to be drawn forward.

20 designates an angular lever fulcrumed on a stud 21, projecting forward from the base-plate 1, near one side and toward the top thereof. (See Fig. 3.) For the sake of lightness and strength I form this lever, as shown, with a connection 22 between the two arms, but this is not necessary and may be omitted

if the lever be made strong and heavy enough to bear the strain to which it is subjected in operation.

The depending arm 20^a has a stud 23, which projects back through an opening (indicated by broken lines in Fig. 3) in the base-plate and connects with the actuating mechanism shown in Fig. 10, while the horizontal arm 20^b carries a spring-pressed pawl 24, which engages the teeth of ratchet-wheel 9 and turns the latter forward step by step when the lever is vibrated. Stop-lugs 25 26, formed on the base-plate on opposite sides of the arm 20^b, limit the movements of the lever, the arrangement of said lugs being such that just sufficient movement of the lever is permitted to advance the ratchet-wheel through an angular distance corresponding with the length of one of its teeth.

As represented in Fig. 1, the trip-register is adapted to register one hundred fares, and therefore the ratchet-wheel is formed with one hundred equal teeth, but it will of course be understood that the register may have any capacity above or below that specified, and that whatever the capacity may be the number of teeth on the wheel 9 should correspond with the scale on the dial.

27 designates a stop-pawl pivoted on a stud 28, projecting from the base-plate, said pawl being pressed into engagement with the wheel 9 by a spring 29. The office of this pawl is to prevent backward rotation. It has an extension 27^a, which rests on a forwardly-projecting stud 20^c, formed on the lower end of the arm 20^a of lever 20, the arrangement being such that when the lever is in normal position, as represented in Fig. 3, the pawl is positively held against the wheel, but when the lever is vibrated toward the left the stud 20^c, moving in the arc of a circle, recedes from the arm 27^a enough to permit the pawl to swing outward against the force of its spring, so as to let the next tooth pass. As soon as the tooth has passed the pawl springs into engagement, and then when the lever returns to normal position under the action of a spring 30 it positively locks the pawl and prevents forward as well as backward rotation of the wheel, thus preventing the hand or pointer from being advanced surreptitiously or by other means than the legitimate operation of the register.

A guide or keeper 31, screwed upon the base-plate, overlies the lower end of arm 20^a to prevent the same from rising and the pin 23 from disengaging with the operating mechanism.

As above indicated, the shaft 6 is capable of being moved longitudinally forward, carrying with it the two wheels 9 and 10, which are fast thereon. The range of movement is such that the wheel 9 moves beyond the stop-pawl 27, whereupon the latter snaps under the wheel and prevents its return until the pawl is thrown out. This is effected by the following means:

On its under or rear face the wheel 9 is formed with a circular flange or shoulder 32 somewhat within the base-line of the ratchet-teeth, and this flange or shoulder has a single tooth 33, which coincides with one of the ratchet-teeth of the wheel. The wheel being rotated by turning the shaft 6, the tooth strikes the point of the pawl and throws it out to the limit of its outward movement or until it is arrested by the stud 20^c, when the wheels and shaft are thrown back by the spring 14. The object of this construction and arrangement will appear presently.

34 designates the permanent or total register, which, being of ordinary construction, requires no particular description. This register operates synchronously with the trip-register, being driven from the gear-wheel 10 through a pinion 35 on the rear end of a short horizontal shaft 36, a bevel-gear 37 on the front end of said shaft, and a second bevel-gear 38 on the shaft 39, which supports the register-wheels. The shaft 36 is mounted in a bearing 40, formed or fastened on the front plate 3. The two bevel-gears 37 38 are of the same size—that is, they have the same number of teeth, the number being immaterial—but the pinion 35, which meshes with the gear-wheel 10, has ten teeth, while the said gear-wheel has the same number of teeth as the ratchet-wheel 9, from which it will be understood that each forward movement or impulse of the wheels 9 10 will turn the pinion 35, and consequently the units-wheel of the permanent register, which is fast on its shaft, through one length of a rotation.

In the use of fare-registers it is customary to reset the trip-register to zero after each trip. In this case this is accomplished by taking hold of the button 19 and pulling the shaft 6 and its connected wheels 9 10 forward, as already fully explained. When the pawl 27 snaps under the ratchet-wheel 9, it prevents the return of the parts to normal position until the shaft and wheels have been turned forward to complete a full rotation and bring the hand 18 to zero. When this position is reached, the tooth 33 throws the pawl 27 out and permits the parts to move back to normal position under the influence of spring 14, it being understood that the tooth 33 is located with reference to the hand and the pawl to throw the latter out at the instant the zero position is reached.

The forward movement of shaft 6 carries the wheel 10 beyond and out of mesh with the pinion 35, thus entirely breaking connection between the permanent register and the trip-register. It is necessary that the permanent register be locked during the continuance of such disconnection, so as to prevent fraudulent operation. This I accomplish in the following manner: A bracket 41, secured on the front plate 3, sustains a pivoted lever 42, one end of which is adapted to be thrown into and out of engagement with the teeth of the pinion 35. (See Fig. 9.) The other end of

said lever is bent down and forked, the two prongs 42^a and 42^b extending on opposite sides of the gear-wheel 10, which is normally in mesh with pinion 35 to actuate the permanent or total register. When the shaft 6 and the wheels 9 and 10 are drawn forward, the latter disengages from the pinion 35, leaving the permanent register entirely disconnected from any driving or actuating mechanism.

The same movement of the wheel that disconnects it with the pinion rocks the lever 42 and throws its free end into engagement with the teeth of the pinion to lock the latter and positively prevent the permanent register from being operated. The two positions of the wheel and lever are indicated in Fig. 9 by broken lines *x y*, *x* being the normal or operative and *y* the disconnected or inoperative position.

43 designates the direction-indicator. This consists of a block square in cross-section and of sufficient length to bear on its faces the legends to indicate the direction in which the car is moving. It is mounted on an axis 44, which is journaled in ears 45 45, projecting out from the front plate 3. One end of the axis 44 projects through the ear 45, and is provided outside of the same with a four-toothed wheel 46, shaped substantially as shown in Fig. 11. A swinging spring-pressed arm 47, mounted in the same plane with the wheel 46, bears against the back of the wheel 46, the arrangement being such that when the indicator is free to turn the swinging arm will move it and the wheel 46 from the position indicated by full lines to that indicated by broken lines. At the opposite side of said wheel is a vibrating arm 48, pivoted to an ear 49, which also projects from the plate 3. One end of this arm carries a laterally-projecting pin 50, which extends into the groove 13 in hub 12. The other end of the arm extends close to the wheel 46, the arrangement being such that when the parts are in normal or operative position (shown in full lines in Fig. 11) the arm 48 prevents the wheel 46 from rotating. When, however, the shaft 6 is pulled forward preparatory to resetting the trip-register to zero, the arm 48 swings to the position indicated by broken lines, releasing the wheel 46 and permitting it and the direction-indicator to make a partial rotation under the influence of the swinging arm 47. This partial rotation having been effected a tooth of wheel 46 stands in the path of arm 48, which, on the return of the shaft 6 to normal position when the register has been reset, strikes said tooth and carries it forward to complete a quarter-rotation of the wheel and indicator, bringing the next face of the latter to view through the glazed sight-opening 51 in the dial and so changing the indication.

52 designates the bell, which is mounted on a post or standard 53, projecting forward from the front plate 3, and 54 is the bell-hammer. The arm of the hammer comprises an elbow-lever 55 and a resilient rod or extension 56.

A spring 57, applied to one arm of the elbow-lever, throws the hammer toward the bell, the movement being limited by a stop, which in this instance is shown as the ear on which the swinging arm 47 is pivoted, said stop being so arranged as to arrest the hammer just before it strikes the bell. The stroke is completed by momentum, and the hammer is instantly retracted by the resiliency of its arm 56, leaving the bell perfectly free and unobstructed.

The vertical arm of the elbow-lever 55 has at its end a laterally-projecting lug 58, and the pawl 24 has a forwardly-extending arm 59, which in the normal position of the parts stands just above the lug 58, the adjacent vertical faces of these two members standing approximately in the same plane. When the register is operated, the pawl 24 moves downward to rotate the wheel 9, carrying the arm 59 opposite the lug 58. On the return of the pawl to normal position the arm 59 is thrown toward the left by reason of the point of the pawl riding over the next tooth of wheel 9, whereby the elbow-lever 55 is rocked on its pivot and the hammer is retracted. As soon the arm 59 passes the lug 58 or as soon as the point of the pawl 24 passes the tooth on which it is riding and drops behind the same the hammer is free to respond to its spring 57 and is thrown forward to strike the bell.

An important feature of my invention is a provision for preventing operation of the trip-register or ringing of the bell while the trip and permanent registers are disconnected. This provision comprises a brake arranged and adapted to act on the ratchet-wheel 9 in the following manner: On the arm 20^b of the lever 20 is formed a lug 60, and on this lug is a plate 61. The plate projects inward over the lug, and the arrangement is such that when shaft 6 and the wheels 9 and 10 are pulled forward preparatory to resetting the plate will be in the same plane with the wheel 9 and in close proximity thereto. (See Figs. 3 and 4.) If now an attempt be made to operate the register, the plate will be drawn against the teeth of the wheel and will not only serve as a stop for the operating mechanism, but will also act as a brake to prevent the wheel from rotating. The drawings show the edge of the plate as being plain, but if preferred it may be formed with teeth to engage those of wheel 9 and positively lock the latter.

62 designates the block, which is to be permanently attached at some conspicuous place within the car or other vehicle on which the register is to be used, screw-holes 63 being shown for this purpose. Near the top of the block is a hook-stud 64, upon which the register is hung, the base-plate 1 being provided with a hole 65 to receive said stud, and near the bottom of the block is a staple 66, which enters an eye 67, formed in a projection at the lower edge of the base-plate 1. This staple is intended to receive the hasp of a lock

or other locking device for securing the register in place.

The block 62 is recessed on its face, as represented at 68, and in this recess is secured a plate 69, provided toward its ends with two studs 70 71, on which are mounted two levers 72 73 of the first and second orders, respectively, provided at their lower ends with coupling-pieces 74, whereby they are adapted to be connected with the ordinary operating lever, rod, or strap. To the upper end of the lever 72 is pivoted a push-plate 75, notched or slotted at its free end, and to the lever 73 is pivoted a plate 76, having an elongated eye 77 at its free end. The two plates 75 76 overlap each other and are both coupled with the pin 23, which projects back from the lever 20. The two levers 72 73 are arranged to swing outward, as indicated by the arrows, and both operate through their connections in the same direction, the first pushing the pin 23 and the other pulling it toward the left. Under this arrangement the two levers act entirely independently of each other, and either is adapted to be operated without moving or disturbing the other.

78 79 are guide-lugs formed on the plate 69, and 80 81 are stop-lugs to limit the inward movements of the levers.

An expanding-spring 82, applied to the lever 72, and a contracting-spring 83, applied to lever 73, hold the said levers in normal position against their stop-lugs or restore them to such position after operation.

Having now described my invention, I claim—

1. In a register the combination of a ratchet-wheel movable back and forth in the direction of the length of its axis, means for driving the same, a spring-pressed pawl for preventing back rotation, said pawl being adapted to pass behind the teeth of the wheel when the latter is moved forward, and a tooth or projection on the back of the wheel to throw the pawl out from behind the same.

2. In a register the combination of a ratchet-wheel movable back and forth in the direction of the length of its axis, means for driving the same, a spring-pressed pawl normally in engagement with the teeth of the wheel to prevent back rotation, said pawl being adapted to pass behind the teeth of the wheel when the latter is moved forward, a tooth or projection on the back of the wheel to throw the pawl out, and a spring to throw the wheel back automatically when the pawl is thrown out from behind the same.

3. In a dial-register the combination with the central shaft or spindle movable back and forth in the direction of its length, the hand or pointer, and a ratchet-wheel fast thereon, of a swinging or vibrating lever, a pawl thereon for driving the ratchet-wheel, a second pawl mounted on a stationary pivot to prevent back rotation, and arranged and adapted to pass behind the wheel when the latter is moved forward, a spring acting on

said second pawl to hold it in action, a tooth or projection on the back of the wheel to throw the pawl out from behind the same on the completion of a full rotation, and a spring for automatically returning the wheel to normal position when the pawl is thrown out from behind the same.

4. In a dial-register the combination with the central shaft or spindle and a ratchet-wheel fast thereon formed with an offset or shoulder on the back thereof within the baseline of the teeth, said shaft and wheel movable back and forth in the direction of the length of the axis, means for driving the ratchet-wheel, a pawl for preventing back rotation adapted to pass behind the teeth of the wheel when the latter is moved forward, a spring to hold the pawl in action, a single tooth or projection on said shoulder or offset to throw the pawl out from behind the wheel on the completion of a rotation, and a spring for returning the shaft and ratchet-wheel to normal position when the pawl is thrown out from behind the wheel.

5. In a fare-register the combination of a permanent or total register comprehending a pinion, and a dial trip-register comprehending a central shaft movable back and forth in the direction of its length, a gear-wheel fast thereon normally in mesh with said pinion to drive the same, the connection between said gear and pinion being broken by the movement of the gear-wheel in one direction, and a lever connected with, and operated by the gear-wheel to lock the pinion when the connection is broken, substantially as shown and described.

6. The combination of a dial trip-register comprehending a driven gear-wheel movable in the direction of the length of its axis, a permanent or total register comprehending a pinion driven by said gear-wheel, the connection between said pinion and gear-wheel being broken by the movement of the latter in one direction, and a pivoted lever having a fork at one end in which the gear-wheel runs, its opposite end being arranged and adapted to be thrown into engagement with the teeth of the pinion when the connection between the gear-wheel and pinion is broken, and out of engagement when said connection is restored.

7. In a register the combination of a ratchet-wheel, an operating-lever and pawl for rotating the same, a stop-pawl for preventing back rotation, and a connection between said operating-lever and pawl to hold the latter against the wheel and prevent forward rotation when the lever is in normal or retracted position.

8. The combination of a rotatable direction-indicator, a pivoted arm standing normally in position to prevent rotation of the indicator, a swinging spring-pressed arm arranged and adapted to partially rotate the indicator when released, and a longitudinally movable and rotatable shaft, comprising a part of the

registering mechanism, connected with said pivoted arm and operating by its longitudinal movements to throw the arm into and out of engagement with the direction-indicator and to turn the latter to a new indicating position on the return of the shaft to normal position.

9. The combination of a rotatable direction-indicator rectangular in cross-section, a four-toothed wheel fixed on the projecting axis thereof, a swinging spring-pressed arm arranged to act upon one of the teeth of said wheel to partially rotate the same when free, a longitudinally-movable shaft comprising a part of the registering mechanism, and a vibrating arm pivoted between the four-toothed wheel and the shaft and coupled with the latter, the said arm acting to lock and unlock the said wheel when the shaft is moved back and forth and change the position of the wheel and indicator on the return of the shaft to normal position.

10. In a register of the character described, the combination of a rotatable shaft comprising a part of the registering mechanism, the same being movable back and forth in the direction of its length, a ratchet-wheel fast on said shaft, a vibrating lever and a pawl thereon for rotating the ratchet-wheel and its shaft, and a brake mounted on said lever to act upon the ratchet-wheel when the latter is out of normal position.

11. In a register of the character described, the combination of a rotatable shaft comprising a part of the registering mechanism, the same being movable back and forth in the direction of its length, a ratchet-wheel fast on said shaft, a vibrating lever and a pawl thereon for rotating the ratchet-wheel and its shaft, a lug on the lever, and a plate mounted on the lug and overhanging the same on the side toward the ratchet-wheel, the arrangement being such that when the shaft and wheel are moved out of normal position the wheel will be in the same plane with said plate, the latter then serving as a stop to prevent operative vibration of the lever and as a brake to prevent rotation of the ratchet-wheel and its shaft.

12. In a register of the character described, the combination of a dial trip-register including a rotatable shaft or spindle, a ratchet-wheel fast thereon, a vibrating lever and a pawl thereon for rotating the said wheel and

shaft, a permanent or total register geared with, and operated from, the trip-register, a separable connection between the permanent and the trip registers, and a projection on the vibrating lever of the trip-register arranged to impinge against said ratchet-wheel to prevent operative movement of the lever, and to brake the wheel while the two registering mechanisms are disconnected.

13. The combination with a register comprehending a reciprocating mechanism through which it is operated, of an operating mechanism comprehending two levers arranged to move actively in opposite directions and to operate in the same direction, and connections between said levers and the reciprocating mechanism of the register adapted to permit the latter to be operated by either of said levers independently of, and without moving, the other.

14. The combination with a register comprehending a reciprocating mechanism through which it is operated, of an operating mechanism comprehending a lever of the first order and a lever of the second order, the handle ends of both levers standing in the same direction substantially parallel to each other, and connections between said levers and the reciprocating mechanism of the register adapted to permit the latter to be operated by either of said operating-levers independently of, and without moving the other.

15. The combination of the base-block provided with means for holding a register, two levers fulcrumed thereon at opposite sides of a vertical central line, stop-lugs and springs for holding the handle ends of said levers normally in substantially vertical position, one lever having a push-bar pivoted thereto above its fulcrum to act on a movable projection of the register and the other lever having a link pivoted thereto below its fulcrum, said link having an elongated eye for the reception of said movable projection of the register, whereby the register is adapted to be operated by either of said levers without moving the other.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. KENNELLY.

Witnesses:

JOHN H. WELCH,
JOHN B. BENTON.