(No Model.)

J. H. GREENLEAF.

TURNSTILE.

No. 349,156. Patented Sept. 14, 1886.

Fig. 1.

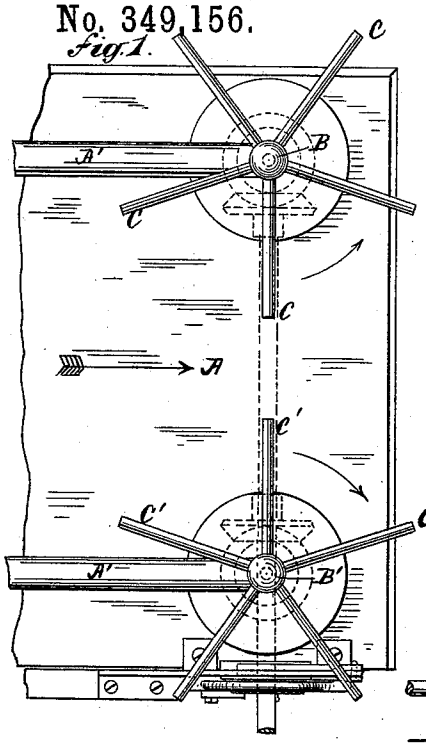


Fig. 2.

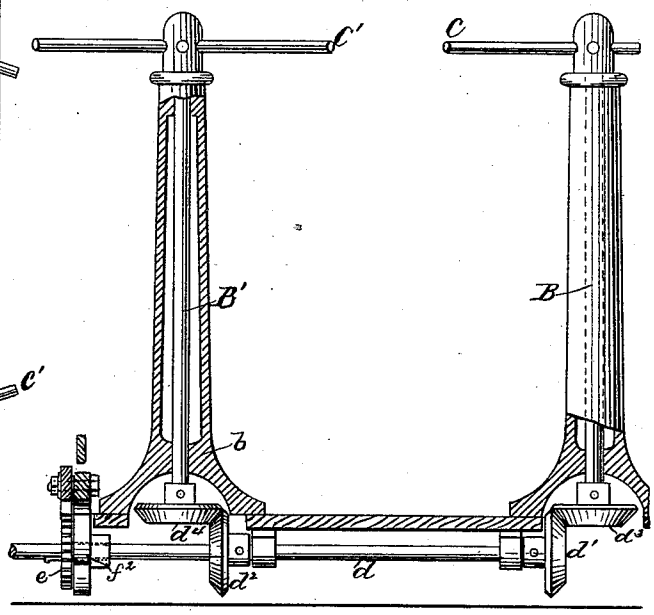


Fig. 3.

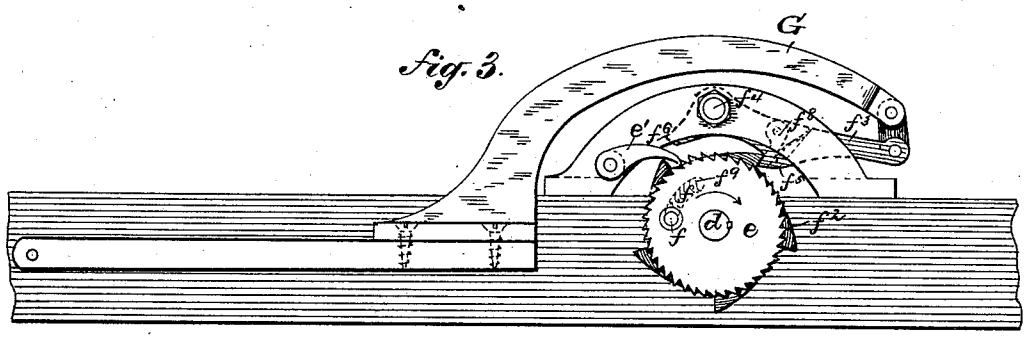
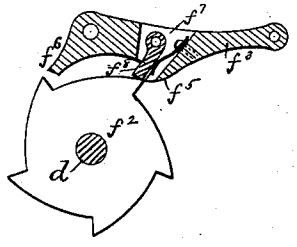


Fig. 4



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UNITED STATES PATENT OFFICE.

JOSEPH H. GREENLEAF, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO EDWARD A. BRADFORD, OF BROOKLYN, NEW YORK.

TURNSTILE.

SPECIFICATION forming part of Letters Patent No. 349,156, dated September 14, 1886.

Application filed November 12, 1885. Serial No. 182,519. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. GREENLEAF, of New Haven, county of New Haven, State of Connecticut, and a citizen of the United States, have invented an Improved Turnstile, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a turnstile device to admit the passage singly and in succession of persons through an entrance or passage-way—as, for example, where fares or tickets are collected; and it consists of two vertical revoluble posts or shafts placed one on each side of the passage-way, and each carrying the same number of horizontal radial arms, so that an arm of one post will extend opposedly endwise to an arm of the other post, likewise extended, substantially to the middle of said passage-way, together with mechanism, substantially as hereinafter described, between and connecting the said posts, whereby the rotation of one post will cause a simultaneous and concurrent rotation of the other post, so that the passing of a person between the posts, and thus through the stile, will, by contact of the person with one or both of the opposed arms, rotate the stiles and bring the next succeeding pair of arms to an opposed position across the passage-way; and my invention furthermore consists in a clutch device, substantially as hereinafter described, which, in combination with the aforesaid turnstile device, fixes the direction of and limits the period or distance of the rotation of the turnstiles, or prevents such rotation, so that the attendant is enabled to control the operation of the turnstile, all as hereinafter set forth.

Figure 1 is a turnstile device containing my invention. Fig. 2 is an end elevation, partly in vertical section, of the same. Fig. 3 is a detached side elevation of the clutch device, and Fig. 4 is a detail view of parts of said clutch.

At A is shown a passage-way, which may be bounded by a guide-railing, A′, leading to the turnstile.

B and B′ are vertical posts or shafts set one at each side of the passage and arranged to be revoluble in suitable bearings, as shown at *b*. The posts carry the fixed horizontal radial arms C and C′, respectively, there being the same number on each post and arranged equidistant from each other on the respective posts. The arms are of such length that they will extend to the middle, or nearly so, of the passage, so that each pair of arms, one extending from each post, will be opposedly in line with each other, and thus bar the passage. Each pair of arms will thus, when brought into endwise opposed position by the rotation of the posts, successively bar the passage. I preferably employ the following-described mechanism between and connecting the posts to secure the simultaneous and concurrent rotation of both when either post is rotated, although any other known and equivalent devices may be employed for this purpose. A horizontal shaft, *d*, is hung in bearings beneath the flooring of the passage, in line with and extending between the lower ends of the posts. This shaft carries the bevel-gears d' and d^2, which respectively engage bevel-gears d^3 and d^4 on the lower ends of the posts B and B′, respectively. The rotation of the posts will thus be simultaneous and concurrent.

The clutch device which I preferably employ in combination with the described turnstiles, to fix the direction and limit the extent of the rotation of the stiles, is as follows: A ratchet-wheel, *e*, is keyed to the shaft *d*, and is provided with a pawl, e', arranged as shown in Fig. 3, so that the shaft *d* is free to turn in the direction in which it is rotated by the posts B and B′ when a person passes forward through the stile, and its rotation in the opposite direction, and consequently the reverse turning of the stile-posts, is stopped. A ratchet-wheel, f^2, is mounted on the shaft *d*, and is connected to and engages the ratchet-wheel *e* by means of a stud, *f*, on f^2, which plays in a slot, f', in wheel *e*, together with a collar on the shaft *d*, as shown. The teeth of the wheel f^2 are equidistant from each other and equal in number to the pairs of stile-arms C C′ on the posts B B′. These teeth of the wheel f^2 are projected or directed in the direction opposite to that of the projection of the teeth of the wheel *e*.

Pivoted at f^4 to a suitable frame is the lever f^5, the short arm of which constitutes a dog, f^6, and the long arm of which carries the

dog f^6. In the slot f^7 in the lever, in front of the face of the dog f^5, is pivoted the pawl f^8, adapted to rest upon the face of the dog f^5, and when thus placed to be substantially equal in length to the dog, and said pawl is provided with a spring, as shown in Fig. 4, to lift it off and away from the face of the dog f^5. When thus lifted and swung away from the dog f^5, the end of the said pawl will project from the slot in the lever downwardly and in front of the nose of the dog. The dogs f^5 and f^6 are the same distance apart as the distance from tooth to tooth on the ratchet-wheel f^2, and the dogs are relatively of such a length or projection that when the long arm of the lever f^3 is swung downward and the dog f^5 engages a tooth on the wheel f^2 the dog f^6 on the short arm of the lever will be in line above, but out of engagement with, the next succeeding tooth of said wheel, and that when the lever is swung so as to disengage the dog f^5 and its pawl from the face of its tooth the dog f^6 will be swung into engagement with the next succeeding tooth, which, as stated, is then immediately below said dog. The pawl f^8 will, while the dog f^6 engages a tooth, be carried or thrown forward onto the rim of the ratchet f^2 by its spring, and, the lever f^3 being swung backward or reversely, the play of the pawl f^8 forward in its slot in the lever will permit this to be done, while the nose of the dog f^6 will be drawn from engagement with its said ratchet-tooth. As the ratchet-wheel f^2 is revolved, the pawl f^8 will ride on the rim of the wheel, holding the dog f^5 out of engagement with the tooth it has just left, and said pawl will then next engage the tooth just escaped from the dog f^6, and the further motion of the wheel will force the spring-pawl back against the dog f^5, when the ratchet will be stopped. The slot f', in which the stud f engages, is curved coincidently with the rim of the ratchets, and, preferably, has a spring, f^9, bearing on the stud, so that the stud will have play or yielding engagement, thereby avoiding a shock and breakage of the several connected parts when the shaft d is suddenly checked by the dogs. The ratchet-wheel f^2 is arranged on the shaft d relatively to arms C C' on the stile-posts so that when the arms are extended opposedly in pairs across the passage-way the dog f^5 will engage a tooth on the ratchet-wheel. An operating-lever, G, is preferably employed, linked to the lever f^3, and desirably so located and arranged as to be operated and controlled by the foot of the stile attendant. By lifting said lever G the lever f^3 will be swung upward to release the dog f^5, the other arm of said lever f^3 being swung down, so that the dog f^6 engages the next tooth of the pinion. While the posts are in this position, it is intended that the person desiring to pass through the stile should pay a fare, deposit a ticket, or perform whatever act is required to obtain passage, when the attendant will disengage the dog f^6 by allowing the operating-lever G to descend, thus reversely swinging the lever f^3, when the stile may be rotated to enable the person to pass through, and the next succeeding pair of arms on the posts be closed in across the passage in front of the next succeeding passenger.

Any other known or equivalent clutch device may be employed in combination with my described turnstiles which will fix and limit the direction and duration of the rotation of the stiles; and it is evident that my described clutch device may be employed in combination with a turnstile composed of only a single post bearing radial arms.

By means of my described devices persons must pass through the stile in single file, and can pass through successively in a straight line, and without having to turn sidewise in order to rotate the stiles, and a person so passing will rotate both stiles simultaneously and concurrently, and the attendant can so control the stile as to prevent the passage of any person who fails to pay the fare, and can, furthermore, open the stile for a passenger, and that the stile will then lock itself and bar the passage of the next passenger until the attendant unlocks the stile.

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

1. In a turnstile device, the combination of two vertical revoluble posts, one on each side of a passage-way, carrying each an equal number of radial arms adapted to extend successively in pairs, opposedly endwise, across and bar the passage, a shaft geared to and connecting said posts and limited to rotation in one direction only, a ratchet-pinion on said shaft having teeth equal in number to the said pairs of arms, and an operating-lever provided with dogs engaging said pinion, as described, whereby the rotation of the shaft is controlled, as and for the purpose specified.

2. In combination with a turnstile device composed of radial arms arranged to bar a passage-way successively in pairs extending opposedly endwise from revoluble upright posts, and mechanism intermediate the posts whereby the same have a simultaneous and concurrent rotation, the clutch device composed of the ratchet-pinion e and pawl e', and the ratchet-pinion f^2, lever f^3, carrying dogs f^5 and f^6, and spring-pawl f^8, constructed and arranged to operate as and for the purpose set forth.

3. A clutch device for turnstile-shafts and other purposes, composed of the ratchet and pawl e e', the ratchet-pinion f^2, having stud f, engaging slot f', and the lever f^3, fulcrumed at f^4 and carrying dogs f^5 and f^6, and slotted at f^7 to receive spring-pawl f^8, together with an operating-lever, substantially as described, all constructed to operate as and for the purpose specified.

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ELI MIX.