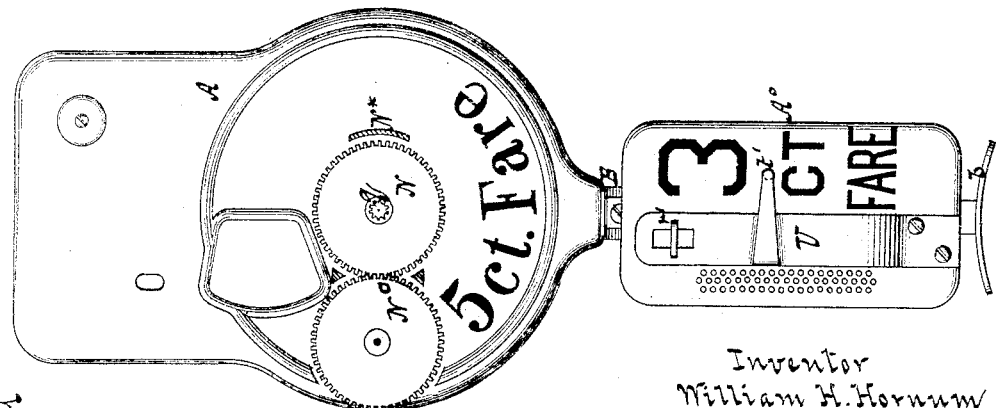
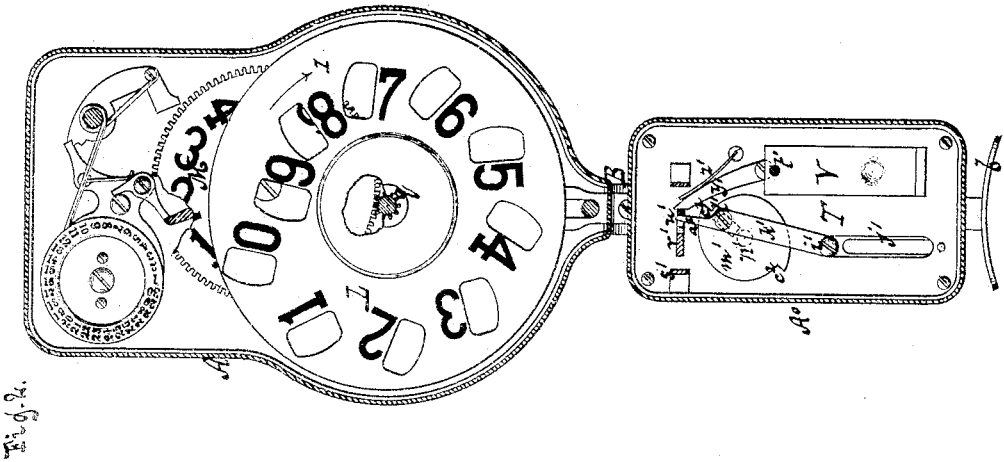
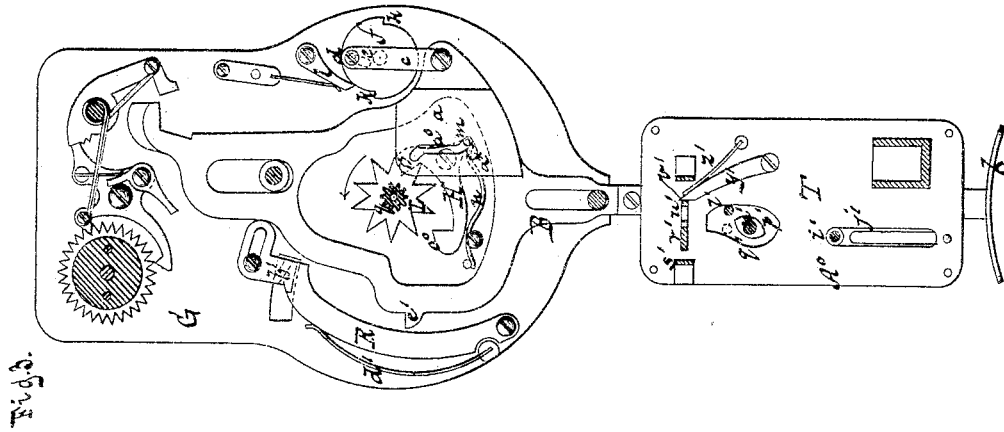


W. H. HORNUM.
Fare-Register.

No. 214,777.

Patented April 29, 1879.



Witnesses.
Otto Shufeland
William Miller.

Inventor
William H. Hornum
by
Van Santvoord & Hauff
his attys.

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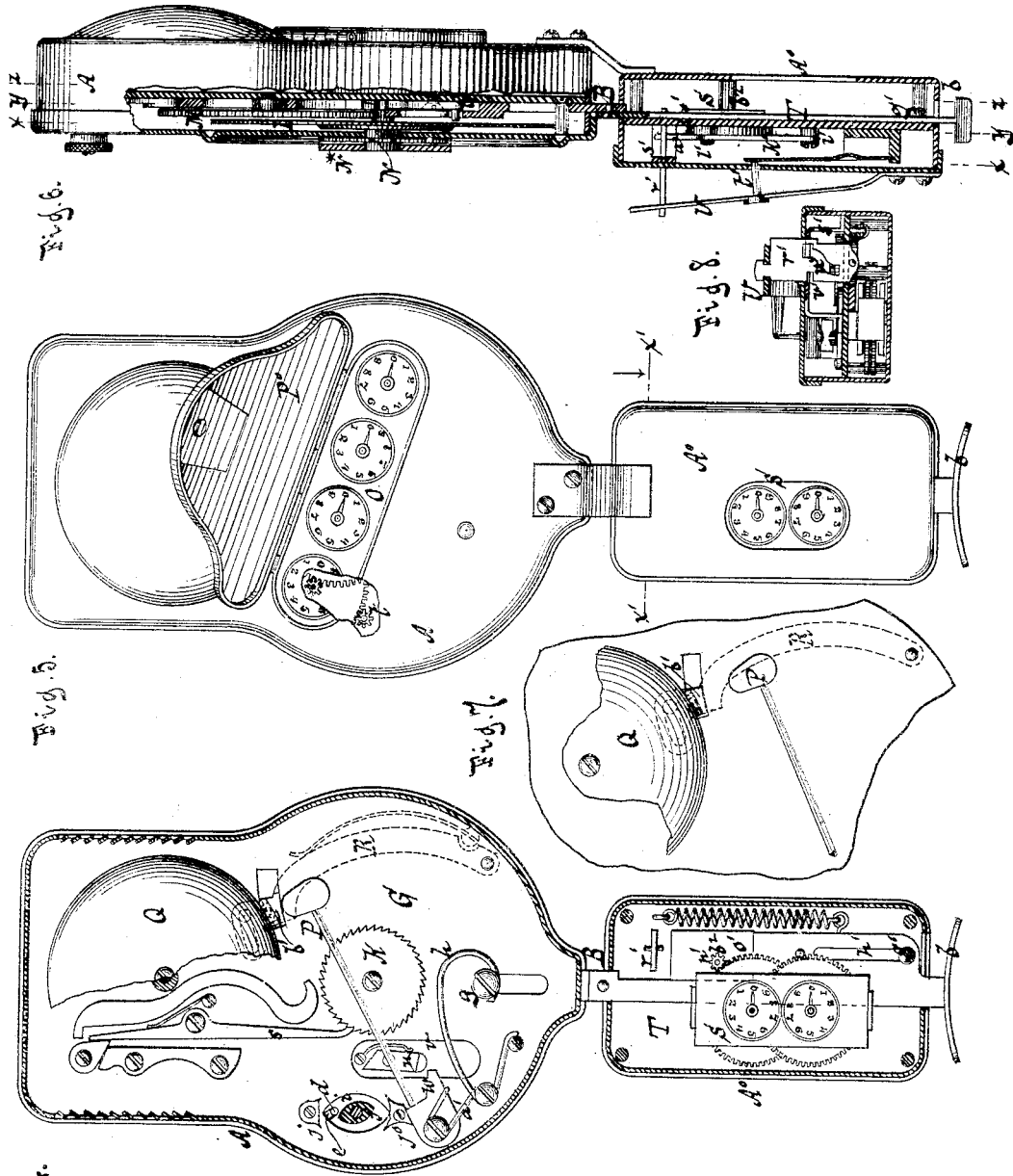


Fig. 4.

Witnesses
Otto Aufeland.
William Miller.

Inventor.
William H. Hornum.
by
Van Gantwood & Hauff
his attys.

UNITED STATES PATENT OFFICE.

WILLIAM H. HORNUM, OF NEW YORK, N. Y., ASSIGNOR TO THE HORNUM PATENT REGISTER MANUFACTURING COMPANY.

IMPROVEMENT IN FARE-REGISTERS.

Specification forming part of Letters Patent No. 214,777, dated April 29, 1879; application filed March 12, 1879.

To all whom it may concern:

Be it known that I, WILLIAM H. HORNUM, of the city, county, and State of New York, have invented a new and useful Improvement in Fare-Registers, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a face view. Fig. 2 is a section in the plane $x x$, Fig. 6. Fig. 3 is a similar section in the plane $y y$, Fig. 6. Fig. 4 is a similar section in the plane $z z$, Fig. 6. Fig. 5 is a rear view. Fig. 6 is a transverse vertical section. Fig. 7 is a detached view of the hammer-guard, showing its position when the hammer has been partially raised. Fig. 8 is a horizontal section in the plane $x' x'$, Fig. 5.

Similar letters indicate corresponding parts.

The invention consists, first, in the combination, in a fare register, of a registering device, an alarm composed of a bell and a hammer, a hammer-guard, situated in the path of the hammer, and mechanism for throwing said hammer-guard out of the path of the hammer when the prime mover is being moved out sufficiently far to impart motion to the registering device, thereby preventing the hammer from striking the bell without causing the registering device to advance one step for each blow of the hammer; also, in the combination of a cam-slot with the prime mover, the anchor, and the escapement-wheel, which transmits the motion of the prime mover to the registering device, so that, by the action of said cam-slot, a positive motion is imparted to the anchor in either direction; further, in the combination, in a fare-register, with a full-fare or main registering device and an alarm and a prime mover common to both, of a secondary or half-fare-registering device, and an alarm operated by mechanism for throwing this secondary registering device in or out of gear with the prime mover of the full-fare-registering device, so that when the secondary registering device is thrown in gear with the prime mover and the prime mover is drawn out, both the full-fare and the secondary registering devices are simultaneously actuated; also, in the combination of a secondary alarm

(giving a different sound from the main alarm) with the coupling mechanism for throwing the secondary registering device in gear with the prime mover, so that whenever this coupling mechanism is operated the secondary alarm is sounded, and the fact that a half-fare is about to be registered is made manifest; also, in the combination of a locking mechanism with the coupling mechanism which serves to throw the secondary registering device in gear with the prime mover, said locking mechanism being released automatically after one half-fare has been registered, so that not more than one half-fare can be registered without again sounding the secondary alarm; further, in the combination, with the alarm-bell and with the prime mover, of a damper, which, when the prime mover is in a state of rest, bears against the surface of the bell and prevents the same from being sounded by external blows, and which is withdrawn from the bell by the action of the prime mover at the time when the hammer strikes.

In the drawings, the letter A designates a case, made of sheet metal or any other suitable material, in the form best adapted for the purpose for which it is to be used. In this case is situated a slide or prime mover, B, which serves to actuate the single-trip register, the alarm, and the general or concealed register, if such is used. Said prime mover rests upon a plate, G, being guided by suitable slots and pins, and it is provided with a suitable finger-piece, b , which serves to operate the same.

The plate G is secured in the case A, and forms a partition between the single-trip register on one side and the alarm and general register on the opposite side, and it supports the principal working parts of my apparatus.

In the under side of the prime mover is secured a pin, g , which extends through a slot in the partition-plate G, Fig. 4, and is exposed to the action of a spring, h , that has a tendency to throw the prime mover up to the position shown in the drawings.

To the prime mover is pivoted a link, c , from the under side of which projects a pin, d , through a slot, e , in a disk, f , and into an oval guide-groove, i , in the partition-plate, G, Fig. 4. To the under surface of this partition-plate

is firmly secured a plate, j^0 , with an oval projection, j , which extends into the oval guide-grooves i , and occupies a slightly-oblique position, as shown in Fig. 4.

When the prime mover is drawn out, the pin d of the link c passes down over the inner edge of the projection j ; and if the prime mover, after having been drawn out to its full extent, is released, so as to be free to follow the action of its spring h , the pin d passes up on the outer edge of the projection j , and at the same time the disk f is caused to make a complete revolution. On the circumference of the disk f are two or more ratchet-teeth, k , which engage with a pawl, l , and prevent said disk from turning in the wrong direction.

On the prime mover is firmly secured a plate, a , with a cam-slot, a^0 , which engages with a pin, m , projecting from an anchor, H , that is pivoted to the partition-plate G , Fig. 3, and subjected to the action of a spring, n , which keeps the pallet o of said anchor in gear with an escapement-wheel, I , and the pin m in the position shown in Fig. 3. When the prime mover is drawn out the cam-slot a^0 acts upon the pin m , so as to throw the pallet o out of gear with the escapement-wheel and to throw the pallet o in gear with said escapement-wheel by a positive motion at the moment the prime mover has reached the outer end of its stroke, thereby propelling the registering mechanism half a step; and when the prime mover is released the pallet o is thrown back in gear with the escapement-wheel I by the direct action of the cam-slot a^0 on the pin m , and the registering mechanism is propelled the second half-step.

In order to allow the registering mechanism to be turned backward by hand, the cam-slot a^0 is provided with a branch, a^* , which allows the anchor to yield when the escapement-wheel is turned in the direction of the arrow marked thereon in Fig. 3. By this arrangement a positive motion is imparted to the anchor in either direction, and its correct action on the escapement-wheel is insured.

The escapement-wheel I turns on a gudgeon which projects through a hole in the partition-plate G , and to the lower square end of this gudgeon is firmly secured a ratchet-wheel, K . (See Fig. 4.) On the upper surface of the escapement-wheel I is firmly secured a pinion, g , (Figs. 2 and 3,) provided with a corrugated hub, to fit into a correspondingly-corrugated socket in the center of the units-disk L , so that, by the action of the prime mover, the units-disk, together with the pinion g , the escapement-wheel I , and the ratchet-wheel K , are turned step by step in the direction of arrow 1, Fig. 2. The pinion g gears into cogs on the periphery of the tens-disk M , and is so proportioned that for each complete revolution of the units-disk said tens-disk is caused to make one-tenth of a revolution. In the example shown in the drawings the units-disk is provided with ten apertures, which are moved over the successive figures on the tens-disk.

To the under surface of the partition-plate G is pivoted a spring-pawl, s , which engages with the ratchet-wheel K , and the corrugated hub of the escapement-wheel extends through a hole in the cover of the case A , and serves to support a cog-wheel, N , Figs. 1 and 6, which gears in a similar cog-wheel, N^0 , the edge of which projects slightly beyond the edge of the case A , so that it can be manipulated by hand. The cog-wheels N N^0 are protected by a plate, N^* , Fig. 6. If the pawl s is thrown out of gear with the ratchet-wheel K , the units-disk L can be turned by means of the cog-wheels N^0 N in the direction opposite to arrow 1, Fig. 2; but it can not be turned by said cog-wheels in the direction of arrow 1, being retained by the pallet o and the escapement-wheel I .

The arbor of the disk f , Fig. 3, extends through the partition-plate j^0 , Fig. 4, and carries a pinion, t , Fig. 5, which transmits the motion of the disk f to the general or concealed register O , which can be inspected by raising a lid, P^0 , secured to the back plate of the case A .

On the under surface of the prime mover B is pivoted a spring-dog, u , which projects through a slot, v , in the partition-plate G , Fig. 4; and when the prime mover is drawn out this spring-dog acts on a shoulder, w , formed on the butt of the shank of the hammer P , so as to raise said hammer against the action of its spring a^1 . Between the hammer P and the bell Q is situated the hammer-guard b^1 , which is secured to a lever, R , that is pivoted to the upper side of the partition-plate G , (see Figs. 3 and 4,) and subjected to the action of a spring, d^1 , which has a tendency to retain the hammer-guard in the path of the hammer. On the prime mover is formed a nose, e^1 , Fig. 3; and if the prime mover is drawn out and approaches the lower end of its stroke, this nose strikes the edge of the lever R , and the hammer-guard is thrown back out of the path of the hammer. At the same time the hammer is released by the spring-dog u and it strikes the bell. When the prime mover is released the hammer-guard is thrown back between the hammer and the bell by the action of the spring d^1 . When the prime mover is only partially drawn out, so as to raise the hammer to the position shown in Fig. 7, the hammer-guard retains its position in the path of the hammer, and it is therefore rendered impossible to cause the hammer to strike the bell without drawing the prime mover out to its full extent, so that the registering device will be moved one step whenever the alarm is sounded.

In the example shown in the drawings the hammer-guard b^1 is placed in the path of the head of the hammer; but its position may be changed, and it may be placed opposite to some portion of the shank of the hammer and moved in a suitable direction without departing from my invention.

The back of my hammer-guard b^1 is covered with felt or other suitable material, and when

the same is permitted to follow the action of its spring d' its felt-covered back bears close against the circumference of the bell, so that it acts as a damper, and prevents the bell from sounding before said damper is withdrawn. If the bell is used without the damper a sharp blow against the case A causes the bell to sound, and the erroneous impression is produced that a fare has been registered.

It is obvious that the damper and the hammer-guard may be applied separate—that is to say, a damper may be used which does not at the same time act as a hammer-guard, or a hammer-guard may be used which does not also act as a damper; and if the damper is used the hammer-guard may be dispensed with, the damper being withdrawn from the bell by the action of the prime mover only when the latter has been drawn out a sufficient distance to impart motion to the registering device, so that the bell cannot give a clear sound without registering a fare.

With the main registering device, as above described, I have combined a secondary registering device, S, the object of which is to keep a record of half-fares or fares of a different amount from those registered by the main registering device.

In the example shown in the drawings this secondary registering device is inclosed in a separate case, A^0 , which is firmly connected to the case A, as shown in Figs. 5 and 6; but, if desired, both the registering devices may be placed in one and the same case. In the interior of the case A^0 is secured a partition-plate, T, from the under surface of which extends a screw, g' , through a slot, h' , in the prime mover B, Fig. 4, which extends through the case A^0 , so that both the main and the secondary registering devices are operated by the action of the same prime mover. From the prime mover extends a stud, i' , through a slot, j' , in the partition-plate T; and this stud carries a link, k' , Fig. 2, from which projects a pin, l' , through an oblique slot in a disk, m' , which turns on an arbor, n' . This arbor has its bearing in a plate, o' , Fig. 4, which is fastened to the under surface of the partition-plate T, and from which projects a cam, p' , Fig. 3, into an aperture, q' , in the partition-plate. This cam is placed in an oblique position, and it serves as a guide for the pin l' of the link k' , which also extends into the aperture q' .

Through the face-plate of the case A^0 projects a slide, r' , which is guided in a slot in the partition-plate T, and in another slot formed in a \cap -shaped standard, s' , secured to said partition-plate, as shown in Figs. 6 and 8. The outer end of said slide engages with a spring, U, Figs. 1, 6, and 8, which is secured to the face-plate of the case A^0 , and has a tendency to keep the slide in its raised position, Figs. 6 and 8. From the spring U extends a tappet, t' , which, whenever said spring is depressed, serves to sound an alarm, V.

In the example shown in the drawings I

have represented an elastic steel blade which, whenever the spring U is depressed, produces a clicking noise; but any other suitable alarm may be substituted for this clicking blade, it being desirable, however, to select an alarm the sound of which can be readily distinguished from the sound of the alarm in the main register.

The slide r' is provided with a cam-slot, u' , and in one of its edges is a notch, v' , Fig. 8, which, when the slide is depressed, engages with a latch, y' , Figs. 2 and 3, that is pivoted to the partition-plate T and subjected to the action of a spring, z' . The link k' , Figs. 2 and 6, has a spur, a^2 , which projects into the cam-slot u' of the slide r' . On the lower end of the arbor n' of the disk m' is secured a pinion, b^2 , Fig. 4, which serves to transmit motion to the secondary register S, which is secured to the rear or under surface of the partition-plate T.

If the slide r' is raised, its cam-slot acts on the spur of the link k' , so as to retain the pin l' in the position shown in full lines in Fig. 4; and if the prime mover is drawn out, said pin l' moves down on the right-hand edge, Fig. 3, of the cam p' , turning the disk m' forward one-half of a revolution; but if the prime mover is permitted to move back, the pin l' returns on the same edge of the cam p' , and the disk m' is turned back to its original position, so that the secondary register remains unchanged, while the alarm of the main register has been sounded and a fare has been registered on the main register. If a half-fare is to be registered, the slide r' is depressed, the secondary alarm is sounded, and the latch y' engages with the notch v' of the slide r' , so as to prevent it from rising up again. By depressing the slide r' the pin l' of the link k' is forced over to the position shown in dotted lines in Fig. 3; and if the prime mover is drawn out and allowed to recede, the said pin l' moves down on the left-hand edge of the cam p' and up on its right-hand edge, so as to impart to the disk m' and to the pinion b^2 one complete revolution, and to register one fare on the secondary register S.

The revolution of the disk m' , however, cannot be completed if the slide r' remains in its depressed position, because unless said slide is raised while the disk m' turns the spur of the link k' strikes the solid portion of the slide and thereby the prime mover is prevented from completing its back stroke, and the disk m' is arrested before it has completed a full revolution.

For the purpose of releasing the slide r' the disk m' is provided with two projections, e^2 , which, when said disk turns round, act on the latch y' , throwing the same out of gear with the notch v' and leaving the slide free to follow the action of its spring U. At the same time, when the secondary register is turned one step the main register is also propelled one step, so that the whole number of passengers is recorded by the main register, while the sec-

ondary register records only the number of passengers paying half-fare or a fare different from the regular fare. At the same time, whenever a half-fare is to be registered the slide r' has to be depressed and the secondary alarm is sounded, so that the attention of the passengers is called to the fact that a half-fare is about to be registered.

It will be noticed from this description that the slide r' , link k' , and disk m' form the coupling mechanism whereby the secondary register is thrown in gear with the prime mover; but I do not wish to be confined to these precise devices, since other devices might be readily suggested by which the same result could be accomplished.

I would further remark that the latch y' , which forms the locking mechanism, could be replaced by any other device suitable for this purpose.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a fare-register, of a registering device, an alarm composed of a bell and hammer, a hammer-guard situated in the path of the hammer, and mechanism for throwing said hammer-guard out of the path of the hammer when the prime mover is being moved out sufficiently far to impart motion to the registering device, thereby preventing the hammer from striking the bell without causing the registering device to advance one step for each blow of the hammer, substantially as set forth.

2. The combination of a cam-slot, a^0 , with the prime mover, the anchor, and the escape-wheel, which transmits the motion of the prime mover to the registering device, substantially as and for the purpose set forth.

3. The combination, in a fare-register, with a full-fare or main registering device, an alarm, and a prime mover common to both, of a secondary or half-fare registering device, and an alarm operated by mechanism for throwing this secondary registering device in or out of gear with the prime mover of the main registering device, said prime mover serving to actuate simultaneously both registering devices whenever it is coupled to the secondary register, substantially as shown and described.

4. The combination of a secondary alarm with the coupling mechanism for throwing the secondary registering device in gear with the prime mover, substantially as and for the purpose set forth.

5. The combination of a locking mechanism with the coupling mechanism which serves to throw the secondary registering device in gear with the prime mover, and mechanism for automatically releasing said coupling device after one half-fare has been registered, substantially as and for the purpose described.

6. The combination, with the alarm-bell and with the prime mover, of a damper, which, when the prime mover is in a state of rest, bears against the surface of the bell and prevents the same from being sounded by external blows, and which is withdrawn by the action of the prime mover at the time the hammer strikes, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 8th day of March, 1879.

WILLIAM H. HORNUM. [L. S.]

Witnesses:

W. HAUFF,
E. F. KASTENHUBER.