(No Model.) 2 Sheets—Sheet 1.

W. L. SILVEY.

FARE REGISTER.

No. 472,232. Patented Apr. 5, 1892.

Fig 1.

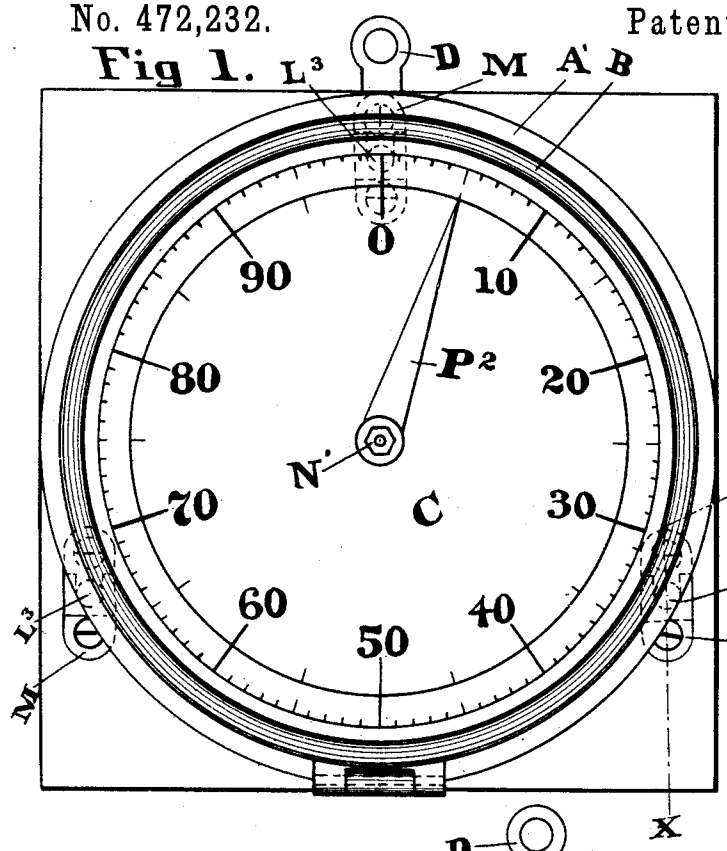


Fig 2.

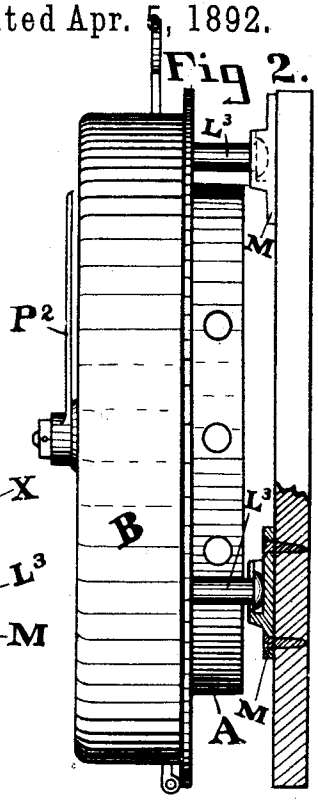
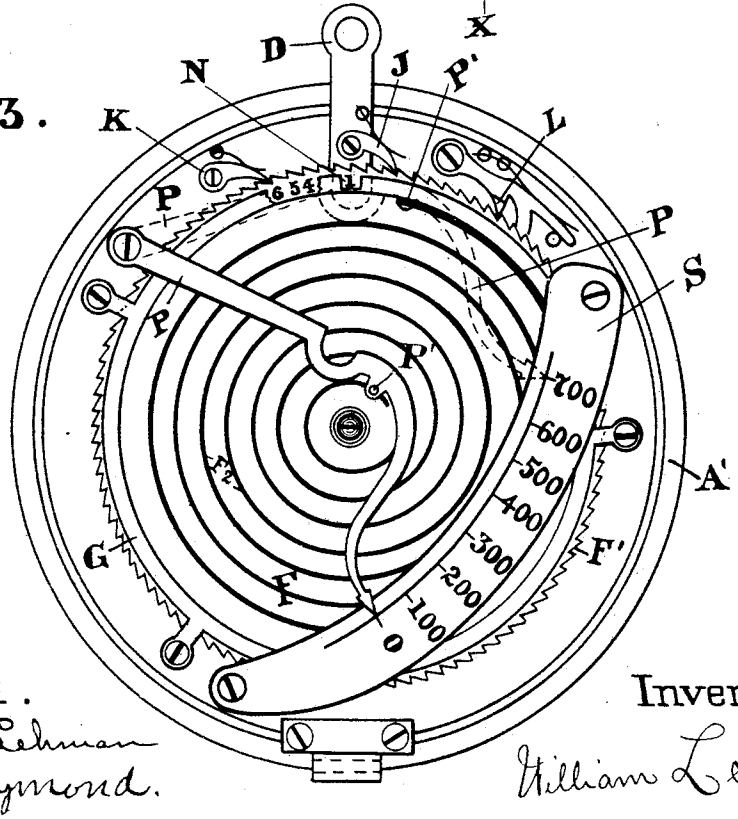


Fig 3.



Attest.
E. B. Lehman
C. U. Raymond.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

2 Sheets—Sheet 2.

W. L. SILVEY.

FARE REGISTER.

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Fig 6.

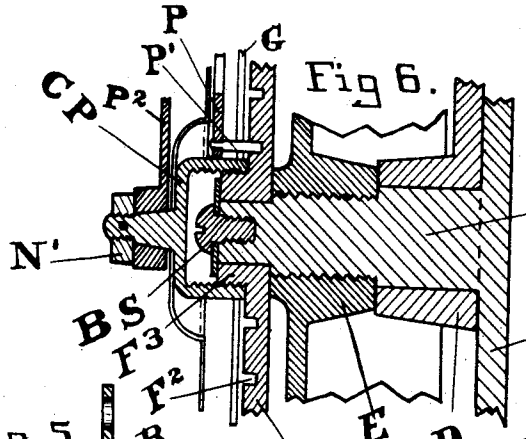


Fig 5.

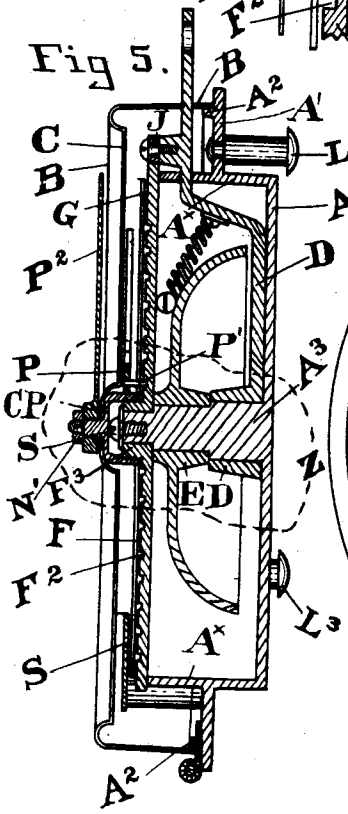
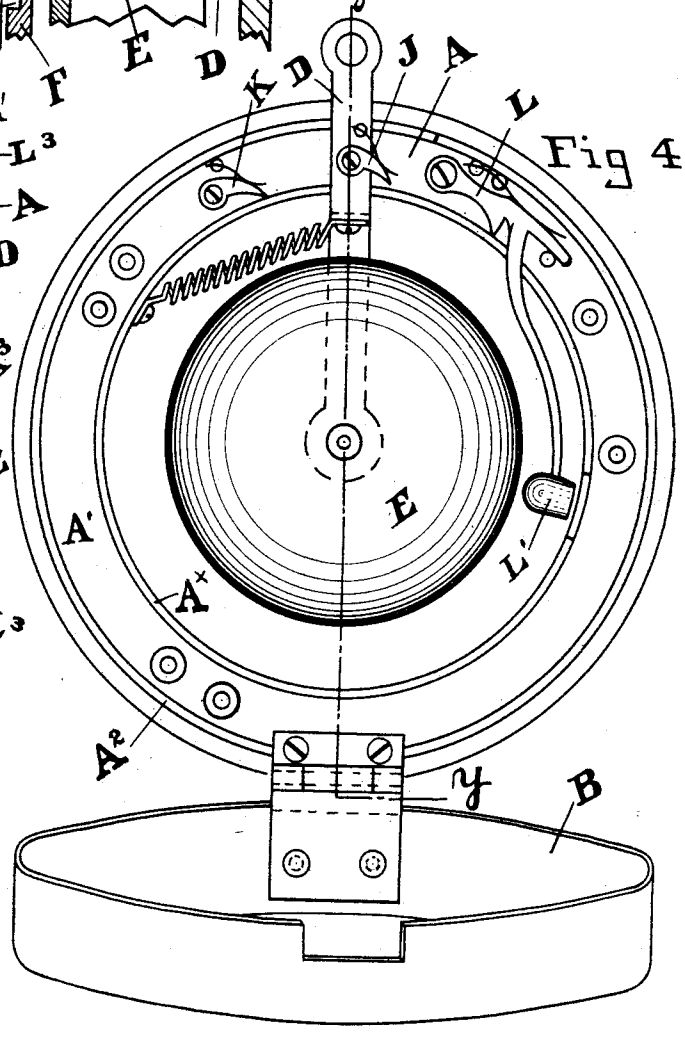


Fig 4.



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UNITED STATES PATENT OFFICE.

WILLIAM L. SILVEY, OF LIMA, ASSIGNOR TO THE DAYTON MANUFACTURING COMPANY, OF DAYTON, OHIO.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 472,232, dated April 5, 1892.

Application filed July 28, 1891. Serial No. 401,003. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. SILVEY, a resident of Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Fare-Registers, of which the following is a specification.

My invention relates to a rotative registering and indicating apparatus which is to be operated by the conductor either simultaneously with the collection of the fares or at any other required time, and preferably by pulling a rope, strap, or other suitable device, whereby an indicating-hand is caused to move over the face of an exterior indicating-dial, and at the same time effect an accurate total register inside the apparatus; and it is my object to produce an apparatus which will be very strong and simple in its construction, not liable to get out of order, and one that will always produce a reliable report of the number of fares collected.

Referring to the accompanying drawings, which are made a part hereof, and in which similar letters of reference indicate corresponding parts, Figure 1 is a face view of the complete register. Fig. 2 is a side or edge view of the complete register, a part of the hanger-board and one of the hanger-plates being broken away in order to show the plan for hanging it in the car. Fig. 3 is an interior view of the register. Fig. 4 shows an interior view of the register, the spiral face-plate or ratchet-plate removed in order to show the bell-ringing mechanisms and their association with relation to each other and to other parts. Fig. 5 is a vertical transverse central section on the line Y Y of Fig. 4. Fig. 6 is an enlarged detail view of that portion of Fig. 5 inclosed by the irregular dotted line Z.

The apparatus proper consists, preferably, of an annular back-plate casting A, having an annular flange $A^{\times}$, extending in this instance at right angles to the plate, the two forming a housing or casing for the operating mechanism. From the flange $A^{\times}$ projects a vertical ledge, lip, or flange A′, having near its upper outer face a small annular flange A^2, which serves the purpose of effectually closing all access to the interior of the apparatus when the lid B is closed, as shown in Figs. 2 and 5. The front part of this cover B serves the purpose of a dial C, and is laid off into regular divisions and numbered, as shown in Fig. 1. These divisions begin with zero and number therefrom as high as the denominations are desired to go, which I have found in practice to be best numbered from zero to 100, every ten divisions being designated by a suitable numeral, as shown in Fig. 1—as, for instance, "10," "20," "30," "40," "50," and so on.

Attached to the center of the plate A and on the front side thereof is a stem A^3, which is reduced at several points in its length to form a plurality of bearings, as shown in Figs. 5 and 6, and on one of these bearings the bell-lever D is journaled, a recess being cut in the flange $A^{\times}$ of the plate A, and in the flange of the lid B, through which the outer end of the lever passes, the recess being of sufficient size to allow a limited lateral movement to the said lever. The lever is secured in place upon the stem A^3 by the bell-gong E, the central inner portion of which has a boss, in which a screw-thread is cut, and by which the bell is secured firmly to the stem A^3. The outer face of the bell-gong is provided with a second boss, which extends outward a sufficient distance to be in perfect vertical alignment with the edges of the flange $A^{\times}$ of the back plate, and against the said flange and the outer boss of the bell-gong bears an annular plate F, which is rotated upon the stem A^3. Within the periphery of the plate F are cut ratchet-teeth F′, and on its outer face is cut or otherwise formed a continuous spiral groove F^2, which begins near the center and gradually diverges toward the periphery of the said plate. Stamped around the plate or wheel F contiguous to the ratchet-teeth F′ are figures corresponding in number to the teeth in the wheel, which I have found in practice are best when extending from "1" to "100." A shield G covers the figures for the purpose of preventing them being read incorrectly, only one number being exposed at a time through a notch N, as shown by 1 in Fig. 3. This shield may be omitted, if desired, and a pointer substituted therefor, which may be fastened to the driving-pawl J on lever D. A second or stationary pawl K, which I call a "check-pawl," serves to prevent

the wheel F being rotated backward or from being moved too far forward by any sudden jerk on the lever D and pawl J. The pawl K is slightly out of time with the driving-pawl J to allow for any eccentric movement of the wheel F or any irregularity in the ratchet-teeth, the driving-pawl having a limit of play over a space equal to about one and one-half of a tooth on the wheel F. To one side of the driving-pawl J and lever D is a third pawl L, which, like the check-pawl K, is stationarily pivoted on the case A'. The outer or free end of this pawl has an extension, to which a bell-hammer L' is fastened. This pawl is actuated as follows: The lever D and pawl J being operated, a rotary step-by-step motion is imparted to the ratchet-wheel F, which in turn imparts an up-and-down motion to pawl L by sliding over the ratchet-teeth, springs serving to keep all the pawls in contact with the ratchet-wheel, the motions of all being nearly simultaneous. Whenever the lever D is moved, the wheel F is given a motion forward one tooth and the bell-pawl slides up the incline on one side of the tooth and drops off the straight side, thus imparting a sudden and violent downward motion to the bell-hammer L', which strikes the bell-gong and gives an alarm. At each registration an alarm is given.

I have already alluded to the ratchet-wheel F as having a spiral groove F^2 cut in its outer face, and I will now describe its purpose. Pivoted to one side of the case eccentrically to the axis of the wheel F is a pointer P. This pointer extends across the face of the plate F, the outer or free end pointing to a numeral on a scale S. Near the center of this pointer is a pin P', which extends into the spiral groove F^2, so that by the rotation of the wheel F the pointer is gradually moved to the periphery of the wheel, each revolution of the wheel propelling the pointer forward the distance between two convolutions of the groove F^2. To illustrate, suppose that it is necessary for the ratchet to make one hundred strokes to rotate the wheel F one revolution. During this time the pointer will have moved over one space on the scale S, at the second revolution two spaces, and so on to the limit of the apparatus, which can easily be made to register ten thousand fares with the dial C not larger than ten inches in diameter.

It will be observed by an examination of Figs. 5 and 6 that the ratchet-wheel F has an enlargement F^3 at its center, on which a thread is cut and a cup-shaped center post C P is screwed. The cup-shaped portion, which is in reality a nut, is so made in order to give room for a binding-screw B S, which serves to hold the ratchet-wheel firmly in place. However, any other means for attaching the center post may be adopted; but I have found this one of the easiest ways of attachment. The post C P is tapered where it projects through the dial C, and a pointer P^2 is held thereon by frictional contact imparted to it by means of a screw or nut N'. This manner of attaching the pointer P^2 to the interior moving mechanism by frictional contact enables the conductor to set the pointer back to zero at each end of the road, thereby enabling any irregularity or dishonesty in not registering fares collected to be easily detected by a spotter or detective getting on the car, who can easily count the number of passengers, and if the dial does not indicate the proper number it is obvious that some irregularity is being practiced, for the register cannot register wrong.

In order to attach the register to the car in such a manner as to admit of its being taken down or removed from one car to another I have provided three studs L^3, attached to the register-case and having enlarged heads on their outer ends. These heads slip into U-shaped stirrup-plates M, (shown in Figs. 1 and 2,) the stirrup being open at the top, thus allowing the easy ingress and egress of the studs L^3; but the weight of the apparatus effectually prevents its falling or jarring out of place. These stirrup-plates may be permanently screwed up in the car or attached to a board, as I have shown in Figs. 1 and 2, which is a matter of choice or of expedience; but I have found in all cases that at least three studs are necessary to prevent the apparatus being pulled from side to side and swinging about by the motions of the car.

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

1. In a fare-register, a rotative disk having a spiral, a segmental scale, a pointer pivoted at one side of and operated by the spiral to move over the scale in the arc of a circle, and mechanism for preventing backward rotation of the disk.

2. In a fare-register, the combination, with a rotative disk having a spiral on one of its faces and automatic mechanism for preventing backward rotation of the disk, of a scale and a pivoted pointer operated by the spiral to move over the scale, the pointer being pivoted eccentrically to the disk.

3. In a fare-register, a rotative disk having a spiral groove cut in one of its faces, automatic mechanism for preventing backward rotation of the disk, a scale, and a pivoted pointer having a projection engaging the said groove, whereby to cause the pointer to move over the scale.

4. In a fare-register, the combination, with a rotative disk having ratchet-teeth in its periphery and a spiral on its face and pawls for preventing backward rotation of the disk, of a pointer pivotally attached to the case and actuated by the spiral to traverse the same in a direction eccentric to the center of rotation of the disk, the axes of the pointer and of the disk being on a line parallel with each other, but at right angles to the face of the disk.

5. In a fare-register, the combination, with a case therefor, of a center post attached

thereto, a disk rotative thereon and having a spiral on its face, a pointer actuated by the spiral, a scale, a bell-gong secured to the center post beneath the said disk, mechanism pivotally secured on the said post for rotating the disk and the pointer, and a bell-hammer actuated by the disk.

6. In a fare-register, a ratchet-wheel having a spiral on its face, a scale, a pivoted pointer actuated by the spiral, a gong, a gong-hammer, and mechanism for rotating the ratchet-wheel, whereby to actuate the said pointer and the gong-hammer.

In testimony hereof I hereby set my hand, this 21st day of July, 1891, in presence of two subscribing witnesses.

WILLIAM L. SILVEY.

Witnesses:
GUY FULTON,
C. U. RAYMOND.