

B. DAVIES.
FARE REGISTER.

No. 179,899.

Patented July 18, 1876.

Fig. 1-

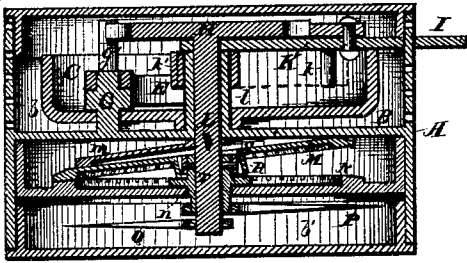


Fig. 4-

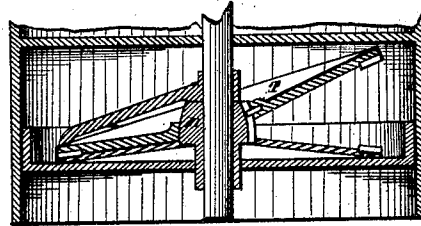


Fig. 2-

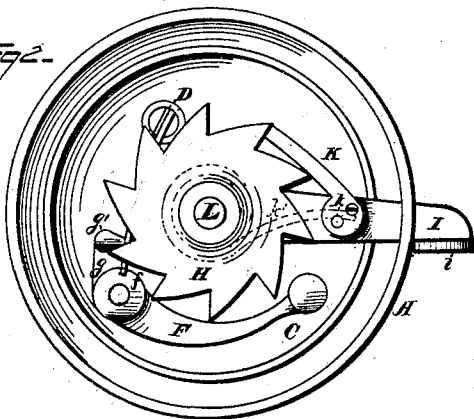


Fig. 5

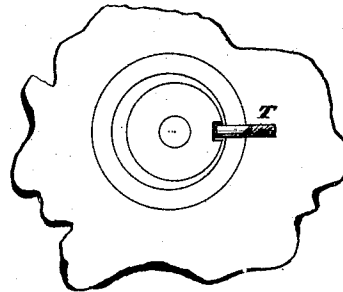
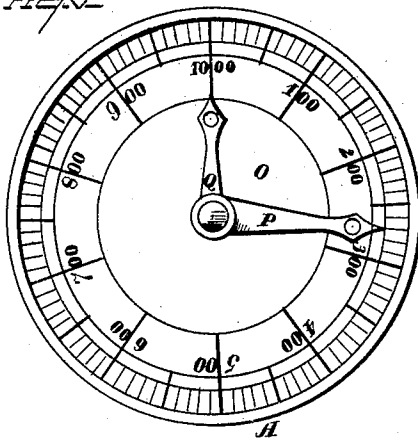


Fig. 3



WITNESSES
C. S. Kittingham
Albert H. Bright.

INVENTOR
Benjamin Davies,
By S. Eggett & S. Eggett,
Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN DAVIES, OF CINCINNATI, OHIO.

IMPROVEMENT IN FARE-REGISTERS.

Specification forming part of Letters Patent No. **179,899**, dated July 18, 1876; application filed April 3, 1876.

To all whom it may concern:

Be it known that I, BENJAMIN DAVIES, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fare-Registers; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to fare alarm-registers for street-car and other analogous uses, the object and advantage of which are well understood, not only in the art current, but in common knowledge.

The accurate registration of each and all fares, regulated by an alarm mechanism acting in unison therewith, is a matter of desirable moment on all roads. To attain such an end with a simple and complete device, whereby the necessity of punching a trip-slip at each receipt of fare is obviated, is the object of my invention. This latter hence consists, first, in actuating mechanism, in combination with two gear-wheels, which operate a registering device; second, in the combination of the foregoing with an arm, serving to maintain the said gear mechanism in operative connection; third, in circular bevel-gear mechanism whose plate-faces work at a constant angle to one another by means of a universal joint and an outer depressing lever-arm; fourth, in a central ratchet-actuated spindle, bearing a registering device, and also an intermediate gear-work, which operates a second and independent register; fifth, in the combination, with said spindle, of a lever-actuated pawl and an alarm; sixth, in a spring-pressed pawl operating a ratchet, which, in turn, actuates a spring-pressed hammer in sounding an alarm.

Referring to the drawings, Figure 1 is a sectional elevation; Fig. 2, a plan, with the upper cap removed; Fig. 3, a reverse plan, with the lower cap off, showing the dial-plate. Figs. 4 and 5 are detached modification views.

A is a metallic case, preferably circular, and of dimensions as shown, which is divided into two compartments by a central plate, B, passing through it on a plane parallel to that of its flat faces, and firmly secured to the case. On one side of said division-plate are the actuating and bell-alarm mechanisms, while on the other are the gearing and registering devices. The upper apartment *b* has the bell C in close hub-connection with this division-wall, while its face stands out from same sufficiently to allow of its vibrations. A stud, D, juts forth at right angles from the division-wall, and, passing free through a corresponding hole in the bell-body, forms a seat for a metallic spring, E, which latter is curved in conformity with the force required, so that as it engages with the lever-hub *f* of the hammer F it may cause same, when urged forward, to have a tendency to return and react in a blow upon the bell as it is released from such urging force. This hammer is loosely pivoted upon the stud G seated in the division-wall, and also freely passing through a hole in the face of the bell, so as not to interfere with its resonance. It is provided with a parallel and continuous plane-arm, *g*, angularly inclined to it beyond its hub-connection, which bears at its extremity a right-angular lug or projection, *g'*. This latter locks into the teeth of the ratchet-wheel H, and is actuated thereby, in turn operating the spring-pressed hammer, which rings the bell. A thumb-lever, I, bearing on its outer extremity a plate, *i*, for pressing same, passes through a slot into the interior of this upper compartment, where it is provided with a pawl-arm, K, working into the ratchet. This pawl carries a right-angular lug, *k*, passing down through an elongated slot in the lever-body, where it engages with a spiral spring, *k'*, whose action is obtained in consequence of its forced attachment to the central hub *l*. The spindle L bears the ratchet-wheel on its extremity within this compartment *b*, while it passes free down through the division-wall into the second chamber, *b'*, in which it carries the arm *m*, which is provided with a terminal angular projection, which bears

against the upper face of the bevel-gear wheel M. The wheel M also gears into the corresponding bevel-wheel N, which latter is rigidly secured to, or made part of, the dial face-plate O, and is unaffected by the revolution of the spindle.

The dial-plate is registered and subdivided as follows: First, ten equal divisions complete the outer circle. These are subdivided each into ten additional, aggregating one hundred points. This outer circle is traversed by the long hand P, rigidly connected to and revolving in common with the bevel-wheel M, by means of the projecting hollow spindle or sleeve *n*, while the shorter and quicker traveling-hand Q revolves in concert with the spindle as the latter is actuated by the ratchet.

The operative connection of the bevel-gearing is obtained at a constant angular inclination, urged together by the depressing-arm, as before described; but the primal capacity for such an angular working is gained through a universal joint, as follows:

The sleeve *n* is loose upon the spindle, and is connected to the ring R by two pins, *r r'*. The bevel-wheel M has a ring-projection, S, which is connected to the ring R by two pins, *s s'*, one on each side, and in the same plane as the pins *r r'*, but at right angles to same, thus, as is apparent, forming a universal-joint connection between the wheel M and the sleeve *n*. This latter mechanism also allows of a sufficient space-distance to be maintained between the two gears.

The chamber *b* may be covered by any suitable cap, well protecting the parts from damage and dirt, while the chamber *b'*, with its dial-plate, should also be locked from view and unwarranted inspection or handling by a strong cover and guarding device.

The circular part of the case which incloses the bell should be perforated sufficiently to admit of the chambered air connecting its vibrations to the outer atmosphere, as same may be thrown into action by the sounded alarm.

Having thus described the mechanism, the operation of same is as follows: The dial-plate is divided into ten, and these again into ten, making one hundred divisions. The hand Q counts ten at one revolution, and the hand P marks one division, which is called ten. The ratchet has ten cogs, as shown, and the bevel-wheel N ninety-nine cogs and the bevel-wheel M one hundred cogs.

When the conductor receives a fare he presses back the lever I at *i*, which turns the ratchet-wheel round in the direction of the arrows until the projection *g'* on lever *g* falls into the next tooth of the ratchet-wheel, when the hammer F strikes the bell C and warns the passenger. At the same time the hand Q has made one-tenth of the circle on the dial-plate, which counts one. The conductor now lets go

the lever I, when the spring *k'* returns it with the pawl K to its original position, the ratchet being held firmly by the projection *g'* on the lever *g*.

When the operation has been repeated ten times the hand Q will have made one complete revolution, which counts ten. The arm *m* would in the mean time have made one revolution on the back of the wheel M, compelling it to make one complete gyration on the wheel N, and, as N has ninety-nine teeth and is stationary, while the wheel M has one hundred teeth, it is clear that M would be carried forward one cog, and the hand P, by means of the sleeve *n*, one division on the dial-plate, and so on until the hand P has made the circuit or pointed off one thousand, as every small division by this hand counts ten.

I have shown the connection between the two bevel-wheels by means of the rings R and S and the sleeve *n*, forming a universal joint; but it will be seen that the same thing can be accomplished by making the end of the sleeve *n* spherical, as shown in Fig. 4, the sleeve being carried forward by a pin, T, fixed in the wheel M and traversing a slot in the spherical part of the sleeve *n*, as shown in Fig. 5.

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

1. A fare alarm and registering device, consisting of actuating mechanism, in combination with bevel-gearing, said latter working at a constant relative angle and operating a registering-hand, substantially as and for the purpose specified.

2. In an alarm fare-register, the combination, with the casing, consisting of two close chambers, of the alarm mechanism and the registering mechanism, the same separated by a central partition, and connected to each other and actuated by a common spindle, I, substantially as and for the purpose specified.

3. In an alarm fare-register, the combination, with a casing, consisting of two close chambers, of a spindle, to which the alarm and registering mechanism is attached, and actuated, of an alarm-bell located in one chamber of the casing, and having a hammer arranged within the same, substantially as and for the purpose set forth.

4. In a register, the combination of bevel-gearing, inclined at a constant angle by means of universal-joint connection and an exterior depressing-arm, substantially as and for the purpose described.

5. The case A, provided with a sleeve, *l*, the same forming a bearing for the bell, ratchet, spindle, and springs, substantially as and for the purpose specified.

6. The combination, with the bevel-gearing, working at a constant angle, of the supporting-spindle, operating the arm which throws said gearing into close relative engagement,

substantially as and for the purpose described.

7. The combination, with the angularly-gearing mechanism and the actuating-spindle, of the two separate and independent registering-hands, said hands rigidly attached respectively to the gear-work and the actuating-spindle, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of March, 1876.

BENJAMIN DAVIES.

Witnesses:

N. ROCKHOLD, Jr.,
H. T. FURRILL.