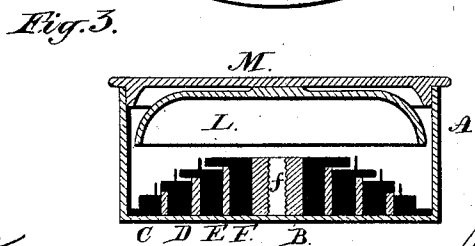
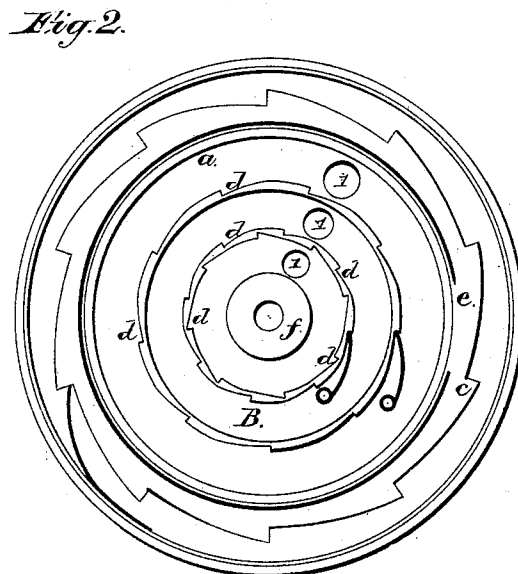
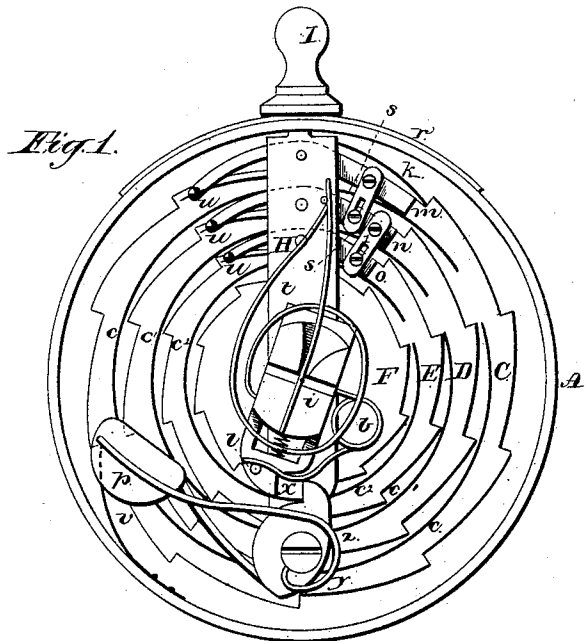


G. BEADLE.
FARE-REGISTER.

No. 176,419.

Patented April 25, 1876.



Witnesses:

Z. F. Miller

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UNITED STATES PATENT OFFICE.

GEORGE BEADLE, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN FARE-REGISTERS.

Specification forming part of Letters Patent No. **176,419**, dated April 25, 1876; application filed April 8, 1876.

To all whom it may concern:

Be it known that I, GEORGE BEADLE, of Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Improved Fare-Register, which is fully set forth in the following specification, reference being had to the annexed drawings, in which—

Figure 1 represents a top-plan view of the inside, the cover being removed. Fig. 2 represents a top-plan view of the bottom, the actuating mechanism and all the registering-wheels being removed except the outer one. Fig. 3 represents a cross-section of the register, showing the bell and the several registering-wheels.

The letters of reference represent corresponding parts wherever they occur.

The object of my invention is to register the number of fares received by conductors of street-railway or other cars, or drivers of omnibuses or other public conveyances, or for many other purposes where it is necessary to keep an accurate count or tally.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and manner of operation thereof.

In the construction of it I first make a cylindrical case, A, with a bottom, B, upon the upper surface of which I place and fasten, in any ordinary manner, a series of circular rims, a a^1 a^2 , of different sizes, placed within each other, and a suitable distance apart. On the outer surface of each of the rims a^1 and a^2 I cut ten ratchet-teeth, d , at equal distances from each other, and on the inner surface of the rim a^2 I cut ten similar ratchet-teeth. The object and use of these ratchet teeth will more fully appear when I describe the other parts of my invention, to which they directly appertain.

In the center of the bottom B I place a solid hub, f , with a hole bored in the center, and a thread cut therein; or I can make the case A, bottom B, rims a a^1 a^2 , and the hub f all in one piece by turning it and them out of a solid piece of metal, and then cutting the ratchet-teeth in the rims.

The object of the rims a a^1 a^2 is to separate

and keep the registering-wheels apart from each other, so that they will not interfere with each other when operated.

I next make a series of registering-wheels, C, D, E, and F. The wheel C I make of such size as to fit loosely in the space between the inside of the case A and the rim a . On the upper side, and for about one-half to two-thirds of the thickness thereof, the outer periphery is reduced in size, so as to make a raised portion. On the outer periphery of this raised portion I make ten ratchet-teeth, equidistant from each other. Upon the upper surface of this raised portion, and a slight distance from the inner edge, and parallel to the inner periphery, I cut a shallow perpendicular circular slot, in which I fasten a light metallic flange, c , projecting a little distance above the surface of the wheel, and all the way around, excepting that a small gap or opening, e , is left therein.

I make the registering-wheel D with the lower part of such size as to fit loosely between the rims a and a^1 , and with the outer periphery of the upper part enough larger than that of the lower part to allow a series of ten ratchet-teeth, equidistant from each other, to be cut clear of the periphery of the lower part, and so that the projecting part of the wheel will just clear the flange c and slightly overlap the inner edge of the wheel C. This wheel I make of about the same height as the rim a^1 . Upon the upper surface of this wheel, and about midway between the inner and outer periphery, I place the flange c^1 in a slot in the same manner as the flange c , and with a similar gap or opening, e^1 , I make the registering-wheel E in the same manner as I make the wheel D, with the lower part to fit between the rims a^1 and a^2 , and the projecting upper portion lapping over the rim a^1 and the wheel D far enough to just clear the flange c^1 , and having a flange, c^2 , like the flange c^1 , and similarly located, and also having ten equidistant ratchet-teeth cut in the outer periphery of the overlapping part. I make the registering-wheel F like the wheels D and E, to fit between the rim a^2 and the hub f , and having also ten equidistant ratchet-teeth cut in the outer periphery of the upper part which

overlaps enough to nearly fill the space between the flange c^2 and the hub.

In case I desire to add another registering-wheel to increase the capacity of the register I then place upon the wheel F a flange similar to the flange c^2 on the wheel E.

To actuate these registering-wheels I employ the following described mechanism: I make the lever H of about the shape shown in the drawings, and about the middle thereof, I pivot it upon a pivot screwed into the hole in the hub f . Upon the under side thereof, and so located as to come just inside of the case A, I fasten a push-pawl, k , made of spring-steel, and of such shape and length that the point will engage in the ratchet-teeth upon the wheel C, and upon the lever H being pushed forward this pawl will move the wheel C forward one tooth, and so on as the operation is repeated. Just inside of this pawl k , and upon the under side of the lever H, I pivot a spring-pawl, m , of such construction and shape that the point will engage in the ratchet-teeth upon the wheel D and push it forward when the lever H is operated. Inside of this pawl m I pivot, upon the under side of the lever H, two similar spring-pawls, n and o , the points of which engage in the ratchet-teeth of the wheels E and F, respectively, and move them forward just as the wheel D is moved. I make this lever H of such length that the outer end will project through a slot cut in the case A a short distance, and upon the projecting end I place first a sliding cover, r , of such width and length as to at all times cover the slot, and then screw on a knob, I.

The object of the flanges c c^1 c^2 is to regulate the revolutions of the registering-wheels by controlling the action of the pawls m , n , and o upon the teeth of these ratchet-wheels.

I can best explain this by describing the manner in which the wheels C, D, E, and F are actuated, revolved, and operated.

On the under side of each wheel, opposite each ratchet-tooth, or nearly so, are stamped figures numbering consecutively from 1 to 9, inclusive, followed by 0, making ten numbers on each wheel. To commence with, all the wheels are set at 0; the lever H is thrown back; the point of the pawl k rests in the ratchet-tooth opposite the figure 0 of the wheel C; and the points of the pawls m , n , and o rest respectively upon the flanges c , c^1 , and c^2 , just back of the openings or gaps e e^1 e^2 . Moving the lever H forward, the pawl k pushes the wheel C around the distance between two of the ratchet-teeth, and the wheel C will register 1. All the other wheels will, in the meantime, remain stationary, and continue so until the wheel C registers the figure 9. While this is being done the flange c is being carried around with the wheel C, and in the meantime the point of the spring-pawl m is sliding along on the outside of the flange c . When the wheel C has registered the figure 9

the opening or gap e in the flange c is reached by the pawl m , and the point drops through and engages with the teeth of the wheel D opposite the figure 0. The next forward movement of the lever H moves forward both of the wheels C and D, registers 1 on the wheel D and 0 on the wheel C, and leaves the point of the pawl m again resting upon the flange c . In like manner another revolution of the wheel C will cause the pawl m to operate again upon the teeth of the wheel D, which will then register the figure 2. Continuing this until the figure 9 is registered on the wheel D, and likewise upon the wheel C, then the pawl n , which has been sliding along on the flange c^1 during the revolution of the wheel D, will drop into the opening or gap e^1 in the flange c^1 , and engage in the teeth of the wheel E, which flange has been carried around by the revolution of the wheel D; and at the same time the point of the pawl m will drop into the gap or opening in the flange c on the wheel C, and engage in the teeth of the wheel D; and the next movement of the lever H will move forward simultaneously the wheels C, D, and E, and register 1 on the wheel E and 0 on each of the wheels C and D. In like manner, when the wheel E registers 9 and the wheels C and D likewise each register 9, the flange c^2 on the wheel E having been carried around by the revolution of the wheel E, the opening or gap e^2 in the flange c^2 , being reached, allows the pawl o to drop down through the gap e^2 and engage in the teeth of the wheel F, the pawls m and n , respectively, at the same time dropping through the gaps e and e^1 in the rings c and c^1 , and engaging in the teeth of the wheels D and E, respectively, the pawl k being, at the same time, engaged in the teeth of the wheel C; then the forward movement of the lever H will register 1 on the wheel F and 0 on each of the wheels C, D, and E. The registering-wheels being arranged on the basis of units, tens, and hundreds, at this point the wheels will register one thousand fares. The operation of the lever H being continued until all the wheels register 9, respectively, the pawls are all in gear, and the next movement of the lever H will cause all the wheels to move, and they then all register 0, indicate ten thousand fares, and the whole device be at the starting-point, ready to repeat the operation.

From this it will be seen that the push-pawl k is always in gear with the teeth of the wheel C, and that the spring-pawls m , n , and o only come into gear, respectively, with the ratchet-teeth of the wheels D, E, and F when the wheels C, D, and E respectively register 9 each.

The spring-pawls m and n are connected near their points by the connection s , and the pawls n and o in like manner by the connection s' . The connection operates when the pawls m and n are in gear, and the operation of the lever H throws the pawl m out of gear to lift the pawl n out of gear. And in like

manner, when all the pawls *m*, *n*, and *o* are in gear, the connections *s* and *s'* will simultaneously lift the pawls *n* and *o* out of gear when the pawl *m* is thrown out of gear. The slot in the connection *s* is put there to allow the pawl *m* to drop through the gap *e* in the flange *c* without affecting the pawl *n*, and in like manner the slot in the connection *s'* allows the pawl *n* to drop into the gap *e'* in the flange *c'* without affecting the pawl *o*.

I prefer to make the pawls *m*, *n*, and *o* with tail-pieces *u* extending back of the lever *H*, with springs, as shown in the drawings, so that the springs acting upon the tail-pieces *u* of the pawls, respectively, will cause their points, respectively, to always drop into the gaps *e* *e'* *e''* in the flanges *c* *c'* *c''*, respectively, whenever the gaps or either of them are open, to engage with the teeth of the wheels *D*, *E*, and *F*, as heretofore set forth.

To prevent the registering-wheels *C*, *D*, *E*, and *F*, respectively, from being moved around backward, and to prevent the register from being tampered with, or a fraud perpetrated by the operator for the wheel *C*, I attach a spring, *v*, to the inner surface of the case *A*, of such a shape and length that the loose end will engage in the teeth of the wheel *C*, as shown in Fig. 1 of the drawings, slipping from one tooth to another with the forward movement of the wheel *C*, but preventing any backward movement; for each of the wheels *D* and *E*, to the inner periphery of each, in a space cut out in each for the purpose, I fasten a spring, similar to the spring *v*, of such length and in such a manner that they will, respectively, engage in the teeth *d* of the rim *a'*, and in the teeth *d* on the outer periphery of the rim *a''*, allowing, like the spring *v*, a forward movement of each of the wheels *D* and *E*, but none backward; and for the wheel *F*, to the outer periphery of the lower part, in a place cut out in like manner, I attach a similar spring to the spring *v*, so constructed as to engage in the teeth *d* on the inner periphery of the rim *a''*, and operating as a stop, like the spring *v*. Upon the inner surface of the cover *I* attach an ordinary concave bell, *L*, and to cause this bell to ring whenever a fare is registered, I use the following mechanism:

Upon the top of the pivot, upon which the lever *H* plays, I place the cap-piece *i*, and in the upper surface I cut a slot and opening, as shown in the drawings, in which slot I place the spring *t*, which extends outward and at its outer end impinges upon the pin in the outer end of the lever *H*, located just inside of the case *A*, as also appears in the drawings, and this spring operates to throw the lever *H* back whenever pushed forward. A spring of different shape may be used for the spring *t*, if desired. The lower part of this cap-piece *i* is made rectangular in shape, and smaller than the upper part. I make the yoke *l* with a rectangular or parallelogram shaped opening a little wider than the rectangular part of the cap-piece *i*, so as to fit thereon loosely, and

somewhat longer, so as to allow the yoke *l* to play up and down. At the lower end of the yoke *l* I make a shoulder, *x*, as shown in the drawings. Upon the upper surface at the inner end of the lever *H*, I fasten loosely by a screw the cam-shaped piece *z*, with a shoulder upon the upper side, as shown in the drawings. To the side of this cam *z* I fasten the wire and striker *p*, and to the screw holding this cam the spring *y*. And to the side of the cap-piece *i* I attach the spring *b* impinging upon the pin in the shoulder *x*, as shown in the drawings.

This mechanism is operated as follows: Upon the lever *H* being pushed forward the faces of the shoulder of the cam *z* strike against the shoulder *x*, the striker *p* is thrown away from the bell, and when the shoulders slip past each other the striker is released and the spring *y* throws it against the bell, thereby causing it to ring. The striker is thrown back and held away from the bell after striking it by means of a pin on the under side of the cam *z*, playing in a slot cut in the side of the lever *H*. With the return backward of the lever *H*, the inclined backs of the shoulders slide past each other, pushing the yoke *l* upward, and when past each other the spring *b* throws the yoke down into position again.

Springs of other shape may be used in place of or with the spring *b*, to throw the yoke *l* back into position.

Through the bottom *B* I cut a series of holes, (of which three are shown in Fig. 2 of the drawings,) in a straight line from the center to the outer periphery, which holes may be covered, if desired, with glass or any transparent substance, through which holes the figures upon the registering-wheels can be seen and the number of fares registered ascertained without opening the register. Through the case *A* I drill a series of holes to allow the sound of the ringing of the bell to escape and be better heard. The cover *M* can be screwed onto the case *A*, or, as I prefer, hinged at one side and locked at the other side in any ordinary manner.

In order to take up any extra looseness created by the wear of the wheel *C* and keep the same fitting closely to the inner side of the case *A*, I place, in a slot cut for the purpose in the inner periphery of the wheel *C*, a spring with both ends fastened, so as to cause the spring to project slightly beyond the surface of the inner part of the wheel, so that when the wheel is placed in position the spring presses constantly against the outer periphery of the rim *a*, and keeps the wheel in place better, and more regular and steady in operation. This spring is made to extend from one-third to one-half of the distance around the inner surface of the wheel.

Having thus set forth the construction and operation of my invention, what I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The ratchet-registering wheels *C*, *D*, *E*,

and F, made with the flanges c , c^1 , and c^2 , with gaps or openings e , e^1 , and e^2 therein, and with the spring devices v for preventing their movement backward, when constructed and operated substantially as described.

2. The actuating-mechanism, composed of lever H, having pawls k , m , n , and o located thereon and operated thereby, connections s and s' , tail-pieces and springs u , and the cap-piece i and spring t , when constructed and operated substantially as above set forth.

3. The combination of the ratchet-registering wheels C, D, E, and F, flanges c , c^1 , and c^2 , gaps or openings e , e^1 , and e^2 , with the lever H, the pawls k , m , n , and o , connections s and s' , and tail-pieces and springs u , when combined and operating together substantially as above set forth.

4. The combination of the bell L with the

striking mechanism composed of the yoke located over lever H, shoulder x , cam z on the end of lever H, with its bell-hammer p , and springs y and b , when constructed, combined, and operated substantially as above set forth.

5. The combination of the registering-wheels C, D, E, and F, flanges c , c^1 , and c^2 , gaps or openings e , e^1 , and e^2 , and the springs for preventing any movement of the wheels backward, with the bottom B, rims a a^1 a^2 , ratchet-teeth d , and hub f , when combined with each other and operated substantially as above described.

GEORGE BEADLE.

Witnesses:

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LOUIS MARSHALL.