B. F. CARD.
Turnstile-Registers.

No. 198,761. Patented Jan. 1, 1878.

Fig. 1

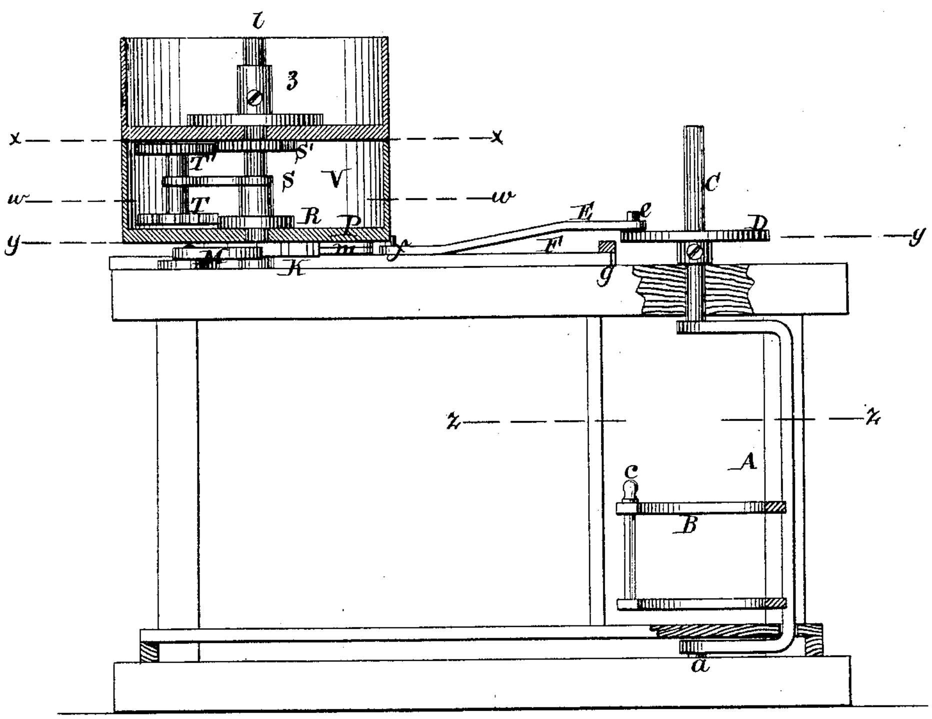
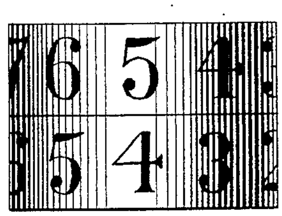


Fig. 2.



Witnesses.
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Louis W. Frost

Inventor.
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3 Sheets—Sheet 2.

B. F. CARD.

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Fig. 3.

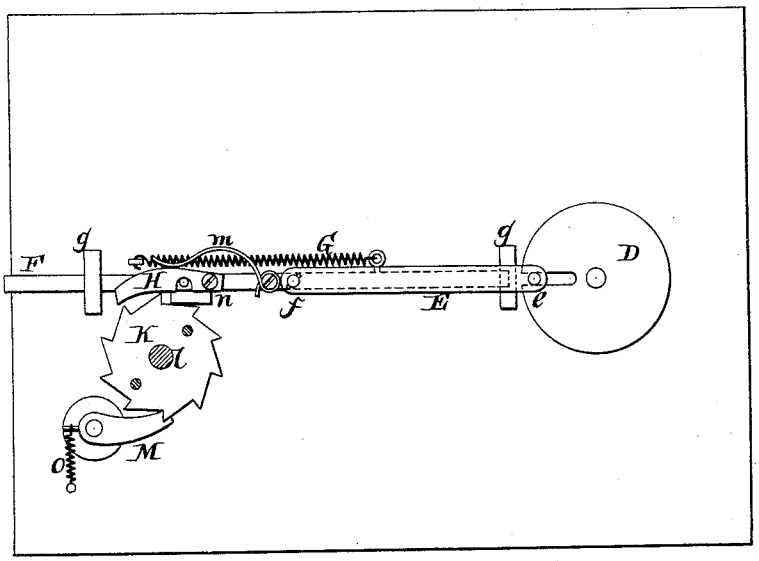
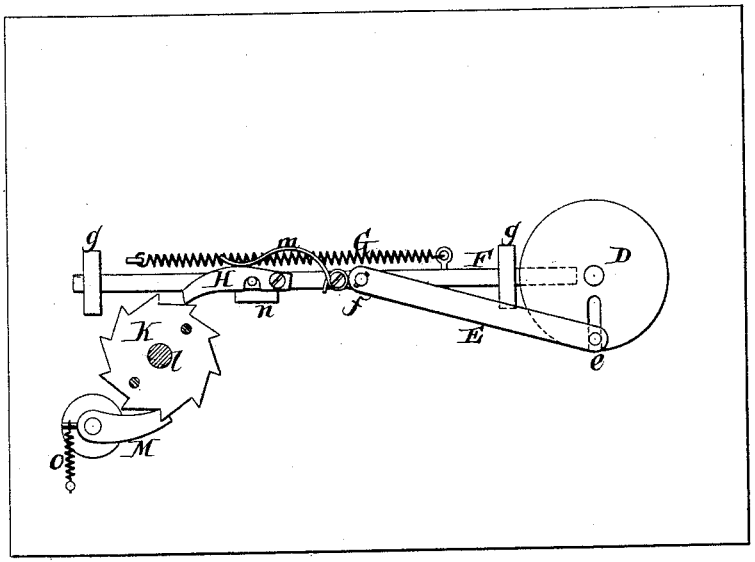


Fig. 4.



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3 Sheets—Sheet 3.

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Turnstile-Registers.

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Fig. 5.

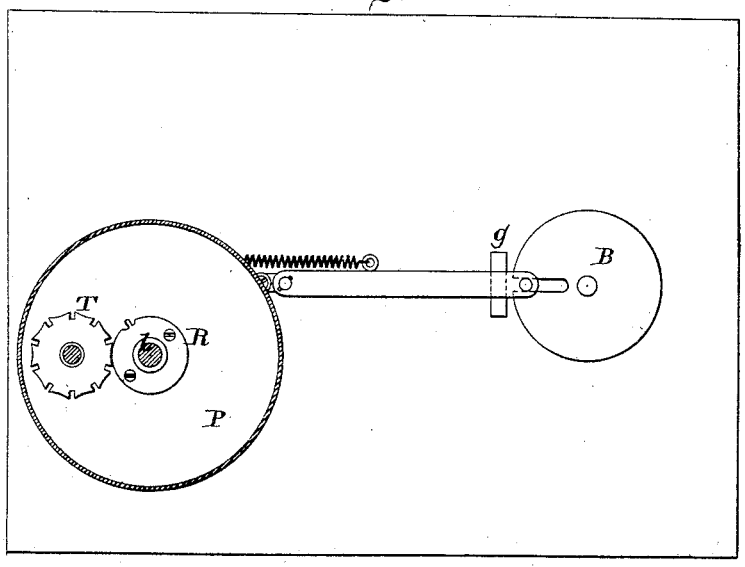


Fig. 6.

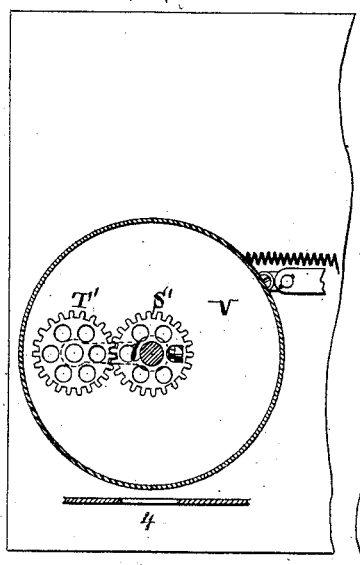
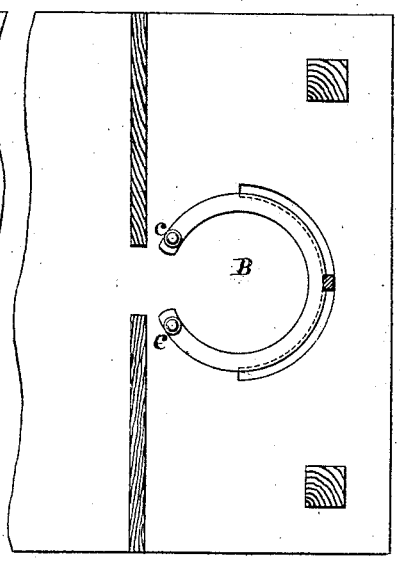


Fig. 7.



Witnesses.
Charles G. Loose
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UNITED STATES PATENT OFFICE.

BENJAMIN F. CARD, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN TURNSTILE-REGISTERS.

Specification forming part of Letters Patent No. **198,761**, dated January 1, 1878; application filed April 6, 1877.

To all whom it may concern:

Be it known that I, BENJAMIN F. CARD, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Turnstiles and Registering Mechanism for Cars and other Vehicles; and that the following, taken in connection with the accompanying drawing, is a full and complete description of the same.

The object of my improvement is to form a new and useful improvement in turnstiles and registering mechanism for cars and other vehicles; and consists of an arrangement of a turnstile on one or both platforms of a car, or at the entrance or exit, or both entrance and exit, of any vehicle for the conveyance of passengers, so connected with a suitable registering mechanism as to register a passenger on entering or leaving the car or other vehicle, or both on entering and leaving the car or vehicle.

My invention is adapted especially for use in street-cars, and, when applied to them, is so arranged as to register a passenger both on his entering and leaving the car, while at the same time it permits the conductor to pass freely in and out of the car without registering.

I prefer to close the front platform with gates, so as to prevent passengers from entering the car from the front platform.

In the drawings, Figure 1 represents a vertical longitudinal section of my improvement. Fig. 2 is a side view of the registering-cylinders. Fig. 3 is a horizontal section in the line *y y*, Fig. 1. Fig. 4 is a like section, showing the position of the parts when the stile is open. Fig. 5 is a horizontal section in the line *w w*, Fig. 1. Fig. 6 is a similar section in the line *x x*, Fig. 1. Fig. 7 is a horizontal section in the line *z z*, Fig. 1.

My invention is described as follows: I use a double crank, A, the lower arm of which passes under the rear platform of the car, and turns on a pivot, *a*, secured in a suitable socket. (See Fig. 1, Sheet 1.)

On the wrist of said crank A are one or more suitable semicircular arcs or arms, B, so formed as to allow the conductor to pass freely in and out of the body of the car. (See Fig. 1, Sheet 1, and Fig. 7, Sheet 3.) These arms B are provided with handles *c c*, for convenience in turning the said arms B. (See Fig. 1.) The upper arm of crank A is pivoted to a movable vertical shaft, C, situated at or near the roof of the car. (See Fig. 1.)

Rigidly secured to the shaft C is a disk or crank, D, of wood or metal, which turns with every motion of shaft C. (See Figs. 1, 3, and 4.)

At or near the outer edge of disk D is a pin, *e*, to which is attached one end of a bar or connecting-rod, E, the other end of which is secured to the reciprocating lever F by pin *f*. The reciprocating lever F is held in position by means of the metallic straps *g g*. (See Figs. 1, 3, and 4.)

The lever F is furnished with one or more tension-springs, G, arranged in such a manner that when the lever F is drawn out by the motion of shaft C, caused by the entrance of a person into the car, the recoil of the tension-spring G brings the said lever F back to its original position. (See Figs. 3 and 4, Sheet 2.)

Attached to the lever F is a pawl, H, which works in connection with the ratchet-wheel K, which ratchet-wheel K turns on the rigid shaft *l*. The pawl H has a wire spring, *m*, secured to it, for the purpose of controlling the said pawl H. (See Figs. 3 and 4, Sheet 2.) Secured to the side of the lever F is a locking-bar, *n*, for the purpose of preventing a reverse motion of the ratchet-wheel K, and locking the said ratchet-wheel K. (See Figs. 3 and 4, Sheet 2.) On the opposite side of the ratchet-wheel K, and working with it, is a pawl, M, provided with the tension-spring *o*, which, in connection with the locking-bar *n*, prevents the ratchet-wheel K from turning in either direction unless a person enters or leaves the car. (See same figures.) Placed above and secured to the ratchet-wheel K is a circular disk, P, through which passes the rigid shaft *l*. Above the disk P, and secured to it, is a smaller circular disk, R, through which, also, the shaft *l* passes. (See Figs. 1 and 5.) This disk R has its periphery cut with one tooth or cog. Passing around the rigid shaft *l*, and secured to it, is an arm, S. The outer end of arm S is formed into a sleeve, through which passes the vertical arbor *t*. (See Figs. 1 and 6.) On the lower end of arbor *t* is a disk, T,

having ten slots cut in its periphery, placed at equal intervals. (See Fig. 5.) The periphery of disk T between these slots is made concave, so as to correspond to, and adjust itself to, the periphery of the disk R, while the tooth or cog on the disk R plays into the slots on disk T. (See Fig. 5.) To the upper end of the arbor *t* is attached the cog-wheel T′, the teeth of which engage with the teeth of another cog-wheel, S′, which passes around the fixed shaft *l*, and above which cog-wheel S′, and secured to it, is the circular disk V. (See Fig. 6.) The cog-wheel S′ rests and turns on the washer placed on the shaft *l*. (See Fig. 1.) The disks R and V are each provided with bands, on which are painted or marked suitable figures for registering. (See Fig. 2.) For holding the disks R and V together a suitable disk or clamp, 3, slips over and is secured to shaft *l*. (See Fig. 1.) A series of disks provided with bands marked with numerals can thus be placed one above the other. This apparatus of registering-bands is placed in a box, with suitable openings for showing the figures as registry is made, a portion of which box is shown at 4 in Fig. 6.

The working and operation of my improvement are as follows:

When a passenger desires to enter the car he takes hold of one of the handles *c c* on one of the arms B, and turns the said arm B. This causes the double-crank A to revolve, and imparts motion to the vertical shaft C pivoted to it. The movement of the shaft C causes the disk or crank D to make a part of a revolution, which movement of disk D, by means of the connecting-rod E, draws forward the reciprocating lever F. This movement of the lever F causes the pawl H, controlled by the wire spring *m*, to slip over the teeth of the ratchet-wheel K. When the passenger, after entering within the arms B, lets go the handle *c*, the recoil of the tension-spring G carries back the lever F, and in so doing causes the pawl H, in its backward movement, to strike against one of the teeth of the ratchet-wheel K, and to move the said ratchet-wheel K the space of one of its teeth.

After the recoil of the spring G, and the movement of the ratchet-wheel K, the return of the lever F to its original position causes the locking-bar *n*, working in connection with the pawl M on the opposite side of ratchet-wheel K, to hold fast the ratchet-wheel K, so that it will not be turned in either direction until another passenger enters or leaves the car.

The movement of the ratchet-wheel K carries with it the circular disks P and R, which turn loosely on shaft *l*. The movement thus imparted to the disk R causes it to revolve and engage its tooth or cog with one of the ten slots into which the periphery of the disk T is cut. This disk T being connected, as before stated, to the rigid shaft *l* by arm S, the movement of the disk T causes the band-wheel, marked with figures on disk R, to revolve and register. After this band-wheel on disk R has registered 9, and before it comes to the next numeral, the teeth of the cog-wheel S′, secured to the disk V above it, engage with the teeth or cogs of cog-wheel T′, and cause the band-wheel secured around the disk V to revolve and register.

By a series of cog-wheels, like S′ and T′, one of which is secured on shaft *l* to disks, around which band-wheels, marked with proper numerals, are attached, a registering mechanism may be formed which will register to an indefinite number.

When a passenger leaves the car the same process as detailed above is repeated, and a registry is made.

By dividing the number of passengers registered by two the proper number of fares for which the register is responsible is obtained.

As will be readily seen, the position of the arms B on the platform of the car does not at all interfere with the passage of the conductor to and fro from the platform to the body of the car, and vice versa.

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

1. A turnstile for a car or other vehicle, constructed with a double crank, A, and its attachments, connected with a registering mechanism, substantially as described, and so arranged as to register a passenger both on entering and leaving the car or other vehicle, or either on entering or leaving the car, and also so arranged as to permit the conductor to pass in and out of the car without registering.

2. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, pawl H, and ratchet-wheel K, substantially as described.

3. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F and connecting-rod E, pawl H, and ratchet-wheel K, substantially as described.

4. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, pawl H, ratchet-wheel K, and disks R and T, substantially as described.

5. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, pawl H, tension-spring G, ratchet-wheel K, and disks R and T, substantially as described.

6. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, connecting-rod E, pawl H, tension-spring G, ratchet-wheel K, and disks P, R, and T, substantially as described.

7. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, pawl H, tension-spring G, ratchet-wheel K, disks P

and R, and disk T, and disks S′ and T′, substantially as described.

8. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, tension-spring G, pawl H, and ratchet-wheel K, substantially as described.

9. The combination of the double crank A, provided with the arms B and vertical shaft C, with the reciprocating lever F, tension-spring G, pawl H, ratchet-wheel K, disks R and T, and disks S′ and T′, substantially as described, and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 5th day of April, 1877.

BENJAMIN F. CARD.

In presence of—
CHARLES G. COE,
LOUIS W. FROST.